

## A CONSERVATION PROGRAM FOR THE SNOW LEOPARD IN KASHMIR

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This program was drawn up at the invitation of the Chief Wildlife Warden of the state of Jammu and Kashmir, Mir Inayat Ullah, following joint survey work and discussions held over the period 1980-86. The recommendations have been accepted and will be incorporated into Department of Wildlife Protection policy.

The aim of the program is the long-term conservation of the snow leopard on a self-sustaining basis throughout the state. Two basic assumptions underlie the program: (1) The snow leopard cannot be protected in isolation, but only in the context of the conservation of the environment as a whole, and (2) To be most effective, any long-term plan needs the cooperation of local people and must take into account their needs and traditional rights.

### SNOW LEOPARD IN JAMMU AND KASHMIR (J. & K.)

Within the state, snow leopards are distributed throughout the Trans-Himalayan district of Ladakh and more sporadically on the south side of the main Himalayan range where there are records from Kishtwar, Tarsar, Liddarwat and Marsar (Upper Dachigam).

In Ladakh they occur widely and more or less continuously, and there appear to be reasonable numbers in several places. On the southern side of the Himalaya, it occurs in smaller numbers and its status is uncertain. Geographical and ecological conditions are very different in the Himalayan and Trans-Himalayan parts of the state.

### CONSERVATION STATUS

The snow leopard is fully protected by the J. & K. Wildlife Protection Act of 1978. The law is strictly enforced, but it is difficult to continuously police such a large area of rugged mountain terrain.

Some snow leopards are killed in the state each year, a few by hunters but mainly by villagers during attacks on their livestock.

The number killed annually in J. & K. appears to be small, and shooting usually occurs when hunters come across them by chance while hunting ibex or other wild sheep and goats. Occasionally snow leopards may be caught in the large stone-pit wolf traps that are a feature of some villages, but no systematic trapping or poisoning of snow leopards takes place within the state.

In Ladakh the traditional avoidance of killing by the largely Buddhist population has ensured that hunting has never been such a widespread activity as in many parts of the Himalayan region. Hunting is more frequent in Kishtwar and Kashmir where there are no religious taboos on killing and population pressures are greater.

Illegal killing of snow leopards occurs most frequently during attacks on domestic livestock. Most of these attacks take place in winter, and on occasion, a snow leopard gains entrance to the room where sheep and goats are kept at night. If caught in the room, the

snow leopard is often killed, though it may simply be driven away. The damage may be considerable: forty sheep and goats were destroyed during one night in early 1986. and there is no doubt that snow leopards will be killed under these circumstances regardless of the legal position. There is a general feeling among many farmers that the snow leopard is a danger to livestock and should be killed if possible, but it is not actively pursued on this account, nor is it disliked as much as the wolf, a regular, year-round predator on livestock. There are no records of snow leopards attacking people in J. & K.

There is a long established fur trade in Kashmir and in the past snow leopard furs were on open sale in Srinagar, but this is no longer the case.

Some illegal hunting for meat takes place primarily on large ungulates and game birds which are also preyed upon by the snow leopard. The Impact on prey populations is difficult to assess since the composition of the diet of the snow leopard in J. & K. has not been established, and we do not know how adaptable it is in the event of the local disappearance of one or more of its prey species.

## GENERAL ENVIRONMENTAL THREATS

As top of the food chain pyramid, the snow leopard could be affected by any environmental change. The high altitude environment is relatively unproductive, people are thinly spread throughout the area and thus make wide use of what natural resources exist for their everyday needs. Long-established rights determine the pastures to be used by a village, the wood that may be cut, and even apportion the woody shrubs on the hillsides to individual families.

As well as the direct effects, any human land use is a potential cause of disturbance to wildlife. Increasing energy demands to find

food and perhaps driving animals away to areas of non-optimal habitat. Regular landuse in an area may result in permanent depopulation by wildlife.

The activity which has the greatest effect is grazing by domestic stock in direct competition with wild herbivores. Numbers of livestock vary greatly from place to place, but in all localities there is some movement annually to summer pastures where temporary settlements are sited. In some areas, migratory graziers bring large herds to the mountains. There also exists the possibility that domestic animals may transmit disease to wild ungulates.

Large-scale conversion of land to agriculture is not generally a problem since there is very little suitable land: villages are in general restricted to sites where there is sufficient room to construct terraced fields and enough water to irrigate them.

Wood is cut for fuel and timber, and shrubs are gathered for fuel and winter fodder. The Forest Department has established plantations in many places, which has alleviated the problem of woodcutting to some extent.

Tourism is an important source of revenue throughout the state. Many tourists undertake trekking tours in the mountains with some consequent impact on the environment such as disturbance of wildlife, woodcutting for fires and the accumulation of litter at campsites.

There is no doubt that the human population is increasing throughout the state, but demographic patterns vary, and in some places there has been movement away from rural areas to the town.

There is a road building program under way to connect many remote rural areas with administrative centers, although severe limitations are imposed by the relief. One road under construction will cut through the Hemis High Altitude National Park, and there are plans to extend it eventually to Zanskar, 100 km away. This would

cause massive disturbance to the most remote area in the state, but given the natural obstacles and consequent enormous cost, it is unlikely that it will ever be completed. At present there is no conservation input at the planning stage of development activities.

## PROTECTION MEASURES

The most important practical steps for protection are:

- (1) The extension of the Protected Area Network to include areas of importance for snow leopard.
- (2) The prevention of retaliatory killing of snow leopard.
- (3) A training program for Wildlife Protection Department personnel.
- (4) The regular monitoring of snow leopard and prey populations.
- (5) The involvement of local people in wildlife conservation.
- (6) A program of research.
  
- (7) Education programs.
- (8) A reduction in the amount of grazing by livestock.
- (9) Controls on illegal hunting and fur sales.
- (10) Action on woodcutting, tourism and development.

## THE PROTECTED AREA NETWORK

The establishment of a representative network of protected areas is the first aim of the National Wildlife Action Plan, and the identification of new areas to fill up gaps in the network was recognized as one of the two highest conservation priorities in the Resolutions of the Fifth International Snow Leopard Symposium (this volume).

It is important that reserves are as large as possible in order to hold a viable breeding population and maintain genetic diversity, but at present we do not know the area necessary to maintain a viable breeding population of snow leopards. In addition, if the dispersal of young adult snow leopards from their parents' home range involves long distances as in other species, such as the mountain lion, *Felis concolor*, then replacement of resident adults following natural mortality depends on the immigration of young animals from other areas. Therefore it is necessary to ensure the protection of the snow leopard outside reserves and to create corridors between them. So while recognizing the fundamental importance of the Protected Area Network, the aim is to develop a whole-area strategy combining legal protection and active local cooperation which will at the same time preserve the currently unfragmented distribution of the snow leopard in J. &K.

Dachigam National Park is long-established and well-managed, and snow leopards have been recorded there. The Hemis High Altitude National Park was notified in 1981 and has a good snow leopard population. A series of new Protected Areas has been proposed that will protect the full range of montane habitats in the state. Of these, three national parks and four wildlife sanctuaries all contain snow leopard populations, and each is 100 km<sup>2</sup> or more in area.

During our surveys we identified several areas for consideration as additional Protected Areas. They were chosen primarily for their ecological value on a single-criterion basis of a good snow leopard population as revealed through sign density.

Three areas were so inaccessible that it would be impossible to carry out management strategies there, and we regarded them as *de facto* reserves, without a legal framework.

One area was identified as being particularly suitable for Protected Area status and recommended to the Chief Wildlife Warden in 1985. Following further survey work, a full report was submitted earlier this year. The area concerned forms an extension to the Hemis High Altitude National Park and increases its area to 3,350 km<sup>2</sup>. The recommended extension consists of three valley systems with the best snow leopard population so far found in J. & K. and excellent prey populations. They are not subject to heavy human pressure and they are relatively remote and undisturbed.

The most important of these valleys is the Chang Chu or Karnak Valley. Its lower half, covering 1,500 km<sup>2</sup> is completely uninhabited and forms a ready-made core area for the Hemis High Altitude National Park which it adjoins along a shared watershed. The provision of a core area for this national park is essential to meet national and international criteria on the establishment of national parks and to allow the development of multiple-use strategies for the inhabited areas. Translocation of villages is a completely impractical policy here since all localities that are suitable for settlement are already occupied by villages.

The extended national park would in effect form a snow leopard reserve, ideally situated in the very center of the species distribution in Ladakh.

## PREVENTION OF KILLING

As mentioned above, the largest single cause of illegal killing of snow leopards concerns those animals caught while attacking livestock. The snow leopards are able to enter the sheep and goat rooms when ventilation holes, windows or doors have, over a period of years, become enlarged or broken. As well as resulting in the death of many snow leopards, the fact that livestock may be killed during a single attack increases the hostility towards the snow leopard on the part of the local people, and makes it more likely that the next animal caught will be killed and not chased away.

The Wildlife Protection Department will begin a program to repair the doors and fit bars across windows and ventilation holes of sheep and goat rooms. The only materials needed are simple tools and wooden bars: these are widely used in housebuilding and are readily available in all villages. The Department will provide the materials, and the work will be carried out by the villagers themselves. They will receive a sum of money as an incentive payment on satisfactory completion. Such a scheme should prevent the killing of many snow leopards, reduce large-scale damage to livestock, and in the long-term induce a less hostile attitude towards the snow leopard. It also has the advantage of involving the local people in the conservation program, and since they receive a material benefit, may help to convince them that wildlife protection is in their interest.

The problem of snow leopards killing sheep and goats at the pastures will be dealt with by a compensation scheme, whereby money is paid to the stock owner. The level will be fixed by the local Wildlife Ranger according to local conditions. Such a scheme is open to abuse and is probably best administered in areas with permanent presence of Wildlife Department staff.

## TRAINING AND INFORMATION

Without trained personnel in the field, a Protected Area exists in name only. The first priority is the training of department personnel in national park management techniques, beginning with one person each from Srinagar, Ladakh and Kishtwar, and extending later to cover

all Protected Areas. All personnel will require training in field survey techniques to carry out the sign-based snow leopard monitoring program and prey censuses.

Databases should be established at the Wildlife Protection Department in Srinagar, important regional centers, and national park headquarters. All visiting research teams should be obliged to leave copies of (a) preliminary results and (b) a full report with the Wildlife Protection Department.

## MONITORING

One of the main tasks of department personnel in the field will be the monitoring of snow leopard population levels through sign by means of regular transects. This will allow them to detect changes in the animals' use of an area or its disappearance. They will also monitor the levels of stock-killing and prey population levels.

## LOCAL INVOLVEMENT

Given the aim to ensure state-wide protection for the snow leopard, the need for cooperation of local people is self-evident and has been referred to above. Several steps will be necessary:

- (1) Take into account at planning stages the traditional rights and customs of local people.
- (2) Ensure that if they are deprived of anything, something is substituted or they are compensated.
- (3) Use local labor, transport, supplies and accommodation wherever possible during surveys and in the management of Protected Areas.
- (4) Explain all steps that are taken and ensure local people know what is being done and why.

## RESEARCH AND COOPERATION

Detailed knowledge of the ecology of a species is of great importance in drawing up effective conservation measures. Knowledge of snow leopard ecology is still very limited, and useful fields of research

would include: home range size and population density; dispersal distances of young; diet analysis; identification of particular factors in the topographical-ecological complex which make optimal snow leopard habitat; comparative studies of sign and habitat in the various national parks in J. & K.; and prey surveys. In addition, there is a need to know more about levels of human land use and the impact of tourism.

The main responsibility for conducting research should rest with local scientists, but cooperation with overseas scientists is not excluded and is at the discretion of the Chief Wildlife Warden. The Indian Army has expressed the desire to do some conservation work, and this is a very useful development in view of their available manpower, logistical framework, and knowledge of remote areas.

The research program will be coordinated by the Department of Wildlife Protection in Srinagar in cooperation with other agencies and organisations at local, national, and international levels. Guidance and legal questions will be coordinated through the Department of the Environment, Government of India; research and training in collaboration with the Wildlife Institute of India, and information-exchange with concerned national bodies: Zoological Survey of India, WWF-India, and Bombay Natural History Society. At the international level,

the Department will maintain contact with fieldworkers in other countries, the Cat Specialist Group of the International Union for Conservation of Nature and Natural Resources, the International Snow Leopard Trust, the studbook keeper, and the captive breeding program of the Species Survival Plan.

## EDUCATION

The importance of education in the campaign to gain local cooperation was mentioned above. Education will consist of visits to villages by Department personnel, posters and leaflets (in Urdu, Kashmiri and Ladakhi), audio-visual presentations, and an educational program in schools.

Some material should be directed at decision makers in local government.

## GRAZING

This is the area in which action is most difficult. It will be necessary to prevent all grazing by domestic animals in national park core areas, and the Department will have to provide either alternative grazing areas or fodder. This could also be done in other especially sensitive areas of good snow leopard density, but in the long-term what is needed is a reduction in the number of livestock and/or the improvement of grazing grounds around the villages. It should be pos-

sible to improve the quality of the herds, but it will need a subsidy or compensation scheme to encourage smaller herds.

The problem of migrating graziers is even more difficult and needs resolution at the government level.

## HUNTING AND FURS

Vigilance must be maintained on poaching and illegal fur sales. The staffing of national parks and reserves with Department personnel should improve the situation as far as illegal hunting is concerned, and the army could also play a useful anti-poaching role.

## OTHER STEPS

An increase in the number of plantations in sensitive wildlife areas would reduce the need for cutting of wild trees, and it may be possible to experiment with *chula* stoves which burn efficiently and save wood. The Solar Energy Group in Ladakh might be persuaded to extend their activities to the national parks, saving more fuel-wood.

Tourists should be obliged to remove rubbish from the national parks and told not to cut live trees. The possibility of excluding large trekking groups or even all tourists from core areas should be considered.

As far as development is concerned, there is a clear need for some conservation input at the planning stage so as to avoid damage to the most sensitive and valuable parts of the environment.

## IMPLEMENTATION OF THE PROGRAM

Some aspects of this program are already under way: it is hoped

to begin others during the winter of 1986-87. This is particularly the case with the scheme to prevent retaliatory killing which is clearly a priority. It will not be possible to undertake all steps simultaneously and in all parts of the state, but work will begin in the Hervis National Park on a pilot project which will be extended later to other areas. This park lies close to the Indus Valley and has easy access with a good logistical base.

Conditions in J. & K. are in many ways favorable. There is a dynamic Wildlife Protection Department, a large Protected Area Network is planned, and many people are interested in wildlife conservation. There are also good numbers of snow leopards whose range has so far escaped the process of fragmentation which is so often the first step on the road to extinction. However, we must act quickly to maintain this situation into the foreseeable future.