# MONITORING OF MARINE MAMMALS IN HONG KONG WATERS (2012-13)

## FINAL REPORT
## (1 April 2012 to 31 March 2013)


*Submitted by*

Samuel K.Y. Hung, Ph.D.

Hong Kong Cetacean Research Project



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## TABLE OF CONTENTS

## EXECUTIVE SUMMARY


Since 1995, a longitudinal study on Chinese White Dolphins (also known as the Indo-Pacific humpback dolphin, *Sousa chinensis*) and Indo-Pacific finless porpoises (*Neophocaena phocaenoides*) has been conducted in Hong Kong. With the funding support from Agriculture, Fisheries and Conservation Department, the present monitoring project represents a continuation and extension of this long-term research study that covers the period of April 2012 to March 2013.

During the12-month study period, 163 line-transect vessel surveys with 5,038.7 km of survey effort were conducted among nine survey areas in Hong Kong. A total of 345 groups of 1,097 Chinese White Dolphins and 97 groups of 292 finless porpoises were sighted during vessel and helicopter surveys. Most dolphin sightings were made in West Lantau (WL) and Northwest Lantau (NWL) survey areas, while the porpoise sightings were mainly sighted in South Lantau waters.

The combined estimate of dolphin abundance in WL, NWL and Northeast Lantau (NEL) survey areas in 2012 was 61 dolphins, which was considerably lower than the estimates in previous two years of monitoring, and the lowest in the past decade of monitoring. The declining trends in dolphin abundance were significant among all three areas. It is suspected that the significant decline was linked to the construction activities associated with the Hong Kong-Zhuhai-Macao Bridge (HZMB). Several recommendations in management strategies have been made to combat this serious issue, including the establishment of the proposed Fan Lau Marine Park, and the presumption against further reclamation around Lantau waters.

Habitat use patterns of Chinese White Dolphins from 2008-12 revealed that their high density areas included the west coast of Lantau, around Lung Kwu Chau, near the northeast corner of airport, Kau Ling Chung and Yam O. However, the Brothers Islands and Sham Shui Kok were once considered important habitat for dolphins, but their densities have diminished there in the past five years. On the other hand, the important porpoise habitats during 2004-12 were located to the south of Tai A Chau, near Shek Kwu Chau, the waters between these two islands, the southwestern and eastern side of Lamma Island during the dry season, and around Po Toi Islands during the wet season.

Throughout the monitoring period, 177 individuals with 568 re-sightings were

identified, with 21 of them being newly-added to the photo-identification catalogue. Most re-sightings were made in WL and NWL, and many newly identified individuals from the previous monitoring period were sighted repeatedly in the present study period, indicating their increased reliance of Hong Kong waters. Several well-known individual dolphins from the photo-ID catalogue were found to be stranded alive or dead in Hong Kong and Chinese waters in the past 12 months.

Many identified individual dolphins moved extensively across different areas around Lantau during the study period. However, some dolphins appeared to range less frequently to the Brothers Islands than before, which coincided with the abundance decline detected in NEL. On the other hand, many individuals moved between NWL and WL, and it is uncertain whether such movements would be hindered by the on-going HZMB construction works. Examination of traveling corridors for dolphins to move between different core areas was conducted, using past photo-ID information as well as the data collected from a pilot focal follow study. Preliminary results indicated that the main traveling corridors may exist to the north and west of the airport as well as near Pillar Point. This critical subject should be further examined, since existing and future threats may potentially affect dolphin movement around Lantau waters by disrupting their traveling corridors.

For the long-term acoustic monitoring work, a total of 10.16 hours of recordings in 101 sound samples were collected. Preliminary study on dolphin whistles found a total of 1,410 whistles from 13 recordings between 2010 and 2011. Twenty-seven whistle types were identified, indicating that Chinese White Dolphins in Hong Kong produce a diverse range of sounds, with more complex contours than humpback dolphins elsewhere. Further study should examine how whistles may change in different acoustic habitats with various levels of anthropogenic noise.

A passive acoustic monitoring study using the C-PODs, a underwater system that detects and logs dolphin tonal clicks over extended periods, was initiated under the present study. During a month-long deployment near Lung Kwu Chau, a total of 1,253 detection positive minutes (DPM) were logged in 813.7 monitoring hours. Analyzed results showed that dolphins regularly used the Lung Kwu Chau area both day and night. In light of the new information on acoustic behaviour of dolphins at night, any night-time construction work should not be allowed until a better understanding of dolphin behaviour and habitat use at night, to ensure that the acoustic behaviour and foraging activities would not be seriously affected.

Thirty-five sessions with 151.6 hours of theodolite tracking were conducted from three shore-based stations. From these observations, 216 groups of dolphins with 3,673 fixes of their position were collected. The theodolite tracking data collected from Fan Lau station was analyzed to examine the potential impact of vessel movement on dolphin behaviour. For naturally occurring variation, dolphins swam slower and in a more linear fashion in the morning than in the afternoon. In relation to vessel activity, dolphins swam slower and changed direction of travel more often when the number of vessels present at one time increased. A higher number of vessels presents might result in a crowded environment for dolphins, thus making it difficult to maneuver quickly or in a linear fashion. Moreover, dolphins may speed up and change direction to evade or approach vessels, depending on the vessel type. More data should be collected in the future to assess dolphin movement patterns based on natural and human-generated factors at Fan Lau and other stations.

During the study period, HKCRP researchers delivered 16 education seminars at local schools regarding the conservation of local dolphins and porpoises. Through this integrated approach of long-term research and publicity programme, the Hong Kong public can gain first-hand information from researchers.

**行政摘要 (中文翻譯)**

自 1995 年起，一項有關本地之中華白海豚及印度太平洋江豚的長期研究已展開，現在這個為期一年 (由 2012 年 4 月至 2013 年 3 月)、獲香港政府漁農自然護理署資助的研究，正是這項監察項目的延伸。

在 2012-13 年期間，研究員共進行了 163 次樣條線船上調查，在全港九個調查區共航行了 5,038.7 公里，並觀察到共 345 群中華白海豚 (總數達 1,097 隻)及 97 群江豚 (總數達 292 隻)。中華白海豚大多出沒於大嶼山西面及西北面水域，而江豚主要在大嶼山以南一帶水域活動。

在 2012 年間，中華白海豚在三個主要出沒區域的整體數目估計為 61 隻；此數字遠低於 2010 年及 2011 年的估計，亦是過去十年間之最低數字，而且在三個區域均呈現明顯的下降趨勢。研究員相信海豚數目的下降，與港珠澳大橋最近展開的眾多工程不無關係。為應對此嚴峻情況，我們提出數項建議，包括要求當局儘快於分流等水域落實海岸公園的成立，並應避免在大嶼山水域進行更多填海的工程。

量化生境使用分析顯示，在 2008-12 年間錄得最高海豚密度的重要生境，包括大嶼山以西、龍鼓洲一帶、機場東北角、狗嶺涌及欣澳附近等水域。雖然大、小磨刀洲及深水角等水域曾被視作海豚重要棲身地，但在過去五年間牠們在該處水域的使用量明顯減少。此外，在 2004-12 年期間，在旱季期間被確認為重要的江豚生境包括大鴉洲以南水域、石鼓洲附近水域、大鴉洲與石鼓洲之間水域、及南丫島西南及東面等水域；在雨季期間，江豚使用量較高的生境則集中在蒲台群島一帶附近水域。

在 2012-13 年度，研究員共辨認出 177 隻個別海豚，共 568 次的目擊紀錄，其中 21 隻海豚為相片名錄的新成員。大部分目擊紀錄均出現在大嶼山北面及西北面水域，而一部分於上年度成為相片名錄新成員的海豚，均於本年度恆常地出現，顯示牠們正逐漸增加使用香港的水域。在過去的十二個月內，亦有數條中華白海豚相片名錄的成員相繼於香港及大陸水域擱淺或死亡。

在研究期間，眾多海豚仍頻繁地在大嶼山周圍的不同調查區來回穿梭，但有個別曾經經常利用大、小磨刀洲作為活動核心區的海豚，卻明顯減少在該處水域出沒，此情況與大嶼山東北水域的海豚數目下降趨勢甚為吻合。此外，為數甚多的海豚經常來往大嶼山以西及西北之水域，但這些頻繁移動會否受到港珠澳大橋工程所影響仍屬未知之數。利用海豚相片名錄資料及聚焦跟蹤海豚試驗計劃所搜

集的初步資料，發現海豚利用一些既定移動路線，來往穿梭不同的活動核心區；初步分析所得出的路線，包括機場以西及以東的水域、及近踏石角附近的龍鼓水道。由於這些移動路線的存在對海豚甚爲重要，因此必須加以研究，並以防將來在大嶼山附近的一些工程影響白海豚繼續使用這些移動通道。

在 2012-13 年間，研究員在大嶼山一帶水域的水底聲音監察站，共錄取了 101 個、合共 10.16 小時的水底聲音片段。一項針對海豚哨聲的研究，利用了 2010-211 年間搜集的 13 個海豚發聲片段，共分析了 1,410 個哨聲樣本；該研究共辨別出 27 種白海豚哨聲，足證香港的中華白海豚會發出眾多不同的聲音，而其哨聲的輪廓比其他地方的駝背豚種群更爲複雜。未來的研究將集中分析白海豚哨聲，會否因不同程度的人爲噪音所影響而有所改變。

一項嶄新的「被動水底聲音監察項目」亦於本年度展開，主要是將名爲 C-POD 的先進儀器，長期放置於海豚棲身環境中偵測及記錄牠們發出的卡嗒聲音調。在爲期一個月、位於龍鼓洲東面水域進行的試驗計劃中，於 813.7 小時的監察裡共錄得 1,253 分鐘的海豚發聲紀錄；分析結果發現，海豚不分晝夜地使用龍鼓洲水域作爲其棲身地。由於此研究發現海豚在夜間甚爲活躍，我們建議在還未完全瞭解海豚在夜間的行爲及棲息地運用以前，應不要貿然容許任何在海豚生境內的工程在夜間進行，以確保海豚在夜間的發聲行爲及覓食活動不受影響。

一項利用精密經緯儀、在陸上追蹤中華白海豚的移動模式及行爲變化之研究仍持續進行。在 2012-13 年間，研究員在三個陸上觀察點進行了 35 次、共 151.6 小時的陸上觀察。期間共發現 216 群海豚，並錄取牠們的 3,673 個位置數據。研究員初步分析了由分流陸上觀察點搜集的數據，以評估該水域的頻繁船隻航行會否對海豚的行爲及移動構成影響。分析結果發現，海豚在早上的游泳速度明顯較慢、及其移動較爲有方向性；當船隻在海豚附近的數目上升時，海豚的泳速減慢並較常改變方向，此可能是由於眾多船隻的出現而做成較爲擠擁的環境，令海豚較難快速調動游泳姿態或向一方向移動。因應不同類型船隻的出現，海豚的泳速更會加快或改變方向以逃避或迎向船隻。在未來將需要更多的數據，以詳盡分析海豚移動模式會否因應自然因素或人爲因素而作出轉變，以確定海上交通對海豚的影響。

在本年度，研究員爲本地中小學主持了共16場講座，內容主要圍繞香港中華白海豚及江豚的最新保育狀況。透過糅合長期研究監察及公眾教育活動，香港市民可從研究員獲得更多有關鯨豚的最新資訊。

# 1. INTRODUCTION

Since 1995, the Hong Kong Cetacean Research Project (HKCRP) has been conducting a longitudinal study on Chinese White Dolphins (also known as the Indo-Pacific humpback dolphin, *Sousa chinensis*) and Indo-Pacific finless porpoises (*Neophocaena phocaenoides*) in Hong Kong and the Pearl River Delta region, primarily funded by the Agriculture, Fisheries and Conservation Department (AFCD) as well as various government departments, environmental consultants and NGOs. The multi-disciplinary research programme aims to provide critical scientific information to the Hong Kong SAR Government to formulate sound management and conservation strategies for the local populations of dolphins and porpoises.

In addition, HKCRP has been extensively involved in numerous environmental consultancy studies to assess potential impacts of marine construction projects on cetaceans in Hong Kong and the Pearl River Estuary, and to provide suggestions on mitigation measures to lessen the development pressures on dolphins and porpoises. Results from these integrated studies have been used to establish several systematic databases, which can be used to estimate population size, to monitor trends in abundance, distribution, habitat use, behaviour and individual ranging pattern over time, and to keep track of levels and changes in mortality rates of the local cetaceans (e.g. Dungan et al. 2012; Hung 2008; Hung and Jefferson 2004; Jefferson 2000a, b; Jefferson and Hung 2008; Jefferson et al. 2002a, 2006, 2009, 2011; Piwetz et al. 2012; Sims et al. 2011, 2012).

The present monitoring project represents a continuation and extension of this research programme, with funding support from the Agriculture, Fisheries and Conservation Department of HKSAR Government. This is a one-year project covering the period of 1 April 2012 to 31 March 2013. And this final report is submitted to AFCD to summarize the status of the monitoring project covering the entire 12-month study period.

## 2. OBJECTIVES OF PRESENT STUDY

The main goal of this one-year monitoring study was to collect systematic data for assessment of distribution, abundance and habitat use of Chinese White Dolphins and Indo-Pacific finless porpoises in Hong Kong, to take photographic records of individual dolphins, and to analyze the monitoring data for better understanding of the various aspects of local dolphin and porpoise populations. To achieve this main goal, several specific objectives were set for the present study.

The first one was to assess the spatial and temporal patterns of distribution, abundance and habitat use of Chinese White Dolphins and Indo-Pacific finless porpoises in Hong Kong in detail. This objective was achieved through data collection on dolphins and porpoises by conducting regular systematic line-transect vessel surveys and helicopter surveys. The second objective was to identify individual Chinese White Dolphins by their natural markings using photo-identification technique. This objective was achieved by taking high-quality photographic records of Chinese White Dolphins for photo-identification analysis. Photographs of re-sighted and newly identified individuals were compiled and added to the current photo-ID catalogue, with associated descriptions for each newly identified individual. Photographic records of finless porpoises were also taken during vessel and helicopter surveys for educational purposes.

The third objective was to analyze the monitoring data for a better understanding of the various aspects of local dolphin and porpoise populations. This objective was achieved by conducting various data analyses, including line-transect analysis, encounter rate analysis, distribution analysis, behavioural analysis and quantitative grid analysis to assess the spatial and temporal patterns of abundance, distribution, habitat use and trends of occurrence of local dolphins and porpoises using systematic line-transect survey data; and acoustic data analysis and theodolite tracking data analysis to assess the anthropogenic impacts on local dolphins. The fourth objective was to conduct ranging pattern analysis, movement pattern analysis and residency pattern analysis to study individual movement and range use based on the data obtained from both the line-transect survey and the photo-identification work.

Finally, the fifth objective was to educate the members of the public on local dolphins and porpoises, by disseminating the study results from the long-term monitoring research programme. This objective was achieved by providing public seminars arranged by AFCD.

## 3. RESEARCH TASKS

During the study period, several tasks were completed to satisfy the objectives set for the present marine mammal monitoring study. These tasks were:

- to collect data for assessment on spatial and temporal patterns of distribution, abundance and habitat use of local dolphins and porpoises through systematic line-transect vessel surveys and helicopter surveys;
- to analyze data for assessment on spatial and temporal patterns of distribution, abundance, habitat use and trends of occurrence of dolphins and porpoises in Hong Kong;
- to take photographic records of Chinese White Dolphins for photo-identification analysis and update the photo-identification catalogue;
- to analyze photo-identification data of individual Chinese White Dolphins to assess their ranging patterns, core area use and movement patterns;
- to conduct dolphin-related acoustic studies;
- to conduct shore-based theodolite tracking works;
- to take photographic records of finless porpoises; and
- to assist AFCD in arousing public awareness on local dolphins and porpoises through school seminars.

## 4. METHODOLOGY

### *4.1 Vessel Survey*

The survey team used standard line-transect methods (Buckland et al. 2001) to conduct regular vessel surveys, and followed the same technique of data collection that has been adopted in the past 17 years of marine mammal monitoring surveys in Hong Kong developed by HKCRP (Hung 2005, 2012; Jefferson 2000a, b; Jefferson et al. 2002a). The territorial water of Hong Kong Special Administrative Region is divided into twelve different survey areas, and line-transect surveys were conducted among nine survey areas (i.e. Northwest (NWL), Northeast (NEL), West (WL), Southwest (SWL) & Southeast Lantau (SEL), Deep Bay (DB), Lamma (LM), Po Toi (PT)and Ninepins (NP)) (Figure 1).

For each vessel survey, a 15-m inboard vessel (*Standard* 31516) with an open upper deck (about 4.5 m above water surface) was used to make observations from the flying bridge area. Two experienced observers (a data recorder and a primary observer) made up the on-effort survey team, and the survey vessel transited different transect lines at a constant speed of 13-15 km per hour. The data recorder searched with unaided eyes and filled out the datasheets, while the primary observer searched for dolphins and porpoises continuously through 7 x 50 *Brunton* or *Steiner* marine binoculars. Both observers searched the sea ahead of the vessel, between $270^{o}$ and $90^{o}$ (in relation to the bow, which is defined as $0^{o}$). One to two additional experienced observers were available on the boat to work in shift (i.e. rotate every 30 minutes) in order to minimize fatigue of the survey team members. All observers were experienced in small cetacean survey techniques and identifying local cetacean species. Beforehand they had participated in rigorous at-sea training program provided by the PI.

During on-effort survey periods, the survey team recorded effort data including time, position (latitude and longitude), weather conditions (Beaufort sea state and visibility), and distance traveled in each series (a continuous period of search effort) with the assistance of a handheld GPS (*Garmin eTrex Legend H*). When dolphins or porpoises were sighted, the survey team would end the survey effort, and immediately record the initial sighting distance and angle of the dolphin/porpoise group from the survey vessel, as well as the sighting time and position. Then the research vessel was diverted from its course to approach the animals for species identification, group size estimation, assessment of group composition, and behavioural observations. The perpendicular distance (PSD) of the dolphin/porpoise group to the transect line was later calculated from the initial sighting distance and angle. The line-transect data collected during the present study were compatible with the long-term databases maintained by HKCRP in a way that it can be analyzed by established computer programmes (e.g. all recent versions of DISTANCE programme including version 6.0, ArcView© GIS programme) for examination of population status including trends in abundance, distribution and habitat use of Chinese white dolphins and finless porpoises.

*4.2 Helicopter Survey*

Several helicopter surveys arranged by the Government Flying Service (GFS) through AFCD were conducted during the study period to survey mainly the remote survey areas that were relatively inaccessible by boat (e.g. Ninepins, Sai Kung, Mirs Bay) (Figure 2). The survey coverage of each helicopter survey largely depended on weather conditions such as visibility, sea state, cloud cover and wind direction, and the planned flight route could be changed with some flexibility according to the final decision by the GFS pilot. The helicopter survey usually lasted 1.5 hours, flying at an altitude of about 150 m and a speed of 150-200 km/hr. Three to four observers were on board to search for dolphins and porpoises on both sides of the helicopter. Data on sighting position, environmental conditions, group size and behaviour of the dolphins or porpoises were recorded when they were sighted. The off-effort helicopter surveys were mainly used to collect data for distribution of Chinese White Dolphins and finless porpoises, but individual dolphins with very distinct identifying features were occasionally identified from pictures taken from the helicopter.

### *4.3 Photo-identification Work with Focal Follow Pilot Study*

When a group of Chinese White Dolphins were sighted during the line-transect survey, the survey team would end effort and approach the group slowly from the side and behind to take photographs of them. Every attempt was made to photograph each dolphin in the group, and even photograph both sides of the dolphins, since the colouration and markings on both sides may not be symmetrical. Two professional digital cameras (*Canon* EOS 7D and 60D models), each equipped with long telephoto lenses (100-400 mm zoom), were available on board for researchers to take sharp, close-up photographs of dolphins as they surfaced. The images were shot at the highest available resolution and stored on Compact Flash memory cards for downloading onto a computer.

All digital images taken in the field were first examined, and those containing potentially identifiable individuals were sorted out. These photographs would then be examined in greater details, and were carefully compared to over 800 identified dolphins in the PRE Chinese White Dolphin photo-identification catalogue. Chinese White Dolphins can be identified by their natural markings, such as nicks, cuts, scars and deformities on their dorsal fin and body, and their unique spotting patterns were also used as secondary identifying features (Jefferson 2000a; Jefferson and Leatherwood 1997). All photographs of each individual were then compiled and arranged in chronological order, with data including the date and location first identified (initial sighting), re-sightings, associated dolphins, distinctive features, and age classes entered into a computer database. Any new individuals were given a new identification number, and their data were also added to the catalogue, along with text descriptions including age class, gender, any nickname or unique markings. The updated photo-ID catalogue incorporated all new photographs of individual dolphins taken during the present study.

A pilot study of focal follow observations of individual dolphins was also conducted to examine their movement patterns and behaviour in greater detail . The focal follow study can gain knowledge on their utilization of different parts of the dolphins' ranges and core areas, and to determine whether important traveling corridors exist for individuals or different social clusters to transit between different parts of North and West Lantau waters.

The targets of this focal follow study were individual dolphins or small stable groups of Chinese White Dolphins with members that could be readily identified with unaided eyes during observations. During the regular line-transect surveys, when such targets were encountered and the weather condition was favourable, the on-effort search would be aborted and extended periods would be spent to follow the targeted dolphin or dolphin groups. During focal follows, the research vessel was driven parallel to the group, matching the dolphin(s) heading and speed and at such a distance as to minimize influencing the dolphin(s) movements (Würsig and Jefferson 1990; Markowitz et al. 2004). The positions and time data were continuously logged by handheld GPS at 5-minute intervals to track their movement. In addition, information including the environmental condition, the dolphin's reaction to research vessel, boat association, sub-group size and composition, behavioural state of the dolphins, as well as the occurrence of moving vessels around the targeted individuals were recorded. The sampling duration for each focal follow session was extended as long as possible, in order to provide the best representative sampling of individual movement patterns.

### *4.4 Dolphin-related Acoustic Work*

#### 4.4.1. Calibrated hydrophone

For acoustic data collection, a set of calibrated hydrophones were deployed 3 to 7 metres below the sea surface by a 2-metre long spar buoy from the stern of the research vessel, with the vessel engine switched off and the vessel drifting. Recordings of background ambient noise and broadband dolphin sounds were made with a Cetacean Research Technology spot-calibrated hydrophone (model: CR1; sensitivity: -197.7 dB, re. 1 V/μPa; usable frequency response listed as 4 Hz-68 kHz +3/-12 dB connected to a 1 MΩ input impedance; linear frequency range: 0.2-48 kHz ± 3 dB). The spar buoy acted to prevent excessive hydrophone movement from wave and boat motion. The recordings were then streamed into a digital memory field recorder (model: Fostex FR-2; frequency response: 20 Hz-80kHz ±3 dB) with a pre-amplified signal conditioner (model: PC200-ICP; precision gain: x0.1-x100; frequency range: >100 kHz; system response: 1 Hz-100 kHz ± 3 dB) to prevent overloading and minimize cable noise. The recordings were stored in a 4 GB Compact Flash Card, to be downloaded onto a laptop computer for further analysis.

During regular line-transect surveys, the HKCRP research vessel would stop at various monitoring stations set up along the transect lines in North, West and South Lantau waters (Figure 3) to collect ambient sound level and existing/potential anthropogenic noises within the dolphin habitat. Date, start and end times, hydrophone and water depths, Beaufort sea state, area, start and end locations, gain, event, and notes were taken for each recording. Additional locations were also included opportunistically to collect vocalizations of dolphins when they came close to the stern of the research vessel.

#### 4.4.2. Towed hydrophone

HKCRP research team also used a towed hydrophone array developed by Mr. Josh Jones, at the Whale Acoustic Lab at Scripps Institution of Oceanography, to enhance the overall capability of the current acoustic data collection regime on local dolphins. The hydrophone array was set in an oil-filled tube and was composed of two Burns Electronic CR-80 hydrophones with high-pass filters. It was connected to 50 metres of reinforced cable and was plugged into an amplifier/filter box onboard the HKCRP research vessel. The filters were designed to remove ship and flow noise for real-time listening and to facilitate automated detection of clicks and whistles produced by the Chinese White Dolphins (and possibly finless porpoises). The entire system was connected to a laptop with computer programs *Logger* 2000 and *Ishmael* 1.0, which allowed visual display of the signals in a real-time spectrogram, and to perform automated detection and localization of clicks and whistles.

#### 4.4.3. Passive acoustic monitoring system

During the present monitoring period, a feasibility study on the application of passive acoustic monitoring (PAM) system was conducted to gain further knowledge of different aspects of local dolphins. The latest version of the PAM system the C-POD (Chelonia Limited, see www.chelonia.co.uk) was used, which consists of an 80-cm long plastic pipe with a hydrophone at one end below which an electronic filter and amplifier are positioned. The hydrophone records all sounds omnidirectionally within the frequency range of 20-160 kHz. By using C-PODs, continuous information can be obtained on the presence or absence of Chinese White Dolphins at selected locations over extended periods, independent of weather conditions and time of day (i.e. during low light situations where visual detection is highly compromised). The data collected by C-POD were automatically filtered to remove clicks from ambient noise and boat sonar, and data analysis was largely automated as well, although some visual verification is essential for calibration and to ensure the accuracy of automated detection.

The C-POD detects tonal clicks and logs the time, duration and other click features to a 5-ms resolution. Cetacean clicks are 'tonal' because a narrow band of frequencies within a small range contains more energy than the rest of the broadband frequency range (Richardson et al. 2005). Cetacean clicks were logged by C-POD when exceeding a user-defined threshold frequency of 20 kHz with a range up to 160 kHz. By being selective of which sounds to log, the C-POD stored small amounts of data spanning a long period of time.

### *4.5. Shore-based Theodolite Tracking Work*

During the present study period, a long-term behavioural study on Chinese White Dolphins using a shore-based theodolite tracking technique continued, to determine if dolphin movement patterns and behaviours change in the presence of different types of vessels (Piwetz et al. 2012).

Shore-based theodolite tracking sessions were conducted from three different stations at Tai O, Shum Wat and Fan Lau during the present study period, with different research goals in mind at each station (Figure 4). Observation from Tai O aimed to examine the impacts of dolphin-watching and trawling activities as well as to collect information on undisturbed behaviours of Chinese White Dolphins. From Fan Lau, shore-based observation targeted the movement of high-speed ferries traversing between Hong Kong, Macau and mainland Chinese cities, which may have created immense acoustic disturbance to dolphins occurring in this area (see Hung 2012; Sims et al. 2012). The station near Shum Wat was set up for collecting information to examine impacts of HZMB construction on dolphins, including the acoustic disturbance from bored piling activities as well as the potential obstruction of limiting north-south movement of dolphins underneath the bridge. All three stations were selected based on height above sea level (>20 metres; Würsig et al. 1991), close proximity to shore, and unobstructed views of dolphin habitat. To maximize the efficiency, research was typically conducted from one station per shore-based study day so that valuable daylight hours were not spent traveling among sites.

For the theodolite-tracking works conducted from these three stations, the methodology followed the one described by Piwetz et al. (2012). A digital theodolite (Sokkia Model DT5) with 30-power magnification and ±5-sec precision was well-positioned from unobstructed vantage points and at such a height above the monitoring area, so that movement and behavioural patterns of Chinese White Dolphins were continuously monitored. The digital theodolite recorded horizontal and vertical angles, while a computer with *Pythagoras* software (version 1.2; Gailey and Ortega-Ortiz 2002), tethered to the theodolite, recorded those angles that were then converted to geographic coordinates (latitude and longitude) of objects (dolphin, boats, etc.) being tracked, thus providing information on their distance from shore, distance from other objects, and relative speed and orientations. At Tai O, two theodolites were set up on some survey days for synchronized tracking work to improve the overall data collection efficiency, with one focusing on tracking dolphin movement and behaviour while the other one focusing on tracking vessel movements.

On each survey day, observers searched continuously for dolphins using the unaided eye and hand-held 7x50 *Brunton* or *Steiner* binoculars. A theodolite tracking session was initiated when an individual dolphin or group of dolphins was located, and focal follow methods were used to track the dolphins (Lundquist 2012; Lundquist et al. 2012a, b; Piwetz et al. 2012). Within a group, a focal individual was selected for the purposes of tracking the behaviour and movement of the group, based on its distinctive feature such as colouration or severe injury mark. The focal individual was then tracked continuously via the theodolite, with positions recorded whenever the dolphin surfaces. If an individual could not be positively distinguished from other members, the group was tracked by recording positions based on a central point within the group when the dolphins surface.

In addition to tracking dolphins, all vessels that moved within close proximity to shore (<5 km) were tracked. At least two positions for each vessel were obtained to calculate leg speed. Additional positions were acquired when vessels changed course or speed. A tracking session continued until focal animals moved beyond the range of reliable visibility (generally >2 km), or visibility was obstructed due to environmental conditions (e.g., intense haze, Beaufort sea state >5, or sunset).

### *4.6 Data Analyses*

#### 4.6.1. Distribution pattern analysis

The line-transect survey data was integrated with Geographic Information System (GIS) in order to visualize and interpret different spatial and temporal patterns of dolphin and porpoise distribution using sighting positions. Location data of dolphin and porpoise groups were plotted on map layers of Hong Kong using a desktop GIS (ArcView© 3.1) to examine their distribution patterns in details. The dataset was also stratified into different subsets to examine distribution patterns of dolphin groups with different categories of group sizes, fishing boat associations, young calves and activities. Data from the long-term sighting databases were used to compare past distribution patterns of dolphins and porpoises in recent years to the one in the present study period.

### 4.6.2. Encounter rate analysis

Since the line-transect survey effort was uneven among different survey areas and across different years, the encounter rates of Chinese White Dolphins and finless porpoises (number of on-effort sightings per 100 km of survey effort) were calculated in each survey area in relation to the amount of survey effort conducted. In addition, the encounter rates of young dolphin calves, and dolphin groups engaged in different activities were calculated to compare with previous monitoring periods and to detect any temporal changes. The encounter rate could be used as an indicator to determine areas of importance to dolphins and porpoises within the study area.

### 4.6.3. Line-transect analysis

Density and abundance of Chinese White Dolphins were estimated by line-transect analysis using systematic line-transect data collected under the present study. For the analysis, survey effort in each single survey day was used as the sample. Estimates were calculated from dolphin sightings and effort data collected during conditions of Beaufort 0-3 (see Jefferson 2000a), using line-transect methods (Buckland et al. 2001). The estimates were made using the computer program DISTANCE Version 6.0, Release 2 (Thomas et al. 2009). The following formulae were used to estimate density, abundance, and their associated coefficient of variation:

$$\hat{D} = \frac{n\ \hat{f}(0)\ \hat{E}(s)}{2\ L\ \hat{g}(0)}$$

$$\hat{N} = \frac{n\ \hat{f}(0)\ \hat{E}(s)\ A}{2\ L\ \hat{g}(0)}$$

$$\hat{CV} = \sqrt{\frac{\hat{\text{var}}(n)}{n^2} + \frac{\hat{\text{var}}[\hat{f}(0)]}{[\hat{f}(0)]^2} + \frac{\hat{\text{var}}[\hat{E}(s)]}{[\hat{E}(s)]^2} + \frac{\hat{\text{var}}[\hat{g}(0)]}{[\hat{g}(0)]^2}}$$

where D = density (of individuals), n = number of on-effort sightings, f(0) = trackline probability density at zero distance, E(s) = unbiased estimate of average group size, L = length of transect lines surveyed on effort, g(0) = trackline detection probability, N

= abundance, A = size of the survey area, CV = coefficient of variation, and var = variance.

A strategy of selective pooling and stratification was used in order to minimize bias and maximize precision in making the estimates of density and abundance (see Buckland et al. 2001). Distant sightings were truncated to remove outliers and accommodate modeling, and size-bias corrected estimate of group size was calculated by regressing $\log_e$ of group size against distance. Three models (uniform, half-normal and hazard rate) were fitted to the data of perpendicular distances. The model with the lowest values of Akaike's Information Criterion (AIC) was chosen as the best model and used to estimate f(0) and the resulting dolphin density and abundance (Buckland et al. 2001).

Besides estimating dolphin abundance in 2012, annual abundance estimates were also generated for every year since 2001 in NWL and NEL survey areas and since 2003 in WL survey area, to investigate any significant temporal trend using linear regression model. To perform such trend analysis, the linear regression model is considered in the three areas by Dr. Gilbert Lui from the Department of Statistics and Actuarial Science of the University of Hong Kong, as follow:

$$x_t = a + bt + u_t \qquad \text{for} t = 1, \ldots, n$$

where $x_t$ denotes the abundance data of dolphin at time $t$, $n$ is the number of observations, and $u_t$ is an error term which follows normal distribution with mean zero and variance $\sigma^2$.

4.6.4. Quantitative grid analysis on habitat use

To conduct quantitative grid analysis of habitat use (Hung 2008), positions of on-effort sightings of Chinese White Dolphins and finless porpoises were retrieved from the long-term sighting databases, and then plotted onto 1-km$^2$ grids among the nine survey areas on GIS. Sighting densities (number of on-effort sightings per km$^2$) and dolphin/porpoise densities (total number of dolphins/porpoises from on-effort sightings per km$^2$) were then calculated for each 1 km by 1 km grid with the aid of GIS. Sighting density grids and dolphin/porpoise density grids were then further normalized with the amount of survey effort conducted within each grid. The total amount of survey effort spent on each grid was calculated by examining the survey coverage on each line-transect survey to determine how many times the grid was surveyed during the study period. For example, when the survey boat traversed through a specific grid 50 times, 50 units of survey effort were counted for that grid. With the amount of survey effort calculated for each grid, the sighting density and dolphin/porpoise density of each grid were then normalized (i.e. divided by the unit of survey effort).

The newly-derived unit for sighting density was termed SPSE, representing the number of on-effort **s**ightings **p**er 100 units of **s**urvey **e**ffort. In addition, the derived unit for actual dolphin/porpoise density was termed DPSE, representing the number of **d**olphins **p**er 100 units of **s**urvey **e**ffort. Among the 1-km$^2$ grids that were partially covered by land, the percentage of sea area was calculated using GIS tools, and their SPSE and DPSE values were adjusted accordingly. The following formulae were used to estimate SPSE and DPSE in each 1-km$^2$ grid within the study area:

$$SPSE = ((S / E) \times 100) / SA\%$$

$$DPSE = ((D / E) \times 100) / SA\%$$

where S = total number of on-effort sightings
D = total number of dolphins / porpoises from on-effort sightings
E = total number of units of survey effort
SA% = percentage of sea area

Both SPSE and DPSE values can be useful in examining dolphin/porpoise usage within a one square kilometre area. For the present study, both SPSE and DPSE values were calculated in each 1-km$^2$ grid among all survey areas for the entire one-year period in 2012, and in recent years of monitoring (2008-12 for Chinese White Dolphins and 2004-12 for finless porpoises).

### 4.6.5. Behavioural analysis

When dolphins were sighted during vessel surveys, their behaviour was observed. Different behaviours were categorized (i.e. feeding, milling/resting, traveling, socializing) and recorded on sighting datasheets. This data was then input into a separate database with sighting information, which can be used to determine the distribution of behavioural data using a desktop GIS. Distribution of sightings of dolphins engaged in different activities and behaviours would then be plotted on GIS and carefully examined to identify important areas for different activities. The behavioural data was also used in the quantitative analysis on habitat use (see Section 4.6.4) to identify important dolphin habitats for various activities.

### 4.6.6. Ranging pattern analysis

For the ongoing ranging pattern study, location data of individual dolphins with 10 or more re-sightings that were sighted during the present study period were obtained from the dolphin sighting database and photo-identification catalogue. To deduce home ranges for individual dolphins using the fixed kernel methods, the program Animal Movement Analyst Extension, created by the Alaska Biological Science Centre, USGS (Hooge and Eichenlaub 1997), was loaded as an extension with ArcView© 3.1 along with another extension Spatial Analyst 2.0.

Using the fixed kernel method, the program calculated kernel density estimates based on all sighting positions, and provided an active interface to display kernel density plots. The kernel estimator then calculated and displayed the overall ranging area at 95% UD (utilization distribution) level. The core areas of individuals with 15+ re-sightings at two different levels (50% and 25% UD) were also examined to investigate their range use in greater detail.

#### 4.6.7. Residency pattern analysis

To examine the monthly and annual occurrence patterns of individual dolphins, their residency patterns in Hong Kong were carefully evaluated. “Residents” were defined as individuals that were regularly sighted in Hong Kong for at least eight years during 1995-2012, or five years in a row within the same period. Other individuals that were intermittently sighted during the past years were defined as “Visitors”. In addition, monthly matrix of occurrence was also examined to differentiate individuals that occurred year-round (i.e. individuals that occur in every month of the year) or seasonally (i.e. individuals that occur only in certain months of the year). Using both yearly and monthly matrices of occurrence, “year-round residents” were the individual dolphins that were regularly sighted in Hong Kong throughout the year, while “seasonal visitors” were the ones that were sighted sporadically in Hong Kong and only during certain months of the year within the study period.

#### 4.6.8. Movement pattern analysis

Individual movement across different survey areas during the monitoring period were broadly examined using the photo-ID data, while detailed movement patterns of individual dolphins were further assessed using the focal follow observation data. Locations of these identified individuals from the focal follows were plotted on a GIS to illustrate their tracklines for visual interpretation on movement pattern. In addition, past records of the individual dolphins observed during previous photo-identification works were analyzed to deduce their past movement patterns, by drawing segments between consecutive sightings being made within consecutive days. These past movement patterns recorded during surveys were compared with the movement patterns collected during the dedicated focal follow observations under the present pilot study.

### 4.6.9. Acoustic data analysis

#### 4.6.9.1 Characteristics of dolphin whistles

For the present monitoring period, a study on whistles of Chinese White Dolphins in Hong Kong as part of the acoustic repertoire was initiated by Mr. Jordan Hoffman from Trent University, in order to improve understanding of the vocalizations of local dolphins. Under this study, sound recordings collected from calibrated hydrophone and towed hydrophone were opened in Raven Pro 1.4 (Cornell Lab of Ornithology, Ithaca, New York) to digitally process audio signals and produce spectrograms (smoothing window: Hanning; Fast Fourier Transform (FFT): 1024; hop size: 10-11 ms; FFT window overlap: 50%), where vocalizations could be visualized in terms of their frequency as a function of time. Acoustic parameters (duration, minimum frequency, maximum frequency, frequency range, start and end frequency, and number of harmonics) were measured from whistle spectrograms using the 'selections' tool in Raven Pro 1.4 to quantify whistle types detected in recordings.

Measurements of the maximum frequency were restricted by the upper limit of the calibrated hydrophone (48 kHz) and the towed hydrophone array (24 kHz). Number of inflection points and the number of upsweeps / downsweeps was counted on the spectrogram. Whistle types were defined according to visual inspection of the contour shape in the spectrogram. Basic whistle types were categorized into idealized shapes based on Petrella et al. (2011) including: unmodulated, constant frequency (ranging no more than 1,000 Hz from maximum to minimum frequency), upsweep, downsweep, convex, concave, wavering sinusoidal, or more complex intermediate types.

Whistles were scored on quality from 1 (poor) to 4 (excellent) based on the ability to identify contour shape and the signal to noise ratio. To minimize the use of unreliable whistles, only quality 3 and quality 4 whistles were used in the analyses. Quality 1 whistles were detected aurally, but had a weak signal to noise ratio to detect on a spectrogram. Quality 2 whistles were detected both aurally and on a spectrogram, but had an intermediate signal to noise ratio to reliably confirm the contour shape on spectrogram. Quality 3 whistles were detected both aurally and on a spectrogram, with reliable contour shape and a strong signal to noise ratio. Quality 4 whistles were detected both aurally and on a spectrogram, with a very clear contour shape and a very strong signal to noise ratio.

4.6.9.2. C-POD analysis with focus on diel pattern of dolphin occurrence

The C-POD data was analyzed by Mr. Jordan Hoffman of Trent University, and a specific software (CPOD.exe) developed by Chelonia Limited was used to detect cetacean click trains with a user-defined range of 5+ clicks in a single train. Dolphin/porpoise clicks of low, moderate and high probability of originating from cetaceans were analyzed using the GENENC classifier. The main limitation of the GENENC classifier is where there are significant densities of weak unknown train sources that may be classed as originating from dolphins. However, visual data validation confirmed a low classification error rate (approximately 0.4%), so the GENENC classifier was chosen over the more basic KERNO classifier.

Detection positive minutes (DPM), the total amount of minutes where at least one click train was detected within a one-minute time period, was used as a measure of the duration dolphins spent in an area. The number of click trains has been revealed in previous studies to be an unreliable measure of relative area usage as click trains are occasionally split into shorter segments, especially when inter-click intervals were longer (Carlström 2005). Using DPM also eliminated the possibility of counting individual click trains produced by more than one dolphin, as the number of dolphins detected by C-POD at a time was unknown. DPM has previously been reported by Haelters et al. (2010) on harbour porpoises, and Elliot et al. (2011) on common bottlenose dolphins.

To examine the diel pattern of dolphin occurrences, the C-POD data was classified into one of four diel phases (morning, day, evening and night) used in previous studies on harbour porpoises (Carlström 2005; Todd et al. 2009) and common bottlenose dolphins (Elliot et al. 2011) to detect patterns of area usage. Diel phases were based on the vertical angle of the sun to the horizon, and hence the amount of available light for vision, as defined by the US Naval Observatory (www.usno.navy.mil). The onset of morning was at the beginning of civil twilight where the sun was geometrically six degrees below the horizon, and the duration of morning was defined as twice the time between the beginning of civil twilight and sunrise. The end of evening was defined as the end of civil twilight. The duration of evening lasts twice the duration of the time between sunset and the end of civil twilight. Morning and evening phases have been noted in previous studies as possible changeover phases where animals may be leaving or arriving to the area, and so were included in the present study (Carlström 2005; Todd et al. 2009; Elliot et al. 2011).

### 4.6.10. Theodolite-tracking data analysis

The theodolite-tracking data was analyzed by Ms. Sarah Piwetz at Texas A&M University, a graduate student of Professor Bernd Würsig, using the *Pythagoras* software (version 1.2; Gailey and Ortega-Ortiz 2002) developed by his team. For the present study, theodolite tracking data collected from the Fan Lau station was analyzed to understand the potential impacts of vessel traffic, including high-speed ferries in Southwest Lantau, on the movement and behaviour of Chinese White Dolphins.

For the data analysis, focal follow data were filtered to include only tracks obtained by experienced personnel that were 10 minutes or greater in duration. If two consecutive dolphin tracks were more than 5 minutes apart, they were split and analyzed separately. Three factors were calculated for each track including the total number of vessels present over the entire track, the maximum number of vessels present at any time, and the number of different types of vessels over the entire track. A broad time of day category was also assigned for each track (morning = first position recorded before 12 pm; afternoon = first position recorded at 12 pm or later). Dolphin response variables that were calculated for each track included mean swimming speed, reorientation rate, and linearity. Mean swimming speed was calculated by dividing the distance traveled by the duration between two consecutive positions (Gailey et al. 2007). Reorientation rate quantifies the change in bearing along individual tracklines relative to linear movement. This rate was calculated by adding all bearing changes in degrees along a trackline and dividing by total duration in minutes of that trackline (Smultea and Würsig 1995). Linearity is an index of net movement and was calculated by taking the sum of distances traveled for each leg and dividing by the net distance between the first and last fix of a track.

To evaluate variation in dolphin movement patterns in the presence of vessels, it was necessary to establish a distance threshold. When vessels were within 500 m of the focal individual or group, they were considered present. Because it is not possible to record geographic locations of all targets simultaneously, positions for dolphins and vessels were interpolated *post hoc*, allowing for a more precise estimation of vessel distances from dolphins at a given time.

The generalized additive models (GAMs) framework is well-suited for detecting trends in complex data that are multivariate and nonlinear by nature (Hastie and Tibshirani 1986; Richards et al. 2010). Smoothing models fit data locally rather than globally (Quinn and Keough 2002) and evaluate predictor variables simultaneously which reduces problems associated with many step-wise techniques. GAMs were fitted for data using the mgcv package, Version 2.14.2 in *R* (Wood 2001) to evaluate dolphin responses to natural and human-generated variables of interest. This particular package uses thin-plate regression splines for fitting smooth terms for the predictor or explanatory variables.

Histogram outputs were used to select the appropriate distribution and link function for each response variable. The fully saturated model is:

$$y \sim s(SumBoats) + MaxBoats + TypeOfBoats + TimeOfDay$$

Smooth terms were dropped from the model if the following three conditions were met (based on guidelines described by Wood, 2001):

1. The estimated degrees of freedom (edf) was near to 1
2. The confidence interval for the term included 0 everywhere
3. The generalized cross-validation (GCV) score dropped and deviance explained increased when the term was removed

If only condition 1 was met, then a linear term replaced the smooth term. Linear terms were then dropped if:

1. The parameter coefficient was close to 0
2. The significance of the term was near to 1
3. The GCV score dropped and deviance explained increased when the term was removed

The fully saturated analytical technique is a model that considers all variables of interest for when dolphin movement might be affected (Bain et al. 2006, Lundquist 2012). After this model was run, the GAM statistical technique was applied to identify predictor variables for differences in movement and to describe the heterogeneity in the response. If the variables of interest were significant factors in the best-fitting model, then it can be determined whether they influenced dolphin movements.

## 5. RESULTS AND DISCUSSIONS

### *5.1. Summary of Survey Effort, Dolphin and Porpoise Sightings*

5.1.1. Number of surveys

During the monitoring period (i.e. April 2012 to March 2013), 163 line-transect vessel surveys were conducted among nine survey areas in Hong Kong waters. These included 31 surveys in NEL, 41 surveys in NWL, 35 surveys in WL, 21 surveys in SWL, 16 surveys in SEL, five surveys in DB, five surveys in LM, five surveys in PT and four surveys in NP. The details of the survey effort data are shown in Appendix I.

In addition, with the support of the Government Flying Service, five helicopter surveys were arranged by AFCD on May 16$^{th}$, July 9$^{th}$, September 3$^{rd}$, December 12$^{th}$ and January 7$^{th}$ during the 12-month study period. These surveys mainly covered the eastern and southern waters of Hong Kong, and off-effort data on local dolphins and porpoises collected from these surveys were also included in the distribution analysis and group size analysis.

5.1.2. Survey effort

From April 2012 to March 2013, 609.0 hours were spent to collect 5,038.7 km of survey effort among the nine survey areas in Hong Kong. The majority of effort (79.3% total) was conducted in six survey areas where dolphins regularly occur, in which 42.3% of total effort were spent in NEL/NWL, 14.3% in WL, 20.6% in SEL/SWL and 2.2% in DB. In addition, 41.3% of total survey effort was also allocated to survey areas in southern and eastern waters of Hong Kong where porpoise occurrences were more frequent. Notably, 91.0% of total survey effort was conducted under favourable sea conditions (Beaufort 3 or below with good visibility), which is crucial to the success of the marine mammal data collection programme in Hong Kong as only such data can be used in various analyses to examine encounter rate, habitat use, and estimation of density and abundance.

Since 1996, the long-term marine mammal monitoring programme coordinated by HKCRP has collected a total of 139,057 km of line-transect survey effort in Hong Kong and Guangdong waters of the Pearl River Estuary under different government-sponsored monitoring projects, consultancy studies and private studies, with 53.4% of the effort funded by AFCD. The survey effort in 2012 alone comprised 4.9% of the total survey effort collected since 1996.

5.1.3. Chinese White Dolphin sightings

From April 2012 to March 2013, 345 groups of Chinese White Dolphins, numbering 1,097 individuals, were sighted from both vessel and helicopter surveys (Appendix II). Among these dolphin groups, 251 were sighted during on-effort line-transect vessel surveys, while the other 94 sightings were made during off-effort search. Most dolphin sightings were made in WL (169 sightings) and NWL (108 sightings), comprising 80.3% of the total. Dolphins occurred much less frequently in NEL (29 sightings) and SWL (35 sightings) despite the consistent survey effort that was conducted in these two areas. Only four sightings were made in Deep Bay, likely due to the low amount of survey effort there. No dolphin was sighted in SEL, LM, PT or NP survey areas.

5.1.4. Finless porpoise sightings

During the 12-month study period, 97 groups of finless porpoises totaling 292 individuals were sighted during vessel surveys (see Appendix III). Eighty-two sightings were made during on-effort search, which can be used in the encounter rate analysis and habitat use analysis. The porpoise groups were mainly sighted in SEL (39 groups) and SWL (31 groups), with another 18 and 8 groups sighted in LM and PT respectively. Only one group of two porpoises were sighted in NP survey area, which was partly due to the low amount of survey effort conducted there.

*5.2. Distribution*

5.2.1 Distribution of Chinese White Dolphins

During the 12-month study period, Chinese White Dolphins were sighted to the north, west and south of Lantau Island as well as at the mouth of Deep Bay (Figure 5). In North Lantau, dolphin sightings were concentrated within and adjacent to the Sha Chau and Lung Kwu Chau Marine Park, around the Brothers Islands, and to the west of the airport platform near Shum Wat (Figure 6). They also occurred near Black Point, to the northeast of the airport platform, and the coastline between Yam O and Sham Shui Kok. Notably, the water adjacent to the east side of the airport platform was blocked off by the reclamation works of the Hong Kong Boundary Crossing Facilities (HKBCF) since the first quarter of the study period. That body of water is no longer available for the dolphins, but they still occurred in the nearby Tai Mo To (Figure 6).

In West Lantau, dolphins were sighted along the entire coastline, with particularly higher concentrations near Tai O Peninsula, Kai Kung Shan, Peaked Hill and Fan Lau (Figure 7). As in the previous monitoring period in 2011-12, dolphins appeared to occur more often inshore than in the offshore waters (Figure 7). Moreover, dolphins rarely occurred on the last transect line at the southern end of the survey area, where intense high-speed ferry traffic traverses throughout the day (Figure 7). In fact, most dolphin sightings toward the southern end of the survey area mainly clustered around the tip of Fan Lau, and this was likely due to their avoidance behaviour from the high-speed ferry traffic (Hung 2012).

Similar to the previous monitoring period, dolphins were regularly sighted at the juncture between NWL and WL survey areas near Shum Wat (Figures 6-7). It should be emphasized that this important region was identified as the overlapping area where individual dolphins from both northern and western social clusters in Hong Kong come into contact (Dungan et al. 2012). During the first quarter of 2013, bored piling works associated with the Hong Kong Link Road (HKLR) construction in this particular area will be commenced, and dolphin usage of this area should be closely monitored to determine whether the on-going construction works will affect the movements of dolphins from both social clusters into this important habitat.

When compared with the distribution records in the previous five monitoring periods (2007-12), distribution pattern of Chinese White Dolphins in the present period (2012-13) was similar to the ones in recent years. However, it appeared that more dolphins occurred between Pillar Point and the airport platform in 2012-13 (Figure 8), which may be related to the diminished level of dredging works at the contaminated mud pits in this area in recent months. Moreover, dolphins were more frequently sighted toward the western end of the airport platform at the juncture of NWL and WL survey areas in 2012-13 (Figure 8), which coincided with the frequent movement of individual dolphins between North and West Lantau waters (see Section 5.8.2). Notably, the waters to the north of the Brothers Islands, especially near Siu Lam and Castle Peak Bay were rarely utilized by dolphins in the past, but several dolphin groups were sighted in this area in the past two monitoring periods (Figure 8). On the contrary, dolphins used to occurred regularly at the northeast corner of the airport platform, but due to the reclamation works of HKBCF, dolphins have been absent from this area in 2012-13 (Figure 8). Finally, dolphins appeared to occur more often around the Soko Islands in 2012-13, where they were generally absent in the past three monitoring periods.

Seasonal variation was evident during the 2012-13 monitoring period. In North

Lantau, dolphin sightings were concentrated around both Lung Kwu Chau and Sha Chau in autumn months, but they only occurred around Lung Kwu Chau but not near Sha Chau in summer months. Moreover, they occurred more often around the Brothers Islands in summer and autumn months, but not in winter and spring months (Figure 9). In summer months, dolphins occurred much more frequently in West Lantau than the other three seasons, especially between Tai O Peninsula and the airport platform. In South Lantau, dolphins mostly occurred near Kau Ling Chung in summer months but not in the other seasons, and they were only found around the Soko Islands in spring and summer months (Figure 9). This is in contrary to the previous monitoring period, when dolphins mainly occurred in South Lantau during autumn months (Hung 2012).

5.2.2. Distribution of finless porpoises

From April 2012 to March 2013, finless porpoises were mostly sighted in South Lantau waters, but to a lesser extent around the Lamma Island and Po Toi Islands (Figure 10). In particular, high concentration of porpoise sightings could be found in the waters between Shek Kwu Chau and the Soko Islands. In contrast to previous monitoring periods, very few porpoises occurred in the vicinity of Shek Kwu Chau, but they occurred much more frequently just a few kilometers to the west of Shek Kwu Chau (Figure 10). Notably, a number of porpoise sightings were made in the inshore waters of SEL and SWL (Figure 10), which was in contrary to the previous monitoring period with porpoises avoiding the most part of SWL and the inshore waters of SEL (Hung 2012).

In the LM survey area, porpoises were sparsely sighted at the southwest and eastern sides of the island (Figure 10). No porpoise was sighted near Po Toi Island or Beaufort Island in PT survey area, but most porpoise sightings made in this area were found near Sung Kong and Waglan Island, with a few sightings made in offshore waters. Surprisingly, no porpoise sighting was made in the eastern and northeastern waters of Hong Kong from helicopter surveys, and porpoises rarely occurred in the NP survey area during the study period (Figure 10).

When compared to previous distribution records of finless porpoises in recent years, it appeared that more porpoises were sighted in the inshore waters of South Lantau, and fewer of them were sighted in the eastern offshore waters (Figure 11). Notably, the waters between Shek Kwu Chau and Tai A Chau has been consistently utilized by finless porpoises at a high level during the past six monitoring periods (Figure 11), indicating the importance of this habitat to the Hong Kong porpoises.

### *5.3. Encounter Rate*

#### 5.3.1. Encounter rates on primary vs. secondary lines

Since 2010, data collection protocol for line-transect vessel surveys under the long-term marine mammal monitoring programme has been slightly revised, in which the survey effort conducted on primary lines (the main transect lines that run perpendicular to the coastline) and secondary lines (the connecting lines between the primary lines as well as the sections for transiting around islands) were separately recorded. This would allow the examination of the potential effect of secondary line data on overall dolphin encounter rates and abundance estimates. Here the dolphin encounter rate generated from the primary lines alone was compared with the dolphin encounter rates deduced from secondary lines as well as all lines combined (including both primary and secondary lines), to determine any noticeable difference among the three categories, and whether the effort and sighting data collected from secondary lines should be included in future analyses on dolphin encounter rates and abundance estimate.

Using the entire dataset collected during 2010-12 with 10,395 km of survey effort and 934 on-effort dolphin sightings, encounter rates (number of sightings per 100 km of survey effort) calculated from the three categories (i.e. primary lines alone, secondary lines alone and the combination of both primary and secondary lines) were broadly similar among the three main areas of dolphin occurrence (Figure 12). In fact, the encounter rates in NEL yielded from the three categories were essentially the same (3.9), and the ones in NWL only ranged between 7.3-7.9 with negligible differences. The encounter rate in WL yielded from primary lines (16.2) was slightly lower than the secondary lines (17.3), but was still very similar to the one deduced from the combination of both primary and secondary lines (16.8).

The results from the comparison between the three categories clearly indicated that there is no apparent bias induced from collecting survey effort and dolphin sighting information from the secondary lines to determine dolphin encounter rates. On the other hand, the incorporation of survey effort and dolphin sighting information can certainly increase the overall sample size to deduce a more accurate encounter rate. Therefore, it is recommended that both survey effort and sightings collected along primary and secondary lines should all be included in the encounter rate analysis and abundance estimation.

#### 5.3.2. Encounter rates of Chinese White Dolphins

To calculate encounter rates of Chinese White Dolphins, only data collected in

Beaufort 0-3 conditions was included in the analysis, since the dolphin encounter rate was considerably lower in Beaufort 4-5 conditions (4.84 sightings per 100 km of survey effort) than in Beaufort 0-3 conditions (7.30) during the study period. From April 2012 to March 2013, the combined encounter rate of Chinese White Dolphins from NWL, NEL WL and SWL was 7.3, which was slightly lower than the previous monitoring period (Figure 13). Among the survey areas around Lantau Island, the encounter rate was the highest in WL, which was much higher than the other four areas of main dolphin occurrence during the 12-month study period (Figure 14).

Temporal trends in annual dolphin encounter rates have been closely monitored in NWL/NEL since 1996, and WL since 2002. Overall, the combined annual encounter rates of NWL, NEL and WL showed a gradual decline since 2004, and reached the lowest in 2012 (Figure 15). Although the annual encounter rates in NWL and NEL were slightly bounced back in 2011 after a steady decline in recent years, they remained at a lower level in 2012 (Figure 15). In West Lantau, the annual encounter rate remained at a lower level during 2010-2012, and reached the lowest in 2012 (Figure 15). The declining trend in annual dolphin encounter rates coincided well with the decline in dolphin abundance in Hong Kong (see Section 5.4), which should be closely monitored in the next few years in light of the intensive construction activities of the Hong Kong-Zhuhai-Macau Bridge (HZMB).

### 5.3.2. Encounter rates of finless porpoises

Encounter rates of finless porpoises were calculated using only data collected in Beaufort 0-2 conditions, since the porpoise encounter rate dropped noticeably from 4.73 sightings per 100 km of survey effort in Beaufort 0-2 conditions to 1.79 in Beaufort 3-5 conditions. In 2012-13, the combined encounter rate of SWL, SEL, LM and PT was 4.7 porpoises per 100 km of survey effort, which was slightly higher than the one in 2011-12 monitoring period (4.3), and much higher than the ones recorded in 2010-11 and 2009-10 monitoring periods (3.3 and 3.5 respectively). Among the four survey areas, porpoise encounter rate was the higher in SEL (8.4) and SWL (5.9), but was considerably lower in PT (2.2). Out of the 180 km of survey effort in NP, only one on-effort sighting of porpoises was made, resulted in a very low encounter rate of 0.6 in this area.

The temporal trend of annual porpoise encounter rates showed that porpoise usage of Hong Kong waters varied considerably in the past decade (Figure 16). The one in 2012 was the fourth highest since 2002, and was higher than the previous two years (Figure 16). Among the four survey areas, the inconsistency in porpoise usage was even more evident (Figure 17). Notably, the porpoise encounter rate in LM was exceptionally high in 2012, while their usage in PT was the lowest in recent years. To account for the potential frequent movements across SEL, SWL and LM in winter and sprig months, the data was pooled to calculate the annual porpoise encounter rate and examined its trend in the past decade. In 2012, porpoise usage in the southern waters of Hong Kong was higher among recent years, which was likely contributed by the exceptionally high occurrence in LM (Figure 18). However, several infrastructure projects (e.g. IWMF, offshore windfarm, pipeline-laying) are currently under planning within the porpoise habitats in the southern waters of Hong Kong, and therefore the annual encounter rate of porpoises should be continuously monitored to examine their temporal pattern of habitat use in these waters.

### *5.4. Density and Abundance*

#### 5.4.1. Estimates of dolphin density and abundance in 2012

Using line-transect analysis method, the density and abundance of Chinese White Dolphins in NWL, NEL and WL were estimated, following the same methodology as in previous years of dolphin monitoring in Hong Kong (Hung 2011, 2012). Only effort and sighting data collected under conditions of Beaufort 0-3 were used in the analysis, which resulted in 3,998 km of on-effort survey effort and 282 groups of Chinese White Dolphins during the one-year study period.

In 2012, WL recorded the highest dolphin densities among the three survey areas, with 61.52 individuals/100 $km^2$ for the year, but was considerably lower than the previous year (100.40). NWL recorded a density of 45.73 individuals/100 $km^2$, which was very similar to the period of 2008-11. Notably, the differential in dolphin densities between NWL and WL was considerably lower in 2012 than in previous years. For example, in 2008-10, dolphin densities in WL were about three times higher than the ones in NWL. But in 2012, dolphin density in WL was only 1.4 times higher than the NWL. On the contrary, NEL recorded exceptionally low dolphin density in 2012 with 8.15 individuals / 100 $km^2$, which was much lower than in previous year (19.89).

The abundance estimates of Chinese White Dolphins in 2012 were 17, 40 and 4 individuals respectively in WL, NWL and NEL, with the combined estimate of 61 dolphins from the three areas. This estimate was considerably lower than in previous two years (75 dolphins in 2010; 78 dolphins in 2011), and was the lowest since dolphin abundance estimates were calculated in 2003 (Figure 19). The coefficient of variations (%CV) remained fairly low (17% in WL, 12% in NWL and 33% in NEL), indicating that the annual estimates generated in 2012 should be reliable.

5.4.2. Temporal trend in dolphin abundance

Temporal trends of annual dolphin abundance in each of the three survey areas were further examined since 2001. All three areas showed noticeable declining trends during the past decade (Figure 20). In WL, individual abundance has steadily decreased from 54 dolphins in 2007 to only 17 dolphins in 2012, with a 68.5% decline in just five years. The decline was the most obvious during 2011-12, dropping from 28 dolphins to 17 dolphins in one year. Similarly, dolphin abundance in NEL also dropped from the highest in 2001-03 (18-20 dolphins) to the lowest in 2012 (4 dolphins). After a brief rebound in 2011 to 11 dolphins in NEL, their abundance dropped noticeably to only 4 dolphins in the following year. Such a marked decline also occurred during 2003-04 and 2008-09. On the contrary, after a steady decline in dolphin abundance between 2001-08 in NWL, their numbers appeared to stabilized in recent years, and remained in the range of 35-40 dolphins.

Using the linear regression model, the test statistics for hypotheses $H_0{:}b=0$ vs. $H_1{:}b<0$ in the respective three areas were found to be as follow:

- West Lantau: the test statistic for the hypotheses was -5.3602 whose *p*-value was 0.0002 <5%. Therefore, the hypothesis $H_0$ is rejected at 5% level of significance and the abundance data of dolphin West Lantau was concluded to possess a significant downward sloping trend.

- Northwest Lantau: the test statistic for the hypotheses was -6.8957 whose *p*-value was ≈ 0.0000 <5%. Therefore, the hypothesis $H_0$ is rejected at 5% level of significance and the abundance data of dolphin Northwest Lantau was concluded to possess a significant downward sloping trend.

- Northeast Lantau: the test statistic for they hypotheses was -3.8688 whose *p*-value was ≈ 0.0016 <5%. Therefore, the hypothesis $H_0$ is rejected at 5% level of significance and the abundance data of dolphin Northeast Lantau was also concluded to possess a significant downward sloping trend.

5.4.3. Implications of significant downward trend in dolphin abundance

It is of great concern that the dolphin numbers have been significantly declining in the past decade, and the declining trend has apparently accelerated in recent years in WL, the most important dolphin habitat in Hong Kong (Hung 2008). In WL waters, in addition to the disturbance from the high-speed ferries near Fan Lau (Hung 2012) and dolphin-watching activities near Tai O (Hung 2006), the most obvious threat in recent years has been the reclamation works of artificial islands and associated construction activities of HZMB adjacent to the border of Hong Kong-Guangdong Province, which are only located a few kilometers from the critical dolphin habitats near Tai O Peninsula and Peaked Hill. Since the construction works across the border began in 2010-11, dolphin numbers in WL have been steadily declined from 43 dolphins in 2009 to only 17 dolphins in 2012. However, the relative contribution of these various threats towards the detected decline could not be ascertained.

It is uncertain how the reclamation and associated works adjacent to the western border of Hong Kong would have affected the dolphin usage of WL waters. However, it was evident from the ranging pattern analysis that most dolphins utilizing WL (i.e. individuals from the western social cluster) range extensively across the border with frequent cross-boundary movements (Hung 2008). One possible reason for the decline in dolphin numbers in WL waters is that dolphins occurred near the Hong Kong-Guangdong border has shifted their range elsewhere, or they have diminished their usage of this water due to the intensive construction activities and deterioration of overall marine environment in relation to the reclamation and associated works. If it is indeed a major factor to the decline, then the situation is unlikely to improve in the near future, as imminent construction works of the Hong Kong section of the HZMB will commence in 2013 and onward. The HKLR will be situated to the north of Tai O and pass through the juncture between NWL and WL, or the overlapping area where the two social clusters of Hong Kong dolphins meet (Dungan et al. 2012). Intensive bored piling activities will persist in the next few years with an increased amount of working vessels which will be present in this area. Moreover, the underwater tunnel connecting the two artificial islands just across the border will be constructed soon, which will undoubtedly cause even more disturbances to the dolphins, and affect their usage in this general area to the west of Lantau Island.

To combat these issues that are further compounded by the disturbance from high-speed ferry traffic and dolphin-watching activities in WL, there is an urgent need to establish the marine park at Fan Lau, and extend the park boundary to cover more important dolphin habitats in WL as previously suggested in Hung (2008). Without the proper protective measures to help safeguard dolphin usage in this area of important habitat, it will be difficult to stabilize or reverse the declining trend in WL. Moreover, stringent mitigation measures, such as the exclusion zone monitoring during bored piling activities along the HKLR alignment, should be strictly enforced in order to minimize the acoustic disturbance on the dolphins. In view of the new information on night-time occurrence and activities of dolphins from the passive acoustic monitoring study (see Section 5.9.3), and the uncertainty whether the night-time works would seriously affect the foraging activities of dolphins at night, any proposal of construction works outside of daylight hours should be carefully considered, in order to avoid any further disturbance to the dolphins in WL.

In NEL, the situation appeared to have worsened in 2012, with the dolphin abundance dropping to the lowest since 2001, or an 80% decline in just a decade. The sharp decline from 2011 to 2012 coincided with the HKBCF construction, in which the massive reclamation projects of 130 hectares to the northeast of Chek Lap Kok international airport has commenced in early 2012. With the deployment of silt curtains and working vessels anchoring nearby, the construction works might have taken up a significant amount of available habitat for the dolphins in NEL, and hence had caused some disturbance to the dolphins. The several on-going EM&A programmes of the HZMB projects should be able to shed more light on the causal relationship between the construction works and the dolphin occurrence in NEL. The problem was further compounded by the increased amount of vessel traffic originating from the Sky Pier on the airport island, which have caused serious acoustic disturbance to the dolphins and affected their movement from NWL into NEL (Hung 2012).

The declining usage of dolphins in NEL is worrisome, as the Brothers Islands in this area was once considered an important dolphin habitat (Hung 2008), and the waters around this group of islands will be designated upon the completion of HKBCF as a major compensation measure for the loss of dolphin habitat. Therefore, it is very important to ensure that the dolphins would continuously use the Brothers Islands and the rest of NEL as an important part of their range. Vessel movements and anchoring in this area in relation to the HKBCF construction works should be strictly regulated and minimized. The designation of the Brothers Islands Marine Park, or at least the enhancement measures to be implemented within the marine park, should be advanced as far as possible in order to provide early protection and benefit to the dolphins. Moreover, as suggested in the previous monitoring period (Hung 2012), the high-speed ferry traffic originating from the Sky Pier should be strictly regulated to minimize the disturbance to the dolphins. All management options should be considered to halt the continuous decline of dolphin usage in NEL, especially in light of the imminent construction of Tuen Mun-Chek Lap Kok Link in NEL waters which will undoubtedly cause even more disturbance to the dolphins. All future reclamation plans in NEL waters, in particular the proposed development at Siu Ho Wan which is in close proximity to the proposed Brothers Islands Marine Park, should be critically reviewed in order to help reverse the declining trend of dolphin usage.

The gradual decline in dolphin abundance in NWL appears to have stabilized in recent years, which is an encouraging sign especially when the rapid decline in the adjacent areas is considered. However, two pieces of massive reclamation have been proposed in this survey area within the dolphin habitats, including the third runway expansion project to the north of the airport that would involve 650 hectares of reclamation, and another reclamation project at Lung Kwu Tan that would involve several hundred hectares of reclamation. In view of the declining trend in dolphin abundance, such proposals should be carefully evaluated.

Considering the on-going construction works related to the HZMB construction in the coming years, and the existing threats within the dolphin habitats (e.g. water pollution, acoustic disturbance, risk of vessel collision), the Administration should give a high priority to insuring the Chinese White Dolphin’s continuous utilization of Hong Kong waters as part of their range. To achieve this goal, a presumption against further reclamation around Lantau waters would be needed, such that only fully-justified reclamation proposals with over-riding public needs would be considered. The presumption against reclamation could be relaxed when the declining trend of dolphin usage has been reversed, or reviewed when research effort has managed to establish the threshold of development pressure and other on-going threats that the local dolphin population can cope with. Such adaptive management strategy would be important to fulfill the overall long-term goal of the Chinese White Dolphin Conservation Plan adopted by the Hong Kong SAR Government, which is “to enable the Chinese White Dolphins to continue to use waters of Hong Kong as a portion of their population range and to enhance the continued survival of this dolphin population inhabiting the Pearl River Estuary” (AFCD, 2000).

### *5.5. Group Size and Group Composition*

5.5.1. Group sizes of Chinese white dolphins

From April 2012 to March 2013, group sizes of Chinese White Dolphins ranged from singles to 18 animals, with an overall mean of 3.2 ± 2.69. The mean dolphin group size in the present monitoring period reached the lowest in 2012-13 in the past decade, and was noticeably lower than the previous years (3.5 in both 2010-11 and 2011-12) (Figure 21). Among the six areas where dolphins regularly occurred, the mean group size was slightly higher in NEL (3.6), but was considerably lower in SWL (2.5). The mean group sizes in NWL, WL and DB were very similar to the average. Besides spring months with slightly higher mean group size (3.6), the ones in the other three seasons were very similar to the overall mean.

Moreover, the majority of dolphin groups sighted in 2012-13 monitoring period tended to be small, with 54.5% of the groups composed of 1-2 animals, and 77.1% of the groups with fewer than five animals (Figure 22). The smaller groups were scattered throughout the survey areas around Lantau Island, especially in the peripheral areas of the dolphins' range including the mouth of Deep Bay and around Soko Islands in SWL (Figure 23). On the contrary, 43 groups consisted of more than seven animals, and only six dolphin groups consisted of more than 10 animal. These large groups were mainly distributed along the west coast of Lantau as well as within the Sha Chau and Lung Kwu Chau Marine Park (Figure 23).

5.5.2. Group sizes of finless porpoises

During the 12-month study period, porpoise group sizes ranged from singles to eight animals, with an overall mean of 3.0 ± 2.77. This mean group size was slightly higher than the recent monitoring periods. Most porpoise groups sighted were generally very small, with 53.6% of porpoise groups composed of 1-2 animals, and 84.5% with less than five animals per group (Figure 24). Only 15 out of 97 groups consisted of five or more animals per group, and these larger groups were evenly spread across SWL, SEL and LM with no apparent concentration.

5.5.3. Group composition and calves of Chinese White Dolphins

Of the 1,097 dolphins sighted during April 2012 to March 2013, 60.3% were categorized into six age classes (see Jefferson 2000a). The spotted juveniles (22.7%) and spotted adults (17.9%) comprised of the majority of dolphins that were identified with their age classes. Moreover, a total of 8 unspotted calves (UC) and 38 unspotted juveniles (UJ) were sighted in Hong Kong during the 12-month period, and these young calves comprised of 4.2% of the total. Distribution and temporal trend of occurrence of these young calves were further examined. The UCs were mainly sighted around the marine park and near the Brothers Islands, while the UJs were evenly spread throughout NEL, NWL and WL with no particular concentration (Figure 25).

When compared to previous monitoring periods, the occurrence of young calves has been considerably lower in the recent two monitoring periods (2011-12 and 2012-13) (Figure 26a and 26b). The lower percentage of young calves could be related to the decline in dolphin abundance in WL, as this area used to be identified as an important area for nursing activities with higher densities of mother-calf occurrence (Hung 2008, 2012). As mother-calf pairs are more sensitive to anthropogenic disturbances, their occurrence and calf survival should be closely monitored throughout the HZMB construction period.

### *5.6. Activities and Associations with Fishing Boats*

The activities of Chinese White Dolphins were regularly observed and recorded during the systematic line-transect vessel surveys throughout the study period. A total of 40 and 13 dolphin groups were found to be associated with feeding and socializing activities respectively, comprising of 11.6% and 3.8% of the total dolphin sightings. The percentage of feeding activities in the present monitoring period was considerably lower than the previous three periods (Figure 27), which may be related to the decline in fishing boat association in 2012-13. Most of the feeding activities occurred around Lung Kwu Chau, near the Brothers Islands, and along the nearshore waters of WL and SWL (Figure 28). On the other hand, dolphins engaged in socializing activities in recent years were considerably less frequent than in earlier years (Figure 27). During the 12-month study period, sightings that were associated with the socializing activity were scattered near Sha Chau, Tai O Peninsula and Fan Lau (Figure 28).

Moreover, only 16 dolphin groups were associated with operating fishing boats, of 4.6% of all dolphin groups. The percentage in 2012 was the lowest since 1996, and will likely continue to fall in 2013 when the trawl ban in Hong Kong comes into effect. Among these 16 groups, 13 of them were associated with hang-trawlers, while the other three groups were associated with gill-netters. Most of these associations occurred in spring and summer months as in previous years. These boat-associated sightings were mainly distributed along the west coast of Lantau, while a few also occurred near Lung Kwu Chau, Kau Ling Chung and the Brothers

Islands (Figure 29).

*5.7. Habitat Use*

5.7.1. Habitat use patterns of Chinese White Dolphins

For the quantitative grid analysis on habitat use, the SPSE and DPSE values (i.e. sighting densities and dolphin densities respectively) were calculated among all grids in the six survey areas where Chinese White Dolphins regularly occurred during 2012 as well as the recent five-year period in 2008-12. In 2012, the important dolphin habitats in North Lantau waters that recorded high densities of dolphins were identified near Black Point, around Lung Kwu Chau, near Sha Chau, at the northeast corner of the airport platform and near Yam O (Figure 30). Most grids in WL recorded dolphin usage, with several areas with particularly high dolphin densities, including the waters near Tai O Peninsula, Kai Kung Shan, Peaked Hill and around Fan Lau. Only the grids near Kau Ling Chung recorded high dolphin density in South Lantau waters (Figure 30).

To examine dolphin habitat use in recent years, all survey effort and on-effort dolphin sightings from 2008-12 were pooled to calculate the overall SPSE and DPSE values during the five-year period. The longer study period with a much larger sample size offered a more accurate picture of where the important dolphin habitats were located in the western waters of Hong Kong in recent years. During this recent five-year period, most grids in North, West and Southwest Lantau were utilized by Chinese White Dolphins in various degrees (Figure 31). The only areas that were avoided by the dolphins were around the perimeter of the airport platform (but mainly due to the restricted zones with very little amount of survey effort), near Castle Peak Bay, the inner part of Deep Bay, north of Siu A Chau and southeast of Tai A Chau (Figure 31). On the other hand, the west coast of Lantau contained the most high-density grids, especially near Tai O Peninsula, Kai Kung Shan and Fan Lau. Moreover, a number of grids around Lung Kwu Chau also recorded very high dolphin densities, and several grids near the northeast corner of airport, Kau Ling Chung and Yam O also had moderately high dolphin densities (Figure 31). Notably, the Brothers Islands and Sham Shui Kok were once considered important habitat for dolphins, but dolphin densities there in the past five years have diminished, and the grids around the islands only recorded low to moderate dolphin densities (Figure 31). This coincided with the significant decline in dolphin abundance within this area in the past few years (see Section 5.4). Habitat use of dolphins in this area should be continuously monitored there during the construction of HKBCF, to determine whether dolphin usage in this area continues to dwindle.

### 5.7.2. Habitat use patterns of finless porpoises

The habitat use patterns of finless porpoises were also examined by calculating SPSE and DPSE values among the grids in the five areas where they regularly occurred (i.e. SWL, SEL, LM, PT and NP) for the entire year of 2012 and the nine-year period in 2004-12. In 2012, the spatial patterns of the porpoise habitat use revealed that their most heavily utilized habitats included the waters between Soko Islands and Shek Kwu Chau, to the southwestern and eastern side of Lamma Island, and near Waglan Island in PT (Figure 32). However, it should be cautioned that despite the very high porpoise densities recorded among the grids in LM, PT and NP survey areas, results in these grids could be heavily biased by the relatively low amount of survey effort during the one-year study period. Therefore, survey effort and porpoise sighting data should be pooled from past monitoring periods to depict a better picture of porpoise habitat use in Hong Kong waters.

Therefore, the SPSE and DPSE values of porpoise habitat use were also calculated by pooling the survey effort and on-effort porpoise sightings from 2004-12 with a larger sample size and longer study period. Since finless porpoise in Hong Kong exhibited pronounced seasonal pattern of distribution, with rare occurrence in each survey area during certain period of the year (Hung 2005, 2008; Jefferson et al. 2002a), the nine-year dataset was stratified into winter/spring (December through May) and summer/autumn (June through November) to deduce habitat use patterns of porpoises for the dry and wet seasons respectively.

For the examination of porpoise habitat use patterns during the dry season (winter and spring months) in 2004-12, in which survey effort was mostly allocated to SWL, SEL and LM survey areas, the grids with high porpoise densities were mostly located to the south of Tai A Chau, near Shek Kwu Chau, the waters between these two islands, the southwestern and eastern side of Lamma Island (Figure 33). On the contrary, the porpoises generally avoid the offshore area at the juncture of SEL and LM survey areas as well as the northern part of Lamma Island, and occurred in low densities toward the western end of SWL survey area and southeastern corner of LM survey area (Figure 33).

On the contrary, more survey effort has been allocated to the eastern survey areas (i.e. PT and NP) during wet season (summer and autumn months), while the survey effort remained the same in SWL and SEL but very little in LM (Figure 34). During the wet season, porpoise densities were generally low among SWL and SEL grids, and mainly between Shek Kwu Chau and Tai A Chau. However, they occurred regularly in PT with higher densities found around Po Toi Islands, especially near Waglan Island (Figure 34). They also occurred sporadically in NP in quite high densities, but the results could be biased as the survey effort accumulated over the nine-year period in NP was still relatively low.

## *5.8. Spatial Modeling Work Progress*

Starting in the present monitoring period, a spatial modeling project has been initiated by Ms. Lauren Dares, a graduate student from Trent University supervised by Professor Bradley White and Dr. John Wang, with the goal to produce a predictive model for the projection of impacts of future anthropogenic impacts in Hong Kong on the density and distribution of the Chinese White Dolphin population in Hong Kong and the Pearl River Estuary. The Generalized Linear Models (GLM) are used, which are useful tools that are frequently used when analyzing complicated data that does not fit into the framework of many traditional statistical methods. Using rigid linear models that assume a linear relationship between response and explanatory variables, GLMs utilize “link functions” that can fit log, exponential or other relationships in the data, which are often better suited to ecological data (Guisan et al. 2002). For the present spatial modeling work, a Poisson GLM is fit to count data, with the purpose of predicting the impacts of marine construction on animal abundance.

### 5.8.1. Methods on spatial modeling

Line-transect survey data collected during 1996-2011 was used, and the survey area around Lantau was divided into a series of 1-km$^2$ grid cells, with effort calculated every time a grid cell was visited while on effort (see Hung 2008). When dolphins were sighted, the location of the sighting and number of animals present in the group were recorded, and were later to calculate dolphins per unit effort (DPUE) for each grid cell.

Water temperature, salinity, turbidity, and chlorophyll-A (ChA) data for surface water were accessed via the Hong Kong Environmental Protection Department’s Water Quality Monitoring website, which listed monthly measurements of these variables taken by water quality buoys throughout the study area. Kriging was performed in ArcGIS 10.0 (ERSI) to interpolate these measurements to obtain values for the entire study area, with samples being taken from the kriging surface at the centre of each line-transect survey grid cell at coordinates consistent across years.

Remotely sensed bathymetric data were also obtained from the Scripps Institute of Oceanography, which measured underwater topography via satellite altimetry. These values were again interpolated via kriging and samples for each grid cells in ArcGIS 10.0. Slope was calculated from depth data as the largest difference in depth between two adjacent grid cells. Vessel traffic data was obtained from the Hong Kong Marine Department. Marine construction impacts in each grid cell were classified based on proximity to construction activities.

A quasi-Poisson GLM with log link function was fitted to count and environmental data using the statistical software R, with land and effort and percentage of land covering each grid cell. Starting with a null model that included all of the above explanatory variables, backwards stepwise selection using Akaike's Information Criteria (AIC) was then performed by sequentially removing variables of least importance (determined by f-distribution analysis of variance) to determine which variables should be included in the final model. Backwards selection was stopped when AIC increased following the removal of a variable from the model. The $R^2$ value for the final model was calculated to determine goodness-of-fit, and assumptions of quasi-Poisson GLMs were then assessed using plots of Pearson's standardized residuals.

5.8.2. Data exploration, model selection and assessment

Count data were assumed to follow a Poisson distribution, and were found to be right-skewed and have a large number of zero values, a common feature of ecological data (Martin et al. 2005). Sea surface temperature varied from year to year, but did not drop below 22.4°C or exceed 25°C (Figure 35a). Salinity was consistent across the study period, ranging from 20.1 psu to 41.6 psu (Figure 35b). Yearly turbidity varied, with a minimum of 2.4 NTU and maximum of 28.2 NTU (Figure 35c). ChA gradually increased over the course of the study period, starting at a minimum of 1.4 mg/L and peaking at 13.1 mg/L (Figure 35d). Some variation in yearly environmental data is expected as environmental conditions vary from season to season and year to year (Liang and Wong 2003), although increases in ChA over time may be due to agricultural runoff and other human activities (Tang et al. 2003). Depth and slope were assumed not to vary from year to year as bathymetry of the sea floor was expected to be static over time. Depth ranged from 0.14 m to 26.48 m (Figure 35e), and slope from 0.05 m to 16.2 m (Figure 35f).

The null model, which included all available explanatory covariates took the form of:

$$\log(\text{count}) = \beta_0 + \beta_1\text{Grid} + \beta_2\text{Impact} + \beta_3\text{Year} + \beta_4\text{SST} + \beta_5\text{Salinity} + \beta_6\text{Turbidity} + \beta_7\text{ChA} - \beta_8\text{Slope} + \beta_9\text{Vessel Traffic} + \varepsilon$$

where $\beta_0$ is the intercept, $\beta_{1..8}$ are slope estimates for each explanatory covariate indicating the rate of change of the log of count per unit increase in each explanatory covariate, and $\varepsilon$ is the error term. Based on the null model, only the measurement of slope showed a negative slope coefficient, indicating that increases in sea surface temperature, salinity, turbidity, and chlorophyll-A all contributed to an increase in number of dolphins, while steeper slope of the sea floor was correlated with fewer dolphins. Backwards stepwise selection resulted in the removal of vessel traffic and slope from the model:

$$\log(\text{count}) = \beta_0 + \beta_1\text{Grid} + \beta_2\text{Impact} + \beta_3\text{Year} + \beta_4\text{SST} + \beta_5\text{Salinity} + \beta_6\text{Turbidity} + \beta_7\text{ChA} + \varepsilon$$

Checking the dispersion parameter revealed overdispersion in the model (variance of the response was greater than the variance assumed by the model; for Poisson models, the dispersion parameter was estimated to be 1), so the model was re-fit as a quasi-Poisson model, which compensated for overdispersion when making predictions.

Plotting observed counts against counts predicted by the model indicated that the model did not consistently over- or under-predict counts at high or low values. Over-prediction is evident when fitted values are significantly higher than observed values, and vice versa for under-prediction. The Durbin-Watson test statistic for independence indicates that there is positive autocorrelation in the model, likely due to spatial autocorrelation in the data. Calculation of the coefficient of determination ($R^2$) indicated fair fit, with 63% of the variation in the response variable explained by the model.

5.8.3. Future works

For the upcoming works, the GLMs will be fitted to the data to access the impact of marine construction works in the past, and project these impacts onto the rest of the study area to predict how future construction projects such as the construction of HZMB and proposal of third runway expansion could impact the local dolphin population. In addition, evaluation of different model types using simulated data to determine the best model type for ecological data will be conducted, and the selected model type will then be used to model the density and distribution of the PRE Chinese White Dolphins for prediction of future anthropogenic impacts, with emphasis on connecting the modeling results with dolphin ecology.

### *5.9. Photo-identification Work*

#### 5.9.1 Summary of photo-ID data collection

From April 2012 to March 2013, over 35,000 digital photographs of Chinese White Dolphin were taken during line-transect vessel surveys and shore-based theodolite tracking for the photo-identification of individual dolphins. All photographs taken in the field were compared with existing individuals in the photo-identification catalogue that has been compiled by HKCRP since 1995. All new photographs identified as existing or new individual during the study period, as well as any updated information on gender and age class were also incorporated into the catalogue.

Up to March 2013, a total of 829 individual Chinese White Dolphins have been identified by HKCRP researchers in Hong Kong waters and the rest of the Pearl River Estuary. These included 77 new individuals being added to the catalogue since last year, with 21 of these new individuals identified in Hong Kong waters during the present monitoring period. Within the current catalogue, 461 individuals were first identified within Hong Kong territorial waters, while the rest were first identified in Guangdong waters of the Pearl River Estuary. Moreover, 201 individuals have been seen 10 times or more, 150 individuals have been seen 15 times or more; 66 individuals have been seen 30 times or more; and 24 individuals have been seen 50 times or more. Individual dolphin NL24 has the highest number of re-sightings, and has been regularly seen 172 times in Hong Kong since 1996. Nevertheless, more than half of the identified individuals (52.1%) have only been seen once or twice, and most of these were first identified in Guangdong waters (301 out of 368 individuals). Temporal trends in total number of identified individuals, the total number of re-sightings made, and the number of individuals within several categories of number of re-sightings showed that good progress in photo-identified work has been made in 2012 (Figure 36).

During the 12-month study period, a total of 177 individuals, sighted 568 times altogether, were identified during AFCD regular vessel surveys and shore-based theodolite tracking works (Appendix IV). The majority of re-sightings during the 12-month period were made in WL and NWL survey areas, comprising 45.8% and 30.5% respectively, and these proportions have been fairly similar in the recent monitoring periods. Moreover, re-sightings of individuals were frequently made in NEL (81) and SWL (47), while only seven re-sightings were made in DB survey area. Twenty one of the 47 re-sightings of individual dolphins were also made during shore-based theodolite tracking at Fan Lau station. Notably, many newly-identified individuals from the previous monitoring period were also sighted repeatedly in the present period (e.g. NL288, NL295), indicating their increased reliance of Hong Kong waters recently.

Most of the 177 identified individuals were sighted only once or twice during the 12-month study period under AFCD surveys, while some have been sighted repeatedly, indicating their strong reliance of Hong Kong as an important of their home ranges. For example, NL24 and NL33 were sighted more than 10 times, and six individuals were sighted 8-9 times. Moreover, 19 other individuals were sighted 6-7 times during the 12-month study period. Notably, most of these individuals are considered year-round residents, and the majority of them belong to the northern social cluster. Some of them are also females (e.g. NL33, NL93, NL123, NL202, NL264) that have been frequently seen with their young calves in Hong Kong. On the other hand, only a few individuals that centered their range use in WL and SWL waters were sighted repeatedly (e.g. WL50, WL69, WL116, WL165), and the rest were infrequent visitors of Hong Kong waters.

During the present monitoring period, several individuals were found to be stranded alive or dead in Hong Kong and Chinese waters. On March 12, 2012, a known individual from the photo-ID catalogue, NL60, was found upstream of the Pearl River, and was later brought back to the Pearl River Estuary Chinese White Dolphin National Reserve Rescue Centre for rehabilitation. The presumably old male was first seen in 1996 in NWL, and since then it ranged extensively throughout Lingding Bay with repeated sightings on both sides of the Hong Kong-Guangdong border (Appendix V). After some 10 months of rehabilitation, this dolphin died of internal organ failure related to old age.

Another known individual, NL75, was stranded alive near Yantian Harbour in Shenzhen on September 28, 2012. The female dolphin was brought back to a nearby aquarium for rehabilitation, but subsequently died on October 13, 2012. The animal was last seen about a month before her stranding, and she was sighted a total of 32 times since 1996. This seasonal resident centered its range use around the Brothers Islands, and has only been seen in North Lantau before but not elsewhere (Appendix V). It is uncertain why this individual would venture out to Mirs Bay, which is very far away from its normal range of activity.

Two additional known dolphins in the photo-ID catalogue were also found dead in Hong Kong waters in the past six months. A well-known Hong Kong resident, NL176, was found floating to the north of Lung Kwu Chau on September 3, 2012. This female had been sighted regularly in North and West Lantau waters 59 times since she was first identified in November 2003 (Appendix V). The gender of NL176 was first confirmed when a biopsy sample was collected from her in 2006. Subsequently she gave birth to three calves between 2008 and 2012, and the first two neonates were not able to survive beyond a few months. The 260-cm long female was observed near the Brothers just four days before her death, and has been accompanied by her calf since October 2011. We suspect that her presumably year-old calf still survives at present, as a young calf was found following other females (e.g. CH34, NL188) and another mother-calf pair (NL33 and her calf) in subsequent months, and this calf shares some distinct features with NL176's calf.

Another well-known individual, NL118, was found floating near the Brothers Islands on March 4, 2013. NL118 was also a female and she was also biopsied in 2006. She gave birth to a neonate in September 2011 but the calf apparently died within a few months. Unfortunately, a late-term fetus of 84 cm was found inside her womb when her body was recovered and examined by Ocean Park veterinarians. Similar to NL176, NL118 had been sighted regularly in North and West Lantau waters 53 times since she was first identified in January 1999 (Appendix V). The 236-cm long female was considered a year-round resident, and was last sighted in NWL in February 2013, just about a month before her death.

### 5.9.2. Individual movement patterns

Combined with all photo-ID data collected through the present monitoring study and other studies, movement patterns of individual dolphins within Hong Kong territorial waters were broadly examined during the 12-month study period. From April 2012 to March 2013, a total of 203 individuals were sighted, with 164 individuals sighted more than once (i.e. occurred at more than one location). By examining their movement patterns between re-sightings, it was observed that many individuals moved extensively across different survey areas around Lantau Island. For example, 60 individuals were re-sighted in both NWL and WL survey areas, while 40 individuals occurred across NWL and NEL survey areas. On the contrary, only 31 individuals occurred exclusively in NWL survey areas, with a few venturing into the mouth of Deep Bay nearby. Many individuals utilized both WL and the SWL (37 individuals), and only 30 individuals occurred exclusively in WL during the 12-month study period. In addition, eight individuals ranged all the way from SWL to NWL waters, while NL226 was found in NEL, NWL, WL and SWL within the 12-month period. Notably, 24 individuals ranged between NEL, NWL and WL survey areas.

The monitoring of movement patterns of individual dolphins across different survey areas around Lantau is important in light of the on-going construction works of HZMB. In 2012, the dolphin abundance estimate dropped noticeably in NEL (Section 5.4), indicating that fewer dolphins occurred in this area, especially around the Brothers Islands where many year-round residents utilized it as their core area of activity. In fact, a number of individuals used to utilize the Brothers Islands as their core area appeared to spend less time there. For example, NL93, NL104 and NL118 all utilized the Brothers as their 50% UD core area in the past, but NL93 and NL104 were sighted only once out of their 12 and 13 re-sightings respectively, while NL118 was not sighted at all in NEL among her 11-re-sightings. Moreover, CH34, NL37 and NL264 all utilized the Brothers Islands as their 25% UD core area, but only two out of 13 re-sightings of CH34 and three out of 15 re-sightings of NL264 were made in NEL, while NL37 was not even sighted in NEL at all among its six re-sightings. In addition, six other individuals that utilized the Brothers Islands as their core area were only seen in NEL in half of their re-sightings. Although the number of re-sightings of each individual in NEL could be slightly affected by the survey effort spent there among different years, it was still evident that some individuals have already diminished their usage of this piece of important habitat as part of their range use in 2012. This should be further monitored in the future along with the trend in abundance in NEL, as the intensive HZMB-related construction works including the construction of HKBCF and TMCLKL in the next few years may continue to affect dolphin usage in the area.

On the other hand, many individuals moved extensively between NWL and WL survey areas. In Hong Kong, two social clusters were identified in North Lantau and West Lantau respectively (Dungan et al. 2012), and the important overlapping area to facilitate interaction between the two clusters lies along the coastal waters between Shum Wat and Peaked Hill. During the 12-month study period, the majority of individuals that moved between NEL, NWL and WL were from the northern social cluster (e.g. NL24, NL93, WL04, WL05), and they would occasionally utilize WL as part of their range. Likewise, most individuals that moved between WL and NWL were from the western social cluster, and spent most of their time in WL while occasionally venturing into the overlapping area of the two clusters, with some going all the way north to the marine park area (e.g. CH153, SL35, WL46, WL61). As the HKLR construction works began in March 2013, individual movements between NWL and WL should be closely monitored, to determine whether such movements would be hindered by the extensive bored piling activities that cut right across the overlapping area of the two social clusters.

5.9.2.1. Examination of traveling corridors with focal follow pilot study data

In the past, individual movement patterns were broadly examined to reveal that individual dolphins move extensively and frequently across different parts of Lantau waters, especially among the three main core areas of dolphin occurrence (i.e. Sha Chau and Lung Kwu Chau Marine Park, the Brothers Islands and the stretch of coastline between Tai O and Fan Lau). It appears that traveling corridors exist for dolphins to move between the three areas, where dolphin densities appear to be lower, such as the northern and western sides of the airport platform. A pilot focal follow study aims to examine the fine-scale movement of individual dolphins in greater details, with the aim to establish where these important traveling corridors are to facilitate their movement between the core areas.

Under the pilot focal follow study, six tracks of five individual dolphins were collected during the present monitoring period, with three individuals being followed in NEL (mainly around the Brothers Islands area), and another two being followed in WL waters (Figure 37). The focal follow sessions lasted between 0.70 and 2.97 hours, and the distances of dolphin tracks ranged from 2.0 to 11.3 km. The swimming speed of dolphins from the six tracks ranged from 2.22 – 4.83 km/hour, with a mean of 3.4 ± 0.94 km/hour. It appeared that the swimming speed was the highest when the dolphin was travelling, but the lowest when it was engaged in feeding and milling activities.

For the several tracks that were recorded around the Brothers Islands, the dolphins did not move extensively, but remained in the same general area after extended period of focal follow (Figure 37). For example, the movement of NL98 appeared to be circuitous, and the animal moved around the area between Tai Mo To and Shum Shui Kok from 12:24 to 17:03 (it disappeared in 13:54 but was later discovered again at the same location at 16:21). On the contrary, the tracks of NL226 and WL124 appeared to be more directional, and both animals moved consistently from southwest to the northeast, with WL124 traveling at greater speed than NL226 (the latter were engaged in feeding and milling activities as it was traveling up north).

The sample size was certainly quite small under this pilot study, as it was challenging to find good candidates for focal follow observations. Therefore, it remains to be determined where the traveling corridors exist between the high densities of dolphin occurrence. However, preliminary information of the movement of NL226 and WL124 showed that the dolphins were likely moving along the western side of the airport from WL to NWL or vice versa. This was further confirmed during the recent theodolite tracking sessions in relation to the HKLR baseline monitoring works (Hung pers. obs.). Presumably, when the dolphins are traveling quickly, it would be more difficult to sight them at sea, as they appeared to take longer dives and surface more elusively during traveling. Nevertheless, the travelling corridors are critical components of the dolphin habitat for them to move from one place to another, and it is important to locate where these corridors are.

5.9.2.2. Examination of traveling corridors with past photo-ID data

To further examine the existence of traveling corridors, the sighting records were examined among 12 different individual dolphins that were frequently sighted and moved extensively across different parts of Lantau waters in the past decade. Segments were drawn between the locations of consecutive sightings that were made during the same day or on consecutive days, assuming that dolphins moved linearly from one sighting location to the next. If the straight-line segment was blocked by land-mass, it would be re-drawn to curve around the land-mass. All segments were displayed for each individual dolphin to examine any potential traveling corridor that they preferred to utilize when moving from one area to another (Figure 38).

Among these 12 individuals, they moved frequently between the three core areas at Lung Kwu Chau, the Brothers Islands and the west coast of Lantau, in relatively short periods of time. There were a number of cases that the same dolphin was observed in Lung Kwu Chau in the morning, and were re-sighted again near the Brothers Island in the afternoon. Moreover, several cases revealed that some dolphins first occurred in West Lantau, but on the following day the same animals were re-sighted again in NEL. Overall, it appeared that the main traveling corridors existed to the north of the airport, near Pillar Point and to the west of the airport (Figure 38). However, it should be cautioned that this is under the assumption that dolphins are moving from one place to another in a linear fashion, and this assumption remains to be tested using focal follow data or shore-based theodolite tracking data in the future.

It is critical to examine the traveling corridor issue, since existing threats such as vessel movement as well as proposals for future infrastructure projects may potentially affect dolphin movement around Lantau waters by disrupting their traveling corridors. It also remains to be seen whether the HKLR will affect the north-south movement of individual dolphins with the on-going bored piling activities as well as the physical presence of the bridge pier structure in the post-construction era. More focal follow observation sessions and theodolite tracking works should be conducted in the future to clarify this issue, which can help devise suitable management strategies to ensure that dolphin movements would not be affected by anthropogenic activities.

#### 5.9.3. Individual range use and residency pattern

To examine individual range use, the 95% kernel ranges of 130 individuals that occurred in 2012 were deduced using the fixed kernel method, and their ranging patterns are shown in Appendix VI.

In addition, 105 individual dolphins that were sighted ≥15 times and occurred in recent years were further examined for their range use and residency pattern (Table 1). Among these individuals, most of them were sighted in NWL (87 dolphins), NEL (47), WL (94) and SWL (38), while only a few have utilized DB, EL or SEL survey areas as part of their ranges. Moreover, about 44% of these individuals occupied ranges that spanned from Hong Kong across the border to Guangdong waters, the majority of them mostly occurred in WL waters.

The residency patterns of these individuals were also assessed by examining their annual and monthly occurrences. Of the 105 individuals, all except six were considered residents in Hong Kong, as they have been sighted consistently in the past decade, or at least five years in a row. The proportion of visitors that utilized Hong Kong waters is likely underestimated, as these visitors would utilize Hong Kong waters more periodically, and it will be harder for them to reach the minimum requirement on the number of re-sightings for this analysis. Based on the monthly occurrences, about 60% of individuals only occurred in Hong Kong in certain months of the year, while the rest occurred here year-round (Table 1). Overall, 39 and 60 individuals were identified as year-round and seasonal residents respectively, while two year-round visitors and four seasonal visitors were also identified.

In light of the imminent development pressure, the range use and residency patterns of these individuals should be continuously monitored, to determine whether they will continue to use Hong Kong waters as an important part of their range, or diminish their use with the increasing amount of anthropogenic disturbance. The year-round residents should receive most attention during the construction works, as they will likely be impacted the most with the regular usage of Lantau waters. It will be important to examine any fine-scale changes in their range use during the construction works.

### *5.10. Dolphin-related Acoustic Studies*

#### 5.10.1. Summary of acoustic data collection

For the long-term acoustic monitoring work that aims to improve the overall understanding of the natural sound habitat and anthropogenic noises within dolphin habitat around Lantau Island, a total of 10.16 hours of recordings in 101 sound samples were collected from 19 acoustic monitoring stations around Lantau and in Deep Bay (see Appendix VII). Opportunistic recordings of dolphin sounds were also collected at different locations from calibrated hydrophone system and towed hydrophone array. The acoustic data collected under the present study were all integrated into a long-term database, which can serve as useful baseline information for future studies. The data will also allow further investigations on anthropogenic noises and dolphin vocalizations in Hong Kong, and relationship between the two.

#### 5.10.2. Dolphin whistle repertoire

For the present report, some preliminary findings of whistle repertoire of Chinese White Dolphins from the acoustic monitoring are presented. The goal of studying whistles is to address research questions related to the local acoustic environment and effects on acoustic behaviour, including the overlap of anthropogenic noise and potential masking of the dolphin sounds. Whistles are narrowband frequency modulated sounds, and are likely to function exclusively in underwater communication between individuals (Richardson and Thomson 1995). Diversity in whistle type can be easily detected, making these sounds ideal for examining differences among species, populations, and even individuals (Richardson and Thomson 1995).

From the 13 recordings with dolphin whistles detected between April 2010 and November 2011, a total of 1,410 whistles (360 from calibrated hydrophone recordings and 1,059 from towed hydrophone recordings) were detected aurally and visually. Whistles of quality ≥3 (n=1,234) of all whistle types showed a mean whistle duration of 0.22 seconds (range: 0.02-1.48 s, s.d.±0.24 s) and a mean frequency range of 2,270 Hz (range: 0-11,151 Hz; s.d.±1,554 Hz). The mean start and end frequencies were 7,662 Hz (range: 561-24,224 Hz, s.d.±3,551 Hz) and 7,601 Hz (range: 2,087-22,529 Hz, s.d.±3,561 Hz), respectively. The mean minimum and maximum frequencies were 6,284 Hz (range: 560-21,803 Hz, s.d.±3,216 Hz) and 8,554 Hz (range: 2,087-24,224 Hz, s.d.±3,612 Hz), respectively. The mean number of harmonics was 1.5 (range: 0-31; s.d.2.6). Whistles of quality ≥3 with an identifiable contour revealed a total of 27 different whistle types (Figures 39-41). Summary statistics of each of the 27 contours are presented in Table 2. Of the two most common whistle types, 10 (n=327) and 2 (n=152), the majority were found in West and Southwest Lantau (see Table 3).

The present study of Chinese White Dolphin whistles in Hong Kong waters indicated that the dolphins produce a diverse range of sounds. Many whistle types matched those contours described by Van Parijs and Corkeron (2001) for humpback dolphins in Australian waters, Zbinden et al. (1997) for *Sousa plumbea* in the Indus River Delta region, and Weir (2010) for *Sousa teuszii* off Angola. These studies noted whistles in *Sousa* spp. with relatively simple structures, often only a single inflection point. However, the present study found complex contours with a greater degree of frequency modulation in multiple whistle types. Such complex whistle types were often found in recordings where socializing and larger groups (≥8 individuals) were noted.

Sims et al. (2012) found an overlap of sound spectra for vessels ≥100 metres, which exceeded the dolphin sounds at closer distances. Chinese White Dolphins may respond to this sound overlap by changing the characteristics of sounds emitted, habituating to increased noise, displacing from areas of high noise, or by using directional hearing to mitigate the vessel noise (Richardson and Würsig 1995). If Chinese White Dolphins change their characteristics of sounds, it may be especially important to investigate how whistles may change in different acoustic habitats with various levels of anthropogenic noise. Changes in vocalization in response to habitats with high levels of noise has been observed in other species of cetaceans such as orcas (Talus 2000; Foote et al. 2004; Holt et al. 2008), bottlenose dolphins (May-Collado and Wartzok 2008), and beluga (Lesage 1999) due to masking of vocalizations by anthropogenic noise. It should be further investigated whether such masking effects on the acoustic repertoire of Chinese White Dolphins exist in light of the increased amount of acoustic disturbance. Moreover, there is the potential to examine any intraspecific differences in whistle repertoire between the Pearl River Estuary population with other areas where humpback dolphins exist, such as in Australia (Van Parijs and Corkeron 2001).

5.10.3. Passive acoustic monitoring using C-POD

5.10.3.1. Initial trials and deployment near Lung Kwu Chau

Under the present study period, two C-PODs have been tested with some initial deployments from the HKCRP research vessel with an anchor for extended periods of time during the first quarter. During those initial trials, the C-PODs were able to pick up dolphin click trains successfully with visual confirmation. Moreover, several sessions with C-POD deployment synchronized with shore-based theodolite tracking was conducted off the waters of Tai O, to reveal that the effective detection range was at least 200 metres or more. Several overnight surveys with longer periods of C-POD deployment also revealed dolphin vocalizations at nighttime near Fan Lau.

After the initial trials, a permit was obtained from the Educational and Scientific Study Subcommittee of the Marine Park Authority of AFCD, to deploy the C-POD for an extended period of time within the Sha Chau and Lung Kwu Chau Marine Park. Subsequently, a C-POD was deployed to the east of Lung Kwu Chau near a marine park buoy as well as around the Brothers Islands with over 119 hours of recordings during the second quarter of the monitoring period. In October-November 2012, a long-term deployment of the C-POD was conducted at the Lung Kwu Chau east buoy, with a total acoustic duration of 33 days, 20 hours and 14 minutes. The month-long data was analyzed by Mr. Jordan Hoffman, with the supervision by Dr. John Wang and Dr. Nick Tregenza (the developer of C-PODs and the associated software).

5.10.3.2. Diel pattern of dolphin occurrence

For this report, preliminary findings from the C-POD data analysis are presented, with the aims to improve the overall understanding of the daily and diel pattern of dolphin occurrence through click train detection. During the month-long deployment at Lung Kwu Chau east buoy, a total of 1,253 detection positive minutes (DPM) were logged in 813.73 monitoring hours being analyzed (33.91 days). The mean DPM per day and standard deviation was 35.8 ± 28.2 DPM/day. The maximum DPM in a single day was 111 DPM on November 18$^{th}$ (Figure 42). Detection negative days (no DPM) occurred on five days in the study period, four of which were full, 24-hour, days (Figure 42).

For the diel pattern, the mean length of the morning phase was 0.79 ± 0.02 hours (34 phases); day phase 10.51 ± 0.18 hours (33 phases); evening phase 0.77 ± 0.02 hours (34 phases); and night phase 11.94 ± 0.17 hours (34 phases). For the dolphin diel pattern of occurrence, the mean DPM per phase was 0.12 ± 0.54 minutes; day phase 3.97 ± 5.20 minutes; evening phase 0.12 ± 0.41 minutes; and night phase 5.32 ± 8.33 minutes (Figure 43). The results showed that Chinese White Dolphins regularly used the Lung Kwu Chau area both day and night based on DPM. It is important to understand the diel patterns of dolphin habitat use in order to provide effective management of activities that may have impacts on dolphins, especially when the animals cannot be observed visually at night.

In the past, DPM was not widely reported in a number of previous studies, but the broader measure of encounter rate was used instead (e.g. Carlström 2005; Todd et al. 2009; Philpott et al. 2007). However, the DPM was chosen over encounter rate as it showed how much time dolphins actually spent within the marine park area. A study by Haelters et al. (2010) on harbour porpoises in Belgian waters reported DPM per day peaking at 50 DPM per day with short periods (approximately two weeks) at specific sites reported with an average 21 DPM per day. However, it should be noted that a direct comparison cannot be drawn between harbour porpoises and Chinese White Dolphins as the detection range for dolphins far exceeds that of harbour porpoises by as much as three times (Philpott et al. 2007). These studies were also using a more basic classifier, which could deflate the DPM found during the present study (1,253 DPM using the GENENC classifier, as compared to only 230 DPM using the KERNO classifier under the present study).

Echolocation patterns have been shown to differ between day and night in harbour porpoises, and it has been postulated that this is due to increased feeding activities and increased echolocation rates to compensate for a lack of vision at night (Carlström 2005; Todd et al. 2009). However, echolocation patterns may show interspecies differences, or may be related to habitat use, or geographical variation (Jones and Sayigh 2002; Philpott et al. 2007). Carlström (2005) found harbour porpoises in Scottish waters to have a median encounter rate of 0.61 encounters/hour during the morning phase; 0.35 encounters/hour during the day phase; 0.50 encounters/hour during the evening phase; and 1.03 encounters/hour during the night phase. In these studies an encounter was defined as a group of trains that are separated by periods of silence with a minimum duration of 10 minutes (Carlström 2005; Todd et al. 2009; Philpott et al. 2007). Contrary to the previously mentioned results, a study by Philpott et al. (2007) on bottlenose dolphins in Irish waters found no apparent difference in the encounter rate between diel phases, but instead found the encounter rate to increase after high tide. A study by Elliot et al. (2011) on bottlenose dolphins in New Zealand waters showed no significant difference in DPM per hour between day and night, but was significantly higher during the morning and evening phases than day or night.

The present study showed that Chinese White Dolphins are apparently using the marine park area at night, and may either be spending more time in the area or are more vocally active at night. There is a lack of studies on wild or captive *Sousa* spp. to show differences in echolocation activity between day and night. Placing an increasing number of C-PODs around Hong Kong waters in strategic areas in the future may allow for a comparison between areas to test for factors influencing area usage and echolocation behavior. Data collected by C-PODs may also allow inferences to be made about dolphin behaviour, where feeding and searching echolocation patterns and characteristics may be differentiated.

Notably, dolphin click train detections logged during the monitoring period are a conservative estimate of marine park usage. C-PODs have a detection range restricted by the attenuation of dolphin click trains, directionality of click trains with respect to the C-POD hydrophone, and whether or not the dolphins are producing clicks when in the vicinity of the C-POD. Dolphin detection has been found to exceed a 1,000 m radius around a T-POD (preceding version of the C-POD) with bottlenose dolphins (Philpott et al. 2007).

The successful deployment of the C-POD at Lung Kwu Chau demonstrated the potential for long-term passive acoustic monitoring in areas with ongoing or planned construction projects where 24-hour monitoring is not feasible using standard visual techniques (e.g. vessel based surveys or theodolite observations). In light of the new information on acoustic behaviour of dolphins at night, any night-time construction work should not be allowed until there is a better understanding of dolphin behaviour and habitat use at nighttime, to ensure that the acoustic behaviour and foraging activities of dolphins would not be seriously affected. This is especially true when implementation of mitigation measures (e.g. monitored exclusion zone) becomes a challenge at night, and therefore pre-cautionary principle should be adopted for any night-time construction works to safeguard the dolphins from further anthropogenic acoustic disturbance.

## *5.11. Shore-based Theodolite Tracking Work*

### 5.11.1. Summary of theodolite tracking data collection

During the 12-month study period, a total of 35 sessions with 151.6 hours of theodolite tracking were conducted from Tai O (22 sessions), Shum Wat (9 sessions) and Fan Lau (4 sessions) shore-based stations (Appendix VIII). Most of the effort was spent at the Tai O station, where the location was the most accessible one with frequent dolphin occurrence among the three.

From these sessions, 216 groups of Chinese White Dolphins with 3,673 fixes of their positions were collected. Another 4,273 fixes were also made from locations of dolphin-watching boats, fishing boats, high-speed ferries and other type of vessels, to examine the level of vessel traffic as well as their potential effects on dolphin movement and behaviour. For the present report, the theodolite tracking data collected from Fan Lau station was analyzed to examine dolphin movement and behaviour there, and the potential impact from the nearby high-speed ferry traffic.

5.11.2. Analysis of theodolite tracking data from Fan Lau

Previous studies indicated that a notable decline in dolphin densities at Fan Lau coincided with the marked increase in volume of high-speed ferry traffic in this area, and this may partly contribute to the overly decline in dolphin occurrence in West Lantau (Hung 2012). In addition, the on-going acoustic monitoring study showed that the high-speed ferries have been the major contributor to the noise environment near Fan Lau, and the negative impact on the acoustic behaviour of Chinese White Dolphins and their habitat use pattern can be significant (Hung 2012; Sims et al. 2012). To further examine the impact of vessel movement on the dolphin behaviour, theodolite tracking data collected from Fan Lau were analyzed by Ms. Sarah Piwetz and Professor Bernd Würsig of the Marine Mammal Behavioural Ecology Group at Texas A& M University.

A total of ten days with 45.78 hours of land-based monitoring were conducted from Fan Lau station from April 2011 through February 2013. After filtering all data as described in the data analysis section, 31 focal dolphin tracks met the inclusion criteria for analysis. Fourteen tracks were collected in the morning and 17 tracks were collected in the afternoon. Vessels were present at some point during 22 of the 31 tracks, including 108 total vessels within 500 metres of focal dolphins. These vessels consisted of 6 fishing boats, 51 high-speed ferries, 4 police vessels, 8 research vessels, 3 sand barges, 5 container boats, 5 speedboats, and 16 commercial trawlers. There was a maximum of five different vessel types over the course of a single track, a maximum of 27 boats passing within 500 metres of a focal dolphin individual/group over the course of a single track, and a maximum number of six vessels present at one point in time.

The three variables, including swimming speed, reorientation rates and linearity, were checked visually and quantitatively for normality using qq plots and the Shapiro-Wilk test for normality before analyzing models. All variables had a normal distribution (swimming speed: Shapiro-Wilk = 0.9859, p-value = 0.9469; reorientation rate: Shapiro-Wilk = 0.9499, p-value = 0.1556; linearity: Shapiro-Wilk = 0.9635, p-value = 0.3596) and did not require transformations. Data of natural temporal variation were relatively balanced (14 tracks in the morning, 17 in the afternoon); however, data evaluating anthropogenic variation were not balanced (9 tracks with no vessels present, 22 tracks with vessels present including 5 tracks with a single vessel, 9 tracks with 2 vessels, 4 tracks with 3 vessels, 3 tracks with 4 vessels, and 1 track with six vessels) and should be considered when interpreting results. Unbalanced data may be inherent at the Fan Lau location due to the frequency of high speed vessels that regularly travel through the area.

*Swimming Speed*

The selected model for swimming speed included linear terms for the total and maximum number of vessels within 500 m of focal dolphins, and the time of day:

$$Speed \sim SumBoats + MaxBoats + TimeOfDay$$

This model identified significant variation in swimming speed, accounting for 15.3% of the deviance (adj-$R^2$ = 0.059, GCV score = 1.099, n = 31). There was a positive linear relationship between swimming speed and the total number of vessels passing within 500 m of the focal dolphins. This indicates that dolphins increase speed as the total number of vessels that pass through the area increases. Alternatively, there was a negative linear relationship between swimming speed and the maximum number of vessels present, indicating that when vessel number increases, dolphins reduce swimming speed. Results indicate that dolphin groups swam faster in the afternoon than in the morning. Residuals for the fitted GAM showed no major problems with heteroscedasticity or obvious patterns, indicating the model fitted the data well. Mean group swimming speed by vessel presence and absence, time of day, and number of vessels present are calculated in Table 4.

*Reorientation Rate*

The selected model for reorientation rate included linear terms for the total and maximum number of vessels within 500 m of focal dolphins, number of types of vessels present, and the time of day:

*ReorientationRate ~ SumBoats + MaxBoats + TypeOfBoats + TimeOfDay*

This model identified significant variation in reorientation rate, accounting for 17.8% of the deviance (adj-$R^2$ = 0.051, GCV score = 419.32, n = 31). There was a positive linear relationship between reorientation rate and the sum of all boats present during a track. These findings indicate that dolphins change direction of movement more often as the overall number of vessels passing through increase. There was also a positive linear relationship between reorientation rate and the maximum number of vessels within 500 m of focal dolphins. These findings indicate that dolphins change direction of movement more often as the number of vessels at one point in time increases. Presumably, as dolphins increase their reorientation rate, swimming speed would decrease, which is consistent with the findings above. There was a negative relationship between reorientation rate and the variety of boat types present, indicating that dolphins changed direction less often when the variety of vessel types increased. Results indicate that there was no detectable natural variation in reorientation based on time of day. Residuals for the fitted GAM showed no major problems with heteroscedasticity or obvious patterns, indicating the model fitted the data well. Mean group reorientation rate by vessel presence and absence, time of day, and number of vessels present are calculated in Table 4.

*Linearity*

The selected model for linearity (Table 3) included linear terms for the total and maximum number of vessels within 500 m of focal dolphins, number of types of vessels present, and the time of day:

*Linearity ~ SumBoats + MaxBoats + TypeOfBoats + TimeOfDay*

This model identified significant variation in linearity, accounting for 22.4% of the deviance (adj-$R^2$ = 0.104, GCV score = 0.069, n = 31). There was a negative relationship between linear movement of dolphins and the total number of vessels passing within 500 m of the focal dolphins, indicating that dolphins swim in a less direct path when they are in the presence of increasing numbers of vessels. There was a positive relationship between linear movement of dolphins and maximum number of vessels within 500 m of focal dolphins. There was also a positive relationship between linear movement of dolphins and the variety of boat types present. This indicates that dolphins swim in a more direct path when there are numerous vessels present at once and when there are a variety of vessels present. Results indicate that dolphin movement was more linear in the morning, and more circuitous in the afternoon. Residuals for the fitted GAM showed no major problems with heteroscedasticity or obvious patterns, indicating the model fitted the data well. Mean group linearity by vessel presence and absence, time of day, and number of vessels present are calculated in Table 4.

*Possible impacts of vessel presence on dolphin movement patterns*

These preliminary results indicate that the movement patterns of Chinese White Dolphins off Fan Lau varied based on natural factors (time of day) and anthropogenic disturbance (vessel presence). In terms of naturally occurring variation, dolphins swam slower and in a more linear fashion in the morning than in the afternoon. Behavioural state information has been recently added to data collection methodology, which will shed light on how these movement patterns reflect behaviour. For example, dolphins might rest more in the morning, explaining the slow swimming speed and linear movement, and forage more in the afternoon, explaining faster swimming speed and increased directional changes.

In relation to vessel activity, dolphins swam slower and changed direction of travel more often when the number of vessels present at one time increased. A higher number of vessels present in a discrete area might result in a crowded environment for dolphins, thus making it difficult to maneuver quickly or in a linear fashion. When the total number of vessels present over the course of a single track increased, dolphins swam faster and changed direction more often. Dolphins may speed up and change direction to evade, or perhaps approach, vessels. Vessel type likely influences these movement patterns. For example, dolphins may swim away from tour boats or research vessels that approach abruptly, whereas they may swim toward commercial fishing trawlers that concentrate prey items. It was also found that dolphins moved in a more linear fashion as the number of vessel types increased; however, larger sample sizes will shed light on how different vessel types influence dolphin movement patterns off Fan Lau.

In this preliminary study, sample size was still fairly small, and some of the effects were subtle (e.g. effect of maximum number of boats present at one time on dolphin reorientation rate) and should be considered when interpreting results. More data will be collected from Fan Lau station in the future to increase the sample size and further evaluate long-term objectives, including assessing dolphin movement patterns based on natural (group size, temporal variation) and human-generated (various distance thresholds of vessels, vessel type) factors.

*5.12. School Seminars and Public Talks*

During the study period, HKCRP researchers continued to provide assistance to AFCD to increase public awareness on the conservation of local cetaceans. In total, HKCRP researchers delivered 16 education seminars at local primary and secondary schools regarding the conservation of Chinese White Dolphins and finless porpoises in Hong Kong.

For these school talks, a PowerPoint presentation was produced with up-to-date information on both dolphins and porpoises gained from the present long-term monitoring programme. The talks also included content such as the threats faced by local cetaceans, and conservation measures that AFCD has implemented to protect them in Hong Kong. Through this integrated approach of the long-term monitoring programme and publicity/education programme, the Hong Kong public can gain first-hand information from our HKCRP researchers. Their support will be vital to the long-term success in conservation of local cetaceans.

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Table 1. Range use (50%/25% UD core areas and sighting coverage) and residency pattern of 105 individuals with 15+ sightings from the PRE humpback dolphin photo-ID catalogue during 1995-2012.

(abbreviations: SR=Seasonal Resident; YR=Year-round Resident; SV=Seasonal Visitor; YV=Year-round Visitor; UD= Utilization Distribution; MP= Sha Chau & Lung Kwu Chau Marine Park; CLK= northeast corner of airport; BR= Brothers Islands; WL= West Lantau; DB= Deep Bay; EL= East Lantau; NEL= Notheast Lantau; NWL= Northwest Lantau; SWL= Southwest Lantau; SEL= Southeast Lantau; CH=Chinese waters)
(* denotes individuals that have their gender determined by biopsy sampling)

| | Last | | | | Occurrence in Survey Areas | | | | | | | | 50% UD Core Area | | | | 25% UD Core Area | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ID# | Sighted | # STG | Gender | Residency | DB | EL | NEL | NWL | WL | SWL | SEL | CH | MP | CLK | BR | WL | MP | CLK | BR | WL |
| CH12 | 07/08/12 | 25 | ? | SR | | | | | √ | √ | | √ | | | | √ | | | | √ |
| CH25 | 06/05/11 | 16 | F | SR | | | | √ | √ | | | √ | | | | √ | | | | √ |
| CH34 | 17/12/12 | 64 | F | YR | √ | | √ | √ | | | | √ | √ | | √ | | | | √ | |
| CH37 | 21/11/11 | 16 | ? | SR | | | | | √ | √ | | √ | | | | √ | | | | √ |
| CH38 | 12/12/12 | 36 | ? | SR | | | | | √ | √ | | √ | | | | √ | | | | √ |
| CH98 | 09/11/12 | 50 | ? | YR | √ | | | √ | √ | | | | √ | | | | √ | | | |
| CH108 | 12/09/12 | 31 | F | YR | | | | | √ | √ | | √ | | | | √ | | | | √ |
| CH113 | 18/05/12 | 19 | F | SR | | | | √ | √ | | | √ | | | | √ | | | | √ |
| EL01 | 06/12/12 | 81 | M* | YR | | √ | √ | √ | √ | | | | √ | | √ | | | | √ | |
| NL06 | 03/08/12 | 21 | ? | YR | | | √ | √ | | | | | √ | | √ | | √ | | | |
| NL11 | 09/11/12 | 84 | F | YR | √ | | | √ | | | | √ | √ | | | | √ | | | |
| NL12 | 02/11/11 | 22 | F | SR | | | √ | √ | | √ | | √ | √ | | | | √ | | | |
| NL18 | 09/12/12 | 100 | F | YR | | | √ | √ | √ | | | √ | √ | | √ | | | | √ | |
| NL24 | 02/11/12 | 172 | F | YR | | | √ | √ | √ | | | √ | √ | | √ | | √ | | | |
| NL33 | 20/12/12 | 75 | F* | YR | | | √ | √ | √ | | | | √ | | √ | | √ | | √ | |
| NL37 | 31/05/12 | 53 | ? | SR | | √ | √ | √ | √ | | | | √ | √ | √ | | √ | √ | √ | |
| NL46 | 13/12/12 | 51 | F* | YR | | | | √ | √ | | | √ | √ | | | | √ | | | |
| NL48 | 13/12/12 | 58 | ? | SR | | | √ | √ | √ | | | | √ | | | | √ | | | |
| NL49 | 13/12/12 | 27 | F* | SR | | | √ | √ | √ | | | | √ | | | | √ | | | |
| NL75 | 29/08/12 | 28 | F | SR | | | √ | √ | | | | | √ | √ | √ | | | | √ | |
| NL93 | 17/12/12 | 41 | F | SR | | | √ | √ | √ | | | | √ | | √ | | √ | | | |
| NL98 | 12/11/12 | 101 | F* | YR | | | √ | √ | √ | | | √ | √ | √ | √ | | √ | | √ | |
| NL103 | 06/12/12 | 39 | ? | SR | | | | √ | √ | | | | √ | | | | √ | | | |
| NL104 | 17/12/12 | 68 | F | YR | | | √ | √ | √ | | | √ | √ | √ | √ | | √ | | | |
| NL105 | 11/07/12 | 20 | ? | SR | | | | √ | √ | | | √ | √ | | | √ | √ | | | |
| NL112 | 28/12/12 | 21 | M* | SR | √ | | √ | √ | √ | | | | √ | | | | √ | | | |
| NL120 | 20/12/12 | 73 | F* | YR | | | √ | √ | √ | | | | | | √ | | | | √ | |
| NL123 | 20/12/12 | 102 | F | YR | | | √ | √ | √ | | | √ | √ | √ | √ | | | √ | √ | |
| NL128 | 07/06/12 | 39 | M* | YR | | | √ | √ | √ | √ | √ | √ | | | | √ | | | | √ |
| NL136 | 06/12/12 | 46 | F* | SR | | | √ | √ | √ | | | | √ | | | | √ | | | |
| NL139 | 09/12/12 | 88 | F | YR | | | √ | √ | √ | | | √ | | | √ | | | | √ | |
| NL145 | 07/03/12 | 25 | F | SR | | | √ | √ | √ | | | | √ | | | | √ | | | |
| NL150 | 13/12/12 | 21 | ? | SR | | | √ | √ | √ | | | | √ | | | | √ | | | |
| NL153 | 20/06/12 | 17 | F | SR | | | | √ | | | | √ | √ | | | | √ | | | |
| NL156 | 01/11/12 | 21 | ? | SR | | | | √ | √ | | | | √ | | | √ | √ | | | |
| NL165 | 11/12/12 | 43 | ? | YR | | | √ | √ | √ | | | | √ | | √ | | √ | | √ | |
| NL179 | 20/12/12 | 49 | ? | YR | | | √ | √ | | | | | | √ | √ | | | | √ | |
| NL182 | 13/12/12 | 34 | ? | SV | | | √ | √ | | | | | √ | | √ | | √ | | √ | |
| NL188 | 13/12/12 | 38 | ? | SR | | | √ | √ | √ | | | | √ | | | | √ | | | |
| NL191 | 17/12/12 | 46 | ? | YR | | | √ | √ | √ | | | √ | √ | | √ | | √ | | √ | |
| NL202 | 12/11/12 | 52 | F | YR | | | √ | √ | √ | | | | √ | | | | √ | | | |
| NL206 | 04/07/12 | 28 | F* | SR | | | | √ | √ | √ | | | | | | √ | | | | √ |
| NL210 | 04/07/12 | 28 | ? | SR | | | √ | √ | √ | | | | √ | | | | √ | | | |
| NL212 | 10/07/12 | 19 | F | SR | | | | √ | √ | | | √ | | | | √ | | | | √ |
| NL215 | 19/02/12 | 18 | F | SR | | | √ | √ | √ | | | | | √ | √ | | | √ | | |
| NL219 | 26/02/12 | 17 | ? | SR | | | | √ | | | | | √ | | | | √ | | | |
| NL220 | 06/12/12 | 34 | ? | SR | | | √ | √ | √ | | | | √ | | | | √ | | | |
| NL224 | 24/08/12 | 31 | ? | YV | √ | | √ | √ | √ | | | √ | √ | | | | √ | | | |
| NL226 | 20/12/12 | 26 | ? | SV | √ | | √ | √ | √ | | | | | | √ | | | | √ | |

Table 1. (cont'd)

| ID# | Last Sighted | # STG | Gender | Residency | Occurrence in Survey Areas | | | | | | | | 50% UD Core Area | | | | 25% UD Core Area | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | DB | EL | NEL | NWL | WL | SWL | SEL | CH | MP | CLK | BR | WL | MP | CLK | BR | WL |
| NL233 | 14/06/12 | 32 | F | SR | | | √ | √ | √ | | | | √ | | | | √ | | | |
| NL236 | 11/07/12 | 18 | ? | YV | | | | √ | √ | | | | √ | | | | √ | | | |
| NL241 | 13/09/12 | 21 | ? | SR | | | | √ | | | | | √ | | | | √ | | | |
| NL242 | 17/12/12 | 37 | F* | YR | | | √ | √ | √ | | | | √ | | √ | | √ | | | |
| NL244 | 09/12/12 | 44 | F | YR | | | √ | √ | √ | | | | √ | | | | √ | | | |
| NL246 | 20/12/12 | 35 | ? | SR | | | √ | √ | | | | | √ | √ | √ | | √ | | √ | |
| NL258 | 04/07/12 | 18 | ? | SR | | | | √ | √ | √ | | | √ | | | √ | √ | | | √ |
| NL259 | 17/12/12 | 33 | ? | YR | | | √ | √ | √ | | | | √ | | | √ | √ | | | |
| NL260 | 13/12/12 | 37 | ? | SR | | | √ | √ | √ | | | | √ | | √ | | | | √ | |
| NL261 | 17/12/12 | 32 | ? | YR | √ | | √ | √ | √ | | | | | | √ | | | | √ | |
| NL262 | 13/12/12 | 21 | ? | SR | | | | √ | √ | | | | √ | | | | √ | | | |
| NL264 | 11/12/12 | 33 | F | YR | | | √ | √ | √ | | | | √ | | √ | | √ | | √ | |
| SL05 | 26/10/12 | 35 | F | SR | | | | | √ | √ | | | | | | √ | | | | √ |
| SL27 | 12/12/12 | 26 | M | SR | | | | √ | √ | √ | | | | | | √ | | | | √ |
| SL35 | 21/12/12 | 66 | ? | YR | | | | √ | √ | √ | √ | √ | | | | √ | | | | √ |
| SL40 | 16/08/12 | 31 | F | YR | | | | | √ | √ | | √ | | | | √ | | | | √ |
| WL04 | 01/11/12 | 32 | ? | SR | √ | | | √ | √ | | | | √ | | | | √ | | | |
| WL05 | 18/11/12 | 42 | ? | YR | | | √ | √ | √ | | | √ | √ | | | | √ | | | |
| WL09 | 26/11/10 | 20 | ? | SR | | | | √ | √ | √ | | √ | | | | √ | | | | √ |
| WL11 | 02/11/12 | 53 | F* | YR | | | √ | √ | √ | | | √ | √ | | | | √ | | | |
| WL15 | 21/12/12 | 52 | M* | YR | | | √ | √ | √ | √ | | | | | | √ | | | | √ |
| WL17 | 20/05/12 | 20 | ? | SR | | | | | √ | √ | √ | | | | | √ | | | | √ |
| WL21 | 10/07/12 | 35 | F | SR | | | | √ | √ | √ | | √ | | | | √ | | | | √ |
| WL25 | 12/12/12 | 103 | F | YR | | | | √ | √ | √ | | √ | | | | √ | | | | √ |
| WL29 | 10/07/12 | 22 | F | SR | | | | | √ | | | √ | | | | √ | | | | √ |
| WL37 | 15/08/12 | 20 | ? | SR | | | | | √ | √ | | √ | | | | √ | | | | √ |
| WL40 | 14/05/11 | 18 | F* | SV | | | | √ | √ | | | √ | √ | | | | √ | | | |
| WL42 | 07/08/12 | 51 | ? | YR | | | | √ | √ | √ | | √ | | | | √ | | | | √ |
| WL44 | 30/01/12 | 22 | ? | SR | | | √ | √ | √ | √ | | √ | √ | | | √ | | | | √ |
| WL46 | 05/07/12 | 23 | ? | SR | | | √ | √ | √ | | | | | | | √ | | | | √ |
| WL47 | 25/10/12 | 19 | ? | SV | √ | | | √ | √ | √ | √ | √ | √ | | | √ | √ | | | √ |
| WL48 | 11/02/12 | 15 | F | SR | | | | √ | √ | | | √ | | | | √ | | | | √ |
| WL50 | 26/10/12 | 42 | F* | YR | | | | √ | √ | √ | | √ | | | | √ | | | | √ |
| WL55 | 04/07/12 | 28 | ? | SR | | | | √ | √ | √ | | | | | | √ | | | | √ |
| WL61 | 13/12/12 | 33 | ? | SR | | | | | √ | | | | | | | √ | | | | √ |
| WL62 | 29/11/11 | 34 | F | SR | | | | √ | √ | √ | √ | √ | | | | √ | | | | √ |
| WL69 | 12/12/12 | 37 | ? | YR | | | | | √ | √ | | √ | | | | √ | | | | √ |
| WL72 | 12/12/12 | 43 | F | YR | | | | √ | √ | √ | | | | | | √ | | | | √ |
| WL73 | 21/08/12 | 23 | ? | SR | | | | | √ | √ | | | | | | √ | | | | √ |
| WL84 | 06/06/12 | 18 | F | SR | | | | | √ | √ | | | | | | √ | | | | √ |
| WL86 | 12/12/12 | 32 | F | YR | | | | | √ | √ | | | | | | √ | | | | √ |
| WL87 | 25/10/12 | 32 | ? | SR | | | | | √ | √ | √ | √ | | | | √ | | | | √ |
| WL88 | 29/11/11 | 31 | F | YR | | | | √ | √ | √ | √ | | | | | √ | | | | √ |
| WL93 | 10/11/12 | 20 | ? | SR | | | | √ | √ | √ | | | | | | √ | | | | √ |
| WL94 | 07/08/12 | 17 | ? | SR | | | | | √ | | | √ | | | | √ | | | | √ |
| WL98 | 24/05/12 | 17 | F | SR | | | | √ | √ | | | √ | | | | √ | | | | √ |
| WL109 | 10/07/12 | 36 | ? | SR | | | | √ | √ | √ | | √ | | | | √ | | | | √ |
| WL111 | 13/11/12 | 18 | F* | SR | | | √ | √ | √ | | | | √ | | | | √ | | | |
| WL114 | 21/11/12 | 21 | ? | SR | | | | √ | √ | √ | | √ | | | | √ | | | | √ |
| WL116 | 03/10/12 | 27 | ? | SR | | | | √ | √ | √ | | √ | √ | | | | √ | | | |
| WL118 | 12/12/12 | 21 | F | SR | | | | | √ | √ | | | | | | √ | | | | √ |
| WL120 | 10/07/12 | 16 | ? | SR | | | | √ | √ | | | | | | | √ | | | | √ |
| WL123 | 26/10/12 | 32 | F | YR | | | | √ | √ | √ | | √ | | | | √ | | | | √ |
| WL130 | 07/08/12 | 21 | ? | SR | | | | √ | √ | √ | | | | | | √ | | | | √ |
| WL131 | 12/12/12 | 34 | ? | YR | | | | | √ | | | | | | | √ | | | | √ |
| WL138 | 20/02/12 | 21 | ? | SR | | | | √ | √ | | | | | | | √ | | | | √ |

**Table 2. Descriptive statistics, showing mean ± s.d., and range of acoustic parameters of 27 whistles type of Chinese White Dolphins in Hong Kong**

| Whistle Type | | Duration (s) | Start (Hz) | End (Hz) | Min. (Hz) | Max. (Hz) | Range (Hz) | # Harm. |
|---|---|---|---|---|---|---|---|---|
| #1 (n=13) | mean ± s.d. | 0.24 ± 0.15 | 8390 ± 2714 | 8916 ± 2475 | 6036 ± 2706 | 9088 ± 2479 | 3052 ± 1135 | 1.5 ±1.8 |
| | range | 0.06-0.51 | 3557-13848 | 4830-13358 | 2214-11101 | 4830-13848 | 1140-4802 | 0-6 |
| #2 (n=170) | mean ± s.d. | 0.21 ± 0.18 | 5957 ± 2757 | 5852 ± 2721 | 5494 ± 2738 | 6205 ± 2755 | 711 ± 200 | 1.1 ±3.6 |
| | range | 0.03-1.01 | 1318-17743 | 2087-16755 | 1318-16755 | 2087-17743 | 0-993 | 0-31 |
| #3 (n=33) | mean ± s.d. | 0.31 ± 0.18 | 7003 ± 2668 | 6452 ± 2584 | 4712 ± 2036 | 7483 ± 2736 | 2771 ± 1794 | 1.2 ±1.8 |
| | range | 0.09-0.83 | 3874-13733 | 3582-13489 | 2806-11371 | 3874-13733 | 1017-8020 | 0-9 |
| #4 (n=46) | mean ± s.d. | 0.15 ± 0.15 | 9389 ± 3631 | 7299 ± 3119 | 6329 ± 3172 | 9430 ± 3598 | 3101 ± 1844 | 1.8 ±3.2 |
| | range | 0.03-0.89 | 4785-17721 | 3629-14927 | 1307-14048 | 4785-17721 | 823-9297 | 0-20 |
| #5 (n=86) | mean ± s.d. | 0.31 ± 0.29 | 8642 ± 4430 | 6369 ± 3330 | 6280 ± 3332 | 8804 ± 4394 | 2524 ± 1876 | 1.0 ±2.2 |
| | range | 0.04-1.19 | 3341-21534 | 3035-17743 | 3035-17743 | 4317-21534 | 1011-11151 | 0-15 |
| #6 (n=7) | mean ± s.d. | 0.52 ± 0.18 | 5600 ± 1273 | 4506 ± 1477 | 4001 ± 1202 | 6046 ± 1198 | 2045 ± 596 | 1.0 ±1.2 |
| | range | 0.29-0.75 | 4250-7691 | 3461-7636 | 3248-6702 | 4776-8405 | 1528-2966 | 0-3 |
| #7 (n=6) | mean ± s.d. | 0.76 ± 0.19 | 9057 ± 1771 | 6442 ± 2134 | 5034 ± 1220 | 10089 ± 2467 | 5055 ± 1387 | 0.8 ±1.2 |
| | range | 0.43-0.99 | 7569-11558 | 3992-8938 | 3984-6924 | 8221-14429 | 3651-7505 | 0-3 |
| #8 (n=59) | mean ± s.d. | 0.29 ± 0.26 | 6789 ± 2589 | 4941 ± 2271 | 4807 ± 2284 | 6847 ± 2566 | 2040 ± 1234 | 0.8 ±1.1 |
| | range | 0.04-1.28 | 3842-14719 | 3002-12525 | 3002-12525 | 4275-14719 | 896-8167 | 0-4 |
| #9 (n=32) | mean ± s.d. | 0.5 ± 0.36 | 8458 ± 3609 | 5769 ± 3216 | 5463 ± 3294 | 8759 ± 3736 | 3295 ± 1540 | 1.5 ±1.5 |
| | range | 0.09-1.46 | 3955-16425 | 2582-14447 | 2582-14447 | 3955-16425 | 1017-7838 | 0-4 |
| #10 (n=333) | mean ± s.d. | 0.09 ± 0.08 | 8881 ± 3402 | 8921 ± 3461 | 7225 ± 3226 | 9155 ± 3464 | 1930 ± 936 | 1.7 ±2.4 |
| | range | 0.02-1.02 | 2182-21692 | 2419-21692 | 1402-19610 | 2419-21692 | 195-6731 | 0-20 |
| #11 (n=9) | mean ± s.d. | 0.28 ± 0.12 | 7374 ± 2851 | 8504 ± 3184 | 5402 ± 2211 | 8974 ± 3473 | 3572 ± 1895 | 1.8 ±2.3 |
| | range | 0.13-0.50 | 4316-13986 | 4032-14328 | 3225-9151 | 4316-15639 | 806-6488 | 0-6 |
| #12 (n=20) | mean ± s.d. | 0.2 ± 0.16 | 10183 ± | 8570 ± 2796 | 7985 ± 2756 | 11894 ± 3109 | 3909 ± 1869 | 0.7 ±1.0 |
| | range | 0.06-0.64 | 3681-17492 | 4120-14128 | 3681-13466 | 5274-18025 | 1593-8844 | 0-4 |
| #13 (n=90) | mean ± s.d. | 0.1 ± 0.11 | 8147 ± 2962 | 10149 ± | 7295 ± 2949 | 10159 ± 3393 | 2864 ± 1237 | 2.0 ±2.7 |
| | range | 0.04-1.05 | 2416-15766 | 3241-18001 | 1758-14997 | 3241-18001 | 775-5878 | 0-20 |
| #14 (n=75) | mean ± s.d. | 0.12 ± 0.13 | 6162 ± 3357 | 8828 ± 3609 | 6145 ± 3405 | 8881 ± 3624 | 2736 ± 1765 | 2.0 ±3.8 |
| | range | 0.03-0.84 | 561-15931 | 2130-16974 | 561-15931 | 2130-16974 | 853-8405 | 0-23 |
| #15 (n=28) | mean ± s.d. | 0.47 ± 0.25 | 5883 ± 4771 | 7161 ± 4789 | 5375 | 9141 | 3766 | 1.9 ±1.7 |
| | range | 0.06-1.20 | 1699-19610 | 3535-20578 | 1699-19610 | 5036-21837 | 1598-6866 | 0-6 |
| #16 (n=16) | mean ± s.d. | 0.69 ± 0.37 | 6274 ± 2762 | 7403 ± 3895 | 5550 ± 2608 | 9624 ± 3673 | 4074 ± 2339 | 2.6 ±1.9 |
| | range | 0.11-1.48 | 2711-11325 | 2428-14557 | 2428-10524 | 4680-15100 | 1114-9064 | 0-6 |
| #17 (n=14) | mean ± s.d. | 0.34 ± 0.25 | 11038 ± | 9077 ± 5378 | 7752 ± 5589 | 11349 ± 5319 | 3596 ± 2120 | 1.0 ±1.0 |
| | range | 0.09-0.96 | 5878-24224 | 4164-22529 | 3244-21803 | 5933-24224 | 1310-10108 | 0-3 |
| #18 (n=14) | mean ± s.d. | 0.36 ± 0.19 | 5260 ± 2813 | 6976 ± 2335 | 4565 ± 2533 | 7915 ± 2323 | 3350 ± 1674 | 2.5 ±2.8 |
| | range | 0.08-0.69 | 2130-12498 | 3186-11507 | 2130-11507 | 5132-13489 | 1703-6642 | 0-10 |
| #19 (n=22) | mean ± s.d. | 0.44 ±0.30 | 4494 ± 2545 | 6012 ± 3105 | 4345 ± 2467 | 6396 ± 2998 | 2050 ± 1146 | 0.9 ±1.1 |
| | range | 0.06-1.23 | 2123-12362 | 2627-16928 | 2123-12362 | 3821-17364 | 498-5001 | 0-4 |
| #20 (n=41) | mean ± s.d. | 0.1 ± 0.05 | 8478 ± 3229 | 8513 ± 3160 | 8252 ± 3159 | 10193 ± 3598 | 1940 ± 1661 | 0.9 ±2.4 |
| | range | 0.03-0.23 | 2635-16717 | 2635-15922 | 2635-15922 | 3700-17660 | 566-7746 | 0-15 |
| #21 (n=39) | mean ± s.d. | 0.21 ± 0.12 | 6332 ± 2077 | 6260 ± 2084 | 4718 ± 2142 | 6557 ± 2083 | 1839 ± 831 | 2.5 ±2.9 |
| | range | 0.07-0.49 | 3124-11717 | 3958-11877 | 2747-10667 | 4065-11877 | 879-4450 | 0-9 |
| #22 (n=14) | mean ± s.d. | 0.12 ± 0.06 | 7525 ± 2451 | 10077 ± | 7419 ± 2329 | 10925 ± 2733 | 3506 ± 1626 | 1.1 ±1.1 |
| | range | 0.05-0.25 | 4194-11481 | 6892-14754 | 4194-11481 | 7615-15985 | 1321-6922 | 0-3 |
| #23 (n=11) | mean ± s.d. | 0.2 ± 0.10 | 10260 ± | 8508 ± 3926 | 8341 ± 3905 | 10408 ± 3345 | 2067 ± 912 | 0.7 ±1.0 |
| | range | 0.08-0.35 | 5568-15766 | 2966-14337 | 2966-14337 | 5568-15766 | 1065-3689 | 0-3 |
| #24 (n=19) | mean ± s.d. | 0.15 ± 0.11 | 5374 ± 2970 | 7048 ± 3041 | 5287 ± 2889 | 7048 ± 3041 | 1761 ± 549 | 1.7 ±1.9 |
| | range | 0.06-0.45 | 1124-11151 | 2697-13843 | 1124-11151 | 2697-13843 | 1099-2971 | 0-5 |
| #25 (n=8) | mean ± s.d. | 0.57 ± 0.29 | 3854 ± 288 | 3528 ± 241 | 3246 ± 319 | 6909 ± 729 | 3663 ± 586 | 1.8 ±0.9 |
| | range | 0.41-1.29 | 3196-4146 | 3196-3877 | 2747-3756 | 5606-7457 | 2411-4261 | 1-3 |
| #26 (n=12) | mean ± s.d. | 0.11 ± 0.07 | 9973 ± 1912 | 8209 ± 2349 | 8209 ± 2349 | 10813 ± 1627 | 2604 ± 1218 | 0.2 ±0.6 |
| | range | 0.05-0.30 | 5900-12140 | 3642-10852 | 3642-10852 | 6622-12553 | 1206-5383 | 0-2 |
| #27 (n=17) | mean ± s.d. | 1.1 ± 0.19 | 4818 ± 996 | 3761 ± 1458 | 3327 ± 701 | 7607 ± 502 | 4208 ± 655 | 1.3 ±0.8 |
| | range | 0.74-1.38 | 3446-7157 | 2355-7157 | 2355-4373 | 6237-8185 | 2971-5507 | 0-2 |

**Table 3. The percentage and total number (n) of whistle types recorded in three sampling areas West Lantau (WL), Southwest Lantau (SWL), and Northwest Lantau (NWL).**

| Whistle Type | WL (%) | SWL(%) | NWL (%) | n |
|---|---|---|---|---|
| 1 | 45 | 55 | 0 | 11 |
| 2 | 47 | 45 | 8 | 152 |
| 3 | 58 | 21 | 21 | 33 |
| 4 | 43 | 54 | 2 | 46 |
| 5 | 40 | 45 | 14 | 84 |
| 6 | 71 | 0 | 29 | 7 |
| 7 | 33 | 0 | 67 | 6 |
| 8 | 49 | 31 | 20 | 59 |
| 9 | 53 | 31 | 16 | 32 |
| 10 | 38 | 59 | 4 | 327 |
| 11 | 67 | 17 | 17 | 6 |
| 12 | 65 | 20 | 15 | 20 |
| 13 | 22 | 66 | 11 | 89 |
| 14 | 30 | 49 | 21 | 71 |
| 15 | 56 | 15 | 30 | 27 |
| 16 | 50 | 31 | 19 | 16 |
| 17 | 71 | 7 | 21 | 14 |
| 18 | 57 | 43 | 0 | 14 |
| 19 | 31 | 63 | 6 | 16 |
| 20 | 58 | 30 | 13 | 40 |
| 21 | 43 | 49 | 8 | 37 |
| 22 | 21 | 64 | 14 | 14 |
| 23 | 36 | 64 | 0 | 11 |
| 24 | 21 | 68 | 11 | 19 |
| 25 | 0 | 100 | 0 | 8 |
| 26 | 42 | 50 | 8 | 12 |
| 27 | 0 | 100 | 0 | 17 |

**Table 4. The means of all response variables including swimming speed, reorientation rate, and linearity in the presence and absence of vessels by time of day, and maximum number of vessels present.**

| | Swimming Speed (km/hr) | Reorientation rate (degrees/surfacing) | Linearity |
|---|---|---|---|
| **Vessels absent** | 3.43 | 58.45 | 0.414 |
| Morning (n=5) | 3.05 | 61.65 | 0.298 |
| Afternoon (n=4) | 3.89 | 54.46 | 0.559 |
| **Vessels present** | 2.69 | 68.30 | 0.434 |
| Morning (n=9) | 2.61 | 70.48 | 0.395 |
| Afternoon (n=13) | 2.74 | 66.80 | 0.461 |
| 1 vessel (n=5) | 2.75 | 72.47 | 0.508 |
| 2 vessels (n=9) | 2.98 | 60.71 | 0.495 |
| 3 vessels (n=4) | 2.59 | 65.61 | 0.421 |
| 4 vessels (n=3) | 1.65 | 86.34 | 0.165 |
| 6 vessels (n=1) | 3.34 | 72.57 | 0.367 |

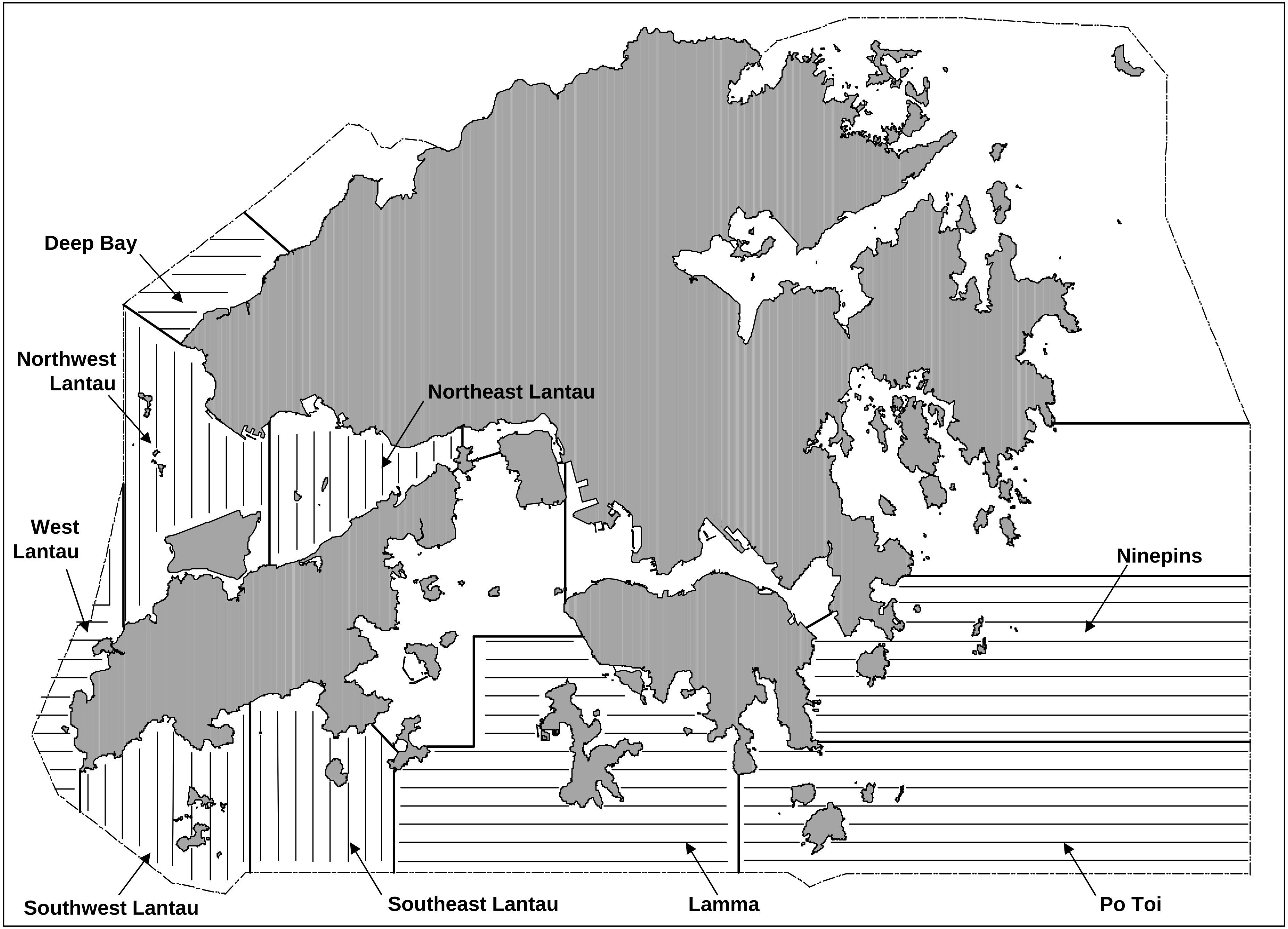



Figure 1. Nine Line-Transect Survey Areas within the Study Area

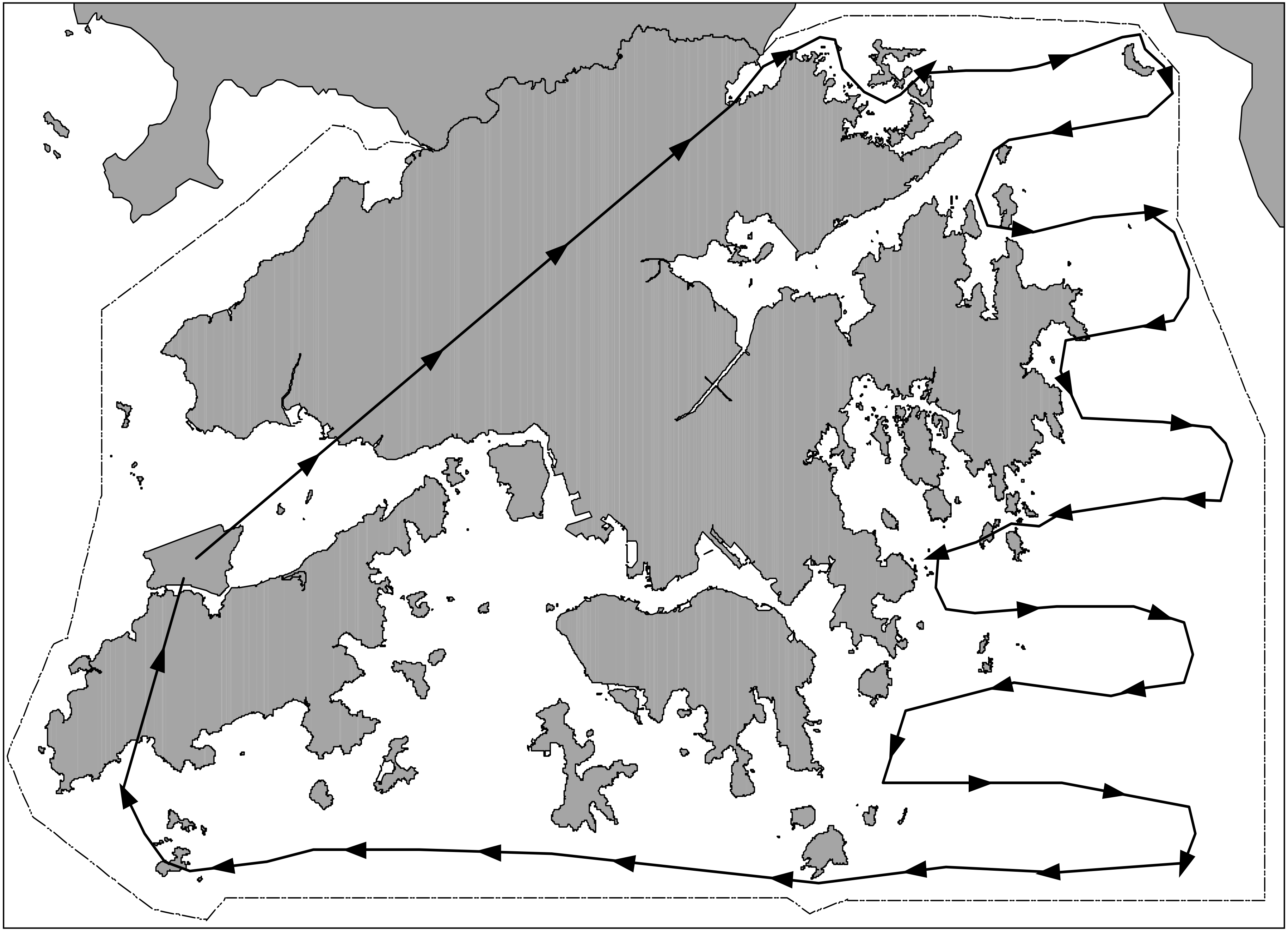


Figure 2. Survey Route for Helicopter Surveys in Eastern and Southern Waters of Hong Kong

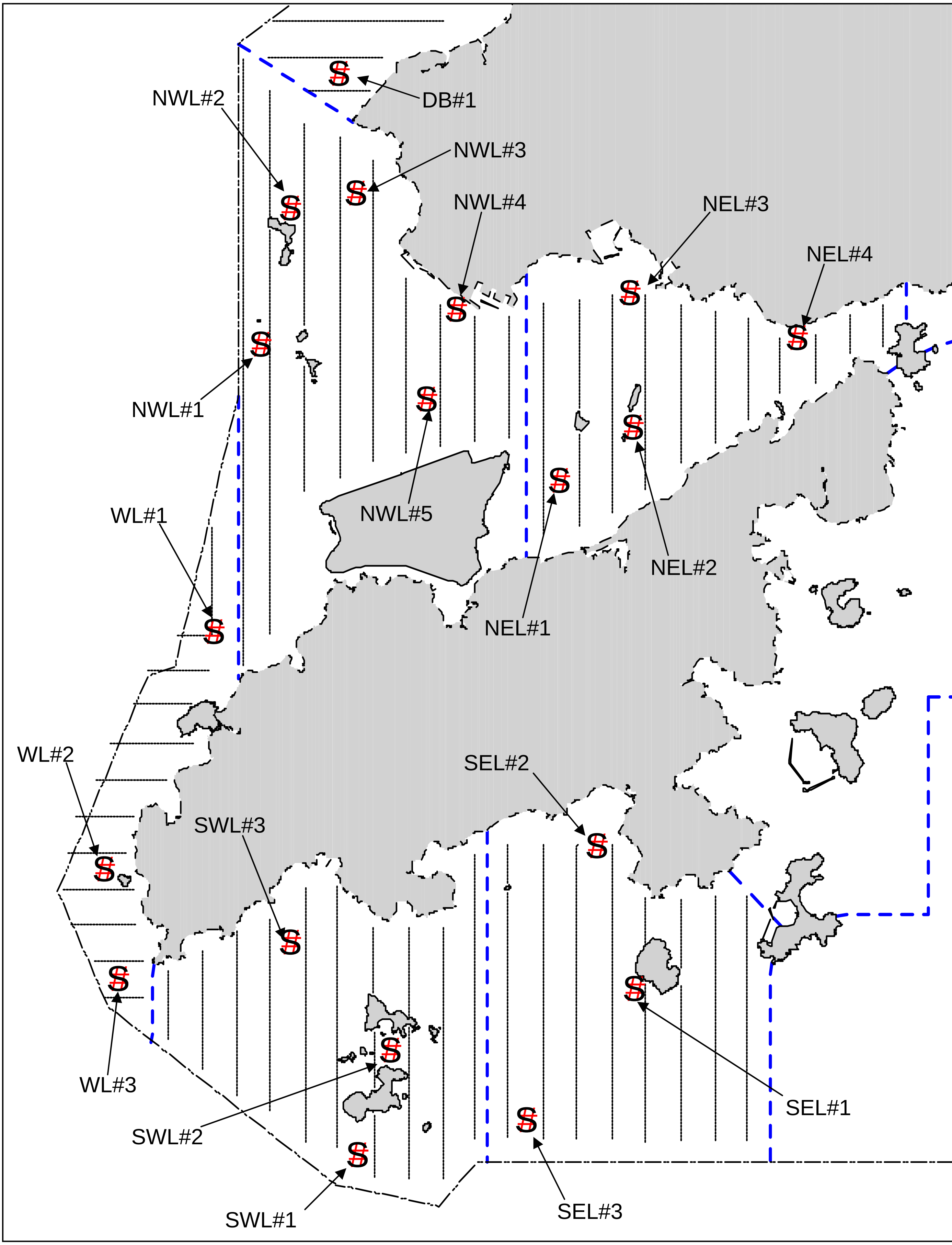



Figure 3. Locations of various acoustic monitoring stations around Lantau waters

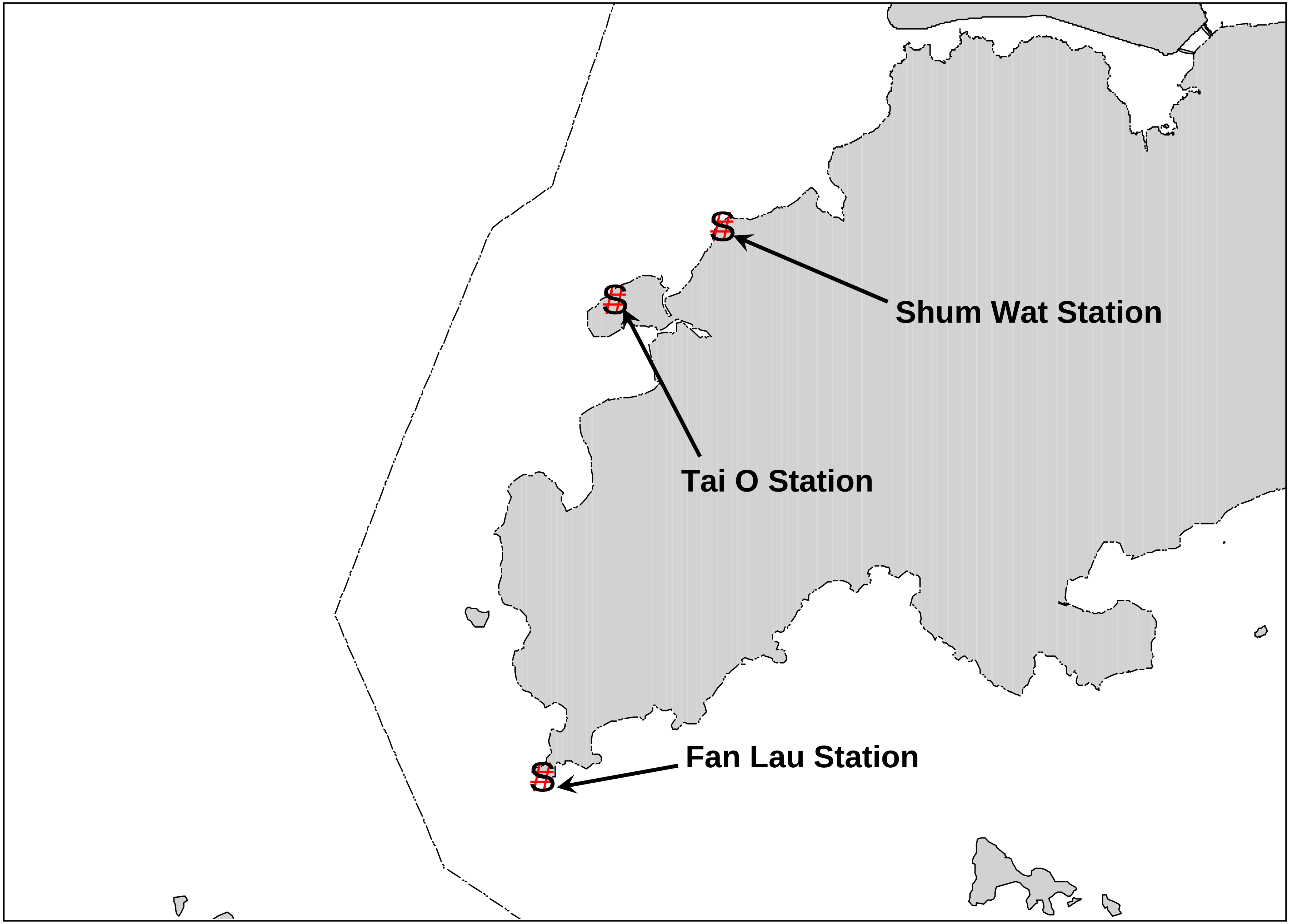



Figure 4. Three theodolite-tracking stations set up along the western coastline of Lantau Island

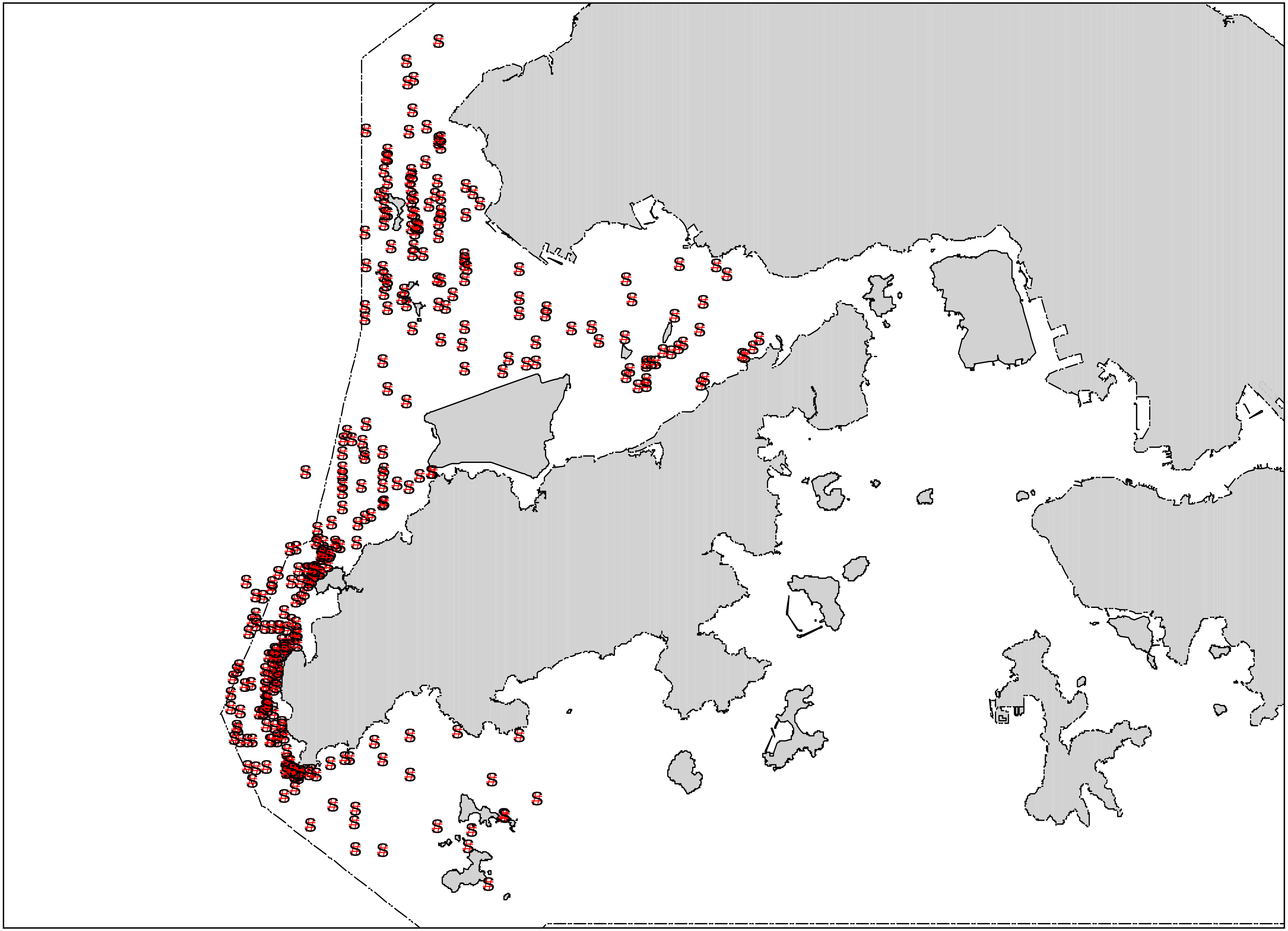


Figure 5. Distribution of Chinese white dolphin sightings in Hong Kong waters (April 2012 – March 2013)

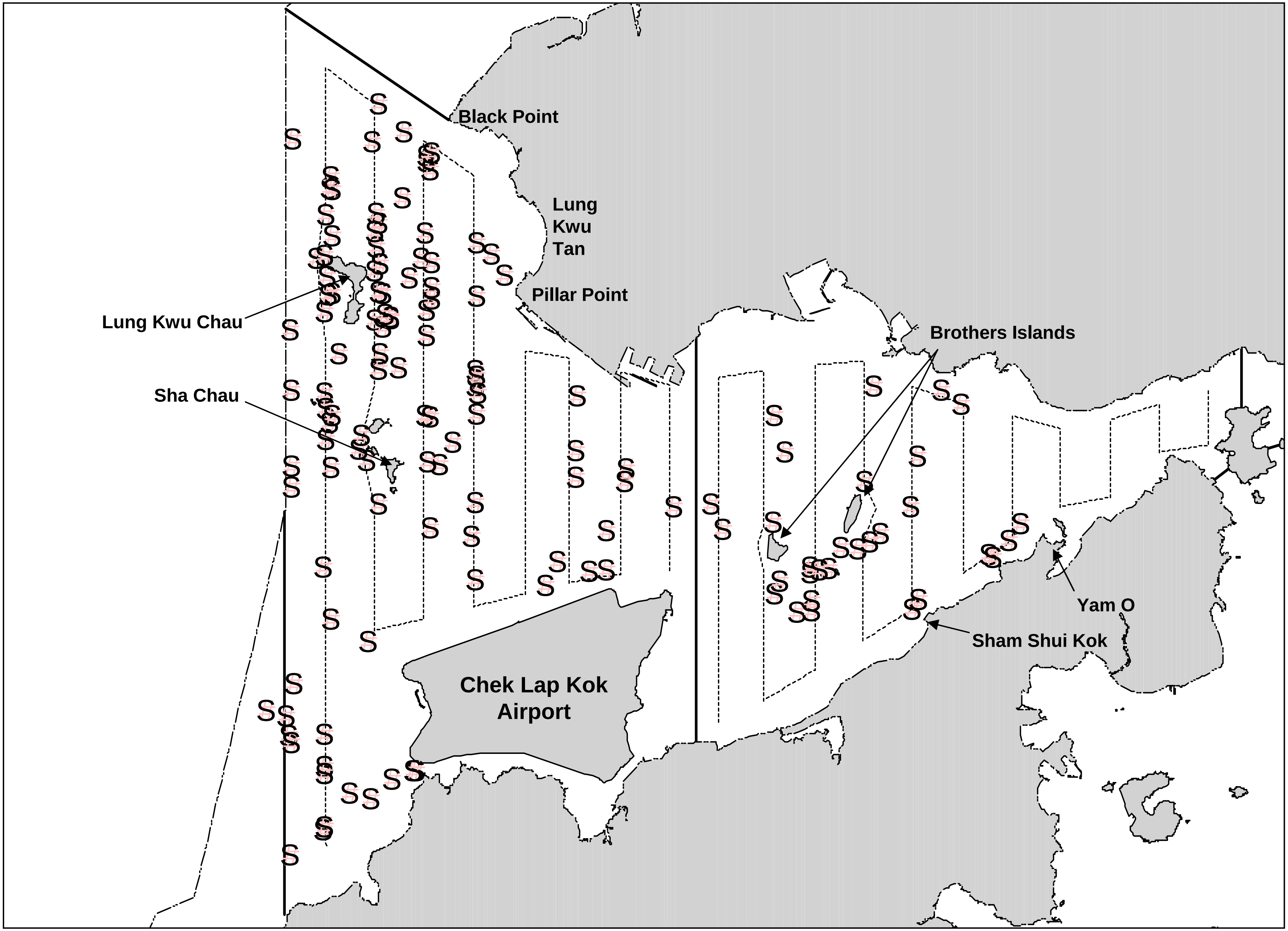



Figure 6. Distribution of Chinese white dolphin sightings in North Lantau waters (April 2012 – March 2013)

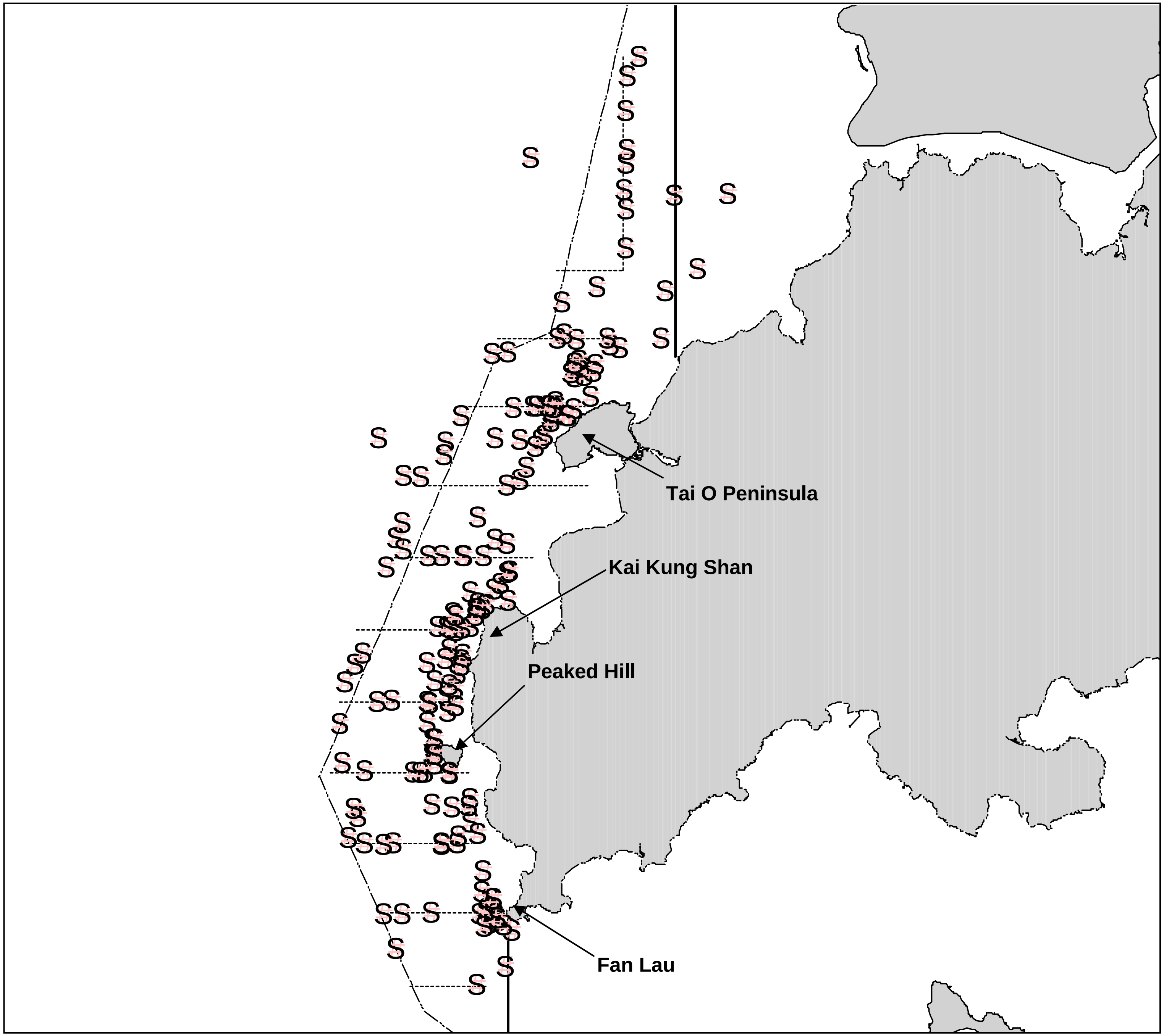



Figure 7. Distribution of Chinese white dolphin sightings in West Lantau waters (April 2012 – March 2013)

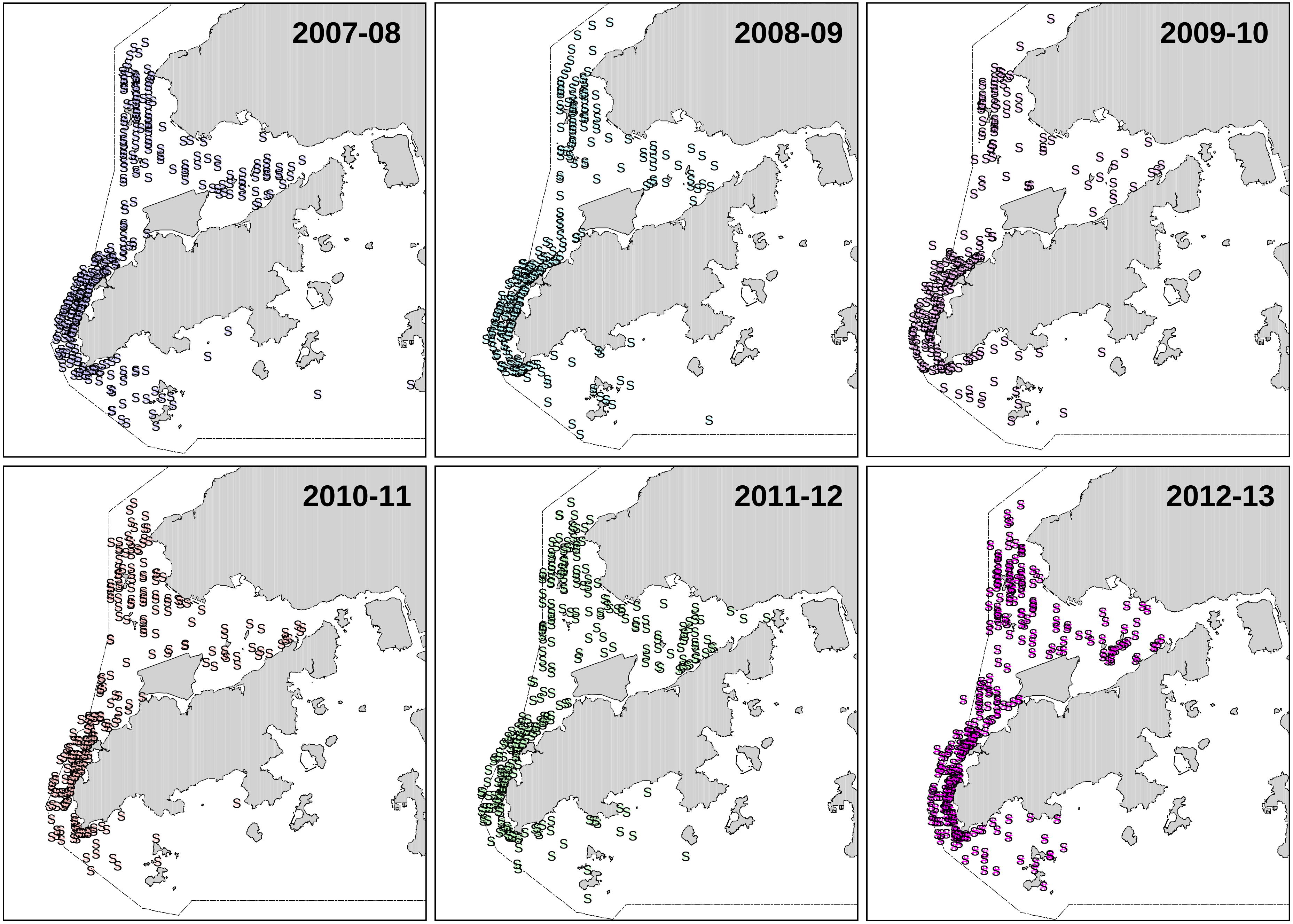


Figure 8. Comparison of dolphin distribution patterns from the past six monitoring periods (2007-13)

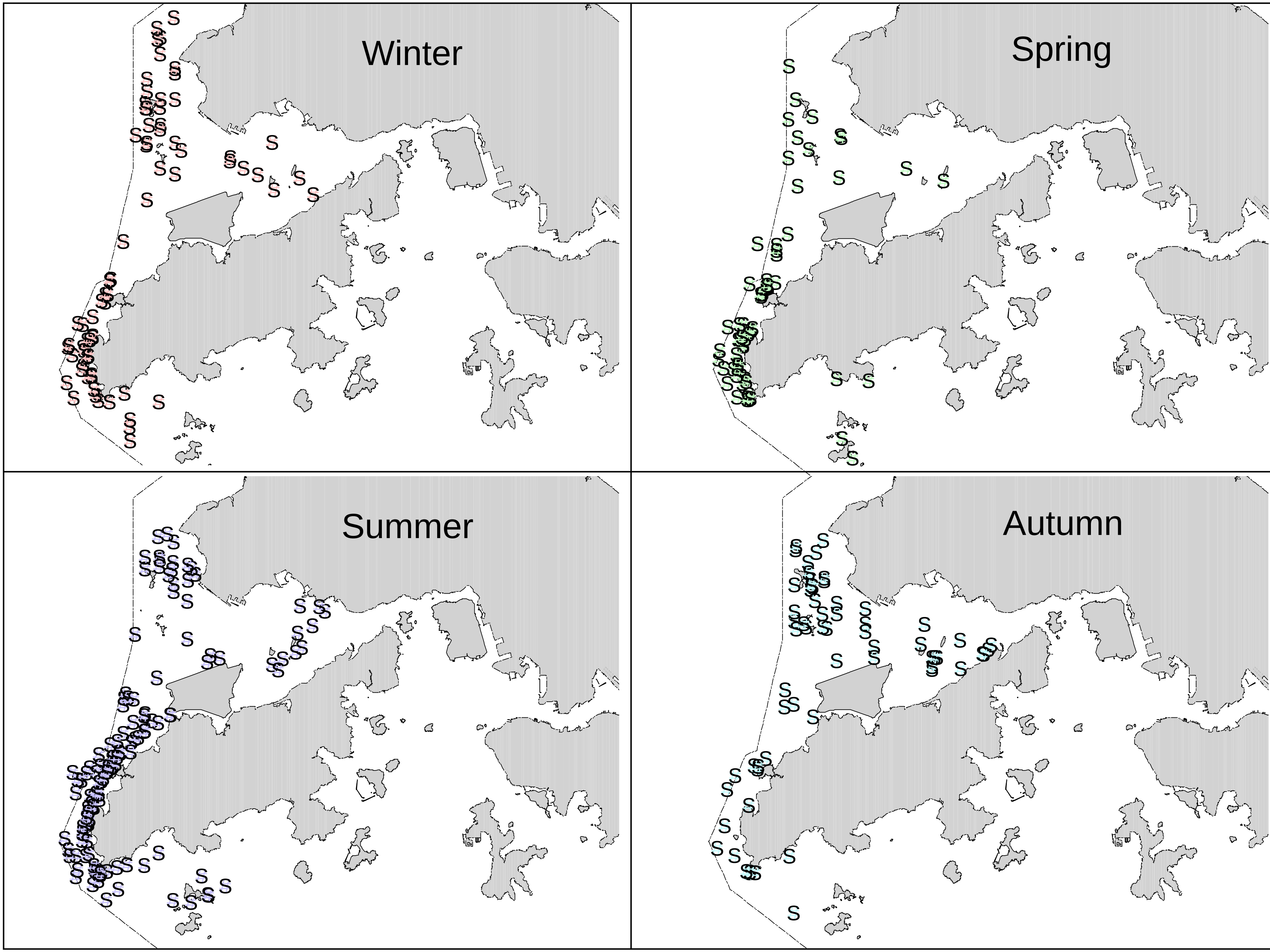



Figure 9. Seasonal distribution of Chinese white dolphins in Hong Kong waters (April 2012 – March 2013)

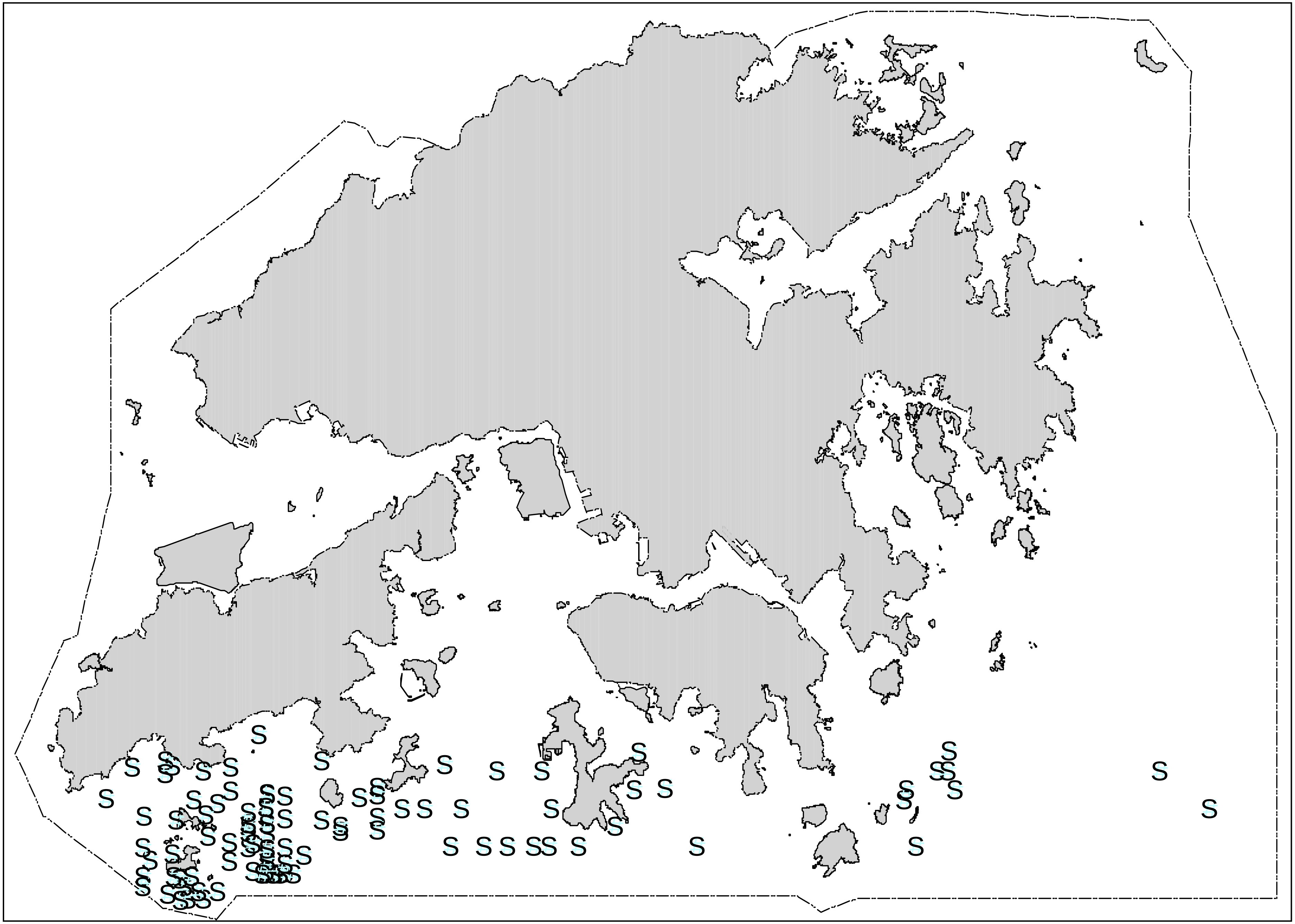


Figure 10. Distribution of finless porpoise sightings (April 2012 – March 2013)

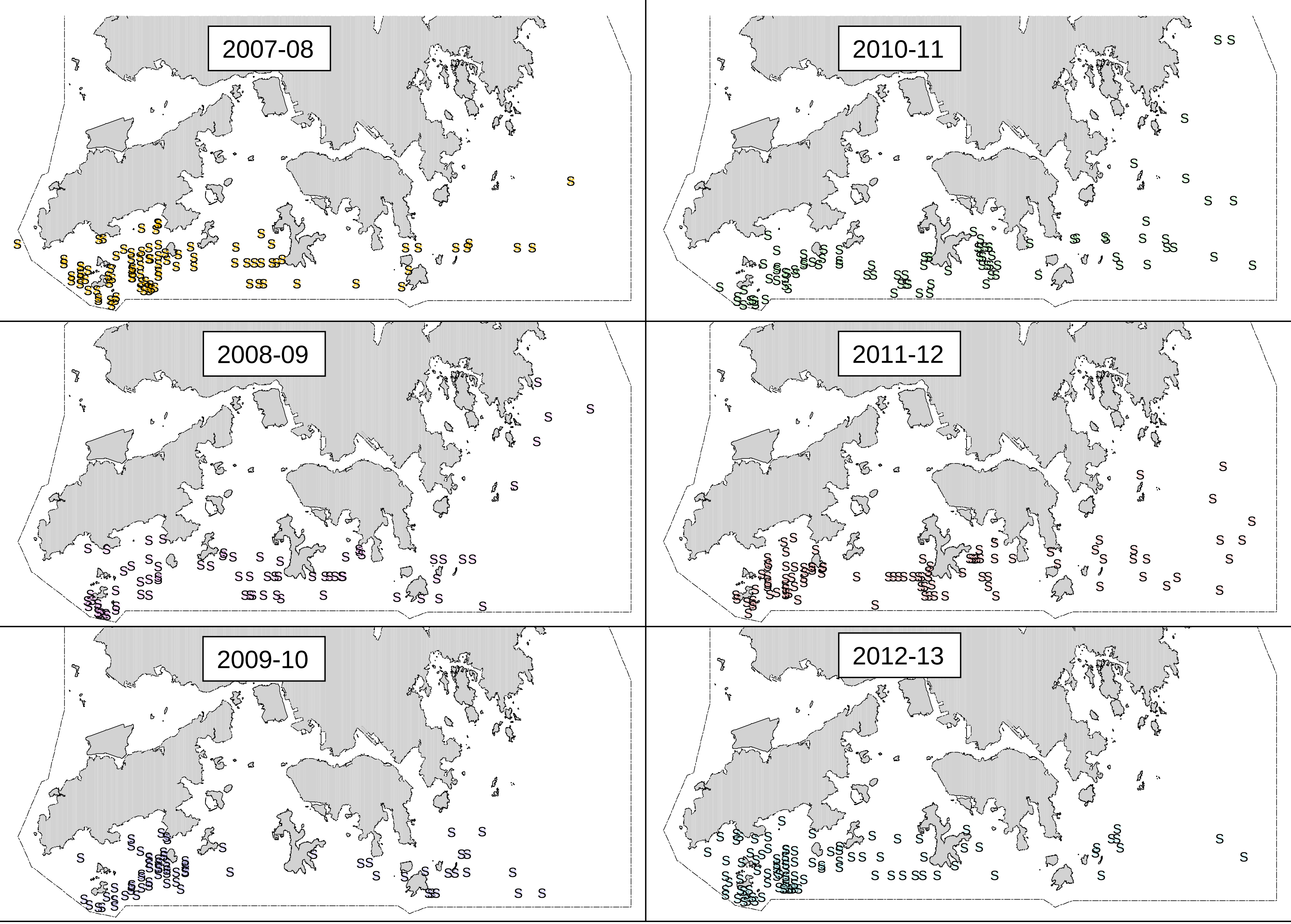



Figure 11. Comparison of porpoise distribution patterns from the past six monitoring periods (2007-13)

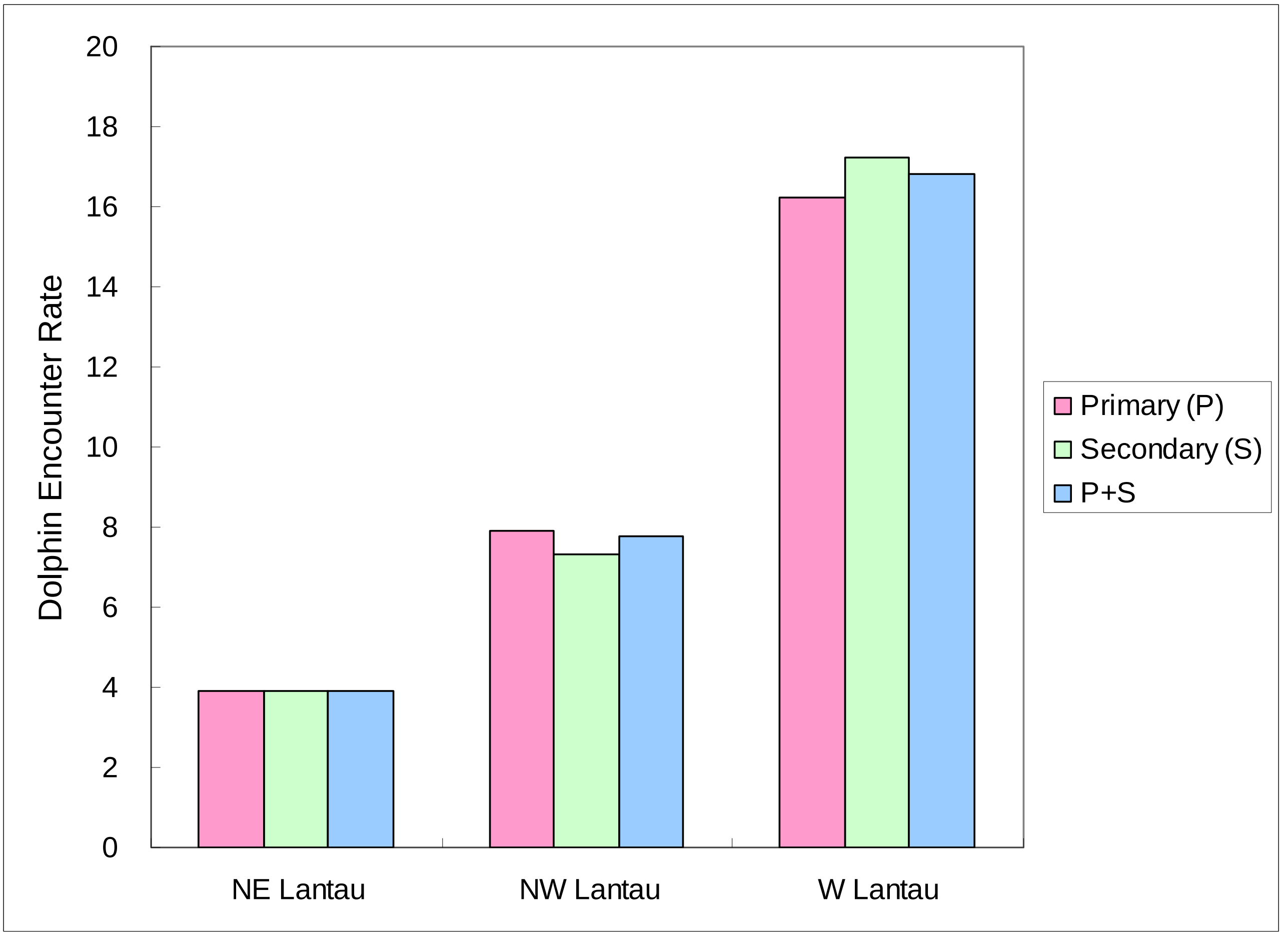



Figure 12. Comparison of dolphin encounter rates (number of on-effort sightings of Chinese White Dolphins per 100 km of survey effort) deduced from data collected along primary lines alone, along secondary lines alones, and along both primary and secondary lines combined in Northeast, Northwest and West Lantau during 2010-12

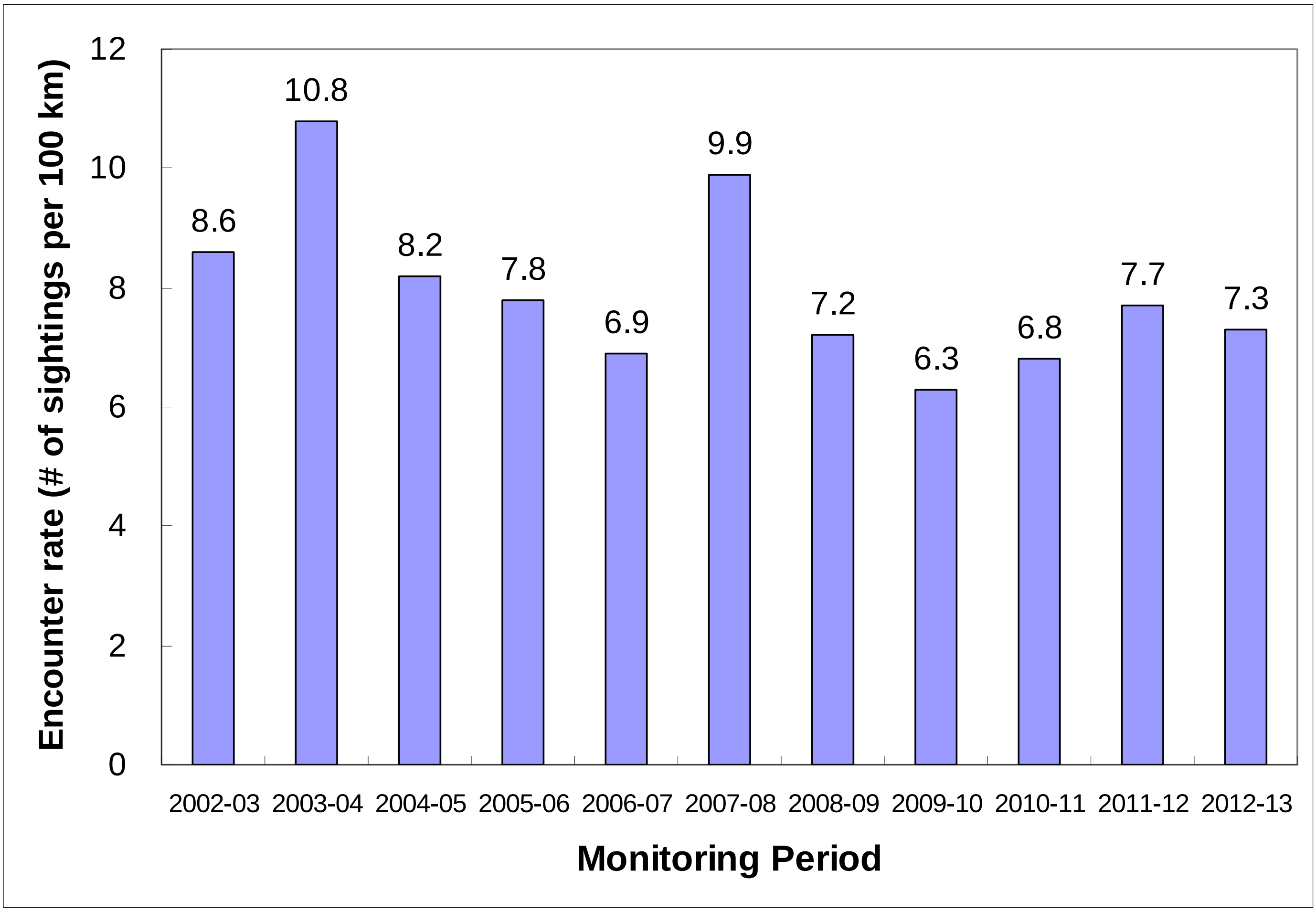



Figure 13. Temporal trend in encounter rates of Chinese white dolphins (combined from WL, NWL, NEL and SWL survey areas) in the past eleven monitoring periods from 2002-13

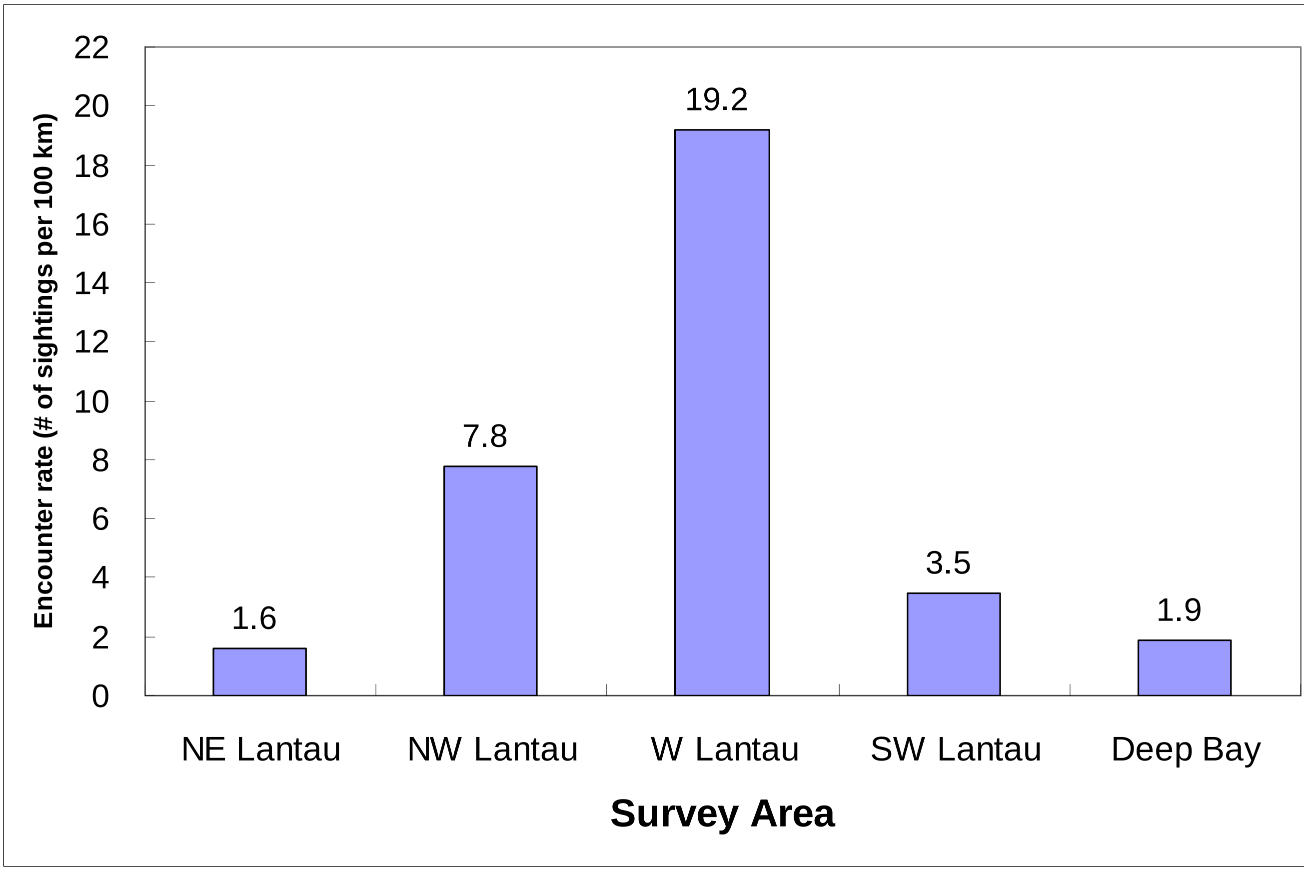



Figure 14. Encounter rates of Chinese white dolphins among different survey areas (April 2012 – March 2013)

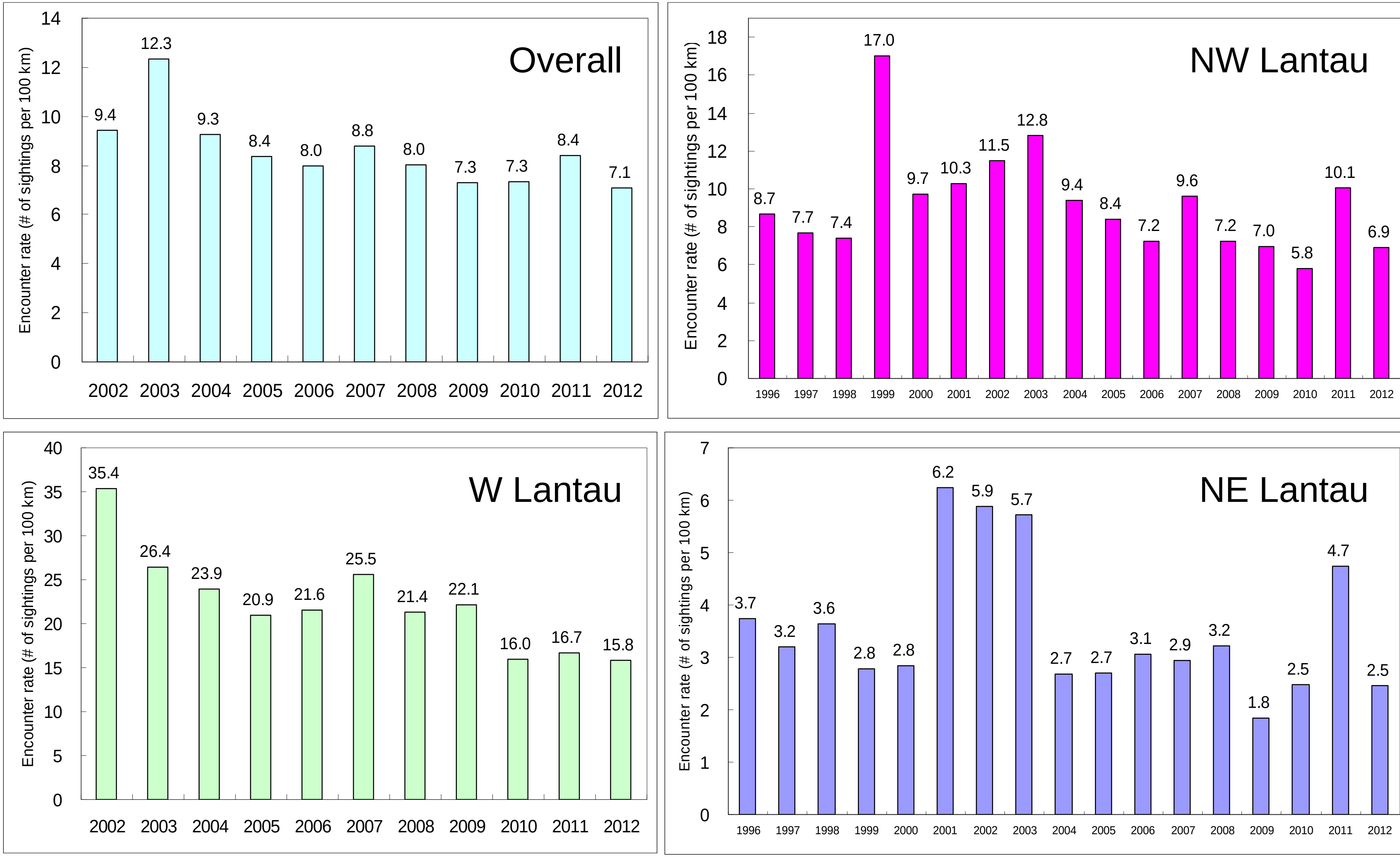



Figure 15. Long-term trends in annual encounter rates of Chinese white dolphins in different survey areas

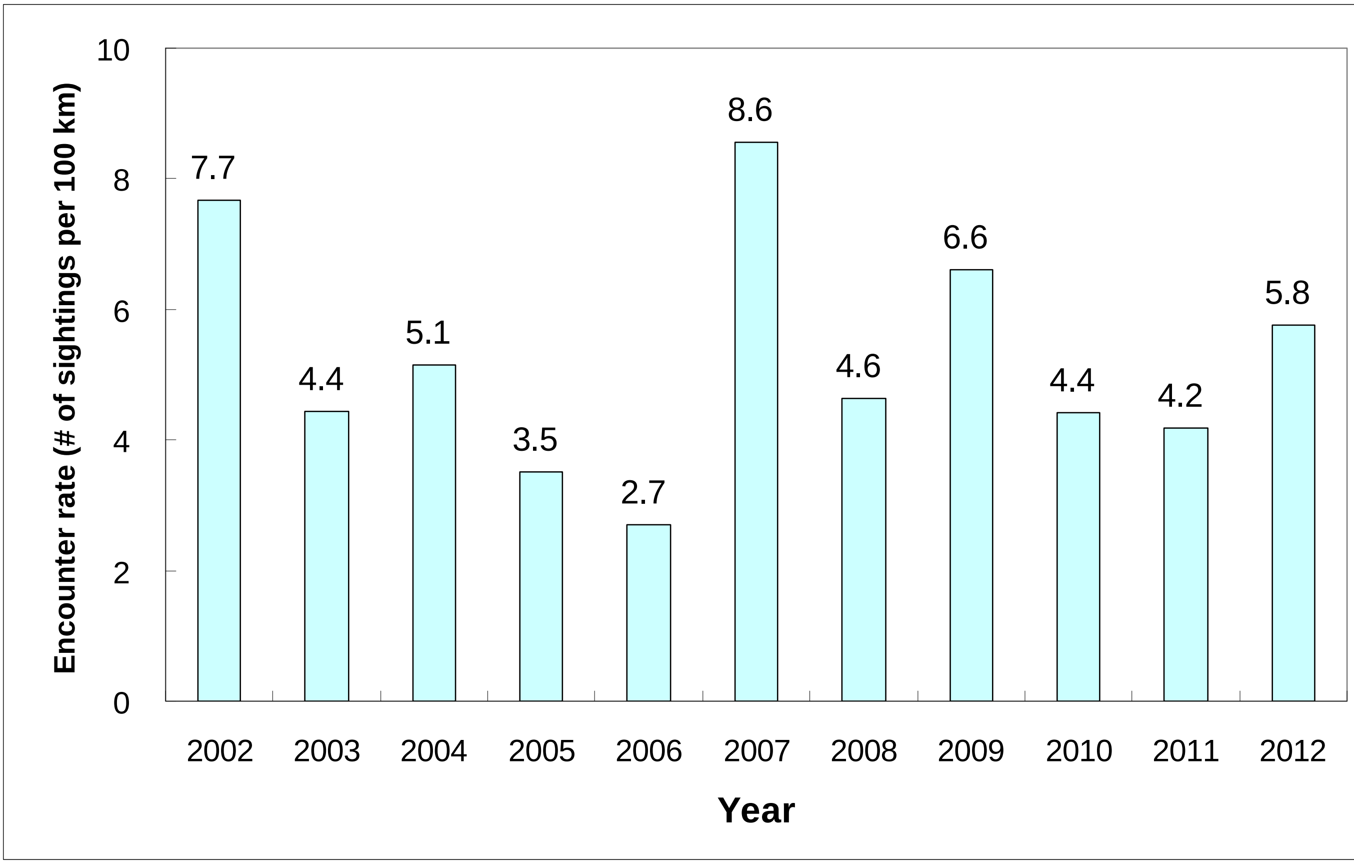



Figure 16. Temporal trend of annual encounter rates of finless porpoises (combined from SWL, SEL, LM and PT survey areas) from 2002-12

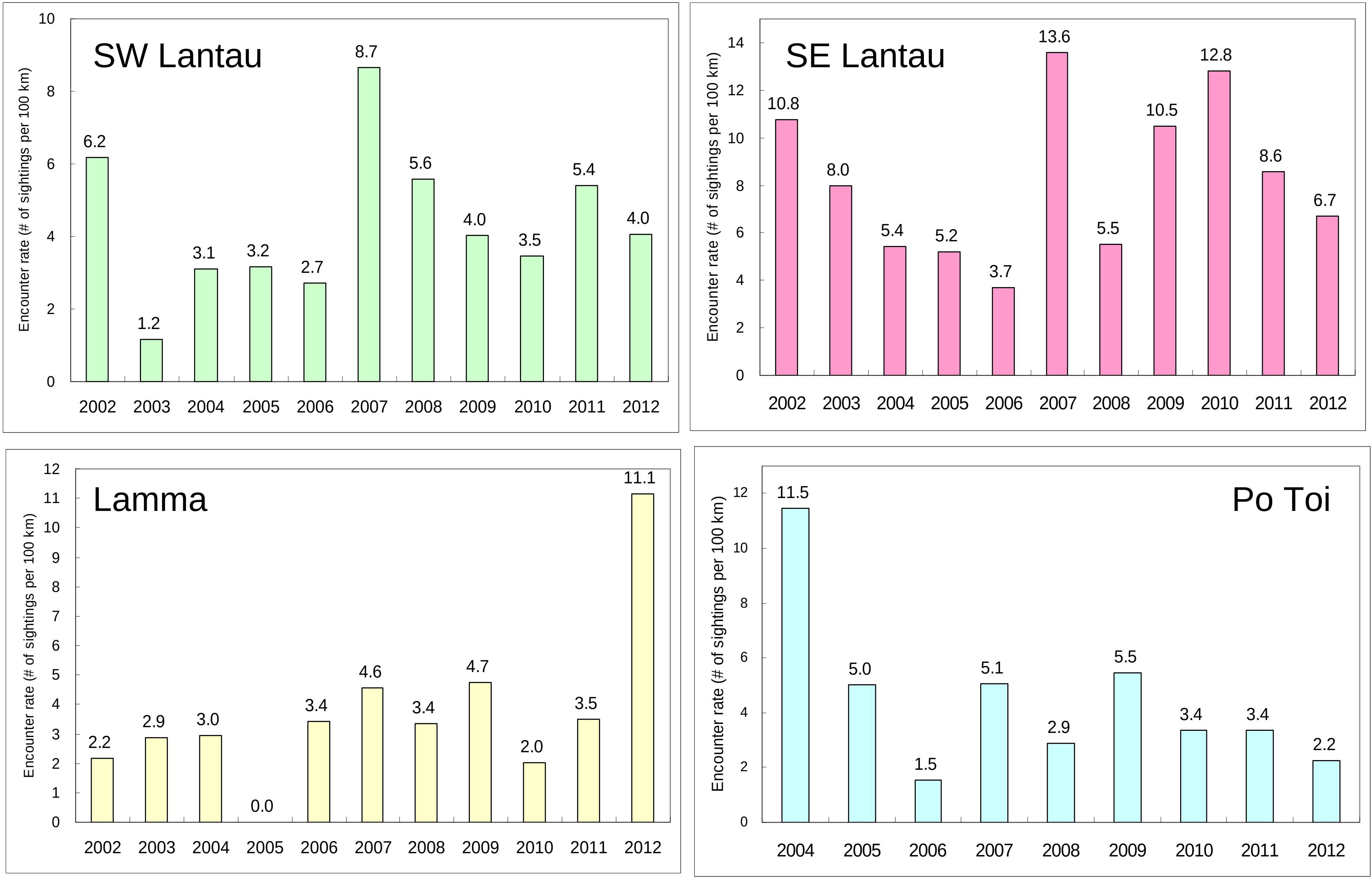



Figure 17. Temporal trends in annual encounter rates of finless porpoises among different survey areas

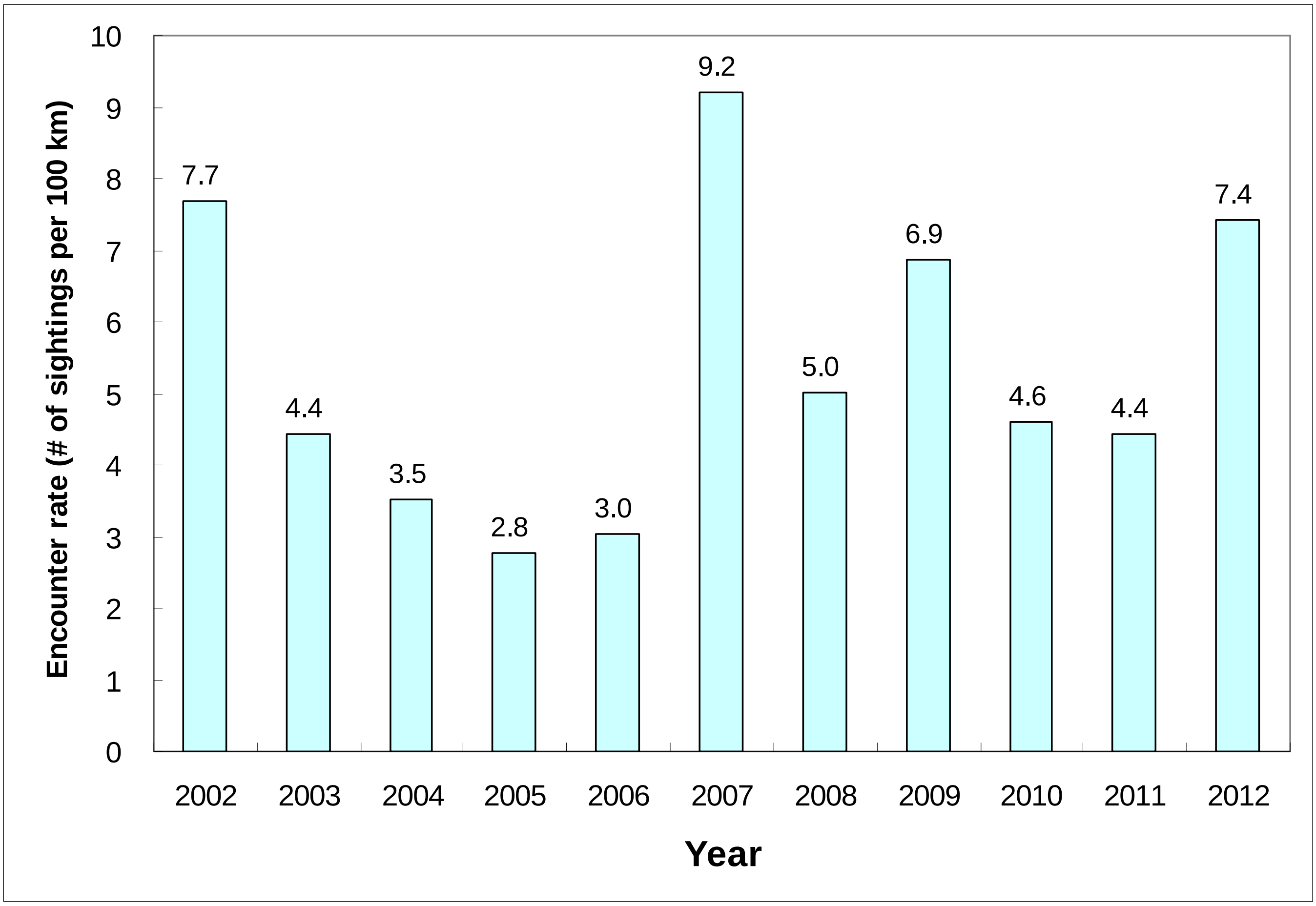



Figure 18. Temporal trend of porpoise encounter rates in South Lantau and Lamma waters combined from winter/spring months of 2002-12

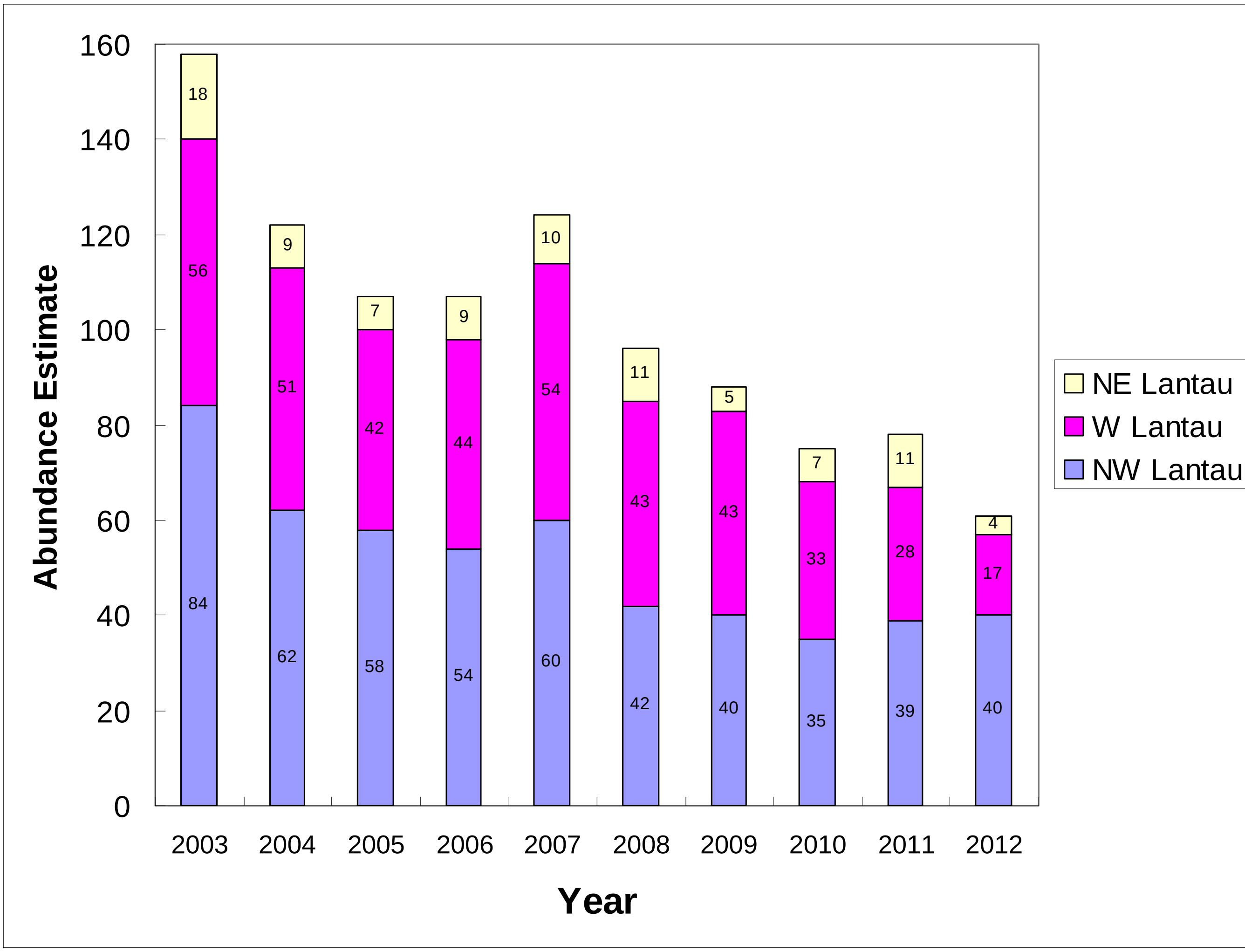



Figure 19. Temporal trends in combined abundance estimates of Chinese white dolphins in West, Northwest & Northeast Lantau from 2003-12

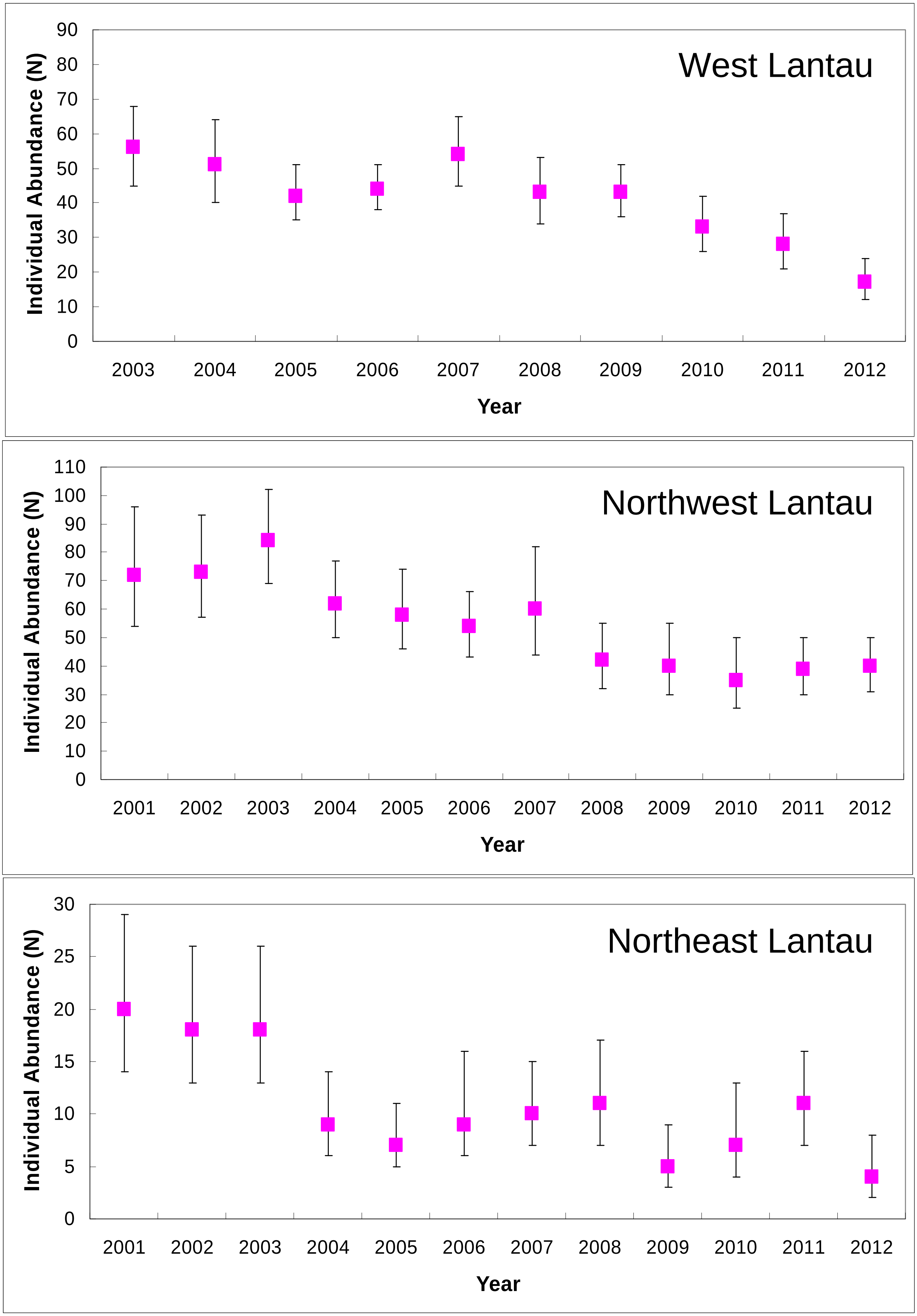



Figure 20. Temporal trends in abundance estimates of Chinese white dolphins in West, Northwest & Northeast Lantau from 2001-12 (error bars: 95% confidence interval of abundance estimates)

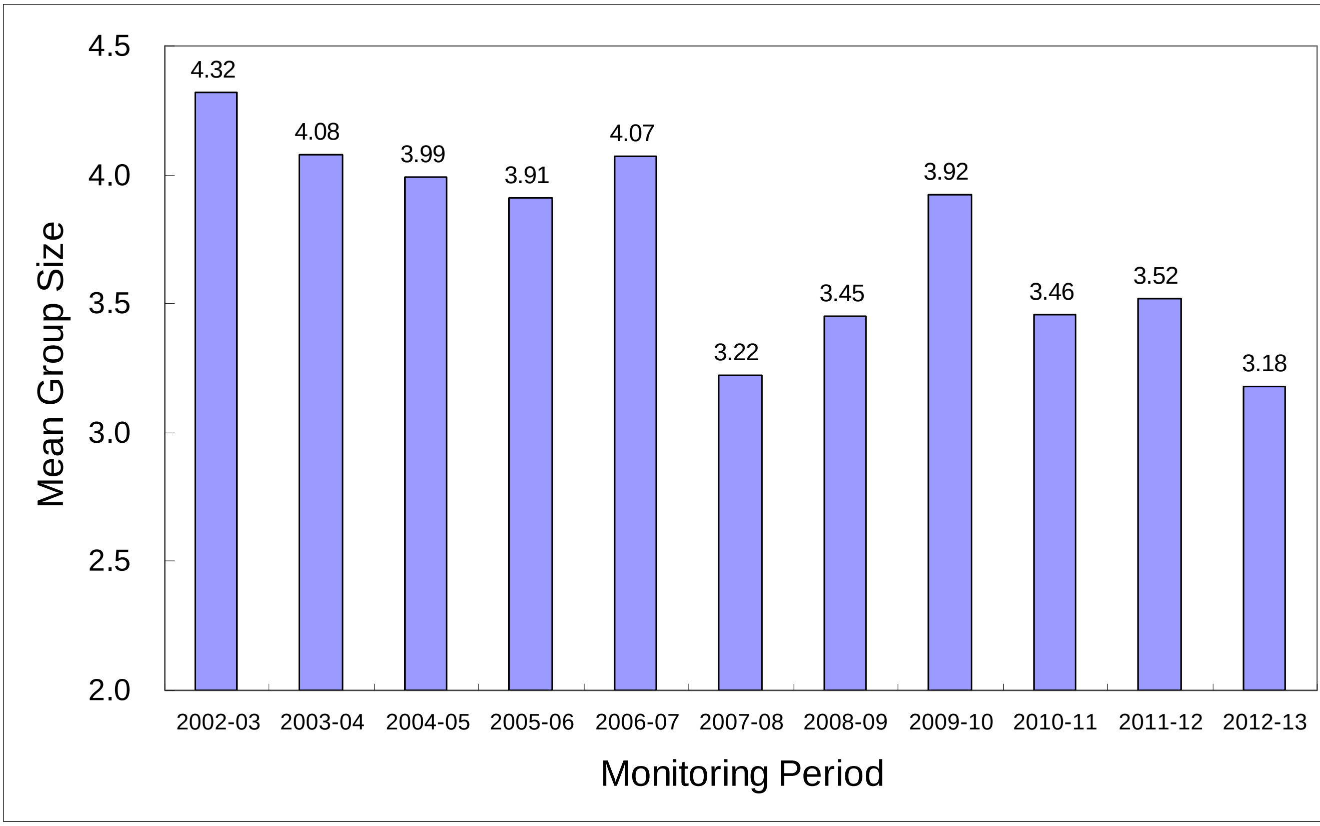



Figure 21. Temporal trend of mean dolphin group size in 2002-13

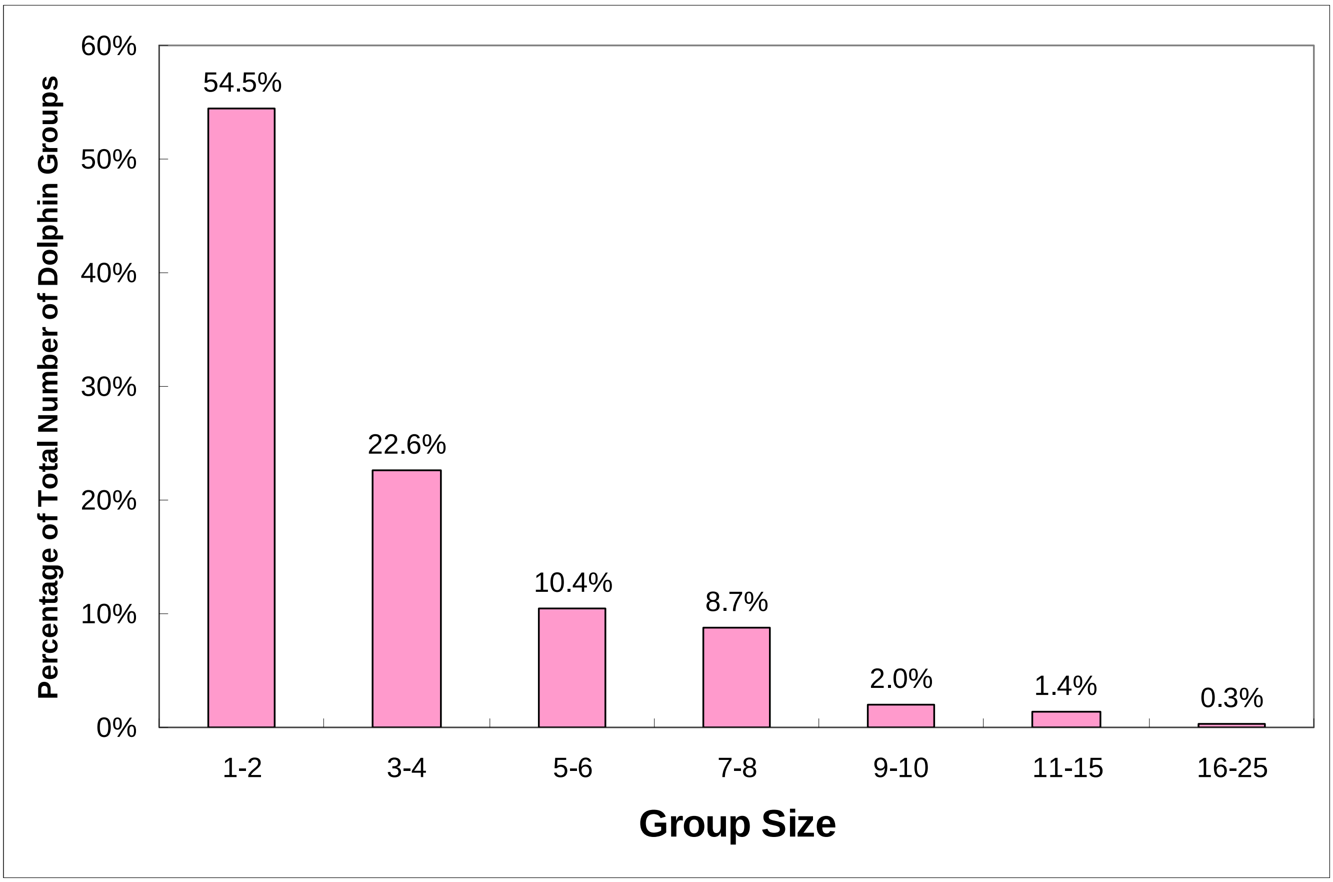
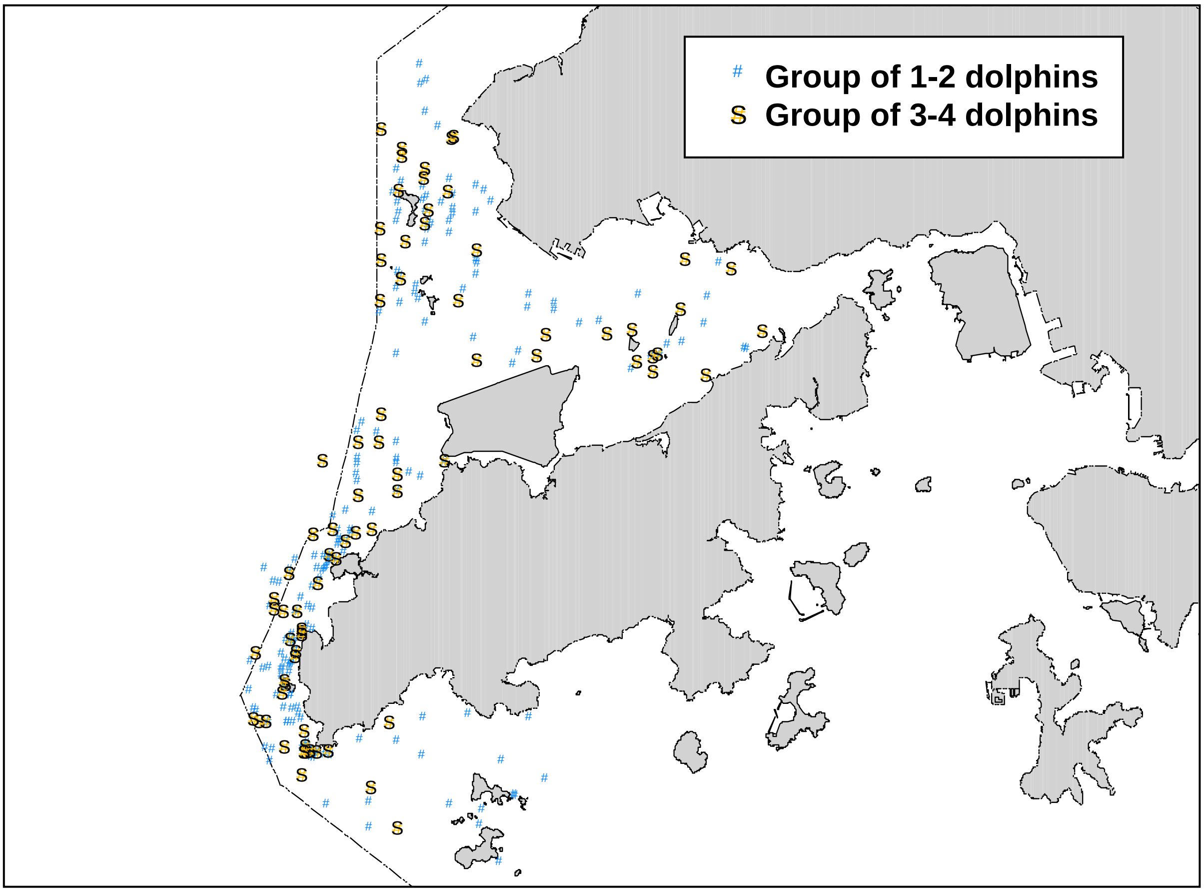



Figure 22. Percentages of different group sizes of Chinese white dolphins in Hong Kong during April 2012 to March 2013



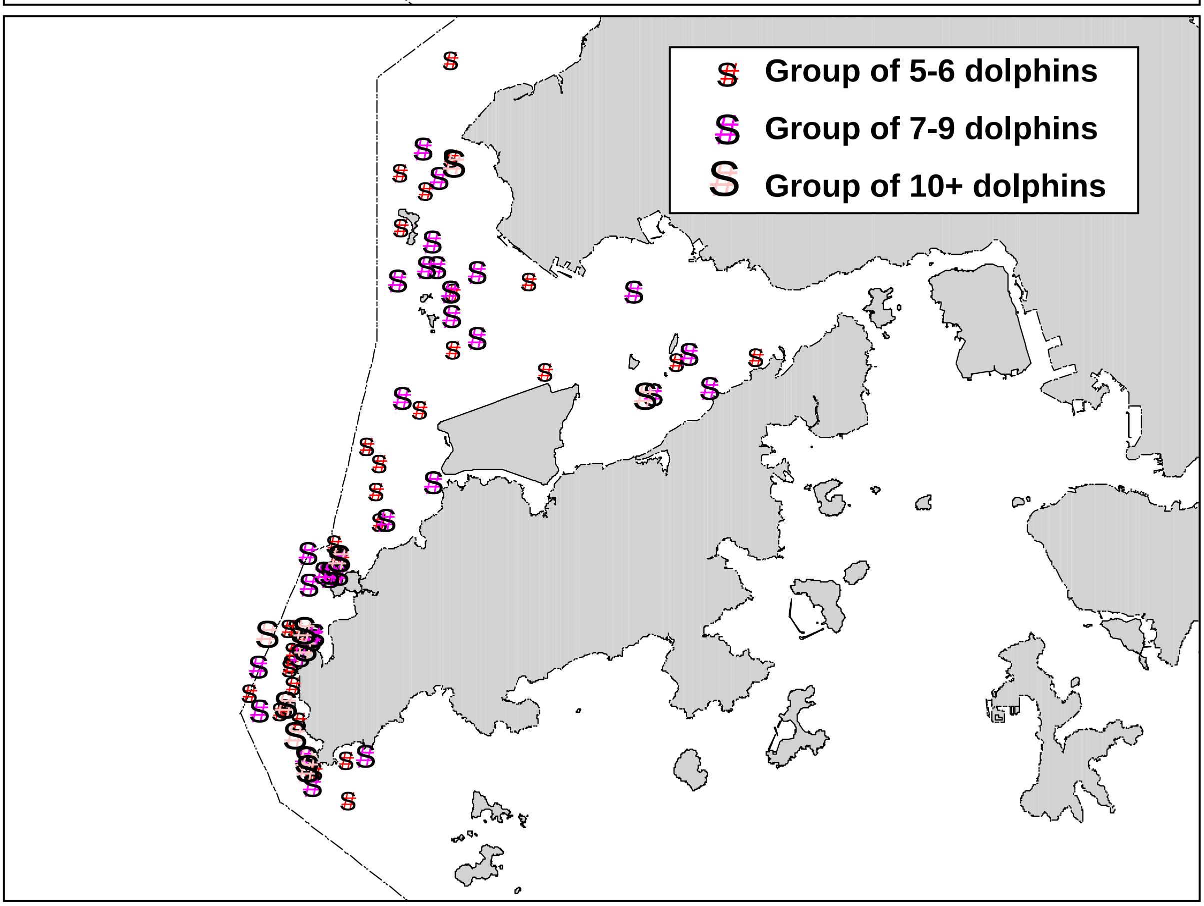




Figure 23. Distribution of Chinese white dolphins with different group sizes (April 2012 – March 2013)

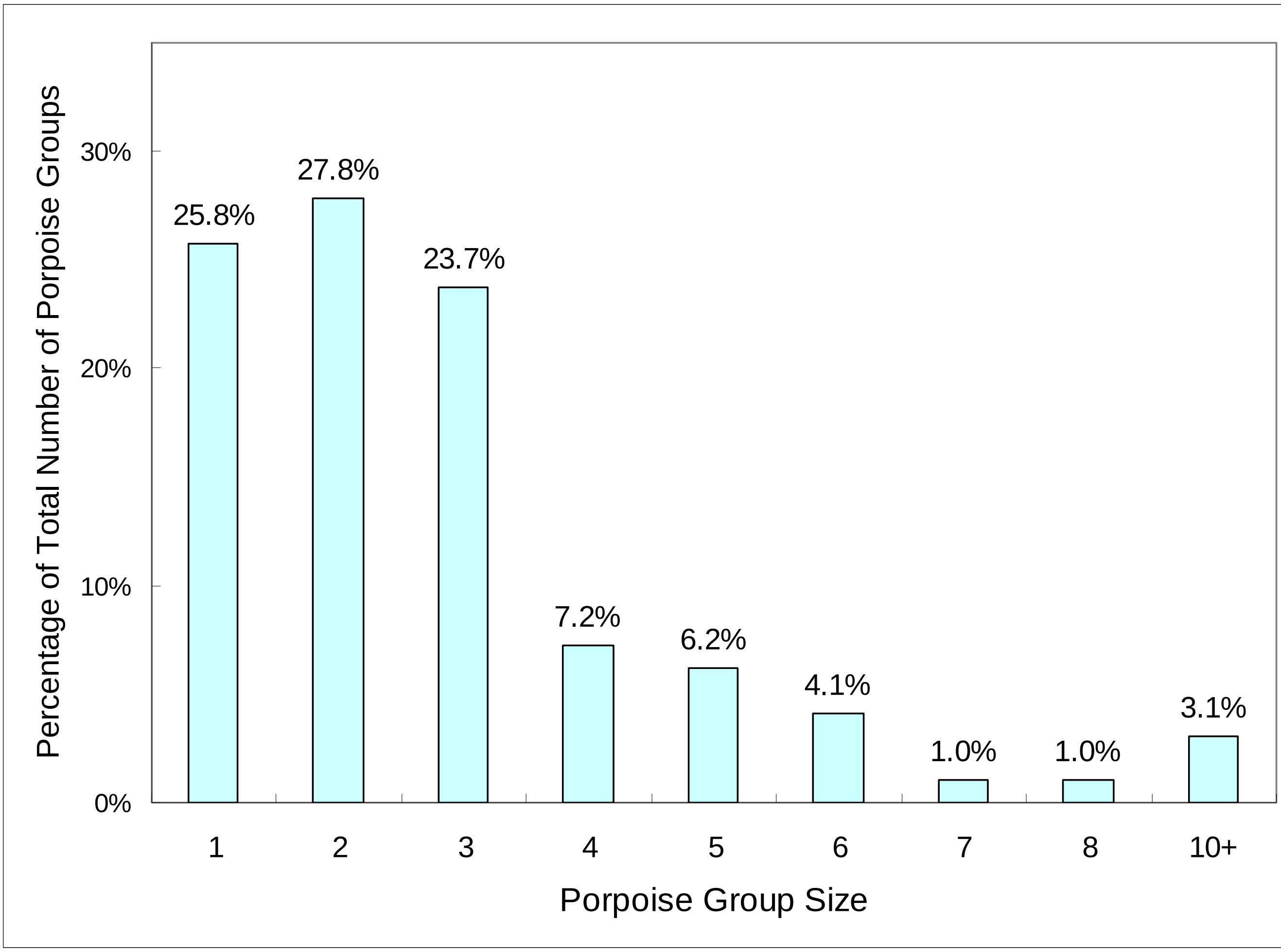



Figure 24. Percentages of different group sizes of finless porpoises in Hong Kong during April 2012 to March 2013

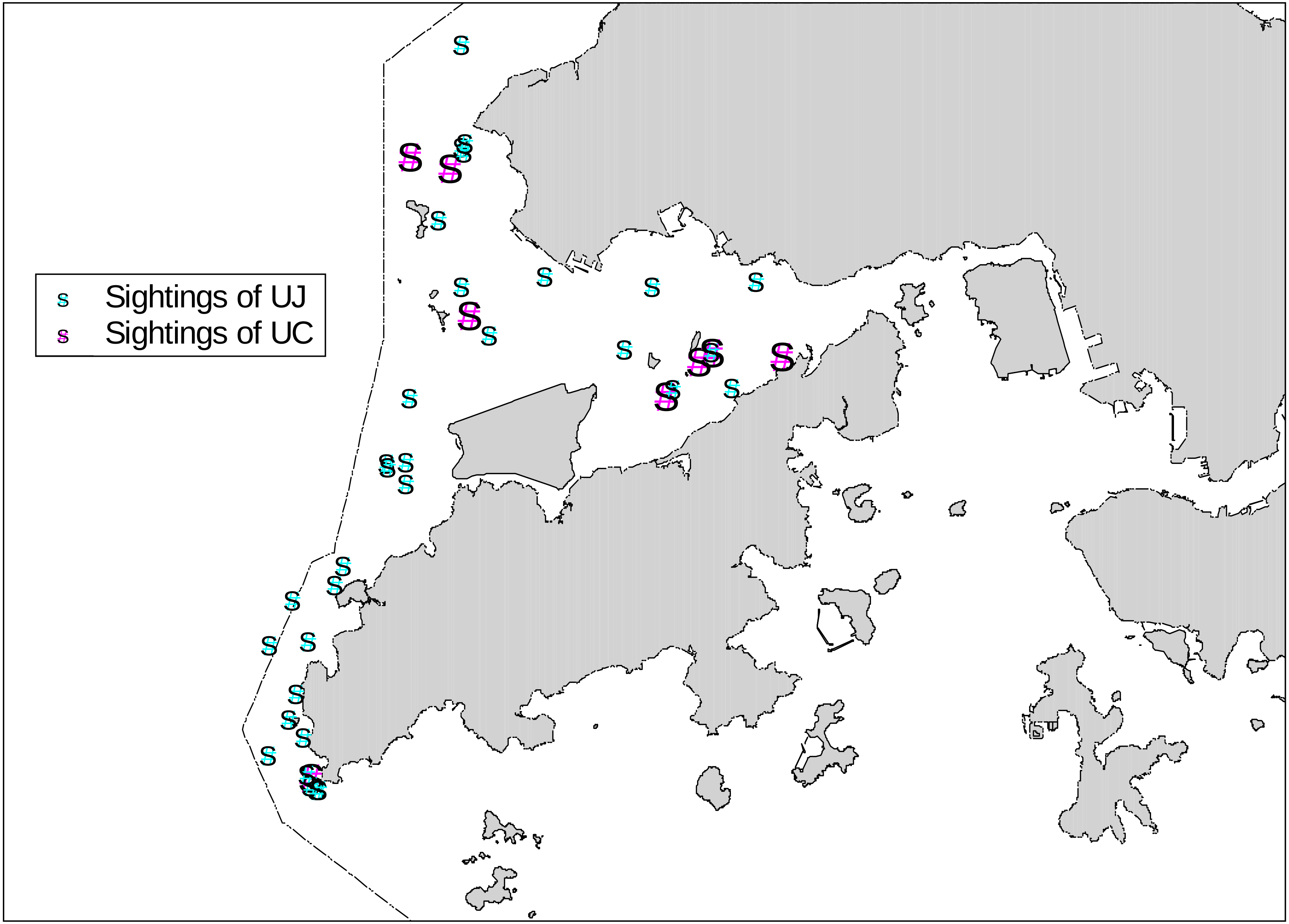



Figure 25. Distribution of Unspotted Calves (UC) & Unspotted Juveniles (UJ) (April 2012 – March 2013)

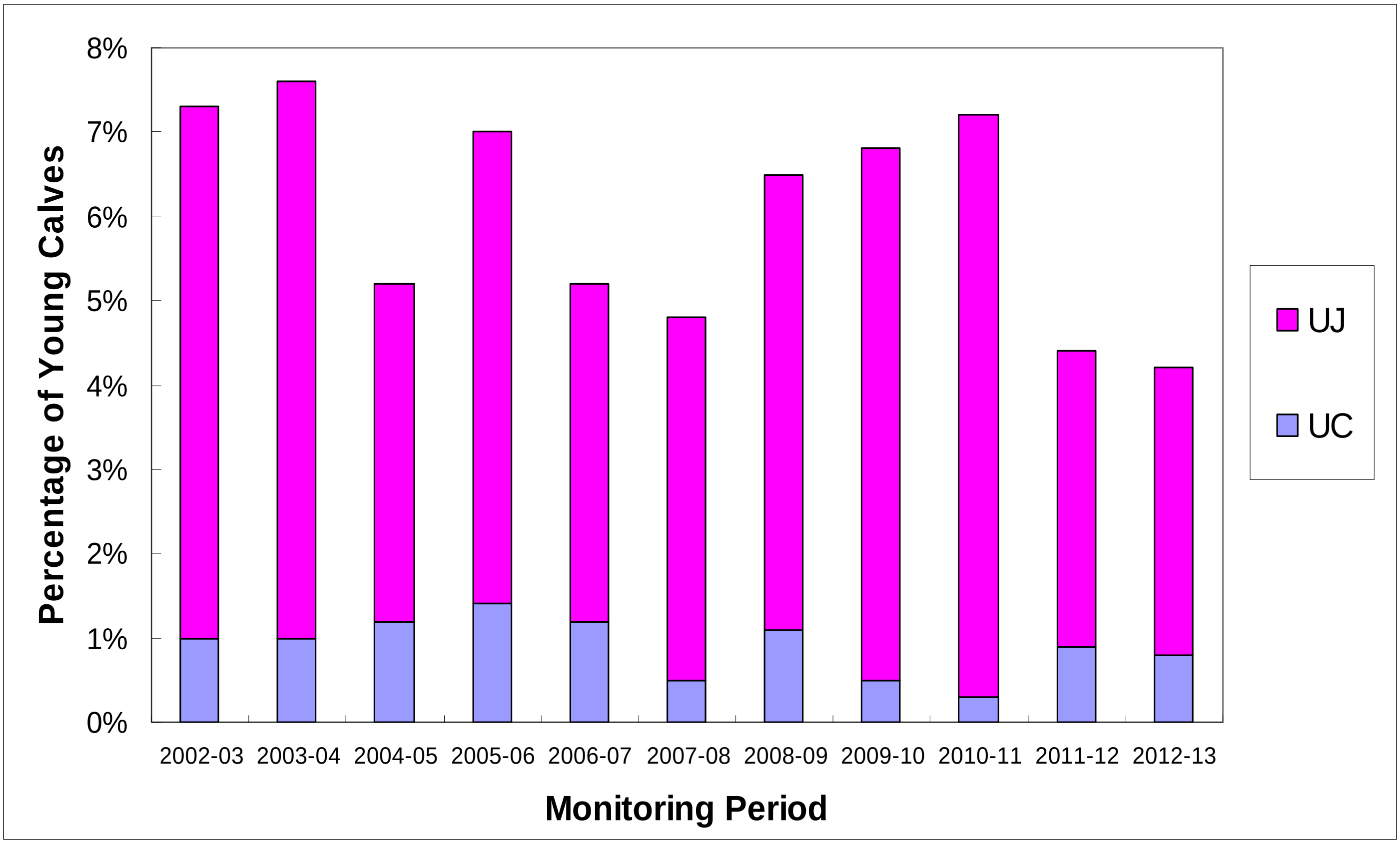



Figure 26a. Percentages of young calves (i.e. unspotted calves (UC) and unspotted juveniles (UJ)) among dolphin groups during 2002-13

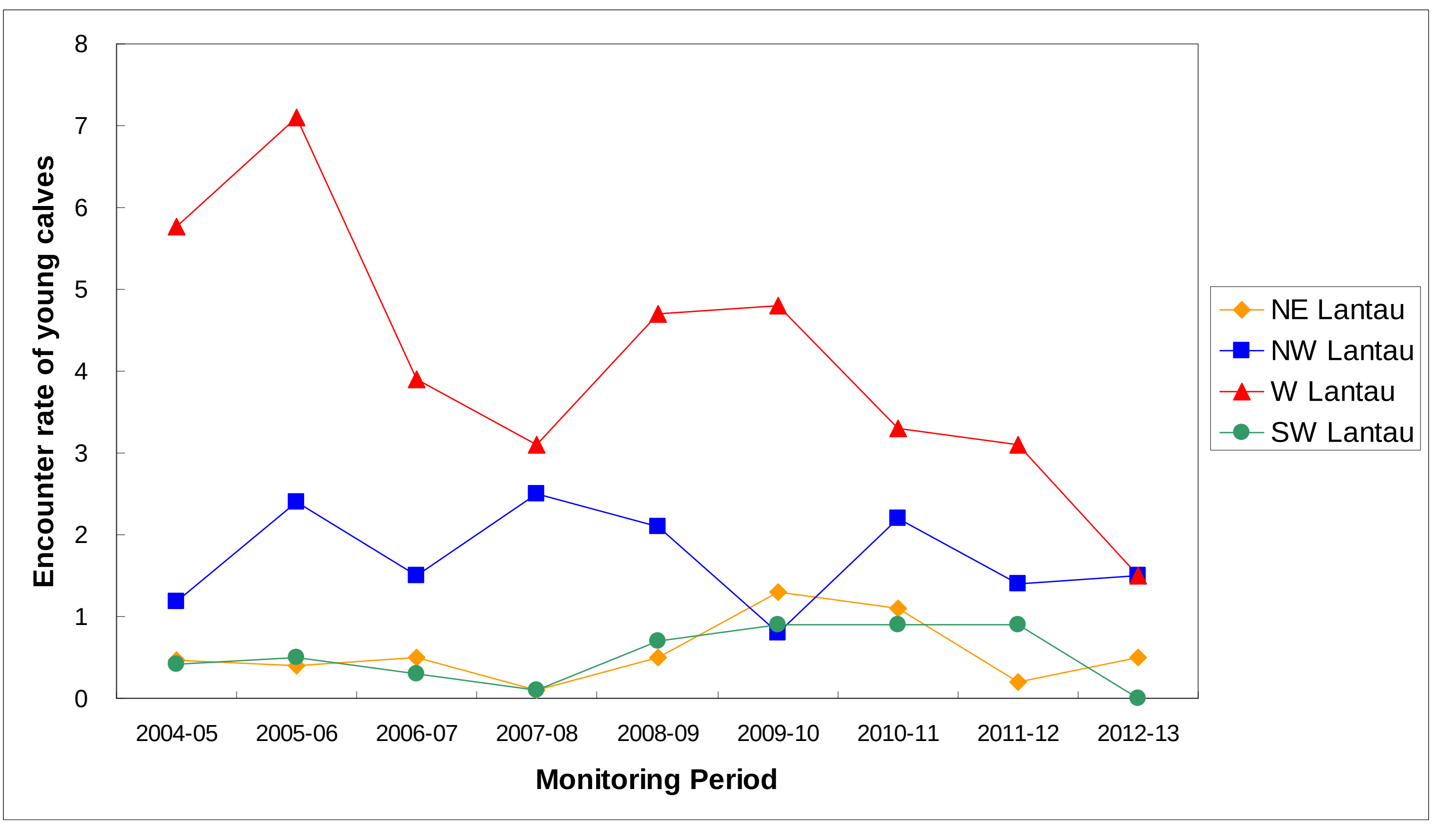



Figure 26b. Temporal trends of encounter rates of young calves (including unspotted calves and unspotted juveniles) in 2004-13

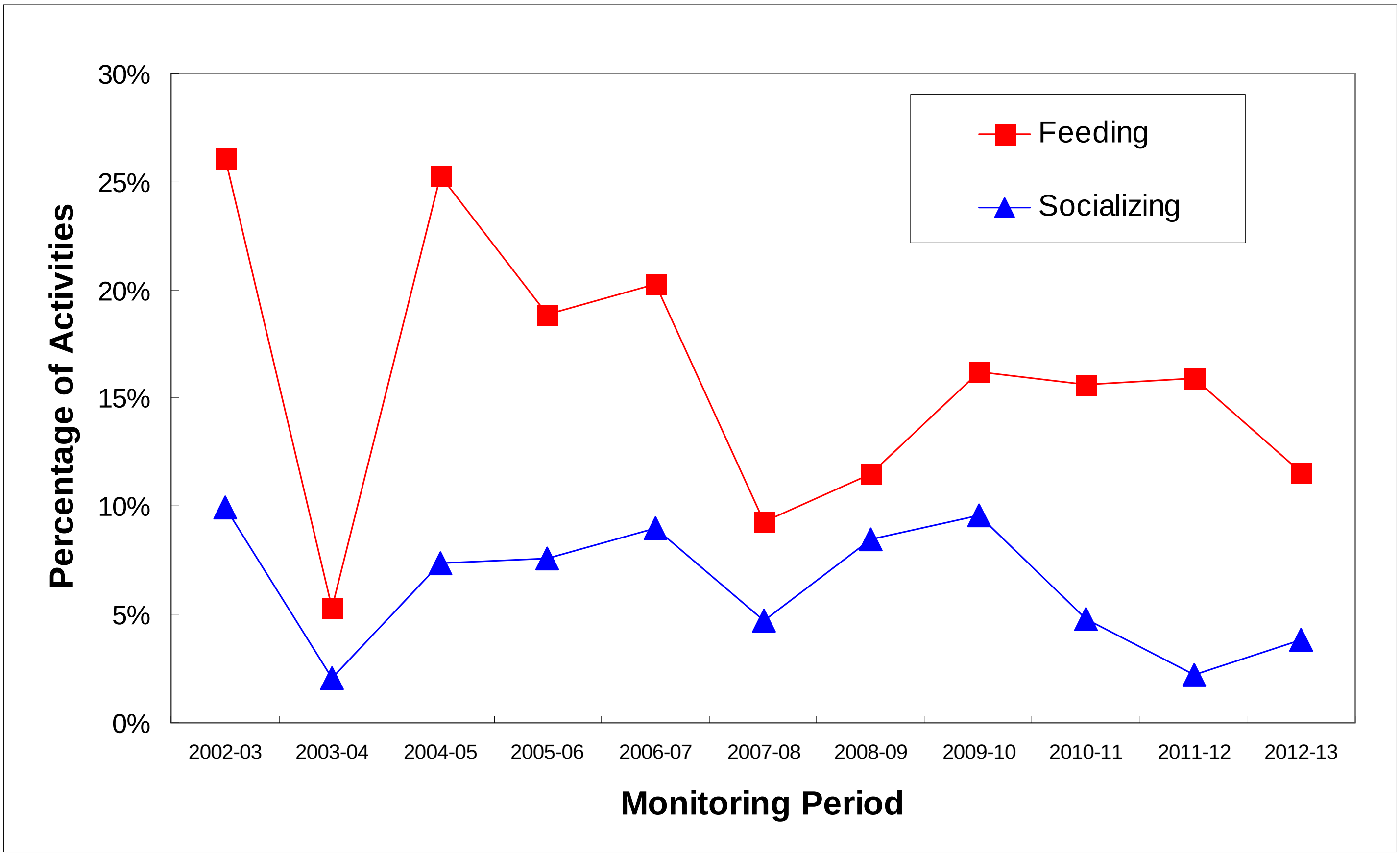



Figure 27. Percentages of feeding and socializing activities among all dolphin groups sighted in Hong Kong during 2002-13

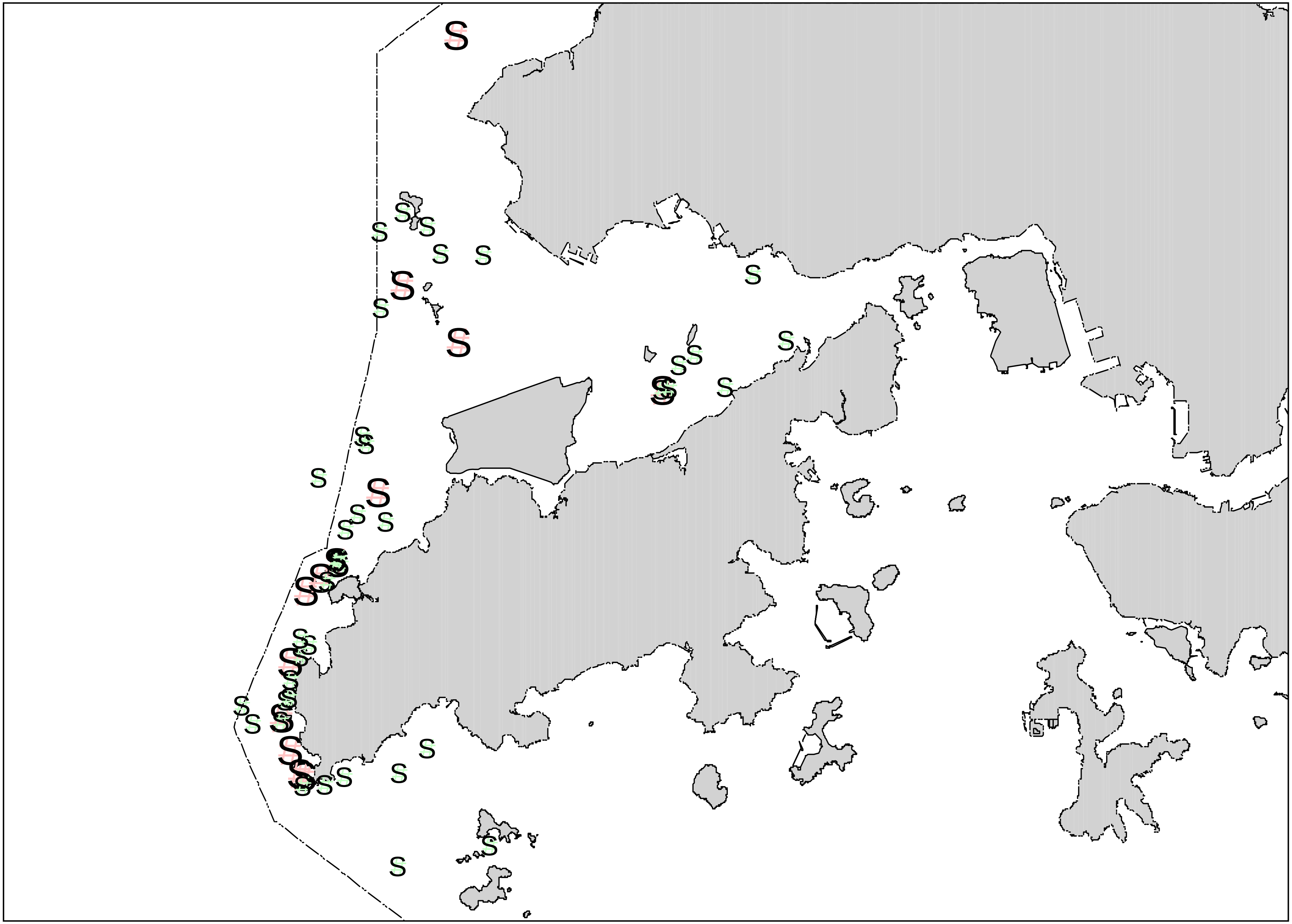


Figure 28. Distribution of Chinese white dolphins engaged in feeding (green dots) and socializing (pink dots) activities (April 2012 – March 2013)

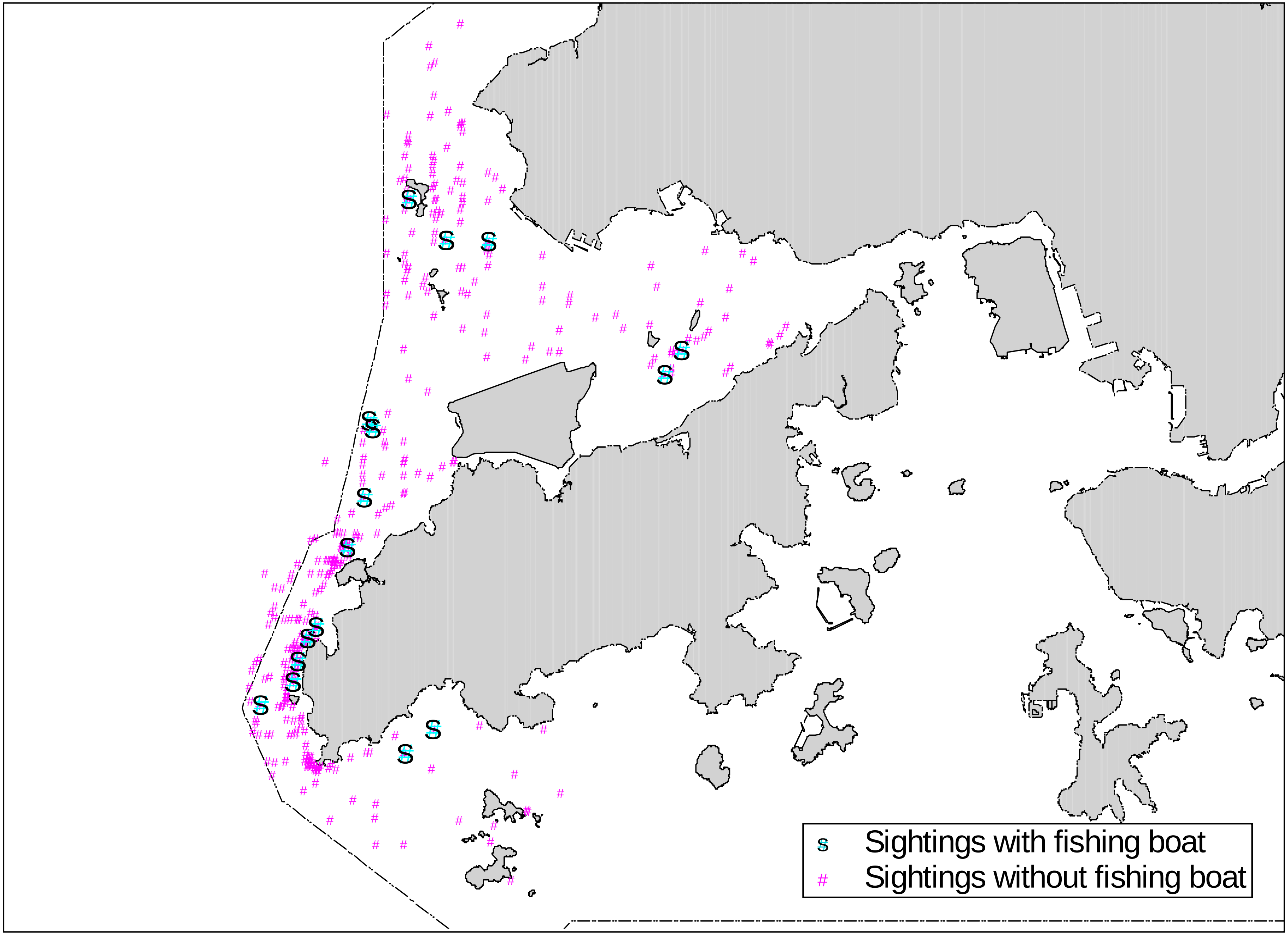
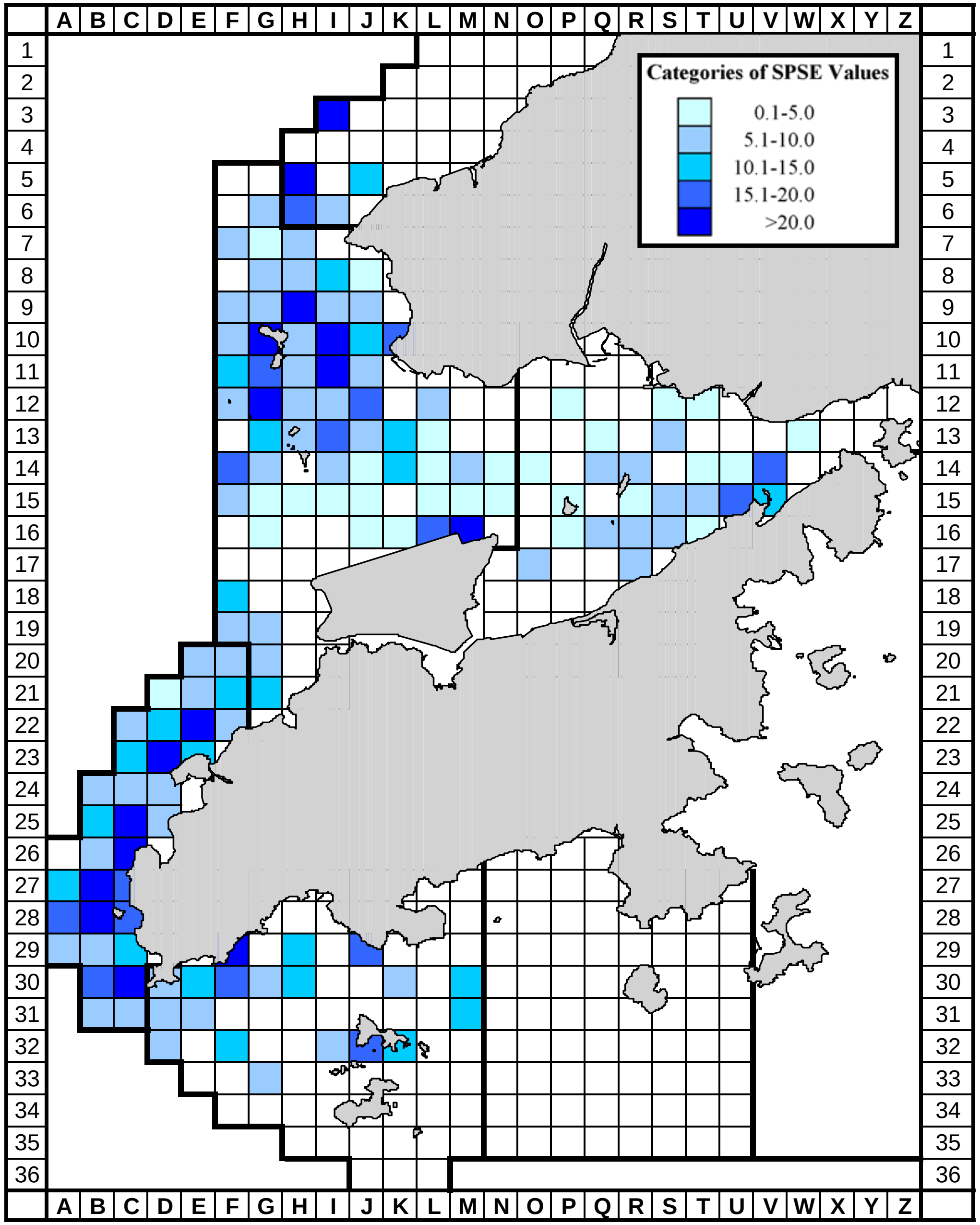



Figure 29. Distribution of dolphin sightings associated with and without fishing boats (April 2012 – March 2013)



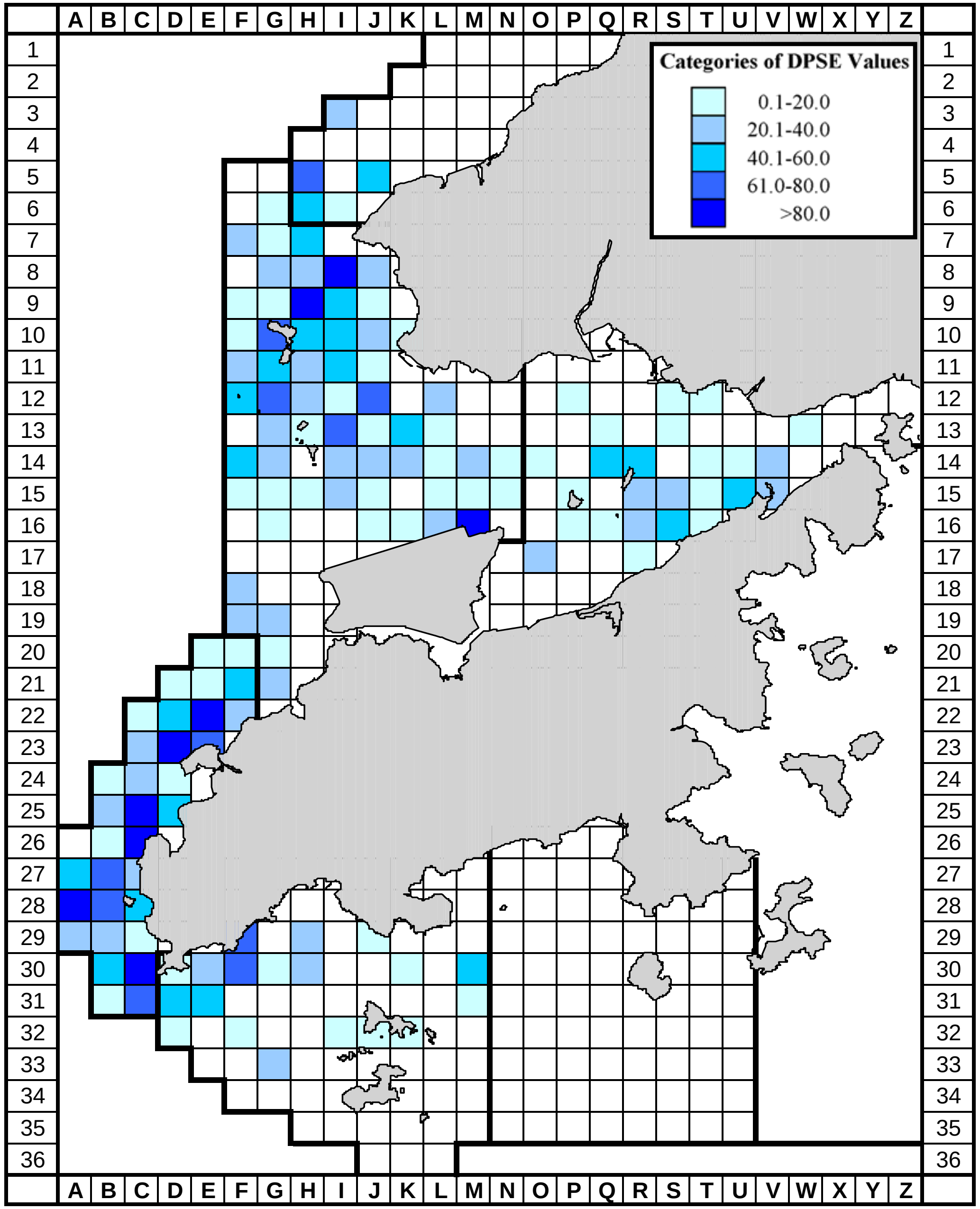




Figure 30. (left) Sighting density of Chinese white dolphins with corrected survey effort per km$^2$ in waters around Lantau Island (number within grids represent "SPSE" = no. of on-effort dolphin sightings per 100 units of survey effort) (using data from January - December 2012)

(right) Density of Chinese white dolphins with corrected survey effort per km$^2$ in waters around Lantau Island (number within grids represent "DPSE" = no. of dolphins per 100 units of survey effort) (using data from January - December 2012)

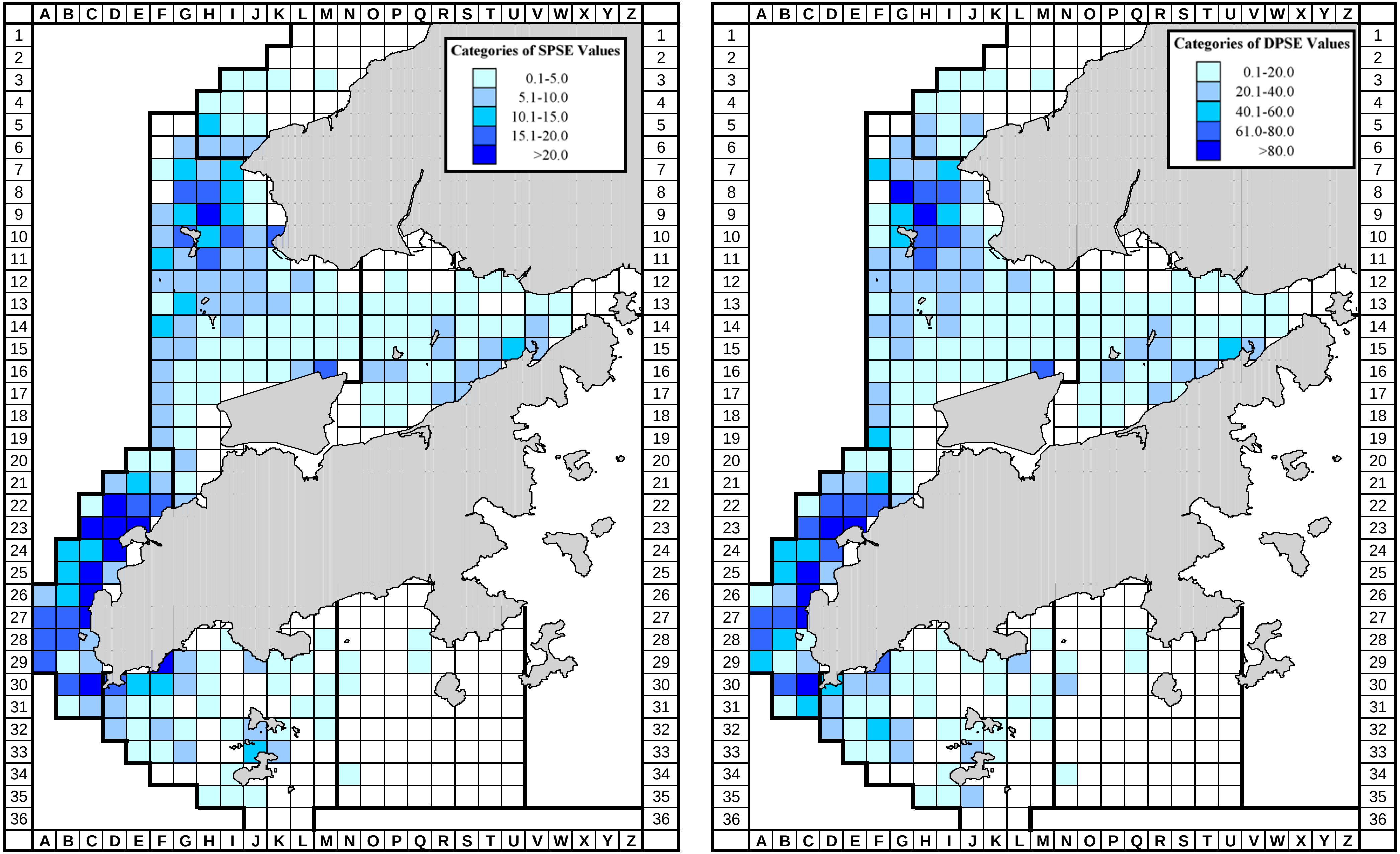



Figure 31. (left) Sighting density of Chinese white dolphins with corrected survey effort per km$^2$ in waters around Lantau Island during 2008-12 (number within grids represent "SPSE" = no. of on-effort sightings per 100 units of survey effort)

(right) Density of Chinese white dolphins with corrected survey effort per km$^2$ in waters around Lantau Island during 2008-12 (number within grids represent "DPSE" = no. of dolphins per 100 units of survey effort)

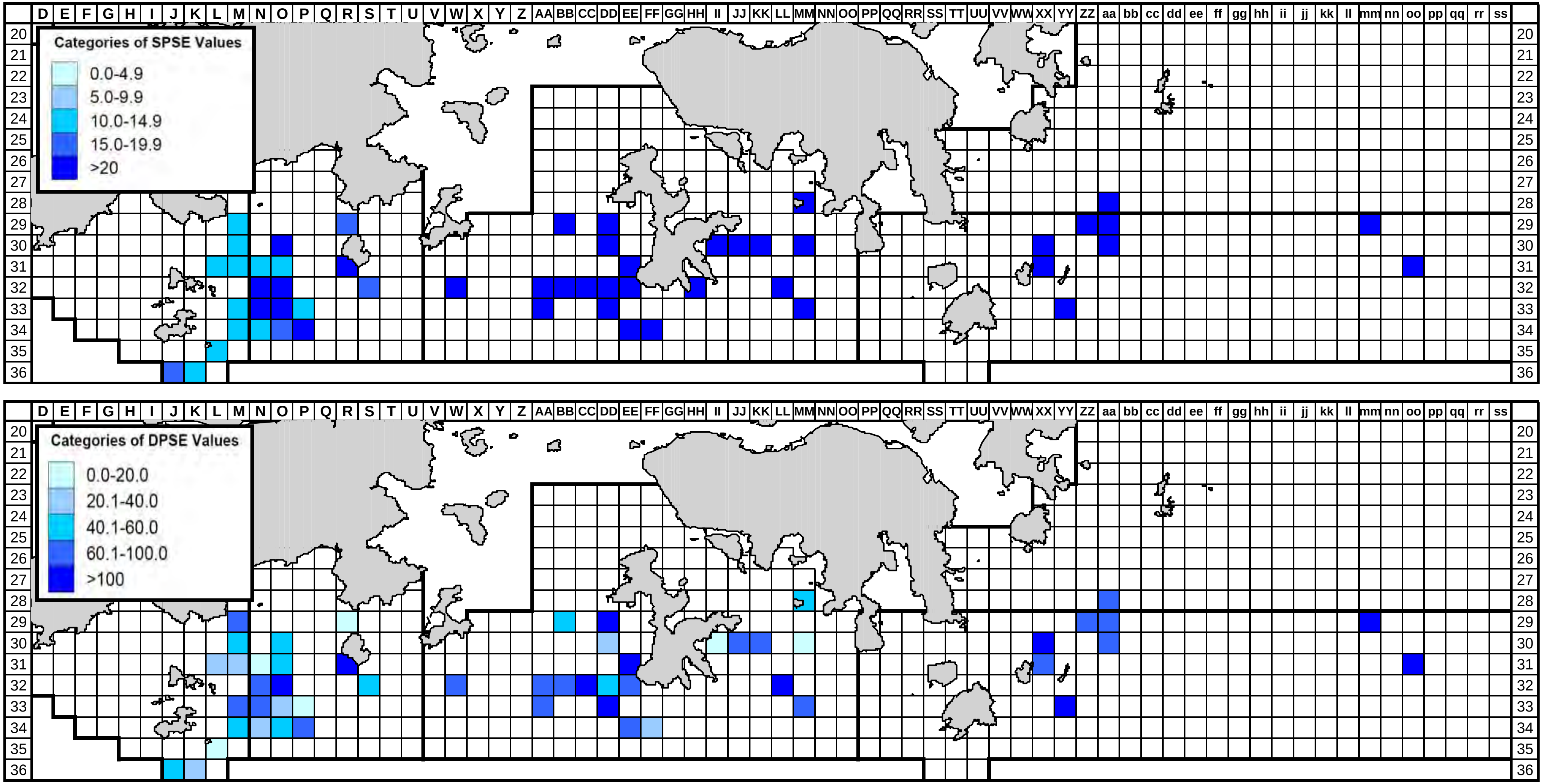



Figure 32. (top) Sighting density of finless porpoises with corrected survey effort per km$^2$ in southern waters of Hong Kong (number within grids represent "SPSE" = no. of on-effort porpoise sightings per 100 units of survey effort) (using data from January - December 2012)

(bottom) Density of finless porpoises with corrected survey effort per km$^2$ in southern waters of Hong Kong (number within grids represents "DPSE" = no. of porpoises per 100 units of survey effort) (using data from January - December 2012)

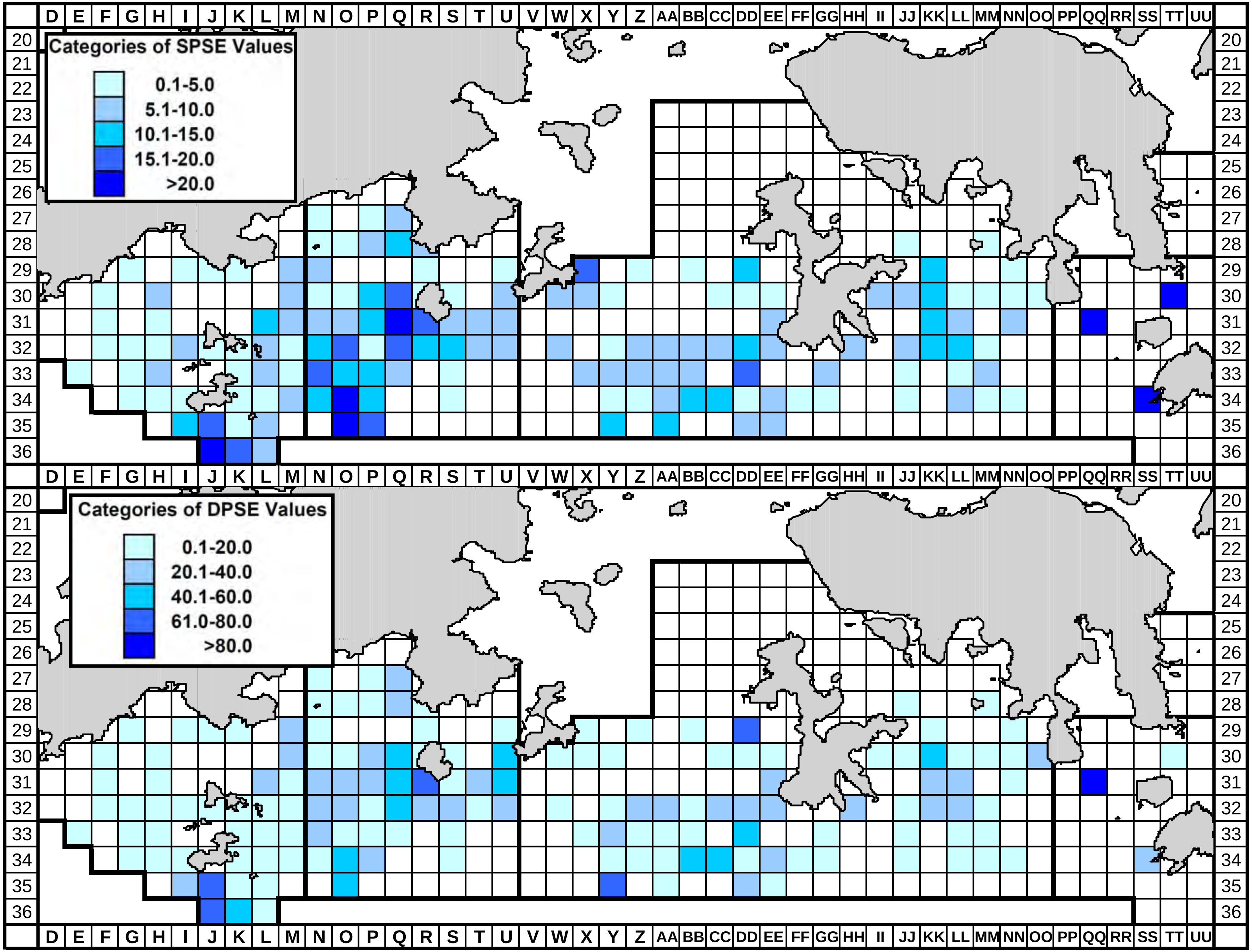



Figure 33. Density of finless porpoises with corrected survey effort per km$^2$ in southern waters of Hong Kong during dry season (December to May), using data collected during 2004-12 (SPSE = no. of on-effort porpoise sightings per 100 units of survey effort; DPSE = no. of porpoises per 100 units of survey effort)

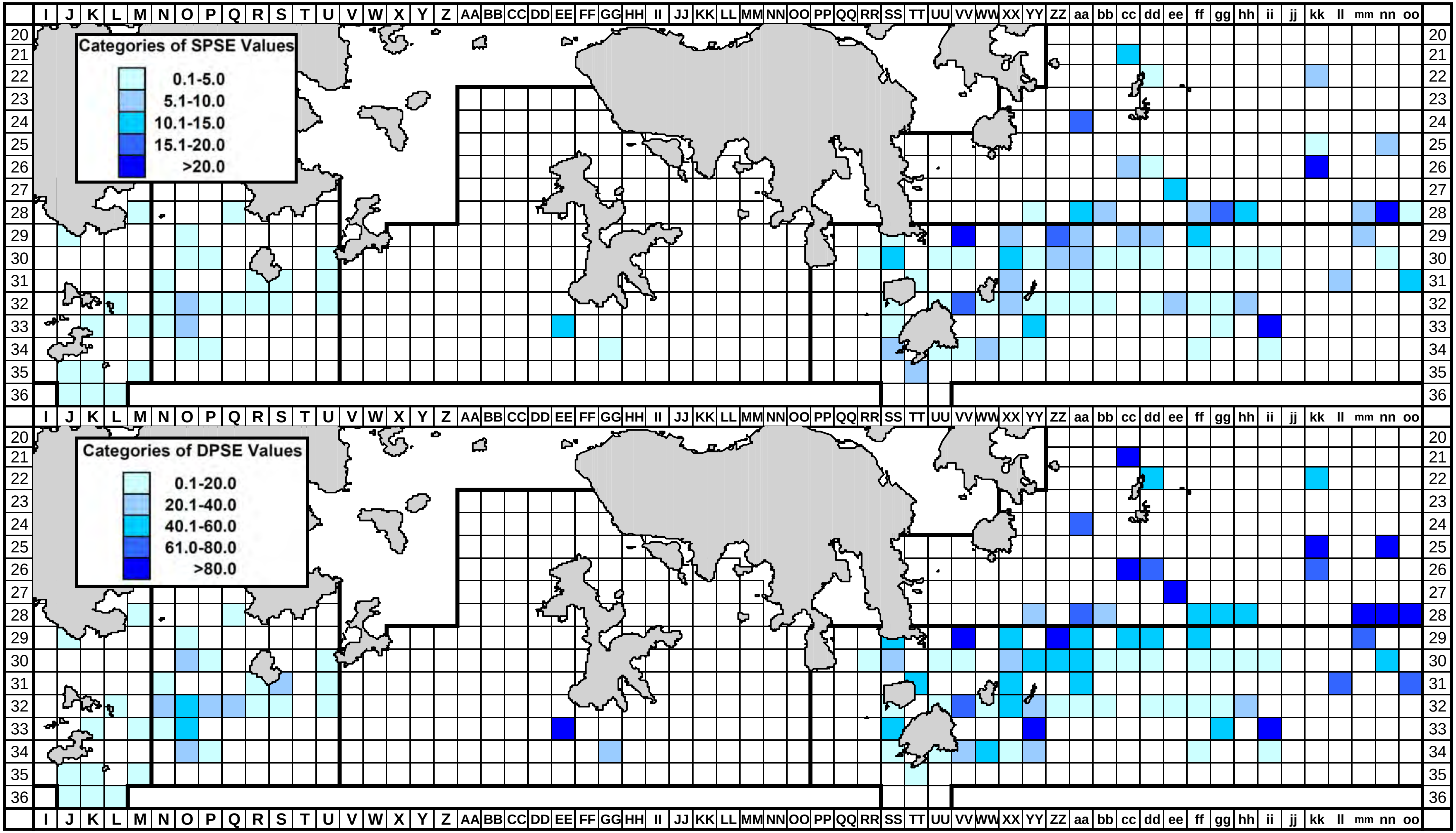



Figure 34. Density of finless porpoises with corrected survey effort per km$^2$ in southern waters of Hong Kong during wet season (June to November), using data collected during 2004-12 (SPSE = no. of on-effort porpoise sightings per 100 units of survey effort; DPSE = no. of porpoises per 100 units of survey effort

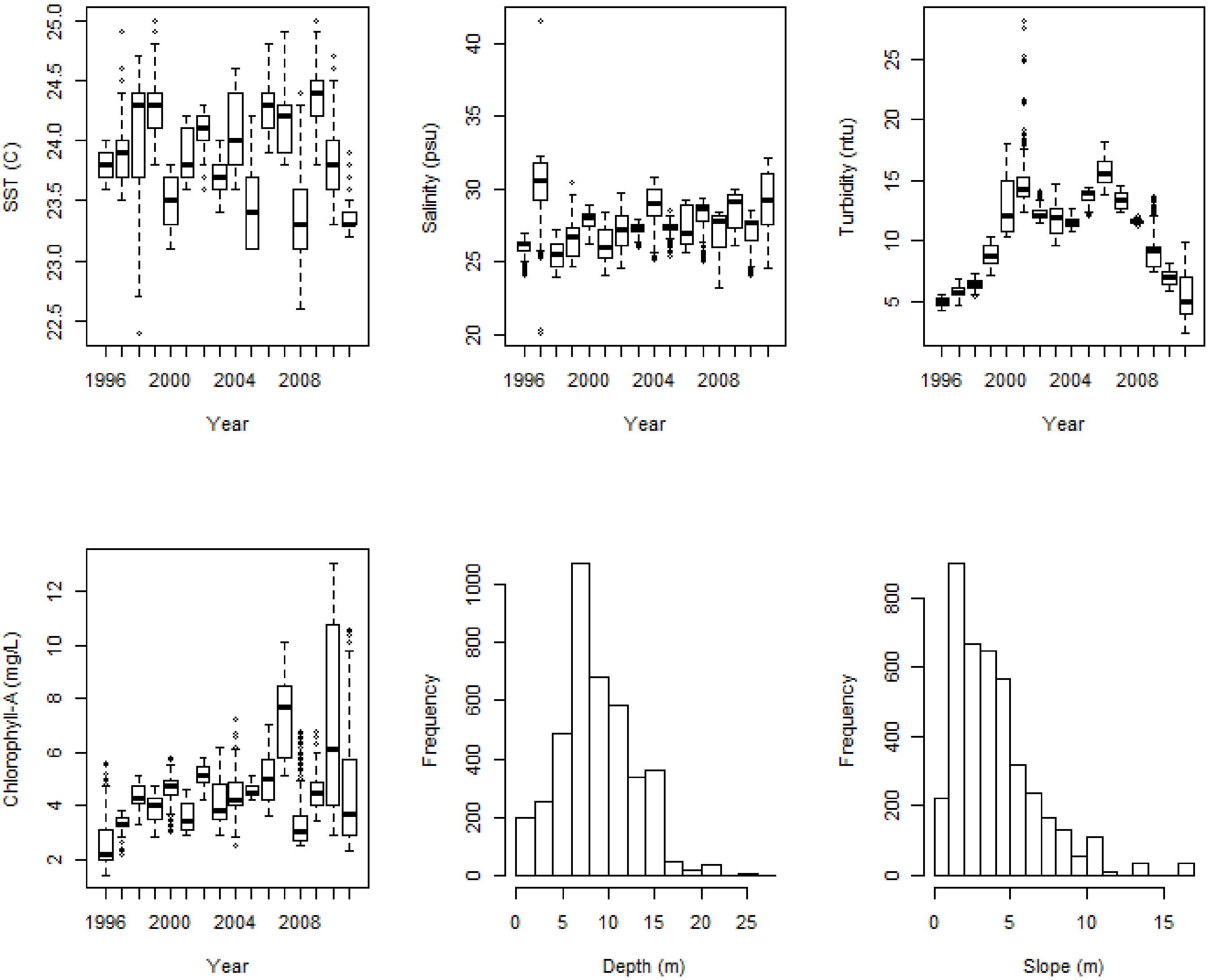



Figure 35. Variation in environmental variables by year for the duration of the study period (1996-2011) (Boxplots show median, upper and lower quartiles and interquartile ranges variation from year to year for (a) sea surface temperature, (b) salinity, (c) turbidity, and (d) chlorophyll-A. Histograms show frequency of (d) depth and (e) slope values, which were assumed to be consistent across the entire study period)

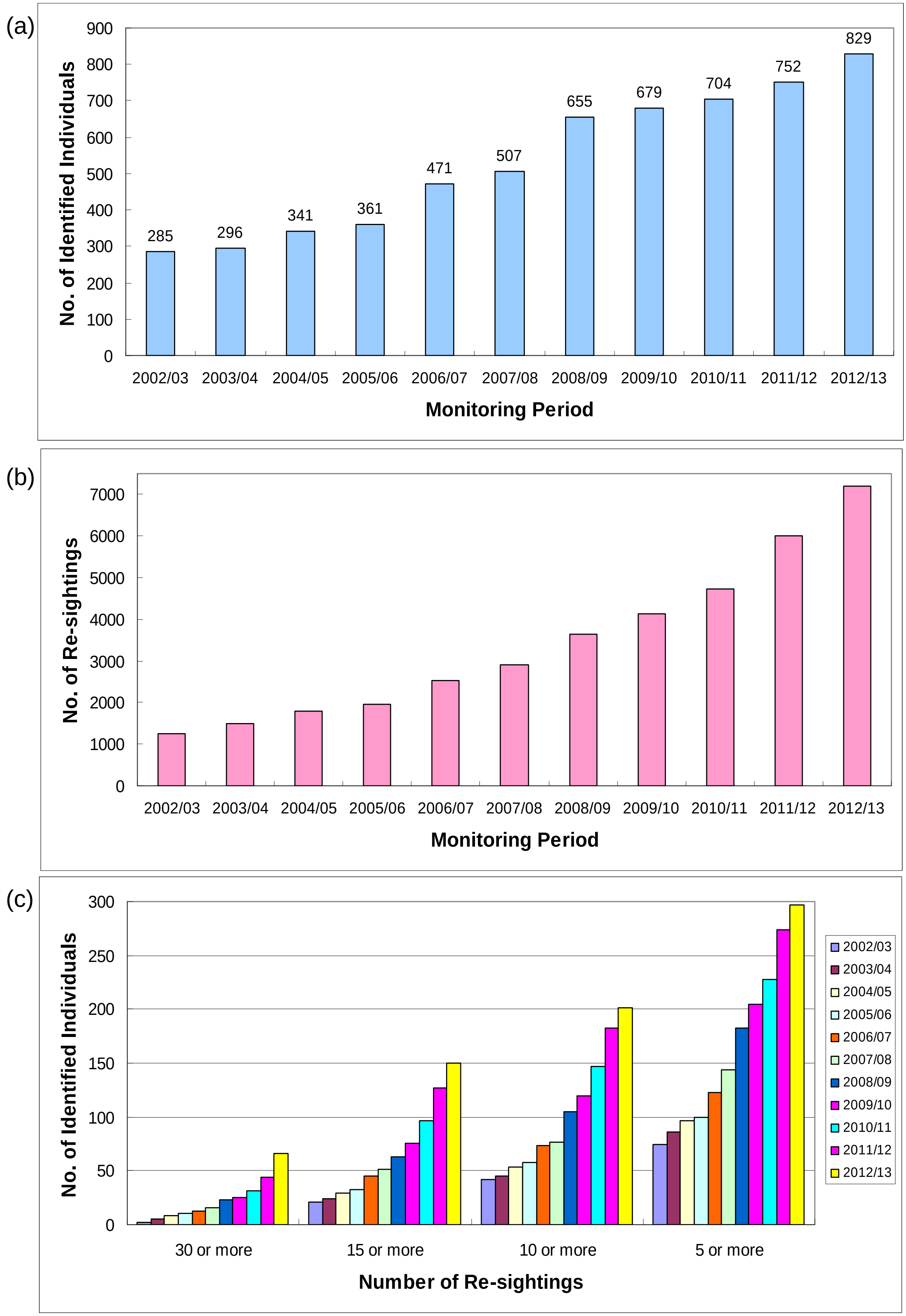



Figure 36. Temporal trends of (a) total number of identified individuals; (b) total number of re-sightings made; and (c) number of identified individuals within several categories of number of re-sightings in the past 11 monitoring periods since 2002

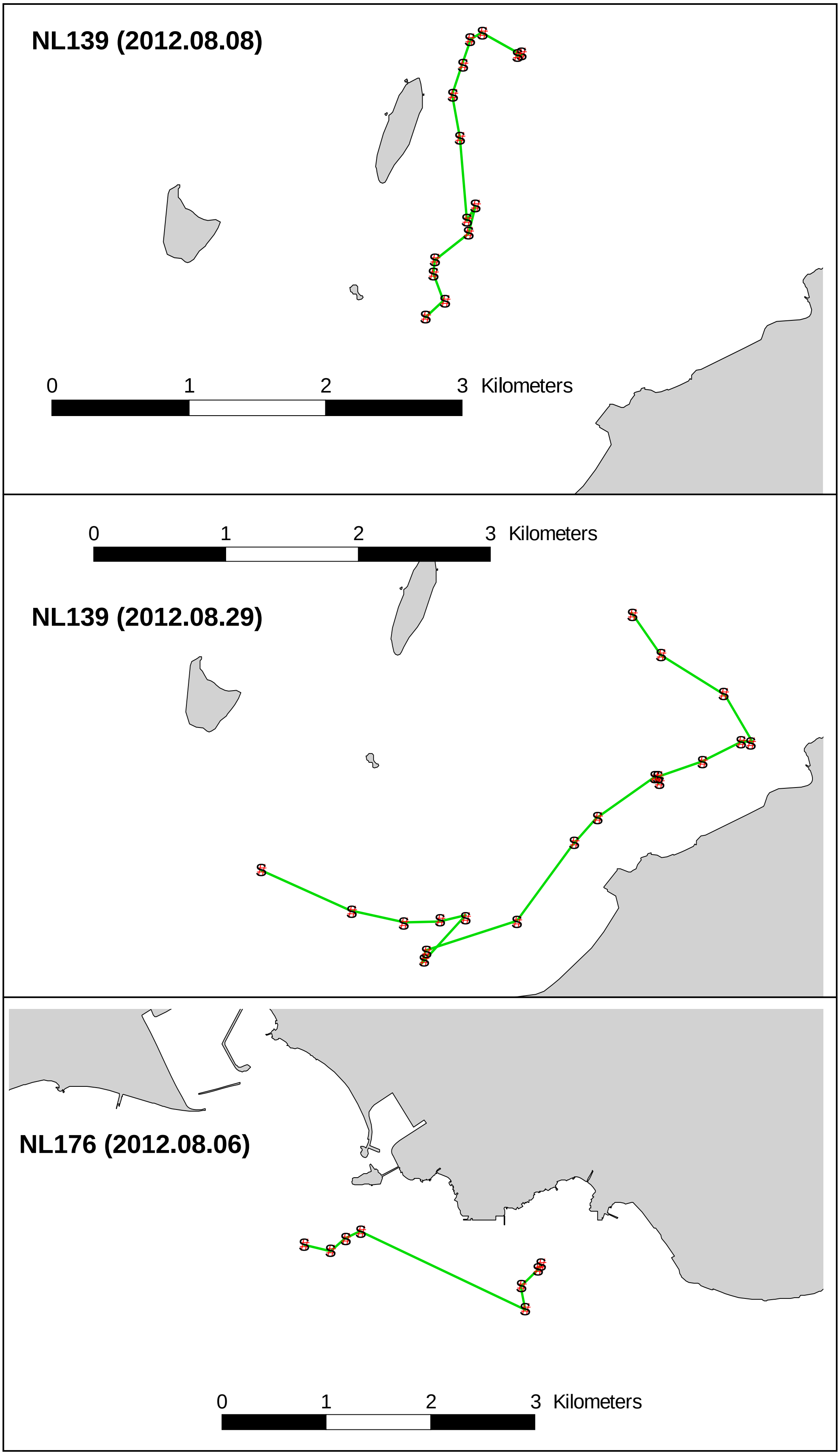



Figure 37. Tracks of six individuals under pilot study of focal follow observations in 2012-13 monitoring period

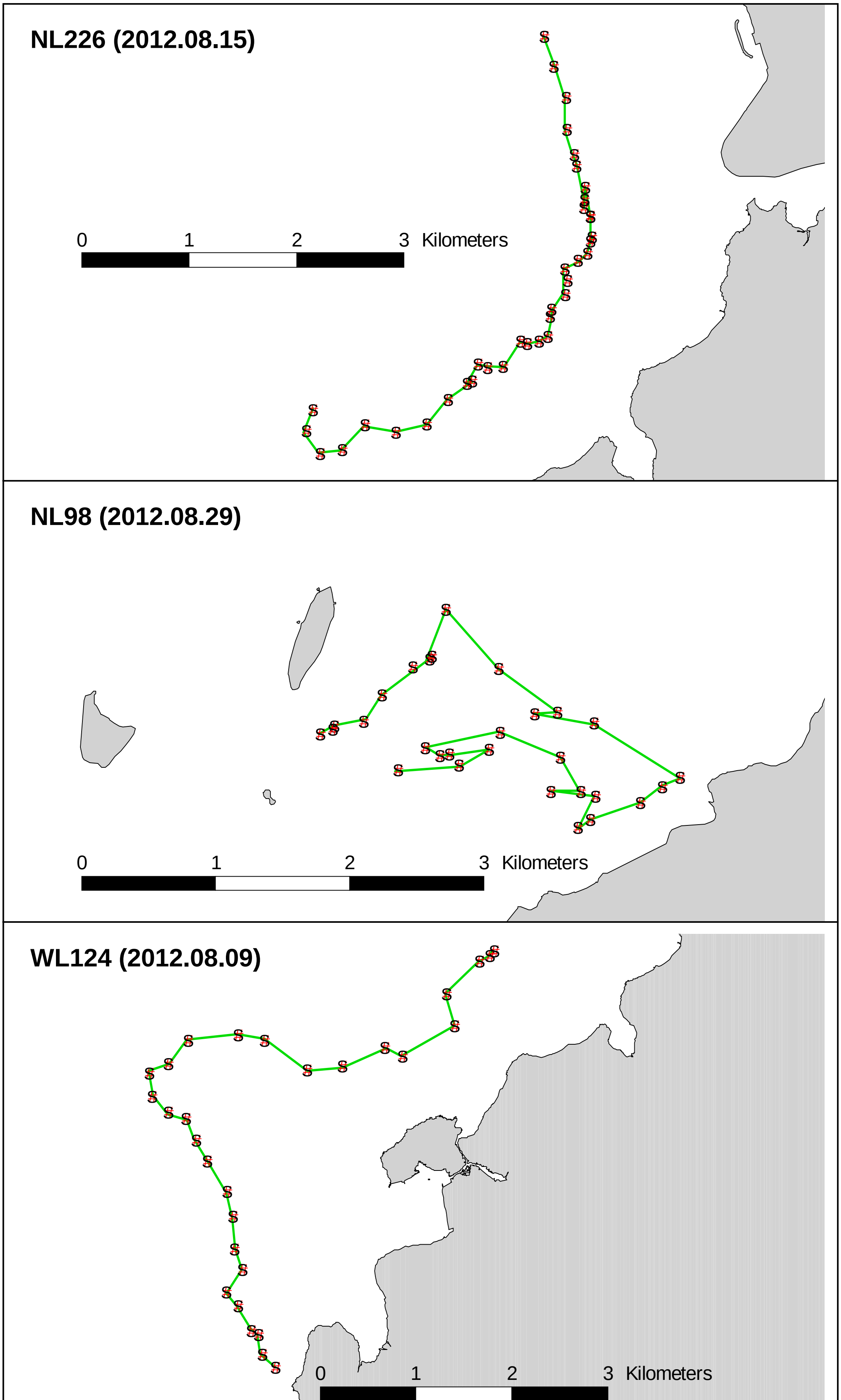



Figure 37. (cont'd)

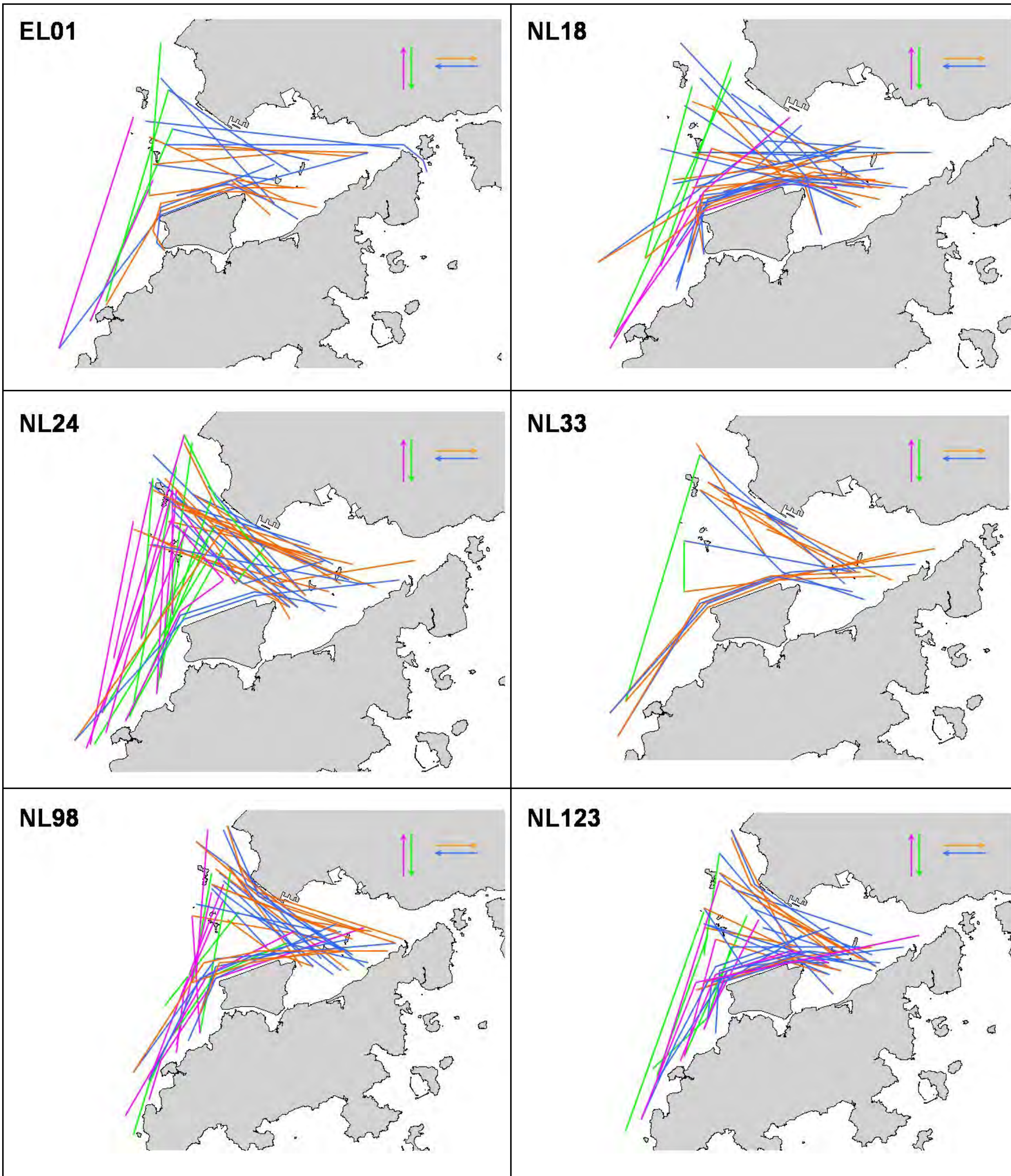



Figure 38. Segments drawn between locations of consecutive sightings that were made during the same day or in consecutive days among 12 different individual, assuming that dolphins move linearly from one sighting location to the next

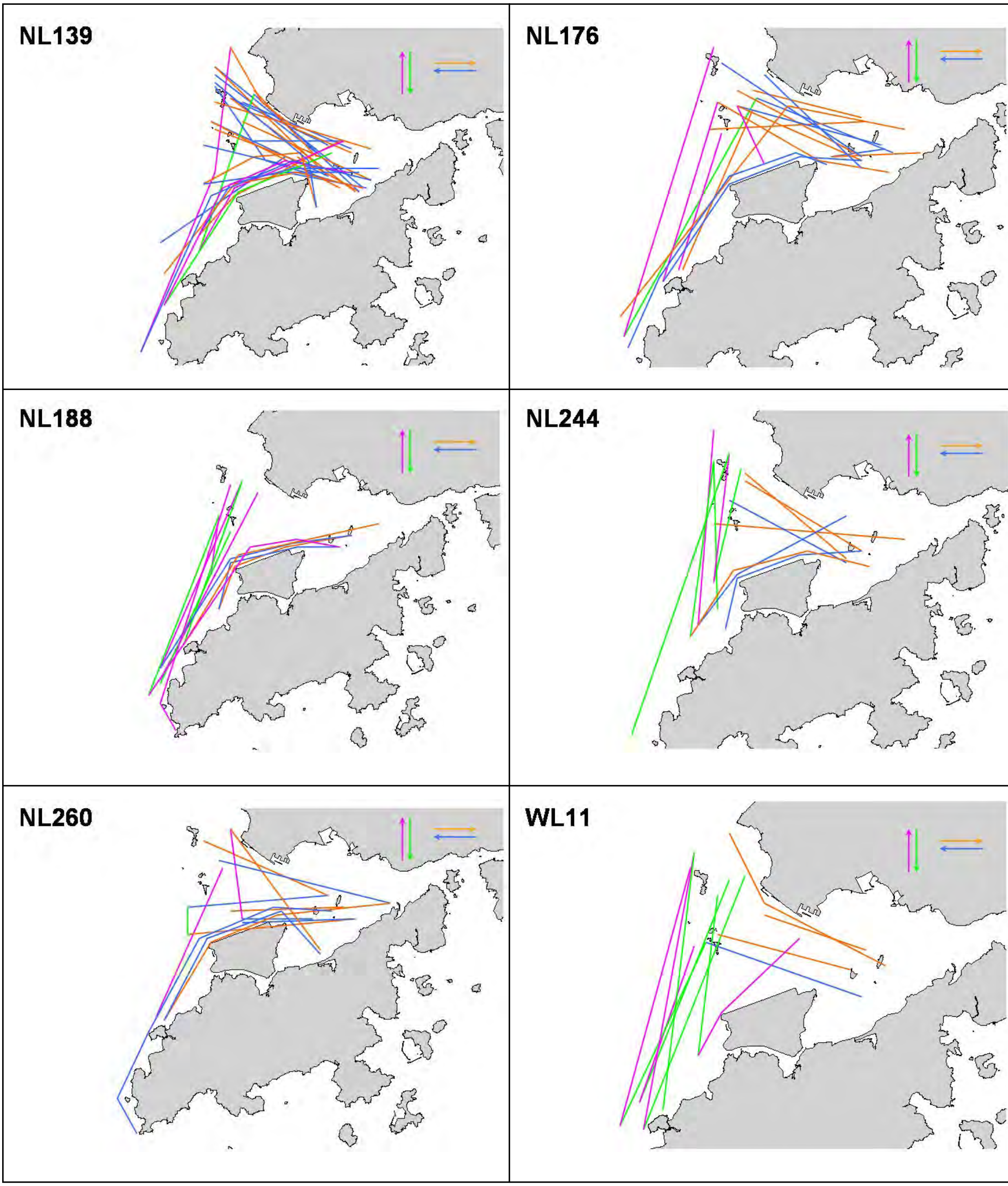



Figure 38. (cont'd)

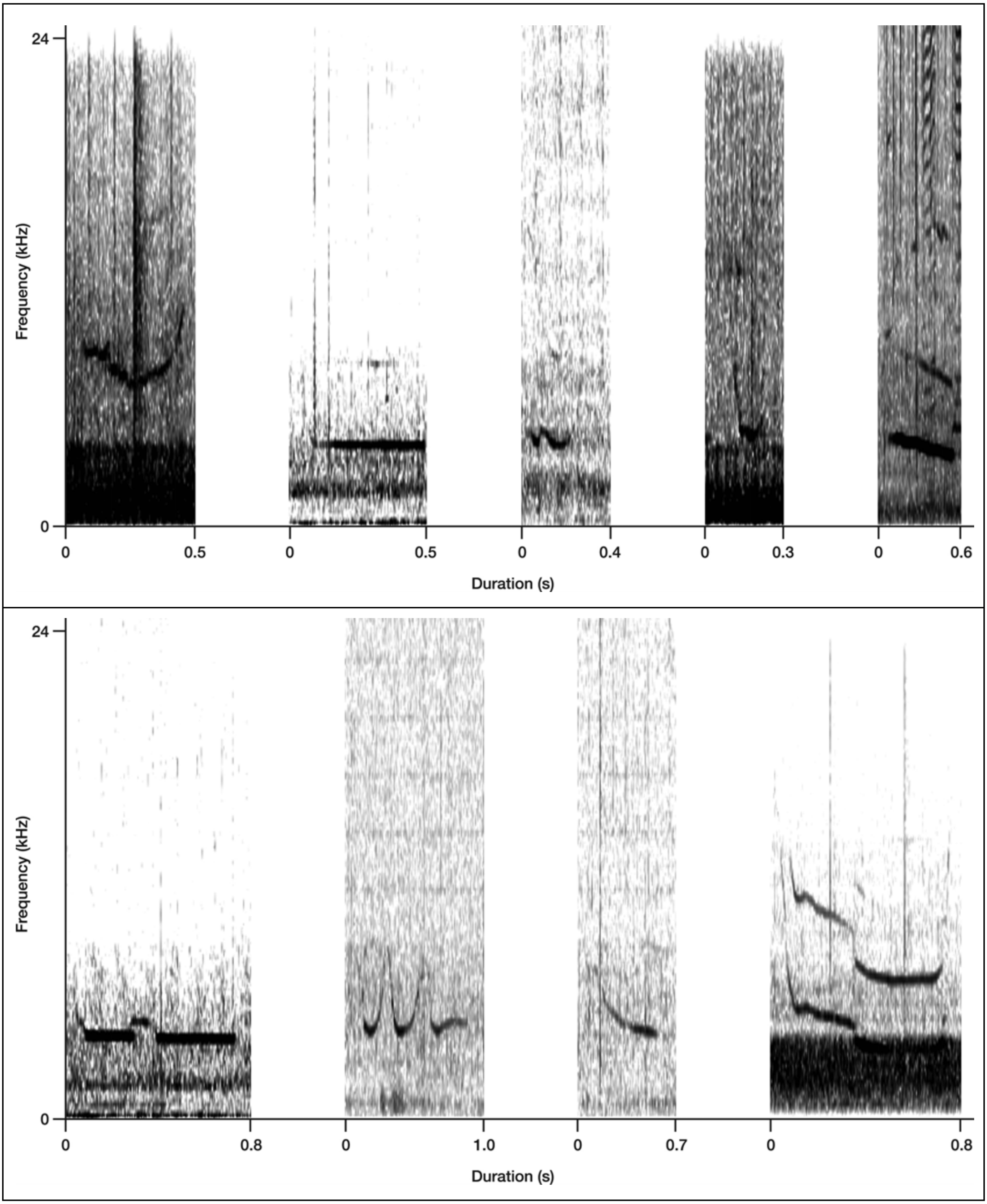



Figure 39. Spectrogram figures of whistle types 1-9 (from left to right) recorded from Chinese White Dolphins (smoothing window: Hanning; Fast Fourier Transform (FFT): 1024; hop size: 10-11 ms; FFT window overlap: 50%).

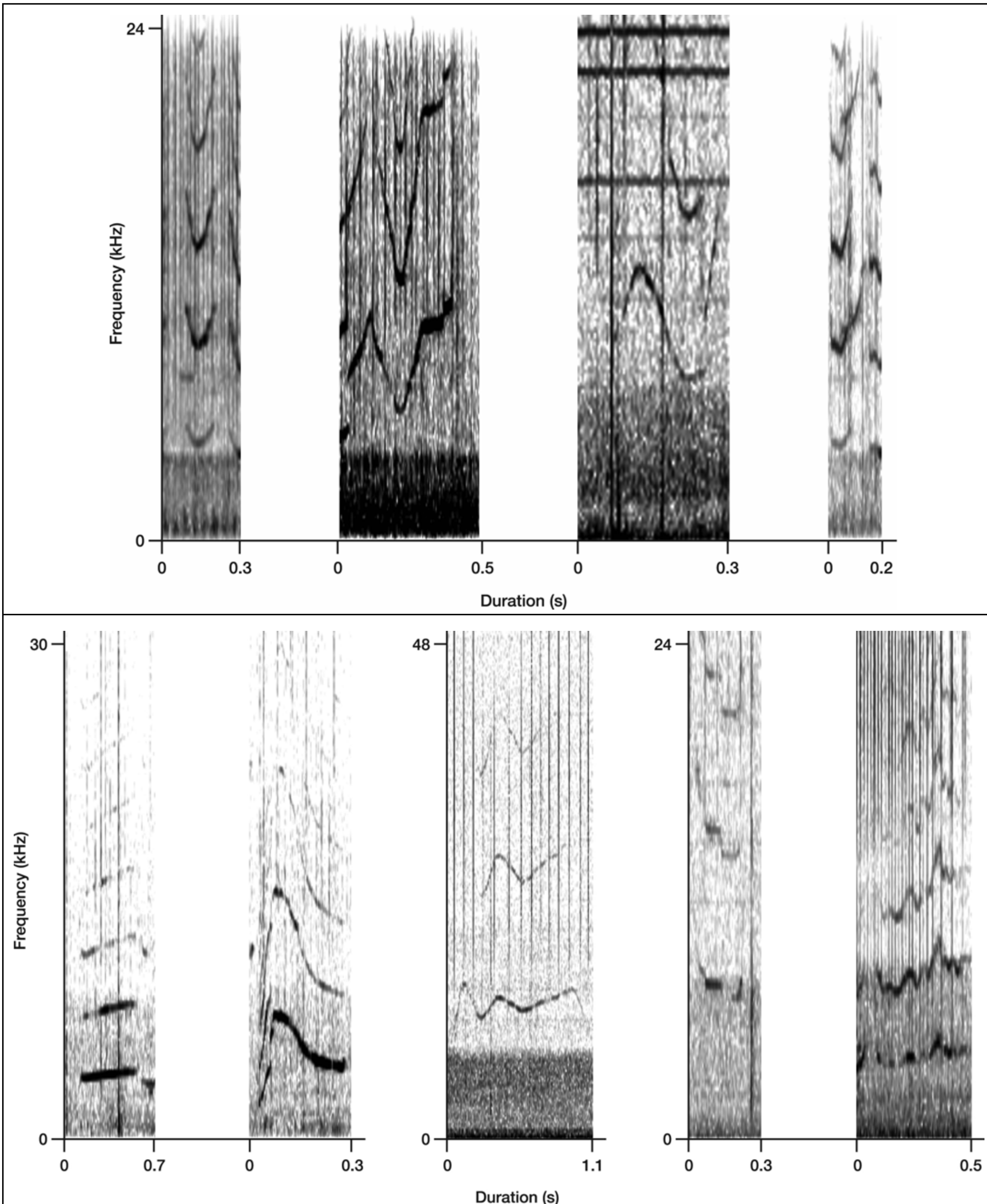



Figure 40. Spectrogram figures of whistle types 10-18 (from left to right) recorded from Chinese White Dolphins (smoothing window: Hanning; Fast Fourier Transform (FFT): 1024; hop size: 10-11 ms; FFT window overlap: 50%).

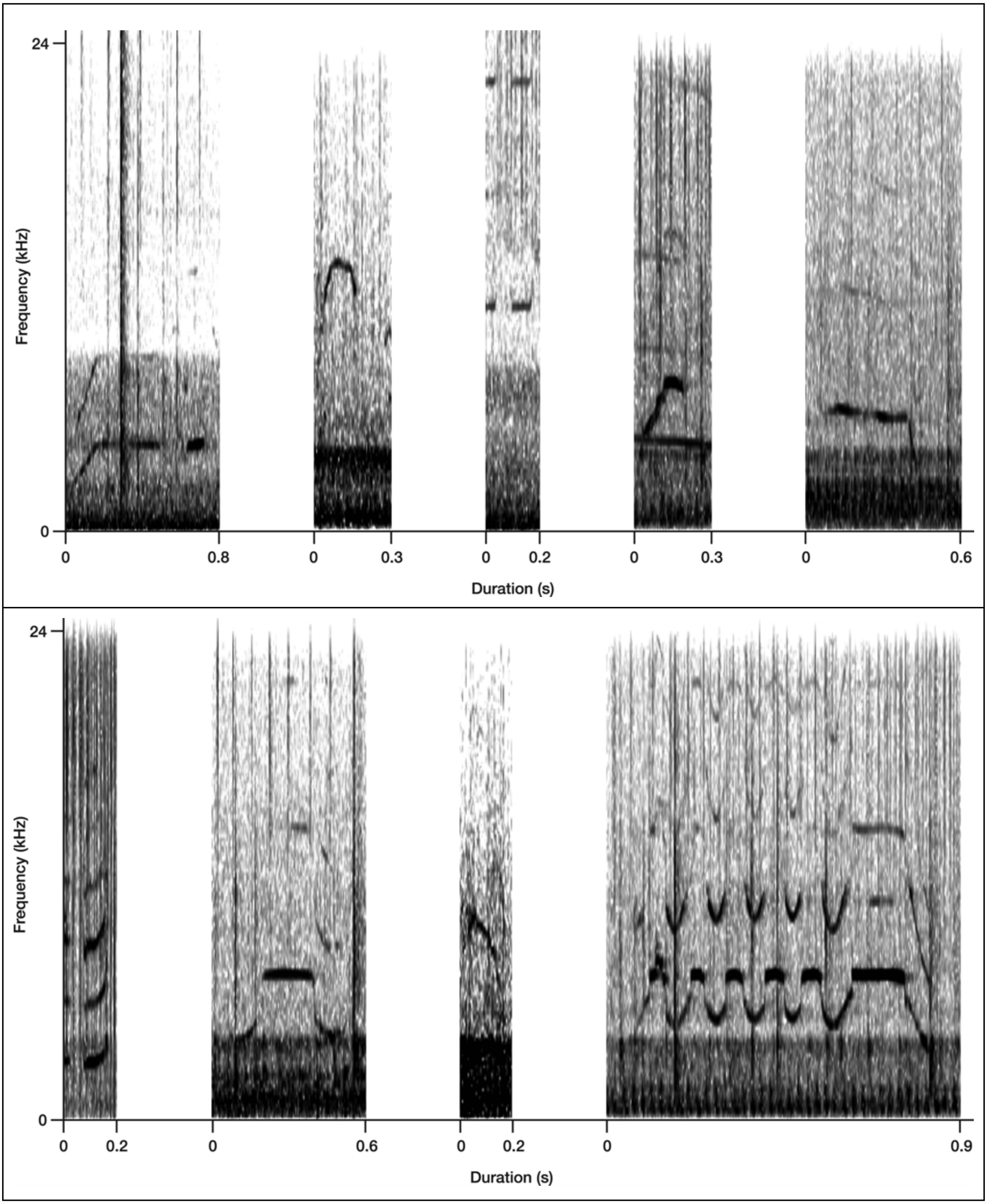



Figure 41. Spectrogram figures of whistle types 19-27 (from left to right) recorded from Chinese White Dolphins (smoothing window: Hanning; Fast Fourier Transform (FFT): 1024; hop size: 10-11 ms; FFT window overlap: 50%).

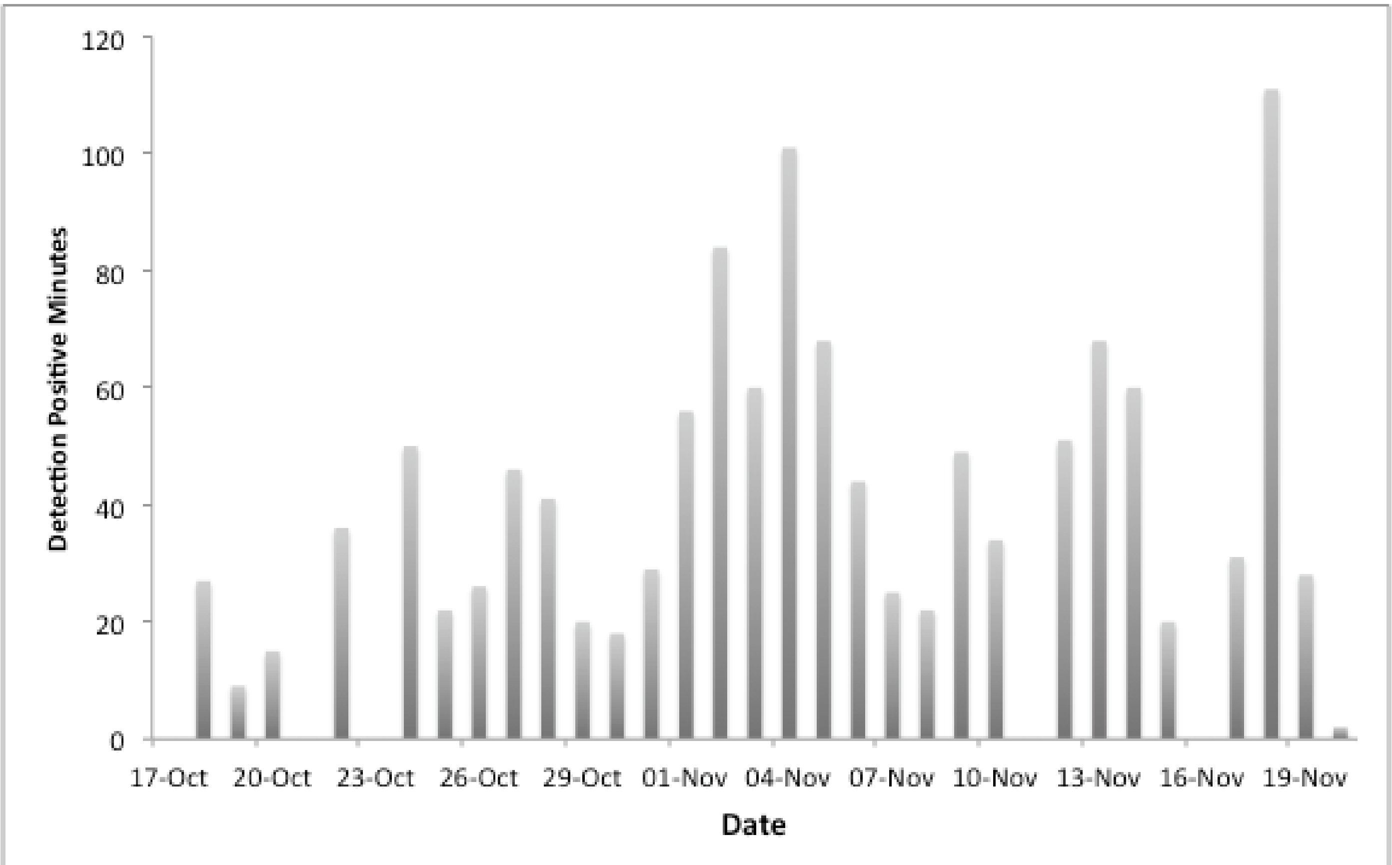



Figure 42. Daily detection positive minutes (DPM) of Chinese White Dolphin click trains through October 17, 2012 to November 20, 2012 at the Lung Kwu Chau east buoy

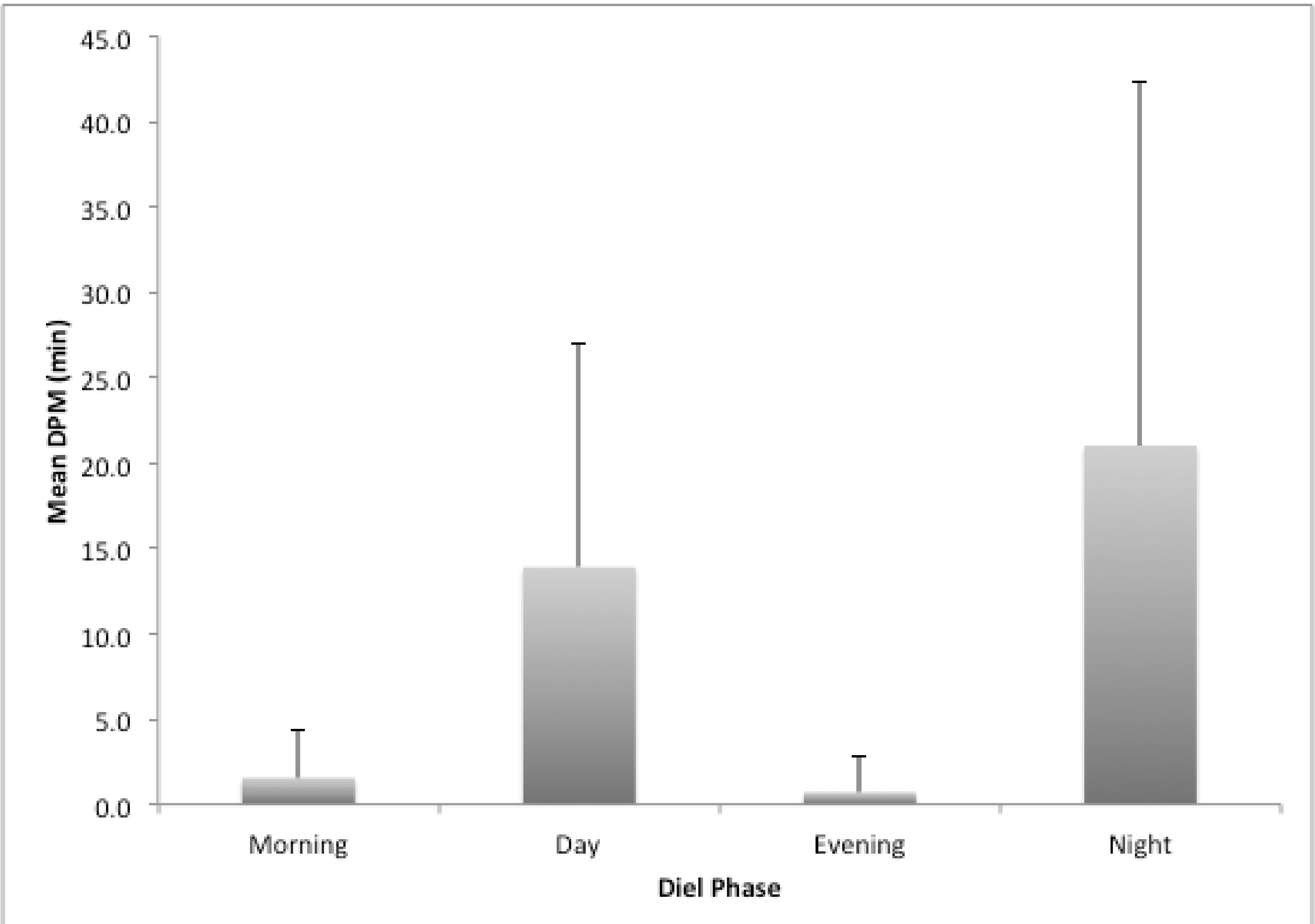



Figure 43. Mean detection positive minutes (DPM) and standard deviation for each diel phase of Chinese White Dolphin click trains through October 17, 2012 to November 20, 2012 at the Lung Kwu Chau east buoy (note: morning and evening phases are shorter in duration and thus have a lower mean DPM)

## Appendix I.  Survey Effort Database (April 2012 - March 2013)
(Note: P = Primary Line Effort; S = Secondary Line Effort)

| DATE | AREA | BEAU | EFFORT | SEASON | VESSEL | PHASE | TYPE | P/S |
|---|---|---|---|---|---|---|---|---|
| 3-Apr-12 | LAMMA | 1 | 38.2 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 3-Apr-12 | LAMMA | 2 | 30.8 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 3-Apr-12 | LAMMA | 1 | 8.7 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 3-Apr-12 | LAMMA | 2 | 11.6 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 11-Apr-12 | SE LANTAU | 1 | 11.0 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 11-Apr-12 | SE LANTAU | 2 | 13.1 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 11-Apr-12 | SE LANTAU | 1 | 5.8 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 11-Apr-12 | SE LANTAU | 2 | 2.4 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 11-Apr-12 | SW LANTAU | 1 | 4.5 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 11-Apr-12 | SW LANTAU | 2 | 21.2 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 11-Apr-12 | SW LANTAU | 1 | 4.2 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 11-Apr-12 | SW LANTAU | 2 | 5.6 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 11-Apr-12 | W LANTAU | 2 | 1.0 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 11-Apr-12 | W LANTAU | 3 | 8.4 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 12-Apr-12 | W LANTAU | 1 | 4.6 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 12-Apr-12 | W LANTAU | 2 | 10.9 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 12-Apr-12 | W LANTAU | 3 | 4.9 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 12-Apr-12 | W LANTAU | 1 | 2.7 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 12-Apr-12 | W LANTAU | 2 | 12.7 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 12-Apr-12 | W LANTAU | 3 | 4.8 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 12-Apr-12 | NW LANTAU | 3 | 17.9 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 12-Apr-12 | NW LANTAU | 4 | 7.5 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 12-Apr-12 | NW LANTAU | 3 | 6.1 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 12-Apr-12 | NW LANTAU | 4 | 2.9 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 26-Apr-12 | SE LANTAU | 1 | 3.1 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 26-Apr-12 | SE LANTAU | 2 | 20.2 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 26-Apr-12 | SE LANTAU | 2 | 8.6 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 26-Apr-12 | SW LANTAU | 2 | 8.4 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 26-Apr-12 | SW LANTAU | 3 | 0.8 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 26-Apr-12 | SW LANTAU | 2 | 12.3 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 26-Apr-12 | SW LANTAU | 3 | 2.3 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 26-Apr-12 | W LANTAU | 2 | 2.9 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 26-Apr-12 | W LANTAU | 3 | 3.0 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 26-Apr-12 | W LANTAU | 4 | 3.2 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 27-Apr-12 | NW LANTAU | 3 | 8.2 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 27-Apr-12 | NW LANTAU | 4 | 13.8 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 27-Apr-12 | NW LANTAU | 5 | 4.0 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 27-Apr-12 | NW LANTAU | 3 | 3.1 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 27-Apr-12 | NW LANTAU | 4 | 4.1 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 27-Apr-12 | NE LANTAU | 2 | 3.6 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 27-Apr-12 | NE LANTAU | 3 | 18.6 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 27-Apr-12 | NE LANTAU | 3 | 0.9 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 27-Apr-12 | NE LANTAU | 4 | 1.2 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 4-May-12 | NW LANTAU | 1 | 5.4 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 4-May-12 | NW LANTAU | 2 | 22.9 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 4-May-12 | NW LANTAU | 3 | 3.8 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 4-May-12 | NW LANTAU | 2 | 8.5 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 4-May-12 | NW LANTAU | 3 | 1.7 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 4-May-12 | NE LANTAU | 2 | 4.2 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 4-May-12 | NE LANTAU | 3 | 7.6 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 4-May-12 | NE LANTAU | 2 | 12.6 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 4-May-12 | NE LANTAU | 3 | 1.2 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 9-May-12 | LAMMA | 2 | 20.9 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 9-May-12 | LAMMA | 3 | 32.7 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 9-May-12 | LAMMA | 4 | 11.6 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |

## Appendix I. (cont'd.)

| DATE | AREA | BEAU | EFFORT | SEASON | VESSEL | PHASE | TYPE | P/S |
|---|---|---|---|---|---|---|---|---|
| 9-May-12 | LAMMA | 2 | 12.4 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 9-May-12 | LAMMA | 3 | 10.1 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 9-May-12 | LAMMA | 4 | 2.9 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 15-May-12 | W LANTAU | 1 | 6.7 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 15-May-12 | W LANTAU | 2 | 0.3 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 15-May-12 | W LANTAU | 3 | 3.6 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 15-May-12 | W LANTAU | 1 | 2.1 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 15-May-12 | W LANTAU | 2 | 4.8 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 15-May-12 | W LANTAU | 3 | 2.0 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 15-May-12 | SW LANTAU | 2 | 8.0 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 15-May-12 | SW LANTAU | 3 | 7.6 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 15-May-12 | SW LANTAU | 2 | 9.4 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 15-May-12 | SW LANTAU | 3 | 4.4 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 15-May-12 | SE LANTAU | 2 | 2.0 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 15-May-12 | SE LANTAU | 3 | 7.8 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 15-May-12 | SE LANTAU | 2 | 6.4 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 15-May-12 | SE LANTAU | 3 | 2.2 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 24-May-12 | W LANTAU | 1 | 1.0 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 24-May-12 | W LANTAU | 2 | 5.2 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 24-May-12 | W LANTAU | 3 | 3.4 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 24-May-12 | W LANTAU | 4 | 7.4 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 24-May-12 | W LANTAU | 1 | 0.8 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 24-May-12 | W LANTAU | 2 | 2.4 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 24-May-12 | W LANTAU | 3 | 2.7 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 24-May-12 | W LANTAU | 4 | 4.4 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 24-May-12 | NE LANTAU | 2 | 3.7 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 24-May-12 | NE LANTAU | 3 | 8.6 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 30-May-12 | NE LANTAU | 2 | 21.3 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 30-May-12 | NE LANTAU | 3 | 7.0 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 30-May-12 | NE LANTAU | 2 | 10.9 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 30-May-12 | NW LANTAU | 1 | 4.1 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 30-May-12 | NW LANTAU | 2 | 14.8 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 30-May-12 | NW LANTAU | 3 | 11.6 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 30-May-12 | NW LANTAU | 1 | 2.9 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 30-May-12 | NW LANTAU | 2 | 5.1 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 30-May-12 | NW LANTAU | 3 | 3.3 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 31-May-12 | W LANTAU | 0 | 3.7 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 31-May-12 | W LANTAU | 1 | 2.8 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 31-May-12 | W LANTAU | 2 | 8.0 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 31-May-12 | W LANTAU | 0 | 2.2 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 31-May-12 | W LANTAU | 1 | 1.9 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 31-May-12 | W LANTAU | 2 | 6.5 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 31-May-12 | NW LANTAU | 1 | 4.4 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 31-May-12 | NW LANTAU | 2 | 17.5 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 31-May-12 | NW LANTAU | 3 | 1.9 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 31-May-12 | NW LANTAU | 1 | 0.5 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 31-May-12 | NW LANTAU | 2 | 8.8 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 6-Jun-12 | W LANTAU | 2 | 13.0 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 6-Jun-12 | W LANTAU | 3 | 5.4 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 6-Jun-12 | W LANTAU | 4 | 2.5 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 6-Jun-12 | W LANTAU | 2 | 4.7 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 6-Jun-12 | W LANTAU | 3 | 12.1 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 6-Jun-12 | W LANTAU | 4 | 1.0 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 6-Jun-12 | NW LANTAU | 1 | 9.8 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 6-Jun-12 | NW LANTAU | 2 | 2.3 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 6-Jun-12 | NW LANTAU | 3 | 5.3 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 6-Jun-12 | NW LANTAU | 2 | 6.0 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 6-Jun-12 | NW LANTAU | 3 | 2.8 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |

## Appendix I. (cont'd.)

| DATE | AREA | BEAU | EFFORT | SEASON | VESSEL | PHASE | TYPE | P/S |
|---|---|---|---|---|---|---|---|---|
| 7-Jun-12 | NW LANTAU | 1 | 6.0 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 7-Jun-12 | NW LANTAU | 2 | 12.1 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 7-Jun-12 | NW LANTAU | 3 | 9.4 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 7-Jun-12 | NW LANTAU | 4 | 1.2 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 7-Jun-12 | NW LANTAU | 1 | 2.4 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 7-Jun-12 | NW LANTAU | 2 | 2.1 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 7-Jun-12 | NW LANTAU | 3 | 2.1 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 7-Jun-12 | NW LANTAU | 4 | 1.0 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 7-Jun-12 | NE LANTAU | 2 | 7.0 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 7-Jun-12 | NE LANTAU | 3 | 21.1 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 7-Jun-12 | NE LANTAU | 4 | 3.1 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 7-Jun-12 | NE LANTAU | 2 | 6.0 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 7-Jun-12 | NE LANTAU | 3 | 8.5 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 7-Jun-12 | NE LANTAU | 4 | 1.3 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 8-Jun-12 | W LANTAU | 1 | 4.0 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 8-Jun-12 | W LANTAU | 2 | 4.6 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 8-Jun-12 | W LANTAU | 3 | 0.7 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 8-Jun-12 | SW LANTAU | 2 | 26.3 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 8-Jun-12 | SW LANTAU | 2 | 12.6 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 8-Jun-12 | SE LANTAU | 2 | 17.9 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 8-Jun-12 | SE LANTAU | 2 | 8.0 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 8-Jun-12 | SE LANTAU | 3 | 0.2 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 14-Jun-12 | NW LANTAU | 1 | 6.0 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 14-Jun-12 | NW LANTAU | 2 | 19.3 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 14-Jun-12 | NW LANTAU | 1 | 3.2 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 14-Jun-12 | NW LANTAU | 2 | 5.2 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 14-Jun-12 | NE LANTAU | 2 | 12.5 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 14-Jun-12 | NE LANTAU | 3 | 12.9 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 14-Jun-12 | NE LANTAU | 4 | 2.3 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 14-Jun-12 | NE LANTAU | 2 | 6.8 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 14-Jun-12 | NE LANTAU | 3 | 3.7 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 21-Jun-12 | W LANTAU | 2 | 0.3 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 21-Jun-12 | W LANTAU | 3 | 9.5 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 21-Jun-12 | W LANTAU | 4 | 5.0 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 21-Jun-12 | W LANTAU | 2 | 0.2 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 21-Jun-12 | W LANTAU | 3 | 7.9 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 21-Jun-12 | W LANTAU | 4 | 2.3 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 21-Jun-12 | SW LANTAU | 2 | 3.7 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 21-Jun-12 | SW LANTAU | 3 | 9.7 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 21-Jun-12 | SW LANTAU | 4 | 2.7 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 21-Jun-12 | SW LANTAU | 2 | 2.0 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 21-Jun-12 | SW LANTAU | 3 | 2.0 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 21-Jun-12 | SW LANTAU | 4 | 7.1 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 21-Jun-12 | SE LANTAU | 3 | 2.7 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 21-Jun-12 | SE LANTAU | 4 | 5.2 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 21-Jun-12 | SE LANTAU | 2 | 1.9 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 21-Jun-12 | SE LANTAU | 3 | 2.2 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 21-Jun-12 | SE LANTAU | 4 | 3.7 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 28-Jun-12 | W LANTAU | 2 | 8.2 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 28-Jun-12 | W LANTAU | 3 | 5.8 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 28-Jun-12 | W LANTAU | 4 | 0.8 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 28-Jun-12 | W LANTAU | 2 | 9.6 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 28-Jun-12 | W LANTAU | 3 | 8.9 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 28-Jun-12 | NW LANTAU | 2 | 8.1 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 28-Jun-12 | NW LANTAU | 3 | 12.7 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 28-Jun-12 | NW LANTAU | 2 | 3.6 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |

## Appendix I. (cont'd.)

| DATE | AREA | BEAU | EFFORT | SEASON | VESSEL | PHASE | TYPE | P/S |
|---|---|---|---|---|---|---|---|---|
| 28-Jun-12 | NW LANTAU | 3 | 2.2 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 29-Jun-12 | PO TOI | 1 | 1.0 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 29-Jun-12 | PO TOI | 2 | 43.4 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 29-Jun-12 | PO TOI | 3 | 13.3 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 29-Jun-12 | PO TOI | 1 | 2.3 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 29-Jun-12 | PO TOI | 2 | 6.3 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 29-Jun-12 | PO TOI | 3 | 1.8 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 5-Jul-12 | W LANTAU | 1 | 3.1 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 5-Jul-12 | W LANTAU | 2 | 12.9 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 5-Jul-12 | W LANTAU | 3 | 0.8 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 5-Jul-12 | W LANTAU | 1 | 2.7 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 5-Jul-12 | W LANTAU | 2 | 11.1 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 5-Jul-12 | W LANTAU | 3 | 3.2 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 5-Jul-12 | NW LANTAU | 2 | 14.8 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 5-Jul-12 | NW LANTAU | 3 | 3.1 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 5-Jul-12 | NW LANTAU | 2 | 1.5 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 5-Jul-12 | NW LANTAU | 3 | 5.3 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 6-Jul-12 | NW LANTAU | 2 | 9.2 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 6-Jul-12 | NW LANTAU | 3 | 16.1 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 6-Jul-12 | NW LANTAU | 2 | 4.9 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 6-Jul-12 | NW LANTAU | 3 | 3.9 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 6-Jul-12 | NE LANTAU | 2 | 10.3 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 6-Jul-12 | NE LANTAU | 3 | 19.2 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 6-Jul-12 | NE LANTAU | 4 | 0.6 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 6-Jul-12 | NE LANTAU | 2 | 4.3 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 6-Jul-12 | NE LANTAU | 3 | 4.7 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 10-Jul-12 | W LANTAU | 2 | 1.2 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 10-Jul-12 | W LANTAU | 3 | 12.1 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 10-Jul-12 | W LANTAU | 4 | 2.6 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 10-Jul-12 | SW LANTAU | 2 | 11.2 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 10-Jul-12 | SW LANTAU | 3 | 8.2 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 10-Jul-12 | SW LANTAU | 2 | 5.6 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 10-Jul-12 | SW LANTAU | 3 | 10.3 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 11-Jul-12 | NW LANTAU | 3 | 10.5 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 11-Jul-12 | NW LANTAU | 4 | 18.3 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 11-Jul-12 | NW LANTAU | 2 | 0.4 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 11-Jul-12 | NW LANTAU | 3 | 5.7 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 11-Jul-12 | NW LANTAU | 4 | 6.0 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 11-Jul-12 | NE LANTAU | 2 | 17.2 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 11-Jul-12 | NE LANTAU | 3 | 11.2 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 11-Jul-12 | NE LANTAU | 2 | 8.2 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 11-Jul-12 | NE LANTAU | 3 | 1.2 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 1-Aug-12 | PO TOI | 1 | 7.4 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 1-Aug-12 | PO TOI | 2 | 55.6 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 1-Aug-12 | PO TOI | 3 | 5.0 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 1-Aug-12 | PO TOI | 2 | 10.0 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 1-Aug-12 | PO TOI | 3 | 0.8 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 1-Aug-12 | NINEPINS | 2 | 10.0 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 1-Aug-12 | NINEPINS | 3 | 2.2 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 2-Aug-12 | NINEPINS | 1 | 3.5 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 2-Aug-12 | NINEPINS | 2 | 57.5 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 2-Aug-12 | NINEPINS | 3 | 13.6 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 2-Aug-12 | NINEPINS | 1 | 0.9 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 2-Aug-12 | NINEPINS | 2 | 9.6 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 6-Aug-12 | NE LANTAU | 1 | 2.0 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 6-Aug-12 | NE LANTAU | 2 | 8.8 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 6-Aug-12 | NE LANTAU | 3 | 3.1 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 6-Aug-12 | NE LANTAU | 1 | 0.9 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 6-Aug-12 | NE LANTAU | 2 | 9.8 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 6-Aug-12 | NE LANTAU | 3 | 0.1 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 6-Aug-12 | NW LANTAU | 1 | 0.7 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |

## Appendix I. (cont'd.)

| DATE | AREA | BEAU | EFFORT | SEASON | VESSEL | PHASE | TYPE | P/S |
|---|---|---|---|---|---|---|---|---|
| 6-Aug-12 | NW LANTAU | 2 | 18.1 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 6-Aug-12 | NW LANTAU | 3 | 4.5 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 6-Aug-12 | NW LANTAU | 2 | 9.1 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 8-Aug-12 | NE LANTAU | 2 | 13.8 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 8-Aug-12 | NE LANTAU | 2 | 8.4 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 8-Aug-12 | NW LANTAU | 2 | 19.9 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 8-Aug-12 | NW LANTAU | 2 | 0.3 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 8-Aug-12 | NW LANTAU | 3 | 4.1 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 9-Aug-12 | W LANTAU | 1 | 1.9 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 9-Aug-12 | W LANTAU | 2 | 4.7 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 9-Aug-12 | W LANTAU | 1 | 1.7 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 9-Aug-12 | W LANTAU | 2 | 3.6 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 9-Aug-12 | NW LANTAU | 4 | 7.0 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 9-Aug-12 | NW LANTAU | 4 | 1.7 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 9-Aug-12 | NE LANTAU | 2 | 12.4 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 9-Aug-12 | NE LANTAU | 3 | 3.8 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 9-Aug-12 | NE LANTAU | 4 | 3.0 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 9-Aug-12 | NE LANTAU | 2 | 8.5 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 9-Aug-12 | NE LANTAU | 3 | 2.0 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 15-Aug-12 | W LANTAU | 2 | 3.0 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 15-Aug-12 | NW LANTAU | 1 | 0.4 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 15-Aug-12 | NW LANTAU | 2 | 20.4 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 15-Aug-12 | NW LANTAU | 3 | 2.1 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 15-Aug-12 | NW LANTAU | 2 | 7.6 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 16-Aug-12 | W LANTAU | 2 | 6.2 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 16-Aug-12 | W LANTAU | 3 | 7.8 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 16-Aug-12 | W LANTAU | 2 | 7.0 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 16-Aug-12 | W LANTAU | 3 | 9.8 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 16-Aug-12 | W LANTAU | 4 | 1.2 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 21-Aug-12 | W LANTAU | 2 | 9.7 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 21-Aug-12 | W LANTAU | 3 | 1.3 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 21-Aug-12 | SW LANTAU | 2 | 20.3 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 21-Aug-12 | SW LANTAU | 3 | 1.0 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 21-Aug-12 | SW LANTAU | 2 | 13.9 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 21-Aug-12 | SE LANTAU | 2 | 14.2 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 21-Aug-12 | SE LANTAU | 3 | 4.6 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 21-Aug-12 | SE LANTAU | 2 | 4.8 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 21-Aug-12 | SE LANTAU | 3 | 3.6 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 22-Aug-12 | PO TOI | 2 | 53.2 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 22-Aug-12 | PO TOI | 3 | 20.9 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 22-Aug-12 | PO TOI | 2 | 17.1 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 29-Aug-12 | NE LANTAU | 1 | 3.6 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 29-Aug-12 | NE LANTAU | 2 | 10.4 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 29-Aug-12 | NE LANTAU | 1 | 0.3 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 29-Aug-12 | NE LANTAU | 2 | 8.7 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 30-Aug-12 | W LANTAU | 2 | 8.7 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 30-Aug-12 | SW LANTAU | 1 | 3.7 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 30-Aug-12 | SW LANTAU | 2 | 19.7 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 30-Aug-12 | SW LANTAU | 1 | 2.7 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 30-Aug-12 | SW LANTAU | 2 | 3.3 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 30-Aug-12 | SW LANTAU | 3 | 0.8 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 30-Aug-12 | SE LANTAU | 2 | 15.8 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 30-Aug-12 | SE LANTAU | 2 | 4.1 | SUMMER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 10-Sep-12 | PO TOI | 1 | 27.3 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 10-Sep-12 | PO TOI | 2 | 41.1 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 10-Sep-12 | PO TOI | 3 | 0.9 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 10-Sep-12 | PO TOI | 1 | 3.9 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 10-Sep-12 | PO TOI | 2 | 8.0 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 10-Sep-12 | NINEPINS | 2 | 12.0 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 11-Sep-12 | NINEPINS | 2 | 74.7 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 11-Sep-12 | NINEPINS | 2 | 11.9 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | S |

## Appendix I. (cont'd.)

| DATE | AREA | BEAU | EFFORT | SEASON | VESSEL | PHASE | TYPE | P/S |
|---|---|---|---|---|---|---|---|---|
| 11-Sep-12 | NINEPINS | 3 | 1.5 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 13-Sep-12 | NW LANTAU | 2 | 6.4 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 13-Sep-12 | NW LANTAU | 3 | 12.3 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 13-Sep-12 | NW LANTAU | 2 | 4.8 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 13-Sep-12 | NE LANTAU | 1 | 1.3 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 13-Sep-12 | NE LANTAU | 1 | 2.0 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 13-Sep-12 | NE LANTAU | 2 | 2.1 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 19-Sep-12 | SE LANTAU | 2 | 8.0 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 19-Sep-12 | SE LANTAU | 3 | 11.9 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 19-Sep-12 | SE LANTAU | 4 | 1.6 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 19-Sep-12 | SE LANTAU | 2 | 4.4 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 19-Sep-12 | SE LANTAU | 3 | 3.9 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 19-Sep-12 | SW LANTAU | 2 | 2.2 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 19-Sep-12 | SW LANTAU | 3 | 19.7 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 19-Sep-12 | SW LANTAU | 4 | 5.2 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 19-Sep-12 | SW LANTAU | 2 | 2.4 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 19-Sep-12 | SW LANTAU | 3 | 6.4 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 19-Sep-12 | SW LANTAU | 4 | 4.6 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 19-Sep-12 | W LANTAU | 1 | 6.8 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 19-Sep-12 | W LANTAU | 2 | 3.7 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 20-Sep-12 | NW LANTAU | 2 | 24.3 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 20-Sep-12 | NW LANTAU | 3 | 13.2 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 20-Sep-12 | NW LANTAU | 2 | 8.6 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 20-Sep-12 | NW LANTAU | 3 | 4.0 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 20-Sep-12 | NE LANTAU | 2 | 19.4 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 20-Sep-12 | NE LANTAU | 3 | 7.1 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 20-Sep-12 | NE LANTAU | 2 | 7.6 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 20-Sep-12 | NE LANTAU | 3 | 3.1 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 24-Sep-12 | NW LANTAU | 2 | 9.7 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 24-Sep-12 | NW LANTAU | 3 | 7.9 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 24-Sep-12 | NW LANTAU | 2 | 5.3 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 24-Sep-12 | NW LANTAU | 3 | 0.1 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 25-Sep-12 | NW LANTAU | 2 | 2.0 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 25-Sep-12 | NW LANTAU | 3 | 9.5 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 25-Sep-12 | NW LANTAU | 4 | 5.1 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 25-Sep-12 | NW LANTAU | 2 | 1.4 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 25-Sep-12 | NW LANTAU | 3 | 2.1 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 25-Sep-12 | NE LANTAU | 2 | 10.5 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 25-Sep-12 | NE LANTAU | 3 | 13.6 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 25-Sep-12 | NE LANTAU | 2 | 7.6 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 25-Sep-12 | NE LANTAU | 3 | 3.6 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 27-Sep-12 | NW LANTAU | 2 | 10.9 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 27-Sep-12 | NW LANTAU | 3 | 10.3 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 27-Sep-12 | NW LANTAU | 4 | 1.4 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 27-Sep-12 | NW LANTAU | 2 | 2.7 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 27-Sep-12 | NW LANTAU | 3 | 3.7 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 27-Sep-12 | NW LANTAU | 4 | 3.0 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 27-Sep-12 | W LANTAU | 2 | 3.1 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 27-Sep-12 | W LANTAU | 3 | 5.8 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 27-Sep-12 | W LANTAU | 2 | 0.7 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 27-Sep-12 | W LANTAU | 3 | 7.3 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 28-Sep-12 | NE LANTAU | 2 | 9.5 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 28-Sep-12 | NE LANTAU | 3 | 8.2 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 28-Sep-12 | NE LANTAU | 4 | 0.7 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 28-Sep-12 | NE LANTAU | 2 | 4.6 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 28-Sep-12 | NE LANTAU | 3 | 1.6 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 28-Sep-12 | NE LANTAU | 4 | 0.5 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 28-Sep-12 | NW LANTAU | 3 | 13.6 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 28-Sep-12 | NW LANTAU | 2 | 1.6 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 28-Sep-12 | NW LANTAU | 3 | 2.7 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 3-Oct-12 | W LANTAU | 2 | 12.2 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |

## Appendix I. (cont'd.)

| DATE | AREA | BEAU | EFFORT | SEASON | VESSEL | PHASE | TYPE | P/S |
|---|---|---|---|---|---|---|---|---|
| 3-Oct-12 | W LANTAU | 3 | 9.1 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 3-Oct-12 | W LANTAU | 2 | 13.9 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 3-Oct-12 | W LANTAU | 3 | 5.0 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 3-Oct-12 | W LANTAU | 4 | 1.2 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 3-Oct-12 | NW LANTAU | 2 | 9.9 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 3-Oct-12 | NW LANTAU | 3 | 5.3 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 3-Oct-12 | NW LANTAU | 2 | 5.0 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 3-Oct-12 | NW LANTAU | 3 | 0.5 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 4-Oct-12 | NW LANTAU | 1 | 1.5 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 4-Oct-12 | NW LANTAU | 2 | 14.6 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 4-Oct-12 | NW LANTAU | 3 | 4.7 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 4-Oct-12 | NW LANTAU | 2 | 8.4 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 4-Oct-12 | NE LANTAU | 2 | 15.4 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 4-Oct-12 | NE LANTAU | 3 | 6.0 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 4-Oct-12 | NE LANTAU | 2 | 5.8 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 4-Oct-12 | NE LANTAU | 3 | 4.3 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 15-Oct-12 | NW LANTAU | 1 | 2.5 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 15-Oct-12 | NW LANTAU | 2 | 6.4 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 15-Oct-12 | NW LANTAU | 3 | 2.9 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 15-Oct-12 | NW LANTAU | 2 | 0.6 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 15-Oct-12 | NW LANTAU | 3 | 1.7 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 16-Oct-12 | W LANTAU | 1 | 2.6 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 16-Oct-12 | W LANTAU | 2 | 9.3 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 16-Oct-12 | SW LANTAU | 2 | 16.0 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 16-Oct-12 | SW LANTAU | 3 | 12.0 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 16-Oct-12 | SW LANTAU | 4 | 0.6 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 16-Oct-12 | SW LANTAU | 2 | 1.6 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 16-Oct-12 | SW LANTAU | 3 | 10.9 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 16-Oct-12 | SE LANTAU | 2 | 17.9 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 16-Oct-12 | SE LANTAU | 3 | 1.0 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 16-Oct-12 | SE LANTAU | 2 | 6.1 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 22-Oct-12 | PO TOI | 2 | 28.4 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 22-Oct-12 | PO TOI | 3 | 33.8 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 22-Oct-12 | PO TOI | 4 | 3.3 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 22-Oct-12 | PO TOI | 2 | 7.3 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 22-Oct-12 | PO TOI | 3 | 4.9 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 9-Nov-12 | NW LANTAU | 2 | 20.7 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 9-Nov-12 | NW LANTAU | 3 | 6.5 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 9-Nov-12 | NW LANTAU | 2 | 4.5 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 9-Nov-12 | NW LANTAU | 3 | 2.4 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 20-Nov-12 | NE LANTAU | 2 | 2.5 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 20-Nov-12 | NE LANTAU | 3 | 21.5 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 20-Nov-12 | NE LANTAU | 2 | 6.4 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 20-Nov-12 | NE LANTAU | 3 | 9.4 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 21-Nov-12 | W LANTAU | 3 | 1.8 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 21-Nov-12 | W LANTAU | 4 | 9.0 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 21-Nov-12 | SW LANTAU | 3 | 14.8 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 21-Nov-12 | SW LANTAU | 4 | 5.8 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 21-Nov-12 | SW LANTAU | 3 | 3.9 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 21-Nov-12 | SW LANTAU | 4 | 3.3 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 21-Nov-12 | SE LANTAU | 2 | 2.9 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 21-Nov-12 | SE LANTAU | 3 | 5.3 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 21-Nov-12 | SE LANTAU | 2 | 4.3 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 21-Nov-12 | SE LANTAU | 3 | 2.0 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 26-Nov-12 | NE LANTAU | 2 | 9.6 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 26-Nov-12 | NE LANTAU | 3 | 15.1 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 26-Nov-12 | NE LANTAU | 4 | 4.5 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 26-Nov-12 | NE LANTAU | 5 | 0.7 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 26-Nov-12 | NE LANTAU | 2 | 3.9 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 26-Nov-12 | NE LANTAU | 3 | 8.6 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 26-Nov-12 | NE LANTAU | 4 | 2.8 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | S |

## Appendix I. (cont'd.)

| DATE | AREA | BEAU | EFFORT | SEASON | VESSEL | PHASE | TYPE | P/S |
|---|---|---|---|---|---|---|---|---|
| 26-Nov-12 | NW LANTAU | 2 | 2.3 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 26-Nov-12 | NW LANTAU | 3 | 1.9 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 26-Nov-12 | NW LANTAU | 4 | 4.2 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 26-Nov-12 | NW LANTAU | 2 | 2.2 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 27-Nov-12 | NW LANTAU | 2 | 25.8 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 27-Nov-12 | NW LANTAU | 3 | 2.0 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 27-Nov-12 | NW LANTAU | 2 | 7.1 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 28-Nov-12 | NE LANTAU | 2 | 15.9 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 28-Nov-12 | NE LANTAU | 2 | 8.7 | AUTUMN | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 12-Dec-12 | SW LANTAU | 2 | 2.7 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 12-Dec-12 | SW LANTAU | 3 | 11.5 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 12-Dec-12 | SW LANTAU | 4 | 1.4 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 12-Dec-12 | SW LANTAU | 2 | 0.9 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 12-Dec-12 | SW LANTAU | 3 | 2.3 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 12-Dec-12 | SW LANTAU | 4 | 2.1 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 12-Dec-12 | W LANTAU | 1 | 1.7 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 12-Dec-12 | W LANTAU | 2 | 8.0 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 17-Dec-12 | NW LANTAU | 2 | 3.0 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 17-Dec-12 | NW LANTAU | 3 | 10.9 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 17-Dec-12 | NW LANTAU | 4 | 8.9 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 17-Dec-12 | NW LANTAU | 2 | 0.8 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 17-Dec-12 | NW LANTAU | 3 | 5.3 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 17-Dec-12 | DEEP BAY | 2 | 9.5 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 17-Dec-12 | DEEP BAY | 3 | 7.4 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 17-Dec-12 | DEEP BAY | 2 | 6.8 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 17-Dec-12 | DEEP BAY | 3 | 6.1 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 17-Dec-12 | NE LANTAU | 2 | 12.4 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 17-Dec-12 | NE LANTAU | 3 | 2.8 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 17-Dec-12 | NE LANTAU | 2 | 9.0 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 17-Dec-12 | NE LANTAU | 3 | 1.5 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 20-Dec-12 | NE LANTAU | 2 | 5.2 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 20-Dec-12 | NE LANTAU | 3 | 21.3 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 20-Dec-12 | NE LANTAU | 4 | 11.8 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 20-Dec-12 | NE LANTAU | 2 | 4.5 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 20-Dec-12 | NE LANTAU | 3 | 5.7 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 20-Dec-12 | NW LANTAU | 2 | 4.6 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 20-Dec-12 | NW LANTAU | 3 | 9.9 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 20-Dec-12 | NW LANTAU | 3 | 4.0 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 21-Dec-12 | W LANTAU | 2 | 4.2 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 21-Dec-12 | W LANTAU | 3 | 3.8 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 21-Dec-12 | SW LANTAU | 2 | 14.2 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 21-Dec-12 | SW LANTAU | 3 | 5.5 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 21-Dec-12 | SW LANTAU | 2 | 10.3 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 21-Dec-12 | SW LANTAU | 3 | 2.9 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 21-Dec-12 | SE LANTAU | 2 | 14.0 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 21-Dec-12 | SE LANTAU | 1 | 1.4 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 21-Dec-12 | SE LANTAU | 2 | 8.2 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 27-Dec-12 | SW LANTAU | 3 | 2.0 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 27-Dec-12 | SW LANTAU | 4 | 6.3 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 27-Dec-12 | SW LANTAU | 3 | 2.8 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 27-Dec-12 | SW LANTAU | 4 | 3.7 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 27-Dec-12 | W LANTAU | 5 | 11.7 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 28-Dec-12 | NW LANTAU | 2 | 21.1 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 28-Dec-12 | NW LANTAU | 3 | 6.8 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 28-Dec-12 | NW LANTAU | 2 | 7.8 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 28-Dec-12 | DEEP BAY | 2 | 5.6 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 28-Dec-12 | DEEP BAY | 3 | 8.8 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 28-Dec-12 | DEEP BAY | 3 | 3.3 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 28-Dec-12 | NE LANTAU | 1 | 7.1 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 28-Dec-12 | NE LANTAU | 2 | 2.8 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 28-Dec-12 | NE LANTAU | 1 | 2.1 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| | | | | | | | | |

## Appendix I. (cont'd.)

| DATE | AREA | BEAU | EFFORT | SEASON | VESSEL | PHASE | TYPE | P/S |
|---|---|---|---|---|---|---|---|---|
| 28-Dec-12 | NE LANTAU | 2 | 7.0 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 3-Jan-13 | W LANTAU | 3 | 12.8 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 3-Jan-13 | W LANTAU | 4 | 7.8 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 3-Jan-13 | W LANTAU | 5 | 1.0 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 3-Jan-13 | W LANTAU | 2 | 0.3 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 3-Jan-13 | W LANTAU | 3 | 6.5 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 3-Jan-13 | W LANTAU | 4 | 2.8 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 3-Jan-13 | W LANTAU | 5 | 1.2 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 3-Jan-13 | NW LANTAU | 2 | 1.4 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 3-Jan-13 | NW LANTAU | 3 | 8.7 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 3-Jan-13 | NW LANTAU | 4 | 1.3 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 3-Jan-13 | NW LANTAU | 5 | 8.8 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 3-Jan-13 | NW LANTAU | 2 | 2.7 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 9-Jan-13 | W LANTAU | 3 | 6.5 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 9-Jan-13 | W LANTAU | 4 | 5.3 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 9-Jan-13 | W LANTAU | 5 | 3.4 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 9-Jan-13 | W LANTAU | 3 | 3.4 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 9-Jan-13 | W LANTAU | 4 | 2.3 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 9-Jan-13 | W LANTAU | 5 | 8.5 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 9-Jan-13 | W LANTAU | 6 | 2.7 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 9-Jan-13 | NW LANTAU | 5 | 1.7 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 9-Jan-13 | NE LANTAU | 2 | 12.6 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 9-Jan-13 | NE LANTAU | 3 | 9.7 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 9-Jan-13 | NE LANTAU | 2 | 4.8 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 9-Jan-13 | NE LANTAU | 3 | 2.0 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 11-Jan-13 | SE LANTAU | 2 | 13.8 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 11-Jan-13 | SE LANTAU | 3 | 13.0 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 11-Jan-13 | SE LANTAU | 4 | 2.2 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 11-Jan-13 | SE LANTAU | 2 | 6.3 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 11-Jan-13 | SE LANTAU | 3 | 3.0 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 11-Jan-13 | SE LANTAU | 4 | 2.1 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 11-Jan-13 | SW LANTAU | 2 | 13.6 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 11-Jan-13 | SW LANTAU | 3 | 5.1 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 11-Jan-13 | SW LANTAU | 2 | 3.6 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 11-Jan-13 | SW LANTAU | 3 | 1.7 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 14-Jan-13 | SE LANTAU | 1 | 2.0 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 14-Jan-13 | SE LANTAU | 2 | 23.2 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 14-Jan-13 | SE LANTAU | 1 | 2.0 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 14-Jan-13 | SE LANTAU | 2 | 7.1 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 14-Jan-13 | SW LANTAU | 2 | 12.2 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 14-Jan-13 | SW LANTAU | 3 | 8.1 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 14-Jan-13 | SW LANTAU | 2 | 11.0 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 14-Jan-13 | SW LANTAU | 3 | 2.3 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 14-Jan-13 | W LANTAU | 2 | 11.8 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 15-Jan-13 | NW LANTAU | 1 | 1.4 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 15-Jan-13 | NW LANTAU | 2 | 15.1 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 15-Jan-13 | NW LANTAU | 3 | 5.4 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 15-Jan-13 | NW LANTAU | 4 | 1.9 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 15-Jan-13 | NW LANTAU | 5 | 6.4 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 15-Jan-13 | NW LANTAU | 1 | 2.3 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 15-Jan-13 | NW LANTAU | 2 | 1.8 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 15-Jan-13 | NW LANTAU | 3 | 0.7 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 15-Jan-13 | DEEP BAY | 2 | 8.3 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 15-Jan-13 | DEEP BAY | 3 | 6.0 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 15-Jan-13 | DEEP BAY | 2 | 1.2 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 15-Jan-13 | DEEP BAY | 3 | 4.9 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 16-Jan-13 | NE LANTAU | 1 | 0.3 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 16-Jan-13 | NE LANTAU | 2 | 14.3 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 16-Jan-13 | NE LANTAU | 1 | 5.1 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 16-Jan-13 | NE LANTAU | 2 | 5.6 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 16-Jan-13 | W LANTAU | 2 | 11.0 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |

## Appendix I. (cont'd.)

| DATE | AREA | BEAU | EFFORT | SEASON | VESSEL | PHASE | TYPE | P/S |
|---|---|---|---|---|---|---|---|---|
| 22-Jan-13 | W LANTAU | 1 | 5.5 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 22-Jan-13 | W LANTAU | 2 | 3.4 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 22-Jan-13 | W LANTAU | 3 | 1.4 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 22-Jan-13 | NW LANTAU | 1 | 13.4 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 22-Jan-13 | NW LANTAU | 2 | 6.1 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 22-Jan-13 | NW LANTAU | 1 | 1.5 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 22-Jan-13 | NW LANTAU | 2 | 0.6 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 23-Jan-13 | NW LANTAU | 1 | 10.0 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 23-Jan-13 | NW LANTAU | 2 | 19.1 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 23-Jan-13 | NW LANTAU | 1 | 2.7 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 23-Jan-13 | NW LANTAU | 2 | 6.3 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 23-Jan-13 | NE LANTAU | 1 | 16.1 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 23-Jan-13 | NE LANTAU | 2 | 17.2 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 23-Jan-13 | NE LANTAU | 1 | 2.6 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 23-Jan-13 | NE LANTAU | 2 | 9.3 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 24-Jan-13 | LAMMA | 2 | 57.1 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 24-Jan-13 | LAMMA | 3 | 10.8 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 24-Jan-13 | LAMMA | 2 | 25.8 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 24-Jan-13 | LAMMA | 3 | 3.6 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 29-Jan-13 | W LANTAU | 1 | 2.3 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 29-Jan-13 | W LANTAU | 2 | 18.8 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 29-Jan-13 | W LANTAU | 3 | 0.4 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 29-Jan-13 | W LANTAU | 1 | 5.2 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 29-Jan-13 | W LANTAU | 2 | 13.6 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 29-Jan-13 | W LANTAU | 3 | 0.8 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 29-Jan-13 | NW LAUTAU | 2 | 15.3 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 29-Jan-13 | NW LAUTAU | 2 | 1.8 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 30-Jan-13 | NW LANTAU | 2 | 1.6 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 30-Jan-13 | NW LANTAU | 3 | 16.9 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 30-Jan-13 | NW LANTAU | 4 | 3.7 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 30-Jan-13 | NW LANTAU | 5 | 5.8 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 30-Jan-13 | NW LANTAU | 3 | 4.7 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 30-Jan-13 | DEEP BAY | 3 | 13.8 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 30-Jan-13 | DEEP BAY | 2 | 3.4 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 30-Jan-13 | DEEP BAY | 3 | 3.1 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 30-Jan-13 | NE LANTAU | 3 | 5.6 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 30-Jan-13 | NE LANTAU | 4 | 3.6 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 30-Jan-13 | NE LANTAU | 5 | 1.9 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 30-Jan-13 | NE LANTAU | 3 | 1.9 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 30-Jan-13 | NE LANTAU | 4 | 3.0 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 30-Jan-13 | NE LANTAU | 5 | 3.0 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 31-Jan-13 | SE LANTAU | 2 | 1.8 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 31-Jan-13 | SE LANTAU | 3 | 9.2 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 31-Jan-13 | SE LANTAU | 4 | 4.2 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 31-Jan-13 | SE LANTAU | 5 | 0.4 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 31-Jan-13 | SE LANTAU | 2 | 1.2 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 31-Jan-13 | SE LANTAU | 3 | 3.2 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 31-Jan-13 | SE LANTAU | 4 | 5.7 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 31-Jan-13 | SW LANTAU | 3 | 6.0 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 31-Jan-13 | SW LANTAU | 4 | 12.7 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 31-Jan-13 | SW LANTAU | 5 | 0.9 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 31-Jan-13 | SW LANTAU | 3 | 8.6 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 31-Jan-13 | SW LANTAU | 4 | 4.6 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 31-Jan-13 | SW LANTAU | 5 | 2.2 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 31-Jan-13 | W LANTAU | 2 | 4.9 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 31-Jan-13 | W LANTAU | 2 | 6.6 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 31-Jan-13 | W LANTAU | 3 | 0.8 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 31-Jan-13 | W LANTAU | 4 | 1.3 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 31-Jan-13 | W LANTAU | 5 | 1.0 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 5-Feb-13 | LAMMA | 0 | 6.4 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 5-Feb-13 | LAMMA | 1 | 14.2 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |

## Appendix I. (cont'd.)

| DATE | AREA | BEAU | EFFORT | SEASON | VESSEL | PHASE | TYPE | P/S |
|---|---|---|---|---|---|---|---|---|
| 5-Feb-13 | LAMMA | 2 | 40.7 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 5-Feb-13 | LAMMA | 3 | 2.1 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 5-Feb-13 | LAMMA | 1 | 4.2 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 5-Feb-13 | LAMMA | 2 | 14.1 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 5-Feb-13 | LAMMA | 3 | 2.4 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 7-Feb-13 | NW LANTAU | 3 | 0.20 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 7-Feb-13 | NW LANTAU | 4 | 9.64 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 7-Feb-13 | NW LANTAU | 5 | 7.05 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 7-Feb-13 | NW LANTAU | 2 | 1.15 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 7-Feb-13 | NW LANTAU | 4 | 0.64 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 7-Feb-13 | NW LANTAU | 5 | 3.41 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 7-Feb-13 | NW LANTAU | 6 | 2.54 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 7-Feb-13 | DEEP BAY | 2 | 8.25 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 7-Feb-13 | DEEP BAY | 3 | 5.20 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 7-Feb-13 | DEEP BAY | 4 | 0.70 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 7-Feb-13 | DEEP BAY | 2 | 1.20 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 7-Feb-13 | DEEP BAY | 3 | 4.55 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 7-Feb-13 | DEEP BAY | 4 | 0.40 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 7-Feb-13 | NE LANTAU | 2 | 12.48 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 7-Feb-13 | NE LANTAU | 3 | 12.65 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 7-Feb-13 | NE LANTAU | 2 | 4.20 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 7-Feb-13 | NE LANTAU | 3 | 4.17 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 19-Feb-13 | SW LANTAU | 0 | 2.00 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 19-Feb-13 | SW LANTAU | 1 | 12.10 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 19-Feb-13 | SW LANTAU | 2 | 3.20 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 19-Feb-13 | SW LANTAU | 0 | 2.20 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 19-Feb-13 | SW LANTAU | 1 | 5.00 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 19-Feb-13 | SW LANTAU | 2 | 1.90 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 19-Feb-13 | W LANTAU | 1 | 5.40 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 19-Feb-13 | W LANTAU | 2 | 5.20 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 22-Feb-13 | SE LANTAU | 2 | 20.80 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 22-Feb-13 | SE LANTAU | 3 | 5.55 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 22-Feb-13 | SE LANTAU | 2 | 4.08 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 22-Feb-13 | SE LANTAU | 3 | 2.58 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 22-Feb-13 | SW LANTAU | 2 | 6.48 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 22-Feb-13 | SW LANTAU | 3 | 15.99 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 22-Feb-13 | SW LANTAU | 4 | 3.78 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 22-Feb-13 | SW LANTAU | 5 | 1.82 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 22-Feb-13 | SW LANTAU | 2 | 2.07 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 22-Feb-13 | SW LANTAU | 3 | 6.28 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 25-Feb-13 | W LANTAU | 2 | 4.65 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 25-Feb-13 | W LANTAU | 3 | 5.80 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 25-Feb-13 | NE LANTAU | 2 | 9.96 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 25-Feb-13 | NE LANTAU | 3 | 11.34 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 25-Feb-13 | NE LANTAU | 2 | 5.20 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 25-Feb-13 | NE LANTAU | 3 | 2.10 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 28-Feb-13 | NE LANTAU | 2 | 4.10 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 28-Feb-13 | NE LANTAU | 3 | 21.00 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 28-Feb-13 | NE LANTAU | 2 | 4.30 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 28-Feb-13 | NE LANTAU | 3 | 6.80 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 28-Feb-13 | NW LANTAU | 3 | 8.70 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 28-Feb-13 | NW LANTAU | 4 | 8.60 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 28-Feb-13 | NW LANTAU | 5 | 8.60 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 28-Feb-13 | NW LANTAU | 3 | 0.60 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 28-Feb-13 | NW LANTAU | 4 | 2.40 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 28-Feb-13 | NW LANTAU | 5 | 4.20 | WINTER | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 1-Mar-13 | NW LANTAU | 3 | 16.50 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 1-Mar-13 | NW LANTAU | 4 | 4.60 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 1-Mar-13 | NW LANTAU | 2 | 3.00 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 1-Mar-13 | NW LANTAU | 3 | 5.80 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |

## Appendix I. (cont'd.)

| DATE | AREA | BEAU | EFFORT | SEASON | VESSEL | PHASE | TYPE | P/S |
|---|---|---|---|---|---|---|---|---|
| 1-Mar-13 | NW LANTAU | 5 | 2.80 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 1-Mar-13 | W LANTAU | 3 | 6.90 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 1-Mar-13 | W LANTAU | 4 | 2.30 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 1-Mar-13 | W LANTAU | 5 | 6.00 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 1-Mar-13 | W LANTAU | 2 | 0.80 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 1-Mar-13 | W LANTAU | 3 | 6.50 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 1-Mar-13 | W LANTAU | 4 | 5.40 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 7-Mar-13 | W LANTAU | 1 | 9.51 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 7-Mar-13 | W LANTAU | 2 | 2.25 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 7-Mar-13 | W LANTAU | 1 | 9.70 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 7-Mar-13 | W LANTAU | 2 | 12.19 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 7-Mar-13 | SW LANTAU | 1 | 10.70 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 7-Mar-13 | SW LANTAU | 1 | 7.81 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 7-Mar-13 | SW LANTAU | 2 | 2.96 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 8-Mar-13 | SW LANTAU | 2 | 7.88 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 8-Mar-13 | SE LANTAU | 2 | 14.24 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 8-Mar-13 | SE LANTAU | 2 | 7.24 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 19-Mar-13 | LAMMA | 0 | 5.10 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 19-Mar-13 | LAMMA | 1 | 19.49 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 19-Mar-13 | LAMMA | 2 | 34.70 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 19-Mar-13 | LAMMA | 3 | 6.10 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 19-Mar-13 | LAMMA | 0 | 3.00 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 19-Mar-13 | LAMMA | 1 | 8.27 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 19-Mar-13 | LAMMA | 2 | 10.60 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 21-Mar-13 | NW LANTAU | 2 | 0.70 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 21-Mar-13 | NW LANTAU | 3 | 1.10 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 21-Mar-13 | NW LANTAU | 4 | 7.50 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 21-Mar-13 | NW LANTAU | 5 | 5.10 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 21-Mar-13 | NW LANTAU | 4 | 0.70 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 21-Mar-13 | NE LANTAU | 2 | 0.70 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 21-Mar-13 | NE LANTAU | 3 | 10.10 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 21-Mar-13 | NE LANTAU | 4 | 4.20 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 21-Mar-13 | NE LANTAU | 3 | 3.30 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 21-Mar-13 | NE LANTAU | 4 | 2.10 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 22-Mar-13 | W LANTAU | 2 | 4.08 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 22-Mar-13 | W LANTAU | 3 | 4.12 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 22-Mar-13 | W LANTAU | 4 | 2.12 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |
| 22-Mar-13 | NW LANTAU | 2 | 12.30 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 22-Mar-13 | NW LANTAU | 3 | 2.99 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | P |
| 22-Mar-13 | NW LANTAU | 2 | 6.72 | SPRING | STANDARD31516 | OPERATIONAL | HKCRP | S |

**Appendix II. Chinese White Dolphin Sighting Database (April 2012 - March 2013)**

(Note: P = sightings made on primary lines; S = sightings made on secondary line

| DATE | STG # | TIME | HRD SZ | AREA | BEAU | PSD | EFFORT | TYPE | NORTHING | EASTING | SEASON | BOAT ASSOC. | P/S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11-Apr-12 | 10 | 1445 | 1 | SW LANTAU | 1 | 103 | ON | HKCRP | 807733 | 808151 | SPRING | NONE | S |
| 11-Apr-12 | 11 | 1640 | 1 | W LANTAU | 3 | 89 | ON | HKCRP | 810084 | 801372 | SPRING | NONE | S |
| 12-Apr-12 | 1 | 1020 | 1 | W LANTAU | 1 | 190 | ON | HKCRP | 816313 | 803797 | SPRING | NONE | P |
| 12-Apr-12 | 2 | 1041 | 2 | W LANTAU | 1 | 507 | ON | HKCRP | 813978 | 803030 | SPRING | NONE | S |
| 12-Apr-12 | 3 | 1049 | 2 | W LANTAU | 2 | 12 | ON | HKCRP | 813558 | 802606 | SPRING | NONE | P |
| 12-Apr-12 | 4 | 1116 | 1 | W LANTAU | 2 | 7 | ON | HKCRP | 811468 | 801365 | SPRING | NONE | P |
| 12-Apr-12 | 5 | 1126 | 1 | W LANTAU | 2 | 94 | ON | HKCRP | 811002 | 801827 | SPRING | NONE | S |
| 12-Apr-12 | 6 | 1259 | 1 | W LANTAU | 2 | 530 | ON | HKCRP | 808435 | 800636 | SPRING | NONE | P |
| 12-Apr-12 | 7 | 1433 | 4 | NW LANTAU | 3 | 245 | ON | HKCRP | 822944 | 804667 | SPRING | NONE | P |
| 12-Apr-12 | 8 | 1515 | 4 | NW LANTAU | 4 | 42 | ON | HKCRP | 829245 | 804690 | SPRING | NONE | P |
| 12-Apr-12 | 9 | 1614 | 1 | NW LANTAU | 3 | 7 | ON | HKCRP | 821586 | 808352 | SPRING | NONE | S |
| 12-Apr-12 | 10 | 1630 | 1 | NW LANTAU | 3 | 141 | ON | HKCRP | 824465 | 808440 | SPRING | NONE | P |
| 26-Apr-12 | 5 | 1350 | 2 | SW LANTAU | 2 | ND | OFF | HKCRP | 807607 | 810523 | SPRING | NONE | |
| 26-Apr-12 | 9 | 1511 | 1 | SW LANTAU | 2 | ND | OFF | HKCRP | 803657 | 808577 | SPRING | NONE | |
| 27-Apr-12 | 1 | 1040 | 1 | NW LANTAU | 4 | 207 | ON | HKCRP | 820983 | 805322 | SPRING | NONE | P |
| 4-May-12 | 1 | 1115 | 3 | NW LANTAU | 2 | 458 | ON | HKCRP | 825569 | 804641 | SPRING | NONE | P |
| 4-May-12 | 2 | 1207 | 4 | NW LANTAU | 2 | 124 | ON | HKCRP | 825765 | 806382 | SPRING | NONE | P |
| 15-May-12 | 1 | 1040 | 14 | W LANTAU | 1 | 458 | ON | HKCRP | 814089 | 803020 | SPRING | NONE | S |
| 15-May-12 | 2 | 1122 | 5 | W LANTAU | 1 | 39 | ON | HKCRP | 811468 | 801375 | SPRING | NONE | P |
| 15-May-12 | 3 | 1142 | 3 | W LANTAU | 2 | 170 | ON | HKCRP | 810006 | 801351 | SPRING | HANG | S |
| 15-May-12 | 4 | 1216 | 10 | W LANTAU | 2 | 199 | ON | HKCRP | 806672 | 801776 | SPRING | NONE | S |
| 15-May-12 | 5 | 1352 | 1 | SW LANTAU | 2 | ND | OFF | HKCRP | 802294 | 809348 | SPRING | NONE | |
| 16-May-12 | 1 | 1558 | 4 | W LANTAU | 2 | ND | OFF | HELI | 817047 | 802377 | SPRING | NONE | |
| 18-May-12 | 1 | 1016 | 4 | W LANTAU | 1 | ND | OFF | HKCRP | 814386 | 803701 | SPRING | NONE | |
| 18-May-12 | 2 | 1030 | 7 | W LANTAU | 1 | ND | OFF | HKCRP | 813414 | 802678 | SPRING | NONE | |
| 18-May-12 | 3 | 1531 | 2 | NE LANTAU | 3 | ND | OFF | HKCRP | 821364 | 815934 | SPRING | NONE | |
| 24-May-12 | 1 | 0905 | 3 | NW LANTAU | 3 | ND | OFF | HKCRP | 817718 | 804604 | SPRING | NONE | |
| 24-May-12 | 2 | 0922 | 1 | W LANTAU | 4 | 189 | ON | HKCRP | 816955 | 803789 | SPRING | NONE | P |
| 24-May-12 | 3 | 0947 | 5 | W LANTAU | 4 | ND | OFF | HKCRP | 813989 | 803174 | SPRING | HANG | |
| 24-May-12 | 4 | 1012 | 1 | W LANTAU | 4 | ND | OFF | HKCRP | 814100 | 803143 | SPRING | NONE | |
| 24-May-12 | 5 | 1039 | 5 | W LANTAU | 4 | ND | OFF | HKCRP | 813624 | 802751 | SPRING | NONE | |
| 24-May-12 | 6 | 1153 | 5 | W LANTAU | 3 | 139 | ON | HKCRP | 811469 | 801066 | SPRING | NONE | P |
| 24-May-12 | 7 | 1212 | 7 | W LANTAU | 2 | 85 | ON | HKCRP | 811079 | 801931 | SPRING | NONE | S |

**Appendix II. (cont'd.)**

| DATE | STG # | TIME | HRD SZ | AREA | BEAU | PSD | EFFORT | TYPE | NORTHING | EASTING | SEASON | BOAT ASSOC. | P/S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 24-May-12 | 8 | 1241 | 5 | W LANTAU | 3 | 215 | ON | HKCRP | 809113 | 799544 | SPRING | NONE | S |
| 24-May-12 | 9 | 1309 | 1 | W LANTAU | 4 | 109 | ON | HKCRP | 807736 | 801490 | SPRING | NONE | S |
| 24-May-12 | 10 | 1319 | 1 | W LANTAU | 4 | 32 | ON | HKCRP | 808423 | 801172 | SPRING | NONE | S |
| 24-May-12 | 11 | 1337 | 2 | W LANTAU | 3 | 1319 | ON | HKCRP | 809689 | 799628 | SPRING | NONE | S |
| 24-May-12 | 12 | 1350 | 1 | W LANTAU | 3 | 143 | ON | HKCRP | 810472 | 800991 | SPRING | NONE | P |
| 24-May-12 | 13 | 1356 | 4 | W LANTAU | 2 | 157 | ON | HKCRP | 810472 | 801135 | SPRING | NONE | P |
| 24-May-12 | 14 | 1409 | 14 | W LANTAU | 2 | 107 | ON | HKCRP | 810792 | 801714 | SPRING | GILL NET | S |
| 24-May-12 | 15 | 1509 | 2 | W LANTAU | 3 | 138 | ON | HKCRP | 814487 | 803051 | SPRING | NONE | P |
| 30-May-12 | 1 | 1318 | 1 | NE LANTAU | 2 | 126 | ON | HKCRP | 822198 | 813257 | SPRING | NONE | P |
| 30-May-12 | 2 | 1837 | 1 | NW LANTAU | 2 | ND | OFF | HKCRP | 826941 | 805190 | SPRING | NONE | |
| 30-May-12 | 3 | 2249 | 2 | W LANTAU | 1 | ND | OFF | HKCRP | 806373 | 801869 | SPRING | NONE | |
| 31-May-12 | 1 | 558 | 3 | W LANTAU | 0 | ND | OFF | HKCRP | 806318 | 801765 | SPRING | NONE | |
| 31-May-12 | 2 | 632 | 3 | W LANTAU | 1 | 474 | ON | HKCRP | 806475 | 800899 | SPRING | NONE | P |
| 31-May-12 | 3 | 642 | 2 | W LANTAU | 0 | 662 | ON | HKCRP | 806462 | 801621 | SPRING | NONE | P |
| 31-May-12 | 4 | 653 | 1 | W LANTAU | 0 | 681 | ON | HKCRP | 807448 | 801294 | SPRING | NONE | P |
| 31-May-12 | 5 | 710 | 7 | W LANTAU | 1 | 312 | ON | HKCRP | 808459 | 799914 | SPRING | HANG | P |
| 31-May-12 | 6 | 728 | 4 | W LANTAU | 1 | 37 | ON | HKCRP | 808767 | 800946 | SPRING | NONE | S |
| 31-May-12 | 7 | 740 | 2 | W LANTAU | 1 | 53 | ON | HKCRP | 809420 | 800844 | SPRING | NONE | S |
| 31-May-12 | 8 | 804 | 8 | W LANTAU | 2 | 63 | ON | HKCRP | 810482 | 801476 | SPRING | NONE | P |
| 31-May-12 | 9 | 826 | 8 | W LANTAU | 2 | 338 | ON | HKCRP | 811234 | 802024 | SPRING | HANG | P |
| 31-May-12 | 10 | 859 | 4 | W LANTAU | 2 | 18 | ON | HKCRP | 813569 | 802678 | SPRING | NONE | P |
| 31-May-12 | 11 | 915 | 2 | W LANTAU | 2 | 49 | ON | HKCRP | 814199 | 803102 | SPRING | NONE | P |
| 31-May-12 | 12 | 1041 | 8 | NW LANTAU | 3 | 176 | ON | HKCRP | 824338 | 805339 | SPRING | NONE | P |
| 6-Jun-12 | 1 | 957 | 2 | NW LANTAU | 2 | ND | OFF | HKCRP | 817048 | 807220 | SUMMER | NONE | |
| 6-Jun-12 | 2 | 1006 | 1 | NW LANTAU | 2 | ND | OFF | HKCRP | 816608 | 805849 | SUMMER | NONE | |
| 6-Jun-12 | 3 | 1021 | 1 | W LANTAU | 2 | 132 | ON | HKCRP | 818184 | 803812 | SUMMER | NONE | P |
| 6-Jun-12 | 4 | 1051 | 1 | W LANTAU | 2 | 254 | ON | HKCRP | 815019 | 802836 | SUMMER | NONE | S |
| 6-Jun-12 | 5 | 1108 | 1 | W LANTAU | 2 | 207 | ON | HKCRP | 813558 | 802761 | SUMMER | NONE | S |
| 6-Jun-12 | 6 | 1134 | 10 | W LANTAU | 2 | ND | OFF | HKCRP | 811456 | 801684 | SUMMER | NONE | |
| 6-Jun-12 | 7 | 1216 | 2 | W LANTAU | 3 | 495 | ON | HKCRP | 808582 | 799574 | SUMMER | NONE | S |
| 6-Jun-12 | 8 | 1301 | 1 | W LANTAU | 4 | 93 | ON | HKCRP | 806517 | 801714 | SUMMER | NONE | P |
| 6-Jun-12 | 9 | 1405 | 1 | W LANTAU | 2 | 100 | ON | HKCRP | 812566 | 800749 | SUMMER | NONE | S |
| 6-Jun-12 | 10 | 1418 | 1 | W LANTAU | 2 | 306 | ON | HKCRP | 813417 | 801348 | SUMMER | NONE | S |
| 6-Jun-12 | 11 | 1448 | 6 | NW LANTAU | 2 | 364 | ON | HKCRP | 815414 | 804630 | SUMMER | NONE | P |

**Appendix II.  (cont'd.)**

| DATE | STG # | TIME | HRD SZ | AREA | BEAU | PSD | EFFORT | TYPE | NORTHING | EASTING | SEASON | BOAT ASSOC. | P/S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6-Jun-12 | 12 | 1539 | 1 | NW LANTAU | 2 | 167 | ON | HKCRP | 822535 | 804655 | SUMMER | NONE | P |
| 7-Jun-12 | 1 | 1000 | 1 | NW LANTAU | 2 | ND | OFF | HKCRP | 816507 | 806302 | SUMMER | NONE | |
| 7-Jun-12 | 2 | 1052 | 4 | NW LANTAU | 1 | 202 | ON | HKCRP | 826996 | 805355 | SUMMER | NONE | P |
| 7-Jun-12 | 3 | 1126 | 5 | NW LANTAU | 1 | 148 | ON | HKCRP | 828830 | 807428 | SUMMER | NONE | P |
| 7-Jun-12 | 4 | 1144 | 1 | NW LANTAU | 1 | 178 | ON | HKCRP | 827446 | 807415 | SUMMER | NONE | P |
| 7-Jun-12 | 5 | 1147 | 4 | NW LANTAU | 1 | 473 | ON | HKCRP | 826959 | 807311 | SUMMER | NONE | P |
| 7-Jun-12 | 6 | 1213 | 2 | NW LANTAU | 3 | 25 | ON | HKCRP | 825464 | 807422 | SUMMER | NONE | P |
| 8-Jun-12 | 1 | 1013 | 1 | W LANTAU | 2 | 779 | ON | HKCRP | 815182 | 804372 | SUMMER | NONE | S |
| 8-Jun-12 | 2 | 1022 | 1 | W LANTAU | 2 | 121 | ON | HKCRP | 814409 | 803556 | SUMMER | NONE | S |
| 8-Jun-12 | 3 | 1034 | 1 | W LANTAU | 1 | 178 | ON | HKCRP | 813436 | 802895 | SUMMER | NONE | S |
| 8-Jun-12 | 4 | 1052 | 5 | W LANTAU | 1 | 137 | ON | HKCRP | 810173 | 801176 | SUMMER | NONE | S |
| 8-Jun-12 | 5 | 1103 | 2 | W LANTAU | 2 | 353 | ON | HKCRP | 809144 | 800844 | SUMMER | NONE | S |
| 8-Jun-12 | 6 | 1130 | 1 | SW LANTAU | 2 | 664 | ON | HKCRP | 804400 | 802565 | SUMMER | NONE | P |
| 14-Jun-12 | 1 | 1120 | 8 | NW LANTAU | 1 | 351 | ON | HKCRP | 829187 | 806307 | SUMMER | NONE | P |
| 14-Jun-12 | 2 | 1214 | 7 | NW LANTAU | 2 | 21 | ON | HKCRP | 822217 | 808436 | SUMMER | NONE | P |
| 14-Jun-12 | 3 | 1417 | 3 | NE LANTAU | 3 | 409 | ON | HKCRP | 820866 | 815305 | SUMMER | NONE | P |
| 21-Jun-12 | 1 | 1019 | 2 | W LANTAU | 2 | ND | OFF | HKCRP | 818461 | 803988 | SUMMER | HANG | |
| 21-Jun-12 | 2 | 1124 | 1 | W LANTAU | 3 | 193 | ON | HKCRP | 813052 | 801121 | SUMMER | NONE | S |
| 21-Jun-12 | 3 | 1148 | 7 | W LANTAU | 2 | 135 | ON | HKCRP | 811256 | 802065 | SUMMER | NONE | S |
| 28-Jun-12 | 1 | 1008 | 4 | W LANTAU | 2 | ND | OFF | HKCRP | 816542 | 805303 | SUMMER | NONE | |
| 28-Jun-12 | 2 | 1028 | 6 | W LANTAU | 3 | ND | OFF | HKCRP | 816522 | 804519 | SUMMER | NONE | |
| 28-Jun-12 | 3 | 1055 | 7 | W LANTAU | 2 | 81 | ON | HKCRP | 814033 | 802978 | SUMMER | NONE | P |
| 28-Jun-12 | 4 | 1115 | 2 | W LANTAU | 3 | 103 | ON | HKCRP | 811725 | 800375 | SUMMER | NONE | S |
| 28-Jun-12 | 5 | 1124 | 3 | W LANTAU | 3 | 105 | ON | HKCRP | 811468 | 801395 | SUMMER | NONE | P |
| 28-Jun-12 | 6 | 1139 | 3 | W LANTAU | 2 | ND | OFF | HKCRP | 809818 | 801299 | SUMMER | NONE | |
| 28-Jun-12 | 7 | 1157 | 1 | W LANTAU | 3 | ND | OFF | HKCRP | 807817 | 799820 | SUMMER | NONE | |
| 28-Jun-12 | 8 | 1201 | 4 | W LANTAU | 3 | 117 | ON | HKCRP | 807440 | 799912 | SUMMER | NONE | S |
| 28-Jun-12 | 9 | 1205 | 1 | W LANTAU | 2 | 104 | ON | HKCRP | 807450 | 800345 | SUMMER | NONE | P |
| 28-Jun-12 | 10 | 1219 | 4 | W LANTAU | 2 | 24 | ON | HKCRP | 806528 | 801735 | SUMMER | NONE | S |
| 28-Jun-12 | 11 | 1249 | 3 | W LANTAU | 2 | 114 | ON | HKCRP | 805465 | 801588 | SUMMER | NONE | P |
| 28-Jun-12 | 12 | 1301 | 2 | W LANTAU | 2 | 69 | ON | HKCRP | 805978 | 800383 | SUMMER | NONE | S |
| 28-Jun-12 | 13 | 1329 | 2 | W LANTAU | 2 | 62 | ON | HKCRP | 809597 | 801247 | SUMMER | NONE | S |
| 28-Jun-12 | 14 | 1426 | 2 | NW LANTAU | 3 | ND | OFF | HKCRP | 817129 | 805345 | SUMMER | NONE | |
| 28-Jun-12 | 15 | 1626 | 3 | NW LANTAU | 2 | 76 | ON | HKCRP | 820906 | 810762 | SUMMER | NONE | S |

**Appendix II. (cont'd.)**

| DATE | STG # | TIME | HRD SZ | AREA | BEAU | PSD | EFFORT | TYPE | NORTHING | EASTING | SEASON | BOAT ASSOC. | P/S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4-Jul-12 | 1 | 1015 | 5 | W LANTAU | 1 | ND | OFF | THEO | 806229 | 801992 | SUMMER | NONE | |
| 4-Jul-12 | 2 | 1050 | 2 | W LANTAU | 1 | ND | OFF | THEO | 806317 | 802219 | SUMMER | NONE | |
| 4-Jul-12 | 3 | 1109 | 1 | W LANTAU | 1 | ND | OFF | THEO | 806173 | 802002 | SUMMER | NONE | |
| 4-Jul-12 | 4 | 1152 | 1 | W LANTAU | 1 | ND | OFF | THEO | 806140 | 802105 | SUMMER | NONE | |
| 5-Jul-12 | 1 | 1023 | 6 | NW LANTAU | 2 | ND | OFF | HKCRP | 818206 | 804142 | SUMMER | HANG | |
| 5-Jul-12 | 2 | 1057 | 8 | W LANTAU | 2 | 204 | ON | HKCRP | 813524 | 803018 | SUMMER | NONE | S |
| 5-Jul-12 | 3 | 1118 | 3 | W LANTAU | 2 | ND | OFF | HKCRP | 812540 | 802223 | SUMMER | NONE | |
| 5-Jul-12 | 4 | 1123 | 8 | W LANTAU | 2 | ND | OFF | HKCRP | 813117 | 801863 | SUMMER | NONE | |
| 5-Jul-12 | 5 | 1153 | 2 | W LANTAU | 2 | ND | OFF | HKCRP | 809508 | 801133 | SUMMER | NONE | |
| 5-Jul-12 | 6 | 1216 | 2 | W LANTAU | 2 | 205 | ON | HKCRP | 807427 | 801067 | SUMMER | NONE | P |
| 5-Jul-12 | 7 | 1314 | 3 | W LANTAU | 2 | ND | OFF | HKCRP | 808446 | 800801 | SUMMER | NONE | |
| 5-Jul-12 | 8 | 1350 | 1 | W LANTAU | 2 | 42 | ON | HKCRP | 810725 | 801662 | SUMMER | NONE | S |
| 5-Jul-12 | 9 | 1434 | 1 | W LANTAU | 2 | 207 | ON | HKCRP | 814508 | 803515 | SUMMER | NONE | P |
| 5-Jul-12 | 10 | 1453 | 4 | NW LANTAU | 2 | 151 | ON | HKCRP | 815911 | 805312 | SUMMER | NONE | P |
| 5-Jul-12 | 11 | 1612 | 1 | NW LANTAU | 2 | 755 | ON | HKCRP | 827793 | 805356 | SUMMER | NONE | P |
| 5-Jul-12 | 12 | 1619 | 5 | NW LANTAU | 2 | 28 | ON | HKCRP | 827625 | 806458 | SUMMER | NONE | S |
| 5-Jul-12 | 13 | 1629 | 2 | NW LANTAU | 2 | 460 | ON | HKCRP | 825929 | 807423 | SUMMER | NONE | P |
| 6-Jul-12 | 1 | 1010 | 1 | NW LANTAU | 2 | 10 | ON | HKCRP | 815955 | 805343 | SUMMER | NONE | P |
| 6-Jul-12 | 2 | 1022 | 2 | NW LANTAU | 2 | 36 | ON | HKCRP | 816985 | 805334 | SUMMER | NONE | P |
| 6-Jul-12 | 3 | 1118 | 2 | NW LANTAU | 3 | 230 | ON | HKCRP | 829374 | 806966 | SUMMER | NONE | S |
| 6-Jul-12 | 4 | 1153 | 4 | NW LANTAU | 2 | 600 | ON | HKCRP | 824775 | 808440 | SUMMER | HANG | P |
| 9-Jul-12 | 1 | 1623 | 5 | W LANTAU | 3 | ND | OFF | HELI | 810969 | 801487 | SUMMER | NONE | |
| 9-Jul-12 | 2 | 1627 | 2 | W LANTAU | 3 | ND | OFF | HELI | 813690 | 803266 | SUMMER | NONE | |
| 10-Jul-12 | 1 | 1028 | 3 | W LANTAU | 3 | 165 | ON | HKCRP | 813436 | 802915 | SUMMER | NONE | S |
| 10-Jul-12 | 2 | 1047 | 2 | W LANTAU | 3 | 48 | ON | HKCRP | 813104 | 802533 | SUMMER | NONE | S |
| 10-Jul-12 | 3 | 1100 | 1 | W LANTAU | 3 | 241 | ON | HKCRP | 811699 | 801860 | SUMMER | NONE | S |
| 10-Jul-12 | 4 | 1128 | 1 | W LANTAU | 3 | ND | OFF | HKCRP | 811633 | 802025 | SUMMER | NONE | |
| 10-Jul-12 | 5 | 1136 | 3 | W LANTAU | 3 | ND | OFF | HKCRP | 810737 | 801569 | SUMMER | NONE | |
| 10-Jul-12 | 6 | 1158 | 3 | W LANTAU | 3 | 187 | ON | HKCRP | 808900 | 800926 | SUMMER | NONE | S |
| 10-Jul-12 | 7 | 1213 | 12 | W LANTAU | 3 | ND | OFF | HKCRP | 807548 | 801304 | SUMMER | NONE | |
| 10-Jul-12 | 8 | 1350 | 1 | SW LANTAU | 2 | 286 | ON | HKCRP | 806753 | 805334 | SUMMER | HANG | P |
| 10-Jul-12 | 9 | 1511 | 1 | SW LANTAU | 3 | 349 | ON | HKCRP | 804773 | 809930 | SUMMER | NONE | S |
| 10-Jul-12 | 10 | 1601 | 6 | SW LANTAU | 2 | 109 | ON | HKCRP | 806789 | 804066 | SUMMER | NONE | S |
| 10-Jul-12 | 11 | 1615 | 5 | SW LANTAU | 3 | 57 | ON | HKCRP | 806624 | 803323 | SUMMER | NONE | S |

**Appendix II.  (cont'd.)**

| DATE | STG # | TIME | HRD SZ | AREA | BEAU | PSD | EFFORT | TYPE | NORTHING | EASTING | SEASON | BOAT ASSOC. | P/S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10-Jul-12 | 12 | 1625 | 3 | SW LANTAU | 3 | ND | OFF | HKCRP | 806349 | 802611 | SUMMER | NONE | |
| 10-Jul-12 | 13 | 1634 | 2 | W LANTAU | 3 | ND | OFF | HKCRP | 806461 | 801848 | SUMMER | NONE | |
| 10-Jul-12 | 14 | 1652 | 1 | W LANTAU | 4 | 149 | ON | HKCRP | 808911 | 800957 | SUMMER | NONE | S |
| 10-Jul-12 | 15 | 1658 | 1 | W LANTAU | 3 | 73 | ON | HKCRP | 809652 | 801175 | SUMMER | NONE | S |
| 10-Jul-12 | 16 | 1706 | 4 | W LANTAU | 4 | 160 | ON | HKCRP | 810814 | 801600 | SUMMER | NONE | S |
| 10-Jul-12 | 17 | 1721 | 5 | W LANTAU | 4 | 100 | ON | HKCRP | 813436 | 802936 | SUMMER | NONE | S |
| 10-Jul-12 | 18 | 1731 | 4 | W LANTAU | 2 | 51 | ON | HKCRP | 814507 | 804330 | SUMMER | NONE | S |
| 11-Jul-12 | 1 | 1056 | 4 | NW LANTAU | 4 | 68 | ON | HKCRP | 827802 | 806396 | SUMMER | NONE | P |
| 6-Aug-12 | 1 | 1116 | 4 | NE LANTAU | 2 | 204 | ON | HKCRP | 824118 | 818400 | SUMMER | NONE | P |
| 6-Aug-12 | 2 | 1148 | 1 | NE LANTAU | 1 | 179 | ON | HKCRP | 824406 | 817978 | SUMMER | NONE | S |
| 6-Aug-12 | 3 | 1214 | 3 | NE LANTAU | 3 | ND | OFF | HKCRP | 824464 | 816598 | SUMMER | NONE | |
| 6-Aug-12 | 4 | 1433 | 1 | NW LANTAU | 2 | 44 | ON | HKCRP | 826623 | 809031 | SUMMER | NONE | S |
| 6-Aug-12 | 5 | 1450 | 1 | NW LANTAU | 2 | 185 | ON | HKCRP | 827034 | 808753 | SUMMER | NONE | S |
| 6-Aug-12 | 6 | 1634 | 1 | NW LANTAU | 2 | 9 | ON | HKCRP | 827160 | 806395 | SUMMER | NONE | P |
| 6-Aug-12 | 7 | 1641 | 1 | NW LANTAU | 2 | ND | OFF | HKCRP | 826572 | 807074 | SUMMER | NONE | |
| 7-Aug-12 | 1 | 914 | 2 | W LANTAU | 3 | ND | OFF | THEO | 806395 | 801951 | SUMMER | NONE | |
| 7-Aug-12 | 2 | 1014 | 2 | W LANTAU | 3 | ND | OFF | THEO | 806473 | 801817 | SUMMER | NONE | |
| 7-Aug-12 | 3 | 1033 | 15 | W LANTAU | 2 | ND | OFF | THEO | 806329 | 801796 | SUMMER | NONE | |
| 8-Aug-12 | 1 | 1015 | 1 | NW LANTAU | 3 | 18 | ON | HKCRP | 821085 | 810103 | SUMMER | NONE | S |
| 8-Aug-12 | 2 | 1551 | 3 | NE LANTAU | 2 | 34 | ON | HKCRP | 822626 | 816410 | SUMMER | NONE | P |
| 8-Aug-12 | 3 | 1638 | 2 | NE LANTAU | 2 | 235 | ON | HKCRP | 823134 | 817492 | SUMMER | NONE | S |
| 9-Aug-12 | 1 | 1036 | 5 | W LANTAU | 2 | 584 | ON | HKCRP | 814155 | 803040 | SUMMER | NONE | S |
| 9-Aug-12 | 2 | 1116 | 1 | W LANTAU | 1 | 51 | ON | HKCRP | 809929 | 801351 | SUMMER | NONE | S |
| 9-Aug-12 | 3 | 1210 | 1 | W LANTAU | 2 | ND | OFF | HKCRP | 812599 | 800501 | SUMMER | NONE | |
| 9-Aug-12 | 4 | 1217 | 1 | W LANTAU | 2 | ND | OFF | HKCRP | 813110 | 800131 | SUMMER | NONE | |
| 9-Aug-12 | 5 | 1307 | 4 | W LANTAU | 2 | ND | OFF | HKCRP | 814312 | 802041 | SUMMER | NONE | |
| 15-Aug-12 | 1 | 956 | 3 | NW LANTAU | 1 | ND | OFF | HKCRP | 817048 | 807169 | SUMMER | NONE | |
| 15-Aug-12 | 2 | 1015 | 2 | NW LANTAU | 2 | ND | OFF | HKCRP | 818094 | 804564 | SUMMER | NONE | |
| 15-Aug-12 | 3 | 1021 | 3 | W LANTAU | 2 | ND | OFF | HKCRP | 817697 | 803800 | SUMMER | NONE | |
| 15-Aug-12 | 4 | 1030 | 3 | W LANTAU | 2 | ND | OFF | HKCRP | 815781 | 803796 | SUMMER | HANG | |
| 15-Aug-12 | 5 | 1040 | 2 | W LANTAU | 2 | 82 | ON | HKCRP | 815240 | 803362 | SUMMER | NONE | P |
| 15-Aug-12 | 6 | 1119 | 7 | W LANTAU | 2 | ND | OFF | HKCRP | 815491 | 804868 | SUMMER | NONE | |
| 15-Aug-12 | 7 | 1350 | 5 | NW LANTAU | 3 | ND | OFF | HKCRP | 819530 | 806226 | SUMMER | NONE | |
| 15-Aug-12 | 8 | 1512 | 1 | NW LANTAU | 2 | 696 | ON | HKCRP | 827245 | 808455 | SUMMER | NONE | P |

**Appendix II.  (cont'd.)**

| DATE | STG # | TIME | HRD SZ | AREA | BEAU | PSD | EFFORT | TYPE | NORTHING | EASTING | SEASON | BOAT ASSOC. | P/S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 15-Aug-12 | 9 | 1527 | 1 | NW LANTAU | 2 | 55 | ON | HKCRP | 826215 | 808453 | SUMMER | NONE | P |
| 15-Aug-12 | 10 | 1557 | 1 | NW LANTAU | 2 | 62 | ON | HKCRP | 820620 | 809875 | SUMMER | NONE | S |
| 16-Aug-12 | 1 | 1033 | 2 | W LANTAU | 2 | 337 | ON | HKCRP | 812452 | 802037 | SUMMER | NONE | P |
| 16-Aug-12 | 2 | 1109 | 1 | W LANTAU | 3 | 6 | ON | HKCRP | 808434 | 801172 | SUMMER | NONE | P |
| 16-Aug-12 | 3 | 1119 | 8 | W LANTAU | 3 | 155 | ON | HKCRP | 806772 | 801653 | SUMMER | NONE | S |
| 16-Aug-12 | 4 | 1147 | 1 | W LANTAU | 3 | ND | OFF | HKCRP | 806454 | 800477 | SUMMER | NONE | |
| 16-Aug-12 | 5 | 1159 | 8 | W LANTAU | 2 | 201 | ON | HKCRP | 805719 | 802001 | SUMMER | NONE | S |
| 16-Aug-12 | 6 | 1330 | 2 | W LANTAU | 3 | 239 | ON | HKCRP | 813548 | 802132 | SUMMER | NONE | P |
| 21-Aug-12 | 1 | 1025 | 1 | W LANTAU | 2 | 210 | ON | HKCRP | 813469 | 802688 | SUMMER | NONE | S |
| 21-Aug-12 | 2 | 1035 | 1 | W LANTAU | 2 | 44 | ON | HKCRP | 813148 | 802595 | SUMMER | NONE | S |
| 21-Aug-12 | 3 | 1053 | 1 | W LANTAU | 2 | ND | OFF | HKCRP | 810671 | 801239 | SUMMER | NONE | |
| 21-Aug-12 | 4 | 1105 | 2 | W LANTAU | 2 | 152 | ON | HKCRP | 809409 | 800875 | SUMMER | NONE | S |
| 21-Aug-12 | 5 | 1327 | 1 | SW LANTAU | 2 | 95 | ON | HKCRP | 804233 | 808692 | SUMMER | NONE | S |
| 29-Aug-12 | 1 | 1208 | 6 | NE LANTAU | 1 | ND | OFF | HKCRP | 821319 | 816264 | SUMMER | NONE | |
| 29-Aug-12 | 2 | 1431 | 1 | NE LANTAU | 2 | 187 | ON | HKCRP | 820458 | 814552 | SUMMER | NONE | P |
| 29-Aug-12 | 3 | 1445 | 6 | NE LANTAU | 2 | ND | OFF | HKCRP | 820103 | 815016 | SUMMER | HANG | |
| 29-Aug-12 | 4 | 1644 | 7 | NE LANTAU | 2 | ND | OFF | HKCRP | 821617 | 816728 | SUMMER | NONE | |
| 30-Aug-12 | 1 | 1020 | 2 | W LANTAU | 2 | 148 | ON | HKCRP | 814143 | 803350 | SUMMER | NONE | S |
| 30-Aug-12 | 2 | 1031 | 1 | W LANTAU | 2 | ND | OFF | HKCRP | 812717 | 802326 | SUMMER | NONE | |
| 30-Aug-12 | 3 | 1043 | 2 | W LANTAU | 2 | 74 | ON | HKCRP | 810416 | 801280 | SUMMER | NONE | S |
| 30-Aug-12 | 4 | 1047 | 5 | W LANTAU | 2 | 500 | ON | HKCRP | 810029 | 801114 | SUMMER | NONE | S |
| 30-Aug-12 | 5 | 1114 | 6 | W LANTAU | 2 | ND | OFF | HKCRP | 806228 | 802105 | SUMMER | NONE | |
| 30-Aug-12 | 6 | 1135 | 5 | SW LANTAU | 1 | 244 | ON | HKCRP | 805151 | 803423 | SUMMER | NONE | P |
| 30-Aug-12 | 7 | 1232 | 2 | SW LANTAU | 1 | 15 | ON | HKCRP | 807604 | 806378 | SUMMER | HANG | S |
| 30-Aug-12 | 8 | 1304 | 2 | SW LANTAU | 2 | 311 | ON | HKCRP | 804390 | 807392 | SUMMER | NONE | P |
| 30-Aug-12 | 9 | 1336 | 1 | SW LANTAU | 2 | ND | OFF | HKCRP | 804740 | 809961 | SUMMER | NONE | |
| 30-Aug-12 | 10 | 1344 | 1 | SW LANTAU | 2 | 58 | ON | HKCRP | 806048 | 809458 | SUMMER | NONE | P |
| 30-Aug-12 | 11 | 1410 | 1 | SW LANTAU | 2 | 214 | ON | HKCRP | 805358 | 811158 | SUMMER | NONE | P |
| 3-Sep-12 | 1 | 1551 | 2 | W LANTAU | 2 | ND | OFF | HELI | 810846 | 802054 | AUTUMN | NONE | |
| 12-Sep-12 | 1 | 948 | 2 | SW LANTAU | 3 | ND | OFF | THEO | 806239 | 802116 | AUTUMN | NONE | |
| 12-Sep-12 | 2 | 1006 | 3 | SW LANTAU | 3 | ND | OFF | THEO | 806284 | 802188 | AUTUMN | NONE | |
| 13-Sep-12 | 1 | 1011 | 4 | NW LANTAU | 2 | 36 | ON | HKCRP | 821692 | 811124 | AUTUMN | NONE | S |
| 13-Sep-12 | 2 | 1046 | 8 | NW LANTAU | 2 | 524 | ON | HKCRP | 824664 | 808450 | AUTUMN | NONE | P |
| 13-Sep-12 | 3 | 1431 | 2 | NW LANTAU | 3 | 11 | ON | HKCRP | 823441 | 805358 | AUTUMN | NONE | P |

**Appendix II.  (cont'd.)**

| DATE | STG # | TIME | HRD SZ | AREA | BEAU | PSD | EFFORT | TYPE | NORTHING | EASTING | SEASON | BOAT ASSOC. | P/S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 13-Sep-12 | 4 | 1601 | 6 | NE LANTAU | 2 | ND | OFF | HKCRP | 820135 | 815314 | AUTUMN | NONE | |
| 13-Sep-12 | 5 | 1623 | 4 | NE LANTAU | 2 | ND | OFF | HKCRP | 820177 | 817375 | AUTUMN | NONE | |
| 13-Sep-12 | 6 | 1635 | 2 | NE LANTAU | 2 | 34 | ON | HKCRP | 821227 | 818973 | AUTUMN | NONE | S |
| 13-Sep-12 | 7 | 1640 | 6 | NE LANTAU | 2 | 144 | ON | HKCRP | 821503 | 819365 | AUTUMN | NONE | S |
| 13-Sep-12 | 8 | 1653 | 4 | NE LANTAU | 2 | ND | OFF | HKCRP | 821813 | 819623 | AUTUMN | NONE | |
| 19-Sep-12 | 4 | 1614 | 1 | SW LANTAU | 3 | 10 | ON | HKCRP | 806239 | 802539 | AUTUMN | NONE | P |
| 20-Sep-12 | 1 | 1127 | 4 | NW LANTAU | 2 | 59 | ON | HKCRP | 827448 | 806375 | AUTUMN | NONE | P |
| 20-Sep-12 | 2 | 1233 | 3 | NW LANTAU | 2 | 49 | ON | HKCRP | 820733 | 808423 | AUTUMN | NONE | P |
| 20-Sep-12 | 3 | 1628 | 2 | NE LANTAU | 2 | 180 | ON | HKCRP | 821161 | 819045 | AUTUMN | NONE | S |
| 24-Sep-12 | 1 | 1129 | 4 | NW LANTAU | 2 | ND | OFF | HKCRP | 826263 | 806538 | AUTUMN | NONE | |
| 25-Sep-12 | 1 | 1049 | 5 | NW LANTAU | 3 | 73 | ON | HKCRP | 824295 | 810510 | AUTUMN | NONE | P |
| 27-Sep-12 | 1 | 1105 | 7 | NW LANTAU | 4 | ND | OFF | HKCRP | 825786 | 806691 | AUTUMN | NONE | |
| 27-Sep-12 | 2 | 1528 | 2 | NW LANTAU | 3 | 66 | ON | HKCRP | 817749 | 805336 | AUTUMN | NONE | P |
| 27-Sep-12 | 3 | 1612 | 2 | NW LANTAU | 2 | 186 | ON | HKCRP | 825922 | 805353 | AUTUMN | NONE | P |
| 28-Sep-12 | 1 | 1001 | 1 | NE LANTAU | 3 | 612 | ON | HKCRP | 820966 | 815305 | AUTUMN | NONE | P |
| 28-Sep-12 | 2 | 1224 | 9 | NW LANTAU | 3 | ND | OFF | HKCRP | 823902 | 807409 | AUTUMN | NONE | |
| 28-Sep-12 | 3 | 1245 | 4 | NW LANTAU | 3 | 2 | ON | HKCRP | 822949 | 807706 | AUTUMN | NONE | P |
| 28-Sep-12 | 4 | 1258 | 7 | NW LANTAU | 3 | 175 | ON | HKCRP | 823016 | 807458 | AUTUMN | NONE | P |
| 28-Sep-12 | 5 | 1427 | 3 | NE LANTAU | 3 | ND | OFF | HKCRP | 821853 | 814534 | AUTUMN | NONE | |
| 3-Oct-12 | 1 | 1000 | 7 | NW LANTAU | 2 | ND | OFF | HKCRP | 816872 | 806736 | AUTUMN | NONE | |
| 3-Oct-12 | 2 | 1105 | 7 | W LANTAU | 2 | 28 | ON | HKCRP | 813558 | 802421 | AUTUMN | NONE | P |
| 3-Oct-12 | 3 | 1126 | 4 | W LANTAU | 2 | 390 | ON | HKCRP | 812886 | 801089 | AUTUMN | NONE | S |
| 3-Oct-12 | 4 | 1140 | 4 | W LANTAU | 2 | 163 | ON | HKCRP | 811924 | 800479 | AUTUMN | NONE | S |
| 3-Oct-12 | 5 | 1212 | 1 | W LANTAU | 2 | 104 | ON | HKCRP | 809444 | 800329 | AUTUMN | NONE | P |
| 3-Oct-12 | 6 | 1225 | 2 | W LANTAU | 3 | 134 | ON | HKCRP | 807939 | 799758 | AUTUMN | NONE | S |
| 3-Oct-12 | 7 | 1242 | 2 | W LANTAU | 2 | 185 | ON | HKCRP | 807449 | 801056 | AUTUMN | NONE | P |
| 3-Oct-12 | 8 | 1555 | 1 | NW LANTAU | 2 | 862 | ON | HKCRP | 824039 | 805380 | AUTUMN | NONE | P |
| 3-Oct-12 | 9 | 1611 | 2 | NW LANTAU | 2 | 64 | ON | HKCRP | 825609 | 806536 | AUTUMN | NONE | S |
| 3-Oct-12 | 10 | 1655 | 5 | NW LANTAU | 2 | 547 | ON | HKCRP | 820928 | 811122 | AUTUMN | NONE | S |
| 4-Oct-12 | 1 | 1020 | 6 | NW LANTAU | 3 | 83 | ON | HKCRP | 817574 | 804655 | AUTUMN | NONE | P |
| 4-Oct-12 | 2 | 1037 | 3 | NW LANTAU | 2 | 1153 | ON | HKCRP | 818736 | 804709 | AUTUMN | NONE | P |
| 4-Oct-12 | 3 | 1102 | 1 | NW LANTAU | 2 | 38 | ON | HKCRP | 823041 | 806212 | AUTUMN | NONE | S |
| 4-Oct-12 | 4 | 1106 | 8 | NW LANTAU | 2 | 46 | ON | HKCRP | 824822 | 806854 | AUTUMN | HANG | S |
| 4-Oct-12 | 5 | 1129 | 1 | NW LANTAU | 3 | 21 | ON | HKCRP | 826706 | 806384 | AUTUMN | NONE | P |

**Appendix II. (cont'd.)**

| DATE | STG # | TIME | HRD SZ | AREA | BEAU | PSD | EFFORT | TYPE | NORTHING | EASTING | SEASON | BOAT ASSOC. | P/S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4-Oct-12 | 6 | 1218 | 1 | NW LANTAU | 2 | 147 | ON | HKCRP | 823934 | 808449 | AUTUMN | NONE | P |
| 4-Oct-12 | 7 | 1245 | 1 | NW LANTAU | 2 | 212 | ON | HKCRP | 823232 | 810508 | AUTUMN | NONE | P |
| 4-Oct-12 | 8 | 1625 | 1 | NE LANTAU | 3 | ND | OFF | HKCRP | 822137 | 817367 | AUTUMN | NONE | |
| 4-Oct-12 | 9 | 1708 | 1 | NE LANTAU | 2 | ND | OFF | HKCRP | 820943 | 815676 | AUTUMN | HANG | |
| 15-Oct-12 | 1 | 1043 | 1 | NW LANTAU | 2 | 504 | ON | HKCRP | 823263 | 806048 | AUTUMN | NONE | S |
| 15-Oct-12 | 2 | 1103 | 7 | NW LANTAU | 2 | 214 | ON | HKCRP | 828122 | 806953 | AUTUMN | NONE | P |
| 15-Oct-12 | 3 | 1124 | 3 | NW LANTAU | 2 | ND | OFF | HKCRP | 828930 | 807439 | AUTUMN | NONE | |
| 15-Oct-12 | 4 | 1515 | 4 | NE LANTAU | 3 | ND | OFF | HKCRP | 820324 | 815315 | AUTUMN | NONE | |
| 15-Oct-12 | 5 | 1525 | 4 | NE LANTAU | 3 | ND | OFF | HKCRP | 820932 | 815501 | AUTUMN | NONE | |
| 16-Oct-12 | 1 | 1028 | 1 | W LANTAU | 2 | 120 | ON | HKCRP | 813347 | 802688 | AUTUMN | NONE | S |
| 9-Nov-12 | 1 | 1157 | 2 | NW LANTAU | 3 | 287 | ON | HKCRP | 826161 | 807526 | AUTUMN | NONE | P |
| 9-Nov-12 | 2 | 1210 | 1 | NW LANTAU | 3 | 76 | ON | HKCRP | 826372 | 807527 | AUTUMN | NONE | P |
| 9-Nov-12 | 3 | 1252 | 5 | NW LANTAU | 2 | 310 | ON | HKCRP | 828314 | 805450 | AUTUMN | NONE | P |
| 9-Nov-12 | 4 | 1359 | 1 | NW LANTAU | 3 | ND | OFF | HKCRP | 825797 | 806691 | AUTUMN | NONE | |
| 9-Nov-12 | 5 | 1407 | 1 | NW LANTAU | 3 | ND | OFF | HKCRP | 825853 | 806599 | AUTUMN | NONE | |
| 21-Nov-12 | 1 | 1015 | 3 | W LANTAU | 4 | 72 | ON | HKCRP | 814044 | 803308 | AUTUMN | NONE | S |
| 21-Nov-12 | 2 | 1022 | 1 | W LANTAU | 4 | 237 | ON | HKCRP | 813536 | 802730 | AUTUMN | NONE | S |
| 21-Nov-12 | 3 | 1102 | 3 | W LANTAU | 3 | 173 | ON | HKCRP | 806351 | 801889 | AUTUMN | NONE | S |
| 21-Nov-12 | 4 | 1159 | 3 | SW LANTAU | 3 | 266 | ON | HKCRP | 807396 | 804985 | AUTUMN | NONE | S |
| 21-Nov-12 | 5 | 1227 | 3 | SW LANTAU | 3 | 19 | ON | HKCRP | 803531 | 805307 | AUTUMN | NONE | P |
| 26-Nov-12 | 1 | 1123 | 1 | NE LANTAU | 4 | ND | OFF | HKCRP | 823204 | 814793 | AUTUMN | NONE | |
| 27-Nov-12 | 1 | 1443 | 1 | NW LANTAU | 2 | ND | OFF | HKCRP | 822898 | 805480 | AUTUMN | NONE | |
| 27-Nov-12 | 2 | 1520 | 3 | NW LANTAU | 2 | 177 | ON | HKCRP | 828513 | 805481 | AUTUMN | NONE | P |
| 27-Nov-12 | 3 | 1632 | 1 | NW LANTAU | 2 | 115 | ON | HKCRP | 822723 | 810487 | AUTUMN | NONE | P |
| 12-Dec-12 | 1 | 1537 | 3 | SW LANTAU | 3 | ND | OFF | HKCRP | 802731 | 806708 | WINTER | NONE | |
| 12-Dec-12 | 2 | 1610 | 1 | W LANTAU | 3 | ND | OFF | HKCRP | 807947 | 801222 | WINTER | NONE | |
| 12-Dec-12 | 3 | 1621 | 2 | W LANTAU | 3 | 29 | ON | HKCRP | 810725 | 801600 | WINTER | NONE | S |
| 12-Dec-12 | 1 | 1540 | 1 | W LANTAU | 1 | ND | OFF | HELI | 809974 | 800846 | WINTER | NONE | |
| 17-Dec-12 | 1 | 1039 | 4 | NW LANTAU | 3 | 49 | ON | HKCRP | 823762 | 805451 | WINTER | NONE | P |
| 17-Dec-12 | 2 | 1347 | 14 | NW LANTAU | 2 | 54 | ON | HKCRP | 828653 | 807521 | WINTER | NONE | P |
| 20-Dec-12 | 1 | 1214 | 8 | NE LANTAU | 4 | 12 | ON | HKCRP | 820354 | 817530 | WINTER | NONE | P |
| 21-Dec-12 | 1 | 928 | 2 | W LANTAU | 3 | 264 | ON | HKCRP | 813005 | 802461 | WINTER | NONE | S |
| 21-Dec-12 | 2 | 945 | 1 | W LANTAU | 3 | 92 | ON | HKCRP | 810450 | 801187 | WINTER | NONE | S |
| 21-Dec-12 | 3 | 950 | 1 | W LANTAU | 2 | ND | OFF | HKCRP | 809719 | 800958 | WINTER | NONE | |

**Appendix II.  (cont'd.)**

| DATE | STG # | TIME | HRD SZ | AREA | BEAU | PSD | EFFORT | TYPE | NORTHING | EASTING | SEASON | BOAT ASSOC. | P/S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 21-Dec-12 | 4 | 1019 | 1 | SW LANTAU | 3 | 4 | ON | HKCRP | 806811 | 803901 | WINTER | NONE | S |
| 21-Dec-12 | 5 | 1122 | 2 | SW LANTAU | 2 | 24 | ON | HKCRP | 806231 | 806344 | WINTER | NONE | P |
| 27-Dec-12 | 1 | 1333 | 1 | SW LANTAU | 4 | 97 | ON | HKCRP | 804507 | 804247 | WINTER | NONE | P |
| 27-Dec-12 | 3 | 1556 | 1 | W LANTAU | 5 | 22 | ON | HKCRP | 808689 | 800915 | WINTER | NONE | S |
| 28-Dec-12 | 1 | 1148 | 2 | DEEP BAY | 3 | ND | OFF | HKCRP | 831102 | 806506 | WINTER | NONE | |
| 28-Dec-12 | 2 | 1216 | 2 | DEEP BAY | 2 | 192 | ON | HKCRP | 830970 | 806289 | WINTER | NONE | P |
| 28-Dec-12 | 3 | 1322 | 2 | DEEP BAY | 3 | 252 | ON | HKCRP | 831712 | 806239 | WINTER | NONE | S |
| 28-Dec-12 | 4 | 1431 | 1 | NW LAUTAU | 2 | ND | OFF | HKCRP | 825089 | 806474 | WINTER | NONE | |
| 3-Jan-13 | 1 | 1222 | 5 | W LANTAU | 2 | 101 | ON | HKCRP | 808068 | 801491 | WINTER | NONE | S |
| 3-Jan-13 | 2 | 1619 | 6 | NW LANTAU | 2 | 493 | ON | HKCRP | 823891 | 807512 | WINTER | NONE | P |
| 3-Jan-13 | 3 | 1647 | 1 | NW LANTAU | 3 | ND | OFF | HKCRP | 823403 | 807964 | WINTER | NONE | |
| 9-Jan-13 | 1 | 1105 | 1 | W LANTAU | 3 | 86 | ON | HKCRP | 813558 | 802483 | WINTER | NONE | P |
| 9-Jan-13 | 2 | 1450 | 7 | NE LANTAU | 3 | 545 | ON | HKCRP | 823913 | 814557 | WINTER | NONE | P |
| 14-Jan-13 | 6 | 1611 | 1 | W LANTAU | 2 | 62 | ON | HKCRP | 806306 | 801982 | WINTER | NONE | S |
| 15-Jan-13 | 1 | 1104 | 2 | NW LANTAU | 2 | 81 | ON | HKCRP | 826586 | 805385 | WINTER | NONE | P |
| 15-Jan-13 | 2 | 1210 | 6 | DEEP BAY | 3 | ND | OFF | HKCRP | 832451 | 807425 | WINTER | NONE | |
| 15-Jan-13 | 3 | 1344 | 3 | NW LANTAU | 2 | 0 | ON | HKCRP | 828985 | 807542 | WINTER | NONE | P |
| 15-Jan-13 | 4 | 1524 | 2 | NW LANTAU | 2 | 55 | ON | HKCRP | 822876 | 811527 | WINTER | NONE | P |
| 15-Jan-13 | 5 | 1557 | 3 | NW LANTAU | 1 | ND | OFF | HKCRP | 820701 | 814676 | WINTER | NONE | |
| 16-Jan-13 | 1 | 1413 | 1 | W LANTAU | 2 | 62 | ON | HKCRP | 813094 | 802224 | WINTER | NONE | S |
| 16-Jan-13 | 2 | 1617 | 1 | NE LANTAU | 2 | 119 | ON | HKCRP | 821474 | 816522 | WINTER | NONE | P |
| 22-Jan-13 | 1 | 1443 | 8 | NW LANTAU | 1 | 273 | ON | HKCRP | 819986 | 805485 | WINTER | NONE | P |
| 22-Jan-13 | 2 | 1508 | 1 | NW LANTAU | 2 | 293 | ON | HKCRP | 823895 | 805493 | WINTER | NONE | P |
| 22-Jan-13 | 3 | 1527 | 1 | NW LANTAU | 2 | 134 | ON | HKCRP | 827372 | 805500 | WINTER | NONE | P |
| 22-Jan-13 | 4 | 1618 | 6 | NW LANTAU | 1 | 513 | ON | HKCRP | 821743 | 807518 | WINTER | NONE | P |
| 23-Jan-13 | 1 | 1100 | 5 | NW LANTAU | 2 | 149 | ON | HKCRP | 826276 | 805497 | WINTER | GILL NET | P |
| 23-Jan-13 | 2 | 1144 | 2 | NW LANTAU | 2 | 275 | ON | HKCRP | 829939 | 806462 | WINTER | NONE | S |
| 23-Jan-13 | 3 | 1341 | 4 | NE LANTAU | 2 | 131 | ON | HKCRP | 821710 | 813514 | WINTER | NONE | P |
| 29-Jan-13 | 1 | 1023 | 1 | W LANTAU | 2 | 390 | ON | HKCRP | 817154 | 803810 | WINTER | NONE | P |
| 29-Jan-13 | 2 | 1045 | 5 | W LANTAU | 2 | 266 | ON | HKCRP | 814576 | 802876 | WINTER | NONE | S |
| 29-Jan-13 | 3 | 1059 | 7 | W LANTAU | 2 | 115 | ON | HKCRP | 813558 | 802658 | WINTER | NONE | P |
| 29-Jan-13 | 4 | 1128 | 3 | W LANTAU | 2 | 19 | ON | HKCRP | 811469 | 800859 | WINTER | NONE | P |
| 29-Jan-13 | 5 | 1145 | 4 | W LANTAU | 2 | 1776 | ON | HKCRP | 810626 | 801569 | WINTER | NONE | S |
| 29-Jan-13 | 6 | 1157 | 1 | W LANTAU | 2 | 559 | ON | HKCRP | 809433 | 800112 | WINTER | NONE | P |

**Appendix II. (cont'd.)**

| DATE | STG # | TIME | HRD SZ | AREA | BEAU | PSD | EFFORT | TYPE | NORTHING | EASTING | SEASON | BOAT ASSOC. | P/S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 29-Jan-13 | 7 | 1212 | 4 | W LANTAU | 2 | 298 | ON | HKCRP | 807530 | 799685 | WINTER | NONE | S |
| 29-Jan-13 | 8 | 1253 | 1 | W LANTAU | 2 | 572 | ON | HKCRP | 806465 | 800198 | WINTER | NONE | P |
| 29-Jan-13 | 9 | 1309 | 1 | W LANTAU | 1 | 634 | ON | HKCRP | 807968 | 801470 | WINTER | NONE | S |
| 29-Jan-13 | 10 | 1317 | 6 | W LANTAU | 2 | 77 | ON | HKCRP | 808435 | 800749 | WINTER | NONE | P |
| 29-Jan-13 | 11 | 1341 | 3 | W LANTAU | 2 | 359 | ON | HKCRP | 809943 | 799773 | WINTER | NONE | S |
| 29-Jan-13 | 12 | 1401 | 1 | W LANTAU | 2 | 193 | ON | HKCRP | 810460 | 801373 | WINTER | NONE | P |
| 29-Jan-13 | 13 | 1446 | 3 | W LANTAU | 2 | 588 | ON | HKCRP | 814510 | 802794 | WINTER | NONE | P |
| 29-Jan-13 | 14 | 1545 | 3 | NW LANTAU | 2 | 920 | ON | HKCRP | 824406 | 804670 | WINTER | NONE | P |
| 29-Jan-13 | 15 | 1553 | 4 | NW LANTAU | 2 | 649 | ON | HKCRP | 825102 | 805639 | WINTER | NONE | S |
| 29-Jan-13 | 16 | 1558 | 8 | NW LANTAU | 2 | 143 | ON | HKCRP | 824812 | 806452 | WINTER | NONE | P |
| 29-Jan-13 | 17 | 1625 | 1 | NW LANTAU | 2 | 334 | ON | HKCRP | 822188 | 806458 | WINTER | NONE | P |
| 30-Jan-13 | 1 | 1056 | 1 | NW LANTAU | 3 | 60 | ON | HKCRP | 826254 | 805425 | WINTER | NONE | P |
| 30-Jan-13 | 2 | 1110 | 3 | NW LANTAU | 3 | 142 | ON | HKCRP | 828269 | 805502 | WINTER | NONE | P |
| 30-Jan-13 | 3 | 1450 | 2 | NW LANTAU | 3 | 192 | ON | HKCRP | 822144 | 812505 | WINTER | NONE | P |
| 31-Jan-13 | 6 | 1522 | 2 | W LANTAU | 3 | 108 | ON | HKCRP | 809287 | 801164 | WINTER | GILL NET | S |
| 31-Jan-13 | 7 | 1533 | 5 | W LANTAU | 2 | 321 | ON | HKCRP | 809375 | 801277 | WINTER | NONE | P |
| 31-Jan-13 | 8 | 1557 | 8 | W LANTAU | 2 | 684 | ON | HKCRP | 810109 | 799887 | WINTER | NONE | S |
| 31-Jan-13 | 9 | 1636 | 3 | W LANTAU | 2 | 77 | ON | HKCRP | 811570 | 800488 | WINTER | NONE | S |
| 31-Jan-13 | 10 | 1654 | 2 | W LANTAU | 2 | 113 | ON | HKCRP | 812010 | 801593 | WINTER | NONE | S |
| 7-Feb-13 | 1 | 1057 | 1 | NW LANTAU | 5 | ND | OFF | HKCRP | 826296 | 806466 | WINTER | NONE | |
| 7-Feb-13 | 2 | 1405 | 2 | NW LANTAU | 4 | 68 | ON | HKCRP | 822644 | 811496 | WINTER | NONE | P |
| 19-Feb-13 | 2 | 1329 | 3 | SW LANTAU | 2 | 245 | ON | HKCRP | 805006 | 804289 | WINTER | NONE | P |
| 19-Feb-13 | 3 | 1339 | 1 | SW LANTAU | 2 | 103 | ON | HKCRP | 803555 | 804276 | WINTER | NONE | P |
| 19-Feb-13 | 11 | 1632 | 2 | SW LANTAU | 1 | ND | OFF | HKCRP | 806205 | 802786 | WINTER | NONE | |
| 19-Feb-13 | 12 | 1639 | 1 | W LANTAU | 1 | 303 | ON | HKCRP | 806672 | 801828 | WINTER | NONE | S |
| 19-Feb-13 | 13 | 1642 | 3 | W LANTAU | 1 | 111 | ON | HKCRP | 807060 | 801674 | WINTER | NONE | S |
| 28-Feb-13 | 1 | 1457 | 2 | NW LANTAU | 5 | 147 | ON | HKCRP | 826870 | 807528 | WINTER | NONE | P |
| 28-Feb-13 | 2 | 1513 | 1 | NW LANTAU | 5 | 201 | ON | HKCRP | 826839 | 806487 | WINTER | NONE | S |
| 1-Mar-13 | 1 | 1259 | 1 | W LANTAU | 5 | 253 | ON | HKCRP | 816590 | 803777 | SPRING | NONE | P |
| 1-Mar-13 | 2 | 1330 | 9 | W LANTAU | 3 | 74 | ON | HKCRP | 814302 | 801825 | SPRING | NONE | S |
| 1-Mar-13 | 3 | 1512 | 11 | W LANTAU | 4 | 69 | ON | HKCRP | 811304 | 800251 | SPRING | NONE | S |
| 7-Mar-13 | 1 | 1201 | 6 | W LANTAU | 1 | 96 | ON | HKCRP | 808545 | 800956 | SPRING | NONE | S |
| 7-Mar-13 | 2 | 1226 | 1 | W LANTAU | 1 | 423 | ON | HKCRP | 807580 | 801603 | SPRING | NONE | S |
| 7-Mar-13 | 3 | 1239 | 4 | W LANTAU | 2 | 235 | ON | HKCRP | 807429 | 800200 | SPRING | NONE | P |

**Appendix II. (cont'd.)**

| DATE | STG # | TIME | HRD SZ | AREA | BEAU | PSD | EFFORT | TYPE | NORTHING | EASTING | SEASON | BOAT ASSOC. | P/S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7-Mar-13 | 4 | 1301 | 4 | W LANTAU | 2 | 757 | ON | HKCRP | 806285 | 801693 | SPRING | NONE | P |
| 7-Mar-13 | 5 | 1356 | 1 | W LANTAU | 2 | ND | OFF | HKCRP | 806395 | 801900 | SPRING | NONE | |
| 7-Mar-13 | 9 | 1623 | 10 | W LANTAU | 2 | 75 | ON | HKCRP | 808689 | 800956 | SPRING | NONE | S |
| 22-Mar-13 | 1 | 1036 | 5 | W LANTAU | 2 | 61 | ON | HKCRP | 810638 | 801270 | SPRING | NONE | S |
| 22-Mar-13 | 2 | 1056 | 2 | W LANTAU | 3 | 19 | ON | HKCRP | 807992 | 800924 | SPRING | NONE | S |
| 22-Mar-13 | 3 | 1533 | 1 | NW LANTAU | 2 | 582 | ON | HKCRP | 823517 | 806110 | SPRING | NONE | S |
| 22-Mar-13 | 4 | 1624 | 1 | NW LANTAU | 3 | ND | OFF | HKCRP | 824343 | 808501 | SPRING | NONE | |

## Appendix III. Finless Porpoise Sighting Database (April 2012 - March 2013)

(Note: P = sightings made on primary lines; S = sightings made on secondary lines)

| DATE | STG # | TIME | HRD SZ | NORTHING | EASTING | AREA | BEAU | PSD | EFFORT | TYPE | SEASON | P/S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3-Apr-12 | 1 | 1102 | 2 | 807445 | 826052 | LAMMA | 2 | 158 | ON | HKCRP | SPRING | P |
| 3-Apr-12 | 2 | 1114 | 5 | 807432 | 828547 | LAMMA | 2 | 51 | ON | HKCRP | SPRING | P |
| 3-Apr-12 | 3 | 1134 | 2 | 805461 | 829093 | LAMMA | 2 | 17 | ON | HKCRP | SPRING | P |
| 3-Apr-12 | 4 | 1241 | 2 | 803514 | 825327 | LAMMA | 2 | 43 | ON | HKCRP | SPRING | P |
| 3-Apr-12 | 5 | 1255 | 6 | 803491 | 828112 | LAMMA | 2 | 248 | ON | HKCRP | SPRING | P |
| 3-Apr-12 | 6 | 1304 | 3 | 803490 | 828989 | LAMMA | 1 | 504 | ON | HKCRP | SPRING | P |
| 3-Apr-12 | 7 | 1340 | 2 | 803499 | 837230 | LAMMA | 1 | 322 | ON | HKCRP | SPRING | P |
| 3-Apr-12 | 8 | 1442 | 3 | 806500 | 835435 | LAMMA | 2 | 72 | ON | HKCRP | SPRING | P |
| 11-Apr-12 | 1 | 1124 | 1 | 807975 | 816308 | SE LANTAU | 2 | 205 | ON | HKCRP | SPRING | P |
| 11-Apr-12 | 2 | 1209 | 3 | 802109 | 814268 | SE LANTAU | 2 | 390 | ON | HKCRP | SPRING | P |
| 11-Apr-12 | 3 | 1216 | 5 | 802055 | 813165 | SE LANTAU | 1 | ND | OFF | HKCRP | SPRING | |
| 11-Apr-12 | 4 | 1227 | 6 | 803452 | 812197 | SE LANTAU | 1 | 247 | ON | HKCRP | SPRING | P |
| 11-Apr-12 | 5 | 1240 | 2 | 804504 | 812199 | SE LANTAU | 1 | 370 | ON | HKCRP | SPRING | P |
| 11-Apr-12 | 6 | 1314 | 7 | 807651 | 811173 | SW LANTAU | 2 | 95 | ON | HKCRP | SPRING | P |
| 11-Apr-12 | 7 | 1331 | 3 | 806377 | 811170 | SW LANTAU | 2 | 131 | ON | HKCRP | SPRING | P |
| 11-Apr-12 | 8 | 1346 | 6 | 803697 | 811156 | SW LANTAU | 2 | 38 | ON | HKCRP | SPRING | P |
| 11-Apr-12 | 9 | 1354 | 3 | 802701 | 811154 | SW LANTAU | 2 | 79 | ON | HKCRP | SPRING | P |
| 26-Apr-12 | 1 | 1238 | 3 | 802042 | 814722 | SE LANTAU | 2 | 47 | ON | HKCRP | SPRING | S |
| 26-Apr-12 | 2 | 1246 | 3 | 802043 | 813732 | SE LANTAU | 2 | ND | OFF | HKCRP | SPRING | |
| 26-Apr-12 | 3 | 1305 | 4 | 805100 | 813210 | SE LANTAU | 2 | 87 | ON | HKCRP | SPRING | P |
| 26-Apr-12 | 4 | 1318 | 2 | 806230 | 813222 | SE LANTAU | 1 | 45 | ON | HKCRP | SPRING | P |
| 26-Apr-12 | 6 | 1425 | 1 | 801140 | 810440 | SW LANTAU | 2 | 13 | ON | HKCRP | SPRING | P |
| 26-Apr-12 | 7 | 1432 | 3 | 800710 | 809655 | SW LANTAU | 2 | 20 | ON | HKCRP | SPRING | S |
| 26-Apr-12 | 8 | 1445 | 3 | 800734 | 808809 | SW LANTAU | 2 | 150 | ON | HKCRP | SPRING | S |
| 9-May-12 | 1 | 1050 | 1 | 806489 | 833724 | LAMMA | 3 | 106 | ON | HKCRP | SPRING | P |
| 9-May-12 | 2 | 1112 | 5 | 804519 | 832682 | LAMMA | 2 | 77 | ON | HKCRP | SPRING | P |
| 8-Jun-12 | 7 | 1439 | 4 | 804170 | 813230 | SE LANTAU | 2 | 34 | ON | HKCRP | SUMMER | P |
| 21-Aug-12 | 6 | 1436 | 3 | 804216 | 812178 | SE LANTAU | 2 | 282 | ON | HKCRP | SUMMER | P |
| 22-Aug-12 | 1 | 1336 | 2 | 803516 | 849432 | PO TOI | 2 | 91 | ON | HKCRP | SUMMER | P |
| 22-Aug-12 | 2 | 1508 | 3 | 805940 | 848801 | PO TOI | 2 | 25 | ON | HKCRP | SUMMER | S |
| 22-Aug-12 | 3 | 1608 | 2 | 807437 | 850625 | PO TOI | 2 | 63 | ON | HKCRP | SUMMER | P |
| 30-Aug-12 | 12 | 1433 | 2 | 802200 | 812432 | SE LANTAU | 2 | ND | OFF | HKCRP | SUMMER | |
| 30-Aug-12 | 13 | 1443 | 1 | 803118 | 813218 | SE LANTAU | 2 | 356 | ON | HKCRP | SUMMER | P |
| 30-Aug-12 | 14 | 1453 | 3 | 804657 | 813220 | SE LANTAU | 2 | 342 | ON | HKCRP | SUMMER | P |
| 30-Aug-12 | 15 | 1507 | 2 | 806274 | 813233 | SE LANTAU | 2 | 113 | ON | HKCRP | SUMMER | P |
| 30-Aug-12 | 16 | 1626 | 3 | 804297 | 817345 | SE LANTAU | 2 | 228 | ON | HKCRP | SUMMER | P |
| 10-Sep-12 | 1 | 1451 | 3 | 806461 | 848945 | PO TOI | 2 | 80 | ON | HKCRP | AUTUMN | P |
| 10-Sep-12 | 2 | 1508 | 2 | 806474 | 851615 | PO TOI | 2 | 49 | ON | HKCRP | AUTUMN | P |
| 10-Sep-12 | 3 | 1630 | 2 | 808489 | 851304 | NINEPINS | 2 | 174 | ON | HKCRP | AUTUMN | P |
| 19-Sep-12 | 1 | 1215 | 2 | 803651 | 812476 | SE LANTAU | 3 | 75 | ON | HKCRP | AUTUMN | S |
| 19-Sep-12 | 2 | 1222 | 2 | 804670 | 812189 | SE LANTAU | 3 | 174 | ON | HKCRP | AUTUMN | P |
| 19-Sep-12 | 3 | 1228 | 1 | 805246 | 812190 | SE LANTAU | 2 | 46 | ON | HKCRP | AUTUMN | P |
| 22-Oct-12 | 1 | 1328 | 3 | 805475 | 865859 | PO TOI | 2 | 347 | ON | HKCRP | AUTUMN | P |
| 22-Oct-12 | 2 | 1424 | 2 | 807464 | 863091 | PO TOI | 2 | 70 | ON | HKCRP | AUTUMN | P |
| 22-Oct-12 | 3 | 1516 | 2 | 807459 | 851233 | PO TOI | 3 | 40 | ON | HKCRP | AUTUMN | P |
| 12-Dec-12 | 1 | 1537 | 3 | 802731 | 806708 | SW LANTAU | 3 | ND | OFF | HKCRP | WINTER | |
| 21-Dec-12 | 6 | 1323 | 2 | 805725 | 810458 | SW LANTAU | 2 | 35 | ON | HKCRP | WINTER | P |
| 27-Dec-12 | 2 | 1454 | 5 | 801376 | 808594 | SW LANTAU | 3 | ND | OFF | HKCRP | WINTER | |
| 11-Jan-13 | 1 | 1204 | 1 | 802032 | 813969 | SE LANTAU | 3 | 57 | ON | HKCRP | WINTER | S |
| 11-Jan-13 | 2 | 1227 | 1 | 805532 | 813211 | SE LANTAU | 3 | ND | OFF | HKCRP | WINTER | |
| 11-Jan-13 | 3 | 1246 | 8 | 809398 | 812784 | SE LANTAU | 2 | ND | OFF | HKCRP | WINTER | |
| 11-Jan-13 | 4 | 1553 | 1 | 804852 | 816314 | SE LANTAU | 2 | 20 | ON | HKCRP | WINTER | P |
| 14-Jan-13 | 1 | 1152 | 2 | 806140 | 814243 | SE LANTAU | 2 | 390 | ON | HKCRP | WINTER | P |
| 14-Jan-13 | 2 | 1201 | 4 | 804944 | 814252 | SE LANTAU | 2 | 266 | ON | HKCRP | WINTER | P |
| 14-Jan-13 | 3 | 1211 | 1 | 803416 | 814239 | SE LANTAU | 2 | 406 | ON | HKCRP | WINTER | P |
| 14-Jan-13 | 4 | 1402 | 3 | 801753 | 808388 | SW LANTAU | 2 | 95 | ON | HKCRP | WINTER | P |
| 14-Jan-13 | 5 | 1438 | 2 | 807723 | 807976 | SW LANTAU | 2 | 55 | ON | HKCRP | WINTER | S |
| 22-Jan-13 | 1 | 1423 | 1 | 805960 | 809118 | SW LANTAU | 2 | ND | OFF | HKCRP | WINTER | |
| 22-Jan-13 | 2 | 1433 | 1 | 805128 | 809817 | SW LANTAU | 2 | ND | OFF | HKCRP | WINTER | |
| 22-Jan-13 | 3 | 1442 | 3 | 804020 | 809939 | SW LANTAU | 2 | ND | OFF | HKCRP | WINTER | |

## Appendix III. (cont'd)

| DATE | STG # | TIME | HRD SZ | NORTHING | EASTING | AREA | BEAU | PSD | EFFORT | TYPE | SEASON | P/S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 22-Jan-13 | 4 | 1457 | 2 | 801907 | 809007 | SW LANTAU | 1 | ND | OFF | HKCRP | WINTER | |
| 23-Jan-13 | 1 | 1242 | 2 | 807989 | 807554 | SW LANTAU | 2 | ND | OFF | HKCRP | WINTER | |
| 23-Jan-13 | 2 | 1302 | 1 | 807660 | 805718 | SW LANTAU | 2 | ND | OFF | HKCRP | WINTER | |
| 31-Jan-13 | 1 | 1016 | 4 | 806587 | 819400 | SE LANTAU | 3 | ND | OFF | HKCRP | WINTER | |
| 31-Jan-13 | 2 | 1021 | 4 | 806178 | 819389 | SE LANTAU | 3 | 110 | ON | HKCRP | WINTER | P |
| 31-Jan-13 | 3 | 1031 | 3 | 805026 | 819409 | SE LANTAU | 3 | 46 | ON | HKCRP | WINTER | P |
| 31-Jan-13 | 4 | 1037 | 1 | 804317 | 819387 | SE LANTAU | 4 | 72 | ON | HKCRP | WINTER | P |
| 31-Jan-13 | 5 | 1051 | 1 | 804519 | 817335 | SE LANTAU | 5 | 98 | ON | HKCRP | WINTER | P |
| 5-Feb-13 | 1 | 1130 | 1 | 803478 | 830629 | LAMMA | 0 | 227 | ON | HKCRP | WINTER | P |
| 5-Feb-13 | 2 | 1151 | 2 | 803480 | 826668 | LAMMA | 0 | 79 | ON | HKCRP | WINTER | P |
| 5-Feb-13 | 3 | 1208 | 6 | 803516 | 823471 | LAMMA | 1 | 2 | ON | HKCRP | WINTER | P |
| 5-Feb-13 | 4 | 1237 | 1 | 805490 | 820791 | LAMMA | 1 | 321 | ON | HKCRP | WINTER | P |
| 5-Feb-13 | 5 | 1248 | 3 | 805466 | 822018 | LAMMA | 2 | 227 | ON | HKCRP | WINTER | P |
| 5-Feb-13 | 6 | 1307 | 1 | 805464 | 824101 | LAMMA | 2 | 64 | ON | HKCRP | WINTER | P |
| 5-Feb-13 | 7 | 1415 | 1 | 807791 | 823165 | LAMMA | 2 | 232 | ON | HKCRP | WINTER | S |
| 19-Feb-13 | 1 | 1319 | 4 | 805969 | 804291 | SW LANTAU | 2 | 180 | ON | HKCRP | WINTER | P |
| 19-Feb-13 | 4 | 1359 | 18 | 801890 | 806335 | SW LANTAU | 1 | 156 | ON | HKCRP | WINTER | P |
| 19-Feb-13 | 5 | 1418 | 3 | 803451 | 806339 | SW LANTAU | 1 | 101 | ON | HKCRP | WINTER | P |
| 19-Feb-13 | 6 | 1427 | 5 | 805090 | 806342 | SW LANTAU | 1 | 120 | ON | HKCRP | WINTER | P |
| 19-Feb-13 | 7 | 1506 | 2 | 804854 | 808146 | SW LANTAU | 1 | 76 | ON | HKCRP | WINTER | P |
| 19-Feb-13 | 8 | 1525 | 12 | 801909 | 808017 | SW LANTAU | 1 | 48 | ON | HKCRP | WINTER | P |
| 19-Feb-13 | 9 | 1537 | 4 | 800657 | 808427 | SW LANTAU | 1 | 30 | ON | HKCRP | WINTER | P |
| 19-Feb-13 | 10 | 1547 | 17 | 801120 | 809418 | SW LANTAU | 1 | 47 | ON | HKCRP | WINTER | P |
| 22-Feb-13 | 1 | 1156 | 2 | 803027 | 815280 | SE LANTAU | 2 | 79 | ON | HKCRP | WINTER | P |
| 22-Feb-13 | 2 | 1210 | 1 | 802055 | 813598 | SE LANTAU | 2 | 357 | ON | HKCRP | WINTER | S |
| 22-Feb-13 | 3 | 1213 | 1 | 802177 | 813206 | SE LANTAU | 2 | 59 | ON | HKCRP | WINTER | P |
| 22-Feb-13 | 4 | 1217 | 1 | 802720 | 813217 | SE LANTAU | 2 | 173 | ON | HKCRP | WINTER | P |
| 22-Feb-13 | 5 | 1221 | 3 | 803362 | 813218 | SE LANTAU | 2 | 202 | ON | HKCRP | WINTER | P |
| 22-Feb-13 | 6 | 1458 | 1 | 800979 | 807664 | SW LANTAU | 3 | 67 | ON | HKCRP | WINTER | S |
| 7-Mar-13 | 6 | 1424 | 5 | 807291 | 807583 | SW LANTAU | 1 | ND | OFF | HKCRP | SPRING | |
| 7-Mar-13 | 7 | 1451 | 1 | 803116 | 807988 | SW LANTAU | 1 | 254 | ON | HKCRP | SPRING | S |
| 7-Mar-13 | 8 | 1520 | 3 | 801369 | 806324 | SW LANTAU | 1 | 248 | ON | HKCRP | SPRING | S |
| 8-Mar-13 | 1 | 1427 | 2 | 807432 | 809646 | SW LANTAU | 2 | 63 | ON | HKCRP | SPRING | S |
| 8-Mar-13 | 2 | 1512 | 2 | 802044 | 812969 | SE LANTAU | 2 | 137 | ON | HKCRP | SPRING | S |
| 8-Mar-13 | 3 | 1523 | 1 | 802585 | 814248 | SE LANTAU | 2 | 227 | ON | HKCRP | SPRING | P |
| 8-Mar-13 | 4 | 1622 | 1 | 806035 | 818378 | SE LANTAU | 2 | 21 | ON | HKCRP | SPRING | P |
| 19-Mar-13 | 1 | 0953 | 2 | 808460 | 833992 | LAMMA | 1 | 3 | ON | HKCRP | SPRING | P |

## Appendix IV. Individual dolphins identified during AFCD surveys (April 2012 to March 2013)

| DOLPHIN ID | DATE | STG# | AREA |
|---|---|---|---|
| CH12 | 24/05/12 | 14 | WL |
| | 31/05/12 | 6 | WL |
| | 31/05/12 | 8 | WL |
| | 07/08/12 | 3 | FL |
| | 01/03/13 | 2 | WL |
| | 01/03/13 | 3 | WL |
| CH34 | 04/05/12 | 2 | NWL |
| | 29/08/12 | 1 | NEL |
| | 17/12/12 | 2 | NWL |
| | 15/01/13 | 3 | NWL |
| CH38 | 24/05/12 | 7 | WL |
| | 31/05/12 | 6 | WL |
| | 31/05/12 | 8 | WL |
| | 10/07/12 | 7 | WL |
| | 10/07/12 | 10 | SWL |
| | 16/08/12 | 3 | WL |
| | 16/08/12 | 5 | WL |
| | 07/03/13 | 4 | WL |
| CH98 | 13/09/12 | 2 | NWL |
| | 04/10/12 | 4 | NWL |
| | 15/10/12 | 3 | NWL |
| | 09/11/12 | 3 | NWL |
| CH108 | 15/05/12 | 3 | WL |
| | 31/05/12 | 9 | WL |
| | 10/07/12 | 6 | WL |
| | 12/09/12 | 2 | FL |
| | 31/01/13 | 8 | WL |
| | 01/03/13 | 3 | WL |
| | 07/03/13 | 3 | WL |
| | 07/03/13 | 9 | WL |
| CH113 | 18/05/12 | 2 | WL |
| CH151 | 24/05/12 | 5 | WL |
| | 24/05/12 | 14 | WL |
| CH153 | 05/07/12 | 10 | NWL |
| | 15/08/12 | 6 | WL |
| EL01 | 30/05/12 | 1 | NEL |
| | 29/08/12 | 2 | NEL |
| NL11 | 06/08/12 | 4 | NWL |
| | 13/09/12 | 2 | NWL |
| | 27/09/12 | 1 | NWL |
| | 15/10/12 | 2 | NWL |
| | 09/11/12 | 3 | NWL |
| | 03/01/13 | 2 | NWL |
| | 15/01/13 | 2 | DB |
| NL12 | 15/01/13 | 2 | DB |
| NL18 | 06/08/12 | 1 | NEL |
| | 06/08/12 | 3 | NEL |
| | 13/09/12 | 5 | NEL |
| | 04/10/12 | 4 | NWL |
| | 04/10/12 | 8 | NEL |
| | 15/10/12 | 5 | NEL |
| | 23/01/13 | 3 | NEL |
| NL24 | 12/04/12 | 7 | NWL |
| | 04/05/12 | 2 | NWL |
| | 24/05/12 | 14 | WL |
| | 31/05/12 | 5 | WL |
| | 29/08/12 | 1 | NEL |
| | 29/08/12 | 4 | NEL |
| | 13/09/12 | 8 | NEL |
| | 25/09/12 | 1 | NWL |
| | 28/09/12 | 3 | NWL |
| | 22/01/13 | 1 | NWL |
| | 23/01/13 | 1 | NWL |
| | 29/01/13 | 16 | NWL |

| DOLPHIN ID | DATE | STG# | AREA |
|---|---|---|---|
| NL33 | 14/06/12 | 2 | NWL |
| | 25/09/12 | 1 | NWL |
| | 27/09/12 | 2 | NWL |
| | 28/09/12 | 2 | NWL |
| | 15/10/12 | 4 | NEL |
| | 17/12/12 | 2 | NWL |
| | 20/12/12 | 1 | NEL |
| | 09/01/13 | 2 | NEL |
| | 22/01/13 | 1 | NWL |
| | 23/01/13 | 3 | NEL |
| NL37 | 31/05/12 | 6 | WL |
| | 31/05/12 | 9 | WL |
| NL46 | 31/05/12 | 12 | NWL |
| | 07/06/12 | 5 | NWL |
| | 15/10/12 | 2 | NWL |
| | 27/11/12 | 2 | NWL |
| NL48 | 07/06/12 | 2 | NWL |
| | 13/09/12 | 5 | NEL |
| | 27/09/12 | 1 | NWL |
| | 04/10/12 | 4 | NWL |
| | 09/11/12 | 1 | NWL |
| | 15/01/13 | 2 | DB |
| | 29/01/13 | 16 | NWL |
| NL49 | 27/09/12 | 1 | NWL |
| | 22/01/13 | 4 | NWL |
| | 29/01/13 | 16 | NWL |
| NL75 | 29/08/12 | 3 | NEL |
| NL80 | 28/09/12 | 2 | NWL |
| | 28/09/12 | 4 | NWL |
| | 15/01/13 | 2 | DB |
| NL93 | 28/06/12 | 2 | WL |
| | 17/12/12 | 2 | NWL |
| NL98 | 29/08/12 | 1 | NEL |
| | 29/08/12 | 4 | NEL |
| | 13/09/12 | 7 | NEL |
| | 24/09/12 | 1 | NWL |
| | 28/09/12 | 3 | NWL |
| | 22/01/13 | 1 | NWL |
| | 23/01/13 | 1 | NWL |
| NL103 | 28/09/12 | 4 | NWL |
| | 15/01/13 | 2 | DB |
| NL104 | 14/06/12 | 2 | NWL |
| | 28/06/12 | 2 | WL |
| | 17/12/12 | 2 | NWL |
| | 15/01/13 | 3 | NWL |
| NL105 | 12/04/12 | 8 | NWL |
| | 11/07/12 | 1 | NWL |
| | 29/01/13 | 16 | NWL |
| NL112 | 15/10/12 | 2 | NWL |
| | 28/12/12 | 1 | DB |
| | 28/12/12 | 3 | DB |
| NL118 | 13/09/12 | 2 | NWL |
| | 27/09/12 | 1 | NWL |
| | 15/10/12 | 1 | NWL |
| NL120 | 20/12/12 | 1 | NEL |
| | 09/01/13 | 2 | NEL |
| | 22/01/13 | 1 | NWL |
| | 23/01/13 | 3 | NEL |
| | 01/03/13 | 3 | WL |
| | 22/03/13 | 1 | WL |
| NL123 | 08/08/12 | 3 | NEL |
| | 13/09/12 | 1 | NWL |
| | 13/09/12 | 7 | NEL |
| | 20/09/12 | 1 | NWL |
| | 15/10/12 | 5 | NEL |
| | 20/12/12 | 1 | NEL |

| DOLPHIN ID | DATE | STG# | AREA |
|---|---|---|---|
| NL128 | 06/06/12 | 6 | WL |
| | 07/06/12 | 2 | NWL |
| NL136 | 28/09/12 | 2 | NWL |
| | 28/09/12 | 5 | NEL |
| | 04/10/12 | 4 | NWL |
| | 15/10/12 | 3 | NWL |
| | 22/01/13 | 4 | NWL |
| NL139 | 29/08/12 | 3 | NEL |
| | 13/09/12 | 4 | NEL |
| | 28/09/12 | 2 | NWL |
| | 28/09/12 | 5 | NEL |
| | 04/10/12 | 4 | NWL |
| | 15/10/12 | 5 | NEL |
| | 09/01/13 | 2 | NEL |
| | 23/01/13 | 3 | NEL |
| NL150 | 11/07/12 | 1 | NWL |
| NL156 | 28/06/12 | 1 | WL |
| | 05/07/12 | 1 | NWL |
| | 01/03/13 | 2 | WL |
| NL165 | 09/08/12 | 4 | WL |
| | 29/08/12 | 4 | NEL |
| | 13/09/12 | 4 | NEL |
| | 09/01/13 | 2 | NEL |
| | 22/01/13 | 4 | NWL |
| | 29/01/13 | 16 | NWL |
| | 30/01/13 | 1 | NWL |
| NL176 | 14/06/12 | 2 | NWL |
| | 06/08/12 | 1 | NEL |
| | 06/08/12 | 2 | NEL |
| | 29/08/12 | 4 | NEL |
| NL179 | 04/05/12 | 2 | NWL |
| | 07/06/12 | 2 | NWL |
| | 29/08/12 | 3 | NEL |
| | 13/09/12 | 6 | NEL |
| | 15/10/12 | 4 | NEL |
| | 20/12/12 | 1 | NEL |
| | 09/01/13 | 2 | NEL |
| | 22/01/13 | 4 | NWL |
| | 23/01/13 | 3 | NEL |
| NL182 | 14/06/12 | 1 | NWL |
| | 06/08/12 | 1 | NEL |
| | 09/08/12 | 5 | WL |
| | 13/09/12 | 8 | NEL |
| | 28/09/12 | 4 | NWL |
| | 09/11/12 | 1 | NWL |
| NL188 | 15/05/12 | 1 | WL |
| | 31/05/12 | 6 | WL |
| NL191 | 09/08/12 | 5 | WL |
| | 17/12/12 | 2 | NWL |
| NL202 | 31/05/12 | 12 | NWL |
| | 07/06/12 | 5 | NWL |
| | 14/06/12 | 1 | NWL |
| | 06/07/12 | 4 | NWL |
| | 13/09/12 | 3 | NWL |
| | 20/09/12 | 1 | NWL |
| | 03/10/12 | 9 | NWL |
| | 09/11/12 | 3 | NWL |
| | 03/01/13 | 2 | NWL |
| NL206 | 15/05/12 | 4 | WL |
| | 31/05/12 | 1 | WL |
| | 04/07/12 | 3 | FL |
| | 07/03/13 | 1 | WL |
| | 22/03/13 | 1 | WL |
| NL212 | 10/07/12 | 7 | WL |
| NL213 | 15/01/13 | 1 | NWL |

## Appendix IV. (cont'd)

| DOLPHIN ID | DATE | STG# | AREA |
|---|---|---|---|
| NL220 | 04/05/12 | 2 | NWL |
| | 09/08/12 | 1 | WL |
| | 25/09/12 | 1 | NWL |
| | 28/09/12 | 5 | NEL |
| NL224 | 24/05/12 | 4 | WL |
| | 24/05/12 | 15 | WL |
| | 15/08/12 | 7 | NWL |
| NL226 | 15/08/12 | 5 | NWL |
| | 29/08/12 | 3 | NEL |
| | 12/09/12 | 1 | FL |
| | 20/12/12 | 1 | NEL |
| | 09/01/13 | 2 | NEL |
| | 22/01/13 | 1 | NWL |
| NL233 | 14/06/12 | 1 | NWL |
| NL236 | 11/07/12 | 1 | NWL |
| NL241 | 13/09/12 | 2 | NWL |
| NL242 | 14/06/12 | 2 | NWL |
| | 29/08/12 | 3 | NEL |
| | 29/08/12 | 4 | NEL |
| | 28/09/12 | 3 | NWL |
| | 17/12/12 | 2 | NWL |
| | 22/01/13 | 1 | NWL |
| | 23/01/13 | 1 | NWL |
| NL244 | 09/08/12 | 1 | WL |
| | 29/08/12 | 1 | NEL |
| | 29/08/12 | 3 | NEL |
| NL246 | 29/08/12 | 4 | NEL |
| | 13/09/12 | 7 | NEL |
| | 13/09/12 | 8 | NEL |
| | 20/12/12 | 1 | NEL |
| | 22/01/13 | 4 | NWL |
| NL249 | 05/07/12 | 4 | WL |
| NL255 | 04/05/12 | 1 | NWL |
| | 28/06/12 | 15 | NWL |
| NL256 | 07/06/12 | 3 | NWL |
| | 28/06/12 | 3 | WL |
| NL258 | 31/05/12 | 12 | NWL |
| NL259 | 28/06/12 | 2 | WL |
| | 13/09/12 | 4 | NEL |
| | 09/11/12 | 3 | NWL |
| | 17/12/12 | 2 | NWL |
| NL260 | 14/06/12 | 2 | NWL |
| | 29/08/12 | 3 | NEL |
| | 13/09/12 | 4 | NEL |
| | 20/09/12 | 2 | NWL |
| NL261 | 08/08/12 | 2 | NEL |
| | 17/12/12 | 1 | NWL |
| | 22/01/13 | 4 | NWL |
| NL262 | 31/05/12 | 12 | NWL |
| | 07/06/12 | 2 | NWL |
| | 14/06/12 | 1 | NWL |
| | 28/06/12 | 2 | WL |
| | 15/10/12 | 2 | NWL |
| NL264 | 15/05/12 | 1 | WL |
| | 31/05/12 | 12 | NWL |
| | 14/06/12 | 3 | NEL |
| | 13/09/12 | 1 | NWL |
| | 13/09/12 | 4 | NEL |
| | 03/01/13 | 2 | NWL |
| NL267 | 24/05/12 | 14 | WL |
| NL269 | 24/05/12 | 14 | WL |
| | 31/05/12 | 12 | NWL |
| | 07/06/12 | 5 | NWL |
| NL271 | 14/06/12 | 1 | NWL |

| DOLPHIN ID | DATE | STG# | AREA |
|---|---|---|---|
| NL272 | 07/06/12 | 6 | NWL |
| | 28/06/12 | 2 | WL |
| | 15/08/12 | 10 | NWL |
| | 29/08/12 | 3 | NEL |
| | 13/09/12 | 6 | NEL |
| | 15/10/12 | 4 | NEL |
| NL276 | 05/07/12 | 10 | NWL |
| NL278 | 10/07/12 | 7 | WL |
| | 10/07/12 | 11 | SWL |
| | 15/08/12 | 7 | NWL |
| | 17/12/12 | 2 | NWL |
| NL279 | 08/06/12 | 3 | WL |
| | 10/07/12 | 13 | WL |
| | 30/08/12 | 1 | WL |
| NL282 | 24/05/12 | 5 | WL |
| NL283 | 10/07/12 | 17 | WL |
| NL285 | 08/08/12 | 3 | NEL |
| | 13/09/12 | 1 | NWL |
| | 13/09/12 | 7 | NEL |
| | 20/09/12 | 1 | NWL |
| | 15/10/12 | 5 | NEL |
| | 17/12/12 | 2 | NWL |
| | 20/12/12 | 1 | NEL |
| NL286 | 31/05/12 | 12 | NWL |
| | 07/06/12 | 5 | NWL |
| | 14/06/12 | 1 | NWL |
| | 06/07/12 | 4 | NWL |
| | 13/09/12 | 3 | NWL |
| | 20/09/12 | 1 | NWL |
| | 03/10/12 | 9 | NWL |
| | 09/11/12 | 3 | NWL |
| NL287 | 06/08/12 | 6 | NWL |
| | 04/10/12 | 3 | NWL |
| NL288 | 15/05/12 | 1 | WL |
| | 31/05/12 | 12 | NWL |
| | 14/06/12 | 3 | NEL |
| | 13/09/12 | 1 | NWL |
| | 13/09/12 | 4 | NEL |
| | 17/12/12 | 1 | NWL |
| | 03/01/13 | 2 | NWL |
| NL291 | 27/09/12 | 1 | NWL |
| | 27/11/12 | 2 | NWL |
| NL293 | 24/05/12 | 7 | WL |
| | 16/08/12 | 3 | WL |
| NL295 | 09/08/12 | 1 | WL |
| | 20/09/12 | 2 | NWL |
| | 09/11/12 | 4 | NWL |
| | 23/01/13 | 1 | NWL |
| NL296 | 14/06/12 | 2 | NWL |
| | 13/09/12 | 4 | NEL |
| NL299 (new) | 28/06/12 | 3 | WL |
| | 10/07/12 | 7 | WL |
| | 10/07/12 | 11 | SWL |
| NL303 (new) | 29/08/12 | 3 | NEL |
| NL304 (new) | 04/10/12 | 1 | NWL |
| NL305 (new) | 15/08/12 | 7 | NWL |
| NL306 (new) | 31/05/12 | 2 | WL |
| SL05 | 05/07/12 | 4 | WL |
| | 10/07/12 | 7 | WL |
| | 10/07/12 | 10 | SWL |
| | 19/09/12 | 4 | SWL |
| | 22/03/13 | 2 | WL |

| DOLPHIN ID | DATE | STG# | AREA |
|---|---|---|---|
| SL35 | 11/04/12 | 10 | SWL |
| | 12/04/12 | 3 | WL |
| | 26/04/12 | 9 | SWL |
| | 24/05/12 | 14 | WL |
| | 30/08/12 | 9 | SWL |
| | 03/10/12 | 6 | WL |
| | 21/12/12 | 1 | WL |
| | 23/01/13 | 1 | NWL |
| SL40 | 04/07/12 | 1 | FL |
| | 10/07/12 | 7 | WL |
| | 16/08/12 | 3 | WL |
| | 03/01/13 | 1 | WL |
| | 07/03/13 | 4 | WL |
| SL42 | 31/05/12 | 11 | WL |
| SL44 | 12/04/12 | 4 | WL |
| | 04/07/12 | 2 | FL |
| | 07/08/12 | 3 | FL |
| SL46 | 01/03/13 | 3 | WL |
| SL47 | 03/10/12 | 2 | WL |
| SL48 | 05/07/12 | 4 | WL |
| SL49 | 03/10/12 | 2 | WL |
| SL50 (new) | 21/11/12 | 3 | WL |
| WL04 | 15/05/12 | 1 | WL |
| | 09/08/12 | 1 | WL |
| | 28/09/12 | 2 | NWL |
| WL05 | 15/05/12 | 1 | WL |
| | 14/06/12 | 3 | NEL |
| | 08/08/12 | 1 | NWL |
| | 29/08/12 | 4 | NEL |
| | 27/09/12 | 1 | NWL |
| | 15/10/12 | 2 | NWL |
| WL11 | 15/05/12 | 1 | WL |
| WL15 | 28/06/12 | 8 | WL |
| | 21/12/12 | 1 | WL |
| WL21 | 18/05/12 | 2 | WL |
| | 10/07/12 | 16 | WL |
| WL25 | 24/05/12 | 14 | WL |
| | 31/05/12 | 8 | WL |
| | 21/06/12 | 3 | WL |
| | 04/07/12 | 1 | FL |
| | 05/07/12 | 7 | WL |
| | 10/07/12 | 7 | WL |
| | 10/07/12 | 10 | SWL |
| | 31/01/13 | 6 | WL |
| | 01/03/13 | 2 | WL |
| | 07/03/13 | 9 | WL |
| WL29 | 05/07/12 | 4 | WL |
| | 10/07/12 | 7 | WL |
| | 10/07/12 | 10 | SWL |
| WL33 | 20/09/12 | 2 | NWL |
| WL37 | 10/07/12 | 1 | WL |
| | 15/08/12 | 6 | WL |
| WL42 | 21/06/12 | 3 | WL |
| | 05/07/12 | 4 | WL |
| | 10/07/12 | 7 | WL |
| | 10/07/12 | 12 | SWL |
| | 07/08/12 | 1 | FL |
| WL46 | 05/07/12 | 2 | WL |
| | 05/07/12 | 4 | WL |
| | 05/07/12 | 8 | WL |
| WL47 | 24/05/12 | 8 | WL |
| | 30/08/12 | 6 | SWL |

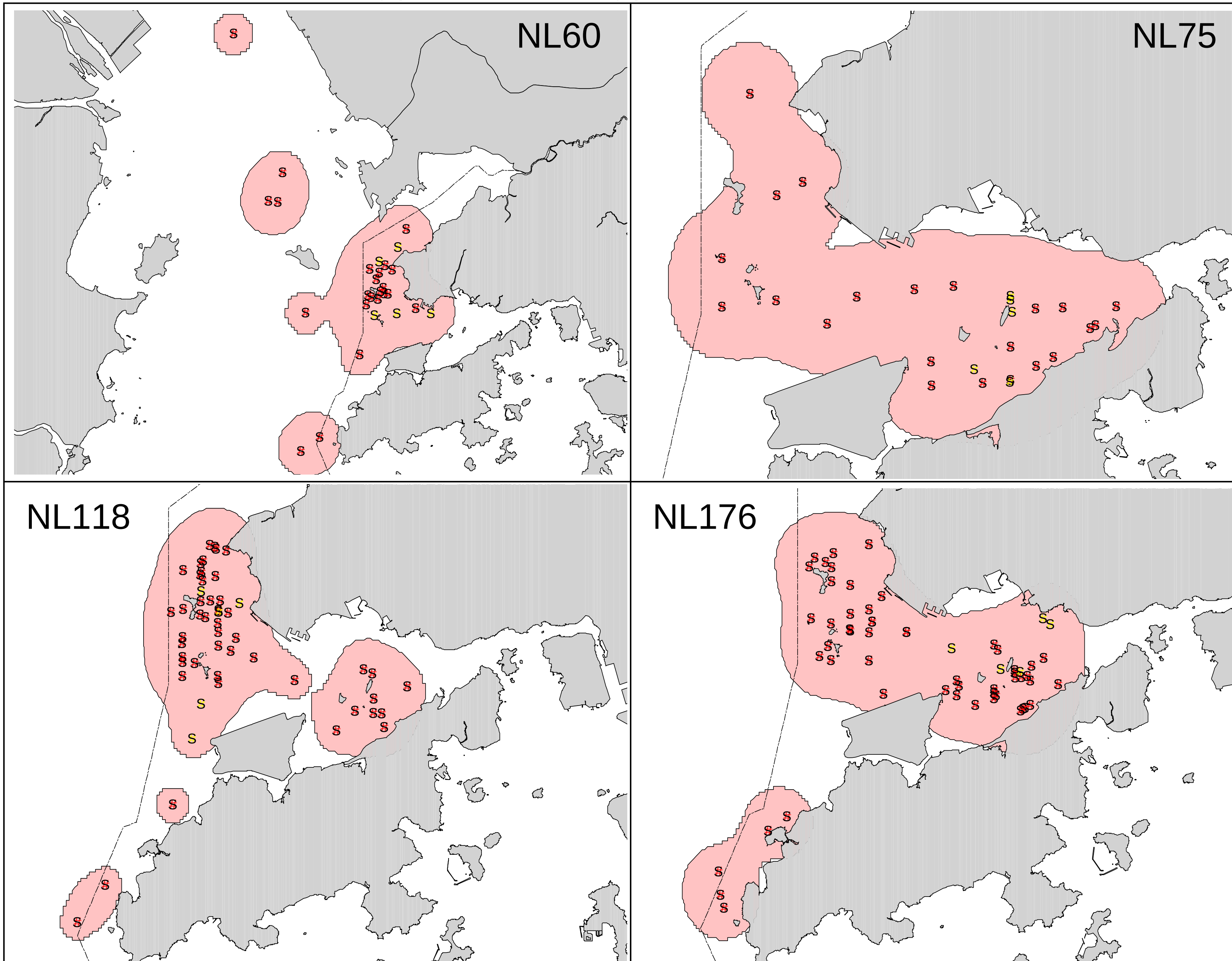
## Appendix IV. (cont'd)

| DOLPHIN ID | DATE | STG# | AREA |
|---|---|---|---|
| WL50 | 24/05/12 | 7 | WL |
| | 24/05/12 | 13 | WL |
| | 21/06/12 | 3 | WL |
| | 10/07/12 | 7 | WL |
| | 10/07/12 | 11 | SWL |
| | 14/01/13 | 6 | WL |
| | 01/03/13 | 2 | WL |
| | 07/03/13 | 9 | WL |
| WL55 | 12/04/12 | 3 | WL |
| | 15/05/12 | 4 | WL |
| | 04/07/12 | 1 | FL |
| WL58 | 31/05/12 | 8 | WL |
| | 10/07/12 | 5 | WL |
| WL60 | 29/08/12 | 3 | NEL |
| WL61 | 06/06/12 | 6 | WL |
| | 21/06/12 | 3 | WL |
| | 05/07/12 | 7 | WL |
| | 10/07/12 | 7 | WL |
| | 03/10/12 | 3 | WL |
| | 01/03/13 | 2 | WL |
| WL62 | 29/01/13 | 2 | WL |
| | 31/01/13 | 8 | WL |
| WL68 | 29/01/13 | 2 | WL |
| WL69 | 26/04/12 | 5 | SWL |
| | 15/05/12 | 4 | WL |
| | 04/07/12 | 4 | FL |
| | 21/08/12 | 5 | SWL |
| | 16/10/12 | 1 | WL |
| | 21/11/12 | 5 | SWL |
| | 29/01/13 | 12 | WL |
| WL72 | 15/05/12 | 2 | WL |
| | 05/07/12 | 4 | WL |
| | 10/07/12 | 6 | WL |
| | 30/08/12 | 3 | WL |
| | 01/03/13 | 2 | WL |
| | 01/03/13 | 3 | WL |
| WL73 | 24/05/12 | 7 | WL |
| | 07/08/12 | 2 | FL |
| | 21/08/12 | 4 | WL |
| WL74 | 15/05/12 | 4 | WL |
| | 31/05/12 | 8 | WL |
| | 28/06/12 | 10 | WL |
| | 04/07/12 | 2 | FL |
| | 07/08/12 | 3 | FL |
| WL76 | 24/05/12 | 14 | WL |
| | 05/07/12 | 9 | WL |
| WL79 | 31/05/12 | 10 | WL |
| WL84 | 31/05/12 | 5 | WL |
| | 06/06/12 | 6 | WL |
| WL86 | 15/05/12 | 4 | WL |
| | 10/07/12 | 13 | WL |
| | 21/11/12 | 1 | WL |
| | 29/01/13 | 7 | WL |
| WL87 | 26/04/12 | 5 | SWL |
| | 15/05/12 | 5 | WL |
| | 16/08/12 | 5 | WL |
| WL91 | 10/07/12 | 7 | WL |
| WL92 | 07/08/12 | 3 | FL |
| | 07/03/13 | 1 | WL |
| WL93 | 24/05/12 | 8 | WL |
| WL94 | 15/05/12 | 4 | WL |
| | 07/08/12 | 3 | FL |
| | 07/03/13 | 3 | WL |
| WL97 | 16/01/13 | 1 | WL |

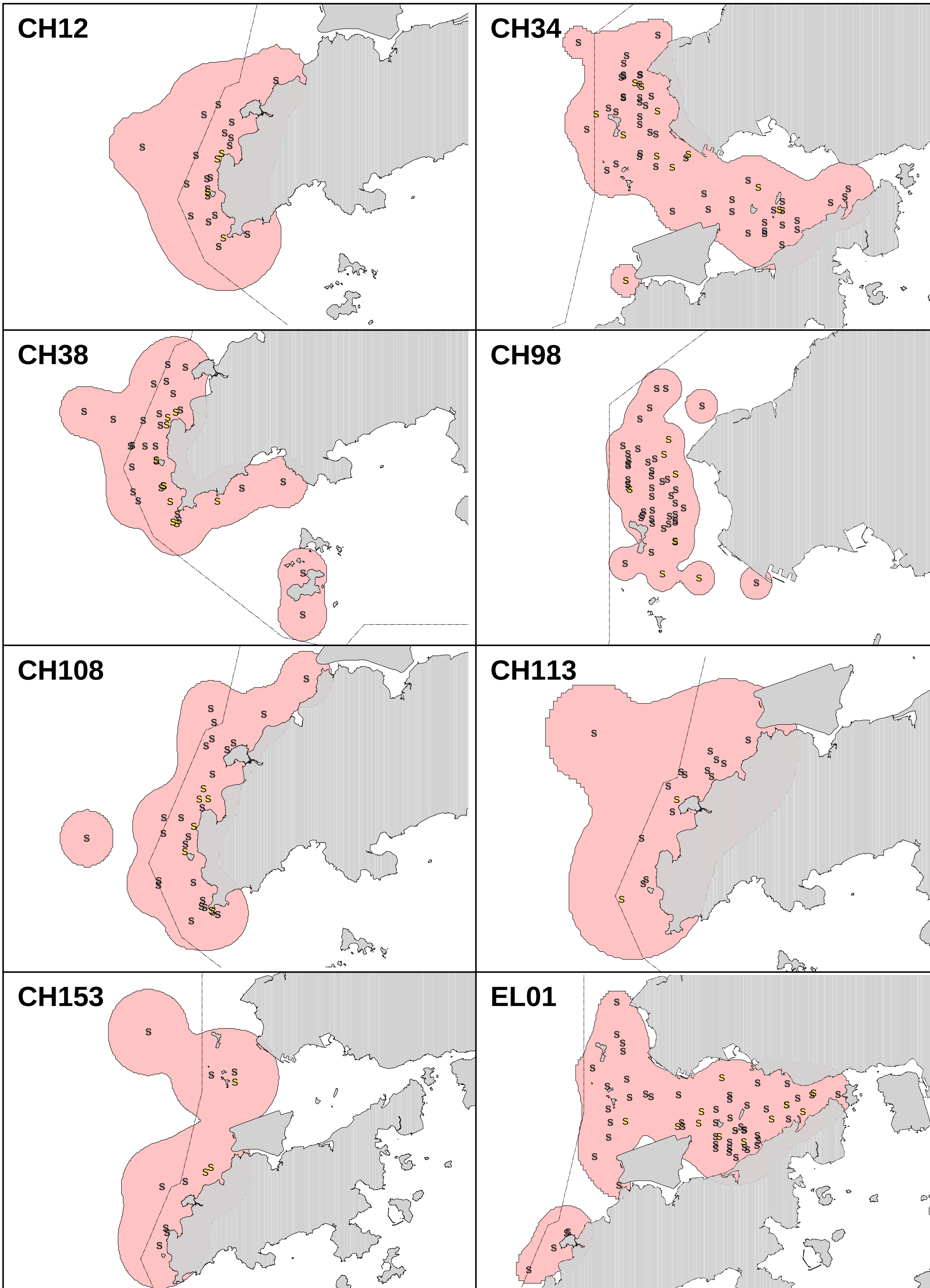
| DOLPHIN ID | DATE | STG# | AREA |
|---|---|---|---|
| WL98 | 15/05/12 | 1 | WL |
| | 18/05/12 | 2 | WL |
| | 24/05/12 | 1 | NWL |
| WL100 | 31/05/12 | 8 | WL |
| WL109 | 24/05/12 | 7 | WL |
| | 10/07/12 | 7 | WL |
| | 10/07/12 | 10 | SWL |
| | 01/03/13 | 2 | WL |
| WL114 | 15/05/12 | 2 | WL |
| | 21/11/12 | 5 | SWL |
| WL116 | 15/05/12 | 2 | WL |
| | 24/05/12 | 6 | WL |
| | 31/05/12 | 1 | WL |
| | 16/08/12 | 5 | WL |
| | 03/10/12 | 2 | WL |
| | 29/01/13 | 4 | WL |
| | 07/03/13 | 1 | WL |
| | 22/03/13 | 1 | WL |
| WL118 | 18/05/12 | 2 | WL |
| | 06/06/12 | 6 | WL |
| | 30/08/12 | 5 | WL |
| | 03/10/12 | 3 | WL |
| | 01/03/13 | 3 | WL |
| | 07/03/13 | 9 | WL |
| WL120 | 05/07/12 | 2 | WL |
| | 10/07/12 | 14 | WL |
| WL123 | 24/05/12 | 14 | WL |
| | 10/07/12 | 10 | SWL |
| | 07/08/12 | 3 | FL |
| | 07/03/13 | 9 | WL |
| WL124 | 08/06/12 | 2 | WL |
| | 05/07/12 | 2 | WL |
| | 10/07/12 | 7 | WL |
| | 09/08/12 | 2 | WL |
| WL128 | 28/06/12 | 10 | WL |
| | 22/03/13 | 1 | WL |
| WL130 | 15/05/12 | 4 | WL |
| | 24/05/12 | 8 | WL |
| | 10/07/12 | 7 | WL |
| | 07/08/12 | 3 | FL |
| | 07/03/13 | 1 | WL |
| WL131 | 15/05/12 | 2 | WL |
| | 10/07/12 | 11 | SWL |
| | 07/08/12 | 2 | FL |
| | 30/08/12 | 3 | WL |
| | 31/01/13 | 8 | WL |
| | 01/03/13 | 2 | WL |
| | 01/03/13 | 3 | WL |
| | 07/03/13 | 9 | WL |
| WL137 | 24/05/12 | 8 | WL |
| | 03/10/12 | 4 | WL |
| | 21/12/12 | 5 | SWL |
| | 29/01/13 | 4 | WL |
| WL142 | 31/05/12 | 1 | WL |
| | 04/07/12 | 3 | FL |
| | 03/10/12 | 2 | WL |
| | 29/01/13 | 4 | WL |
| WL145 | 28/06/12 | 11 | WL |
| WL146 | 28/06/12 | 5 | WL |
| WL152 | 24/05/12 | 14 | WL |
| | 10/07/12 | 5 | WL |
| | 01/03/13 | 2 | WL |
| | 01/03/13 | 3 | WL |
| WL153 | 15/08/12 | 6 | WL |
| WL156 | 07/03/13 | 9 | WL |
| WL157 | 15/05/12 | 1 | WL |

| DOLPHIN ID | DATE | STG# | AREA |
|---|---|---|---|
| WL159 | 24/05/12 | 1 | NWL |
| | 28/06/12 | 1 | WL |
| WL165 | 15/05/12 | 4 | WL |
| | 24/05/12 | 9 | WL |
| | 05/07/12 | 4 | WL |
| | 07/08/12 | 3 | FL |
| | 30/08/12 | 4 | WL |
| | 29/01/13 | 7 | WL |
| WL167 | 04/05/12 | 1 | NWL |
| WL168 | 05/07/12 | 4 | WL |
| WL170 | 09/08/12 | 3 | WL |
| WL173 | 15/05/12 | 2 | WL |
| | 24/05/12 | 7 | WL |
| WL176 | 28/06/12 | 1 | WL |
| WL179 | 05/07/12 | 7 | WL |
| | 10/07/12 | 7 | WL |
| WL180 | 01/03/13 | 3 | WL |
| WL181 | 24/05/12 | 6 | WL |
| WL186 | 18/05/12 | 2 | WL |
| WL187 | 06/06/12 | 6 | WL |
| | 30/08/12 | 11 | SWL |
| WL188 | 28/09/12 | 4 | NWL |
| WL191 | 31/05/12 | 11 | WL |
| | 28/06/12 | 11 | WL |
| | 07/03/13 | 9 | WL |
| WL193 | 15/05/12 | 1 | WL |
| | 15/08/12 | 5 | NWL |
| | 15/08/12 | 6 | WL |
| WL196 | 10/07/12 | 5 | WL |
| WL197 | 24/05/12 | 8 | WL |
| | 03/10/12 | 2 | WL |
| WL199 | 12/04/12 | 7 | NWL |
| | 21/06/12 | 3 | WL |
| WL201 | 29/01/13 | 10 | WL |
| | 07/03/13 | 3 | WL |
| | 07/03/13 | 9 | WL |
| WL203 (new) | 10/07/12 | 7 | WL |
| | 10/07/12 | 10 | SWL |
| WL204 (new) | 05/07/12 | 4 | WL |
| WL205 (new) | 10/07/12 | 7 | WL |
| | 10/07/12 | 10 | SWL |
| WL206 (new) | 03/10/12 | 1 | NWL |
| | 04/10/12 | 1 | NWL |
| WL207 (new) | 06/07/12 | 1 | NWL |
| WL208 (new) | 21/06/12 | 3 | WL |
| | 03/10/12 | 4 | WL |
| WL209 (new) | 16/08/12 | 3 | WL |
| WL210 (new) | 30/08/12 | 6 | SWL |
| WL211 (new) | 24/05/12 | 7 | WL |
| | 24/05/12 | 14 | WL |
| WL212 (new) | 06/06/12 | 1 | NWL |
| | 06/06/12 | 11 | NWL |
| | 16/08/12 | 3 | WL |
| WL213 (new) | 24/05/12 | 14 | WL |
| | 05/07/12 | 1 | NWL |

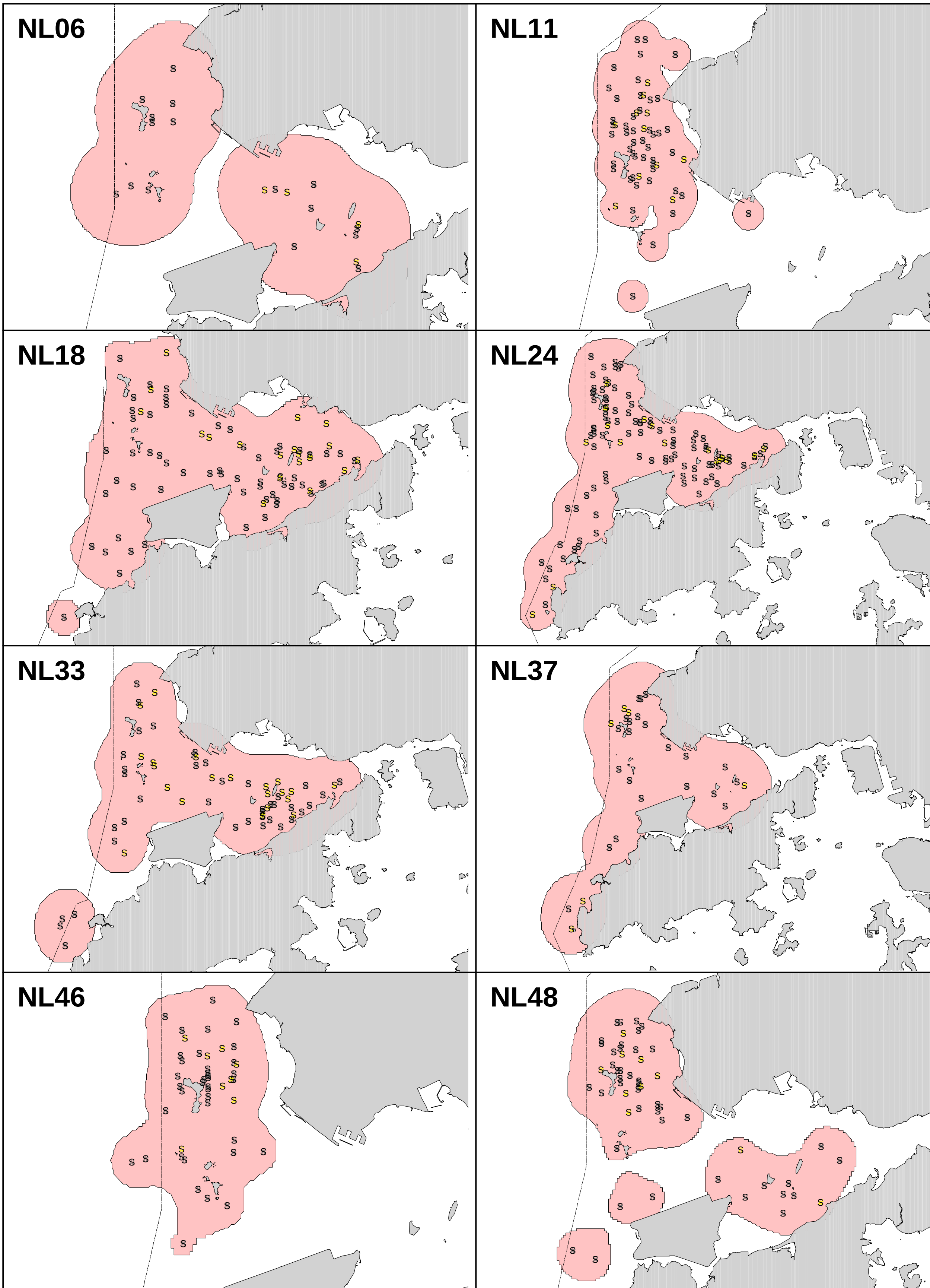
Appendix V. Ranging patterns (95% kernel ranges) of four well-known individual dolphins that were stranded alive or dead during present monitoring period (yellow dots: last five sightings before stranding)



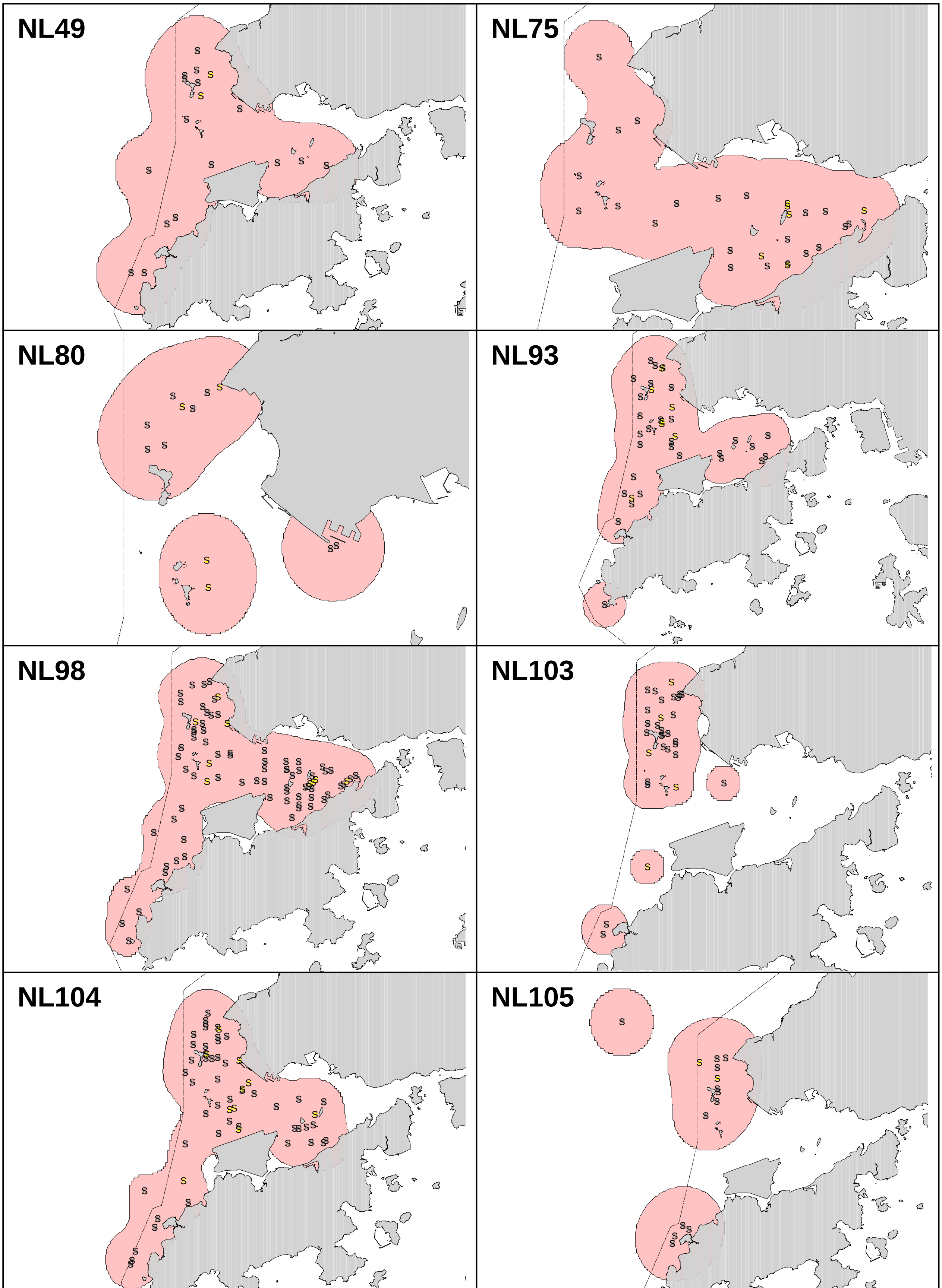
Appendix VI. Ranging patterns (95% kernel ranges) of 120 individual dolphins with 10+ re-sightings that were sighted during 2012-13 AFCD monitoring period (note: yellow dots indicates sightings made in 2012)



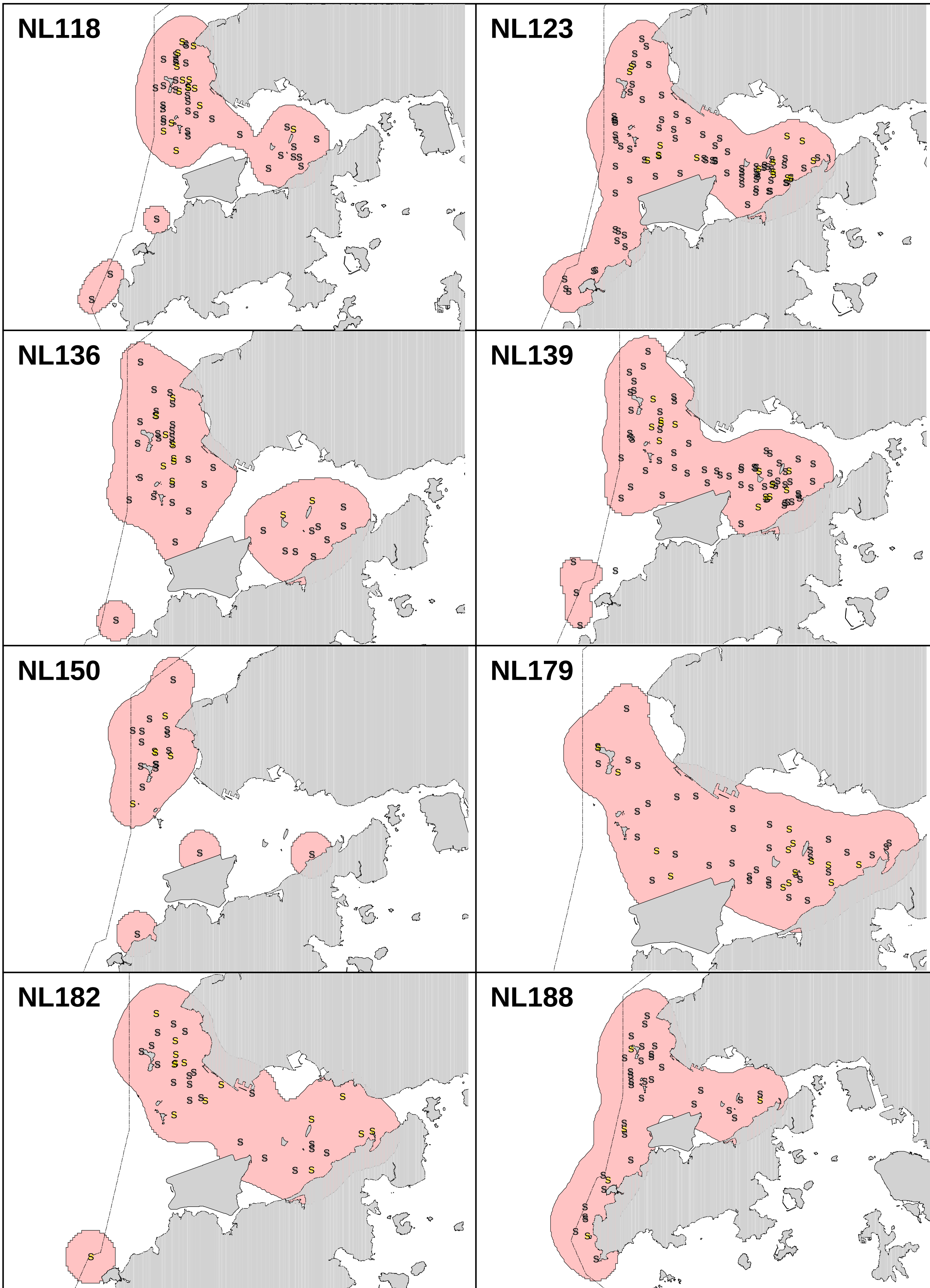
Appendix VI (cont'd).



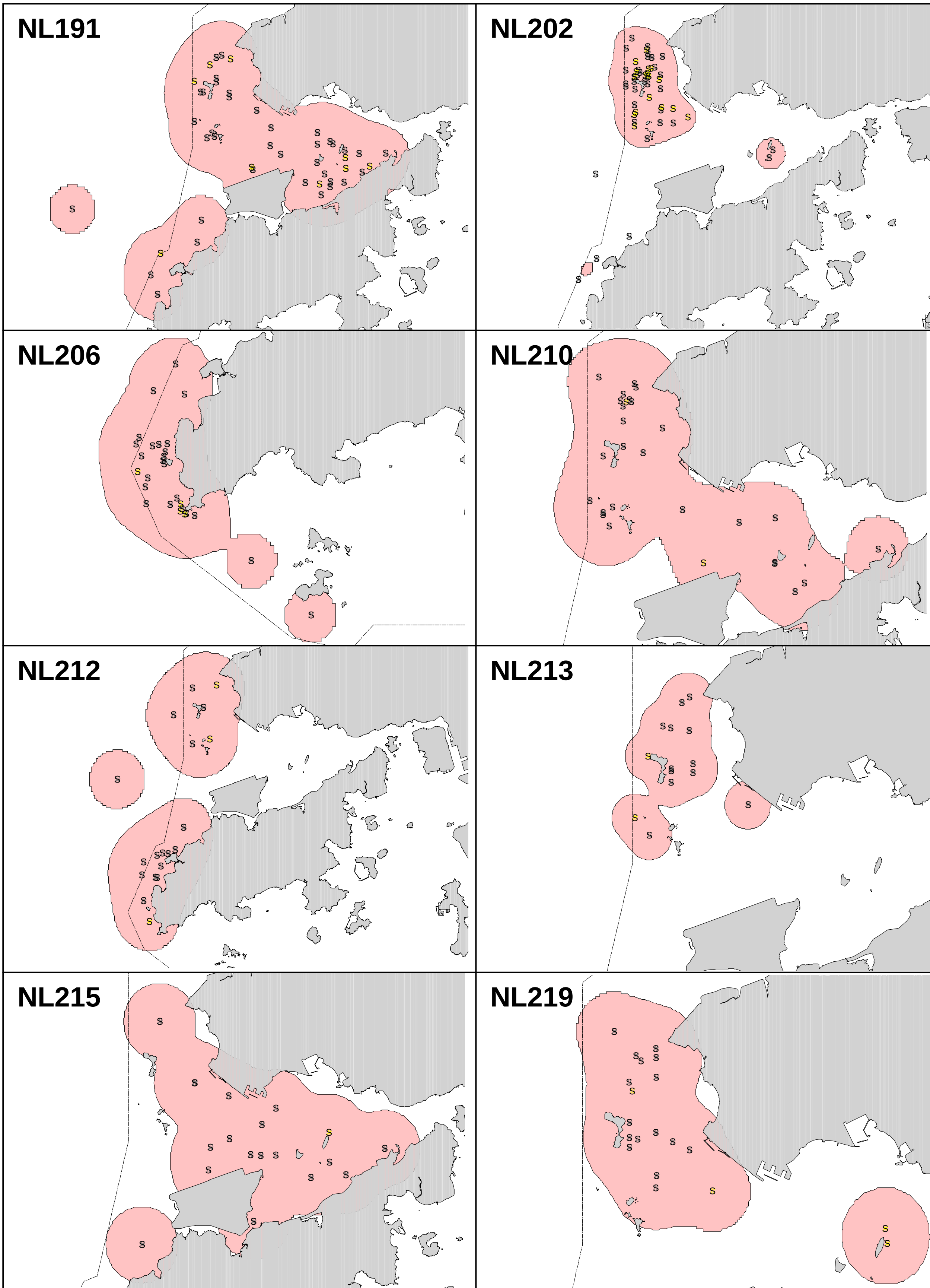
Appendix VI (cont'd).



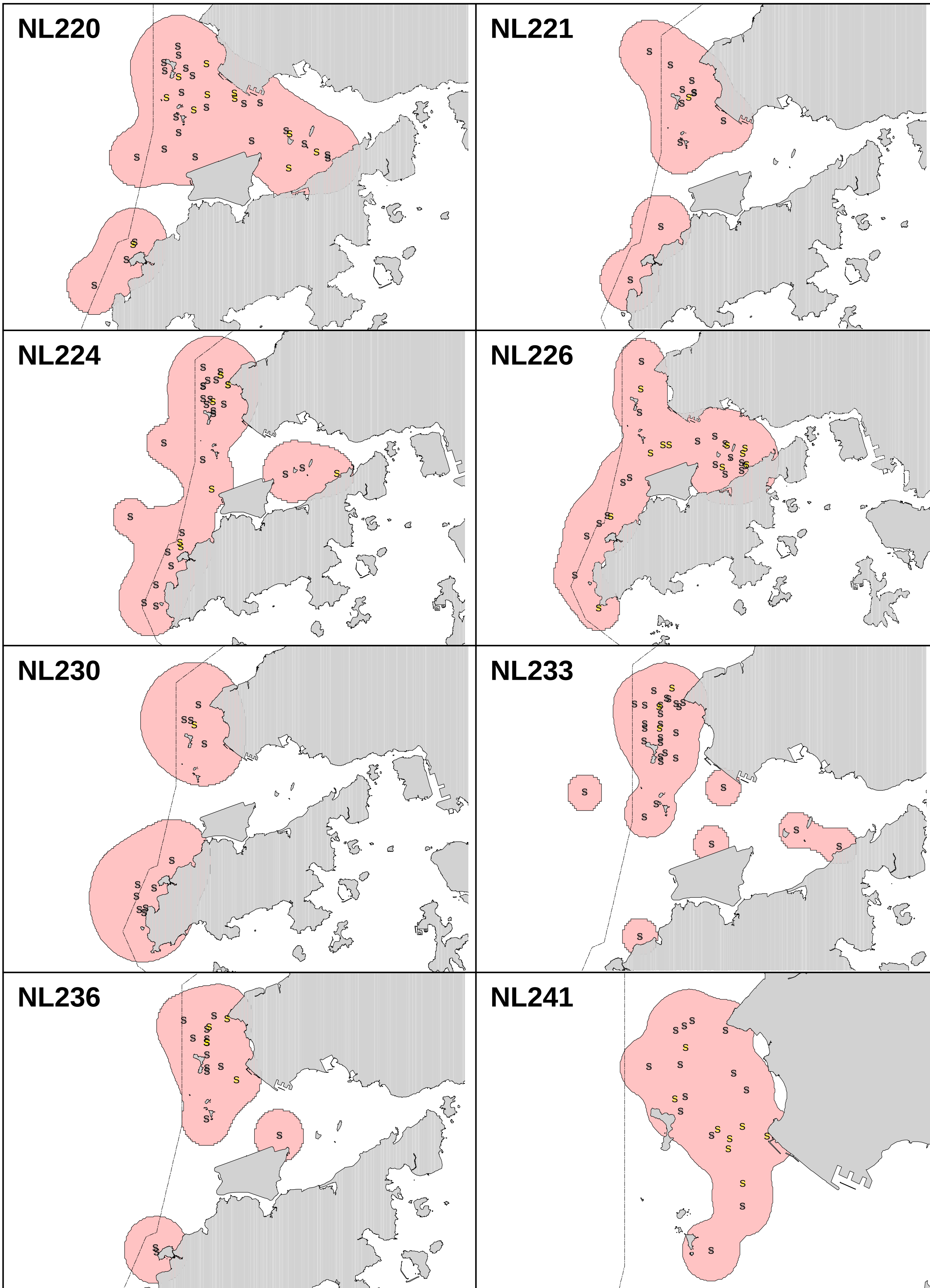
Appendix VI (cont'd).



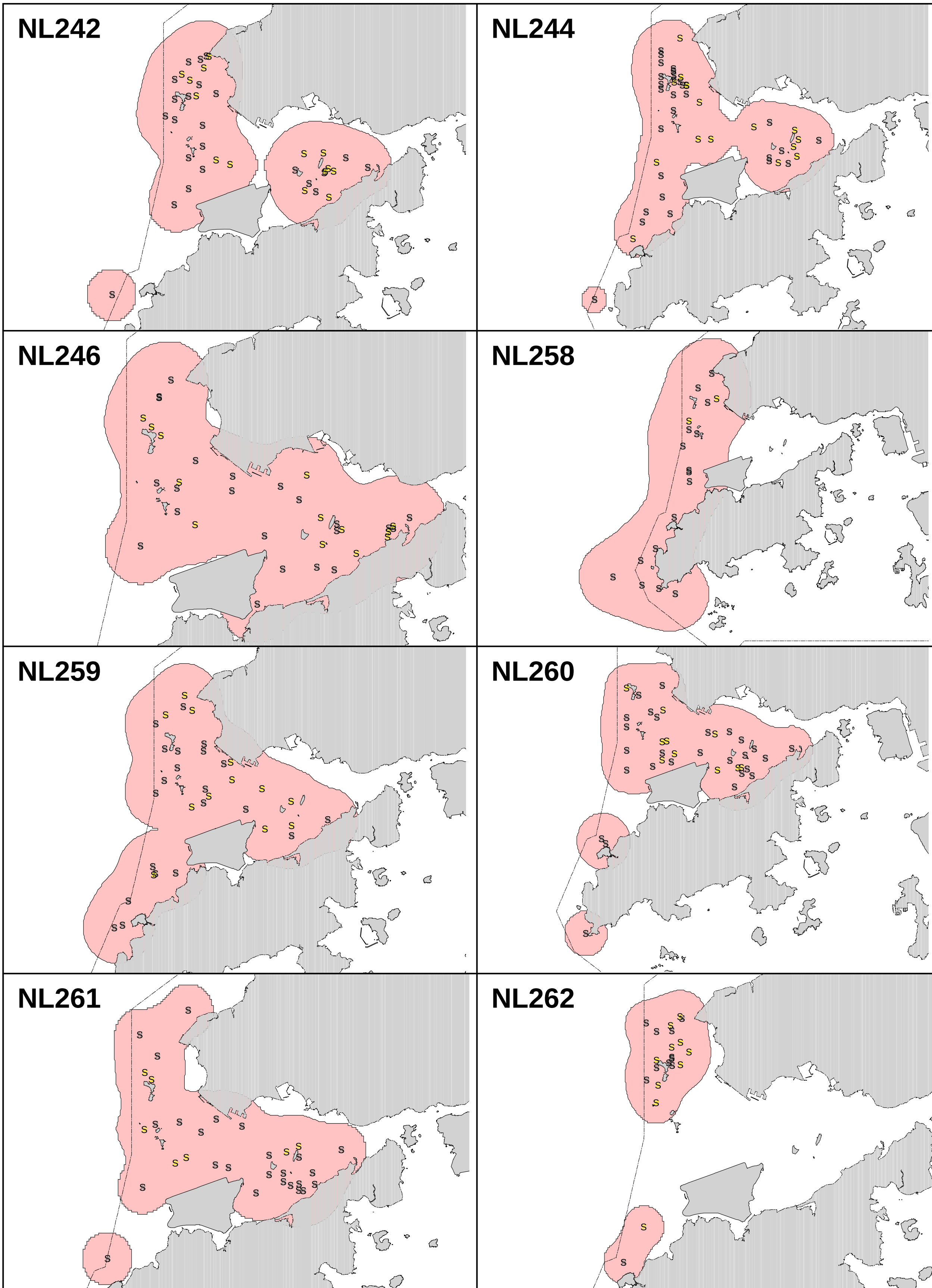
Appendix VI (cont'd).



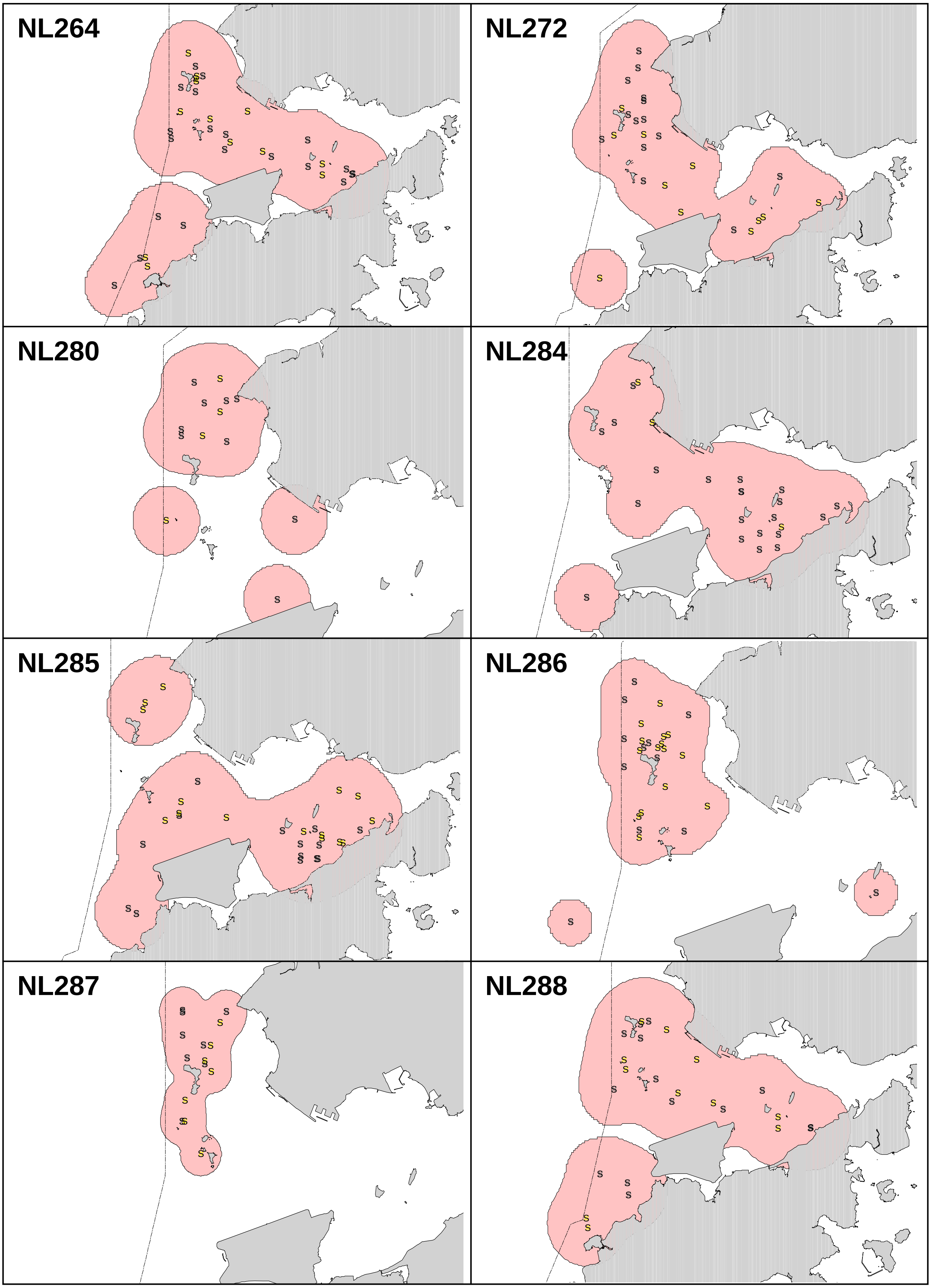
Appendix VI (cont'd).



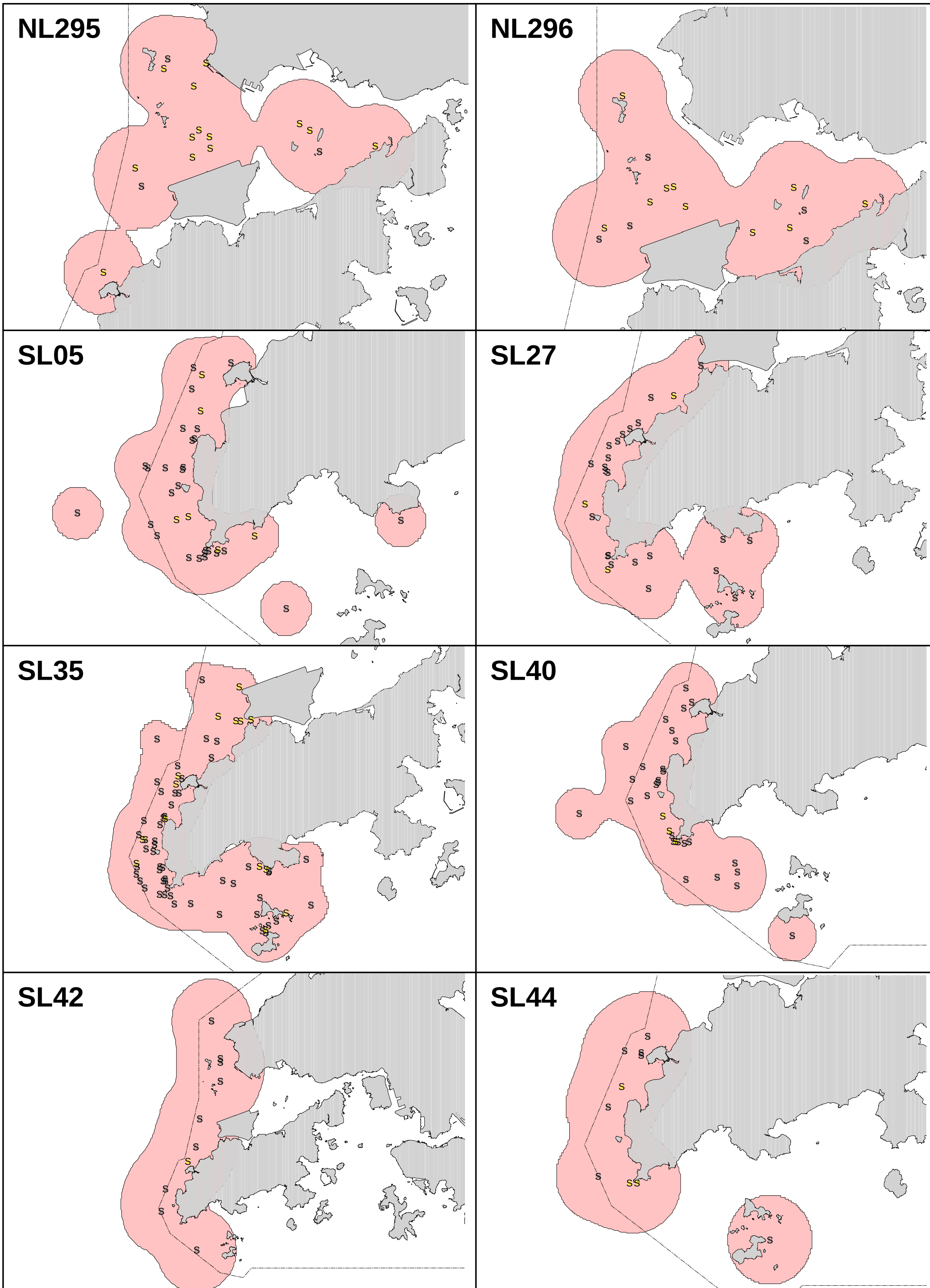
Appendix VI (cont'd).



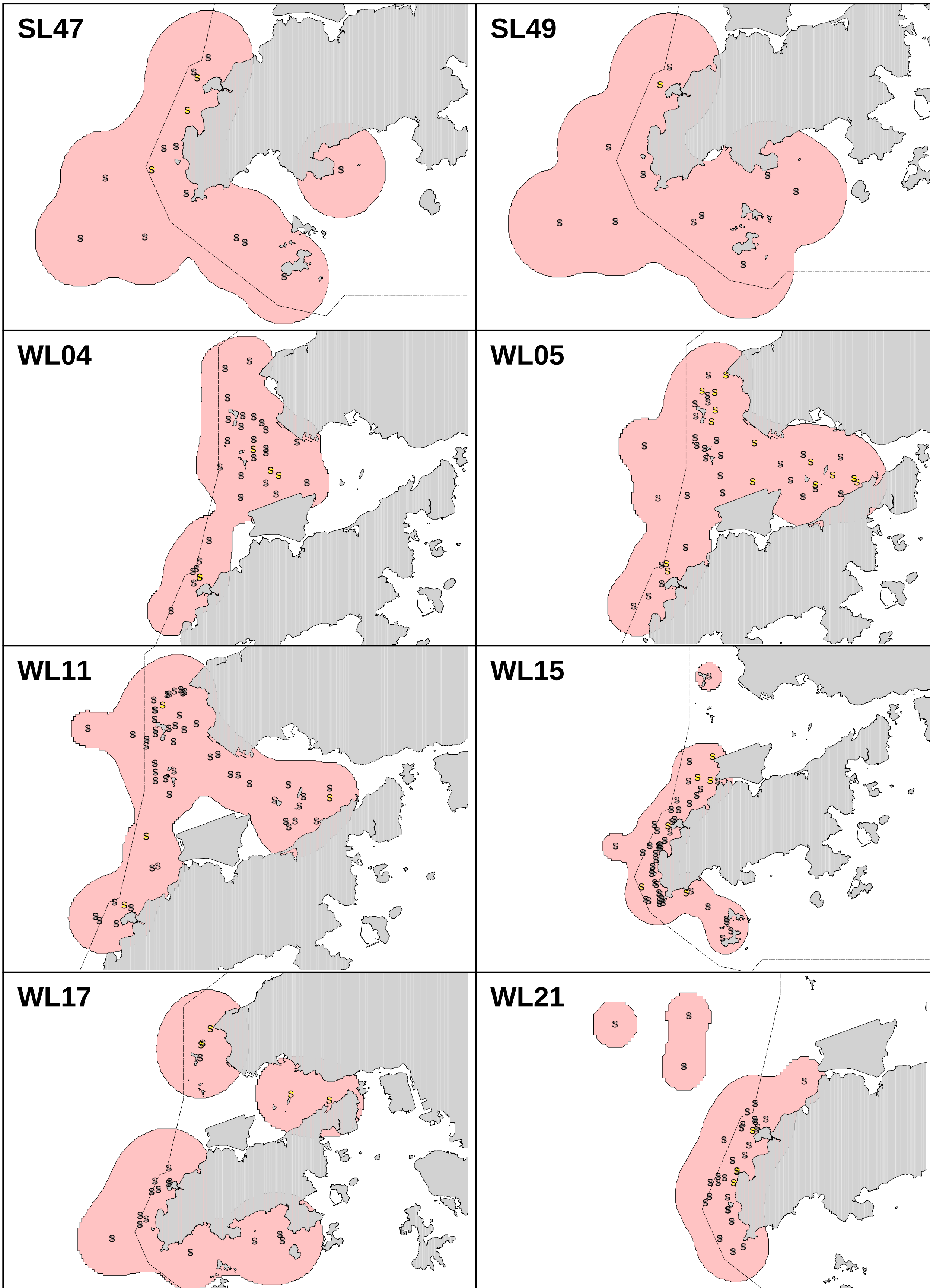
Appendix VI (cont'd).



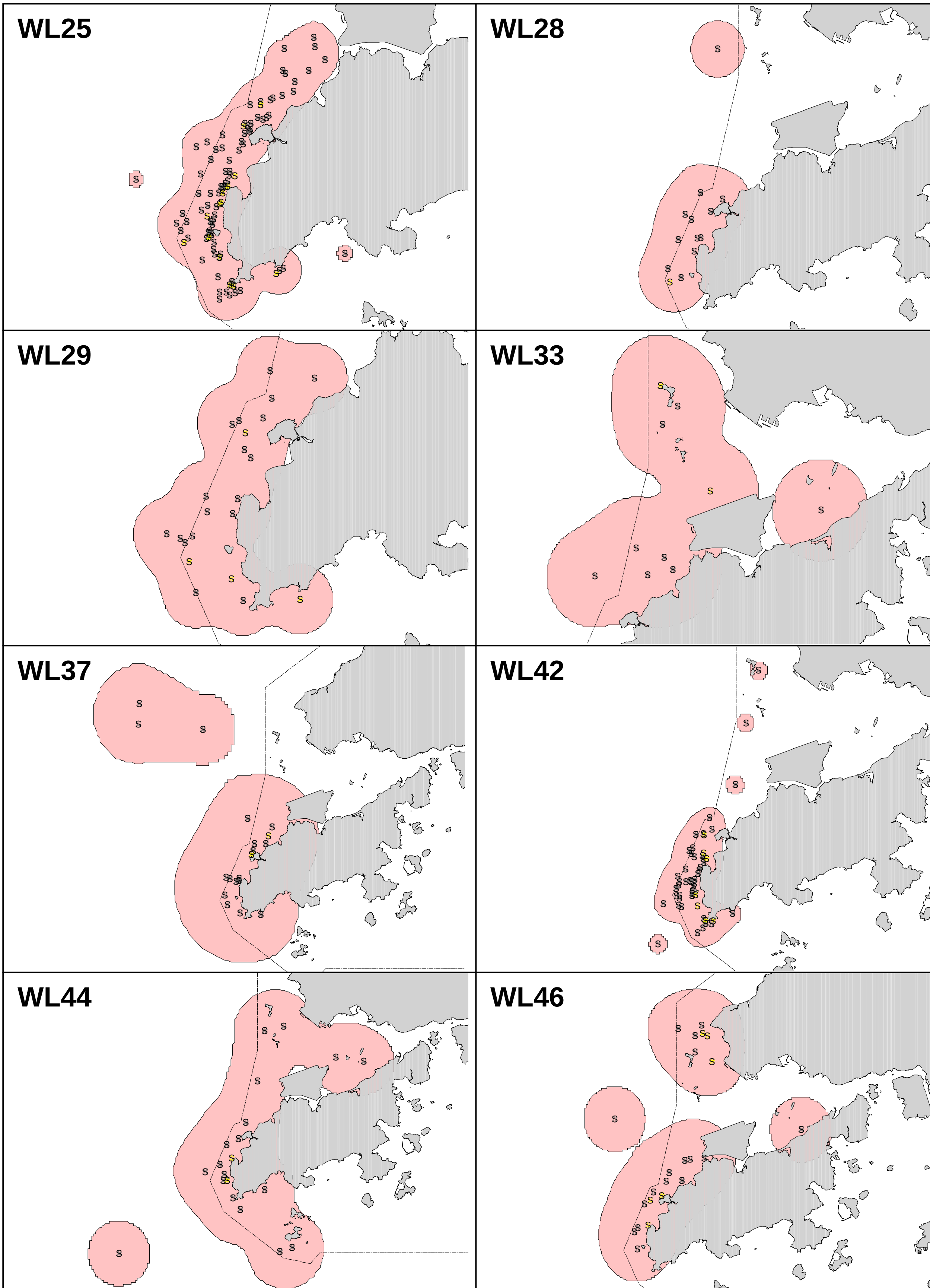
Appendix VI (cont'd).



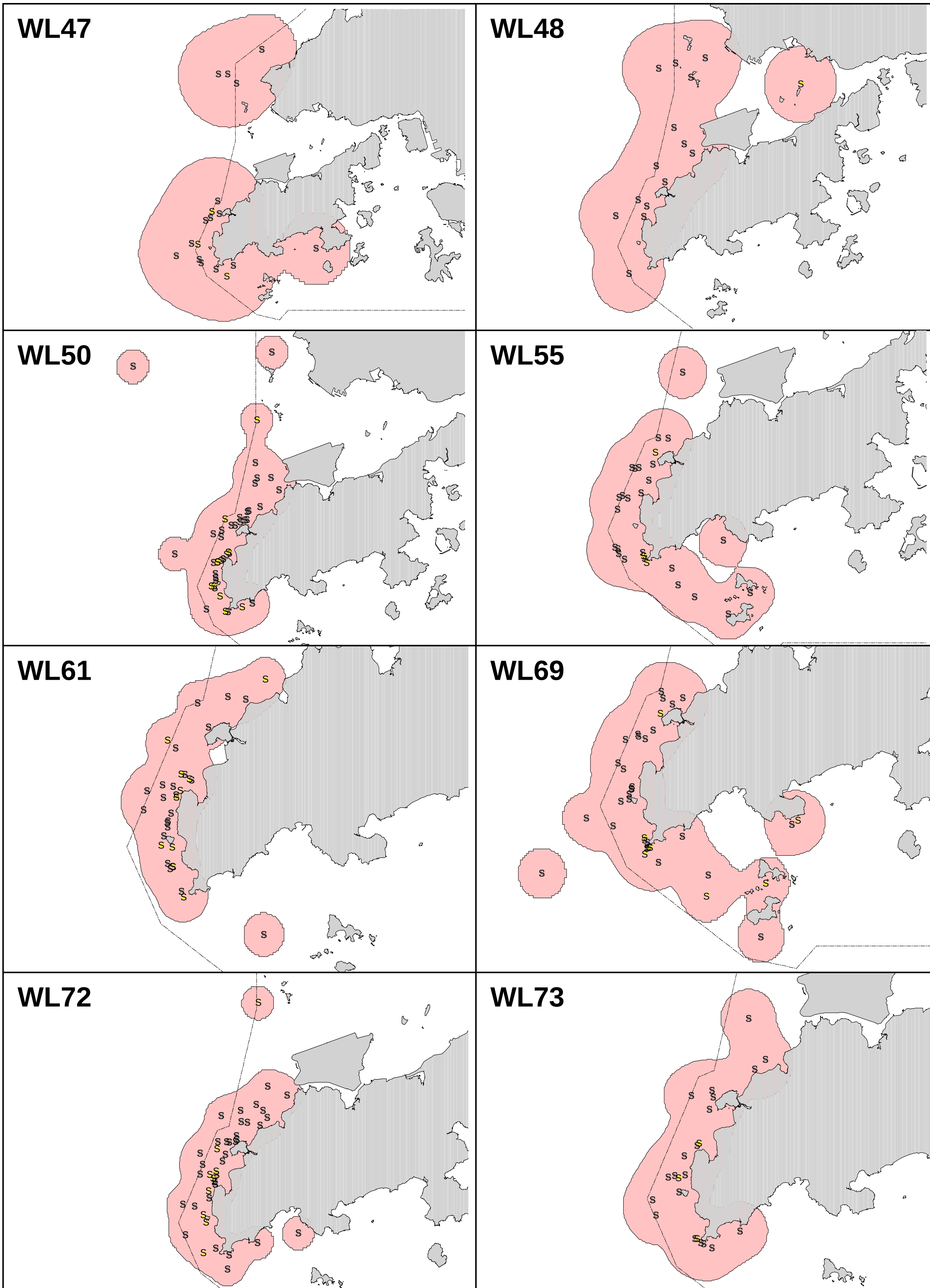
Appendix VI (cont'd).



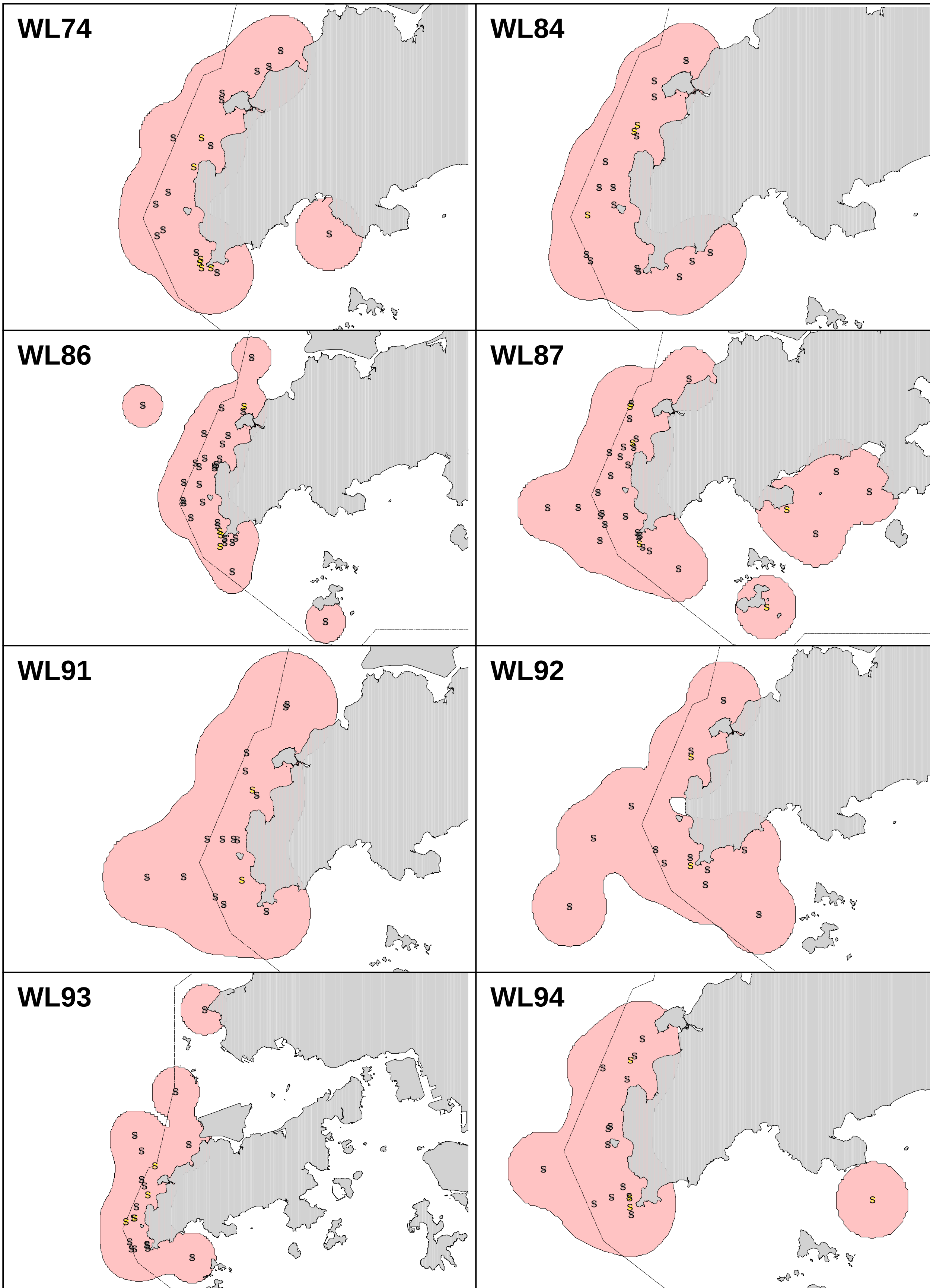
Appendix VI (cont'd).



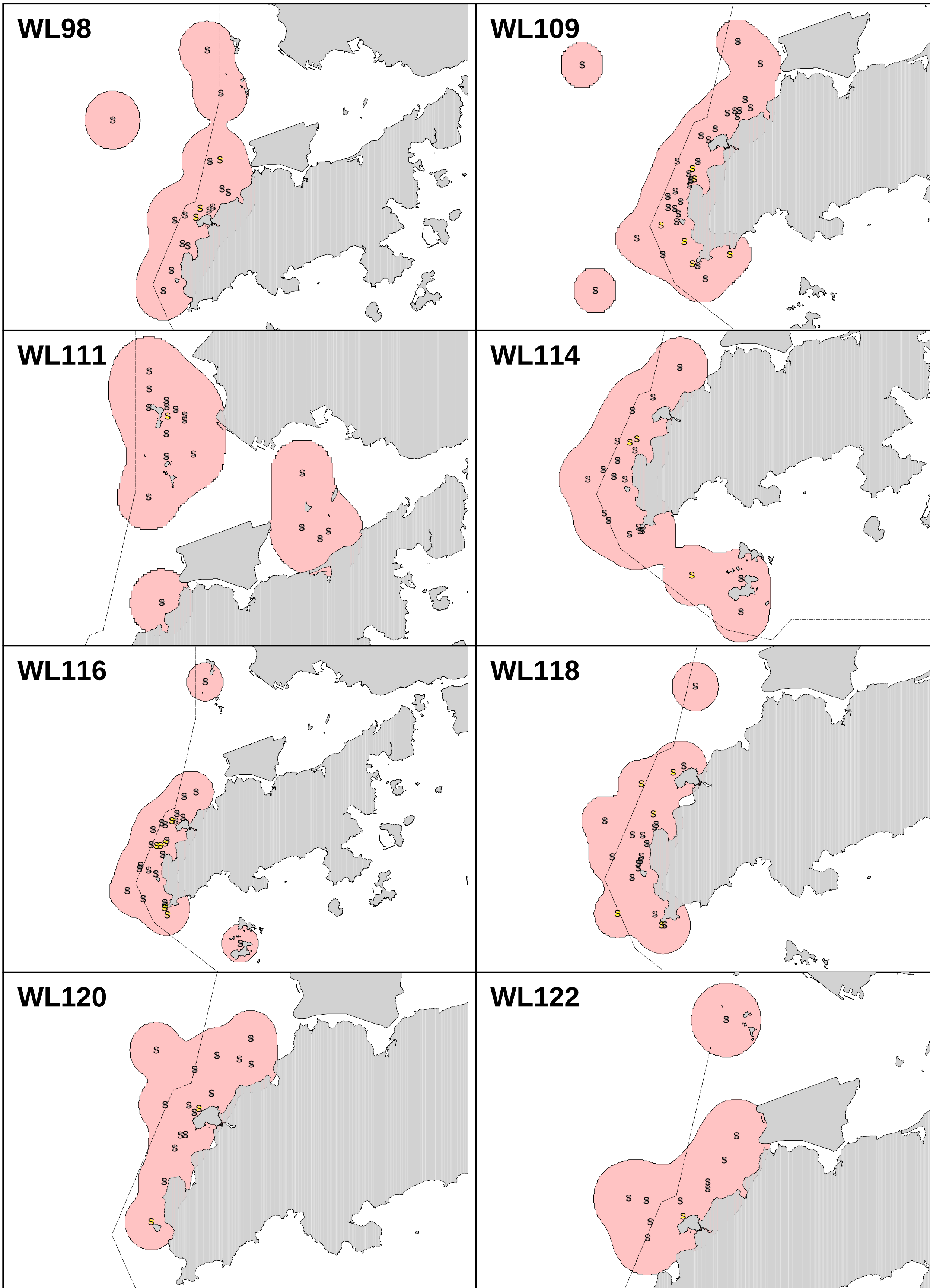
Appendix VI (cont'd).



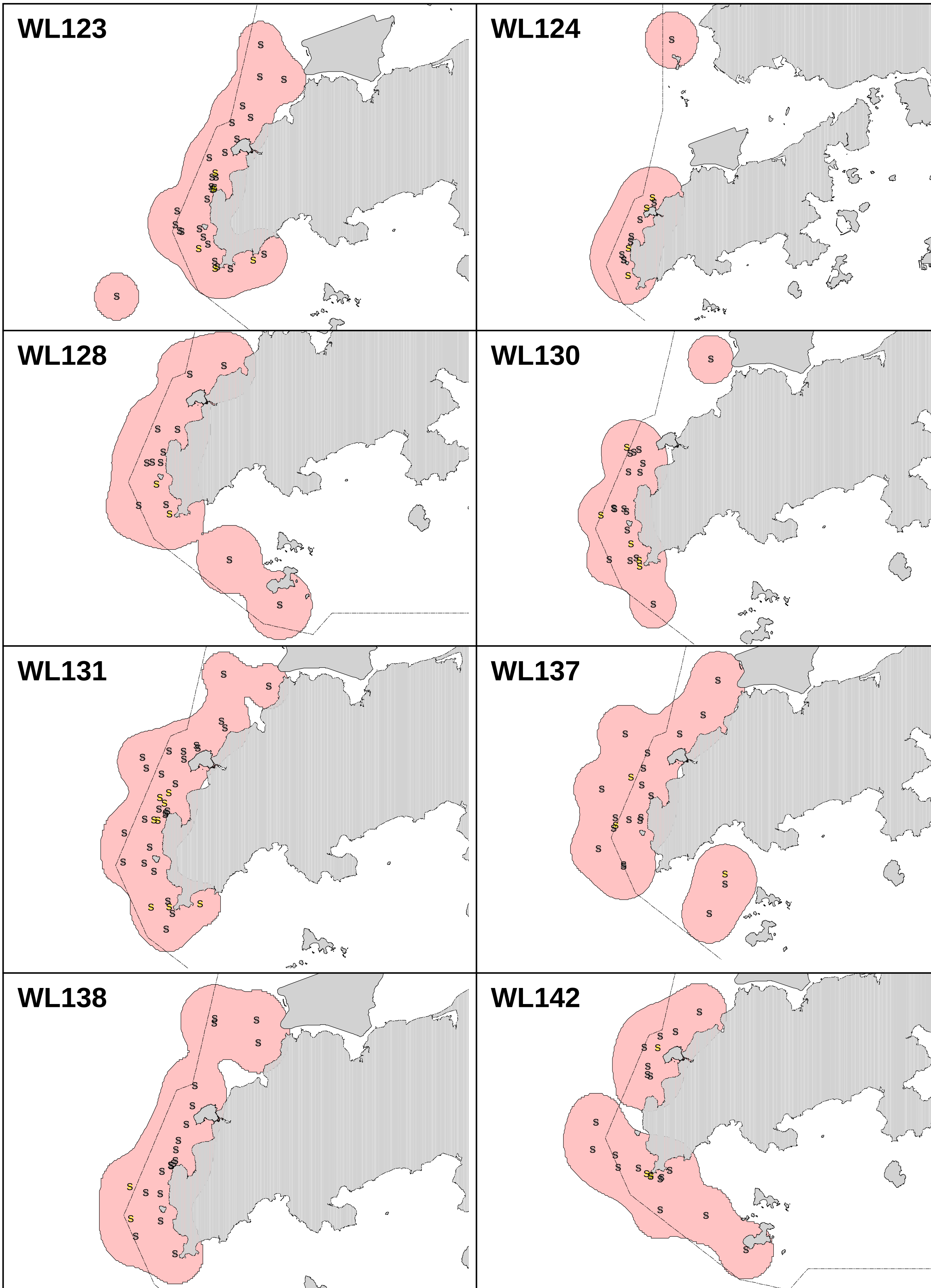
Appendix VI (cont'd).



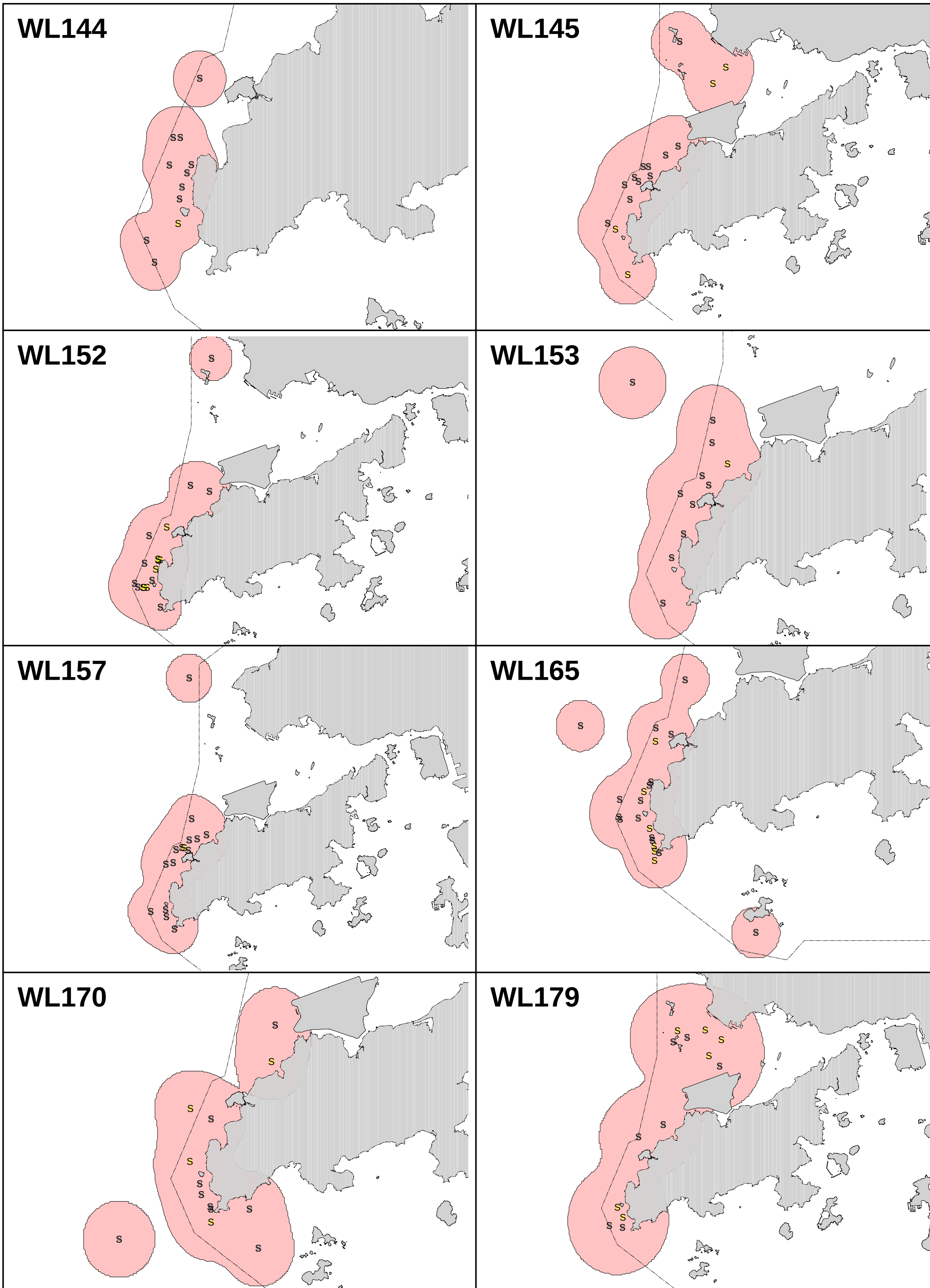
Appendix VI (cont'd).



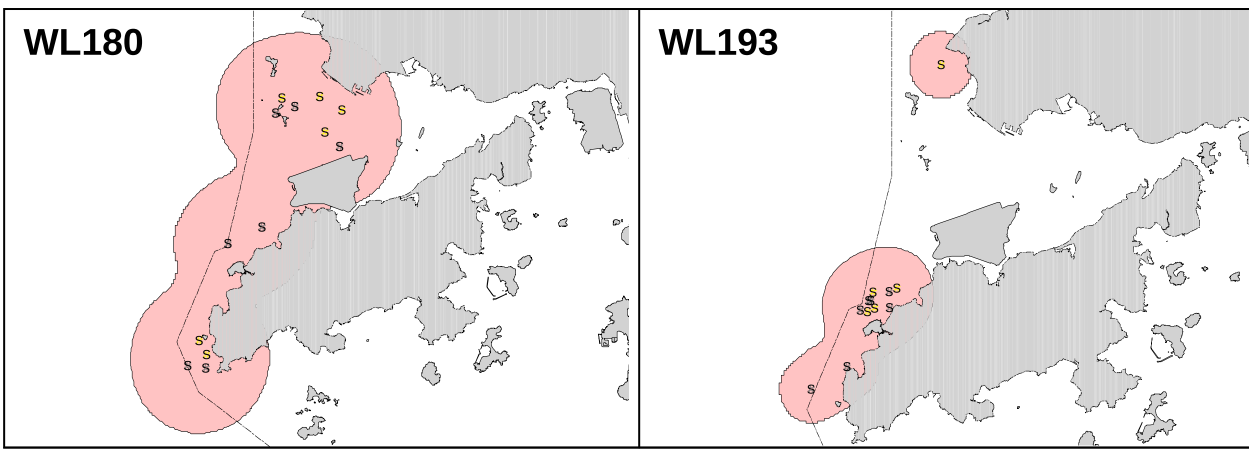
Appendix VI (cont'd).



Appendix VI (cont'd).



Appendix VI (cont'd).



## Appendix VII.  Underwater Acoustic Database (April 2012 - March 2013)

| | | Begin | End | Location | | | | | | Hp | | ICP | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | File # | Time | Time | Latitude | Longitude | Area | Event | Beau | Hp | Depth | HPF | Gain | Note(s) |
| 11-Apr-12 | 1 | 11:01:41 | 11:04:44 | 22.1864 | 113.9833 | SE LANTAU | SEL Station#1 | 2 | CR1 | 7 | N | 10x | |
| 11-Apr-12 | 2 | 13:22:32 | 13:26:52 | 22.2078 | 113.9339 | SW LANTAU | STG#6 | 2 | CR1 | 7 | Y | 10x | Subgroup of 3 porpoises passing by the end of boat (~200m) in first minute |
| 11-Apr-12 | 3 | 16:02:48 | 16:05:38 | 22.2004 | 113.8766 | SW LANTAU | SWL Station#3 | 2 | CR1 | 7 | N | 10x | Croaking sound, Out of battery |
| 12-Apr-12 | 1 | 11:48:11 | 11:51:21 | 22.2233 | 113.8326 | W LANTAU | WLStation#2 | 2 | CR1 | 7 | N | 10x | Container boat ~800m away |
| 12-Apr-12 | 2 | 12:31:50 | 12:34:51 | 22.1874 | 113.8399 | W LANTAU | WL Station#3 | 2 | CR1 | 7 | N | 10x | |
| 12-Apr-12 | 3 | 15:41:40 | 15:44:42 | 22.3837 | 113.8874 | NW LANTAU | NWL Station#2 | 3 | CR1 | 7 | N | 10x | |
| 26-Apr-12 | 1 | 11:58:09 | 12:01:09 | 22.2207 | 113.9726 | SE LANTAU | SEL Station#2 | 2 | CR1 | 7 | N | 10x | croaking sound |
| 26-Apr-12 | 2 | 15:56:41 | 15:59:42 | 22.2101 | 113.8863 | SW LANTAU | SWL Station#3 | 2 | CR1 | 7 | N | 10x | |
| 27-Apr-12 | 1 | 11:39:54 | 11:45:03 | 22.3966 | 113.8967 | NW LANTAU | NWL Station#3 | 3 | CR1 | 7 | N | 10x | snapping shrimp sound |
| 27-Apr-12 | 2 | 14:39:24 | 14:42:24 | 22.3333 | 113.9737 | NE LANTAU | NEL Station#2 | 2 | CR1 | 7 | N | 10x | |
| 4-May-12 | 1 | 10:56:39 | 11:00:48 | 22.3474 | 113.8695 | NW LANTAU | NWL Station#1 | 3 | CR1 | 5.5 | N | 10x | snapping shrimp sound |
| 4-May-12 | 2 | 13:38:21 | 13:44:03 | 22.3606 | 113.9275 | NW LANTAU | NWL Station#4 | 2 | CR1 | 7 | N | 10x | faint croaking sound |
| 15-May-12 | 1 | 12:37:03 | 12:40:05 | 22.1914 | 113.8471 | W LANTAU | WL Station#3 | 2 | CR1 | 7 | N | 10x | |
| 18-May-12 | 1 | 14:37:36 | 14:54:53 | 22.3184 | 113.9561 | NE LANTAU | NEL Station#1 | 2 | CR1 | 5.5 | N | 10x | |
| 18-May-12 | 2 | 15:23:32 | 15:40:30 | 22.3313 | 113.9796 | NE LANTAU | NEL Station#2 | 3 | CR1 | 7 | N | 10x | Snapping shrimp sound; croaking sound; dolphin >300m (breaching) |
| 23-May-12 | 1 | 13:32:21 | 13:36:22 | 22.4224 | 113.9064 | DEEP BAY | DB Station#1 | 3 | CR1 | 7 | N | 10x | Barge ~800m stationary (grabbing stone) |
| 23-May-12 | 2 | 13:42:36 | 13:46:03 | 22.4187 | 113.9105 | DEEP BAY | Inshore of Deep Bay | 2 | CR1 | 6 | N | 10x | Barge ~210m stationary (grabbing stone) @00.10, snapping shrimp noise |
| 23-May-12 | 3 | 16:21:32 | 16:36:21 | 22.3235 | 113.9853 | NE LANTAU | NEL Station#2 | 4 | CR1 | 7 | N | 10x | |
| 24-May-12 | 1 | 10:00:31 | 10:27:35 | 22.2657 | 113.8554 | W LANTAU | Tai O | 4 | CR1 | 7 | N | 10x | |
| 24-May-12 | 2 | 10:48:44 | 11:29:38 | 22.2581 | 113.8479 | W LANTAU | Tai O | 3 | CR1 | 7 | N | 10x | HPF on @01:42, dolphin within 100m; HPF off @10:30 |
| 30-May-12 | 1 | 15:51:31 | 15:54:50 | 22.3940 | 113.8970 | NW LANTAU | NWL Station#3 | 2 | CR1 | 7 | N | 10x | |
| 30-May-12 | 2 | 17:51:37 | 18:21:49 | 22.3820 | 113.8752 | NW LANTAU | NWL Station#2 | 2 | CR1 | 7 | N | 10x | Snapping shrimp sound |
| 30-May-12 | 3 | 21:02:11 | 21:33:02 | 22.2553 | 113.8480 | W LANTAU | Tai O | 1 | CR1 | 7 | N | 10x | Croaking sound; snapping shrimp sound; strange interference noise |
| 30-May-12 | 5 | 22:52:38 | 23:11:27 | 22.1956 | 113.8434 | W LANTAU | Fan Lau | 1 | CR1 | 7 | N | 10x | dolphin near the boat (~200m); boat in front of the bow @05:41 |
| 6-Jun-12 | 1 | 12:04:04 | 12:07:05 | 22.2219 | 113.8319 | W LANTAU | WL Station#2 | 3 | CR1 | 7 | N | 10x | |
| 7-Jun-12 | 2 | 12:53:38 | 12:57:11 | 22.3303 | 113.9163 | NW LANTAU | NWL Station#5 | 2 | CR1 | 7 | N | 10x | |
| 7-Jun-12 | 3 | 13:27:32 | 13:32:35 | 22.3574 | 113.9373 | NW LANTAU | NWL Station#4 | 3 | CR1 | 7 | N | 10x | |
| 7-Jun-12 | 4 | 16:30:26 | 16:33:31 | 22.3303 | 113.9846 | NE LANTAU | NEL Station#2 | 3 | CR1 | 7 | N | 10x | |
| 8-Jun-12 | 1 | 13:32:01 | 13:35:13 | 22.1751 | 113.9217 | SW LANTAU | SWL Station#2 | 2 | CR1 | 7 | N | 10x | |
| 14-Jun-12 | 1 | 14:54:20 | 15:00:54 | 22.3631 | 113.9719 | NE LANTAU | NEL Station#3 | 2 | CR1 | 7 | N | 10x | |
| 14-Jun-12 | 2 | 15:36:37 | 15:39:51 | 22.3298 | 113.9837 | NE LANTAU | NEL Station#2 | 3 | CR1 | 5.5 | N | 10x | Snapping shrimp |
| 21-Jun-12 | 1 | 10:52:36 | 10:58:58 | 22.2778 | 113.8625 | W LANTAU | WL Station#1 | 2 | CR1 | 7 | N | 10x | |
| 21-Jun-12 | 2 | 13:04:23 | 13:04:57 | 22.1870 | 113.8424 | W LANTAU | WL Station#3 | 3 | CR1 | 7 | N | 10x | |
| 21-Jun-12 | 3 | 13:06:50 | 13:12:10 | 22.1865 | 113.8432 | W LANTAU | WL Station#3 | 3 | CR1 | 7 | N | 10x | |
| 28-Jun-12 | 2 | 12:35:35 | 12:45:38 | 22.1905 | 113.8419 | W LANTAU | WL Station#3 | 3 | CR1 | 7 | N | 10x | |
| 28-Jun-12 | 3 | 15:38:16 | 15:41:34 | 22.3917 | 113.9061 | NW LANTAU | NWL Station#3 | 3 | CR1 | 7 | N | 10x | |
| 5-Jul-12 | 1 | 12:32:42 | 12:38:15 | 22.1869 | 113.8429 | W LANTAU | WL Station#3 | 2 | CR1 | 7 | N | 10x | |
| 6-Jul-12 | 1 | 14:27:53 | 14:33:02 | 22.3621 | 113.9770 | NE LANTAU | NEL Station#3 | 3 | CR1 | 7 | N | 10x | snapping shrimp sound |
| 6-Jul-12 | 2 | 16:03:49 | 16:09:02 | 22.3538 | 114.0229 | NE LANTAU | NEL Station#4 | 2 | CR1 | 7 | N | 10x | |
| 10-Jul-12 | 4 | 15:48:37 | 15:51:44 | 22.2043 | 113.8839 | SW LANTAU | SWL Station#3 | 2 | CR1 | 7 | N | 10x | snapping shrimp sound |
| 6-Aug-12 | 1 | 10:40:38 | 10:43:41 | 22.3527 | 114.0229 | NE LANTAU | NEL Station#4 | 2 | CR1 | 7 | N | 10x | |
| 6-Aug-12 | 2 | 15:14:08 | 15:17:15 | 22.3943 | 113.9072 | NW LANTAU | NWL Station#3 | 2 | CR1 | 7 | N | 10x | |
| 9-Aug-12 | 1 | 14:46:29 | 14:51:38 | 22.3577 | 113.9345 | NW LANTAU | NWL Station#4 | 4 | CR1 | 7 | N | 10x | |
| 9-Aug-12 | 2 | 15:47:39 | 15:50:39 | 22.3316 | 113.9733 | NE LANTAU | NEL Station#2 | 2 | CR1 | 5.5 | N | 10x | BCF stationary sand barge 808m |

## Appendix VII.  (cont'd)

| Date | File # | Begin Time | End Time | Location Latitude | Location Longitude | Area | Event | Beau | Hp | Hp Depth | HPF | ICP Gain | Note(s) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 15-Aug-12 | 1 | 10:38:04 | 10:41:15 | 22.2764 | 113.8609 | W LANTAU | WL Station#1 | 2 | CR1 | 7 | N | 10x | Dolphins behind hang trawler (Stg#3) |
| 15-Aug-12 | 2 | 16:11:08 | 16:14:08 | 22.3303 | 113.9262 | NW LANTAU | NWL Station#5 | 2 | CR1 | 7 | N | 10x | Snapping shrimp sound |
| 21-Aug-12 | 1 | 13:00:07 | 13:03:07 | 22.1477 | 113.9068 | SW LANTAU | SWL Station#1 | 2 | CR1 | 7 | N | 10x | |
| 21-Aug-12 | 2 | 13:24:14 | 13:27:14 | 22.1745 | 113.9105 | SW LANTAU | SWL Station#2 | 2 | CR1 | 7 | N | 10x | |
| 29-Aug-12 | 1 | 12:14:07 | 12:17:08 | 22.3302 | 113.9835 | NE LANTAU | NEL Station#2 | 2 | CR1 | 5.5 | N | 10x | Dolphins close to our boat ~150m closest (Stg#1) |
| 30-Aug-12 | 1 | 11:02:44 | 11:05:46 | 22.2219 | 113.8351 | W LANTAU | WL Station#2 | 3 | CR1 | 7 | N | 10x | Snapping shrimp sound |
| 30-Aug-12 | 2 | 15:35:50 | 15:39:00 | 22.2219 | 113.9709 | SE LANTAU | SEL Station#2 | 2 | CR1 | 7 | N | 10x | |
| 19-Sep-12 | 1 | 11:17:53 | 11:22:54 | 22.1901 | 113.9826 | SE LANTAU | SEL Station#1 | 3 | CR1 | 7 | N | 10x | the plaform and the vessels are around proposed reclaimation area |
| 19-Sep-12 | 2 | 14:03:34 | 14:06:46 | 22.1752 | 113.9121 | SW LANTAU | SWL Station#2 | 3 | CR1 | 7 | N | 10x | |
| 19-Sep-12 | 3 | 14:41:27 | 14:44:46 | 22.2009 | 113.8874 | SW LANTAU | SWL Station#3 | 3 | CR1 | 7 | N | 10x | |
| 20-Sep-12 | 4 | 11:46:35 | 11:49:39 | 22.3836 | 113.8849 | NW LANTAU | NWL Station#2 | 2 | CR1 | 7 | N | 10x | STG#1 (NL202, NL286 ~500m away); snapping shrimp sound |
| 20-Sep-12 | 5 | 13:52:28 | 13:55:28 | 22.3384 | 113.9273 | NW LANTAU | NWL Station#4 | 3 | CR1 | 7 | N | 10x | |
| 20-Sep-12 | 6 | 15:42:12 | 15:45:15 | 22.3305 | 113.9840 | NE LANTAU | NEL Station#2 | 3 | CR1 | 7 | N | 10x | radio interference |
| 24-Sep-12 | 1 | 22:32:52 | 23:34:54 | 22.3350 | 113.9772 | NE LANTAU | Between Brother Islands | 2 | CR1 | 7 | N | 10x | Heavy rain overnight |
| 28-Sep-12 | 1 | 10:11:45 | 10:18:53 | 22.3309 | 113.9730 | NE LANTAU | NEL Station#3 | 3 | CR1 | 7 | N | 10x | |
| 3-Oct-12 | 1 | 10:49:40 | 10:52:48 | 22.2773 | 113.8613 | W LANTAU | WL Station#1 | 3 | CR1 | 7 | N | 10x | |
| 4-Oct-12 | 2 | 14:37:21 | 14:40:28 | 22.3626 | 113.9847 | NE LANTAU | NEL Station#3 | 3 | CR1 | 7 | N | 10x | |
| 4-Oct-12 | 3 | 15:39:26 | 15:41:05 | 22.3526 | 114.0236 | NE LANTAU | NEL Station#4 | 3 | CR1 | 7 | N | 10x | |
| 16-Oct-12 | 1 | 12:03:04 | 12:06:05 | 22.1976 | 113.8772 | SW LANTAU | SWL Station#3 | 3 | CR1 | 7 | N | 10x | |
| 16-Oct-12 | 2 | 15:03:47 | 15:06:47 | 22.1565 | 113.9542 | SE LANTAU | SEL Station#3 | 3 | CR1 | 7 | N | 10x | |
| 9-Nov-12 | 1 | 11:00:13 | 11:03:15 | 22.3409 | 113.9172 | NW LANTAU | NWL Station#5 | 3 | CR1 | 7 | N | 10x | |
| 12-Nov-12 | 1 | 13:24:59 | 13:32:02 | 22.3229 | 113.9123 | NW LANTAU | Airport central buoy | 2 | CR1 | 7 | N | 10x | |
| 12-Nov-12 | 2 | 14:08:27 | 14:13:45 | 22.3376 | 113.8980 | NW LANTAU | Sha Chau SE buoy | 2 | CR1 | 7 | N | 10x | |
| 21-Nov-12 | 1 | 12:59:34 | 13:02:34 | 22.1488 | 113.8970 | SW LANTAU | SWL Station#1 | 4 | CR1 | 7 | N | 10x | |
| 21-Nov-12 | 2 | 14:44:34 | 14:47:40 | 22.1740 | 113.9204 | SW LANTAU | SWL Station#2 | 3 | CR1 | 7 | N | 10x | |
| 20-Dec-12 | 3 | 11:16:33 | 11:21:59 | 22.3535 | 114.0221 | NE LANTAU | NEL Station#4 | 3 | CR1 | 7 | N | 10x | |
| 20-Dec-12 | 5 | 13:05:31 | 13:07:11 | 22.3289 | 113.9850 | NE LANTAU | NEL Station#2 | 4 | CR1 | 7 | N | 10x | |
| 20-Dec-12 | 6 | 13:30:37 | 13:33:42 | 22.3617 | 113.9844 | NE LANTAU | NEL Station#3 | 3 | CR1 | 7 | N | 10x | 2 container boats >1km away |
| 20-Dec-12 | 7 | 14:28:47 | 14:32:08 | 22.3262 | 113.9655 | NE LANTAU | NEL Station#1 | 4 | CR1 | 7 | N | 10x | |
| 20-Dec-12 | 8 | 16:00:49 | 16:04:06 | 22.3322 | 113.9267 | NW LANTAU | NWL Station#5 | 3 | CR1 | 7 | N | 10x | |
| 21-Dec-12 | 1 | 11:39:29 | 11:43:09 | 22.2027 | 113.8872 | SW LANTAU | SWL Station#3 | 2 | CR1 | 7 | N | 10x | |
| 21-Dec-12 | 2 | 12:40:28 | 12:45:42 | 22.1479 | 113.9067 | SW LANTAU | SWL Station#1 | 2 | CR1 | 7 | N | 10x | |
| 21-Dec-12 | 3 | 15:23:20 | 15:26:23 | 22.1916 | 113.9819 | SE LANTAU | SEL Station#1 | 2 | CR1 | 7 | N | 10x | |
| 28-Dec-12 | 9 | 11:01:36 | 11:04:37 | 22.3522 | 113.8698 | NW LANTAU | NWL Station#1 | 2 | CR1 | 5.5 | N | 10x | radio interference |
| 28-Dec-12 | 10 | 13:49:29 | 13:58:29 | 22.4223 | 113.9099 | DEEP BAY | DB Station#1 | 3 | CR1 | 5.5 | N | 10x | radio interference |
| 9-Jan-13 | 1 | 10:35:49 | 10:39:27 | 22.2772 | 113.8615 | W LANTAU | WL Station#1 | 3 | CR1 | 7 | N | 10x | |
| 9-Jan-13 | 2 | 12:11:09 | 12:14:12 | 22.2232 | 113.8353 | W LANTAU | WL Station#2 | 5 | CR1 | 7 | N | 10x | Interference noise |
| 9-Jan-13 | 3 | 14:28:06 | 14:33:10 | 22.3258 | 113.9641 | NE LANTAU | Closest to BCF | 3 | CR1 | 7 | N | 10x | |
| 14-Jan-13 | 1 | 11:09:59 | 11:13:02 | 22.1876 | 113.9831 | SE LANTAU | SE Station#1 | 2 | CR1 | 7 | N | 10x | |
| 14-Jan-13 | 2 | 12:27:58 | 12:30:58 | 22.1567 | 113.9508 | SE LANTAU | SE Station#3 | 2 | CR1 | 7 | N | 10x | |
| 14-Jan-13 | 3 | 14:58:51 | 15:02:59 | 22.2014 | 113.8872 | SW LANTAU | SW Station#3 | 2 | CR1 | 7 | N | 10x | |
| 15-Jan-13 | 4 | 12:20:27 | 12:25:39 | 22.4320 | 113.8975 | DEEP BAY | DB Station #1 / STG#2 | 3 | CR1 | 5.5 | N | 10x | Interference; Dolphins ~200m around |
| 28-Feb-13 | 2 | 10:02:13 | 10:07:16 | 22.3521 | 114.0281 | NE LANTAU | NEL Station#4 | 2 | CR1 | 7 | N | 10x | |
| 28-Feb-13 | 3 | 11:05:54 | 11:08:59 | 22.3624 | 113.9852 | NE LANTAU | NEL Station#3 | 3 | CR1 | 7 | N | 10x | |
| 28-Feb-13 | 4 | 11:33:00 | 11:36:03 | 22.3320 | 113.9759 | NE LANTAU | NEL Station#2 | 3 | CR1 | 7 | N | 10x | Shrimp snapping sound |
| 28-Feb-13 | 5 | 12:04:02 | 12:09:06 | 22.3117 | 113.9662 | NE LANTAU | NEL Station#1 | 2 | CR1 | 4 | N | 10x | |
| 28-Feb-13 | 6 | 13:26:08 | 13:29:40 | 22.3580 | 113.9366 | NW LANTAU | NWL Station#4 | 4 | CR1 | 4 | N | 10x | |
| 28-Feb-13 | 7 | 14:06:54 | 14:09:57 | 22.3290 | 113.9160 | NW LANTAU | NWL Station#5 | 5 | CR1 | 4 | N | 10x | Interference noise |

## Appendix VII. (cont'd)

| Date | File # | Begin Time | End Time | Location | | Area | Event | Beau | Hp | Hp Depth | HPF | ICP Gain | Note(s) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Latitude | Longitude | | | | | | | | |
| 28-Feb-13 | 8 | 15:04:38 | 15:08:39 | 22.3798 | 113.8976 | NW LANTAU | NWL Station#3 | 5 | CR1 | 7 | N | 10x | |
| 28-Feb-13 | 9 | 15:26:31 | 15:29:35 | 22.3846 | 113.8767 | NW LANTAU | NWL Station#2 | 5 | CR1 | 7 | N | 10x | croaker sound; Interference noise; Snapping shrimp sound |
| 28-Feb-13 | 10 | 15:51:20 | 15:54:25 | 22.3480 | 113.8776 | NW LANTAU | NWL Station#1 | 3 | CR1 | 5.5 | N | 10x | croaker sound; Interference noise; Snapping shrimp sound |
| 1-Mar-13 | 11 | 13:14:03 | 13:17:30 | 22.2785 | 113.8617 | W LANTAU | WL Station#1 | 5 | CR1 | 7 | N | 10x | some snapping shrimp |
| 1-Mar-13 | 12 | 13:37:04 | 13:40:05 | 22.2703 | 113.8407 | W LANTAU | STG#2 | 5 | CR1 | 7 | N | 10x | dolphin nearby |
| 1-Mar-13 | 13 | 13:40:28 | 13:44:13 | 22.2708 | 113.8398 | W LANTAU | STG#2 | 5 | CR1 | 7 | N | 10x | dolphin nearby |
| 1-Mar-13 | 14 | 13:47:23 | 13:52:14 | 22.2717 | 113.8388 | W LANTAU | STG#2 | 5 | CR1 | 7 | N | 10x | dolphin nearby |
| 1-Mar-13 | 15 | 14:45:50 | 14:48:50 | 22.2227 | 113.8306 | W LANTAU | WL Station#2 | 5 | CR1 | 7 | N | 10x | 2 large container vessels >1km moving away |
| 1-Mar-13 | 16 | 15:27:35 | 15:30:46 | 22.2395 | 113.8265 | W LANTAU | STG#3 | 4 | CR1 | 7 | N | 10x | dolphin nearby |

## Appendix VIII.  Land-based Theodolite Tracking Database (April 2012 - March 2013)

| Date | Station | Start Time | End Time | Duration | Beaufort | Visibility | Number of Dolphin Groups | Total No. of Fixes | No. of fix (dolphin) | No. of fix (dolphin-tour boat) | No. of fix (fishing boat) | No. of fix (high-speed ferry) | No. of fix (other vessels) | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 30/04/12 | Tai O | 9:07 | 11:13 | 2:06 | 4 | 1.5 | 0 | 44 | 0 | 0 | 16 | 0 | 6 | |
| 08/05/12 | Tai O | 8:50 | 13:32 | 4:42 | 2-3 | 1 | 8 | 508 | 415 | 36 | 17 | 9 | 18 | |
| 10/05/12 | Tai O | 8:13 | 11:42 | 3:29 | 2 | 1 | 8 | 74 | 31 | 1 | 26 | 4 | 1 | |
| 21/05/12 | Tai O | 8:50 | 13:33 | 4:43 | 2 | 2 | 9 | 345 | 191 | 46 | 56 | 2 | 24 | Dual Stations |
| 24/05/12 | Tai O | 8:39 | 13:35 | 4:56 | 2-3 | 1.5 | 12 | 356 | 204 | 51 | 34 | 5 | 57 | Interface with C-POD |
| 27/05/12 | Tai O | 8:56 | 14:48 | 5:52 | 2-3 | 2 | 10 | 596 | 258 | 265 | 12 | 12 | 28 | Dual Stations |
| 04/06/12 | Tai O | 8:06 | 12:25 | 4:19 | 2 | 1.5 | 10 | 295 | 240 | 27 | 9 | 8 | 5 | |
| 11/06/12 | Tai O | 7:45 | 11:53 | 4:08 | 4 | 1 | 3 | 52 | 14 | 0 | 12 | 7 | 15 | |
| 13/06/12 | Tai O | 7:44 | 12:03 | 4:19 | 2 | 1-1.5 | 7 | 184 | 147 | 0 | 11 | 8 | 15 | |
| 19/06/12 | Tai O | 9:55 | 10:45 | 0:50 | 2 | 1-1.5 | 1 | 21 | 21 | 0 | 0 | 0 | 0 | |
| 20/06/12 | Tai O | 7:58 | 12:45 | 4:47 | 2 | 1-2 | 15 | 300 | 213 | 27 | 37 | 2 | 17 | |
| 23/06/12 | Tai O | 15:39 | 17:55 | 2:16 | 4 | 1 | 0 | 50 | 0 | 0 | 0 | 14 | 30 | |
| 25/06/12 | Tai O | 7:43 | 12:23 | 5:41 | 2-3 | 2 | 4 | 118 | 32 | 0 | 40 | 10 | 27 | |
| 26/06/12 | Shum Wat | 9:33 | 12:59 | 3:26 | 2 | 2 | 6 | 108 | 61 | 0 | 33 | 7 | 5 | |
| 27/06/12 | Tai O | 7:48 | 11:59 | 4:11 | 3 | 2 | 6 | 131 | 67 | 23 | 31 | 5 | 2 | |
| 02/07/12 | Shum Wat | 8:13 | 12:17 | 4:04 | 1-2 | 2 | 15 | 190 | 147 | 0 | 18 | 5 | 15 | |
| 03/07/12 | Tai O | 7:40 | 13:34 | 5:54 | 1-2 | 2 | 10 | 297 | 179 | 47 | 26 | 7 | 35 | |
| 04/07/12 | Fan Lau | 9:24 | 15:00 | 5:36 | 1-4 | 1 | 12 | 437 | 151 | 0 | 18 | 186 | 78 | |
| 12/07/12 | Tai O | 9:37 | 13:52 | 4:15 | 3-4 | 1 | 5 | 162 | 69 | 52 | 1 | 6 | 17 | |
| 13/07/12 | Shum Wat | 6:07 | 10:30 | 4:23 | 2 | 1 | 13 | 145 | 47 | 0 | 58 | 6 | 30 | |
| 30/07/12 | Tai O | 9:24 | 13:16 | 3:52 | 2-3 | 1-2 | 3 | 575 | 30 | 312 | 61 | 32 | 124 | Dual Stations |
| 31/07/12 | Shum Wat | 6:29 | 11:00 | 4:31 | 1 | 3 | 4 | 152 | 47 | 0 | 45 | 8 | 48 | |
| 07/08/12 | Fan Lau | 9:03 | 14:07 | 5:04 | 2-3 | 3-3.5 | 10 | 422 | 125 | 0 | 34 | 209 | 53 | |
| 14/08/12 | Tai O | 8:54 | 12:54 | 4:00 | 2 | 1-2 | 7 | 310 | 142 | 87 | 18 | 7 | 53 | |
| 20/08/12 | Shum Wat | 9:24 | 13:15 | 3:51 | 1-2 | 2.5 | 4 | 295 | 233 | 0 | 25 | 13 | 22 | |
| 06/09/12 | Tai O | 9:04 | 13:11 | 4:07 | 2-4 | 2 | 9 | 202 | 106 | 43 | 33 | 9 | 8 | |
| 12/09/12 | Fan Lau | 9:02 | 13:54 | 4:52 | 2-3 | 1 | 10 | 301 | 97 | 0 | 27 | 115 | 60 | |

## Appendix VIII.  (cont'd)

| Date | Station | Start Time | End Time | Duration | Beaufort | Visibility | Number of Dolphin Groups | Total No. of Fixes | No. of fix (dolphin) | No. of fix (dolphin-tour boat) | No. of fix (fishing boat) | No. of fix (high-speed ferry) | No. of fix (other vessels) | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 09/10/12 | Shum Wat | 9:31 | 12:56 | 3:25 | 2 | 2-3.5 | 1 | 61 | 17 | 0 | 21 | 8 | 13 | |
| 10/12/12 | Shum Wat | 10:06 | 14:35 | 4:29 | 3 | 2.5 | 1 | 81 | 25 | 0 | 7 | 4 | 44 | Dual Stations |
| 10/12/12 | Tai O | 9:08 | 14:08 | 5:00 | 3 | 2.5 | 3 | 198 | 70 | 47 | 19 | 11 | 49 | Dual Stations |
| 20/12/12 | Shum Wat | 12:56 | 16:46 | 3:50 | 3-4 | 2-3 | 1 | 96 | 5 | 3 | 4 | 6 | 76 | |
| 18/01/13 | Tai O | 8:46 | 14:11 | 5:25 | 2-3 | 3 | 5 | 293 | 162 | 50 | 10 | 10 | 60 | |
| 25/02/13 | Shum Wat | 10:08 | 15:08 | 5:00 | 2-3 | 2 | 1 | 120 | 13 | 0 | 32 | 6 | 68 | |
| 26/02/13 | Fan Lau | 8:50 | 14:41 | 5:51 | 1-2 | 2.5 | 0 | 348 | 0 | 0 | 24 | 223 | 100 | |
| 01/03/13 | Tai O | 10:15 | 14:37 | 4:22 | 2-3 | 2-2.5 | 3 | 290 | 114 | 54 | 24 | 17 | 79 | |