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**SHEUNG SHUI TO LOK MA CHAU SPUR LINE**

**Environmental Committee Meeting**

Minutes of Meeting No. 28 held at 10:30am

on Friday, 16<sup>th</sup> January 2015,

at Room 15A, 15/F, MTR Headquarters Building, Telford Plaza, Kowloon Bay

<b>Present:</b>		
Mr. Tobi Lau	WWF Hong Kong	Member (NGO)
Ms. Karen Barretto	Friends of the Earth (Hong Kong)	Member (NGO)
Mr. Michael Kilburn	The Hong Kong Bird Watching Society	Member (NGO)
Dr. Ng Cho-nam	The University of Hong Kong	Member (NGO)
Ms. Kenny Yiu	Manager-Environmental Engineering	Member (MTR)
Mr. Chan Wai Keung	Maintenance Manager - Civil	Member (MTR)
Mr. Peter Choi	Environmental Engineer	Member (MTR)
Dr. Michael Leven	Ecological Consultant	Member (consultant)
Ms. Elizabeth Wu	Ecological Consultant	Member (consultant)
<b>Absent with apology:</b>		
Mr. Bena Smith	WWF Hong Kong	Member (NGO)
Dr. Kam Chan	Environmental Engineering Manager	Member (MTR)

<b>Attachments</b>	
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Annex A	Presentation Material of EC Meeting No. 28
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<u>Item/Description</u>	<u>Action By</u>
1. Welcomed Members to the EC Meeting No. 28.	
<p><b>Item 1 - <u>Confirmation of minutes of Meeting No. 27</u></b></p> <p>2. There were no comments on the minutes of Meeting No. 27 and the minutes were confirmed.</p>	Noted
<p><b>Item 2 - <u>Ecological Enhancement Works and Monitoring - an Update on Management Works and Look Ahead</u></b></p> <p>3. <i>Dr. Leven</i> reported on the ecological monitoring and management works undertaken between January and December 2014 at the LMC EEA (detailed in <b>Annex A</b>). It was noted that:</p> <ul style="list-style-type: none"> <li>• The erection of permanent site boundary fence around the whole LMC EEA and the dog-excluding fence (with mammal underpasses) at Compartment A are completed. There were photos taken by the installed auto-triggered cameras showing that Eurasian Otter and Leopard Cat were using the mammal underpasses. The underpasses will be monitored to see if they will be used by puppies, which may be small enough to pass through. <i>A Member (NGO)</i> enquired if the mammals went out of the LMC EEA. <i>A Member (consultant)</i> reported that the mammals also went out of the site (with the support of the animation shown in the presentation material).</li> <li>• Pond 5 was reprofiled due to the erosion of pond bund. <i>A Member (NGO)</i> enquired if the pond was made deeper. <i>A Member (consultant)</i> reported that the pond was reprofiled to create gentle shallow edge.</li> <li>• Ponds 3, 4, 6 and 7 were drained between October and December 2014. As Pond 8 will be reprofiled in early wet season, it will be emptied by the end of January 2015.</li> <li>• Supplementary fish stocking was conducted in the summer 2014 to prepare for a stable supply of small fish in case there is lack of fish around the Chinese New Year 2015.</li> <li>• Winter fish stocking was conducted during October to December 2014, and should be noted that there may be lack of fish during Chinese New Year 2015.</li> <li>• Large fish was taken out from Pond 8 in November 2014 and</li> </ul>	<p>Noted</p> <p>Noted</p> <p>Noted</p> <p>Noted</p> <p>Noted</p>

<u>Item/Description</u>	<u>Action By</u>
<p>January 2015 respectively; fish species harvested including Silver Carp, Bighead Carp, Grass Carp, Mud Carp and Tilapia. These large fish were donated to Food Angel. The second harvest was postponed to January as there was dead duck found in the Pond. <u>A Member (NGO)</u> enquired if the dead duck was suffering from botulism. <u>A Member (consultant)</u> reported that AFCD collected the dead duck and only tested for avian flu; thus, the duck was confirmed to be not suffered from avian flu. <u>A Member (NGO)</u> enquired if there was any monitoring on the sick/ dead birds and if they were eaten. <u>A Member (consultant)</u> confirmed that there was continuous monitoring on sick/ dead birds within the site and also signs of birds being eaten within LMC EEA (e.g. feathers sighted on the pond bund). However, it is difficult to tell if the sick/ dead birds were eaten or if the being-eaten individuals were sick.</p> <ul style="list-style-type: none"> <li>• Routine vegetation management works were carried out in this year; the Wetland Maintenance Contractor was performing well in the vegetation management works.</li> <li>• Pest management including Red Imported Fire Ant (RIFA) nests treatment continued in the reporting period. There were over 1,000 nests treated in 2013 and 2014, and treatment will also be carried out in the following week – before the wet season commenced. <u>A Member (NGO)</u> enquired if the number of nests treated as shown in the presentation materials were the number of new nests. <u>A Member (consultant)</u> reported that they are the number of new nests as it is difficult to kill the whole population of RIFA. <u>A Member (NGO)</u> suggested AEC Ltd. to contact a lecturer in The University of Hong Kong, who is studying the invasive ants in the Hong Kong Airport. <u>A Member (consultant)</u> welcomed to this idea and expressed thanks to A Member (NGO) for introducing AEC Ltd. to the lecturer for more details on RIFA.</li> <li>• <u>A Member (consultant)</u> reported that the apple snail control was carried out by hand-picking, which will be carried out continuously in the coming monitoring period.</li> <li>• <u>A Member (consultant)</u> reported there were nine dogs trapped in 2014 and hoped that the dog-excluding fence in the Compartment A will help in excluding dogs. <u>A Member (consultant)</u> also reported there will be 50 more nest boxes to be installed within the LMC EEA in the coming breeding</li> </ul>	<p></p> <p>Noted</p> <p>Noted</p> <p>Noted</p> <p>Noted</p>

<u>Item/Description</u>	<u>Action By</u>
<p>season and half of those will have larger diameter to attract White-cheeked Starling and Red-billed Starling. In response to a suggestion by <u>A Member (NGO)</u>, <u>A Member (consultant)</u> agreed that deployment of larger boxes, for example to attract owls, would be worth considering in the future. It was reported the tree monitoring was carried out and the results will be used to inform the tree management works (such as tree management for safety and preventing too much of the site becoming overgrown due to succession). <u>A Member (NGO)</u> enquired if the tree monitoring identified the planted and/or self-sown individuals. <u>A Member (consultant)</u> reported that the monitoring recorded the trees in tree and seedling groups, and identified individuals or groups to species level.</p> <ul style="list-style-type: none"> <li>• <u>A Member (consultant)</u> reported the approval of the latest HCMP, in which the target species were updated. He also noted that the dropped bird target species will still be counted though this is no longer required. <u>A Member (NGO)</u> enquired if the updated target species list was sent to the EPD only and if ACE will also be notified. <u>A Member (MTR)</u> reported this was only submitted to the EPD, but AFCD and ACE were consulted previously and accepted the changes in principle.</li> <li>• <u>A Member (consultant)</u> reported on the density of the 26 target bird species in the past five years at LMC EEA and in the control areas. He noted that the performance of Chinese Pond Heron had improved in the past three years, and Great Egret (which is a fish stocking and pond drain-down sensitive species) had improved from last year (which had problems in the fish supply). <u>A Member (NGO)</u> enquired if the improvement in Great Egret was related to the fish stocking. <u>A Member (consultant)</u> suggested that this was likely, but the records in the remaining winter period would be reviewed and the results would be presented in the next EC meeting. <u>A Member (NGO)</u> enquired as to the accuracy of the bird counts in the MPST Control Area now that there is no tower count, and also enquired if disturbance to the birds would affect the transect count. <u>A Member (consultant)</u> reported that disturbance caused by the counter was not really an issue as it was easy enough to avoid double-counting disturbed birds. However, the transect count was a snapshot of the birds at one time which meant that the counts might fluctuate more than the tower counts which were replicate counts of non-disturbed</li> </ul>	<p>Noted</p> <p>Noted</p>

<u>Item/Description</u>	<u>Action By</u>
<p>birds. However, averaging over a 12-month period would help to even out these factors.</p> <ul style="list-style-type: none"> <li>• <u>A Member (consultant)</u> reported on the performance of the new bird target species, which do not have a required numerical target. He reported that Yellow-breasted Bunting was not recorded in the LMC EEA in 2014; however initial results for other species showed densities significantly higher than in the Control Areas. He confirmed that these species will be monitored continuously in the same way as for the numerical targets. <u>A Member (NGO)</u> enquired if there was any brackish water rice planted in the LMC EEA. <u>A Member (consultant)</u> reported that there was no brackish water in the LMC EEA, hence there is no such rice planted. Some rice planting had been tried in previous years, but munias had eaten all the rice before the arrival of bunting species. He understood that HKBWS had found that it was necessary to have several fields under rice before attraction of buntings was significant; this was not really feasible at LMC EEA.</li> </ul>	Noted
<ul style="list-style-type: none"> <li>• <u>A Member (consultant)</u> reported on the winter roost count results at LMC EEA. <ul style="list-style-type: none"> <li>a. <u>A Member (consultant)</u> noted that LMC EEA became the third major Great Cormorant roost in the Deep Day area, in addition to the Mai Po Nature Reserve and Nam Sang Wai. <u>A Member (NGO)</u> enquired as to the drop of the Great Cormorant roosts from November to December. <u>A Member (consultant)</u> reported that, based on the results of the Great Cormorant roost counts conducted in the three sites, there is a tendency for the Great Cormorant roost at Nam Sang Wai to be occupied first and for birds to move to Mai Po Nature Reserve later in the season. He also reported that Great Cormorants seem to use sites where there are Great Cormorants roosting already and are not loyal to the roosting sites. However, as monitoring of the LMC roost had just commenced it was perhaps too early to draw firm conclusions.</li> </ul> </li> </ul>	Noted
<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>b. <u>A Member (NGO)</u> enquired the location of the winter roosts. <u>A Member (consultant)</u> reported that the roosts were located at the eastern side of Pond 2 and within</li> </ul> </li> </ul>	Noted

<u>Item/Description</u>	<u>Action By</u>
<p>the fenced area.</p> <p>c. <u>A Member (consultant)</u> reported there were a few starling roosts on site in November and December 2014, but the reason for this is not clear. <u>A Member (NGO)</u> enquired the species of the starlings recorded. <u>A Member (consultant)</u> reported that most were White-cheeked and Red-billed Starlings.</p> <ul style="list-style-type: none"> <li>• <u>A Member (consultant)</u> reported on the installation of egret decoys at LMC EEA.</li> <li>• <u>A Member (consultant)</u> reported the results of the monitoring of mammals by the installed cameras. There were more photos captured with mammals but this may be related to cameras having been moved to the fence to investigate if there is any effect from the fence on the mammal usage of the site. He further reported the number of photos recording Leopard Cat was increased; this may be because the fence erected in Compartment A and/or there is a healthy population of this species around the site. He reported that, if there are resources, AEC will review the photos taken in detail to investigate the number of individuals of this species recorded in the LMC EEA.</li> </ul> <p>a. <u>A Member (NGO)</u> enquired the low number of occurrence of Small Asian Mongoose in LMC EEA. <u>A Member (consultant)</u> reported that this species occurred more often in Mai Po Nature Reserve than in LMC EEA, based on personal observation.</p> <p>b. <u>A Member (NGO)</u> suggested that the underpasses would provide an opportunity to trap mammals and tag for detailed study. <u>A Member (consultant)</u> reported that this would be interesting but would be costly (both in equipment and time required). However, there will be small mammal trap monitoring to be conducted in the coming summer.</p> <p>c. <u>A Member (NGO)</u> enquired as to whether one photo was of a Domestic Cat rather than a Leopard Cat. <u>A Member (consultant)</u> reported that he would check this with the surveyors. Post Meeting Note: check confirmed that this photo was indeed of a Domestic Cat; all cat photographs are now being checked</p>	<p>Noted</p> <p>Noted</p> <p>Noted</p> <p>Noted</p> <p>Noted</p> <p>AEC Ltd.</p> <p>Noted</p>

<u>Item/Description</u>	<u>Action By</u>
<p style="text-align: center;">thoroughly,</p> <ul style="list-style-type: none"> <li>• <u>A Member (consultant)</u> reported the number of reptile species recorded in 2014 was the lowest recorded, but in view of the small number of records (which was typical) this is not thought to indicate any particular trend. In discussion, it was agreed that fish pond areas in Hong Kong tend to have much lower numbers of species and individuals than farmland and village edge areas.</li> <li>• <u>A Member (consultant)</u> reported the amphibian findings in 2014, which the number of species recorded was typical, but with a high number of Günther's Frog and low number of Ornate Pigmy Frog recorded. <u>A Member (NGO)</u> enquired if the low number of findings of herpetofauna was related to the weather (e.g. rainfall). <u>A Member (consultant)</u> agreed to review the data together with the weather conditions and will present the findings in the next EC meeting.</li> <li>• <u>A Member (consultant)</u> reported the dragonfly findings in 2014, no new species were recorded and the number of species and species diversity is rather stable.</li> <li>• <u>A Member (consultant)</u> reported on the forthcoming major management works to be conducted in the LMC EEA. Ponds 8 and 11 required reprofiling, there is an urgent need for the former due to the bund stability (but commencement will depend on the suitable weather and equipment in the coming wet season) but not so urgent for the latter as no safety concern was raised (but is for the enhancement of microhabitat for birds).</li> <li>• <u>A Member (NGO)</u> enquired if the increase in people within the LMC station had created disturbance to the wildlife within the LMC EEA. <u>A Member (consultant)</u> reported there is little disturbance generated from the operation of the Station. He noted that the EIA report identified disturbance as being of much greater significance during construction, with disturbance being rather low during the operational phase. He also reported that the Eastern Imperial Eagle, which was predicted to be impacted significantly during the construction phase, was now found roosting on the isolated trees within the site and found regularly above Ponds 16 – 20. He suggested</li> </ul>	<p>AEC Ltd.</p> <p>Noted</p> <p>Noted</p> <p>Noted</p>


<b><u>Item/Description</u></b>	<b><u>Action By</u></b>
<p>that the Eastern Imperial Eagle may use the up-drift created by the Station and the design of the Station means that people within the Station are difficult see from the outside; it is probably human activity rather than the building itself which is the main source of disturbance. <u>A Member (NGO)</u> agreed that the design of the Station is good in minimizing the disturbance to the birds.</p>	
<p><b>Item 3 - <u>Any Other Business</u></b></p> <p>4. <u>A Member (NGO)</u> was happy that the issues of fish supply and wetland maintenance contractor was resolved.</p> <p>5. <u>A Member (NGO)</u> suggested to have a site visit to the LMC EEA to check the situation after the erection of boundary fence. <u>A Member (NGO)</u> and <u>A Member (consultant)</u> suggested to have the site visit in the coming autumn. <u>A Member (MTR)</u> confirmed that such site visit will be arranged.</p> <p>6. <u>A Member (MTR)</u> thanked the EC members for their valuable suggestions.</p>	<p>Noted</p> <p>MTR Corporation</p>
<p><b>Item 4 - <u>Date of Next Meeting</u></b></p> <p>7. The date of the next meeting is to be advised.</p>	<p>-</p>



# Lok Ma Chau Spur Line 28<sup>th</sup> Environmental Committee Meeting

Report on Ecological Monitoring and Management, and Works Programme  
January – December 2014

16<sup>th</sup> January 2015



ecology  
arboreal culture  
landscape

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### Overview of Management Works in 2014

**Boundary Fence Erection**

- Erection of boundary fence around the whole EEA was completed - Dog-excluding underpass at Compartment A was completed in November 2014.

**Demolition of Bird Tower at Mai Po San Tsuen**

- Bird tower at Mai Po San Tsuen was demolished in December 2014.





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### Overview of Management Works in 2014 – Usage of the Mammal Underpass

Eurasian Otter (20<sup>th</sup> November 2014, Pond 2a)



Camera Name 32 071n 645  
11-20-2014 02:13:22





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### Overview of Management Works in 2014 – Usage of the Mammal Underpass

Eurasian Otter (4<sup>th</sup> December 2014, Pond 2a & 2b)



2014-12-04 01:20:29 AM 11 17.2





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### Overview of Management Works in 2014 – Usage of the Mammal Underpass

Eurasian Otter (6<sup>th</sup> December 2014, Pond 2a & 2b)



2014-12-06 22:49:52 AM 11 17.3





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### Overview of Management Works in 2014 – Usage of the Mammal Underpass

Leopard Cat (28<sup>th</sup> November 2014, Pond 2a)



Camera Name 26 911n 755  
11-28-2014 19:24:04



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**Overview of Management Works in 2014**

Pond Reprofilng

- Reprofilng of Pond 5 (during August to October)

During Reprofilng



After Reprofilng



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**Overview of Management Works in 2014**

Water Level Adjustment

- Ponds 3, 4, 6 and 7 were drained between October to December;
- Pond 5 was refilled with water soon after the reprofilng was finished;
- Pond 8b was drained in November to provide foraging area and prepare for the bund maintenance work in the coming wet season.






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**Overview of Management Works in 2014**

Supplementary Fish Stocking

- In order to have a stable supply of small size trash fish in the dry season (especially during January to March), supplementary stocking of small sized Tilapia was conducted from July to September 2014.






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**Overview of Management Works in 2014**

Winter Fish Stocking

- Fish stocked during October to December, the mean length was generally < 12cm.





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**Overview of Management Works in 2014**

Big Fish in Ponds


- Large fish was found in Pond 8, the harvested fish was donated to Food Angel
- Harvesting in Pond 8b was conducted on 13<sup>th</sup> November, including Silver Carp, Tilapia, Grass Carp;
- Dead duck was found in Pond 8a on 7<sup>th</sup> December, the harvesting in this pond was postponed to avoid any potential infection of the fishermen and the consumers;
- Harvesting in Pond 8a is scheduled on 9<sup>th</sup> January 2015 and this slide will be updated on this harvesting event in the final version of the powerpoint.



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**Overview of Management Works in 2014**

Vegetation Management

- Routine pond bund grass cutting and weeding of climbers;
- Routine removal of unwanted species (e.g. *Phragmites*, *Typha angustifolia*, *Ipomoea aquatica*, Parrot Feather etc.);
- Removal of sedges in Pond 19.




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**Overview of Management Works – Red Fire Ant Nest Treatment (since 2008)**

**Pest Management (Red Fire Ant)**

- 1,211 Red Fire Ant nests were treated with the approved pesticide in 2014;
- Red Fire Ant nests treatment using the approved pesticide will be continued.

Year	2008	2009	2010	2011	2012	2013	2014
No. of nests treated	170	164	(not available)	315	790	1760	1211


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**Overview of Management Works in 2014**

**Pest Management (Apple Snail – hand picking)**

- Apple Snails removal in Compartment C is conducted manually on a weekly basis.
- Apple Snails removed in the second half of 2014:

Pond No.	15	16	17	19	21	Total
Jun	-	-	5	45	33	83
Jul	8	-	-	13	29	50
Aug	5	-	5	11	6	27
Sep	10	-	-	19	3	32
Oct	2	40	-	3	2	47
Nov	3	-	-	10	4	17
Dec	1	-	-	4	-	5
<b>Total</b>	<b>29</b>	<b>40</b>	<b>10</b>	<b>105</b>	<b>77</b>	<b>261</b>

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**Overview of Management Works in 2014**

**Other Site Management**

- Dog trapping – 9 dogs was trapped and collected in 2014;
- Nest boxes provision – 69 available on site which will be checked and cleaned at the end of the dry season, 50 additional nest boxes will be deployed in the coming breeding season;
- Tree monitoring – carried out in November, and the results will inform the tree management works in the coming wet season.




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**Change in Targets Species of LMC EEA**


**Approval of HCMP Issue 16 (AEC, 2014)**

- The revised HCMP was approved in August 2014;
- New monitoring and management approach of the EEA was adopted since October 2014;
- Application of variation of Environmental Permit was submitted in December 2014 and is pending the approval of the EPD;
- Updated wildlife targets include:
  - 2 mammal species (Eurasian Otter and Leopard Cat);
  - 30 bird species (refer to the next two slides);
  - 2 reptile species (Burmese Python and Chinese Soft-shelled Turtle);
  - 1 amphibian species (Chinese Bullfrog);
  - Dragonfly diversity and abundance.

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**Bird Targets Performance in the Past 5 Years**

A table to show the bird density (of all target species, including the newly added target and dropped target) between Jan – Dec of Years 2010 to 2014 – this will be provided in the final version of the powerpoint.


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**Winter Roost Count in 2014**

- Winter roost survey was conducted in January to March, November and December in 2014;
- Winter roost is mainly located at Pond 2, including the island and the northern bund.


Bird Taxa	Jan	Feb	Mar	Nov	Dec
Ardeids*	285	378	540	140	467
Black-faced Spoonbill	-	-	8	-	4
Starlings	500	1,550	700	-	45
Great Cormorant	35	300	102	1,740	490
<b>Total</b>	<b>820</b>	<b>2,228</b>	<b>1,350</b>	<b>1,880</b>	<b>1,006</b>

\* Mainly Great Egret, Little Egret, Eastern Cattle Egret and Chinese Pond Heron

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### Egret Decoys Installation in 2014

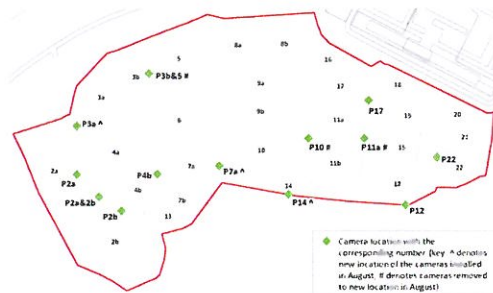
- 30 decoys installed at Ponds 2 and 4 in January and February;
- All decoys were taken down in July to avoid the peak period of typhoon;
- 30 decoys re-installed on island of Pond 2 in December 2014.



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### Mammal Findings in LMC EEA in 2014

- 10 infra-red cameras in use at the EEA since January 2014.



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### Mammal Findings in LMC EEA in 2014

- Photos of Eurasian Otter were captured in January, November and December 2014 at Pond 2a and between Ponds 2a and 2b;
- Cameras captured mostly 'brown rat', followed by Leopard Cat, Small Indian Civet and Small Asian Mongoose.

Species	Number of Dates Recorded													Total
	P2a	P2a & 2b	P2b	P3a	P3b & 5	P4b	P7a	P10	P11a	P12	P14	P17	P22	
'brown rat'	6	13	6		19	9		23		2		5	13	96
Eurasian Otter	1	3												4
Small Indian Civet	4	1	3			4								14
Small Asian Mongoose		5	4							1		3		13
Leopard Cat	24	6	14	2	1	4	2			13	0	8	3	83

Key:  
 Red - new camera locations (since August 2014)  
 Blue - old camera locations (removed in August 2014)

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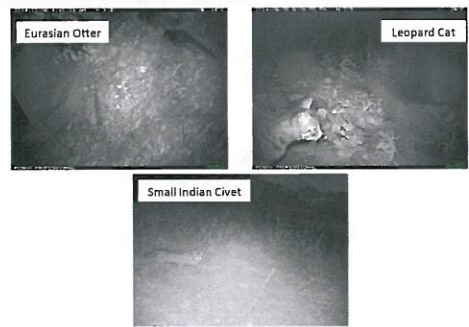
### Mammal Targets Recorded since 2006

	2006	2007	2008	2009	2010	2011	2012	2013	2014
<b>Eurasian Otter <i>Lutra lutra</i></b>									
Maximum Count	1	1	2	1	3*	0	1	1	2
No. of Records <sup>1</sup>	2	2	2	1	2	0	1	13*	5*
<b>Leopard Cat <i>Prionailurus bengalensis</i></b>									
No. of Records <sup>1</sup>	2	14	5	9	20	12	1	11	83

Note:  
 1. In terms of the number of dates recorded by the installed cameras multiplied by the number of independent sightings  
 Key:  
 \* Up to 3 individuals recorded between Ponds 1 and 2 by AFCD  
 † Including one dead individual found at LMC EEA  
 ‡ Including direct observation of one individual at Pond 12

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### Mammal Findings in LMC EEA in 2014



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### Reptile Findings since 2006

Species/ Maximum Number of Individuals recorded in all ponds in LMC EEA	2006	2007	2008	2009	2010	2011	2012	2013	2014	
Red-eared Slider <i>Trachemys scripta</i>	0	0	0	0	1	2	0	2	4	
Chinese Soft-shelled Turtle <i>Pelodiscus sinensis</i>	1	1	1	1	1	1	1	1	1	
Malayan Snail-eating Turtle <i>Malayemys macrocephala</i>	0	0	0	1	0	0	0	0	0	
Four-clawed Gecko <i>Calypto maculata</i>	0	0	0	0	1	0	0	0	0	
Chinese Gecko <i>Gekko chinensis</i>	0	0	0	1	0	0	0	0	0	
Bowring's Gecko <i>Hemidactylus bowringii</i>	4	3	1	2	2	2	1	5	1	
Chinese Skink <i>Eumeces chinensis</i>	0	0	1	0	0	0	0	1	0	
Reeves' Smooth Skink <i>Scincella reevesii</i>	0	0	0	0	1	0	0	0	0	
Common Blind Snake <i>Ramphosiphys baraminus</i>	0	0	0	0	1	0	0	0	0	
Burmese Python <i>Python bivittatus</i>	1	1	1	0	0	0	0	1	1	
Chinese Water Snake <i>Enhydra chinensis</i>	1	1	0	1	0	1	0	1	0	
Plumbeous Water Snake <i>Enhydra plumbina</i>	0	0	0	1	1	0	0	0	0	
Indo-Chinese Rat Snake <i>Ptyas korrae</i>	1	1	0	0	0	0	0	0	0	
Common Rat Snake <i>Ptyas mucroca</i>	1	1	1	0	1	1	1	1	1	
Buff-striped Keelback <i>Amphizema stolicum</i>	0	0	0	0	0	0	0	1	0	
Checkered Keelback <i>Xenocephalus piscator</i>	1	1	1	2	6	3	1	2	0	
Many-banded Krait <i>Bungarus multicinctus</i>	0	1	0	0	0	0	1	1	0	
Chinese Cobra <i>Naja atra</i>	0	0	0	0	1	0	1	1	0	
No. of species recorded	7	8	6	7	10	6	6	11	4	
Total no. of species recorded	78									

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### Reptile Targets Recorded since 2006

- Burmese Python recorded in 2014
  - 1 sighted at Pond 5 in March
  - 1 sighted twice in November at Pond 12
- Chinese Soft-shelled Turtle recorded in 2014
  - 1 sighted at Pond 2 in March
  - 1 sighted between Ponds 1 and 2 in June



Species/Maximum Count	2006	2007	2008	2009	2010	2011	2012	2013	2014
Burmese Python <i>Python bivittatus</i>	1	0	1	0	0	0	0	1	1
Chinese Soft-shelled Turtle <i>Pelodiscus sinensis</i>	1	1	1	1	1	1	1	1	1

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### Amphibian Findings since 2006

- 1 Chinese Bullfrog was recorded at Ponds 11 and 17 in June and July respectively.

Species/Maximum Total Number of Individuals recorded in all ponds in LMCEE	2006	2007	2008	2009	2010	2011	2012	2013	2014
Asian Common Toad <i>Bufo melanostictus</i>	0	3	3	1	2	4	3	1	2
Asiatic Painted Frog <i>Kaloula pulchra</i>	0	0	0	0	0	2	2	1	0
Butler's Pigmy Frog <i>Microhyla butleri</i>	0	0	0	1	2	0	0	2	0
Ornate Pigmy Frog <i>Microhyla ornata</i>	0	9	13	46	128	25	5	7	4
Marbled Pigmy Frog <i>Microhyla pulchra</i>	0	0	0	0	0	0	0	0	1
Paddy Frog <i>Fejervarya limnoccharis</i>	35	25	23	14	12	7	20	6	1
Chinese Bullfrog <i>Hoplobatrachus chinensis</i>	0	1	1	2	4	2	2	1	1
Gunther's Frog <i>Rana guntheri</i>	130	157	145	74	137	86	132	108	293
Two-striped Grass Frog <i>Rana tigrina</i>	0	0	0	0	2	1	1	1	0
Brown Tree Frog <i>Polydactylus megacephalus</i>	12	16	32	33	27	33	12	14	7
<b>No. of species recorded</b>	<b>3</b>	<b>6</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>8</b>	<b>8</b>	<b>9</b>	<b>7</b>

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### Dragonfly Findings since 2006

- The number of dragonfly species recorded is stable since 2006.

Dragonfly recorded as adults or larvae at LMCEE	2006	2007	2008	2009	2010	2011	2012	2013	2014
Orange-tailed Midgelet	Agriocnemis femina	✓	✓	✓	✓	✓	✓	✓	✓
Mandarin Midgelet	Agriocnemis pygmaea	✓	✓	✓	✓	✓	✓	✓	✓
Orange-tailed Scud	Crocopteryx curvicauda	✓	✓	✓	✓	✓	✓	✓	✓
Common Bluetail	Ischnura elegans	✓	✓	✓	✓	✓	✓	✓	✓
Blue Spine	Pseudagrion microcephalum	✓	✓	✓	✓	✓	✓	✓	✓
Pink-winged Emperor	Aesop gularis	✓	✓	✓	✓	✓	✓	✓	✓
Lesser Emperor	Aesop parthenope	✓	✓	✓	✓	✓	✓	✓	✓
Common Flangetail	Stenopogon pernix	✓	✓	✓	✓	✓	✓	✓	✓
Golden Flangetail	Stenopogon cinctus	✓	✓	✓	✓	✓	✓	✓	✓
Large Pond Cruiser	Ephydra curvicauda	✓	✓	✓	✓	✓	✓	✓	✓
Ashy Pintail	Aeschna parsonagei	✓	✓	✓	✓	✓	✓	✓	✓
Blue Dasher	Brachyagrion chalybea	✓	✓	✓	✓	✓	✓	✓	✓
Ashy Amberwing	Brachyagrion contortum	✓	✓	✓	✓	✓	✓	✓	✓
Crimson Darter	Crocotermis servillii	✓	✓	✓	✓	✓	✓	✓	✓
Blue Fritter	Diplacodes trilineata	✓	✓	✓	✓	✓	✓	✓	✓
Amber-winged Glider	Hydropsyche unicolor	✓	✓	✓	✓	✓	✓	✓	✓
Coastal Glider	Macromia ceras	✓	✓	✓	✓	✓	✓	✓	✓
Hazel Fritter	Neurothemis fusca	✓	✓	✓	✓	✓	✓	✓	✓
Pink Fritter	Neurothemis fulva	✓	✓	✓	✓	✓	✓	✓	✓
Common Red Skimmer	Oithetrum prasinum	✓	✓	✓	✓	✓	✓	✓	✓
Green Skimmer	Oithetrum rubra	✓	✓	✓	✓	✓	✓	✓	✓
Mandarin Glider	Pantala flavescens	✓	✓	✓	✓	✓	✓	✓	✓
Pink Skimmer	Pseudischnura zanzibar	✓	✓	✓	✓	✓	✓	✓	✓

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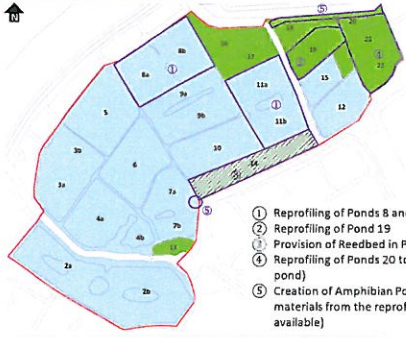
### Dragonfly Findings since 2006

- The number of dragonfly species recorded is stable since 2006.

Dragonfly recorded as adults or larvae at LMCEE	2006	2007	2008	2009	2010	2011	2012	2013	2014
Red Skimmer	Pseudischnura zanzibar	✓	✓	✓	✓	✓	✓	✓	✓
Blue Darter	Rhyothemis rubra	✓	✓	✓	✓	✓	✓	✓	✓
Sapphire Flutterer	Rhyothemis triangulata	✓	✓	✓	✓	✓	✓	✓	✓
Varegated Flutterer	Rhyothemis variegata	✓	✓	✓	✓	✓	✓	✓	✓
Evening Skimmer	Thalania thalana	✓	✓	✓	✓	✓	✓	✓	✓
Saddlebag Glider	Tramea virgata	✓	✓	✓	✓	✓	✓	✓	✓
Crimson Drovers	Trithemis aurora	✓	✓	✓	✓	✓	✓	✓	✓
Dancing Drovers	Trithemis jacobsoni	✓	✓	✓	✓	✓	✓	✓	✓
Scarlet Saker	Utricularia spicata	✓	✓	✓	✓	✓	✓	✓	✓
<b>Number of Species Recorded</b>	<b>22</b>	<b>23</b>	<b>23</b>	<b>22</b>	<b>24</b>	<b>23</b>	<b>25</b>	<b>22</b>	<b>23</b>
<b>Total Number of Species Recorded</b>	<b>32</b>								

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### Major Upcoming Events



- Reprofiling of Ponds 8 and 11
- Reprofiling of Pond 19
- Provision of Reedbed in Pond 14
- Reprofiling of Ponds 20 to 22 (to provide large lily pond)
- Creation of Amphibian Ponds (with surplus of materials from the reprofiling of Ponds 20 to 22 if available)

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### Major Upcoming Events



- Pond 14 - Provision of Reedbed**
  - Relocation of boardwalk from Pond 22;
  - Removal of non-reed vegetation;
  - Minor adjustment of the profile to sub-divide the pond and installation of overflow pipes
- Ponds 20, 21 and 22 - Reprofiling**
  - Transplanting lily from Ponds 20 and 21 to Pond 8 (after the reprofiling and associated water quality adjustment of Pond 8 are finished);
  - Clearance of lotus and removal of topsoil containing lotus/rhizomes in Ponds 20, 21 and probably 22;
  - Reprofiling will include excavating and lowering the existing bunds between these ponds, and creating more internal bunds and deep areas in cells;
  - These ponds will be submerged in shallow water after reprofiling, and monitored and controlled for any re-generation of reed and lotus;
  - After filling, lily from Pond 8 will be transplanted to these ponds
- Ponds 8 and 11 - Reprofiling**
  - Reprofiling due to bund instability and adjustment of internal bunds/islands
- Pond 19 - Reprofiling**
  - Reprofiling to create internal bunds and flat pond bottom with shallow pool
- Creation of Amphibian Ponds**
  - If there is surplus of soil after the reprofiling of ponds 20 to 22, amphibian ponds will be created.

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