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THE ELUSIVE BLACK-PARTRIDGE: UNCOVERING ITS ECOLOGICAL SECRETS

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Abstract

The Black Partridge is an ecologically significant game bird being found in a variety of Pakistani habitats, including sub-mountainous ecosystems of 300-2100 m above sea level as low down as desert plains and river forest. Recent ecological research indicates that the species are very habitat-specific to prefer woody ravines, agro-forestry land, pasturelands and shrub-dominated ecosystems as a source of protection and food. These seasonal effects are also observed in the studies of population density whereby the richest season found is the post-breeding fall since of the foliage cover being good and due to increased survival of the children. High vegetation analyses have revealed the important functions of the hopbush, raspberry, barberry and blackberry shrubs in avian nesting and defence against predators. The fast local loss of populations is however caused by anthropogenic pressure such as habitat fragmentation, exposure to pesticides, poaching and changes in rainfall patterns as a result of climate. The density estimates of most recent past indicate that individuals in the Northern region of Pakistan are still incredibly low as compared to the olden days, a disease of persistent ecological strain. These results highlight the significance of conserving habitat, sustaining land, and providing a long-term ecological control of the habitats on which to make sure that the population of the Black Partridge not only survives but also has a good ecological state.

1. INTRODUCTION

Black Francolin or the Black Partridge also known as Kala Teetar in local language is a galliform bird that spread across the South and Central Asia, however, huge populations of them are located in Pakistan. The species has quite a high distribution in irrigation fields, riverine strips, grasslands and scrub dominated places particularly in the provinces of Punjab, Khyber Pakhtunkhwa and Sindh, in Pakistan. Ecological processes of the Black Partridge are very sensitive to the vegetation structure, availability of water and the agricultural land-use patterns (Khan et al., 2010; Ullah et al., 2025).

Recent observations were carried out in the northern region of Pakistan and it has been found that, the Black Francolin prefers habitat that comprises of dense shrubs, mixed grasses and areas near wetlands as this provides cover besides the provision of food sources which are large. The distance sampling evaluation of population has demonstrated that the density estimates of Black Francolins are found in pasturelands and agro forestry systems compared to open drylands. The results can be supported by the previous evidence that the vegetation complexity and microhabitat factors are significant in their proliferation and territory selection. In diet, the Black Partridge is a ground foraging omnivorous predator which consumes seeds, grains and insects. Its dietary plasticity has allowed it to exist in controllable landscapes,

although research has shown that excessive application of pesticides and habitat simplification may have indirect impacts on food and breeding success (Kakakhel, 2012).

It has a significant aspect of breeding ecology within its ecological framework. The ground nests they build are usually put in high vegetation zones where the risk of predation is low. In a recent study on nesting habitat and reproductive efficiency in Pakistan, the mean clutch size of a nest in bushy wetlands was about half a dozen of eggs and the fledging success rate was better unlike the open drylands (Ullah et al., 2025).

These results highlight the great significance of microhabitat selection on reproductive success and risks that the species may become exposed to when the mating season is disrupted by disturbed habitats. The ecology of the Black Francolin in Pakistan has been slowly impacted by the anthropogenic factors. Hunting pressure, habitat fragmentation, agricultural rise, and mechanised agricultural practices are the main variables that determine the trend of local populations in the research works by (Khan et al. (2010) and the IUCN (2023).

Though it has been pronounced as Least Concern on the international list, it is reported that the dwindling at the local scale has been in the areas with the fast-evolving land use. Besides, translocation and contested chirping breeding can also influence genetic structure and population connectedness as revealed in the molecular ecology study of francolin populations (Forcina et al., 2018). One of the main areas where the research in the recent literature was done is breeding ecology. The species nest in the ground in clumps of thick grass or shrubs which are predator discouraging mechanisms as well as body temperature control. Fledging success and mean size of a nestling were much higher in the wetland habitats containing Bush-dominated wetlands and the breeding success was more than 70 percent in a 20232024 field study of the nesting success in wetlands and drylands (Ullah et al., 2025).

The experiment also found out that positioning of nests in thick vegetation led to more microclimatic stability and the minimization of predation risk and thus habitats structure played a significant role in the determination of reproductive success. According to the existing ecological research, the Black Partridge is an ecologically adaptable species in the habitat that has been subject to a human invasion, yet its sustainability depends on the sustainability of the environment and the vegetation structure. The preferred habitat, feeding ecology, and reproductive strategies of farmland biodiversity requires one to know the conservation systems needed to support the continued existence of farmlands. The necessity to maintain the stable population of this ecologically and culturally significant bird in Pakistan thus presupposes the constant ecological control and the management of the habitat (Bhatti, Q. B. (2026).

2. Habitat and Distribution Studies of Black Partridge (*Francolinus francolinus*) in Pakistan

Black Partridge, Black Francolin, *Francolinus francolinus*, is a ground-dwelling galliform bird with unique spatial and habitat use patterns in the heterogeneous landscapes of Pakistan. An analysis of various studies conducted on the ecology of different protected areas, like the Swegali Game Reserve in Swat District, Khyber, showed that Black Francolins do not inhabit every habitat type equally, instead opting for a particular habitat type depending on the vegetation structure and availability of resources, which are very important for foraging, shelter, and breeding activities of the species (Kakakhel, 2012)

In the Swegali Game Reserve, the researchers surveyed the major habitat types using line transect surveys and Geographic Information System (GIS) mapping. Black Francolins were recorded in three of the six Swegali habitat types. In fact, statistics proved that Black Francolins showed a strong habitat preference for woody ravines, shrub vegetation, and agricultural fields. Black Francolins seemed to favor habitat sites for their ability to offer dense covers for the birds and to reduce predation and thermal stress during peak daylight hours (Kakakhel, 2012)

Spatial distribution patterns are further shaped by the vegetation complex as well as the seasonality cycle. In a detailed study of the ecological patterns in the Totali Game Reserve located in the Buner District of Pakistan, distance sampling and vegetation analysis were

implemented for three major habitat classes: agricultural ground, agroforests, and pasture grounds. Both Black and Grey Francolins were recorded, but the study demonstrated the occurrence of Black Francolins in these habitats and thus an apparently broader range of ecological tolerance compared to other galliform species. However, the vegetation components such as hopbush, raspberry, barberry, and blackberry seemed to ensure higher detection rates (Ullah et al., 2025)

Similarly, the data on the distribution of the Black Francolins indicates that they occupy habitats at varied elevations in Pakistan, ranging from 300 m to 2100 m, which confirms their adaptability to variable climates and topography. Unlike Grey partridge which were seen in lowland areas the Black Francolins were seen at higher regions and in mixed habitat expressing their flexibility in ecology, as indicated by Ullah et al., 2025.

In Lal Suhanra National Park in South Punjab presents long-term distributional evidence for the species. This confirms the overall density patterns to be variable in habitat types dominated by reed bed vegetation and irrigated plantations. This again confirms the habitat to be a major factor influencing the variable densities. In addition, it stresses the effect of water availability and vegetative cover for the distribution hotspots of the species (Khan & Mian, 2013).

3. Agro-Ecology and Farmland Association of Black Partridge (*Francolinus francolinus*) in Pakistan

The black partridge, or "Black Francolin" as it is also referred to under the scientifically accepted classification of *Francolinus francolinus*, is not merely a resident game bird of Pakistan but is ecologically an important species of the agro-ecosystem of the irrigated plains, grasslands, cultivated fields, and pasturelands. The relationship of the black partridges with farmlands encompasses a variety of ecological activities, thus rendering them an important part of the agricultural biodiversity of Pakistan.

4. Farmland Habitat Utilization and Vegetation Association

Ecological surveys were conducted in the northern and central agricultural areas of Pakistan, and it was found that *F. francolinus* was strongly related to heterogeneous farmland habitats. In the Totali Game Reserve in Buner District, Black Francolins were reported in occupied habitats ranging from farmland to pasturelands and Agro-forest edges. In the area, high density of *F. francolinus* has been recorded due to diverse vegetation composition and structural complexity of the vegetation. Effective foraging activity were enabled and dodging predators activities efficiently (Ullah et al., 2025). Similar findings have also been recorded in Lal Suhanra National Park. This shows that there is an association between plant composition and *F. francolinus* and their presence along with dense low vegetation. This indicates that crop margins and mixed vegetation crop fields are very important microhabitats for farmlands (Khan & Mian, 2012)

5. Role in Agro-Ecological Food Webs

Ecosystem services of farmlands are increased with the consumption of various seeds and parts of plants due to the omnivorous foraging of Black Francolins. Even though older studies of the diet composition of Black Francolins in Pakistan showed dominance of the diet with various seeds and invertebrates, the composition varying seasonally with eggs, leaves, and insects, the implications for the ecology of farmlands are significant. *F. francolinus*, in fact, augments pest control activities, and along with the role of providing positive support for the importance of nutrient cycling through the dispersal and decomposition of plant parts, shows a positive impact on either the productivity of farmlands or the sustainability of farmlands (Khan et al., 2011).

6. Spatial Distribution Relative to Farmland Features

Research studies concentrating particularly on the spatial ecology of Black Francolins in Pakistan report that the distribution of Black Francolins in the farmland matrix is neither random nor uniform and is shaped by microhabitat patterns, plant species composition

in the area, and the heterogeneity of the landscape. Black Francolins are more recorded in the farmlands with a combination of more than one crop and a range of vegetation cover compared to the extent and larger coverage of monoculture tracts. In other words, the heterogeneity of the landscape increases the habitat quality for Black Francolins (Ullah et al., 2025).

6.1. Comparative Agro-Ecological Significance

Though the systematic research regarding the farmland association with Black Francolin in Pakistan is in its evolutionary stages, comparative examinations, such as grey francolins (*Francolinus pondicerianus*) and other game bird species, reveal comparable Farmland dependency trends, particularly with regards to vegetation cover .The presence and distribution of Phasianidae birds in agricultural ecosystems characterize complex ecological dynamics where the composition, practices, and patterns of agricultural fields are factors that determine the distribution and dynamics of these bird species (Hussain et al., 2012).There the following habitat preferences of Black francolin in Agricultural landscape of Pakistan is explained by the following Diagram.

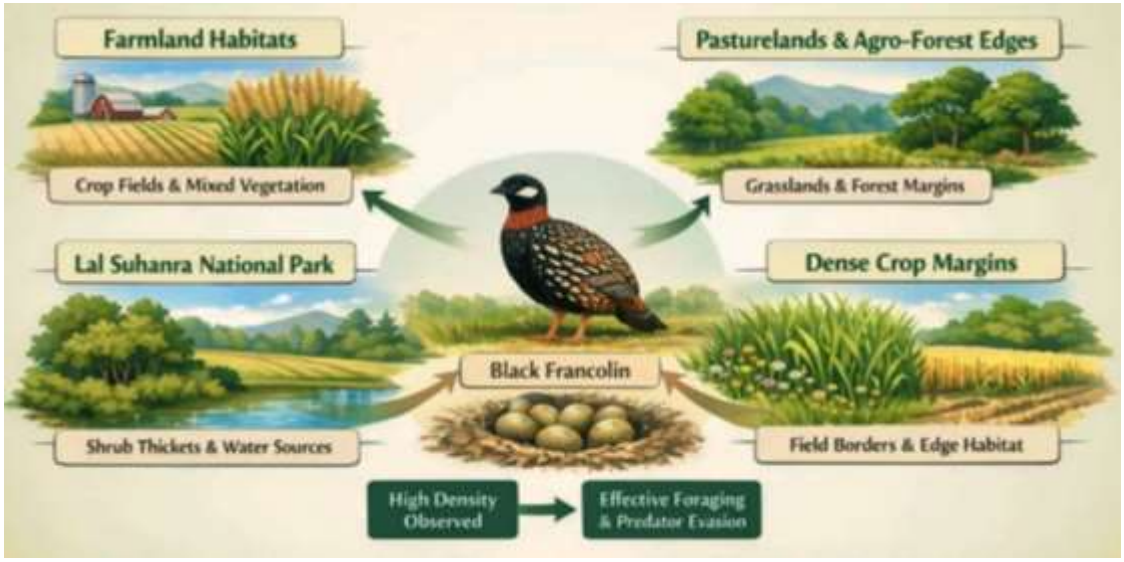


Figure 01. Habitat preferences of Black partridge in Agricultural landscape

7. Breeding and Reproductive Ecology of Black Partridge in Pakistan

7.1. Breeding Ecology

Black Partridge (*Francolinus francolinus*) is a ground-nesting galliform species widely distributed across South Asia and Middle East. Their reproductive ecology shaped by habitat structure, seasonal climatic fluctuations and land-use practices. Breeding ecology which includes breeding seasonality, nest site selection, clutch size, hatching and fledging success etc., provide an insight about its reproductive performance in relation to population trends and conservation requirements. There has been limited field investigations on the reproductive biology of *F. francolinus* in Pakistan, although recent studies conducted at Totali Game Reserve (TGR), Buner District revealed information about clutch size, hatching success, fledging success and habitat association on breeding activity and success(Ullah et al., 2025).

Breeding of black francolin shows definite seasonal pattern with initiation after pair formation in early spring (March) and continues till mid-summer season (June–July). Black francolin nests were not recorded before late March in TGR study and initiation of laying started from mid-April and peaked during May–June. Reproductive activities coincide with the peak vegetative growth and insects availability on which both adult birds and chicks mainly depend during breeding season as it provides energy rich food items(Ullah et al., 2025).

Black francolins construct ground scrape nests concealed under the vegetation, which are preferably built in wetland bushes rather than

plain drylands. Nest size and location play important role in reproductive parameters like clutch size and fledging success. Average nest size was recorded 22–23 cm in Pakistani population of black francolin and nests located within bush habitat showed slightly higher reproductive success than field edges possibly because of lower predation rate and favourable microhabitat (Ullah et al., 2025).

Taken together, these research findings demonstrate that the breeding ecology of black francolins is shaped by a combination of seasonal timing, habitat structure, nest placement, and clutch characteristics, and that successful reproduction in this species requires a mosaic of suitable habitat features. These insights are critical for conservation management, particularly in regions where habitat alteration threatens the availability of high-quality breeding sites.

Nest site selection in breeding ecology is explained by the following diagram.



Figure 02. Black francolin nest site selection based on microhabitat preferences and vegetation density

8. Hunting and Preservation Characteristics of Black Partridge in Pakistan

8.1. Effects of hunting

The black francolin, or Black Partridge as they are called in Pakistan, is a game bird that has been hunted since long ago for sport and bush meat. The species has become less dense locally due to excessive hunting pressure, and especially male birds due to their bright plumage being poached for feathers which leads to less population density in Pakistan compared to normal healthy populations explained in (table 01). Hunting of males for chirping competitions may also play a role. They are also captured for such chirping competitions. Hunting is also believed to cause subspecies to mix since individuals are sold or transported out of their local regions for hunting purposes. Genetic differences should be taken into account when hunting regulations are put into place (Forcina et al., 2018; Khan et al., 2019; Roberts, 1991).

8.2. Traditional and cultural uses

Male birds are hunted locally and in chirping competitions. Chirping competitions are a tradition where birds are hunted or captured and put into cages where their chirping can be judged. Hunting pressure from such events may be unsustainable (table 01). Hunting regulations should be considered when taking these birds for these competitions because bird numbers may become locally depleted (Forcina et al., 2018; BirdLife International, 2023).

Habitat degradation affects hunting removals because if pesticides are applied incorrectly or if farmlands take over birds' natural habitat of scrublands and grasslands then they have less territory to forage in. If there is less space to forage in they will cluster together in open areas

making them easy targets for hunters. Habitat loss effects of Black francolin is explained by the following diagram (Ullah et al., 2025; Kumar & Sharma, 2020).

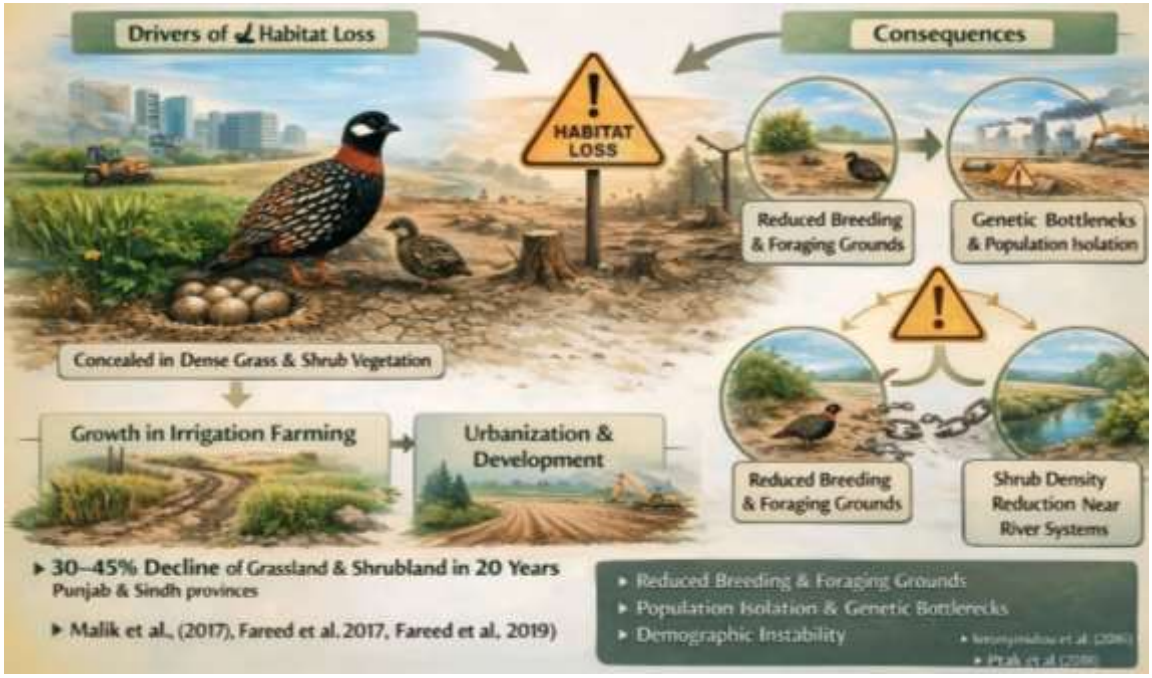


Figure 03. Habitat loss Impact on Black Partridge

8.3. Protection status

Pakistan allows hunting of game birds (including black francolin) which are not listed as threatened or endangered with established hunting seasons. Hunting black francolin appears unrestricted, although enforcement of sustainable hunting regulations are sporadic at best (table 01). Supporters of protective regulations state that mechanisms including hunting seasons, bag limits, and awareness outreach would prevent unsustainable harvest and illegal poaching year-round, particularly during nesting season when adult birds and chicks face the greatest risk of mortality. Similar methods are used elsewhere in game bird management (Khan et al., 2019; IUCN, 2023).

8.4. Conservation strategies and programs

Attempts have been made at captive breeding populations of the black partridge in Pakistan in order to introduce birds back into the wild and increase their numbers. Captive breeding programs have been established in KP where black francolins have been bred in captivity and subsequently released back into the wild although the breeding rates were significantly lower for francolins than other partridges (table 01). The success of these initiatives is currently unknown although with suitable management it could be possible to help boost wild populations as natural reproduction may have been negatively affected due to overhunting and habitat loss. The black francolin population trends with habitat associations have been recorded in seasonally varying habitats of Totali Game Reserve, Pakistan (Forcina et al.,).

Habitat management practices and continuous population monitoring are required to assess hunting and habitat disturbance impacts on francolin populations. Adjacent habitat management, such as preventing conversion of pasture and agroforests will also allow places where black francolin populations can remain despite hunting pressure. Studies have shown that overhunting and human assisted transportation of black partridges throughout Pakistan have changed the genetic makeup of this subspecies, causing concerns for unique genes found in these birds. Regulation of hunting and trade can also help conserve these genetics by preventing rapid genetic fluctuations within populations. Continued

monitoring of genetics in conjunction with limiting human assisted transportation of birds is suggested for long term conservation of these genes (Forcina et al., 2018; BirdLife International, 2023).

Conservation efforts

Conservation efforts could include awareness of the benefits these birds provide like rodent control and seed dispersal. Clarifying hunting limitations and negative population impacts through education could change hunter behaviour. Participatory wildlife management is also another possible solution to allow hunters to maintain their tradition but control their efforts (Forcina et al., 2018; BirdLife International, 2023).

8.5. Limitations conservations and Role of protected areas

Limitations Effective law enforcement is also required to maintain black partridge populations. Hunting laws will not be successful in maintaining populations of black partridges if hunts are not monitored and there are no consequences for illegal harvests. Researchers and wildlife managers have suggested increasing the capacity of wildlife departments, establishing additional patrol teams to monitor hunting seasons, and allowing the public to report hunting incidents (Roberts, 1991).

Research Needs and Management Recommendations Going forward with conservation of black partridges in Pakistan, integrated management efforts that include hunting regulation, habitat protection, captive breeding, and stakeholder involvement should be implemented. Priority should be placed on further demographic monitoring of black partridges, updating hunting regulations to include quotas that reflect current populations, and designating additional buffer zones where hunting is not allowed (Khan et al.,)

These steps should aid in halting population declines and conserving this valued game species. Conservation in protected areas Black Partridge (*Francolinus francolinus*) conservation in protected areas like Lal Suhanra National Park and Totali Game Reserve involves regulating their harvest. In protected areas where hunting of black partridges occurs with limits, or is non-existent allows for researchers to obtain population estimates and study demographics in these areas (table 01). For example, population density estimates and nesting success were found to be higher in the protected grassland and forests of Khyber Pakhtunkhwa than outside of the protected areas on farmland (Khan et al., 2019; Ullah et al., 2025).

These increases can be linked to protection of nesting areas and vegetation and decrease risk of nest disturbance. Although, limiting leisure hunting in these reserves can vary and human activity from adjacent buffer areas can impact populations (Roberts, 1991).

Researchers should continue to monitor black partridges in these reserves to help determine sustainable hunting limits. There the following characteristics preservation status, issues , Hunting status , cultural Status of Black francolin in Pakistan is explained by the following table given by different authors (Forcina et al., 2018; Khan et al., 2019; Roberts, 1991)., (Khan et al., 2019; Ullah et al., 2025)., (Roberts, 1991). (Khan et al., 2019; IUCN, 2023).

Table 01: Ecological status and importance of Black partridge.

Issue	Current Status	Importance	References
Hunting pressure	High Hunting	for meat & chirping competition threatens populations and genetics	Forcina et al. 2018
Cultural Use	Chirping competition	increase capture and stress on birds	Forcina et al. 2018
Habitat & Hunting Interaction	Habitat loss	amplifies hunting, impacts due to their colourfull plumage	Ullah et al. 2025
Less legal framework	Controlled hunting	allowed but enforcement weak	Totali Reserve study
Captive Breeding	Pilot breeding programs exist	low numbers released	Kakakhel et al. 2020
Community Engagement	Allow greater hunting due to low preservation knowledge	Preserve greater amount of Partridges by spreading knowledge	Totali Reserve study

Conclusion

The Black Francolin, also called the Black partridge, is a ground-dwelling bird that is found throughout Pakistan's grasslands, riverine belts, agricultural plains, and scrub environments. In terms of ecology, it exhibits a great deal of versatility, flourishing in environments that offer both wide areas for foraging and dense foliage for roosting and nesting. It can aid in seed distribution and natural pest management in agro-ecosystems because of its diet, which primarily consists of seeds, grains, fragile plant shoots, and a significant amount of insects. The quality of the habitat, especially the presence of dense cover to shield nests from predators and human disturbance, is directly related to breeding success. Its local migrations and activity patterns are influenced by seasonal fluctuations, which frequently occur in response to rainfall and crop cycles. Despite its resilience, the species is under growing ecological pressure from unethical hunting methods, pesticide use, intensive agriculture, and habitat destruction. In some areas, these variables may lower population density and interfere with normal breeding patterns. Overall, Pakistan's black partridge ecology strikes a balance between resilience and vulnerability; although it can survive in altered habitats, habitat preservation, controlled hunting, and sustainable land-use practices that preserve ecological integrity and vegetation diversity are necessary for its long-term stability.

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