STUDY ON THE DECLINED POPULATION AND NESTING BIOLOGY OF GREEN PARROTS (*PSITTACULA KRAMERI* SCOPOLI, 1769)

Rameez Raja Kaleri[1-2*], Hubdar Ali Kaleri[2], Ghulam Mustafa Solangi[3], Zainab Lanjar[4], Raza Ali Mangi[5], Imran Ahmed[6], Habibullah Janyaro[7], Sajid Mahmood Sajid[6], Abdul Jabbar[6], Tamseel Saleem[8], Deepesh Kumar Bhuptani[9] and Agha Raza Ali Khan[1]

[1]*Department of Livestock & Fisheries, Government of Sindh, Pakistan*
[2]*Department of Animal Breeding and Genetics, Sindh Agriculture University, Tandojam, Pakistan*
[3]*Department of Veterinary Pathology, Shaheed Benazir Bhutto University of Veterinary & Animal Sciences, Sakrand, Pakistan*
[4]*Department of Veterinary Microbiology, Shaheed Benazir Bhutto University of Veterinary & Animal Sciences, Sakrand, Pakistan*
[5]*Department of Veterinary Anatomy and Histology, Shaheed Benazir Bhutto University of Veterinary & Animal Sciences, Sakrand, Pakistan*
[6]*Department of Livestock and Poultry Production, University of Poonch, Rawalakot, Azad Kashmir*
[7]*Department of Veterinary Surgery, Shaheed Benazir Bhutto University of Veterinary & Animal Sciences, Sakrand, Pakistan*
[8]*Department of Veterinary Physiology and Biochemistry, Sindh Agriculture University, Tandojam, Pakistan*
[9]*Department of Meat Technology, Shaheed Benazir Bhutto University of Veterinary & Animal Sciences, Sakrand, Pakistan*
*Corresponding Author: rameezkaleri@gmail.com

ABSTRACT

Green parrot is native parrot specie of Sindh, Pakistan. This is well known and famous companion bird in Sindh. This survey was aimed to analysis the population and nesting biology of green parrot in district Tando Allahyar, Sindh. There is no any study previously have been conducted to observe their live, vacant nesting biology and cavity position of nest on particular plant species where they made their nest. The findings of present study showed that (66.33%) vacant and (33.67%) live or active nest were recorded. In this study total seven different species of tree were brought under the nest formation by parrot. These species were *Tamarix articulata*, *Mangifera indica* , *Acacia arabica (nilotica)*, *Populus euphratica*, *Eucalyptus camaldulensis*, *Tamarindus indica (aphylla)* and *Cordia myxa (dicotoma)* whereas the commonly used species for nesting was *Mangifera indica* due to more number of nest and present of old nest. Birds made more nest for their safety (41.13%) on trunk (38.29%) on fork and (20.585%) on terminal part of trees. It is concluded that because of less and thriving population only (mean = 8 ± 3) green parrots were observed during the roost counting process. Rapid cutting of trees and destruction of nesting area and illegal poaching for selling in local market are major reason of their declined population. It is suggested that Sindh Government should take strict action against selling of this species and put fine on its illegal poaching.

Keywords: Declined population, *Psittacula Krameri*, Nesting biology, Tando Allahyar

INTRODUCTION

Green parrot (*P. Krameri* Scopoli, 1769) is one of most famous types of four different parakeet species present in Sindh. This specie is widely found in Sindh and also in other provinces of Pakistan due to its companion and friendly nature (Bilal *et al*., 2020). Green parrot is most companion cage bird found in cultivated field, rural areas, mango gardens, public parks and urban agriculture areas (Sanz and Rodriguez-Ferrao, 2006). The green parrot belongs order of *Psittaciformes* medium sized 35 to 40 cm body aggressive nature and cavity nesting bird. It has green and dark plumage, with prominent black collar ring of male neck whereas female bright green ring other than black (Waseem, *et al*., 2015). Green parrot attain there breed age at the during the 3rd year of life. They have long tail half of the body length about 25 cm. This bird have tolerance and feeding niche with wide behavior and able of live in various colonize parts (Shwartz *et al*., 2009). They have ability to make their feral population in various regions due to escaping from cages (Khan, 2002). The population of this bird is facing life threats in Pakistan due to

degradation, fragmentation and loss of habitat and also by illegal poaching hunting (Khan and Husnain, 1990. No any study has been conducted in Sindh regarding population, habitat, breeding and nesting biology of parakeets. This study was emphasized on the reduction factors of population in this region as well as to observe the effect of predation on green parrots which will surely help to produce model for conservation in future. This study was aimed to observe the introductory level of information about declined population and nesting biology of parakeets by analyzing the nest availability and roost potential under different conditions such as cavity, trunk and terminal based part of plants in three different taluka Tando Allahyar, Jhando Mari, and Chambar of district Tando Allahyar, Sindh.

MATERIAL AND METHODS

An introductory survey was performed in selected taluk of Tando Allahyar district, Sindh for analyzing the declined population and nesting biology of green parrots. Study was carried out in different rural union councils of taluka Jhando Mari, Tando Allahyar and Chambar mainly characterized with agriculture cultaivated pracies and vegatiations. Most of the people remain in paka houses but have not access with built road.

Tree vegetation and types with local names

In these areas major vegetation includes *Tamarix articulata* (Farash), *Mangifera indica* (Mango), *Acacia arabica (Nilotica (Acacia), Populus euphratica (Bahan), Eucalyptus camaldulensis* (river red gum), *Tamarindus indica (aphylla)* (Imli) and *Cordia myxa (dicotoma)*(Laoora).

Field Survey

Field survey was performed from May 2022 to April 2023 in three different taluka of district Tando Allahyar. For this purpose data was recorded through two different observer and 1-4 volunteers in all regions. The green parrots were observed for short period of time through naked eye (Bilal *et al*., 2020) without disturbing them. While the data regarding nesting biology were collected during their breeding season start from February 2022 to May 2023 (Ali, 2002).

Nesting Biology

The information regarding nest area and nesting type was recorded weekly bases during the morning and evening time by survey (Bilal *et al*., 2020). Present survey was rapidly performed observe population of green parrots and their nest in respective areas (Hairiah *et al*., 2001). In this survey green population was estimated by distribution and population most correctly. The nest only was recorded on mentioned trees through the stick procedure as well as measuring tap (Ali, 2002). Whenever green parrot roost gathers in flock, we applied counting procedure for estimating the population in respective region (Pithon and Dytham, 1999). The total observation was performed on specific sheet for further analysis. In this survey different pictures of parrots were captured through DSCLR camera (Bilal *et al*., 2020).

RESULTS AND DISCUSSION

Vacant and lives nest

The nest can be defined as a structure designed for breeding as well as for protection purpose of new born chick (Collias, 1964). The crevices and holes inside the trunk of tree were formed due to insect, birds, aging of trees and some ecological and environmental factors. In these areas if competition was present then green parrot push back to other birds from nest for their breeding and new born protection. It was also noted that secondary nest digger also use past holes in the trees for their breeding purpose and life spend. In our survey the live nest was visualized through present of green parrot for hatching guarding and nourishing of young chicks present in their nest. The nest condition and status was observed by the present of activity of green parrots as compared with other nest. During the survey we have observed 97 (66.33%) vacant or destroyed and 55 (33.67%) live or active nest were recorded. The present of 97 number of vacant nest showed size of population of green parrots in that particular area was much enough. For the confirmation of status of live nest some villagers were also interviewed in those areas.

Table 1. Tree species and nest data of Rose ringed parkeets in Taluka Tando Allahyar.

S.#	Tree specie	Total nest	Live nest	Vacated	Percentage
1	*Tamarix articulata*	3	0	3	5.61
2	*Mangifera indica*	7	5	2	15.34
3	*Acacia arabica (nilotica)*	4	1	3	9.91
4	*Populus euphratica*	2	0	2	8.12
5	*Eucalyptus camaldulensis*	1	1	0	11.17
6	*Tamarindus indica (aphylla)*	4	1	3	17.23
7	*Cordia myxa (dicotoma)*	2	2	0	10.04

Site selection for nest

The site selection for nest is important thing for increasing their reproductive efficiency in birds and choice for nest site vary from bird to bird and specie and specie. It is major driving ability for improving abundance population. The site of nest selection is important effective traits for bird's fitness. It has been observed that most of green parrot dug the cavities in old and hollow trunk of trees. It is also been reported by Mabb, (1997) and Khan *et al*. (2004) that cavity of nest can be observed by age and type of tree of green parrots in district Tando Allahyar. During the site selection for bird's distribution, availability of food, water and concealment are main things which consider by birds during nest formation. It was observed that green parrot mostly started selection of site in December to end of May. Broadening of dome shape cavity opening formation responsibility carried out by female. Green parrot carried dry grassy leaves, downy feathers for making comfortable environment for eggs and chicks. Similar findings were reported by Ali and Riply (1969). They reported that most of the green parrot selected site for nest with availability of water and cavities were filled with comfortable bedding material in trees in southern Punjab. In our study most of the live nest was observed *Mangifera indica* with 5 nests were live and 2 were vacant out of 7 and lowest number of nest was recorded in *Acacia Arabica (nilotica)* specie of tree in all three taluka including Jhando Mari, Tando Allahayar and Chmabar. It was observed that this tree was favorable for green parrots and their nest site selection. It was further observed that preference of mango tree might be due to older agree tree with cavities present and availability of food, water as well surrounding maize and oats field in this area. The findings of Ali and Riply), were also according to the results of our study, who reported that most of the green parrot found place in nearby trees with availability of food, water and nearby human beings. This statement was controversial with the result revealed by Sarwar *et al.* (1989), who could not find any nest nearby the human being living. The variation among site selection varies from bird to bird and depends upon the condition of environment in that area. Roberts, (1991) reported that green parrot make their nest away from human dwelling due to their poaching hunting and safety of their as well as their young one.

Table 2. Tree species and nest data of Rose ringed parkeets in Taluka Jhando Mari.

S.#	Tree specie	Total nest	Live nest	Vacated	Percentage
1	*Tamarix acticulata*	1	0	1	6.81
2	*Mangifera indica*	5	1	4	11.32
3	*Acacia arabica (nilotica)*	3	2	1	13.55
4	*Populus euphratica*	1	0	1	8.12
5	*Eucalyptus camaldulensis*	4	2	2	9.13
6	*Tamarindus indica (aphylla)*	5	1	4	19.27
7	*Cordia myxa (dicotoma)*	1	1	0	13.03

Table 3. Tree species and nest data of Rose ringed parkeets in Taluka Chambar.

S.#	Tree specie	Total nest	Live nest	Vacated	Percentage
1	*Tamarix acticulata*	7	3	4	12.11
2	*Mangifera indica*	3	2	1	14.98
3	*Acacia arabica (nilotica)*	6	1	5	11.79
4	*Populus euphratica*	2	0	2	9.21
5	*Eucalyptus camaldulensis*	7	3	4	13.23
6	*Tamarindus indica (aphylla)*	6	0	6	7.11
7	*Cordia myxa (dicotoma)*	2	1	1	8.15

Position of cavity

In our study the cavity position percentage was observed maximum in the in trunk of older trees with (41.13%), (47.23%) and (51.17%) and lowest (20.58%), (15.28%) and (21.3%) in taluka Jhando Mari, Tando Allahyar and Chambar, respectively. Whistler, 1986) revealed that the position of cavity is key factor for ensuring the safety and security of nest. The findings of our study was accordance with result revealed by Roberts (1991) that most of green parrot cavities were found in trunk of trees due to protection and hidden from predators and human being. It was also reported that the adoptability of this situation might be due to remain safe from the poaching hunting to difficult access for chicks and eggs.

Pooching hunting and predation

The green parrots are most threatened to predation particularly human due to entry into their nest cavity during broody female nosiy chicks which attracts enemy or predator to find out their nest and attack on them. It has been reported that (37%) of nest were recorded lost only due to predation during nestling time. Number of predator damages the chicks, eggs as well as female parrot after getting entry inside the cavity as reported by Sanz and Rodriguez-Ferrao (2006). There are wide range of species which attacks on the green parrots nest including squirrel, own, rodent, snakes and crawls (Bjurlin and Cypher, 2005). Research has shown that charismatic species can positively influence people's attitudes towards conservation efforts. However, residents in the study area lack ecological knowledge, and perceptions and awareness vary among different socio-economic classes. It is important to educate the community to help protect this species. This bird was considered as pest by increasing wide range for competing with human being for their food. Whistler, (1986) reported that green parrot were cause of destruction of orchards, crops including maize, millet, sorghum, sunflower and this brought economical loss for former as well as country economy. Another report published by Khan (2002) that green parrot eats mango, guava, citrus, nuts, almond and various other fruits as according to their hunger and availability of food and crops.

Table 4. Cavity position of total, live and vacant nest of Rose ringed parkeets in Taluka Tando Allahyar.

Cavity position	Live nest	Vacated	Percentage
At tree trunk	3	4	41.13
At fork	2	5	38.29
At terminal	5	6	20.58
Total	10	14	100

Table 5. Cavity position of total, live and vacant nest of Rose ringed parkeets in Taluka Jhando Mari.

Cavity position	Live nest	Vacated	Percentage
At tree trunk	1	6	47.23
At fork	3	7	37.49
At terminal	2	5	15.28
Total	6	18	100

Table 6. Cavity position of total, live and vacant nest of Rose ringed parkeets in Taluka Chambar

Cavity position	Live nest	Vacated	Percentage
At tree trunk	3	8	51.17
At fork	1	5	27.53
At terminal	3	7	21.3
Total	7	20	100

Conclusion

Further studies are needed to estimate the breeding biology of the Rose-ringed parakeet, including nesting, behavior, feeding, and breeding habits in the region. Future research should also examine its interactions with other species and its behavior as a cavity-dwelling bird. This study aimed to address the local decline of the Rose-ringed parakeet, and future studies should encompass the entire area of district Tando Allahyar.

REFRECNES

Ali S (2002). *The Book of Indian Birds.* Bombay: Bombay Natural History Society, Oxford University Press, Inc. Bombay.

Ali S and R. D. Riply (1969). *A handbook of the birds of India and Pakistan* (Vol. 1). Bombay, India: Oxford University Press.

Bilal, M., Z. Khalid, A. H. Mosvi and A. Naseer (2020). Feeding ecology, behaviour and habitat utilization of Black Drongo (Dicrurus macrocercus) in Pothwar Plateau, Pakistan. *J Bioresour Manage*., 7(2): 47-56.

Bjurlin, C. D. and B. L. Cypher (2005). Encounter frequency with the urbanized San Joaquin kit fox correlates with public beliefs and attitudes toward the species. *Endanger Sp Updat*., 22: 107-115.

Casagrande, D. G. and S. R. Beissinger (1997). Evaluation of four methods for estimating parrot population size. *Condor.*, 99: 445-457.

Collias, N. E. (1964). The evolution of nests and nest building in birds. *Am Zool.*, 4: 175-190.

Hairiah, K., S. M. Sitompul, M. V. Noordwijk and C. Palm (2001). *Methods for sampling carbon stocks above and below ground. Bogor Indonesia.* Retrieved from: http://www.icarf.cgiar.org/sea

Hossain, M. T., K. Z. Husain and M. K. Rahman (1993). Some aspects of the breeding biology of the rose-ringed parakeet, Psittacula krameri borealis (Neumann). *Bangladesh J Zool*., 21: 77-85.

Khan, H. A., M. A. Beg and A. A. Khan (2004). Breeding habitats of the Rose-Ringed Parakeet (Psittacula krameri) in the cultivations of Central Punjab. *Pak. J. Zool*., 36(2): 133-138.

Khan, A. A. and I. Husnain (1990). Parakeet, Psittacula krameri (Scopoli), damage to standing maize crop in Pakistan. *J Agri*., 6(2): 185-191.

Khan, H. A. (2002). Diurnal rhythms of the Rose-ringed parakeet (Psittacula krameri) in daylight hours in its communal roost. *Online J. Biol. Sci.*, 2(8): 551-53.

Mabb, K (1997). Roosting behaviour of naturalized parrots in the San Gabriel Valley, California. *West Birds*, 28: 202-208.

Pithon, J. A. and C. Dytham (1999). Census of the British Ring-necked Parakeet Psittacula krameri population by simultaneous count of roosts. *Bird St*., 46: 112-115.

Roberts, T. J. (1991). *The Birds of Pakistan* (Vols. 1: Regional Studies and Non-Passeriformes). Oxford: Oxford University Press.

Sanz, V. and A. Rodriguez-Ferrao (2006). Reproductive parameters and productivity of the Yellow-shouldered Parrot on Margarita Island, Venezuela: a long-term study. *Condor*., 178-192.

Sarwar, M., M. A. Beg, A. A. Khan and D. Shahwar (1989). Breeding behaviour and reproduction in roseringed parakeet. *Pak J Zool*., 21: 131-138.

Shwartz, A., D. Strubble, C. J. Butler, E. Matthysen and S. Kark (2009). The effect of enemy-relaease and climate conditions on invasive birds: a regional test using the rose-ringed parakeet (*Psittacula krameri*) as a case study. *Divers Distrib.*, 15(2): 310-318.

Waseem, M., I. Ashraf and T. Hussain (2015). Nesting behavior of Rose-ringed parakeet (Psittacula krameri) in Southern Punjab, Pakistan. *Sci Int.*, 27(5): 4255-4261.

Whistler, H. (1986). *Handbook of Indian birds.* Cosmo Publications.

(*Accepted for publication September 2024*)