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

**Environmental Committee**

Minutes of Meeting No. 21 held at 2:30pm  
On Wednesday, 13 July 2011,  
at Room 709, 8/F, MTR Headquarters Building.

| <b>Present:</b>             |                                     |                     |
|-----------------------------|-------------------------------------|---------------------|
| Mr. Bena Smith              | WWF Hong Kong                       | Member (NGO)        |
| Ms. Karen Barretto          | Friends of the Earth (Hong Kong)    | Member (NGO)        |
| Dr. Ng Cho-nam              | The University of Hong Kong         | Member (NGO)        |
| Mr. Michael Kilburn         | The Hong Kong Bird Watching Society | Member (NGO)        |
| Dr. Michael Leven           | Ecological Consultant               | Member (consultant) |
| Ms. Shirley Lam             | Ecological Consultant               | Member (consultant) |
| Dr. Chan Kam-foon           | Environmental Engineering Manager   | Member (MTR)        |
| Ms. Catherine Leung         | Manager - Environmental Engineering | Member (MTR)        |
| Mr. Peter Choi              | Environmental Engineer              | Member (MTR)        |
|                             |                                     |                     |
| <b>Absent with apology:</b> |                                     |                     |
|                             |                                     |                     |

|  | <u>Action By</u> |
|--|------------------|
| 1. Welcomed Members to the No. 21 EC meeting.  |                  |
| <b>Item 1 - <u>Confirmation of minutes of Meeting No. 20</u></b>   |                  |
| 2. There were no comments on the minutes of Meeting No. 20 and the minutes were confirmed.   | Noted            |
| <b>Item 2 - <u>Ecological Enhancement Works and Monitoring - an Update on Management Works and Look Ahead</u></b>  |                  |
| <p>3. <u>A Member (consultant)</u> reported on the ecological monitoring and management work undertaken between January and June 2011 at the LMC EEA (detailed in <b>Annex A</b>). It was noted that:</p> <ul style="list-style-type: none"> <li>• All management activities comprised routine management practices such as vegetation management, including grass cutting, weeding, and other micro-habitat management practices, pond drain down, fish stocking, and pest control.</li> <li>• It was noted that the LMC EEA successfully attracted several bird species of conservation importance to breed on-site, which included two bird target species, i.e. Greater Painted-snipe, Black-winged Stilt, and White-shouldered Starling. Two Pheasant-tailed Jacanas were recorded on-site as well, including one in full breeding plumage (all previous records of the species were of non-breeding plumaged birds). It was agreed that current effort in attracting the species to breed on-site is to be continued.</li> <li>• <u>A Member (NGO)</u> expressed concern over the possibility of 'by-catch' from the dog cage (such as Greater Coucal and mongoose). <u>A Member (consultant)</u> confirmed that no other faunal species had ever been caught in the cage. <u>A Member (NGO)</u> further commented that a comparison of the dogs trapped using the dog cage and by the dog team (outside of the trap) might be useful in evaluating the effectiveness of the dog cage at LMC. It was agreed that such data would be presented in the next EC meeting.</li> <li>• <u>A Member (NGO)</u> noted that the two leopard cats on the presentation material were obviously from two individuals. <u>A Member (consultant)</u> agreed the number of individual leopard cats should be identifiable from photo database and would report back to the EC in the next meeting.</li> <li>• <u>A Member (consultant)</u> reported that the <i>Nymphaea</i> pond was heavily infested by Apple Snail. Further actions to eliminate the pest from this pond would be undertaken in the early dry season, such as adjusting the pond pH to outside of the pH tolerance of Apple Snail. <u>A Member (NGO)</u> commented that <i>Nymphaea</i> pond was a valuable habitat and more drastic actions to resolve the Apple Snail issue would be justified.</li> <li>• Regarding control of <i>Nelumbo</i>, <u>A Member (consultant)</u> noted that some of the herbicides are found to be highly toxic to aquatic animals and would follow-up with Mai Po staff on the use of</li> </ul> | Noted            |

|  | <b>Action By</b> |
|--|------------------|
| <p>herbicide. <u>A Member (NGO)</u> noted that a system should be in place to ensure that the contractor would not just use anything available on-site.</p> <ul style="list-style-type: none"> <li>• <u>A Member (NGO)</u> noted that the tables showing the progression of the wetland performance in terms of attracting target species would be a very good reference material and should be written up.</li> <li>• <u>A Member (NGO)</u> suggested the use of small mammal traps to supplement the use of infra-red cameras for surveying site utilization by mammals.</li> <li>• <u>A Member (NGO)</u> noted the trend of general decline in Paddy Frogs. <u>A Member (consultant)</u> agreed that there seemed to be a decreasing trend and would look into possible causes with the completion of data collection from this year's wet season.</li> <li>• EC members expressed an interest in reviewing the data across years for reptile and mammal species. It was agreed that these would be presented in the next EC meeting.</li> <li>• A general concern on the dragonfly species target levels was raised. <u>A Member (consultant)</u> explained that there were no numerical target levels for faunal groups other than birds. Effectiveness of the site in providing habitats for these non-bird faunal groups was based largely on a comparison with the Control Areas qualitatively. The results of these will be presented in the 5-yearly Review of the HCMP, which is due this year. <u>A Member (NGO)</u> commented on the new dragonfly record for the LMC EEA (i.e. Orange-tailed Midget). The species is a common and widespread species in the Deep Bay Area; however, it is easily confusable with Wandering Midget. <u>A Member (consultant)</u> agreed to discuss species identification method with the dragonfly surveyor. <u>A Member (NGO)</u> also queried the absence of Evening Skimmer in the record this year. <u>A Member (consultant)</u> reported that the surveying time of dragonfly surveys generally cover late afternoon and the species should have been recorded if it was present on-site.</li> </ul> <p><i>[Post-meeting note: species identification has been confirmed. It is concluded that both midget species occur at LMC. Due to identification difficulty (primarily based on trapping of specimen and checking under the microscope), future records will be noted as Midget sp.]</i></p> <ul style="list-style-type: none"> <li>• <u>A Member (NGO)</u> noted that one of the bird target species, Japanese Yellow Bunting, was never observed on-site or at the Control Areas. Discussion on revision of the target list was raised. <u>A Member (consultant)</u> explained that such discussion was previously raised with the Government but there was a general reluctance to changing target list as this might provide a way out for developers who were not genuine in managing the site for target species. <u>A Member (NGO)</u> further suggested broadcasting <i>Brassica</i> seed to attract the species.</li> <li>• Concerning two of the target species for which meeting of target levels have been a constant issue (i.e. Little Egret and Chinese Pond Herons); <u>A Member (consultant)</u> proposed the use decoys and tape to attract them in establishing an egretty at the island between Pond 2. Members welcomed the proposal.</li> </ul> |                  |

|  | <b>Action By</b> |
|--|------------------|
| <p>4. <u>A Member (MTR)</u> reported that the funding of the site boundary fence was being reviewed. It was anticipated that the fence would be completed by the end of October 2011.</p> <p><i>[Post-meeting note: The funding for the fence has been approved; the proposal to construct a fence along the site boundary is being reviewed by the Lands Department. An approval from the Department is anticipated within the next few weeks. Due to the delay in the programme, the fence will be built in phases, with the first section being around Pond 2, which abuts adjoining fishponds. Other sections of the fence are expected to be completed in the next wet season.]</i></p> | Noted            |
| <p>5. Concerning the 5-yearly Review, it was agreed that the conservation value of the site should be highlighted in light of the findings from the past 5 years. Other items to be detailed include potential conflicts in the management measures for different target species and evaluation of management priorities in light of the conservation status of the species involved and the habitat value in a local and regional context.</p>  | Noted            |
| <p>6. Members expressed concern over their role in the 5-yearly Review process, and also concerned if the document will be made a public document. It was agreed that the reporting process (i.e. the Environmental Committee) of the LMC EEA was one of the best globally and the 5-yearly Review document would be a valuable resource for similar projects locally.</p>   | Noted            |
| <p>7. <u>A Member (NGO)</u> queried on the success of the animal crossing constructed near Tun Yue Road. <u>A Member (MTR)</u> noted that the animal crossing is the requirement for the LMC Road and Public Interchange EP which is responsible for Highways Department.</p>  | Noted            |
| <p>8. <u>A Member (NGO)</u> reported that a new Otter holt was built in Mai Po. The design differs that from the design at LMC EEA. The effectiveness of this new design will be evaluated at a later stage.</p>   | Noted            |
| <p>9. <u>A Member (NGO)</u> queries if there would be a 5-yearly Review of the Clean-up Reedbed. <u>A Member (MTR)</u> responded that no such review was required for the reedbed as it was a wastewater treatment facility.</p>   | Noted            |
| <p><b>Item 3 - <u>Any Other Business</u></b></p>   |                  |
| <p>10. None were identified.</p>   | Noted            |
| <p><b>Item 4 - <u>Date of Next Meeting</u></b></p>   |                  |
| <p>11. The date of the next meeting is to be advised.</p>  | Noted            |

**Lok Ma Chau Spur Line  
21<sup>st</sup> Environmental Committee Meeting  
13<sup>th</sup> July 2011**

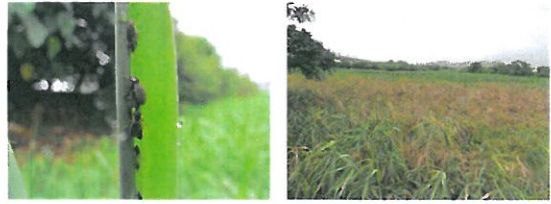
**Report on Ecological Monitoring  
& Management & Works Programme  
Jan – Jun 2011**

**Asia Ecological Consultants Limited**

**Overview of Management Works  
Jan - Jun 2011**

Vegetation Management

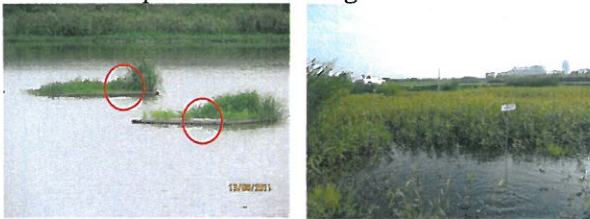
- Routine grass cutting
- Routine weeding
- Routine removal of unwanted species (*Phragmites*, *Typha*, *Mimosa*, *Mikania* etc.)
- Control of *Dimorphopte spinolae* at Pond 22 and 14



**Overview of Management Works  
Jan - Jun 2011**

Wildlife Management

- Periodic pond drain down (Jan – Mar)
- Provision of duck and starling Food (Jan – Mar)
- Trash fish stocking for winter food (May – Jun)
- Water level management for breeding Greater Painted-snipe and Black-winged Stilt



**Overview of Management Works  
Jan - Jun 2011**

General Site Management

- Golden Apple Snail removal at Ponds 14 – 22
- Fish stock management
- Water quality management
- Dog trapping
- Site safety management

**Nelumbo Control at Pond 21  
Presence of Pheasant-tailed Jacana**



**Scheduled Management Works for  
2011 Wet Season**

- Control of water quality
- Fish stocking for winter
- Oversee transplantation of trees from South Island Line
- Routine grass cutting and general vegetation management, including control of exotics
- Monitoring establishment of *Nymphaea*
- Monitoring success of herbicide trial and continuing control of *Nelumbo*
- Control & monitor of *Phragmites*
- Control of Apple Snails, Fire Ants and dog trapping
- Monitor the potential impact of the site boundary fence erection
- Additional planting/screen for viewing

**Scheduled Management Works for  
2011 Dry Season**

- Timely water level adjustment and fish stocking
- Provision of food for ducks and starlings
- Continue with routine grass cutting and general vegetation management
- Monitoring establishment of *Nymphaea* and control of *Nelumbo*
- Control & monitor of *Phragmites*
- Control of Apple Snails, Fire Ants and dog trapping
- Control of water quality
- Provision of an osprey platform between Ponds 4 & 7

**Operational Stage Monitoring**

- Required as off August 2007 when Spurline commenced operation (although operational stage monitoring started in January 2006)
- Wildlife targets extended to cover species of conservation importance detailed in the Environmental Impact Assessment:
  - Eurasian Otter
  - 26 bird species (c.f. Table 2.3 of the HCMP)
  - Burmese Python, Chinese Soft-shelled Turtle, Chinese Bullfrog
  - Dragonflies (increased numbers and species diversity)

# Monitoring of Target Waterbird Species: protocol

- Counts from towers at LMC at Mai Po San Tsuen (MPST) for larger waterbirds and raptors.
- Transect survey for smaller target species at LMC and MPST and for all species at San Tin.
- Methodology for calculation of targets reviewed in early 2007 (included in HCMP)



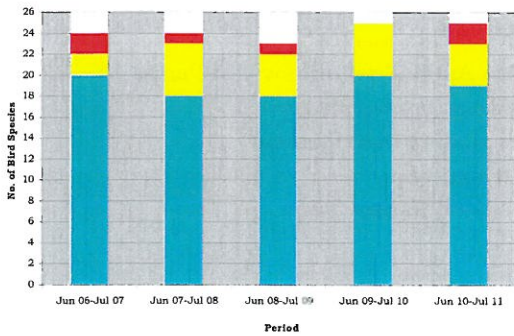
## 26 Bird Target Species (Up to Jun 2011)

| Year                         | Jul 2006- Jun 2007 |      |       | Jul 2007- Jun 2008 |      |       | Jul 2008- Jun 2009 |      |       | Jul 2009- Jun 2010 |      |       | Jul 2010- Jun 2011 |      |       |
|------------------------------|--------------------|------|-------|--------------------|------|-------|--------------------|------|-------|--------------------|------|-------|--------------------|------|-------|
|                              | LMC                | CA   | Ratio | LMC                | CA   | Ratio | LMC                | CA   | Ratio | LMC                | CA   | Ratio | LMC                | CA   | Ratio |
| Great Cormorant              | 4.28               | 2.24 | 1.91  | 3.57               | 2.98 | 1.20  | 3.27               | 2.23 | 1.46  | 2.20               | 1.72 | 1.07  | 2.21               | 1.22 | 1.81  |
| Grey Heron                   | 4.06               | 3.11 | 1.31  | 3.16               | 2.14 | 1.47  | 3.09               | 2.61 | 1.18  | 2.34               | 1.92 | 1.22  | 2.24               | 1.22 | 1.81  |
| Great Egret                  | 0.79               | 0.48 | 1.63  | 1.16               | 0.73 | 1.59  | 1.13               | 0.69 | 1.61  | 0.72               | 0.45 | 1.61  | 0.72               | 0.45 | 1.58  |
| Little Egret                 | 1.14               | 1.08 | 1.05  | 1.05               | 1.05 | 1.00  | 0.79               | 1.34 | 0.72  | 0.69               | 1.04 | 1.18  | 0.85               | 1.38 | 0.61  |
| Chinese Pond Heron           | 0.72               | 0.42 | 1.71  | 0.42               | 0.40 | 1.05  | 0.57               | 0.51 | 1.12  | 0.71               | 0.45 | 1.57  | 0.94               | 0.81 | 1.85  |
| Black-faced Spoonbill        | 0.73               | 0.63 | 1.16  | 0.67               | 0.63 | 1.07  | 0.72               | 0.69 | 1.04  | 0.65               | 0.72 | 0.90  | 0.72               | 1.25 | 0.57  |
| Common Teal                  | 0.73               | 0.63 | 1.16  | 0.67               | 0.63 | 1.07  | 0.72               | 0.69 | 1.04  | 0.65               | 0.72 | 0.90  | 0.72               | 1.25 | 0.57  |
| Greater Spotted Eagle        | 0.73               | 0.63 | 1.16  | 0.67               | 0.63 | 1.07  | 0.72               | 0.69 | 1.04  | 0.65               | 0.72 | 0.90  | 0.72               | 1.25 | 0.57  |
| Imperial Eagle               | 0.73               | 0.63 | 1.16  | 0.67               | 0.63 | 1.07  | 0.72               | 0.69 | 1.04  | 0.65               | 0.72 | 0.90  | 0.72               | 1.25 | 0.57  |
| Eurasian Hobby               | 0.73               | 0.63 | 1.16  | 0.67               | 0.63 | 1.07  | 0.72               | 0.69 | 1.04  | 0.65               | 0.72 | 0.90  | 0.72               | 1.25 | 0.57  |
| Japanese Quail               | 0.00               | 0.00 | nr    | 0.00               | 0.00 | nr    | 0.00               | 0.00 | nr    | 0.00               | 0.00 | nr    | 0.00               | 0.00 | nr    |
| Eurasian Coot                | 0.73               | 0.63 | 1.16  | 0.67               | 0.63 | 1.07  | 0.72               | 0.69 | 1.04  | 0.65               | 0.72 | 0.90  | 0.72               | 1.25 | 0.57  |
| Pheasant-tailed Jacana       | 0.73               | 0.63 | 1.16  | 0.67               | 0.63 | 1.07  | 0.72               | 0.69 | 1.04  | 0.65               | 0.72 | 0.90  | 0.72               | 1.25 | 0.57  |
| Greater Painted-snipe        | 0.73               | 0.63 | 1.16  | 0.67               | 0.63 | 1.07  | 0.72               | 0.69 | 1.04  | 0.65               | 0.72 | 0.90  | 0.72               | 1.25 | 0.57  |
| Black-winged Stilt           | 0.73               | 0.63 | 1.16  | 0.67               | 0.63 | 1.07  | 0.72               | 0.69 | 1.04  | 0.65               | 0.72 | 0.90  | 0.72               | 1.25 | 0.57  |
| Pintail/Swinhoe's Snipe      | 0.73               | 0.63 | 1.16  | 0.67               | 0.63 | 1.07  | 0.72               | 0.69 | 1.04  | 0.65               | 0.72 | 0.90  | 0.72               | 1.25 | 0.57  |
| Common Snipe                 | 0.73               | 0.63 | 1.16  | 0.67               | 0.63 | 1.07  | 0.72               | 0.69 | 1.04  | 0.65               | 0.72 | 0.90  | 0.72               | 1.25 | 0.57  |
| Richard's Pipit              | 0.04               | 0.04 | 1.13  | 0.04               | 0.04 | 1.00  | 0.07               | 0.06 | 1.19  | 0.12               | 0.09 | 1.23  | 0.09               | 1.31 | 0.69  |
| Bluetthroat                  | 0.73               | 0.63 | 1.16  | 0.67               | 0.63 | 1.07  | 0.72               | 0.69 | 1.04  | 0.65               | 0.72 | 0.90  | 0.72               | 1.25 | 0.57  |
| Common Stonechat             | 0.73               | 0.63 | 1.16  | 0.67               | 0.63 | 1.07  | 0.72               | 0.69 | 1.04  | 0.65               | 0.72 | 0.90  | 0.72               | 1.25 | 0.57  |
| Pallas's Grasshopper Warbler | 0.73               | 0.63 | 1.16  | 0.67               | 0.63 | 1.07  | 0.72               | 0.69 | 1.04  | 0.65               | 0.72 | 0.90  | 0.72               | 1.25 | 0.57  |
| Zitting Cisticola            | 0.73               | 0.63 | 1.16  | 0.67               | 0.63 | 1.07  | 0.72               | 0.69 | 1.04  | 0.65               | 0.72 | 0.90  | 0.72               | 1.25 | 0.57  |
| Japanese Yellow Bunting      | 0.00               | 0.00 | nr    | 0.00               | 0.00 | nr    | 0.00               | 0.00 | nr    | 0.00               | 0.00 | nr    | 0.00               | 0.00 | nr    |
| Red-billed Starling          | 2.72               | 2.00 | 1.36  | 2.35               | 1.42 | 1.65  | 2.53               | 1.70 | 1.49  | 1.67               | 1.67 | 0.92  | 1.42               | 1.42 | 1.00  |
| Black-winged Oriole          | 0.73               | 0.63 | 1.16  | 0.67               | 0.63 | 1.07  | 0.72               | 0.69 | 1.04  | 0.65               | 0.72 | 0.90  | 0.72               | 1.25 | 0.57  |

Key:  
 NR - Not recorded within WCA or Control Areas during the period  
 Blue - Target met (i.e. density in WCA at least twice that in Control Areas)  
 Yellow - Target not met, although density higher than in Control Areas  
 Red - Target not met and density lower than in Control Areas  
 \* Casual observation only

## 26 Bird Target Species (Up to Jun 2011)

26 Bird Targets Update

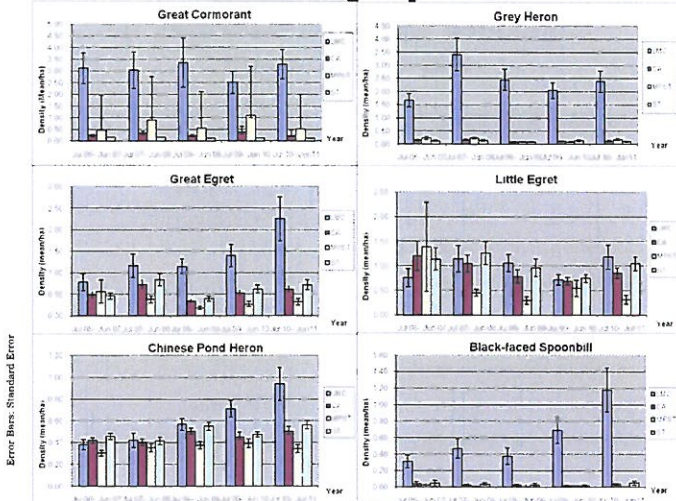


Key:  
 White - Not recorded within WCA or Control Areas during the period  
 Blue - Target met (i.e. density in WCA at least twice that in Control Areas)  
 Yellow - Target not met, although density higher than in Control Areas  
 Red - Target not met and density lower than in Control Areas  
 \* Casual observation only

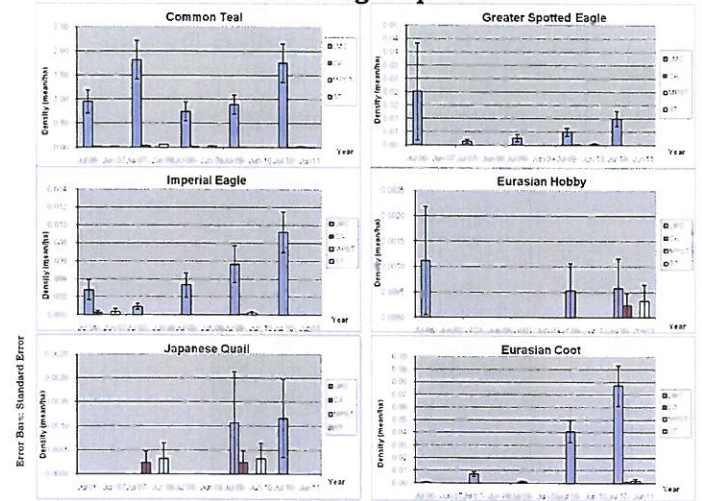
## Endangered Birds Jan - Jun 2011

| Species name          | Status          | Highest Count |     |     |     |     |     |
|-----------------------|-----------------|---------------|-----|-----|-----|-----|-----|
|                       |                 | Jan           | Feb | Mar | Apr | May | Jun |
| Black-faced Spoonbill | Endangered      | 234           | 146 | 129 | 49  | 0   | 0   |
| Greater Spotted Eagle | Vulnerable      | 1             | 0   | 1   | 1   | 0   | 0   |
| Imperial Eagle        | Vulnerable      | 2             | 2   | 2   | 0   | 0   | 0   |
| Collared Crow         | Near Threatened | 1             | 0   | 0   | 3   | 0   | 0   |

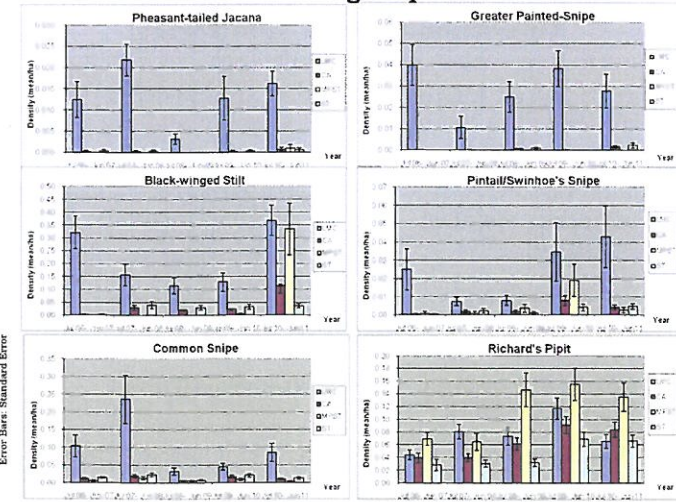
## 26 Bird Target Species



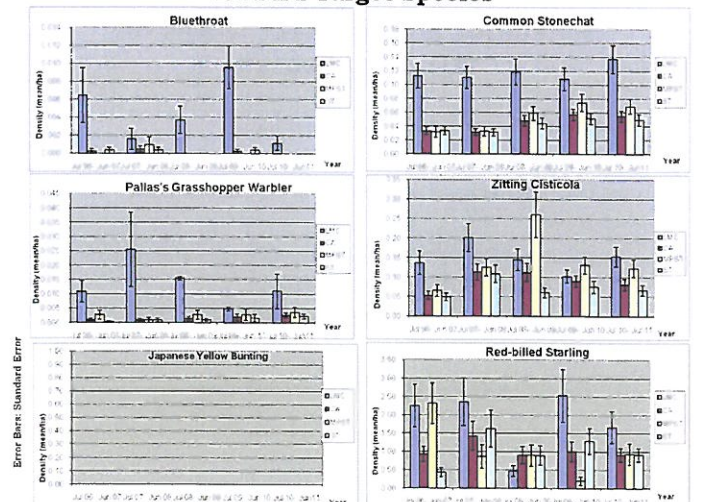
## 26 Bird Target Species



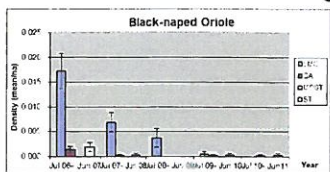
## 26 Bird Target Species



## 26 Bird Target Species



## 26 Bird Target Species



Error Bar = Standard Error

## Mammal Targets

- Four records of **Leopard Cat** and constant records of individuals of **Chestnut Spiny Rat** between January and May 2011.



## Herpetofauna Targets

### Amphibians

| Maximum Total Number of Individuals recorded in all ponds in LMC EEA |                                 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 <sup>^</sup> |
|--|---------------------------------|------|------|------|------|------|-------------------|
| Asian Common Toad  | <i>Bufo melanostictus</i>       | 0    | 3    | 3    | 1    | 2    | 4                 |
| Asiatic Painted Frog   | <i>Kaloula pulchra</i>          | 0    | 0    | 0    | 0    | 0    | 2                 |
| Butler's Pigmy Frog  | <i>Microhyla butleri</i>        | 0    | 0    | 0    | 1    | 2    | 0                 |
| Ornate Pigmy Frog  | <i>Microhyla ornata</i>         | 0    | 9    | 13   | 46   | 128  | 25                |
| Paddy Frog   | <i>Fejervarya limnocharis</i>   | 35   | 25   | 23   | 14   | 12   | 7                 |
| Chinese Bullfrog   | <i>Hoplobatrachus chinensis</i> | 0    | 1    | 1    | 2    | 4    | 1                 |
| Günther's Frog   | <i>Rana guentheri</i>           | 130  | 157  | 145  | 74   | 137  | 86                |
| Two-striped Grass Frog   | <i>Rana taipehensis</i>         | 0    | 0    | 0    | 0    | 2    | 1                 |
| Brown Tree Frog  | <i>Polypedates megacephalus</i> | 12   | 16   | 32   | 33   | 27   | 33                |
| No. of species recorded  |                                 | 3    | 6    | 6    | 7    | 8    | 8                 |
| Total No. of species recorded  |                                 | 9    |      |      |      |      |                   |

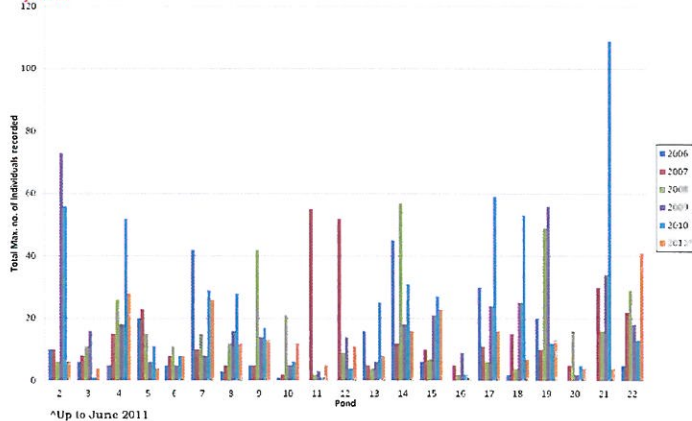
<sup>^</sup>Up to June 2011

### Reptiles

- One Chinese Soft-shelled Turtle was found in April 2011 during herpetofauna survey
- Tracks of Chinese Soft-shelled Turtle was seen in ponds in March 2011
- Exuvia of Common Rat Snake were regularly collected in November

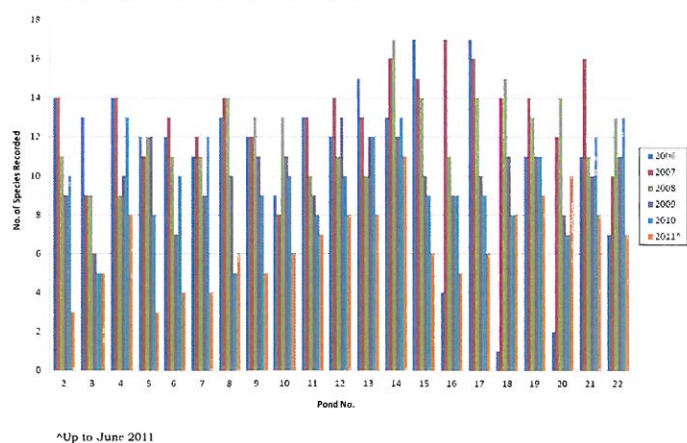
## Herpetofauna Recorded at Individual Pond

Maximum No. of Individuals (sum of max of each species) recorded in each pond



## Dragonfly Record (Adult) at Individual Pond

Total no. of Species recorded in each pond



## Dragonfly Targets

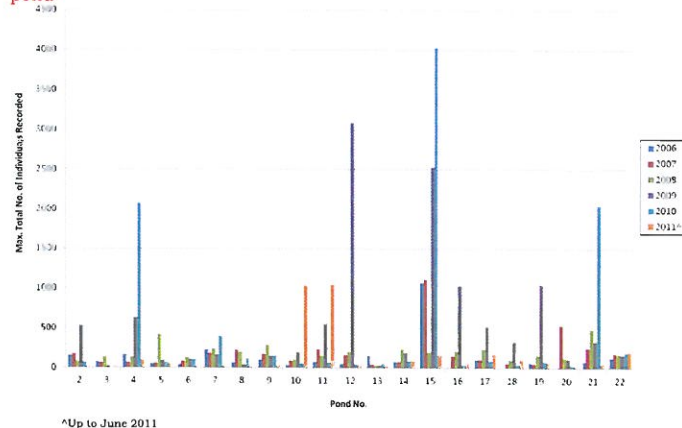
### Species Diversity

| Dragonfly recorded as adults or exuviae at LMC WCA |                                  | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 <sup>^</sup> |
|--|----------------------------------|------|------|------|------|------|-------------------|
| Orange-tailed Midlet                               | <i>Agriocnemis famina aryzae</i> | ✓    | ✓    | ✓    | ✓    | ✓    | ✓                 |
| Wandering Midlet                                   | <i>Agriocnemis pygmaea</i>       | ✓    | ✓    | ✓    | ✓    | ✓    | ✓                 |
| Orange-tailed Sprite                               | <i>Ceragrion aurantulum</i>      | ✓    | ✓    | ✓    | ✓    | ✓    | ✓                 |
| Common Bluetail                                    | <i>Ischnura senegalensis</i>     | ✓    | ✓    | ✓    | ✓    | ✓    | ✓                 |
| Pale-spotted Emperor                               | <i>Anax pattulus</i>             | ✓    | ✓    | ✓    | ✓    | ✓    | ✓                 |
| Leiner Emperor                                     | <i>Anax parthenope</i>           | ✓    | ✓    | ✓    | ✓    | ✓    | ✓                 |
| Common Flatgetail                                  | <i>Irtinogomphus portiox</i>     | ✓    | ✓    | ✓    | ✓    | ✓    | ✓                 |
| Golden Flatgetail                                  | <i>Sinunogomphus curvatus</i>    | ✓    | ✓    | ✓    | ✓    | ✓    | ✓                 |
| Regal Pond Cruiser                                 | <i>Epopteralia elegans</i>       | ✓    | ✓    | ✓    | ✓    | ✓    | ✓                 |
| Asian Pantail                                      | <i>Artemesia panopoides</i>      | ✓    | ✓    | ✓    | ✓    | ✓    | ✓                 |
| Blue Dasher  | <i>Brachypteryx chalybea</i>     | ✓    | ✓    | ✓    | ✓    | ✓    | ✓                 |
| Asian Amberwing                                    | <i>Brachypteryx contaminata</i>  | ✓    | ✓    | ✓    | ✓    | ✓    | ✓                 |
| Crimson Darter                                     | <i>Cyathodonta senilis</i>       | ✓    | ✓    | ✓    | ✓    | ✓    | ✓                 |
| Blue Percher                                       | <i>Diplaxius musalis</i>         | ✓    | ✓    | ✓    | ✓    | ✓    | ✓                 |
| Amber-winged Glider                                | <i>Hydrobasileus croceus</i>     | ✓    | ✓    | ✓    | ✓    | ✓    | ✓                 |
| Coastal Glider                                     | <i>Macromia plex corea</i>       | ✓    | ✓    | ✓    | ✓    | ✓    | ✓                 |
| Pied Percher                                       | <i>Neurothemis fullia</i>        | ✓    | ✓    | ✓    | ✓    | ✓    | ✓                 |
| Common Red Skimmer                                 | <i>Orthetrum prasinum</i>        | ✓    | ✓    | ✓    | ✓    | ✓    | ✓                 |
| Green Skimmer                                      | <i>Orthetrum sabina</i>          | ✓    | ✓    | ✓    | ✓    | ✓    | ✓                 |
| Wandering Glider                                   | <i>Pantala flavescens</i>        | ✓    | ✓    | ✓    | ✓    | ✓    | ✓                 |
| Pied Skimmer                                       | <i>Pseudothemis ornata</i>       | ✓    | ✓    | ✓    | ✓    | ✓    | ✓                 |
| Ruby Darter  | <i>Rhodallagma rufa</i>          |      |      | ✓    |      |      |                   |
| Stragulated Flatflier                              | <i>Rhythemis variegata</i>       | ✓    | ✓    | ✓    | ✓    | ✓    | ✓                 |
| Evening Skimmer                                    | <i>Tholymia nitens</i>           | ✓    | ✓    | ✓    | ✓    | ✓    | ✓                 |
| Saddlebag Glider                                   | <i>Tramea angusta</i>            | ✓    | ✓    | ✓    | ✓    | ✓    | ✓                 |
| Dancing Drowner                                    | <i>Trithemis pathosensis</i>     | ✓    | ✓    | ✓    | ✓    | ✓    | ✓                 |
| Scarlet Basker                                     | <i>Urothemis signata</i>         | ✓    | ✓    | ✓    | ✓    | ✓    | ✓                 |
| No. of Species Recorded                            |                                  | 22   | 23   | 23   | 22   | 24   | 17                |
| Total No. of Species Recorded                      |                                  | 27   |      |      |      |      |                   |

<sup>^</sup>Up to June 2011

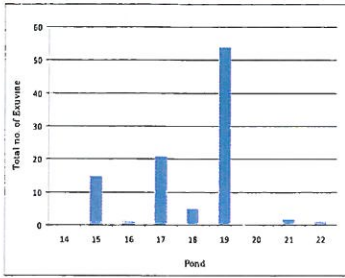
## Dragonfly Record (Adult) at Individual Pond

Maximum No. of Individuals (sum of max of each species) recorded in each pond



# Dragonfly Record (Exuviae) at Individual Pond 2011^

| Pond Totals  | 14       | 15        | 16       | 17        | 18       | 19        | 20       | 21       | 22       | Total     |
|--|----------|-----------|----------|-----------|----------|-----------|----------|----------|----------|-----------|
| <i>Ischnura senegalensis</i> (Common Bluetell)     | 0        | 13        | 0        | 0         | 0        | 26        | 0        | 0        | 1        | 40        |
| <i>Anax guttatus</i> (Pale-spotted Emperor)        | 0        | 0         | 0        | 0         | 3        | 0         | 0        | 0        | 0        | 3         |
| <i>Ischnogomphus pertinax</i> (Common Flatgill)    | 0        | 0         | 0        | 3         | 0        | 0         | 0        | 0        | 0        | 3         |
| <i>Brachythemis contaminata</i> (Asian Amberwing)  | 0        | 1         | 0        | 0         | 0        | 1         | 0        | 0        | 0        | 2         |
| <i>Orthetrum prunosum</i> (Common Red Skimmer)     | 0        | 0         | 0        | 0         | 0        | 1         | 0        | 0        | 0        | 1         |
| <i>Orthetrum sabius</i> (Green Skimmer)            | 0        | 0         | 1        | 18        | 2        | 23        | 0        | 1        | 0        | 45        |
| <i>Pantala flavescens</i> (Wandering Glider)       | 0        | 0         | 0        | 0         | 0        | 3         | 0        | 0        | 0        | 3         |
| <i>Rhyothemis variegata</i> (Variegated Flutterer) | 0        | 1         | 0        | 0         | 0        | 0         | 0        | 1        | 0        | 2         |
| <b>Total Number of Exuviae Recorded</b>            | <b>0</b> | <b>15</b> | <b>1</b> | <b>21</b> | <b>6</b> | <b>54</b> | <b>0</b> | <b>2</b> | <b>1</b> | <b>99</b> |
| <b>Total Number of Species Recorded</b>            | <b>0</b> | <b>3</b>  | <b>1</b> | <b>2</b>  | <b>2</b> | <b>5</b>  | <b>0</b> | <b>2</b> | <b>1</b> | <b>8</b>  |



^Up to June 2011

## 5-yearly Review of HCMP

According to EP-129/2002/B, clause 4.1 (b),

"a Five-yearly review programme for the HCMP, which shall include both qualitative and quantitative review of management objectives and targets, together with measures necessary to accomplish any revised objectives, and targets that are set, shall be submitted for the Director's approval."

Next review due:

**Aug 2011**

| Species Name                 | Fellows et al. (2002)                         | IUCN (2010)     | No. of months target exceeded / No. of months recorded |
|------------------------------|---|-----------------|--|
| Great Cormorant              | Potential Regional Concern                    | -               | 40/42  |
| Grey Heron                   | Potential Regional Concern                    | -               | 62/64  |
| Great Egret                  | Potential Regional Concern (Regional Concern) | -               | 37/46  |
| Little Egret                 | Potential Regional Concern (Regional Concern) | -               | 16/66  |
| Chinese Pond Heron           | Potential Regional Concern (Regional Concern) | -               | 14/66  |
| Black-faced Spoonbill        | Potential Global Concern                      | Endangered      | 37/40  |
| Common Teal                  | Regional Concern                              | -               | 29/39  |
| Greater Spotted Eagle        | Global Concern                                | Vulnerable      | 28/30  |
| Imperial Eagle               | Global Concern                                | Vulnerable      | 25/26  |
| Eurasian Hobby               | Local Concern                                 | -               | 4/5  |
| Japanese Quail               | Local Concern                                 | Near Threatened | 3/5  |
| Eurasian Coot                | Regional Concern                              | -               | 19/19  |
| Pheasant-tailed Jacana       | Local Concern                                 | -               | 31/32  |
| Greater Painted-snipe        | Local Concern                                 | -               | 26/27  |
| Black-winged Stilt           | Regional Concern                              | -               | 49/55  |
| Pintail/Swanhoe's Snipe      | PS - ; 50: Local Concern                      | -               | 21/34  |
| Common Snipe                 | -   | -               | 11/42  |
| Richard's Pipit              | -   | -               | 15/50  |
| Blarthroat                   | Local Concern                                 | -               | 19/22  |
| Common Stonechat             | -   | -               | 32/45  |
| Pallas's Grasshopper Warbler | Local Concern                                 | -               | 13/19  |
| Zitting Cisticola            | Local Concern                                 | -               | 37/63  |
| Japanese Yellow Bunting      | Global Concern                                | Vulnerable      | 9/0  |
| Red-billed Starling          | Potential Regional Concern                    | -               | 17/47  |
| Black-naped Oriole           | Local Concern                                 | -               | 19/21  |

## 5-yearly Review of HCMP

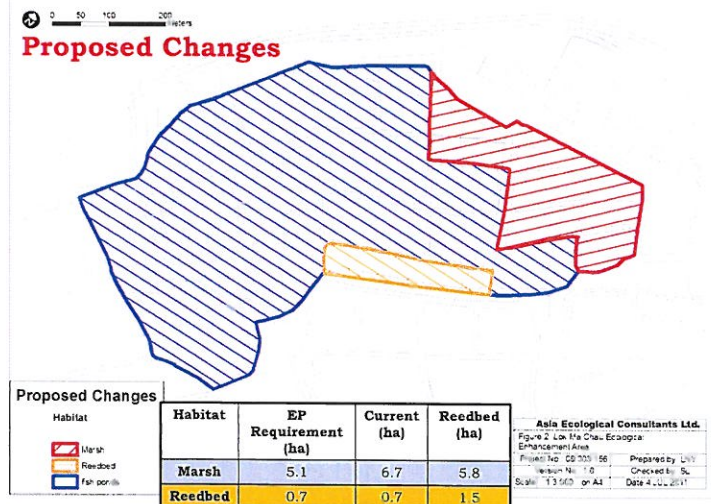
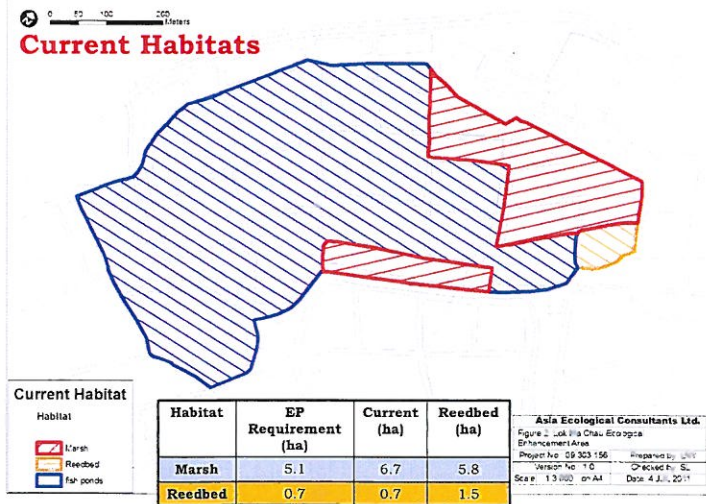
Mammal Target (max recorded):

| Species Name/No. of Ponds         | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 |
|-----------------------------------|------|------|------|------|------|------|
| Eurasian Otter <i>Lutra lutra</i> | 2    | 2    | 2    | 1    | 3*   | 0    |

\* Up to 3 individuals recorded between Pond 1 and 2 by APCD.

Herpetofauna Target:

| Species Name/Maximum Count                       | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 |
|--|------|------|------|------|------|------|
| Chinese Bullfrog <i>Hoplobatrachus chinensis</i> | 0    | 1    | 1    | 2    | 4    | 1    |
| Burmese Python <i>Python molurus</i>             | 1    | 0    | 1    | 0    | 0    | 0    |



## 5-yearly Review of HCMP Management Objectives - Overview

### Review of Management Objectives Quantitatively & Qualitatively

- ✓ Overall, current management objectives have proved effective in achieving target levels for most target species.
- ✓ Some species are less-important from a conservation point of view. Hence, emphasis on improving the site for more ecologically important species is encouraged.
- ✓ Address some long-term tree management issues.

## 5-yearly Review of HCMP Proposed Updated Management Objectives

### 1. Propose solutions to some long-term management issues

- ✓ Recurrent issues with beetle infestation at Pond 22
- ✓ Long-term vegetation control of *Phragmites* at Pond 14

### 2. Address other long-term management issues which are not currently covered in the HCMP

- ✓ The use and control of trees



## 5-yearly Review of HCMP Management Actions Required to Achieve Identified Objectives

### 1. **Additional Management Actions Proposed:**

- ✓ Attract Little Egret/Chinese Pond Heron as a breeding species by using decoys and tape
- ✓ Provide more suitable habitat to encourage breeding of Pheasant-tailed Jacana, Greater-painted Snipe and Black-winged Stilt
- ✓ Increase habitat diversity by re-contouring pond bunds

### 2. **Management Actions to be Continued:**

- ✓ Continue to provide ponds with large fringes of emergent vegetation
- ✓ Continue stocking and drain-down schedule
- ✓ Provide shallow water ponds throughout the dry season
- ✓ Provide shallow water marsh areas throughout the dry season
- ✓ Continue to provide food source
- ✓ Provide refugia areas in both dry and wet season

## 5-yearly Review of HCMP Consequences

### Management Implications

#### **Marsh Area (Management Compartment C)**

- ✓ Pond 14 to be kept as reedbed, natural colonisation by *Phragmites*
- ✓ Pond 19 minor re-profiling to increase shallow water
- ✓ Current use be kept for other ponds, i.e. Pond 15 *Nymphaea* pond, Ponds 16 & 18, fish-free pond, Pond 17 marsh
- ✓ Continue reviewing the data from exuviae traps on the marsh ponds to review the need to maintained as Ponds 20 – 22 as *Nymphaea* pond

#### **Fishpond Area (Management Compartment B & A)**

- ✓ Continue current practice of food provision for ardeids, ducks and starlings;
- ✓ Manage trees to attract breeding egrets and ardeids wintering roost.
- ✓ Include winter ardeids roost count

## 5-yearly Review of HCMP Consequences

### Management Implications

#### **Establish a Tree Management Plan:**

- ✓ Identify trees where removal, limit growth or other management actions might be required on a regular basis
- ✓ Enhance tree cover/diversity in areas where required
- ✓ Overview of tree management requirement in a wetland

## 5-yearly Review of HCMP

### Current requirement (monitoring and targets)

- ✓ No change proposed at this point but comment welcomed