

Motus Network for the East Asian - Australasian Flyway: current status, challenges and future

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Satellite trackers have answered movement ecology questions about some of the species that use the EAAF, however for small species that are not able to carry these technologies, it is a challenge to understand their movement. Archival devices are still used on small species, although there is a high likelihood of non-retrieval of information when you don't recapture tagged individuals.

The Motus Network is an international collaborative research network that uses a coordinated automated radio telemetry array to track the movement and behaviour of small species. It uses automated receivers that work 24/7 and receive the signal of coded transmitters that give a broader spatial scale of animal movement. This array has been established in the Americas and recently in Europe (<https://motus.org/>). It has successfully helped track large insects, bats, small and large migratory birds.

In this talk I will explain how the Motus network works, the advantages that will bring the EAAF, the challenges and how we can work together to understand better the movement of all species that use the flyway.

Theme: Migration Ecology

Preferred option: Oral Presentation

Efficacy of shorebird chick radio-tracking

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Monitoring survival of free-living precocial avian young is critical for population management. Perhaps the most promising technique available to track survival is the deployment of devices such as radio-transmitters or data loggers, which allow for tracking of the individuals. Here, we aim to understand if the deployment of radio-transmitters or the process of radio-tracking negatively impact chick survival by analysing survival of tagged chicks. Fifty masked lapwing (*Vanellus miles*), 42 red-capped plover (*Charadrius ruficapillus*) and 27 hooded plover (*Thinornis cucullatus*) chicks were radio-tracked. Mortality between tagged and untagged chicks within broods was compared to examine whether radio-telemetry influenced chick survival. We found no statistically significant difference in survival between chicks with and without radio-transmitters and the radio-transmitters enabled the determination of cause of death for 0–28% of radio-tagged chicks. The survival of shorebird chicks does not appear to be affected by attachment of transmitters, thus radio-tracking remains a promising way of studying the movement and survival of shorebird chicks, and is helpful but not reliable for assigning the cause of mortality.

Theme: Monitoring

Preferred option: Oral Presentation

Genetic population structure of long-distance migratory shorebirds on the East Asian-Australasian Flyway: insights and future prospects

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Conservation of migratory species requires knowledge of their year-round movements, demography, and ecology. On the East Asian-Australasian Flyway (EAAF), many migratory shorebirds are represented by multiple subspecies with varying degrees of spatial and ecological overlap throughout the year, which complicates population estimates and strategies to conserve them. Black-tailed Godwits *Limosa limosa*, Bar-tailed Godwits *L. lapponica*, and Red Knots *Calidris canutus* are all declining on the EAAF, and each includes 2–4 distinct flyway populations with imperfectly described geographic separation in the non-breeding season, and some evidence of cryptic populations with unknown year-round distributions. Here, we describe recent efforts using high-resolution genetic techniques (1000s of genome-wide single-nucleotide polymorphisms; SNPs) to explore the population structure, evolutionary history, and degree of isolation among EAAF populations of these three long-distance migratory species. For each species, we describe our revised perspective on population structure on the EAAF, and propose future work, in both genetic and individual-tracking approaches, to solve the remaining mysteries regarding migratory connectivity and geographic overlap of non-breeding populations.

Shorebirds ringing activities at Chukh Bird Research Station in Northeastern Mongolia, 2019

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In Mongolia, there are 58 species of shore birds have been recorded and most of them migrate along the East Asian-Australasian Flyway. However, we have very limited information about shorebirds. There are numerous water points that scattered throughout the dry steppe of the eastern part of Mongolia are significantly important place for migratory birds to use as stopover sites during migration period. In 2019, we conducted shorebird monitoring at "Chukh" lake, in northeastern Mongolia. The study area located in the buffer zone of Mongolian Daurian Strictly Protected area which is designated as World Heritage of UNESCO, The Man and Biosphere Reserve, Ramsar Convention, Important Bird Area (MN066), East Asian-Australasian Flyway, and the Daurian International Protected Area. During the study period, total 407 individuals of 31 species have been captured by mist-net and ringed by metal on its left leg and also all individuals were tagged by color flags as blue over green on the right leg. Most common species was Wood Sandpiper (*Tringa glareola*), Marsh Sandpiper (*Tringa stagnatilis*), Common Redshank (*Tringa totanus*), Little Stint (*Calidris minuta*), Temminck's Stint (*Calidris temminckii*) which were occupied almost 50% of all trapped birds. The birds were active and mostly trapped between 03:00-06:00am and 21:00-00:00pm. Besides, we also tracked 39 individuals of 9 species of shore birds using GSM based 5-6gr transmitters, including near threatened Asian Dowitchers, Black-tailed Godwits and Eurasian Curlews. We also conducted invertebrates survey of the monitoring lake for diet study of shorebirds in autumn. We identified 3201 individuals of invertebrates from 14 families of 10 order and most of them were *Cladocera*, *Hemiptera*, which are collected from more muddy areas.

Theme: Monitoring, Migration Ecology

Preferred option: Oral presentation

Satellite tracking of Migratory shorebirds in Singapore

-a sharing of the preliminary results

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Migration routes of shorebirds in Southeast Asia are generally less known due to limited migration studies. Previous studies suggest that most of the shorebirds from this region use the East Asian-Australasian Flyway (EAAF) although there have been a few reports of some birds, such as the Curlew Sandpipers (*Calidris ferruginea*) and Common Redshanks (*Tringa nebularia*), which were found at Central Asia and Northwest China during the breeding season, that falls under the Central Asian Flyway (CAF) instead of the EAAF. A study of Common Redshanks through the use of geolocators (which weigh 1g) was carried out in 2014-2016. Results from that study found that all 6 adult birds breed in the Tibet-Qinghai Plateau in China.

To further understand the migration routes of shorebirds that spends its winter in Singapore, we deployed 20 Solar-powered PTTs which weighs 9.5g and 5g, on five species of shorebirds from Mar 2017 to Dec 2018. This included 11 Whimbrels (*Numenius phaeopus*), 2 Grey Plovers (*Pluvialis squatarola*), 4 Common Redshanks (*Tringa totanus*), 2 Common Greenshanks (*Tringa nebularia*) and one Pacific Golden Plover (*Pluvialis fulva*). Preliminary results found that all the Common Redshanks and one Whimbrel has taken the CAF instead of the EAAF, with some of the birds undertaking a direct route across the Himalayas. Other than the Common Redshanks which bred at the Qinghai-Tibet Plateau, the other shorebirds all breed at Northern Russia. Important stopover sites that have been identified include the Inner Gulf of Thailand, Mekong River Delta in Vietnam, Gulf of Mottama in Myanmar and Yellow sea coast in China and North Korea. Inland wetlands were also found to be critically important, including wetlands along Yangtze River, Northern China and Southern Siberia. Till 20th Oct 2020, seven satellite trackers continue to provide active signals giving insights on the migratory path and staging sites for the 2nd year going into the 3rd year. Additional details are being analyzed and the findings will be made shared when completed.