



What is Migration?

CMS COP12 Regional Preparatory Workshop for Asia

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[What is migration?]
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CMS Definition of migration



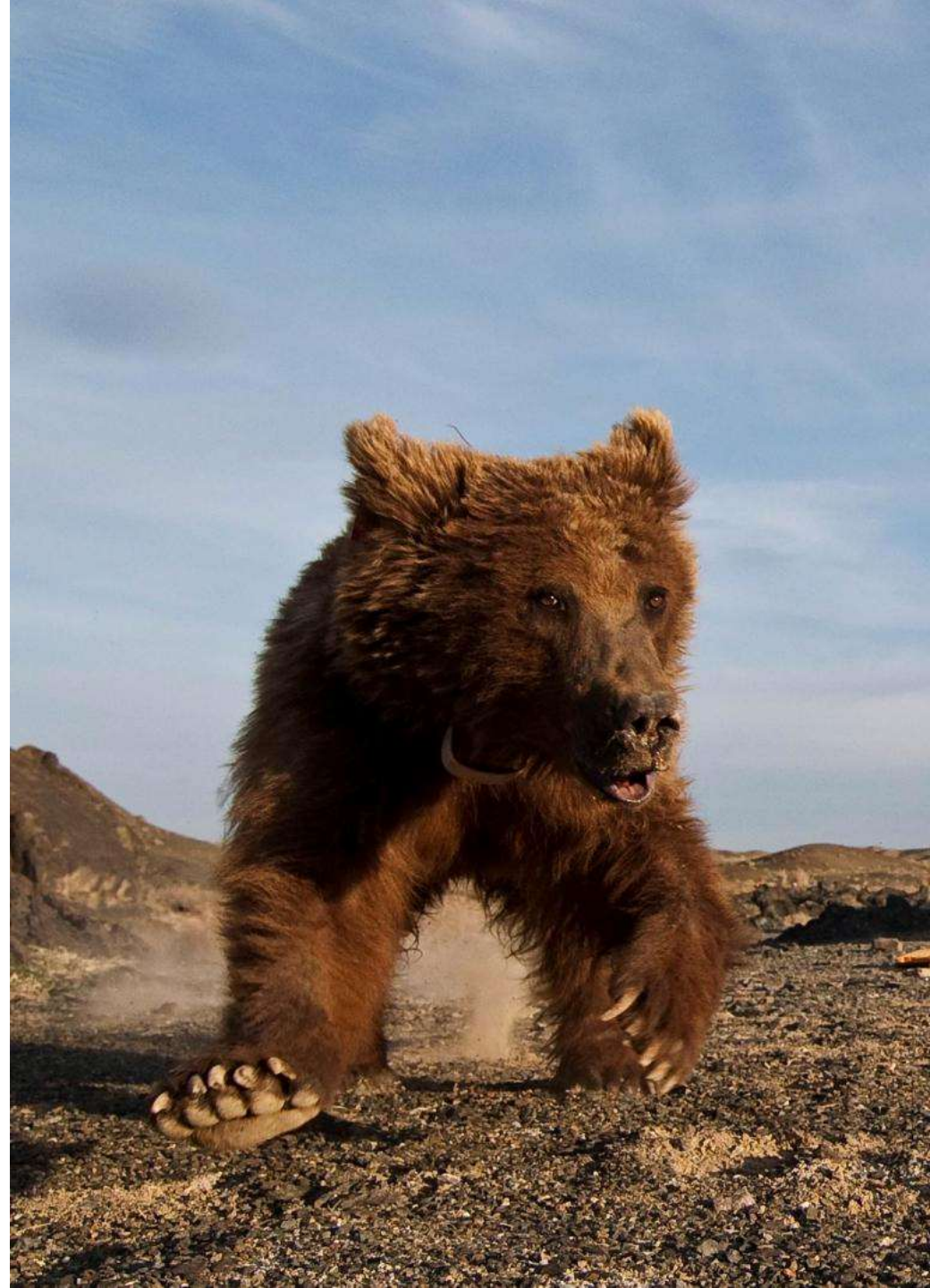
- “Migratory species” means the entire population or any geographically separate part of the population of any species or lower taxon of wild animals, a significant proportion of whose members cyclically and predictably cross one or more national jurisdictional boundaries.

It does not fit for species that only migrate within one country.



The CMS definition has a biological background but it is formulated to meet policy and political criteria

Terminology like '*cyclically*' and '*predictably*' have later been specified to ensure that, for instance, species with nomadic or poorly defined movements also fall under CMS.



More simply:

- **Migratory species** are those that, during their lifecycles, perform regular movements between separate areas, usually linked to seasonal changes.
- **Migration:** The regular movement of animals between separate areas.

Common Cranes in
Kazakhstan (photo:
Albert
Salemgareyev)



Migration as a widespread phenomenon: invertebrates

- **Invertebrates** such as butterflies
 - Monarch / North America
 - Atlanta / Africa-Europe



Migration as a widespread phenomenon: birds

Bird migration is present among **many groups**:

- **Waterbirds**, e.g. storks, flamingos, pelicans, ducks & geese, waders



Note that many bird species are NOT migratory



Migration as a widespread phenomenon: birds

- Most **seabirds**, e.g. albatrosses, petrels, shearwaters, gannets, auks



Migration as a widespread phenomenon: birds

- **Raptors**, e.g. harriers, osprey, eagles, vultures, falcons, kestrels



Migration as a widespread phenomenon: birds

- **Passerine birds**



Migration as a widespread phenomenon: bats

- many species are relatively short distance migrants
- some move in huge numbers



Migration as a widespread phenomenon: terrestrial mammals

- Many species from antelopes to elephants ...
- Many trans-boundary movements of largely resident species



Migration as a widespread phenomenon: marine mammals

Whales, dolphins, seals, dugong,
manatee



Migration as a widespread phenomenon: reptiles

- particularly marine turtles



Migration as a widespread phenomenon: fish

- **Fish** have various migration strategies:
 - migration in sea
 - migration in freshwater
 - migration between fresh & saltwater



Why be migratory?

It has important **ecological advantages**, e.g.:

- optimal use of available of **shelter** and **habitat for breeding** (and for birds **moulting**) over a wider area
- optimal use of **food supplies** which differ in place and time, often in a predictable way (i.e. ‘follow the young rich grass’, ‘follow the fish’)
- protection **against bad weather** conditions, predators, parasites etc.



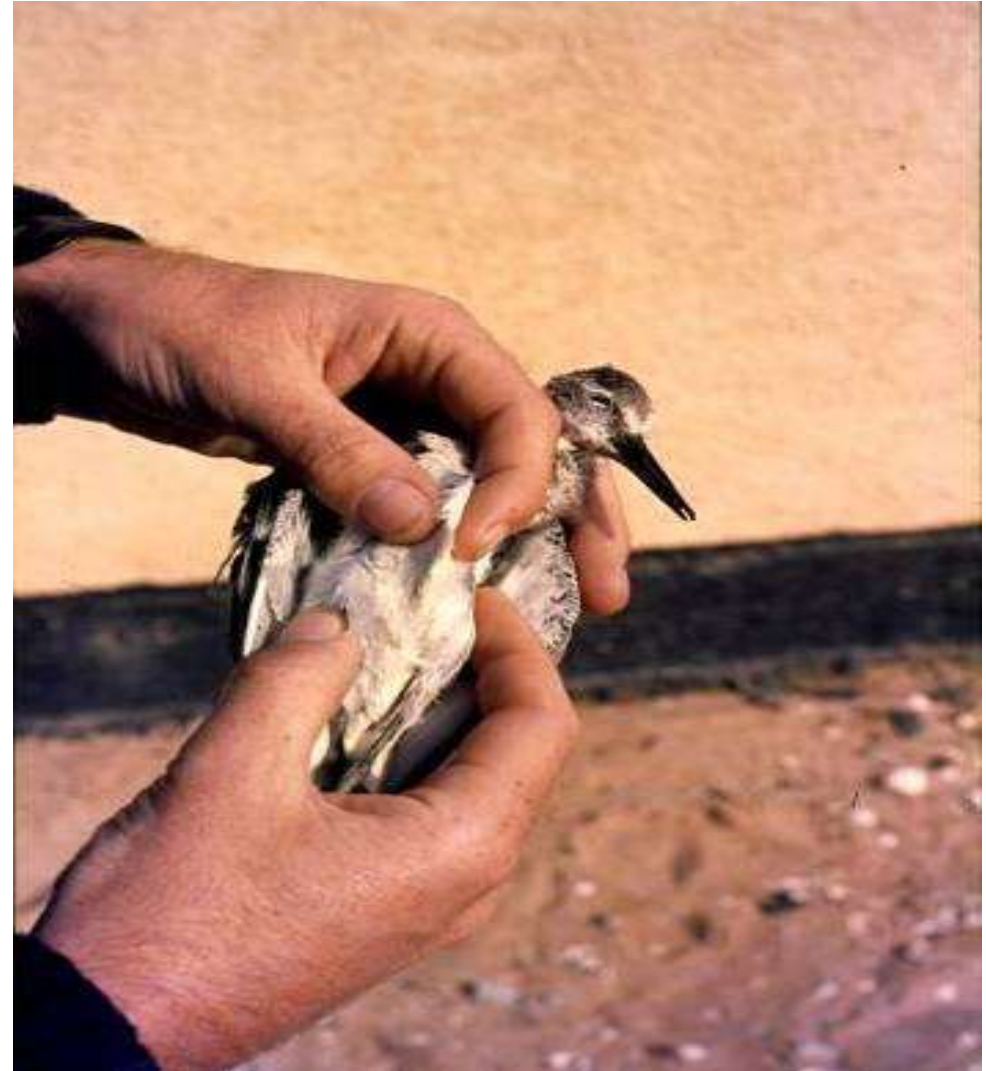
Migration routes are not static

- Climate change discussions and large scale habitat destruction should take this into account
- Loss of Marshlands and receding coastlines
- Conservation consequences: areas presently less important can become of crucial importance.
- ‘No net loss of habitats’ is an important policy.



Energy requirements and adaptations of migratory birds

- Migration needs energy
- Physiological adaptation
 - fat accumulation
 - consuming part of muscles
 - reduce body weight by reducing size and weight of stomach etc.
- Morphological adaptation
 - Wing shape and flight
- Behavioural adaptation
 - Group formation
 - Migration routes



Weather

Weather can have a strong impact on migration

- Strong winds Blown off course
 - Fog Become disoriented
 - Intense heat Use more energy for moving distances
 - Snow & ice cover Cold, food unavailable
 - Drought Dry, food shortage
-
- Weather can strongly influence the timing of migration.



Migration strategies

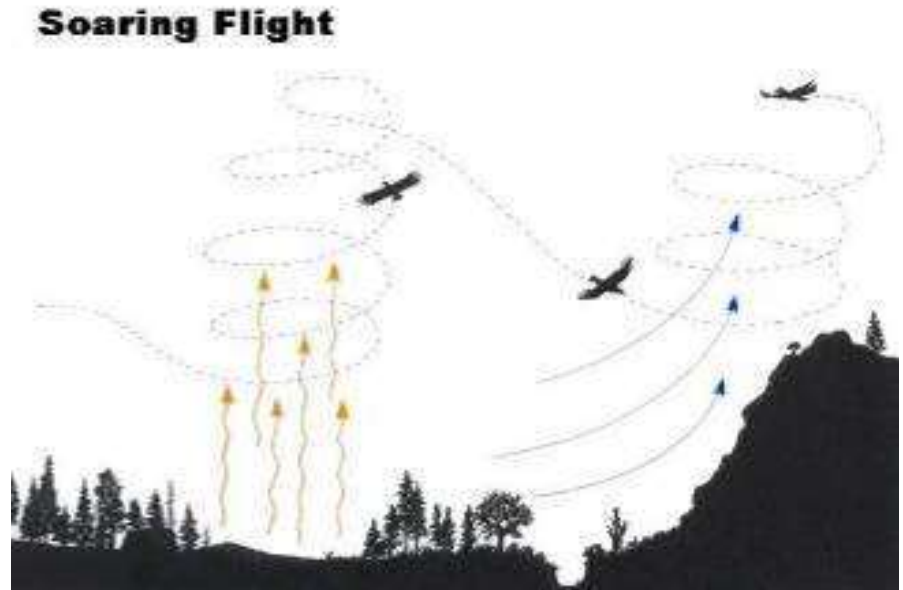
- **Technique:**
e.g. Birds: how they fly – soaring or active flight
- **Travel schedules:**
The way they cover distance and 'refuel'
- **Strategies:**
How migration takes place



Soaring flight

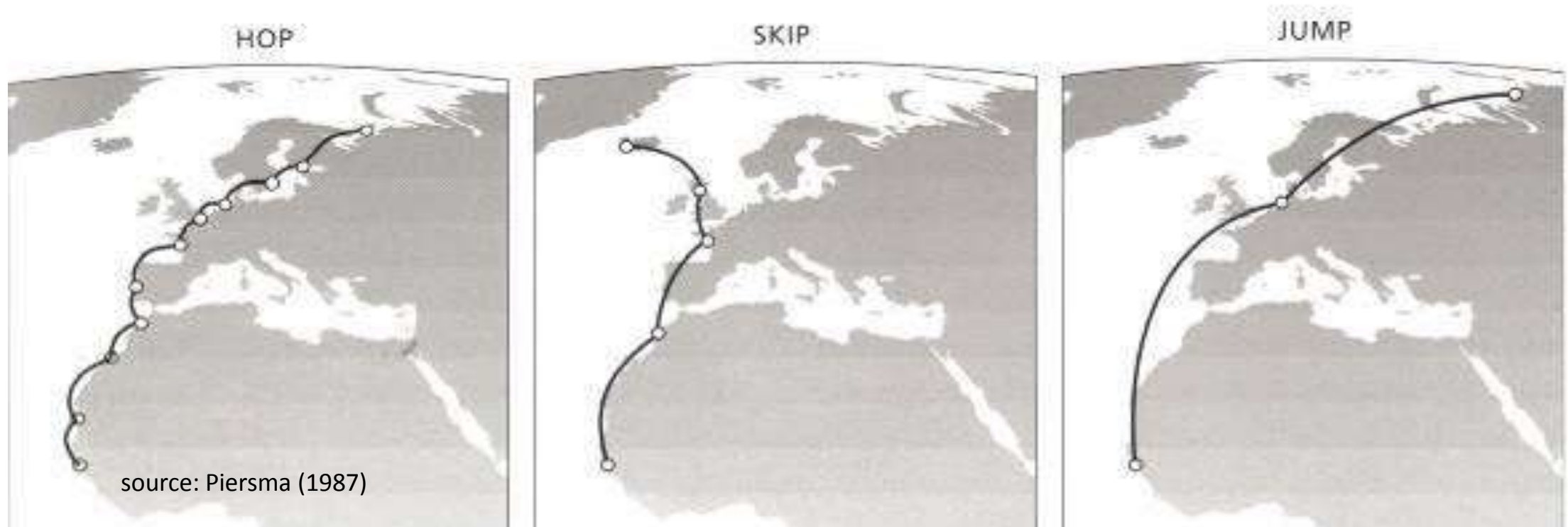
What are the implications of soaring flight?

- Migration is dependent on **weather** ⇒ protracted bad weather can be fatal
- “**Bottleneck**” areas ⇒ high vulnerability
- **Low manouverability** ⇒ high collision risk

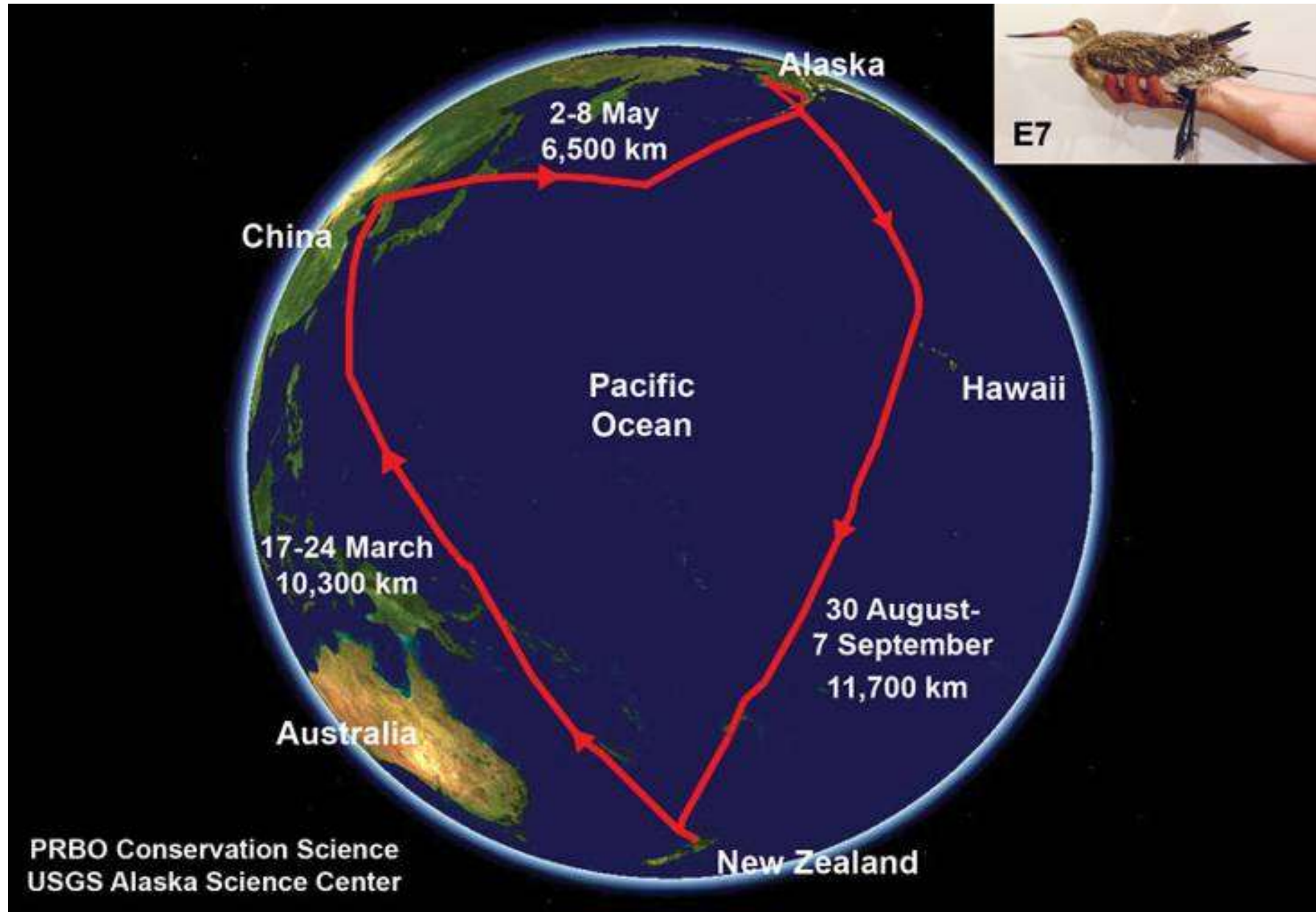


Travel schedules: How to cover distances?

- **Hop:** series of short flights, many stop-over sites (e.g. Ruddy Turnstone) ⇒ less risky, lower importance of individual sites
- **Skip:** intermediaries
- **Jump:** long distance flights between a few high-quality stop-over sites (Red Knot, Bar-tailed Godwit) ⇒ higher risk of failure



'Extreme jumping': Satellite tagged Bar-tailed Godwit



Conservation status conclusions

- A species is likely to be **vulnerable** if it combines:
 - Restricted breeding area
 - Passes through bottleneck areas
 - Birds: Moulting all flight feathers
 - Long distance migrant with only a few stop-over sites
 - Specialised diet
 - Valuable harvest resource
 - Prone to specific threats



Exercise: Draw a Migratory Route

- Demoiselle Crane
- Turtles: Leatherback / Loggerhead
- Saiga

