Advances in the study and conservation of waterbirds and shorebirds in Cuba

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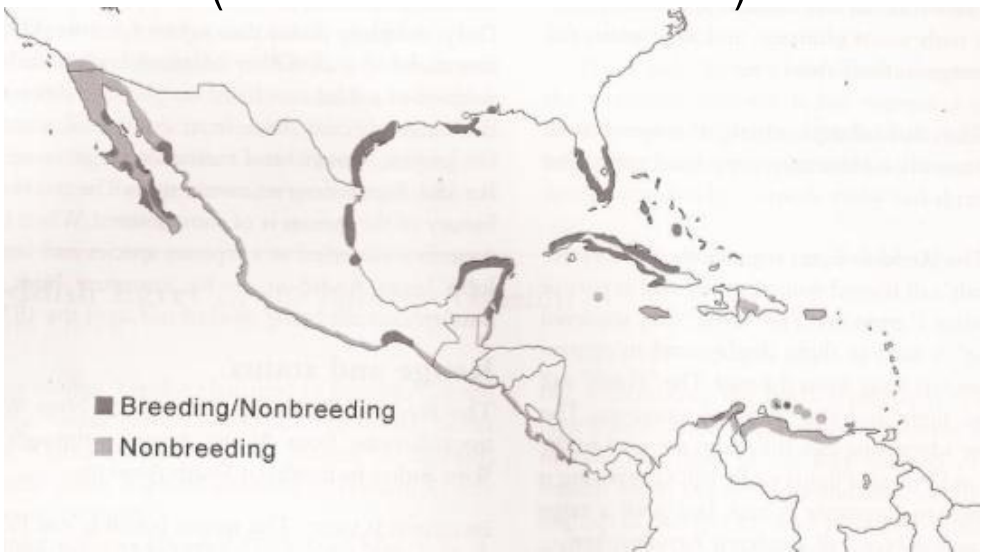
Clinal variations in the morph ratio of Reddish Egret (*Egretta rufescens*) in Cuba

Ariam Jiménez, Alieny González, Ianela García-Lau, Lourdes Mugica y Martín Acosta

Reddish Egret *(Egretta rufescens)*

Near threatened

(BirdLife International 2012)



Small population size (5,000-7,000 individuals; Green 2006)

Limited distribution

Habitat specialist

WATERBIRDS

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Current Status of Reddish Egret (*Egretta rufescens*) in Cuba

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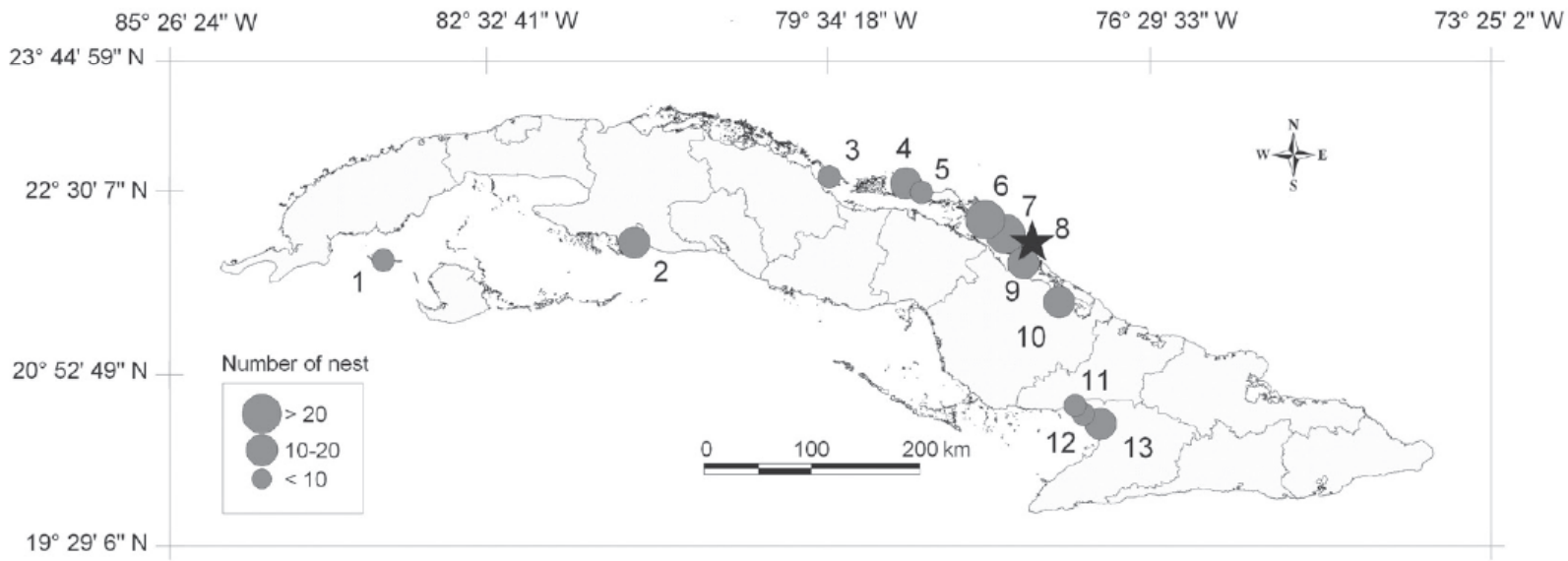
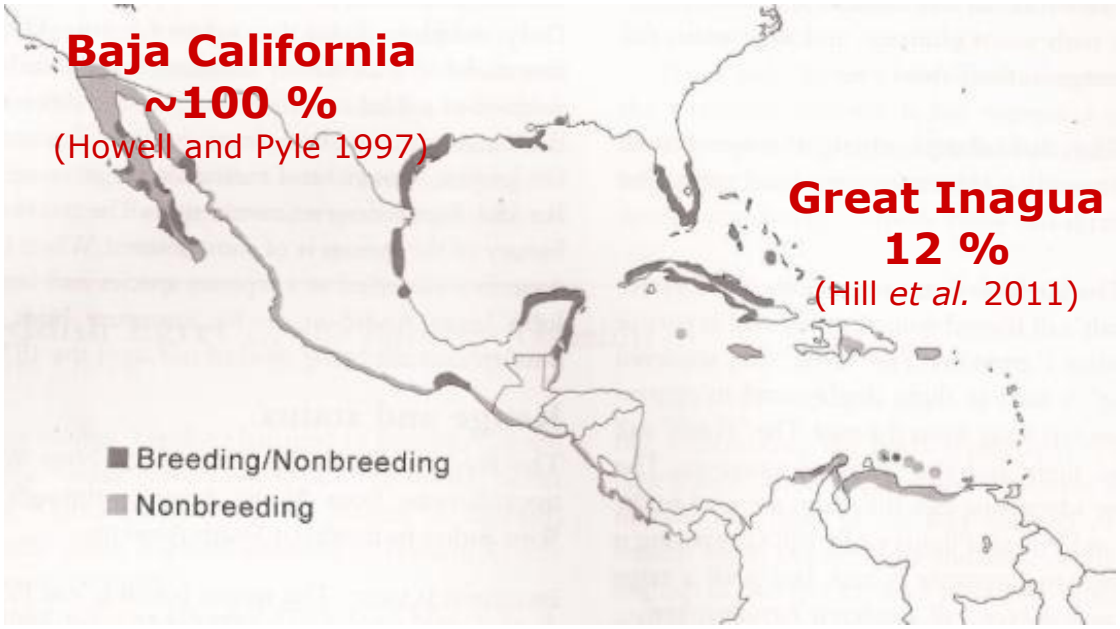
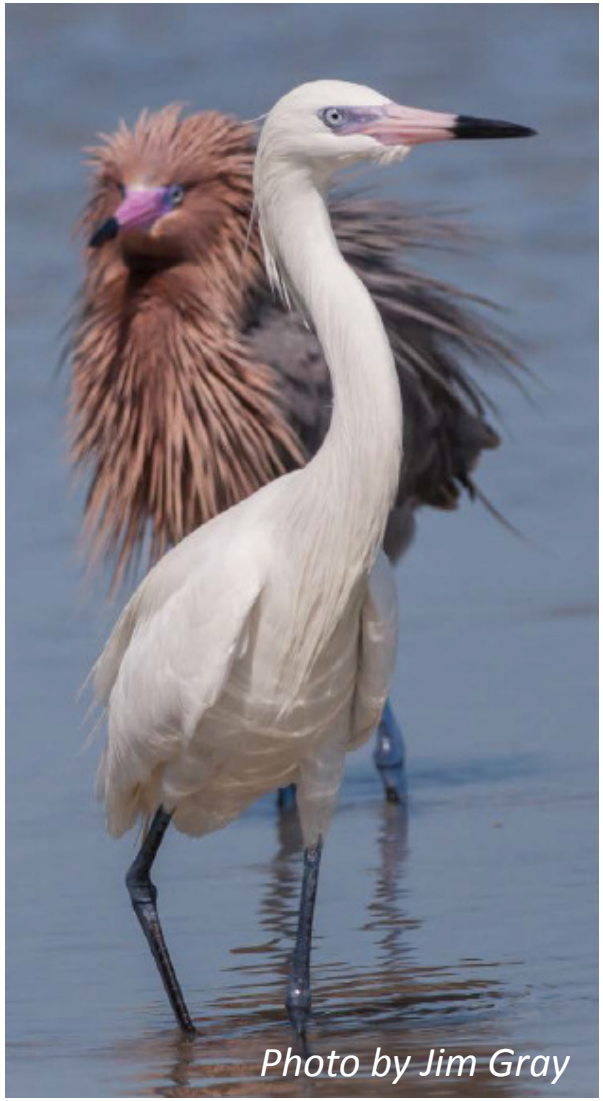


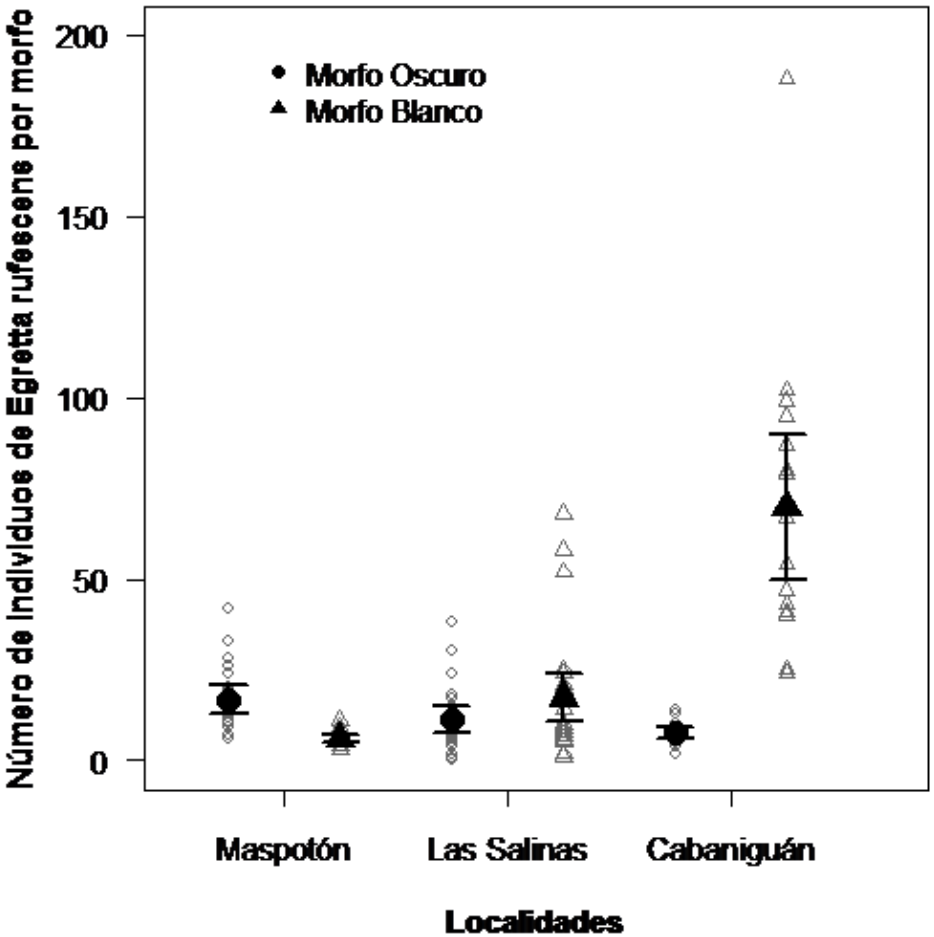
Figure 1. Breeding sites of Reddish Egrets (*Egretta rufescens*) in Cuban coastal saline habitats. Number of nests at breeding sites ranged from 2 to 27. The star indicates a confirmed nesting site, but no information on the number of nests exists (1: Cayos de San Felipe; 2: Las Salinas, Ciénaga de Zapata; 3: Cayo Fragoso; 4: Cayo Las Palmas; 5:



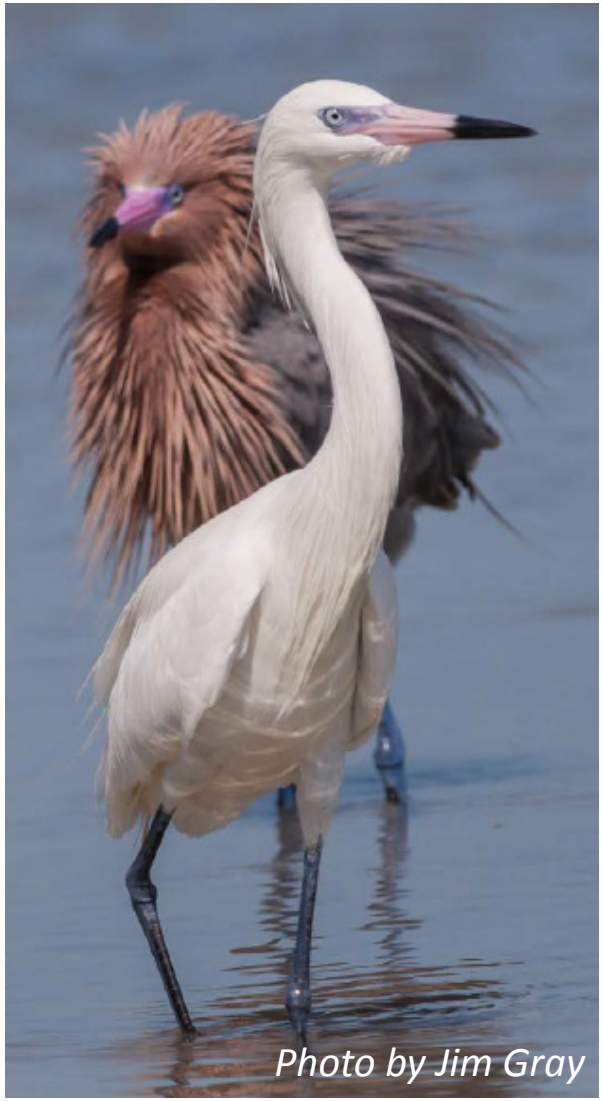
Reddish Egret *(Egretta rufescens)*



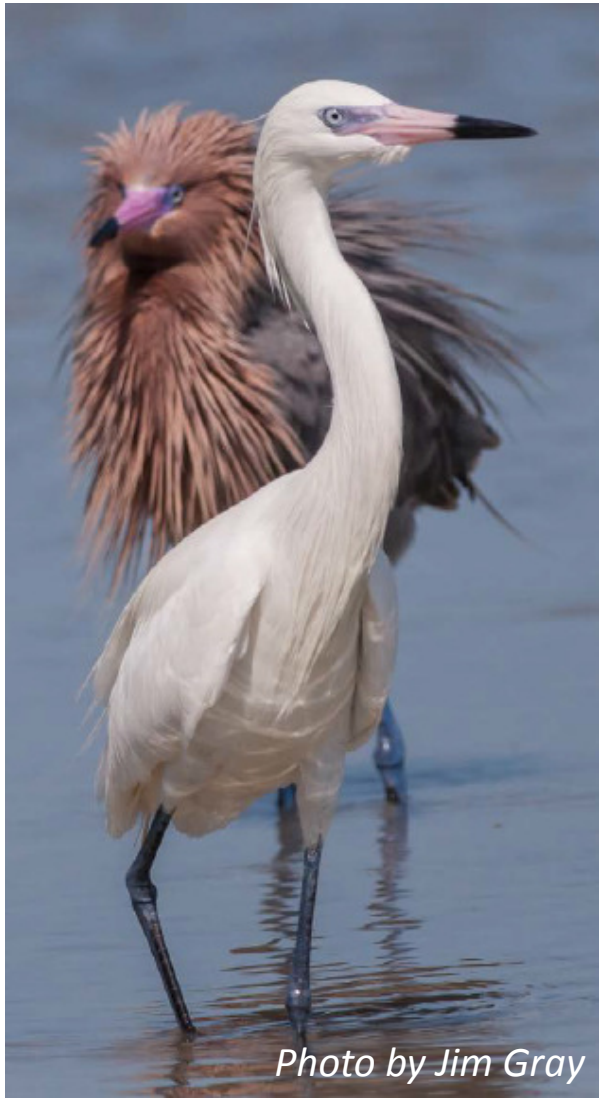
Cuba: 63% dark morph



Reddish Egret *(Egretta rufescens)*



Reddish Egret *(Egretta rufescens)*



Plumage polymorphism in Ardeidae

Objectives:

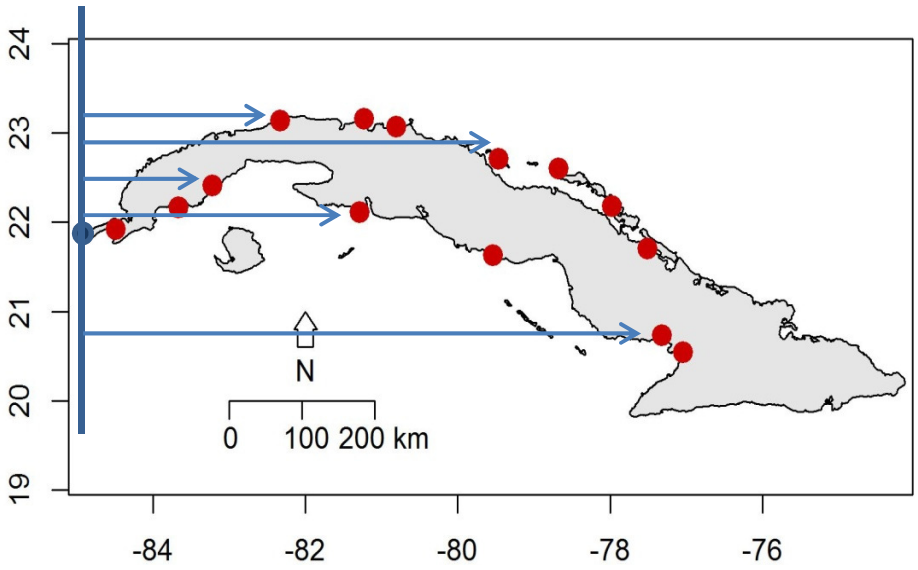
1) to explore whether the species exhibits clinal variation within Cuba in the ratio of its two morphs, and

2) whether this is associated with different seasonal patterns in rainfall across Cuban coastal habitats (Glogger's rule)

METHODS

- 14 sampled sites

- Number of foraging birds by morph



CSA: Cabo de San Antonio
(Westernmost point of Cuba)

- 5 competitive models for clinal assessment:

Dark morph ratio =

- Coast
- Distance
- Coast + Distance
- Coast + Distance^2
- NULL

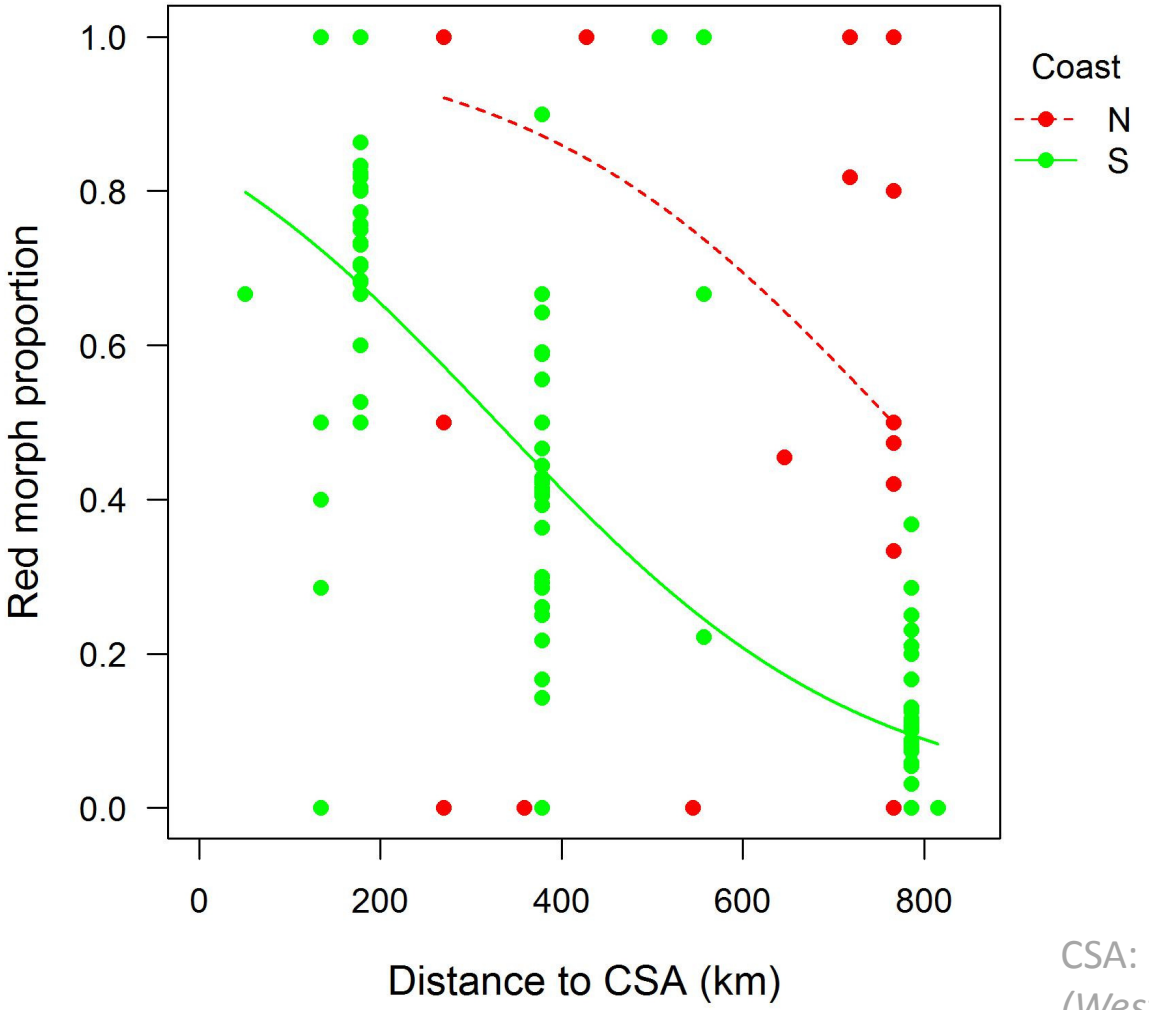
RESULTS

Consistent geographic variation suggests adaptative explanations

	K	ΔQAICc	ω
Coast + Distance^2	5	0.00	0.56
Coast + Distance	4	0.47	0.44
…			
NULL	2	418.82	0.00

RESULTS

Consistent geographic variation suggests adaptative explanations



CSA: Cabo de San Antonio
(Westernmost point of Cuba)

CONCLUSIONS

•Results provide strong support for a clinal pattern of dark morph variation in Cuba (higher frequency of dark morphs in the west).

➢ *Is that an adaptative response to cope with wetter environments (e.g. degrading bacteria, feather abrassion)?: Glogger's rule.*

➢ *Is the high within site variation in dark morph ratio related with local predator-prey interactions?*

Bill size of Least Sandpiper (*Calidris minutilla*) varies with prey availability in Cuba

Ariam Jiménez, Ianela García-Lau, Alieny González, Lourdes Mugica, Martín Acosta, Ron Ydenberg, and Robert W. Elner

Ecology, 88(3), 2007, pp. 781–791

LATITUDINAL CLINES IN FOOD DISTRIBUTION CORRELATE WITH DIFFERENTIAL MIGRATION IN THE WESTERN SANDPIPER

Kimberley J. Mathot,[1,3] Barry D. Smith,[1,2] and Robert W. Elner[1,2]

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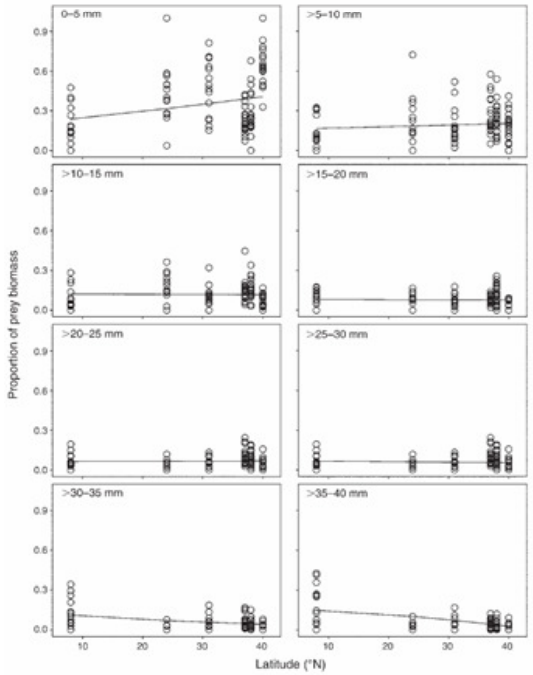
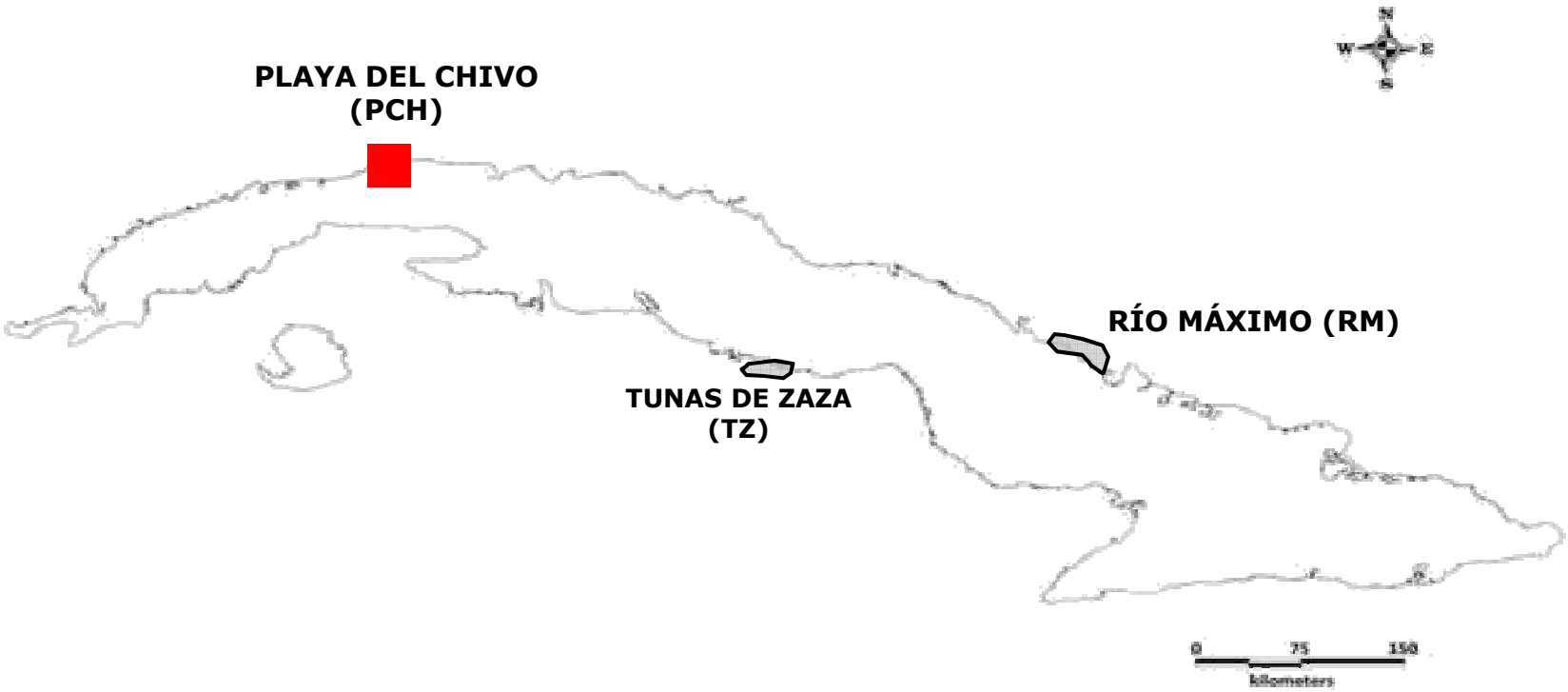
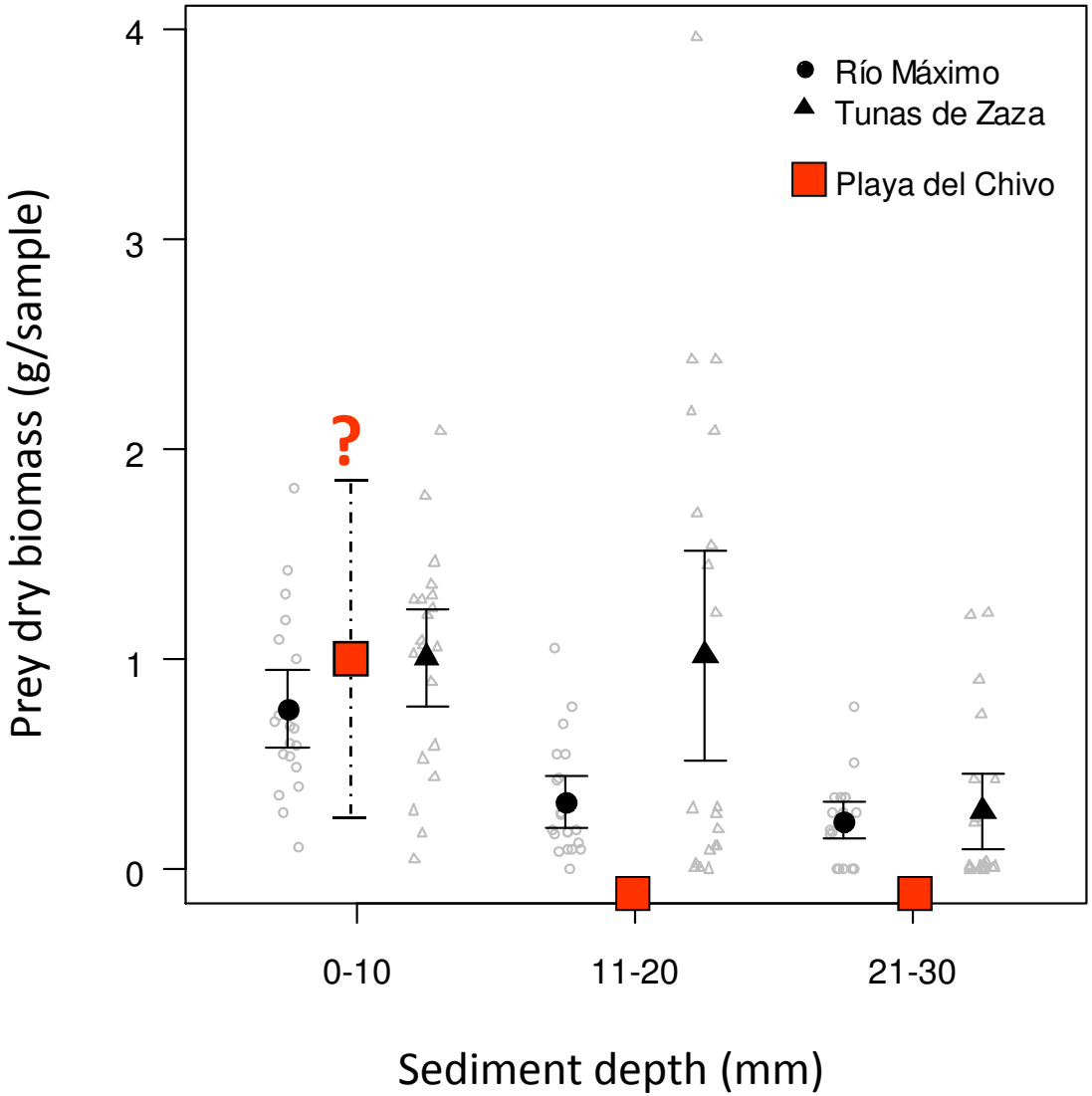
[2]*Pacific Wildlife Research Centre, Canadian Wildlife Service, Environment Canada, RR1, 5421 Robertson Road, Delta, British Columbia V4K 3N2 Canada*




PLAYA DEL CHIVO
(PCH)
RÍO MÁXIMO (RM)
TUNAS DE ZAZA
(TZ)
N
W
E
S
0
75
150
kilometers

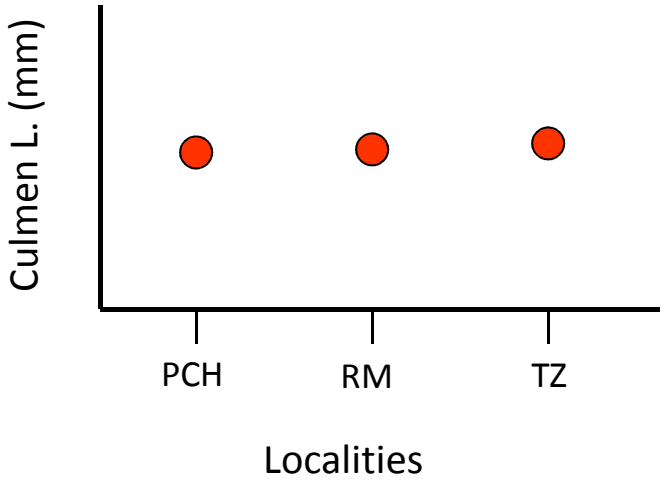


PLAYA DEL CHIVO (PCH)

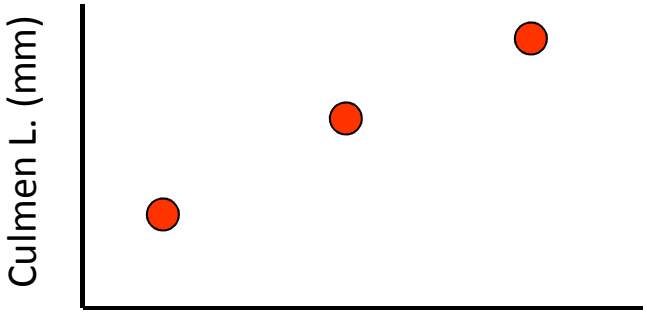
Our question:

Is sex ratio and/or bill length variation of Least Sandpiper and adaptation to reduce resource competition while wintering in Cuba?

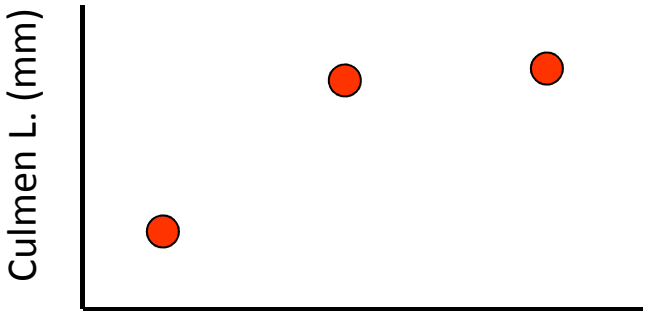
H1: NULL model



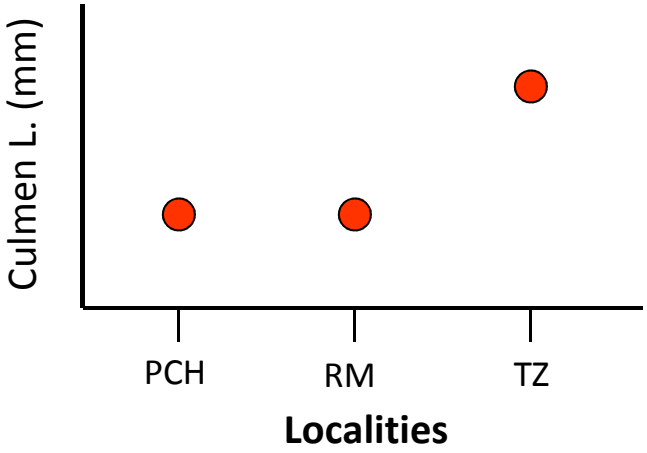
H2: PCH, RM, TZ
Bill length varies with prey availability

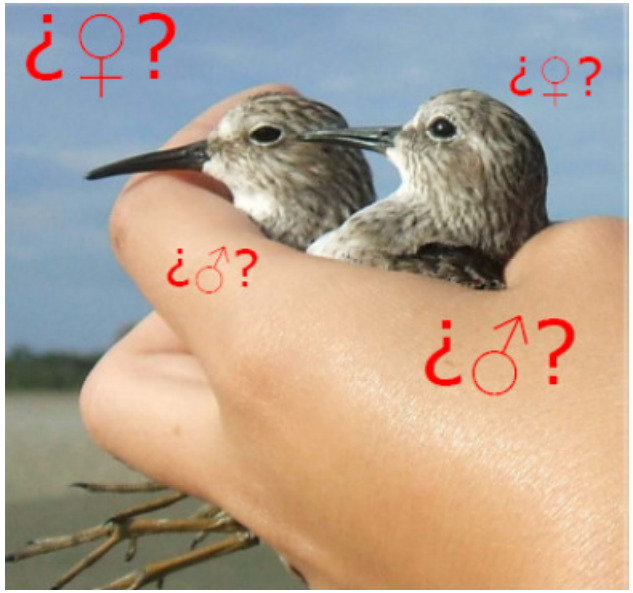


H3: PCH, RM = TZ
Bill length varies according to the type of sediment (rocky vs. silt)



H4: PCH = RM, TZ
Bill length varies according to prey detectability (chemoreception)





Bill Length Range (BLR) sexing criteria for Least Sandpiper (Page 1974):

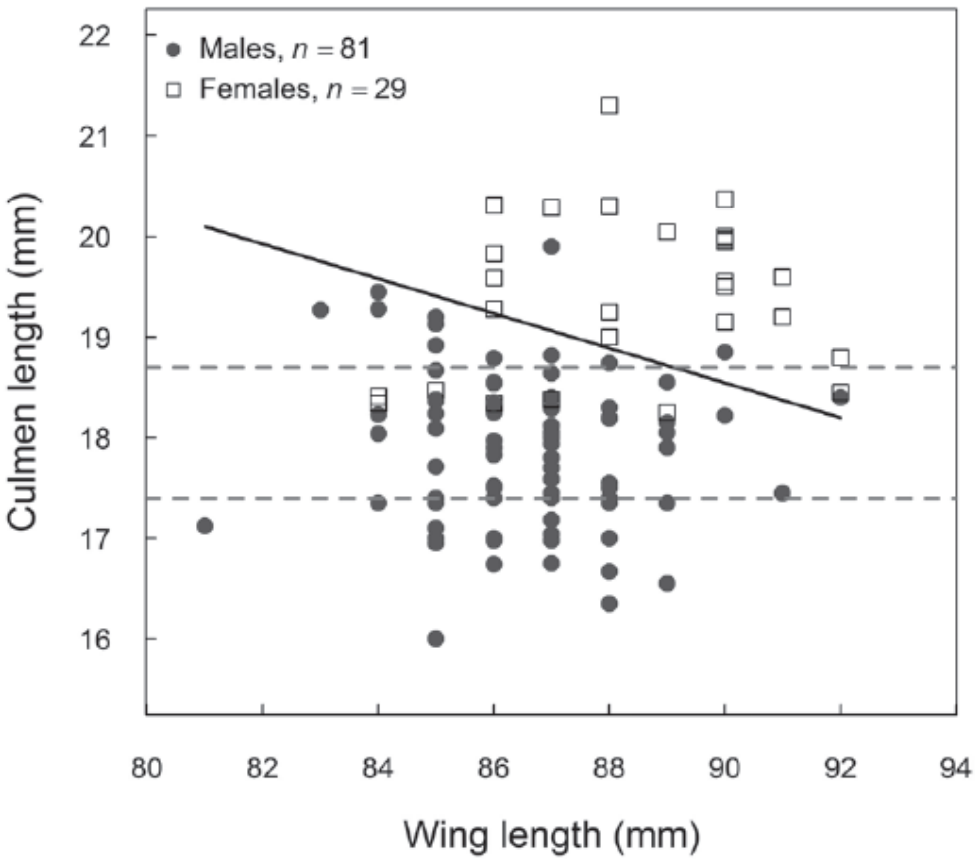
Males <=17.4 mm

Females >= 18.7 mm

Sex Determination of Least Sandpiper (*Calidris minutilla*) and Western Sandpiper (*Calidris mauri*): Comparing Methodological Robustness of Two Morphometric Methods

Ariam Jiménez[1,*], Ianela García-Lau[2], Alieny Gonzalez[1], Martín Acosta[1] and Lourdes Mugica[1]

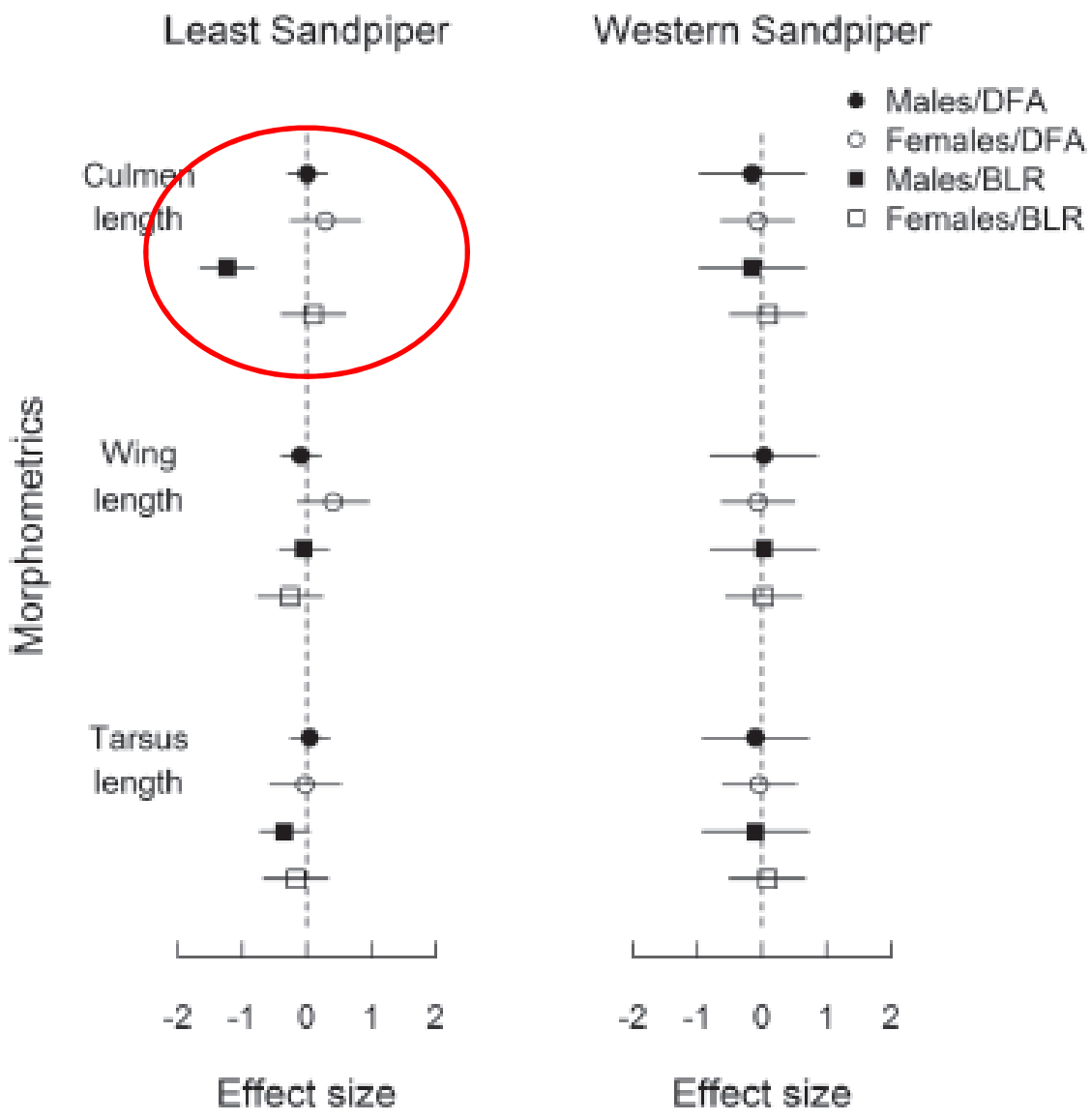
Waterbirds 38(1): 10-18, 2015



Discriminant function: 91% efficiency

BLR: 44% efficiency

Waterbirds 38(1): 10-18, 2015



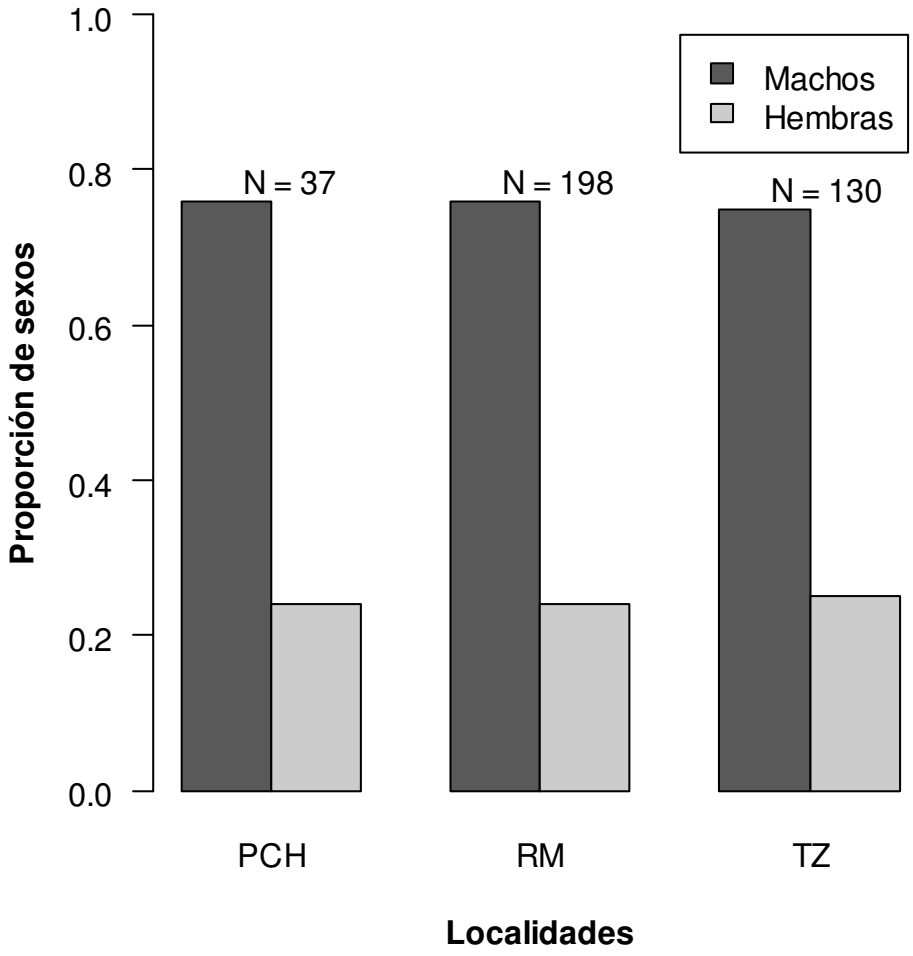
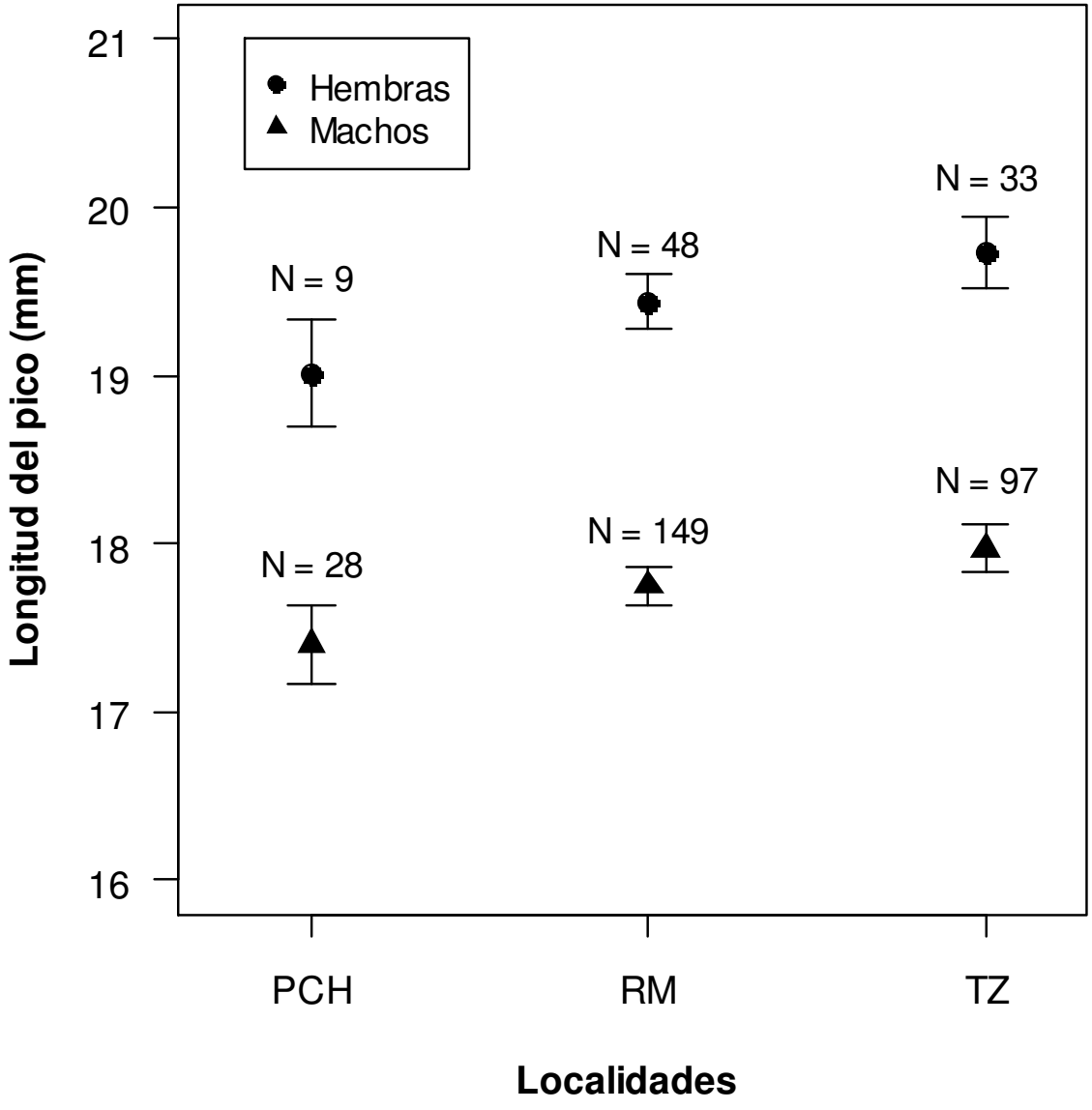


FIG. Sexo of Least Sandpiper at Playa del Chivo (PCH), Rio Maximo (RM), and Tunas de Zaza (TZ).

TABLA 1. Competitive models to assess bill length variation of Least Sandpiper in Cuba

			Females (n = 90)		**Males (n = 274)**	
	Models	**K**	**ΔAICc**	**ω_i**	**ΔAICc**	**ω_i**
Bill length (mm)						
	PCH, RM, TZ	4	**0.00**	**0.60**	**0.00**	**0.80**
	PCH = RM, TZ	3	**1.94**	**0.23**	4.07	0.10
	PCH, RM = TZ	3	2.74	0.15	4.19	0.10
	PCH = RM = TZ	2	7.32	0.02	12.09	0.00



Differences between TZ and PCH:

Females: 0.8 mm

Males: 0.6 mm

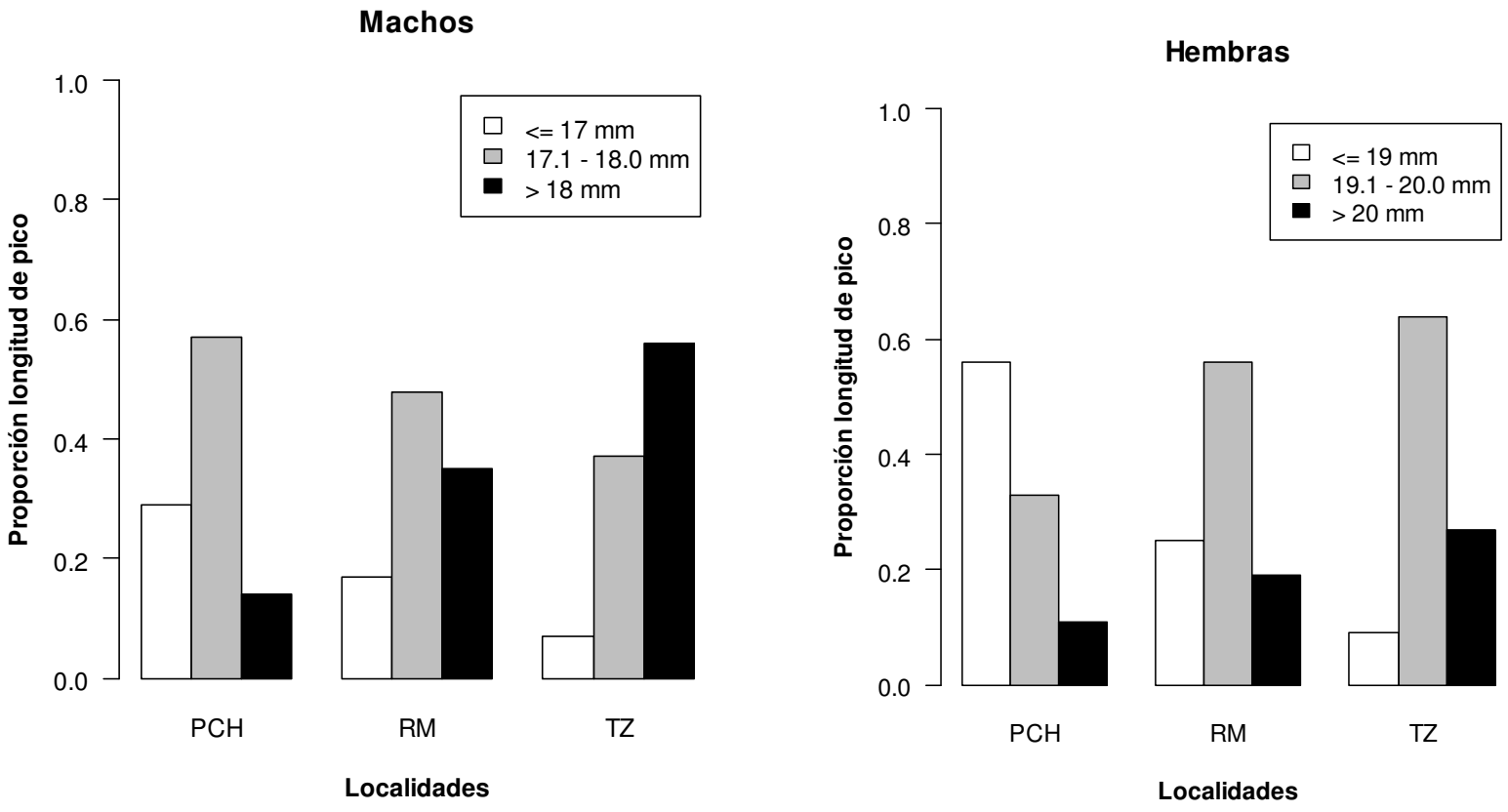


FIG. Occurrence pattern of bill size of Least Sandpiper at the three Cuban wintering sites. White: small bills, Grey: medium bills, Black: large bills

CONCLUSIONS

Sex ratio of Least Sandpiper wintering in Cuba was very similar in the studied localities, thus not supporting the sex-oriented partitioning hypothesis within a narrow latitudinal range.

Bill length of Least Sandpiper wintering in Cuba matched prey availability (depth). Supporting evidence for hypotheses stating that shorebirds can “adjust” their wintering distribution as a result of a combination of both their foraging capabilities and prey availability.

FINAL REMARK

Both studies highlighted the importance of conserving habitat diversity in order to conserve population variability.

THANKS

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