



for a living planet

**Baseline survey on
the usage of MPNR by roosting
Barn Swallow *Hirundo rustica*
and Yellow Wagtail *Motacilla flava***



CONTENTS

Chapter	Page
1. INTRODUCTION	1
1.1 Background	1
1.2 Aims	1
2. METHODS	1
3. RESULTS	3
4. CONCLUSION and RECOMMENDATIONS	5
5. REFERENCES & BIBLIOGRAPHY	6

Tables

1. Barn Swallow - Monthly peak roosting count and roosting location.	4
2. Summary on the reed stand type used by roosting Barn Swallow.	4
3. Yellow Wagtail - Monthly peak roosting count.	5

Figures

1. Map showing counting locations.	2
2. Final roost locations of Barn Swallow and Yellow Wagtail.	3

Appendix

Ia. Historical Records of Barn Swallow roosting in the MPNR Reedbeds..	7
Ib. Historical Records of Yellow Wagtail roosting in the MPNR Reedbeds.	7
II. Summary on Barn Swallow Roosting Count 2007.	8
IIIa. Summary on Yellow Wagtail Roosting Count 2007 – Reed stand at <i>Gei wai</i> #8b.	9
IIIb. Summary on Yellow Wagtail Roosting Count 2007 – Reed stand at <i>gei wai</i> #14.	9

This publication should be cited as:

WWF-HK, 2010. **Baseline survey on the usage of MPNR by roosting Barn Swallow *Hirundo rustica* and Yellow Wagtail *Motacilla flava*.** World Wide Fund For Nature Hong Kong.

Cover photo: Yellow Wagtail *Motacilla flava*, Barn Swallow *Hirundo rustica* and Common Reedgrass *Phragmites australis*. Photo credit: Neil Fifer, Fion Tse and Rubin Chua.

Report Author: Ms Katherine Leung, Reserve Officer, Mai Po Nature Reserve, WWF Hong Kong.

Field Surveyors:

Mr. Bena Smith and Ms. Katherine Leung

1. INTRODUCTION

1.1 Background

- 1.1.1 Barn Swallow *Hirundo rustica* is recorded in Hong Kong all year round but most abundant during spring passage. The largest flocks occur between mid-March to mid-April with the highest count being 3,000 at Mai Po on 02 April 1995 (Carey, *et al.* 2001). There are only a few records of roosting swallow from the MPNR reedbeds, the highest roost count being 1,800 individuals (including Red-rumped Swallow *H. daurica*) recorded on 12 October 2004 (HKBWS, 2009). Besides, anecdotal observations in late 2005 and 2006 showed between 100 and 500 birds roosting in the reed stands at *Gei wai* #7, #8b, #10 and Pond #24 (Appendix Ia).
- 1.1.2 Yellow Wagtail *Motacilla flava* is a common winter visitor and passage migrant to Hong Kong. Three races (*taivana*, *tschutschensis* and *macronyx*) are present in Hong Kong and, with the exception of extreme data, one or all are present between September to May (Carey, *et al.* 2001). All three races are known to use the *Gei wai* #8b reed stand as night roost (Hong Kong Bird Ringing Group ringing data). More than 3,000 individuals were recorded roosting in May 1999 and November 2002 and according to an academic study in 1995-97, roosting was observed at *Gei wai* #3, #8b and #14 (Lee, 1997). Recent high counts include single flocks of 1,500 individuals reported flying out of *Gei wai* #8b at first light on 12 November 2005 (Paul Leader, pers. comm.) and 920 on 11 November 2006 (Bena Smith pers. obs.). Other observations in late 2005 noted 500 roosting inside *Gei wai* #14 (Bena Smith pers. obs.) (Appendix Ib).
- 1.1.4 The above records suggest MPNR could be important roost area for Barn Swallow and Yellow Wagtail. Therefore a baseline study is needed to ascertain the current usage of the Reserve by these species and also create a baseline data set for future comparisons.

1.2 Aims

- 1.2.1 The specific aims of the study are to:
- Determine the importance of the MPNR for roosting Barn Swallow and Yellow Wagtail.
 - Gain a better understanding of the roosting population and preferred roost location(s) of Barn Swallow and Yellow Wagtail in MPNR.
 - Obtain a baseline data set using a simple repeatable field survey methodology.

2. METHODS

- 2.0 Evening roost counts were carried out on Barn Swallow and Yellow Wagtail in 2007 to survey their usage of reed stands at MPNR as night roost.

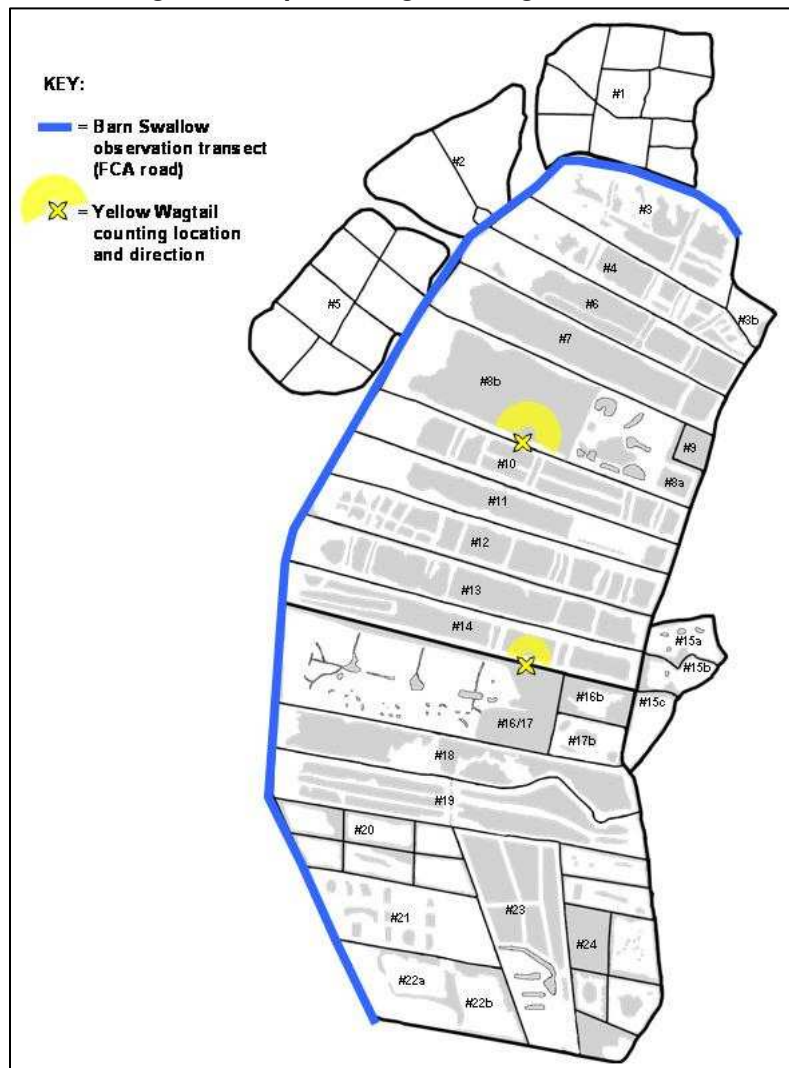
2.1 Barn Swallow

- 2.1.1 Counts on Barn Swallow were carried out twice every month (one in earlier part and one in later part of the month) from January to December. Counts started approximately one hour before sunset.
- 2.1.2 Gathering flock of swallow was first located by observation along the FCA road (Fig 1). The flock was then tracked until it eventually descended into a reed stand inside the Reserve. Prior to roosting, several counts were carried out on the flock as it circled above the reed stand.
- 2.1.3 The number of roosting bird and their final roosting location were recorded. For surveys where the final roost location was undeterminable or outside the MPNR boundary, maximum flock size was recorded.

2.2 Yellow Wagtail

- 2.2.1 Counts on Yellow Wagtail were carried out twice a month (one in earlier part and one in later part of the month) from January to May and from September to December. Due to their low abundance in June, July and August no survey was conducted in those months. Counts commenced one hour before sunset.
- 2.2.2 A precursory study in 2006 showed that Yellow Wagtail favoured reed stands in *Gei wai* #8b and *Gei wai* #14 (Appendix Ib), hence they were selected for the study. Surveys were conducted on each reed stand at fixed counting locations (Fig 1): on the bund between *Gei wai* #8b and *Gei wai* #10 and from the Education Center access track.
- 2.2.3 Individual birds/flocks entering or leaving the reed stand were tallied to determine the total number of birds roosting. For surveys where the final roosting location was undeterminable or outside of the MPNR boundary, the maximum number of bird observed was recorded.

Figure 1: Map showing counting locations.

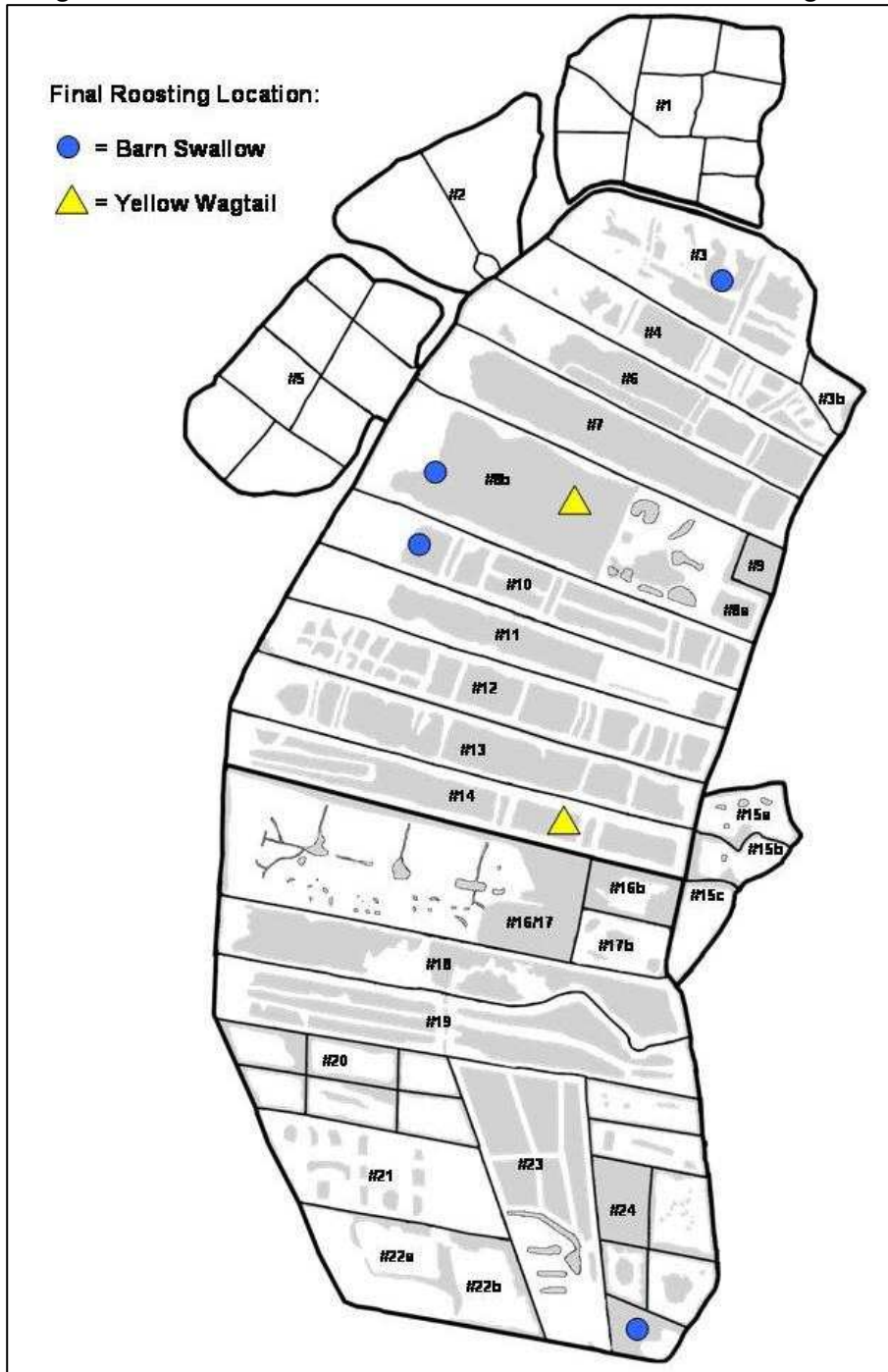


3. RESULTS

3.1 Barn Swallow

3.1.1 Twenty-four scheduled counts were completed with 5 additional observations (Appendix II). Swallow was observed roosting on 13 occasions (i.e. 54% of the counts) and utilised 4 different reed stands at MPNR (Fig 2). Roosting occurred in most months except January (no bird observed within MPNR during survey), May, June and August (roosting location undetermined) (Table 1).

Figure 2: Final roost locations of Barn Swallow and Yellow Wagtail.



- 3.1.2 During February, March and April, birds were observed roosting in a reed stand at Pond #24a in southern MPNR. In other months, reed stands at *Gei wai* #8b and #10 located at northern MPNR were used. The reed stand at the eastern side of *Gei wai* #3 was used once in July.
- 3.1.3 The highest number of Barn Swallow was observed on 20 July 2007 when 2,500 individuals roosted in *Gei wai* #3. Spring roosting number varied between 200-390 individuals, Autumn numbers between 430-520 individuals.

Table 1: Barn Swallow - Monthly peak roosting count and roosting location.

Month	Peak	Roost location
Jan	0	-
Feb	280	Pond #24a
Mar	385	Pond #24a
Apr	14	Pond #24a
May	0	Undetermined
Jun	0	Undetermined
Jul	2,500	<i>Gei wai</i> #3
Aug	0	Undetermined
Sep	433	<i>Gei wai</i> #8b
Oct	520	<i>Gei wai</i> #10
Nov	430	<i>Gei wai</i> #8b
Dec	110	<i>Gei wai</i> #8b

- 3.1.4 Barn Swallow was observed roosting in 4 different reed stands located at both the northern and southern part of the MPNR. All 4 stands contain reed submerged in water (“wet reedbed”) surrounded by open water. Stands of reed in brackish water were used 8 times and those in fresh water 5 times (Table 2).

Table 2: Summary on the reed stand type used by roosting Barn Swallow.

Location	Brackish/Freshwater	Month of use
<i>Gei wai</i> #3	Brackish	Jul
<i>Gei wai</i> #8b	Brackish	Jul, Sep, Oct, Nov, Dec
<i>Gei wai</i> #10	Brackish	Oct
Pond #24a	Freshwater	Feb, Mar, Apr

- 3.1.5 On those occasions when flocks chose not to roost inside MPNR, most were observed flying out of the Reserve in a southerly direction. This suggests suitable roost sites might exist elsewhere.

3.2 Yellow Wagtail

- 3.2.1 Eighteen scheduled counts were completed at both *Gei wai* #8b and #14, with 4 additional observations at *Gei wai* #8b (Appendix IIIa & b). Counts were paused in June, July and August when Yellow Wagtail are not present or in extremely low number in Hong Kong. Roosting locations are shown in Figure 2.
- 3.2.2 At *Gei wai* #8b, roosting was observed on 10 count dates (56%), in February, April and May, and then continuously from October to December. The highest number, 612 individuals, was observed on 20 November 2007 (Table 3) and an additional observation on 28 October 2007 recorded more than 800 individuals leaving the reed stand at dawn. Roosting occurrence generally coincided with the main migration periods with late October and November associated with the highest numbers.

3.2.3 Roosting at *Gei wai* #14 was only observed on 5 occasions (28% of the counts) between September to December with a high count with 108 individuals on 15 October 2007 (Table 3).

Table 3: Yellow Wagtail - Monthly peak roosting count.

Month	<i>Gei wai</i> #8b	<i>Gei wai</i> #14
Jan	0	0
Feb	33	0
Mar	0	0
Apr	305	0
May	282	0
Jun	No survey	
Jul		
Aug		
Sep	0	4
Oct	323	108
Nov	612	4
Dec	370	4

3.2.4 Observations of bird flocks flying away from MPNR during the study suggest that suitable roosting site(s) probably occur outside the boundary of MPNR.

4. CONCLUSION and RECOMMENDATIONS

4.1 Barn Swallow

4.1.1 Although Barn Swallow is not classified as a wetland dependant species and is not listed as a species of conservation concern (Fellowes *et. al.* 2002), it is clear that the Deep Bay Swallow population utilises the wetland areas to roost. Thus, the reed stands within MPNR are deemed of local importance for Barn Swallow.

4.1.2 Barn Swallow has a strong preference to roost in “wet reedbed” surrounded by open water as shown in this study. Therefore it is recommended to maintain existing stands of wet reed within the MPNR and consider establishing new areas when undertaking reed restoration projects.

4.2 Yellow Wagtail

4.2.1 Being a wetland-dependent species, Yellow Wagtail passing through the territory strongly rely on the Deep Bay wetlands. Based on this study and historical observations, the reed stands within MPNR are considered locally important for passage and wintering Yellow Wagtail.

4.2.2 The reed stand at *Gei wai* #8b was constantly used for roosting, especially during winter months. The area therefore should be maintained as reed habitat in the future. This is in keeping with the current management intention for Biodiversity Management Zone 5 which is to “adjust conditions in favour of supporting a substantial block of reedbed habitat” (WWF-HK, 2006).

4.2.3 Further study should be carried out to survey other reed stands within MPNR to provide a more comprehensive picture of usage and preference. This would provide useful information for WWF’s reedbed management strategy. The study would also provide information on the population trend and migration pattern of Yellow Wagtail in Deep Bay.

5. REFERENCES (*) & BIBLIOGRAPHY

- BirdLife International, 2010. **Species factsheet: *Motacilla flava***. Downloaded from <http://www.birdlife.org> on 13/6/2010.
- Brazil, M. 2009. **Birds of East Asia**. Princeton University Press, United States.
- * Carey, G.J., Chalmers, M.L., Diskin, D.A., Kennerley, P.R., Leader, P.J., Leven, M.R., Lewthwaite, R.W., Melville, D.S., Turnbull, M. and Young, L. 2001. **The Avifauna of Hong Kong**. Hong Kong Bird-watching Society, Hong Kong.
- * Fellowes, J.R., M.W.N. Lau, D. Dudgeon, G.T. Reels, G.W.J. Ades, G.J. Carey, B.P.L. Chan, R.C. Kendrick, Lee K.S., M.R. Leven, K.D.P. Wilson and Yu Y.T. 2002. **Wild Animals to Watch: Terrestrial and Freshwater Fauna of Conservation Concern in Hong Kong**. *Memoirs of the Hong Kong Natural History Society* 25, 123-159.
- * HKBWS, 2002. **Systematic List 1998**. *The Hong Kong Bird Report 1998*. Hong Kong Bird Watching Society, Hong Kong.
- HKBWS, 2004. **Systematic List 1999 and 2000**. *The Hong Kong Bird Report 1999 & 2000*. Hong Kong Bird Watching Society Limited, Hong Kong.
- * HKBWS, 2007. **Systematic List 2001-02**. *The Hong Kong Bird Report 2001-02*. Hong Kong Bird Watching Society Limited, Hong Kong.
- * HKBWS, 2009. **Systematic List 2003-04**. *The Hong Kong Bird Report 2003-04*. Hong Kong Bird Watching Society Limited, Hong Kong.
- Kirby, R.E. 1978. **Roosting of Passerine over Open Water at Night**. *North American Bird Bnder* Vol. 3, No.3: 104-105.
- * Lee, W.H. 1997. **Ecological value of reedbeds (*Phragmites australis*) at Mai Po Marshes Nature Reserve**. Unpub. M.Phil. thesis. City University of Hong Kong, Hong Kong.
- Smiddy, P., Cullen, C. and O'Halloran, J. 2007. **Time of roosting of Barn Swallows *Hirundo rustica* at an Irish reedbed during autumn migration**. *Ringing & Migration* 23: 228-230.
- Surmacki, A., G. Lorek, & P. Tryjanowski. 1999. **Communal roosting of Linnets *Carduelis cannabina* and Blue-headed Wagtails *Motacilla flava* at post-breeding period in Western Poland**. *Vogelwarte* 40: 146-148.
- Verma, S.K. 2010. **Population and roosting behaviour of Barn Swallows *Hirundo rustica* wintering in Jamshedpur, Jharkhand, India**. *Journal of Threatened Taxa* 2(2): 721-723.
- Walthew, G. 1995. **Focus on Fish Ponds I – Fish Ponds and Birds**. *Porcupine!* 13. Department of Ecology and Biodiversity, the University of Hong Kong.
- * Wong, L.C., Lam, V.W.Y. and Ades, G.W.J. Eds. 2009. **Ecology of the Birds of Hong Kong**. Kadoorie Farm and Botanic Garden, Hong Kong.
- * WWF-HK. 2006. **Management Plan for Mai Po Marshes Wildlife Education Centre and Nature Reserve 2006-2010**. The World Wide Fund for Nature Hong Kong, Hong Kong.
- * WWF-HK & HKBRG, 2008. **Study into the Avian Value of Different Aged Stands of *Phragmites Australis* at Mai Po Nature Reserve**. Joint report by the World Wide Fund For Nature Hong Kong and the Hong Kong Bird Ringing Group.

Appendix Ia: Historical Records of Barn Swallow roosting in the MPNR reedbeds.

Date	No. of Roosting Birds	Comments	Reference/Observer
08-Oct-04	800	Roost location unknown.	HKBWS, 2009
12-Oct-04	1,800	Roost location unknown (included Red-rumped Swallow)	HKBWS, 2009
29-Oct-05	195	Roost at <i>Gei wai</i> #8b reedbed.	Bena Smith
09-Nov-05	105	Roost at <i>Gei wai</i> #10 reedbed.	Katherine Leung
19-Oct-06	310	Roost at Pond #24 reedbed.	Bena Smith
31-Oct-06	500	Roost at <i>Gei wai</i> #7 reedbed.	John Allcock

Appendix Ib: Historical Records of Yellow Wagtail roosting in the MPNR reedbeds.

Date	No. of Roosting Birds	Comments	Reference/Observer
30-Jan-88	1,000	Roost location unknown.	Carey, <i>et al.</i> 2001
12-Feb-89	1,000	Roost location unknown.	Carey, <i>et al.</i> 2001
1995-97	2,733	Roosting at <i>Gei wai</i> #3 reedbed.	Lee, 1997
1995-97	Unknown	Roosting at <i>Gei wai</i> #8b reedbed.	Lee, 1997
1995-97	Unknown	Roosting at <i>Gei wai</i> #14 reedbed.	Lee, 1997
03-Apr-98	500	Leaving <i>Gei wai</i> #8b reedbed at dawn.	HKBWS, 2002
03-May-99	3,500	Roost location unknown.	Paul Leader
04-May-99	3,840	Roost location unknown. Record highest count for Hong Kong.	Paul Leader
21-Feb-02	500	Roost location unknown.	HKBWS, 2007
23-Nov-02	3,000	Roosting at <i>Gei wai</i> #8b reedbed.	HKBWS, 2007
08-Oct-04	600	Roost location unknown.	HKBWS, 2009
12-Oct-04	500	Roost location unknown.	HKBWS, 2009
25-Oct-05	536	Roosting at eastern side of <i>Gei wai</i> #14 reedbed.	Bena Smith and Katherine Leung
03-Nov-05	485	Roosting at eastern side of <i>Gei wai</i> #14 reedbed.	Katherine Leung
19-Oct-05	303	Roosting at <i>Gei wai</i> #8b reedbed.	Katherine Leung
12-Nov-05	1,500	Leaving <i>Gei wai</i> #8b reedbed at dawn.	Paul Leader
11-Nov-06	920	Leaving <i>Gei wai</i> #8b reedbed at dawn.	Bena Smith

Appendix II: Summary on Barn Swallow Roosting Count 2007.

Count Date	No. of Roosting Birds	Final Roost Location/Comments
4-Jan-07	0	None seen inside the Reserve.
18-Jan-07	0	None seen inside the Reserve.
6-Feb-07	203	Pond #24a reed stand. Birds circulated above Pond #24a and roosted at 18:40.
21-Feb-07	280	Pond #24a reedbed. Birds circulated around Pond #24, Lut Chau and Fairview Park and roosted at 18:40.
6-Mar-07	385	Pond #24a reed stand. Birds circulated around Pond #24 and Lut Chau and roosted at 18:26.
19-Mar-07	16	Pond #24a reed stand. Flock of 304 birds observed flying to Lut Chau between 18:30-18:45, these birds roosted outside MPNR. 16 roosted at 18:50.
3-Apr-07	14	Pond #24a reed stand. Single flock of 7 birds observed flying to Lut Chau between 18:15-18:40, these birds roosting outside MPNR. Very windy with light shower.
17-Apr-07	0	None seen inside the Reserve. Flock of 93 birds observed flying to Lut Chau between 18:20-18:45.
4-May-07	0	None seen inside the Reserve. Flock of 74 birds observed flying to Lut Chau between 18:20-19:00.
22-May-07	0	None seen inside the Reserve. Flock of 170 birds observed flying around MPNR.
4-Jun-07	0	None seen inside the Reserve. Flock of 120 birds observed feeding along the seaward end of <i>Gei wai</i> between #8b and #23 between 18:34-19:21.
18-Jun-07	0	None seen inside the Reserve. Over 600 birds feeding around MPNR between 18:39-19:23. Most flocks disappeared over the FCA mangroves and towards Lut Chau.
11-Jul-07	300	<i>Gei wai</i> #8b reed stand near FCA road. Single flock of over 500 birds feeding around MPNR which flew off towards Fairview Park direction.
20-Jul-07	2,500	<i>Gei wai</i> #3 (eastern side) reed stand. Birds circulated around <i>Gei wai</i> #3, roosting started at 19:25, all roosted by 19:35.
2-Aug-07	0	None seen inside the Reserve. Single flock of 60 birds observed flying Northward away from MPNR. A big flock observed flying North near Tam Kon Chau egrettry.
14-Aug-07	0	Final roosting location undetermined. Single flock of over 460 birds observed circulating above <i>Gei wai</i> #3 at 19:00.
3-Sep-07	433	<i>Gei wai</i> #8b reed stand near FCA road. Birds circulated around <i>Gei wai</i> #8b and #10 before roosting, roosted at 19:00.
18-Sep-07	65	<i>Gei wai</i> #8b reed stand near FCA road. Birds circulated around <i>Gei wai</i> #8b and #10 before roosting, roosted at 18:45.
3-Oct-07	119	<i>Gei wai</i> #8 reed stand near FCA road. Birds circulated around <i>Gei wai</i> #8b and #10 before roosting, roosted at 18:28.
17-Oct-07	520	<i>Gei wai</i> #10 reed stand near FCA road. Birds circulated above <i>Gei wai</i> #8b and #10, roosted at 18:22.
6-Nov-07	430	<i>Gei wai</i> #8b reed stand near FCA road. Birds circulated around <i>Gei wai</i> #8b before roosting, roosted at 18:04.
19-Nov-07	0	Final roost location undetermined. Single flock of 23 birds observed flying north.
3-Dec-07	0	Final roost location undetermined. Single flock of 160 birds observed circulating very high above northern MPNR at 17:50.
18-Dec-07	110	<i>Gei wai</i> #8b reed stand near FCA road. Birds circulated around <i>Gei wai</i> #8b and #10 before roosting, roosted at 18:05.
*15-Jan-07	55	<i>Gei wai</i> #23 or Pond #24a-g. Roosted at 18:21.
*20-Sep-07	246	<i>Gei wai</i> #10. Roosted at 18:40.
*12-Oct-07	420	<i>Gei wai</i> #10 reed stand near FCA road. Birds circulated around <i>Gei wai</i> #8b and #10 before roosting, roosted at 18:28.
*20-Nov-07	0	Final roost location undetermined. Single flock of 210 birds observed circulating above <i>Gei wai</i> #8b between 17:50-18:00.
*4-Dec-07	0	Final roost location undetermined. Single flock of 60 birds observed flying to northern MPNR at 17:45.

* - Casual/Additional Observations

Appendix IIIa: Summary on Yellow Wagtail Roosting Count 2007 – Reed stand at *Gei wai* #8b.

<i>Gei wai</i> #8b		
Count Date	No. of Roosting Birds	Comments
06-Jan-07	0	None observed roosting.
19-Jan-07	0	None observed roosting.
06-Feb-07	33	
22-Feb-07	0	None observed roosting. Flock of 22 birds seen flying northward over the reed stand.
05-Mar-07	0	None observed roosting.
20-Mar-07	0	None observed roosting. Flock of 7 birds seen flying northward over the reed stand.
10-Apr-07	305	
20-Apr-07	2	1 other bird flew over. <i>Gei wai</i> 70% drained.
03-May-07	282	Some birds observed flying towards southern MP before roosting. <i>Gei wai</i> 70% drained.
17-May-07	0	None observed roosting. Flock of 52 birds observed flying to southern MP. 16 flew north and left MPNR.
05-Sep-07	0	None observed roosting. Flock of 186 birds flew over, all appeared to be migrating birds flying South.
20-Sep-07	0	None observed roosting.
02-Oct-07	16	13 other birds flew over in north-west direction and 4 flew south.
15-Oct-07	323	
06-Nov-07	418	
20-Nov-07	612	
03-Dec-07	370	
18-Dec-07	81	2 other birds observed flying over the reed stand.
*10-Oct-07	23	Birds observed leaving roost at dawn.
*13-Oct-07	>80	Birds observed leaving roost at dawn.
*19-Oct-07	666	Birds observed leaving roost at dawn.
*28-Oct-07	>800	Birds observed leaving roost at dawn.

* - Casual/Additional Observations

Appendix IIIb: Summary on Yellow Wagtail Roosting Count 2007 – Reed stand at *Gei wai* #14.

<i>Gei wai</i> #14		
Count Date	No. of Roosting Birds	Comments
05-Jan-07	0	None observed roosting.
23-Jan-07	0	None observed roosting.
13-Feb-07	0	None observed roosting.
21-Feb-07	0	None observed roosting.
02-Mar-07	0	None observed roosting. 3 birds flew over towards northern MP.
20-Mar-07	0	None observed roosting. 34 birds flew over towards northern MP.
04-Apr-07	0	None observed roosting.
19-Apr-07	0	None observed roosting. 7 birds flew over towards northern MP.
04-May-07	0	None observed roosting. At least 40 birds observed flying towards northern MP.
17-May-07	0	None observed roosting. 44 birds flew over towards southern MP.
03-Sep-07	0	None observed roosting. One bird flew over towards northern MP.
20-Sep-07	4	A flock of 32 birds flew towards northern MP.
02-Oct-07	0	None observed roosting. 11 birds flew over towards northern MP.
15-Oct-07	108	Other flocks of 239 birds flew over towards northern MP. Most small flocks gathered (pre-roost) on Island 3 in <i>Gei wai</i> #16/17 and circulated above <i>Gei wai</i> #14 before heading north.
08-Nov-07	3	Other flocks totalling 211 birds flew over towards northern MP.
20-Nov-07	4	Other flocks totalling 258 birds flew over towards northern MP.
03-Dec-07	0	None observed roosting. 93 birds flew over towards northern MP.
19-Dec-07	4	At least 19 birds flew over towards northern MP. Poor light condition.