8th Australasian Shorebird Conference "The Role of Science in the Conservation of Shorebirds"

Napier Building, University of Adelaide, South Australia, 29/30 September 2012

Program and Abstracts

Saturday 29th September

0815 - 0900 **Registration**

0900-0910 **Welcome**

0910 – 1010 **Keynote -** David Paton - *Ecological consequences for the Coorong from over-extraction of water in the Murray Darling Basin*.

1010 -1040 **Morning Tea**

Migration

1040 – 1100 Clive Minton - *Unlocking some of the mysteries of migration – geolocators providing new insights of the migration strategies for 4 shorebird species.*

1100 – 1120 Ken Gosbell - *What can geolocators tell us about shorebirds breeding in the Arctic?*

1120 – 1140 Danny Rogers - *Females fly further - extreme differential migration in the Grey Plover.*

1140 – 1200 Gregory Kerr - *Departure dates and flock characteristics of northward migrating waders from Roebuck Bay, Western Australia 1994 to 2008.*

1200 – 1245 **Lunch**

Ecology of migratory shorebirds

1245 – 1305 Yaara Aharon- Rotman - *Breeding success of migratory waders indicate that lemming cycles are losing their grip on the functioning of Arctic ecosystems.*

1305-1325 Sora Estrella - Lyngbya majuscula blooms in Roebuck Bay, WA: effects on Bar-tailed Godwits.

1325-1345 Chris Hassell - Industrialisation threatens two subspecies of Red Knot

1345-1405 Sayam Chowdhury - *Saving the Critically Endangered Spoon-billed Sandpiper in Bangladesh.*

1405-1425 Jing Li - *The China Coastal Water-bird Census Team.*

1425-1445 Jody O'Connor - *Modeling waterbird responses to ecological conditions in the Coorong, Lower Lakes, and Murray Mouth Ramsar site.*

1445-1515 **Afternoon Tea**

Resident shorebird ecology

1520- 1540 Reece Pedler - *Banded Stilts: cross-continental movements by an extreme boom-bust species.*

1540-1600 Stuart Collard - *Banded Stilts in the brine: Lake Torrens breeding event, May 2010.*

1600-1620 Grainne Maguire - *Returning the Balance: Five years of managing threats to the Hooded Plover.*

1620-1640 Simeon Lisovski - *Avian Influenza in Australian Waders: A Souvenir from Migrants?*

1640-1700 Kasun Ekanayake - *Does sexually dimorphic ornamentation in birds attract predators as well as mates?*

Sunday 30th September

Symposium – Shorebirds and Saltworks

0900 – 0930 Plenary: Jose Mazero – *Saltworks as suitable habitats for shorebirds: an overview*

0930-0955 Sora Estrella - *Feeding mechanisms of migratory shorebirds in saltpans*.

0955-1015 Demetrios Bertzeletos - *Water, salt and substrate; how these abiotic parameters create globally significant shorebird habitat in tropical Australian salinas.*

1015-1035 Chris Purnell - *A pinch of salt: The value of the commercial saltfields as supratidal habitats for shorebirds in Gulf St Vincent.*

1035 – 1105 Morning Tea

1105-1125 Steve Rusbridge - *Use of Biodiversity Action Planning to Protect Migratory Birds.*

1125-1145 Siriya Sripanomyom - *Traditional salt-pans vitally sustains shorebird populations in the Inner Gulf of Thailand.*

Flyway population monitoring

1145-1205 Rob Clemens - *Progress Toward Uncovering Evidence of Declines In Migratory Shorebirds In Australia And The Habitats They Rely On In Se Asia.*

1205-1225 Dan Weller - *Tracking flyway population trends using Australian Shorebirds 2020 volunteer survey data.*

1225-1310 Lunch

1310-1330 Danny Rogers - *Effects of the Saemangeum reclamation on shorebird populations in Australia.*

1330-1350 Kiran Dhanjal-Adams, - *Spatial and temporal changes in Shorebird abundance across Moreton Bay.*

1350-1410 Chris Herbert - *Shorebird Population Trends in the Hunter Estuary.*

1410-1440 Afternoon Tea

Conservation and adaptive management

1440-1500 Chelsea Hankin - *Shorebird responses to major infrastructure developments on Botany Bay.*

1500-1520 Karen Hunt - *Headlines, deadlines and sexing up - the role of media in conservation of shorebirds.*

1520-1540 David Milton - *The tricky question of how to monitor the ecological character of Australia's Ramsar sites to measure unacceptable change.*

1540-1600 Meghan Cullen – *Human Dimensions of managing beach-nesting birds.*

CONFERENCE ABSTRACTS

KEYNOTE ADDRESS

Ecological consequences for the Coorong from over-extraction of water in the Murray Darling Basin.

David C. Paton

Associate Professor

Ecology, Sciences, School of Earth & Environmental Sciences.

The University of Adelaide, Australia 5005.

E-mail: david.paton@adelaide.edu.au

The Coorong is a Wetland of International Importance and is a unique and diverse wetland system near the Mouth of the River Murray. Using data gathered over the last 30 years, David will summarize recent trends and future predictions for this region. Its ecology is driven by hydrology and as the last wetland system in the Murray Darling Basin to receive water is a barometer for assessing sustainable use of water within the Basin. Reductions in flows to the Murray Mouth not only affect whether the Murray Mouth remains open, but also result in increasing salt loads in the Coorong and disruption to water levels. Increases in salinity and low water levels during the last decade resulted in significant reductions in the abundances and distribution of key aquatic plants, aquatic invertebrates, fish and birds, including waders. Despite flows returning to the region in spring 2010, components of the system have not fully recovered, and some have deteriorated further. The proposed return of 2750 GL of water to the environment as outlined in the current draft Murray Darling Basin Plan will be too little and too late to maintain the ecological character of the Coorong.

THEME: MIGRATION

Unlocking some of the mysteries of migration – geolocators providing new insights of the migration strategies for 4 shorebird species,

Clive Minton, Ken Gosbell

E-mail: mintons@ozemail.com.au

During 2009 to 2011, the VWSG and AWSG deployed a number of geolocators on four different species, Ruddy Turnstone, Eastern Curlew and Sanderling in several locations in

Southeast Australia and Greater Sand Plover in Broome, northwest Australia. With good retrieval rates on Ruddy Turnstone and Greater Sand Plover, we were able to increase our knowledge of migration strategies for both these species in particular. The northward migration of Ruddy Turnstone was on a narrow path with many birds completing an initial non-stop flight of 7,600 km to Taiwan. Most later staged in the Yellow Sea before locations became indiscernible as birds encountered continuous daylight. The southward migration paths generally showed a much wider spread, ranging from Mongolia to the central Pacific including one of unexpected results was a bird that moved east to the Aleutian Islands before making a long trans Pacific flight in two successive years; a round trip of 27,000km each year. Several birds have now been tracked for two successive years, which provides evidence of repeat strategies.

This program has already added to our knowledge of migration pathways, departure dates, return dates and speeds as well as highlighting several conservation issues. The use of the northern Yellow Sea as a stopover for Ruddy Turnstone was a new insight as was the widespread individual strategies of southward migration adopted by this species. We will present information on the migration strategy and timings for Eastern Curlew which breed in sub Arctic regions. In the case of Greater Sand Plovers, we show how the use of the coasts of Vietnam for stopovers was important as they travelled to northern China and Mongolia to breed.

What can geolocators tell us about shorebirds breeding in the Arctic?

Ken Gosbell, Clive Minton

E-mail: ken@gosbell.id.au

Our understanding of breeding characteristics of shorebirds in the breeding areas is generally poor due to difficulties of geography and location. Here we describe how the data obtained from geolocators can be used to obtain information about incubation timings relative to arrival and departure of several species of shorebirds studied by VWSG and AWSG in 2009 to 2011. The core of the study is related to 26 geolocators retrieved from Ruddy Turnstone originally banded at Flinders, Victoria, SE of SA and King Island, Tasmania. Our presentation will show data demonstrating successful breeding outcomes in almost half of the birds studied. Moreover, we present evidence that a second nesting attempt is often made in the case of the first attempt failing. Data from smaller samples from Eastern Curlew and Sanderling will also be presented. This information is important to aid the understanding of breeding characteristics and their influence on population dynamics. It also demonstrates the valuable contribution geolocators can make to improving our understanding of shorebird behavior and ecology.

Females fly further - extreme differential migration in the Grey Plover

Dr Danny Rogers

Australasian Wader Studies Group, 340 Nink's Rd, St Andrews, Victoria 3761.

drogers@melbpc.org.au

Grey Plovers (*Pluvialis squatarola*) are widespread long-distance migrants, breeding in arctic tundra and migrating to non-breeding grounds thousands of kilometers to the south. We examined sex ratios in non-breeding populations of Grey Plover, using genetic methods to sex Grey Plovers captured in Australia, and label data to obtain sex-ratios from museum skins worldwide. Remarkably, over 98% of Grey Plovers in Australia proved to be female. The proportion of males in the non-breeding population increased gradually to the north, and the northernmost non-breeding populations of the East Asian – Australasian Flyway are dominated by males. Similar sex skews occur in other migratory flyways of the world, but they may be less strong. Grey Plovers appear to exhibit the strongest differential migration known in migratory waders. We discuss possible reasons, and also consider whether their differential migration increases their vulnerability to habitat loss.

Departure dates and flock characteristics of northward migrating waders from Roebuck Bay, Western Australia 1994 to 2008.

Authors: Gregory D. Kerr and Clive D. T. Minton

Affiliation: Australasian Wader Study Group

E-mail: gregkerr@adam.com.au

For long-distance migratory species the duration of stay and timing of departure from key stopover sites along their flyway is an integral feature of its migration strategy. An understanding of when each species departs from a migratory stopover, the degree of rigidity or plasticity in the timing of departures within and between species, and the conditions under which they successfully depart provides key insights into each species migratory ecology. This study is based on a relatively extensive and long-term (15 years) data set of departure dates for 17 species from Roebuck Bay in the north west of Australia. A total of 331,028 birds were recorded departing and 61,561 were recorded returning – having aborted migration – in a total of 5416 flocks over the study. We report on an analysis of species by species departure dates, departure times, flock sizes and migration patterns. The frequencies with which flocks aborted migration and returned to Roebuck Bay were also investigated.

THEME: ECOLOGY OF MIGRATORY SHOREBIRDS

Breeding success of migratory waders indicate that lemming cycles are losing their grip on the functioning of Arctic ecosystems

YaaraAharon- Rotman

Centre for Integrative Ecology, School of life and Environmental Science, Deakin University

Email: yaara.rotman@deakin.edu.au

The alternative prey hypothesis suggests lemming cycles in the Arctic breeding grounds are indirectly responsible for inter-annual fluctuation in breeding success of geese and waders. Previous studies found such interactions in the East Atlantic Flyway. We studied whether lemming cycles may also indirectly affect breeding success of waders from the East Asian-Australasian flyway, however no evidence for such an effect was found. Most species did not show population cycles, as would have been expected if they are under the influence of lemming cycles, and breeding success did not correlate with lemming abundance in the different breeding areas. We interpret our results to be due to current changes in lemming cycles showing a tendency to disappear over the past two decades.

Lyngbya majuscula blooms in Roebuck Bay, WA: effects on Bar-tailed Godwits.

Sora M. Estrella.

School of Animal Biology, University of Western Australia. 35 Stirling Highway. Crawley WA 6009. Perth, Australia

E-mail: sora.estrella@uwa.edu.au

Roebuck Bay is one of the main non-breeding areas for migratory shorebirds in Australia. The bay is characterised by an extremely high diversity and biomass of benthic invertebrates that supports the elevated shorebird numbers. Since 20% of shorebird species that regularly migrate along the East Asian-Australasian Flyway have been officially classified as globally threatened, due at least in part to habitat degradation along the flyway, there is an urgent need to monitor and conserve the remaining important sites in the flyway. But since 2005 blooms of toxic cyanobacterium (blue-green algae) *Lyngbya majuscula* have increased in frequency and extension in the bay and the potential impacts of these blooms on shorebirds remain unidentified. *Lyngbya* blooms in Roebuck Bay appear to be related with changes in the diversity of benthic invertebrates, but little is known about how these changes in prey availability can affect the feeding behaviour of shorebirds. The foraging behaviour of Bar-tailed Godwits was analysed in two wet seasons, one with an intense bloom and the other with a non-significant bloom. Although there were not significant differences in the number of probes per minute and prey captured per minute between both situations, a shift in Bar-tailed Godwits diet was detected. The effect of this shift in prey on the energy acquisition by this long distance migratory bird is evaluated.

Modelling waterbird responses to ecological conditions in the Coorong, Lower Lakes, and Murray Mouth Ramsar site.

Jody O'Connor, Dan Rogers and Phil Pisanu

Department for Environment, Water, and Natural Resources

E-mail: jody.o'connor@sa.gov.au

The Coorong, Lower Lakes and Murray Mouth Ramsar site is ranked as one of Australia's most important wetlands for migratory shorebirds. The site regularly supports over 100,000 waterbirds in summer, when large numbers of international migrants visit to forage on local prey resources. The distribution and abundance of waterbirds at this site is largely regulated by water flows from the River Murray and associated ecological conditions within wetland habitats. Between the early 2000s-2009, prolonged drought and upstream diversion of River Murray water resulted in a cascade of adverse ecological changes in the CLLMM. Water levels in the Lower Lakes fell below sea level, exposing harmful acid-sulfate soils, and salinity in the Coorong South Lagoon increased to >200ppt (modelled natural is 80ppt). These unprecedented conditions had a negative impact on the abundance and distribution of waterbirds as well as the fish, macroinvertebrate and plant species that make up much of their diet. In order to better understand the impact of the site's hydrology on the availability of waterbird habitat, we developed Bayesian models that enable managers to predict the consequences of ecological change for waterbirds. These species-specific models characterise cause and effect relationships between habitat components and a particular measure of waterbird habitat. We demonstrate the use of these habitat models as tools for the effective management and conservation of waterbirds.

Saving the Critically Endangered Spoon-billed Sandpiper in Bangladesh

Sayam U. Chowdhury

Coordinator Bangladesh Spoon-billed Sandpiper Conservation Project & Focal Point of the Spoon-billed Sandpiper Task Force in Bangladesh

E-mail: sayam_uc@yahoo.com

The Spoon-billed Sandpiper *Eurynorhynchus pygmeus* is a migrant shorebird that breeds in the Russian Arctic and winters primarily in Bangladesh and Myanmar. To determine the current status of Spoon-billed Sandpiper in Bangladesh all previously sighted locations were surveyed during last three winters. GIS analysis was conducted using Google earth to identify potential sites. Semi-structured interviews were conducted with local people to determine the degree of hunting pressure on SBS. After thorough surveys we identified Sondia Island and Domar Char to be the most significant intertidal mudflats for the Spoon-billed Sandpiper. The study findings added value to the current distribution, wintering population and ecology of this highly threatened wader. The identified sites are under extreme anthropocentric pressure, especially shorebird hunting. A total of 25 active bird-trappers were identified at Sonadia Island and 8 of them claimed to have captured c.22 SBS

in last two seasons. All 25 hunters have signed agreements to stop shorebird hunting and protect them instead by taking alternative livelihood support. Village Conservation Groups (VCG) of these villages will be in charge of monitoring and hunters will repay a small percentage of the income generated by the alternative livelihood to their VCG over the next 24 months. The respective VCGs will then use this money for further hunting mitigation.

Water bird monitoring program along China's Coast in 2005~2012

Jing Li.

Project Manager at Survey Sampling International

National coordinator for training, Regional coordinator for surveys in shanghai and Rudong

E-mail: Sylvie.jig@gmail.com

Coordinators and volunteer surveyors:
Bai Qingquan, Zhang Ming, Chen Jianzhong, Wang Fengqin, Shan Kai, Meng Derong, Han Yongxiang, **Li Jing**, Tong Menxiu, Zhang Lin, Bo Shunqi, Yang Zhidong, Ni Guanghui, Tang Qinyuan, Yang Jin, Chen Zhihong, Xu Zhiwei, Zeng Xiangwu, Tian Suixing, Cheung H.F., Fion Cheung Ka Wing, Wing Kan Vivian FU, Yu Yat Tung

China Coastal Waterbird Census is a program conducted by volunteers with the aim of monitoring the distribution, migration and seasonal changes of waterbirds through monthly surveys along the eastern coast of China mainland. The program covers 15 sites from 11 provinces and Special Administrative Regions (Liaoning, Hebei, Tianjin, Shandong, Jiangsu, Shanghai, Zhejiang, Fujian, Guangdong, Hong Kong S.A.R. and Hainan) and was started in September 2005. Regular monthly surveys were carried out in 11 sites and all these 11 sites are Important Bird Areas.

Survey results provide more information about the migratory bird along the EAAF, counts of 73 species of waterbird reach 1% of EAAF population at a single site in a single survey. Among them, Eastern Curlew, Asian Dowitcher, Spoon-billed Sandpiper and several other endangered species show different migratory strategy in southward and northward migration as of stop over sites selection that had no field data supported before. Surveys also show the extensive changes to waterbird habitat due to reclamation, invasive plant and economic development etc.

Two survey reports were published and 4 training seminars were held and around 200 volunteers have been participating the survey work in the past 7 years.

THEME: RESIDENT SHOREBIRD ECOLOGY

Banded Stilts: cross-continental movements by an extreme boom-bust species

Pedler, R.D and Bennett, A.T.D

PhD Candidate, Deakin University

Centre for Integrative Ecology, School of Life and Environmental Sciences

E-mail: rpedler@deakin.edu.au

Banded Stilts are iconic among Australian birds for their classic boom and bust life ecology strategy, which involves them travelling hundreds of kilometres to inland salt lakes following major rainfall events and breeding *en masse* in colonies totalling tens or hundreds of thousands to exploit rich but highly ephemeral food resources. Despite Australian ornithology's fascination with boom and bust and this species in particular, there is very little known about the strategies and cues important to this complex and risky ecological strategy, particularly in view of the threats facing the species from climate change, regulation of inland waterways, toxic waste-water storages and predation at breeding events.

Early results from satellite tracking using 5 gram solar-powered tags attached to Banded Stilt at a recent breeding event demonstrate that a large number of inland ephemeral lakes, coastal wetlands and artificial salt fields play an important role as post-breeding stop-over sites for this species. Cross -continental scale movements demonstrate that the degree of interconnectedness between eastern and western Australia is likely to be much greater than previously thought and suggest that regular movements of hundreds of kilometres are commonplace for this species.

Banded Stilts in the brine: Lake Torrens breeding event, May 2010

Stuart Collard[1], Alex Clarke[2]

[1]Rural Solutions SA

[2]Department of Environment, Water and Natural Resources

E-mail: stuart.collard@ncssa.asn.au

Summary

In early 2010, heavy rain fell across outback South Australia, providing ideal conditions for one of the largest Banded Stilt breeding events ever recorded in Australia. Aerial surveys of the inland salt lakes led to the discovery of the breeding colony at Lake Torrens National Park. A field surveillance team from the Department of Environment and Natural Resources was deployed to observe the breeding birds and if needed, protect them from predatory Silver Gulls. In this paper, we describe the climatic conditions leading up to the mass breeding event and the techniques used to locate the colony. We present results from field-based behavioural observations, including the impact of Silver Gulls and the overall success of the breeding event. We also provide information from follow-up observations, including the discovery of a second, smaller breeding colony at Lake Torrens in the same year. Stilt

behaviour was similar to that observed in previous studies, although the impact of gulls was lower than anticipated. Findings are discussed in the context of Banded Stilt conservation and the long-term implications of the breeding event on population viability in southern Australia.

Returning the Balance: Five years of managing threats to the Hooded Plover.

G. S. Maguire[1], M. A. Weston[2], G. C. Ehmke[1], and M. Cullen[1].

[1]BirdLife Australia, Suite 2-05, 60 Leicester St, Carlton Victoria, 3053, Australia; [2]Centre for Integrative Ecology and Faculty Research Cluster in Environmental Sustainability, School of Life and Environmental Sciences, Faculty of Science and Technology, Deakin University, 221 Burwood Hwy, Victoria, 3125, Australia.

E-mail: grainne.maguire@birdlife.org.au

Hooded Plovers are Australian shorebirds that nest directly on the beach or dunes during late spring and summer, and are consequently highly impacted by human recreation. Threats include direct crushing of eggs and chicks by people, dogs, horses and vehicles, as well as impacts of disturbance leading to overheating of eggs, starvation of chicks and increased depredation rates. Poor breeding success is resulting in population decline within Victoria. Management efforts are being implemented to alleviate threats, including fencing nesting sites, signage, wardening and chick shelters. We monitored between 70 and 90 pairs of Hooded Plovers in Victoria across five breeding seasons (2006-2011). At each breeding territory, the presence and intensity of threats were recorded per visit, enabling a standardized comparison of the effectiveness of on-ground managements across sites. Managed nests experienced higher hatching rates, however, fledgling production appeared equal between unmanaged and managed nests. When site-based threats were accounted for, there was a significant improvement in fledging success for heavily threatened sites that were managed compared to heavily threatened, unmanaged sites. This suggests that on-ground management efforts are effective at reducing human-based threats. We present results which explore threats across regions of Victoria and discuss barriers to effectively conserving beach-nesting birds.

Avian Influenza in Australian Waders: A Souvenir from Migrants?

Simeon Lisovski, Marcel Klaassen

Centre for Integrative Ecology, Deakin University, Geelong

E-mail: slisovski@deakin.edu.au

Besides Anseriformes, Charadriiformes, and in particular gulls, terns and waders, are expected to constitute the major natural reservoir for low pathogenic avian influenza viruses (LPAI). Hundreds of thousands of migratory waders from the Australasian flyway spend their winter in Australia, potentially introducing and distributing LPAI viruses into native avifauna. However, our knowledge on the frequency and temporal dynamics of infections among

migratory waders is still rather limited. Here we want to present an overview of our research in Avian Influenza studies on waders and how we can improve our knowledge by combining different sampling methods with powerful epidemiological modelling approaches.

Does sexually dimorphic ornamentation in birds attract predators as well as mates?

Kasun Ekanayake[1], Mike Weston[1], Tanya Pyk[2]

[1]School of Life and Environmental Sciences, Deakin University, 221 Burwood Hwy, Burwood, VIC 3125
[2]BirdLife Australia, Suite 2-05, 60 Leicester Street, Carlton VIC 3053

A potentially important cost of sexually dimorphic ornamentation is that the ornaments may attract visually foraging predators as well as mates. Among species where the ornamented sex contributes to parental care, a potential anti-predator adaptation may exist whereby the ornamented sex provides parental care only by night, when visually foraging predators are inactive. This study examined whether relatively frequent detection of ornamented males by visually foraging predators helps explain the division of incubation duties between sexes of the red-capped plover (RCP), a species in which the brighter coloured males incubate only by night and egg predation is common. Firstly, this study demonstrated that little ravens were a common, visually foraging, daytime-only predator of plover eggs. False RCP eggs were placed next to model RCP males and females. Increased depredation during daytime occurred for males compared with females while at night depredation was the same for both sexes. Variation in degree of ornamentation among females did not significantly predict hatching success of real nests. While the scheduling of incubation duties between the sexes reduces depredation risk of eggs during daytime, the relatively subtle variation in the degree of ornamentation among females does not apparently alter depredation risk of eggs.

SHOREBIRDS AND SALTWORKS SYMPOSIUM

Saltworks as suitable habitats for shorebirds: an overview

Jose A. Masero

Department of Anatomy, Cell Biology and Zoology. University of Extremadura, Spain.

E-mail: jamasero@unex.es

Coastal saltworks are man-made hypersaline wetlands used for obtaining salt by evaporation of seawater. This review provides an overview of the role of coastal saltworks as foraging, roosting and breeding habitats for migratory shorebirds. Coastal saltworks support important numbers of shorebirds and other waterbirds around the world. Several studies have shown that saltworks are high-quality foraging and roosting habitats for migratory shorebirds during the non-breeding season, supporting the idea that saltworks are valuable buffer wetlands that may supplement declining natural habitat for many shorebirds. The role of coastal saltworks in providing functional wetlands for non-breeding shorebirds will vary according to several factors, including gradient of salinity, type of exploitation, time of year, and geographical position in the flyways. Within this context it must be noted that these wetlands are hypersaline habitats, so their role as foraging grounds depends on the ability of shorebirds to cope with high salt concentrations. This issue is relevant, especially during the breeding season, because recent studies performed with shorebirds have showed that developing and maintaining an active osmoregulatory machinery is energetically expensive; moreover, the strength of the immune response of small-sized migratory shorebirds is negatively influenced by salinity. Overall, a threat to the value of the present coastal saltworks for shorebirds is the abandonment of the salt production as a consequence of economic constraints. In this sense, the current and new potential uses of saltworks are reviewed, from artisanal fisheries or food products such as 'flower of salt" to ecotourism or microalgae and halobacteria cultures.

Water, salt and substrate; how these abiotic parameters create globally significant shorebird habitat in tropical Australian salinas.

Demetrios Bertzeletos

Ph D Candidate at Edith Cowan University (ECU, Australia)- School of Natural Sciences
Supervisors: Prof. Pierre Horwitz and Dr. Robert Davis

E-mail: d.bertzeletos@ecu.edu.au

This project is collaboration between the School of Natural Sciences (ECU) and Dampier Salt Limited (DSL, Rio Tinto).

Many shorebird populations are currently declining in the East Asian-Australasian Flyway, probably because of habitat loss in Asia. A potential way to ameliorate these declines is by

recreating and managing habitats elsewhere. Salinas are often used by shorebirds and are potentially suitable settings for such work. Salinas are areas where high solar evaporation rates allow for the accumulation of salt from salt water. The habitats in these areas are attractive to shorebirds; however, there have been few studies examining the parameters, biotic and abiotic, behind this attraction globally and none done in Australia. By investigating these parameters in three salinas in northern Western Australia, Lake MacLeod and the Port Hedland and Dampier Saltworks; my study aims are to discover the parameters influencing shorebird distribution at these sites, how they do so and if any of these can be utilized to predict shorebird distribution in other areas and habitats. I will do so by examining and sampling abiotic (water, substrate, salinity, wind) and biotic (invertebrate and shorebird numbers and behaviours) factors across a range of habitats found at these three sites; eventually inputting these in species distribution models and testing these in other shorebird habitats and areas.

A pinch of salt: The value of the commercial saltfields as supratidal habitats for shorebirds in Gulf St Vincent.

Chris M. Purnell

BirdLife Australia, Adelaide Mt Lofty Ranges NRM

E-mail: chris.purnell@birdlife.org.au

Gulf St Vincent has long been recognised as an internationally significant area for shorebirds, however coastal eutrophication, increased disturbance, mangrove incursion, extreme weather events and sea-level rise threaten to decrease the value of intertidal habitat. Given these threats, population monitoring and mapping of the gulf's supratidal shorebird habitats has become a conservation priority for land managers. In Gulf St Vincent, the most significant supratidal habitat is provided by a series of commercial salt evaporation ponds (salinas) found within Cheetham Salt's Dry Creek operation.

Since 1976, 52 species of shorebirds have been recorded in the salt fields, nine of them in international significant numbers (>1% EAA Flyway pop). The predictable manipulation of water depth and salinity used for salt production, create variations in fluvial dynamics and benthic substrates resulting in distinct invertebrate communities that represent reliable yet diverse shorebird habitats. Consequently, the salinas provide both preferential high-tide and supplemental low-tide feeding habitats for a variety of shorebirds species, increasing the number of birds that the region can sustain and reducing the detrimental impacts of the loss of intertidal habitats elsewhere in the gulf.

Dampier Salt Limited - Use of Biodiversity Action Planning to Protect Migratory Birds

Steve Rusbridge – Principal Advisor Sustainable Development

Dampier Salt Limited

E-mail: Steve.Rusbridge@riotinto.com

Dampier Salt Limited (part of the Rio Tinto Group) produces about 11Mtpa of solar salt for the global chemical industry from our three salt producing operations at Lake MacLeod, Dampier and Port Hedland in Western Australia's Gascoyne and Pilbara regions. All three sites are identified as important bird areas (IBA's) because of the habitat in and around the operating sites that attract a number of key migratory bird species. This presents both opportunities and threats for the Company.

Rio Tinto recognises that conservation and responsible management of biodiversity are important business and societal issues. In 2004 Rio Tinto committed to delivering a net positive impact on biodiversity. Rio Tinto's operations in environmentally sensitive areas are required to develop and implement a biodiversity action plan which aims to leave the area in a better ecological condition when the operation eventually ends.

In line with this strategic approach to biodiversity, DSL made the decision to invest in a number of programmes supporting migratory birds. This involves committing to a significant research programme that would define the relationship between our production ponds and migratory species that utilize them. Beyond this DSL is also engaging with various NGOs to investigate opportunities to invest in the protection of inter-tidal habitats along the East-Asian Australasian Flyway that are vital to the future of the migratory species found at the DSL sites.

Traditional salt-pans vitally sustain shorebird populations in the Inner Gulf of Thailand

Siriya Sripanomyom

Independent conservation ecologist

E-mail: siriya88@gmail.com

The Inner Gulf of Thailand is the country's largest tidal flat known to supports a large number of overwintering shorebirds in Southeast Asia. Nevertheless, supratidal habitats of the area have been heavily destroying and converted for developments. Migratory shorebirds were surveyed at 20 sites covering most of the Inner Gulf during Oct. 2007 – Apr. 2008 and were related with landscape configurations of each site. Sites with salt-pans present in a larger proportion of the total landscape held significantly higher species richness, abundance and diversity of shorebirds. Contrary to sites in the landscape dominated by aquaculture, shorebirds tended to avoid. Landscapes with a larger proportion of tidal flats accompanying with salt-pans were the best predictors of sites with higher species richness, abundance and diversity. Shorebirds appeared to use salt-pans as both roosting sites and supplementary feeding grounds during high tide. Traditional salt-pans therefore contribute significantly support to overwintering shorebird populations in the Inner Gulf of Thailand. Collaboration between researchers, salt farmers and planning authorities to soundly manage salt-pans as important shorebird roost sites is urgently needed. Fortunately, at least public awareness for this area recently commenced.

Feeding mechanisms of migratory shorebirds in saltpans.

Sora M. Estrella.

Coastal Wetlands Conservation Group. Biology.

Department School of Sciences of the Sea and Environment.

University of Cádiz, 11510 Puerto Real. Spain

Current address: School of Animal Biology, University of Western Australia. 35 Stirling Highway, Crawley WA 6009. Perth, Australia

E-mail: sora.estrella@uwa.edu.au

Most migrant waders depend at some stage of their migrations on aquatic systems such as saltpans which present physical and chemical characteristics distinct from those present in the intertidal or terrestrial areas. Nevertheless, waders are able to use an arsenal of feeding mechanisms and behaviours that allow them to exploit efficiently these distinctive aquatic systems.

A common feeding mechanism in small or medium-sized wader species feeding on small prey items in saltpan shallow waters is the Surface Tension Transport (STT). Birds using STT can transport a prey up to 3.6 times faster than the theoretical value predicted previously and are capable of achieving high intake rates foraging on small prey items when they are available at high densities.

In saltpans, prey are located at different depths in the water column and vary in size over a small range. Waders are found to modulate their bill gape in response to differences in prey size and position in the water column, which is a common behaviour among trophic generalists. Waders' bill gape is modulated frequently through the use of distal rhynchokinesis. Although the use of distal rhynchokinesis has been commonly associated with the deep probing feeding method, its use and occurrence was reported recently for the first time in wild long-billed waders feeding on small prey items suspended in saltpans water column.

Foraging behaviour of typical plovers is highly stereotyped, and to date, the use of a sandpiper-like foraging method by typical plovers is considered anecdotal. However sandpiper-like foraging method is common in Grey Plover (*Pluvialis squatarola*) and Ringed Plover (*Charadrius hiaticula*) feeding in prey-abundant pans, being particularly important for Ringed Plover.

FLY-WAY POPULATION MONITORING

Progress towards uncovering evidence of declines in migratory shorebirds in Australia and the habitats they rely on in SE Asia

R.S. Clemens[1], N.J. Murray[1], H.B. Wilson[1], B.E. Kendall[2], C.E. Studds[1], K. Dhanjal-Adams[1], and R.A. Fuller[1,3]

[1] School of Biological Sciences, University of Queensland, St Lucia, QLD 4072, Australia; [2] Bren School of Environmental Science & Management, University of California, Santa Barbara, Santa Barbara, CA 93106-5131, USA; [3] CSIRO Climate Adaptation Flagship and CSIRO Ecosystem Sciences, 41 Boggo Road, Dutton Park, Queensland 4102, Australia.

E-mail: r.clemens@uq.edu.au

Shorebird monitoring by volunteers since 1980 has resulted in an exceptionally rich data set on an important component of Australian biodiversity. Here, we review the spatial and temporal coverage of the Australian shorebird monitoring count data. We report on some of the techniques used to identify changes in abundance in wildlife, and highlight some of the growing number of results indicating long-term declines in some migratory shorebird species at selected individual sites in Australia. We then report on progress in quantifying the loss of staging habitat which is thought to be one of the most likely causes for some shorebird declines. Developing a novel remote sensing approach which uses Landsat data selected with the help of a regional tide model, we have mapped the extent of intertidal wetlands in the Yellow Sea in 1980's and 2000's. Here we describe the status and distribution of intertidal mudflats across the Yellow Sea region. We have discovered that a large proportion of intertidal habitat has been lost primarily to coastal reclamation. Together habitat loss estimates and available count data will form the foundation of a project seeking to quantify the scale of declines in migratory shorebirds while identifying the causes of those declines.

Tracking flyway population trends using Australian Shorebirds 2020 volunteer survey data.

Dan Weller, Shorebirds 2020 Project Officer and Dr Golo Maurer, Shorebirds 2020 Project Manager

BirdLife Australia, Suite 2-05, 60 Leicester St, Carlton, Victoria, 3053

Email: Dan.weller@birdlife.org.au

BirdLife Australia's *Shorebirds 2020* Program commenced in 2007 to reinvigorate the volunteer-driven national shorebird population monitoring program started by the AWSG in 1981, with support from the Australian Government's Caring for our Country initiative. The program collates shorebird population count data collected by a 1400-strong volunteer network at over 150 mapped Shorebird Areas for over three decades in a national online database.

Here we present a brief overview of preliminary comparative analyses between national count summary data following the 2011/2012 summer counts, and the last-published count summary data (2009/2010 summer counts), providing an up-to-date perspective of shorebird population trends in Australia, which continue to demonstrate declines in a number of resident and migratory species.

The overview highlights an increase in areas counted providing some confidence for population trends deduced from the Shorebirds 2020 dataset, especially for a number of common migratory shorebird species. However, incomplete spatial coverage continues to be an issue, especially in northern Australia, and therefore much uncertainty remains.

Our data show that the maintenance of the counter base and the geographic expansion of the Shorebirds 2020 program are crucial in identifying flyway population trends more rapidly and accurately. Improvements relating to a standardised count methodology and streamlined data collection, vetting, and management are required to facilitate effective and timely identification of population trends. Ongoing recruitment of and support for volunteer counters is essential for the Shorebirds 2020 program to continue to guide best-practice management and conservation outcomes for shorebirds across Australia.

Effects of the Saemangeum reclamation on Great Knot populations in Australia

Danny Rogers

Australasian Wader Studies Group, 340 Nink's Rd, St Andrews, Victoria 3761.

drogers@melbpc.org.au

Loss of tidal flat habitats to land 'reclamation' projects in east Asia is widely considered to be the main driving force behind serious population declines in shorebirds of the East Asian – Australasian Flyway (EAAF). However, proponents of reclamation projects have claimed that they do not affect shorebird populations because shorebirds can find alternative staging habitats if a particular site is lost. Although this optimistic view is implausible and in contradiction of research in other flyways, it is difficult to assess in a flyway like the EAAF where relatively few staging sites are monitored in detail. However, an 'opportunity' was provided by the reclamation of Saemangeum, on the west coast of South Korea. Saemangeum used to be the most important staging site for shorebirds in the East Asian – Australasian Flyway. The site has been lost to a major tidal flat reclamation project, and closure of the seawall in 2006 led to a huge decline in the numbers of Great Knots staging at Saemangeum on northwards migration – over 80,000 Great Knots 'disappeared' from the region between 2006 and 2008. We investigate whether corresponding declines occurred on Australian non-breeding grounds, using a combination of shorebird count data, and a survival analysis from a population of colour-banded birds in north-western Australia.

Spatial and temporal changes in Shorebird abundance across Moreton Bay

Dhanjal-Adams, Kiran L.*[1],H.B. Wilson[1], B.E. Kendall[2], C.E. Studds[1], and R.A. Fuller[1,31]

School of Biological Sciences, University of Queensland, St Lucia, QLD 4072, Australia; [2] Bren School of Environmental Science & Management, University of California, Santa Barbara, Santa Barbara, CA 93106-5131, USA;[3] CSIRO Climate Adaptation Flagship and CSIRO Ecosystem Sciences, 41 Boggo Road, Dutton Park, Queensland 4102, Australia;*

E-mail: kiran.dhanjaladams@uqconnect.edu.au

Recent analyses of QWSG monitoring data from Moreton Bay have identified declines of up to 79% in at least 7 species of migrants between 1994 and 2008 (Wilson et al. 2009).Population trends in Moreton Bay are therefore likely indices of declines occurring elsewhere along the East Asian-Australasian flyway and are most likely being amplified by migratory connectivity (Iwamura et al. in press). There is therefore an urgent need to identify what might be causing these declines. Our research investigates the potential for using point count data, like that collected by QWSG, to detect potential drivers of shorebird declines. To do so, we first contrast a spatial formulation of the N-mixture model (Royle 2004, Dail and Madsen 2012) with non-spatial models and estimate abundance, fecundity and survival of 22 migrant and 8 resident shorebird species in Moreton Bay to identify how these have changed since 1994. Prior to these analyses, the spatial data collected across Moreton Bay was amalgamated into a non-spatial index of bird abundance; the average number of birds counted per site visited. In contrast, N-mixture models allow the spatial data to be analysed by keeping site as a random factor in the model. Finally, we account for environmental variability by testing the effects of different covariates on abundance: such as wind-speed, disturbance level, temperature or rainfall for example. This enables us to identify some of the underlying local drivers of population dynamics. Our research highlights the urgent need for broader scale analyses of shorebird abundance to confirm whether population trends observed here are mirrored elsewhere along the flyway.

Shorebird Population Trends in the Hunter Estuary

Chris Herbert and Liz Crawford, Hunter Bird Observers Club

E-mail: chrisliz@internode.on.net

The Hunter Estuary has long been considered the most important site for migratory shorebirds in NSW. A large part of the estuary, including an embayment with extensive intertidal mudflats, was declared a Nature Reserve in 1983 and subsequently listed as a Wetland of International Importance under the Ramsar Convention because of the large numbers of migratory shorebirds.

Unfortunately, migratory shorebird populations have since declined and species such as Eastern Curlew, once present in internationally significant numbers, no longer meet the 1% of Flyway Population criterion. Since the earliest records in the Hunter Estuary (1970),

migratory shorebird populations have decreased to such an extent that some species, such as the Lesser Sand Plover, have become locally extinct while others are now present in counts of only 5 to 40 per cent of maximum numbers recorded in the 1970s.

While migratory shorebird populations have decreased significantly, non-migratory shorebirds such as Pied Oystercatcher, Sooty Oystercatcher and Red-necked Avocet have increased in the Hunter Estuary.

CONSERVATION AND ADAPTIVE MANAGEMENT

Shorebird responses to major infrastructure developments on Botany Bay

Chelsea Hankin[a], Joan Dawes and Phil Straw[a].

[a]Avifauna Research and Services.

Since 1990 construction of the third runway for Kingsford Smith Airport and a major expansion of Port Botany have had major impacts on important shorebird feeding and roosting sites on the north side of Botany Bay. Over the same period there has been some habitat degradation on the south side of the Bay, but no major development.

We have analysed summer shorebird populations on the north and south sides of Botany Bay from 1980 to 2012. Total shorebird numbers in the Bay have decreased by >50% during this period; on the north side the decline has been >80%, but on the south side only 20%. Bar-tailed Godwit are the most numerous migratory shorebird in Botany Bay and are found on both sides of the Bay. Their population has declined by >50%, but their distribution is relatively unchanged. By contrast, Curlew Sandpiper, Pacific Golden Plover and Red-necked Stint were largely found on the north side in the 1980s. Their numbers have declined dramatically and the great majority of those that remain are now found on the south side of the Bay. Whimbrel, which only occur on the south side of Botany Bay, have remained stable over this period.

Headlines, deadlines and sexing up - the role of media in conservation of shorebirds.

Karen Hunt

E-mail: gr.kehunt@bigpond.com

Conservation has lost its sex appeal – unless its a small bird vs a mining giant or the Japanese whaling fleet vs a band of hard core sea shepherds, many believe the media isn't interested in publishing stories about conservation issues or initiatives. It's hard to get airtime in the mainstream media for those issues that require a detailed analysis or which can't be explained in a 10 second sound byte. But whether it's through radio, TV, newspapers or social media, going public is still the best way to engage Mr and Mrs Ordinary in conservation issues, and through them, to get those issues on the national agenda.

So how does the conservation community get their agendas noticed in a very crowded media space? There are organisations and institutions, which use the media well, but for

many, engaging with the media is something to be avoided at all costs. The idea of developing a media strategy to run alongside research projects is even more foreign, but one which is being used by other industries very successfully. New technologies such as social and mobile media, and practices such as crowd sourcing and blogging offer new opportunities for spreading the conservation message but it will mean moving beyond comfortable boundaries.

The tricky question of how to monitor the ecological character of Australia's Ramsar sites to measure unacceptable change

David Milton[1], Peter Driscoll[2] and Sandra Harding[2]

[1]Australasian Wader Studies Group

[2] Queensland Wader Study Group

E-mail: david.milton@csiro.au

Nomination of a wetland as a Ramsar site involves demonstrating that the wetland meets at least one of the eight criteria. Two criteria refer directly to the wetland-dependent birds, including waders – the site must hold > 1% of the population of a migratory species or support > 20,000 wetland-dependent birds. The federal government recently established a process to obtain appropriate criteria by which to identify unacceptable changes to our Ramsar wetlands. These unacceptable ecological change criteria are intended to be used as a trigger for more targeted on-ground management actions to recover and maintain the integrity of the wetland.

Bowling Green Bay, about 50 km south of Townsville was nominated and listed as a Ramsar site in 1996. The nomination documented large aggregations of waterbirds within the site, particularly Brolga and Magpie Geese. Wader counts at Cape Bowling Green in the mid 1990s included a large count of Black-tailed Godwit (2,100) and Red-necked Stint (4,500) that exceeded the 1% criteria for both species. I will explore the tricky question of how to identify appropriate criteria for unacceptable change. This will show the critical role of wader count programs by volunteers in monitoring the ecological character of many Ramsar sites.

Human Dimensions of Managing Beach-nesting Birds

Weston, Michael; Maguire, Grainne; Miller, Kelly; Cullen, Meghan*; Henry, Stacey; Williams, Kathryn; Gouzerh, Alice; Young, Kirsten; Rimmer, James

BirdLife Australia

E-mail: Meghan.cullen@birdlife.org.au

The breeding success of beach-nesting birds is heavily impacted by human recreation on beaches. Awareness and understanding of threats, and minor adjustments to recreational behaviour are required to improve the conservation status of this suite of highly threatened birds.

We investigated human attitudes and values regarding three elements of beach-nesting bird conservation through a series of questionnaires and interactions with beach users, using the Hooded Plover as a flagship species: 1) the characteristics people value about beaches; 2) understanding of threats to Hooded Plovers and acceptance of the different management strategies available, and; 3) attitudes toward leashing dogs on beaches.

Our results show that beaches were regularly used by coastal residents of south-east Australia and that they value uncrowded, clean beaches with opportunities to view wildlife. Within Victoria, there were high levels of awareness about Hooded Plovers but there was considerable variation in the levels of understanding about mechanisms of threat to breeding birds. Dog owners in particular commonly did not perceive their dog as a threat to beach-nesting birds, and their propensity to leash their dog was subject to how they valued unleashed exercise for their dog's health and social pressures. These findings provide important insight into designing and improving education and awareness campaigns for beach-nesting birds.