

A large flock of birds, likely waterfowl, is captured in flight against a vibrant sunset sky. The birds are silhouetted against the bright orange and yellow light of the setting sun, which is visible as a glowing horizon line at the bottom of the frame. The sky transitions from a deep orange near the horizon to a darker purple and blue at the top. The birds are scattered throughout the frame, with a higher concentration near the horizon, suggesting they are migrating or foraging.

Can migratory birds effectively carry HPAI H5N1 virus along migratory pathways?

A summary of studies currently underway

Presenter:

Mini Nagendran, Ph.D., D.V.M.

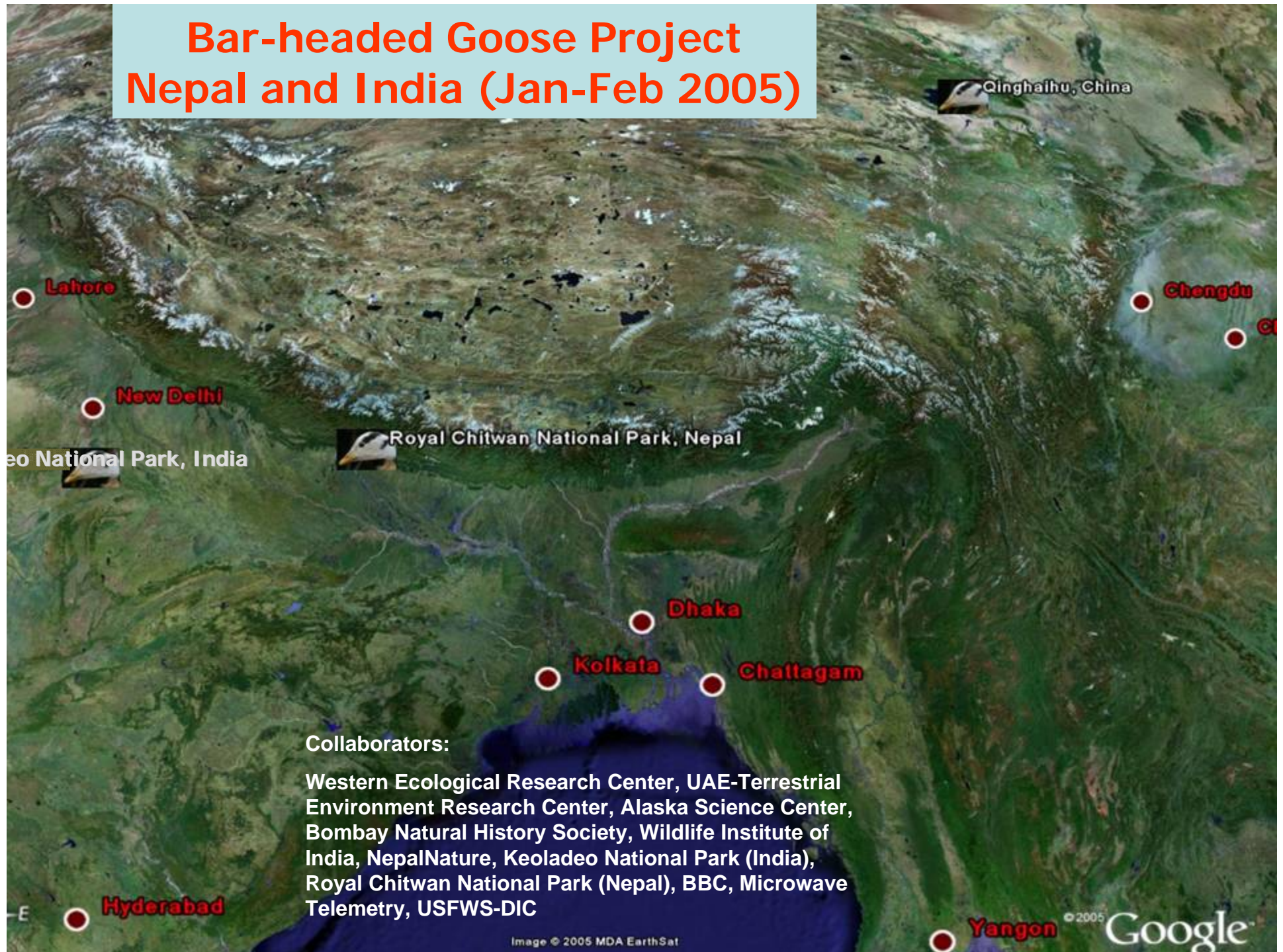
USFWS, Division of International Conservation

Movements of Bar-headed Geese (*Anser indicus*)



- 60,000 world population
 - >1,500 died of HPAI H5N1, 30 Apr 2005, Qinghai Lake
 - >500 died, 23 Apr 2006, Gancha County
- Social, mate for life, biparental care
- High site fidelity, small colonies and wintering flocks
- Feeds both in uplands and agricultural areas
- ***Little studied in the wild, no information on migration routes and population delineation***

Bar-headed Goose Project Nepal and India (Jan-Feb 2005)



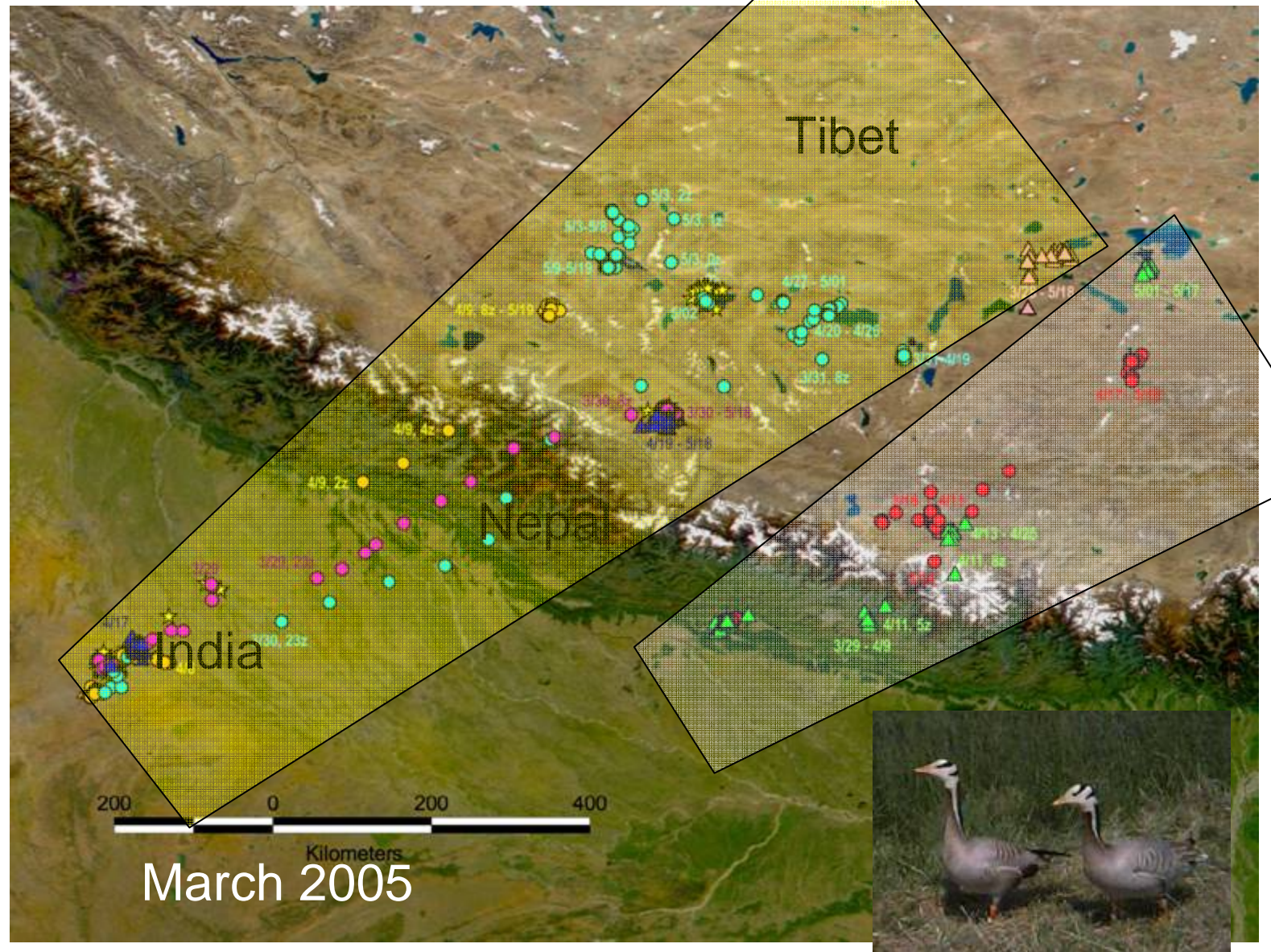
Traditional Capture Techniques (Indian trappers)



New Marking Technologies

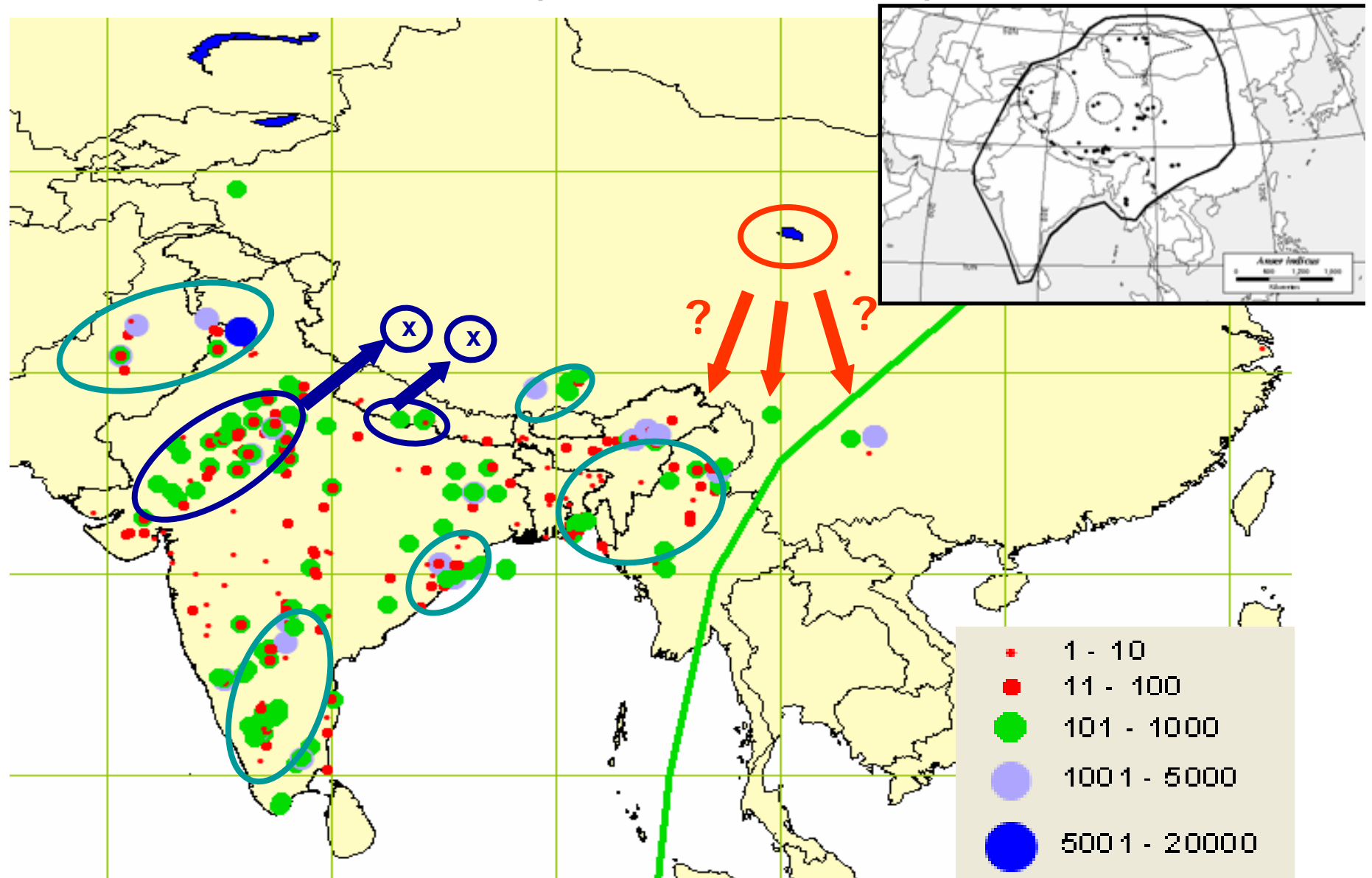


Bar-headed Migration over the Himalayas (Bird by color: circles GPS, triangles PTT)



Wintering and Breeding Area Connectivity

Bar-headed Goose (*Anser indicus*)



Ministry of Forestry, Qinghai Lake Nature Reserve (4400 sqkm)



Collaborators:

Western Ecological Research Center, Patuxent Wildlife Research Center, Alaska Science Center, United Nations-FAO, Chinese Academy of Sciences (Computer Network Information Center, Institute of Zoology, Microbiology, Virology, and NW Institute of Qinghai Plateau Biology)



Egg Island
Breeding Colony

Mongolia 2006 International Avian Influenza Research Team

Byung Sun Chun,
South Korea
National Science
Museum

Dulam Purevtseren
Mongolia Central
Vet Laboratory

Dr. John Takekawa,
USGS WERC

Dr. Martin Gilbert,
Wildlife Conservation
Society Field Vet

Diann Prosser,
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Dr. Kristine Smith,
WCS GAINS

Dr. Scott Newman,
United Nations FAO
Wild Bird Lead

Nyambayar Batbayar,
Mongolia Wildlife Science
Conservation Center

Tseveenmyadag
Natsagdorjiin,
Mongolia Academy of
Sciences



Drive Trapping

- Captured molting whooper swans and swan geese

Testing and Marking



Fall Migration (>2500 km)

www.werc.usgs.gov/sattrack

Swan Goose: Poyang Lake

Whooper Swan: South Korea

(Newman, Takekawa et al., in prep.)



**Western Ecological Research Center,
Patuxent Wildlife Research Center, Alaska
Science Center, United Nations-FAO, Chinese
Academy of Sciences (Institute of Zoology,
and Wuhan Institute of Virology), University of
New Hampshire (Complex Systems Research
Center)**

**Eurasian
Widgeon**

Falcated Teal

Common Teal

Chinese Spot-bill

Baikal Teal

Garganey Duck

Mallard

Eurasian Widgeon

Falcated Teal

Common Teal

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Baikal Teal

Garganey Duck

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Image NASA
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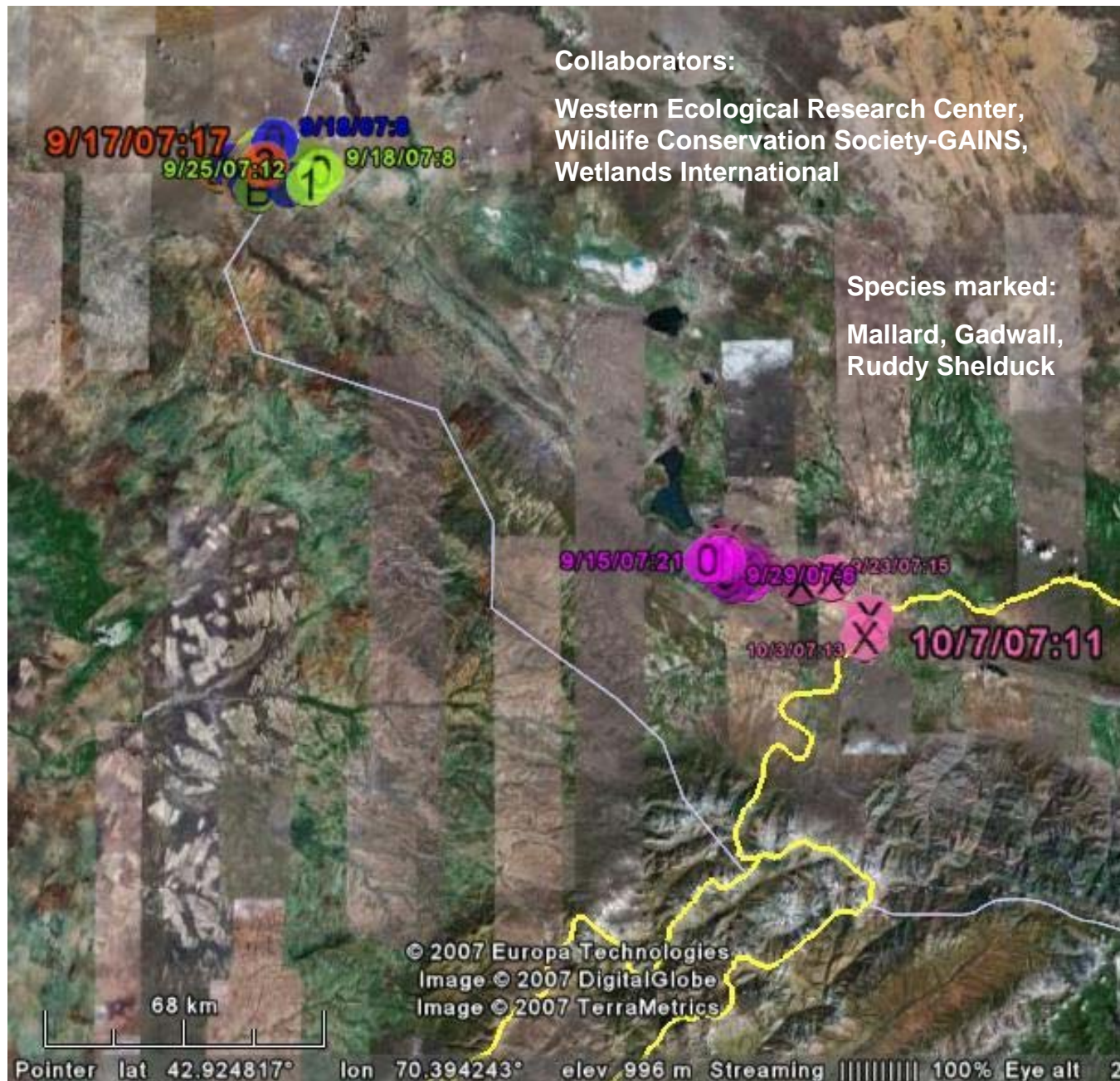
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Pointer 47°08'46.20" N 123°01'11.38" E

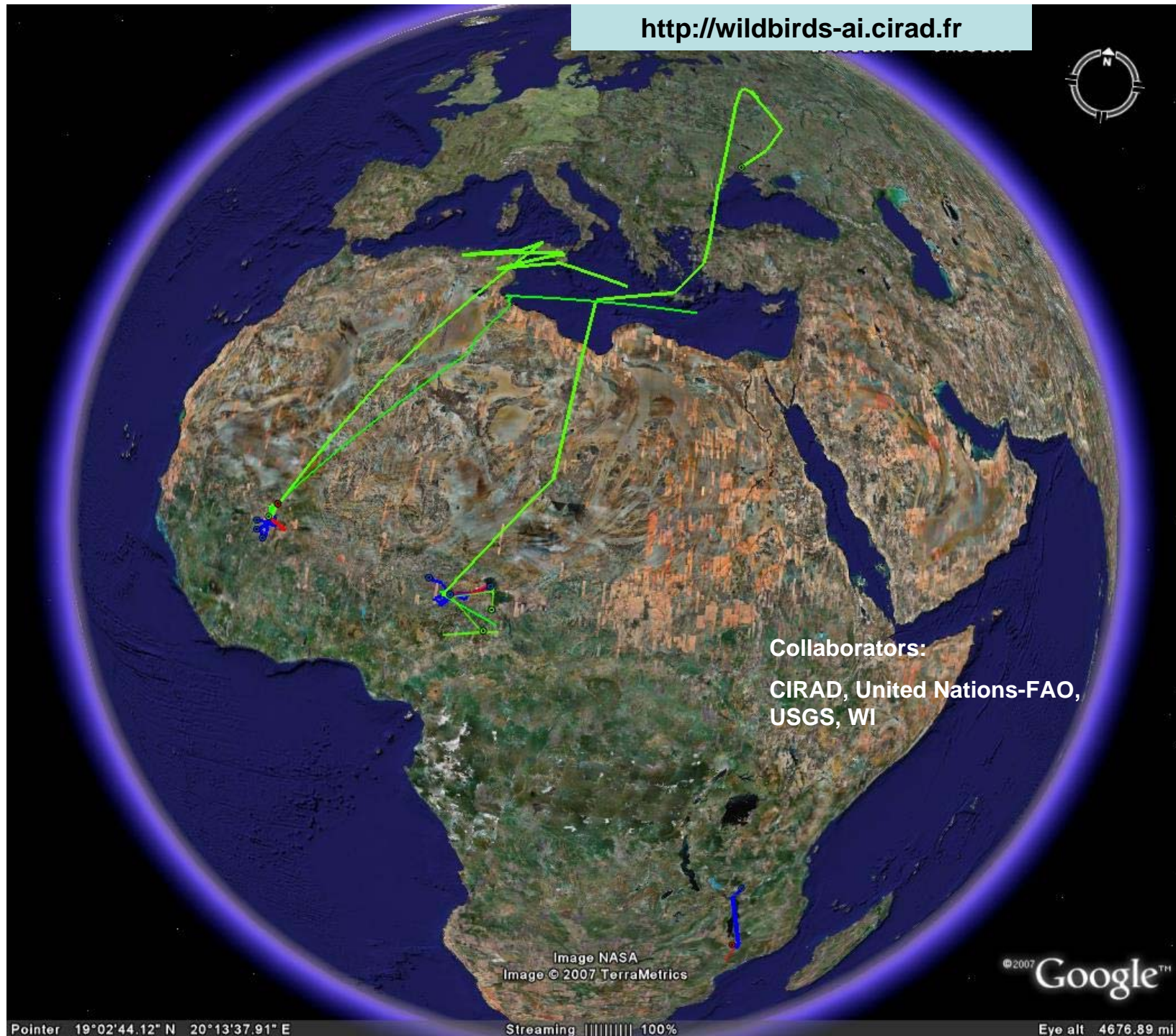
Streaming ||||| 100%

Eye alt 3380.17 mi

Ducks marked at Kyzylol Lake in Kazakhstan in September 2007



<http://wildbirds-ai.cirad.fr>



Collaborators:
CIRAD, United Nations-FAO,
USGS, WI

Image NASA
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Pointer 19°02'44.12" N 20°13'37.91" E

Streaming ||||| 100%

Eye alt 4676.89 mi