pISSN:2349-5707 Volume:13,Issue 1, January -2025 eISSN:2349-5715

Umedov Azizbek Hasanovich
Master's student, Bukhara State University
E-mail: azizbekumedov65@gmail.com
Phone: +998 91 973 11 43

THE ROLE OF THE HAQQUSH COLONY IN THE ECOSYSTEM: A CASE STUDY OF BUKHARA REGION

Abstract

This study investigates a colony of the Black-crowned Night Heron inhabiting a cultural park located in the Robotiqalmoq area of Bukhara Region. Observations documented nest construction, egg laying, and chick rearing processes. The results demonstrate that night heron colonies, as high-trophic-level predatory birds, contribute to the regulation of populations of small fish, amphibians, reptiles, and invertebrates, enhance nitrogen and phosphorus fluxes through guano deposition, and exhibit bioindicator properties in riparian habitats. The presence of a nearby fish farming facility provides an important trophic base supporting the persistence of the colony in this area. The article also offers practical recommendations for standardizing monitoring, reducing anthropogenic disturbance, and conserving breeding habitats. The obtained data highlight the ecological adaptability and trophic interactions of the Black-crowned Night Heron.

Keywords: Black-crowned Night Heron (Nycticorax nycticorax), piscivorous birds, colony, nesting, eggs and chick development, feeding objects (fish, water snake, frog), Bukhara fish farm, population adaptation, migration, trophic chain, bioindicator, monitoring, conservation.

Introduction

Each species existing in nature possesses specific biological and ecological characteristics that play an important role in maintaining ecosystem balance. The Black-crowned Night Heron (*Nycticorax nycticorax*) is one of the ardeid bird species widely distributed in wetland ecosystems and is mainly active during twilight and nighttime hours. This species is particularly distinguished by its colonial nesting behavior. Colonies are not only a reproductive strategy but can also be regarded as "centralized biological hubs" that influence matter and energy flows at the ecosystem level. Therefore, studying the habitats, feeding resources, and population characteristics of this species remains a relevant issue in ecology and ornithology.

In recent years, anthropogenic factors have significantly altered bird habitats. The study of fish-eating birds, particularly the Black-crowned Night Heron (*Nycticorax nycticorax*), is essential for understanding ecological balance. Their feeding behavior is closely associated with fish farms and natural water bodies and plays a unique role in maintaining ecosystem stability. The ecological role of the Black-crowned Night Heron is often simplified and interpreted mainly from the perspective of "pressure on fish resources." However, their feeding behavior is largely opportunistic, and prey composition varies depending on seasonal and anthropogenic conditions of water bodies. Therefore, evaluating the role of Black-crowned Night Heron colonies in ecosystems requires a comprehensive approach that considers population–biotope–trophic network–biogeochemical cycles rather than focusing solely on the interests of a single economic sector.

The presence of a Black-crowned Night Heron colony in a cultural park located in the Bukhara region demonstrates the adaptive capacity of birds to urban environments. This situation emphasizes the necessity of scientifically studying the ecological characteristics of these birds under anthropogenic conditions.

Purpose of the Study

The aim of this study is to investigate the ecological characteristics of the Black-crowned Night Heron (*Nycticorax nycticorax*) population inhabiting a cultural park located in the

pISSN:2349-5707 Volume:13,Issue 1, January -2025 eISSN:2349-5715

Robotiqalmoq neighborhood of Bukhara district. The research focuses on nest construction, morphometric indicators, egg-laying and chick-hatching periodicity, composition of feeding objects, and adaptation processes to anthropogenic environments. In addition, the study seeks to determine the relationship between the feeding activity of Black-crowned Night Herons and fish resources in local water bodies, as well as their adaptation to urban conditions.

Object of the Study

The object of the study is the Black-crowned Night Heron (*Nycticorax nycticorax*) colony located in the cultural park of the Robotiqalmoq neighborhood, Bukhara district. Data were collected on population dynamics, biology, ecology, nest construction, breeding periodicity, and feeding characteristics of the species.

Subject of the Study

The subject of the study includes nest construction by the Black-crowned Night Heron (*Nycticorax nycticorax*) in a cultural park, egg-laying phenology, chick development, feeding characteristics, adaptation to anthropogenic and urban environments, as well as improvement of measures for population management and sustainable use.

Relevance of the Study

Studying the population of the Black-crowned Night Heron is important not only from an ornithological but also from an ecological perspective. Under increasing anthropogenic pressure, analyzing birds' adaptation to human settlements, trophic base formation, and biological characteristics is considered highly relevant.

Research Methods

The study employed basic zoological methods (stationary observation, direct observation, and route methods), ecological approaches, as well as statistical and comparative analysis methods. The abundance of birds in water bodies and their annual dynamics were determined based on the methodologies proposed by N. Kashkarov (1927) and A. Novikov (1949).

Data Description

The Black-crowned Night Heron (*Nycticorax nycticorax* L.) is a typical representative of the Ardeidae family, which includes six species worldwide. Among them, *Nycticorax nycticorax* is distributed within the territory of Uzbekistan. Scientific literature provides extensive information on the distribution of this species in Uzbekistan; however, data on the ecological distribution of Black-crowned Night Herons in the lower reaches of the Zarafshan River basin, particularly in the water bodies of Bukhara region, remain insufficient [1, 2, 3, 4, 5, 6, 7].

The study was conducted in a cultural park located in the Robotiqalmoq neighborhood of Bukhara district. The total area of the park is 5 hectares, and a large number of Black-crowned Night Heron nests were identified. The herons were observed living in symbiosis with cormorants. A total of 69 nests of Black-crowned Night Herons were recorded on Oriental plane trees, pines, and poplars at heights ranging from 10 to 20 meters above the ground. The park contains more than 200 large trees, 62 of which hosted nests of Black-crowned Night Herons and cormorants.

The highest number of nests was observed on an approximately 100-year-old Oriental plane tree with a height of 25 meters, where 22 nests were recorded, including 9 belonging to Black-crowned Night Herons. The arrival of Black-crowned Night Herons was observed from the fourth week of February to the first half of March (Figure 1). Departure was observed from the second half of September, with wintering occurring from October to February.

The main factor contributing to the presence of Black-crowned Night Herons in this area was the establishment of artificial fish-breeding ponds nearby. Typically, Black-crowned Night Herons are cautious birds that avoid humans; however, the population inhabiting the cultural park has adapted to urban noise and human presence. This indicates behavioral changes and adaptation to altered living conditions.

Route and observation methods were applied during the study. Equipment used included binoculars, spotting scopes, cameras, calipers, nets, and specimen bags. Some individuals

pISSN:2349-5707 Volume:13,Issue 1, January -2025 eISSN:2349-5715

constructed new nests, while most returned to previously used ones. Egg-laying began between March 15 and March 20, while chicks started hatching between April 5 and April 10, continuing until April 17. Clutches typically consisted of 2–3 eggs, and in some cases up to 4 eggs.

Observations showed that because the heron incubates each egg as it is laid, chicks do not hatch simultaneously. The interval between hatching of individual chicks ranged from 2 to 3 days. Newly hatched chicks were recorded during observations; they had light brownish-white down feathers. It was noted that adult herons brought various food items to the nest to feed their chicks, including small fish.



1-picture.

It was determined that immediately after hatching, the chicks are fed small fish and insects. Observations showed that one-month-old chicks are fed various vertebrate animals. In particular, remains of prey found inside the nest included a water snake (approximately 35 cm in length), fish (with an average length of about 15 cm), as well as frog remains.

Among the food items, fish species were clearly dominant. It was established that silver crucian carp, belonging to the family *Cyprinidae*, constituted the main prey delivered to the night heron chicks. This indicates that the foraging activity of the night heron is closely associated with aquatic habitats and that fish form the core of its trophic base.

The construction and dimensions of the night heron's nest have distinctive characteristics. According to the studied sample, the total nest length was 30 cm, the diameter of the main egg-laying platform (nest cup) was 15 cm, and its height was 7 cm. These parameters are shaped in accordance with the morphological and biological needs of the species, serving to securely place the eggs, maintain stable temperature conditions, and ensure successful brood rearing.

The night heron colony is located in a cultural park, approximately 1.5–2 km from the Bukhara Fish Farm. This fish farm covers an area of 200 hectares and breeds various fish species in its water bodies, including silver crucian carp (*Carassius auratus gibelio*), pikeperch (*Sander lucioperca*), carp (*Cyprinus carpio*), and common carp (sazan). Birds regularly forage in these water bodies and predominantly feed on fish.

When approximately 70 breeding pairs nest in one location, food transport becomes centralized, indicating that prey resources are mainly collected from aquatic habitats located at a certain distance from the colony. As a result, within the "foraging radius," local selective pressure may develop on populations of small fish, frogs, water snakes, aquatic insects, and other invertebrates.

According to literature sources, the diet of this species is generally flexible and closely linked to the composition of available prey in water bodies. Colonial waterbirds are sensitive to habitat quality and select nesting sites based on factors such as disturbance levels, stability of food resources, and protection from predators. Therefore, the emergence, persistence, or

pISSN:2349-5707 Volume:13,Issue 1, January -2025 eISSN:2349-5715

disappearance of a colony may indirectly signal the structural integrity of riparian biotopes and the trophic condition of nearby water bodies.

In the Bukhara region, where anthropogenic management of water resources is intensive, correct interpretation of such signals requires particular consideration of hydrological regimes and seasonal water shortages.

The trophic role of the night heron colony should not be evaluated through a simplistic "beneficial or harmful" dichotomy. Indeed, night herons often feed on small fish and in some areas are perceived as competitors to fish farms. During feeding activities, they may cause a certain level of damage to fishery operations. However, their diet is dominated by fish species of relatively low economic value, slow growth rates, and limited commercial importance, particularly silver crucian carp (*Carassius auratus gibelio*).

From an ecological perspective, it is also discussed that predatory birds may preferentially capture weak or diseased individuals, exerting an effect similar to "sanitary selection" within aquatic ecosystems. Kushlan (1978) demonstrated that the feeding ecology of ardeids is strongly dependent on habitat conditions and prey density [8].

Potential nesting biotopes for the night heron include wooded areas, where tall tree branches provide protection from predators and opportunities to avoid disturbance. Keller and Atkinson (2015) emphasize that disturbance factors and habitat quality significantly influence reproductive success in colonial waterbirds [9]. This is also highly relevant under Bukhara conditions, where tree cutting, drying of water bodies, and food depletion coinciding with the breeding season may lead to colony abandonment.

The global distribution and ecological plasticity of the night heron allow its use as a bioindicator species; however, indicator value should not be limited to mere presence or absence. Colony size, annual dynamics of nest numbers, chick fledging success, and frequency of food delivery are indicators sensitive to changes in water body conditions. According to *BirdLife International* (2024), the species is widely distributed globally, and habitat-related factors are identified as the main limiting constraints in many regions [10]. This approach suggests that in the Bukhara region, "colony conservation" should be directly linked to "riparian habitat conservation." A particularly significant risk factor in this context is a sharp decline in water levels combined with constant disturbance.

These observations scientifically confirm that night herons utilize a variety of aquatic and semi-aquatic animals during chick rearing and that their feeding objects are directly dependent on available ecosystem resources (Table 1).

Table 1. Observation data of the Night Heron (*Nycticorax nycticorax*)

Parameter	**Description**
Scientific name	Night Heron
Russian name	Кваква
Latin name	*Nycticorax nycticorax*
Population location	Bukhara district, Robotikalmoq MFY cultural park
Number of nests recorded	69 nests
Morphological characteristics	Body length 58–65 cm, wingspan 95–106 cm, weight 700–850 g
Period of occurrence	March – October
Wintering period	November – February
Biotic associations	Coexists with crows
Reason for habitat selection	Presence of nearby fish farms
Methods	Route and observation methods
Equipment	Binoculars, spotting scope, camera, caliper, net, sample bag
Migration	Arrival from late February to early March

pISSN:2349-5707 Volume:13,Issue 1, January -2025 eISSN:2349-5715

Parameter	Description
Egg-laying period	From March 15–20
Hatching period	Between April 5–17
Clutch size	2–4 eggs
Chick hatching interval	2–3 days apart
Chick plumage color	Brown down
Food items	Fish, water snake (35 cm), frog, insects
Main prey	Crucian carp (silver crucian)
Nest dimensions	Length 30 cm, diameter 15 cm, height 7 cm
Nearby facility	Bukhara Fish Farm (200 ha)
Fish species present	Silver crucian, pikeperch, carp, sazan
Period of stay in the area	March – September

The birds regularly forage in nearby water bodies and predominantly feed on fish. The night heron colony typically occupies the area from spring and migrates to other regions in late August–early September. The head and upper body are black, the underside is light, and the wings are gray. During spring, elongated white plumes form a crest on the head. The bill is black, legs are yellow or pinkish, and the eyes are red.

Conclusion:

The study of the Black-crowned Night Heron (*Nycticorax nycticorax*) is important for understanding ecological balance within urban ecosystems through the assessment of its adaptation to urban environments, feeding behavior, and reproductive biology. This species has significant scientific value as a bioindicator reflecting the condition of water bodies, the stability of food chains, and the degree of anthropogenic impact. Therefore, regular monitoring of night heron populations and the preservation of their habitats are essential components of nature conservation and biodiversity protection.

References:

1. Bakaev, S.B. *Species Composition of Nesting Birds of the Bukhara Region.* Methodological guide. — Bukhara, 1987.
2. Mukhina, E.A., Lukashevich, R.V. *Riparian and Waterfowl Birds of the Karshi Steppe.* — pp. 123–135, 135–147.
3. Sagitov, A.K. *Ciconiiform Birds of Uzbekistan.* Vol. 1. — Tashkent, 1987.
4. Sagitov, A.A., Nikulin, Yu.B., Punchkas, M.V. *Modern Settlements of Pelecaniformes and Wading Birds on the Lakes of Karakul, Bukhara Region.* — pp. 193–204.
5. Turaev, M.M., Khodzhiev, F.D., Raymond, A.R. *Birds of the Bukhara Region.* — Tashkent: Navruz Publishing House, 2015.
6. Turaev, M.M. *Data on the Ecology of the Black-crowned Night Heron (Nycticorax nycticorax L.).* — Samarkand, 2012.
7. Turaev, M.M. *Specific Features of the Distribution Ecology of Riparian Waterbirds.* — Bulletin of the Ma'mun Academy, 2019, No. 3, p. 17.
8. Kushlan, J.A. *Feeding Ecology of Wading Birds.* — New York: Garland Publishing, 1978, 297 pp.
9. Keller, V., Atkinson, P.W. *Effects of Disturbance on Breeding Colonial Waterbirds: A Review.* — London: British Trust for Ornithology (BTO Research Report), 2015, pp. 1–52.
10. BirdLife International. *Species Factsheet: Nycticorax nycticorax.* — Cambridge: BirdLife International (Digital factsheet publisher), 2024, pp. 1–6.