

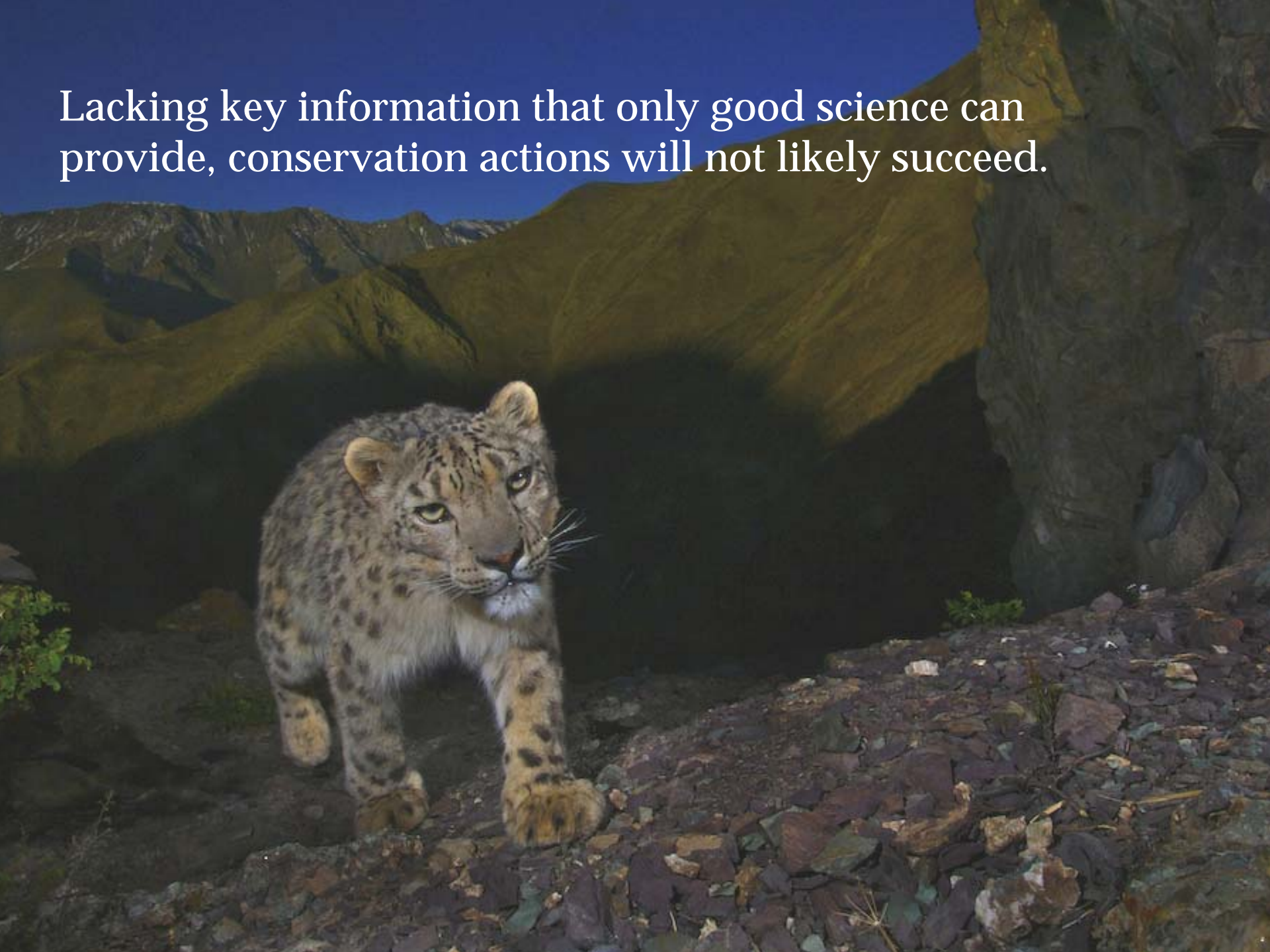


Technological advances in Snow Leopard Research - Mongolia

T. McCarthy, K. Sharma & O. Johansson



Lacking key information that only good science can provide, conservation actions will not likely succeed.

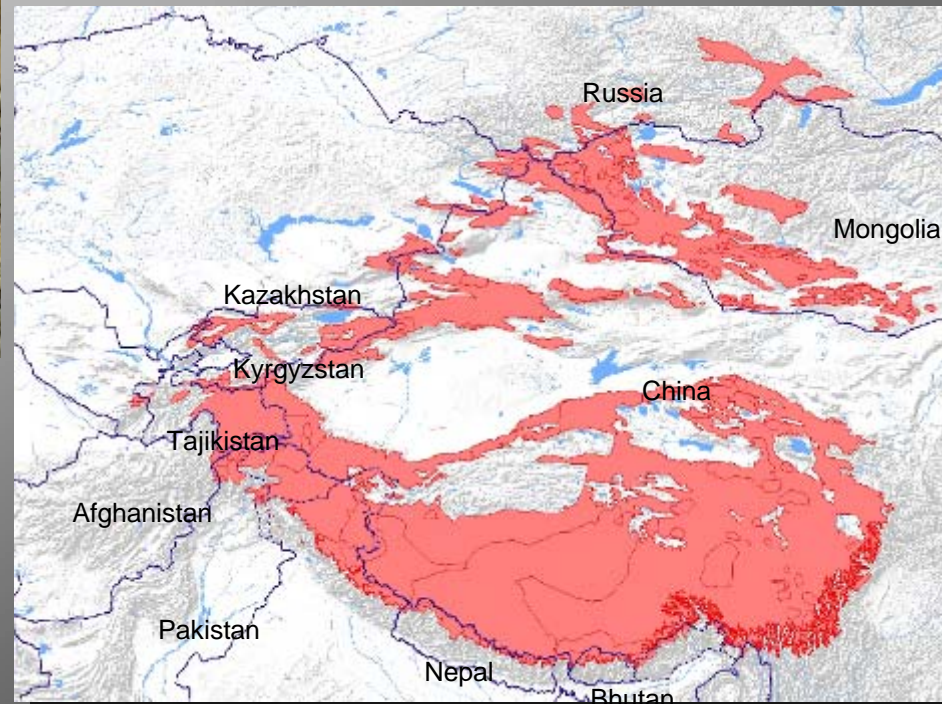


Challenges to studying snow leopards



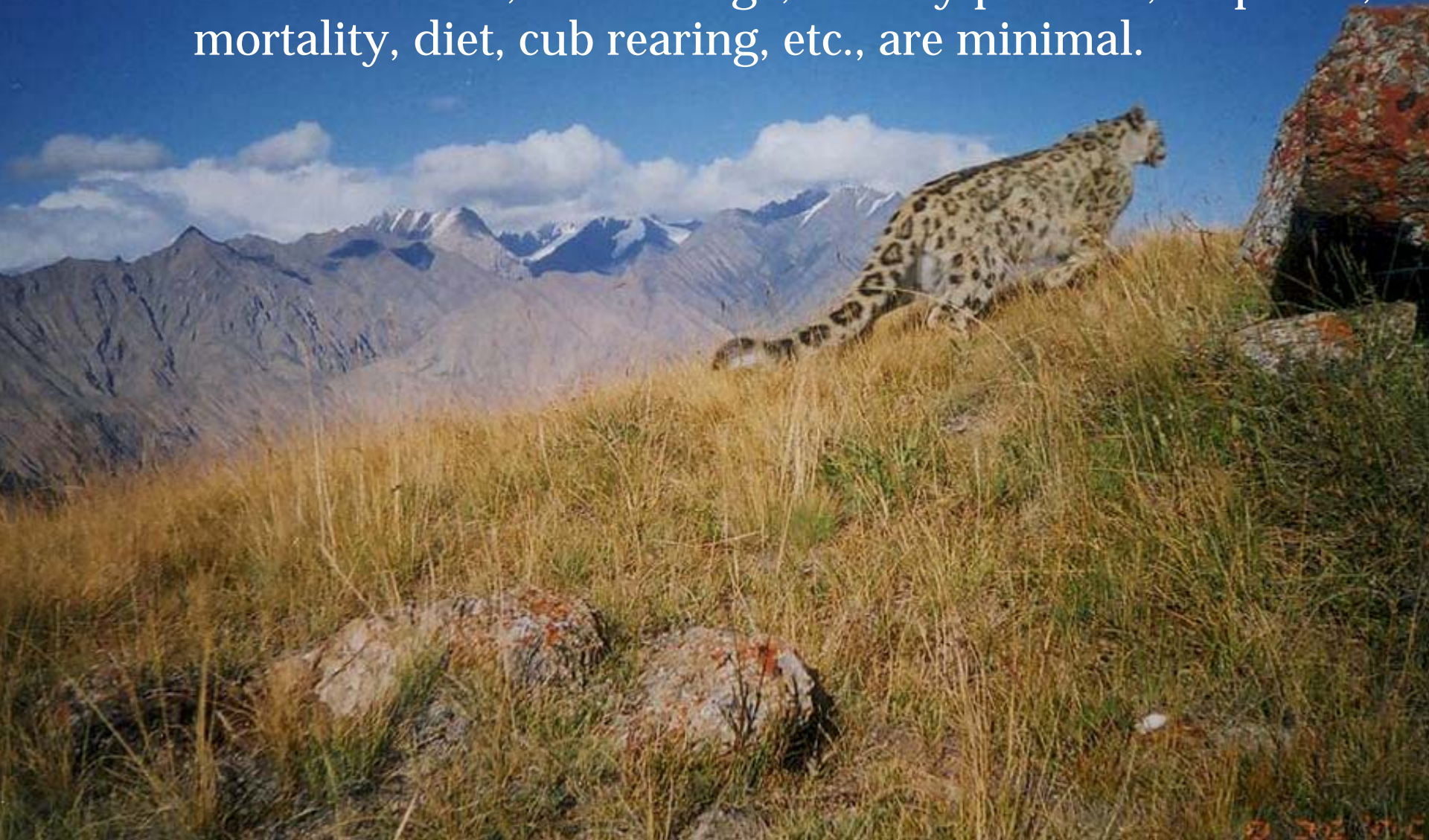
Extremely remote and rugged habitat

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



Basic snow leopard ecology is poorly understood

Data on habitat use, home range, activity patterns, dispersal, mortality, diet, cub rearing, etc., are minimal.



2008 - Panthera and SLT launch the first ever long-term snow leopard study 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 sub-optimal for
ground-based telemetry.

Substantial gaps in data.





1995
Argos PTT

2006
Argos GPS

2008
GPS/sat-phone

2010
GPS/sat-phone



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





1995
Argos PTT

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2010
GPS/sat-phone



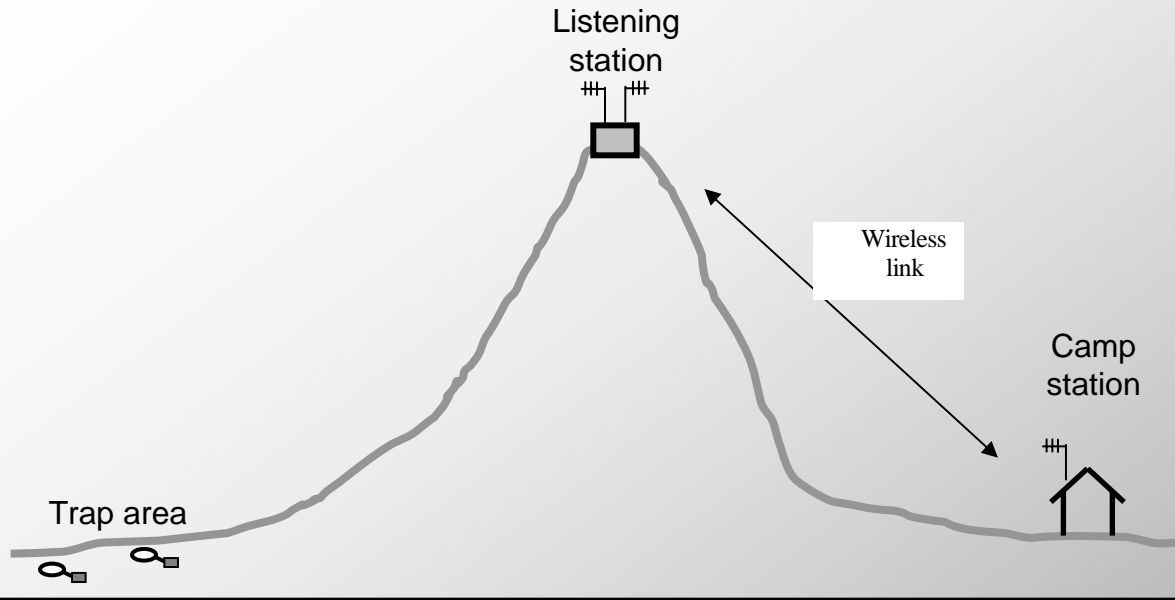
15 years of evolution in
snow leopard collars

Current collar technology used in Mongolia snow leopard study

- * Take GPS reading every 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.



System overview



Irbis System

Monitoring trapsite sensors
for rapid response to
trap events



Listening Station



Camp Station

Safe sedation and collaring of cats by well equipped and skilled team



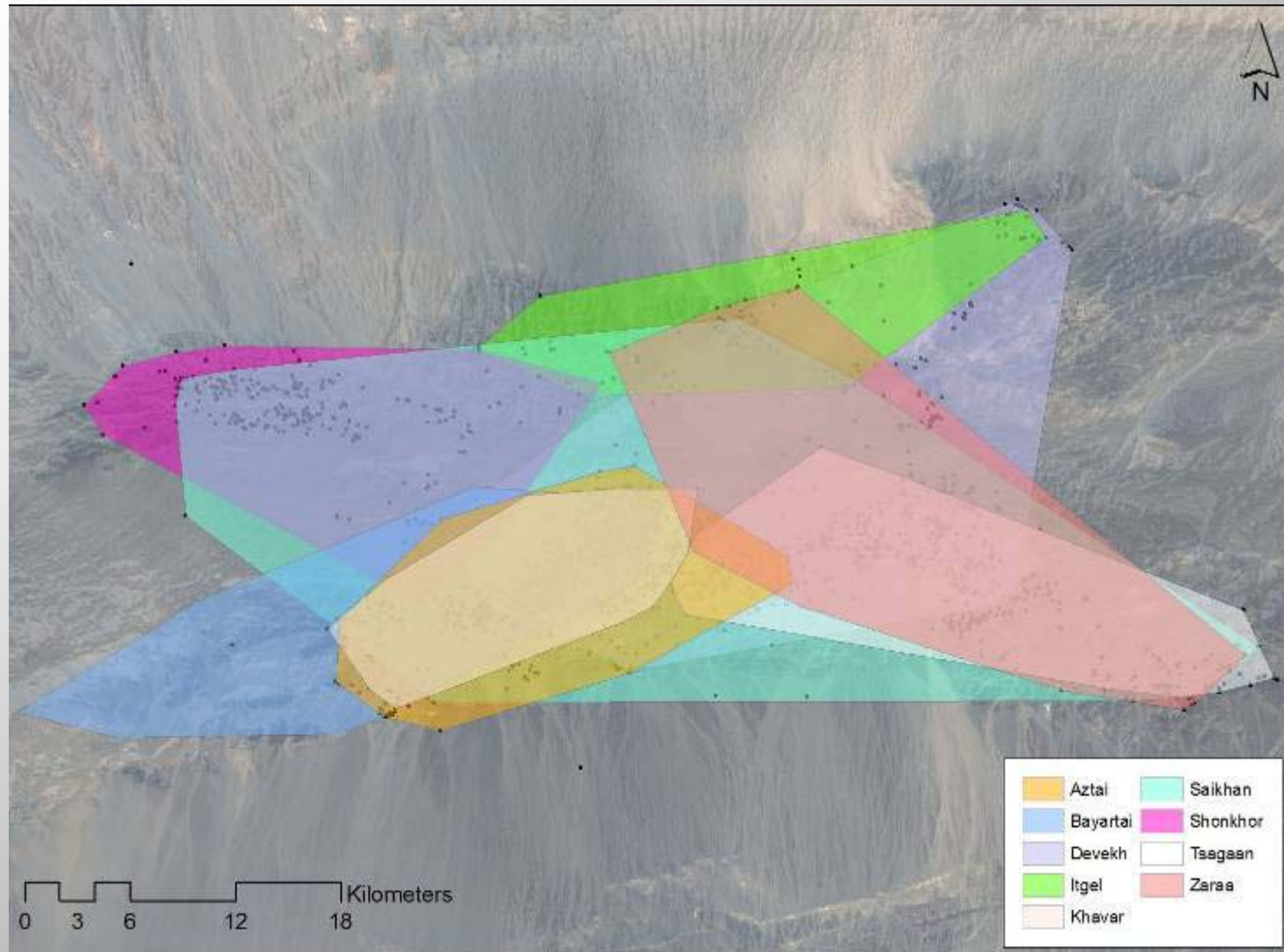


Status:
12 cats collared
8 males/4 females

Second generation
GPS/sat-phone
collar yielding
up to 87% success
rate of GPS uplinks.



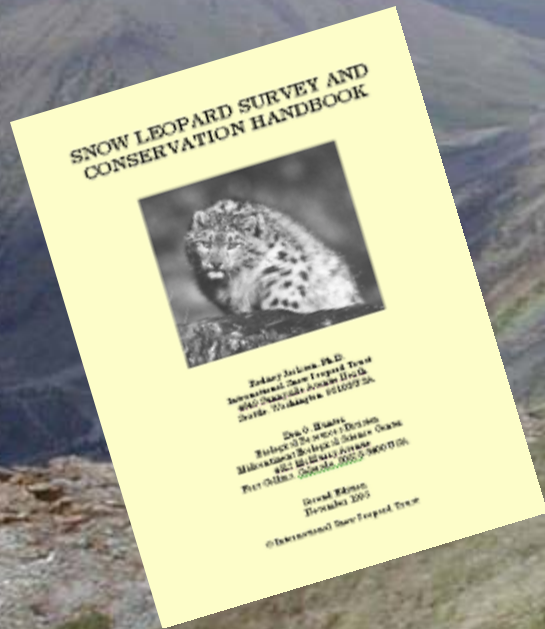
Over 5,500 cat locations to date, increasing rapidly



Home-ranges up to 938 km²

long distance movements up to 175 km

Monitoring snow leopard population status & trends



Camera trapping advances since 2005





2008: Digital camera traps
Black and white
2 pictures per second
25,000+ picture capacity
Long battery life (6+ months)



2010

Providing not just leopard numbers, but insights on behavior

2010-08-10 7:39:02 AM M 1/5



13°C



Image volume (18,253 in 4-week session) necessitates additional technology to store and analyze them

The screenshot shows a Windows Internet Explorer browser window with the following details:

- Address bar: `http://d.pr/bmkv`
- Page Title: `Screen shot 2011-01-03 at 08:38:09.png`
- Page Content: `CatCam Admin Interface`
- Navigation: `Encounters Cameras Photos Users Logout`
- Section: `PHOTOS LIST`
- Table:

<input type="checkbox"/> Thumbnail	Encounter	Created at	Actions
	1	December 21, 2010 5:21 PM	Edit Delete
	1	December 21, 2010 5:21 PM	Edit Delete

Search and Filter Panel:

- Filename: is empty
- Created at: from / / to / /
- Camera:
- Encounter:
- Right flank visible: is empty
- Left flank visible: is empty

Diet analyses via DNA barcoding



Diet analyses via
DNA barcoding



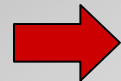
Fecal DNA amplification with universal primers



High throughput Solexa sequencers



GenBank
Reference database

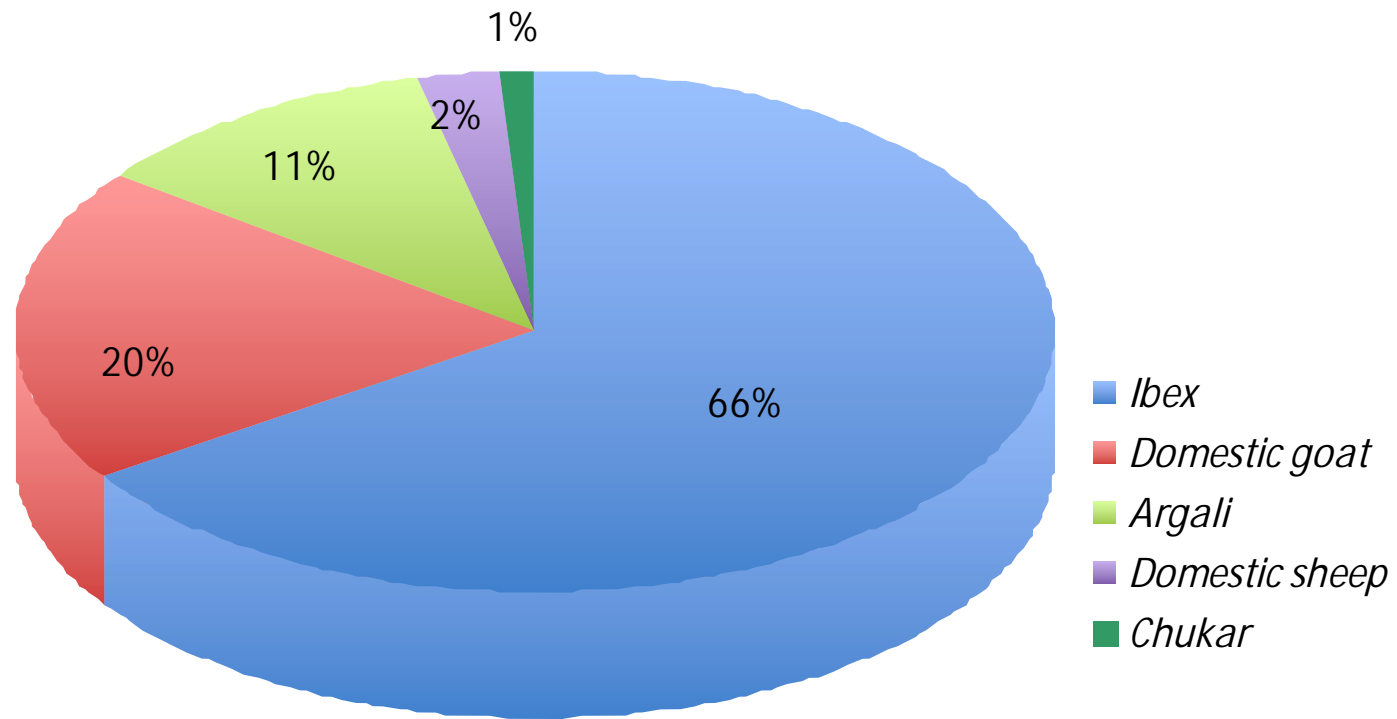


Species identification via DNA barcoding



DIET

Diet composition at fine scale



Communication and power needs



In summary:

Through our use of innovative technology we are much closer to meeting information needs of conservation.

More information at:
panthera.org
snowleopard.org



Thanks to our many supporters!

- Woodland Park Zoo
- Disney Worldwide Conservation Fund
- Twycross Zoo
- Kolmarden Zoo
- Akron Zoo
- Hogle Zoo
- Nordens Ark
- Columbus Zoo
- Cheyenne Mountain Zoo
- AZA Conservation Endowment Fund
- Pittsburgh Zoo

