

REGIONAL CAPACITY BUILDING WORKSHOP FOR CMS NON-PARTIES OF THE CARIBBEAN

Georgetown, Barbados

31 August – 2 September 2016

What is Migration?

Tim Dodman



What is Migration?

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.

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 include nomadic species.

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.

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, cranes, pelicans, ducks & geese, waders

Note that many bird species are NOT migratory, even not in arctic and alpine habitats.

Migration as a widespread phenomenon: birds

- Most **seabirds**, e.g. albatrosses, petrels, shearwaters, gannets
- Many birds of prey & passerines

Migration as a widespread phenomenon: bats

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

Migration as a widespread phenomenon: mammals

- **Terrestrial mammals**

- many species including ungulates, elephants etc.
- 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:
  - oceanodromus: migration in sea
  - potamodromous: migration in freshwater
  - diadromous: migration between fresh & saltwater

Why be migratory?

It has important **ecological advantages**, eg:

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

Migration routes are not static

- **Climate change discussions and large scale habitat destruction** should take this into account.
- e.g. Loss of mudflats, mangroves 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
  - consume part of muscles
  - reduce body weight
- Change wing shape and flight
- Behavioural adaptation
  - Group formation
  - Migration routes

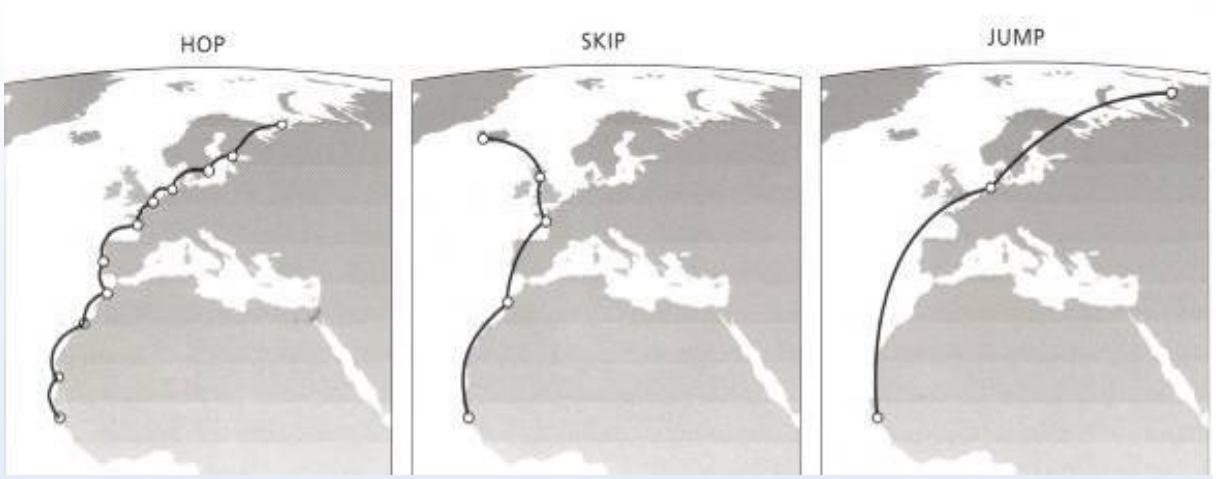
Weather

Weather can have a strong impact on migration

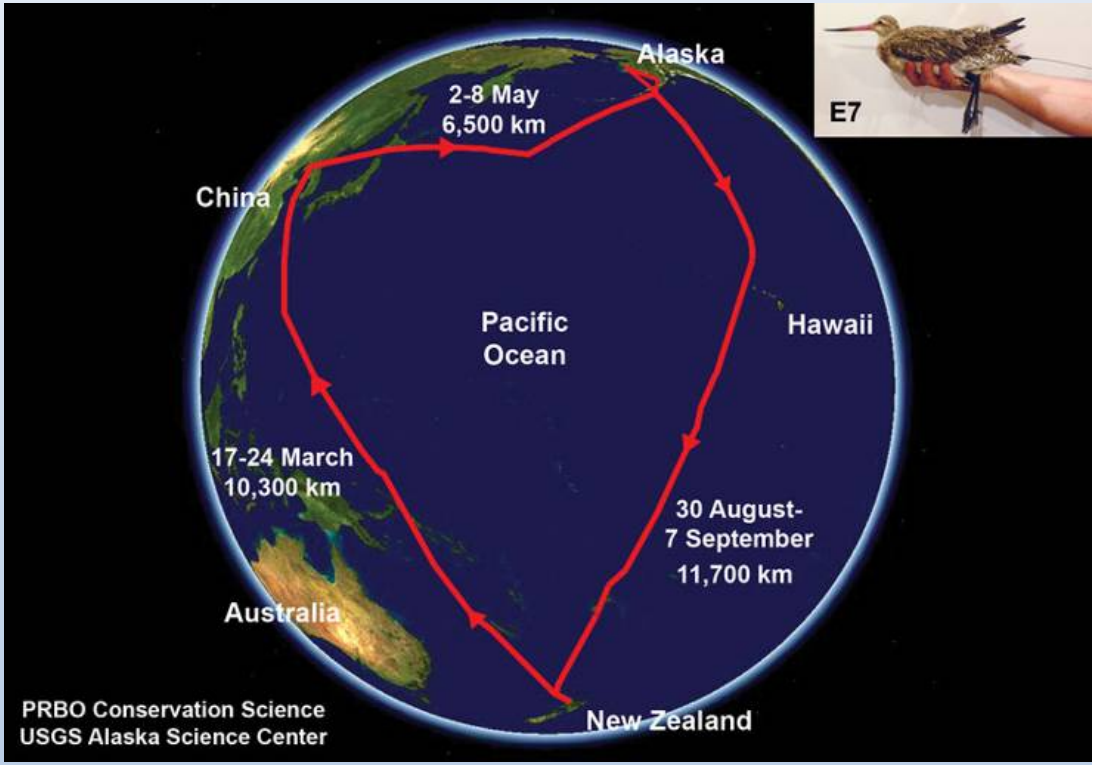
– Strong winds	Blown off course
– Fog	Become disoriented
– Intense heat	Use more energy for moving distances
– Snow & ice cover	Cold, food unavailable
– Drought	Dry, food shortage
– Sea temperature	Widespread effects

- Weather can strongly influence the timing of migration.

Migration techniques & 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



Conservation issues

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

- Whimbrel
- Leatherback Turtle
- Humpback Whale
- Greater Hammerhead Shark

Exercise: Draw a Migratory Route



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Rationale for protecting migratory species

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Rationale for Protecting Migratory Species: a. Ecosystem services

- Important role in shaping environments
- Regulating services
  e.g. pollination, pest control …
- Inter-related with resident flora and fauna

… ACROSS ECOSYSTEMS AND INTERNATIONAL BOUNDARIES

Rationale for Protecting Migratory Species
b. Economic & cultural values

- Provisioning services
  - Sustaining livelihoods

    e.g. source of protein, tourism benefits

- Cultural services
  - Strong cultural beliefs: the 'wonder of migration'
  - Socio-economic benefits
  - Ecotourism
- Indicators of ecological change
  - e.g. climate, pollution

Rationale for Protecting Migratory Species

Threats to Migratory Species Globally

- Barriers to migration
- Habitat loss and Degradation
- By-catch
- Underwater noise
- Alien invasive species
- Wildlife disease
- Illegal hunting & fishing
- Pollution, marine debris
- Poisoning
- Disturbance
- Desertification
- Climate change

Barriers to migration

- Physical structures such as power lines, wind turbines, dams and underwater structures can be significant sources of mortality if located across migratory routes.

- Full assessments are required prior to construction through EIAs, which must consider data on animal movements.

- This *should* avoid structures being built in sensitive areas (e.g. migration bottlenecks).

- Mitigation measures for power & phone lines include flags / markers and neutral wires.

Habitat loss & degradation

Migratory species may use different habitats during their annual cycle.

- wetland drainage
- forest loss
- conversion to other land uses (e.g. irrigation)
- pollution
- dams & water abstraction
- over-harvesting of plants (e.g. mangroves), fire, invasive plants.

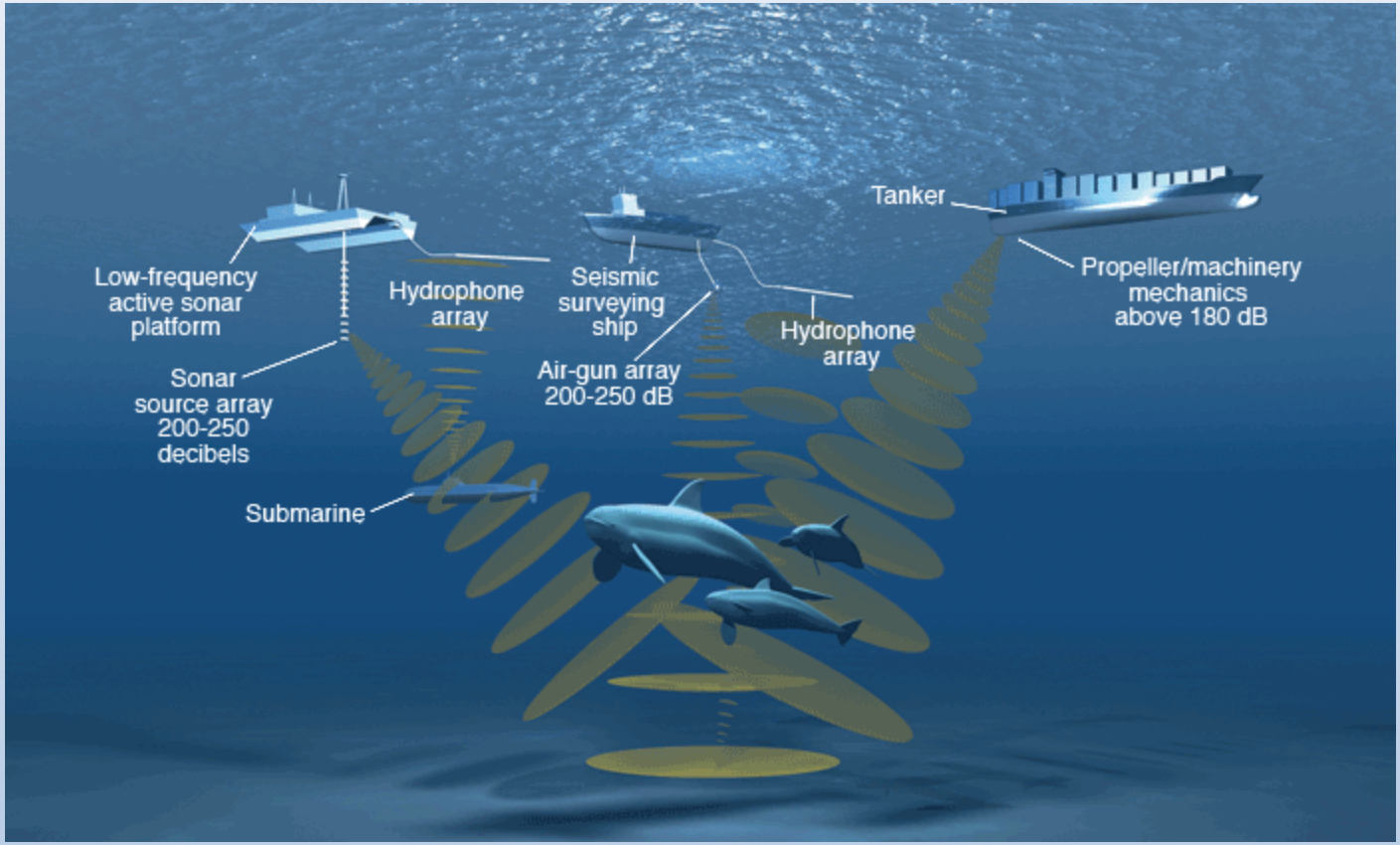
‘Wider’ threats include drought & climate change.

By-catch

- Incidental capture of non-target species

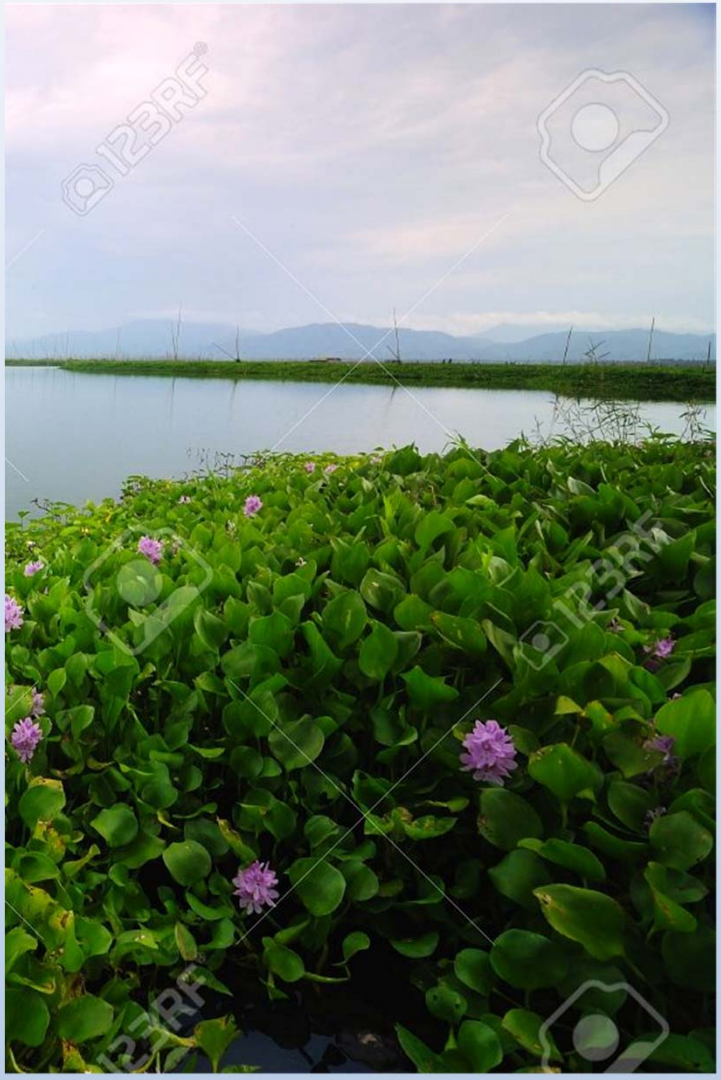
Underwater noise

- the noise from shipping, seismic surveys, military activity etc is creating a totally different marine environment
- Many underwater species have to communicate to survive



Underwater noise:
Beached whales after military sonar exercise

Alien invasive species



Wildlife disease

- Congregatory migratory animals are especially vulnerable:
  - they contact different disease organisms along their way;
  - they form dense flocks / groups;
  - migratory performance can be affected.

- e.g. Botulism, Avian influenza …

Poisoning

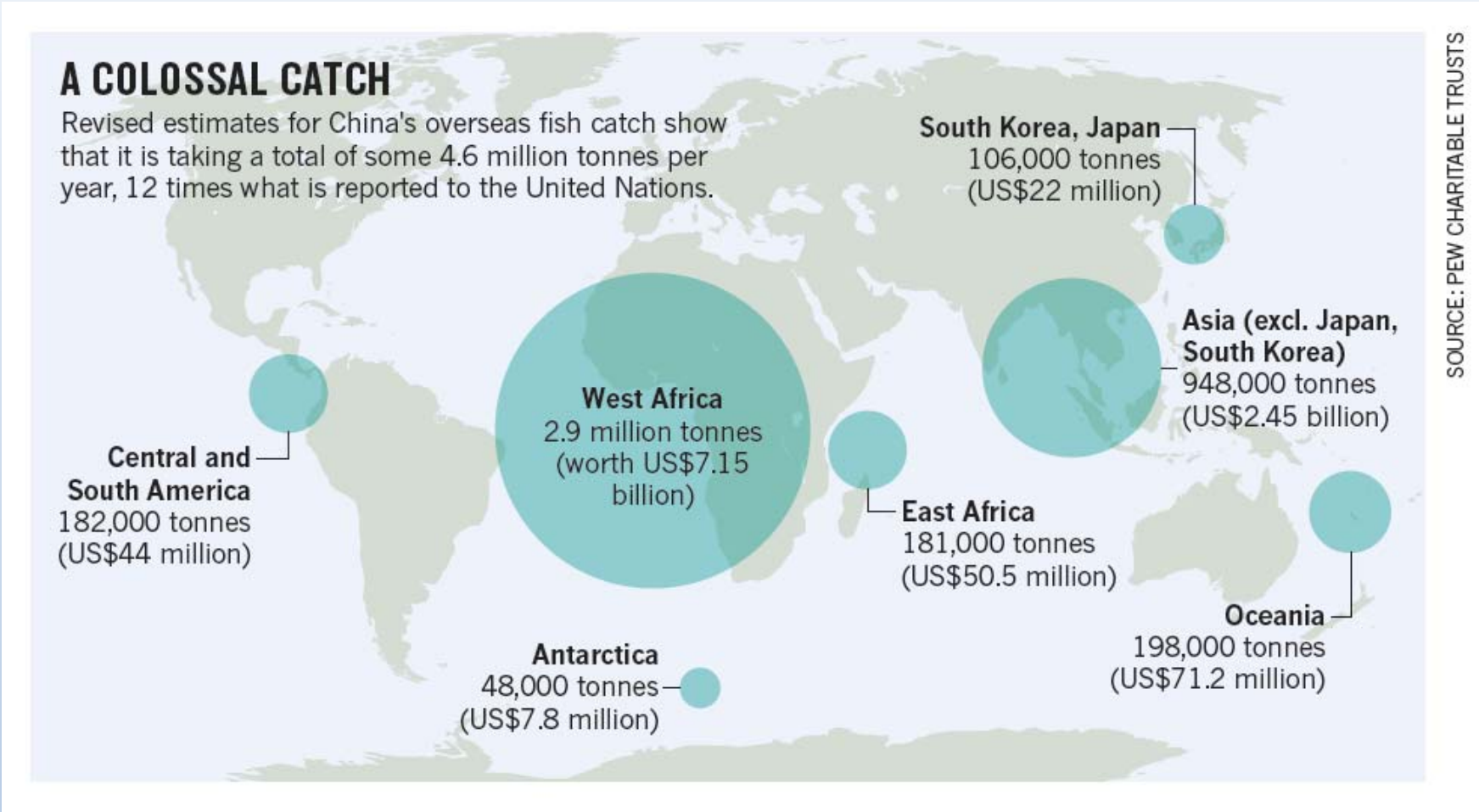
- Fish are especially vulnerable
- CMS: ‘Guidelines to Prevent poisoning in Migratory Birds’

Hunting / harvesting & trade

- Coordinated actions are essential to ensure a sustainable harvest, and that rare animals are not taken.
- Avoid non-selective methods of hunting and trapping.
- Hunting, fishing and harvesting must be carefully monitored, as it is **cumulative** across the whole migratory area.

Illegal fishing

- A major global issue,
- e.g. China's fish catch in south Asia: nearly 1 million tonnes p.a.



Pollution & marine debris

Pollution

- Oil pollution can cause significant harm to migratory marine animals & their habitats.
- The worst cases result from large oil spills, e.g. from wrecked tankers.
- Prevention and preparedness / response measures are vital.

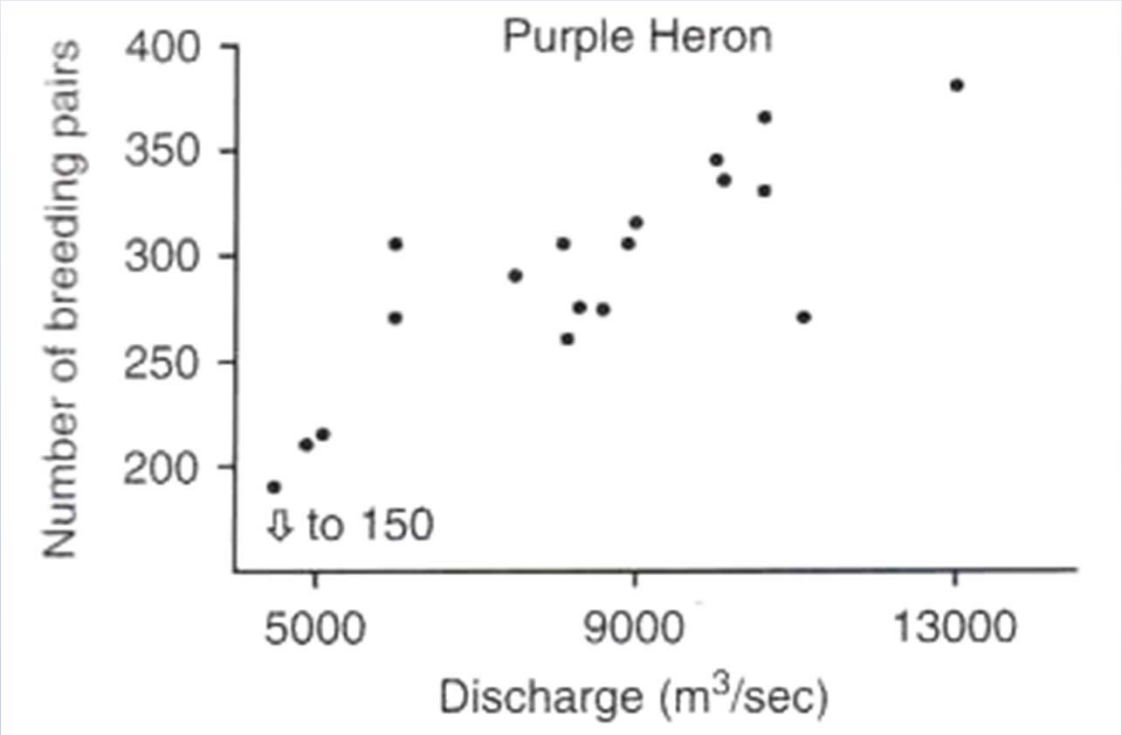
Pollution & marine debris

Disturbance

- Disturbance can significantly influence animal behaviour and can prevent them from feeding (enough) or breeding.
- Colonial migratory species are particularly sensitive to disturbance.
- Disturbance can be minimised through site management and awareness.

Climate Change

- Significant impacts on migratory species
- Can affect their migration route and where they decide to live



Mitigation measures

- Various mitigation measures exist, which countries need to put in place, e.g.:
  - Site action: restoration and effective site management
  - Sound policies
  - Coordinated actions
  - Prevent physical barriers along migratory bottlenecks
  - Devices on barriers
  - Preparedness & surveillance
  - Minimise disturbance at key sites.

THANK YOU VERY MUCH FOR YOUR ATTENTION