

Feeding, resting, and the walking patterns of marabou's behavior (*leptoptilos crumenifer*) in Galagu Camp, Dinder National Park (DNP), Sudan

Abstract

The article describes a study carried out to determine the feeding, walking, and resting behavior of the marabou stork *Leptoptilos crumenifer* in Dinder National Park, Sudan. The study used sampling methods to observe birds at ten-minute intervals during four observation times per day from March to April 2022. The study found that birds spend most of their daily time at rest, followed by behavior to feed. The dominant daily activity was resting, which occurred mainly from 1:00 pm to 2:00 pm, while active eating occurred from 5:00 am to 6:00 am, followed by 10:00 am to 11:00 am and 5:00 pm to 6:00 pm. walking activity was observed mainly at 10:00-11:00 and 5:00- 6:00 pm. The study recommended further research on the behavior of *L. crumenifer*, as the period studied was short. The feeding of *L. crumenifer* and other animals in the park by people must stop to protect the future survival of these species. Overall, the study provides insights into the behavior of marabou storks and highlights the importance of their conservation and management.

Keywords: Marabou stork, behavior, scan sampling method

Volume 7 Issue 2 - 2023

Tahani Ali Hassan

Department of Wildlife Sciences, College of Natural Resources and Environmental Studies, University of Bahri, Khartoum, Sudan

Correspondence: Tahani Ali Hassan, Department of Wildlife Sciences, College of Natural Resources and Environmental Studies, University of Bahri, Khartoum, Sudan, Tel +249915064830, Email tahanihassan@gmail.com

Received: March 29, 2023 | **Published:** May 04, 2023

Introduction

The Marabou stork *Leptoptilos crumenifer* (Lesson, RP, 1831) is a massive bird large specimen, which is thought to reach a height of 152 Centimeters (4.99 feet) and a weight of 9 kg.¹ With a wingspan of 3.7 m (12 ft.), the species has the largest wing spread of any living bird.¹ Typical weight is 4.5–8 kg (9.9–17.6 lb.), unusually as low as 4 kg (8.8 lb.), and length (from bill to tail) is 120 to 130 cm (47 to 51 in).²

The *L. crumenifer* in Sudan are commonly found in many habitats, often near human settlements. They migrate north during the rains but they breed mostly in Southern Sudan.^{3,4} Like most storks, the marabou is gregarious and a colonial breeder. In the African dry season (when food is more readily available as the pools shrink), it builds a tree nest in which two or three eggs are laid. It is known to be quite ill-tempered.^{3,4}

The marabou stork is a frequent scavenger, and the naked head and long neck are adaptations to this livelihood, as it is with the vultures with which the stork often feeds.^{3,4} This large and powerful bird eats mainly carrion, scraps, and feces but will opportunistically eat almost any animal matter it can swallow. It occasionally eats other birds.^{3,4} When feeding on carrion, marabou frequently follows vultures, which are better equipped with hooked bills for tearing through carrion meat and may wait for the vultures to cast aside a piece, or steal a piece of meat directly from the vulture or wait until the vultures are done.⁵

The favorable habitat for Marabou Storks is those near water where most Storks live as waders in shallow pools and marches in search of food in the form of fish, and frogs. Near human habitations, they feed on carrion and scavenge on waste collection sites or rubbish dumps.^{6,7} Increasingly, marabous have become dependent on human garbage and hundreds of the huge birds can be found around African dumps or waiting for a handout in urban areas.^{6,7} Very few studies have been conducted on Marabou stork *L. crumenifer* in DNP, and there is a lack of information on their behavior, therefore this study aimed to determine the daily time budget; feeding, walking, and resting behavior of Marabou stork in Dinder National Park.

Materials and methods

Study area

Dinder National Park (DNP) was established in 1935, the park lies between latitude 11° 45 E 12° 50 N and longitude 34° 30 E 36° 00 south-eastern- eastern part of Sudan against the Ethiopian frontier.⁸

The area of the park principally consists of a low-lying flood plain that slopes gently from the Ethiopian highlands with a few rocky hills at its southern corner.⁸ The global significance of the DNP is that it falls between two important ecological zones, the Sudan-Sahelian and the Ethiopian. DNP was designated as A Ramsar site in 200. The National Park supports 27 species of mammals, more than 160 species of birds, and 32 species of fishes, reptiles, and amphibians. There are about 58 species of shrubs and trees.⁸

The climate is characterized by two seasons a hot and humid rainy season (May- November) and a cool and dry season (December-March). Annual rainfall averages about 800mm (Figure 1).⁹

Data collection

The feeding/ resting and walking behavior of Marabou stork *L. crumenifer* were studied by the scan sampling methods,¹⁰ within ten minutes intervals, four observation times has been conducted; 05:00-06:00 am., 10:00- 11:00 am., 11:00 am. – 03:00 pm., and 05:00- 06:00 pm. respectively for a period of 7 (seven) hours per day from March to April 2022. Marabou stork *L. crumenifer* was observed daily during the observation times, and data on activity patterns such as feeding, walking, and resting behavior were recorded, using focal animal sampling.¹⁰ At the start of the observations, each day; Ten Marabou storks were selected randomly and video recorded using a digital zoom camera, the focal birds instantaneously scanned for the major behavior, including feeding, walking, and resting. The daily activities were recorded at 10 minutes intervals for 7 hours daily during the study period. Depending on the number of Marabou stork visible at any one time, the recording took 5 minutes.

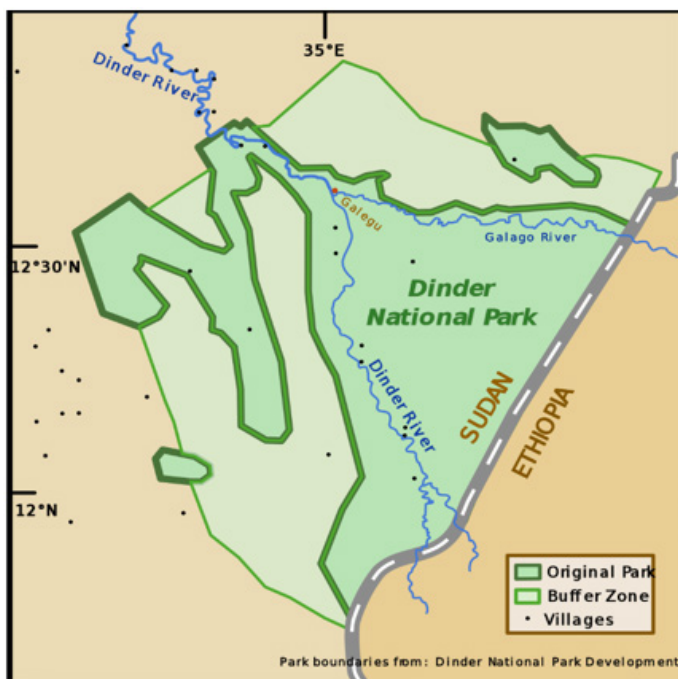


Figure 1 Location map of Dinder National Park, Sudan, Wikipedia.

Data analysis

During this study period, a total of 210 observation hours were made for the entire study period. Daily activity patterns were studied by calculating the proportion of time spent in each activity for the temporal class and then summed over and summarized in an hourly basis.

Results

The behavior of Marabou stork *Leptoptilos crumenifer* in this study was largely limited to feeding, walking, and resting, the data collected presented in a form of figures showing feeding, walking/ resting behavior of Marabou stork *Leptoptilos crumenifer* in Galagu Camp, Dinder National Park (DNP) Mach and April, 2022 (Figure 2, 3).

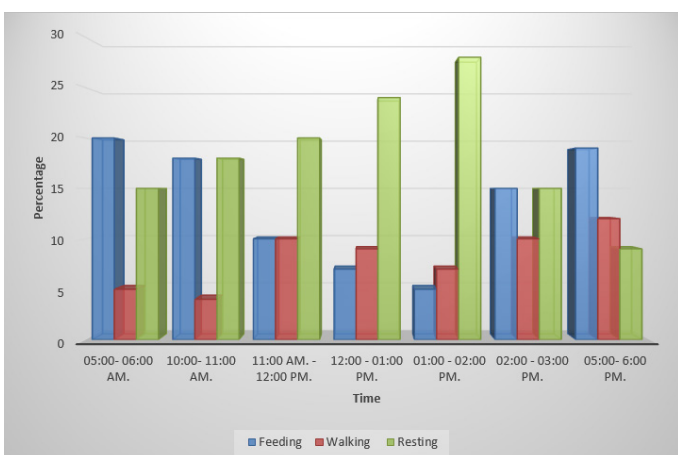


Figure 2 Feeding, walking/ resting behavior of Marabou stork *Leptoptilos crumenifer* in Galagu Camp, Dinder National Park (DNP) Mach, 2022.

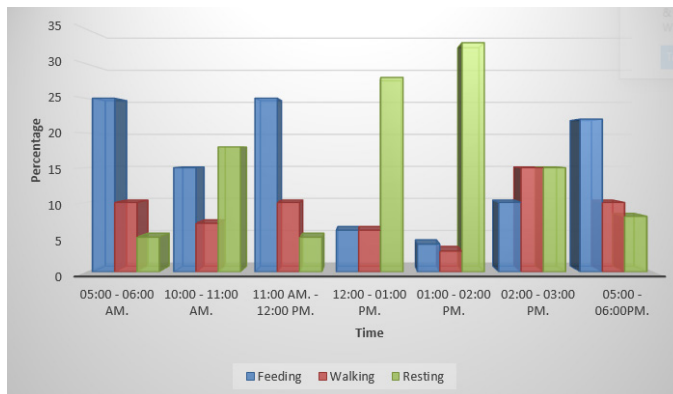


Figure 3 Feeding, walking/ resting behavior of Marabou stork *Leptoptilos crumenifer* in Galagu Camp, Dinder National Park (DNP), April, 2022.

Discussion

There were alternating periods of feeding, resting, and the walking behavior of Marabou stork *Leptoptilos crumenifer* in the park. The study showed that Marabou stork *Leptoptilos crumenifer* spend much of their daily time budget resting (46%, 40% respectively) followed by feeding (34%, 38% respectively) in Galagu Camp (Figure 2 and 3).

The dominant daily activity was resting which peaked at 01:00 pm - 02:00 pm and this is maybe attributed to the stork's tendency to reduce energy expenditure during the hottest hours of the day. Major resting activity occurred from 01:00- 02:00 pm followed by 12:00-01:00 pm. At 05:00 - 6:00 am, the dominant activity was resting which peaked at 01:00 - 02:00 pm.

Followed by feeding that peaked at 05:00-06:00 am and 05:00-06:00 pm during March and April 2022 (Figures 2 and 3).

The most active feeding hours of the day were 05:00- 06:00 am, followed by 10:00 – 11:00 am, another active feeding hour occurred at 05:00- 06:00 pm (Figure 2 and 3).

The walking activity dominated at 10:00- 11:00 am and 05:00 - 06:00 pm during March (Figure 2) and peaked at 02:00- 03:00 pm and followed by 11:00 - 12:00 pm and 05:00- 06:00 pm in April and this may be attributed to the searching for food in the morning and leaving to their roosting sites in the evening.

The birds depend on the carrion, insects, fish and meat which is in line with the findings of.¹¹ In comparison between the two months, there were not many differences in the daily activities of the Marabou stork *Leptoptilos crumenifer* because the climate of Dinder National Park consists of two climatic seasons, cool and dry in winter and wet and warm in summer. The wet season starts in May and ends in November. The temperature range from as low as 20°C at the begging of the dry season in December to as high as 42°C in March and April, towards the end of the dry season.¹²

Conclusion and recommendation

Globally, the bird population is decreasing as a result of natural causes such as climate change and human interference, so it is important to study the feeding, resting, and walking behavior of this species in DNP, to get recommendations that help to conserve and manage this species. Marabou stork *Leptoptilos crumenifer* spend most of their daily activity resting (40% and 46%) followed by feeding

(34% and 38%) and walking (20% and 22%). The feeding of Marabou stork *Leptoptilos crumenifer* and other animals in the park by people should be stopped because it will affect their feeding behavior and their future survival. Since the study period was very short, more studies on the behavior of Marabou stork *L. crumenifer* are needed.

Acknowledgments

I am especially grateful to the wildlife officers and personnel for their valuable assistance during the data collection. I wish to thank the fifth-year students of the Wildlife Department, College of Natural Resources and Environmental Studies, University of Bahri, for the help they provided during the fieldwork.

Conflicts of interest

Author declares that there is no conflict of interest.

References

1. Murray PR, Rosenthal KS, Kobayashi GS, et al. *Medical microbiology*. 4th ed. St. Louis: Mosby; 2002.
2. Laurie E. *The Encyclopedia of Birds*. InfoBase Publishing; 1986. 616 p.
3. Stevenson T, Fanshawe J. *Field Guide to the Birds of East Africa: Kenya, Tanzania, Uganda, Rwanda, Burundi*. Elsevier Science; 2001.
4. Nikolaus G. *Distribution Atlas of Sudan's Birds with notes on Habitat and status*. Bonner Zoologist Monograph, Nr.25. Zoologisches Frostings institute und Museum Alexander Koenig, Bonn; 1987.
5. Cave FO, Macdonald JD. *Birds of Sudan*. Oliver and Boyd: Edinburgh and London; 1955. 444 p.
6. Hancock K, Kahl S. *Storks, Ibises and Spoonbills of the World*. Princeton University Press; 1992.
7. Pomeroy D. *Counting birds guide to Assessing number biodiversity Afro tropical birds AWLF*. Kenya series 6; 1992. 3-6 p.
8. Brown LH, Urban EK, Newman K. *The Birds of Africa*. Vol 1, London Academic Press; 1982. 186-199 p.
9. Anonymous. *Larger than Elephants Inputs for an EU strategic approach to wildlife conservation in Africa-Synthesis*. Directorate-General for International Cooperation and Development. European Commission: Brussels, Belgium; 2005.
10. Holsworth NW. *Dinder National Park*. Report to the Government of Sudan. No TA 2457. FAO, Rome; 1968.
11. Altmann J. Observational Study of Behavior: Sampling Methods. *Behaviour*. 1974;49(3):227-267.
12. Kanno IO. *Application of Remote Sensing in Monitoring Ecological Changes in Dinder National Park*. Ph.D. Thesis; University of Juba: Khartoum Sudan; 2004.