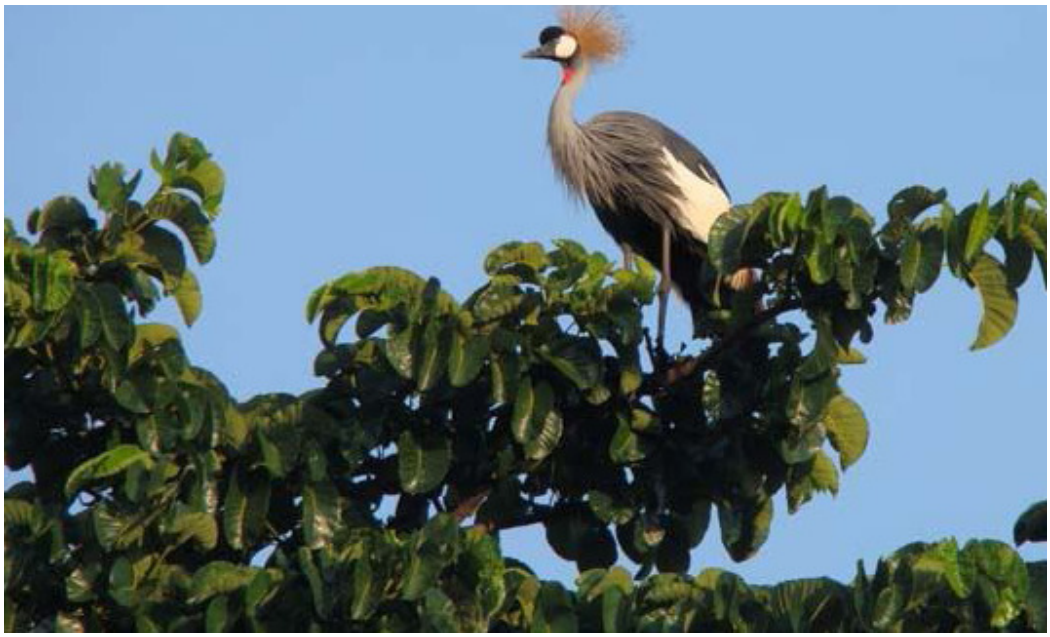
The Current Population and Threats Affecting the Grey crowned Crane, *Balearica regulorum*, in the Doho wetlands, eastern Uganda



Photograph: Courtesy of William Olupot 2014

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February 2015

Acknowledgement

This study was fully supported by the African Bird Club (ABC) small grants scheme through ***Nature***Uganda. We are most grateful for the support. Special thanks go to the Local authorities of Butaleja district that gave us permission to undertake this study in the study site and the respondents who were very helpful in giving us the required responses. We want to sincerely thank our volunteers for taking us to the very remote areas in pursuance of individuals of *Balearica regulorum*

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1. Introduction

The Doho wetlands in Butaleja district have been important foraging and breeding grounds for the Grey crowned crane *Balearica regulorum* in the eastern parts of Uganda (Gumonye-Mafabi, 1992). Findings by Beilfuss *et al.* 2007 show that *Balearica regulorum* is the fastest declining crane species in the world mainly as a result of increasing human population, habitat loss, trade, and the illegal removal of birds and eggs from the wild. Listed as Vulnerable in 2009, its status was uplisted to Endangered on the IUCN Red Data List in June 2012. This crane species shows a preference for short to medium height open grasslands adjacent to wetlands for foraging and breeds within or at the edges of wetlands (Meine and Archibald 1996) especially in marshes with water 1 m deep and with emergent vegetation 1m above the water (Urban *et al.* 1986). *Balearica regulorum* is the national bird of Uganda and features prominently on the national flag. This bird is well known throughout the country, and it is considered by many to be a symbol of wetland health.

One of the strategies in the Uganda Government's mission of agricultural modernization is the fullest exploitation of agricultural potential with respect to resource endowment and comparative advantage while at the same time conserving the resources for future generations. The plan for modernization of agriculture strategy identified the districts of eastern Uganda, within which Butaleja falls, as areas of high activity and production in wetland rice cultivation. Paddy rice is thus providing a reasonable income to at least 25% of farmers in districts designated in this strategy. Out of the three large irrigation rice schemes in the country, two of them, Kibimba and Doho are found in eastern Uganda. The schemes have had a tremendous spillover effect, with farmers in this region uncontrollably reclaiming swamps for rice growing thereby affecting the flora and fauna in a much wider area.

Crane distribution studies have been conducted in Uganda (Gumonye-Mafabi 1992; Muheebwa-Muhoozi 2001; Olupot and Plumptre 2006; Olupot *et al.* 2009, Olupot 2014, Nachuha *et al* 2015) and Stabach *et al* (2009). These studies showed occurrence of cranes in fairly large numbers in southwestern Uganda and to some extent in northern Uganda. *Balearica regulorum* was a relatively common bird in eastern Uganda particularly in the Doho wetlands where it lived and bred (Gumonye-Mafabi, 1992). However the demand for food and money is threatening the habitats for *Balearica regulorum* and other biodiversity in this region. This study was motivated by our recent recording of a flock of 24 individuals of *Balearica regulorum* roosting on a Mvule tree *Milicia exclesa* at the Islamic University in Uganda as reported in Nachuha et al 2015. In addition, a brief interaction with the local authorities and preliminary observations seemed to indicate that these birds have been pushed to the edge of extinction in the Doho wetlands, mainly through wetland drainage for rice cultivation. Although rice farms provide suitable foraging grounds for most

waterbirds (Nachuha, 2009, Nachuha and Quinn 2012), the practices on ground are far from the guidelines for smallholder paddy rice cultivation and apparently do not compensate for loss of suitable habitats for the birds' survival.

Amidst this habitat loss and other threats, little is known about the current status of *Balearica regulorum* in these wetlands after almost a period of over 20years from the last study that was conducted by Gumony- Mafabi in 1989. The main objectives of this project were to 1) assess the current population size and distribution of *Balearica regulorum,* 2) document the eminent threats to the occurrence of *Balearica regulorum.* The findings of which will inform the process of developing a comprehensive site specific conservation strategy for this crane species to inform subsequent researches/interventions.

2. Study sites and methods

2.1. Study sites

This study was conducted in the Doho wetland complex part of which was converted into rice paddies as mentioned in the introduction section of this report (See also Fig.1). Recently there has been extensive expansion of rice growing in this wetland complex and this has been facilitated by the fact that most of the parts of this wetland complex that used to have water throughout the year have become seasonal wetlands, making them suitable for farming. This has resulted into unsustainable reclamation of the wetland mainly for rice cultivation.

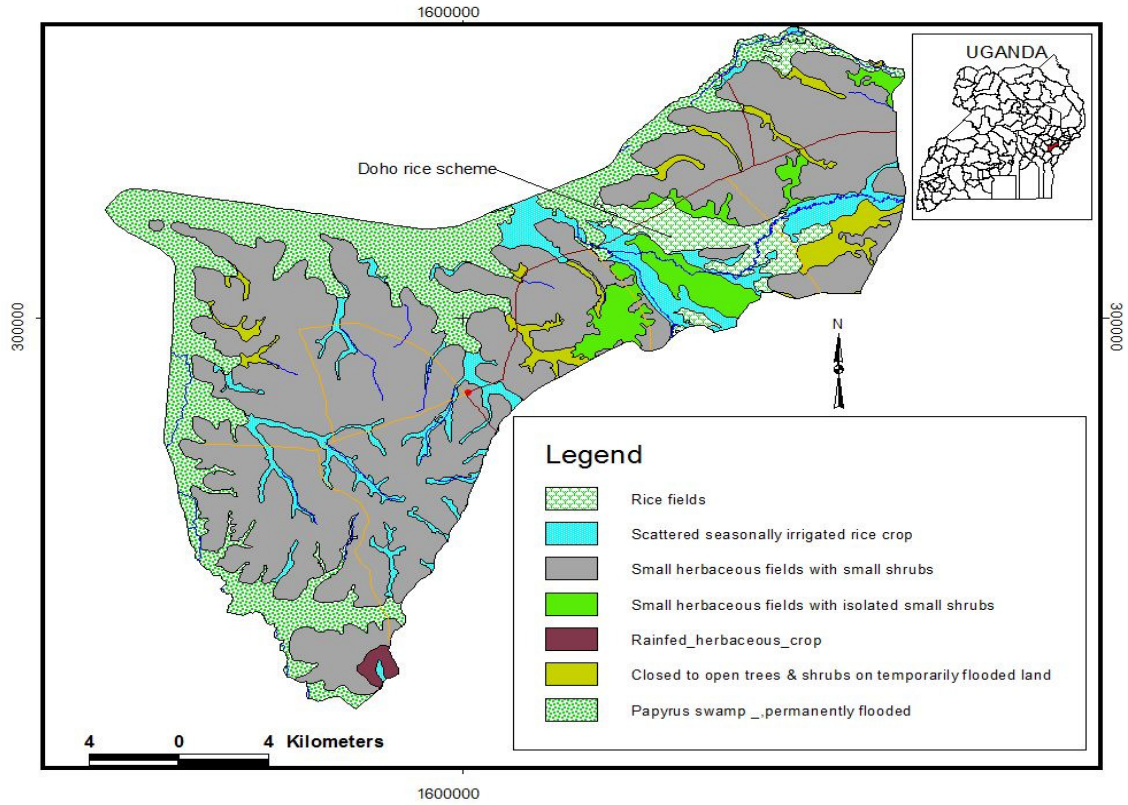

Figure 1. Showing the Doho wetland complex

2.2. Methods of data collection

2.2.1. Assessing the current status of *Balearica regulorum*

We undertook a rapid assessment in March 2015 in which we interviewed 45 local people on issues relating to the current status of *Balearica regulorum* and the threats that this bird species faces. One of the key questions that we asked the respondents was about the current and previous foraging and breeding sites of *Balearica regulorum*. Based on responses we obtained, we then undertook monthly surveys to document the numbers of *Balearica regulorum* in each of the mentioned sites. These surveys were conducted for a period of 10months (April 2014-January 2015). With the help of the locals, some of whom reared this crane species before, we searched in all the grasslands adjacent to the cultivated areas for evidence of breeding considering this period is the known breeding season for *Balearica regulorum*. Current human activities and habitat characteristics of these sites were also noted. All these locations were recorded using a hand held GPS unit.

2.2.2. Documenting threats to *Balearica regulorum* and the different ways to minimize these threats**.**

We used a combination of interview and stakeholders meetings to achieve this objective. Communities and community leaders are foundations for long-term sustainable conservation. The same 47 farmers interviewed to address objective 1 were also asked questions relating to this objective. We also held a joint **s**takeholders meeting that was aimed at developing home-grown conservation initiatives for *Balearica regulorum* and the Doho wetland in general. As future custodians of natural resources, we held conservation campaigns in two primary schools in which we distributed some materials related to wise use of wetlands and photographs of *Balearica reguloru.* We also encouraged the pupils to join Wildlife Clubs of Uganda (a local non-governmental organization dedicated to promoting environmental conservation through schools).

2.3 Data analysis

Descriptive statistics and mainly frequencies were used to summarize the data that was then presented in form of tables

3. Results

3.1. Demographic information of the respondents

All the 47 farmers interviewed were male and 70.2% were from Mazimasa sub-county, 14.9% from Himutu, 12.8% from Kachonga and 2.1% from Naweyo all of which neighbor the Doho wetland ecosystem. Although most of the respondents mentioned that their main source of income was rice farming, some of them mentioned that they were also involved in other activities such as livestock keeping, brick laying and selling of fruits such as Mangoes (table 1)

Table 1. Different income generating activities that the local communities near Doho wetlands are engaged in

Source of income	Frequency	Percent
None	2	4.3
Rice farming	39	83.0
Rice farming and Livestock Keeping	3	6.4
Rice farming, Livestock Keeping and Brick laying	1	2.1
Rice farming, Fishing and selling Mangoes	1	2.1
Rice farming and brick laying	1	2.1
Total	47	100

3.2 Current status of **Balearica regulorum** *in Doho rice scheme*

3.2.2 Population of *Balearica regulorum*

On very few occasions did we record cranes foraging and no record or even sighting of evidence of breeding was made in all the 7 wetlands that we visited during the ten months of our survey. We however recorded a total of 46 individuals, with majority being recorded in the Doho Rice Scheme. April, May and June seem to be the best months for counting these birds (Table 2). We were also informed by the local people that some of their colleagues used to trap chicks of *Balearica regulorum* and rear them for food in the past but have since then stopped because the birds have now become wise these days and do not come around to use the wetlands for breeding.

Table 2. Numbers of *Balearica regulorum* as recorded in the different sites across the 10 months

	Wetlands surveyed							
Month	Wapala wetlands	Hijiji wetlands	Nakwasi swamp	Muhula wetland	Halango wetlands	Masululа outgrowers	Doho Rice Scheme	Total
April 2014	1	2	0	0	0	0	3	6
May	2	0	0	0	0	10	0	12
June	0	5	0	0	0	0	12	17
July	0	2	0	0	0	0	0	2
August	0	0	0	0	5	0	0	5
September	0	0	0	1	0	0	1	1
October	0	0	0	0	0	0	0	0
November	0	0	0	0	0	0	0	0
December	0	0	0	0	0	0	0	0
January 2015	0	0	0	0	0	1	2	3
Total	**3**	**9**	**0**	**1**	**5**	**11**	**18**	**46**

33 (70.2%) of the respondents informed us that they had not sighted *Balearica regulorum* chicks in the last two years while 14 (29.2) indicated that they had done so, but only in the company of foraging adults in the rice scheme, that are also sighted seasonally (Table 3). This informs seems to agree very well with the response in table 5 in which *Balearica regulorum* chick sighting is becoming rare within the Doho wetland complex. In addition, 43 (91.5%) of the respondents said that the *Balearica regulorum* population in the Doho wetlands had decreased while 4 (8.5%) said that they didn't know. Majority (78.7%) of the local people interviewed indicated that the decline in *Balearica regulorum* was more than half (table4).

Table 3. Frequency of *Balearica regulorum* sighting

Sighting of Adult Cranes	Frequency	Percent
Don't know	1	2.1
Daily	2	4.3
Once a week	7	14.9
Once a month	12	25.5
Seasonally	20	42.6
Once a year	3	6.4
Never	2	4.3
Total	47	100

Table 4. Magnitude of *Balearica regulorum* population change

Magnitude of crane population change	Frequency	Percent
Don't know	2	4.3
Less than half	2	4.3
By half	6	12.8
More than half	37	78.7
Total	47	100

3.2.3. Breeding population of *Balearica regulorum*

The local residents that we interviewed indicated that that the breeding sites of *Balearica regulorum* have changed over time as shown in table 5. *Balearica regulorum* also has preference for particular locations within these sites and these include: short grasses that are interspersed with papyrus, bushes, at riversides, dry lands and on trees or swamps (table 6). Namunasa (Currently Doho Rice Scheme) wetland was a hotspot breeding site for *Balearica regulorum* but with the continuous cultivation of rice and the expansion of the rice growing area, *Balearica regulorum* has migrated to other wetlands in close proximity to this wetland. However, there has been unsustainable expansion of the rice growing activity that has also degraded these would be refugia that this resulted in a gradual but acute decline in the population of cranes in this wetlands.

Table 5. Previous and current breeding sites for *Balearica regulorum* in the Doho wetlands

Previous breeding places	**Current breeding sites**
Namunasa- Currently Doho Rice Scheme	Uncultivated area of Doho Rice Scheme
Wapala wetlands	Wapala wetlands
Hijiji wetlands	Hijiji wetlands
Nakwasi swamp	-
Muhula	Muhula
	Halango wetlands
	Masulula outgrowers

Table 6. Breeding locations for *Balearica regulorum* within the Doho wetlands

Breeding habitats	Frequency	Percent
Don't know	2	4.3
Wetlands	26	55.3
Bushes	6	12.8
Riverside	6	12.8
Dry lands	3	6.4
On trees near or in swamps	4	8.5
Total	47	100

3.3. Threats affecting **Balearica regulorum** *in Doho rice scheme*

A number of threats affecting *Balearica regulorum* were mentioned, with the most eminent being habitat loss and hunting (table 7). These threats are a result of increased human population, poverty, and lack of awareness among others (table 8).

Table 6: Threats to *Balearica regulorum* population

Cause of change in crane population	Frequency	Percent
Loss of habitat	20	42.6
Loss of habitat and increase in human population	1	2.1
Loss of habitat and hunting	13	27.7
Hunting	4	8.5
Prolonged drought	1	2.1
Deforestation	4	8.5
Increase in human population	2	4.3
Loss of habitat and Increase in human population	1	2.1
Increase in human population and weather changes	1	2.1
Total	47	100

Table 7. Causes of the threats to *Balearica regulorum* population

Reasons why these threats occur	Frequency	Percent
Demand for timber, demand for fuel wood and Poverty	3	6.4
Demand for fuel wood and High human population	2	4.3
Poverty	3	6.4
Poverty and Lack of awareness	7	14.9
Poverty and high human population	4	8.5
Poverty and food insecurity	1	2.1
High human population and Poverty	7	14.9
High human population, Poverty and Lack of awareness	1	2.1
High human population and Lack of awareness	4	8.5
High human population, Food insecurity and Poverty	1	2.1
High human population and unsustainable farming methods	2	4.3
Lack of awareness	5	10.6
Lack of awareness and Poverty	1	2.1
Lack of awareness, Poverty and High human population	1	2.1
Lack of awareness and High human population	2	4.3
Lack of awareness and drought	1	2.1
Tough laws	1	2.1
Drought and Poverty	1	2.1
Total	47	100

3.3.1. Mitigation of the threats to *Balearica regulorum*

The local community members including the local government leaders were concerned about the declining number of cranes. In a bid to recover the population and safeguard the very few that are remaining, majority of the respondents indicated that there was need to enact by-laws, create awareness among the populace and proper management of the environment (table 8). Other mitigation measures should involve change in the livelihood activities

that most people are engaged in. For example there is need to shift from majorly rice growing to growing crops such as sweet potatoes and rearing of animals (table 9) although most of them indicated that rice growing was most lucrative than any other farming activity as of now.

Table 8. Measures to mitigate *Balearica regulorum* population decline

Mitigation	Frequency	Percent
Missing results	3	6.4
By laws	22	46.8
By laws and awareness campaigns	1	2.1
By laws and Policing	1	2.1
Awareness campaigns	3	6.4
Awareness campaigns and Plant trees	1	2.1
Awareness campaigns and Managing environment well	1	2.1
Awareness campaigns and Policy implementation	1	2.1
Awareness campaigns and Policing	1	2.1
Plant trees	3	6.4
Plant trees and By laws	1	2.1
Plant trees, awareness campaigns and establishing an information centre	1	2.1
Plant trees and Managing environment well	1	2.1
Managing environment well	5	10.6
Put aside some part of wetland for protection	1	2.1
Policy implementation	1	2.1
Total	47	100

Table 9. Alternative livelihood activities proposed by the respondents

Alternatives to rice growing	Frequency	Percent
Other crops such as sweet potatoes	26	55.3
Other crops such as sweet potatoes and Animal husbandry	4	8.5
Other crops such as sweet potatoes and fruit growing	1	2.1
Buy and sell agricultural products	1	2.1
Animal husbandry	12	25.5
Animal husbandry and fruit growing	1	2.1
Animal husbandry and tree growing	1	2.1
Horticulture	1	2.1
Total	47	100

3.4. Stakeholders meeting

We held a stakeholders meeting in Nampologama, near the Doho Rice Scheme management headquarters. The information that was generated from this meeting did not differ so much from the responses from the survey. For example all the participants were in agreement that the major threats to *Balearica regulorum* were hunting for food, expansion of rice growing into the grasslands, Ignorance, Erratic weather patterns a result of climatic changes and Cropping calendar. For these threats to be mitigated there is a dire need for strengthening the existing laws and regulations including guidelines on how wetlands should be utilized and also creating a network with Development and research institutions for example the Islamic University in Uganda, World Vision, Red Cross, Child Fund that will not only inform decision making but also provide technical expertise and cost share. These institutions can also play a big role in sensitizing the communities on issues related to ecosystem services, capacity building and providing seed money for wetland restoration.

Participants mentioned that they are faced with enormous challenges given that the population is poor and there is almost no direct financial benefit of *Balearica regulorum* to the farmers. However, they were optimistic that it is possible to improve on the status quo given that there are still a few individuals of the species still present, there are some technical staff at the district, Some

wetlands are still intact, there is a strong political will considering that even this occasion was graced by the Local council leader (LC5) and the Resident District Commissioner (RDC). In addition to these strengths and opportunities, the participants also mentioned that there was need to diversify the activities that would generate income to the local people by introducing Ecotourism, fish farming, bee keeping, tree planting, mushroom growing, horticulture, wetland restoration, zoning of critical wetland areas, potato and cassava growing with value addition

3.5. School visitation

Our visit to the two schools neighboring the rice scheme enlightened the pupils about *Balearica regulorum* some of whom indicated that they have never seen it but have heard it call. They were however very not sure they will live to see it since they also intend to become rice growers in future.

3.6. Training of Volunteers

We managed to recruit three volunteers who we trained on general bird watching skills. These were also given some tips on how they could empower themselves financially without necessarily growing rice.

4. Discussion

Findings by this study indicate that *Balearica regulorum* population, both breeding and non-breeding is on the decline. These results seem to agree with a 2006 assessment of crane breeding and distribution throughout Uganda that reported very few incidences of nesting and occurrence in Eastern Uganda (ref). However, they deviate from a recent survey that seems to indicate that *Balearica regulorum* still occurs in relatively good numbers in most wetland habitats in eastern Uganda (Olupot, 2014). However, it is also possible that's these could be the same individuals we are observing considering that these birds have local migrations. It would be wise to undertake a detailed study in which we track these flocks to follow their movements.

All the different sources of our data have indicated that the biggest threat to *Balearica regulorum* in this study is habitat loss mainly as a result of rice growing. Habitat loss a general phenomenon has been found to be a cause of declines in populations of many organisms *Balearica regulorum* inclusive (Beilfuss *et al.* 2007, Olupot 2014).

In a bid to initiate mitigation measures, I strongly suggest that Local NGOs like *Nature*Uganda that has the full mandate to conserve birds should begin to engage with the local government officials in ensuring that they evolve by-laws and continuously sensitise the farmers on the wise use of wetlands. It is also very important stakeholders meetings are held atleast once a year to monitor the population and presence of this bird species. Convincing the farmers to take on another income generating activity other than rice growing would seem an uphill task. However, considering that they have suggested this themselves, then it worthwhile trying. Our visit to the two schools neighboring the rice scheme enlightened the children about the Crane some of whom promised to compose songs about this bird species.

5. Site- based actions

Considering that there are still opportunities in this study area as mentioned in section 3.4 I suggest the following site based actions that would help safeguard *Balearica regulorum*

i. Formulation of by-laws for better use of the wetlands

ii. Engagement of the local communities especially the farmers to develop sound action plans on how to manage wetlands (wise use)

iii. Strengthening the local NGOs in their knowledge and understanding of the importance of not only this crane species but all bird species and wetlands in general.

iv. There is need for serious environmental education in Primary schools to empower the young generation

v. There is need to pilot one of the alternative livelihood options that the farmers suggested.

vi. Mass sensitization of the local communities on ecosystem services of wetlands and how these link with changes in weather patterns given the current climatic conditions

vii. Promote massive tree growing

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7. Financial Accountability

	Activity	Description	Budget estimate (UK £)	comments
1	Stationery	Printing, paper, note books, pens, cartridge	*44,500/=*	Some of the items were provided by IUIU
2	Fuel @2 *$per km for 50 km* **6 trips*	This covers the distance from Mbale to Butaleja and local travel within Butaleja	*1,800,000/=*	Money was spent on fuel
3	Living allowance for Research scientists	2 * $10 *per day for 30 days* The days will be spread across the 6 months of the project	*1, 754,200/=*	Money was spent on perdiems and other items
4	Workshops and training of volunteers	*These will be held on 10 different days spread across the 6 months of the project	*2,028,600/=*	Money was spent on transport refunds for the participants and meals
	Total		***£1500 = 5,627,300***	**Amount requested for is £1500**

*We were advised by the technical team in the district to hold one stakeholders meeting given the way local governments work. In most cases it so difficult to raise quorum, so the meetings become unproductive

Compiled by Dr. Sarah Nachuha Kasozi