

Habitat Preference, and Behavioral Activities of Senegal Thick – Knee (*Burhinus senegalensis*) in Bayara Wetland, Elssuki, Sudan

Mohamed Elmakki Ali Elbzdawi¹, Abderahman Nour Eddien² and Kamal E.,G..E.³

1. Assistant professor (Ornithologist), Faculty of Natural Resources and Environmental Studies, Wildlife Department, University of Sinnar. makki71@gmail.com

2. Abd elrahman Nour Eddien Abderahman Sulieman (Graduate student, wildlife department. university of Sinnar.

3. Kamal Elddin Gafer Elbasheir Aboush. Department of Poultry production Omdurman Islamic University

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ABSTRACT

The study conducted in Bayara Meadow, located in Essuki town at sinnar, state. Sudan. It sits at the eastern bank of the Blue Nile (E:03352351 N: 1319302) Which considered as breeding, roosting sites for many bird's species. The total area of it is ٣٥,٨٦٢km² (129m length, 278m long). The study extended from 28/7/2022 to 7/11//22022 during the rainy season, first period from 28/7/2022 to 7/9/2022, the second period from 12/ 10/2022 to 20/10/2022 the last period from 24/10/2022 to 7/11/2022. The total area was divided to four plots of (3225 length 278long) total area 8965.5 M². The direct count method is used to count the birds number and try to monitor its behavior, feeding roosting site and other activities on the morning and evening. The morning count begin at 6 o'clock till 1 ٠o'clock while the evening watching begin from 4:00 o'clock to 6:00 o'clock. Equipment used for data collection are a pair of binoculars (8X50 magnifications), Telescope - Swarovski (660 - 940), digital still camera for documenting, data recording sheets, notebook The bird was observed, counted if inside each block only and notes were taken directly about activities pattern. A pair sample test was used to compare between the number of birds in the morning and evening, using PSPP programmer. The total number of bird is 2789. In the morning 646, 473, 226 with total 1345 in the three period respectively and evening 696, 514, 234 total 1444 first period the high number of individual recorded in block number ١, while the lowest in block number 4. A pair sample t. test result revealed no statistically significant difference between

the two periods $p < 0.05$ ($t(10) = 0.29$, $p = 0.788$). Senegal thick-knee is very sensitive to human, favored habitat is near water but spent more time at high land between bushes. Feeding on some grasses, small reptiles and insects or arthropods. No nest recorded during the study period in the site but there are evidences that the bird fly away crossing the Blue Nile to the other bank. Other individuals observed building nest on roofs of houses in the town.

Key words: Roosting, Wetland, Direct Count, Nesting, Block, Nocturnal Species

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Introduction:

The thick-knees (*Burhinus senegalensis*) are largely tropical waders consist members of family Burhinidae. They are distributed worldwide within the tropical zone, with some species also breeding in temperate Europe and Australia. They are medium to large waders but, most of them have a preference for arid or semi-arid habitats. There are 9 species worldwide. [1]. Lepage, Denis 2007. The species is evaluated as Least Concern, [2]. (Birdlife international .org)

Habitat

The species occupies a wide variety of different habitat, open land with sparse or un-vegetated, including savanna and woodland clearings, open orchards, sandy or stony ground amidst thorny scrub, gardens in towns and villages (Cramp and Simmons 1983,[3] Hayman, et al. 1986) [4], gravel roads (Urban, et al. 1986) [5], burnt woodland and semi-arid grassland (del Hoyo, et al. 1996) [6]. It is found also in the close proximity to water, sandy riverbeds, riverside mud banks, rocks mid-stream (Cramp and Simmons 1983, Hayman, et al. 1986), [7] lake shores, mangroves (Urban, et al. 1986) [8], grassy flats beside rivers and irrigated fields (del Hoyo, et al. 1996) [9]. It is always tending to avoid steep broken terrain, desert and tall, dense vegetation, either in forest or wetland (Cramp and Simmons 1983)[10].

Senegal thick-knee is carnivorous that feeds on land (del Hoyo, et al. 1996) [11], its diet comprises mainly insects and small rodent, crustaceans, mollusks, worms, frogs, and tadpoles (Cramp and Simmons 1983, Urban, et al. 1986) [12].

It is mostly sedentary but may have seasonal movements in parts of West Africa in relation to flooding and (del Hoyo, et al. 1996) [13]. It is found commonly in pairs or small parties of up to six individuals but when in flocks occasionally exceed 20-60 individuals on the River Nile in Egypt (del Hoyo, et al. 1996 [14], It is nesting in pairs during the breeding season as territorial and disperse usually to nest singly. The nest of this species is a shallow scrape positioned on bare ground, sand-banks, the top of low flat rocks or on rocky islets in rivers.

(Cramp and Simmons 1983) [15]. In the Nile Delta, the species commonly nests in small colonies, with up to 21 nests recorded on the roof of one house. The breeding season timing varies according to locality (Urban, et al. 1986, del Hoyo, et al. 1996 [16]), but it usually occurs before the rains in areas with seasonal rainfall (del Hoyo, et al. 1996) [17]. The species is mainly nocturnal, but is often crepuscular (Cramp and Simmons 1983, Urban, et al. 1986)[18], sometimes foraging in the twilight hours of morning and evening (Cramp and Simmons 1983).[19]

in Egypt it has been recorded nesting on the flat roofs of buildings (Cramp and Simmons 1983)[20].

(Nikolaus 2001)[20] stated that Senegal thick-knee is hunted and traded at traditional medicine markets in Nigeria

In Sudan there are 3 species which occur in Sudan

[Eurasian Thick-knee](#) *Burhinus oedicephalus*

[Senegal Thick-knee](#) *Burhinus senegalensis* (Sawainson 1837).

[Spotted Thick-knee](#) *Burhinus capensis*, Clements, James F. (2000).

The bird was recorded by Nequlous 1987, and at different sites all over Sudan by many researchers; Ola Elleström 2006, mention it in his list f birds watching in Tutti Island. Hussien, E,MA 2011,2018, at dindir national parks and Sinnar state respectively, Mandain 2013, also noticed it at s some wetlands of White Nile.

Also of it is presence but no study focused and described the ecology of the bird, distribution, behavior, breeding biology and status in Sudan.

This study will be basic one to provide basic required information to understand the bird life.

Objectives:

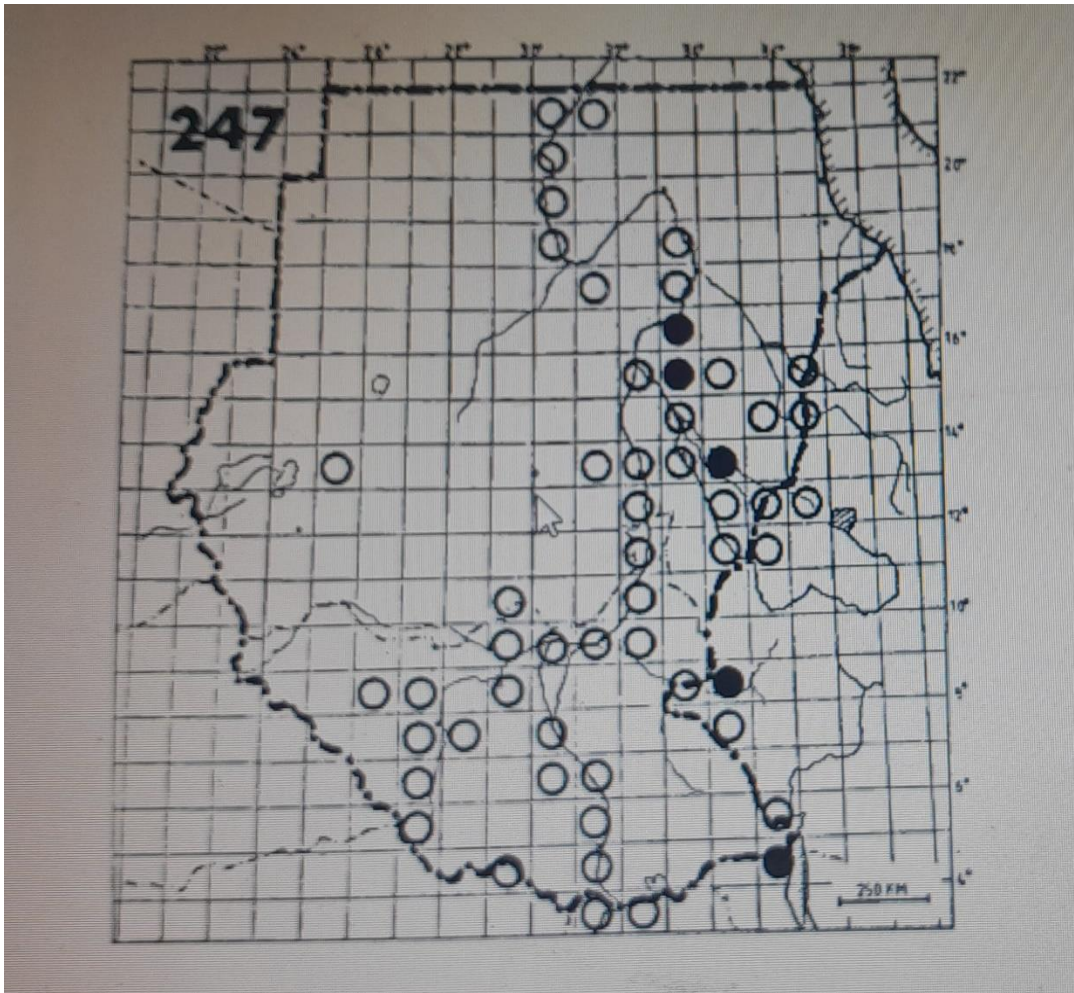
1. To assess the total number of birds and the effect of day time.on numbers.
2. Monitoring the bird's activities during the daylight such as behavior, feeding, and breeding biology, like nesting.
3. To assess the threats that facing the bird.

Test of hypothesis:

Hypothesis to be tested was:

There was statistically significant difference in the mean number of birds between the morning and evening periods. The null hypothesis was accepted as p value was 0.788, indicating that time of the day did not significantly affect the birds counts.

Figure.1: Distribution of Senegal thicknee in Sudan



Source: From Nikolous 1987.

Study area:

Elssuki area is located at eastern bank of the Blue Nile at the south east of Sinnar state, N 13 31 67 E 33 8833, its elevation is 399 meters above sea level and its population amounts to 33,524. It is located in poor Savanah zone or semi desert climate. It is dominated by tropical climate, the mean of annual rainfall is 400 - 500 mm, the temperature 37⁰ - 40⁰ C.

Bayara Medow, located in Essuki town at sinnar, state. Sudan. It sits at the eastern bank of the Blue Nile (E:03352351 N: 1319302). It was surrounded by two irrigation pimp, slouter, grave yard, Electricity station and the Blue Nile. The total area of it is

٣٥,٨٦٢km² (129m length, 278m long). It was considered as seasonal wetland that feeded from the flood of the Blue Nile and the rain fall during the rainy season. The wetland was important for many birds species as roosting site and feeding or nesting site and one of the most important colony of Cattle egret.

Figure.2: Location of study area



Figure.3: Location of bayara wetland. Elssuki, Sudan.

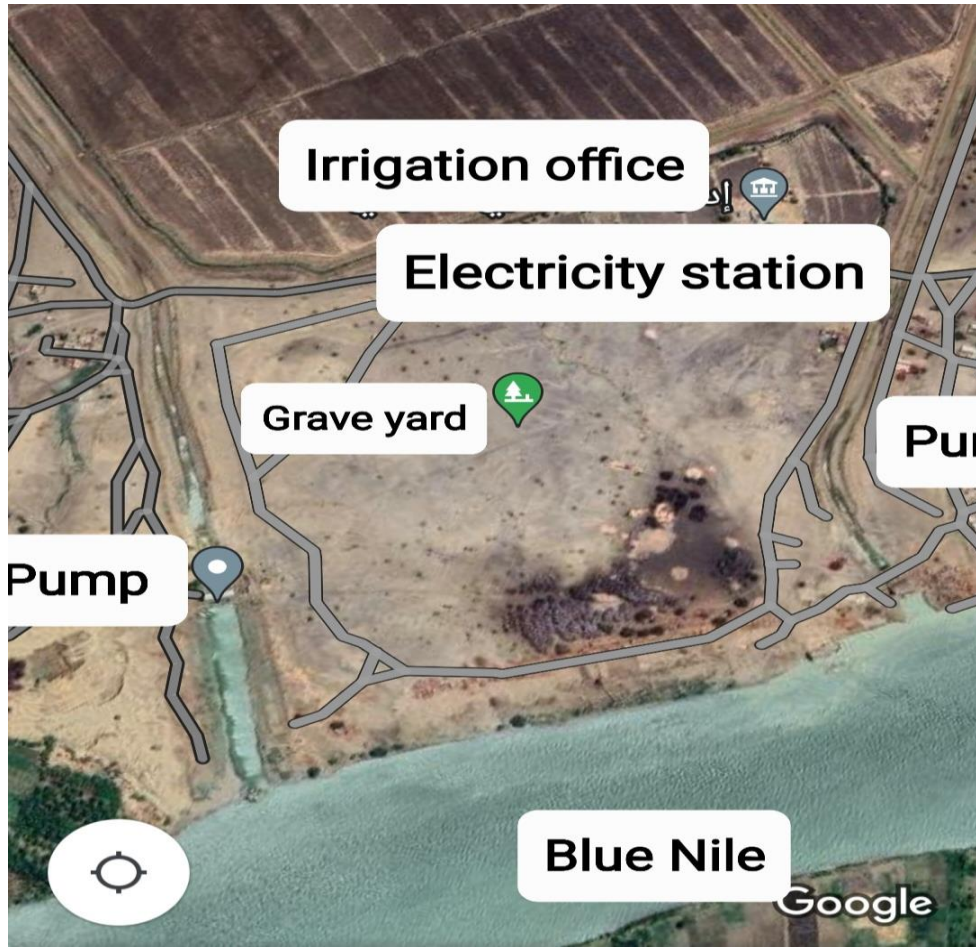


Table. 1: Pant species at study area.

No	Species
1	<i>Echinochloa colona</i>
2	<i>Dactyloctenium aegyptium</i>
3	<i>Euphorbia granulata</i>
4	<i>Tribulis terrstris</i>
5	<i>Cyndon dectylon</i>
6	<i>Ipomia aquatic</i>
7	<i>Cyprus gigantia</i>

Table.2: Tree species at study area.

No	Species
1	<i>Acacia nilotica.</i>
2	<i>Capparis decidua</i>
3	<i>Acacia nubica</i>
4	<i>Ziziphus spina-chris</i>

Materials and Method:

The study extended from 28/7/2022 to 7/11//22022 during the rainy season, first period from 28/7/2022 to 7/9/2022, the second period from 12/ 10/2022 to 20/10/2022 the last period from 24/10/2022 to 7/11/2022. The total area was divided to four plots of (32,25m length 278m long) total area 8965.5 M².

The direct count method is used to count the birds number and monitoring its behavior, feeding roosting site and other activities on the mooring and evening. The morning count begin at 6 o'clock till 19 o'clock while the evening watching begin from 4:00 o'clock to 6:00 o'clock. Equipment used for data collection are a pair of binoculars (8X50 magnifications), Telescope, Swarovski (660 - 940), digital still camera for documenting, data recording sheets, notebook The bird was observed, counted if inside each block only and notes were taken directly about activities pattern. An Papp was used to analyses the data, using pair sample t. test to compare the number of birds in the two period morning and evening.

Result:

Table No.3: Number of bird during the morning

Total number	Third period	Second period	First period	Block
193	64	62	67	1
135	44	91	----	2
568	42	148	378	3
449	76	172	201	4
1345	226	473	646	Total

The total number of Senegal thick-knee in the morning is 1345; the high number recorded in Block3 and Block 4, and first period is the highest while the third period is the lowest number (Table.3).

Table. 4: Number of bird during the evening

Total number	Third period	Second period	First period	Block
191	28	83	80	1
142	71	71	----	2
604	48	149	407	3
507	87	211	209	4
1444	234	514	696	Total

The total number in the evening is 1444 and the first period is highest with slow decreasing in the second period, however the thirds period is lowest one. (Table. 4)

Table .5: Number of bird and density at all block.

Density	Block total area	Total number of individuals	Block Number
23.35	8965.5	384	1
32.37	8965.5	277	2

7.65	8965.5	1172	3
9.28	8965.5	966	4
12.9	٣٥,٨٦٢	2789	Total

The number that counted I the whole period; morning and evening was 35862 individuals, Block 3 has more concentration of birds

Discussion:

Number and abundance.

The study showed that Senegal thick-knee is sedentary agreed with (del Hoyo, *et al.* 1996). The number of bird in the site indication the status condition of the conservation which categorized as least concern (LC). In spite of the small size of the site and it was proximity close to the city and where intensive activities around here especially the bricks making.

It was clear that Senegaal thick-knee tends to aggregated for forage earlier in mooring but the more concentration in the evening since the bird considered as nocturnal activities, Cramp and Simmons 1983) stated the same result. However, also the wetland was seasonal and its capacity storage depend on the amount of rain fall but considered as one important site in the area for many bird's species mainly Cattle egret (*Bubulicus ibis*) which colonize, nesting and breeds annually with high concentration.

The decreasing in number of bird at October attributed to the disturbance of labour of bricks making (kamina) along the bank that begins after the rainy season and depend on the high amount of siltation of cleaning operation the irrigating pump. This disturbance affects directly on the bird and forced him to migrate to an island on the western bank of the river. (Called Gazira).

T. Test:

The result of the paired - samples T. test indicated that there was no statistically significant difference between the number of birds in the morning and evening ($t(10) = 0.29, p= 0.788$). The mean was 9 birds, with standard deviation of 106.9. These findings suggest that bird activity remains relatively consistent across both time periods within the studies sample.

The most remarkable that Senegal thick -knee concentrated in the third and fourth block due to large open area far from any human disturbance where bushes and high land representing suitable site for resting and roosting. The study confirm the fact that the bird is roosting at high lands and open land which mentioned by (Cramp and Simmons 1983) in Egypt.

Other activities:

The study stated that the bird was not preferred to feed in large groups but small one or in pairs also it was in same place but tend to scattered in the site .The bird was very sensitive to human and avoid to be close to human with distance separate between him no than between three to five meter.

No nesting or egg noticed during the study period the reason that the birds is may built his nest at the other site of the river or on roofs of the houses near the site and there is an evidence approved this assumption that one bird was observed in the roof in the faculty of natural resources and environmental studies, with great confirmation of local people around. (Urban, et al. 1986, del Hoyo, et al. 1996) showed the same result.

No hunting was registered for the birds, this mainly for reason that for Sudanese culture, the most Sudanese people not hunting this species in most parts of Sudan.

Recommendation:

1. The more studies needed for nesting and breeding biology in most part of Sudan.

2. Also the conservation status of the bird is not globally threatened or hunted but in Sudan where no conservation measures applied and policy dependent, the more species such like Senegal thick- knee may exposure to other threats.
3. The wetlands of Sudan are mainly neglected sand the small size where located near communities were under pressure of deferment pattern of human activities, these need more attention.
4. Future research should focus on other environmental variables, such as temperature or food availability, which may have greater impact on bird activity than the time Of day.
5. Expanding the study to include different geographical locations or diverse habitats in is suggested to verify if these patterns remain consistent.

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تفضيل الموئل والأنشطة السلوكية لطائر الكروان السنغالي بميعة البيارة السوكي، السودان

محمد المكي علي البدوي^١، عبدالرحمن نورالدين^٢ وكمال الدين جعفر عبوش^٣

١. أستاذ مساعد (عالم الطيور) - قسم الحياة البرية - كلية الموارد الطبيعية والدراسات البيئية - جامعة سنار.
٢. خريج قسم الحياة البرية - كلية الموارد الطبيعية والدراسات البيئية - جامعة سنار.
٣. قسم إنتاج الدواجن - كلية الزراعة - جامعة أم درمان الإسلامية

البريد الإلكتروني: makki71@gmail.com

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مستخلص الدراسة:

تمت هذه الدراسة بميعة البيارة التي تقع بمنطقة السوكي بولاية سنار، السودان. وهي تقع في الشاطي الغربي الشرقي للنيل الازرق (E:03352351 N: 1319302). وتبلغ مساحتها الكلية ٣٥,٨٦٢ كلم^٢ (٢٧ متر عرض و ١٢٩ طول) وتمثل منطقة تجمع سنوية للطيور ومنطقة مبيت وتكاثر. الدراسة امتدت ما بين ٢٠٢٢/٧/٢٢ الي ٢٠٢٢ /١١/٧ خلال الموسم الرطب، الفترة الاولى من ٢٠٢٢/٧/٢٨ الي ٢٠٢٢/٩/٧، الفترة الثانية من ٢٠٢٢/١٠/١٢ الي ٢٠٢٢/١٠/٢٠ والفترة الثالثة من ٢٠٢٢/١٠/٢٤ الي ٢٠٢٢/١١/٧. قسمت المساحة الكلية الي اربعة قطاعات متساوية المساحة ٨٩٦٥,٥ متر^٢ (٣٢,٢٥ متر طول، ٢٧,٨ متر عرض). الطريقة التي استخدمت في هذه الدراسة هي طريقة العد المباشر لاحصاء اعداد الطائر في المنطقة ومحاولة مراقبة السلوك، التغذية ومكان المبيت والبيئة المفضلة وأي أنشطة أخرى صباحاً من الساعة السادسة حتي العاشرة ومساءً من الرابعة حتي السادسة. المعدات التي استخدمت في الدراسة : منظار (8X50)، تلسكوب نوع سوارفسكي (940 - 660) وكاميرا ديجتال نوع كانون، دفتر وقلم لتسجيل البيانات. يتم حساب الطائر فقط اذا كان داخل المربع. العدد الكلي للطائر ٢٧٨٩. الاعداد للفترة المسائية ٦٤٦، ٤٧٣ و ٢٢٦ والعدد الكلي للفترة المسائية ١٣٤٥ اما الفترة الصباحية فكانت اعدادها ٦٩٦، ٥١٤ و ٢٣٤ والعدد الكلي بلغ ١٤٤٤ طائرا. البيئة المفضلة لطائر الكروان السنغالي قرب الماء لكن يقضي معظم وقته في المناطق العالية وبين الشجيرات خاصة اثناء النهار. يتغذي الطائر علي الحشائش، صغار الزواحف، الحشرات والعناكب. حساب اختبار لمقارنة أعداد الطائر في الفترة الصباحية والمسائية وقد ظهر أن مستوي الدلالة اصغر من 0.5 وبذلك فان الدراسة اكدت ان اعداد الطائر لانتاثر بالفترة من اليوم صباحاً ومساءً ولا فروق جوهرية بين الاعداد في الفترتين لم يتم رصد اي عش للطائر في المكان اثناء فترة الدراسة ويعزي ذلك لحساسية وحذر الطائر من

الانسان لكن بعض الشواهد تدل علي ان الطائر يقطع النيل الازرق الي الضفة الاخري والجزيرة وشوهد يبني
عشاً في سقوف المنازل.

جامعة ام درمان الإسلامية، كل حقوق النشر محفوظة. ©٢٠٢٥