



Stopover ecology of northward migrating great knots in the Yellow Sea

¹ Hebo Peng, ¹ Ning Hua, ² Chi-Yeung Choi, ¹ Zhijun Ma

¹ Coastal Ecosystems Research Station of Yangtze River Estuary, Ministry of Education
Key Laboratory for Biodiversity Science and Ecological Engineering, Institute of
Biodiversity Science, Fudan University, Shanghai, 200438, P. R. China

² School of Biological Sciences, University of Queensland, Brisbane, QLD 4072, Australia

Yellow Sea

– important **stopping area** in the East Asian - Australasian Flyway



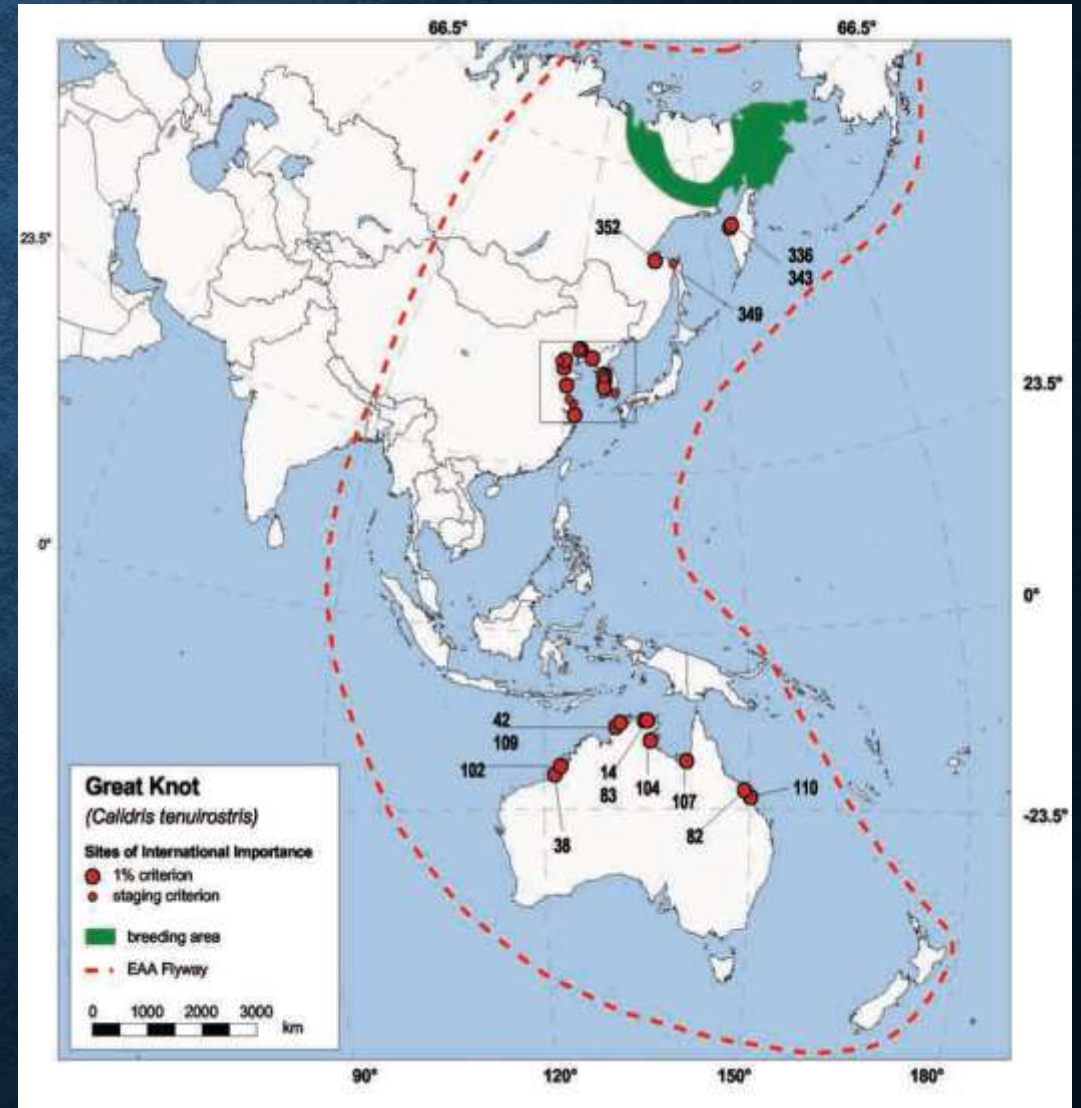
The functions of stopping sites :

- ❑ Temporary resting ground
- ❑ Staging ground
- ❑ Adjusting the migration schedule
- ❑ Molting
- ❑



Great knots

- **Endemic specie** in the EAAF, the population decreased rapidly probably due to reclamation of stopping sites in the Yellow Sea.



Objectives and Methods



- ❑ Stopping site use and migration schedule adjustment
- ❑ Energy supplement
- ❑ Molting

Radio tracking



Banding



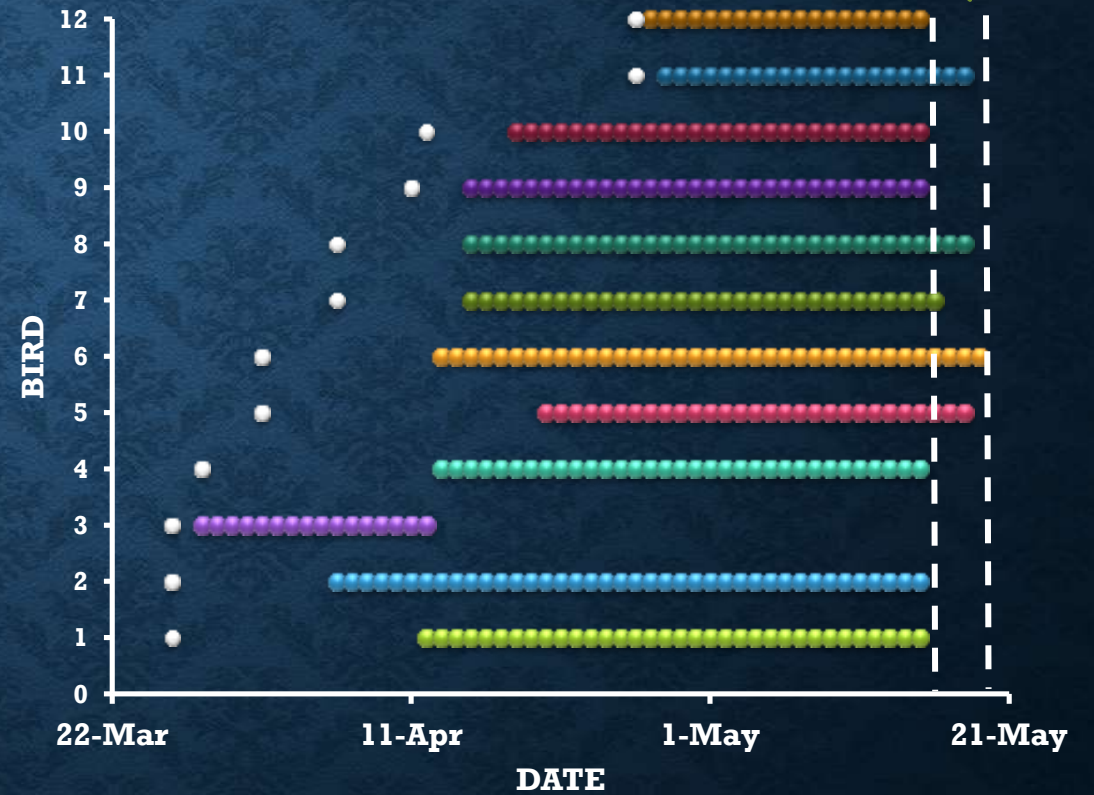
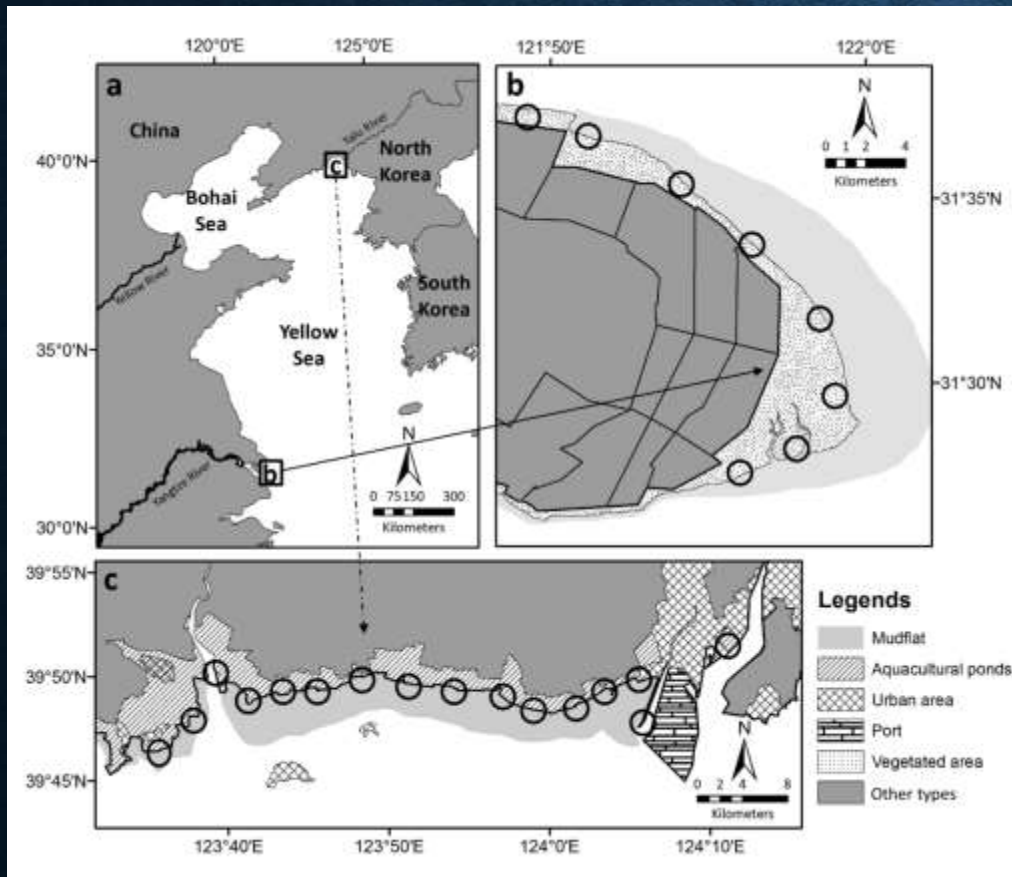


What's the functions of different stopping sites and **how** do great knots **adjust their migration schedules** in the Yellow Sea?

Migration schedule



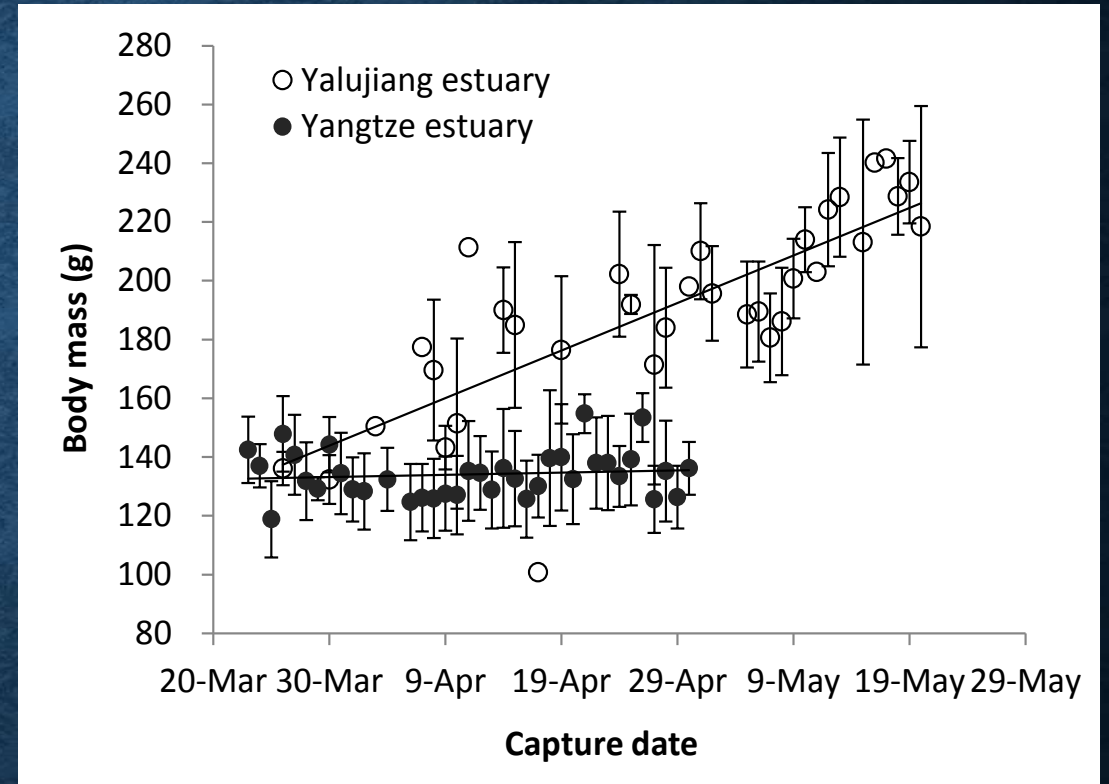
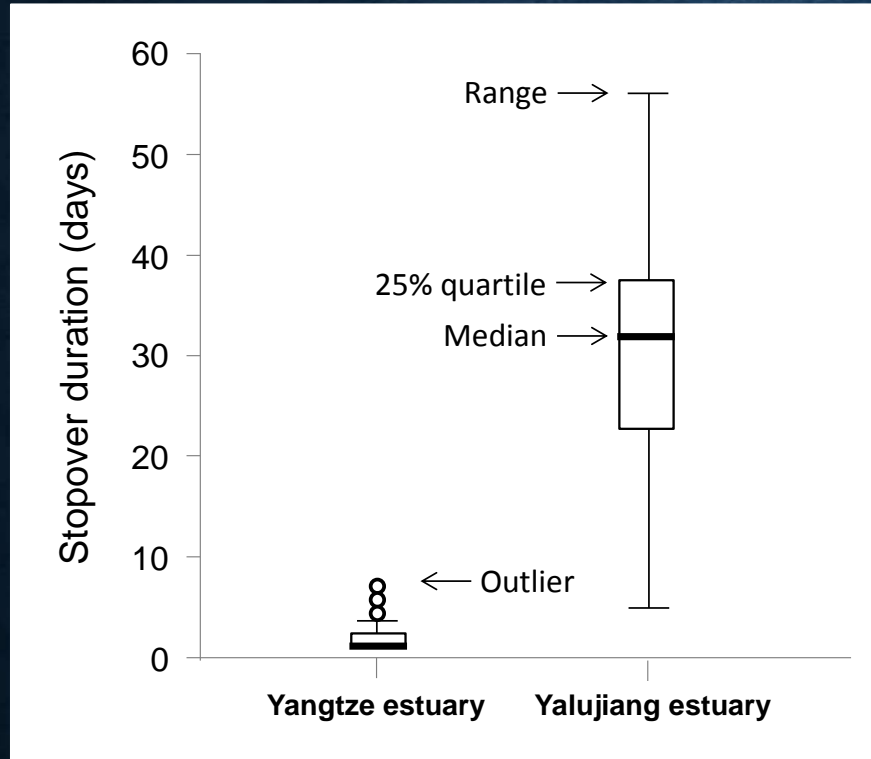
Great knots departed from northern Yellow Sea (Yalu Jiang) within 5 days



■ Daily signal records of individual great knots in yellow sea.
 The white points were the last signals recorded in CMDT, the colour points indicated the situation in YLE.

Peng *et al.* 2014 journal of ornithology

Stopping site use

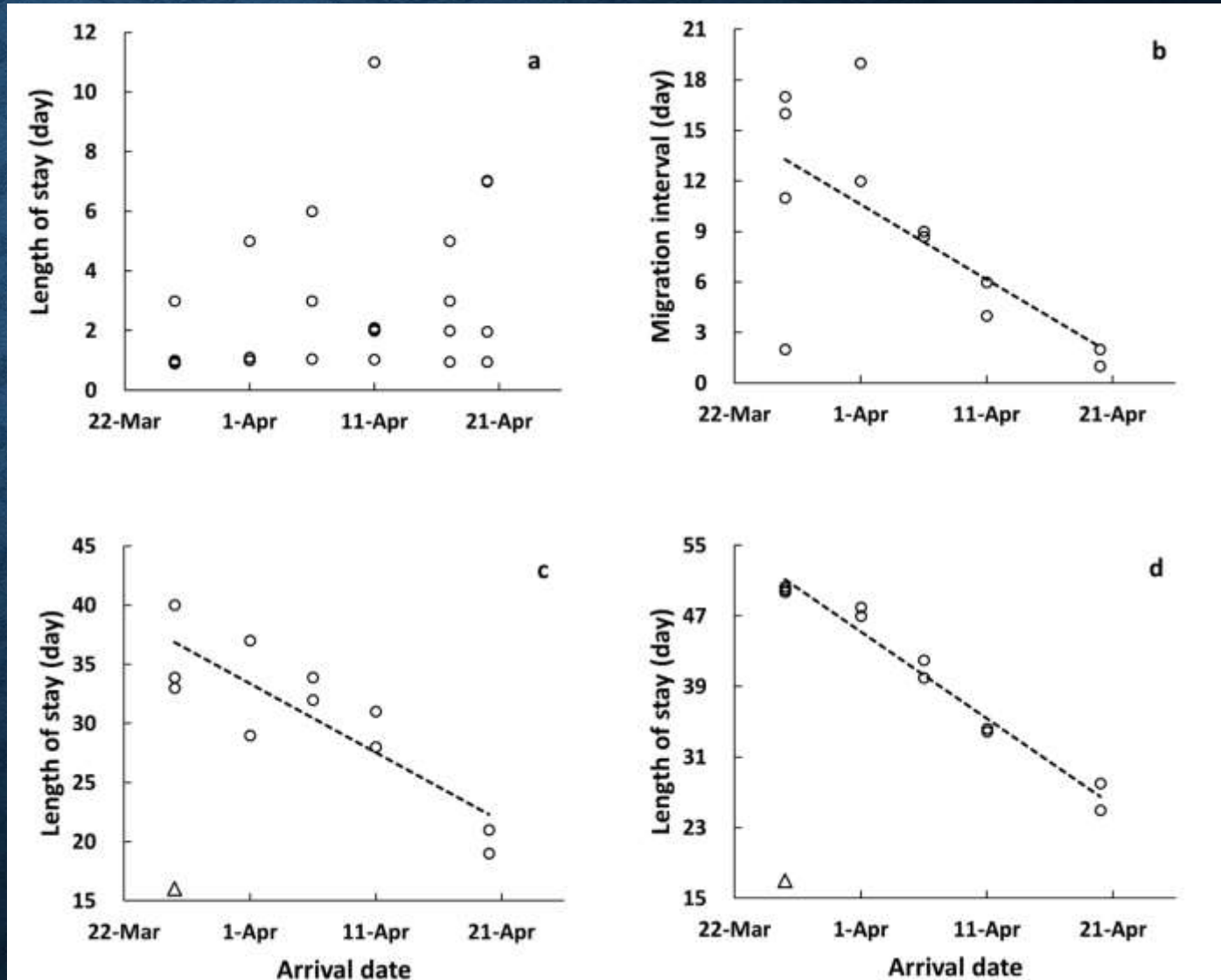


- CMDT (southern Yellow Sea) acts as a temporary stopover
- YLE (northern Yellow Sea) is a critical staging site where great knots refuel for migration to the breeding grounds.

Migration schedule



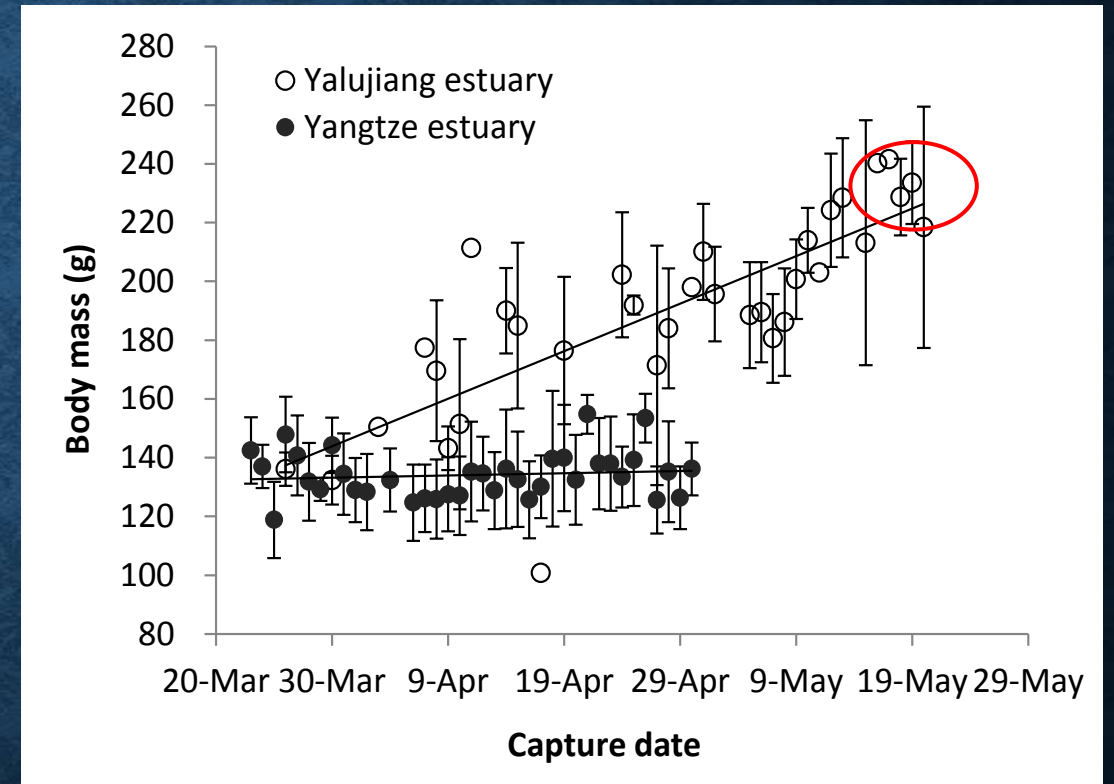
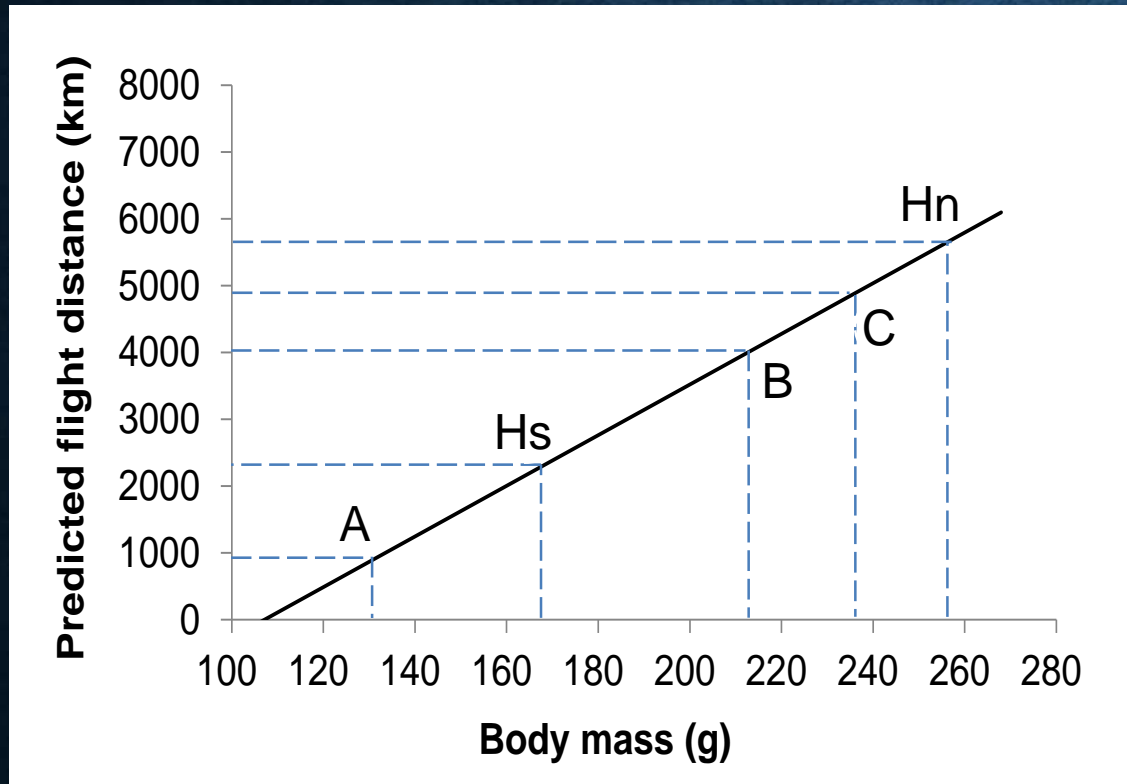
- ❑ Arrival date did not affect the length of stay (LOS) of birds in the south Yellow sea(a)
- ❑ The later a bird arrived south Yellow sea, the shorter it took to arrive at north Yellow sea (b)
- ❑ The earlier a bird arrives Yellow sea, the longer it stays in Yellow sea area (d, c)





What's the effect of different migration schedules on great knots?

Fuel store



- Individual great knots need a body mass of at least 215g for a nonstop flight from north yellow sea to the breeding grounds
- Almost all the individuals exceeded 215g in departure period (15-20 May)

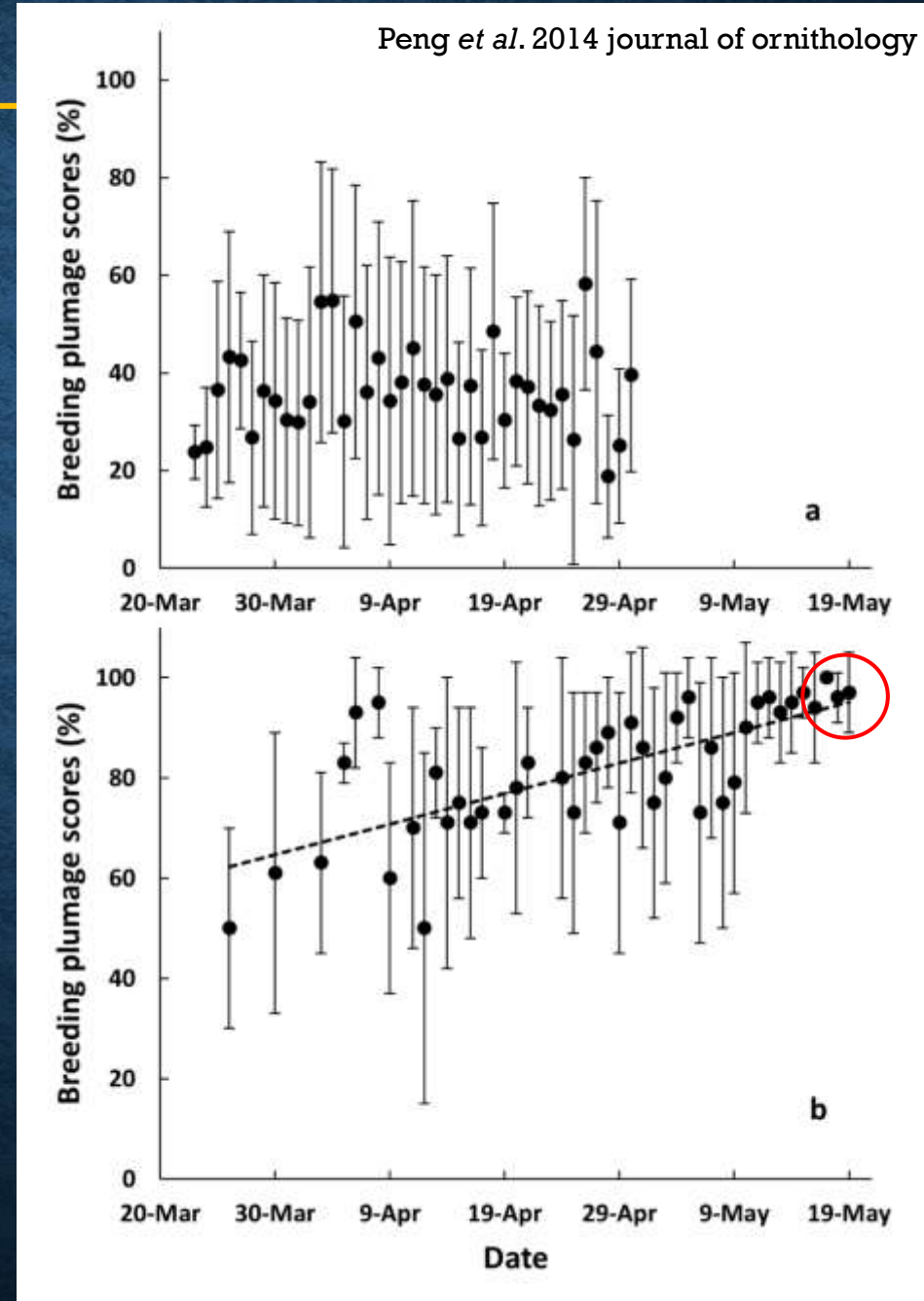
Breeding plumage score

- ❑ Great knots molted in the yellow sea, which also cost lots of energy.
- ❑ The appearance of alternate plumage affects mate competition on the breeding grounds



Breeding plumage score

- Almost all the great knots finished breeding plumage molt in the north Yellow Sea, arrival date have no significant effect on the final breeding plumage score of great knots



Conclusion



- ❑ Great knot adjusted their migration schedules to match the narrow departure window in the yellow sea.
- ❑ The south Yellow Sea was used as a temporary stopover site and the north Yellow Sea is an area of conservation priority as it served as refuelling site for the entire population
- ❑ Arrival date did not affect the departure date, final body mass and breeding plumage score of great knots which stopped in the yellow sea
- ❑ Early and late migration are the two ends of migratory schedule, with the former adapting to unpredictable and rigorous environments and the later to stable and favorable environments en route. Stopping sites play an important role for birds to adjust their migration schedule to meet optimal timing of arrival at migratory destination.

Future policies



- ❑ Developing different treatments to different stopovers.
- ❑ Monitoring population dynamic
- ❑ Monitoring the variation of great knots' food

Acknowledgement



Adria Cantero



Jing Qian



David Melville



Yan Gao



Qian Zhou



Ying Chen



Qingquan Bai



Peter Brakels

□ Student Conference on Conservation Science **Australia**

□ Chongming Dongtan Nature Reserve

□ Yalu Estuarine Wetland Nature Reserve



Thank you