SELVA: Investigación para la Conservación en el Neotrópico

Fall stopover ecology of the Blackpoll Warbler on the Guajira Peninsula, Colombia

Preliminary Results Fall 2017

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SELVA: Investigación para la Conservación en el Neotropico

BACKGROUND

Many abundant and widespread species of Nearctic-Neotropical migratory birds are showing steep declines, among them the Blackpoll Warbler. The causes of these declines are many and no one single factor can explain the declines observed in a diverse array of species. The Blackpoll Warbler differs from many species of long-distance migratory passerines in having a fall migration strategy shared by few others. The majority of migratory birds that winter south of the United States typically migrate towards the Gulf Coast before crossing to the Yucatan or circumventing the Gulf of Mexico, in order to enter Central America. In contrast, Blackpoll Warblers migrate east or southeast towards the Atlantic coast of northeastern North America before flying southwards across the Atlantic Ocean towards the eastern and central Caribbean and South America. This unique and extremely demanding strategy involves over-water flights greater than 2500 km, which likely represent the physiological limit for small migratory passerines. To successfully complete their migration, birds must encounter both high quality stopover (fuelling) habitats in North America, as well as quality habitats where they can recover following long-haul flights. Given the demanding nature of the species' migratory strategy, loss of quality stopover habitat has the potential to be a key driver of declines in Blackpoll Warblers.

Endurance flights, such as those exhibited by Blackpoll Warblers, may require birds to consume part of their digestive organs, flight muscle, among other structures to provide emergency fuel. These structures must then be rebuilt on arrival, likely placing high energetic demands on birds on arrival in northern South America. The same sites used for recovery are also likely used in order to gain the fuel for the final flight to the wintering grounds further south in Venezuela, Colombia and Ecuador. Despite the obvious importance of the regions in northern South America used following trans-oceanic flights, no studies have documented where birds arrive along the Caribbean coast of South America, the condition of birds on arrival or habitat use.

In 2016, occupancy surveys were carried out across northern Colombia under the Neotropical Flyways Project, revealing high numbers of Blackpoll Warblers in dry scrub habitats on the Guajira Peninsula, northeastern Colombia. This concentration of warblers was previously undocumented and likely relates to birds making stopovers on arrival in South America.

In order to understand the stopover ecology of Blackpoll Warblers on the Guajira peninsula and understand the needs of birds there, we established a constant effort mist-netting station during the fall migration of 2017. The study had the following aims:

AIMS

- Determine the phenology of migration of Blackpoll Warblers on the Guajira peninsula
- Assess the condition of Blackpoll Warbler on arrival in the Guajira peninsula
- Estimate stopover durations based on captures and recaptures
- Estimate fuel deposition rates based on changes in body mass between captures
- Estimate departure masses based on fuel deposition rates and stopover durations

METHODS

CONSTANT EFFORT MIST-NETTING

- 2 banders
- 2 mist-netting sites
- Low xerophytic scrub vs scrub – tropical dry forest transition
- Daily from 22 Sep – 08 Nov.
- 14 mist nets
- 2766 mist net hours

MIGRATION COUNTS

- Daily morning counts
- Typically 3 hours
- 21 September – 23 October

FORAGING OBSERVATIONS

- Timed sequences
- Directional movements bill = attack
- 5 Substrates: Insects small, medium, large, flower, fruit.
- Most birds consuming insects, especially small caterpillars, some birds observed consuming fruit.

RESULTS – SPECIES COMPOSITION (1,202 migrants banded)

Mist-netting confirmed the species composition described by occupancy surveys carried out under the Neotropical Flyways Project in 2016. One notable exception was the capture of 8 Connecticut Warblers, a species that was not detected during observations. As expected from occupancy surveys, Blackpoll Warbler was the commonest migrant in the region.

Species*	Scientific Name	Banded	Recaptures
Yellow-billed Cuckoo	*Coccyzus americanus*	11	1
Willow Flycatcher	*Empidonax traillii*	44	2
Trails Flycatcher	*Empidonax traillii/alnorum*	24	2
Alder Flycatcher	*Empidonax alnorum*	26	1
Great-crested Flycatcher	*Myiarchus crinitus*	5	
Veery	*Catharus fuscescens*	61	4
Gray-cheeked Thrush	*Catharus minimus*	5	
Black-whiskered Vireo	*Vireo altiloquus*	4	
Red-eyed Vireo	*Vireo olivaceus*	6	
Yellow-green Vireo	*Vireo flavoviridis*	79	
Tennessee Warbler	*Leiothlypis peregrina*	2	
Yellow Warbler	*Setophaga petechia*	74	1
Blackpoll Warbler	*Setophaga striata*	602	38
American Redstart	*Setophaga ruticilla*	25	
Northern Waterthrush	*Parkesia noveboracensis*	192	23
Prothonotary Warbler	*Protonotaria citrea*	26	1
Connecticut Warbler	*Geothlypis agilis*	8	

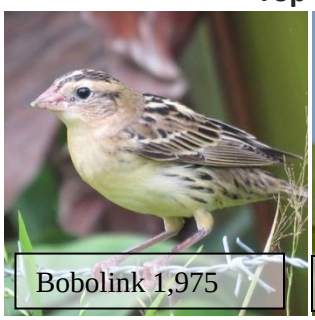
*8 species were captured on just one occasion: Gray Kingbird, Baltimore Oriole, Chestnut-sided Warbler, Bay-breasted Warbler, Mourning Warbler, Dickcissel, Indigo Bunting, Rose-breasted Grosbeak.

MIGRATION COUNTS

>10,000 migrants recorded

Top Five


Dickcissel 6,498

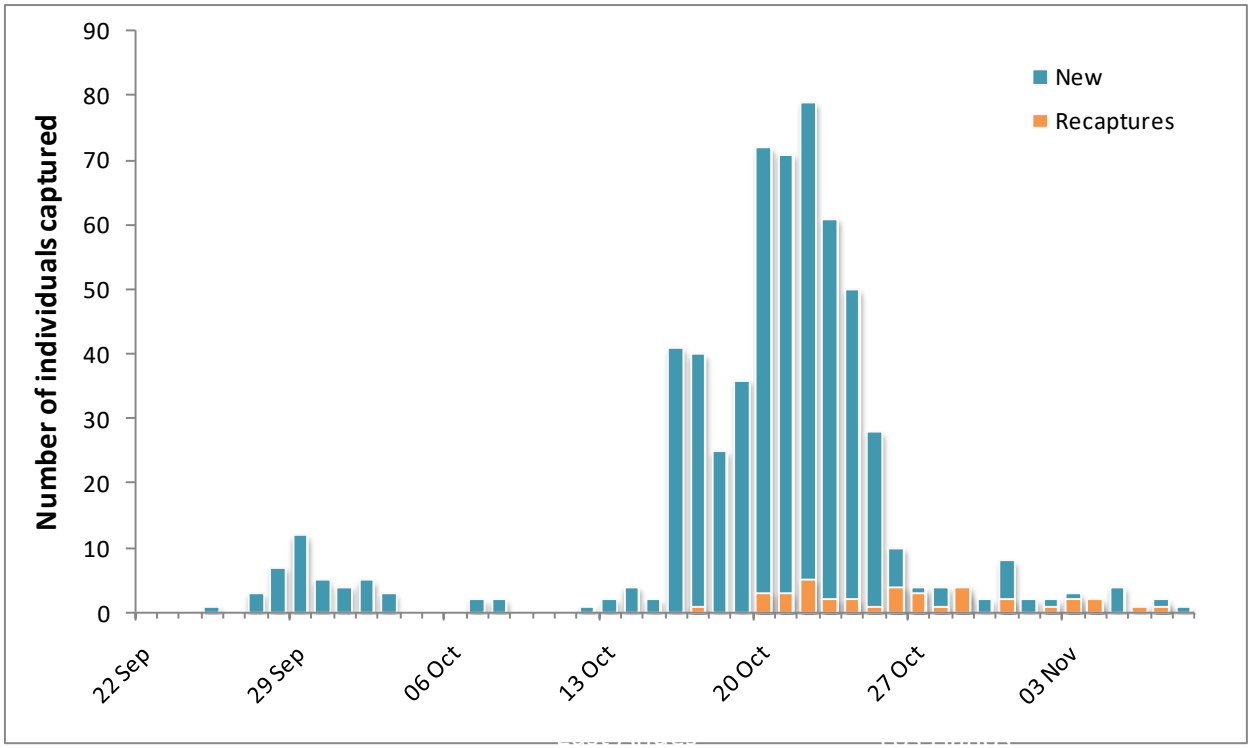

Bobolink 1,975

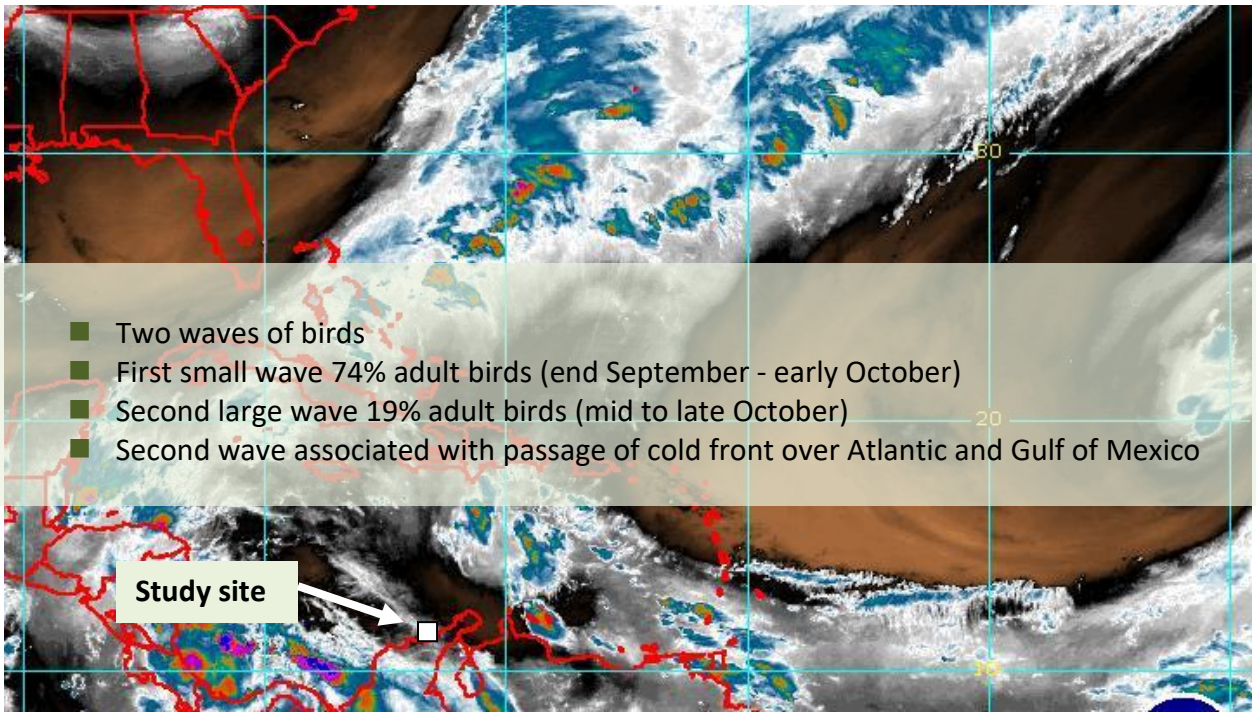

Eastern Kingbird 662


Gray Kingbird 411

Blackpoll Warbler 410: On peak arrival days, Blackpoll Warbler were observed migrating overhead throughout the morning in loose groups of up to 20 birds.

RESULTS – PHENOLOGY

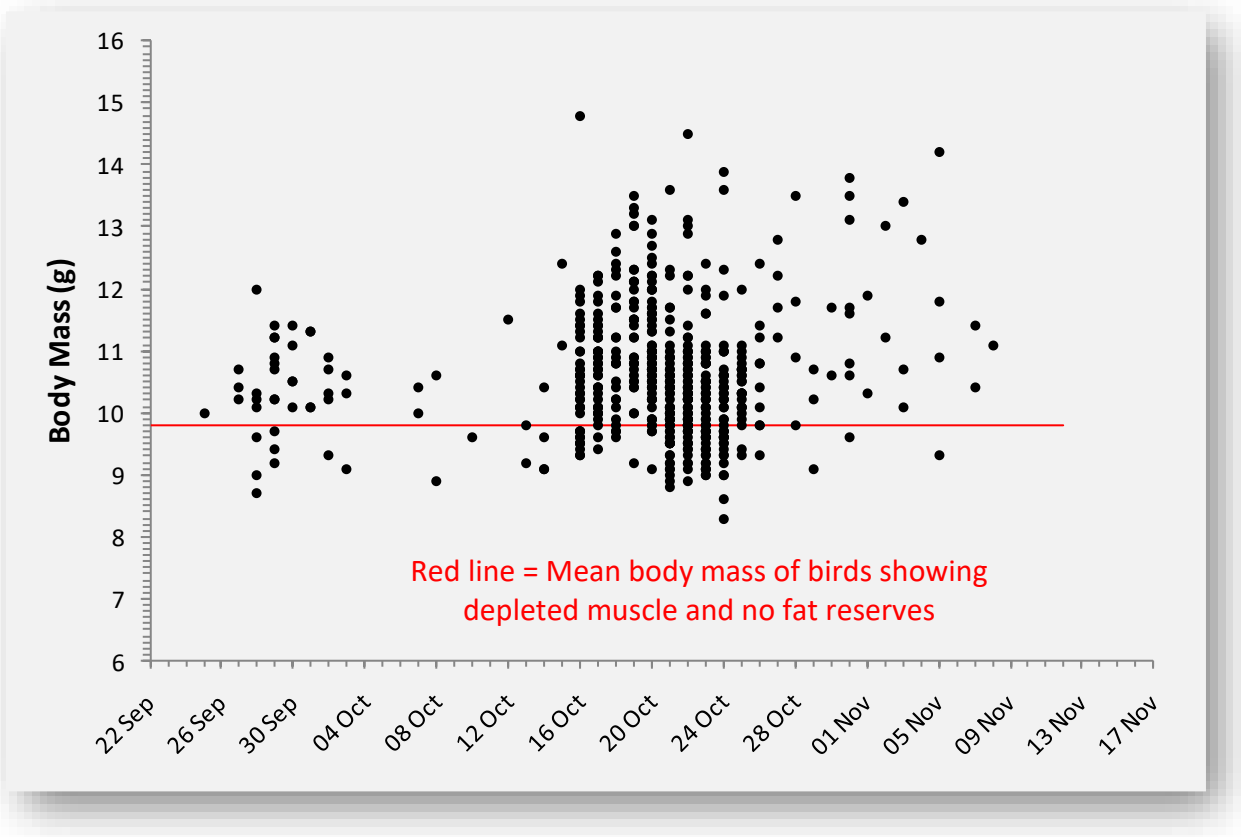


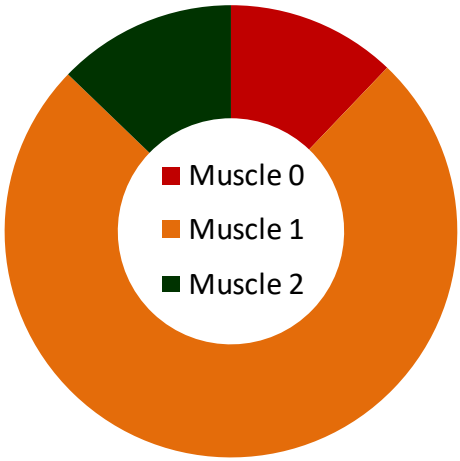


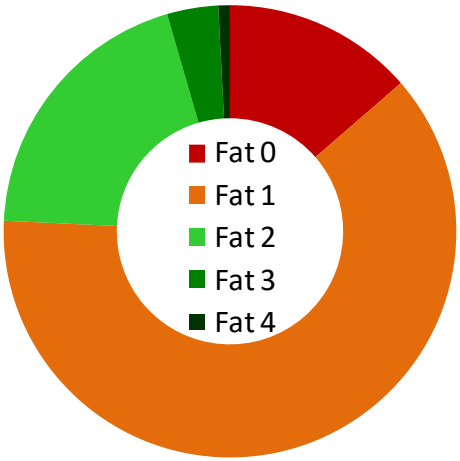
19th October 2017 - Cold front over the Atlantic generating northerly winds.

RESULTS – ARRIVAL BODY CONDITION

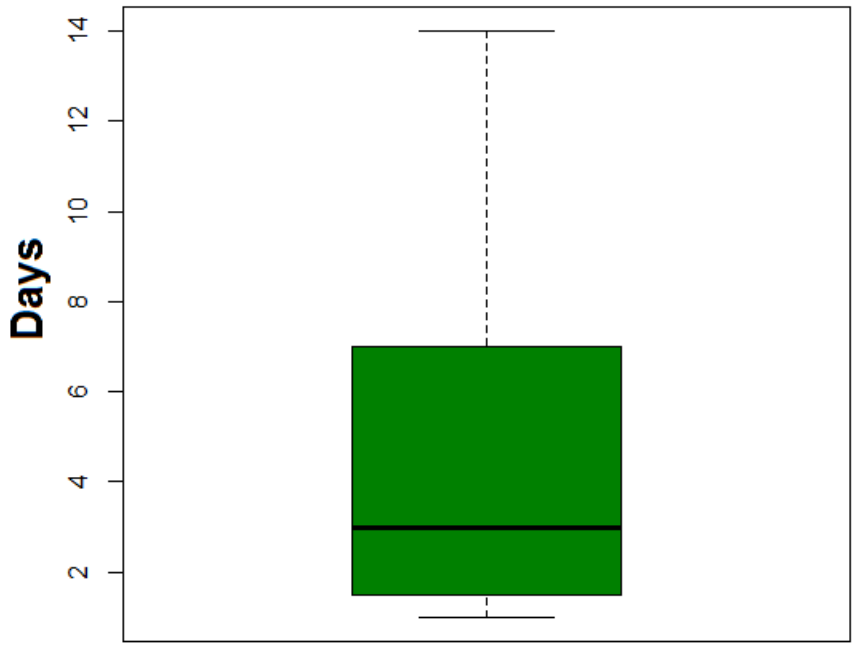
- Muscle depleted or fat depleted birds represent around 20% of population
- Degree of depletion appears to depend on arrival day





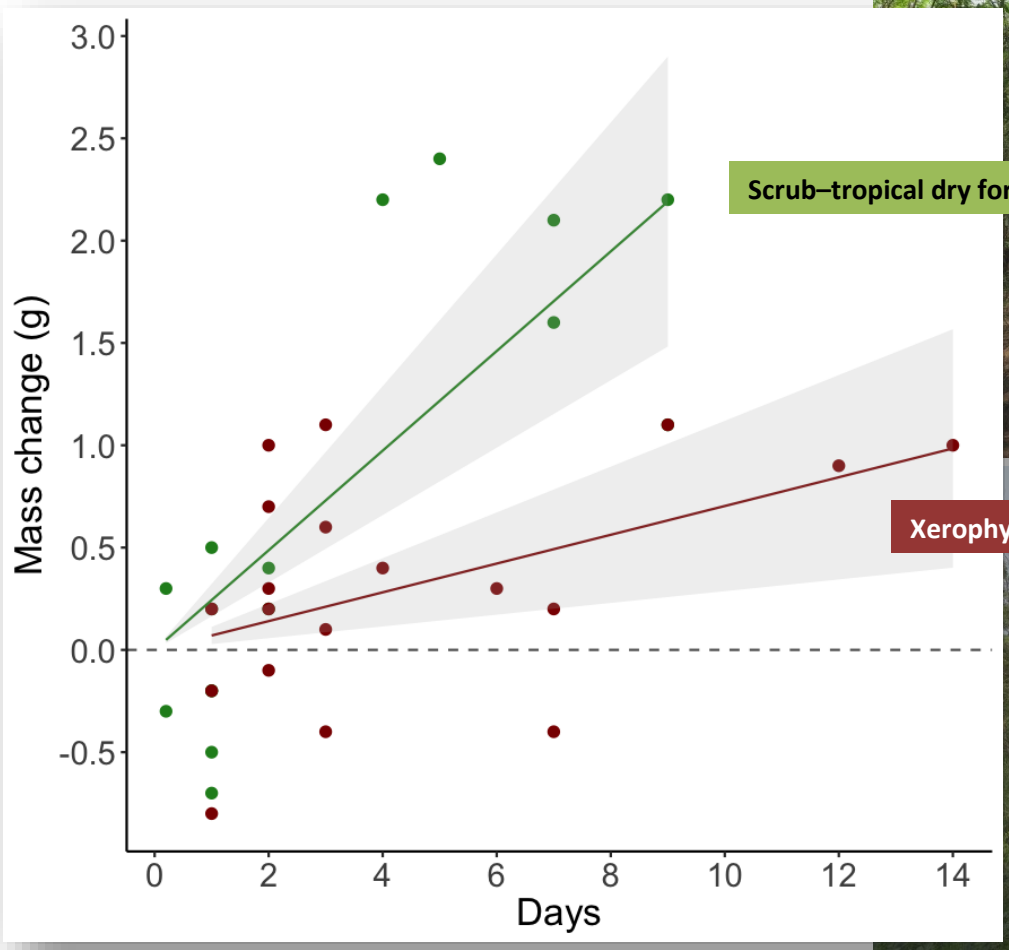


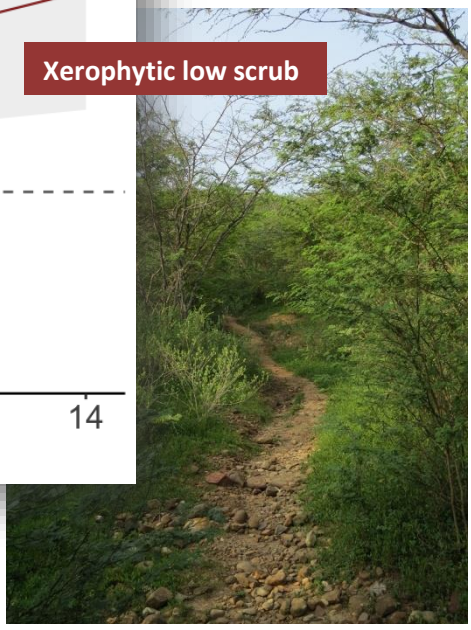
RESULTS – MINIMUM STOPOVER DURATION



- Minimum durations (days elapsed between first and second capture) varied from 1 -14 days
- Apparent difference between habitats (see below)
- True stopover duration likely to be around 6 days

RESULTS – BODY MASS CHANGE





- Maximum body mass changes represent around 25% of lean body mass
- Birds in taller vegetation (green symbols) gained mass faster
- Birds in lower dry scrub (red symbols) struggled to regain mass
- Limited gains may be related to need to rebuild structures such as flight muscles

TAKE HOME MESSAGES

- Blackpoll Warblers are highly abundant on the Guajira Peninsula during fall migration.
- Many birds arrive in poor body condition, often having consumed their flight muscle.
- Both stopover durations and body mass gains indicate that birds undertake multi-day stopovers to recover from over-water flights and prepare for onward migration.
- Ability to gain mass and increase fat reserves appears to depend on vegetation type, with stands of higher acacia trees supporting faster rates.
- Birds in stands of tall acacia trees were largely observed consuming small caterpillars.
- Based on initial data, the xerophytic scrub and tropical dry forests of the Guajira peninsula appear to be a crucial resource for Blackpoll Warblers during fall migration.

TOTAL BUDGET $6,700 USD

DONORS
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