

Scientific Articles related with the EAAF & Partners

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**East Asian – Australasian Flyway
Partnership Secretariat**

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Migration

Pérez et al. 2010. Deuterium (δD) in Feathers of Mongolian Waterbirds Uncovers Migratory Movements. *Waterbirds* 33: 438-443.

Comments of Science officer: The importance of stable isotopes in migration studies is rapidly increasing. The isotopic patterns in foodwebs have been frequently used to estimate the moulting or breeding origin of migratory birds in Europe and North America, but scarce in Asia. This study shows the usefulness of stable isotope analysis using feathers in migratory studies in Asia, but also suggests that geographic patterns of isotope signature in feathers should be more refined to estimate precise migration routes.

Abstract: The need for better understanding of migratory movements of wild birds in Asia promoted an evaluation of the usefulness of deuterium in feathers (δD_f) to assign origins. Feathers were sampled from Bar-headed Geese (*Anser indicus*), Whooper Swans (*Cygnus cygnus*), Mongolian Gulls (*Larus vegae mongoliens*), Curlew Sandpipers (*Calidris ferruginea*) and Pacific Golden Plover (*Pluvialis fulva*) in north-central Mongolia, from June to September 2007. Univariate statistical analyses were performed to test for differences between study sites for all species and between growing (blood) and previously grown (non-blood) feathers only for Bar-headed Geese. Values of δD_f in actively growing feathers generally agreed with those expected from integrated isotopic signals in precipitation expected for sampling sites. Values of δD_f from adult migrant birds also indicated varying degrees of movement from north to south expected from the movement of these species in Asia. These results show promise for the isotope approach for establishing origins of molt of migratory waterbirds in Asia in a cost-effective manner without the need for mark and recapture. Projects required to track movements of waterbirds in Asia could benefit by incorporating this approach into study design. However, greater refinement of the δD_f isoscape for Asia is now needed.

Warnock, N. 2010. Stopping vs. staging: the difference between a hop and a jump. Journal of Avian Biology 41: 621-626.

Comments of Science officer: There are always similar words or terminology widely used without clear distinction from each other; when describing migration pattern and strategy, 'stopover' and 'staging' are good examples. Author proposes that 'stopover sites', linked with hopping and skipping strategies, mean all sites used by migratory birds for short-term periods where the prey quantity/quality for refueling is not an essential part in site selection. On the other hand, 'staging sites' are proposed as more selected and large areas to prepare for next long-distance migration (jumping strategy) by staying for longer time periods. This may be good start for further discussion.

Abstract: The Places where migrant birds stop to rest, drink, and eat at are often described as either stopover or staging sites. Attempts have been made to differentiate between these two terms but they are frequently used interchangeably. Some authors have equated staging sites with sites that attract large concentrations (many thousands) of birds, a definition that others have expanded to include long stopover durations and significant rates of refueling on predictable, abundant prey. It has also been suggested that birds using staging sites are those that employ a jumping strategy during migration. I argue that while all sites where birds rest and feed during migration are stopover sites, further classification of stopover sites is of ecological and conservation value. I propose that sites with abundant, predictable food resources where birds prepare for an energetic challenge (usually a long flight over a barrier such as an ocean or a desert) requiring substantial fuel stores and physiological changes without which significant fitness costs are incurred are most appropriately described as staging sites.

Rice Field Ecology

- Elphick, C. S. 2010. Why Study Birds in Rice Fields? *Waterbirds* 33 (SP1): 1-7.
- Fujioka et al. 2010. Bird use of Rice Fields in Korea and Japan. *Waterbirds* 33 (SP1): 8-29.
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- Sandilyan et al. 2010. Do agriculture lands serve as alternative habitat for Shorebirds? A systematic survey is the need of this hour in India. *Wader Study Group Bulletin* 117: 194-195.

Comments of Science officer: The journal 'Waterbirds' published a special publication on rice field ecology. Rice fields are very important for people along the EAA Flyway, but these habitats are essential for many waterbirds as well as forest birds regardless of their migratory habits. This special publication entitled 'Ecology and Conservation of Birds in Rice Fields: a Global Review' covers wide aspects of bird ecology, conservation, local issues, rice field managements, effect of pesticides, poultry and disease transmission. Please note that the last one was published on WSGB (Wader Study Group Bulletin), not on Waterbirds.

SEABIRDS

Yamamoto et al. 2010. At-Sea Distribution and Behavior of Streaked Shearwaters (*Calonectris leucomelas*) During the Nonbreeding Period. Auk 127: 871-881.

Comments of Science officer: The migratory and wintering behaviors of Streaked Shearwaters were revealed by GLS loggers which estimate locations based on light intensity. In spite of its big error radius, it is widely used for long distance migrants such as seabirds and shorebirds with high site fidelity. Authors found that the main wintering areas of the Japanese population are the Arafura Sea, the South China Sea, and particularly northern New Guinea.

Abstract: Streaked Shearwaters (*Calonectris leucomelas*) breed in temperate regions of East and Southeast Asia and have been thought to migrate to tropical regions near the Equator after breeding. We documented the migratory and foraging behavior of this species using global location sensors (GLS). The GLS loggers were attached to 48 breeding birds in 2006 and were subsequently recovered from 38 birds in the following year. The Streaked Shearwaters migrated from the seas around Japan to three wintering areas in the tropics, the seas off northern New Guinea, the Arafura Sea, and the South China Sea (4,000, 5,400, and 3,500 km from the breeding colony, respectively). Most Streaked Shearwaters wintered off northern New Guinea, an area of low primary productivity but high Skipjack Tuna (*Katsuwonus pelamis*) abundance. Streaked Shearwaters flew for longer periods and landed on the water more frequently around dawn and dusk during the wintering period. This pattern of activity is similar to that of subsurface predators such as tuna, and to that of tropical seabirds that are known to feed with subsurface predators. We suggest that Streaked Shearwaters probably forage in association with subsurface predators in the tropical oceans during the wintering period. Foraging in association with subsurface predators and morphological adaptations for gliding may allow Streaked Shearwaters to forage efficiently in both temperate and tropical environments.

Jiang et al. 2010. Preliminary assessment on the current knowledge of the Chinese Crested Tern (*Sterna bernsteini*). Chinese Birds 1: 163-166.

Comments of Science officer: The Chinese Crested Tern is a Critically Endangered (CR) species which had no observation report for several decades. Although new breeding population was re-discovered, the world population may be fallen to less than 50 individuals. This article reviews the current status of three known breeding flocks of the CCT. In Dec 2010, one wintering CCT was observed in Palau Lusaolate, north Seram, Indonesia; this is the first observation of this species outside the breeding season for over 70 years according to the BirdLife International. Increased public awareness and survey efforts may reduce knowledge gaps which deter effective actions for conservation of threatened species in the Flyway.

Abstract: [No original abstract] The Chinese Crested Tern (*Sterna bernsteini*; hereafter regarded as CCT) is perhaps the most enigmatic tern bird in the world – though discovered as early as in 1863, but so few the records of this tern had far been reported in the last 50 years or even 150 years. Quite recently, a dramatic decline, caused more likely by human disturbance, happened to the bird in the last two or three years, making the CCT population apparently fallen to less than 50 individuals in the wild. Although being of such a tiny population as far known worldwide, still, it can be recognized that the Chinese Crested Tern currently might be regarded as being of three small flocks (difficult to say subpopulation), assuming that the four birds found at the Xisha Archipelago in the South China Sea in April 2004 were wintering wanderers, or the birds in migration. For a tern bird, occupying such a large region during the breeding season but so far with so few of its breeding records, it is therefore proper and reasonable to regard the bird being Critically Endangered. By any means, those CCT birds are showing to us a very good sample that a tern bird with such a tiny population could have virtually and eventually survived in nature for 50 years, or even longer.

Cranes

Yoo et al. 2010. Accident cases and causes of electric line collision of cranes at Cheorwon, Korea. Korean Journal of Ornithology 17: 331-343. (in Korean with English Abstract)

Comments of Science officer: The Demilitarized Zone (DMZ) is located between South and North Korea, and it is a critical habitat for cranes as well as diverse wildlife without human disturbances. Cheorwon near the DMZ is a traditional wintering area of Red-crowned and White-naped Cranes in Korea and in NE Asia. According to this study, wintering cranes often become victims of pesticide poisoning which was caused by poaching trials mainly targeting geese, ducks, pigeons, and pheasants. However, the collision with man-made structures (especially electronic wires and military fences) seems to be the most significant threat to wintering cranes in Korea. Although its mortality rate was not high, such incidental death of adult cranes, which have low mortality and long longevity, may cause negative effects on cranes populations in NE Asia.

Abstract: The objectives of this study were to investigate the causes of crane fatality in Cheorwon area, and to analyze factors of the human disturbance related to its fatality. Spatial analysis of land form and artifacts including electric power lines and iron fences along DMZ has been done with GIS. The findings can be summarized as follows. First, we have found 42 accident individuals in 36 cases during the study period from 2000 to 2010. 19 individuals of Red-crowned Crane were suffered in 14 cases, and 23 individuals of the White-naped Crane were suffered in 22 cases. Second, major causes of accidents were identified as poisoning (31.0%), electric line collision (26.2%), iron fence collision along DMZ (14.3%), fracture (4.8%), exhaustion (4.8%), and gunshot wound (2.4%). Third, the density of electric line was the statistically significant impact to electric power line collision of cranes, but topography factors of slope and curvature of the survey area was insignificant impact to the accidents. Conservation plan for the cranes should include a strict poaching control, density reduction of electric power lines, and the visibility enhancement measures of aerial obstacles such as attaching warning strips to power lines and upper parts of iron fences along the DMZ.

SHOREBIRDS

Rogers et al. 2010. Red Knots (*Calidris canutus piersmai* and *C. c. rogersi*) depend on a small threatened staging area in Bohai Bay, China. *Emu* 110: 307-315.

Comments of Science officer: Shorebirds are strong migrants with high site-fidelity in general. This study indicates that two different populations of Red Knots rely on one small site in the Yellow Sea Eco-region during their journey. Conservation of key staging areas, particularly along the Yellow Sea, is critical in the survival of most migratory shorebirds as well as Red Knot populations in the EAA Flyway.

Abstract: We monitored numbers of Red Knots (*Calidris canutus*) staging in Bohai Bay, China (39°02'N, 118°15'E) on northward migration. Knots were identified to subspecies, and we systematically searched for colour-banded birds from the non-breeding grounds. We modelled migratory turnover, and revised estimates of flyway population using recently published counts from the non-breeding grounds. Two Russian-breeding subspecies occurred at our study site: *C. c. rogersi* (migrating to Chukotka), and *C. c. piersmai* (migrating to the New Siberian Islands); they co-occur on non-breeding grounds in Australia and New Zealand, but differ markedly in timing of migration. We conservatively estimate that our study site, comprising only 20 km of coastline, was used by over 45% of the combined world population of adult *C. c. rogersi* and *C. c. piersmai* - a conclusion supported by the independent data on frequency of resighting of colour-banded birds from north-western Australia and New Zealand. Much of this vital staging area is now being destroyed through construction of the Caofedian Industrial Zone and more westerly developments, which comprise only some of the many tidal flat 'reclamation' projects in the region. Preservation of the remaining tidal flats of Bohai Bay is essential to the conservation of Red Knots in the East Asian-Australasian Flyway.

Clark et al. 2010. The use of light-level geolocators to study wader movements. Wader Study Group Bull. 117(3): 173-178.

Comments of Science officer: In spite of many limitations, the number of geolocator (GLSs) use for migration researches has increased in number. It has been successfully used in migration studies for many seabirds, passerines like swallows and martins, and shorebirds including Ruddy Turnstones. This article reviewed merits, limitations, current and potential usages, and future developments of GLS in migratory shorebirds studies.

Abstract: Light-level geolocators have been deployed on a number of wader species to track migratory movements, and identify breeding, stopover, and wintering areas. These devices, which have only become available for small to medium-sized waders in the past few years, measure ambient light levels and store them in a time series in their internal memory. Such data allow estimates of the time of sunrise and sunset, and by conversion, latitude and longitude, on a daily basis. Geolocator use is limited to situations where there are periods of night and day, and when the need for location accuracy is rather low (hundreds of kilometres). Inaccuracies in the locations are primarily in latitude (as opposed to longitude) and are strongly positively correlated with proximity to the equinoxes and to the equator. Deployment is currently limited to situations where individuals can be recaptured at some later date. Breeding grounds can be ideal for species that are site-faithful although low densities and remote working conditions limit this approach. Migratory stopover and wintering grounds can be fruitful deployment locations although recaptures may be more difficult. Geolocators are typically attached using leg rings or flags, leg harnesses, or body harnesses. In principle implanting a geolocator in the coelomic cavity is possible but this has not yet been attempted. More studies are needed to adequately assess the impact of attaching geolocators to birds. We recommend studies on birds fitted with geolocators both in captivity and in the field, and the measurement of return rates of birds with and without geolocators. Future developments will likely see further miniaturization, remote downloading of data, and refinement of data analysis techniques.

ANATIDAE

LIU et al. 2010. A survey to the distribution of the Scaly-sided Merganser (*Mergus squamatus*) in Changbai Mountain range (China side). Chinese Birds 1:148-155.

Comments of Science officer: As an endangered migratory species with small distribution ranges, there is significant knowledge gap for conservation of Scaly-sided Mergansers due to the lack of basic information. More information such as population size, migration routes, status of breeding and wintering ranges, and other biological data are still required for conservation action. This article indicates that rivers around China-North Korean border are important breeding sites for Scaly-sided Mergansers.

Abstract: In 2008 and 2009, we made continuous and repeated breeding surveys of the Scaly-sided Merganser (*Mergus squamatus*) in the Changbai Mountain range (China side), using a combination of rubber-boat drifting and walking. Each survey consisted of a census of breeding pairs in the spring and broods in the summer. A total of 1553 km in length of 17 river stretches were surveyed in four different river systems of the Yalujiang, Songhuajiang, Tumenjiang and Mudanjiang rivers. A total of 1354 individuals of the Scaly-sided Merganser were recorded during the both surveys. The breeding density for all the stretches surveyed over both years averaged 0.26 ± 0.30 pairs per km; the population density in the spring averaged 0.75 ± 0.88 individuals per km. According to our survey results, we estimated that the breeding population in the Changbai Mountain range was about 170 breeding pairs of the Scaly-sided Merganser. Three major breeding sites of this bird were found in the Changbai Mountain range in these surveys.

Kasahara and Koyama. 2010. Population trends of common wintering waterfowl in Japan: participatory monitoring data from 1996 to 2009. Ornithological Science 9: 23-36.

Comments of Science officer: TRIM (TRends & Indices for Monitoring data) is a software developed for the analysis of count data obtained from monitoring wildlife populations. This program has been also used to analyze population trends of waterbirds in Asia monitored by AWC (Asian Waterbird Census). The overall results of this study were concordant to the previous reports that showed the general decline of waterfowls in Japan as well as other Asian countries in the EAA Flyway. Nevertheless, this study also suggests that the (both increasing and decreasing) trend of waterfowl populations may be dependant on complex factors including species, foraging habits, breeding areas, wintering habitats, and anthropogenic factors (i.e. water quality).

Abstract: We analyzed population trends of 13 waterfowl (Anseriformes) species wintering in Japan during a 14-year period (1996-2009). We used data from annual volunteer-participatory waterfowl count surveys which were conducted in Japan by the Ministry of the Environment and local prefectural governments. Population indices and long-term trends of each species were calculated using TRIM (TRends and Indices for Monitoring data). TRIM is a freeware program developed for analysis of time series count data with missing observations. During the 14 years, seven species exhibited significant long-term declines, while four species showed long-term increases. Most of the species that showed long term declines were characterized as being water-surface foraging species, species breeding in both middle and high latitude regions, or species using rice fields. Most species that showed long-term increases were characterized as diving species, species breeding at high latitude or species rarely using rice fields. We calculated composite indices for these groups. The group of water-surface foraging species showed declines in river, natural lakes and artificial lakes, except reservoirs, when each habitat was analyzed separately. In contrast, the group of diving foraging species showed an increase in estuarine habitat. We suggest that changes in water quality, breeding habitat in the middle latitude region, and in cultivation methods in rice fields, have affected population changes of some species and groups.

AVIAN INFLUENZA

Indriani *et al.* 2010. Environmental Sampling for Avian Influenza Virus A (H5N1) in Live-Bird Markets, Indonesia. Emerging Infectious Diseases 16: 1889-1895.

Comments of Science officer: Bird markets particularly with many ducks are often suspected as important sources of AI virus transmission. This study carried out in Indonesia indicates that nearly everything used in bird markets can be contaminated. Apart from AI surveillance and food safety in national level, personal hygiene is required after visiting live bird markets, especially slaughter and waste-disposal zones in all countries as well as Indonesia.

Abstract: To identify environmental sites commonly contaminated by avian influenza virus A (H5N1) in live-bird markets in Indonesia, we investigated 83 markets in 3 provinces in Indonesia. At each market, samples were collected from up to 27 poultry-related sites to assess the extent of contamination. Samples were tested by using real-time reverse transcription-PCR and virus isolation. A questionnaire was used to ascertain types of birds in the market, general infrastructure, and work practices. Thirty-nine (47%) markets showed contamination with avian influenza virus in ≥ 1 of the sites sampled. Risk factors were slaughtering birds in the market and being located in West Java province. Protective factors included daily removal of waste and zoning that segregated poultry-related work flow areas. These results can aid in the design of evidence-based programs concerning environmental sanitation, food safety, and surveillance to reduce the risk for avian influenza virus A (H5N1) transmission in live-bird markets.

Hansbro et al. 2010. Surveillance and Analysis of Avian Influenza Viruses, Australia. Emerging Infectious Diseases 16: 1889-1895.

Comments of Science officer: Because of the possible human infection risk from high pathogenic avian influenza (HPAI), there are many on-going AI surveillance programs worldwide. This study showed that no HPAI virus was detected in Australian wild birds and that the detected LPAI (low pathogenic AI) may be distinct lineages from previously known ones which have many cases of human infection. It suggests that Australia is relatively free from concerns about human health and AI, but more surveillance and researches are still required particularly in northern Australia that hosts many migratory birds in the Flyway.

Abstract: We investigated carriage of avian influenza viruses by wild birds in Australia, 2005-2008, to assess the risks to poultry industries and human health. We collected 21,858 (7,357 cloacal, 14,501 fecal) samples and detected 300 viruses, representing a detection rate of $\approx 1.4\%$. Rates were highest in autumn (March-May) and differed substantially between bird types, areas, and years. We typed 107 avian influenza viruses and identified 19 H5, 8 H7, and 16 H9 (40% of typed viruses). All were of low pathogenicity. These viruses formed clearly different phylogenetic clades to lineages from Eurasia or North America, suggesting the potential existence of Australian lineages. H7 viruses were similar to highly pathogenic H7 strains that caused outbreaks in poultry in Australia. Several periods of increased detection rates (numbers or subtypes of viruses) were identified. This study demonstrates the need for ongoing surveillance to detect emerging pathogenic strains and facilitate prevention of outbreaks.

Lebarbenchon et al. 2010. Persistence of Highly Pathogenic Avian Influenza Viruses in Natural Ecosystems. Emerging Infectious Diseases 16: 1057-1062.

Comments of Science officer: HPAI virus outbreak and mass mortality in the wild were extremely rare phenomenon before mid-1990s. This article reviews the environmental features which affect the evolution of avian influenza virus. Authors point out that HPAI evolves and persists more easily in artificial ecosystems such as poultry farms and live bird markets because of several ecological features: low intra/inter-specific diversity, stable host density, host dispersal by commercial trades, no predation risks, and so on.

Abstract: Understanding of ecologic factors favoring emergence and maintenance of highly pathogenic avian influenza (HPAI) viruses is limited. Although low pathogenic avian influenza viruses persist and evolve in wild populations, HPAI viruses evolve in domestic birds and cause economically serious epizootics that only occasionally infect wild populations. We propose that evolutionary ecology considerations can explain this apparent paradox. Host structure and transmission possibilities differ considerably between wild and domestic birds and are likely to be major determinants of virulence. Because viral fitness is highly dependent on host survival and dispersal in nature, virulent forms are unlikely to persist in wild populations if they kill hosts quickly or affect predation risk or migratory performance. Interhost transmission in water has evolved in low pathogenic influenza viruses in wild waterfowl populations. However, oropharyngeal shedding and transmission by aerosols appear more efficient for HPAI viruses among domestic birds.

CONSERVATION

Hoffmann et al. 2010. The Impact of Conservation on the Status of the World's Vertebrates. Science 330: 1503-1509.

Comments of Science officer: Threatened animal species are increasing in number; many bird species moved from a lower to a higher category of threat, and trends in the Red List Index (RLI) for the world's birds also declined for last two decades. Given the global patterns of threat and net extinction risk, terrestrial and freshwater ecosystems in South Asia, where the EAA Flyway belongs to, were most threatened in the world. This is why more conservation efforts along the EAA Flyway are essential to maintain Global Biodiversity.

Abstract: Using data for 25,780 species categorized on the International Union for Conservation of Nature Red List, we present an assessment of the status of the world's vertebrates. One-fifth of species are classified as Threatened, and we show that this figure is increasing: On average, 52 species of mammals, birds, and amphibians move one category closer to extinction each year. However, this overall pattern conceals the impact of conservation successes, and we show that the rate of deterioration would have been at least one-fifth again as much in the absence of these. Nonetheless, current conservation efforts remain insufficient to offset the main drivers of biodiversity loss in these groups: agricultural expansion, logging, overexploitation, and invasive alien species.