MA19019 - Ecological Monitoring Result and Analysis

Table I: Recorded Bird Species and their Abundance in the Reporting Month					
Scientific Name	**Common Name**	**Chinese Name**	**Waterbird**	**Point Count Abundance**	**Transect Abundance**
Acridotheres cristatellus	Crested Myna	八哥		155	+++++
Acridotheres tristis	Common Myna	家八哥		0	
Actitis hypoleucos	Common Sandpiper	磯鷸	*	2	+
Alcedo atthis	Common Kingfisher	普通翠鳥	*	0	
Amaurornis phoenicurus	White-breasted Waterhen	白胸苦惡鳥	*	0	+
Anthus hodgsoni	Olive Backed Pipit	樹鷚		3	+
Anthus richardi	Richard's Pipit	理氏鷚		0	
Apus nipalensis	House Swift	小白腰雨燕		3	+
Ardea alba	Great Egret	大白鷺	*	24	+
Ardea cinerea	Grey Heron	蒼鷺	*	0	
Ardeola bacchus	Chinese Pond Heron	池鷺	*	80	+++++
Bubulcus coromandus	Eastern Cattle Egret	牛背鷺	*	16	+
Buteo japonicus	Eastern Buzzard	普通鳶	*	0	+
Cacomantis merulinus	Plaintive cuckoo	八聲杜鵑		0	
Centropus bengaiensis	Lesser Coucal	小鴉鵑		0	+
Centropus sinensis	Greater Coucal	褐翅鴉鵑		6	+
Ceryle rudis	Pied Kingfisher	斑魚狗	*	0	
Charadrius alexandrinus	Kentish Plover	環頸鴴	*	0	
Charadrius dubius	Little Ringed Plover	金眶鴴	*	0	
Columba livia	Domestic Pigeon	原鴿		0	
Copsychus saularis	Magpie Robin	鵲鴝		4	+
Corvus macrorhynchus	Jungle Crow	大嘴烏鴉		1	+
Corvus torquatus	Collared Crow	白頸鴉	*	1	+
Cuculus micropterus	Indian Cuckoo	四聲杜鵑		0	
Cyanopica cyanus	Azure-winged magpie	灰喜鵲		10	
Dicrurus hottentottus	Hair-crested Drogon	髮冠卷尾		0	
Dicrurus macrocercus	Black Drongo	黑卷尾		1	+
Egretta garzetta	Little Egret	小白鷺	*	142	+++++
Egretta intermedia	Intermediate Egret	中白鷺	*	0	
Emberiza spodocephala	Blacked-face Bunting	灰頭鵐		0	
Eudynamys scolopacea	Common Koel	噪鵑		3	+
Falco tinnunculus	Common Kestrel	紅隼	*	0	
Ficedula albicilla	Red-throated Flycatcher	紅喉姬鶲		0	
Gallinula chloropus	Common Moorhen	黑水雞	*	0	
Garrulax perspicillatus	Masked Laughing Thrush	黑臉噪鸝		18	++
Glareola maldivarum	Oriental pratincole	普通燕鴴	*	0	
Halcyon smyrnensis	White-throated Kingfisher	白胸翡翠	*	4	+
Hierococcyx sparverioides	Large Hawk Cuckoo	大鷹鵑		1	+
Himantopus himantopus	Black-winged Stilt	黑翅長腳鷸	*	0	
Hirundo rustica	Barn Swallow	家燕		18	++
Lanius cristatus	Brown Shrinke	紅尾伯勞		0	
Lanius schach	Rufous-backed Shrike	棕背伯勞		0	
Leiothrix lutea	Red-billed Leiothrix	紅嘴相思鳥		0	
Lonchura punctulata	Spotted Munia	斑文鳥		6	++
Lonchura striata	White-rumped Munia	白腰文鳥		0	
Milvus migrans	Black Kite	黑鳶	*	1	+
Motacilla alba	White Wagtail	白鶺鴒		11	++
Motacilla cinerea	Grey Wagtail	灰鶺鴒		0	
Muscicapa latirostris	Asian Brown Flycatcher	北灰鶲		0	
Myophonus caeruleus	Blue Whistling Thrush	紫嘯鶇		0	
Nycticorax nycticorax	Black-crowned Night Heron	夜鷺	*	0	
Orthotomus sutorius	Common Tailorbird	長尾縫葉鶯		14	++
Pandion haliaetus	Osprey	魚鷹	*	0	
Parus cinereus	Cinereous Tit	蒼背山雀		0	
Passer montanus	Eurasian Tree Sparrow	樹麻雀		27	+++
Phalacrocorax carbo	Great Cormorant	普通鸕鷀	*	0	
Phoenicurus auroreus	Daurian Redstart	北紅尾鴝		0	
Phylloscopus borealis	Arctic Warbler	極北柳鶯		0	
Phylloscopus fuscatus	Dusky Warbler	褐柳鶯		1	+
Phylloscopus inornatus	Yellow-browed Warbler	黃眉柳鶯		0	+
Phylloscopus proregulus	Pallas's Leaf Warbler	黃腰柳鶯		4	+
Pica pica	Magpie	喜鵲		0	+
Platalea minor	Black-faced Spoonbill	黑臉琵鷺	*	0	
Prinia flaviventris	Yellow-bellied Prinia	黃腹鷦鶯		7	+
Prinia inornata	Plain Prinia	純色鷦鶯		2	
Psittacula eupatria	Alexandrine Parakeet	亞歷山大鸚鵡		0	+
Pycnonotus jocosus	Crested bulbul	紅耳鵯		19	+++
Pycnonotus sinensis	Chinese Bulbul	白頭鵯		4	+
Recurvirostra avosetta	Pied Avocet	反嘴鷸	*	0	
Saxicola stejnegeri	Stejneger's Stonechat	黑喉石鴝		0	
Spatula clypeata	Northern Shoveler	琵嘴鴨	*	0	
Spilornis cheela	Crested Serpent Eagle	蛇鵰	*	0	
Streptopelia chinensis	Spotted Dove	珠頸斑鳩		52	+++
Sturnus nigricollis	Black-necked Starling	黑領椋鳥		32	+++
Tachybaptus ruficollis	Little Grebe	小鸊鷉	*	0	
Tringa glareola	Wood Sandpiper	林鷸	*	0	
Tringa nebularia	Common Greenshank	青腳鷸	*	0	
Tringa ochropus	Green Sandpiper	白腰草鷸	*	0	
Turdus hortulorum	Grey-backed Thrush	灰背鶇		0	
Urocissa erythrorhyncha	Red-billed Blue Magpie	紅咀藍鵲		2	+
Vanellus cinereus	Grey-headed Lapwing	灰頭麥雞	*	0	
Zitting cisticola	Streaked Fantail Warbler	棕扇尾鶯		0	
Zosterops japonicus	Japanese White-eye	暗綠繡眼鳥		17	++
			Total Point Count Abundance	691	
			Total Waterbirds	270	

*For waterbird

For transect abundance, +: <10, ++: 11-20, +++: 21-30, ++++: 31-40, +++++: >40

Remarks: (1) According to S4.7 of the approved Baseline Monitoring Report (Ecology), "waterbirds" was defined as "waterbirds and wetland-dependent species", which was referenced to Monthly Waterbird Monitoring Biannual Reports prepared by the Hong Kong Bird Watching Society (Anon, 2018). Also, S.13.11.3.2 of NENT NDA EIA Study requires "Monitoring of Measures to Mitigate for Impacts of the Project on Wetland-dependent Fauna using the Ng Tung, Sheung Yue and Shek Sheung Rivers". Therefore, "wetland-dependent birds" should be considered as "waterbirds". As raptors and Collared Crow are "wetland-dependent species", they should be taken into consideration in data analysis and impact assessment on waterbirds.

MA19019 - Waterbird Ecological Monitoring Result

Monitoring Month Jul
Season Summer

Table II : Total Bird Abundance from Point Count						
Survey Information				Total Bird Abundance from Point Count		
No.	Date	Time	Tide Level	Individuals Recorded	Total	Species Recorded
#1	2 Jul 2021	15:00	High	64	**132**	13
		10:00	Low	68		18
#2	7 Jul 2021	14:30	High	34	**88**	8
		11:00	Low	54		11
#3	16 Jul 2021	13:00	High	74	**189**	15
		9:00	Low	115		18
#4	22 Jul 2021	13:30	High	42	**100**	15
		10:30	Low	58		14
#5	28 Jul 2021	14:00	High	94	**182**	14
		16:00	Low	88		12
				Overall Total	**691**	

Table III: Total Waterbird Abundance from Point Count					
Survey Information				Numbers of Waterbirds	
No.	Date	Time	Tide Level	Individuals Recorded	Total
#1	2 Jul 2021	15:00	High	17	**41**
		10:00	Low	24	
#2	7 Jul 2021	14:30	High	16	**31**
		11:00	Low	15	
#3	16 Jul 2021	13:00	High	17	**65**
		9:00	Low	48	
#4	22 Jul 2021	13:30	High	20	**45**
		10:30	Low	25	
#5	28 Jul 2021	14:00	High	38	**88**
		16:00	Low	50	
				Overall Total	**270**
				Average	**46**

Table IV: T-Test Analysis for All Waterbirds

Baseline Data
Monthly Average Abundance (Jul) 47.25
Seasonal Average Abundance (Summer) 45.34

T-test
The following hypothesis was made and a one-tail t-test will be used to test the data collected from the monitoring:

H_0 The data collected in the reporting month falls within the normal distrubution when compared to the baseline monitoring data.

H_1 The data collected does not falls within the normal distrubution when compared to the baseline monitoring data.

If t-test value is smaller than the critical value, then rejects H_0.

For the data in the reporting month, the critical values are:
Crit. Value = -2.132 (95% Confidence Level)
Crit. Value = -3.747 (99% Confidence Level)

			Confidence Level	
T-values of Data in Reporting Month			95%	99%
Abundance	Monthly	1.058	✔	✔
	Season	1.357	✔	✔
		Overall:	✔	✔

Remarks:
✔ = T-value falls within the confidence level, the impact monitoring data shows no significant difference to the baseline data.
✘ = T-value falls outside the confidence level, the impact monitoring data shows significant difference to the baseline data.

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Monitoring Month Jul
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Table V: Abundance of Representative Waterbirds from Point Count

Representative Species			Recorded Abundance							Baseline Data	
Species Name	**Common Name**	**Chinese Name**	**2 Jul 2021**	**7 Jul 2021**	**16 Jul 2021**	**22 Jul 2021**	**28 Jul 2021**	**Total**	**Average**	**Avg (Jul)**	**Avg (Summer)**
Egretta garzetta	Little Egret	小白鷺	13	14	31	18	66	142	28	25	21
Ardea cinerea	Grey Heron	蒼鷺	0	0	0	0	0	0	0	0	1
Ardeola bacchus	Chinese Pond Heron	池鷺	18	7	22	22	11	80	16	18	16
Phalacrocorax carbo	Great Cormorant	普通鸕鷀	0	0	0	0	0	0	0	0	0
Ardea alba	Great Egret	大白鷺	3	6	6	3	6	24	5	3	3
Bubulcus coromandus	Eastern Cattle Egret	牛背鷺	6	4	4	2	0	16	3	2	3

Table VI: T-test Analysis for Representative Waterbirds from Point Count

The following hypothesis was made and a one-tail t-test will be used to test the data collected from the monitoring:

H_0 The data collected in the reporting month falls within the normal distrubution when compare to the baseline monitoring data.

H_1 The data collected does not falls within the normal distrubution when compare to the baseline monitoring data.

If t-test value for a specific representative is smaller than the critical value, then rejects H_0.

For the data in the reporting month, the critical values are:

Crit. Value = -2.132 (95% Confidence Level)
Crit. Value = -3.747 (99% Confidence Level)

Representative Species			T-value	Confidence Level		T-value	Confidence Level		Overall
Species Name	Common Name	Chinese Name	Monthly	95%	99%	Seasonal	95%	99%	
Egretta garzetta	Little Egret	小白鷺	0.367	✔	✔	0.793	✔	✔	✔
Ardea cinerea	Grey Heron	蒼鷺				N/A*			
Ardeola bacchus	Chinese Pond Heron	池鷺	-0.663	✔	✔	-0.061	✔	✔	✔
Phalacrocorax carbo	Great Cormorant	普通鸕鷀				N/A*			
Ardea alba	Great Egret	大白鷺	3.130	✔	✔	2.987	✔	✔	✔
Bubulcus coromandus	Eastern Cattle Egret	牛背鷺	1.422	✔	✔	-0.114	✔	✔	✔

Remarks

* Great Cormorant (*Phalacrocorax carbo*) and Grey Heron (*Ardea cinerea*) were not recognised as representative waterbird species during Summer.

✔ = T-value falls within the confidence level, the impact monitoring data shows no significant difference to the baseline data.

✘ = T-value falls outside the confidence level, the impact monitoring data shows significant difference to the baseline data.