SARAHAN PHEASANTRY: ANNUAL REPORT 2022-23

WILDLIFE WING,
HIMACHAL PRADESH FOREST DEPARTMENT

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Sarahan Pheasantry: Annual Report 2022-23.

Authors: **Durgesh Patil (Research Assistant), Kajal Joshi (Forest Guard), Shivam Agnihotri (Range Forest Officer, Dofda), Ashok Negi (Divisional Forest Officer, Wildlife Division, Sarahan), Thirumal K. (CCF, Wildlife, South Shimla Circle).**

Introduction –

The Western Tragopan, scientifically known as *Tragopan melanocephalus*, is a type of pheasant that is native to the north-western Himalayan region and is in danger of extinction. It belongs to the *Tragopan* genus, which includes five species, four of which are found in India, including the Western Tragopan. The species is found in a fragmented manner in the NW Himalayas from the Indus-Kohistan district in northern Pakistan to NW India, including Kashmir and Himachal Pradesh, and perhaps the western regions of Uttarakhand (Gaston et al., 1981).

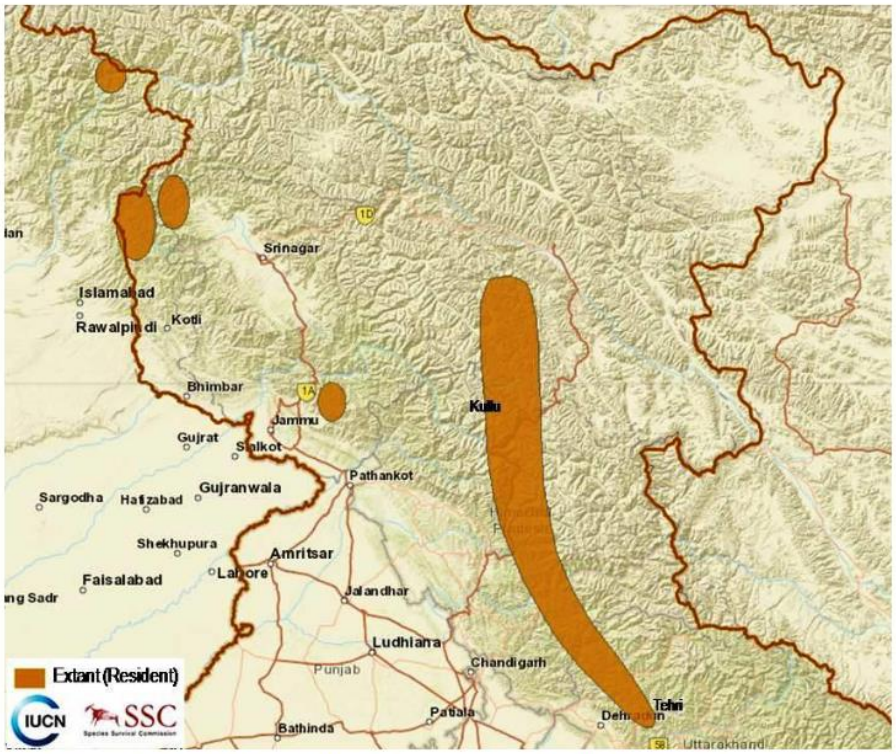

Figure 1: Distribution of Western tragopan (BirdLife International 2013)

Although an estimated 5000 individuals were present worldwide according to McGowan and Garson (1995), recent estimates by BirdLife International (2017) suggest that the number of individuals has decreased to less than 3500. Nevertheless, new populations have been discovered across its range such as in the Pakistan-administered Jammu and Kashmir regions, Chamba, and Gharwal regions of Himachal Pradesh and Uttarakhand, respectively, indicating that the actual global population might be higher than the current estimates. Due to the species' small and scattered population, which is likely to decline and become increasingly fragmented, it has been classified as "Vulnerable" by the IUCN (IUCN Red List 2018.1).

Western Tragopan Pair at Sarahan Pheasantry

The Western Tragopan, being a species that specializes in particular habitats, is in danger due to various activities that disturb its habitat. For instance, activities such as livestock grazing and minor forest produce collection, as well as fragmentation through changes in land-use practices, are posing a threat to the species. As a result, the natural populations of the Western Tragopan are becoming increasingly smaller, more fragmented, and declining in numbers. The decline is caused by the loss of habitat and the overall reduction in habitat quality throughout its limited range.

The Western Tragopan typically lives in high-altitude temperate forests that are situated between 2500-3200m above sea level (Gaston et.al, 1981). During spring and summer, the species mostly occupies habitats with Spruce *Picea smithiana*, Fir *Abies pindrow*, Yew *Taxus baccata*, and Oak *Qercus semicarpifolia*(Islam & Crawford, 1987). In contrast, the species can be found in mid-altitude dense coniferous or mixed mountain forests during winter (Islam & Crawford, 1987). The differences in vegetation reflect the species' possible seasonal movements across different elevations. Both summer and winter habitats are characterized by dense undercover. Due to the complex topography of the Western Tragopan's forests and its elusive behaviour, there is a lack of comprehensive knowledge about the species' biology. The species likely feeds on vegetative matter, such as sprouted leaves of Oak, shrubs like Ringal bamboo,*Arindunaria sps*, and other plant materials. Similar to other Tragopan species, the Western Tragopan has a unique nesting behaviour, building nests at high elevations (Ali & Ripley, 1968; Beebe, 1990; Johnsgard, 1986). The breeding season takes place from April to June and includes courtship and display, egg-laying, incubation, and hatching.

Sarahan Pheasantry –

The Western Tragopan conservation breeding center is situated in Sarahan, which is located in the Shimla district of the Himachal Pradesh state. The center is positioned within a fenced forest land, which is located at a considerable distance from human settlements and has an elevation of approximately 2300msl. The forest land covers an area of almost 12 hectares (0.12 km2). The location's geographic coordinates are 31° 30' 25.53" N, 77° 47' 46.95" E, and it is situated within the natural distributional range of the species. Additionally, wild Western Tragopans have been observed in the pheasantry in past.

Sarahan Pheasntry Main Entrance

History -During the early 1990s, the initial efforts to maintain and breed Western Tragopan in captivity were carried out. The first successful captive breeding of the species was reported in 1993, which involved a pair of wild-born rescued birds. Subsequently, additional attempts were made to breed the species, with varying degrees of success. Eventually, in 2003-04, the Himachal Pradesh Forest Department (HPFD) submitted a conservation breeding project proposal for the Western Tragopan, which was approved by the Central Zoo Authority (CZA). In 2007, the Central Zoo Authority (CZA) identified the Western Tragopan as a species requiring priority attention for conservation breeding (Bonal, 2010). As a result, Sarahan Pheasantry was selected as the "Coordinating Zoo" for the conservation breeding program of the Western Tragopan.

Sarahan Pheasantry In Winters

Western Tragopan Husbandry -

Asend of the year 2022, prior to the onset of the breeding season, the captive population at Sarahan Pheasantry is comprised of 45 individuals with 21 males and 24 females. Along with that in Display enclosures, One Male Himalayan Monal and One Male Khalij Pheasants are kept.

Enclosures And Housing

The breeding facility includes 10 enclosures that are not open to the public. Some of these enclosures were constructed in the 1990s and do not meet modern zoo standards. In 2015 and 2016, two new breeding aviaries were built, which were designed with the species' biology, bird management, and modern zoo design in mind. The new enclosures provide more ground space per breeding pair compared to the old enclosures, with access to greater vertical space. The new enclosures have a ground space of over 100m^2 per breeding pair as compared to the previously available size of 42 m^2, and with increased access to vertical space.

Old enclosures

New Enclosures at Jadgi

There are also separate compartments for temporary separation of individuals, such as breeding females. Each enclosure has perches at different heights, with the highest perches located 24-30" from the roof. The wood and branches used for perches were selected based on their rough texture and appropriate diameter. The enclosures are planted with species that are found in tragopan habitats, and have a natural ground cover. Each enclosure has a sheltered indoor section for birds to retreat during inclement weather. To prevent predators from burrowing into the enclosure, fine mesh is installed beneath the natural ground substrate. The partitions in adjacent enclosures are covered with opaque sheets to visually isolate breeding pairs and prevent territorial behaviour during the breeding season. Most of the plants in the enclosure are those that naturally occur in the tragopan habitat, such as *Ringal* bamboo and *Buxus sp.*

Apart from the breeding enclosures, seven exhibit enclosures that are available for public viewing house five tragopans. Additionally, a Himalayan Monal and a Kalij Pheasant are kept for display purposes

Display Enclosures

The breeding enclosures are under constant surveillance using CCTV cameras. The pheasantry premises are monitored by two cameras as well. This enables the staff to observe the behaviour of the species up close and most importantly, to monitor breeding females without disturbing them during incubation and after hatching.

Food and feeding

Western Tragopan is predominantly a frugivorous and folivore.pheasant in the wild. At Sarahan Pheasantry, to accommodate the unique dietary needs of Western Tragopan, the captive birds are offered a diet consisting mainly of fruits, vegetables, greens, and sprouts. Most of the greens are grown locally within the pheasantry premises in polyhouse. A small amount of hard-boiled egg is included in the diet as a substitute for animal protein. The birds are also given a mixture of grains and seeds. The feeding schedule is designed to match the natural feeding times of the birds, with food being provided early in the morning (between 6:00-7:00 am). Occasionally, wild food items such as berries collected from their natural habitat are also offered to the birds.

Daily Diet

Polyhouse

Feed Distribution

Breeding management

A total of 35 nests were made available to breeding females in 10 enclosures. Each enclosure had at least three different nesting options to provide females with multiple choices. The nests were made of bamboo baskets and were about 30-40cm in diameter and 20cm deep. They were mounted at different locations and heights within the enclosures using tripods or wooden perches, both indoors and outdoors. The nests were camouflaged with liana and other creepers from the sides and top, and outdoor nests were covered with waterproof plastic sheets to prevent rainwater

from entering. Predator proofing was also given high importance when positioning the nests. Dried moss, fern, and other materials were used for nesting, and perches were placed closely to facilitate movement to and from the nests. Inclined wooden perches were placed near all nesting platforms with incubating females to provide climbing options for chicks to return to their nest for roosting. Disturbance near the nesting platform was minimized, and active nests were monitored using CCTV. Nests were provided in April, just as the birds began exhibiting breeding behaviours such as territorial vocalizations by males and courtship display. Egg-laying began in the third week of April, followed by incubation in May and hatching in June-July. Since Western Tragopans are elevated nesters, nests were provided at various heights in the enclosures to allow for this natural behaviour. The nests were also sheltered to protect eggs and incubating females from inclement weather.

Hygiene

Maintaining hygiene is an important aspect of managing the species at the centre. The enclosures are cleaned every day and food and water are removed at Evening. A foot-bath at the entrance of each enclosure prevents infections from entering or exiting. The top soil is replaced annually to avoid the accumulation of infections. Perches and solid surfaces are disinfected annually. The health of the birds is closely monitored before the breeding season and they are dewormed to prevent endoparasites. The pheasantry is kept closed during the breeding season to minimize disturbance to the birds. The birds are regularly examined for endoparasites and dewormed twice a year, before and after the breeding season. The enclosures are cleaned regularly, and the substrate is removed annually to prevent the accumulation of infections.

Demographic and Genetic Management

The Western Tragopan conservation breeding centre uses a studbook to manage the genetic and demographic aspects of its captive population. Each bird is identified with leg rings that have a unique number and a National Studbook number is assigned to each individual bird. This studbook contains all the relevant information about the bird such as its age, parentage and acquisition history. The studbook helps in identifying pairs that can produce the highest genetic diversity in the captive population and also based on the birds' compatibility. Using this information, the centre has formedTotal Two breeding pairs and Seven triplets (two females and one male) consisting 27 breeding individuals during breeding season of 2022.

The Studbook of the captive Western Tragopan is regularly updated using the SPARKS program (Single Population Analysis and Record Keeping System) and analysed using PMx (version 1.4.7) (Ballou et al., 2010). The results of this analysis are used to manage the captive stock in order to preserve maximum genetic diversity and ensure a low degree of relatedness among newly born individuals. The primary objective is to ensure that each wild-born individual and founder have at least 10 descendants (Ballou et al., 2010).

To achieve this goal, individuals are paired with more than one mate, allowing either a single male to mate with multiple females or vice versa. This strategy increases the chances of successful breeding for wild-born birds. Additionally, it compensates for the slightly higher number of females in the collection and increases the number of available pairs over time. The plan is to maintain the genetic diversity at approximately 90% for the next decade.

Since the current captive population was established with a small number of wild-born individuals, it may be necessary to introduce new genetic material to enhance diversity.

During a collaborative research project between the centre and the Wildlife Institute of India from 2011 to 2014, a standardized husbandry protocol was developed. This protocol has been implemented and has shown positive outcomes. As a result, it will be adopted in the future. The Western Tragopan Conservation Breeding Plan (Lakshminarasimha R, 2014) provides the specific details of this husbandry regime.

Egg Laying

During the 2022 breeding period, 12 female birds capable of reproduction collectively produced 34 healthy eggs. This indicates an improvement in their ability to reproduce compared to previous breeding seasons, during which a notable number of eggs with thin shells or insufficient size were observed. The modifications implemented in the care and management practices since 2012 have played a crucial role in promoting the well-being of the birds at the pheasantry. Furthermore, in the 2022 breeding season, each female laid a number of eggs that closely aligned with the typical clutch size (3-4 eggs) for the species. This outcome is regarded as positive.

Incubation and Hatching

During the breeding season of 2022, 12 female birds displayed natural behaviour of incubating eggs, with two of them being from the newly formed pairs. All females were able to successfully incubate and hatch their chicks. All the chicks that hatched were taken care of by the tragopan hens in a natural way. To improve reproductive health, changes in husbandry regimes were implemented after 2012. During the 2022 breeding season, 12 breeding females laid 34 normal eggs with no abnormalities, which is a significant improvement. Some eggs were abandoned by younger females. These eggs were collected for artificial incubation and none of the chicks hatched. In total, eight chicks were born naturally during the season and one chick died. The captive population now consists of 45 individuals, including 21 males and 24 females and the breeding success achieved in last few years contributed significantly to its growth. However, with a good number of younger individuals in the captive stock, optimal population growth is expected in the following years. The demographic and genetic parameters of the captive stock are presented in Table 2, showing that the population is growing and maintaining genetic diversity at globally accepted standards

Population Status

As of December 2022, the Western Tragopan captive population at the pheasantry included 45 individuals, with 21 male and 24female birds. The breeding success achieved in 2022contributed significantly to the population growth. In small captive populations, such events can have a highly pronounced effect (Snyder et al., 1996). Nevertheless, the large number of young individuals, including those born in 2022, suggests optimal population growth in the coming years provides an overview of important demographic and genetic parameters of the Western Tragopan captive stock at Sarahan Pheasantry. The population growth rate is above the stable value of 1, indicating that the population is growing. The current and potential gene diversity is89% and 94%, respectively, meeting the globally accepted standards for genetic diversity to be maintained in captive populations bred for conservation purposes (Ballou et al., 2010).

Personnel and Record Keeping

The management of the centre is based on scientific principles and supervised by a qualified and trained Research Assistant and Forest Guard-in-charge. The zoo keepers stationed at the centre have extensive experience working with the species over a long period of time. Given the importance of stress management in maintaining this species in captivity, the keepers receive regular training in this specific aspect. This includes practices such as avoiding close proximity to the birds and providing them with opportunities to avoid the keepers when working inside the enclosures. These measures are taken to prevent stress and potential harm to the birds caused by sudden movements or fright responses.

Education and Outreach

Promoting awareness about the species and the need for conservation is an integral part of the conservation efforts. The centre currently houses two species of pheasants in display enclosures that are open to the public. In the future, the facility has the potential to evolve into a knowledge center focused on Himalayan pheasants. Additionally, plans are underway to establish an interpretation centre at the entrance of the pheasantry. The area has been surveyed by experts and engineering staff to facilitate these developments.

Furthermore, the pheasantry regularly welcomes Forest official trainees from various Forest training institutes in country, Forest Guard batches from Chail and Sundernagar, as well as students from nearby schools. These visitors have the opportunity to tour the pheasantry and listen to talks given by the Divisional Forest Officer (DFO), the Research Assistant, and the Forest Guard-in-charge, covering topics related to pheasants, the pheasantry itself, and the experience of working in an ex-situ facility and Re-introduction. These visits contribute to the training and knowledge of the forest officials and students, respectively. The pheasantry also

celebrates World Wildlife Day, World Environment Day etc. within its premises, further emphasizing the importance of wildlife conservation.

Reference

Ballou, J. D., Lees, C., Faust, L. J., Long, S., Lynch, C., Bingaman Lackey, L., & Foose, T.J. (2010). Demographic and genetic management of captive populations. Wild mammals incaptivity: principles and techniques for zoo management, 219.

Ballou, J.D., R.C. Lacy, and J.P. Pollak. 2010. PMx: software for demographic and geneticanalysis and management of pedigreed populations. Chicago Zoological Society,Brookfield, Illinois, USA.

BirdLife International (2017) Species factsheet: Tragopan melanocephalus. Downloadedfrom http://www.birdlife.org on 29/10/2017. Recommended citation for factsheets for morethan one species: BirdLife International (2017) IUCN Red List for birds. Downloaded from http://www.birdlife.org

Fuller, R. A., & Garson, P. J. (Eds.). (2000). Pheasants: status survey and conservation actionplan 2000-2004 (Vol. 51). IUCN.

McGowan, P. J., & Garson, P. J. (1995). Pheasants: status survey and conservation actionplan 1995-1999 (Vol. 24). IUCN.

McGowan, P.J.K. & Kirwan, G.M. (2017). Western Tragopan (Tragopanmelanocephalus).In: del Hoyo, J., Elliott, A., Sargatal, J., Christie, D.A. & de Juana, E. (eds.). Handbook ofthe Birds of the World Alive. Lynx Edicions, Barcelona.