A publication

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Migratory Birds
in a Changing Climate

Wetlands Vol 14:1

"Climate change has severe consequences for these nomads of the skies: it causes the loss of essential bird habitats, changes migration patterns and increases the competition for food between migrating birds and residents. This aspect often remains unrecognised by the public."

Message from United Nations Environment Programme for World Migratory Bird Day 2007

EDITORIAL

World Migratory Bird Day (WMBD) was first commemorated on 9 April 2006. It is a global initiative devoted to the celebration of the beauty of migratory birds and for the promotion of bird conservation worldwide. This year, WMBD will take place on the weekend of 12-13 May 2007. As part of our contribution to this day, we are devoting this issue of Wetlands to the birds, in the hope of raising awareness and understanding for the conservation of these amazing creatures. Do join us for a series of activities on migratory birds for example, talks and photo exhibition during that weekend.

– Linda Goh

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Cover picture of Blue-winged Pitta by Jeremy Ang, Conservation Officer

NATIONAL PARKS

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Water Regime Management at Sungei Buloh Wetland Reserve

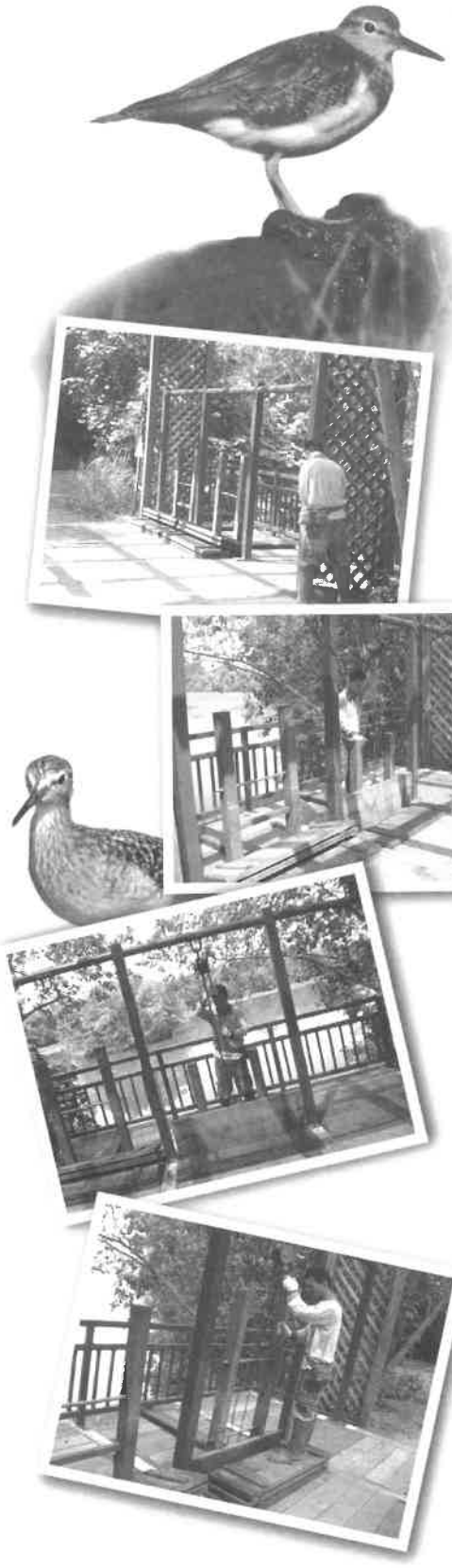
By James Gan, Senior Conservation Offcier
& Jeremy Ang, Conservation Officer

Have you ever visited Sungei Buloh and seen the two brackish water ponds in front of the Main Hide filled with water? And at other times found that one pond has exposed mudflats while the other is completely filled with water and vice versa regardless of the tide? What is the rationale for this water level regime?

The idea of managing the water levels in a wetland began with the desire to increase the number of migratory shorebirds that make use of Sungei Buloh. You see, historically and currently, Sungei Buloh acts as both a high tide roost site and a feeding ground for shorebirds but mainly as a high tide roost. When the tides are low across the northern coast of Singapore, these birds fly out from Sungei Buloh and forage on the tidal mudflats for polychaetes and mollusc. A few hours later when the water rolls in and submerge these mudflats at high tide, the birds need to find a roost to wait out the tides. Sungei Buloh serves to provide them this roost site within the ponds that have low water levels. And this is possible in Sungei Buloh, a forested mangrove area because of the network of existing bunds that have created ponds whose water levels can be regulated through the use of sluice channels and sluice gates.

Water levels in three brackish water ponds within the wetland are currently managed as a system on a fortnightly cycle generally between the shorebird migratory months of July and April. Outside of the migratory months, the water levels are generally not regulated and natural tidal influences are maintained. At no point in time are any of the three ponds mudflats submerged for more than four days (or left exposed to dry out for also more than four days). For perspective, there are five other brackish water ponds in the wetland whose water levels are not regulated at all and are subject only to natural tidal influence.

What might happen to shorebirds should the water levels in all the ponds be left to natural tidal influences? The first effect would be the loss of valuable exposed mudflats for shorebirds to roost (and to a lesser degree, feed) on during high tide. These birds will have to find other areas to roost since the northern coastal flats of Singapore as well as Sungei Buloh would be



submerged under water. And this will directly affect the number of shorebirds that are present (and can be observed) at Sungei Buloh during the high tide period. Should the shorebirds be unable to find alternative high tide roosts within close proximity to their feeding grounds, there is a possibility that the entire high tide roost cum feeding ground system (that is Sungei Buloh – Singapore north coast mudflats) may be abandoned for more suitable alternative systems in the region.

Are there detrimental effects to the regulation of water levels in the three ponds? Over the years, we have found that leaving the ponds at low water level for periods of more than a week result in the drying out of the mud with consequent die off of the mud invertebrates. When two or three ponds are carefully operated with minimal drying out periods of four days or less, the benefits of water level regulation are evident.

The bottom line – Has the number of shorebirds in Sungei Buloh increased, decreased or remained stable over all these years?

Analysis of the shorebird census data for Sungei Buloh has been made for the wetland's seven most abundant shorebird species over a period of seven years (from 2000 to 2006). The trends discerned are as follows:

Common Greenshank, Common Redshank, Pacific Golden Plover and Whimbrel – Increasing numbers during both southward and northward migration

Marsh Sandpiper – Stable numbers during both southward and northward migration

Mongolian Plover – Steady recovery in numbers during the southward migration after a dramatic and steep decrease observed in 2002 and 2003. Avoidance of the wetland during the northward migration since the spring of 2003.

Curlew Sandpiper – Erratic numbers during the southward migration. Avoidance of the wetland during the northward migration since the spring of 2001.

In summary, the current water regime management at Sungei Buloh serves its purpose. Overall, the absolute number of shorebirds counted at Sungei Buloh is at its highest over the last seven (and even ten) years. More can be done to further improve the conservation management of the wetland's biodiversity and in particular the shorebirds that make use of Sungei Buloh. We invite concerned and interested people to contribute to the improvement of Sungei Buloh as a wetland thriving with biodiversity. Opportunities are available for volunteers in areas as diverse as research, guiding, educational outreach, photography and documentation. Interested? Call 67941401 or email at info@sbwr.org.sg

Bird Ringing in Sungei Buloh Wetland Reserve in 2006

James Gan, Senior Conservation Officer

Bird ringing has been conducted at Sungei Buloh Wetland Reserve (SBWR) since 1990. This article gives an overview of some of the results of the bird ringing effort at Sungei Buloh over the past year. In 2006, a total of 658 birds from 66 species were ringed. The ringing field works was carried out on scheduled days and nights throughout the year. A summary of the number of birds ringed in 2006 (and the previous six years) is provided in Table 1.

The most commonly ringed bird species were (Numbers ringed in brackets) : Pacific Golden Plover (89), Yellow-vented Bulbul (72), Scaly-breasted Munia (69), Common Redshank (61) and Collared Kingfisher (42). Compared to the previous year (2005 ringing results), the number of birds ringed has increased from 479 to 658. The increase is attributed to the additional hours of mist netting.

Four new species of birds were ringed for the first time at SBWR in 2006. They are the Dollarbird, Greater Coucal, Lanceolated Warbler and Oriental White-eye. Other interesting species ringed include the Blue-winged Pitta, Greater Sand Plover, Ruddy Kingfisher, Ruddy Turnstone and Siberian Blue Robin.

There were 62 recoveries from 21 species that had been ringed before 2006. The Common Redshank had the most recoveries with 10 birds while the Pacific Golden Plover saw 9 recoveries. One use for the data obtained from recovered birds is the enabling of longevity records and the survival of the different bird species in the wild to be determined. A Common Redshank ringed on 1 Nov 1990 was recaptured (controlled) on 12 Sep 06. This is the oldest recaptured bird for Sungei Buloh with a retrap interval of 190 months (15 years 10 months). The longevity records based on birds recovered in 2006 are provided in Table 2.

There are other notable recoveries worth highlighting. An Oriental Magpie Robin had been recovered and found to have made Sungei Buloh its home for the past 10 years where it was first ringed in 1996. This suggests that the protection afforded by the wetland has helped this sought after bird in the song bird trade improve its chances to survive in the wild. A Pallas Grasshopper Warbler mist netted in March had been ringed the previous year in May and is the first of its species to be controlled at Sungei Buloh. A Lanceolated Warbler was ringed on 23 Feb 06 and retrapped on 5 May 06. This species is believed to be a migrant that breeds in Eastern Russia, Northern China, Japan and Korea. The recovery is evidence that Sungei Buloh could be serving as the wintering home for this individual bird. A weight gain of about 10% was noted when the warbler was measured in May compared to its weight in Feb. This could indicate fattening in preparation for its migratory flight back to its breeding grounds. Further work could help reveal information on the extent of fattening, and the arrival and departure dates as they pertain to the presence of the warbler in the wetland.

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Table 1

Summary of individual birds ringed and retraps at Sungei Buloh Wetland Reserve in 2006 and preceeding years (2000 to 2005)

S/N	Species	Ring 2000	Retrap pre-2000	Ring 2001	Retrap pre-2001	Ring 2002	Retrap pre-2002	Ring 2003	Retrap pre-2003	Ring 2004	Retrap pre-2004	Ring 2005	Retrap pre-2005	Ring 2006	Retrap pre-2006
1	Abbott's Babbler	2		2	1	3		0		0		0		1	
2	Arctic Warbler	3		2		0		2		0		1		1	
3	Ashy Minivet	0		0		0		1		0		0		0	
4	Ashy Tailorbird	20	1	18	2	19	4	19	6	12	2	13	3	15	
5	Asian Brown Flycatcher	2		0		0		1		1		0		0	
6	Asian Dowitcher	1		0		0		0		0		0		0	
7	Asian Glossy Starling	53	1	18		23	1	20		7		9		7	
8	Asian Koel	2		1		0		1		0		1		0	
9	Asian Paradise Flycatcher	0		1		1		1		1		0		4	
10	Baya Weaver	60		22	3	23		16		7	1	11		14	
11	Black Bittern	5		3	1	4	1	5		2	1	2		0	
12	Black-browed Reed Warbler	1		0		0		0		0		0		0	
13	Black-capped Kingfisher	6		3	1	4	1	5	1	5	1	2	2	5	
14	Black-naped Oriole	5		2		2		2		1		1		6	
15	Black-tailed Godwit	1		0		0		0		0		0		0	
16	Blue Magpie	1		0		0		0		0		0		0	
17	Blue-eared Kingfisher	0		0		1		0		1		0		0	
18	Blue-tailed Bee-eater	3		1		0		1		1		3		2	
19	Blue-throated Bee-eater	6		2		6		4		3		0		3	
20	Blue-winged Pitta	0		0		0		1		0		0		1	
21	Brown Shrike	4		7		1	1	1		0		0	1	2	
22	Brown-chested Jungle-Flycatcher	0		0		1		1		0		0		0	
23	Chestnut Munia	2		0		0		0		1		3		1	
24	Chestnut-winged Cuckoo	4		2		0		0		0		0		1	
25	Cinnamon Bittern	5		0		2		2		3		1		0	
26	Cinnamon-headed Pigeon	1		0		0		0		0		0		0	
27	Collared Kingfisher	43	8	48	12	32	16	26	16	11	11	23	5	42	7
28	Collared Scops Owl	5	1	5	2	3	4	3		3		2		4	1
29	Common Flameback	1	1	2		3	3	1	2	1		1		2	
30	Common Greenshank	0		2		1		1		0		1		0	
31	Common Iora	6		5	1	4		2		0		5		7	
32	Common Kingfisher	15		13		4	2	7	1	6	1	3		4	
33	Common Redshank	263	24	117	21	72	13	26	2	32	4	32	8	61	10
34	Common Sandpiper	9	1	17	3	5	3	6	3	4	3	8	2	4	
35	Common Tailorbird	15		14	1	16	3	13	2	6	3	19	1	13	4
36	Copper-throated Sunbird	0		1		9	1	2	1	2		0		6	1
37	Crimson Sunbird	0		0		0		1		0		0		0	
38	Crow-billed Drongo	1		0		0		1		0		1		0	
39	Curlew Sandpiper	26		34		9		0		0		8		4	
40	Dark-necked Tailorbird	3		1		0		2		0		2		4	
41	Dollarbird	0		0		0		0		0		0		1	
42	Drongo Cuckoo	1		0		0		0		0		0		0	
43	Eastern Crowned Warbler	0		0		0		2		1		0		0	
44	Emerald Dove	13	1	3	6	2	1	2		5		6	4	3	2
45	Eurasian Curlew	1		0		0		0		0		0		0	
46	Forest Wagtail	0		1		1		0		0		0		0	
47	Greater Coucal	0		0		0		0		0		0		1	
48	Greater Sand Plover	1		0		0		1		0		0		1	
49	Grey Heron	0		0		1		0		0		0		0	
50	Grey-tailed Tattler	0		1		0		1		1		0		0	
51	Indian Cuckoo	0		1		0		0		0		0		0	
52	Japanese Sparrowhawk	2		1		0		1		0	1	1		2	
53	Javan Munia	80		124	3	60	2	35		10	1	4		28	
54	Laced Woodpecker	4		3	2	3	2	5	4	5	1	2	3	4	
55	Lanceolated Warbler	0		0		0		0		0		0		1	
56	Large-tailed Nightjar	1		4	1	4	3	4	2	0		1		1	
57	Lesser Coucal	1		1		0		0		0		0		0	1
58	Little Bronze Cuckoo	1		1		0		0		0		1		0	
59	Little Egret	0		0		0		0		0		1		0	

Summary of individual birds ringed and retraps at Sungei Buloh Wetland Reserve in 2006 and preceeding years (2000 to 2005)

S/N	Species	Ring 2000	Retrap pre-2000	Ring 2001	Retrap pre-2001	Ring 2002	Retrap pre-2002	Ring 2003	Retrap pre-2003	Ring 2004	Retrap pre-2004	Ring 2005	Retrap pre-2005	Ring 2006	Retrap pre-2006
60	Marsh Sandpiper	25		60	5	48	3	46	9	5	0	4		9	2
61	Mongolian Plover	61	2	96	4	10	1	8	3	9		9		38	
62	Olive-backed Sunbird	1		15	1	4		1		2		0		2	
63	Olive-winged Bulbul	7		9	4	6	1	6	1	7	1	8	3	12	3
64	Oriental Magpie Robin	12	1	7	3	9	2	5	1	3		5	4	10	2
65	Oriental Reed Warbler	2		2		1	1	0		0		0		0	
66	Oriental Scops Owl	1		0		0		0		0		1	1	0	
67	Oriental White-eye	0		0		0		0		0		0		2	
68	Pacific Golden Plover	27	1	86	2	52	8	87	12	103	14	82	10	89	9
69	Pacific Swallow	7		3		0		0		1		2		1	
70	Pallas' Grasshopper Warbler	0		2		0		1		0		2		2	1
71	Pied Fantail	10	1	9	2	6	2	13	2	5	3	8	2	6	3
72	Pied Triller Warbler	1		1		0		0		0		0		1	
73	Pink-necked Pigeon	8		3		2		3		4		0		1	
74	Pintail Snipe	0		1		0		0		2		1		0	
75	Plain-throated Sunbird	73	4	47	14	36	3	26	9	18	6	13	4	18	2
76	Red-legged Crake	1		0		0		0		0		0		0	
77	Red-necked Stint	0		0		1		0		0		0		0	
78	Ruddy Kingfisher	1		1		0		0		0		0		1	
79	Ruddy Turnstone	0		1		0		0		0		0		1	
80	Ruddy-breasted Crake	0		0		0		0		0		1		0	
81	Rufous Woodpecker	0		2		0		2		0		1		1	
82	Rufous-tailed Tailorbird	15		10	3	8	1	6	1	2	1	2		14	
83	Rusty-breasted Cuckoo	1		0		2		0		0		0		0	
84	Scaly-breasted Munia	45		49		23		7		13		66		69	
85	Scarlet-backed Flowerpecker	1		2		0		1	1	0		2		1	
86	Siberian Blue Robin	3		0		1		0		0		0		1	
87	Slaty-breasted Rail	1		0		0		1		0		0		0	
88	Spotted Dove	3		1		1		0		0		3		1	
89	Stork-billed Kingfisher	9		6	4	6	2	7	4	0	3	1		4	1
90	Streaked Bulbul	0		0		1		0		0		0		0	
91	Streaked Weaver	0		0		0		0		0		1		0	
92	Striated Heron	9		6	4	3		3	1	2	1	1	2	5	1
93	Striped Tit Babbler	0		0		3		1		2		3		4	2
94	Terek Sandpiper	16	1	2		0		0		0		0		0	
95	Tiger Shrike	16		8		4		8	1	9		11		10	1
96	Watercock	1		0		0		0		0		0		0	
97	Whimbrel	13		27		6		8	1	1		0		0	
98	White-breasted Waterhen	5	1	11	1	0		0		3		0		4	1
99	White-browed Crake	1		2		0		0	2	0		0		0	
100	White-chested Babbler	0	1	0		0		0		0		0		0	
101	White-headed Munia	0		1		0		0		0		3		1	
102	White-rumped Shama	0		0		1		0		0		0		0	
103	White-throated Kingfisher	10		10	1	5	1	3	1	6		6		0	
104	Yellow Bittern	17		10	3	5	1	6	3	9		9	2	3	
105	Yellow-bellied Prinia	3	1	3	2	5	4	5	1	3	6	1	9	3	
106	Yellow-rumped Flycatcher	5		2		4		1		3		8		3	
107	Yellow-vented Bulbul	60	3	22	11	20	8	52	4	28	1	48	4	72	5
108	Zebra Dove	6		6		3		3		1		4		7	
TOTAL		**1156**	**54**	**1003**	**124**	**595**	**99**	**535**	**97**	**373**	**60**	**479**	**62**	**658**	**62**

Table 2

Longevity Records (Selected species)
At least 6 months for resident birds or 1 season for migrants

Species	Date Ringed	Date Recaptured	Interval (mths)
Ashy Tailorbird	1 Aug 01	5 May 06	57
Common Redshank	1 Nov 90	12 Sep 06	190
Olive-winged Bulbul	12 Sep 02	11 Aug 06	47
Oriental Magpie Robin	6 May 96	16 Jun 06	121
Pallas Grasshopper Warbler	18 May 05	24 Mar 06	10
Pied Fantail	13 Mar 01	28 Jun 06	63
Stork-billed Kingfisher	25 Aug 00	22 Nov 06	75
Striped Tit Babbler	15 Jun 05	15 Nov 06	17
Yellow-vented Bulbul	27 Jun 96	5 May 06	118

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The ringing data also revealed that four Asian Paradise Flycatchers were netted with an early arrival recorded on 19 Jul, one individual in Sep and two individuals in Oct. Previous years had recorded at most one bird ringed for the year. The presence of Yellow-rumped Flycatchers (usually detected in the wetland through mist netting work) was confirmed when three individual flycatchers were ringed in October. October was also the month when a single Siberian Blue Robin was ringed. Yellow Bitterns appeared a month later in November 2006.

In summary, bird ringing in 2006 has continued to reveal surprises in the presence of bird species, their movements, abundance and survival in Sungei Buloh. Data collected is invaluable for the long-term conservation and management of the wetland reserve.

Comments or feedback? Email at info@sbwr.org.sg

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Shorebird Counts in Sungei Buloh Wetland Reserve From 2000 to 2006

James Gan, Senior Conservation Officer,
and Ramakrishnan Kolvandavelu, Conservation Officer

Summary

Shorebirds from the Scolopacidae and Charadriidae were counted regularly in Sungei Buloh Wetland Reserve between January 2000 and December 2006. A total of 23 species was recorded during the census sessions. Total shorebird numbers peaked in October, November or December for all years. The most abundant bird was the Pacific Golden Plover *Pluvialis fulva* with counts consistently exceeding 1,000 for all years since 2001 with a maximum of 2,000. The counts have revealed information on the composition of shorebird species, their numbers and their presence in different months over the past seven years. More specifically, the relative importance of Sungei Buloh as a shorebird site in Singapore is reinforced. Data collected will help to improve the conservation work and management practices at Sungei Buloh for the next few years.

Introduction

This article is based on an earlier paper submitted by the same authors and published in The Stilt No.48 Oct 2005. It is an update of the shorebird count data obtained from monthly wader census conducted at SBWR with a brief analysis. It is also the intention of this update to prime people to take a greater interest and appreciation in the shorebirds of Singapore.

Results

A total of 23 species was recorded during the census sessions. Seven of the 23 species dominated with counts of at least 100 birds at any one session during the study period. Count data for these seven species for the period January 2000 to December 2006 are listed in Table 1. Note that the totals as given in the tables refer to the highest count for a given month and are not average counts.

For all years, maximum shorebird counts were in either November or December with the exception of 2006 when it peaked in October. Peak counts of shorebirds did not exceed 3,200 birds in any year. Only the Pacific Golden Plover had counts exceeding 1,000 birds. This occurred fairly regularly during both the periods for southward and northward migration. The only other shorebird with numbers exceeding a thousand was the Mongolian Plover *Charadrius mongolus* (1,003 on January 2000). Common Redshank *Tringa totanus* and Whimbrel *Numenius phaeopus* were the only two species noted in the boreal summer for 2001 to 2006 where they were present in very low numbers (below 20 birds) except in June 2003 when no shorebirds were observed.

To generalise, the species with the highest numbers recorded during the southward migration (Sep/Oct/Nov) relative to their numbers throughout the year were Common Redshank, Mongolian Plover and Curlew Sandpiper. Species with the highest numbers recorded during the northward migration (Mar/Apr) were Pacific Golden Plover and Whimbrel. Species with the highest numbers in the northern mid winter (Dec/Jan) were Common Greenshank and Marsh Sandpiper.

Species Account

A comparison was made of the seven most common shorebird species at the reserve with the maximum counts recorded by the Asian Waterfowl Census (AWC) for Singapore between 1991 and 2001 (Perennou & Mundkur 1991, 1992; Mundkur & Taylor 1993; Lopez & Mundkur 1997; Li & Mundkur 2004). Direct comparison is possible for counts taken in January since the AWC counts are consistently conducted in that month at low tide. The percentage of each species of shorebird that can be found in the reserve against the Singapore population is at best a rough estimate but still an indicator of the relative importance of the reserve with respect to other sites in Singapore. The relevant data are given in Table 2.

Common Greenshank
Tringa nebularia.

Trend: Increased numbers during both southward and northward migration

The maximum count at the wetland was 364 recorded in Nov 2005. It seems likely that during high tide about half the population of Greenshanks in Singapore use the wetland as a roost.

Common Redshank
Tringa totanus

Trend: Increased numbers during both southward and northward migration

The maximum count was 683 recorded in Sep 2000. The peaks in September followed by a 60% to 70% drop the following month in 2000, 2001 and 2002 provide some indication of turnover rates for Redshanks on passage.

Curlew Sandpiper
Calidris ferruginea

Trend: Erratic numbers during the southward migration. Avoidance of the wetland during the northward migration since the spring of 2001

The maximum count was 519 in Oct 2006. The 1991-2001 counts for Singapore range from 5 to 781. First migrants were recorded in August. Since 2001, negligible (less than 10) numbers of birds were present between January and July. The data and observation could be explained by the possibility that since 2001, Curlew Sandpipers take a northward migration route that bypass or use other wetlands in Singapore or the region. Such an alternative route could possibly be along the eastern coast of Sumatra before crossing over to Malaysia and/or Thailand. Large numbers of Curlew Sandpiper occur along the east coast of Sumatra at this time (A. Crossland pers. comm.). Wader counts at suitable sites in Indonesia and the Malay Peninsula would help to clarify the actual route taken. The peak counts in October for most years indicate a strong southward passage in that month before falling sharply in January for the northward migration.

Marsh Sandpiper
Tringa stagnatilis

Trend: Stable numbers during both southward and northward migration.

The maximum count was 486 observed in Dec 2001. Counts for Singapore range from 526 and 1294. Birds arrive at the wetland in appreciable numbers only from October. The data collected are consistent with the observations in the Malay Peninsula where Marsh Sandpipers arrive late and depart relatively early with a further peak in the boreal spring (Wells 1999). This surge was noted in early April 2001 but not in 2000. It may however have happened between count dates and was therefore unrecorded.

Mongolian Plover
Charadrius mongolus

Trend: Steady recovery in numbers during the southward migration after a dramatic and steep decrease observed in 2002 and 2003; Avoidance of the wetland during the northward migration since the spring of 2003.

The maximum count of 1,003 was recorded on 26 January 2000. Another count of 878 was recorded on 10 February 2000. AWC counts for Singapore have recorded historic peaks of up to 1,000 birds. Observations in the Malay Peninsula have generally noted decreases in Mongolian Plover numbers from December to March (Wells 1999). These observations are consistent with the pattern of counts recorded for all years when counts are generally highest in December and decrease as the northward migration progresses. This may indicate a boreal spring exodus without significant augmentation by passage migrants. High tide counts taken from a boat in the West Johore Straits on 3 Jan 03 revealed up to 600 Mongolian Plovers resting on floating pontoons. The following year, on 6 Feb 04, 200 Mongolian Plovers were counted at the same pontoons during high tide. Thus it would seem, unlike the Curlew Sandpiper, that the main northward migration route of Mongolian Plovers continues to include the vicinity of Sungei Buloh. Further monitoring

and implementation of various habitat management measures at Sungei Buloh may help to reveal the reasons for the general avoidance of the wetland in favour of the pontoons during the northward migration period.

Pacific Golden Plover

Pluvialis fulva

Trend: General increase in numbers during both the periods of southward and northward migration.

Counts exceeded 1,000 birds in all years except 2000. A mid-winter peak count of 2000 was recorded in Jan 2005 and this number is unusual as Jan counts for Pacific Golden Plovers in previous years had never exceeded 1,000 birds. It could however indicate some disturbance at the Mandai Mudflats where records of Pacific Golden Plovers exceeding 2,000 birds at low tide have been recorded. The southward migration in the same year confirmed this number with a peak of 1,735 birds counted in Nov 2005. The following year also saw an unusually high surge of Pacific Golden Plovers in Jan 2006 with a count of 1,321 birds. AWC counts for Singapore range from 908 to 2416. There appears to be a trend that more Pacific Golden Plovers are making use of Sungei Buloh. The reasons are not clear but could be due to the loss of previously derelict land in the Kranji area that had been used by the plovers as a high tide roost area and which was in 2005 and 2006 being redeveloped resulting in the plovers moving to Sungei Buloh as the next best high tide roost. The count of 1,081 birds in April 2001 suggests staging during northward migration.

Whimbrel

Numenius phaeopus

Trend: Increased numbers during both southward and northward migration

A maximum count of 442 was obtained. That count was taken in Nov 2003 and likely involves birds passing through and making use of Sungei Buloh as a stop over site. Significant increases in Whimbrels from the preceding months in April 2001 (219 birds), Mar 2002 (215 birds), Mar 2004 (301 birds), Apr 2005 (320 birds) and Apr 2006 (268 birds) might indicate staging. The high counts of Whimbrels in Mar and April quickly slumps to generally 20 birds or less in early May. Some Whimbrels may have over summered in Singapore as small numbers were present throughout May, June and July in most years. First arrivals were noted in late July or early August and a large influx of birds was noted in September for most years.

DISCUSSION

This study of shorebird count data from the years 2000 to 2006 has shown that generally, for counts between September and March (Table 3), over 1,000 shorebirds may be expected at SBWR during the high tide period. From May to July, only a few species of shorebirds can be found, usually Common Redshank and Whimbrel with fewer than 30 individuals. From the census data for the seven years period, the shorebird community at the reserve is composed of seven main species and sixteen other species that occur in much smaller numbers. These in descending order of abundance are Common Sandpiper *Tringa hypoleucos,* Terek Sandpiper *Tringa cinerea,* Broad-billed Sandpiper *Limicola falcinellus,* Ruddy Turnstone *Arenaria interpres,* Bar-tailed Godwit *Limosa lapponica,* Little Ringed Plover *Charadrius dubius,* Great Knot *Calidris tenuirostris,* Pintail Snipe *Gallinago sterura,* Eurasian Curlew *Numenius arquata,* Grey-tailed Tattler *Tringa brevipes,* Grey Plover *Pluvialis squatarola,* Red-necked Stint *Calidris ruficollis,* and Black-tailed Godwit *Limosa limosa,* Little Curlew *Numenius minutes,* Greater Sand Plover *Charadrius leschenaultii* and Asian Dowitcher *Limnodromus semipalmatus.* Other shorebird species, for example Black-winged Stilt *Himantopus himantopus* observed at the reserve in 2005 (Tay 2006) were not recorded during the actual census sessions.

Preliminary data obtained through the counts and observations suggest that the wetland is favoured by perhaps more than 80% of the Singapore population of Whimbrel, Mongolian Plover (except during the northward migration period when they completely avoid the wetland) and Pacific Golden Plover. The data also suggest that about 50% of the Common Greenshank and 30% of the Marsh Sandpiper and Common Redshank population use the wetland as a high tide roost. About 10% of the Curlew Sandpiper population is thought to use Sungei Buloh as a high tide roost. Further studies would be required to confirm these hypotheses. More frequent counts over a longer period would help to establish patterns of seasonal abundance, distribution and movements of shorebirds in Singapore. A limitation of the data obtained during the study period is that a substantial influx of passage waders might last only a few days and might be missed through slipping between counts that are spaced at wider intervals. Closer-spaced counts during migration periods would refine our knowledge of the exact magnitude and timing of passage peaks. The data presented, though limited by resource constraints, is however sufficient to give an indicative picture of the seasonal abundance of shorebirds at Sungei Buloh. It is clear that the Sungei Buloh wetland area is an important site for these shorebirds. Similar sites in Singapore and around Singapore may possibly reveal similar species, similar monthly counts and composition of species.

ACKNOWLEDGEMENTS

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Table 1

Peak High Tide Counts of each Wader Species for each Month at Sungei Buloh from 2000 to 2006

Year 2000	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Common Greenshank	191	148	96	54	NC	NC	0	15	28	55	36	115
Common Redshank	48	131	24	2	NC	NC	20	433	683	399	51	310
Curlew Sandpiper	105	103	73	1	NC	NC	0	12	15	275	185	238
Marsh Sandpiper	357	380	170	37	NC	NC	0	0	31	122	232	347
Mongolian Plover	1003	878	20	60	NC	NC	0	0	367	189	555	603
Pacific Golden Plover	488	220	662	171	NC	NC	0	0	455	334	393	311
Whimbrel	166	201	89	41	NC	NC	0	11	149	139	143	139

Year 2001	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Common Greenshank	220	118	58	124	5	0	1	12	41	111	118	189
Common Redshank	115	44	7	116	17	7	32	154	305	190	221	152
Curlew Sandpiper	67	0	0	0	0	0	0	50	133	302	248	288
Marsh Sandpiper	376	372	129	223	3	0	0	3	84	314	134	486
Mongolian Plover	786	213	104	112	10	0	0	183	675	555	440	606
Pacific Golden Plover	348	450	327	1081	0	0	0	220	545	624	1022	940
Whimbrel	139	186	118	219	10	13	14	20	113	176	157	198

Year 2002	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Common Greenshank	135	89	148	179	8	0	2	32	46	120	148	219
Common Redshank	61	78	73	29	1	0	15	129	404	158	152	160
Curlew Sandpiper	13	0	0	0	0	0	0	65	8	59	63	1
Marsh Sandpiper	360	378	410	100	0	0	0	3	45	266	318	271
Mongolian Plover	25	361	0	0	0	0	2	44	274	130	7	3
Pacific Golden Plover	344	583	570	16	0	0	0	16	549	1010	1222	519
Whimbrel	159	121	215	143	11	17	37	39	78	155	302	145

Year 2003	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Common Greenshank	218	195	151	103	20	0	0	27	82	87	307	159
Common Redshank	137	347	53	53	27	0	5	137	299	249	296	214
Curlew Sandpiper	1	0	0	0	0	0	0	2	18	2	388	79
Marsh Sandpiper	251	362	348	230	0	0	0	0	57	251	259	223
Mongolian Plover	0	0	0	0	0	0	0	10	1	0	146	0
Pacific Golden Plover	157	85	64	70	0	0	1	40	253	1111	1015	568
Whimbrel	333	272	166	134	51	0	5	3	130	220	442	220

Year 2004	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Common Greenshank	300	161	187	138	2	0	1	40	70	130	233	144
Common Redshank	315	334	257	121	40	8	28	122	239	271	299	362
Curlew Sandpiper	0	3	0	0	0	0	0	28	107	206	0	1
Marsh Sandpiper	219	394	313	109	0	0	0	20	178	202	245	245
Mongolian Plover	0	12	0	0	0	0	0	19	175	144	24	2
Pacific Golden Plover	431	580	468	53	0	0	0	81	593	913	1028	1044
Whimbrel	170	216	301	268	4	6	24	21	242	193	207	239

Year 2005	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Common Greenshank	191	280	103	164	1	0	5	35	100	143	364	293
Common Redshank	395	544	185	230	31	4	25	140	302	382	355	340
Curlew Sandpiper	9	0	2	0	0	0	0	0	43	58	276	62
Marsh Sandpiper	289	476	203	252	0	0	0	1	141	405	325	298
Mongolian Plover	0	1	0	0	0	0	0	4	310	141	73	22
Pacific Golden Plover	2000	1314	1561	654	0	0	0	9	625	857	1735	1233
Whimbrel	245	290	248	320	8	7	6	16	126	203	307	327

Year 2006	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Common Greenshank	341	185	170	170	1	0	1	42	183	144	146	153
Common Redshank	426	344	205	116	62	7	7	338	312	592	453	469
Curlew Sandpiper	0	0	0	0	0	0	0	0	331	519	389	103
Marsh Sandpiper	450	213	126	136	1	0	0	14	79	137	204	169
Mongolian Plover	4	0	0	0	0	0	0	1	272	212	374	228
Pacific Golden Plover	1321	1278	662	248	0	0	0	277	769	982	911	583
Whimbrel	303	128	191	268	20	23	21	100	271	376	294	291

Table 2

Summary and comparison of Singapore's totals of selected species of shorebirds counted during the Asian Waterbird Census (1991 - 2004) and shorebirds counted in Sungei Buloh Wetland Reserve (2000-2006).

	Common Greenshank	Common Redshank	Curlew Sandpiper	Marsh Sandpiper	Mongolian Plover	Pacific Golden Plover	Whimbrel	No. of sites counted
Asian Waterbird Census 1991-2004								
1991	180	712	114	709	173	908	88	10
1992	472	267	781	989	178	1952	247	13
1993	265	459	429	1294	773	2154	315	13
1994	326	530	411	1261	724	1609	224	15
1995	294	668	28	526	86	1697	341	15
1996	386	1004	5	696	351	2416	217	13
1997	664	333	3	722	1000	1195	329	10
1998	299	778	180	901	591	1428	149	6
1999	439	898	207	480	811	2424	321	11
2000	137	292	50	391	715	1217	71	10
2001	290	205	25	682	617	1306	112	10
2002	122	12	13	360	0	344	159	1
2003	267	336	0	215	161	1383	240	9
2004	209	282	0	207	40	497	107	9
Singapore's January Maximum (SJM) 1991-2004								
	664	1004	781	1294	1000	2424	341	
SBWR's January Maximum 2000-2006								
Number	341	426	105	450	1003	2000	333	
% to SJM	51.4%	42.4%	13.4%	34.8%	100.3%	82.5%	97.7%	
SBWR's Maximum. All months 2000-2006								
Number	364	683	519	486	1003	2000	442	
% to SJM	54.8%	68.0%	66.5%	37.6%	100.3%	82.5%	129.6%	

Table 3

Sungei Buloh Shorebird Census Data 2000-2006 -Day Peak Counts in each Month

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Year												
2000	1998	1772	1079	367	NC	NC	21	478	1607	1448	1605	2078
2001	1738	1391	755	1622	45	20	32	407	1787	1968	2213	2470
2002	1018	1539	1126	355	16	17	38	230	1431	1525	2071	1057
2003	923	1211	747	484	88	0	5	169	683	1718	2643	1283
2004	1088	1451	1086	713	45	11	36	237	954	1763	1745	1832
2005	2140	2763	2163	1543	36	11	36	204	1212	2310	3152	1917
2006	2287	2045	1196	890	70	30	27	786	1969	2974	2532	1633

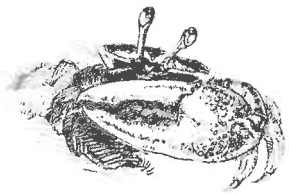
NC= No Count

Calendar of Events

(April to August 2007)

Compiled by Halilah Ahmad, Outreach Officer.

Admission charges apply on Saturday, Sunday, Public Holidays and School Holidays for all events except otherwise stated.



Free Guided Walks

Every Saturday at 9.30am and 3.30pm

Join us for a free guided walk through the serenity of the mangroves habitat. Get to know the marine fishes that swim pass Sungei Buloh Besar during the marine fish walk on certain Saturdays. Walks are subjected to weather conditions. Check out SBWR website at http://www.sbwr.org.sg/events/guidedtours/ for timeslots and updates.

Prawn Watch

Saturday: 26 May, 9 June, 23 June

Come and witness the traditional prawn harvesting activity. Please be at the Information counter by 9.00am and a guide will lead you to the prawn harvesting demonstration site. Check out SBWR website at http://www.sbwr.org.sg/events/prawnwatch/ for updates.

Significant days for observation:

World Migratory Bird Day

12 May 2007

Come and view a photo exhibition on the common migratory bird species that make SBWR one of their rest stops. This is a rare chance to view the birds up close through the eyes and lens of the photographers.

Talks on the migratory birds are in the pipeline on Saturday and Sunday 7 & 8 April 2007. Look out for updates at http://www.sbwr.org.sg

International Biological Diversity Day

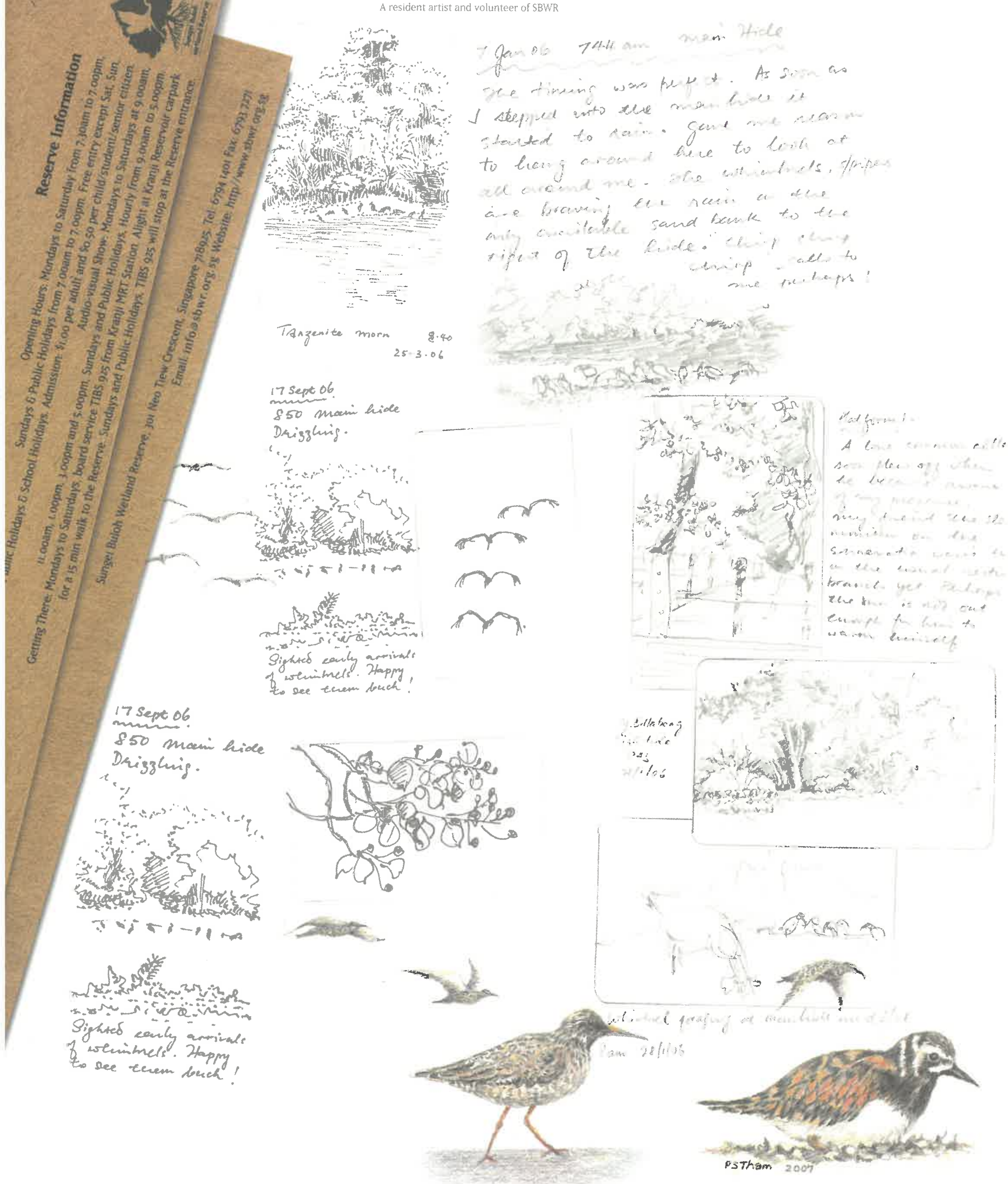
22 May 2007

World Environment Day

5 June 2007

Field Journal from Tham Pui San

A resident artist and volunteer of SBWR



The Common Palm Civet loves toddy. But it's more likely to disappear from our ignorance than its passion.

The Common Palm Civet has a not so common habit. It exhibits an unusual fondness for palm flower sap, which when fermented, becomes toddy, a sweet liquor. Which explains its other name, Toddy Cat. However, it's not the habit that's harmful to the Civet. It is what we do to its home that is. You see, our rainforest area, and other natural habitats, are under threat. In fact, only about 3% of our island is covered by rainforest. This habitat loss makes the animal vulnerable. No home, no animal. It's that simple. But we've already taken a step in the right direction with HSBC's Fun With Nature programme. It aims to educate our children about our amazing wildlife.

Help our children learn about our amazing wildlife through HSBC's Fun with Nature programme.

And the importance of preserving our rainforest and its other residents, such as the Common Flying Dragon, Common Tiger Butterfly and Black-spotted Sticky Frog.

The logic is simple. By getting our children involved and excited about wildlife we can get them to care for the future of our habitats. Because, they will not protect what they don't love. They won't love what they don't appreciate. And it's difficult for them to appreciate what doesn't exist. **Care for Nature. Care for Our Heritage.**

The Care-for-Nature stamp series is an HSBC initiative to protect what little we have. This year's Fun with Nature stamp series features the endangered residents of our nature areas. You can support the cause by purchasing these stamps. The proceeds will go towards educating our children to become more environmentally aware. The HSBC Care-for-Nature Collector's Cover (S$9.90), and the Limited Edition Stamp Prints (Set-of-4 for S$198 and 4-in-1 at S$88), can be bought at any HSBC branch across the island. Or you can place your order online at **www.hsbc.com.sg**

Help save the Toddy Cat, he needs his drink.

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