Taiwan New Year 2021 Annual Report

BIRD COUNT

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Preface & Acknowledgements

Lin Da-li

At the time of writing, Taiwan is currently under a Level Three COVID-19 alert which began in May. Level Three restrictions limit certain activities as well as the ability to gather in groups. However, the 8th Taiwan New Year Bird Count (Taiwan NYBC) was conducted between December 2020 and January 2021, before the level change. The organizers are therefore able to once again present an uninterrupted look at the situation facing migratory birds along the East Asian-Australasian Flyway (EAAF) in 2021. It is hoped that the current Covid situation will stabilize soon and that people will be able to get vaccinated before the next count. With that in mind, the organizers wish to remind readers to follow the rules and guidelines put in place by local authorities to mitigate against the impacts of the current pandemic: stay at home if you can, wear face masks, wash your hands well, and get vaccinated. We are all in this together!

The Taiwan NYBC is a citizen science project which aims to monitor the status and trends of migratory waterbirds in Taiwan proper and its outlying islands. This 8th report represents the results of 2021, and was conducted between December 19, 2020 and January 10, 2021. During the survey, 1,054 participants recorded 328,453 bird individuals from 337 species in 173 circle samples.

These survey results provide comprehensive insights into the distribution and community composition of the wintering avifauna of Taiwan. This has importance for conservation goals along the EAAF as it offers an in depth look at the site usage of a number of migratory bird species. The data is also shared with Wetlands International for use in the Asian Waterbird Census. The organizers would like to express their deep gratitude and appreciation to all the participants, NGOs, donors, and sponsors without whom the Taiwan NYBC would not be possible.

Taiwanese researchers have used NYBC data collected between 2014 and 2021 to create population trajectories to better understand the situation on the ground for migratory waterbirds. Models have been made for Taiwan proper as well as three areas considered migratory bird hotspots: (1) the Changhua Coast in western Taiwan, (2) the Chianan Coast in southwestern Taiwan, and (3) the Yilan Plain in northeastern Taiwan. Of these three areas, the situation in the Yilan Plain is most concerning, with 15 species of waterbird showing significant population declines. This phenomenon was first recognized last year and this year's data shows no change. The data also showed that Eurasian Moorhen (*Gallinula chloropus*) numbers have decreased dramatically in all areas. Meanwhile, a government-led removal of invasive African Sacred Ibis (*Threskiornis aethiopicus*) which began in 2019 has had a positive impact on results for resident species. More good news is that the Taiwan NYBC 2021 mascot, the Kentish Plover (*Charadrius alexndrinus*), maintained stable numbers, even showing a gradual increase in most parts of Taiwan aside from the Yilan Plain. This is promising considering it is one of the major migratory shorebird species found on Taiwan's tidal flats. Little Ringed Plovers (*Chaeadrius dubius*) and Black-bellied Plovers (*Pluvialis squatarola*) also showed significant increases in the Changhua Coast area. Population numbers for other shorebird species decreased significantly however. These numbers serve as a warning for researchers and conservationists that more must be done to ensure the survival of waterbird species in Taiwan, including maintaining and improving

the condition of critical habitats such as the tidal flats at the Dadu River Mouth Wildlife Refuge in Changhua County. Maintaining these tidal flats is one of the most important actions that can be taken towards that end. Appropriate conservation actions should also be developed accordingly.

The issue of tidal flat conservation in Taiwan is part of a larger problem facing the EAAF as a whole. Over the last two decades there has been a dramatic decrease in the number of the migratory waterbirds using the migration superhighway, and one of the major factors behind it has been the loss of tidal flats over the last forty years. Tidal flats provide diverse ecosystem functions and services for both wildlife and humans, such as mitigating against the impacts of coastal erosion and the effects of sea-level rise on coastal communities. Moreover, the high abundance of invertebrates and plankton in tidal flats serve as an invaluable food source for migratory shorebirds. Yet unfortunately, tidal flat loss has become a serious problem in many parts of the world, especially in the area around the Yellow Sea in East Asia. The organizers are heartened to see that through coordinated international efforts, World Heritage status has been granted to tidal flats in both China and South Korea. These are important steps to help migratory waterbirds on a global scale. Congratulations to all those involved in these efforts!

The EAAF constitutes one of the most diverse flyways in the world, spanning over 20 countries with different cultures, geographies, politics, and levels of development. Therefore, launching an international monitoring network for it, the world's largest flyway, presents a massive challenge. However, most countries along the EAAF have already created their own nationwide monitoring projects. This includes Taiwan. Yet the data collected only represents the status of birds in a single part of the flyway, just part of the story. Recently, an article in Australian Zoologist reviewed the factors that have hindered the emergence of a flyway-wide shorebird monitoring scheme for the EAAF. These include fragmentation of monitoring databases, low data readiness, inadequate metadata, and survey coverage gaps. The article went on to explain that it will only be through international cooperation and technical skill sharing that solutions to these issues may be found.

The fact is that migration routes cross many boundaries and span many countries. Therefore, all hands are needed to get the full picture. One small, but important example, is that of a globally threatened Far-eastern Curlew named "AAD". It was banded by a team at the University of Queensland, and arrived in southern Taiwan on March 22nd, 2021. A Taiwanese birder, Mr. Li Zheng-feng (李　正　峰), spotted the bird as she foraged along a river bank in Tainan and let others know. This caused great excitement in both Taiwan and Australia since Mr. Li, through this simple act, provided an important piece to solving the puzzle that is bird migration patterns! Birds don't know borders, so it is only through collective efforts that the conservation needs of migratory bird species can be properly addressed. As members of the global community, Taiwan will continue to do its best to monitor, share information on, and conserve the migratory birds along this major flyway.

The Taiwan NYBC is organized by the Taiwan Wild Bird Federation (TWBF), the Wild Bird Society of Taipei (WBST), the Kaohsiung Wild Bird Society (KWBS) and the Taiwan Endemic Species Research Institute (TESRI). The organizers would also like to give special thanks to Allen Lyu (呂 翊 維 TWBF), Scott Pursner (潘森識 TWBF), Chiang Kung-kuo (蔣 功國 WBST), Lin Kun-hai (林昆海 KWBS), Lin Ruey-shing (林 瑞 興 TESRI), Tsai Chih-yi (蔡 芷 怡 TESRI) and Lin Da-li (林大利 TESRI) for their tireless effort in making the Taiwan NYBC 2021 a reality.

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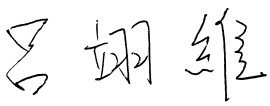
Forward from our Friends

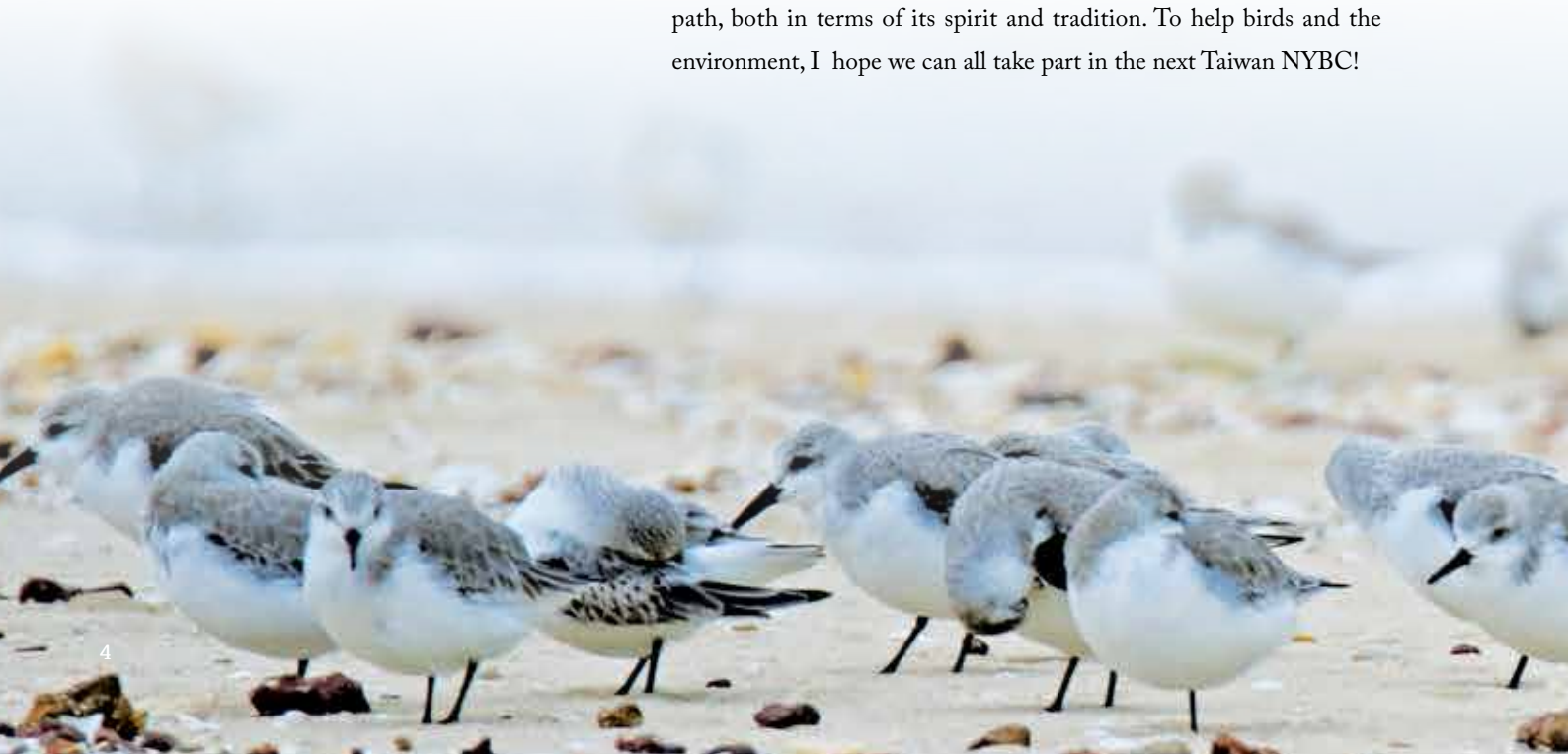


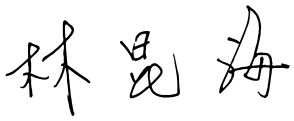
Allen Lyu
Secretary-General, Taiwan Wild Bird Federation

It is incredible to think that the Taiwan New Year Bird Count is already in its EIGHTH year! The NYBC has a special place in my heart as it was the first work assignment of my professional career. Now, as one of the core organizers of this project, it is really meaningful to see how the birding community comes together for this event year after year. The passion of volunteers is the driving force behind the Taiwan NYBC and the thing that inspires me to continue working on and promoting citizen science projects.

As an avid birder, I am able to help "do the count" at many sites. But there is more to it than just science and study. For many birders it's a time for making new friends and reuniting with old ones. This is why we call it a "Carnival" instead of "field work" in Mandarin. It is my hope, and the hope of all the organizers, that participants have good birding experiences, creating wonderful memories at their sites and along their routes year after year. Over 1,000 birders join the Taiwan NYBC annually, recording over 300,000 birds from over 330 species. This citizen science project is really a shining star of community conservation for the East Asian-Australasian Flyway.

Just as the Christmas Bird Count has now been conducted for 120 years, it is my sincere hope that the NYBC can follow the same path, both in terms of its spirit and tradition. To help birds and the environment, I hope we can all take part in the next Taiwan NYBC!





Lin Kun-hai

Executive Secretary, Kaohsiung Wild Bird Society

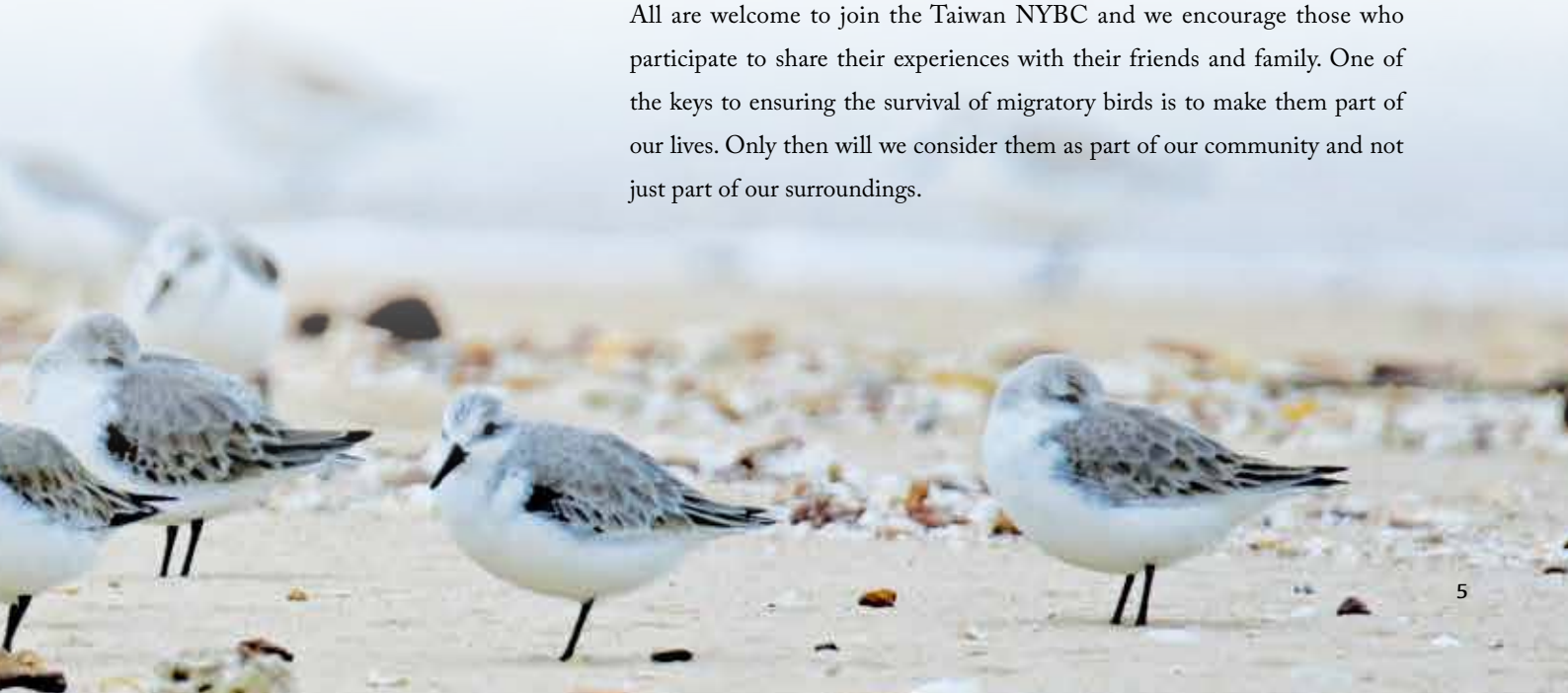
The Taiwan New Year Bird Count, a nationwide citizen science project for birds, has been conducted by the Taiwan Wild Bird Federation, the Taiwan Endemic Species Research Institute, the Wild Bird Society of Taipei, and the Kaohsiung Wild Bird Society since 2014. It has created a wealth of long-term monitoring data for Taiwan proper and its outlying islands, providing the opportunity for researchers to assess the population trajectories of Taiwan's wintering birds.

It gladdens my heart to see thousands of birders record their observations and contribute to survey efforts. This information allows us to determine the population status of many birds we would otherwise be unable to create models for.

I am deeply concerned about habitat degradation, declining waterbird numbers, and a lack of conservation strategies/actions to turn the tide on declining population numbers.

Each year, a winter visitor is chosen as the annual Taiwan NYBC mascot: Whimbrel in 2014, Eurasian Teal in 2015, Saunders's Gull in 2016, Northern Lapwing in 2017, Ruddy Turnstone in 2018, Pied Avocet in 2019, and five farmland waterbirds in 2020. Aside from the Pied Avocet, all mascot birds are currently threatened by habitat degradation and habitat loss and show declining population trends and trajectories in Taiwan! We must do more to ensure that the habitats critical for migratory waterbirds will remain for the next generation of both birds and humans!

All are welcome to join the Taiwan NYBC and we encourage those who participate to share their experiences with their friends and family. One of the keys to ensuring the survival of migratory birds is to make them part of our lives. Only then will we consider them as part of our community and not just part of our surroundings.



Goals

◎ Recording the wintering avifauna of Taiwan proper and its outlying islands

◎ Mainstreaming biodiversity

◎ Enjoying birding

How the NYBC Works

Rules for the Taiwan NYBC are based on the basic principles set out in the Christmas Bird Count. Over the course of 23 days (with January 1st serving as a midpoint), volunteer teams choose one 24-hour period to count all the birds within a circle sample area whose radius is three kilometers. Routes within sample areas are provided for teams by the organizers. Teams are composed of at least one leader, at least one person experienced in birdwatching and surveys, and supporting volunteers. Group numbers could range from as few as three to over 100. While doing their count, teams record species name, number of individuals, location of route(s)/observation area, date, start and end time, number of participants, survey methods and weather conditions. Survey methods vary and include line transects, counting flocks, area searches, and others.

Site-Based Results

Lin Da-li, Tsai Chih-yi

From December 19, 2020 to January 10, 2021, NYBC 2021's 1,054 participants performed bird surveys at 173 sites (Fig 1, Table 1), recording 328,453 individuals from 337 species. A total of 68 of the 173 sites were located in Important Bird and Biodiversity Areas (IBAs, Fig 1). The southwest coast and northeastern plains of Taiwan proper were hotspots in both species richness and abundance in the winter (Fig 2, 3). The distribution map created for this year's mascot, the Kentish Plover (*Charadrius alexandrinus*), shows that its main wintering sites are the Yilan Plain, the Tamsui River Estuary, and the central west coast. (Fig 4)

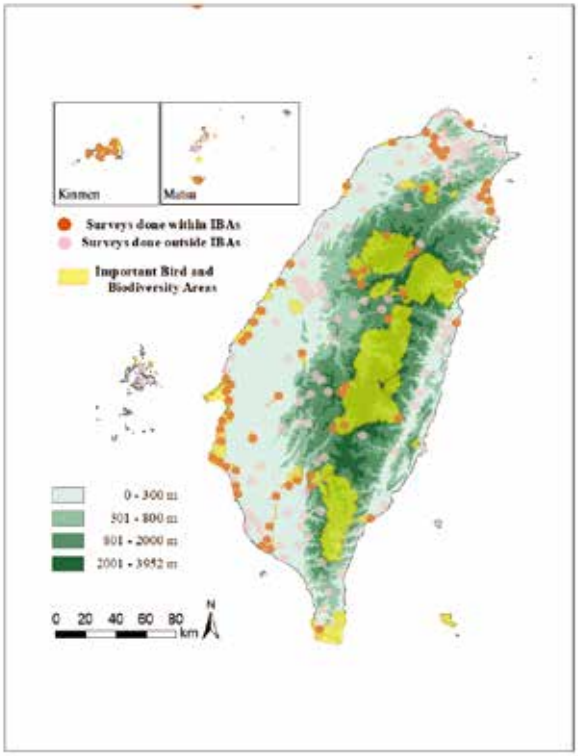


Fig 1. NYBC 2021 site map highlighting surveys done in IBAs. Red circles indicate that survey circles were completely inside of or overlapped with IBAs. Pink circles indicate that survey circles were located completely outside of IBAs (credit: Tsai Chih-yi).

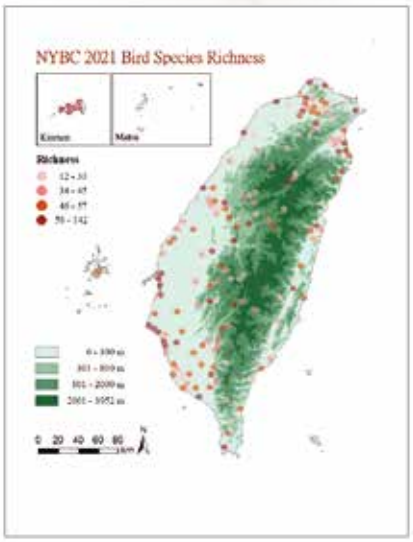


Fig 2. NYBC 2021 Bird Species Richness (credit: Tsai Chih-yi)

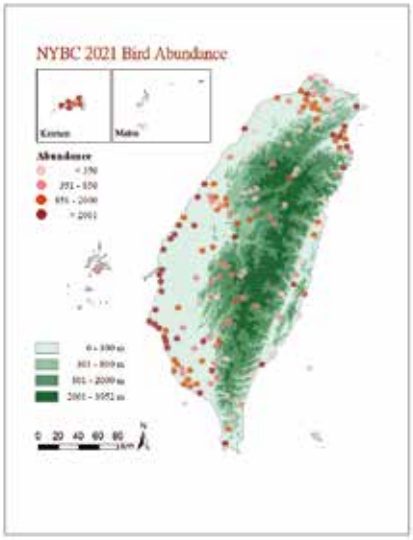


Fig 3. NYBC 2021 Bird Abundance (credit: Tsai Chih-yi)

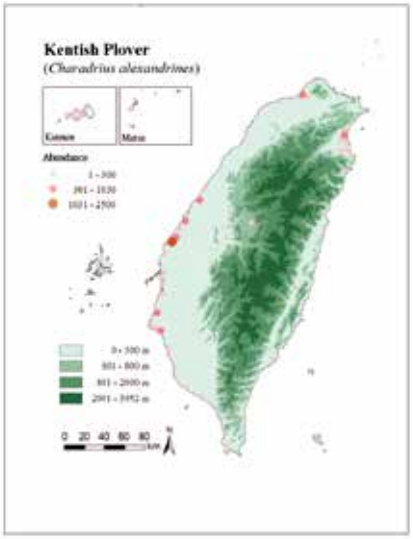


Fig 4. NYBC 2021 Distribution maps for this year's mascot, the Kentish Plover (*Charadrius alexndrinus*) (credit: Tsai Chih-yi)

Table 1. Site-Based Results for the Taiwan NYBC 2021

Site Number	Site Name	Number of Species						Number of Individuals					
		2016	2017	2018	2019	2020	2021	2016	2017	2018	2019	2020	2021
1	Tai-an Waterfall	27	30	15	18	27	27	170	224	213	348	127	128
2	Huajiang Bridge	64	61	40	47	34	43	1377	1274	394	630	401	351
3	Shih-Lin	49	45	33	31	42	44	2097	1249	405	737	1040	687
4	Wenshan Muzha	49	53	48	9	56	56	656	886	704	49	897	1478
5	Taipei Parks	42	44	43	37	44	48	1369	1142	1135	1256	1288	1148
6	Academia Sinica	27	32	29	25	30	36	205	451	269	273	363	307
7	Guandu Wetland	90	86	70	47	81	86	5501	4716	4680	1793	4293	5850
8	Fuzhou Bridge	51	50	24	39	54	63	754	890	124	512	1145	1062
9	Gancheng Bridge	44	36	12	46	53	57	602	321	101	499	546	594
10	Zhonghe&Yonghe	42	51	29	49	48	50	2128	1873	102	1941	1343	1739
11	Xindian	38	62	43		51		469	782	536		870	
12	Yehliu	31	23	20	24	30	28	185	132	71	99	183	145
13	Jinshan	58	52	54	74	65	66	426	445	437	880	486	817
14	Wa-Tzu-Wei	49	35	32	27	25	43	936	398	272	313	591	1360
15	Fushan	34	33	40	32			421	199	586	633		
16	Tonghou		15		23	17	28		90		307	88	119
17	Xizhi	37	28	40	39	31	46	314	167	748	578	310	1115
18	Houtong	18	24	23	18	36	25	87	168	58	155	133	107
19	Pinglin	36	39				25	204	333				242
20	Guishan	72	72	71	79	80	76	1105	1039	1619	1804	1403	1749
21	Neidong			31	17	34	36			301	115	290	308
22	Shiding	37	40	40	41	40	36	299	287	368	412	488	342
23	Tien-Liao-Yang	116	107	111	96	140	142	1687	1439	1507	1968	3216	2701
24	Manyueyuan		20			27			225			190	
25	Sanxia	23		12	21			250		251	608		
26	Sanzhi	26	67	54	49	47	63	109	1068	614	623	648	377
27	Chajiao			8	7					171	97		
28	Pingguang Rd.	19		20	52			123		338	284		
29	Hsu-Tsu Kang	30	70	67	57	81	77	322	2123	1655	1253	3549	1702
30	Guoling Forest Park	36						443					
31	Hsian-Shen Wetland	99	86	76	87	85	89	9706	10109	4804	10046	8187	5737
32	National Tsing Hua University	20	20	26		18	26	299	174	327		270	331
33	Sanhudao	38	30	35	26	26	34	931	361	542	736	645	375
34	Mingfong Historic Trail	42		29	26	33	27	226		248	277	335	217
35	Dasyueshan9-23K	41	54	48	54	53	39	222	336	214	478	359	322
36	Dasyueshan23-37K	30	28	37	34	40	30	282	365	373	611	622	159
37	Dasyueshan37-52K	24	14	19	19	28	23	248	81	116	101	313	144
38	Kao-Mei Wetland	59	58	57	68	79	84	6959	7248	2897	4636	3502	7623
39	Taichung Metropolitan Park	29	42	35	40	46	45	266	562	354	531	586	381
40	Dakeng	64	61	62	73	66	66	2500	1307	1024	1603	1392	1647
41	National Museum of Natural Science	27	27	31	29	19	29	431	312	350	425	103	181
42	National Chung Hsing University	23	26	28	32	14	23	298	361	305	717	119	398

Site Number	Site Name	Number of Species						Number of Individuals					
		2016	2017	2018	2019	2020	2021	2016	2017	2018	2019	2020	2021
43	Da-Jia	42	40	39				1098	695	857			
44	Ta-Tu Stream	33	36	33	30	37	30	4090	2760	2234	1922	1248	2347
45	Fazi River	37	32	33	37	36	36	737	292	238	684	787	602
46	Ta-Li Stream	38	28	38	34	38	37	870	842	790	845	1057	1163
47	Taiping	36	37	48	28	50	51	496	523	744	554	838	920
48	Basianshan	27		43	19	39	37	122		231	107	265	267
49	Wuling Farm	45	45	59	52	49	62	867	1186	1256	1791	1258	1970
50	Puli	73	66	67	65	65	66	2242	1946	2153	1649	1894	1728
51	Wushe	57	53	52	61	43	45	679	580	451	667	732	629
52	Mei Feng Farm	63	52	57	54		0	724	682	483	597		0
53	Kunyang	11	11	16	12	18	18	66	130	81	66	121	131
54	Aowanda						55						430
55	Dongpu	50	64	51	58			1215	1543	961	1717		
56	Jiji	88	74	82	87	82	85	2388	1376	2509	2600	1479	2850
57	Xitou	56	50					1257	442				
58	Huisun Forest Area		29	31	22	27	30		161	176	193	203	472
59	Tataka	26	21	25	30	34	27	549	182	285	396	637	295
60	Han-Pao & Fu-Pao Wetland	42	31	39	34	37	37	3469	398	6086	3416	7294	1620
61	Fang-Yuan	27	59	50	37	39	44	7193	6159	5872	3966	4518	4019
62	Dong-Luo-Hsi River	37	33	37	41	46	53	701	872	1532	2899	3611	3461
63	Yiwu Wetland	60	55	63	54	67	71	4715	4932	5684	5840	5305	4617
64	Huben	75	64	51	56	68	74	2451	1291	770	822	1346	1357
65	Douliu		29	31			38		526	627			1711
66	Shibi	60	52	56	49	63	57	930	424	657	587	940	633
67	Fengshan	33	31	26	29		40	184	275	255	234		379
68	Chashan	29	31	21	24		25	167	342	352	315		326
69	Lantan Reservoir	32	27	22	25		39	432	367	207	198		578
70	Pu-Tai	80	82	82	77	79	76	24439	36701	39024	37988	34814	27556
71	Zengwen Reservoir	55	53	59	54	55	62	790	703	658	676	686	802
72	Alishan	28	38	37	35	30	30	680	123	801	879	412	361
73	Aogu Wetland	90	97	93	83	90	95	5596	9438	14286	14100	11372	8635
74	Guanghua		57	59	47	54	41		518	657	580	910	554
75	Szu-Tsao	52	75	76	69	73	74	7193	10273	9755	6515	10661	10175
76	Tainan Tucheng	28	59	71	64	69	71	2575	6873	6294	5217	5969	7146
77	Guan-Tien	55	43		53	59	51	7915	7629		5400	7875	1520
78	Kantou Mountain		26	24	29	45	34		332	163	159	429	187
79	Qigu	72	61	67	69	64	62	6900	3545	4230	2905	3003	3773
80	Chiku-Dingshan	39	68	42	47	40	49	6797	15603	2491	5279	2659	16457
81	National Cheng Kung University	24	32	27	19	17	39	849	768	889	468	322	1585
82	Xinhua	28	41	28	24	21	48	182	204	315	314	162	522
83	Yung-An	47	80	79	45	49	43	2799	3486	2873	1633	4717	2313
84	Shanping	34	39	36	29	27	34	427	289	326	229	352	270
85	Maolin	35	35	50	38	39	43	393	672	541	730	914	1009

Site Number	Site Name	Number of Species						Number of Individuals					
		2016	2017	2018	2019	2020	2021	2016	2017	2018	2019	2020	2021
86	Yellow Butterfly Valley	38	39	40	37	52	45	498	366	603	616	525	790
87	Zuoying	56	59	63	57	65	43	2264	2015	3411	2657	3137	867
88	Cijin,Gushan&Yancheng	52	59	55	51	36	51	1322	2307	1773	1449	526	1329
89	Weiwuying		43	32	38	30	32		507	529	584	507	791
90	Niao-Sung	35	34	35	41	35	33	532	421	546	840	399	827
91	Kaohsiung Old Railway Bridge Wetland	57	61	57	55	49	48	1957	2591	1381	1952	1371	1309
92	Feng-Shan Reservoir	48	41	37	44	52	45	1591	1446	1816	1875	2350	1841
93	Nanxing&Fengshan	46	44	43	45	48	53	696	858	394	452	970	1008
94	Lin-Yuan	45	30	29	38	37	31	4058	3503	1140	1587	2152	985
95	Erjituanshan	44	45	53	57	26	54	802	592	516	746	353	664
96	Zhongliaoshan	32	41	42	46	45	50	503	469	815	377	729	504
97	Yuan-Chung-Kang	40	58	50	59	52	48	1910	2699	1976	2831	2540	1416
98	Qieding	78	75	77	71	69	81	17651	18429	14347	10719	14450	6116
99	Dongsha Islands	51	49	33	34	27		629	446	309	345	281	
100	Shihshan Forest Road	34	34	30	38	38	35	181	241	204	345	365	439
101	Pingtung Shaxi Forest-Road												
102	Wutai	48	12	27	17	15	29	345	60	160	63	72	195
103	Sandimen	35	17	22	41	43	48	368	166	167	697	447	708
104	National Pingtung University of Science and Technology	73	78	74	76	84	85	2716	2411	2109	2119	2136	2798
105	Linhousilin Forest Park	40	31	39	21	46	46	513	363	339	244	834	757
106	Kanding Wetland	47	51	53	58	59	54	1355	1121	1733	1970	1781	1193
107	Da-Peng-Wan	66	58	73	62	75	70	4819	2295	2889	2283	3802	2982
108	DahanShan	31	20	38		19	21	207	68	255		102	102
109	Shuangliou Forest Recreation Area	34	30	19	24	35	17	120	201	65	132	145	63
110	Lung-Luan Lake	103	102	95	104	122	92	2810	4598	2953	2745	3824	3986
111	Mudan	50	50	57	54	53	56	671	802	758	1233	921	1284
112	Pingtung Agricultural Biotechnology Park	53	48	52	48	64	56	1424	1137	1015	1449	1735	1433
113	Weiliaoshan	47	56	44	42	50	40	435	611	419	525	599	775
114	Taiwu	52	44	52	72	38	43	606	776	673	847	379	466
115	YiChiLine	19	20	25	21	31	30	6160	1562	1894	710	2487	1816
116	Zhu'an	70	77	70	77	65	54	7476	6107	5902	7660	2835	4255
117	Yuanshan	31	34	51	32	32	35	1001	1595	2636	2383	2018	3992
118	Shinnan-Meifu	49	35	38	42	40	39	1964	2349	1687	1195	719	3345
119	Lan-Yang Stream	89	95	50	50	52	72	2564	2671	1415	4044	1411	1967
120	Dazhou	38	31	35	33	44	38	470	650	918	1143	782	884
121	Li-Tse	51	53	55	45	75	70	6719	5344	8387	4282	5991	3336
122	Wu-Wei-Kang	49	37	37	39	56	47	820	985	797	656	809	816
123	Nan'ao	107	106	104	105	114	104	2451	2163	2722	1743	2345	2499
124	Tongmen	33						436					
125	Hua-Lien River Mouth	44	49	50	39	46	38	528	593	903	672	690	332
126	San-Min	86	79		65	80	77	8864	7653		3795	5488	6181

Site Number	Site Name	Number of Species						Number of Individuals					
		2016	2017	2018	2019	2020	2021	2016	2017	2018	2019	2020	2021
127	Ruisui	52	36	33	10	14	25	886	377	560	159	147	402
128	Ji-An	35	35	56	42	56	61	403	551	402	617	1370	1756
129	Pei-Nan Wetland	29	33	43		52	40	343	117	1346		736	301
130	Jhihben Wetland	65	48	46		57	53	1188	1886	712		2675	3358
131	Da Po Pond		68		38	69	41		932		633	2503	582
132	Southern Cross-Island Provincial Highway		34		38	55	44		407		221	532	684
133	Taitung Yima Forest Road		36	42	38	33	21		256	363	420	130	97
134	Sanxiantai	34	46		15	31	29	242	391		189	271	269
135	Tsai-Yuan Wetland	30	58	38	36	30	46	159	560	474	403	114	388
136	Chi Lake		64	76	105	96	98		1279	9632	16234	5922	17414
137	Little Kinmen	84	68	80	79	91	88	1676	1264	4809	3544	3423	4672
138	Kinsa	74	80	82	88	90	75	2743	2977	3467	4539	5938	3202
139	Kinmen County Forestry Affair Place	63	79	72	75	83	84	2186	4145	3945	2283	2978	5802
141	Beigan	23	12	16	14	15	12	132	124	56	68	76	107
142	Nangan	43	38	24	31	31	30	685	247	195	200	337	311
143	Juguang	38	33	13	33	23	20	670	265	73	224	208	205
144	Dongyin	38	32			48		276	238			387	
145	Shihmen	17	19	15	12	15		87	272	154	167	33	
146	Wuzhishan Range	54	64	46	45	40	53	815	975	561	613	1434	584
147	Chi-Tou	18	21	15	16	16	22	1458	224	260	270	369	246
148	Bayien	25						216					
149	Kanggaokeng River	17	14	13	13	11	12	68	62	70	101	69	30
150	Jincheng	72	83	89	85	98	88	1278	2284	3296	3546	3928	2485
151	Chonlin	68	79	73	67	87	84	1195	2615	1879	1353	2424	1977
152	Meinong	45	40	50	49	49	49	559	574	1098	746	683	2514
153	Tonglin	36	37	39	51	54	51	415	344	450	488	670	755
154	Shenmei Lake	35	47	58	48	50	53	309	496	513	398	446	359
155	Yulao	32	28	31	38	27	30	518	254	321	353	268	274
156	Yangchoukeng	40	29	31	30	27	32	593	439	300	357	247	427
157	Zhongli	50	48	51	46	53	0	418	489	722	756	949	0
158	Ta Cheng	49	52	61	49	62	53	2098	2933	3804	2105	3972	4310
159	Zhongzhengshan	17	25	22	22	11	21	199	135	152	125	26	141
160	Dongshan	39	26	56		46	73	249	209	519		370	896
161	Dadan Island	41						340					
162	Waipu Lotus Valley	36	36	46	50	52	46	317	669	1747	2191	1420	965
163	Dingzilanhsi	43	33	31	32	43	40	165	169	242	239	189	217
164	Chukou	49	45	48	40	50	52	1285	399	670	520	864	732
165	Jioufenershan	52	31	44	58	60	52	590	364	360	715	577	929
166	Zhuoshui River	65	39	65	59	60	57	12567	7977	11073	15699	10437	12912
167	Orchid Island	22						130					
168	Pozhih Stream	48	54	44	39	58	62	6111	5807	3350	2475	6340	10666

Site Number	Site Name	Number of Species						Number of Individuals					
		2016	2017	2018	2019	2020	2021	2016	2017	2018	2019	2020	2021
169	Ba-Chang-Hsi River	45	56	53	52	37	0	4091	2471	7353	2078	415	0
170	Beimen	51	40	40	39	40	0	3296	1182	765	972	794	0
171	Shou-Feng	30	39	36	30	44	45	1602	1223	2391	1558	921	1923
172	Lalashan	3						23					
173	Li-Yu-Tan		47	56	48	53	48		395	509	368	305	349
174	Danongdafu Forest Park		44	43	49	44	53		408	539	611	325	266
175	Shalun Farm		53	54	49	60	68		1367	2838	3167	2926	2516
176	Keelung River		44	47	39				1291	1983	578		
177	Erchong Floodway		47	52	49	60	47		1183	1196	1235	1533	1594
178	Maokong&Shenkeng		30	30	24				164	151	151		
179	Tunghai University		29	28	30	43	34		503	247	538	747	819
180	Nantun		23	41	32	40	29		779	1339	823	1045	331
181	Dawu		44	50	51	50	54		391	536	465	541	505
182	Tai-Xi		44	41	50	46	39		2165	1818	3032	5253	3109
183	Sihu		31	31	14	24	0		894	472	100	115	0
184	Kouhu				16	36	0				136	595	0
185	Jinshuiying Historic Trail		23						55				
186	Hou-Long-Hsi River		40	34	36				449	572	588		
187	Fonglin		83	104	101	110	118		1704	2267	2400	3809	3649
189	Jiangjun		68						15603				
190	National Dong Hwa University		50	54	56	81	69		1184	739	1563	1862	1403
191	Lao Mei		46	24	21	11	25		372	148	81	36	120
192	Cueifong Lake			13	8					32	11		
193	Walami Trail			65		31	24			778		303	224
194	North-Cross Island Highway's Baling			33						350			
195	Wumei Elementary School Fengshu Branch			16	10		0			265	483		0
196	Meishan Entrance(Meishan Lane)				54	47	61				1189	455	894
197	North-Cross Island Highway's Mingchih				28						125		
198	Cilan Villa				30						287		
199	Sishu				62	52	59				1647	1837	2443
200	Yunei River				26	28	31				160	190	161
201	Nangang				8	19	13				39	44	33
202	Taipingshan Villa				9						50		
203	Tuchang Jioujhihze				22						316		
204	Shakadang				17	20	26				166	82	135
205	Yushan Scenic Highway				28	20	22				214	196	281
206	Lion's Head Mountain					41	36					260	257
207	Si-ma-hsian Forest Trail					56						1152	
208	Ligavon					34						235	
209	Jiali Mountain					22						122	
210	Smangus					21						123	
211	Zhonggang River					51						2178	
x1	Haomeiliao		19						2651				
x2	ita City	28	19			28		175	329			237	
x3	Southern Taiwan Science Park Xinshi Dist.												
x4	Southern Taiwan Science Park Luzhu Dist.												

Species Richness and Population Trends

Lin Da-li, Scott Pursner, Tsai Chih-yi

The NYBC 2021 recorded 328,453 individuals from 337 species.

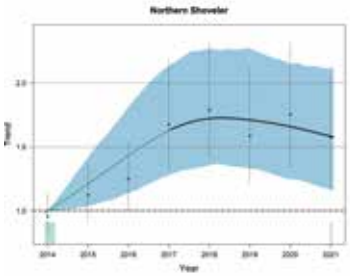
Organizers used NYBC datasets collected between 2014 and 2021 to assess the overall population trends for all waterbird species which stopover or winter in Taiwan proper. They also looked specifically at the data for three areas considered geographical hotspots for migratory waterbirds: the Yilan Plain (northeastern Taiwan), the Changhua Coast (western Taiwan), and the Chianan Plain (southwestern Taiwan). The organizers used R package "poptrend" (Knape 2016) to conduct the analysis using generalized additive mixed modeling (GAMM), setting random site effects and random year effects.

Table 2 to Table 5 represent the analysis results. For waterfowl and coots, the Eurasian Wigeon (*Mareca penelope*) experienced a significant decline in the Yilan Plain between 2014 and 2020 but no real change elsewhere. Meanwhile, during that same period, numbers for Northern Shoveler (*Spatula clypeata*), Tufted Duck (*Aythya fuligula*), and Eurasian Coot (*Fulica atra*) increased significantly throughout Taiwan.

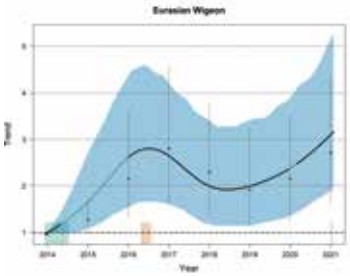
Results regarding shorebirds were not positive. Aside from the Little Ringed Plover (*Chaeadrius dubius*) and Black-bellied Plover (*Pluvialis squatarola*), whose numbers showed significant increases in the Changhua Coast area, population numbers for other shorebird species decreased significantly. These numbers serve as a warning for researchers and conservationists that more must be done to ensure species survival in Taiwan, including improving and maintaining the condition of their habitats, especially tidal flats. Appropriate conservation actions should also be developed accordingly.

Table 2. Population trajectories for waterbirds in Taiwan proper between 2014 and 2021. For periods where there is a significant increase, the trend line is green; where there is a significant decrease, the trend line is orange. Periods where the curvature is significantly positive or negative are marked on the x axis by green and orange rectangles, respectively.

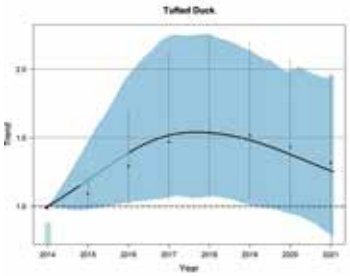
(a) Northern Shoveler



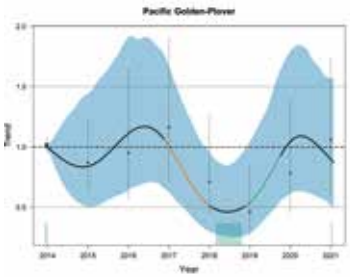
(b) Eurasian Wigeon



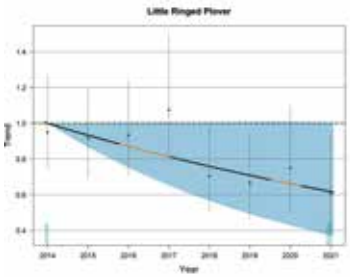
(c) Tufted Duck



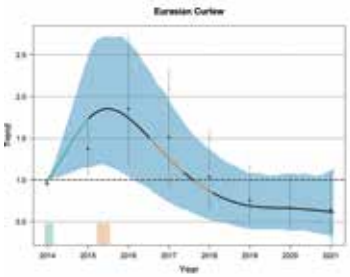
(g) Pacific Golden-Plover



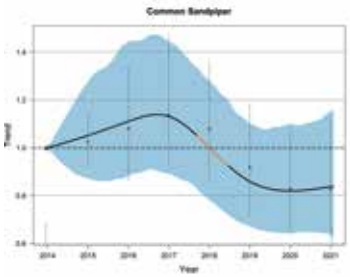
(h) Little Ringed Plover



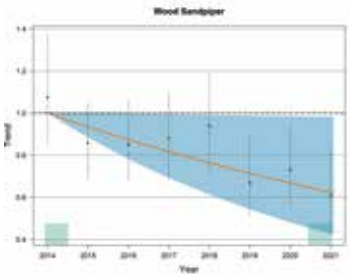
(i) Eurasian Curlew



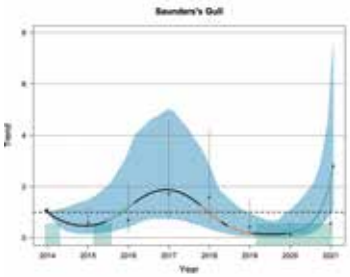
(m) Common Sandpiper



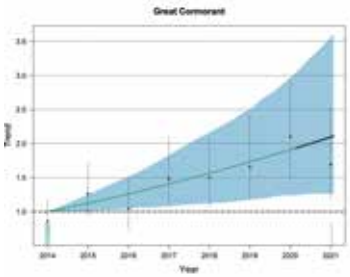
(n) Wood Sandpiper



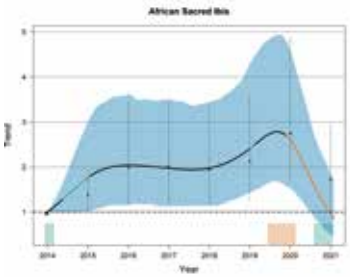
(o) Saunders's Gull



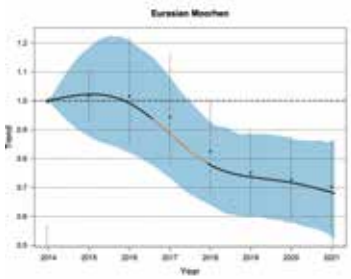
(s) Common Cormorant



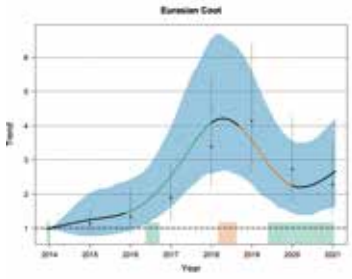
(t) African Sacred Ibis



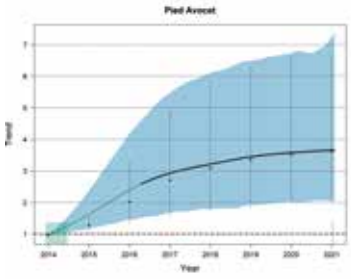
(d) Common Moorhen



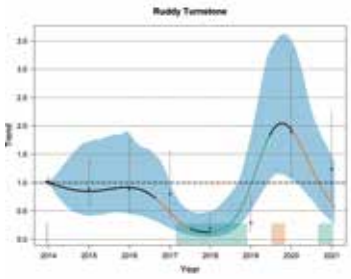
(e) Eurasian Coot



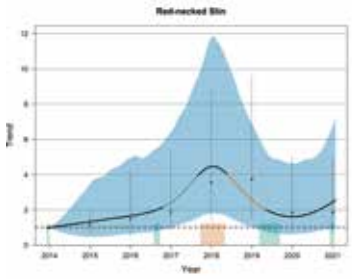
(f) Pied Avocet



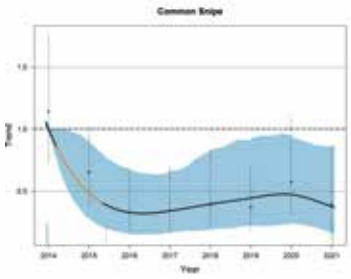
(j) Ruddy Turnstone



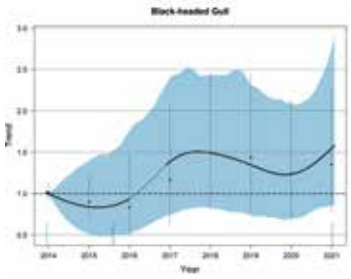
(k) Red-necked Stint



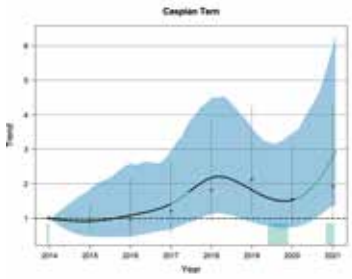
(l) Common Snipe



(p) Black-headed Gull



(q) Caspian Tern



(r) Whiskered Tern

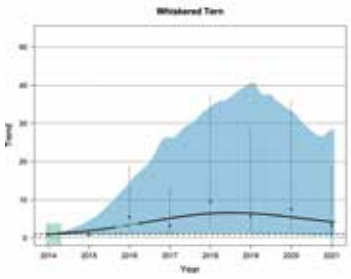
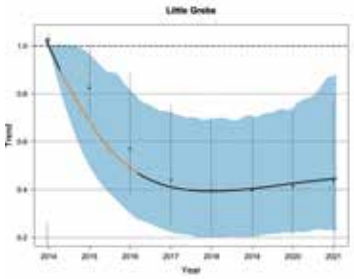
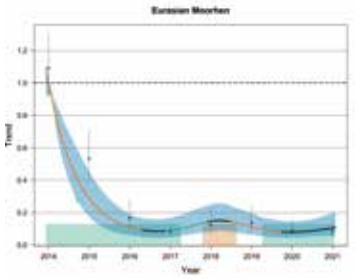


Table 3. Population trajectories for waterbirds counted along the Changhua Coast (western Taiwan) between 2014 and 2021. For periods where there is a significant increase, the trend line is in green; for periods where there is a significant decrease, the trend line is in orange. Periods where the curvature is significantly positive or negative are marked on the x axis by green and orange rectangles, respectively.

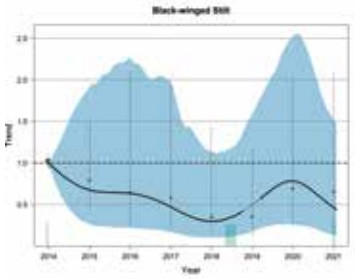
(a) Little Grebe



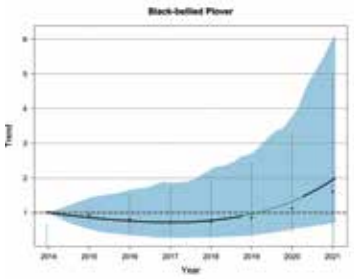
(b) Common Moorhen



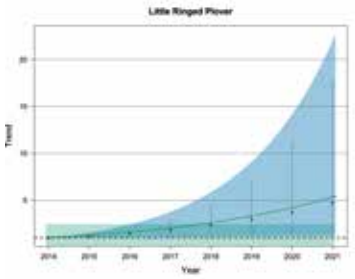
(c) Black-winged Stilt



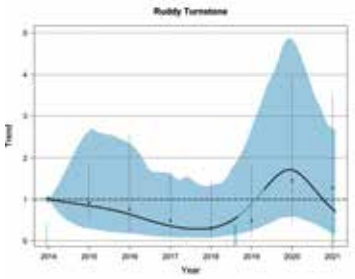
(d) Black-bellied Plover



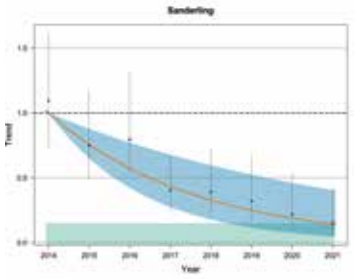
(e) Little Ringed Plover



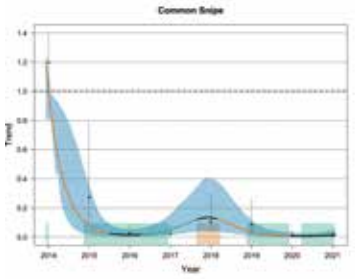
(f) Ruddy Turnstone



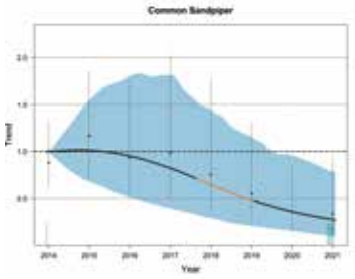
(g) Sanderling



(h) Common Snipe



(i) Common Sandpiper



(j) Wood Sandpiper

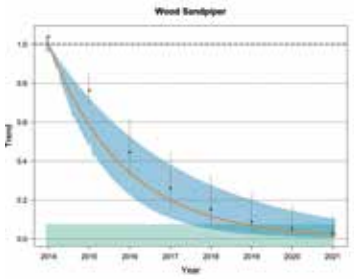
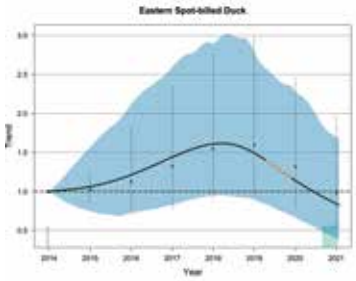
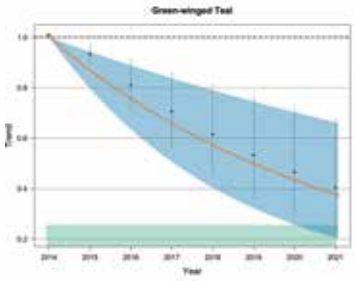


Table 4. Population trajectories for waterbirds counted in the Yilan Plain (northeastern Taiwan) between 2014 and 2021. For periods where there is a significant increase, the trend line is in green; for periods where there is a significant decrease, the trend line is in orange. Periods where the curvature is significantly positive or negative are marked on the x axis by green and orange rectangles, respectively.

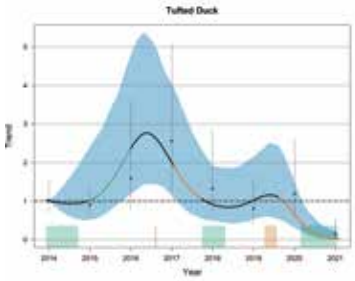
(a) Eastern Spot-billed Duck



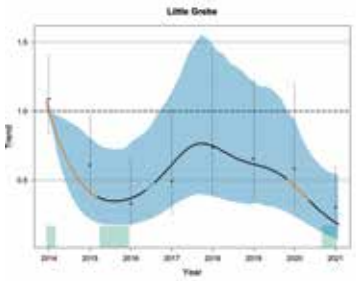
(b) Euasian Teal



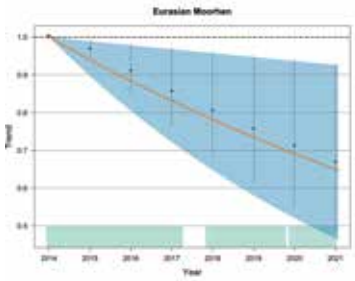
(c) Tufted Duck



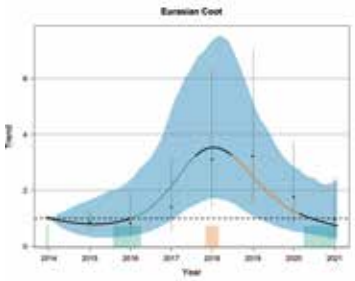
(d) Little Grebe



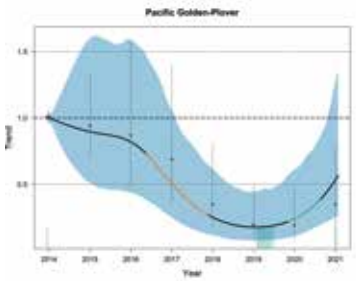
(e) Common Moorhen



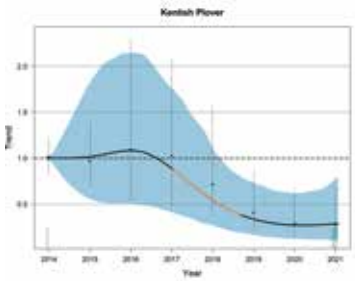
(f) Eurasian Coot



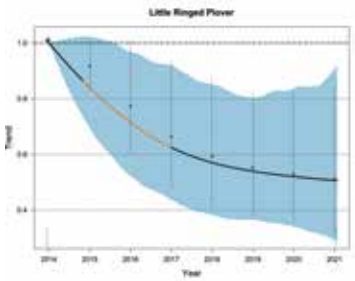
(g) Pacific Golden-Plover



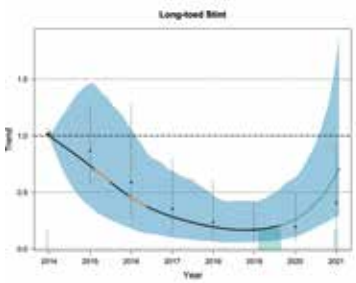
(h) Kentish Plover



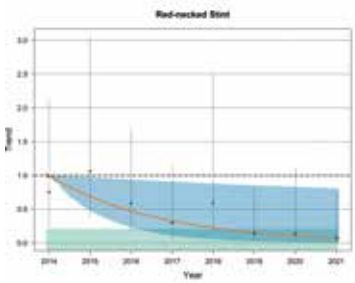
(i) Little Ringed Plover



(j) Long-toed Stint



(k) Red-necked Stint



(l) Dunlin

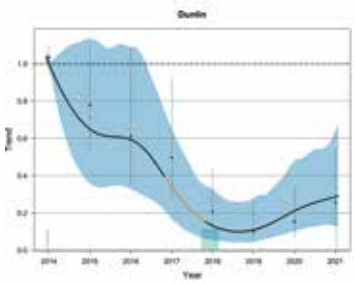
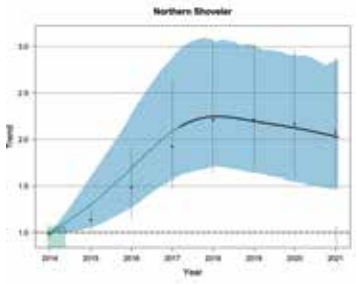


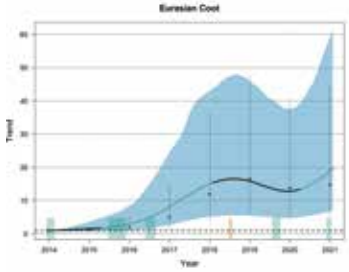
Table 5. Population trajectories for waterbirds counted along the Chianan Plain (southwestern Taiwan) between 2014 and 2021. For periods where there is a significant increase, the trend line is in green; for

(a) Eastern Spot-billed Duck

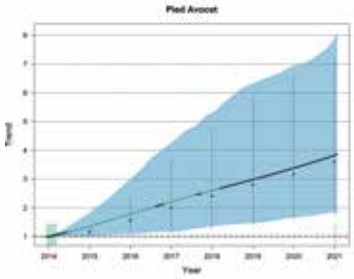


(b) Eurasian Wigeon

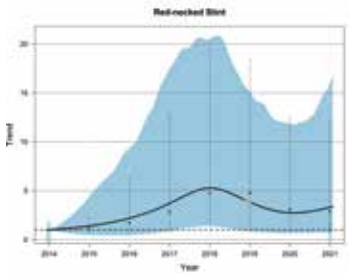
(f) Eurasian Coot



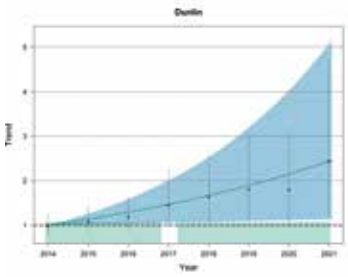
(g) Pied Avocet



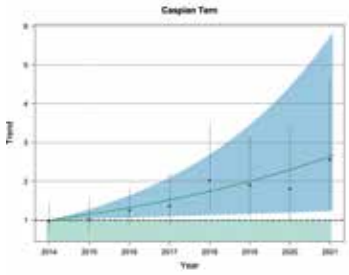
(k) Red-necked Stint



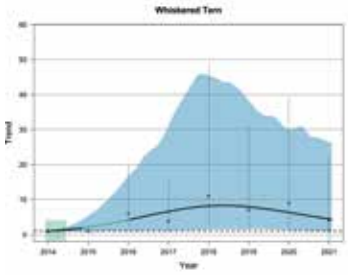
(l) Dunlin



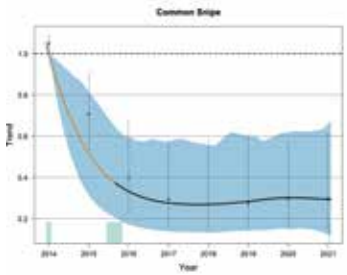
(p) Caspian Tern



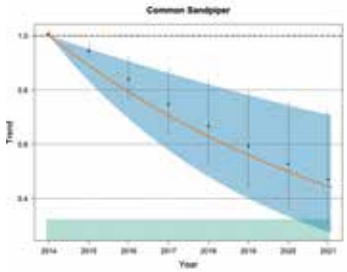
(q) Whiskered Tern



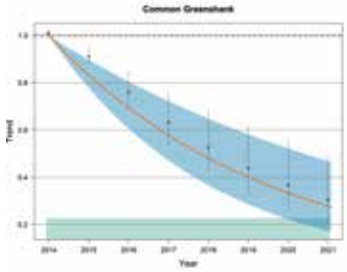
(m) Common Snipe



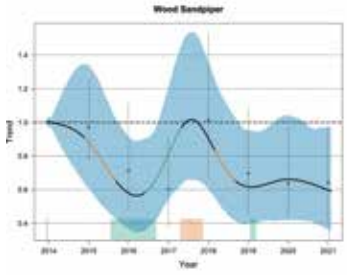
(n) Common Sandpiper



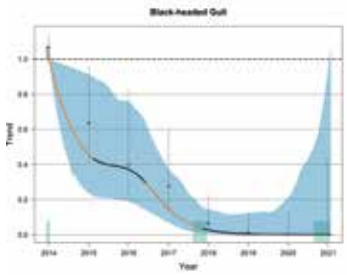
(o) Common Greenshank



(p) Wood Sandpiper



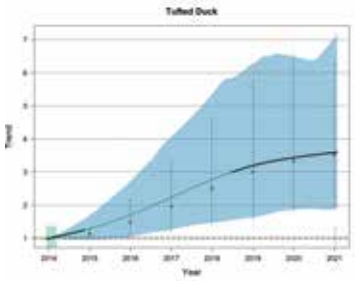
(q) Black-headed Gull



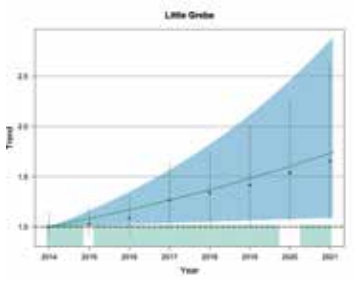
periods where there is a significant decrease, the trend line is in orange. Periods where the curvature is significantly positive or negative are marked on the x axis by green and orange rectangles, respectively.

(c) Eurasian Teal

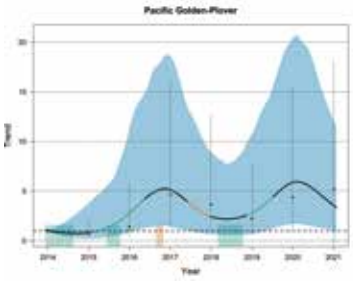
(d) Tufted Duck



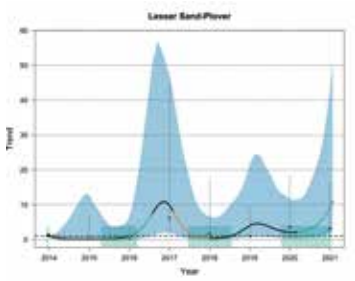
(e) Little Grebe



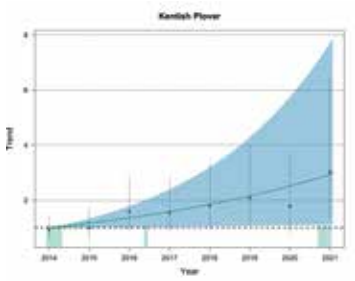
(h) Pacific Golden-Plover



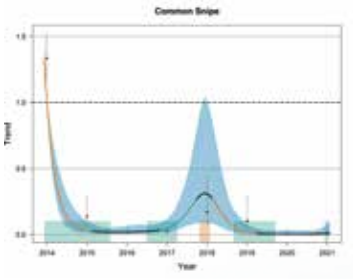
(i) Lesser Sand Plover



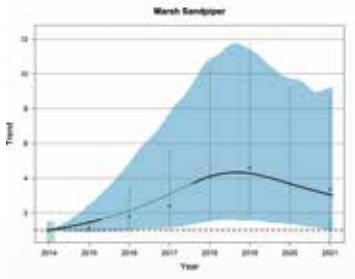
(j) Kentish Plover



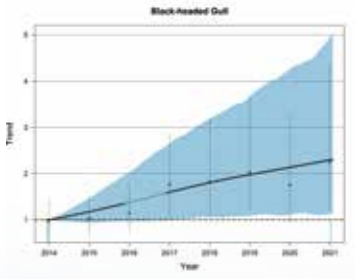
(m) Common Snipe



(n) Marsh Sandpiper



(o) Black-headed Gull



The taxonomy and English names of species in this report follow the eBird/Clements Checklist of Birds of the World Version 2019 (Clements et al. 2019).

Table 6. 2015-2021 NYBC Data by Species

Common Name	2015	2016	2017	2018	2019	2020	2021
Graylag Goose	0	0	0	0	2	0	0
Greater White-fronted Goose	7	0	0	0	0	1	7
Taiga Bean-Goose	1	14	7	0	0	0	9
Tundra Bean-Goose	7	0	0	0	0	7	18
Tundra Swan	0	0	1	0	0	1	0
Ruddy Shelduck	0	16	0	2	2	0	0
Common Shelduck	10	2	4	9	2	7	3
Cotton Pygmy-Goose	0	0	0	0	1	1	0
Mandarin Duck	40	12	22	9	12	6	7
Baikal Teal	0	2	0	3	1	1	0
Garganey	68	149	146	49	11	31	30
Northern Shoveler	7388	9663	14103	14193	11609	13766	11728
Gadwall	84	42	139	61	96	56	135
Falcated Duck	40	8	34	18	18	69	52
Eurasian Wigeon	3848	10334	12237	6860	8190	10035	13858
American Wigeon	0	0	0	0	0	1	0
Philippine Duck	2	0	0	0	0	0	1
Eastern Spot-billed Duck	2349	2866	3400	4177	4132	3538	3540
Mallard	155	146	66	94	147	92	117
Northern Pintail	2392	2600	6446	3760	5759	3566	4522
Green-winged Teal	6609	7239	6844	6829	7229	6712	7516
Common Pochard	158	65	174	39	21	122	26
Ferruginous Duck	2	1	1	0	1	0	4
Baer's Pochard	0	0	0	1	0	0	0
Tufted Duck	2179	3909	4420	3308	4014	3346	3233
Greater Scaup	16	26	37	2	40	33	21
Common Goldeneye	1	0	0	0	0	0	0
Smew	0	0	0	0	0	1	0
Common Merganser	0	0	1	0	0	0	1
Red-breasted Merganser	0	0	4	0	0	0	1
Scaly-sided Merganser	1	1	0	0	0	0	0
Taiwan Partridge	37	50	61	74	94	92	89
Indian Peafowl	0	0	0	0	0	9	25
Blue-breasted Quail	0	0	0	0	0	4	0
Japanese Quail	2	1	2	1	0	4	0
Taiwan Bamboo-Partridge	167	217	247	207	301	229	233
Mikado Pheasant	4	2	1	0	3	0	1
Ring-necked Pheasant	53	56	103	137	86	195	115
Swinhoe's Pheasant	15	7	30	17	12	19	12
Little Grebe	825	888	1308	1242	1259	1417	1159
Great Crested Grebe	22	1	60	125	33	178	123
Eared Grebe	7	0	2	5	5	19	19
Rock Pigeon	2808	4035	5732	4970	5714	5265	8085
Ashy Wood-Pigeon	79	130	470	749	400	455	378
Oriental Turtle-Dove	517	1039	1026	1042	825	870	745
Red Collared-Dove	5405	6658	10288	7932	9488	9462	9296
Spotted Dove	1862	2557	3347	2873	3686	3699	3358

Common Name	2015	2016	2017	2018	2019	2020	2021
Asian Emerald Dove	22	15	14	22	16	34	26
White-bellied Pigeon	92	97	109	97	111	102	174
Whistling Green-Pigeon	41	17	59	84	42	91	21
Black-chinned Fruit-Dove	1	0	0	0	0	0	0
Greater Coucal	19	24	18	38	25	36	37
Lesser Coucal	19	21	18	24	15	23	17
Asian Koel	0	0	6	0	0	1	1
Plaintive Cuckoo	0	0	1	0	0	0	0
Savanna Nightjar	0	0	0	0	23	588	25
White-throated Needletail	0	0	1	6	0	0	0
Silver-backed Needletail	0	1	0	2	0	0	5
Himalayan Swiftlet	0	2	0	0	0	0	1
Pacific Swift	1	3	0	0	9	3	5
House Swift	2236	2391	1825	3732	2144	1520	3076
Brown-cheeked Rail	5	0	0	0	5	2	2
Slaty-breasted Rail	4	4	0	4	1	1	1
Eurasian Moorhen	3271	3722	3514	2984	3384	3905	3328
Eurasian Coot	620	748	1448	2330	2023	1186	1589
Black-backed Swamphen	0	1	0	0	0	1	0
White-breasted Waterhen	200	172	226	342	217	310	248
Slaty-legged Crake	0	0	0	0	0	1	2
Ruddy-breasted Crake	31	13	14	16	8	13	22
Baillon's Crake	0	0	0	0	0	1	0
Siberian Crane	1	1	0	0	58	0	0
Red-crowned Crane	0	1	0	0	0	0	0
Black-winged Stilt	8424	10742	10772	11207	12283	14869	11337
Pied Avocet	1192	3552	3729	3570	4380	4609	4337
Eurasian Oystercatcher	36	9	96	16	130	212	123
Black-bellied Plover	354	885	638	479	895	1015	1411
Pacific Golden-Plover	3898	7150	7047	3031	3210	7293	5476
Northern Lapwing	164	182	134	178	100	177	207
Gray-headed Lapwing	0	0	0	1	1	1	2
Lesser Sand-Plover	317	84	261	246	156	225	208
Greater Sand-Plover	44	344	100	131	350	499	262
Kentish Plover	10363	26753	26995	18998	16908	15753	23376
Common Ringed Plover	0	0	1	1	0	0	0
Long-billed Plover	1	0	1	0	0	8	2
Little Ringed Plover	1083	1639	2222	1287	1280	1578	1312
Greater Painted-snipe	46	39	28	27	50	70	64
Pheasant-tailed Jacana	391	380	257	40	281	281	143
Whimbrel	10	91	202	36	47	220	188
Little Curlew	1	0	0	0	0	0	0
Far Eastern Curlew	4	0	14	2	1	2	2
Eurasian Curlew	1767	1627	2254	950	713	877	776
Bar-tailed Godwit	2	5	0	2	6	15	55
Black-tailed Godwit	5	19	164	202	142	7	3
Ruddy Turnstone	1004	1405	632	458	1145	1968	726

Common Name	2015	2016	2017	2018	2019	2020	2021
Great Knot	6	6	86	6	14	9	19
Red Knot	0	1	73	201	1	2	2
Ruff	4	2	6	10	5	9	1
Broad-billed Sandpiper	0	6	3	3	2	4	0
Sharp-tailed Sandpiper	5	3	5	30	0	0	0
Curlew Sandpiper	1	0	14	1	67	22	2
Temminck's Stint	23	1	6	3	3	10	6
Long-toed Stint	481	1219	239	149	231	599	252
Spoon-billed Sandpiper	0	0	0	1	0	0	0
Red-necked Stint	530	1169	1770	3330	1652	1010	1534
Sanderling	116	220	92	108	162	256	182
Dunlin	9817	13091	17646	15003	14250	12906	16835
Little Stint	0	0	2	5	0	5	0
Long-billed Dowitcher	2	0	2	1	1	2	1
Eurasian Woodcock	3	5	3	9	4	6	6
Common Snipe	470	264	441	486	388	579	430
Pin-tailed Snipe	0	0	0	0	0	2	0
Swinhoe's Snipe	0	14	0	0	0	0	0
Terek Sandpiper	1	3	2	158	8	2	4
Red Phalarope	0	0	0	0	0	0	1
Common Sandpiper	411	500	622	544	424	466	534
Green Sandpiper	95	97	77	94	101	123	112
Gray-tailed Tattler	19	22	33	527	57	33	0
Spotted Redshank	7	1	17	20	47	7	3
Common Greenshank	1464	2271	2308	1792	1342	2331	1572
Lesser Yellowlegs	0	0	0	0	1	0	0
Marsh Sandpiper	332	663	630	817	784	518	584
Wood Sandpiper	1522	1687	1663	1669	1225	1511	1258
Common Redshank	313	484	535	289	434	481	356
Barred Buttonquail	19	14	8	8	5	5	6
Oriental Pratincole	0	2	4	1	0	0	0
Saunders's Gull	24	100	136	84	11	9	184
Black-headed Gull	2544	3281	6648	6433	6580	5794	6124
Pallas's Gull	0	0	0	1	0	0	1
Black-tailed Gull	4	5	1	13	17	3	7
Herring Gull	105	55	225	69	129	86	59
Lesser Black-backed Gull	1	52	14	1	1	4	2
Slaty-backed Gull	1	0	0	68	0	0	0
Little Tern	2	173	56	56	97	58	40
Gull-billed Tern	31	0	6	8	3	3	13
Caspian Tern	688	1023	965	2170	1780	1250	2369
White-winged Tern	0	30	1	1	12	3	0
Whiskered Tern	805	8620	4317	12236	6441	8597	3521
Common Tern	0	1	0	0	0	0	0
Great Crested Tern	0	0	0	5	0	0	0
Streaked Shearwater	3	0	0	0	0	0	0

Common Name	2015	2016	2017	2018	2019	2020	2021
Black Stork	0	2	1	0	0	1	1
Oriental Stork	3	1	2	0	0	3	7
Pelagic Cormorant	0	0	0	0	0	1	0
Great Cormorant	9489	4380	8705	15494	18473	9960	16306
Japanese Cormorant	0	18	23	17	1	22	0
Dalmatian Pelican	0	0	0	0	4	0	0
Great Bittern	1	3	2	2	1	1	1
Yellow Bittern	87	68	70	84	49	103	115
Schrenck's Bittern	1	0	0	1	0	0	1
Cinnamon Bittern	36	19	33	21	17	29	19
Gray Heron	5036	6783	5536	5671	5483	5124	4899
Purple Heron	48	23	31	17	24	30	22
Great Egret	3762	5971	6548	4976	5969	5790	4867
Intermediate Egret	261	421	463	458	468	456	318
Chinese Egret	5	6	14	0	0	1	0
Little Egret	7111	8372	10210	8077	7601	8772	7229
Pacific Reef-Heron	76	13	7	9	14	14	17
Cattle Egret	1783	3331	3500	3679	3712	4022	5534
Chinese Pond-Heron	39	46	70	43	32	61	52
Striated Heron	13	16	26	26	17	29	23
Black-crowned Night-Heron	2664	3060	3324	3114	2555	2075	2001
Malayan Night-Heron	55	52	69	90	63	78	91
Glossy Ibis	0	0	0	0	0	6	0
Sacred Ibis	771	1176	1173	1256	1374	1723	456
Eurasian Spoonbill	16	4	9	17	10	31	24
Black-faced Spoonbill	1251	1373	1454	1947	2009	2193	1470
Osprey	139	158	207	194	186	233	212
Black-shouldered Kite	61	80	93	130	132	187	180
Oriental Honey-buzzard	10	53	53	59	59	63	83
Black Baza	0	0	0	0	1	0	0
Crested Serpent-Eagle	161	213	365	240	218	265	293
Mountain Hawk-Eagle	2	2	4	10	19	5	17
Black Eagle	20	32	28	22	49	35	42
Greater Spotted Eagle	1	0	0	0	1	0	0
Imperial Eagle	0	0	0	1	0	0	0
Gray-faced Buzzard	5	7	6	2	4	4	7
Eurasian Marsh-Harrier	0	0	0	0	0	1	0
Eastern Marsh-Harrier	4	4	5	22	8	14	19
Northern Harrier	2	1	1	0	0	1	5
Pied Harrier	2	0	0	0	0	1	0
Crested Goshawk	86	116	146	111	98	126	129
Chinese Sparrowhawk	0	0	0	0	0	1	1
Japanese Sparrowhawk	2	3	5	5	2	4	4
Besra	22	23	32	19	19	31	30
Eurasian Sparrowhawk	1	2	2	6	3	3	4
Northern Goshawk	0	1	1	1	0	2	2

Common Name	2015	2016	2017	2018	2019	2020	2021
Black Kite	134	204	227	221	273	334	251
White-tailed Eagle	0	0	0	0	1	1	1
Eastern Buzzard	0	0	0	0	49	65	55
Upland Buzzard	0	1	0	0	0	0	0
Australasian Grass-Owl	2	0	0	0	0	0	0
Mountain Scops-Owl	10	18	42	10	31	41	11
Collared Scops-Owl	22	14	31	11	11	26	10
Ryukyu Scops-Owl	0	2	0	0	0	0	0
Oriental Scops-Owl	0	0	0	0	1	0	0
Tawny Fish-Owl	0	0	1	1	0	0	0
Collared Owlet	4	4	2	3	8	4	3
Brown Wood-Owl	1	3	1	0	1	1	0
Himalayan Owl	1	4	2	2	3	0	1
Long-eared Owl	0	0	1	0	1	2	0
Short-eared Owl	0	1	3	0	0	2	4
Northern Boobook	3	1	1	2	5	2	1
Eurasian Hoopoe	35	92	34	44	84	95	54
Common Kingfisher	267	317	357	360	334	439	449
White-throated Kingfisher	9	20	25	42	35	50	33
Black-capped Kingfisher	1	0	0	0	0	0	0
Collared Kingfisher	0	1	1	0	0	0	0
Pied Kingfisher	11	10	12	21	24	34	23
Taiwan Barbet	434	425	384	460	604	786	822
Eurasian Wryneck	0	2	4	1	3	3	9
Gray-capped Woodpecker	163	237	196	239	265	292	285
White-backed Woodpecker	9	7	7	7	7	9	15
Gray-faced Woodpecker	0	3	0	4	3	4	4
Eurasian Kestrel	64	86	76	77	74	97	108
Eurasian Hobby	0	4	1	1	1	0	2
Peregrine Falcon	31	38	30	50	35	41	45
Gray-chinned Minivet	567	605	391	939	673	505	504
Scarlet Minivet	0	0	0	0	0	2	0
Ashy Minivet	0	6	22	23	32	33	2
Large Cuckooshrike	2	0	0	5	1	6	2
Black-winged Cuckooshrike	1	4	2	8	12	1	4
White-bellied Erpornis	186	255	278	226	389	324	410
Black-naped Oriole	15	10	24	18	25	19	26
Maroon Oriole	29	33	63	70	71	74	72
Black Drongo	933	1063	1441	1429	1195	1399	1415
Ashy Drongo	1	0	3	4	0	3	1
Bronzed Drongo	216	300	277	260	308	302	302
Hair-crested Drongo	1	0	10	3	4	5	5
Black-naped Monarch	307	414	387	343	481	516	594
Japanese Paradise-Flycatcher	0	0	0	0	2	0	0
Amur Paradise-Flycatcher	0	0	0	0	0	1	0
Bull-headed Shrike	0	2	2	3	1	1	0
Red-backed Shrike	0	1	0	0	0	1	0

Common Name	2015	2016	2017	2018	2019	2020	2021
Brown Shrike	767	765	971	862	633	834	813
Long-tailed Shrike	219	243	356	346	349	334	311
Chinese Gray Shrike	0	0	1	0	1	0	0
Eurasian Jay	92	26	21	43	81	63	73
Azure-winged Magpie	36	52	5	13	17	17	7
Taiwan Blue-Magpie	155	272	286	422	353	244	327
Gray Treepie	846	1082	876	1074	1130	1521	1395
Eurasian Magpie	678	941	1043	998	1022	1076	1181
Eurasian Nutcracker	15	47	29	16	16	25	15
House Crow	0	0	0	1	0	2	0
Rook	0	1	0	2	3	1	1
Carrion Crow	0	0	0	0	2	4	1
Large-billed Crow	206	325	148	228	356	486	267
Collared Crow	16	35	38	51	51	76	58
Coal Tit	141	59	48	27	21	90	27
Chestnut-bellied Tit	36	15	23	213	169	78	77
Green-backed Tit	202	255	209	190	334	292	370
Japanese Tit	0	0	1	0	0	0	0
Yellow Tit	56	93	31	46	72	43	56
Chinese Penduline-Tit	0	11	27	6	40	0	8
Eurasian Skylark	12	7	5	13	474	103	158
Oriental Skylark	97	223	292	249	366	293	133
Striated Prinia	10	1	8	6	6	6	0
Yellow-bellied Prinia	279	463	474	468	499	797	668
Plain Prinia	821	1128	1375	1357	1249	1617	1465
Zitting Cisticola	46	61	68	28	36	50	34
Golden-headed Cisticola	14	18	18	8	9	22	7
Black-browed Reed-Warbler	0	0	2	2	2	7	1
Oriental Reed-Warbler	13	19	28	15	18	24	20
Pallas's Grasshopper-Warbler	0	1	0	0	1	0	0
Middendorff's Grasshopper-Warbler	1	0	4	0	0	4	0
Lanceolated Warbler	0	2	0	0	0	0	0
Taiwan Bush-Warbler	1	1	4	3	3	0	2
Russet Bush Warbler	0	0	0	0	0	1	0
Taiwan Cupwing	27	80	30	24	18	18	10
Gray-throated Martin	1522	1801	1026	2025	2372	1562	1847
Bank Swallow	0	5	1	4	0	3	7
Barn Swallow	2189	3217	2462	2782	2566	3889	2497
Pacific Swallow	2628	4671	3404	3972	2814	4136	3581
Red-rumped Swallow	15	9	6	11	3	8	24
Striated Swallow	1494	2557	2513	4005	2233	1970	2784
Asian House-Martin	484	937	663	338	540	331	989
Collared Finchbill	243	212	269	211	207	144	278
Styan's Bulbul	847	823	1557	976	1678	1650	1439
Light-vented Bulbul	8450	10026	10224	11082	10669	12007	10754
Sooty-headed Bulbul	0	0	0	0	0	3	1
Black Bulbul	3437	3359	3580	4070	5416	5309	4749

Common Name	2015	2016	2017	2018	2019	2020	2021
Brown-eared Bulbul	1	44	3	3	0	15	2
Chestnut Bulbul	0	3	0	0	0	1	1
Yellow-browed Warbler	56	243	218	92	338	101	119
Hume's Leaf Warbler	0	0	0	0	1	0	0
Pallas's Leaf Warbler	33	49	24	8	26	29	12
Radde's Warbler	0	1	1	0	0	0	0
Yellow-streaked Warbler	0	0	1	0	0	0	0
Dusky Warbler	30	56	90	79	169	133	139
Eastern Crowned Leaf Warbler	0	0	1	0	0	0	0
Two-barred Warbler	0	2	0	0	0	1	0
Arctic Warbler	84	155	288	226	206	248	267
Claudia's Leaf Warbler	0	1	0	0	0	0	0
Hartert's Leaf Warbler	0	0	0	0	0	2	0
Asian Stubtail	1	0	1	9	6	2	6
Rufous-faced Warbler	214	456	310	310	465	395	410
Japanese Bush-Warbler	1	9	3	6	6	8	9
Manchurian Bush-Warbler	42	54	61	68	54	78	66
Brownish-flanked Bush-Warbler	10	34	21	15	29	18	26
Yellowish-bellied Bush-Warbler	31	39	17	19	23	43	39
Black-throated Tit	978	700	622	605	936	686	785
Taiwan Fulvetta	81	93	19	45	43	73	54
Vinous-throated Parrotbill	373	245	420	462	329	266	334
Golden Parrotbill	120	0	0	2	40	4	80
Taiwan Yuhina	1675	1505	1079	1523	2196	1609	1524
Japanese White-eye	0	0	0	0	0	2	0
	5059	8011	5697	6070	7328	7167	9121
Lowland White-eye	0	21	2	0	0	0	0
Rufous-capped Babbler	672	909	830	750	873	877	825
Taiwan Scimitar-Babbler	656	869	906	760	841	882	976
Black-necklaced Scimitar-Babbler	166	210	244	172	195	222	169
Dusky Fulvetta	93	242	271	120	202	206	149
Morrison's Fulvetta	2066	2105	1605	1964	2250	2095	2038
Hwamei	5	11	16	51	27	116	79
Taiwan Hwamei	53	97	80	66	71	36	62
Rufous-crowned Laughingthrush	126	3	11	25	207	6	1
Black-throated Laughingthrush	7	2	1	1	4	6	15
Rusty Laughingthrush	77	49	30	36	81	24	10
White-whiskered Laughingthrush	90	99	44	107	47	89	59
White-eared Sibia	813	595	498	728	837	780	1021
Steere's Liocichla	285	395	313	303	397	258	251
Taiwan Barwing	141	111	18	64	95	70	97
Flamecrest	88	140	79	88	52	151	55
Eurasian Nuthatch	46	78	34	48	78	32	85
Eurasian Wren	16	17	4	16	29	11	6
Brown Dipper	24	20	15	16	25	19	31
Asian Glossy Starling	82	133	104	213	156	356	215
European Starling	7	7	3	0	12	15	0

Common Name	2015	2016	2017	2018	2019	2020	2021
Rosy Starling	0	0	0	0	0	1	0
Daurian Starling	0	0	1	0	0	0	0
Chestnut-cheeked Starling	0	0	6	5	0	3	12
Black-collared Starling	197	240	470	455	397	531	699
White-shouldered Starling	124	181	359	188	188	484	256
Chestnut-tailed Starling	127	68	162	141	285	184	179
Red-billed Starling	122	705	289	157	174	375	123
White-cheeked Starling	77	114	100	59	68	21	61
Common Myna	1481	1891	2517	2267	2467	2872	2927
Jungle Myna	9	6	0	3	0	0	0
Javan Myna	2957	3994	4565	4652	4977	6337	7896
Crested Myna(Taiwan)	182	293	446	516	288	419	359
Crested Myna(Kinmen & Matsu)	2519	1908	2702	4084	3263	4433	3792
Chinese Blackbird	42	158	116	58	141	136	182
Island Thrush	2	3	2	2	1	8	20
Japanese Thrush	1	0	0	0	0	0	0
Gray-backed Thrush	2	5	2	3	0	1	0
Eyebrowed Thrush	16	6	9	21	12	7	7
Brown-headed Thrush	401	302	297	384	243	550	552
Pale Thrush	1090	599	310	173	56	324	406
Red-throated Thrush	0	2	0	0	0	0	1
Dusky Thrush	155	116	134	47	10	98	73
Naumann's Thrush	26	20	6	1	0	3	3
Gray-streaked Flycatcher	0	5	8	0	1	2	1
Ferruginous Flycatcher	2	0	1	1	2	2	0
Asian Brown Flycatcher	0	4	8	7	10	4	4
Oriental Magpie-Robin	213	165	205	207	254	301	309
White-rumped Shama	16	13	36	21	53	91	114
Hill Blue Flycatcher	0	0	0	0	0	1	0
Vivid Niltava	102	93	127	139	83	107	73
Blue-and-white Flycatcher	0	0	0	0	1	0	0
Verditer Flycatcher	0	1	0	3	3	0	0
Lesser Shortwing	0	0	2	0	0	0	0
White-browed Shortwing	15	17	14	10	6	9	7
Japanese Robin	0	0	0	2	3	0	2
Siberian Blue Robin	0	0	0	0	1	0	0
Bluethroat	0	1	1	1	4	1	1
Taiwan Whistling-Thrush	63	59	81	53	99	91	59
Blue Whistling-Thrush	8	24	20	30	15	28	37
Little Forktail	12	19	8	16	13	12	11
Siberian Rubythroat	88	179	226	182	207	247	277
White-tailed Robin	24	25	29	32	38	34	44
Red-flanked Bluetail	20	14	9	9	9	11	14
White-browed Bush-Robin	8	2	2	2	6	6	5
Collared Bush-Robin	57	43	34	46	35	39	52
Korean Flycatcher	0	0	0	0	0	0	1

Common Name	2015	2016	2017	2018	2019	2020	2021
Mugimaki Flycatcher	0	0	1	0	3	0	0
Snowy-browed Flycatcher	9	19	10	32	18	11	15
Taiga Flycatcher	0	1	2	0	0	0	1
Red-breasted Flycatcher	2	2	4	0	2	4	3
Plumbeous Redstart	222	178	170	223	261	239	238
Daurian Redstart	414	531	484	517	685	716	572
Blue Rock-Thrush	129	145	123	116	108	146	118
Siberian Stonechat	21	19	26	19	44	34	41
Japanese Waxwing	0	0	0	0	0	19	0
Plain Flowerpecker	20	15	23	30	31	26	47
Fire-breasted Flowerpecker	89	135	42	55	95	54	87
Fork-tailed Sunbird	7	83	11	6	18	48	51
Orange-cheeked Waxbill	0	11	19	5	0	0	21
Indian Silverbill	3	86	16	25	81	164	154
White-rumped Munia	333	440	477	281	480	675	601
Nutmeg Mannikin	2384	2411	2284	3058	3417	5579	4793
Chestnut Munia	151	11	158	7	78	1215	677
Alpine Accentor	4	0	8	1	0	7	9
Russet Sparrow	0	1	9	28	2	0	35
Eurasian Tree Sparrow	18511	21023	27687	22238	30217	30144	21741
Forest Wagtail	0	0	1	1	0	0	0
Gray Wagtail	442	617	634	614	615	613	584
Western Yellow Wagtail	43	0	1	0	0	0	0
Eastern Yellow Wagtail	1222	1394	1233	1628	1298	1956	1542
Citrine Wagtail	0	0	0	1	0	0	1
Japanese Wagtail	0	1	0	0	0	0	0
White Wagtail	489	665	770	824	1011	1122	1483
Richard's Pipit	87	91	146	210	227	238	316
Blyth's Pipit	0	0	0	1	0	0	0
Olive-backed Pipit	246	241	226	320	344	394	321
Pechora Pipit	0	0	1	1	0	1	0
Red-throated Pipit	66	271	245	184	133	220	128
American Pipit	6	10	13	2	1	10	30
Brambling	48	30	121	52	1	2	103
Hawfinch	0	0	0	0	0	0	0
Yellow-billed Grosbeak	3	107	76	53	111	110	182
Japanese Grosbeak	0	0	1	0	0	0	0
Common Rosefinch	0	0	0	0	0	1	1
Taiwan Rosefinch	4	5	2	5	14	5	13
Brown Bullfinch	20	18	32	32	27	0	27
Gray-headed Bullfinch	24	12	2	6	8	9	2
Oriental Greenfinch	8	105	106	41	61	117	180
Common Redpoll	0	0	0	0	0	1	0

Common Name	2015	2016	2017	2018	2019	2020	2021
Eurasian Siskin	45	0	0	118	20	123	298
Black-headed Bunting	0	1	0	1	0	0	0
Red-headed Bunting	0	1	2	1	0	0	0
Chestnut-eared Bunting	0	0	1	1	1	5	1
Yellow-throated Bunting	3	9	0	15	1	2	2
Ochre-rumped Bunting	0	0	0	1	0	0	0
Pallas's Bunting	0	0	0	0	0	1	1
Yellow-breasted Bunting	0	0	0	1	0	0	0
Little Bunting	7	55	36	36	9	20	9
Rustic Bunting	0	5	1	0	0	1	1
Yellow Bunting	0	7	0	1	14	0	1
Black-faced Bunting	256	375	344	444	395	520	478
Yellow-browed Bunting	2	1	0	0	0	7	5
Tristram's Bunting	0	0	0	3	0	0	2

Open Data

All Taiwan NYBC data is open to the public and can be found at the following two websites:

(1) GBIF

https://www.gbif.org/dataset/4daa291b-0e9d-4e21-b78d-6b4e96093adc

(2) Taiwan's Environmental Protection Administration

https://opendata.epa.gov.tw/

All annual reports (2014-2020)

Chinese language reports (2014-2020)

https://nybc.tw/pub/publication

English language reports (2019-2020)

https://nybc.tw/node/733

NYBC History

2013

2013.Oct.16 – Launch of official NYBC website

2013.Oct.24 – Launch of official NYBC Facebook page

2013.Dec.28 – NYBC 2014 begins

2014

2014.Jan.12 – NYBC 2014 ends

2014.Aug.19 – Poster presentation introducing NYBC debuts at IOC26 in Tokyo, Japan

2014.Dec.20 – NYBC 2015 begins

2015

2015.Jan.11 – NYBC 2015 ends

2015.Mar.10 – First NYBC press conference held to discuss results of NYBC 2015

2015.Dec.19 – NYBC 2016 begins

2016

2016.Jan.10 – NYBC 2016 ends

2016.Mar.22 – NYBC 2016 Press Conference held

2016.Nov.28 – NYBC becomes member of the Asian Waterbird Census, contributing data on behalf of Taiwan

2016.Dec.17 – NYBC 2017 begins

2017

2017.Jan.08 – NYBC 2017 ends

2017.Apr.11 – NYBC 2017 Press Conference held

2017.Dec.16 – NYBC 2018 begins

2018

2018.Jan.07 – NYBC 2018 ends

2018.Aug.23 – Oral presentation on NYBC results made at IOC27 in Vancouver, Canada

2018.Nov.19 – NYBC organizers attend AWC annual meeting

2018.Dec.15 – NYBC 2019 begins

2019

2019.Jan.06 – NYBC 2019 ends

2019.Dec.21 – NYBC 2020 begins

2020

2020.Jan.12 – NYBC 2020 ends

2020.Dec.19 – NYBC 2021 begins

2020.Dec.22 – Publication of State of Taiwan's Birds 2020 report

2021

2021.Jan.10 – NYBC 2021 ends

2021.Mar.22 – A Far-eastern Curlew "AAD" arrives in Taiwan

2021.May.19 – Taiwan's COVID-19 Level 3 alert begins

2021.Jun.20 – Oral presentation at webinar "Taiwan - The Beautiful Isle - Its Birds and Conservation" organized by the Oriental Bird Club

2021.Jul.27 – Taiwan's COVID-19 Level 3 alert ends

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Help us continue the count!

The Taiwan NYBC is one of the most successful citizen science projects in Taiwan. Though only six years old, the data collected is already having an impact on conservation initiatives at both the local and international level, helping inform the decisions of conservationists and policy-makers alike. Yet its success though is dependent on a number of factors, one of the main ones being financing. To learn more about how you could help to support this important annual event, contact the Taiwan NYBC at nybc@bird.org.tw or visit us at http://nybc.tw

Taiwan New Year Bird Count 2021 Annual Report

The materials presented in this work and the geographical designations employed therein do not imply any opinion whatsoever on the part of the TWBF or TESRI concerning the legal status of any country, territory, or area, or concerning the delineation of borders or boundaries.

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