



Supplement

The following supplementary materials are available for this article: Chen, W.-J., Chang, A.-Y., Lin, R.-S., Lee, P.-F. 2024 Mapping winter waterbird biodiversity hotspots for conservation prioritization: Bridging gaps using citizen science data. *Taiwania* 69(2): 266-274. doi: [10.6165/tai.2024.69.266](https://doi.org/10.6165/tai.2024.69.266)

Appendix 1. The species list in this study. Migratory Status (Ding *et al.*, 2023): RC: Resident and Common (70%~100% chance); RU: Resident and Uncommon (30%~70% chance); RO: Resident and Occasional (<30% chance); WC: Winter Visitor and Common (70%~100% chance); WU: Winter Visitor and Uncommon (30%~70% chance); WO: Winter Visitor and Occasional (<30% chance); SC: Summer Visitor and Common (70%~100% chance); SU: Summer Visitor and Uncommon (30%~70% chance); SO: Summer Visitor and Occasional (<30% chance); TC: Transient Migrant and Common (70%~100% chance); TU: Transient Migrant and Uncommon (30%~70% chance); TO: Transient Migrant and Occasional (<30% chance); IU: Introduced Species and Uncommon (30%~70% chance)

ID	Family	Vernacular Name	Common Name	Scientific Name	Migratory Status	IUCN Red List Category (2019)	National Red List Category (2016)
4	Anatidae	鴻雁	Swan Goose	<i>Anser cygnoides</i>	WO	VU	
5	Anatidae	白額雁	Greater White-fronted Goose	<i>Anser albifrons</i>	WO	LC	
7	Anatidae	寒林豆雁	Taiga Bean-Goose	<i>Anser fabalis</i>	WO	LC	
8	Anatidae	凍原豆雁	Tundra Bean-Goose	<i>Anser serrirostris</i>	WO		
11	Anatidae	小天鵝	Tundra Swan	<i>Cygnus columbianus</i>	WO	LC	
13	Anatidae	濱鳧	Ruddy Shelduck	<i>Tadorna ferruginea</i>	WO	LC	
14	Anatidae	花鳧	Common Shelduck	<i>Tadorna tadorna</i>	WO	LC	
15	Anatidae	棉鴨	Cotton Pygmy-Goose	<i>Nettapus coromandelianus</i>	WO	LC	
16	Anatidae	鴛鴦	Mandarin Duck	<i>Aix galericulata</i>	RO/TO	LC	VU
17	Anatidae	巴鴨	Baikal Teal	<i>Sibirionetta formosa</i>	WO	LC	
18	Anatidae	白眉鴨	Garganey	<i>Spatula querquedula</i>	WO/TC	LC	LC
19	Anatidae	琵嘴鴨	Northern Shoveler	<i>Spatula clypeata</i>	WC	LC	LC
20	Anatidae	赤膀鴨	Gadwall	<i>Mareca strepera</i>	WU	LC	
21	Anatidae	羅文鴨	Falcated Duck	<i>Mareca falcata</i>	WO	NT	VU
22	Anatidae	赤頸鴨	Eurasian Wigeon	<i>Mareca penelope</i>	WC	LC	LC
25	Anatidae	花嘴鴨	Eastern Spot-billed Duck	<i>Anas zonorhyncha</i>	RC/WU	LC	LC
26	Anatidae	綠頭鴨	Mallard	<i>Anas platyrhynchos</i>	WO/IU	LC	
27	Anatidae	尖尾鴨	Northern Pintail	<i>Anas acuta</i>	WC	LC	LC
28	Anatidae	小水鴨	Green-winged Teal	<i>Anas crecca</i>	WC	LC	VU
31	Anatidae	紅頭潛鴨	Common Pochard	<i>Aythya ferina</i>	WO	VU	
33	Anatidae	白眼潛鴨	Ferruginous Duck	<i>Aythya nyroca</i>	WO	NT	
34	Anatidae	青頭潛鴨	Baer's Pochard	<i>Aythya baeri</i>	WO	CR	CR
35	Anatidae	鳳頭潛鴨	Tufted Duck	<i>Aythya fuligula</i>	WC	LC	LC
36	Anatidae	斑背潛鴨	Greater Scaup	<i>Aythya marila</i>	WO	LC	
40	Anatidae	白秋沙	Smew	<i>Mergellus albellus</i>	WO	LC	
42	Anatidae	紅胸秋沙	Red-breasted Merganser	<i>Mergus serrator</i>	WO	LC	
43	Anatidae	唐秋沙	Scaly-sided Merganser	<i>Mergus squamatus</i>	WO	EN	
52	Podicipedidae	小鸕鷀	Little Grebe	<i>Tachybaptus ruficollis</i>	RC/WC	LC	LC
55	Podicipedidae	冠鸕鷀	Great Crested Grebe	<i>Podiceps cristatus</i>	WO	LC	
56	Podicipedidae	黑頭鸕鷀	Eared Grebe	<i>Podiceps nigricollis</i>	WO	LC	
97	Rallidae	東亞秧雞	Brown-cheeked Rail	<i>Rallus indicus</i>	WO	LC	
98	Rallidae	灰胸秧雞	Slaty-breasted Rail	<i>Lewinia striata</i>	RU	LC	
100	Rallidae	紅冠水雞	Eurasian Moorhen	<i>Gallinula chloropus</i>	RC	LC	LC
101	Rallidae	白冠雞	Eurasian Coot	<i>Fulica atra</i>	WU	LC	LC
104	Rallidae	董雞	Watercock	<i>Gallicrex cinerea</i>	RO/SO	LC	VU
105	Rallidae	白腹秧雞	White-breasted Waterhen	<i>Amauornis phoenicurus</i>	RC	LC	LC
107	Rallidae	灰腳秧雞	Slaty-legged Crake	<i>Rallina eurizonoides</i>	RU	LC	
108	Rallidae	緋秧雞	Ruddy-breasted Crake	<i>Zapornia fusca</i>	RC	LC	LC
111	Rallidae	小秧雞	Baillon's Crake	<i>Zapornia pusilla</i>	WO	LC	
119	Recurvirostridae	高蹺鴛	Black-winged Stilt	<i>Himantopus himantopus</i>	RC/WC	LC	LC
121	Recurvirostridae	反嘴鴛	Pied Avocet	<i>Recurvirostra avosetta</i>	WC	LC	LC



123	Charadriidae	灰斑鴉	Black-bellied Plover	<i>Pluvialis squatarola</i>	WC	LC	NT
124	Charadriidae	太平洋金斑鴉	Pacific Golden-Plover	<i>Pluvialis fulva</i>	WC	LC	LC
125	Charadriidae	小瓣鴉	Northern Lapwing	<i>Vanellus vanellus</i>	WU	NT	LC
126	Charadriidae	跳鴉	Gray-headed Lapwing	<i>Vanellus cinereus</i>	WO/TO	LC	
127	Charadriidae	蒙古鴉	Lesser Sand-Plover	<i>Charadrius mongolus</i>	WU/TC	LC	LC
128	Charadriidae	鐵嘴鴉	Greater Sand-Plover	<i>Charadrius leschenaultii</i>	WU/TC	LC	NT
129	Charadriidae	東方環頸鴉	Kentish Plover	<i>Charadrius alexandrinus</i>	RU/WC	LC	LC
131	Charadriidae	環頸鴉	Common Ringed Plover	<i>Charadrius hiaticula</i>	WO/TO	LC	
132	Charadriidae	劍鴉	Long-billed Plover	<i>Charadrius placidus</i>	WO	LC	
133	Charadriidae	小環頸鴉	Little Ringed Plover	<i>Charadrius dubius</i>	RU/WC	LC	LC
135	Rostratulidae	彩鴉	Greater Painted-Snipe	<i>Rostratula benghalensis</i>	RC	LC	LC
136	Jacanidae	水雉	Pheasant-tailed Jacana	<i>Hydrophasianus chirurgus</i>	RU/TO	LC	VU
137	Scolopacidae	中杓鴉	Whimbrel	<i>Numenius phaeopus</i>	WU/TC	LC	LC
139	Scolopacidae	鵞鴉	Far Eastern Curlew	<i>Numenius madagascariensis</i>	WO/TU	EN	EN
140	Scolopacidae	大杓鴉	Eurasian Curlew	<i>Numenius arquata</i>	WU	NT	VU
141	Scolopacidae	斑尾鴉	Bar-tailed Godwit	<i>Limosa lapponica</i>	WO/TU	NT	VU
142	Scolopacidae	黑尾鴉	Black-tailed Godwit	<i>Limosa limosa</i>	WO/TU	NT	VU
143	Scolopacidae	翻石鴉	Ruddy Turnstone	<i>Arenaria interpres</i>	WC/TC	LC	LC
144	Scolopacidae	大濱鴉	Great Knot	<i>Calidris tenuirostris</i>	WO/TU	EN	EN
145	Scolopacidae	紅腹濱鴉	Red Knot	<i>Calidris canutus</i>	WO/TU	NT	VU
146	Scolopacidae	流蘇鴉	Ruff	<i>Calidris pugnax</i>	WO	LC	
150	Scolopacidae	彎嘴濱鴉	Curlew Sandpiper	<i>Calidris ferruginea</i>	WO/TC	NT	LC
151	Scolopacidae	丹氏濱鴉	Temminck's Stint	<i>Calidris temminckii</i>	WO	LC	VU
152	Scolopacidae	長趾濱鴉	Long-toed Stint	<i>Calidris subminuta</i>	WU	LC	LC
154	Scolopacidae	紅胸濱鴉	Red-necked Stint	<i>Calidris ruficollis</i>	WC	NT	VU
155	Scolopacidae	三趾濱鴉	Sanderling	<i>Calidris alba</i>	WU	LC	LC
156	Scolopacidae	黑腹濱鴉	Dunlin	<i>Calidris alpina</i>	WC	LC	VU
157	Scolopacidae	小濱鴉	Little Stint	<i>Calidris minuta</i>	WO/TO	LC	
162	Scolopacidae	長嘴半蹼鴉	Long-billed Dowitcher	<i>Limnodromus scolopaceus</i>	WO	LC	
164	Scolopacidae	山鴉	Eurasian Woodcock	<i>Scolopax rusticola</i>	WU	LC	LC
167	Scolopacidae	田鴉	Common Snipe	<i>Gallinago gallinago</i>	WC	LC	LC
168	Scolopacidae	針尾鴉	Pin-tailed Snipe	<i>Gallinago stenura</i>	WO/TC	LC	LC
169	Scolopacidae	中地鴉	Swinhoe's Snipe	<i>Gallinago megala</i>	WO/TC	LC	LC
173	Scolopacidae	磯鴉	Common Sandpiper	<i>Actitis hypoleucos</i>	WC	LC	LC
174	Scolopacidae	白腰草鴉	Green Sandpiper	<i>Tringa ochropus</i>	WU	LC	LC
177	Scolopacidae	鶴鴉	Spotted Redshank	<i>Tringa erythropus</i>	WO	LC	LC
178	Scolopacidae	青足鴉	Common Greenshank	<i>Tringa nebularia</i>	WC	LC	LC
179	Scolopacidae	諾氏鴉	Nordmann's Greenshank	<i>Tringa guttifer</i>	WO/TO	EN	EN
181	Scolopacidae	小青足鴉	Marsh Sandpiper	<i>Tringa stagnatilis</i>	WU/TC	LC	LC
182	Scolopacidae	鷹斑鴉	Wood Sandpiper	<i>Tringa glareola</i>	WC/TC	LC	LC
183	Scolopacidae	赤足鴉	Common Redshank	<i>Tringa totanus</i>	WC	LC	LC
195	Laridae	三趾鷗	Black-legged Kittiwake	<i>Rissa tridactyla</i>	WO	VU	
197	Laridae	黑嘴鷗	Saunders's Gull	<i>Saundersilarus saundersi</i>	WU	VU	CR
199	Laridae	紅嘴鷗	Black-headed Gull	<i>Chroicocephalus ridibundus</i>	WC	LC	LC
205	Laridae	漁鷗	Pallas's Gull	<i>Ichthyaeus ichthyaeus</i>	WO		
206	Laridae	黑尾鷗	Black-tailed Gull	<i>Larus crassirostris</i>	WU/TU	LC	LC
207	Laridae	歐亞海鷗	Common Gull	<i>Larus canus</i>	WO	LC	
208	Laridae	銀鷗	Herring Gull	<i>Larus argentatus</i>	WO	LC	
209	Laridae	小黑背鷗	Lesser Black-backed Gull	<i>Larus fuscus</i>	WO	LC	
210	Laridae	灰背鷗	Slaty-backed Gull	<i>Larus schistisagus</i>	WO	LC	
217	Laridae	小燕鷗	Little Tern	<i>Sternula albifrons</i>	RU/SU	LC	NT
218	Laridae	鷗嘴燕鷗	Gull-billed Tern	<i>Gelochelidon nilotica</i>	WO/TU	LC	LC
219	Laridae	裏海燕鷗	Caspian Tern	<i>Hydroprogne caspia</i>	WU	LC	LC



221	Laridae	白翅黑燕鷗	White-winged Tern	<i>Chlidonias leucopterus</i>	WO/TC	LC	LC
222	Laridae	黑腹燕鷗	Whiskered Tern	<i>Chlidonias hybrida</i>	WC/TC	LC	LC
255	Ciconiidae	黑鸛	Black Stork	<i>Ciconia nigra</i>	WO/TO	LC	
256	Ciconiidae	東方白鸛	Oriental Stork	<i>Ciconia boyciana</i>	WO	EN	EN
264	Phalacrocoraciidae	鸕鷀	Great Cormorant	<i>Phalacrocorax carbo</i>	WC	LC	LC
265	Phalacrocoraciidae	丹氏鸕鷀	Japanese Cormorant	<i>Phalacrocorax capillatus</i>	WO	LC	
267	Ardeidae	大麻鷺	Great Bittern	<i>Botaurus stellaris</i>	WO	LC	
268	Ardeidae	黃小鷺	Yellow Bittern	<i>Ixobrychus sinensis</i>	RU/SU	LC	LC
270	Ardeidae	栗小鷺	Cinnamon Bittern	<i>Ixobrychus cinnamomeus</i>	RU	LC	LC
271	Ardeidae	黃頭黑鷺	Black Bittern	<i>Ixobrychus flavicollis</i>	WO/TO	LC	
272	Ardeidae	蒼鷺	Gray Heron	<i>Ardea cinerea</i>	WC	LC	LC
273	Ardeidae	紫鷺	Purple Heron	<i>Ardea purpurea</i>	ROMWO	LC	LC
274	Ardeidae	大白鷺	Great Egret	<i>Ardea alba</i>	RU/SU/ WC	LC	LC
275	Ardeidae	中白鷺	Intermediate Egret	<i>Ardea intermedia</i>	SO/WC	LC	LC
277	Ardeidae	唐白鷺	Chinese Egret	<i>Egretta eulophotes</i>	WO/TU	VU	VU
278	Ardeidae	小白鷺	Little Egret	<i>Egretta garzetta</i>	RU/SC/ WC/TC	LC	LC
279	Ardeidae	岩鷺	Pacific Reef-Heron	<i>Egretta sacra</i>	RU	LC	LC
281	Ardeidae	黃頭鷺	Cattle Egret	<i>Bubulcus ibis</i>	RU/SC/ WC/TC	LC	LC
283	Ardeidae	池鷺	Chinese Pond-Heron	<i>Ardeola bacchus</i>	WO	LC	LC
285	Ardeidae	綠裳鷺	Striated Heron	<i>Butorides striata</i>	RU/TO	LC	LC
286	Ardeidae	夜鷺	Black-crowned Night-Heron	<i>Nycticorax nycticorax</i>	RC/WO/ TO	LC	LC
292	Threskiornithidae	黑頭白鸛	Black-headed Ibis	<i>Threskiornis melanocephalus</i>	WO/TO	NT	
294	Threskiornithidae	白琵鷺	Eurasian Spoonbill	<i>Platalea leucorodia</i>	WO	LC	
295	Threskiornithidae	黑面琵鷺	Black-faced Spoonbill	<i>Platalea minor</i>	WU/TO	EN	NT

IUCN Red List Categories: CR, Critically Endangered; EN, Endangered; VU, Vulnerable; NT, Near Threatened; LC, Least Concern

Appendix 2. The winter waterbird hotspots in Taiwan.

Data of Figure 1 can be downloaded at <https://pid.depositar.io/ark:37281/k57302t0v>

Column metadata attributes:

n_criteria: 0~5, number of the grid met criteria, and the NULL was data deficient;
 c_01: 0 or 1, 0: not met the criterion of species richness; 1: met the criterion;
 c_02: 0 or 1, 0: not met the criterion of abundance; 1: met the criterion;
 c_03: 0 or 1, 0: not met the criterion of national importance; 1: met the criterion;
 c_04: 0 or 1, 0: not met the criterion of regional importance; 1: met the criterion;
 c_05: 0 or 1, 0: not met the criterion of local importance; 1: met the criterion.