Environmental Impact Assessment Ordinance, Cap.499
Guidance Note

Ecological Baseline Survey for Ecological Assessment

(This guidance note supersedes EIAO Guidance Note No. 7/2002 with immediate effect)

Important Note :

The guidance note is intended for general reference only. You are advised to refer to and follow the requirements in the Environmental Impact Assessment Ordinance (Cap 499) and the Technical Memorandum on the Environmental Impact Assessment (EIA) Process. Each case has to be considered on individual merits. This guidance note serves to provide some good practices on EIA and was developed in consultation with the EIA Ordinance Users Liaison Groups and the Advisory Council on the Environment. This guidance note may be subject to revision without prior notice. You are advised to make reference to the guidance note current to the date. Any enquiry on this guidance note should be directed to the EIA Ordinance Register Office of EPD on 27th Floor, Southorn Centre, 130 Hennessy Road, Wan Chai, Hong Kong. (Telephone: 2835-1835, Faxline: 2147-0894), or through the EIA Ordinance web site (www.epd.gov.hk/eia)

1 Purpose

1.1 As stipulated in the Technical Memorandum on EIA Process (TM) Annex 16 Section 5.1.1, the objective of the baseline study of an ecological assessment is to provide adequate and accurate ecological baseline information. The ecological baseline survey forms an important part of the baseline study to:

(a) provide first hand, specific and updated information on the existing ecological characters of the proposed development site and its vicinity;
(b) verify information obtained from the review of existing information (TM Annex 16 Section 5.1.2.1); and
(c) fill existing information gaps.

1.2 This note aims at providing the general guidelines for conducting an ecological baseline survey in order to fulfil the requirements stipulated in the TM in respect of ecological assessment for a proposed development.

1.3 For the purpose of these guidelines, “habitat survey”, “field survey” or similar terms appeared in Annex 16 of the TM and study briefs for ecological assessment would be collectively referred to as “ecological baseline survey”.

2. Underlying Principles

2.1 Before conducting the ecological baseline surveys, the key ecosystem components and processes as well as the target taxa groups of the study site that are considered relevant, important, valuable, susceptible and sensitive to changes or fundamental to the functioning of the ecosystem should be selected as the focal points of the survey. In addition, efforts should also be focused on locations or target taxa groups where impacts are likely to be significant. On the other hand, it would not be practicable or cost-effective for the baseline survey to provide exhaustive ecological information of the study site, as collection of a great deal of data with little focus does not facilitate

subsequent ecological assessment.

2.2 The ecological baseline survey aims at collecting ecological data through sampling. The actual sampling effort would generally depend on the physical size of the site, diversity of the habitats, flora and fauna, seasonal variation of the target taxa groups under study and availability of existing ecological baseline information. The project proponent, in consultation with environmental consultants where applicable, should determine the appropriate amount of sampling effort in each case based on their professional judgement and actual site situations. In all cases, there should be adequate samplings to ensure that the data obtained are representative to address both spatial and temporal variations. The sampling efforts (e.g. number and frequency of sampling, locations and timing of surveys, etc.) and methods should be appropriately presented in the EIA report for audit purpose.

2.3 Survey methods used should be scientifically robust and appropriate for the habitats and target taxa groups under study. Standardized survey methods should be applied wherever appropriate so that results can be compared with those arising from other studies. If the methods used vary from accepted methods in order to meet the specific needs of a study, the justifications and reliability of the results should be thoroughly presented in the EIA report. The surveys should also be carried out by personnel with adequate knowledge and field experience of the target taxa groups to be surveyed.

2.4 Besides recording the species of the target taxa groups at the site through sampling, the dominant flora and fauna as well as any species of conservation importance should also be noted. The ecological baseline survey should also aim at providing insight into the ecological functions and importance of the habitats in question. For instance, during a bird survey, any notable behaviour such as feeding, roosting or breeding of the birds and the associated habitats and vegetation where they show such behaviours should be recorded. In fact, any special species-habitat relationships observed during the survey should be noted down. Such information is relevant and essential for subsequent impact identification, evaluation and mitigation.

2.5 In essence, an ecological baseline survey aims at revealing the ecological profile of the study area to facilitate the subsequent impact assessment and mitigation. The EIA study brief may also stipulate additional requirements on the ecological baseline survey taking into account the nature of the project, site conditions and valid concerns of the public. However, as each survey has its specific constraints and, probably, unique circumstances, it may not be possible nor appropriate to specify every single detail (e.g. the exact numbers, dates, routes, methodology, etc.) in the EIA study brief. Further investigations to address specific issues may be required during the course of the EIA study and be presented in the EIA report.

3 Duration of Survey

3.1 TM Annex 16, Section 5.1.4 states that the duration of an "ecological baseline survey" required shall be defined in the EIA study brief issued under the EIA Ordinance.

3.2 The duration of an ecological baseline survey should be long enough for gathering the necessary baseline data. Generally, the duration of an ecological baseline survey should

be commensurate with the scale of the proposed development at hand, and the duration specified in the EIA study brief should be regarded as the minimum requirement. Representative information could be obtained in a reasonable period of time if appropriate survey and sampling methods are adopted. An unnecessarily long ecological baseline survey may not yield useful additional information but may impose difficulties on the project proponent in terms of costs, programming and project implementation.

3.3 The duration of an ecological baseline survey for a proposed development is generally dependent on the following factors:

(a) the geographical coverage of the study area;
(b) the diversity of habitats within the study area;
(c) the diversity of flora and fauna within the study area;
(d) presence of ecologically important species or habitats which exhibit distinct seasonal patterns (e.g. migratory animals, seasonal wetlands);
(e) availability of existing ecological information of the study area;

4. Seasonality

4.1 In accordance with the TM Annex 16 Section 5.1.4, an ecological survey of a longer duration with regard to seasonal variations may be required if the area in question is likely to be supporting species of conservation importance which exhibit distinct seasonal patterns or when information on the site is inadequate.

4.2 Hong Kong has a sub-tropical climate and hence does not have four distinct seasons. Typically, Hong Kong has a wet hot "summer" and a dry cool "winter". (The average monthly temperature and rainfall are shown in Figures 1 and 2.) These two periods may be simply referred as "wet" season (April to October) and "dry" season (November to March). However, April and October are regarded by some ecologists as transitional months, the weather of which may not be typical for wet season and may vary from year to year. These considerations should be taken into account when designing survey programme and interpreting survey results.

4.3 In the marine environment, there are also seasonal variations. During the wet season, the discharge of the Pearl River makes the western waters remarkably low in salinity (can be lower than 10 ppt) while the eastern waters remain oceanic (salinity generally above 30 ppt). In the dry season when the freshwater discharge is much reduced, most of our waters are of rather uniformly high salinity. There are also some differences in water temperature and consequently dissolved oxygen levels between the two seasons. The range can be from under 10°C to over 30°C, and from less than 2 mg/L of dissolved oxygen in wet season to over 8 mg/L in dry months.

4.4 Different wildlife groups may differ in their activities and hence conspicuousness at different times of the year, as a result of difference in breeding seasons, migratory behaviour, or physiological changes (e.g. low temperature restricts activity of poikilotherms but not homeotherms). Therefore, to obtain good results, a target taxa group should be surveyed at the time of the year when the group is more active, conspicuous or easy to be identified

Figure 1. Monthly means of air temperature in Hong Kong for the period 1961 - 2000

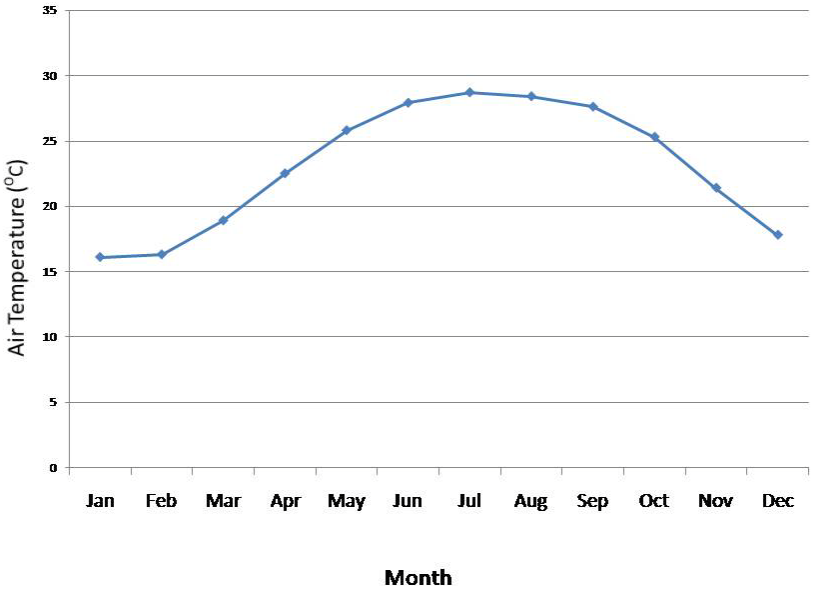
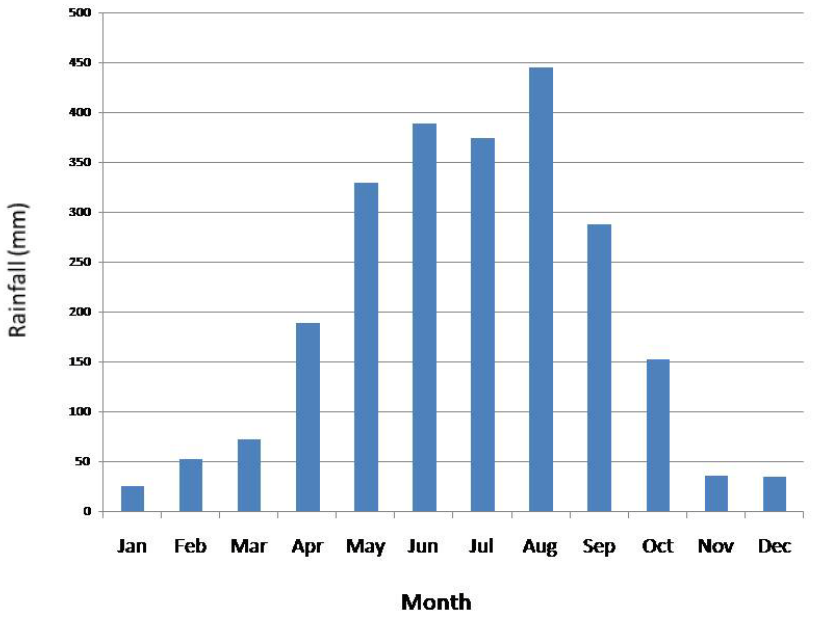


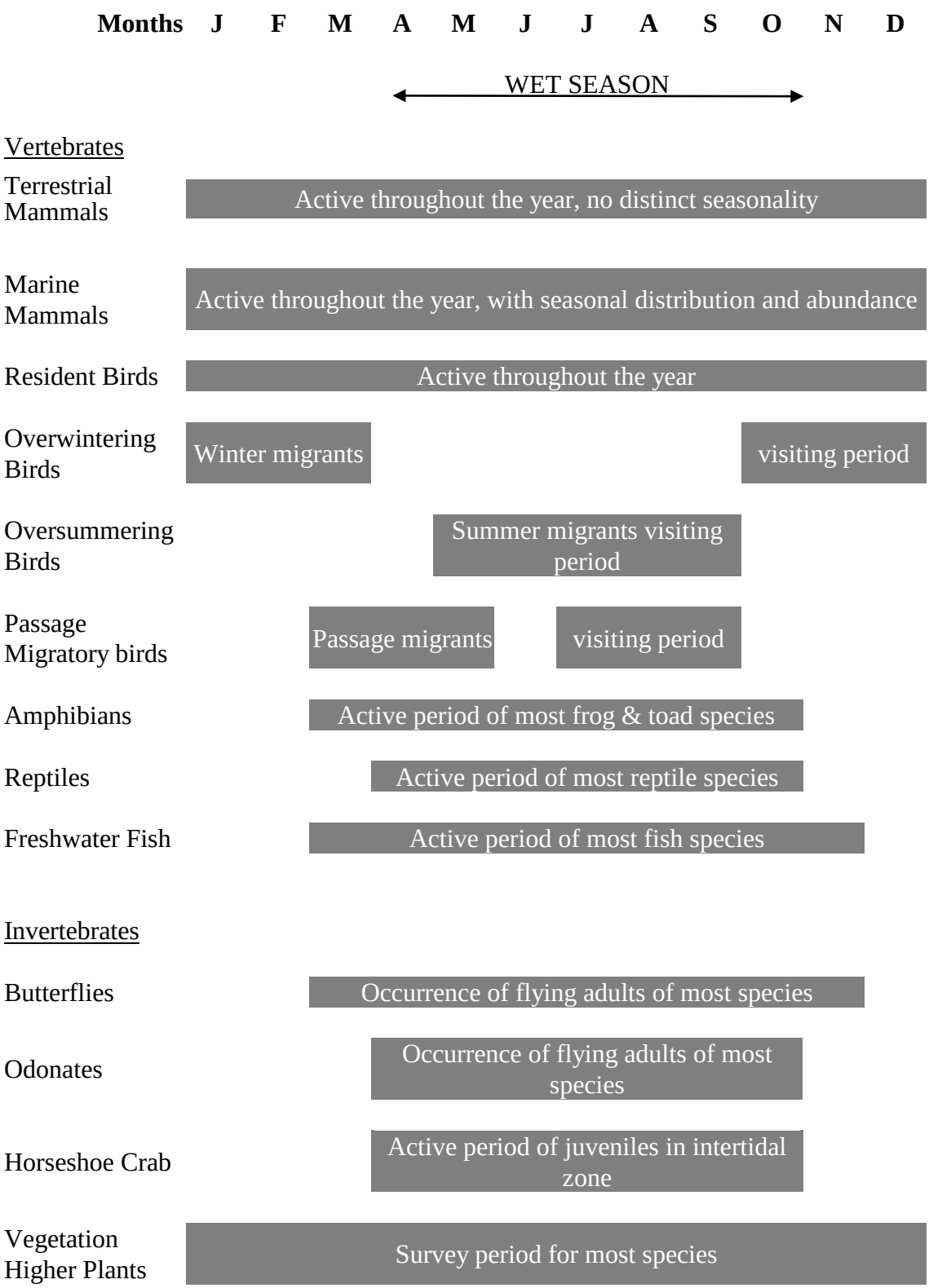
Figure 2. Monthly means of rainfall in Hong Kong for the period 1961 - 2000



Data Source : Hong Kong Observatory Almanac, Hong Kong Observatory (2008)

4.5 The recommended survey seasons for the target taxa groups that are usually included in ecological baseline surveys are shown in Figure 3. It should be noted that the figure only serves as a reference for the period of a year when different faunal or floral groups are generally more conspicuous. The actual timing of survey may need to be adjusted if a target species has special seasonal or diurnal pattern (e.g. egretry should be surveyed during the breeding season of egrets and herons between March and August; it would be more effective to conduct survey for amphibians at night time during wet season) or for special habitat types where certain target species groups are expected.

Figure 3: Time of the year to survey major floral and faunal groups



Types of Survey Period

5.1 On the basis of the factors described in Section 3.3 above and the seasonal patterns of target taxa groups reviewed in Section 4.4 and 4.5, the duration of an ecological baseline survey required will be determined and defined in the study brief. A 4-month ecological baseline survey will generally be required as long as some ecological impacts are anticipated from the proposed development. More specific considerations in respect of the determination of different survey durations are given below:

(a) 4-month survey
- The study area consists of common habitats.
- The 4-month period should provide reasonable amount of information on general wildlife use of the study area.
- Some surveys in the wet season are necessary if there are stream courses or wetlands in the study area.

(b) 6-month survey
- The study area consists of relatively diverse habitats and species.
- A certain extent of seasonal patterns in wildlife use of the study area is anticipated.
- Some surveys in the wet season are necessary if there are streams courses or wetlands in the study area.

(c) 9-month survey
- The study area consists of diverse habitats and species.
- A certain target species with marked seasonality is likely to be present in the study area.

5.2 The above requirements could vary from case to case depending on the wildlife groups and locations to be surveyed, and will be specified in the study brief issued under the EIAO. Having said that, in the event of a planning application has to be made in parallel, the project proponent is reminded of the Town Planning Board Guidelines for Application for Developments within Deep Bay Area under Section 16 of the Town Planning Ordinance (TPB PG-No. 12B (Revised April 1999)), which also has a special requirement for field investigation normally covering a period of not less than 12 months.

6. Survey Programme

6.1 The project proponent and environmental consultants shall make sure that the entire duration of survey specified in the EIA study brief is well covered to take into account the temporal variations and seasonality, if any, of different target taxa groups

6.2 To fulfil the requirements of TM in providing adequate and accurate ecological baseline information (TM Annex 16 Section 5.1), the surveys or samplings for individual target taxa groups should be conducted at appropriate timing and frequencies. For target taxa groups which show little variations over time (e.g. woody plants and corals), they could be surveyed at any time of the survey period. However, for taxa groups which fluctuate greatly in abundance (e.g. birds) or are difficult to detect (e.g. some cryptic or secretive

species), higher survey frequencies at appropriate time during the survey period are necessary. There should also be adequate samplings/surveys at larger or more diverse sites to ensure that the data obtained are representative.

6.3 Ecological impact assessment is an iterative process. Hence, it requires constant review of the information gathered to determine if further actions, such as extending the survey period or conducting supplementary surveys for a particular target species is needed. The project proponent could always increase the survey effort so as to draw up a more comprehensive ecological profile of the study area, particularly if he finds in the course of the ecological baseline survey certain ecologically important species. In such cases, more effort and additional information are needed in order to fully assess the impacts and derive some appropriate mitigation measures.

References:

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Wathern P. (1999). Ecological Impact Assessment. In *Handbook of Environmental Impact Assessment. Volume 1: Environmental Impact Assessment: Process, Methods and Potential*, ed. J. Petts, 327-346. Blackwell Science.

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