Advances in Snow Leopard Research - Mongolia

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Challenges to studying snow leopards

Sparse distribution: < 7,000 cats across 2 million km²

Extremely remote and rugged habitat
Basic snow leopard ecology is poorly understood

Data on habitat use, home range, activity patterns, dispersal, mortality, diet, cub rearing, etc., are minimal.
Lacking key information that only good science can provide, conservation actions will not likely succeed.
2008 - First ever long-term snow leopard study launched in South Gobi, Mongolia

• Minimum of 15 years in length
• State of the art research and training center
• International team of scientists and graduate students
• Use of best available technology
• Improve conservation by answering fundamental ecological questions
May 2008: J. Tserendeleg Snow Leopard Research Center established in South Gobi
Previous snow leopard collaring studies

Four studies in 1980-90s.
All used VHF radio-collars.
Total of 13 cats collared.
Terrain posed difficulties for ground-based telemetry.
Substantial gaps in data.
Last VHF collar placed on a snow leopard in 1996.
15 years of evolution in snow leopard collars
Argos-based collar failures

Gobi bears, khulan, wild camels, saiga all in Mongolia

And one snow leopard in Pakistan in 2006
15 years of evolution in snow leopard collars
Current collar technology used in Mongolia snow leopard study

* Take GPS readings every 3 – 5 hours.

* Store all locations permanently.

* Upload locations immediately by satellite phone.

* Programmable drop-off for full data retrieval.

* Twenty-month battery life yields ~ 3,000 locations.

* Anticipated innovations.
Improving the capture process

‘Soft-catch’ snares

- Tie down
- Spring
- Lock & stop
- Swivels
Irbis System

Monitoring trapsite sensors for rapid response to trap events
2008: Digital camera traps
Black and white
2 pictures per second
25,000+ picture capacity
Long battery life (6+ months)
Cameras - An aid to leopard capture
Foot snares: Safe & effective
Then the waiting starts
Months of preparation comes down to a single moment…

7:20 AM, August 19, 2008
Safe sedation and collaring of cats by well equipped and skilled team
Status:
14 cats collared
8 males/6 females

Second generation GPS/sat-phone collar yielding up to 87% success rate of GPS uplinks.
Over 11,000 cat locations to date, increasing rapidly

Home-ranges up to 938 km²
long distance movements up to 175 km
Possible exploratory movements
Repeated Long-Distance Movements

One male roamed ~ 65 km in 18 days!
Repeated Long-Distance Movements Became his routine
Longest trek ~ 150 km in 16 days
Dispersal?
Getting to know family groups
Value of instant location uplinks

160 cluster sites investigated

Learning what they eat and where the hunt
A much anticipated cluster
Clusters we don’t want to see

Site of night goat depredation by Shonkor

Day-time rest site
Not all good news
New study component: Examining the leopard-human interface
Diet analyses via DNA barcoding
Fecal DNA amplification with universal primers

High throughput Solexa sequencers

GenBank Reference database

Species identification via DNA barcoding

DIET
Diet composition at fine scale

- Ibex: 66%
- Domestic goat: 20%
- Argali: 11%
- Domestic sheep: 2%
- Chukar: 1%
Many questions yet to be answered
First 3 years of the project:

8 males and 6 females collared

High success rate of GPS uplinks (11,000 and counting)

Cubs. Building the family trees.

9 countries, 6 continents represented

6 graduate students involved
In summary:
Through the use of innovative technology we are much closer to meeting information needs of conservation.
Thank You!

Panthera
Snow Leopard Conservation Foundation
Snow Leopard Trust
Ministry of Nature, Environment & Tourism
End of a trek, and a snow leopard