

SCANTLY KNOWN GRIZZLED GIANT SQUIRREL (*RATUFA MACROURA*) OF INDIA : STATUS AND CONSERVATION

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Introduction

Of the four species of giant arboreal squirrels belonging to the genus *Ratufa*, three are found in Indian limits. They are the Indian giant squirrel (*R. indica*) that inhabits the forests of peninsular India south of the Ganges; the Malayan Giant Squirrel (*R. bicolor*) that inhabits areas north of the Ganges in Nepal, Sikkim, Bhutan and Assam and the third form, the Grizzled Giant Squirrel (*R. macroura*), that occurs in some hill ranges of South India and also in Sri Lanka (Prater, 1980). Two races of the Indian Giant Squirrel, *R. indica dealbata*; and *R. indica elphinstonei* are enlisted as endangered in the IUCN list of threatened animals. But the little known grizzled giant squirrel is yet to reach the IUCN list of endangered species although it could be in the final throes of extinction in India. Unless this species receives greater attention for its protection and conservation, it will be a difficult task to save it from extinction (Paulraj, 1991). In this present paper various problems faced by this species and some recommendations to save it from extinction are analysed.

Biology

The species *Ratufa macroura* has three sub-species; *R. m. dandolena* occurs in

Tamil Nadu (India) and Sri Lanka and the other two, *R. m. macroura* and *R. m. melanochra* occur only in Sri Lanka (Ellerman, 1961). The Grizzled Giant Squirrel in India is little smaller in size than the other Indian Giant Squirrels (Plate 1). It is distinctive in having the dorsal surface and tail grey or brownish grey more or less grizzled with white (Prater, 1980). A detailed study on the ecology and biology of this squirrel have been done recently by Joshwa (1991) and Paulraj *et al.* (1992) in Alagerkoil Valley of the Srivilliputhur

Plate 1



Grizzled Giant Squirrel Wildlife Sanctuary, Tamil Nadu, South India. Except these recent studies no other detailed studies are available on its biology. Recent census done during January 1992 to May 1992 reveals that the population of this squirrel in the Grizzled Squirrel Wildlife Sanctuary (480 km²) would be around 200 (Paulraj *et al.*, 1992) and in India its total population is around 300 (Joshwa, 1991). This species has a low rate of reproduction (100 female : 31 young) with female giving birth to one young a year (Joshwa, 1991). The rate of population increase in Alagarkoil Valley between 1987 to 1988 was 3.5% (Joshwa, 1991) while this rate increased to 6.5% from 1988 to 1992 in the same area (Paulraj *et al.*, 1992). The squirrels are diurnal and active during early and late hours of the day. Seeds and young fruits form the bulk of the squirrels diet. Although tamarind (*Tamarindus indicus*) forms the key food tree species in Alagarkoil area, they also survive in localities where there are no tamarind trees. The home range of an individual varied between 0.197 ha and 0.611 ha (Paulraj *et al.*, 1992). This species is restricted to mixed deciduous forests and riverine forests occurring in plains or at elevation below 800 m.

Status and distribution in India

During 1920-30, Grizzled giant squirrel was known to occur in the forests of Dharmapuri, Salem, Attur, Pollachi, Palani and Srivilliputhur in Tamil Nadu and in Chinnar Valley in Kerala State. Now, this species is reported only in Pollachi, Srivilliputhur, Palani and Chinnar Valley and all these areas except Palani are now protected areas (Wildlife Sanctuaries). Not much is known about its status in Sri Lanka. In the Grizzled Giant Squirrel Wildlife Sanctuary (area : 480 km²) they are

restricted to seven isolated pockets of mostly riverine forests. Of these, only Alagarkoil Valley area of this sanctuary has got more than 150 individuals and the population in other areas of the sanctuary varies between 3 and 17. Viable population are seen only in two pockets in India, viz Alagarkoil Valley and Chinnar Valley.

Causes for decline and disappearance

The two major factors which explain the species disappearance in several places are the forest management system and uncontrolled hunting. The forest management system practised two decades earlier was detrimental to the existence of the prime habitats of this species. Clear-felling fuel coupe system devastated the habitat of this arboreal species. As this system was practised for many decades over a very large area in a systematic manner, the squirrel populations were rendered homeless. Recouping of the clear-felled area in a rotation took many years. Thereby this species with low longevity totally vanished in these places. What is left over are the populations surviving in riverine forests where there was no clear-felling. The fragmentation of the population was also largely due to felling of vast areas of forests leaving isolated patches of trees in selected areas. Prior to the promulgation of the Wildlife (Preservation) Act of 1972 by the Government of India, neither the central law nor any provincial law gave any legal protection to this squirrel. As a result hunting of this squirrel without any restriction was going on. Further, the plains and the low elevation forest habitat of this species were the easily accessible areas for frequent hunting. As far as the State (Province) Wildlife Act is concerned they included this species under endangered category quite recently. Prior to this, hunting this

squirrel was not legally a severe offence. Moreover being a small mammal, it did not receive much attention from the protectors. The factors which were responsible for the deterioration of its populations are: (i) fragmentation of the habitat, (ii) biotic degradation, and (iii) habitat disturbance.

(i) *Fragmentation of the habitat* : This arboreal species requires a continuous tree canopy for free movement and for expanding its territory. As the population increases, more and more canopy areas would be required for the new members of the community. If there would be a large discontinuity in the canopy, these arboreal squirrel would not be able to reach a new canopy area by passing through the ground. As a result, there is no scope for the expansion of their populations in such areas. Such isolated populations without any scope for expansion would vanish totally in course of time.

(ii) *Biotic degradation* : The prime habitat of this squirrel being located in plains and nearer to human habitations, faced heavy pressure created by human factors. Tree felling for fuelwood led to loss of habitat. As the rate of destruction was faster than the regeneration of tree growth due to grazing and browsing by the domestic animals, widening of the gap in the canopy cover was increasing. This was detrimental to the growing population. Further, habitat destruction led to reduction in the number of prime food trees preferred by the squirrel. Animals forced to feed on less nutritive food will have a reduced longevity.

(iii) *Habitat disturbance* : This is yet another important factor responsible for the decline of the population. Habitat disturbances were caused by the lessees who were permitted to collect the fruits along

with other forest produce. These fruits are the main food sources preferred by the squirrels. Thus, the collection of these fruits not only deprived the squirrels of the food sources but also caused damage to the nests constructed by the squirrels. This ultimately resulted in reduced breeding success rate.

Existing conservation problems

Since 1989, the entire area of this squirrels habitat in Srivilliputhur is being managed as a protected area. The collection of fruits and other forest produce through lessees was stopped. At present, almost all the squirrel habitats in India are located within the protected areas excepts some fruit orchards located near the protected areas belonging to private persons. Legal protection is extended to this squirrel living in protected areas as well as in private lands. Habitat destruction and habitat disturbance are controlled in all the protected areas. In spite of these measures, the population of this squirrel is not safe for the following problems.

(i) *Problem of fragmented smaller population* : As far as the population at the Srivilliputhur Grizzled Squirrel Wildlife Sanctuary area is concerned, it has been already pointed out that a potentially viable population exists only in two pockets. In other five pockets, where the population has only a few individuals, they will not survive for long periods. Any level conservation measures with these few individuals may not yield fruitful results in these areas. Even in Alagarkoil and Koilar areas of the Sanctuary, where the population is said to be more than 50 individuals each, the population will not persist for many years unless conservation measures based on scientific studies are undertaken.

The low birth rate (0.33 young per female) coupled with low female young ratio (100 : 31) are the challenging problems. The squirrels living in private lands adjoining the protected areas, although few in number, do not receive all protective and conservation measures as extended to the squirrels in protected areas. Hence their survival chances are further worsened.

(ii) *Disturbance to the habitat* : Although the collection of fruits was stopped inside the protected areas legally, uncontrollable illegal collection of fruits (Tamarind) persists and gives a major disturbance. Apart from these, wood and climber cutting goes on illegally resulting in loss of food and nest trees. The collection of *Combretum ovalifolium* climber, a food and nest plant of the squirrel, by the public is also a major problem at Srivilliputhur (Joshwa, 1991). Yet another cause for disturbance was the use of the squirrels habitat by the pilgrims who visit the temples located right inside the habitat in Srivilliputhur protected forests. Thousands of pilgrims use the habitat for which right of way is provided.

(iii) *Predators and natural calamities* : Although there is no arboreal predator existing inside the squirrels habitat, some raptors like kites are said to prey on the squirrel pups (Paulraj, *et al.*, 1992). Seasonal stormy winds occasionally uproot tall trees or damage their branches which are used by the squirrels for the nest construction. As a result, nests with young ones may get lost. There was also considerable damage to squirrel habitat caused by such heavy stormy wind.

Current conservation measures

Complete stoppage of the annual leases given for the collection of fruits and other

minor forest produce since the declaration of the area a Wildlife Sanctuary in the year 1989 is considered a most beneficial step. As a result, the depletion of the major food source (Tamarind fruit) is stopped. Further, the disturbance caused by the fruit collectors is also stopped.

As a long term measure, planting of fruit and other species is also going on. This will not only increase the food sources but will also create a continuity in the canopy.

Research studies are also going on about its biology. A detailed research study on the biology of the Grizzled Squirrel of the Alagarkoil Valley has recently been completed by Joshwa (1991).

Recommendations

The following recommendations will help the management to improve the chances of their survival for a long period.

(i) A thorough survey and status of this species should be undertaken especially at Pollachi hills where the status has not been studied so far as India is concerned. Nothing is known about its present status in Sri Lanka. Survey of the species should be done urgently there also.

(ii) Isolated population with few individuals will not survive for a long period. They may be trapped carefully and released into the adjacent areas where a viable population exists (more than 50 individuals).

(iii) At present no animal exists in captivity. Captive breeding programme should be organised immediately. Isolated population with few individuals in the wild both from protected as well as from private lands may be caught and used for this

purpose. This *ex-situ* conservation programme should be done in a semi-natural and simulated conditions, so that the captive bred population could be released back in the wild. While doing so, the animals derived from one area may be released into some other area. This will improve genetic variability and reduce inbreeding depression.

(iv) The Alagarkoil Valley where a good number of this species is found should be

given tight protection. For this purpose this valley portion of the Sanctuary should be declared as a National Park. Even in this valley region, the discontinuity in the canopy cover separates the population into several pockets. Easy accessibility to the neighbouring population should be done by covering the gaps by planting suitable tree species. This not only helps for the expansion of the population but also increases the genetical variability.

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SUMMARY

The past and the present status and distribution of the scantily known Grizzled Giant Squirrel (*Ratufa macroura*) are studied. The reasons for the decline of their population, the existing conservation problems and recommendations to improve their survival chances are discussed.

भारत की अत्यल्प ज्ञात कुर्बर् बृहद् गिलहरी (रेटुफा मैक्रूरा) की विगत और वर्तमान स्थिति एवं संरक्षण
एस0 पौलराज व एन0 काशीनाथन

सारांश

इस अभिपत्र में अत्यल्प ज्ञात कुर्बर् (चितकबरी) बृहद् गिलहरी (रेटुफा मैक्रूरा) की विगत और वर्तमान स्थिति तथा उसके विस्तार का अध्ययन किया गया है। उनकी संख्या में आए हास, संरक्षण की वर्तमान समस्या तथा उनके अतिजीविता अवसरो में सुधार लाने की सिफारिशों का विवेचन किया गया है।

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