



Taiwan New Year 2020 Annual Report

BIRD COUNT

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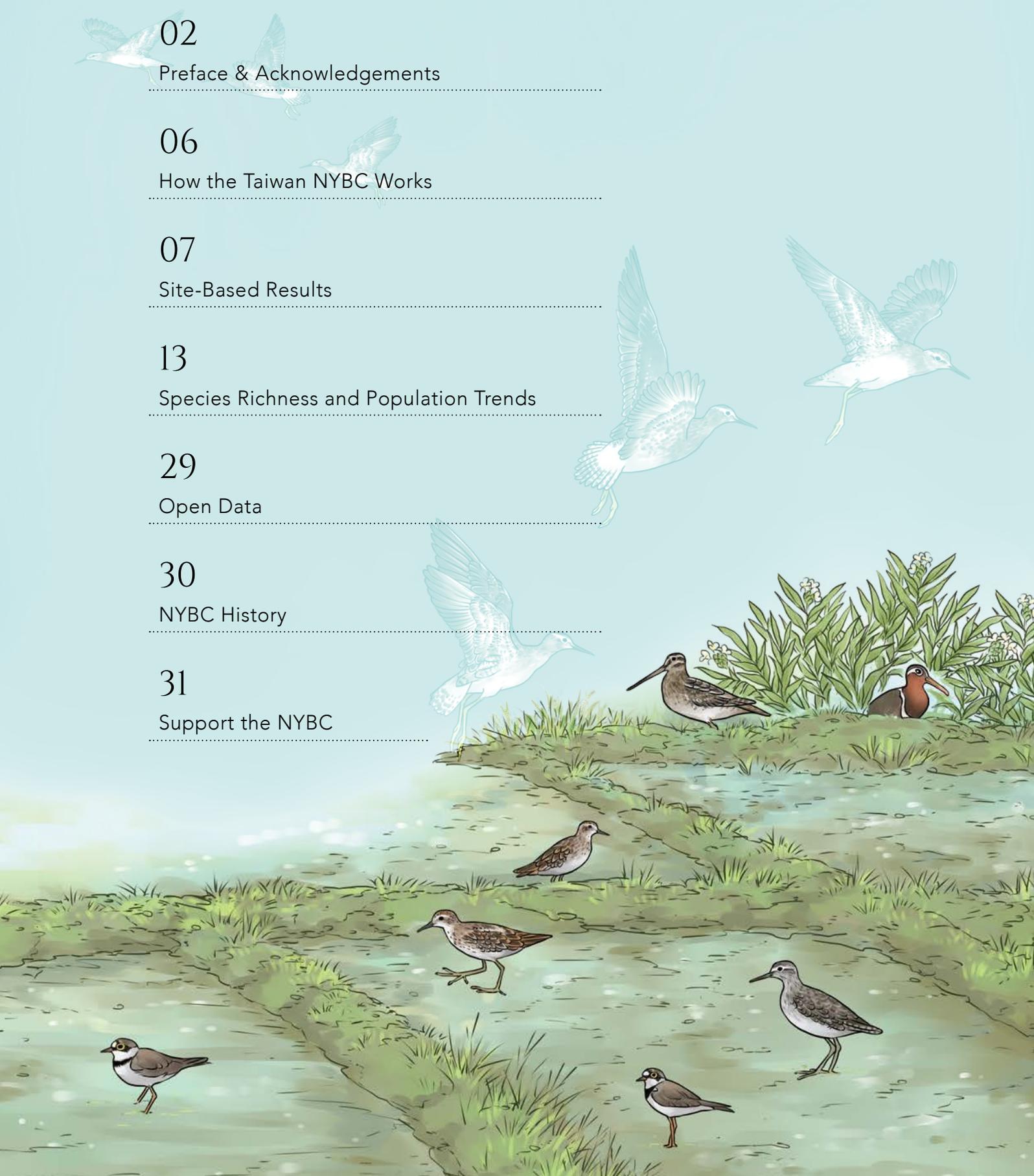
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Preface & Acknowledgements

Da-Li Lin

The year 2020 was poised to be the super year of biodiversity conservation—serving as the final year for the Aichi Biodiversity Targets as well as seeing the conference of parties for both the Convention on Migratory Species and Convention on Biodiversity. However, due to the unprecedented challenges posed by the emergence of Covid-19 and the subsequent global lockdown, some of these important meetings needed to be postponed to a later date. Fortunately for the Taiwan New Year Bird Count 2020, surveys were able to take place without issue, providing an uninterrupted look at the situation facing migratory birds along the East Asian-Australasian Flyway.

The Taiwan New Year Bird Count (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 7th report represents the results of the Taiwan NYBC 2020, conducted from December 21, 2019 to January 12, 2020. During this year's survey, 1,054 participants recorded 323,979 bird individuals from 350 species in 176 circle samples.

Our survey results provide comprehensive insight into the distribution and community composition of the wintering avifauna of Taiwan. This has importance for conservation goals along the East Asian-Australasian Flyway 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.

The loss of wild lands over the last thirty years has served as one of the biggest factors behind global biodiversity loss. Once natural landscapes have been altered for purposes such as agriculture, grazing, or silviculture. Yet though their main function has become the production of goods for human consumption, it is hoped that newer forms of management along with conservation actions can allow for these areas to become more biodiversity-friendly. One main goal of the conservation movement should be to improve the functionality and capacity for biodiversity conservation in these altered landscapes.

Over the last two decades, The East Asian-Australasian Flyway (EAAF) has seen a dramatic decrease in the number of migratory waterbirds which use it. One of the major factors contributing to this has been habitat disturbance, in the form of both loss and degradation. To emphasize the importance of creating more biodiversity-friendly agricultural lands, this year the organizers of



NYBC 2020 chose as mascots migratory waterbirds which prefer paddy field ecosystems. There were five in total: Little Ringed Plover (*Charadrius dubius*), Wood Sandpiper (*Tringa glareola*), Common Snipe (*Gallinago gallinago*), Greater Painted-Snipe (*Rostratula benghalensis*), and Long-toed Stint (*Calidris subminuta*). Their status and trends serve as a barometer for the health of these agricultural landscapes.

For our 2020 report, an analysis of NYBC data collected between 2014 and 2019 was also done to assess population trends for the 47 species of migratory waterbirds which occur in Taiwan. The results were mixed. They showed that 15 species had experienced significant declines, including all 2020 mascot species. Trends of decline were also noted for Eurasian Wigeon (*Mareca penelope*), Pacific Golden Plover (*Pluvialis fulva*), Lesser Sand Plover (*Charadrius mongolus*), Common Sandpiper (*Actitis hypoleucos*), Common Greenshank (*Tringa nebularia*), Marsh Sandpiper (*Tringa stagnatilis*), Common Redshank (*Tringa totanus*), Ruddy Turnstone (*Arenaria interpres*), Sanderling (*Calidris alba*), and Dunlin (*Calidris alpina*). These findings alert us to the need for more protections for these species and their habitats.

The organizers also recognize that this data must be shared with the other countries along these species' ranges. As birds don't know borders, it is only through collective efforts that the conservation needs of migratory bird species can be properly addressed. Taiwan's NYBC data provides a key piece to the puzzle of understanding the situation on the ground for migratory birds in East Asia and the EAAF. 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). They would also like to give special thanks to Allen Lyu (TWBF), Scott Pursner (TWBF), Kung-Kuo Chiang (WBST), Kun-Hai Lin (KWBS), Ruey-Shing Lin (TESRI), Yong-Lun Lin (TESRI), An-Yu Chang (TESRI) and Da-Li Lin (TESRI) for their tireless effort in making the Taiwan NYBC 2020 a reality.

Recommended Citation:

Lin, D-L, Lin Y-L, Chao J, Chang A-Y, Pursner S, Lyu A, Lin K-H, Chiang K-K, Lin, R-S. 2020. Taiwan New Year Bird Count 2020 Annual Report. Taiwan Wild Bird Federation, Taiwan Endemic Species Research Institute, Taiwan.

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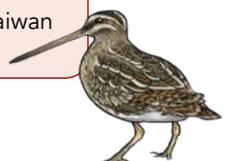
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I have always had great respect for the passion and tremendous efforts of the people of Taiwan in monitoring birds. Today, we all know that the participation of highly motivated citizen scientists, like yourselves, plays an indispensable role in understanding what is happening to the diversity of life on this planet. We also know the critical importance of systematically compiling huge volumes of observations, effectively analysing the collected data, and disseminating what was found, ideally in multiple languages. And it is hard to find examples of this process being done as elegantly as by the Taiwan New Year Bird Count. The world faces a slew of challenges, those from biodiversity loss, climate change, the pandemic, and so on. Nevertheless, successful efforts like the NYBC Taiwan give us hope for making the world a better place, not only for us humans but also for the spectacular diversity of life, including these migratory waterbirds.





Dr. Micha Jackson

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Producing population trends is one of the most difficult and one of the most important aspects of wildlife monitoring. To estimate trends reliably it is necessary to survey the same well-defined sites using consistent methods over multiple years. This takes time, dedication and organisation, and can rarely be achieved without the help of many hard-working volunteers.

The Taiwan New Year Bird Count is a wonderful example of this kind of citizen science in action. It has remarkable coverage and produces clear and meaningful results that help to celebrate successes and warn of populations in trouble. As we all know, migratory waterbirds are shared between many communities. Across huge distances, birds connect people. By making the results of your monitoring available through this report, you not only inform local trends and priorities but also contribute to our wider shared understanding about the health and ecology of the region's waterbirds.

Thank you for undertaking this inspiring work and sharing it with the world!



Goals

- ◎ Recording the wintering avifauna of Taiwan proper and its outlying islands
- ◎ Mainstreaming biodiversity
- ◎ Enjoying birding

How the Taiwan NYBC Works

Rules for the Taiwan NYBC are based off 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

Da-Li Lin, Yong-Lun Lin

From December 21, 2019 to January 12, 2020, NYBC 2020's 1,054 participants performed bird surveys at 176 sites (Fig 1, Table 1), recording 323,979 individuals from 350 species. A total of 68 of the 176 sites were located in Important Bird and Biodiversity Areas (IBAs, Fig 2).

The southwest coast and northeastern plains of Taiwan proper were hotspots in both species richness and abundance in the winter (Fig 3, 4).

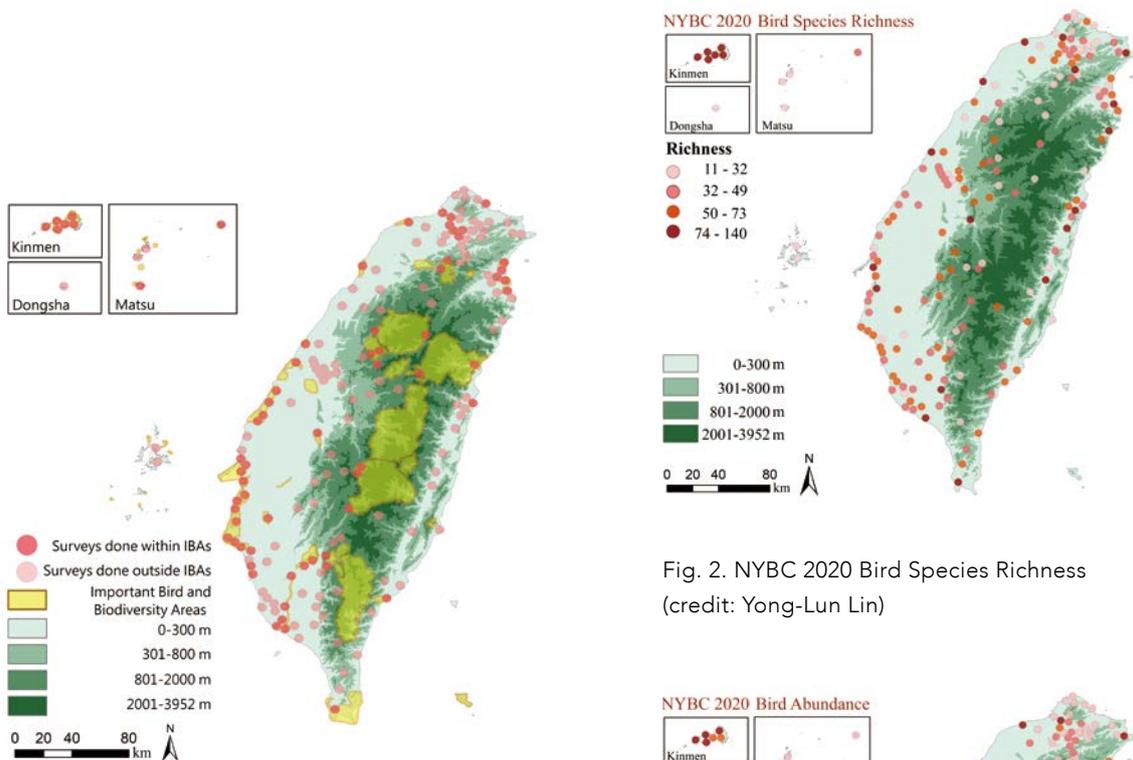


Fig. 2. NYBC 2020 Bird Species Richness (credit: Yong-Lun Lin)

Fig 1. NYBC 2020 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: Yong-Lun Lin).

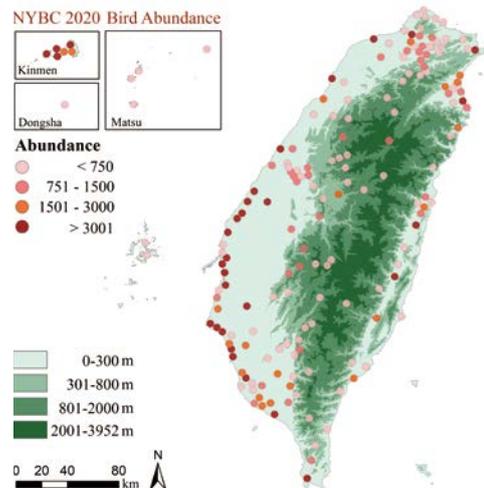


Fig. 3. NYBC 2020 Bird Abundance (credit: Yong-Lun Lin)

Table 1. Site-Based Results for the Taiwan NYBC 2020

Site Number	Site Name	Species Counted						Individuals Counted					
		2015	2016	2017	2018	2019	2020	2015	2016	2017	2018	2019	2020
1	Tai-an Waterfall	28	27	30	15	18	27	140	170	224	213	348	127
2	Huaijiang Bridge	57	64	61	40	47	34	781	1377	1274	394	630	401
3	Shih-Lin	46	49	45	33	31	42	917	2097	1249	405	737	1040
4	Wenshan Muzha	47	49	53	48	9	56	716	656	886	704	49	897
5	Taipei Parks	36	42	44	43	37	44	1188	1369	1142	1135	1256	1288
6	Academia Sinica	29	27	32	29	25	30	277	205	451	269	273	363
7	Guandu Wetland	97	90	86	70	47	81	4203	5501	4716	4680	1793	4293
8	Fuzhou Bridge	49	51	50	24	39	54	1097	754	890	124	512	1145
9	Gancheng Bridge	33	44	36	12	46	53	770	602	321	101	499	546
10	Zhonghe&Yonghe	40	42	51	29	49	48	1510	2128	1873	102	1941	1343
11	Xindian	42	38	62	43		51	477	469	782	536		870
12	Yehliu	28	31	23	20	24	30	205	185	132	71	99	183
13	Jinshan	64	58	52	54	74	65	627	426	445	437	880	486
14	Wa-Tzu-Wei	42	49	35	32	27	25	420	936	398	272	313	591
15	Fushan	30	34	33	40	32		398	421	199	586	633	
16	Tonghou	33		15		23	17	189		90		307	88
17	Xizhi	27	37	28	40	39	31	205	314	167	748	578	310
18	Houtong		18	24	23	18	36		87	168	58	155	133
19	Pinglin	35	36	39				196	204	333			
20	Guishan	74	72	72	71	79	80	1182	1105	1039	1619	1804	1403
21	Neidong	28			31	17	34	250			301	115	290
22	Shiding	46	37	40	40	41	40	493	299	287	368	412	488
23	Tien-Liao-Yang	83	116	107	111	96	140	2282	1687	1439	1507	1968	3216
24	Manyueyuan	34		20			27	266		225			190
25	Sanxia	21	23		12	21		164	250		251	608	
26	Sanzhi		26	67	54	49	47		109	1068	614	623	648
27	Chajiao				8	7					171	97	
28	Pingguang Rd.	28	19		20	52		165	123		338	284	
29	Hsu-Tsu Kang		30	70	67	57	81		322	2123	1655	1253	3549
30	Guoling Forest Park	52	36					2115	443				
31	Hsian-Shen Wetland	96	99	86	76	87	85	7953	9706	10109	4804	10046	8187
32	National Tsing Hua University	17	20	20	26		18	80	299	174	327		270
33	Sanhudaο	25	38	30	35	26	26	1175	931	361	542	736	645
34	Mingfong Historic Trail		42		29	26	33		226		248	277	335
35	Dasyueshan9-23K	50	41	54	48	54	53	765	222	336	214	478	359
36	Dasyueshan23-37K	34	30	28	37	34	40	646	282	365	373	611	622
37	Dasyueshan37-52K	37	24	14	19	19	28	667	248	81	116	101	313
38	Kao-Mei Wetland	75	59	58	57	68	79	5458	6959	7248	2897	4636	3502
39	Taichung Metropolitan Park	22	29	42	35	40	46	345	266	562	354	531	586
40	Dakeng	70	64	61	62	73	66	2034	2500	1307	1024	1603	1392
41	National Museum of Natural Science	19	27	27	31	29	19	449	431	312	350	425	103
42	National Chung Hsing University	23	23	26	28	32	14	431	298	361	305	717	119
43	Da-Jia	34	42	40	39			343	1098	695	857		
44	Ta-Tu Stream	36	33	36	33	30	37	2252	4090	2760	2234	1922	1248





Site Number	Site Name	Species Counted						Individuals Counted					
		2015	2016	2017	2018	2019	2020	2015	2016	2017	2018	2019	2020
45	Fazi River	29	37	32	33	37	36	457	737	292	238	684	787
46	Ta-Li Stream	29	38	28	38	34	38	765	870	842	790	845	1057
47	Taiping	34	36	37	48	28	50	471	496	523	744	554	838
48	Basianshan	34	27		43	19	39	205	122		231	107	265
49	Wuling Farm	38	45	45	59	52	49	460	867	1186	1256	1791	1258
50	Puli	70	73	66	67	65	65	2002	2242	1946	2153	1649	1894
51	Wushe	53	57	53	52	61	43	601	679	580	451	667	732
52	Mei Feng Farm	49	63	52	57	54		615	724	682	483	597	
53	Kunyang	20	11	11	16	12	18	481	66	130	81	66	121
54	Aowanda	39						598					
55	Dongpu	42	50	64	51	58		790	1215	1543	961	1717	
56	Jiji	81	88	74	82	87	82	2626	2388	1376	2509	2600	1479
57	Xitou	58	56	50				401	1257	442			
58	Huisun Forest Area			29	31	22	27			161	176	193	203
59	Tataka	30	26	21	25	30	34	397	549	182	285	396	637
60	Han-Pao & Fu-Pao Wetland	57	42	31	39	34	37	4961	3469	398	6086	3416	7294
61	Fang-Yuan	42	27	59	50	37	39	3214	7193	6159	5872	3966	4518
62	Dong-Luo-Hsi River	30	37	33	37	41	46	605	701	872	1532	2899	3611
63	Yiwu Wetland	74	60	55	63	54	67	6737	4715	4932	5684	5840	5305
64	Huben	57	75	64	51	56	68	1449	2451	1291	770	822	1346
65	Douliu	33		29	31			914		526	627		
66	Shibi	59	60	52	56	49	63	637	930	424	657	587	940
67	Fengshan	29	33	31	26	29		208	184	275	255	234	
68	Chashan	34	29	31	21	24		342	167	342	352	315	
69	Lantan Reservoir	34	32	27	22	25		690	432	367	207	198	
70	Pu-Tai	72	80	82	82	77	79	14531	24439	36701	39024	37988	34814
71	Zengwen Reservoir	68	55	53	59	54	55	764	790	703	658	676	686
72	Alishan	44	28	38	37	35	30	837	680	123	801	879	412
73	Aogu Wetland	89	90	97	93	83	90	7798	5596	9438	14286	14100	11372
74	Guanghua			57	59	47	54			518	657	580	910
75	Szu-Tsao		52	75	76	69	73		7193	10273	9755	6515	10661
76	Tainan Tucheng		28	59	71	64	69		2575	6873	6294	5217	5969
77	Guan-Tien	58	55	43		53	59	3308	7915	7629		5400	7875
78	Kantou Mountain			26	24	29	45			332	163	159	429
79	Qigu	63	72	61	67	69	64	3110	6900	3545	4230	2905	3003
80	Chiku-Dingshan	30	39	68	42	47	40	2214	6797	15603	2491	5279	2659
81	National Cheng Kung University	24	24	32	27	19	17	517	849	768	889	468	322
82	Xinhua	22	28	41	28	24	21	130	182	204	315	314	162
83	Yung-An	43	47	80	79	45	49	1945	2799	3486	2873	1633	4717
84	Shanping	42	34	39	36	29	27	242	427	289	326	229	352
85	Maolin	35	35	35	50	38	39	314	393	672	541	730	914
86	Yellow Butterfly Valley	26	38	39	40	37	52	101	498	366	603	616	525
87	Zuoying	58	56	59	63	57	65	1861	2264	2015	3411	2657	3137
88	Cijin,Gushan&Yancheng	52	52	59	55	51	36	1528	1322	2307	1773	1449	526
89	Weiwuying	30		43	32	38	30	547		507	529	584	507



Site Number	Site Name	Species Counted						Individuals Counted					
		2015	2016	2017	2018	2019	2020	2015	2016	2017	2018	2019	2020
90	Niao-Sung	30	35	34	35	41	35	386	532	421	546	840	399
91	Kaohsiung Old Railway Bridge Wetland	53	57	61	57	55	49	1925	1957	2591	1381	1952	1371
92	Feng-Shan Reservoir	35	48	41	37	44	52	2041	1591	1446	1816	1875	2350
93	Nanxing&Fengshan	33	46	44	43	45	48	286	696	858	394	452	970
94	Lin-Yuan		45	30	29	38	37		4058	3503	1140	1587	2152
95	Erjituanshan	21	44	45	53	57	26	185	802	592	516	746	353
96	Zhongliaoshan	42	32	41	42	46	45	414	503	469	815	377	729
97	Yuan-Chung-Kang	54	40	58	50	59	52	1977	1910	2699	1976	2831	2540
98	Qieding	79	78	75	77	71	69	13878	17651	18429	14347	10719	14450
99	Dongsha Islands	29	51	49	33	34	27	317	629	446	309	345	281
100	Shihshan Forest Road	34	34	34	30	38	38	302	181	241	204	345	365
101	Pingtung Shaxi Forest-Road												
102	Wutai	54	48	12	27	17	15	484	345	60	160	63	72
103	Sandimen	22	35	17	22	41	43	209	368	166	167	697	447
104	National Pingtung University of Science and Technology	84	73	78	74	76	84	3034	2716	2411	2109	2119	2136
105	Linhousilin Forest Park	34	40	31	39	21	46	479	513	363	339	244	834
106	Kanding Wetland	62	47	51	53	58	59	1819	1355	1121	1733	1970	1781
107	Da-Peng-Wan	59	66	58	73	62	75	1988	4819	2295	2889	2283	3802
108	DahanShan		31	20	38		19		207	68	255		102
109	Shuangliou Forest Recreation Area	30	34	30	19	24	35	135	120	201	65	132	145
110	Lung-Luan Lake	106	103	102	95	104	122	2252	2810	4598	2953	2745	3824
111	Mudan	54	50	50	57	54	53	761	671	802	758	1233	921
112	Pingtung Agricultural Biotechnology Park	42	53	48	52	48	64	868	1424	1137	1015	1449	1735
113	Weiliaoshan	43	47	56	44	42	50	569	435	611	419	525	599
114	Taiwu	54	52	44	52	72	38	834	606	776	673	847	379
115	YiChiLine	25	19	20	25	21	31	3446	6160	1562	1894	710	2487
116	Zhu'an	85	70	77	70	77	65	5851	7476	6107	5902	7660	2835
117	Yuanshan	37	31	34	51	32	32	1924	1001	1595	2636	2383	2018
118	Shinnan-Meifu	46	49	35	38	42	40	2174	1964	2349	1687	1195	719
119	Lan-Yang Stream	85	89	95	50	50	52	2304	2564	2671	1415	4044	1411
120	Dazhou	46	38	31	35	33	44	2588	470	650	918	1143	782
121	Li-Tse	62	51	53	55	45	75	7967	6719	5344	8387	4282	5991
122	Wu-Wei-Kang	42	49	37	37	39	56	1087	820	985	797	656	809
123	Nan'ao	94	107	106	104	105	114	1790	2451	2163	2722	1743	2345
124	Tongmen	42	33					359	436				
125	Hua-Lien River Mouth	39	44	49	50	39	46	458	528	593	903	672	690
126	San-Min	66	86	79		65	80	6203	8864	7653		3795	5488
127	Ruisui	33	52	36	33	10	14	661	886	377	560	159	147
128	Ji-An	37	35	35	56	42	56	361	403	551	402	617	1370
129	Pei-Nan Wetland	48	29	33	43		52	1007	343	117	1346		736
130	Jhhiben Wetland	51	65	48	46		57	1472	1188	1886	712		2675
131	Da Po Pond	59		68		38	69	668		932		633	2503





Site Number	Site Name	Species Counted						Individuals Counted					
		2015	2016	2017	2018	2019	2020	2015	2016	2017	2018	2019	2020
132	Southern Cross-Island Provincial Highway	51		34		38	55	688		407		221	532
133	Taitung Yima Forest Road	34		36	42	38	33	395		256	363	420	130
134	Sanxiantai	32	34	46		15	31	116	242	391		189	271
135	Tsai-Yuan Wetland	41	30	58	38	36	30	454	159	560	474	403	114
136	Chi Lake	39		64	76	105	96	3977		1279	9632	16234	5922
137	Little Kinmen	67	84	68	80	79	91	1507	1676	1264	4809	3544	3423
138	Kinsa	81	74	80	82	88	90	4240	2743	2977	3467	4539	5938
139	Kinmen County Forestry Affair Place	59	63	79	72	75	83	2847	2186	4145	3945	2283	2978
141	Beigan	17	23	12	16	14	15	134	132	124	56	68	76
142	Nangan	26	43	38	24	31	31	198	685	247	195	200	337
143	Juguang	23	38	33	13	33	23	123	670	265	73	224	208
144	Dongyin	47	38	32			48	379	276	238			387
145	Shihmen	30	17	19	15	12	15	185	87	272	154	167	33
146	Wuzhishan Range	23	54	64	46	45	40	165	815	975	561	613	1434
147	Chi-Tou	19	18	21	15	16	16	221	1458	224	260	270	369
148	Bayien	9	25					19	216				
149	Kanggaokeng River		17	14	13	13	11		68	62	70	101	69
150	Jincheng		72	83	89	85	98		1278	2284	3296	3546	3928
151	Chonlin		68	79	73	67	87		1195	2615	1879	1353	2424
152	Meinong		45	40	50	49	49		559	574	1098	746	683
153	Tonglin		36	37	39	51	54		415	344	450	488	670
154	Shenmei Lake		35	47	58	48	50		309	496	513	398	446
155	Yulao		32	28	31	38	27		518	254	321	353	268
156	Yangchoukeng		40	29	31	30	27		593	439	300	357	247
157	Zhongli		50	48	51	46	53		418	489	722	756	949
158	Ta Cheng		49	52	61	49	62		2098	2933	3804	2105	3972
159	Zhongzhengshan		17	25	22	22	11		199	135	152	125	26
160	Dongshan		39	26	56		46		249	209	519		370
161	Dadan Island		41						340				
162	Waipu Lotus Valley		36	36	46	50	52		317	669	1747	2191	1420
163	Dingzilanhsi		43	33	31	32	43		165	169	242	239	189
164	Chukou		49	45	48	40	50		1285	399	670	520	864
165	Jiufenershan		52	31	44	58	60		590	364	360	715	577
166	Zhuoshui River		65	39	65	59	60		12567	7977	11073	15699	10437
167	Orchid Island		22						130				
168	Pozhih Stream		48	54	44	39	58		6111	5807	3350	2475	6340
169	Ba-Chang-Hsi River		45	56	53	52	37		4091	2471	7353	2078	415
170	Beimen		51	40	40	39	40		3296	1182	765	972	794
171	Shou-Feng		30	39	36	30	44		1602	1223	2391	1558	921
172	Lalashan		3						23				
173	Li-Yu-Tan			47	56	48	53			395	509	368	305
174	Danongdafu Forest Park			44	43	49	44			408	539	611	325



Site Number	Site Name	Species Counted						Individuals Counted					
		2015	2016	2017	2018	2019	2020	2015	2016	2017	2018	2019	2020
175	Shalun Farm			53	54	49	60			1367	2838	3167	2926
176	Keelung River			44	47	39				1291	1983	578	
177	Erchong Floodway			47	52	49	60			1183	1196	1235	1533
178	Maokong&Shenkeng			30	30	24				164	151	151	
179	Tunghai University			29	28	30	43			503	247	538	747
180	Nantun			23	41	32	40			779	1339	823	1045
181	Dawu			44	50	51	50			391	536	465	541
182	Tai-Xi			44	41	50	46			2165	1818	3032	5253
183	Sihu			31	31	14	24			894	472	100	115
184	Kouhu					16	36					136	595
185	Jinshuiying Historic Trail			23						55			
186	Hou-Long-Hsi River			40	34	36				449	572	588	
187	Fonglin			83	104	101	110			1704	2267	2400	3809
189	Jiangjun			68						15603			
190	National Dong Hwa University			50	54	56	81			1184	739	1563	1862
191	Lao Mei			46	24	21	11			372	148	81	36
192	Cueifong Lake				13	8					32	11	
193	Walami Trail				65		31				778		303
194	North-Cross Island Highway's Baling				33						350		
195	Wumei Elementary School Fengshu Branch				16	10					265	483	
196	Meishan Entrance(Meishan Lane)					54	47					1189	455
197	North-Cross Island Highway's Mingchih						28					125	
198	Cilan Villa					30						287	
199	Sishu					62	52					1647	1837
200	Yunei River					26	28					160	190
201	Nangang					8	19					39	44
202	Taipingshan Villa					9						50	
203	Tuchang Jioujihze						22					316	
204	Shakadang					17	20					166	82
205	Yushan Scenic Highway						28	20				214	196
206	Lion's Head Mountain							41					260
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	Öita City	25	28	19			28		173	175	329		237
x3	Southern Taiwan Science Park Xinshi Dist.												
x4	Southern Taiwan Science Park Luzhu Dist.												



Download Table 1 Here





Species Richness and Population Trends

Da-Li Lin, An-Yu Chang, Yon-Lun Lin

The NYBC 2020 recorded 323,979 individuals from 350 species. The 2020 distribution maps for this year's mascots, the Little Ringed Plover (1,578 individuals), the Greater Painted-Snipe (70 individuals), the Longtoed Stint (599 individuals), the Common Snipe (579 individuals), and the Wood Sandpiper (1,511 individuals), are listed in Figures 4a-e. These numbers add vital context to the conversation surrounding the state of our agricultural landscapes, with farmland loss potentially being one of the major factors behind the population declines.

To assess the population trends of wintering migratory waterbirds, the organizers took the NYBC datasets taken between 2014 and 2019 and analysed the data for the 47 species of waterbird which stopover or winter in Taiwan proper.

The organizers also examined at the data for three geographical areas considered hotspots for migratory waterbirds: the Yilan Plain (northeastern Taiwan), the Changhua Coast (western coast), and the Chianan plain (southwestern coast). Organizers used R package "glmmTMB" to conduct the analysis of generalized linear mixed model (GLMM) and set Poisson distribution as the distribution. The random factors include the codes of circle samples and the survey year.

Table 2 represents the analysis results. For waterfowl and coots, the Eurasian Wigeon (*Mareca penelope*), experienced a significant decline at the Yilan Plain but significant growth along the Changhua Coast. Meanwhile, numbers for Northern Shoveler (*Spatula clypeata*), Tufted Duck (*Aythya fuligula*), and Eurasian Coot (*Fulica atra*) all saw significant growth, with Coot numbers up throughout Taiwan. The results for shorebirds were less positive. Aside from the Red-necked Stint (*Calidris ruficollis*), which showed a significant increase along the Changhua Coast, population numbers for other shorebird species decreased significantly throughout Taiwan. 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. Appropriate conservation actions should also be developed accordingly.



The Taiwan NYBC uses an rtrim package of R 3.5.1 to examine the population trends of waterbirds, including waterfowl, shorebirds, and wintering terns. This method is sensitive to statistical significance, making it adept at detecting growth or decline in populations based on count data. Analysis of the data collected over the last six years has led to the following findings. Populations of Greater Painted-Snipe (*Rostratula benghalensis*), Long-toed Stint (*Calidris subminuta*), and Common Snipe (*Gallinago gallinago*) have decreased significantly

from 2014 to 2019 (all $p < 0.05$, Fig 6). Meanwhile, populations of Eurasian Wigeon (*Mareca penelope*), Eastern Spot-billed Duck (*Anas zonorhyncha*), Northern Shoveler (*Spatula clypeata*), Northern Pintail (*Spatula acuta*), Tufted Duck (*Aythya fuligula*), Great Egret (*Ardea alba*), Intermediate Egret (*Ardea intermedia*), Little Egret (*Egretta garzetta*), Eurasian Coot (*Fulica atra*), Red-necked Stint (*Calidris ruficollis*), and Black-headed Gull (*Chroicocephalus ridibundus*) increased significantly between 2014 and 2019 (all $p < 0.05$, Fig 7-8).

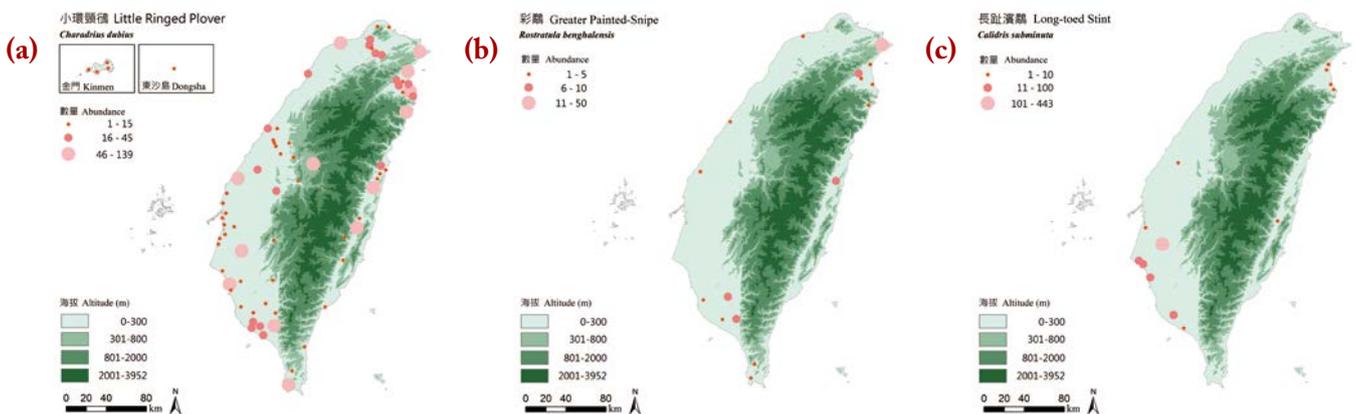
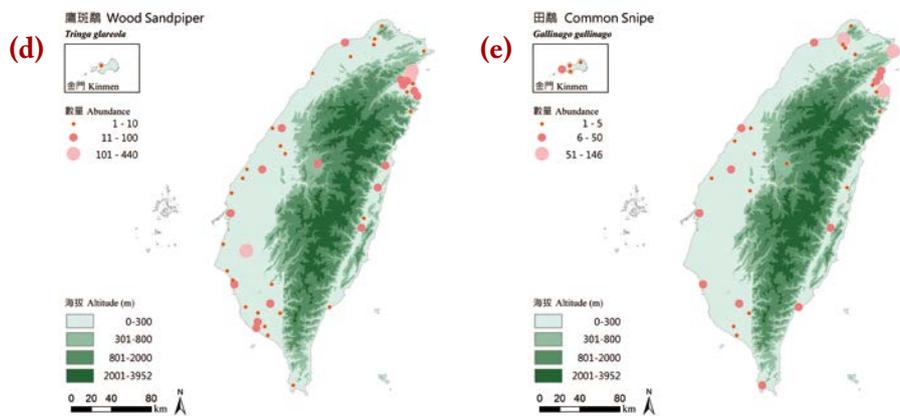


Fig 4. NYBC 2020 Distribution maps for this year’s mascots, (a) Little Ringed Plover (*Charadrius dubius*), (b) Greater Painted-Snipe (*Rostratula benghalensis*), (c) Long-toed Stint (*Calidris subminuta*),

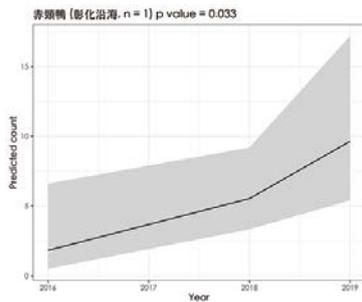


(d) Wood Sandpiper (*Tringa glareola*), and (e) Common Snipe (*Gallinago gallinago*)

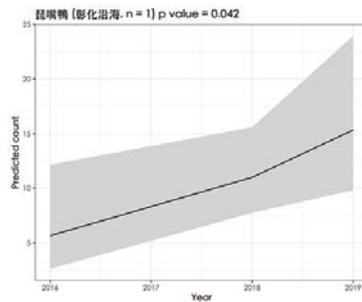


Table 2. Population trends for waterbirds wintering in Taiwan proper as well as three migratory waterbird hotspots. Only species whose population trends reached statistical significance are listed. (Names in blue indicate the species is an NYBC 2020 mascot)

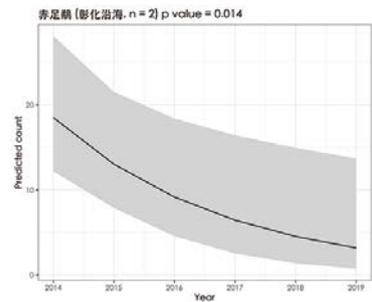
Changhua Coast (Western Taiwan)



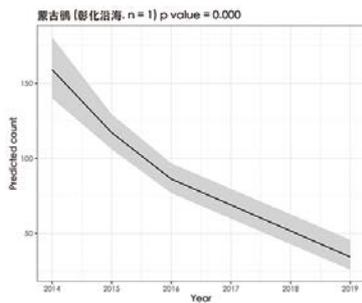
Eurasian Wigeon



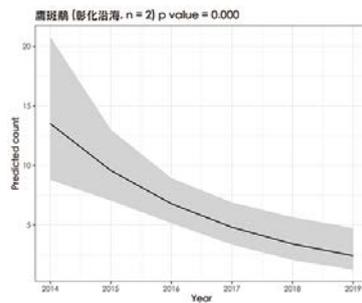
Northern Shoveler



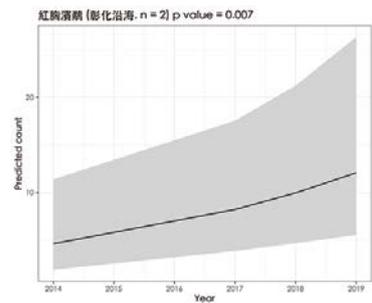
Common Redshank



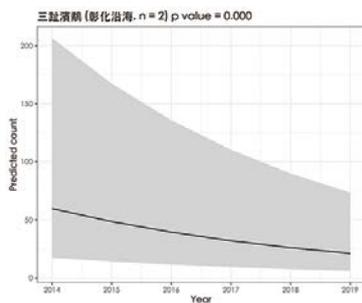
Lesser Sand Plover



Wood Sandpiper



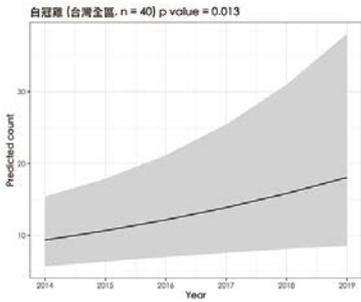
Red-necked Stint



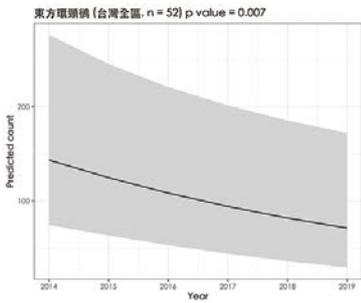
Sanderling



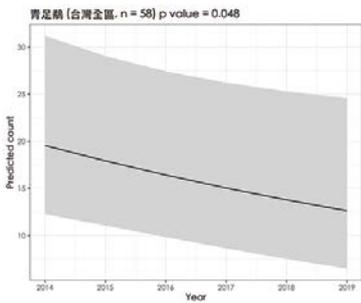
Taiwan Proper



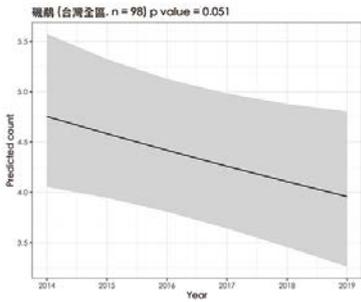
Eurasian Coot



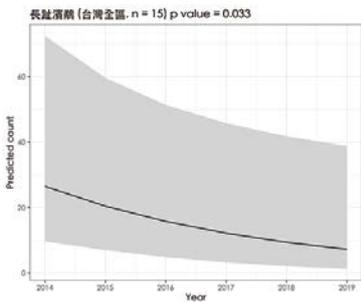
Kentish Plover



Common Greenshank

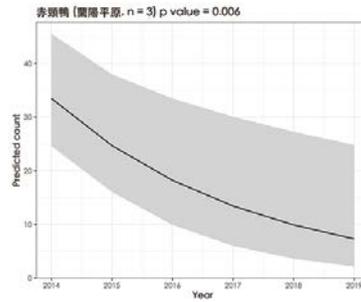


Common Sandpiper

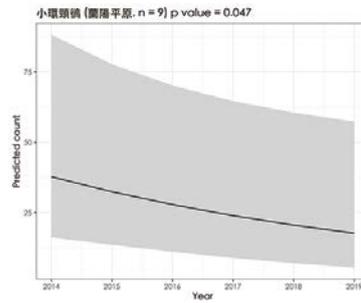


Long-toed Stint

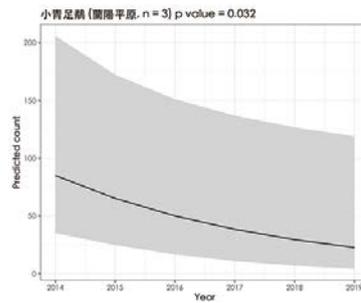
Yilan Plain (Northeastern Taiwan)



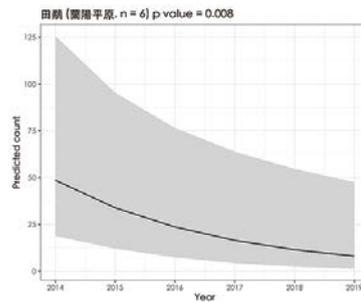
Eurasian Wigeon



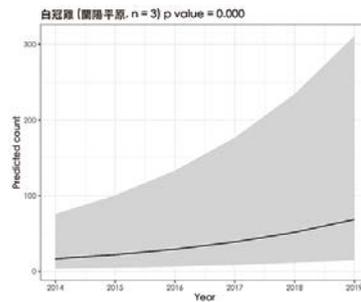
Little Ringed Plover



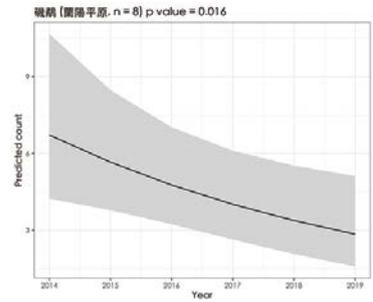
Marsh Sandpiper



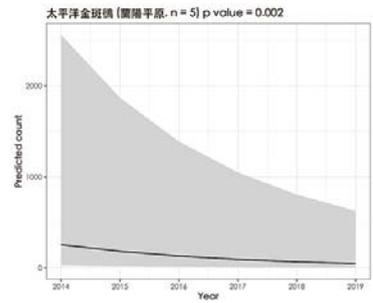
Common Snipe



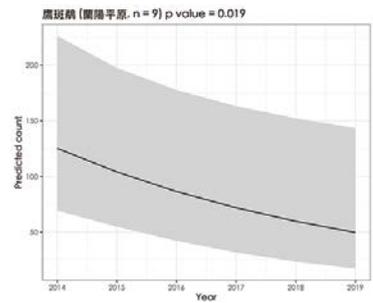
Eurasian Coot



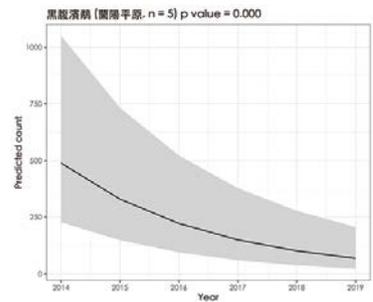
Common Sandpiper



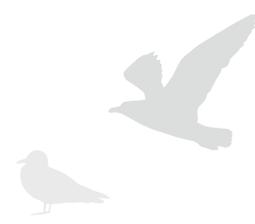
Pacific Golden Plover



Wood Sandpiper

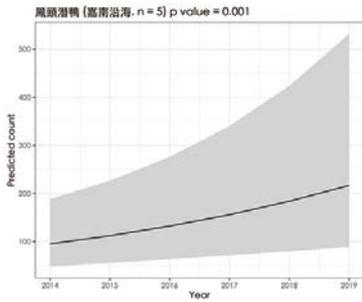


Dunlin

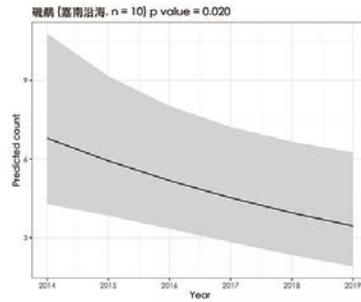




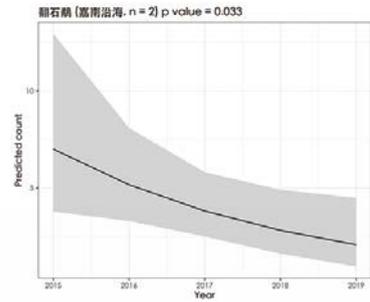
Chianan Plain (Southwestern Taiwan)



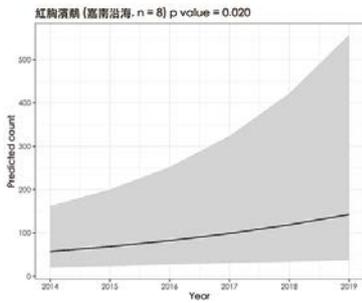
Tufted Duck



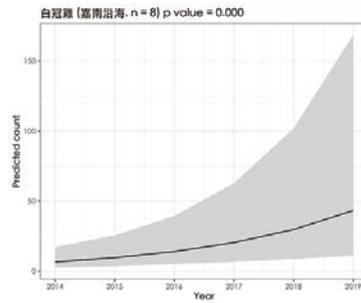
Common Sandpiper



Ruddy Turnstone



Red-necked Stint



Eurasian Coot



Table 3. 2015-2020 NYBC Data by Species

Scientific Name	Common Name	2015	2016	2017	2018	2019	2020
<i>Anser anser</i>	Graylag Goose	0	0	0	0	2	0
<i>Anser albifrons</i>	Greater White-fronted Goose	7	0	0	0	0	1
<i>Anser fabalis</i>	Taiga Bean-Goose	1	14	7	0	0	0
<i>Anser serrirostris</i>	Tundra Bean-Goose	7	0	0	0	0	7
<i>Cygnus columbianus</i>	Tundra Swan	0	0	1	0	0	1
<i>Tadorna ferruginea</i>	Ruddy Shelduck	0	16	0	2	2	0
<i>Tadorna tadorna</i>	Common Shelduck	10	2	4	9	2	7
<i>Nettapus coromandelianus</i>	Cotton Pygmy-Goose	0	0	0	0	1	1
<i>Aix galericulata</i>	Mandarin Duck	40	12	22	9	12	6
<i>Anas formosa</i>	Baikal Teal	0	2	0	3	1	1
<i>Anas querquedula</i>	Garganey	68	149	146	49	11	31
<i>Anas clypeata</i>	Northern Shoveler	7388	9663	14103	14193	11609	13766
<i>Anas strepera</i>	Gadwall	84	42	139	61	96	56
<i>Anas falcata</i>	Falcated Duck	40	8	34	18	18	69
<i>Anas penelope</i>	Eurasian Wigeon	3848	10334	12237	6860	8190	10035
<i>Mareca americana</i>	American Wigeon	0	0	0	0	0	1
<i>Anas luzonica</i>	Philippine Duck	2	0	0	0	0	0
<i>Anas zonorhyncha</i>	Eastern Spot-billed Duck	2349	2866	3400	4177	4132	3538
<i>Anas platyrhynchos</i>	Mallard	155	146	66	94	147	92
<i>Anas acuta</i>	Northern Pintail	2392	2600	6446	3760	5759	3566
<i>Anas crecca</i>	Green-winged Teal	6609	7239	6844	6829	7229	6712
<i>Aythya ferina</i>	Common Pochard	158	65	174	39	21	122
<i>Aythya nyroca</i>	Ferruginous Duck	2	1	1	0	1	0
<i>Aythya baeri</i>	Baer's Pochard	0	0	0	1	0	0
<i>Aythya fuligula</i>	Tufted Duck	2179	3909	4420	3308	4014	3346
<i>Aythya marila</i>	Greater Scaup	16	26	37	2	40	33
<i>Bucephala clangula</i>	Common Goldeneye	1	0	0	0	0	0
<i>Mergellus albellus</i>	Smew	0	0	0	0	0	1
<i>Mergus merganser</i>	Common Merganser	0	0	1	0	0	0
<i>Mergus serrator</i>	Red-breasted Merganser	0	0	4	0	0	0
<i>Mergus squamatus</i>	Scaly-sided Merganser	1	1	0	0	0	0
<i>Arborophila crudigularis</i>	Taiwan Partridge	37	50	61	74	94	92
<i>Pavo cristatus</i>	Indian Peafowl	0	0	0	0	0	9
<i>Synoicus chinensis</i>	Blue-breasted Quail	0	0	0	0	0	4
<i>Coturnix japonica</i>	Japanese Quail	2	1	2	1	0	4
<i>Bambusicola sonorivox</i>	Taiwan Bamboo-Partridge	167	217	247	207	301	229
<i>Symaticus mikado</i>	Mikado Pheasant	4	2	1	0	3	0
<i>Phasianus colchicus</i>	Ring-necked Pheasant	53	56	103	137	86	195
<i>Lophura swinhoii</i>	Swinhoe's Pheasant	15	7	30	17	12	19





Scientific Name	Common Name	2015	2016	2017	2018	2019	2020
<i>Tachybaptus ruficollis</i>	Little Grebe	825	888	1308	1242	1259	1417
<i>Podiceps cristatus</i>	Great Crested Grebe	22	1	60	125	33	178
<i>Podiceps nigricollis</i>	Eared Grebe	7	0	2	5	5	19
<i>Columba livia</i>	Rock Pigeon	2808	4035	5732	4970	5714	5265
<i>Columba pulchricollis</i>	Ashy Wood-Pigeon	79	130	470	749	400	455
<i>Streptopelia orientalis</i>	Oriental Turtle-Dove	517	1039	1026	1042	825	870
<i>Streptopelia tranquebarica</i>	Red Collared-Dove	5405	6658	10288	7932	9488	9462
<i>Streptopelia chinensis</i>	Spotted Dove	1862	2557	3347	2873	3686	3699
<i>Chalcophaps indica</i>	Asian Emerald Dove	22	15	14	22	16	34
<i>Treron sieboldii</i>	White-bellied Pigeon	92	97	109	97	111	102
<i>Treron formosae</i>	Whistling Green-Pigeon	41	17	59	84	42	91
<i>Ptilinopus leclancheri</i>	Black-chinned Fruit-Dove	1	0	0	0	0	0
<i>Centropus sinensis</i>	Greater Coucal	19	24	18	38	25	36
<i>Centropus bengalensis</i>	Lesser Coucal	19	21	18	24	15	23
<i>Eudynamis scolopaceus</i>	Asian Koel	0	0	6	0	0	1
<i>Cacomantis merulinus</i>	Plaintive Cuckoo	0	0	1	0	0	0
<i>Caprimulgus affinis</i>	Savanna Nightjar	0	0	0	0	23	588
<i>Hirundapus caudacutus</i>	White-throated Needletail	0	0	1	6	0	0
<i>Hirundapus cochinchinensis</i>	Silver-backed Needletail	0	1	0	2	0	0
<i>Aerodramus brevirostris</i>	Himalayan Swiftlet	0	2	0	0	0	0
<i>Apus pacificus</i>	Pacific Swift	1	3	0	0	9	3
<i>Apus nipalensis</i>	House Swift	2236	2391	1825	3732	2144	1520
<i>Rallus indicus</i>	Brown-cheeked Rail	5	0	0	0	5	2
<i>Gallirallus striatus</i>	Slaty-breasted Rail	4	4	0	4	1	1
<i>Gallinula chloropus</i>	Eurasian Moorhen	3271	3722	3514	2984	3384	3905
<i>Fulica atra</i>	Eurasian Coot	620	748	1448	2330	2023	1186
<i>Porphyrio poliocephalus</i>	Black-backed Swamphen	0	1	0	0	0	1
<i>Amaurornis phoenicurus</i>	White-breasted Waterhen	200	172	226	342	217	310
<i>Rallina eurizonoides</i>	Slaty-legged Crake	0	0	0	0	0	1
<i>Zapornia fusca</i>	Ruddy-breasted Crake	31	13	14	16	8	13
<i>Zapornia pusilla</i>	Baillon's Crake	0	0	0	0	0	1
<i>Leucogeranus leucogeranus</i>	Siberian Crane	1	1	0	0	58	0
<i>Grus japonensis</i>	Red-crowned Crane	0	1	0	0	0	0
<i>Himantopus himantopus</i>	Black-winged Stilt	8424	10742	10772	11207	12283	14869
<i>Recurvirostra avosetta</i>	Pied Avocet	1192	3552	3729	3570	4380	4609
<i>Haematopus ostralegus</i>	Eurasian Oystercatcher	36	9	96	16	130	212
<i>Pluvialis squatarola</i>	Black-bellied Plover	354	885	638	479	895	1015
<i>Pluvialis fulva</i>	Pacific Golden-Plover	3898	7150	7047	3031	3210	7293



Scientific Name	Common Name	2015	2016	2017	2018	2019	2020
<i>Vanellus vanellus</i>	Northern Lapwing	164	182	134	178	100	177
<i>Vanellus cinereus</i>	Gray-headed Lapwing	0	0	0	1	1	1
<i>Charadrius mongolus</i>	Lesser Sand-Plover	317	84	261	246	156	225
<i>Charadrius leschenaultii</i>	Greater Sand-Plover	44	344	100	131	350	499
<i>Charadrius alexandrinus</i>	Kentish Plover	10363	26753	26995	18998	16908	15753
<i>Charadrius hiaticula</i>	Common Ringed Plover	0	0	1	1	0	0
<i>Charadrius placidus</i>	Long-billed Plover	1	0	1	0	0	8
<i>Charadrius dubius</i>	Little Ringed Plover	1083	1639	2222	1287	1280	1578
<i>Rostratula benghalensis</i>	Greater Painted-snipe	46	39	28	27	50	70
<i>Hydrophasianus chirurgus</i>	Pheasant-tailed Jacana	391	380	257	40	281	281
<i>Numenius phaeopus</i>	Whimbrel	10	91	202	36	47	220
<i>Numenius minutus</i>	Little Curlew	1	0	0	0	0	0
<i>Numenius madagascariensis</i>	Far Eastern Curlew	4	0	14	2	1	2
<i>Numenius arquata</i>	Eurasian Curlew	1767	1627	2254	950	713	877
<i>Limosa lapponica</i>	Bar-tailed Godwit	2	5	0	2	6	15
<i>Limosa limosa</i>	Black-tailed Godwit	5	19	164	202	142	7
<i>Arenaria interpres</i>	Ruddy Turnstone	1004	1405	632	458	1145	1968
<i>Calidris tenuirostris</i>	Great Knot	6	6	86	6	14	9
<i>Calidris canutus</i>	Red Knot	0	1	73	201	1	2
<i>Calidris pugnax</i>	Ruff	4	2	6	10	5	9
<i>Calidris falcinellus</i>	Broad-billed Sandpiper	0	6	3	3	2	4
<i>Calidris acuminata</i>	Sharp-tailed Sandpiper	5	3	5	30	0	0
<i>Calidris ferruginea</i>	Curlew Sandpiper	1	0	14	1	67	22
<i>Calidris temminckii</i>	Temminck's Stint	23	1	6	3	3	10
<i>Calidris subminuta</i>	Long-toed Stint	481	1219	239	149	231	599
<i>Calidris pygmaea</i>	Spoon-billed Sandpiper	0	0	0	1	0	0
<i>Calidris ruficollis</i>	Red-necked Stint	530	1169	1770	3330	1652	1010
<i>Calidris alba</i>	Sanderling	116	220	92	108	162	256
<i>Calidris alpina</i>	Dunlin	9817	13091	17646	15003	14250	12906
<i>Calidris minuta</i>	Little Stint	0	0	2	5	0	5
<i>Limnodromus scolopaceus</i>	Long-billed Dowitcher	2	0	2	1	1	2
<i>Scolopax rusticola</i>	Eurasian Woodcock	3	5	3	9	4	6
<i>Gallinago gallinago</i>	Common Snipe	470	264	441	486	388	579
<i>Gallinago stenura</i>	Pin-tailed Snipe	0	0	0	0	0	2
<i>Gallinago megala</i>	Swinhoe's Snipe	0	14	0	0	0	0
<i>Xenus cinereus</i>	Terek Sandpiper	1	3	2	158	8	2
<i>Actitis hypoleucos</i>	Common Sandpiper	411	500	622	544	424	466
<i>Tringa ochropus</i>	Green Sandpiper	95	97	77	94	101	123





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<i>Tringa brevipes</i>	Gray-tailed Tattler	19	22	33	527	57	33
<i>Tringa erythropus</i>	Spotted Redshank	7	1	17	20	47	7
<i>Tringa nebularia</i>	Common Greenshank	1464	2271	2308	1792	1342	2331
<i>Tringa flavipes</i>	Lesser Yellowlegs	0	0	0	0	1	0
<i>Tringa stagnatilis</i>	Marsh Sandpiper	332	663	630	817	784	518
<i>Tringa glareola</i>	Wood Sandpiper	1522	1687	1663	1669	1225	1511
<i>Tringa totanus</i>	Common Redshank	313	484	535	289	434	481
<i>Turnix suscitator</i>	Barred Buttonquail	19	14	8	8	5	5
<i>Glareola maldivarum</i>	Oriental Pratincole	0	2	4	1	0	0
<i>Saundersilarus saundersi</i>	Saunders's Gull	24	100	136	84	11	9
<i>Chroicocephalus ridibundus</i>	Black-headed Gull	2544	3281	6648	6433	6580	5794
<i>Ichthyaelus ichthyaelus</i>	Pallas's Gull	0	0	0	1	0	0
<i>Larus crassirostris</i>	Black-tailed Gull	4	5	1	13	17	3
<i>Larus argentatus</i>	Herring Gull	105	55	225	69	129	86
<i>Larus fuscus</i>	Lesser Black-backed Gull	1	52	14	1	1	4
<i>Larus schistisagus</i>	Slaty-backed Gull	1	0	0	68	0	0
<i>Sternula albifrons</i>	Little Tern	2	173	56	56	97	58
<i>Gelochelidon nilotica</i>	Gull-billed Tern	31	0	6	8	3	3
<i>Hydroprogne caspia</i>	Caspian Tern	688	1023	965	2170	1780	1250
<i>Chlidonias leucopterus</i>	White-winged Tern	0	30	1	1	12	3
<i>Chlidonias hybrida</i>	Whiskered Tern	805	8620	4317	12236	6441	8597
<i>Sterna hirundo</i>	Common Tern	0	1	0	0	0	0
<i>Thalasseus bergii</i>	Great Crested Tern	0	0	0	5	0	0
<i>Calonectris leucomelas</i>	Streaked Shearwater	3	0	0	0	0	0
<i>Ciconia nigra</i>	Black Stork	0	2	1	0	0	1
<i>Ciconia boyciana</i>	Oriental Stork	3	1	2	0	0	3
<i>Phalacrocorax pelagicus</i>	Pelagic Cormorant	0	0	0	0	0	1
<i>Phalacrocorax carbo</i>	Great Cormorant	9489	4380	8705	15494	18473	9960
<i>Phalacrocorax capillatus</i>	Japanese Cormorant	0	18	23	17	1	22
<i>Pelecanus crispus</i>	Dalmatian Pelican	0	0	0	0	4	0
<i>Botaurus stellaris</i>	Great Bittern	1	3	2	2	1	1
<i>Ixobrychus sinensis</i>	Yellow Bittern	87	68	70	84	49	103
<i>Ixobrychus eurhythmus</i>	Schrenck's Bittern	1	0	0	1	0	0
<i>Ixobrychus cinnamomeus</i>	Cinnamon Bittern	36	19	33	21	17	29
<i>Ardea cinerea</i>	Gray Heron	5036	6783	5536	5671	5483	5124
<i>Ardea purpurea</i>	Purple Heron	48	23	31	17	24	30
<i>Ardea alba</i>	Great Egret	3762	5971	6548	4976	5969	5790
<i>Mesophoyx intermedia</i>	Intermediate Egret	261	421	463	458	468	456



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<i>Egretta eulophotes</i>	Chinese Egret	5	6	14	0	0	1
<i>Egretta garzetta</i>	Little Egret	7111	8372	10210	8077	7601	8772
<i>Egretta sacra</i>	Pacific Reef-Heron	76	13	7	9	14	14
<i>Bubulcus ibis</i>	Cattle Egret	1783	3331	3500	3679	3712	4022
<i>Ardeola bacchus</i>	Chinese Pond-Heron	39	46	70	43	32	61
<i>Butorides striata</i>	Striated Heron	13	16	26	26	17	29
<i>Nycticorax nycticorax</i>	Black-crowned Night-Heron	2664	3060	3324	3114	2555	2075
<i>Gorsachius melanolophus</i>	Malayan Night-Heron	55	52	69	90	63	78
<i>Plegadis falcinellus</i>	Glossy Ibis	0	0	0	0	0	6
<i>Threskiornis aethiopicus</i>	Sacred Ibis	771	1176	1173	1256	1374	1723
<i>Platalea leucorodia</i>	Eurasian Spoonbill	16	4	9	17	10	31
<i>Platalea minor</i>	Black-faced Spoonbill	1251	1373	1454	1947	2009	2193
<i>Pandion haliaetus</i>	Osprey	139	158	207	194	186	233
<i>Elanus caeruleus</i>	Black-shouldered Kite	61	80	93	130	132	187
<i>Pernis ptilorhynchus</i>	Oriental Honey-buzzard	10	53	53	59	59	63
<i>Aviceda leuphotes</i>	Black Baza	0	0	0	0	1	0
<i>Spilornis cheela</i>	Crested Serpent-Eagle	161	213	365	240	218	265
<i>Nisaetus nipalensis</i>	Mountain Hawk-Eagle	2	2	4	10	19	5
<i>Ictinaetus malaiensis</i>	Black Eagle	20	32	28	22	49	35
<i>Clanga clanga</i>	Greater Spotted Eagle	1	0	0	0	1	0
<i>Aquila heliaca</i>	Imperial Eagle	0	0	0	1	0	0
<i>Butastur indicus</i>	Gray-faced Buzzard	5	7	6	2	4	4
<i>Circus aeruginosus</i>	Eurasian Marsh-Harrier	0	0	0	0	0	1
<i>Circus spilonotus</i>	Eastern Marsh-Harrier	4	4	5	22	8	14
<i>Circus cyaneus</i>	Northern Harrier	2	1	1	0	0	1
<i>Circus melanoleucos</i>	Pied Harrier	2	0	0	0	0	1
<i>Accipiter trivirgatus</i>	Crested Goshawk	86	116	146	111	98	126
<i>Accipiter soloensis</i>	Chinese Sparrowhawk	0	0	0	0	0	1
<i>Accipiter gularis</i>	Japanese Sparrowhawk	2	3	5	5	2	4
<i>Accipiter virgatus</i>	Besra	22	23	32	19	19	31
<i>Accipiter nisus</i>	Eurasian Sparrowhawk	1	2	2	6	3	3
<i>Accipiter gentilis</i>	Northern Goshawk	0	1	1	1	0	2
<i>Milvus migrans</i>	Black Kite	134	204	227	221	273	334
<i>Haliaeetus albicilla</i>	White-tailed Eagle	0	0	0	0	1	1
<i>Buteo japonicus</i>	Eastern Buzzard	0	0	0	0	49	65
<i>Buteo hemilasius</i>	Upland Buzzard	0	1	0	0	0	0
<i>Tyto longimembris</i>	Australasian Grass-Owl	2	0	0	0	0	0
<i>Otus spilocephalus</i>	Mountain Scops-Owl	10	18	42	10	31	41





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<i>Otus lettia</i>	Collared Scops-Owl	22	14	31	11	11	26
<i>Otus elegans</i>	Ryukyu Scops-Owl	0	2	0	0	0	0
<i>Otus sunia</i>	Oriental Scops-Owl	0	0	0	0	1	0
<i>Ketupa flavipes</i>	Tawny Fish-Owl	0	0	1	1	0	0
<i>Glaucidium brodiei</i>	Collared Owlet	4	4	2	3	8	4
<i>Strix leptogrammica</i>	Brown Wood-Owl	1	3	1	0	1	1
<i>Strix niviculum</i>	Himalayan Owl	1	4	2	2	3	0
<i>Asio otus</i>	Long-eared Owl	0	0	1	0	1	2
<i>Asio flammeus</i>	Short-eared Owl	0	1	3	0	0	2
<i>Ninox japonica</i>	Northern Boobook	3	1	1	2	5	2
<i>Upupa epops</i>	Eurasian Hoopoe	35	92	34	44	84	95
<i>Alcedo atthis</i>	Common Kingfisher	267	317	357	360	334	439
<i>Halcyon smyrnensis</i>	White-throated Kingfisher	9	20	25	42	35	50
<i>Halcyon pileata</i>	Black-capped Kingfisher	1	0	0	0	0	0
<i>Todiramphus chloris</i>	Collared Kingfisher	0	1	1	0	0	0
<i>Ceryle rudis</i>	Pied Kingfisher	11	10	12	21	24	34
<i>Psilopogon nuchalis</i>	Taiwan Barbet	434	425	384	460	604	786
<i>Jynx torquilla</i>	Eurasian Wryneck	0	2	4	1	3	3
<i>Dendrocopos canicapillus</i>	Gray-capped Woodpecker	163	237	196	239	265	292
<i>Dendrocopos leucotos</i>	White-backed Woodpecker	9	7	7	7	7	9
<i>Picus canus</i>	Gray-faced Woodpecker	0	3	0	4	3	4
<i>Falco tinnunculus</i>	Eurasian Kestrel	64	86	76	77	74	97
<i>Falco subbuteo</i>	Eurasian Hobby	0	4	1	1	1	0
<i>Falco peregrinus</i>	Peregrine Falcon	31	38	30	50	35	41
<i>Pericrocotus solaris</i>	Gray-chinned Minivet	567	605	391	939	673	505
<i>Pericrocotus speciosus</i>	Scarlet Minivet	0	0	0	0	0	2
<i>Pericrocotus divaricatus</i>	Ashy Minivet	0	6	22	23	32	33
<i>Coracina macei</i>	Large Cuckooshrike	2	0	0	5	1	6
<i>Lalage melaschistos</i>	Black-winged Cuckooshrike	1	4	2	8	12	1
<i>Erpornis zantholeuca</i>	White-bellied Erpornis	186	255	278	226	389	324
<i>Oriolus chinensis</i>	Black-naped Oriole	15	10	24	18	25	19
<i>Oriolus traillii</i>	Maroon Oriole	29	33	63	70	71	74
<i>Dicrurus macrocercus</i>	Black Drongo	933	1063	1441	1429	1195	1399
<i>Dicrurus leucophaeus</i>	Ashy Drongo	1	0	3	4	0	3
<i>Dicrurus aeneus</i>	Bronzed Drongo	216	300	277	260	308	302
<i>Dicrurus hottentottus</i>	Hair-crested Drongo	1	0	10	3	4	5
<i>Hypothymis azurea</i>	Black-naped Monarch	307	414	387	343	481	516
<i>Terpsiphone atrocaudata</i>	Japanese Paradise-Flycatcher	0	0	0	0	2	0



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<i>Terpsiphone incei</i>	Amur Paradise-Flycatcher	0	0	0	0	0	1
<i>Lanius bucephalus</i>	Bull-headed Shrike	0	2	2	3	1	1
<i>Lanius collurio</i>	Red-backed Shrike	0	1	0	0	0	1
<i>Lanius cristatus</i>	Brown Shrike	767	765	971	862	633	834
<i>Lanius schach</i>	Long-tailed Shrike	219	243	356	346	349	334
<i>Lanius sphenocercus</i>	Chinese Gray Shrike	0	0	1	0	1	0
<i>Garrulus glandarius</i>	Eurasian Jay	92	26	21	43	81	63
<i>Cyanopica cyanus</i>	Azure-winged Magpie	36	52	5	13	17	17
<i>Urocissa caerulea</i>	Taiwan Blue-Magpie	155	272	286	422	353	244
<i>Dendrocitta formosae</i>	Gray Treepie	846	1082	876	1074	1130	1521
<i>Pica pica</i>	Eurasian Magpie	678	941	1043	998	1022	1076
<i>Nucifraga caryocatactes</i>	Eurasian Nutcracker	15	47	29	16	16	25
<i>Corvus splendens</i>	House Crow	0	0	0	1	0	2
<i>Corvus frugilegus</i>	Rook	0	1	0	2	3	1
<i>Corvus corone</i>	Carrion Crow	0	0	0	0	2	4
<i>Corvus macrorhynchos</i>	Large-billed Crow	206	325	148	228	356	486
<i>Corvus torquatus</i>	Collared Crow	16	35	38	51	51	76
<i>Periparus ater</i>	Coal Tit	141	59	48	27	21	90
<i>Sittiparus castaneiventris</i>	Chestnut-bellied Tit	36	15	23	213	169	78
<i>Parus monticolus</i>	Green-backed Tit	202	255	209	190	334	292
<i>Parus minor</i>	Japanese Tit	0	0	1	0	0	0
<i>Machlolophus holsti</i>	Yellow Tit	56	93	31	46	72	43
<i>Remiz consobrinus</i>	Chinese Penduline-Tit	0	11	27	6	40	0
<i>Alauda arvensis</i>	Eurasian Skylark	12	7	5	13	474	103
<i>Alauda gulgula</i>	Oriental Skylark	97	223	292	249	366	293
<i>Prinia crinigera</i>	Striated Prinia	10	1	8	6	6	6
<i>Prinia flaviventris</i>	Yellow-bellied Prinia	279	463	474	468	499	797
<i>Prinia inornata</i>	Plain Prinia	821	1128	1375	1357	1249	1617
<i>Cisticola juncidis</i>	Zitting Cisticola	46	61	68	28	36	50
<i>Cisticola exilis</i>	Golden-headed Cisticola	14	18	18	8	9	22
<i>Acrocephalus bistrigiceps</i>	Black-browed Reed-Warbler	0	0	2	2	2	7
<i>Acrocephalus orientalis</i>	Oriental Reed-Warbler	13	19	28	15	18	24
<i>Locustella certhiola</i>	Pallas's Grasshopper-Warbler	0	1	0	0	1	0
<i>Locustella ochotensis</i>	Middendorff's Grasshopper-Warbler	1	0	4	0	0	4
<i>Locustella lanceolata</i>	Lanceolated Warbler	0	2	0	0	0	0
<i>Locustella alishanensis</i>	Taiwan Bush-Warbler	1	1	4	3	3	0
<i>Locustella mandelli</i>	Russet Bush Warbler	0	0	0	0	0	1
<i>Pnoepyga formosana</i>	Taiwan Cupwing	27	80	30	24	18	18





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<i>Riparia chinensis</i>	Gray-throated Martin	1522	1801	1026	2025	2372	1562
<i>Riparia riparia</i>	Bank Swallow	0	5	1	4	0	3
<i>Hirundo rustica</i>	Barn Swallow	2189	3217	2462	2782	2566	3889
<i>Hirundo tahitica</i>	Pacific Swallow	2628	4671	3404	3972	2814	4136
<i>Cecropis daurica</i>	Red-rumped Swallow	15	9	6	11	3	8
<i>Cecropis striolata</i>	Striated Swallow	1494	2557	2513	4005	2233	1970
<i>Delichon dasypus</i>	Asian House-Martin	484	937	663	338	540	331
<i>Spizixos semitorques</i>	Collared Finchbill	243	212	269	211	207	144
<i>Pycnonotus taivanus</i>	Styan's Bulbul	847	823	1557	976	1678	1650
<i>Pycnonotus sinensis</i>	Light-vented Bulbul	8450	10026	10224	11082	10669	12007
<i>Pycnonotus aurigaster</i>	Sooty-headed Bulbul	0	0	0	0	0	3
<i>Hypsipetes leucocephalus</i>	Black Bulbul	3437	3359	3580	4070	5416	5309
<i>Hypsipetes amaurotis</i>	Brown-eared Bulbul	1	44	3	3	0	15
<i>Hemixos castanonotus</i>	Chestnut Bulbul	0	3	0	0	0	1
<i>Phylloscopus inornatus</i>	Yellow-browed Warbler	56	243	218	92	338	101
<i>Phylloscopus humei</i>	Hume's Leaf Warbler	0	0	0	0	1	0
<i>Phylloscopus proregulus</i>	Pallas's Leaf Warbler	33	49	24	8	26	29
<i>Phylloscopus schwarzi</i>	Radde's Warbler	0	1	1	0	0	0
<i>Phylloscopus armandii</i>	Yellow-streaked Warbler	0	0	1	0	0	0
<i>Phylloscopus fuscatus</i>	Dusky Warbler	30	56	90	79	169	133
<i>Phylloscopus coronatus</i>	Eastern Crowned Leaf Warbler	0	0	1	0	0	0
<i>Phylloscopus plumbeitarsus</i>	Two-barred Warbler	0	2	0	0	0	1
<i>Phylloscopus borealis</i>	Arctic Warbler	84	155	288	226	206	248
<i>Phylloscopus claudiae</i>	Claudia's Leaf Warbler	0	1	0	0	0	0
<i>Phylloscopus goodsoni</i>	Hartert's Leaf Warbler	0	0	0	0	0	2
<i>Urosphena squameiceps</i>	Asian Stubtail	1	0	1	9	6	2
<i>Abroscopus albogularis</i>	Rufous-faced Warbler	214	456	310	310	465	395
<i>Horornis diphone</i>	Japanese Bush-Warbler	1	9	3	6	6	8
<i>Horornis borealis</i>	Manchurian Bush-Warbler	42	54	61	68	54	78
<i>Horornis fortipes</i>	Brownish-flanked Bush-Warbler	10	34	21	15	29	18
<i>Horornis acanthizoides</i>	Yellowish-bellied Bush-Warbler	31	39	17	19	23	43
<i>Aegithalos concinnus</i>	Black-throated Tit	978	700	622	605	936	686
<i>Fulvetta formosana</i>	Taiwan Fulvetta	81	93	19	45	43	73
<i>Sinosuthora webbiana</i>	Vinous-throated Parrotbill	373	245	420	462	329	266
<i>Suthora verreauxi</i>	Golden Parrotbill	120	0	0	2	40	4
<i>Yuhina brunneiceps</i>	Taiwan Yuhina	1675	1505	1079	1523	2196	1609
<i>Zosterops japonicus</i>	Japanese White-eye	0	0	0	0	0	2
<i>Zosterops simplex</i>		5059	8011	5697	6070	7328	7167



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<i>Zosterops meyeri</i>	Lowland White-eye	0	21	2	0	0	0
<i>Cyanoderma ruficeps</i>	Rufous-capped Babbler	672	909	830	750	873	877
<i>Pomatorhinus musicus</i>	Taiwan Scimitar-Babbler	656	869	906	760	841	882
<i>Megapomatorhinus erythrocnemis</i>	Black-necklaced Scimitar-Babbler	166	210	244	172	195	222
<i>Schoeniparus brunneus</i>	Dusky Fulvetta	93	242	271	120	202	206
<i>Alcippe morrisonia</i>	Morrison's Fulvetta	2066	2105	1605	1964	2250	2095
<i>Garrulax canorus</i>	Hwamei	5	11	16	51	27	116
<i>Garrulax taewanus</i>	Taiwan Hwamei	53	97	80	66	71	36
<i>Ianthocinclia ruficeps</i>	Rufous-crowned Laughingthrush	126	3	11	25	207	6
<i>Ianthocinclia chinensis</i>	Black-throated Laughingthrush	7	2	1	1	4	6
<i>Ianthocinclia poecilorhyncha</i>	Rusty Laughingthrush	77	49	30	36	81	24
<i>Trochaloopon morrisonianum</i>	White-whiskered Laughingthrush	90	99	44	107	47	89
<i>Heterophasia auricularis</i>	White-eared Sibia	813	595	498	728	837	780
<i>Liocichla steerii</i>	Steere's Liocichla	285	395	313	303	397	258
<i>Actinodura morrisoniana</i>	Taiwan Barwing	141	111	18	64	95	70
<i>Regulus goodfellowi</i>	Flamecrest	88	140	79	88	52	151
<i>Sitta europaea</i>	Eurasian Nuthatch	46	78	34	48	78	32
<i>Troglodytes troglodytes</i>	Eurasian Wren	16	17	4	16	29	11
<i>Cinclus pallasii</i>	Brown Dipper	24	20	15	16	25	19
<i>Aplonis panayensis</i>	Asian Glossy Starling	82	133	104	213	156	356
<i>Sturnus vulgaris</i>	European Starling	7	7	3	0	12	15
<i>Pastor roseus</i>	Rosy Starling	0	0	0	0	0	1
<i>Agropsar sturninus</i>	Daurian Starling	0	0	1	0	0	0
<i>Agropsar philippensis</i>	Chestnut-cheeked Starling	0	0	6	5	0	3
<i>Gracupica nigricollis</i>	Black-collared Starling	197	240	470	455	397	531
<i>Sturnia sinensis</i>	White-shouldered Starling	124	181	359	188	188	484
<i>Sturnia malabarica</i>	Chestnut-tailed Starling	127	68	162	141	285	184
<i>Spodiopsar sericeus</i>	Red-billed Starling	122	705	289	157	174	375
<i>Spodiopsar cineraceus</i>	White-cheeked Starling	77	114	100	59	68	21
<i>Acridotheres tristis</i>	Common Myna	1481	1891	2517	2267	2467	2872
<i>Acridotheres fuscus</i>	Jungle Myna	9	6	0	3	0	0
<i>Acridotheres javanicus</i>	Javan Myna	2957	3994	4565	4652	4977	6337
<i>Acridotheres cristatellus</i>	Crested Myna(Taiwan)	182	293	446	516	288	419
<i>Acridotheres cristatellus</i>	Crested Myna(Kinmen)	2519	1908	2702	4084	3263	4433
<i>Turdus mandarinus</i>	Chinese Blackbird	42	158	116	58	141	136
<i>Turdus poliocephalus</i>	Island Thrush	2	3	2	2	1	8
<i>Turdus cardis</i>	Japanese Thrush	1	0	0	0	0	0
<i>Turdus hortulorum</i>	Gray-backed Thrush	2	5	2	3	0	1





Scientific Name	Common Name	2015	2016	2017	2018	2019	2020
<i>Turdus obscurus</i>	Eyebrowed Thrush	16	6	9	21	12	7
<i>Turdus chrysolaus</i>	Brown-headed Thrush	401	302	297	384	243	550
<i>Turdus pallidus</i>	Pale Thrush	1090	599	310	173	56	324
<i>Turdus ruficollis</i>	Red-throated Thrush	0	2	0	0	0	0
<i>Turdus eunomus</i>	Dusky Thrush	155	116	134	47	10	98
<i>Turdus naumanni</i>	Naumann's Thrush	26	20	6	1	0	3
<i>Muscicapa griseisticta</i>	Gray-streaked Flycatcher	0	5	8	0	1	2
<i>Muscicapa ferruginea</i>	Ferruginous Flycatcher	2	0	1	1	2	2
<i>Muscicapa dauurica</i>	Asian Brown Flycatcher	0	4	8	7	10	4
<i>Copsychus saularis</i>	Oriental Magpie-Robin	213	165	205	207	254	301
<i>Copsychus malabaricus</i>	White-rumped Shama	16	13	36	21	53	91
<i>Cyornis banyumas</i>	Hill Blue Flycatcher	0	0	0	0	0	1
<i>Niltava vivida</i>	Vivid Niltava	102	93	127	139	83	107
<i>Cyanoptila cyanomelana</i>	Blue-and-white Flycatcher	0	0	0	0	1	0
<i>Eumyias thalassinus</i>	Verditer Flycatcher	0	1	0	3	3	0
<i>Brachypteryx leucophris</i>	Lesser Shortwing	0	0	2	0	0	0
<i>Brachypteryx montana</i>	White-browed Shortwing	15	17	14	10	6	9
<i>Larivora akahige</i>	Japanese Robin	0	0	0	2	3	0
<i>Larivora cyane</i>	Siberian Blue Robin	0	0	0	0	1	0
<i>Luscinia svecica</i>	Bluethroat	0	1	1	1	4	1
<i>Myophonus insularis</i>	Taiwan Whistling-Thrush	63	59	81	53	99	91
<i>Myophonus caeruleus</i>	Blue Whistling-Thrush	8	24	20	30	15	28
<i>Enicurus scouleri</i>	Little Forktail	12	19	8	16	13	12
<i>Calliope calliope</i>	Siberian Rubythroat	88	179	226	182	207	247
<i>Cinclidium leucurum</i>	White-tailed Robin	24	25	29	32	38	34
<i>Tarsiger cyanurus</i>	Red-flanked Bluetail	20	14	9	9	9	11
<i>Tarsiger indicus</i>	White-browed Bush-Robin	8	2	2	2	6	6
<i>Tarsiger johnstoniae</i>	Collared Bush-Robin	57	43	34	46	35	39
<i>Ficedula mugimaki</i>	Mugimaki Flycatcher	0	0	1	0	3	0
<i>Ficedula hyperythra</i>	Snowy-browed Flycatcher	9	19	10	32	18	11
<i>Ficedula albicilla</i>	Taiga Flycatcher	0	1	2	0	0	0
<i>Ficedula parva</i>	Red-breasted Flycatcher	2	2	4	0	2	4
<i>Phoenicurus fuliginosus</i>	Plumbeous Redstart	222	178	170	223	261	239
<i>Phoenicurus aureoreus</i>	Daurian Redstart	414	531	484	517	685	716
<i>Monticola solitarius</i>	Blue Rock-Thrush	129	145	123	116	108	146
<i>Saxicola maurus</i>	Siberian Stonechat	21	19	26	19	44	34
<i>Bombycilla japonica</i>	Japanese Waxwing	0	0	0	0	0	19
<i>Dicaeum minullum</i>	Plain Flowerpecker	20	15	23	30	31	26



Scientific Name	Common Name	2015	2016	2017	2018	2019	2020
<i>Dicaeum ignipectus</i>	Fire-breasted Flowerpecker	89	135	42	55	95	54
<i>Aethopyga christinae</i>	Fork-tailed Sunbird	7	83	11	6	18	48
<i>Estrilda melpoda</i>	Orange-cheeked Waxbill	0	11	19	5	0	0
<i>Euodice malabarica</i>	Indian Silverbill	3	86	16	25	81	164
<i>Lonchura striata</i>	White-rumped Munia	333	440	477	281	480	675
<i>Lonchura punctulata</i>	Nutmeg Mannikin	2384	2411	2284	3058	3417	5579
<i>Lonchura atricapilla</i>	Chestnut Munia	151	11	158	7	78	1215
<i>Prunella collaris</i>	Alpine Accentor	4	0	8	1	0	7
<i>Passer rutilans</i>	Russet Sparrow	0	1	9	28	2	0
<i>Passer montanus</i>	Eurasian Tree Sparrow	18511	21023	27687	22238	30217	30144
<i>Dendronanthus indicus</i>	Forest Wagtail	0	0	1	1	0	0
<i>Motacilla cinerea</i>	Gray Wagtail	442	617	634	614	615	613
<i>Motacilla flava</i>	Western Yellow Wagtail	43	0	1	0	0	0
<i>Motacilla tschutschensis</i>	Eastern Yellow Wagtail	1222	1394	1233	1628	1298	1956
<i>Motacilla citreola</i>	Citrine Wagtail	0	0	0	1	0	0
<i>Motacilla grandis</i>	Japanese Wagtail	0	1	0	0	0	0
<i>Motacilla alba</i>	White Wagtail	489	665	770	824	1011	1122
<i>Anthus richardi</i>	Richard's Pipit	87	91	146	210	227	238
<i>Anthus godlewskii</i>	Blyth's Pipit	0	0	0	1	0	0
<i>Anthus hodgsoni</i>	Olive-backed Pipit	246	241	226	320	344	394
<i>Anthus gustavi</i>	Pechora Pipit	0	0	1	1	0	1
<i>Anthus cervinus</i>	Red-throated Pipit	66	271	245	184	133	220
<i>Anthus rubescens</i>	American Pipit	6	10	13	2	1	10
<i>Fringilla montifringilla</i>	Brambling	48	30	121	52	1	2
<i>Eophona migratoria</i>	Yellow-billed Grosbeak	3	107	76	53	111	110
<i>Eophona personata</i>	Japanese Grosbeak	0	0	1	0	0	0
<i>Carpodacus erythrinus</i>	Common Rosefinch	0	0	0	0	0	1
<i>Carpodacus formosanus</i>	Taiwan Rosefinch	4	5	2	5	14	5
<i>Pyrrhula nipalensis</i>	Brown Bullfinch	20	18	32	32	27	0
<i>Pyrrhula erythaca</i>	Gray-headed Bullfinch	24	12	2	6	8	9
<i>Chloris sinica</i>	Oriental Greenfinch	8	105	106	41	61	117
<i>Acanthis flammea</i>	Common Redpoll	0	0	0	0	0	1
<i>Spinus spinus</i>	Eurasian Siskin	45	0	0	118	20	123
<i>Emberiza melanocephala</i>	Black-headed Bunting	0	1	0	1	0	0
<i>Emberiza bruniceps</i>	Red-headed Bunting	0	1	2	1	0	0
<i>Emberiza fucata</i>	Chestnut-eared Bunting	0	0	1	1	1	5
<i>Emberiza elegans</i>	Yellow-throated Bunting	3	9	0	15	1	2
<i>Emberiza yessoensis</i>	Ochre-rumped Bunting	0	0	0	1	0	0
<i>Emberiza pallasi</i>	Pallas's Bunting	0	0	0	0	0	1





Scientific Name	Common Name	2015	2016	2017	2018	2019	2020
<i>Emberiza aureola</i>	Yellow-breasted Bunting	0	0	0	1	0	0
<i>Emberiza pusilla</i>	Little Bunting	7	55	36	36	9	20
<i>Emberiza rustica</i>	Rustic Bunting	0	5	1	0	0	1
<i>Emberiza sulphurata</i>	Yellow Bunting	0	7	0	1	14	0
<i>Emberiza spodocephala</i>	Black-faced Bunting	256	375	344	444	395	520
<i>Emberiza chrysophrys</i>	Yellow-browed Bunting	2	1	0	0	0	7
<i>Emberiza tristrami</i>	Tristram's Bunting	0	0	0	3	0	0



Download Table 3 Here

Open Data

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

(1) Taiwan's Environmental Protection Administration

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

(2) eBird Taiwan

<https://ebird.org/taiwan/home>

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>



Taiwan EPA's Open Data
Webpage



Taiwan NYBC English
Language Reports



Taiwan NYBC Chinese
Language Reports



eBird Taiwan

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

Support the NYBC

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 2020 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.

Issuers	Woei-Horng Fang, Jia-Dong Yang
Authors	Da-Li Lin, Yong-Lun Lin, Chao Jung, An-Yu Chang, Scott Pursner, Allen Lyu, Kun-Hai Lin, Kun-Kuo Chiang, Ruey-Shing Lin
English Editor	Scott Pursner
Publishers	Taiwan Endemic Species Research Institute, Taiwan 1, Ming-Shen East Rd, Jiji, Nantou 552203 Taiwan +886-49-276-1331-252 The Taiwan Wild Bird Federation 1F, 3, Lane 36 JingLong St, Taipei City 103005 +886-2-8663-1252-16
Illustrators	Yu-Xuan Jiang, Tamako Diary (玉子日記 @Facebook)
Organizers	Taiwan Wild Bird Federation, Wild Bird Society of Taipei, Kaohsiung Wild Bird Society, Endemic Species Research Institute
Design	Chun Cheng advertising agency (春成廣告社)
Publication Date	October 2020
Price	\$200 NTD (free pdf available at http://nybc.tw)
ISBN	978-986-5449-40-7
GPN	1010901607





ISBN: 978-986-5449-40-7



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GPN | 1010901607



Taiwan Wild Bird Federation
 Wild Bird Society of Taipei
 Kaohsiung Wild Bird Society
 Endemic Species Research Institute
 The State of Taiwan's Birds Partnership