

## **Appendix 12-10** **Methodology and Results of Butterfly Surveys**

### **Methodology**

Survey methodology for butterflies followed the guidelines set out in the EIAO Guidance Note 10/2004. Surveys were conducted each month between June and October 2009 and again during April and May 2010, to cover the wet season months when butterfly activity is higher.

During the surveys, a transect route was followed through the Ecological Assessment Area (see **Figure 12-02**). Literature review and an assessment of habitats present suggested that LMC Loop was not an important site for butterflies, and so only two validation surveys were conducted in this area, in September 2009 and April 2010.

All habitats were surveyed with particular focus on those known to be important for butterflies, especially woodland and shrubland. The grassy hills above Ma Tso Lung were also surveyed to check for hill-topping behaviour by species that may have been overlooked in the lowlands.

All adult butterflies seen along the transects were identified and enumerated. Any obvious signs of larval activity were also recorded, but no intensive searches for larvae were conducted.

### **Results**

In total, 81 species of butterfly were recorded during surveys in 2009-2010. Of these, 14 were recorded in LMC Loop, 55 in the Adjacent Area outside LMC Loop and 52 at Ma Tso Lung (**Table A12-21**).

All species recorded in LMC Loop are widespread throughout Hong Kong. As expected, the observed density of butterflies on surveys in this area was particularly low. Habitats in this area do not support a diverse community of plant species, and the host plants for many butterfly larvae are likely to be absent from the area.

The area of the Western Connection Road was also found to have a reasonably low diversity, albeit greater than that observed in LMC Loop. The area of the Eastern Connection Road includes part of the hillside above Ma Tso Lung. This habitat was used by a variety of butterflies for hill-topping behaviour, including Danaid Egg-fly. The grassy hillsides also provided habitat suitable for Spotted Angle and Small Three-ring, both species of Local Concern that are largely associated with short grassy areas, especially hillsides.

The greatest diversity of butterflies was associated with shrubland habitats at Ma Tso Lung and near LMC Lookout. These habitats support a more diverse community of plant species with a diverse vegetation structure, and as a consequence provide conditions suitable for a variety of butterfly larvae, as well as flowers suitable for adult butterflies.

**Table A12-21** Butterfly species recorded in LMC Loop and surrounding areas during surveys in 2009-10.

Species	Level of Concern <sup>#</sup>	LMC Loop	Adjacent Area in HK outside LMC Loop	MTL	Habitats*
Pale Awlet <i>Bibasis gomata</i> 白傘弄蝶			Y <sup>^</sup>		V
Water Snow Flat <i>Tagiades litigiousus</i> 沾邊裙弄蝶			Y	Y	S
Chestnut Angle <i>Odontoptilum angulatum</i> 角翅弄蝶			Y	Y	O, S
Spotted Angle <i>Caprona alida</i> 白彩弄蝶	LC		Y	Y	G
Bush Hopper <i>Ampittia dioscorides</i> 黃斑弄蝶			Y		M, P
Chinese Dart <i>Potanthus Confucius</i> 孔子黃室弄蝶		Y			G
Rare Swift <i>Parnara ganga</i> 曲紋稻弄蝶			Y		P, S
Formosan Swift <i>Borbo cinnara</i> 袖弄蝶		Y		Y	G
Contiguous Swift <i>Polytremis lubricans</i> 黃紋孔弄蝶			Y	Y	P, G, S
Common Bluebottle <i>Graphium sarpedon</i> 青鳳蝶		Y	Y	Y	M, P, G, O, S, SW, V
Common Jay <i>Graphium doson</i> 木蘭青鳳蝶			Y	Y	S, SW
Tailed Jay <i>Graphium Agamemnon</i> 統帥青鳳蝶			Y	Y	P, G, S, V
Five-bar Swordtail <i>Pathysa antiphates</i> 綠鳳蝶			Y		M, P, S
Common Mime <i>Chilasa clytia</i> 斑鳳蝶			Y	Y	M, P, G, O, S, SW
Swallowtail <i>Papilio xuthus</i> 柑橘鳳蝶			Y	Y	G
Lime Butterfly <i>Papilio demoleus</i> 達摩鳳蝶			Y	Y	G, O, S
Red Helen <i>Papilio helenus</i> 玉斑鳳蝶			Y		G, S, SW
Common Mormon <i>Papilio polytes</i> 玉帶鳳蝶			Y	Y	M, P, G, O, S, SW, V
Great Mormon <i>Papilio memnon</i> 美鳳蝶			Y	Y	P, G, O, S, SW, V
Spangle <i>Papilio protenor</i> 藍鳳蝶			Y		S
Chinese Peacock <i>Papilio bianor</i> 碧鳳蝶			Y	Y	P, G, S, V
Paris Peacock <i>Papilio paris</i> 巴黎翠鳳蝶			Y	Y	P, G, O, S, SW, V
Red-based Jezebel <i>Delias pasithoe</i> 報喜斑粉蝶		Y	Y	Y	P, G, O, S, V
Indian Cabbage White <i>Pieris canidia</i> 東方菜粉蝶			Y	Y	P, G, WA, O, S, SW, V
Great Orange Tip <i>Hebomoia glaucippe</i> 鶴頂粉蝶			Y	Y	G, S, SW, V
Mottled Emigrant <i>Catopsilia pyranthe</i> 梨花遷粉蝶			Y	Y	M, G, S, SW, V
Lemon Emigrant <i>Catopsilia Pomona</i> 遷粉蝶		Y	Y	Y	P, G, O, S, SW, V
Common Grass Yellow <i>Eurema hecabe</i> 寬邊黃粉蝶		Y	Y	Y	M, P, G, WA, O, S, SW, V
Silver-streak Blue <i>Iraota timoleon</i> 鐵木萊異灰蝶			Y		S
White Royal <i>Pratapa deva</i> 珀灰蝶			Y		S
Chocolate Royal <i>Remelana jangala</i> 萊灰蝶			Y	Y	G, S

Species	Level of Concern <sup>#</sup>	LMC Loop	Adjacent Area in HK outside LMC Loop	MTL	Habitats*
Slate Flash <i>Rapala manea</i> 燕灰蝶			Y		S
Purple Sapphire <i>Heliophorus epicles</i> 斜斑彩灰蝶			Y	Y	P, G, S
Dark Cerulean <i>Jamides bochus</i> 雅灰蝶		Y			G
Long-tailed Blue <i>Lampides boeticus</i> 亮灰蝶		Y	Y	Y	P, G, O, S, SW
Pale Grass Blue <i>Zizeeria maha</i> 酢醬灰蝶		Y	Y	Y	P, G, O, S, SW, V
Dark Grass Blue <i>Zizeeria karsandra</i> 吉灰蝶			Y	Y	P, S, SW
Lesser Grass Blue <i>Zizina otis</i> 毛眼灰蝶		Y	Y		M, G
Small Grass Blue <i>Famegana alsulus</i> 瑤灰蝶			Y		G
Tailed Cupid <i>Everes lacturnus</i> 長尾藍灰蝶				Y	S
Quaker <i>Neopithecops zalmora</i> 一點灰蝶			Y	Y	S
Common Hedge Blue <i>Acytolepis puspa</i> 鈕灰蝶			Y	Y	P, G, S
Gram Blue <i>Euchrysops cnejus</i> 棕灰蝶		Y		Y	G, O
Plum Judy <i>Abisara echerius</i> 蛇目褐蛺蝶			Y	Y	G, O, S
Common Evening Brown <i>Melanitis leda</i> 暮眼蝶			Y		G
Dark Evening Brown <i>Melanitis phedima</i> 睇暮眼蝶			Y	Y	S, O, SW
Common Palmfly <i>Elymnias hypermenestra</i> 翠袖鋸眼蝶			Y		S
Dark-brand Bush Brown <i>Mycalasis mineus</i> 小眉眼蝶			Y	Y	M, P, G, S
Common Five-ring <i>Ypthima baldus</i> 矚眼蝶			Y	Y	P, G, O, S
Straight Five-ring <i>Ypthima lisandra</i> 黎桑矚眼蝶			Y		G
Small Three-ring <i>Ypthima norma</i> 小三矚眼蝶	LC		Y		G
Large Faun <i>Faunis eumeus</i> 串珠環蝶			Y	Y	S
Common Duffer <i>Discophora sondaica</i> 鳳眼方環蝶				Y	S
Tawny Rajah <i>Charaxes bernardus</i> 白帶螯蛺蝶			Y	Y	G, S
Angled Castor <i>Ariadne ariadne</i> 波蛺蝶		Y	Y	Y	M, G, O, S, SW, V
Rustic <i>Cupha erymanthis</i> 黃襟蛺蝶			Y		S
Indian Fritillary <i>Argyreus hyperbius</i> 斐豹蛺蝶			Y		G
Red Lacewing <i>Cethosia biblis</i> 紅鋸蛺蝶			Y		S
Blue Admiral <i>Kaniska canace</i> 琉璃蛺蝶			Y		P
Common Jester <i>Symbrenthia lilaea</i> 散紋盛蛺蝶				Y	S
Peacock Pansy <i>Junonia almanac</i> 美眼蛺蝶				Y	S
Grey Pansy <i>Junonia atlites</i> 波紋眼蛺蝶				Y	G, S
Blue Pansy <i>Junonia orithya</i>		Y	Y		G

Species	Level of Concern <sup>#</sup>	LMC Loop	Adjacent Area in HK outside LMC Loop	MTL	Habitats*
翠藍眼蛺蝶					
Great Egg-fly <i>Hypolimnas bolina</i> 幻紫斑蛺蝶			Y	Y	M, P, G, S, SW, V
Danaid Egg-fly <i>Hypolimnas misippus</i> 金斑蛺蝶	LC		Y		G
Common Sailer <i>Neptis hylas</i> 中環蛺蝶		Y	Y	Y	P, G, S, SW, V
Short-banded Sailer <i>Phaedyma columella</i> 柱菲蛺蝶			Y		S
Common Sergeant <i>Athyma perius</i> 玄珠帶蛺蝶			Y		G
Colour Sergeant <i>Athyma nefie</i> 相思帶蛺蝶			Y		SW
Staff Sergeant <i>Athyma selenophora</i> 新月帶蛺蝶			Y	Y	S
Five-dot Sergeant <i>Parathyma sulpitia</i> 殘鐸線蛺蝶			Y	Y	O, S
White-edged Blue Baron <i>Euthalia phemius</i> 尖翅翠蛺蝶				Y	O, S, V
Common Mapwing <i>Cyrestis thyodamas</i> 網絲蛺蝶			Y		G, S
Black Prince <i>Rohana parisatis</i> 羅蛺蝶				Y	O
Red-ring Skirt <i>Hestina assimilis</i> 黑脈蛺蝶			Y	Y	G, O, S, SW
Glassy Tiger <i>Parantica aglea</i> 絹斑蝶			Y		S
Ceylon Blue Glassy Tiger <i>Ideopsis similis</i> 擬旖斑蝶		Y			G
Blue Tiger <i>Tirumala limniace</i> 青斑蝶			Y		G, S
Common Tiger <i>Danaus genutia</i> 虎斑蝶		Y	Y	Y	P, G
Blue-spotted Crow <i>Euploea midamus</i> 藍點紫斑蝶			Y	Y	M, P, G, WA, O, S, SW, V
Striped Blue Crow <i>Euploea mulciber</i> 異型紫斑蝶				Y	S
Common Indian Crow <i>Euploea core</i> 幻紫斑蝶			Y	Y	P, G, S

<sup>#</sup> Level of Concern follows Fellowes *et al.* (2002): LC = Local Concern

\* Habitats: M – marsh, P – ponds, G – grassland or grassland/shrubland, WA – wet agricultural land, O – orchard, S – shrubland, SW – secondary woodland, V – village, village edge or wasteground

^ Larvae observed but no adult butterflies seen during surveys.