

Assessing the population size and distribution of an understudied and threatened endemic wetland bird, the Madagascar jacana (*Actophilornis albinucha*)

By

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FINAL REPORT



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I. Introduction

Date of project:

We started to collect new data from January 2016 by visiting some sites around Morondava, Masoarivo, Amboromalandy and exploring lakes beside the national road connecting Mampikony – Port-Berger – Antsohihy.

Then, other sites were visited between June 2016 and December 2016 with re-assessment of some of the above sites.

Previous knowledge on the topic before the project year (2016):

The Madagascar Jacana (*Actophilornis albinucha*) is an endemic Madagascan shorebird which was up-listed to “near threatened” in 2012 due to population declines and severe threats including habitat loss and hunting pressure.

Concerning its distribution and population (BirdLife International 2015):

Actophilornis albinucha has been described as common or abundant in western and northern Madagascar. It is rare in the east of the island (Langrand 1990, Morris and Hawkins 1998). It has been noted that the species is becoming less frequently observed in suitable habitat (P. Morris *in litt.* 2010, L.-A. René de Roland *in litt.* 2012), probably indicating that a decline has occurred. This apparent decline is suspected to be on-going, on the basis of continued habitat loss and modification, as well as hunting pressure (del Hoyo *et al.* 1996, P. Morris *in litt.* 2010, L.-A. René de Roland *in litt.* 2012, G. Young *in litt.* 2012).

According to BirdLife International (2015), the population is estimated to number 1,000 - 10,000 individuals, roughly equating to 670 - 6,700 mature individuals.

Previous known data on distribution and population estimate are reported below. They are summarized in Table 1 as data from Zicoma 1999 and Safford & Hawkins 2013.

Summary of previous data known on distribution of Madagascar Jacana:

Table 1: Previous distribution sites of Madagascar Jacana before 2016

Year	Site	Sources
Previous data (Before 2016) according to Zicoma 1999		
1998	Lake Sahaka	Zicoma 1999
1998	Wetland East coast of Diego	Zicoma 1999
1998	Complex Forest Menabe	Zicoma 1999
1998	Complex Lake Ihotry hunting reserve and Delta Mangoky	Zicoma 1999
1998	Mikea forest Pk32	Zicoma 1999

Previous data (Before 2016) according to Safford and Hawkins 2013		
1936	North East of Madagascar: Sambava - wetlands in north of Vohemar	Rand 1936a, Benson et al. 1976
1990/1995	Antsiranana - Anivorano to Sambirano region	Langrand 1990, 1995, Safford 2000
	West of Madagascar from Sambirano region to Toliara	
1918	Miandrivazo	Bangs 1918, Rand 1936a
1936	Ankavandra	Langrand 1990, Langrand 1995, Safford 2000a
1931	Toliara-Amboasary	
1931, 1997	Amboasary Sud	Goodman et al 1997b
1892	Lake Alaotra	Baron 1892, Bangs 1918, Delacour 1932a, Pidgeon 1996
1863	Fenoarivo	Newton 1863
1990	Maroantsetra and Toamasina	Langrand 1990, Langrand 1995,
1879-1885	All ponds and rivers of Madagascar	Milne-Edwards and Grandidier 1879-1885
1936a	East of Madagascar: at clearing forest and cultivation of swamp rice? No evidence	Rand 1936
March-April 1936	Lake kinkony region	Rand 1936
March-Jun-July 2011	Lower Mangoky	Appert 2011
Aug	Lake Bemamba	AFAH
Sept-Nov 1999	Menabe wetlands (5 sites)	Young et 2005
Year-round	Lake Sahaka	Safford 2000
1929, 1990s	Lake Alaotra	Delacour 1930, 1932, Rand 1936a, Pidgeon 1996
1861	Lakes around Toamasina	Roch and Newton 1863

Before our survey in 2016, Madagascar Jacana was recorded mainly in the western and southern parts of Madagascar with some additional records in the eastern and highland regions.

A problem that this project has addressed:

Recent surveys of Madagascar Jacana population showed a rarity of sighting of species in the field, suggesting the possible change in conservation status of the species over years. The problem is that there is no data justifying this change in the current population size and the distribution of species that has never been specifically assessed even though the species was up listed to the near threatened IUCN category.

Following the recommendation of BirdLife International, carrying out surveys to acquire a total population estimate and baseline estimates for certain sites should be undertaken.

Objectives of project:

The Global objective of this project is to provide a basic first detailed data for understanding distribution and population size of Madagascar Jacana. This data will help site conservation managers in the development of an effective conservation effort at priority sites of this species.

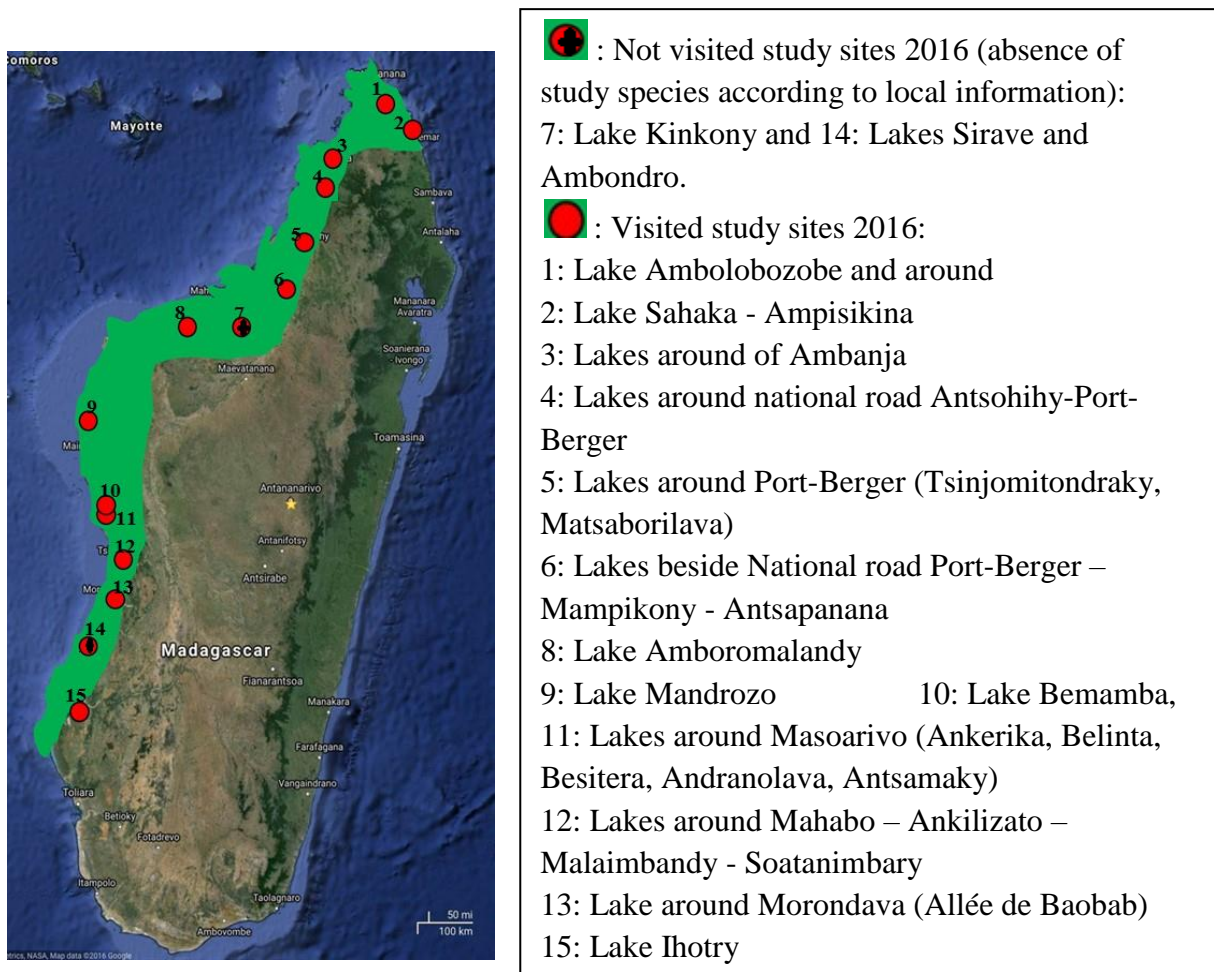
Specific objectives include:

- To map current distribution of Madagascar Jacana
- To estimate current population size in each area and overall.
- To reveal recent changes in population size and distribution of species at some sites showing past data on distributions and population estimates.

Study sites location

Madagascar: West and North West: Lake Ihotry, Morondava (Alle de Baobabs), Lake Bemamba, Lake Antsamaky, Lake Ankerika, Lake Kinkony, Lakes Sirave and Ambondro (Kirindy Forest Reserve), Port Berger wetlands, Lake Sahaka, Lake Mandrozo.

Figure 1: Map locating study sites visited and not visited during the survey 2016



II. Materials and Methods

II.1. Field data collecting

The access at each study site was studied from the use of maps and information gathered from the past data and local guides.

At each study site, we asked local authorities to provide us local guides and pirogues. We requested also the presence of crocodiles in the lake or not for organising the survey of lake. Arriving at each lake to survey, we used pirogues for surveying. There are different ways to make more secure the pirogue according to their size, sometimes we used canoes at great lakes (see figure 2 below).

Figure 2: Different way of using the pirogues during the survey according to their size



Two bonded pirogues (small pirogue)



One people alone (small pirogue)



2 people in bigger pirogue



Using small canoe

At each lake, we observed, counted and located any Madagascar Jacana found during the survey with the pirogue, following the method of direct counting in the survey at a small lake in Zicoma (1997). We tried to move slowly to avoid disturbing the bird and counting the same bird.

We estimated the surveyed area of lake by multiplying its length and width for estimating the density of Madagascar Jacanas per site.

During the field work, we explained to local communities the aims of our work and the importance and benefits of conserving wetland environments. During the surveys, local guides were employed to assist in the surveys.

II.2. Field data analysing

Data analysis will focus on three axes: distribution, population estimate and change in some sites about distribution and population size.

II.2.1. Mapping the current distribution of Madagascar Jacana

Using the GPS coordinates locating the presence and absence of Madagascar Jacana during the survey; we produced a map of the presence and absence of species.

II.2.2. Estimating current population size in each area and overall

Using the total number of individuals of Madagascar Jacana recorded at each site and estimated area of surveyed lake; we can estimate the density of species per site.

Combining these densities per site, we can estimate the population size of Madagascar Jacana by multiplying the total densities with the approximate total area of range of species.

II.2.3. Revealing recent change in distribution of species at some sites showing past data on distribution and population estimate

Some sites showed data on distribution (presence and absence) of Madagascar Jacana from previous data before 2016. We will compare these data with current survey data in 2016 to figure out the change in distribution and population estimate.

Counting methods applied to get the data may be different but this analysis will provide us a basic knowledge on general recent change in distribution of Madagascar Jacana population.

III. Results

The proposed study represents the first detailed assessment of the Madagascar Jacana's current population size and distribution

III.1. Mapping the current distribution of Madagascar Jacana 2016

Table 2: Sites of presence of Madagascar Jacana from the survey 2016

Number	Sites	Town / city	Longitude (Degree)	Latitude (Degree)
2A	Lake Anosy	Sahaka	E049,897047	S13,140222
2B	Lake Ambinagny	Sahaka	E049,955647	S13,129038
5A	Lake Matsaborilava	Tsarahasina-Port-Berger	E047,564033	S15,759850
5B	Lake Tsinjomitondraka South	Port-Berger	E047,123547	S15,665972
8A	Lake Madiromilomboka	Amboromalandy	E046,768407	S16,145052
8B	Lake Ampisara	Amboromalandy	E046,758412	S16,142938
8C	Lake Marogoaky	Amboromalandy	E046,772835	S16,138428
9A	Lake Bejio Est	Mandrozo	E044,116697	S17,569772
9B	Lake Bejio Ouest	Mandrozo	E044,112218	S17,568513
9C	Lake Ampiliravao	Mandrozo	E044,052042	S17,552817
9d	Lake Mokotobe	Mandrozo	E044,058112	S17,550450
9e	Lake Nosin'omby	Mandrozo	E044,070213	S17,545898
9f	Lake Betakilotra	Mandrozo	E044,040198	S17,540305
10	Lake Bemamba	Bemamba	E044,364597	S18,844900

11A	Lake Belinta	Masoarivo	E044,434197	S19,051818
11B	Lake Besitera	Masoarivo	E044,351235	S19,043203
12A	Lake Ranovorindagory	Soatanimbary	E045,539518	S20,134522
12B	Lake Ambariratibe	Manamby (Mahabo)	E044,790410	S20,416272
12C	Lake Berano	Manamby (Mahabo)	E044,793460	S20,407348
12d	Lake Belalitra	Malaimbandy	E045,620982	S20,335848
13A	Lake Allée de Baobab	Morondava	E044,407232	S20,262655
15A	Lake Andramagnokely	Ihotry	E043,585595	S21,892158

Figure 3: Map of distribution of Madagascar Jacana based upon its presence in sites in 2016

The number 2A to 15A in the figure 3 correspond to those 2A to 15A of above table 2

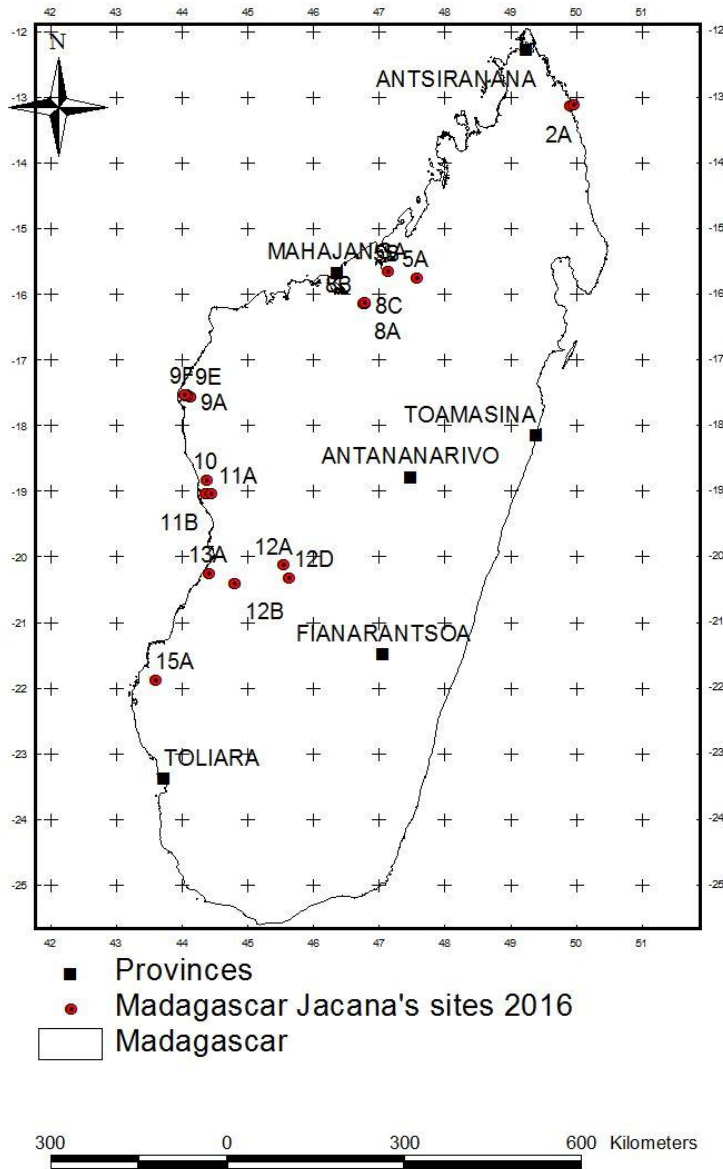


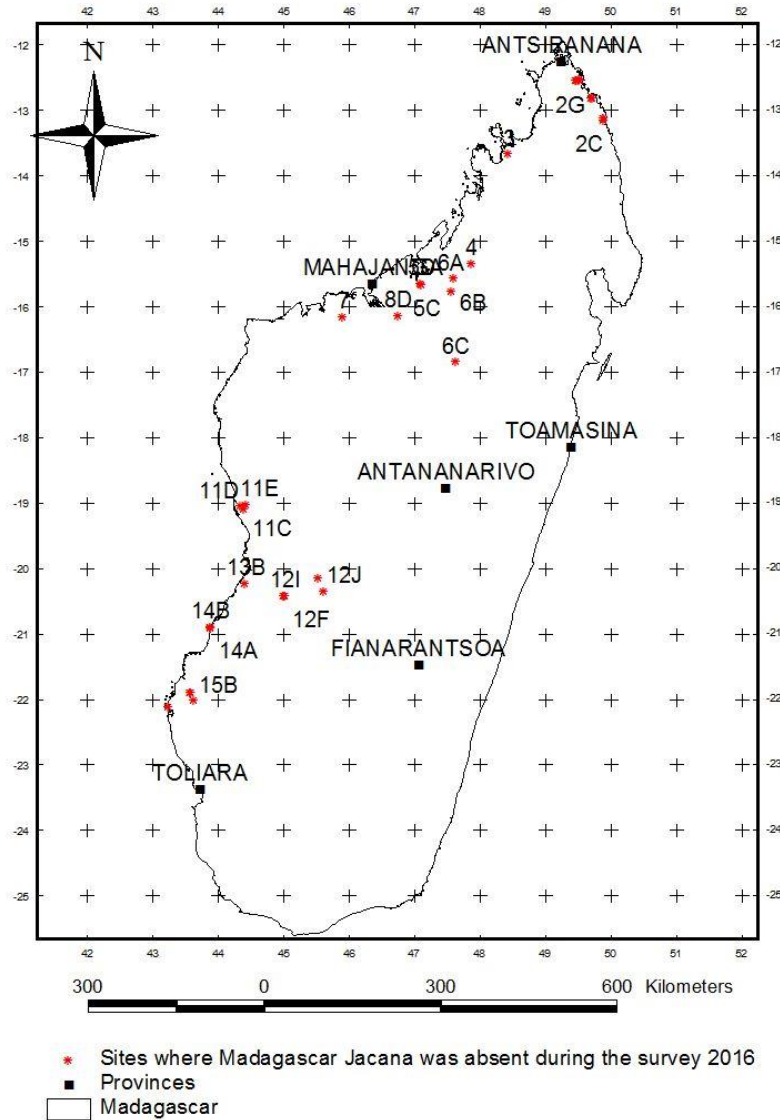
Table 3: Sites in which Madagascar Jacana was not found during the 2016 survey

Number	Sites	Town / city	Longitude (Degree)	Latitude (Degree)
1A	Lake Anjanjany	Ambolobozobe	E049,535023	S12,545598
1B	Lake Ambia	Ambolobozobe	E049,508903	S12,544622
1C	Lake Matsaboribe	Ambolobozobe	E049,480923	S12,542440
1D	Lake Papan'i Jao	Ambolobozobe	E049,529647	S12,527958
2C	Lake Maivadoany	Sahaka	E049,903551	S13,148278
2D	Lake Andohanampagnasy	Sahaka	E049,904585	S13,119007
2E	Lake Andohazavy	Sahaka	49,905102	S13,116803
2F	Lake mitohitohy	Ampagnisa Ampisikina	E049,739556	S12,816562
2G	Lake Andranovorilava	Ampagnisa Ampisikina	E049,726660	S12,803264
3	Lake around Ambanja	Ambanja	E048,450002	S13,666668
4	Lakes beside the National road between Port-Berger and Antsohihy	Antsohihy	E047,883337	S15,333334
5C	Lake Tsinjomitondraka North	Port-Berger	E047,121971	S15,659698
5D	Lake Andranolava	Port-Berger	E047,114525	S15,638420
6A	Lakes beside the National road between Port-Berger and Mampikony	Port-Berger	E047,616669	S15,566666
6B	Lakes beside the National road between Matsaborilava and Port-Berger	Tsarahasina	E047,583335	S15,766667
6C	Lakes beside the National road from Mampikony to Amboromalandy	Mampikony	E047,649999	S16,833334
7	Lake Kinkony	Mitsinjo	E045,914868	S16,146720
8D	Lake Amboromalandy	Amboromalandy	E046,762312	S16,130482
11C	Lake Andranolava	Masoarivo	E044,411880	S19,095579
11D	Lake Antsamaky	Masoarivo	E044,355717	S19,041602
11E	Lake Ankerika	Masoarivo	E044,446180	S19,017829
12E	Lake Ankilizato north	Ankilizato	E043,252791	S22,107751
12F	Lake Ambondro	Ankilizato	E045,024404	S20,417336
12G	Lake Croisement Beiky	Ankilizato	E045,038147	S20,409327
12H	Lake Angodogodo	Ankilizato	E045,042911	S20,408875
12I	Lake Mavogisa	Ankilizato	E045,023482	S20,407749
12J	Lake Ambaibolava	Malaimbandy	E045,632530	S20,341743

12K	Lake Andriamondra	Soatanimbary	E045,550703	S20,145358
13B	Ponds around Allee du Baobab	Morondava	E044,429415	S20,223999
14A	Lake Sirave	Kirindy Mite	E043,896363	S20,902974
14B	Lake Ambondro	Kirindy Mite	E043,898532	S20,886274
15B	Lake Andasakoa	Ihotry	E043,639254	S22,017190
15C	Lake Andramagnobe	Ihotry	E043,590835	S21,894669
15D	Lake Andramagnokely	Ihotry	E043,585595	S21,892158
15E	Lake Andramagnokely	Ihotry	E043,585595	S21,892158
15F	Lake Andramagnokely	Ihotry	E043,585595	S21,892158

Figure 4: Sites of absence of Madagascar Jacana during the 2016 survey

The number 1A to 15F in the figure 4 below correspond those 1A to 15F of above table 3



III.2. Estimating current population size of Madagascar Jacana at each presence site and overall areas

Number	Sites	Town / city	Total number of individuals	Area surveyed (ha)	Density (individuals / ha)
2a	Lake Anosy	Sahaka	2	0,39	5,13
2b	Lake Ambinagny	Sahaka	1	0,17	5,88
5a	Lake Matsaborilava	Tsarahasina-Port-Berger	3	1,00	3,00
5b	Lake Tsinjomitondraka South	Port-Berger	13	10,37	1,25
8a	Lake Madiromilomboka	Amboromalandy	4	8,77	0,46
8b	Lake Ampisaraha	Amboromalandy	2	1,44	1,39
8c	Lake Marogoaky	Amboromalandy	8	6,79	1,18
9a	Lake Bejio Est	Mandrozo	7	2,27	3,09
9b	Lake Bejio Ouest	Mandrozo	3	1,03	2,92
9c	Lake Ampiliravao	Mandrozo	1	2,87	0,35
9d	Lake Mokotobe	Mandrozo	5	1,63	3,06
9e	Lake Nosin'omby	Mandrozo	8	1,00	8,00
9f	Lake Betakilotra	Mandrozo	10	34,32	0,29
10	Lake Bemamba	Bemamba	12	8,00	1,50
11a	Lake Belinta	Masoarivo	10	2,00	5,00
11b	Lake Besitera	Masoarivo	4	0,60	6,67
12a	Lake Ranovorindagory	Soatanimbary	3	1,75	1,71
12b	Lake Ambariratibe	Manamby (Mahabo)	4	0,72	5,56
12c	Lake Berano	Manamby (Mahabo)	2	0,99	2,02
12d	Lake Belalitra	Malaimbandy	8	1,00	8,00
13a	Lake Allée de Baobab	Morondava	2	0,50	4,00
15a	Lake Andramagnokely	Ihotry	23	3,62	6,35

The mean density of Madagascar Jacana per site is 3.49 ± 2.47 individuals per hectare. Depending on the methods to estimate the total area of suitable habitat for the species across its distribution using Geographical Information System (GIS) analysis, the population size could be estimated as the multiplying of this total suitable habitat area with the mean density above.

Instead, if the approximate total area of suitable habitat surveyed holding Madagascar Jacana is estimated to be 91.2232 hectare from direct observation, the population size of Madagascar

Jacana could be estimated from 93.1 to 543.7 individuals or between 100 and 550 individuals living on this suitable habitat surveyed.

III.3. Revealing recent change in distribution and abundance of species at some sites showing past data on distribution and population estimate

Given the difference in method of survey between the past and current survey of sites, the below table showed the change in distribution (presence / absence) and abundance between past and current data in 2016.

Table 4: Change in distribution and population estimate of Madagascar Jacana in Important Bird Area (IBA) between past and current data 2016

Sites names and sources of past data	Past data (presence = 1 / absence = 0)	New data 2016 (presence = 1 / absence = 0)	Change in distribution	Change in population estimate
Zicoma 1999				
Lake Sahaka	1	1	Stable	Decreased number (only 3 individuals found)
ZH Cote Est Diego	1	0	Decreased	No individual
Complex Foret Menabe	1	1	Stable	Scarce (few number found)
Complex RC Lac Ihotry, Delta Mangoky	1	1	Stable	Decreased number
Forêt de Mikea Pk32	1	Not surveyed	Unknown	Unknown
Peregrine Fund and Durell WildLife Conservation Trust surveys data 2013-2015				
Complex Tsimembo Manambolomainty (Ankerika, Antsamaky, Soamalipo and Befotaka)	1	0	Decreased	No individual
Complex Bemamba wetland	1	1	Stable	Reduced number
Tambohorano wetland (Mandrozo)	1	1	Stable	Reduced number

This analysis showed that the conservation status of Madagascar Jacana changed over time. The species became less encountered in its known range and showed a decreased number of individuals at its sighted individuals.

IV. Budget

Items	Description	Cost GBP	Exchange rate	Amont MGA
<i>Equipment</i>	8 x 42 waterproof binoculars quote from Bushnell	250,00	4 601,47	1 150 368,47
<i>Transport (Lake Allée de Baobab)</i>	Morondava town to Allée du Baobab return Taxi	26,71	4 601,47	122 905,37
<i>Accommodation (Lake Allée de Baobab)</i>	Camping in village Allée du Baobab (2 people for 3 nights)	13,36	4 601,47	61 475,69
<i>Food (Lake Allée de Baobab)</i>	3 people (1 guide, 1 student, Sama) plus a cook	16,70	4 601,47	76 844,61
<i>Per diem (Lake Allée de Baobab)</i>	Sama, 1 student and guide (10,000 Per person for 3 days)	20,04	4 601,47	92 213,54
<i>Transport</i>	Morondava to Mahabo- Ankilizato-Malaimbandy- Soatanimbary-Morondava	22,26	4 601,47	102 428,81
<i>Accommodation (Mahabo- Ankilizato- Malaimbandy- Soatanimbary)</i>	Camping / room at the town / city nearby of study sites for 7 nights	31,17	4 601,47	143 427,94
<i>Food (Mahabo- Ankilizato- Malaimbandy- Soatanimbary)</i>	4 people (2 guides, 1 student, Sama) plus cook	46,75	4 601,47	215 118,90
<i>Fees (Mahabo- Ankilizato- Malaimbandy- Soatanimbary)</i>	Local research fee for local association / quarter / communal managing the sites	11,13	4 601,47	51 214,40
<i>Peredium (Mahabo- Ankilizato- Malaimbandy- Soatanimbary)</i>	Sama, 1 student and 2 guides	77,92	4 601,47	358 546,84
<i>Transport</i>	Morondava to Lake Ihotry (Sama and student)	31,17	4 601,47	143 427,94
<i>Accommodation (Lake Ihotry)</i>	Hotel in the way to Lake Ihotry	8,90	4 601,47	40 953,12

<i>Accommodation (Lake Ihotry)</i>	Camping in village close to lake (4 nights)	17,81	4 601,47	81 952,25
<i>Food (Lake Ihotry)</i>	4 people (2 guides, 1 student, Sama) plus cook	26,71	4 601,47	122 905,37
<i>Peredium (Lake Ihotry)</i>	Sama, 1 student and 2 guides	35,62	4 601,47	163 904,50
<i>Transport</i>	Lake Ihotry to Morondava	44,52	4 601,47	204 857,62
<i>Accommodation (Way back to Morondava)</i>	Hotel 1 night for 2 people in the way to Morondava	22,26	4 601,47	102 428,81
<i>Misc</i>	First aid kits	12,00	4 601,47	55 217,69
<i>Misc</i>	Contingency (extra accommodation, food and per diem if required)	40,00	4 601,47	184 058,95
Sub - total of above		755,03	4 601,47	3 474 250,81
<i>Transport</i>	Morondava to Masoarivo	66,79	4 601,47	307 332,44
<i>Accommodation (Masoarivo: Belinta, Betsitera, Antsamaky, Ankeriky and others)</i>	Camping in Masoarivo	26,71	4 601,47	122 905,37
<i>Per diem (Masoarivo: Belinta, Betsitera, Antsamaky, Ankeriky and others)</i>	Sama, 1 student, 2 guides	53,43	4 601,47	245 856,75
<i>Food (Masoarivo: Belinta, Betsitera, Antsamaky, Ankeriky and others)</i>	4 people (2 guides, 1 student, Sama) plus cook	40,07	4 601,47	184 381,06
<i>Transport</i>	Masoarivo to Lake Bemamba return	22,26	4 601,47	102 428,81
<i>Per diem (Lake Bemamba)</i>	Sama, 1 student, 2 guides	44,52	4 601,47	204 857,62
<i>Food (Lake Bemamba)</i>	4 people (Sama, 1 student, 2 guides)	33,39	4 601,47	153 643,21
<i>Transport</i>	Masoarivo to Lake Mandrozo	31,17	4 601,47	143 427,94

<i>Accommodation (Lake Mandrozo)</i>	On the way to Mandrozo + free camping at The Peregrine fund camp	8,90	4 601,47	40 953,12
<i>Food (Lake Mandrozo)</i>	4 people (Sama, 1 student, 2 guides) plus cook	40,07	4 601,47	184 381,06
<i>Per diem (Lake Mandrozo)</i>	Sama, 1 student, 2 guides	53,43	4 601,47	245 856,75
<i>Transport</i>	Lake Mandrozo to Tsiroanomandidy - Antananarivo - Amboromalandy	44,53	4 601,47	204 903,63
<i>Accommodation (Lake Amboromalandy)</i>	Hotel on the way to Amboromalandy for 2 people and 2 nights	22,26	4 601,47	102 428,81
<i>Accommodation (Lake Amboromalandy)</i>	Camping of team in Amboromalandy (rooms)	22,26	4 601,47	102 428,81
<i>Food (Lake Amboromalandy)</i>	4 people (2 guides, 1 student, Sama) plus cook	33,40	4 601,47	153 689,23
<i>Per diem (Lake Amboromalandy)</i>	Sama, 1 student, 2 guides	44,53	4 601,47	204 903,63
<i>Transport</i>	Exploring lakes beside national roads Amboromalandy - Mampikony	26,72	4 601,47	122 951,38
<i>Accommodation (Lakes beside RN6 Amboromalandy – Mampikony)</i>	During the exploring of lakes beside the national roads Amboromalandy - Mampikony	17,81	4 601,47	81 952,25
<i>Food (Lakes beside RN6 Amboromalandy – Mampikony)</i>	4 people (2 guide, 1 student, Sama) plus cook	45,43	4 601,47	209 044,96
<i>Perdium (Lakes beside RN6 Amboromalandy – Mampikony)</i>	Sama, 1 student, 2 guides	45,43	4 601,47	209 044,96
<i>Fees (Lakes beside RN6 Amboromalandy – Mampikony)</i>	Research visit fee to local association / quarter / communal	4,45	4 601,47	20 476,56
Sub - total of above		727,56	4 601,47	3 347 848,32
<i>Transport</i>	Mampikony to Port Berge Wetlands	17,81	4 601,47	81 952,25

<i>Accommodation (Lakes beside RN6 Mampikony – Port - Berger)</i>	Room and camping at Port Berger	22,26	4 601,47	102 428,81
<i>Food (Lakes beside RN6 Mampikony – Port - Berger)</i>	4 people (2 guides, 1 student, Sama) plus cook	33,40	4 601,47	153 689,23
<i>Perdium (Lakes beside RN6 Mampikony – Port - Berger)</i>	Sama, 1 student, 2 guides	44,53	4 601,47	204 903,63
<i>Transport</i>	Port Berger Wetlands to Antsohihy	13,36	4 601,47	61 475,69
<i>Accommodation (Lakes beside RN6 Port-Berger – Antsohihy)</i>	Hotel at Antsohihy and during the visit of lakes between Port-Berger and Antsohihy	13,36	4 601,47	61 475,69
<i>Food (Lakes beside RN6 Port-Berger – Antsohihy)</i>	4 people (2 guides, 1 student, Sama) plus cook	33,40	4 601,47	153 689,23
<i>Perdium (Lakes beside RN6 Port-Berger – Antsohihy)</i>	Sama, 1 student, 2 guides	44,53	4 601,47	204 903,63
<i>Transport</i>	Antsohihy to Lake Sahaka (with car hiring)	44,53	4 601,47	204 903,63
<i>Accommodation (Lake Sahaka – Ampisikina)</i>	Hotel in Vohemar and camping at Lake Sahaka and Ampisikina	20,00	4 601,47	92 029,48
<i>Food (Lake Sahaka – Ampisikina)</i>	4 people (2 guides, 1 student, Sama) plus cook	30,00	4 601,47	138 044,22
<i>Perdium (Lake Sahaka – Ampisikina)</i>	Sama, 1 student, 2 guides	40,00	4 601,47	184 058,95
<i>Transport</i>	Lake Sahaka - Ambolobozobe	8,00	4 601,47	36 811,79
<i>Accommodation (Lake Ambolobozobe and around)</i>	Camping Ambolobozobe	10,00	4 601,47	46 014,74
<i>Food (Lake Ambolobozobe and around)</i>	4 people (2 guides, 1 student, Sama) plus cook	20,00	4 601,47	92 029,48

<i>Perdium (Lake Ambolobozobe and around)</i>	Sama, 1 student, 2 guides	20,00	4 601,47	92 029,48
<i>Transport</i>	Ambolobozobe - Ambanja then back to Morondava	35,00	4 601,47	161 051,59
<i>Food (Ambanja and way back to Morondava)</i>	During the visit of Lakes at Ambanja and on the way back to Morondava	10,00	4 601,47	46 014,74
<i>Accommodation (Ambanja and way back to Morondava)</i>	On the way back to Morondava	10,00	4 601,47	46 014,74
Sub - total of above		470,18	4 601,47	2 163 520,98
TOTAL		1 952,77	4 601,47	8 985 620,12

V. Discussion

Objective reached or not

This project provided new sightings on the current conservation status of Madagascar Jacana. Our three specific objectives were reached. New distribution sites, population estimate and changes in presence and absence of species at some sites were checked.

It was very surprising to know the rarity of encountering of Madagascar Jacana even at its suitable habitat. We visited some suitable sites (lakes with lily pad vegetation on which the species can walk and find food on open leaves of lily pads on water) such as the complex three lakes of Ankerika, Antsamaky and other sites. These showed a good cover of Nymphaeaceae vegetation on the water suggesting to see the Madagascar Jacana but no individual was sighted.

The other strange sightings we learned when we worked with Madagascar Jacana include:

- The rapidly change in the presence and absence of Madagascar Jacana at a given site: some sites revealing the presence of Jacana in previous years according to the result of monitoring data or past data may become absent of Jacanas this year. We predicted that the Madagascar Jacana would execute frequent displacement: it may change many places in search of food or suitable habitat for breeding.
- The Madagascar Jacana is not afraid a lot nor very shy about the presence of human (fishermen or rice cultivator or zebus shepherds) working in some parts of habitat where it is feeding.

- Relation of results with others findings (past data)

Population became rarely encountered in field: Madagascar Jacana could be absent at some previous suitable sites for the species. In addition, at a site with Madagascar Jacana, few and scarce individuals were observed.

This alarming decrease in the distribution of Madagascar Jacana population could be in relation with one or some of these reasons below:

- The behaviours of species such a moving a lot or frequent changes of places for finding suitable habitat for feeding or / and breeding.
- Or, this alarming change in conservation status of Madagascar Jacana population may be the results of severe threats from habitat transformation or habitat loss.
- Or difference of season or period of surveys: Madagascar Jacana could be scattered during the wet season because there are a mixing of many wetland area and types (lakes and rivers could join together) which may became less suitable for the species because of disappearing or instability of lily pad vegetation from water movement / circulation.

We remarked also that a site with some Common Moorhens did not hold Madagascar Jacana. We think that there would be a competition between them so Moorhens could chase away the Madagascar Jacana.

- Possible application of results

The result from this project is useful for updating information about the distribution, range and population estimate of Madagascar Jacana and the conservation status of the species. Information for the on bird Red List for BirdLife or IUCN could be updated.

In addition, this new information will adjust appropriate conservation measures adapted to the current status species at managed IBA sites such as Lake Mandrozo, Lake Sahaka, Lake Belinta and Besitera and Lake Ihotry for instance.

The manager of these sites could address particular attention for improving the conservation programme for Madagascar Jacana in their action site.

VI. Conclusion

The main finding from this project includes the obtaining of new alarming data in the change of the conservation status of Madagascar Jacana regarding its distribution, range and population estimate. A revision of its conservation status is optional for informing and alerting conservation managers to adopt an appropriate conservation management for the species. Lakes Mandrozo and Ihotry are the best sites for the species when Lake Sahaka became the poorest suitable habitat for the species. The status of Madagascar Jacana at the other sites remained comparable and the habitat of species at those sites remained suitable.

A monitoring programme is needed to carry out at some key sites to confirm the changes and stability of Madagascar Jacana populations in terms of presence / absence and number of individuals per site.

VII. Recommendation

- To conduct regular population monitoring of Madagascar Jacana (*Actophilornis albinucha*) populations in key sites 2016 (BirdLife International 2015)

- Revision of conservation status of Madagascar Jacana is suggested, this species could be again up listed among the list of IUCN vulnerable species.

VIII. References

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Annexe: Some photos from the lakes visited



Lake around Allée du Baobab



Lake Betsitera



Lake Antsamaky



Lake Bemamba



Suitable Madagascar Jacana habitat type(Lily Pad)



Madagascar Jacana's nest



Nesting area of Madagascar Jacana