

Species Recovery and Conservation Breeding Plan for the Cheer pheasant

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1. Local/ common/ English and scientific name of the species to be taken up under the SRCB Plan.

Kingdom: *Animalia* Phylum: *Chordata* Class: *Aves* Order: *Galliformes* Family: *Phasianidae*

Common name: **Cheer pheasant**; Scientific name: *Catreus wallichii*

Species authority: Hardwicke, 1827

2. Past history and present status including past and present distribution of the species in the wild.

Cheer Pheasant *Catreus wallichii*, a restricted range species, is distributed through the southern foothills in the western Himalayas from north **Pakistan**, through Kashmir into Himachal Pradesh and Uttaranchal, **India** and east to central **Nepal** (BirdLife International, 2014).

Since the earliest records available this species has been considered generally scarce and local (Hume and Marshal, 1879-1881). Global population is estimated to number less than 10,000 individuals (McGowan and Garson, 1995) and the total could conceivably be much lower, perhaps fewer than 5,000 (Gaston, 1980). Many sub-populations are now thought to number fewer than 10 individuals living in isolated pockets of suitable habitat (Kalsi, 1999). Population declined during the course of the twentieth century and by the 1980s Cheer Pheasant was absent from many early localities (Gaston *et al.*, 1981) and local reports suggested that numbers of the species continued to decline markedly in the 1990s (Kalsi, 1999). By the century's close the majority of surviving sub-populations were found in the hills of Himachal Pradesh (Gaston and Singh, 1980; Sharma and Pandey, 1990) where surveys revealed that most populations were isolated and very small.

The Cheer populations had been estimated about 1000 pairs in Himachal Pradesh as an outcome of result of surveys carried out in 1979 and 1980 under Himachal Wildlife Project lead by a team comprising A.J. Gaston, P.J. Garson and M.L Hunter. The populations had been reported in patchy distribution in four major river catchments *viz.* Sutlej, Beas, Yamuna and Ravi catchments.

3. Details of the habits, habitats, physiology, breeding and behaviour biology of the targeted species.

A predominantly vegetarian diet was suggestive of crop examinations by Beebe (1990) and Ali & Ripley (1968). The authors suggested that their major food items include leaves, roots, tubers, seeds and berries as per availability. During examination of the crop contents of museum specimens, Sheppard, Dierenfeld, & Burnett (1998) conclude the primary food items to be leaves, seeds and fruits. Roosting is generally done in stunted trees, high bushes or on rock summits which are characteristic of the habitat they live in (Johnsgard 1986). Outside the breeding season, these pheasants are believed to be gregarious often found in flocks ranging between 5-15 birds (Johnsgard 1986). The species are believed to be exclusively monogamous (Ali and Ripley 1968, Baker 1932, Johnsgard 1986), although detailed studies on the mating system is missing. Vocalizations have been anecdotally described by various authors (Delacour and Harrison 1951, Johnsgard 1986). The breeding season extends from April to Early June. They have relatively large clutch sizes ranging between 9-12 eggs (Johnsgard 1986). They are ground nesters, often selecting inaccessible and covered areas for nesting (Baker 1932). Incubation lasts for around 26 days, and is done entirely by the female, with the male remaining in her proximity. Following hatching, the male joins the hen in brood rearing (Baker 1932). Studies on incubation patterns and brood rearing are missing.

4. Threats or causes of decline of number or extinction of the species in the wild- habitat loss, habitat fragmentation, habitat degradation, poaching or any other like excess/ absence of prey/ predators, chemicals, being climax species, climate change, invasive species, etc.

The Cheer Pheasant is reported to be one of the widely hunted species in Himachal Pradesh (Kaul *et al.*, 2004) for food and its eggs collected for local consumption. Higher levels of disturbance, heavy grazing and the felling of wooded ravines pose a substantial threat to this species. Conversion of grasslands to permanent arable terraces is reducing available habitat (BirdLife International, 2014). Hydel Electric Projects (HEPs) have been planned in almost all major rivers and their tributaries. The information available with Himachal Pradesh State Compensatory Afforestation Fund Management and Planning Authority (CAMPA) which deals with Catchment Area Treatment Plans of river basins where these projects are located/under process reveal that a total of 125 HEPs in the major river basins include 43 HEPs (9770.50 MW) in Satluj river basin, 45 HEPs (4747.60 MW) in Beas river basin, 26 HEPs (2372.40 MW) in Ravi river basin and 11 HEPs (608.52 MW) in Yamuna river basin. Apart from these there are many other development activities like roads, buildings etc. These are major threats to the species which may trigger its local extermination.

5. Details of the Protected Areas or wild habitats of the species in the vicinity of the coordinating zoo. Present status, condition of the habitats, protection, any other local/region factor.

The Chail Pheasantry (Blossom & Khariun) is located within the notified boundary of Chail Wildlife Sanctuary. Chail Wildlife Sanctaury was estimated to hold about 40 pairs of Cheer in April, 1979, with a density on suitable habitat of about six pairs per km² (Gaston & Joginder Singh, 1980). Some potential Cheer habitat areas both Govt. owned and private land holdings have been excluded from the Chail WLS and its boundaries have been re-defined under rationalization process of boundaries of Protected Areas in Himachal. Chail Wildlife Sanctuary still holds Cheer population but current population estimates are not available.

6. Reasons for the proposal to make special efforts in form of dedicated species recovery plan and conservation breeding programme for the species

The Cheer Pheasant has been listed in the Red Data book of IUCN and is declared 'vulnerable' (IUCN, 2014). BirdLife International is doing a review of global threat status of Cheer Pheasant. Based on global threat status assessment, the species may warrant up listing to endangered category and thus qualifies for making efforts in form of dedicated species recovery plan.

7. Details regarding the involvement of local forests/ wildlife department, in-situ wildlife managers and Chief Wildlife Warden of the state/s.

This recovery plan is prepared by the Wildlife Wing of the HP Forest Department and is proposed to be implemented by deploying a dedicated team comprising of individuals already working as PA Managers, Zoo Directors, Frontline Staff, and Wildlife Veterinarians. There already exists a Nodal Officer for Conservation Breeding Programmes who shall coordinate this Project under over all control of Chief Wildlife Warden. Apart from this Zoo Biologists, Field Biologists and Galliformes Reintroduction Specialists are also proposed to be hired under the current plan by the Wildlife Wing, HP Forest Department and they will be an integral part of the team. If required, Wildlife Wing may liaise with other national and international wildlife organizations.

8. Why the zoo is proposed as coordinating zoo? Total area of the zoo. Availability of the sufficient area for creation of CBC in the zoo promise or at satellite facility site. Past history of keeping/ breeding the targeted species in the zoo, Present captive stock, availability of housing facility for the species. Availability of other infrastructure (related to the management of the CBC) available with the zoo including the technical/ scientific manpower.

The Chail pheasantry (Khariyun & Blossom), located in Chail, Himachal Pradesh is recognized as a conservation breeding centre for the Cheer pheasant by the Central Zoo Authority in 2008, with a zoo in Uttarakhand as a coordinating zoo for the breeding program. It is an off-exhibit facility dedicated for the conservation breeding of Cheer pheasants. Cheer pheasants have been kept and successfully bred at Chail pheasantry (Khariyun & Blossom) since 2000 with more than 50 births recorded following the nomination of the centre as a CBC for Cheer pheasants. The protected land in which the pheasantry is situated is nearly a hectare, with sufficient area available for future expansion, and the facilities required for housing the species have already been established. The current capacity of the facility at Chail pheasantry (Khariyun & Blossom) is around 60 birds (± 10 birds). It may be required that new enclosures are built for the growing population and space is available for expansion. The details of the captive stock are discussed in detail under point-16. The HRD aspects are discussed in detail under point-18.

9. Outside agencies/ organizations/ individuals/ experts involved/ associated with the development and management of the CBC.

This recovery plan is developed by Wildlife Wing by involving it's core wildlife team comprising of Sat Pal Dhiman, Nodal Officer, Pheasant Conservation Breeding Programme and Satish Gupta, Zoo Director under guidance of Dr. Lalit Mohan, Chief Wildlife Warden, Himachal Pradesh. Lakshminarasimha R, Senior Research Scholar of Wildlife Institute of India has analyzed the data and compiled results required for this plan. It is pertinent to mention here that Conservation Breeding Programme for this species is currently run under the umbrella of government run Society named HP Zoos and Conservation Breeding Society and Chairman, Governing Board of this Society is Principal Secretary (Forests) to Government of Himachal Pradesh. This society has official as well as non official members representing organizations like Central Zoo Authority of India, Wildlife Trust of India, Wildlife Institute of India etc. and advice has also been obtained from them.

10. Layout of the conservation breeding centre and its location on the layout plan of the zoo, showing existing features, outer fencing/ boundary, project office, animal enclosures, water point, roads, footpaths, watch tower, etc. The site selection for creation of CBC is very important step. Help of experts or of Central Zoo Authority should be taken for the same.

Attached as Appendix-I

11. Enclosure designs, capacity and scope for future expansion.

Details presented in Appendix-I. The scope of future expansion is discussed under Point-8.

12. Environmental enrichment required/ proposed – details/ outlines/ sketch etc.

The current enclosures are built and enriched as per the CZA norms.

13. Availability of founders. Total numbers required to initiate the programme, later additions. Sources – from the existing stock in the zoo, from other Indian zoos/ rescue centres/ foreign zoos and from wild.

The current population has a total of 12 founders, of which 11 are living (5 males and 6 females). Between 2001 and 2013, there have been 5 addition events, with the recent event recorded in 2009. The individuals added from wild are presumed to belong to same area and hence there seems to be a possibility of relatedness among founders. Therefore, the prospect of addition of new founders to the current population is kept open. Under such conditions, the individuals to be acquisitioned from the wild are planned to be selected from natural populations of areas distant from those of the previous capture locations to minimize the likelihood of relatedness between the founders. Acquisitions are planned only after a rigorous scientific assessment of area, populations and perspectives of the breeding program.

14. Physical health of the founders.

No health issues have been reported either with the founders or with other individuals from the captive population. The birds are screened for endo-parasites and other diseases by in-house veterinarian regularly.

15. Genetic health of the founders.

Detailed parentage records are maintained for all the individuals under the captive breeding program at Chail pheasantry (Khariyun and Blossom). The key genetic parameters of the captive population are:

- a) Founder = 12 (11 living)
- b) Percent ancestry known = 100%
- c) Living descendants = 47 (36 in F₁ and 11 in F₂)
- d) Mean Inbreeding coefficient (F) = 0
- e) Mean Kinship = 0.0815
- f) Genetic diversity = 0.919; Potential gene diversity = 0.957

16. Breeding Plan – history of breeding in captivity in the zoo, other zoos in India and abroad. Efforts/ special efforts required or needed to be made. Births/ infant mortality/ mortality. Chances/ possibilities of inbreeding and or out breeding. Need for assisted reproduction, cloning etc.

Breeding populations of Cheer pheasants are housed elsewhere in India and abroad as well. The global population of Cheer pheasant as obtained from ZIMS comprises of 70 individuals (24 males, 22 females

and 24 unknowns) housed in Asian and European facilities. In Asia, the captive population comprises of 28 individuals (6 males, 3 females and 19 unknowns) housed in 3 institutions, and in Europe the population size is 42 (18 males, 19 females and 5 unknowns) spread across 15 institutions. Cheer pheasants are also common avicultural species and many individuals are held at private collections, which are not reflected in the ZIMS records. Therefore, the actual global population may be much more than what the records reflects.

The breeding history of the captive population at Chail pheasantry is as described. The captive population was founded by 13 individuals, 12 of which have living descendants in the living population. The current captive population consists of 11 wild-born and 47 captive-born individuals. On average, yearly 36% of the females in reproductive age class have bred. The breeding history records were available only for years 2010-2013. A total of 165 eggs were laid during 2010-2013, a median 7 eggs per laying event (Mean \pm SD: 6.9 ± 1.80 ; minimum=2; maximum=9). Of these 124 eggs were incubated and hatched by cheer hens giving a hatching percentage of about 75%, a median 32.5 births year⁻¹ (Mean \pm SD: 31 ± 15.2 ; minimum=11; maximum=48). Of the hatching events, 68 neonate/juvenile mortalities were reported giving a survival rate of around 45%. The sex ratio of fledged chicks is 26:30. It is planned to give utmost priority to increase the proportion of breeding females every year and at the same time address issues related to juvenile mortalities. As per parentage records, the inbreeding co-efficient (F) for individuals of the living population is zero. As mentioned before, the option of addition of new-wild born founders/founders from other captive population is kept open and shall be explored, as the need arises.

As with the use of assisted reproductive techniques, with specific reference to artificial insemination, in the conservation breeding of Cheer pheasants, this procedure is often employed for species where reproductive inefficiency is observed in males. In case of breeding problems, as (Spindler and Wildt 2010) propose, one should first ascertain the origin of the breeding problems, and then should characterize the nature of the problem as arising due to behavioural incompatibility, nutrition and genetic factors, before the use of invasive techniques like artificial insemination or other assisted reproductive techniques. The hatching percentage as obtained by breeding history analysis is more than 75% which does not point to problems of nature indicating male reproductive inefficiency. Therefore, the use of assisted reproductive techniques like artificial insemination is not warranted.

(Frankham, Briscoe et al. 2002) propose a target for effective population size to be set using the formula $N_e = 475/T$, T, being the generation length and 475 representing the effective population size of species with a generation of one year. Substituting the values for generation length (= 3.8 years for the current captive population), an effective population size of 125 individuals is required. However, zoo space available for housing the captive birds is the key deciding factor in determining the target population size for captive populations. As discussed above, the current facility can accommodate a maximum of 60-70

individuals. From this perspective, a target population size ranging between 80-100 individuals is proposed to be achieved and maintained within this range thereafter for the next 20 years.

Given this background, the population sizes were projected under various scenarios (Figure.1). In Scenario-1 ($\lambda=1.1991$), the population was projected from $N_0=58$ to $N_{20}=100$, assuming equal sex ratios at birth and one litter per year. The required target was achieved by the end of third year.

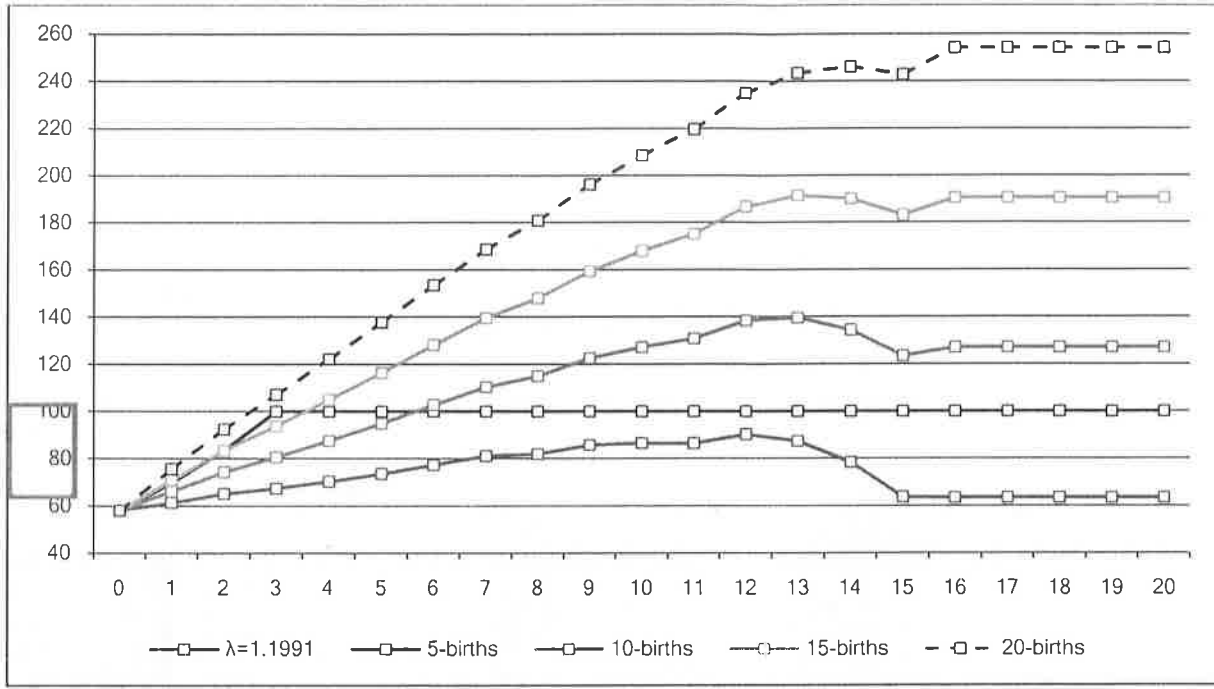


Figure 1: Population projections of Cheer pheasant captive population under different scenarios

The other scenarios were run keeping other demographic rates at ‘status quo’ and by varying the number of births per time unit (in this case, one year). At 5 births per year, the set target could never be achieved and minimum of 10 births were required to achieve the required target (target highlighted in y-axis).

The target sizes were achieved by 4th, 3rd and 2nd years for 10, 15 and 20 births per year respectively. It is planned that once the target size is achieved, reintroduction efforts are to be carried out. Detailed reintroduction plan is yet to be prepared as data required such as in-situ habitat availability, distribution of populations are to be studied.

17. Recordkeeping – identification/ marking of animals, animal history cards, treatment cards, national/ international studbook details. Membership of ISIS/ ZIMS etc.

A studbook is being prepared for the Cheer pheasant with unique ID’s being assigned for each individual. At the pheasantry, each individual bird is tagged with leg bands for identification purposes. A record keeping system is also being developed to aid in better captive management and attempts are ongoing for registration with ISIS and ZIMS.

18. Availability of technical manpower like veterinarian, biologist etc.

An in-house veterinarian looks into disease screening aspects in captive birds. No biologist is currently employed; however, it is planned by the Himachal Pradesh Forest Department to employ a biologist as per the CZA norms.

19. Facilities for health/ behavioural observations, CCTV etc.

All the enclosures at Khariyun are equipped with IP-enabled remote surveillance cameras to remotely monitor activities of the birds either on-site or can be hosted online to be monitored from distant locations. The laboratory analysis for disease screening and post mortem examinations are carried out at the state-of-the-art government laboratory of the Animal Husbandry Department at Shimla, located about 50 km from the facility.

20. Regional cooperation – with universities, other institutions and zoos.

Currently, Chail pheasantry is the only facility in India to have a systematic breeding program ongoing. All individuals of this species housed elsewhere in India, registered in the National studbook, do not have parentage records are hence not being managed as a part of the coordinated breeding program. Occasionally, members of the World Pheasant Association visit the pheasantry to provide inputs on various aspects of captive management.

21. International cooperation – GSMP, WAZA, CBSG, RSG, foreign zoos, breeding centers, institutions, individuals etc.

The Chail Pheasantry is currently not affiliated nor does have any co-operation with any international organizations.

22. Linkage with protected area network or wild habitats of the species. Names, areas, conditions, management, threats, future plans and possibilities.

The natural populations of Cheer pheasant are threatened by ongoing rate of habitat loss and habitat fragmentation. Ex situ conservation is often employed as an active measure in species conservation, for species facing such threats. The Cheer pheasant conservation breeding program is planned in a manner to support in-situ conservation efforts of the state of Himachal Pradesh across its natural distribution range. The ultimate goal of this program is the reintroduction of captive bred individuals to supplement wild populations. In addition that, for species like the Cheer pheasant, which are difficult to access and study in the wild, captive stocks like the one being discussed, can serve as models for understanding the biology of the species on a proximate level. The knowledge gained from such studies can be helpful in the optimization of the management of fragmented wild populations.

23. Habitat analysis, soft release, release sites, monitoring, expected impact on existing population in the wild.

As of date, this aspect has not yet been studied. However, these are priority activities planned in the first two years as part of the proposed species recovery plan. The human resources required to achieve this are as described under Point-7.

24. Public/ political support.

There is public as well as political will behind formulating this plan. Recovery Plan has already appeared in the agenda of the HP Zoos & Conservation Breeding Society and it is already approved that Wildlife Wing should immediately pursue the outlined activities of Recovery Plan for seeking approval as well as funds from Central Zoo Authority of India.

25. Legal requirements.

All the legal requirements, if any as per the provisions laid down under Wildlife (Protection) Act, 1972 and other relevant legislations shall be fulfilled before this plan commences.

Component-V	Reintroduction
Collaring and miscellaneous costs	0.00
Transport cages	25,000.00
Transportation costs	0.00
SUB-TOTAL	25,000.00

Component-VI	Post-release monitoring
Tracking expenses	0.00
Logistics and travel expenses	0.00
Data retrieval and monitoring	0.00
Data entry and analysis	0.00
Supplementation costs (if needed)	0.00
SUB-TOTAL	0.00

Component-VII	Personnel
Zoo Biologist (x1) [Rs. 25000/month]	300,000.00
Field biologist (x2) [Rs. 25000/month]	600,000.00
Field assistants (x4) [Rs. 7000/month]	84,000.00
Data entry operators (x1) [Rs. 8000/month]	96,000.00
Californiae reintroduction specialist	0.00
Consultant engineer	20,000.00
Zoo Staff	100,000.00
Soft-release site staff	100,000.00
SUB-TOTAL	1,300,000.00

Component-VIII	Administrative costs and contingencies
Report printing	5,000.00
Paper-works	5,000.00
Flyers and posters	5,000.00
SUB-TOTAL	15,000.00
TOTAL	2,550,000.00
GRAND-TOTAL	6,748,000.00
TOTAL COSTS FOR 10 YEARS	28,020,000.00

30,690,000.00