



Advances in Snow Leopard Research - Mongolia

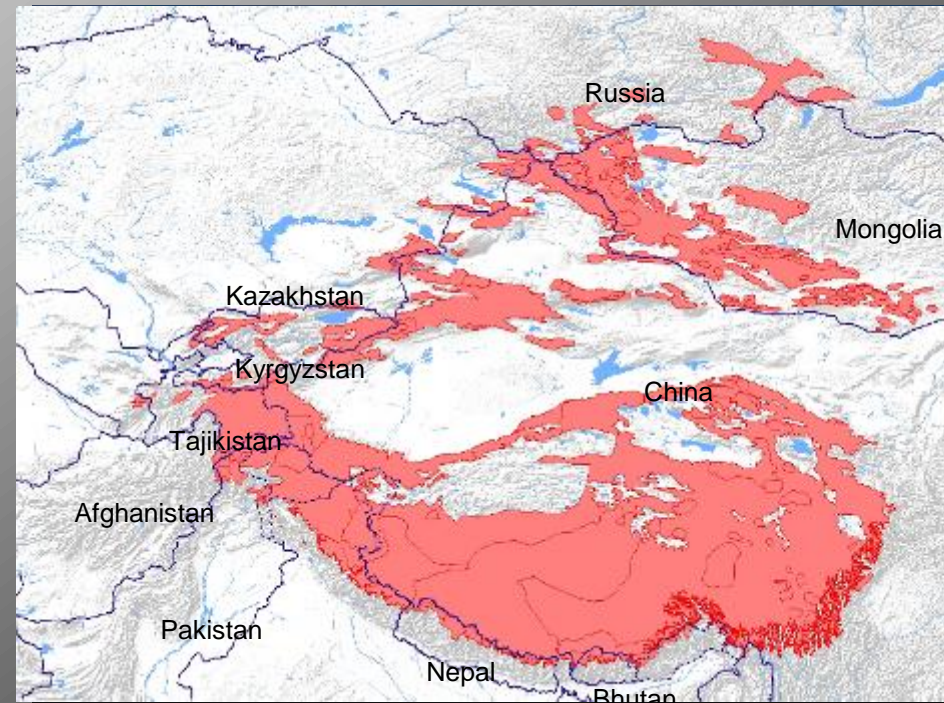
T. McCarthy & O. Johansson

Challenges to studying snow leopards



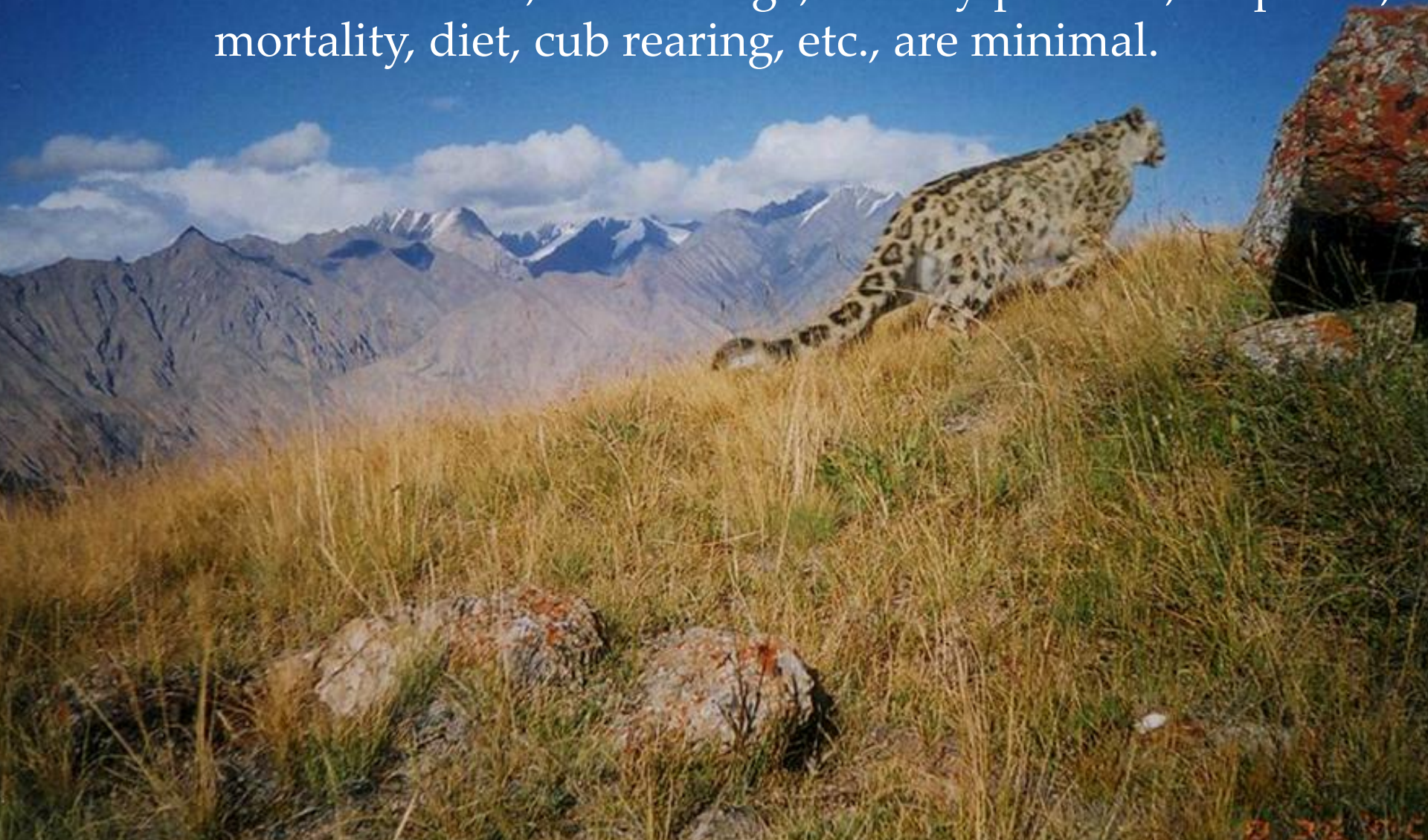
Extremely remote and rugged habitat

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

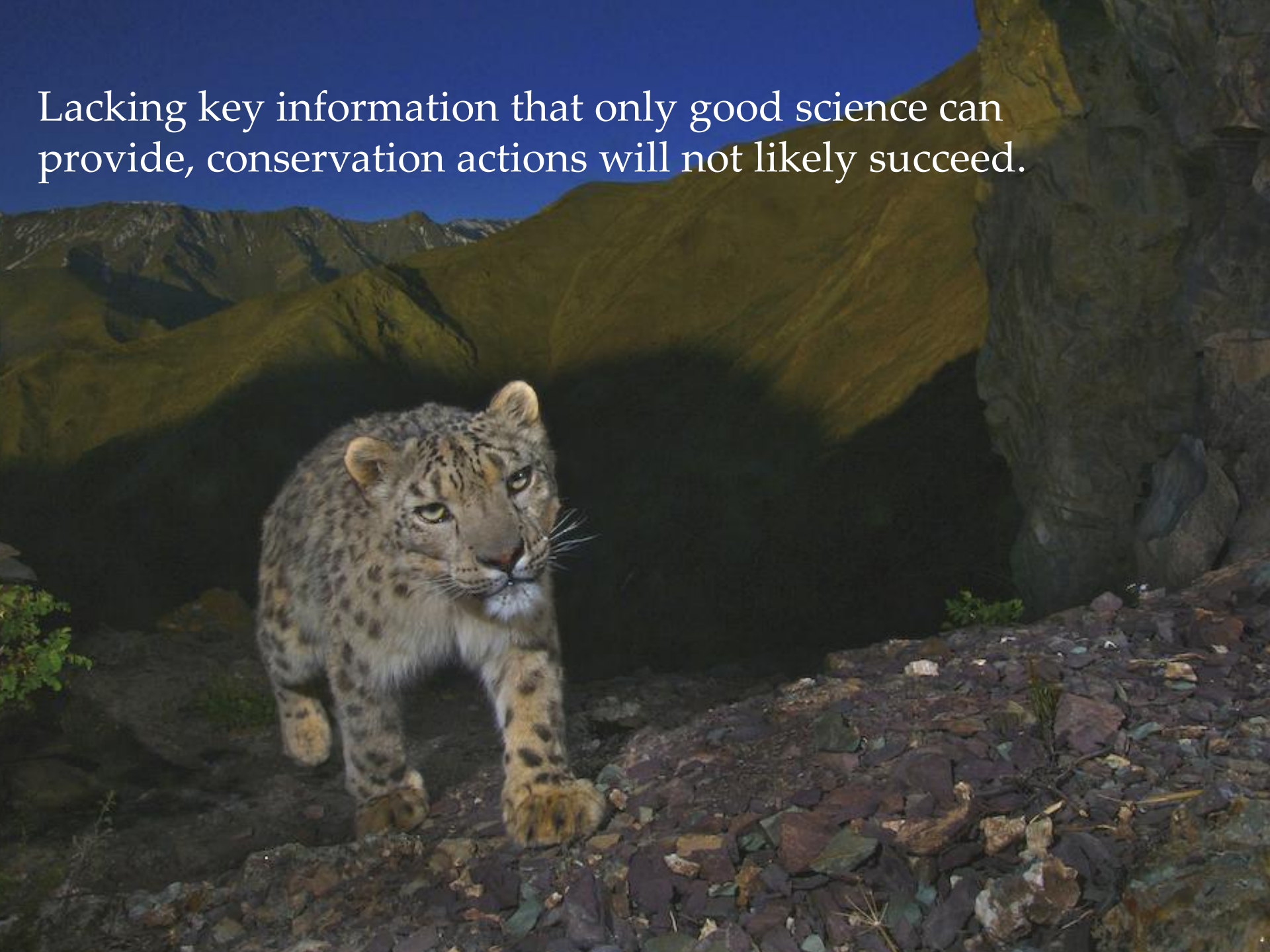


Basic snow leopard ecology is poorly understood

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



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





Mongolia

- International boundary
- - - Province (aymag) boundary
- ★ National capital
- ⊙ Province (aymag) center
- Railroad
- Road



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.





1996

Argos PTT

2006

Argos GPS

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





1996
Argos PTT



2006
Argos GPS



2008
GPS/sat-phone



2011
GPS/sat-phone

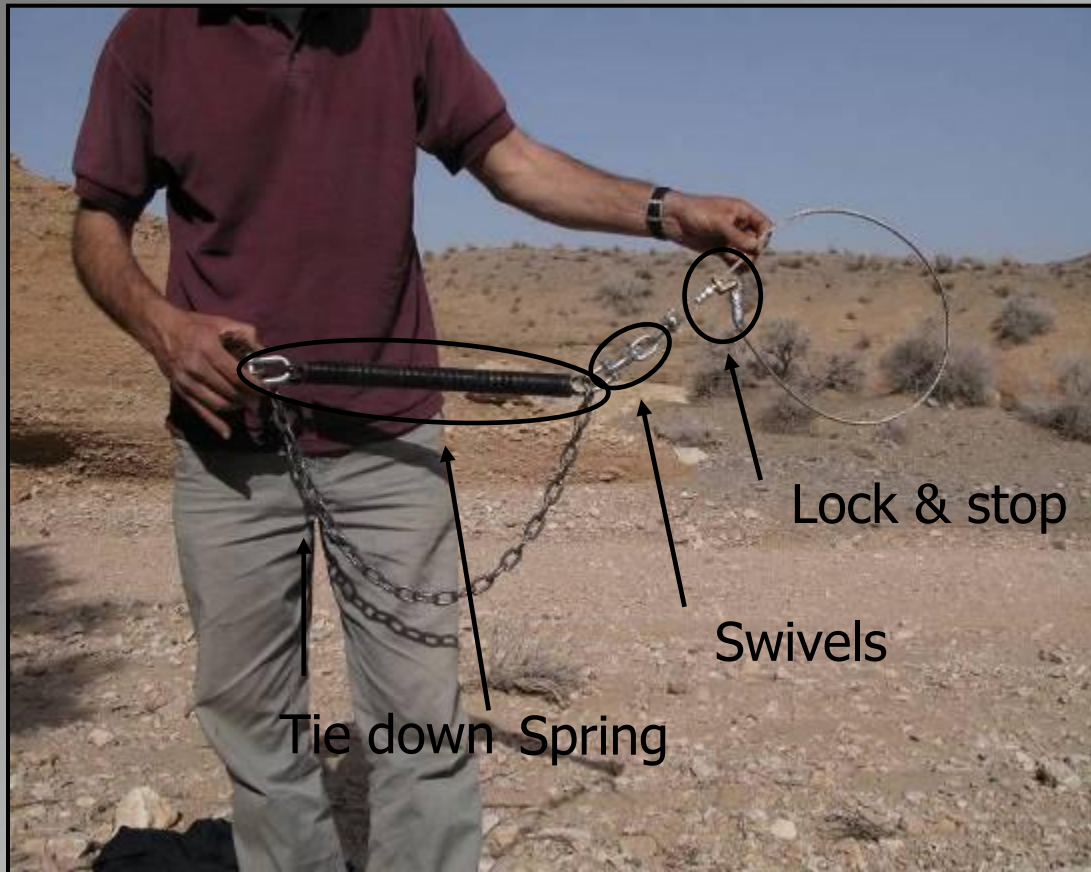
15 years of evolution in
snow leopard collars

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.

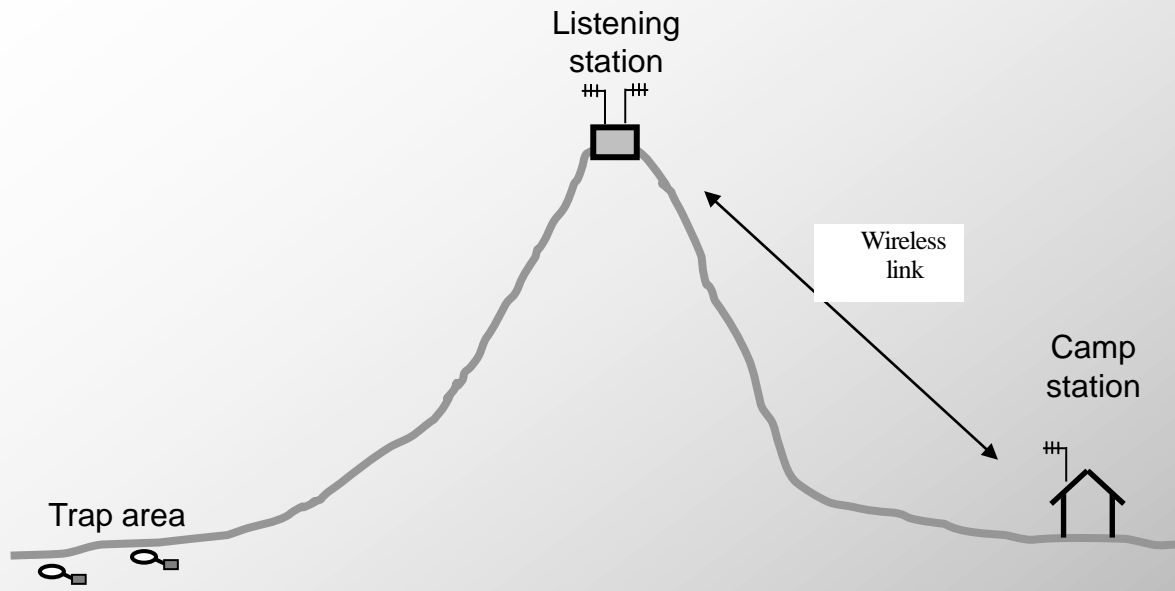


Improving the capture process



'Soft-catch' snares

System overview



Irbi System

Monitoring trapsite sensors
for rapid response to
trap events



Listening Station



Camp Station

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



2010



Cameras - An aid to leopard capture



Snow
Leopard
Trust



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





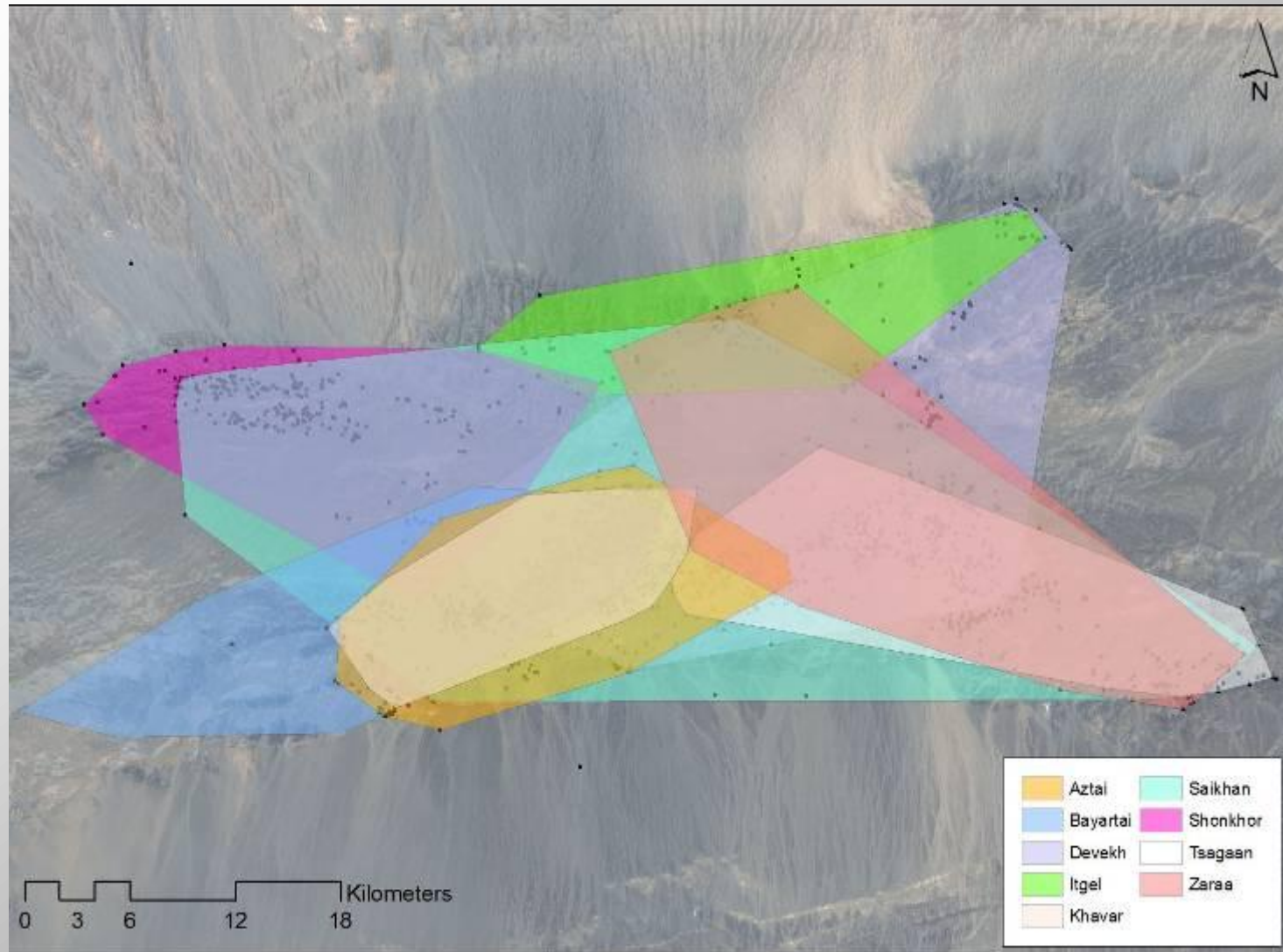


Status:
14 cats collared
8 males/6 females

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

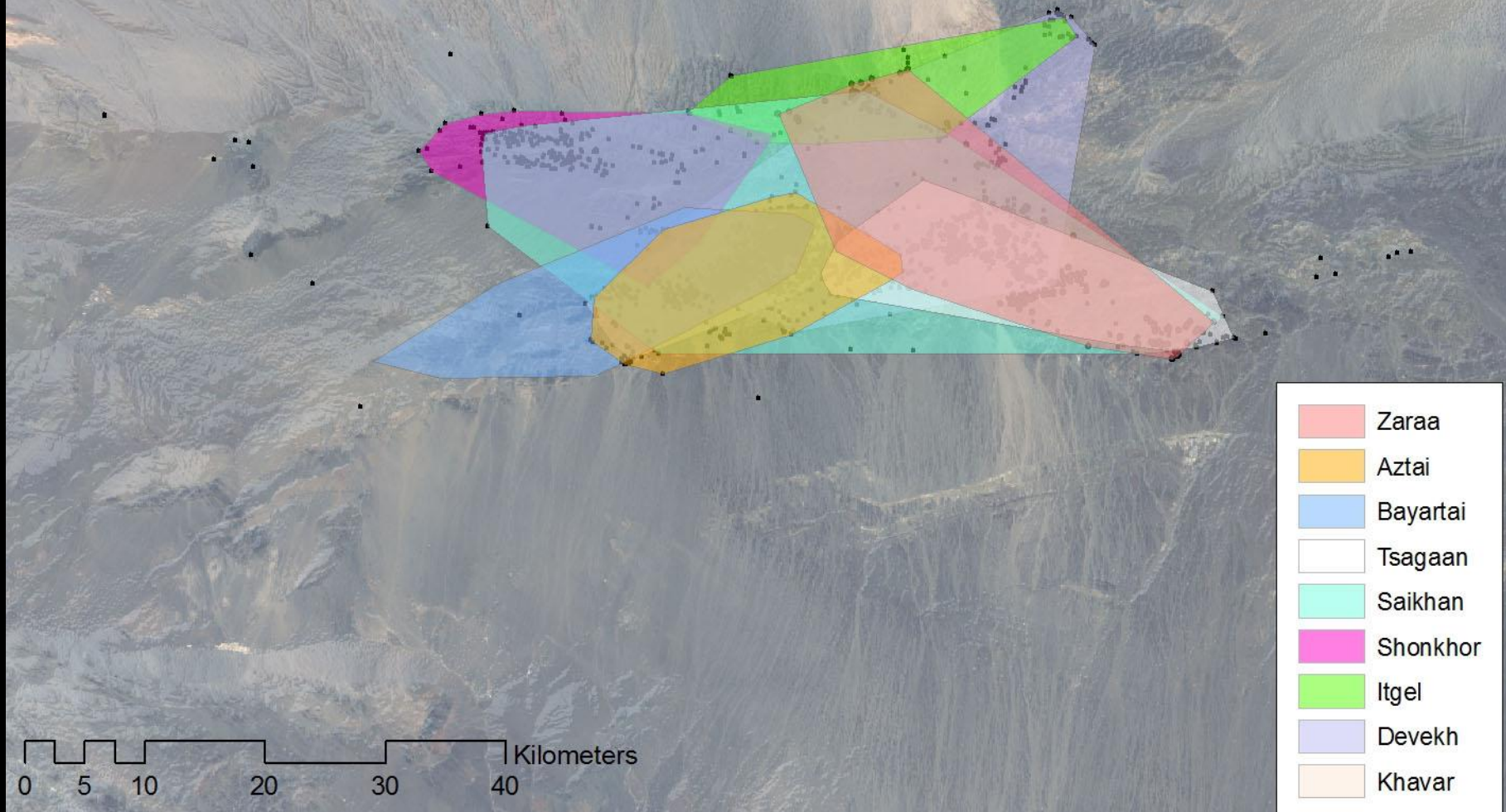


Over 11,000 cat locations to date, increasing rapidly

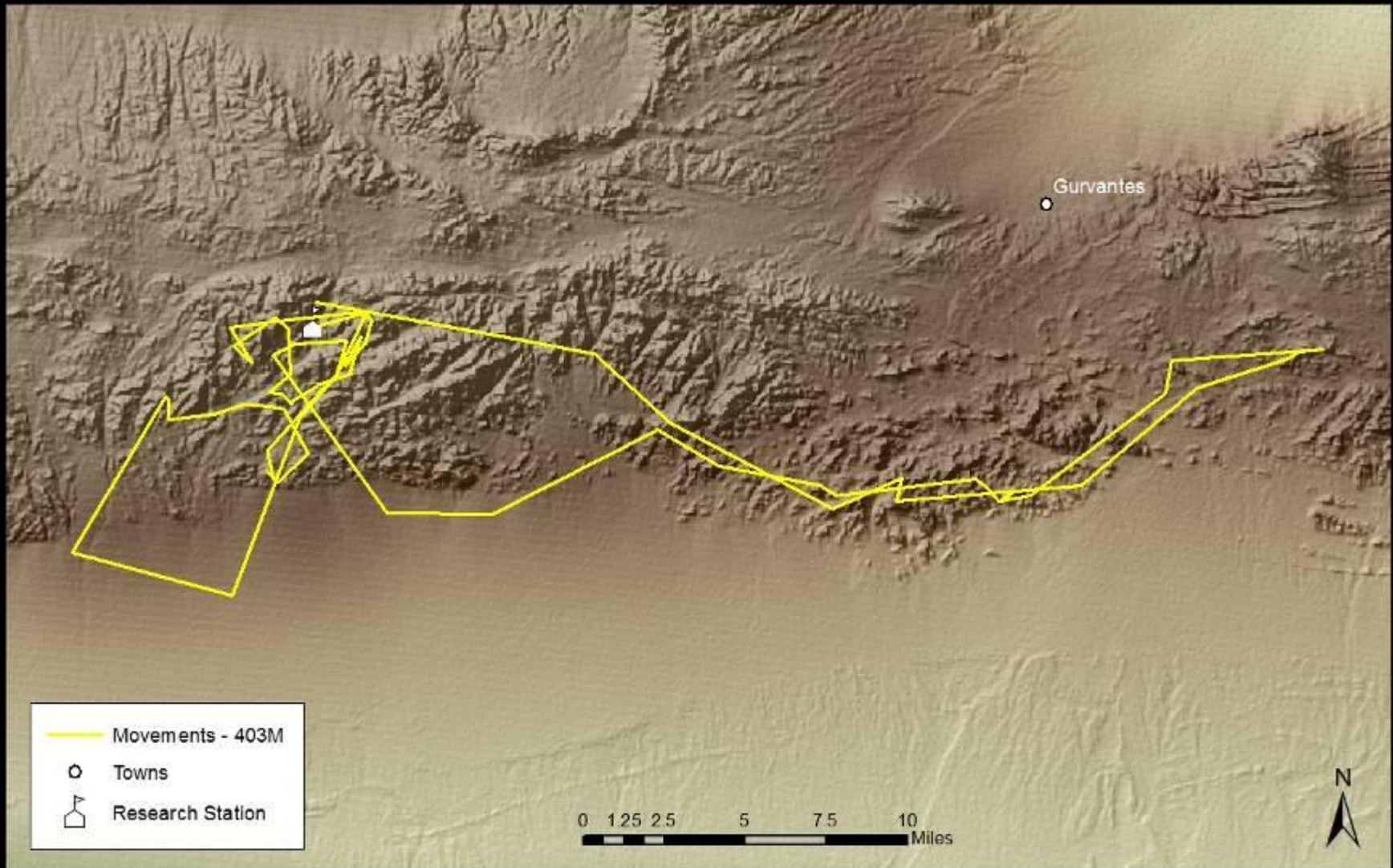


Home-ranges up to 938 km²
long distance movements up to 175 km

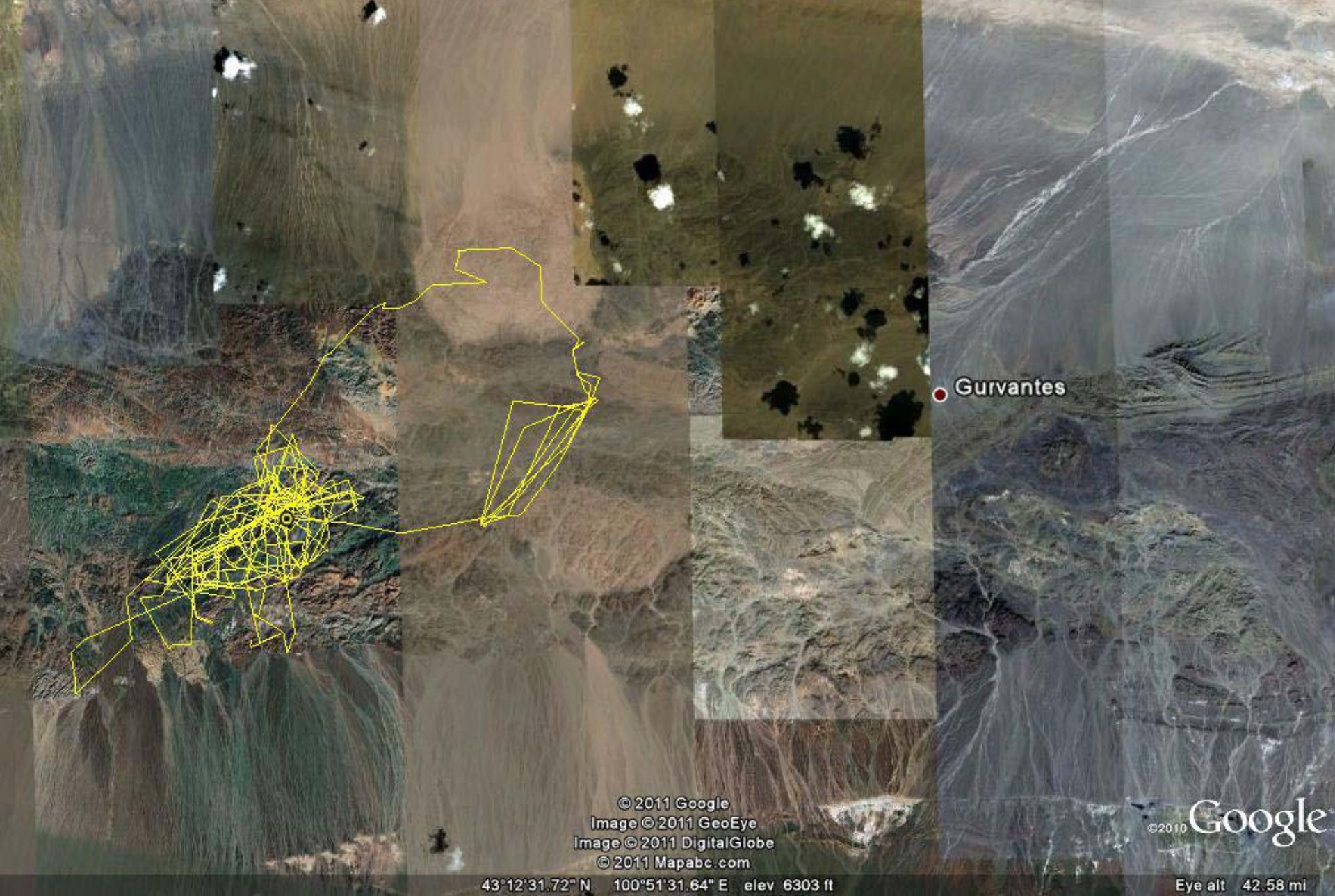
Possible exploratory movements



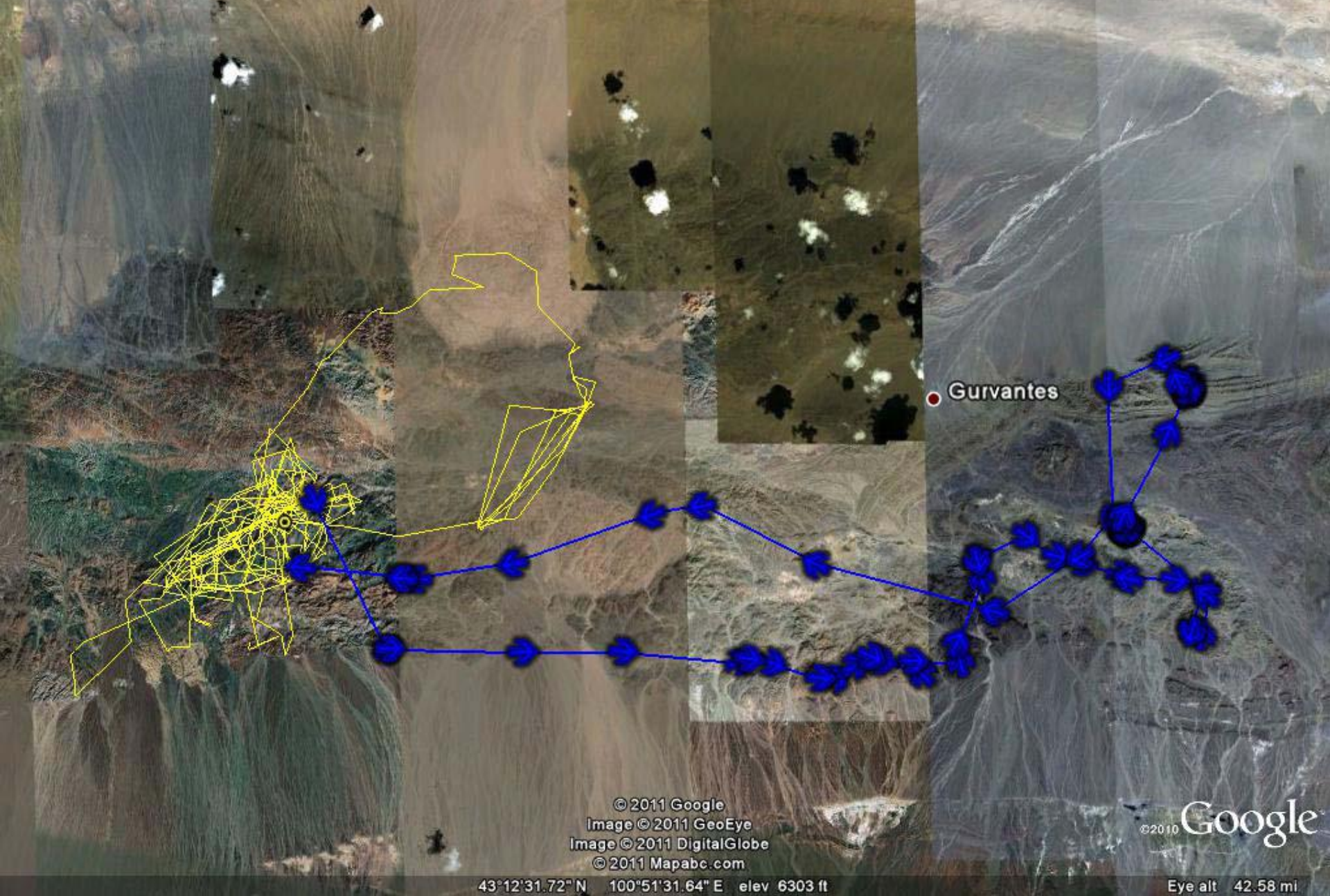
Repeated Long-Distance Movements



One male roamed ~ 65 km in 18 days!



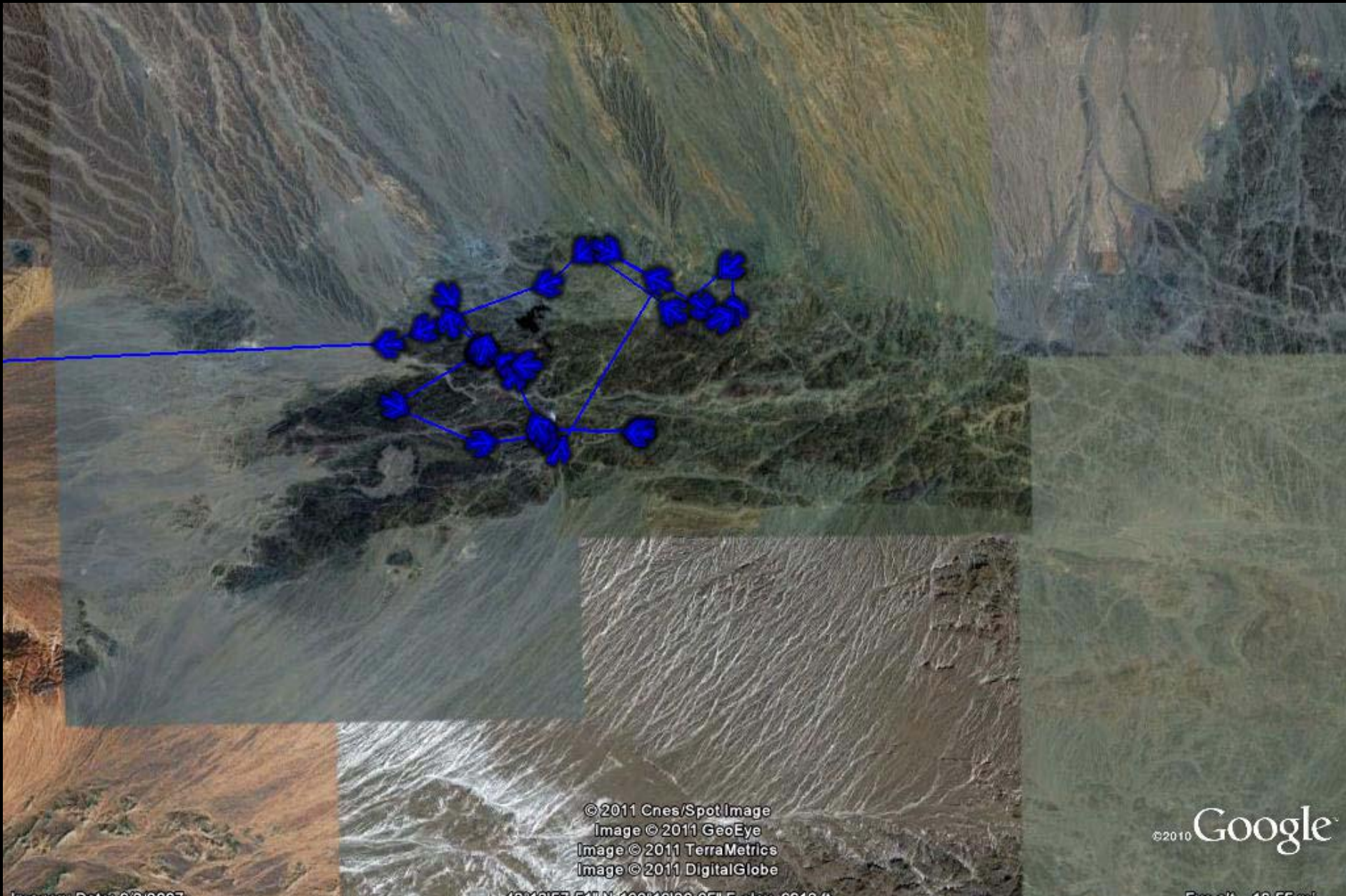
Became his routine

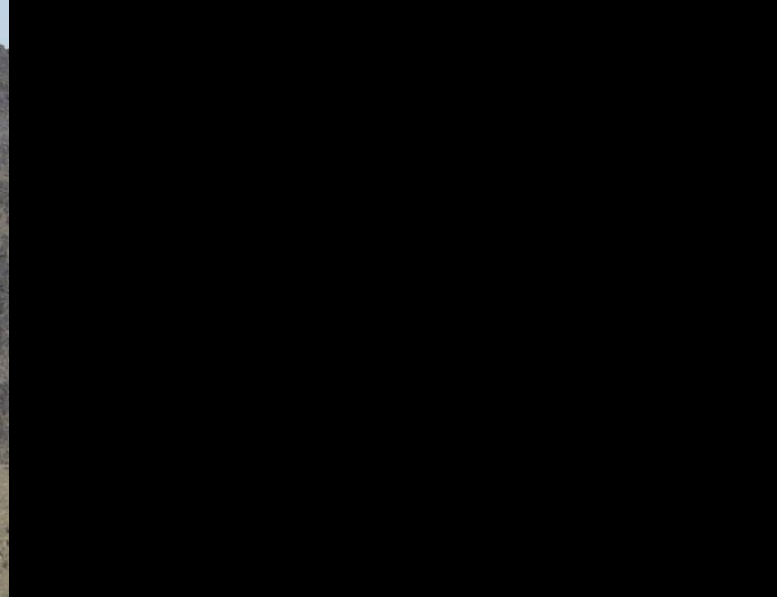
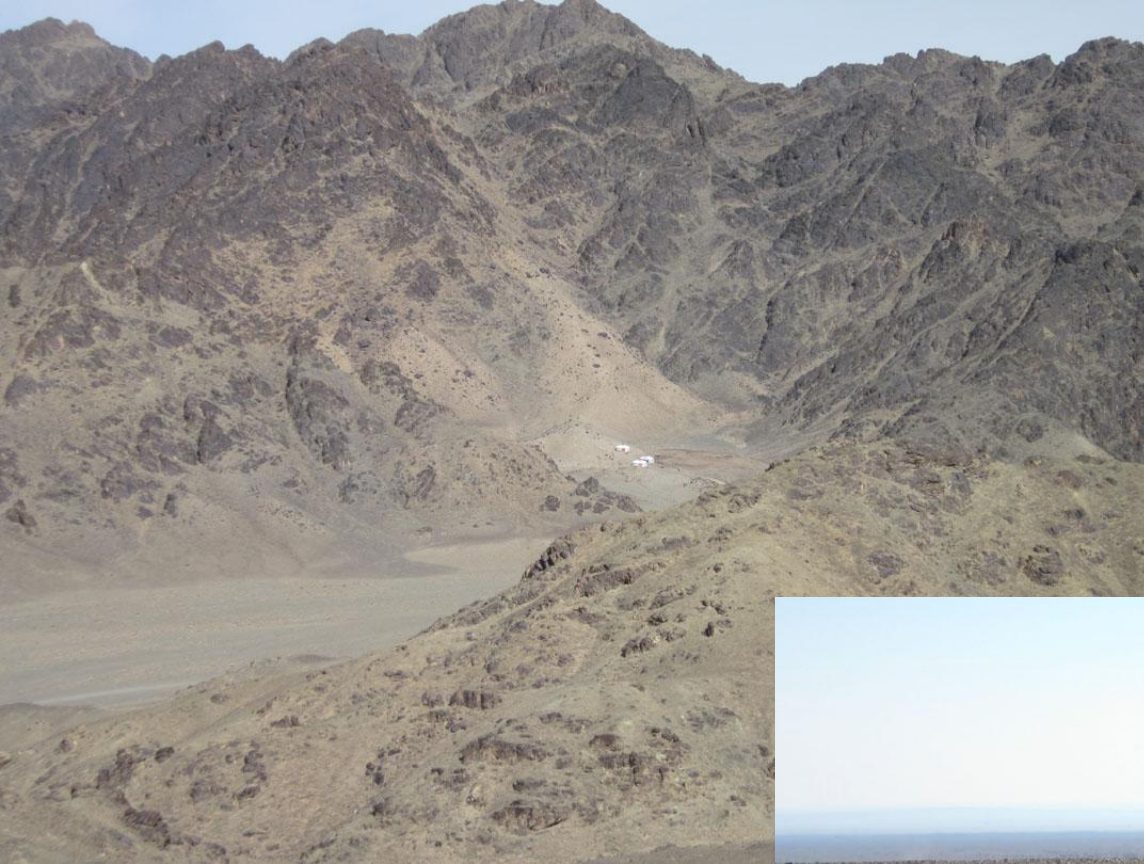


Longest trek ~ 150 km in 16 days



Dispersal?





Motivation?



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Getting to know family groups

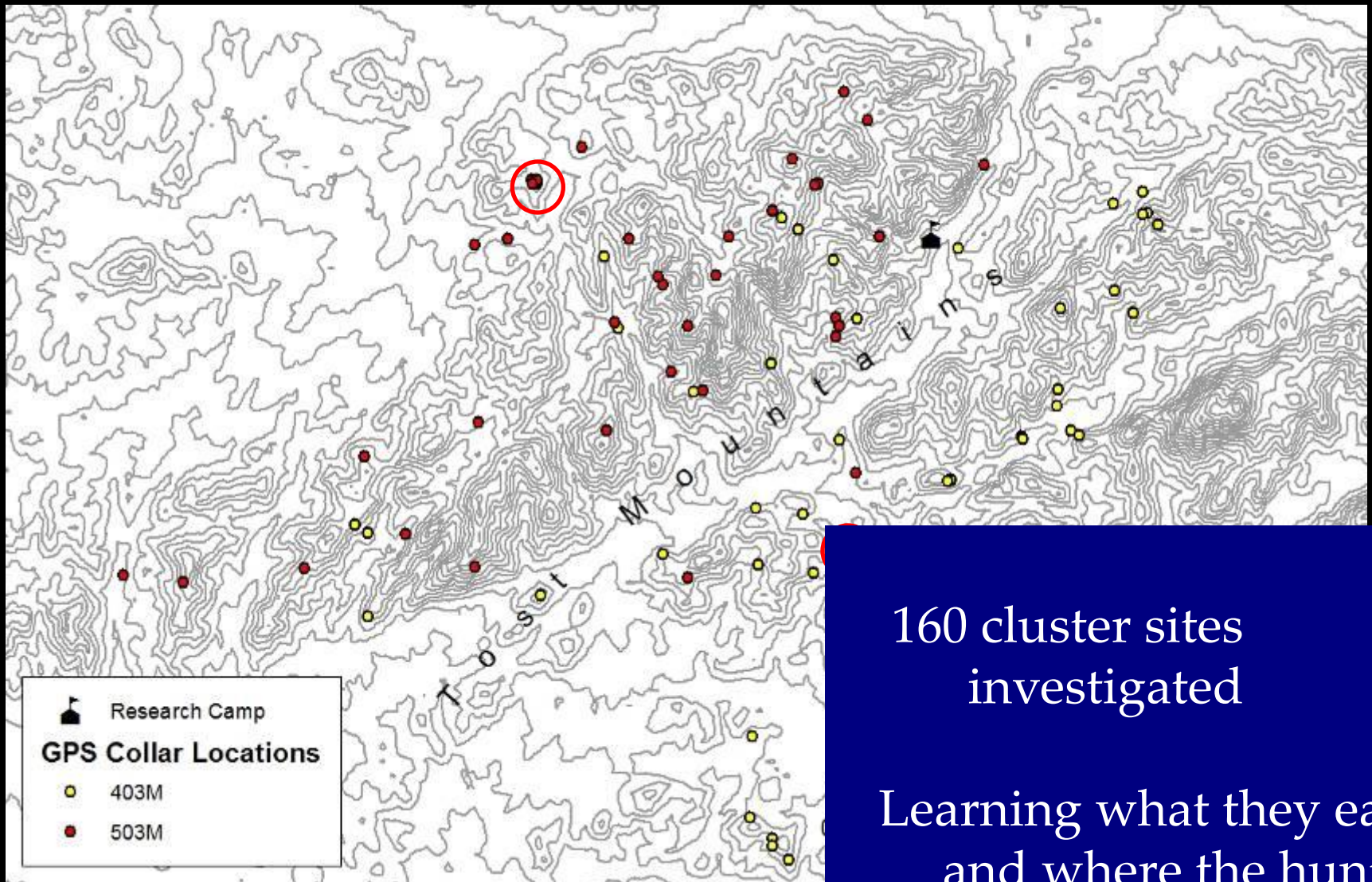
2010-08-10 7:39:02 AM M 1/5

13°C



RECONYX

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



Not all
good news



New study component: Examining the leopard-human interface



Diet analyses via DNA barcoding



Diet analyses via DNA barcoding



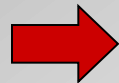
Fecal DNA amplification with universal primers



High throughput Solexa sequencers



GenBank
Reference database

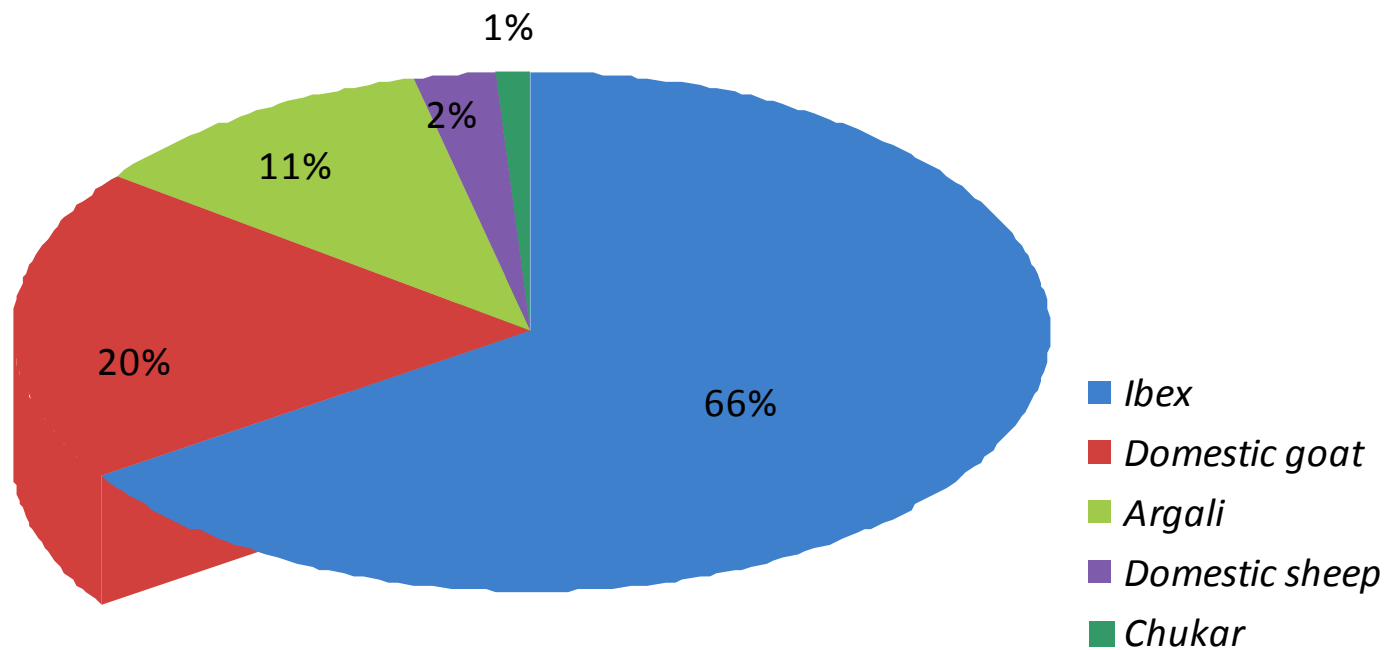


Species identification via DNA barcoding



DIET

Diet composition at fine scale





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:

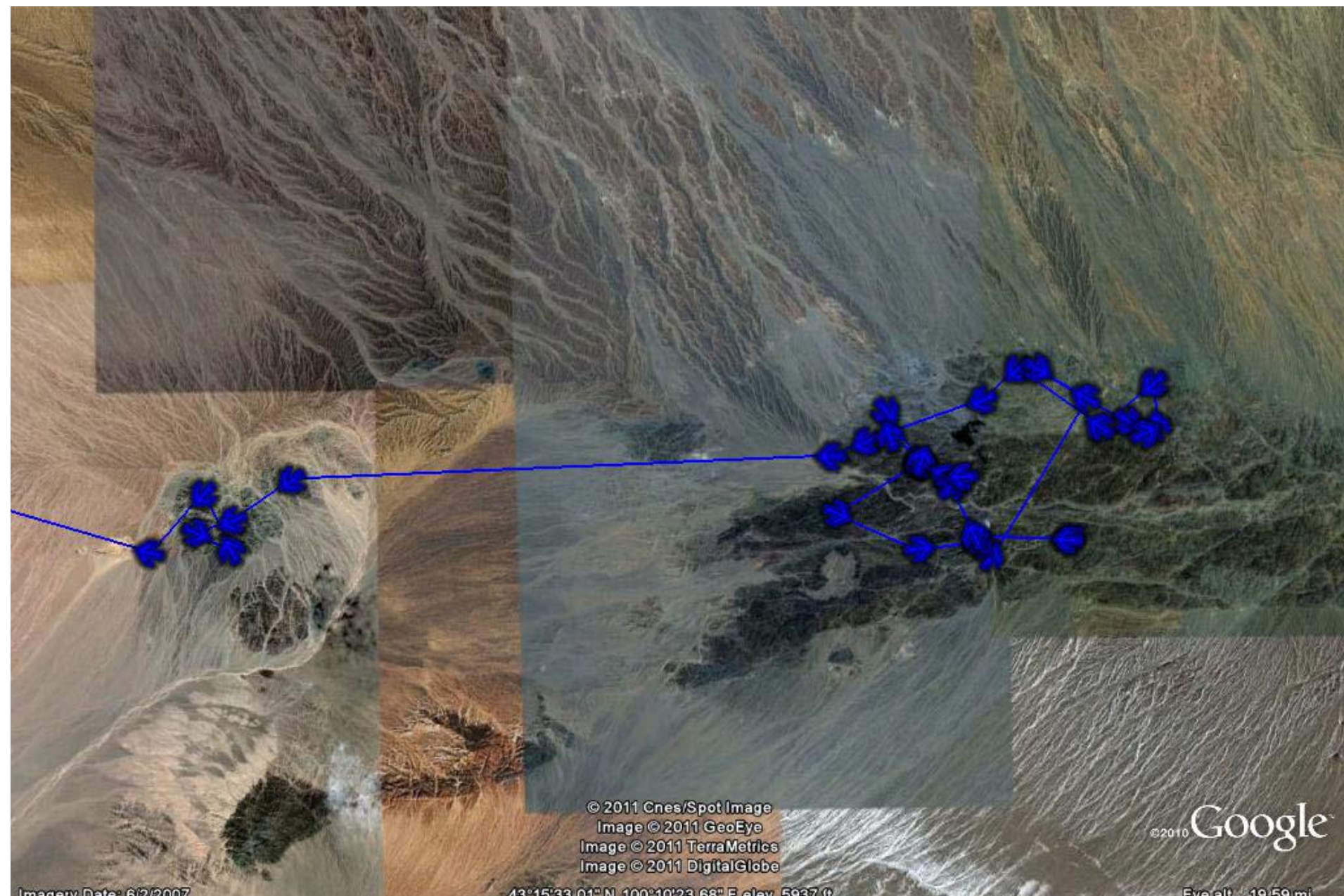
Through the use of innovative technology we are much closer to meeting information needs of conservation.



Thank You!



Panthera
Snow Leopard Conservation Foundation
Snow Leopard Trust
Ministry of Nature, Environment & Tourism



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Imagery Date: 6/2/2007

43°15'33.01" N 100°10'23.68" E elev. 5937.0

Eye alt: 19.59 mi

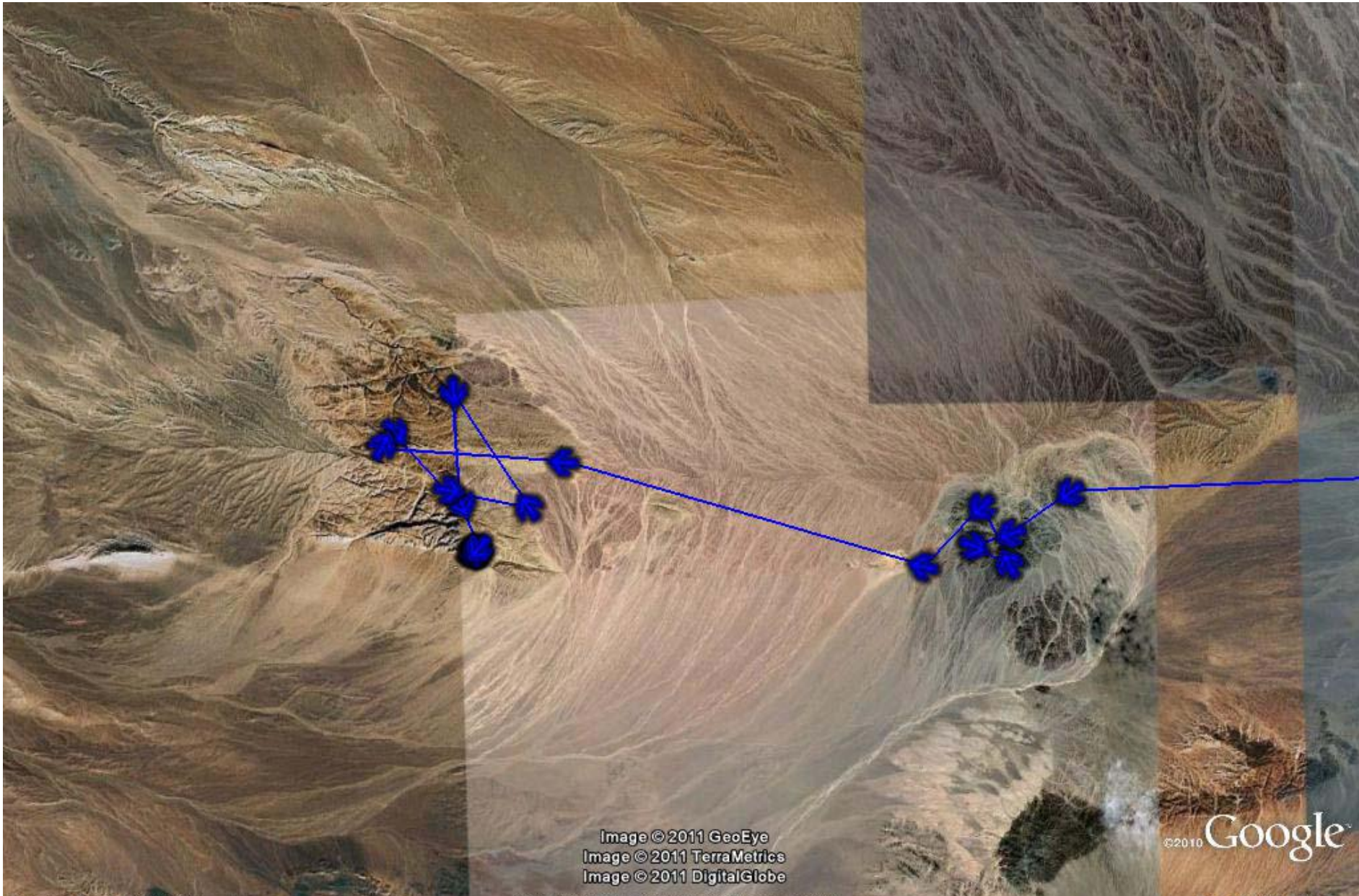


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