

TOWARD A FREE-LIVING SNOW LEOPARD RECOVERY PLAN

*Prepared by Richard D. Taber of
the International Snow Leopard Trust
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The snow leopard *Panthera u.ncia* is listed as endangered, which means that it will become extinct soon if the present situation continues. Efforts to reverse the decline in this species and insure its continued existence are focused both on captive and free-living populations.

For snow leopards in captivity there has been over a decade of careful work, under European leadership, on the compilation and maintenance of the International Snow Leopard Studbook, basic to an understanding and guidance of breeding programs. Building on this, North American workers have developed a Species Survival Plan (SSP), aimed at maintaining a viable captive snow leopard gene pool in perpetuity. For free-living snow leopards, a similar aim would be facilitated by an internationally developed Snow Leopard Recovery Plan. This paper is a first attempt and was prepared for consideration at the Fifth International Snow Leopard Symposium.

The International Snow Leopard Trust, by initiating a Snow Leopard Recovery Plan, hopes to encourage a cooperative effort toward the increasing viability of free-living snow leopard populations on the part of the "Snow Leopard Nations", the Survival Service Commission's Cat Specialist Group, snow leopard research teams, and all other persons and agencies concerned with the free-living snow leopard and its montane habitats. The following Recovery Plan is a draft document intended as a working base for agencies responsible for snow leopard conservation, research and management.

As a non-governmental organization, the International Snow Leopard Trust has the potential for interacting with both official and private entities, on behalf of snow leopard welfare, and for serving as a permanent clearinghouse and source of information on the current state of knowledge and conservation relevant to snow leopard recovery.

BACKGROUND

The snow leopard has a high-mountain distribution through the Central Asian portions of India, Pakistan, Afghanistan, the U.S.S.R., Mongolia, China, Bhutan, and Nepal. Throughout its range, its aboriginal numbers have been much reduced, in some areas to complete extirpation. It is listed as an endangered species in the Convention on International Trade in Endangered Species (CITES).

Initial efforts to perpetuate the snow leopard as a species have been led by authorities in zoos holding captive snow leopard populations. Since 1982, a Species Survival Plan has been developed and implemented in North America with impressive results. Publications from captive studies provide a genetically sound basis for captive breeding; detailed studies of behavior have enhanced reproductive

success; and the increase in captive production has reduced the demand for capture in the wild.

Beginning in 1978, much of this work has been reported in the proceedings of a biennial conference on the snow leopard. International Pedigree Book of Snow Leopards (Leif Blomqvist, Helsinki Zoo, editor). The conference papers, presented in Helsinki (1978), Zurich (1980), Seattle (1982), and Krefeld (GRF.1984), include a substantial amount of information relevant to the biology and conservation of the snow leopard not only in captivity, but in the wild as well.

It is hoped that researchers and administrators concerned with the free-living snow leopard in its native habitats will agree that one major focus of this Symposium is to increase cooperative efforts to advance the welfare of the snow leopard in the wild.

SNOW LEOPARD RECOVERY PLAN

This recovery plan is intended to serve as a means of compiling basic biological data, identifying needed further information, and working toward recommendations for administrators responsible for snow leopard populations and habitats. It is envisioned that sequential drafts will contain an increasing amount of reliable data applicable to the progressive development of effective conservation measures for the snow leopard and its habitat throughout its range, and more accurate estimates of the status of snow leopard populations.

The plan, when thoroughly reviewed and revised, will embody the contributions of many individuals and agencies with expertise and responsibilities related to snow leopards and their management. Ultimately, the plan will provide recommendations concerning the actions necessary for the maintenance, enhancement and recovery of the snow leopard in its aboriginal habitat. The very nature of that habitat, of course, has made snow leopard study arduous, and snow leopard protection difficult. An early step toward recovery, therefore, is in the development of ways to obtain current and comparable information on the status of snow leopard populations throughout their present geographic distribution. Another is the intensive study of sample populations to strengthen available knowledge on the basic elements of snow leopard biology. These, and other tasks relevant to the overall goal of snow leopard recovery, should be reviewed for priority, and accepted for pursuit by one or another of the cooperating bodies.

Recovery of the snow leopard will be a long-term proposition. Ultimately, implementation of the Recovery Plan should provide viable, self-sustaining populations in perpetuity. Researchers have already realized some successes in determining food habits, and other biological characteristics for free-living snow leopards, and many useful observations have been made of the biology of those in captivity. However, a great deal of field research remains to be done before conservation plans can be reliably tailored to biological requirements.

Some mechanism for the identification of currently necessary tasks, and recognized acceptance of responsibility for carrying out each task, along with the provision of a way to record and disseminate the resulting information comprise the tactics that advance the strategic aim of the Recovery Plan toward its goal.

DATA BANK

In order to identify the lack of necessary information one must have a firm grip on information already available. One part of each successive draft Recovery Plan, then, should be a concise data bank on the snow leopard. A preliminary data bank outline for the Snow Leopard Recovery Plan would include: History

Physical Characteristics Social
 Organization and Behavior Past
 Distribution Current
 Distribution/Status Corridors and
 Buffer Zones Population
 Characteristics
 Density
 Home Range. Movement (Tracks, Sign)
 Age and Sex Structure (Criteria of Sex and Age]
 Natality. Survival to Independence
 Mortality, including man-caused
 Habitat (including Prey Populations)
 Food Habits Conservation Education
 Conservation Programs
 Wild
 Captive

In addition to the basic biology of the snow leopard, it is necessary to consider this species within its habitat, in order to identify and assess the factors responsible for its endangered status and to explore ways of alleviating significant constraints on the recovery of its populations.

It is often useful, when an overall distribution of an endangered species has been fragmented, to assess the fragments in terms of long-term genetic viability. This involves numbers of interbreeding individuals and so deals with population numbers and composition and also, since free-living animals require habitat, the geographic distribution of each population. Within each surviving population, if it is to recover, the factors limiting recovery must be identified and alleviated sufficiently for population increase. To maintain or enhance habitat quality it is often useful to identify the critical habitat essential for that population and hence the rational target of managerial protection and enhancement. Similarly, movement corridors along which individuals could move from one population to another can be identified, and made a focus of maintenance and enhancement. And since managerial tactics, including the tactics of persecution and neglect, are carried out by entities engaged in land-use practices, the human side of snow leopard habitat use must be taken into account. Some of these considerations are outlined below.

INFORMATION BASIC TO THE UNDERSTANDING, MONITORING AND MANAGEMENT OF FRAGMENTED SNOW LEOPARD POPULATIONS

Biological Information

1. Populations: Number, structure, and distribution
 - a. Define the minimal number and structure to insure that a snow leopard population is viable.
 - b. Define the amount of snow leopard habitat and key prey necessary to maintain a minimal viable population: this should be the minimum unit of management.
 - c. Describe each identified population in terms of 1a and 1b above.
2. Limiting factors: Patterns and causes of mortality
 - a. Direct control by humans.
 - b. Indirect control (such as habitat modification) by humans
 - c. Other limiting factors.
 - d. For each population unit, assess limiting factors and devise potential ways of encouraging population recovery.
3. Critical habitats and movement corridors

- a. Identification and suggestions for protection of critical habitats.
- b. Identification and suggestions for protection of movement corridors.
- 4. Human land-use and administration
 - a. Relation of traditional human land-uses to snow leopard welfare.
 - b. Relation of contemporary or proposed land-use changes to snow leopard welfare.
 - c. Agencies with custodial authority over general land-use, parks and reserves, and law enforcement.
 - d. Aspects of agency and other programs with relevance to snow leopard welfare.

Potential Managerial Actions

- 5. Managerial tactics
 - a. Establish channels of communication, and mechanisms of cooperation with principal human entities, and work to ward practicable advances in snow leopard welfare.
 - b. Monitor snow leopard populations and habitats before and during recovery.
- 6. Communication
 - a. Maintain a steady flow of reliable snow leopard information between all snow leopard cooperators, including responsible national land-use and conservation agencies.
 - b. Communicate to the greatest extent possible with local, national, and global publics.

TASKS

The review of current knowledge and the search for needed new information may be broken into a number of specific tasks for clearer definition of objectives, for helping to determine priorities, and for facilitating the acceptance of specific responsibilities.

The following list, which does not imply priority, are tasks which would contribute to the successful development and implementation of the Snow Leopard Recovery Plan:

- (a) Prepare a critical review of the biological data base for the snow leopard, clearly identifying what is and is not known,
- (b) Review and report upon needed biological data that have been and could be obtained from studies of captive snow leopards.
- (c) Integrate the organization and information of (a) and (b) above into the Annotated Snow Leopard Bibliography (in press) for use in snow leopard research and management.
- (d) Review and compare current methods for obtaining and reporting comparable information on free-living snow leopard populations.
- (e) Develop and conduct intensive study of population parameters in each major snow leopard habitat, and improve and test extensive population monitoring systems.
- (e) Establish and maintain a snow leopard mortality center to develop guidelines on recording mortality, and to maintain records on all evidence of mortality, including skins in trade.
- (f) Review and compile current information for each "Snow Leopard Nation" on location and management of protected snow leopard habitats, both reserves and travel corridors, protective regulations, and programs to promote snow leopard recovery.
- (h) Review and compile current information for each "Snow Leopard Nation" on legal position and custodial responsibility for management of snow leopard populations and habitats.
- (i) Establish and maintain a central clearinghouse for the re-

ceiving and distributing of information relative to the biology, management programs and monitoring of free-living snow leopard populations.