

## 2023 EAAFP Small Grant Fund Application Form

### Part A.

#### A. Personal Details of Applicant

<b>Title:</b>	Dr. (Mr, Ms etc)	Zhu Family name	Bingrun Given Name/s
<b>Institution:</b>	1. University of Groningen (Global Flyway Network) / 2. Beijing Normal University		
<b>Institutional address:</b>	PO Box 11103		
<b>Degree type:</b>	PhD	Groningen Suburb or town	The Netherlands State or country
			9700 CC Postcode
	+86 18610953005 Primary contact number	+31 6 2990 7355 Mobile phone number	

**Email address:** drewbingrun@outlook.com

#### B. Relevant Working Group or Task Force Chair/Coordinator - DETAILS

Please contact the EAAFP Programme Officer if additional guidance is needed in relation to this section (programme@eaaflyway.net)

**Name of Working Group or Task Force:** Shorebird Working Group

<b>Title of Chair/Coordinator:</b>	Dr. (Mr, Ms etc)	Lanctot Family name	Richard Given Name/s
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**Email address:** richard\_lanctot@fws.gov

#### C. Eligibility of Projects

Please select "Yes" or "No" for each of the following questions:

- The focus of the project is migratory waterbirds and their habitats? Yes
- The project will improve the understanding of factors important for the conservation of migratory waterbirds and their habitats in the EAAFP? Yes
- The applicant agrees to provide a final report within 3 months of the completion of the project? Yes
- The applicant agrees to submit 1-2-page article and photographs for inclusion on EAAFP's website and/or write a brief article for the EAAFP's newsletter. Photographers will be acknowledged? Yes
- The applicant will acknowledge the support of the EAAFP in any publications, presentations and reports arising from this work? Yes

## D. Project Details

**Project Title:** Please provide a concise and informative title of your entire project (not just the component for which funds are sought)

### Invisible connections: Identifying routes, stopping sites and threats for both subspecies of Black-tailed Godwit in the East Asian-Australasian Flyway

#### Project Proposal:

**Details of your entire project (not just the component for which EAAFP funds are sought) (2.5 page maximum)**

##### 1. Objectives:

1. Map the distribution of the two Black-tailed Godwit subspecies that occur in the EAAF
2. Identify key stopping sites for both subspecies
3. Develop an ecological understanding of the subspecies' different distributions
4. Contribute samples to a concurrent study on the population genetics of godwits in the EAAF
5. Estimate flyway population size and trends for both subspecies
6. Communicate our findings to the public/stakeholders with a focus on scientific illustrations

##### 2. Background:

The Black-tailed Godwit (*Limosa limosa*; hereafter "godwit") is a globally near-threatened shorebird (BirdLife International 2017). Designated as a key species by EAAFP (<https://www.eaaflyway.net/key-species-of-eaafp/>), it is thought to be relatively common along the East-Asian Australasian Flyway (EAAF). However, there is a lack of fundamental information about the general biology of godwits along the flyway, including their habitat use, spatiotemporal distribution, and population estimates and trends. Moreover, until recently, *L.l. melanuroides* was thought to be the only godwit subspecies present in the EAAF (Zhu et al. 2021a), and all godwit observations and counts were classified as *melanuroides* by default. Our team's discovery of *L.l. bohaili* – a new genetically distinct and larger-bodied subspecies (Zhu et al. 2021a,b) – drastically changes this picture, and underscores how much still needs to be learned about this flyway. Our goal is to provide a solid ecological understanding of godwits in the EAAF by identifying the distribution, population size, population trends, stopover sites and ecology of each subspecies (see objectives). By filling these critical knowledge gaps, we aim to inform strategic and effective conservation of the flyway in the future.

In the past five years, our team (led by Dr. Zhu, the applicant) has already made inroads into the aforementioned objectives. For example, we used satellite transmitters to describe the annual routines of individual *bohaili* godwits (Zhu et al. 2021b), thereby discovering that Bohai Bay – which is in one of the most populated and industrialized regions of China and experiences both very high pollution levels and severe ecosystem loss due to land reclamation (Conklin et al. 2014, Ma et al. 2014, Melville et al. 2016, Piersma et al. 2016) – is a key stopping site for the *bohaili* subspecies. We also used this data in species-distribution models to predict the current and future breeding distribution of *bohaili* and *melanuroides* (Zhu et al. 2022), showing that *bohaili*'s breeding range is much smaller and more vulnerable to climate change than *melanuroides*'. Similarly, we used the identified morphological differences between the two subspecies (Zhu et al. 2021a) to predict the non-breeding ranges of the two subspecies based on biometric data gathered at 22 sites across nine countries in the EAAF (Zhu et al. 2023).

Though these results provide only the first insights into godwit ecology along the EAAF, they have already uncovered serious conservation concerns that underscore the need for further research. Several major anthropogenic threats to godwits were identified, including the warming climate, land reclamation, urbanization and pollution, but we currently have no idea how they are actually impacting the species. This is partly due to the general dearth of information on godwits in the flyway but also because what population data is available must be re-evaluated to incorporate the existence of two subspecies of differing morphology and with unknown distributions and ecology. Much basic information is missing; for example, the breeding location for *melanuroides* individuals that migrate along the Pacific Coast remains completely unknown. In this project, we want to continue filling some of the most pressing knowledge gaps: (1) map the spatiotemporal distribution of both subspecies, which will require tracking *melanuroides*, in order to (2) reassess previous flyway population estimates and trends, (3) identify key stopover sites for both subspecies and (4) develop an understanding of their different ecologies. Findings (e.g., breeding locations) and samples (e.g. blood, tissue) from this project will also be incorporated into a concurrent study on the population genetics of godwits in the EAAF (funded by the National Natural Science Foundation of China). We will communicate our findings with the public and other stakeholders using scientific illustrations and other media.

We are applying to the EAAFP for funds to conduct fieldwork in Northwest Australia, which is the first step toward fulfilling the aforementioned objectives. Resightings and biometrics from godwits banded in the area suggest they are mostly *melanuroides* migrating along the Pacific Coast (Zhu et al. 2023); *melanuroides* is the

subspecies for which the least is known about the spatiotemporal distribution, including a lack of information on their timing of migration, network of stopping sites and breeding distribution (which might be as far east as the Bering Strait). Thanks to previous experience catching godwits in Northwest Australia, our team already has the necessary local knowledge, permits and most of the gear. We plan to tag 30 Black-tailed Godwits with GPS/GSM transmitters (HQBP0803, 3.3 g) and collect molecular samples required by the population genetics study. We have already acquired the substantial funding required for transmitters (\$16000) and genetic analyses (\$10000), via Hunan Global Messenger Technology and the National Natural Science Foundation of China. Support from the EAAFP Small Grant Fund would be used to cover costs for the actual fieldwork, including travel and accommodation for Dr. Zhu, and as such would be an invaluable contribution to our project.

**3. Project plan, timeline and methods:**

**Project plan:** We will use cannon nets to capture Black-tailed Godwits at their high tide roosts in Roebuck Bay, Northwest Australia, with the goal of outfitting 30 individuals with satellite transmitters. These will be small, targeted catching efforts focused specifically on Black-tailed Godwits; this approach will yield small catches that can be processed quickly and with more attention given to the individual captured birds, while causing relatively little disturbance overall. Godwits suitable for satellite tagging will be selected from the captured birds and outfitted with a transmitter. The Australasian Wader Studies Group will process and release the remaining birds according to their standard procedures and existing permits as part of their ongoing research program on breeding success and migration patterns.

**Project timeline:** Our fieldwork will **start ~2023/10/5** and **end ~2023/10/25**. This targets a period of high tides occurring between 10 and 20 October, which will facilitate catching godwits with cannon nets at high tide roosts, with the added flexibility of catching earlier or later if conditions serve. This gives us  $\pm 20$  days to catch the desired 30 birds.

**Project methods:** Catching will take place using cannon nets set in locations favored specifically by roosting godwits. If necessary, cannon-netted birds will be shaded to prevent them from overheating before they are extracted. Captured individuals will be measured and given a metal ring and a colour-ring combination. A blood sample (10-50  $\mu$ l) and a feather sample will be collected from adult godwits. DNA samples will be saved in collection tubes containing 96% alcohol and stored in a refrigerator for subsequent sexing and genetic analyses. We will determine the age of captured godwits by the state of their flight feathers (Prater et al. 1977) and will select only healthy adults of >180 g for satellite tracking. Satellite transmitters will be outfitted using leg-loop harnesses, which have proven successful for this species (Zhu et al. 2021b).

**Project coordination:** This fieldwork will take place under the supervision of the project leader (Dr. Zhu) and the Australasian Wader Studies Group coordinator (Chris Hassell). Members and volunteers from the Australasian Wader Studies Group and the Broome Bird Observatory will assist with the fieldwork. The fieldwork will fully comply with the Australian Animal Welfare Standards and Guidelines, authorised by the Australian Government's Department of Agriculture, Water and the Environment.

**4. Likely benefit to the conservation of migratory waterbirds and their habitat / or key research outputs:**

We hope our work will ultimately contribute to all objectives outlined in the EAAFP Strategic Plan. Meeting these objectives will rely on fundamental ecological knowledge that is currently lacking – for example, it must be known which sites are used by godwits before it is possible to develop site partnerships, local capacity and flyway-wide conservation approaches for this EAAFP Key Species. Similarly, only by understanding population estimates and trends will it be possible to diagnose conservation needs and implement management.

Our initial contribution will therefore be especially important for EAAFP **Objective 3** by identifying sites of international importance (**KRA 3.3**), and gaining an understanding of their distribution and the potential impact of climate change (**KRA 3.4**, Zhu et al. 2023). Additionally, we expect that identifying sites will contribute to developing the Flyway Network of sites of international importance (**Objective 1, KRA 1.1**), as well as helping to uncover threats that should be addressed (**Objective 5, KRA 5.2**). Our findings will also allow us to reassess previous flyway population estimates and trends and make this updated knowledge available to the EAAFP and larger community (**KRA 3.2**). We believe that our work will be an important source of the basic knowledge required for these and other partnership objectives and their key research outputs.

We aim to enhance education, participation and awareness along the flyway (**Objective 2, KRA 2.1**) by sharing our findings with a wide audience – including groups not targeted by our scientific publications – using diverse media such as illustrations to present research results in an understandable and memorable way.

**5. Alignment with EAAFP Working Groups and Task Forces priorities:**

Our proposed project focuses on a Key Species of the EAAFP **Shorebird Working Group** and aligns with the following working group priorities:

1. Support identification and monitoring of internationally important shorebird sites.

	<ol style="list-style-type: none"> <li>2. Support conservation of shorebird species, especially priorities 2.2 (survey and monitoring of important sites), 2.3 (new and updated shorebird population trends) and 2.4 (migration ecology studies along the EAAF).</li> <li>3. Support capacity building for shorebird conservation and management; especially priorities 3.2 and 3.3, by involving local and international volunteers/members in Northwest Australia with shorebird biology and conservation.</li> <li>4. Enhance communication-related to shorebird conservation, especially priority 4.4, using various media (including artistic means such as scientific illustrations) to disseminate findings to a broad and varied audience.</li> </ol>
<p><b>6. Explain the part of your project for which you are seeking EAAFP funds in this Application</b> (provide details in the Project Budget section below):</p>	<p>We seek funding to cover fieldwork expenses in Australia, such as fieldwork equipment, accommodation, flight tickets, food, and vehicle rental. These funds will play a critical role in this project by enabling us to make use of the substantial funding we have already received for satellite tracking equipment and genetic analyses.</p>
<p><b>7. Scientific References cited in the Application:</b></p>	<ul style="list-style-type: none"> <li>• BirdLife International 2017. <i>Limosa limosa</i> (amended version of 2016 assessment). The IUCN Red List of Threatened Species 2017: e.T22693150A111611637.</li> <li>• <a href="http://dx.doi.org/10.2305/IUCN.UK.2017-1.RLTS.T22693150A111611637.en">http://dx.doi.org/10.2305/IUCN.UK.2017-1.RLTS.T22693150A111611637.en</a>.</li> <li>• Conklin, J.R., Verkuil, Y.I. &amp; Smith, B.R. 2014. Prioritizing Migratory Shorebirds for Conservation Action on the East Asian-Australasian Flyway. Hong Kong: WWF-Hong Kong. <a href="https://eaaflyway.net/wp-content/uploads/2018/01/wwf_prioritization_finalpdf.pdf">https://eaaflyway.net/wp-content/uploads/2018/01/wwf_prioritization_finalpdf.pdf</a></li> <li>• Ma, Z., Melville, D.S., Liu, J., Chen, Y., Yang, H., Ren, W., Zhang, Z., Piersma, T. &amp; Li, B. 2014. Rethinking China's new great wall. <i>Science</i> 346: 912–914.</li> <li>• Melville, D.S., Chen, Y. &amp; Ma, Z. 2016. Shorebirds along the Yellow Sea coast of China face an uncertain future – a review of threats. <i>Emu</i> 116: 100–110.</li> <li>• Piersma, T., Lok, T., Chen, Y., Hassell, C.J., Yang, H.Y., Boyle, A., Slaymaker, M., Chan, Y.C., Melville, D.S., Zhang, Z.W. and Ma, Z., 2016. Simultaneous declines in summer survival of three shorebird species signals a flyway at risk. <i>Journal of Applied Ecology</i> 53: 479-490.</li> <li>• Prater, A.J., Marchant, J.H. &amp; Vuorinen, J. 1977. Guide to the Identification and Aging of Holarctic Waders. British Trust for Ornithology, Thetford.</li> <li>• Zhu, B.R., Verkuil, Y.I., Conklin, J.R., Yang, A., Lei, W., Alves, J.A., Hassell, C.J., Dorofeev, D., Zhang, Z. &amp; Piersma, T., 2021a. Discovery of a morphologically and genetically distinct population of Black-tailed Godwits in the East Asian-Australasian Flyway. <i>Ibis</i> 163: 448-462.</li> <li>• Zhu, B.R., Verhoeven, M.A., Loonstra, A.J., Sanchez-Aguilar, L., Hassell, C.J., Leung, K.K., Lei, W., Zhang, Z. &amp; Piersma, T., 2021b. Identification of breeding grounds and annual routines of the newly discovered bohail subspecies of Black-tailed Godwits. <i>Emu-Austral Ornithology</i>, 121(4), pp.292-302.</li> <li>• Zhu, B.R., Verhoeven, M.A., Saragoni, N.V., Zhang, Z. &amp; Piersma, T., 2022. Current breeding distributions and predicted range shifts under climate change in two subspecies of Black-tailed Godwits in Asia. <i>Global Change Biology</i> 28: 5416-5426.</li> <li>• Zhu, B.R., Verhoeven, M.A., Hassell, C.J., Leung, K.K., Dorofeev, D., Ma, Q., Eiamampai, K., Coleman, J.T., Tserenbat, U., Purev-Ochir, G. &amp; Li, D., 2023. Predicting the non-breeding distributions of the two Asian subspecies of Black-tailed Godwit using morphological information. <i>Avian Research</i> 14: 100069.</li> </ul>
<p><b>8. How will any continuing COVID restrictions be managed for project delivery?:</b></p>	<p>Project members will comply with COVID restrictions (e.g. pertaining to travel, testing, vaccination, and indoor or outdoor gatherings) that are in effect during this project, following guidelines from the Australian government and other relevant national or international agencies. Current COVID policies do not impede our proposed project.</p>

**Part B. FOR CONFERENCE APPLICANTS ONLY**

*(For Task Force or Working Group members delivering their own work as a presentation, paper or poster)*

<p><b>Conference Title:</b></p>	<p><b>Location:</b></p>	<p><b>Date:</b></p>
<p><b>Presentation Abstract</b> (250 word maximum):</p>		

**Part C. FOR ALL APPLICANTS**

**Experience Relevant to Project:**

Project leader Dr. Bing-Run Zhu is an ecologist with nearly a decade of experience in shorebird research. He is experienced in shorebird monitoring, capturing, ringing and satellite tagging. Dr. Zhu received systematic training in fieldwork as a member of the University of Groningen’s long-time Black-tailed Godwit project in the Netherlands. Since 2015, he has been involved in shorebird fieldwork in Asia, Oceania, and Europe, including organising and leading four godwit research expeditions in Northern China and Mongolia.

Project coordinator Chris Hassell is the State Conservation Officer (Western Australia) of the Australasian Wader Studies Group (AWSG). Mr. Hassell has been ringing shorebirds in the proposed study area for over 20 years and has extensive experience with many species including godwits. He is a licensed and highly skilled cannon net user.

All birds will be captured using cannon nets with supervision and assistance from Mr. Hassell and other experienced AWSG officers and members. Cannon netting involves firing a net over a group of birds roosting on the ground, and is a widely-used method for capturing shorebirds. The AWSG is extremely skilled at this procedure, having used cannon netting to capture more than 100,000 shorebirds in Western Australia in the past 30 years as part of its ongoing banding program.

Please **also** attach a maximum 2-page CV or list non-academic research experience and experience with migratory waterbirds/conservation e.g. work experience, volunteer experience, bird banding, birdwatching.

**E. Project Budget** (please outline costs of your entire project, not just the component(s) for which funds are being sought from EAAFP)

	Item (Please list)	Budget (USD)	Co-funding acquired (source and amount in USD)	Co-funding applied for (source and amount in USD)	Support requested from EAAFP (USD)
Equipment: (details)	<i>Transmitters Ringing tools Walkie talkies</i>	16160	<i>16000 (30 satellite transmitters, National Natural Science Foundation of China &amp; Hunan Global Messenger Technology)</i>		160
Consumable items (details)	<i>Gas</i>	750			750
Travel and accommodation (details)	<i>Accommodation Car rental Flight ticket</i>	3300			3300
Computing & clerical (details)	<i>Labwork &amp; analysis</i>	10000	<i>10000 (Population genetics study, National Natural Science Foundation of China)</i>		0
Other (details)	<i>Food</i>	700			700
<b>Total amount requested from EAAFP Small Grants Fund:</b> (in USD)					<b>4910</b>

**Budget justification:** Please provide brief description and justification of all major budgetary items requested, indicating any that are essential to the project and/or conference for which you are applying (250 word maximum):

*The National Natural Science Foundation of China and Hunan Global Messenger Technology have provided the bulk of the funding necessary for this project, enabling us to acquire satellite transmitters and fund genetic analyses. We are applying to the EAAFP Small Grant*

*Fund to offset fieldwork expenses; this requested support is essential to making use of our existing funding and successfully completing this project. Funding for travel, accommodation, gas, and food will enable project leader Dr. Zhu to travel to the study site in Northwest Australia and conduct the proposed research; walkie talkies are necessary for Dr. Zhu's team to safely and effectively coordinate the deployment of cannon nets.*

*Breakdown of expenditures:*

- **Equipment:**

*Walkie talkies:  $\$20 \times 4 \text{ pieces} = \$80$*

*Ringing tools:  $\$80 \times 1 \text{ set} = \$80$*

- **Consumable items:**

*Gas: ca.  $\$1.5/\text{km} \times 25 \text{ km} \times 20 \text{ days} = \$750$*

- **Travel and accommodation:**

*Accommodation at Broome Bird Observatory:  $\$40 \times 20 \text{ days} = \$800$*

*Car rental in Broome:  $\$40 \times 20 \text{ days} = \$800$*

*Round trip flight ticket between Beijing and Broome:  $\$1700$*

*Total =  $\$3300$*

- **Other:**

*Food:  $\$35 \times 20 \text{ days} = \$700$*

## F. Declaration

I have discussed the contents of this Application with the relevant Chair/s and Coordinator/s of relevant Working Group and/or Task Forces and I certify that to the best of my knowledge all documentation and information submitted or made available by me is true, accurate and complete.

By ticking the box you are agreeing to the above statement:

## G. Application Checklist

All relevant sections of this Application have been completed.	Yes
Full payment details have been provided on the final page.	Yes
Application is being submitted electronically as one single document.	Yes
Application is being submitted in MS Word format.	Yes
Application has been discussed with the relevant Chair/s and Coordinator/s of relevant working Group and/or Task Forces and these have been carbon copied (cc) to this application submission as evidence they have seen and approved this Application.	Yes

Applications that do not comply with these guidelines will be returned to the applicant.

## Application Submission

Please email your Application as a single document to:  
[secretariat@eaaflyway.net](mailto:secretariat@eaaflyway.net)

EAAFP will acknowledge the receipt of your Application.

**Applications close at 5pm (KST) on 6 February 2023**  
**Results will be announced on 7 March 2023 on EAAFP Webpage and via email**

### OFFICE USE ONLY:

Decision:

Authorised: \_\_\_/\_\_\_/\_\_\_

Entered: \_\_\_/\_\_\_/\_\_\_

Comments:

Lead Investigator Advised: \_\_\_/\_\_\_/\_\_\_

**PLEASE COMPLETE PAYMENT DETAILS ON FINAL PAGE**

## PAYMENT DETAILS

To ensure prompt payment of successful applications please complete the following details and submit with your Application.

### PREFERRED PAYMENT METHOD

Electronic funds transfer (EFT)

## GRANT CONDITIONS

**In accordance with the application criteria, the following conditions must be met:**

- Funds are to be strictly exempt from organisational administration charges.
- You are required to submit one copy by email of the final report within 3 months of the completion of the project.
- You are required to acknowledge the EAAFP and the Small Grant Fund in any presentations, publications, reports or promotional material arising from this work. Please email [secretariat@eaaflyway.net](mailto:secretariat@eaaflyway.net) in order to obtain an electronic copy of EAAFP logo for use on any display material you will be preparing.
- You may be requested to write a brief article for the EAAFP newsletter.
- You are required to provide EAAFP with an electronic copy of your final report at the completion of your project, as well as a copy of any publications that result from your grant.