

**Research on Snow leopard (*Panthera uncia*)  
niche and population assessment in  
Taxkorgan, Xinjiang, China**

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# Snow Leopard (*Panthera uncia*)



- ◆ IUCN
  - Endangered
  - Decreasing population
- ◆ Elevation range:
  - 3,000–4,500 m
- ◆ Length: 74–130cm
- ◆ Weight: 27–54kg
- ◆ Perfect adaptation

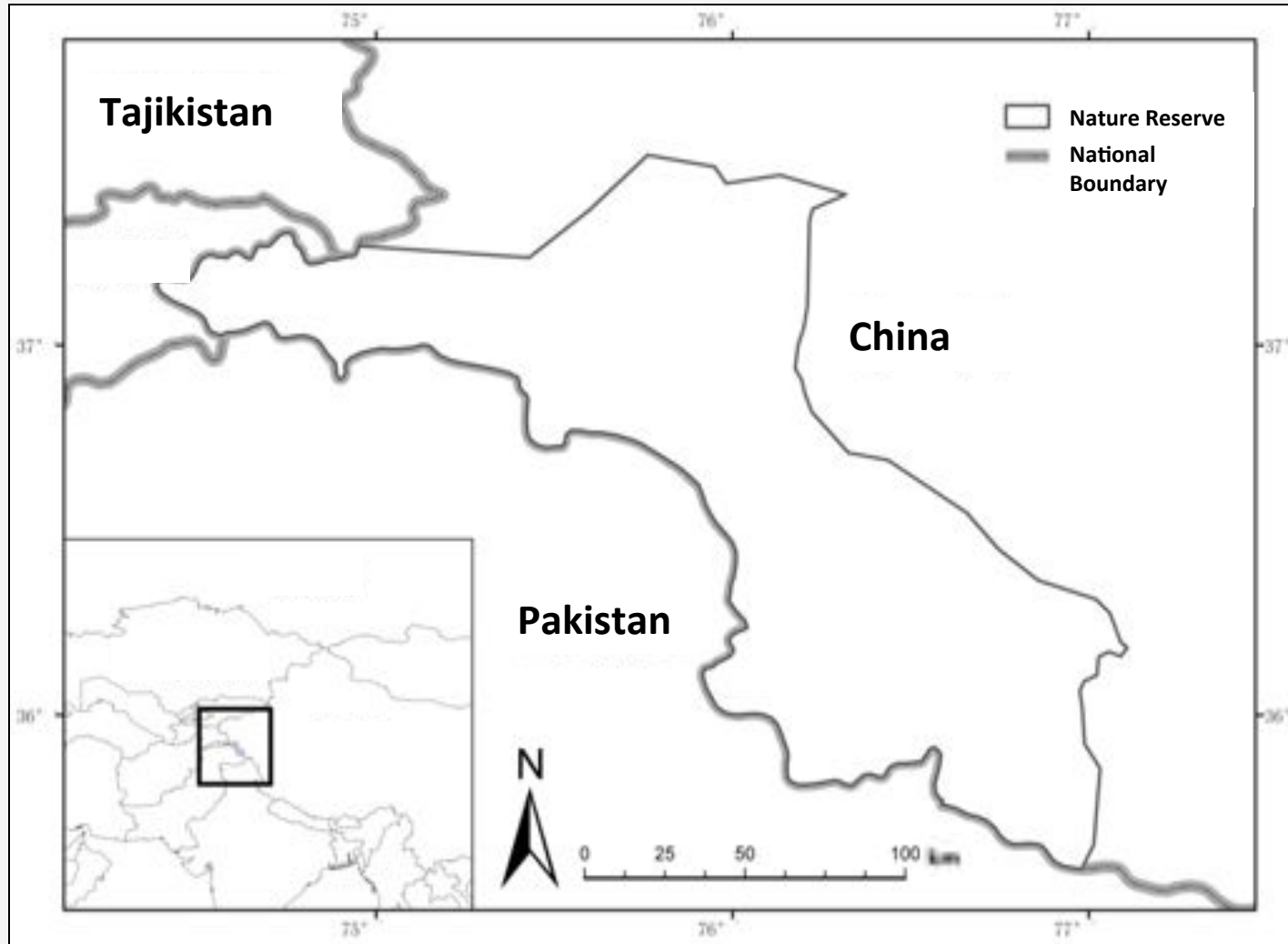


Fox, 1994

- Low productivity mountain habitats ( $\pm 1.25$  million sq km)
- Fragmented range & low densities
- Core areas along or near international borders
- Range over 12 countries
- China has 60% of the potential habitat and 30% – 50% of the total global population
- Most poorly studied big cat

# Study Site

## Taxkorgan Nature Reserve



# Study Site



- Altitude: > 5,000m
- Temperature: 3°C
- Precipitation: 63mm
- Relative height difference:

# Scat analysis

## Why scats?

- Importance of understanding predator's diet habitat
- Direct observation & stomach contents analysis? — **NO!**



Hard part of prey remains  
such as bones, teeth, hairs &  
feathers

# Scat analysis

- February-March, 2009
- 24 foot transects, 196.66km in total
- Collected whenever found along the transects
- Rely on the colour, shape, location and associated signs to identify the scats to species level.
- Scats couldn't be identified were excluded for analysis.

<b>Species</b>	Snow leopard	Wolf	Lynx	Red fox	Pallas' cat	<b>Total</b>
<b>Scats</b>	18	12	1	19	2	<b>69</b>



# Scat analysis

## Procedure

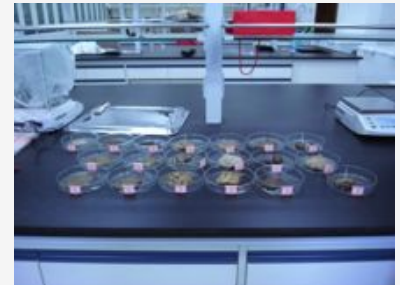
Segregation of scat samples

Making of hair slides (plexiglass)

Scale replication of hairs

Micro-photography (Leica DMI4000, 40 $\times$ )

Species identification



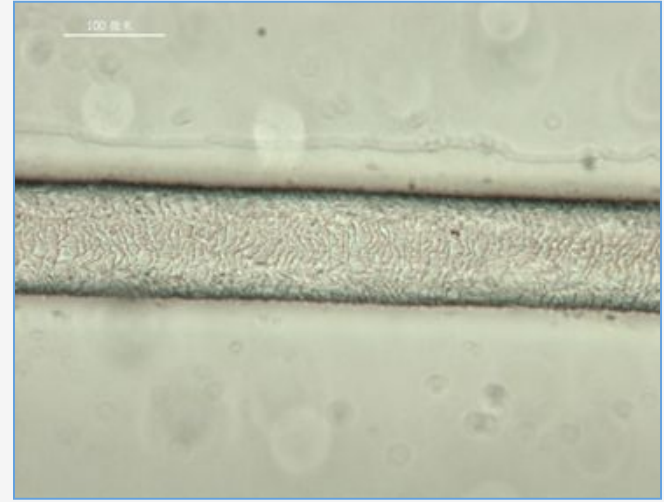
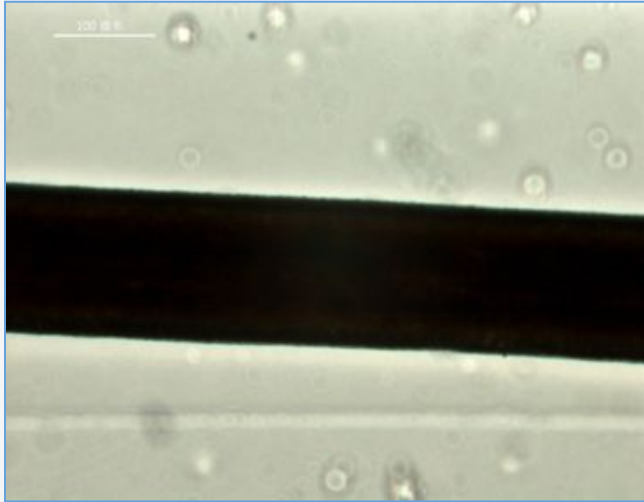
# Scat analysis

## Reference keys

- 1) Study site: Blue sheep, ibex, marmot, yak, goat and sheep.
- 2) Literature: Cape Hare, Pika, Hamster, House mouse, Mountain vole

# Scat analysis

**Yak**



**Sheep**



# Scat analysis

## Pianka index:

$$DO = \frac{\sum P_{ij} P_{ik}}{\sqrt{\sum P_{ij}^2 \sum P_{ik}^2}}$$

$P_{ij}$  is the proportion of prey category  $i$  in the diet of predator  $j$ ;  $P_{ik}$  is the proportion of prey category  $i$  in the diet of predator  $k$ .

# Scat analysis

## Diet composition (%) of snow leopard, wolf, red fox, Pallas' cat and Lynx

Prey Item	Snow Leopard (n=19)		Wolf (n=6)		Red Fox (n=31)		Pallas' Cat (n=9)		Lynx (n=4)	
	Freq.	Occurrence (%)	Freq.	Occurrence (%)	Freq.	Occurrence (%)	Freq.	Occurrence (%)	Freq.	Occurrence (%)
<b>LARGE PREY</b>										
Ibex	7	12.3	4	21.1	14	12.3	4	16.7		
Blue Sheep	2	3.5	3	15.8	7	6.1				
Yak	9	15.8	4	21.1	20	17.5	5	20.8	1	16.7
Goat	3	5.3	1	5.3	8	7.0				
Sheep	2	3.5			3	2.6	1	4.2		
<b>MEDIUM PREY</b>										
Marmot	7	12.3	4	21.1	16	14.0	5	20.8		
Cape Hare	1	1.8			3	2.6	1	4.2	1	16.7
Bird	3	5.3			6	5.3	2	8.3	1	16.7
<b>SMALL PREY</b>										
Hamster					2	1.8	2	8.3		
Pika					3	2.6				
House Rat					1	0.9	1	4.2		
<b>OTHER</b>										
Vegetation	13	22.8	1	5.3	16	14.0	1	4.2	1	16.7
Insect	2	3.5		0.0						
Snail	1	1.8		0.0						
Grit	4	7.0	1	5.3	4	3.5			1	16.7
Plastic Thread	2	3.5								
Unidentified	1	1.8	1	5.3	11	9.6	2	8.3	1	16.7
<b>Total</b>	<b>57</b>		<b>19</b>		<b>114</b>		<b>24</b>		<b>6</b>	

# Scat analysis

## Pianka diet overlap index

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	<b>Snow leopard</b>	<b>Wolf</b>	<b>Red fox</b>	<b>Pallas' cat</b>	<b>Lynx</b>
<b>Snow leopard</b>	1				
<b>Wolf</b>	0.77	1			
<b>Red fox</b>	0.95	0.89	1		
<b>Pallas' cat</b>	0.76	0.84	0.87	1	
<b>Lynx</b>	0.67	0.33	0.58	0.51	1

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# Camera trapping



© Andy Hearn

# Camera trapping

—March – April, 2011

—41 camera traps (31 LTL 5210A and 10

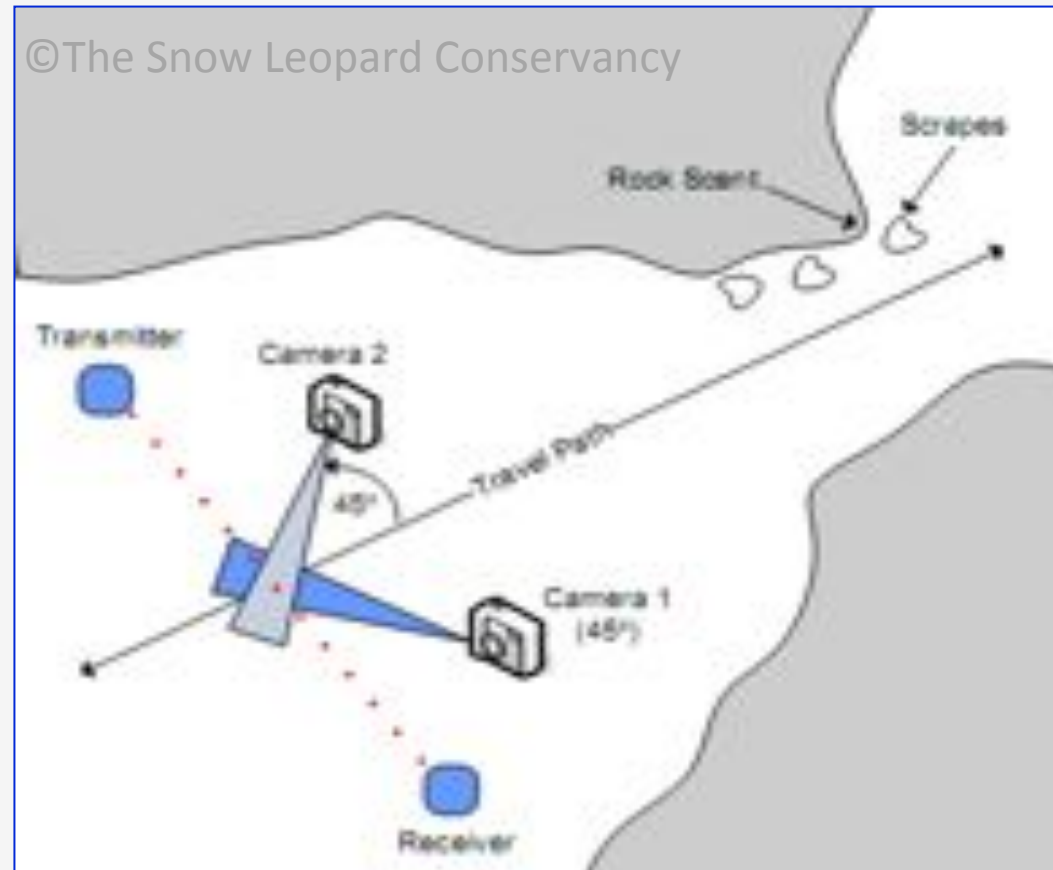
Reconyx HC500)

—Frequently used

locations or the sites

where limit snow

leopard's activity





# Camera trapping

## Result

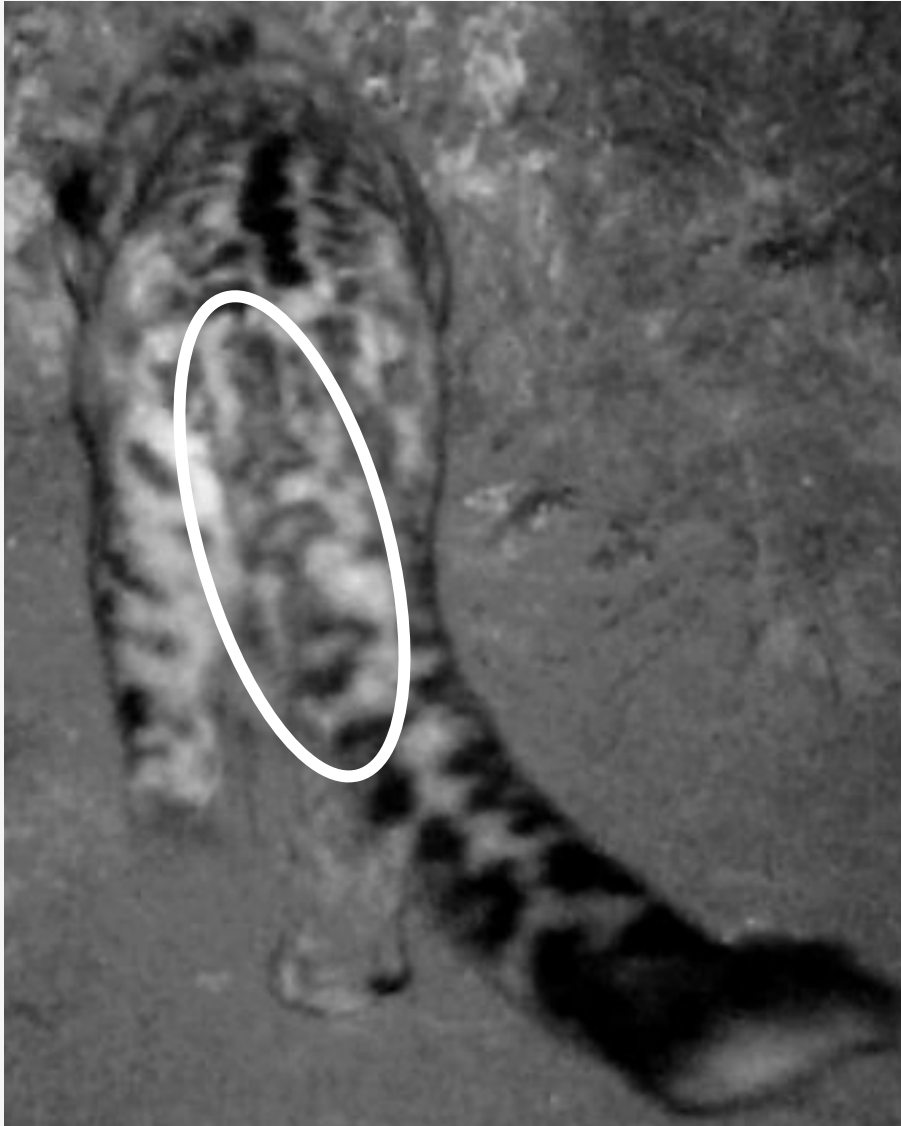
- Survey area: **42km<sup>2</sup>**
- Working days: **34**
- Trapping sites: **29**
- Trapping days: **1138**
- **13** cameras got **79** photos and **10** videos of snow leopard at 8 trapping sites

# Camera trapping

	ID	Capture	NO. of photos	NO. of videos
<b>Identified</b>	XJTX-01	8	61	6
	XJTX-02	2	6	3
	XJTX-03	1	3	0
	<b>Total</b>	<b>11</b>	<b>70</b>	<b>9</b>
<b>Unidentified</b>	XJTX-04	1	0	1
	XJTX-05	1	5	0
	ZJTX-06	1	4	0
	<b>Total</b>	<b>6</b>	<b>9</b>	<b>1</b>

**3~6** snow leopards distributed in the study area, density was **7.14~14.29** individuals/100 km<sup>2</sup>。

# Camera trapping



# Camera trapping

## 1. Population density

Time	Study site	Survey area (km <sup>2</sup> )	Density (只/100km <sup>2</sup> )	Literature
2003	Hemis National Park	71	8.49 (SE=0.22)	(Jackson et al., 2006)
2004	Hemis National Park	135	4.45 (SE=0.16)	(Jackson et al., 2006)
2005	Tuomur, Xinjiang	250	0.020~0.032	(Ma Ming et al., 2006)
2011	Taxkorgan	42	7.14~14.29	

# Camera trapping

## 2. Home range

- 1) XJTX-01 snow leopard was photo captured by 8 times, indicating survey area was frequently used by it and possible located in its “core use area”.
- 2) XJTX-02 and XJTX-03 individuals had less use of survey area.
- 3) Home range overlap area of three snow leopards could be included in the survey area.

# Camera trapping

## 3. Research methodology

### ➤ Mode of camera

Identification & population estimation:

**camera > video**

### ➤ Setting up

Long-term research monitor data

**Training for local staff**

**Thank you !**