Supplementary Material

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Ecology, conservation, and phylogenetic position of the Madagascar Jacana *Actophilornis albinucha*

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Table S1: Lakes visited from January to October in 2016 to survey the Madagascar Jacana *Actophilornis albinucha* and their presence. Long. = degrees longitude; Lat. = degrees latitude. Reported sightings of Madagascar Jacana prior to the surveys are also indicated, in addition to lakes where water hyacinth dominated the wetland at the time of surveying

Site	Town/city/lake complex	Long.	Lat.	Month of survey	Jacana sightings reported	Present = 1 Absent = 0	Total no. of individuals	Dominant Water Hyacinth
Lake Anjanjany	Ambolobozobe	49.54	-12.55	October		0	NA	X
Lake Ambia	Ambolobozobe	49.51	-12.54	October		0	NA	
Lake Matsaboribe	Ambolobozobe	49.48	-12.54	October		0	NA	
Lake Papan'i JAO	Ambolobozobe	49.53	-12.53	October		0	NA	
Lake Maivadoany	Sahaka	49.90	-13.15	September	X	0	NA	

Lake Andohanampagnasy	Sahaka	49.90	-13.12	September	X	0	NA	
Lake Andohazavy	Sahaka	49.91	-13.12	September	X	0	NA	
Lake Mitohitohy	Ampagnisa Ampisikina	49.74	-12.82	October		0	NA	
Lake Andranovorilava	Ampagnisa Ampisikina	49.73	-12.80	October		0	NA	
Lake around Ambanja	Ambanja	48.45	-13.67	October		0	NA	
Lakes beside the national road between Port-Berger and Antsohihy	Antsohihy	47.88	-15.33	February		0	NA	
Lake Tsinjomitondraka North	Port-Berger	47.12	-15.66	October		0	NA	X
Unknown name	Port-Berger	47.11	-15.64	October	X	0	NA	
Lake Kinkony	Mitsinjo	45.91	-16.15		X	0	NA	
Lake Amboromalandy	Amboromalandy	46.76	-16.13	February	X	0	NA	X
Lakes beside the national road between Port-Berger and Mampikony	Port-Berger	47.62	-15.57	February	X	0	NA	
Lakes beside the national road between Matsaborilava and Port-Berger	Tsarahasina	47.58	-15.77	February	X	0	NA	
Lakes beside the national road from Mampikony to Amboromalandy	Mampikony	47.65	-16.83	February		0	NA	X
Lake Andranolava	Masoarivo	44.41	-19.10	January	X	0	NA	
Lake Antsamaky	Masoarivo	44.36	-19.04	January	X	0	NA	
Lake Ankerika	Masoarivo	44.45	-19.02	January	X	0	NA	
Lake Ankilizato North	Ankilizato	43.25	-22.11	June		0	NA	
Lake Ambondro	Ankilizato	45.02	-20.42	June		0	NA	
Lake Croisement Beiky	Ankilizato	45.04	-20.41	June		0	NA	
Lake Angodogodo	Ankilizato	45.04	-20.41	June		0	NA	
Lake Mavogisa	Ankilizato	45.02	-20.41	June		0	NA	
Lake Ambaibolava	Malaimbandy	45.63	-20.34	July		0	NA	X
Lake Andriamondra	Soatanimbary	45.55	-20.15	July		0	NA	
Lake Sirave	Kirindy Mite	43.90	-20.90		X	0	NA	
Lake Ambondro	Kirindy Mite	43.90	-20.89		X	0	NA	

Lake Andasakoa	Ihotry	43.64	-22.02	August	X	0	NA	
Lake Andramagnobe	Ihotry	43.59	-21.89	August	X	0	NA	
Lake Anosy	Sahaka	49.90	-13.14	September	X	1	2	
Lake Ambinagny	Sahaka	49.96	-13.13	September	X	1	1	
Lake Matsaborilava	Tsarahasina-Port-Berger	47.56	-15.76	February	X	1	3	
Lake Tsinjomitondraka South	Port-Berger	47.12	-15.67	October	X	1	13	X
Lake Madiromilomboka	Amboromalandy	46.77	-16.15	October	X	1	4	X
Lake Ampisaraha	Amboromalandy	46.76	-16.14	October	X	1	2	X
Lake Marogoaky	Amboromalandy	46.77	-16.14	October	X	1	8	X
Lake Bejio Est	Mandrozo	44.12	-17.57	September	X	1	7	
Lake Bejio Ouest	Mandrozo	44.11	-17.57	September	X	1	3	
Lake Ampiliravao	Mandrozo	44.05	-17.55	September	X	1	1	
Lake Mokotobe	Mandrozo	44.06	-17.55	September	X	1	5	
Lake Nosin'omby	Mandrozo	44.07	-17.55	September	X	1	8	
Lake Betakilotra	Mandrozo	44.04	-17.54	September	X	1	10	
Lake Bemamba	Bemamba	44.36	-18.84	January	X	1	12	
Lake Belinta	Masoarivo	44.43	-19.05	January	X	1	10	X
Lake Besitera	Masoarivo	44.35	-19.04	January	X	1	4	
Lake Ranovorindagory	Soatanimbary	45.54	-20.13	July		1	3	
Lake Ambariratabe	Soatanimbary	44.79	-20.42	July		1	4	
Lake Berano (Manamby)	Mahabo	44.79	-20.41	July		1	2	
Lake Belalitra	Malaimbandy	45.62	-20.34	July		1	8	X
Lake Allée de Baobab	Morondava	44.41	-20.26	June	X	1	2	X
Lake Andramagnokely	Ihotry	43.59	-21.89	August	X	1	23	
Total						22	135	

Table S2: Location of 11 lakes (Mandrozo New Protected Area [NAP] includes lakes Mandrozo and Andranovaobe) where repeated wetland bird surveys took place in Madagascar, conducted by The Peregrine Fund and the Durrell Wildlife Conservation Trust

Lake	Longitude	Latitude
Lake Antsamaky	44.36	-19.04
Lake Ankerika	44.45	-19.02
Lake Bemamba	44.36	-18.84
Lake Belinta	44.43	-19.05
Lake Andranovorilava South	49.73	-12.8
Lake Antohale	44.57	-19.12
Soatana	44.4857	-19.069
Mandrozo NAP	44.09	-17.55
Lake Soamalipo	44.4052	-19.045
Allee du baobab	44.4379	-20.229

Table S3: Madagascar Jacana *Actophilornis albinucha* presence records from wetland bird surveys conducted by The Peregrine Fund pale grey), the Durrell Wildlife Conservation Trust (dark grey), and the present study (bold font) in 10 areas of Madagascar (see Table S1) between 2001 and 2016

Year	Bemamba	Mandrozo NAP	Antsohale	Baobab	Andranolava South	Soatana	Belinta	Soamalipo	Antsamaky	Ankerika
2001	–	–	–	–	–	–	–	–	1	–
2002	6	–	–	–	–	–	–	–	–	–
2003	37	–	–	–	–	–	–	–	110	–
2004	6	–	–	–	4	–	–	–	6	–
2005	21	–	–	20	8	–	–	–	16	–
2006	9	–	–	–	–	–	–	–	–	–
2007	–	–	–	–	–	–	–	–	–	–
2008	–	–	–	–	–	–	–	–	–	–
2009	–	87	–	–	–	–	–	–	–	–
2010	–	127	–	–	–	–	–	–	–	–
2011	–	112	–	–	–	–	–	–	–	–
2012	–	97	–	–	–	–	–	–	–	–
2013	8	87	6	–	–	4	2	2	0	6
2014	0	107	0	–	–	0	2	2	0	7
2015	0	100	0	–	–	0	4	0	2	7
2016	**12**	**24**	**–**	**2**	**0**	**–**	**10**	**–**	**0**	**0**

Table S4: Morphometric measurements (tarsus length, wing length, and mass) of adult Madagascar Jacana. Normally distributed data were compared with a two-sample *t*-test, whereas Wilcoxon rank-sum tests were performed for non-normally distributed data. Sexual size dimorphism was calculated as log(Male/Female) following the method of Székely et al. (2007). SD = standard deviation; *n* = number of individuals included in the comparison; df = degrees of freedom

	Tarsus length (mm)		**Wing length (mm)**		**Mass (g)**	
	Males	Females	Males	Females	Males	Females
Min.	62.7	64.3	139	180	145	240
Max.	71.0	80.1	167	190	185	285
Mean	66.8	72.5	161.0	185.7	166.6	266.2
SD	2.64	5.54	6.86	3.63	14.70	18.87
n	22	13	22	13	8	4
***t*-test or *W* statistic**	3.46		264*		10.13	
***p*-value**	0.003		<0.001		<0.001	
df	15.29		NA		10	
log(Male/Female)	−0.036		−0.062		−0.204	
Female : Male ratio	1.09 : 1		1.15 : 1		1.60 : 1	
***Wilcoxon rank-sum test**						

Figure S1: Photographs showing plumage variation in immatures of Madagascar Jacana *Actophilornis albinucha*; (row A) immature plumage and (row B) intermediate plumage between the immature and adult stages. Both plumage types were considered immature for our survey records

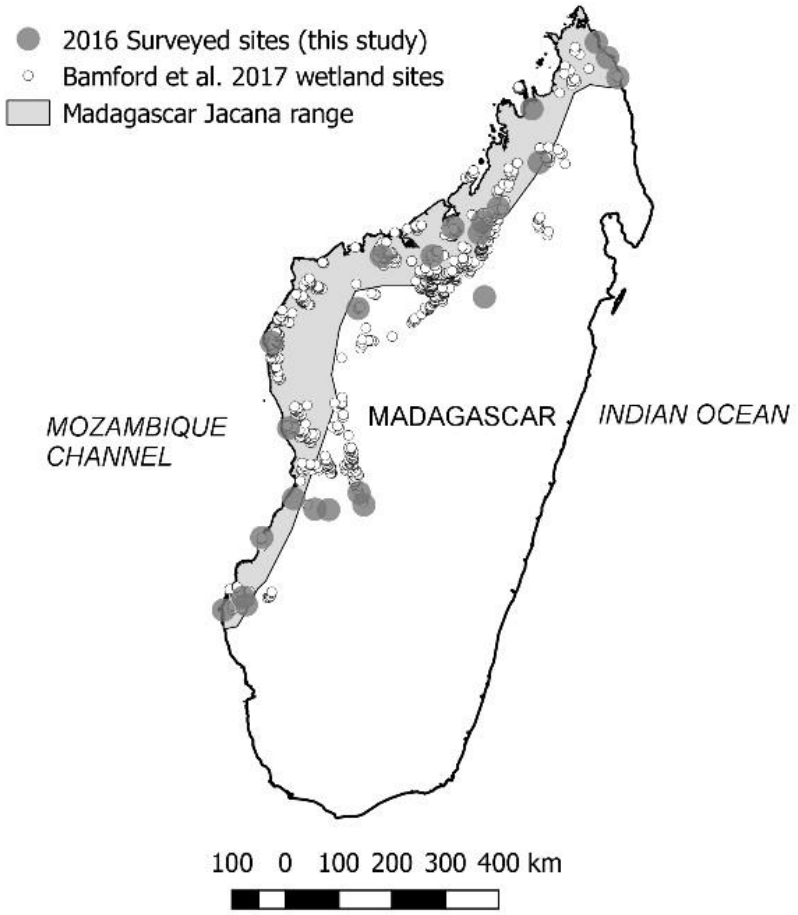

Figure S2: Map showing Madagascar wetland locations (small circles) that were included to estimate the population size of Madagascar Jacana *Actophilornis albinucha*. Grey dots are the location of sites surveyed for Madagascar Jacana during 2016. Shading indicates the predicted range of Madagascar Jacana (BirdLife International 2016)

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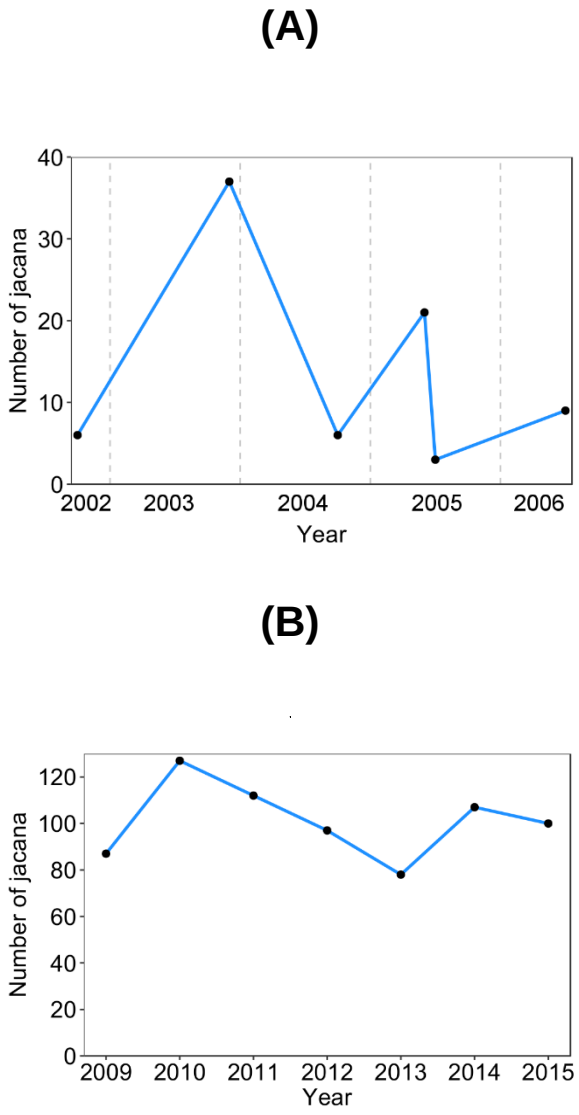

Figure S3: The number of Madagascar Jacana *Actophilornis albinucha* recorded from repeated wetland bird surveys conducted at (A) Lake Bemamba (by the Durrell Wildlife Conservation Trust), with dotted lines indicating the year boundaries; and at (B) Mandrozo New Protected Area (by The Peregrine Fund), but no dates were associated with those surveys

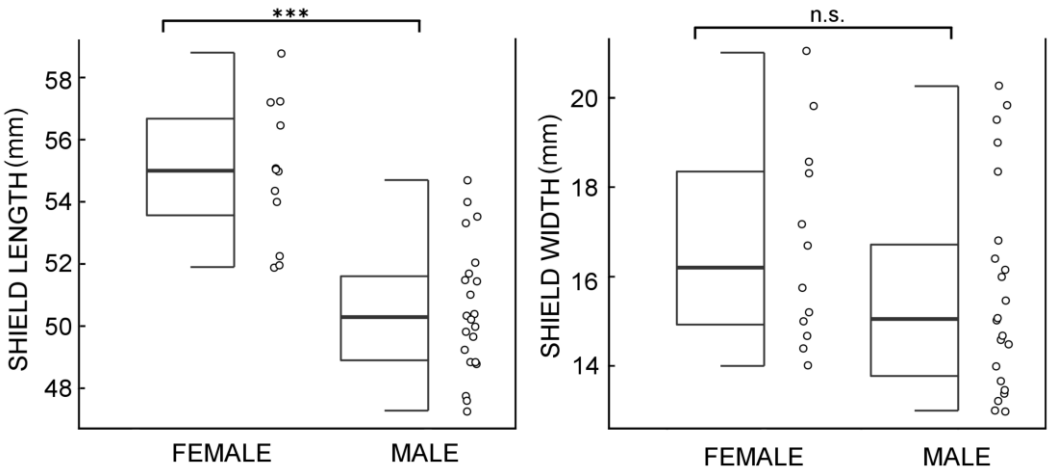

Figure S4: Shield lengths (including bill and shield width) in males and females of Madagascar Jacana *Actophilornis albinucha*. *** = $p < 0.001$

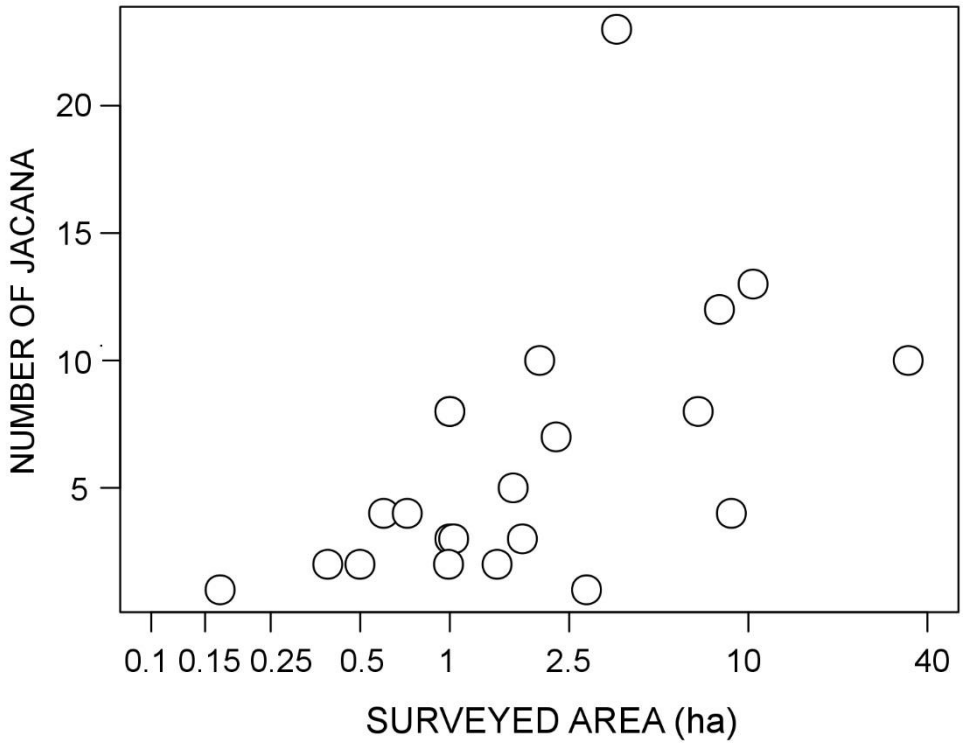

Figure S5: Relationship between the surveyed area (hectares) per lake (*n* = 22 lakes, log-transformed data) and the total number of Madagascar Jacana *Actophilornis albinucha* individuals present within that lake