# Contract No. HY/2011/02
# Baseline Chinese White Dolphin Monitoring for Hong Kong-Zhuhai-Macao Bridge Hong Kong Projects

*Draft Final Report on Baseline Monitoring (September - November 2011)*
*submitted to the*
*Hong Kong-Zhuhai-Macao Bridge Hong Kong Project Management Office,*
*Highways Department*


NL24 with newborn calf © HKCRP

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# 1. INTRODUCTION

In 2009, the Hong Kong-Zhuhai-Macao Bridge (HZMB) received official approval to be built by the Governments of the Hong Kong Special Administrative Region, Guangdong Province and the Macao Special Administrative Region. The Main Bridge will be jointly funded by all three Governments. Each Government will be responsible for constructing its own boundary crossing facility and link road to connect to the Main Bridge. In Hong Kong, there are three projects associated with the HZMB construction, namely the Hong Kong Link Road (HKLR) Project, the Hong Kong Boundary Crossing Facilities (HKBCF) Project, and the Tuen Mun-Chek Lap Kok Link (TM-CLKL) Project. According to the EM&A Manuals and EPs of the HZMB Projects in Hong Kong (i.e. HKBCF, HKLR and TM-CLKL), baseline dolphin monitoring is required to be carried out three months prior to the commencement of the HKBCF reclamation contract.

To comply with the requirements of the EM&A Manuals and EPS of the HZMB Projects in Hong Kong, the present monitoring study aims to collect data on Chinese White Dolphins (a.k.a. Indo-Pacific humpback dolphin, *Sousa chinensis*) during the pre-construction phase (i.e. baseline dolphin monitoring) in Northeast Lantau (NEL), Northwest Lantau (NWL) and West Lantau (WL) survey areas. This report is the draft final report submitted to the Highways Department, summarizing the results of the survey findings during the entire baseline monitoring period (i.e. September to November 2011).

# 2. OBJECTIVES AND METHODOLOGY

## *2.1. Objectives of the Present Study*

Several objectives were set for this baseline monitoring study of Chinese White Dolphins for the study area in North and West Lantau waters, in association with the construction works of HZMB Projects. The first objective was to assess the spatial and temporal patterns of distribution and habitat use of Chinese White Dolphins during the pre-construction phase of HZMB Projects in great details. This objective was achieved through collection of research data on dolphins by conducting line-transect vessel surveys in NWL, NEL and WL survey areas.

The second objective was to identify individual Chinese White Dolphins by their natural marks, which was achieved by taking high-quality photographs of dolphins for photo-identification analysis. Photographs of identified individuals were compiled and added to the photo-identification catalogue.

The third objective was to analyze the monitoring data from the present baseline study for better understanding of the various aspects of local dolphin population in relation to the construction works of HZMB Projects. This objective was achieved by conducting various data analyses, including distribution analysis, encounter rate analysis, behavioural analysis and quantitative grid analysis to assess the spatial and temporal patterns of distribution and habitat use of local dolphins based on systematic line-transect survey data, and ranging pattern analysis to study individual movement based on photo-identification data.

### *2.2. Line-transect Vessel Surveys*

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 last 16 years of marine mammal monitoring surveys in Hong Kong (Hung 2010, 2011; Jefferson 2000). The territorial water of Hong Kong Special Administrative Region was divided into twelve survey areas, and line-transect surveys were conducted in NWL, NEL and WL areas (see transect line layout in Figure 1).

During 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 continuously through 7 x 35 *Brunton* 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 $0^{o}$). Two to three 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 were sighted, the survey team would end the survey effort, and immediately recorded the initial sighting distance and angle of the dolphin 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 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 Hong Kong Cetacean Research Project (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.

### *2.3. Photo-identification*

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 every dolphin in the group, and even photograph both sides of the dolphins, since the colouration and markings on both sides may not be symmetrical (Jefferson 2000). Two professional digital cameras (*Canon* EOS 7-D, 60-D 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 700 identified dolphins in the PRE Chinese White Dolphin photo-identification catalogue managed by the HKCRP researchers. 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 2000). 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.

*2.4. Data Analyses*

2.4.1. Distribution pattern analysis

The line-transect survey data was integrated with the Geographic Information System (GIS) in order to visualize and interpret different spatial and temporal patterns of dolphin distribution using sighting positions. Location data of dolphin 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, young calves and activities.

2.4.2. 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 (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 during the baseline monitoring period, which was also compared to the ones calculated from previous years of monitoring data to examine temporal trend. The encounter rate could be used as an indicator to determine areas of importance to dolphins within the study area.

2.4.3. Quantitative grid analysis on habitat use

To conduct quantitative grid analysis of habitat use, positions of on-effort sightings of Chinese White Dolphins collected during the 3-month baseline monitoring period were plotted onto 1-$km^2$ grids among NWL, NEL and WL survey areas on GIS. Sighting densities (number of on-effort sightings per $km^2$) and dolphin densities (total number of dolphins 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 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 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 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 from on-effort sightings

E = total number of units of survey effort

SA% = percentage of sea area

2.4.4. Behavioural analysis

When dolphins were sighted during vessel surveys, their behaviour was observed. Different activities 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 with 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 of the dolphins.

2.4.5. Ranging pattern analysis

Location data of individual dolphins that occurred during the 3-month baseline monitoring 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 level.

## 3. RESULTS AND DISCUSSIONS

### *3.1. Summary of survey effort and dolphin sightings*

From September to November 2011, a total of 14 line-transect vessel surveys were conducted in NWL, NEL and WL survey areas (Appendix I). Among these surveys, 966 km of survey effort was collected, with 95% of these effort conducted under favourable sea conditions (Beaufort 3 or below with good visibility). The high percentage of survey effort conducted under favourable sea conditions is critical to the success of the dolphin data collection programme in Hong Kong, as only such data can be used in various analyses such as the examination of encounter rates, habitat use and estimation of density and abundance. The details of the survey effort data collected during the baseline monitoring are shown in Appendix II.

During the 3-month study period, 112 groups of Chinese White Dolphins, numbering 413 individuals, were sighted from the vessel surveys (Appendix III). Among them, 91 groups were sighted during on-effort line-transect vessel surveys, while the others were sighted during off-effort search. Most sightings were made in WL (46 groups) and NWL (49 groups), comprising 84.8% of the total (Figure 1). In addition, 17 dolphin groups were also sighted in NEL throughout the 3-month study period (Figure 1).

### *3.2. Distribution*

Dolphin sightings were unevenly distributed throughout the three survey areas of NWL, NEL and WL during the study period. In North Lantau region, concentration of these sightings were found around Lung Kwu Chau, near Black Point, Pillar Point and Shum Shui Kok, but the dolphins generally avoided the waters to the north of the Chek Lap Kok airport as well as the northern and eastern portions of NEL survey area (Figure 2). On the contrary, dolphins occurred evenly throughout the WL survey area, but slightly more sightings were made near Kai Kung Shan, Fan Lau and the offshore waters between Tai O Peninsula and Kai Kung Shan (Figure 3).

Throughout the baseline monitoring period, dolphins occurred regularly in the

vicinity of the future alignments of HKLR and TM-CLKL as well as the reclamation site of HKBCF, but not in high concentration (Figures 2-3). Their occurrence around these future construction sites in association with HZMB Projects should be continuously monitored to determine whether there will be any change in dolphin distribution and habitat use around these work areas during the construction period.

### *3.3. Encounter rate*

To calculate encounter rates of Chinese White Dolphins, only data collected in Beaufort 0-3 conditions was included in the analysis (see Hung 2011). During the baseline monitoring period, the combined dolphin encounter rate of NWL, NEL and WL was 10.8 sightings per 100 km. This was much higher than the ones in previous years from 2008-2010, but was slightly lower than the one in 2007 recorded during AFCD marine mammal monitoring programme (Figure 4a).

Among the three survey areas, the dolphin encounter rate was the highest in WL (20.4 sightings per 100 km), which was much higher than the ones in NWL (9.3) and NEL (5.4) (Figure 4b). The prominent usage of WL during the same three-month period (September to November) was also consistent throughout the past five years (Figure 4b), providing solid evidence that this stretch of coastal waters presents the most important habitat for Chinese White Dolphins in Hong Kong. Moreover, dolphin usage among all three survey areas during this three-month period also followed similar temporal trends, with encounter rates dropping from the highest in 2007 to the lowest in 2010, but increasing to a higher level in 2011 (Figure 4b). In fact, dolphin encounter rate in NEL reached the highest in 2011 during the five-year period.

### *3.4. Group size*

Group sizes of dolphins during the baseline monitoring period ranged from singles to 18 animals, with an overall mean of 3.7 ± 3.1 (SD) animals per group. Among the three survey areas, their mean group sizes were similar across NEL, NWL and WL survey areas (3.2-3.9 dolphins per group). Moreover, the mean dolphin group size during the 3-month study period was very similar to the one recorded during the 2010-11 AFCD monitoring period (Hung 2011).

Most dolphin groups sighted during the 3-month period tended to be small, with 48.2% of the groups composed of 1-2 animals, and 72.3% of the groups with fewer

than five animals. On the other hand, 31 groups had 5 or more animals, and only five groups had 10 or more animals. These larger aggregations of dolphins were mostly found near Sha Chau and between Lung Kwu Chau and Black Point in NWL; around the Brothers Islands in NEL; and between Tai O Peninsula and Peaked Hill in WL (Figure 5). Notably, several large dolphin groups could be found near the alignments of HKLR and TM-CLKL as well as the reclamation site of HKBCF (Figure 5). Since large dolphin aggregations in certain locations may imply rich fishery resources and good feeding opportunities for dolphins, dolphin occurrence in these important feeding habitats should be closely monitored throughout the construction period to determine whether the construction works in association with the HZMB Projects would affect the feeding opportunities of the dolphins.

### *3.5. Habitat use*

From September to November 2011, the most heavily utilized habitats by Chinese White Dolphins included the waters around Lung Kwu Chau and Shau Chau, near Pillar Point and Black Point, and along the Urmston Road in NWL; around the Brothers Islands and near Shum Shui Kok in NEL; and around Tai O Peninsula, near Kai Kung Shan, Peaked Hill and Fan Lau in WL (Figures 6-7). These important dolphin habitats during the baseline monitoring period coincided well with the results from the previous AFCD monitoring periods (e.g. Hung 2010, 2011), further confirming the importance of these habitats to Chinese White Dolphins in Hong Kong.

Notably, several grids along the alignments of HKLR (Grids E21, F21 & G20) and TM-CLKL (Grids O14-15) as well as near the reclamation site of HKBCF (Grid P17) recorded moderate to high dolphin densities (Figures 6-7). Although the impending construction works in association with HZMB Projects are not situated at the most important dolphin habitats in Hong Kong (e.g. Lung Kwu Chau, Tai O Peninsula to Fan Lau, the Brothers Islands), these works will still be in the vicinity of these sensitive habitats, and dolphin usage should therefore be carefully monitored during the entire construction period to observe any significant changes incurred.

### *3.6. Mother-calf pairs*

During the 3-month baseline monitoring period, a total of 14 unspotted calves (UC) and 14 unspotted juveniles (UJ) were sighted among the three survey areas. These young calves comprised 6.8% of all animals sighted. The young calves were

regularly sighted in the WL and NWL survey areas, but only twice in the NEL survey area. Concentration of these sightings with mother-calf pairs could be found near Tai O Peninsula and Black Point (Figure 8). Several sightings with mother-calf pairs were also located near the alignments of HKLR and TM-CLKL. As the young calves need to maintain close acoustic contact with their mothers in order to survive (Van Parijs and Corkeron 2001), they are more susceptible to acoustic disturbances from underwater construction activities, and their activities around the works area should be carefully monitored throughout the entire construction period.

*3.7. Activities and associations with fishing boats*

During the baseline monitoring period, 13 and 6 dolphin sightings were associated with feeding and socializing activities respectively, comprising of 11.6% and 5.4% of the total dolphin sightings. Only two dolphin groups were engaged in traveling activities near Pillar Point and to the west of the airport (Figure 9). Dolphin sightings associated with feeding activities were mostly found near Kai Kung Shan and Tai O in WL, and near Lung Kwu Chau in NWL (Figure 9). On the other hand, sightings associated with socializing activities were more scattered around the marine park area in NWL and the central portion of WL (Figure 9). Notably, several sightings associated with feeding activities were observed along and near the alignments of HKLR and TM-CLKL, and around the reclamation site of HKBCF (Figure 9).

Only six dolphin groups were found to be associated with operating fishing boats, comprising of 5.4% of all dolphin groups. These sightings included three dolphin groups associated with pair trawlers, two with hang trawlers and one with shrimp trawler. The location of these fishing boat-associated sightings were scattered throughout the three survey areas, with no apparent concentration (Figure 10). Only two of these sightings were found in the vicinity of the future work sites of HZMB Projects (Figure 10).

*3.8. Photo-identification work and individual range use*

From September to November 2011, over 5,000 digital photographs of Chinese White Dolphins were taken during the baseline monitoring surveys for the photo-identification work. In total, 96 individuals sighted 182 times altogether were identified (Table 1). The majority of these re-sightings were made in NWL and WL, comprising 53.2% and 31.9% of the total respectively. In addition, 27 re-sightings

were also made in NEL, or about half of the total number of dolphins sighted there during the 3-month study period. Most of the identified individuals were sighted only once or twice, with some notable exceptions though. For example, two individuals (CH34 and NL104) were sighted seven times, and WL04 were sighted five times during the study period. In addition, six individuals were sighted four times, while 15 other individuals were also sighted three times during the baseline monitoring period. Repeated sightings of these individuals during the relatively short study period indicated their frequent use of Hong Kong waters during the baseline monitoring study period.

Ranging patterns of the 96 individuals identified during the baseline monitoring surveys were determined by fixed kernel method, and are shown in Appendix IV. Notably, the majority of these individuals ranged extensively across NEL, NWL and WL survey areas, and many of their ranges overlapped with the alignments of HKLR and TM-CLKL as well as the reclamation site of HKBCF during the baseline monitoring period (Appendix IV). In particular, some individuals (e.g. NL136, NL246, NL264, WL05) were sighted in both NEL and NWL survey areas, while others (e.g. NL258, WL04, WL116, WL137) were sighted in both NWL and WL survey areas during the three-month period (Appendix IV). Several individuals were even sighted across all three areas within the relatively short study period (e.g. NL33, NL123, NL226) (Appendix IV). Their frequent movements across these three survey areas will make them more susceptible to the potential disturbance arisen from the construction activities in association with the HZMB Projects, as the HKLR will be constructed at the boundary of NWL and WL survey areas, while the HKBCF and TM-CLKL will be constructed at the boundary of NWL and NEL survey areas. Recent research on social structure analysis also indicated that there are two social clusters in Hong Kong, with their overall 95% UD ranges overlapped at the waters where the HKLR will be constructed (Dungan 2011; Hung 2011). Consequently, individual movement patterns and habitat use should be closely monitored in the vicinity of the work sites of HKLR, TM-CLKL and HKBCF during and after the construction period, to determine whether individual dolphins will be affected by these construction works.

More importantly, many individuals that were sighted during the baseline monitoring period were year-round residents (e.g. EL01, NL98, NL139, WL25), and some were even accompanied by young calves (e.g. NL24, NL33, NL104, NL123). In fact, these were also the individuals being sighted multiple times during the 3-month baseline monitoring period, showing their strong reliance of Hong Kong

waters. Special attention should be paid to the range use of these year-round residents, as their continuous reliance of these three survey areas during and after the HZMB construction period can become an important indicator to determine whether the local dolphins will be affected by various construction works of HZMB Projects.

## 4. LITERATURE CITED


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**Table 1. Individual dolphins identified during HYD-HZMB baseline dolphin monitoring surveys in September-November 2011**

| ID# | DATE | STG# | AREA |
|---|---|---|---|
| CH34 | 06/10/11 | 6 | NW LANTAU |
| | 28/10/11 | 5 | NW LANTAU |
| | 01/11/11 | 6 | NE LANTAU |
| | 01/11/11 | 8 | NE LANTAU |
| | 02/11/11 | 14 | NW LANTAU |
| | 05/11/11 | 6 | NW LANTAU |
| | 07/11/11 | 2 | NW LANTAU |
| CH40 | 17/10/11 | 2 | W LANTAU |
| | 17/10/11 | 8 | W LANTAU |
| CH98 | 02/11/11 | 13 | NW LANTAU |
| CH108 | 02/11/11 | 3 | W LANTAU |
| | 02/11/11 | 8 | W LANTAU |
| CH153 | 28/10/11 | 3 | NW LANTAU |
| CH157 | 02/11/11 | 3 | W LANTAU |
| EL01 | 01/11/11 | 9 | NE LANTAU |
| | 02/11/11 | 14 | NW LANTAU |
| NL11 | 02/11/11 | 12 | NW LANTAU |
| | 07/11/11 | 2 | NW LANTAU |
| NL12 | 02/11/11 | 12 | NW LANTAU |
| NL24 | 10/10/11 | 2 | NW LANTAU |
| | 05/11/11 | 5 | NW LANTAU |
| | 05/11/11 | 8 | NW LANTAU |
| | 06/11/11 | 2 | NE LANTAU |
| NL33 | 23/09/11 | 10 | NW LANTAU |
| | 01/11/11 | 8 | NE LANTAU |
| | 05/11/11 | 2 | NW LANTAU |
| | 07/11/11 | 5 | NW LANTAU |
| NL37 | 16/09/11 | 4 | NW LANTAU |
| NL46 | 28/10/11 | 4 | NW LANTAU |
| NL48 | 16/09/11 | 5 | NW LANTAU |
| | 02/11/11 | 14 | NW LANTAU |
| | 07/11/11 | 2 | NW LANTAU |
| NL75 | 16/09/11 | 3 | NW LANTAU |
| | 16/09/11 | 7 | NW LANTAU |
| | 01/11/11 | 9 | NE LANTAU |
| NL80 | 02/11/11 | 12 | NW LANTAU |
| NL93 | 05/11/11 | 6 | NW LANTAU |
| | 07/11/11 | 4 | NW LANTAU |
| NL98 | 06/10/11 | 2 | NE LANTAU |
| | 01/11/11 | 8 | NE LANTAU |
| | 06/11/11 | 2 | NE LANTAU |
| | 07/11/11 | 2 | NW LANTAU |

| ID# | DATE | STG# | AREA |
|---|---|---|---|
| NL104 | 16/09/11 | 7 | NW LANTAU |
| | 23/09/11 | 10 | NW LANTAU |
| | 28/10/11 | 5 | NW LANTAU |
| | 02/11/11 | 14 | NW LANTAU |
| | 05/11/11 | 6 | NW LANTAU |
| | 05/11/11 | 8 | NW LANTAU |
| | 07/11/11 | 2 | NW LANTAU |
| NL118 | 16/09/11 | 7 | NW LANTAU |
| NL120 | 10/10/11 | 2 | NW LANTAU |
| | 06/11/11 | 4 | NE LANTAU |
| NL123 | 06/10/11 | 4 | NW LANTAU |
| | 10/10/11 | 2 | NW LANTAU |
| | 06/11/11 | 2 | NE LANTAU |
| NL136 | 16/09/11 | 7 | NW LANTAU |
| | 10/10/11 | 3 | NE LANTAU |
| | 28/10/11 | 1 | NW LANTAU |
| | 28/10/11 | 3 | NW LANTAU |
| NL139 | 16/09/11 | 7 | NW LANTAU |
| | 10/10/11 | 3 | NE LANTAU |
| | 01/11/11 | 9 | NE LANTAU |
| NL165 | 02/11/11 | 14 | NW LANTAU |
| | 05/11/11 | 8 | NW LANTAU |
| NL170 | 06/10/11 | 1 | NE LANTAU |
| NL176 | 01/11/11 | 6 | NE LANTAU |
| | 01/11/11 | 8 | NE LANTAU |
| | 06/11/11 | 4 | NE LANTAU |
| NL179 | 16/09/11 | 7 | NW LANTAU |
| | 06/11/11 | 2 | NE LANTAU |
| NL188 | 28/10/11 | 3 | NW LANTAU |
| | 01/11/11 | 2 | NW LANTAU |
| | 07/11/11 | 5 | NW LANTAU |
| NL191 | 07/09/11 | 1 | NW LANTAU |
| NL202 | 28/10/11 | 3 | NW LANTAU |
| | 07/11/11 | 4 | NW LANTAU |
| NL206 | 17/10/11 | 6 | W LANTAU |
| NL210 | 07/09/11 | 1 | NW LANTAU |
| | 02/11/11 | 14 | NW LANTAU |
| | 05/11/11 | 7 | NW LANTAU |
| | 07/11/11 | 5 | NW LANTAU |
| NL214 | 28/10/11 | 5 | NW LANTAU |
| | 02/11/11 | 14 | NW LANTAU |
| | 05/11/11 | 6 | NW LANTAU |
| NL220 | 10/10/11 | 3 | NE LANTAU |
| NL224 | 28/10/11 | 4 | NW LANTAU |
| NL226 | 17/10/11 | 2 | W LANTAU |
| | 05/11/11 | 2 | NW LANTAU |

**Table 1. (cont'd)**

| ID# | DATE | STG# | AREA |
|---|---|---|---|
| NL230 | 17/10/11 | 4 | W LANTAU |
| | 02/11/11 | 12 | NW LANTAU |
| NL233 | 16/09/11 | 3 | NW LANTAU |
| | 06/10/11 | 4 | NW LANTAU |
| | 28/10/11 | 4 | NW LANTAU |
| NL241 | 16/09/11 | 7 | NW LANTAU |
| | 02/11/11 | 12 | NW LANTAU |
| | 07/11/11 | 2 | NW LANTAU |
| NL242 | 10/10/11 | 2 | NW LANTAU |
| NL244 | 05/09/11 | 3 | W LANTAU |
| | 01/11/11 | 5 | NW LANTAU |
| | 01/11/11 | 8 | NE LANTAU |
| NL246 | 16/09/11 | 7 | NW LANTAU |
| | 06/11/11 | 2 | NE LANTAU |
| NL256 | 02/11/11 | 12 | NW LANTAU |
| NL258 | 05/09/11 | 3 | W LANTAU |
| | 16/09/11 | 5 | NW LANTAU |
| NL259 | 07/11/11 | 5 | NW LANTAU |
| NL260 | 07/11/11 | 5 | NW LANTAU |
| NL261 | 01/11/11 | 9 | NE LANTAU |
| NL264 | 23/09/11 | 11 | NW LANTAU |
| | 06/10/11 | 2 | NE LANTAU |
| | 06/11/11 | 3 | NE LANTAU |
| NL269 | 02/11/11 | 12 | NW LANTAU |
| NL272 | 16/09/11 | 7 | NW LANTAU |
| | 28/10/11 | 4 | NW LANTAU |
| | 02/11/11 | 14 | NW LANTAU |
| | 05/11/11 | 8 | NW LANTAU |
| NL275 | 23/09/11 | 9 | W LANTAU |
| NL278 | 02/11/11 | 12 | NW LANTAU |
| NL279 | 02/11/11 | 12 | NW LANTAU |
| SL40 | 23/09/11 | 4 | W LANTAU |
| SL42 | 02/11/11 | 13 | NW LANTAU |
| SL43 | 28/10/11 | 4 | NW LANTAU |
| SL48 | 23/09/11 | 7 | W LANTAU |
| | 17/10/11 | 3 | W LANTAU |
| | 02/11/11 | 8 | W LANTAU |
| WL04 | 16/09/11 | 6 | NW LANTAU |
| | 10/10/11 | 2 | NW LANTAU |
| | 17/10/11 | 1 | W LANTAU |
| | 02/11/11 | 14 | NW LANTAU |
| | 05/11/11 | 5 | NW LANTAU |
| WL05 | 01/11/11 | 6 | NE LANTAU |
| | 01/11/11 | 8 | NE LANTAU |
| WL11 | 07/11/11 | 5 | NW LANTAU |
| WL25 | 16/09/11 | 1 | NW LANTAU |
| | 23/09/11 | 9 | W LANTAU |
| | 17/10/11 | 4 | W LANTAU |

| ID# | DATE | STG# | AREA |
|---|---|---|---|
| WL28 | 23/09/11 | 9 | W LANTAU |
| WL42 | 05/09/11 | 1 | W LANTAU |
| | 02/11/11 | 6 | W LANTAU |
| WL47 | 17/10/11 | 2 | W LANTAU |
| WL48 | 23/09/11 | 9 | W LANTAU |
| WL61 | 17/10/11 | 4 | W LANTAU |
| WL62 | 23/09/11 | 6 | W LANTAU |
| | 17/10/11 | 2 | W LANTAU |
| WL66 | 07/11/11 | 8 | W LANTAU |
| WL68 | 05/09/11 | 1 | W LANTAU |
| | 05/09/11 | 2 | W LANTAU |
| WL72 | 23/09/11 | 4 | W LANTAU |
| | 02/11/11 | 3 | W LANTAU |
| | 02/11/11 | 8 | W LANTAU |
| WL87 | 23/09/11 | 6 | W LANTAU |
| WL88 | 16/09/11 | 1 | NW LANTAU |
| | 02/11/11 | 6 | W LANTAU |
| WL111 | 02/11/11 | 14 | NW LANTAU |
| WL116 | 16/09/11 | 4 | NW LANTAU |
| WL118 | 02/11/11 | 3 | W LANTAU |
| | 02/11/11 | 8 | W LANTAU |
| WL123 | 02/11/11 | 8 | W LANTAU |
| WL124 | 02/11/11 | 12 | NW LANTAU |
| WL128 | 02/11/11 | 10 | W LANTAU |
| | 07/11/11 | 9 | W LANTAU |
| WL131 | 23/09/11 | 6 | W LANTAU |
| | 02/11/11 | 3 | W LANTAU |
| | 02/11/11 | 8 | W LANTAU |
| WL132 | 23/09/11 | 6 | W LANTAU |
| WL137 | 02/11/11 | 8 | W LANTAU |
| WL138 | 02/11/11 | 8 | W LANTAU |
| WL144 | 02/11/11 | 4 | W LANTAU |
| WL145 | 05/09/11 | 5 | W LANTAU |
| WL146 | 17/10/11 | 2 | W LANTAU |
| WL153 | 07/11/11 | 8 | W LANTAU |
| WL156 | 23/09/11 | 9 | W LANTAU |
| | 28/10/11 | 3 | NW LANTAU |
| WL157 | 23/09/11 | 9 | W LANTAU |
| WL158 | 23/09/11 | 9 | W LANTAU |
| WL162 | 16/09/11 | 3 | NW LANTAU |
| WL163 | 02/11/11 | 4 | W LANTAU |
| | 07/11/11 | 9 | W LANTAU |
| WL165 | 17/10/11 | 6 | W LANTAU |
| WL167 | 17/10/11 | 2 | W LANTAU |
| WL170 | 07/11/11 | 11 | W LANTAU |
| WL171 | 28/10/11 | 8 | W LANTAU |

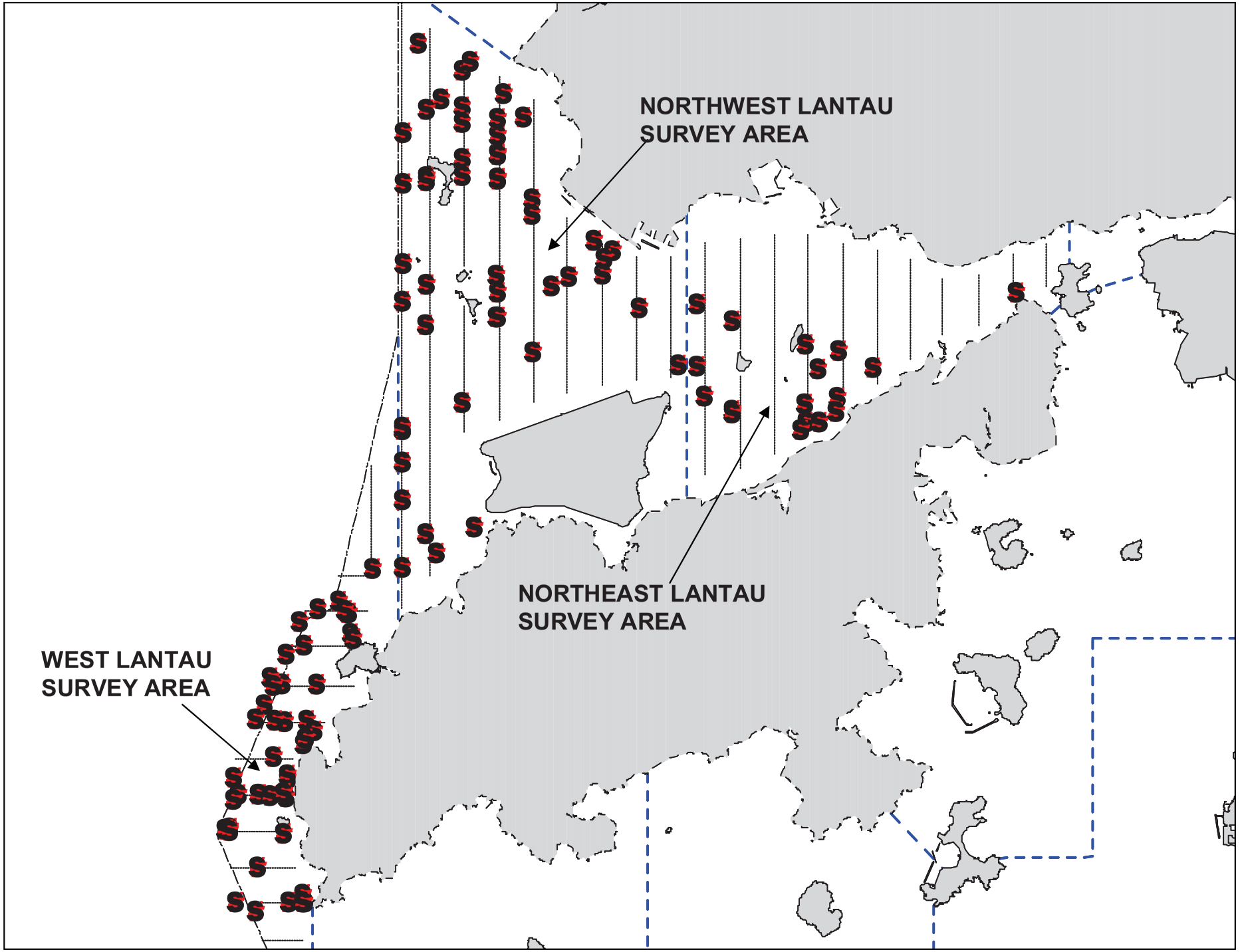



Figure 1. Distribution of Chinese white dolphin sighting during HYD-HZMB baseline monitoring surveys (September – November 2011)

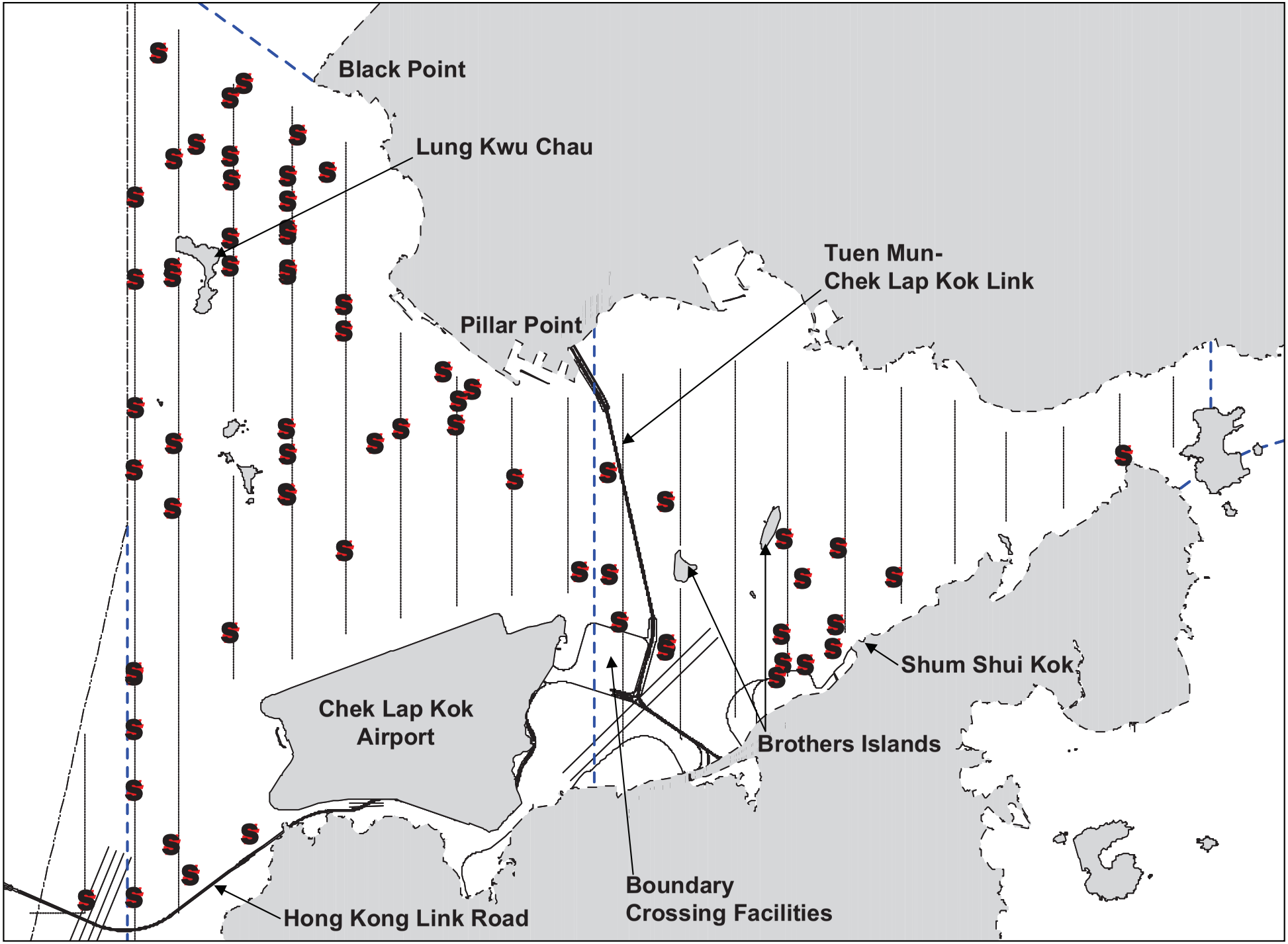



Figure 2. Distribution of Chinese white dolphin sighting in Northwest and Northeast Lantau during HYD-HZMB baseline monitoring surveys (September – November 2011)

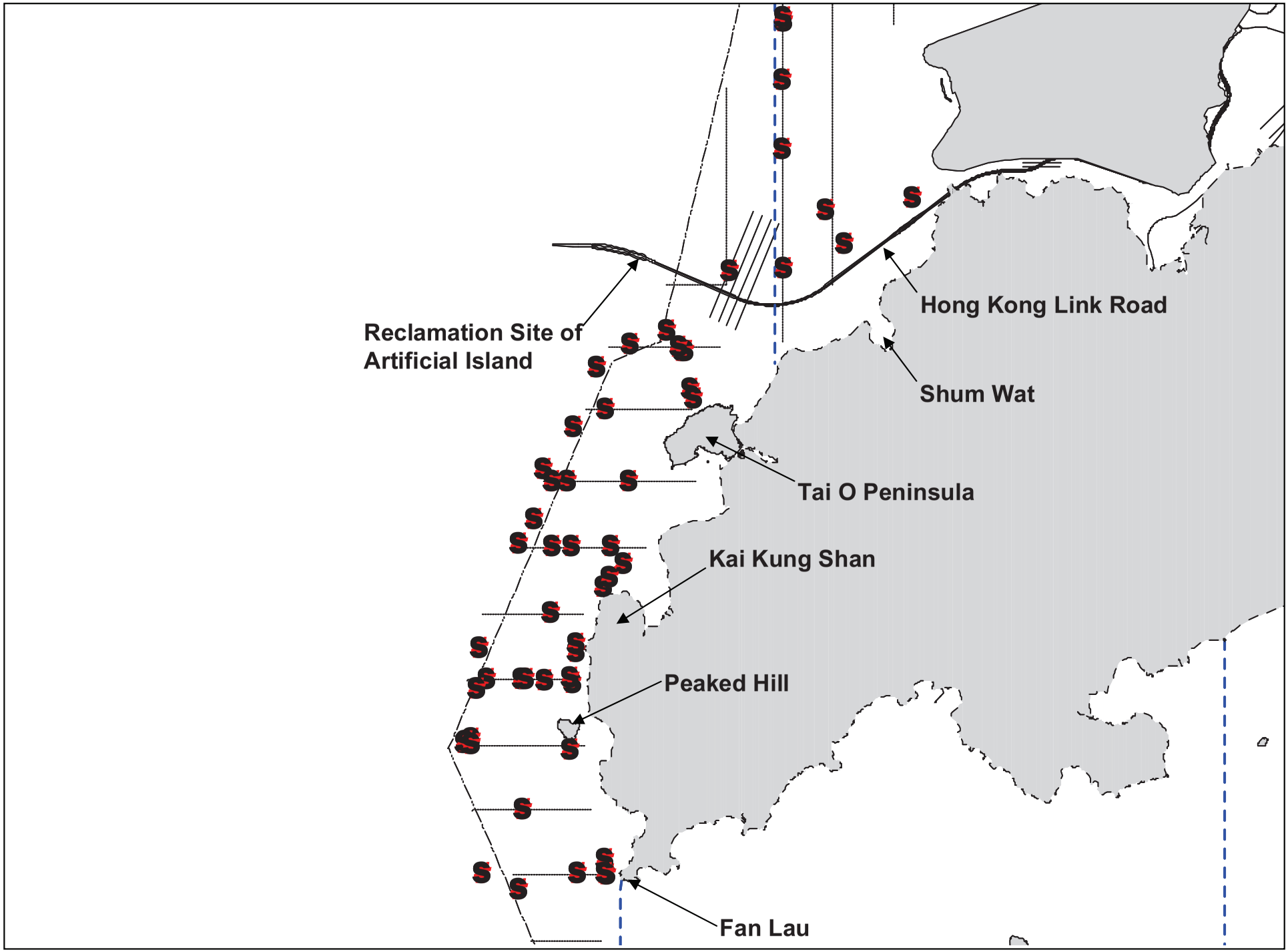



Figure 3. Distribution of Chinese white dolphin sighting in West Lantau during HYD-HZMB baseline monitoring surveys (September – November 2011)

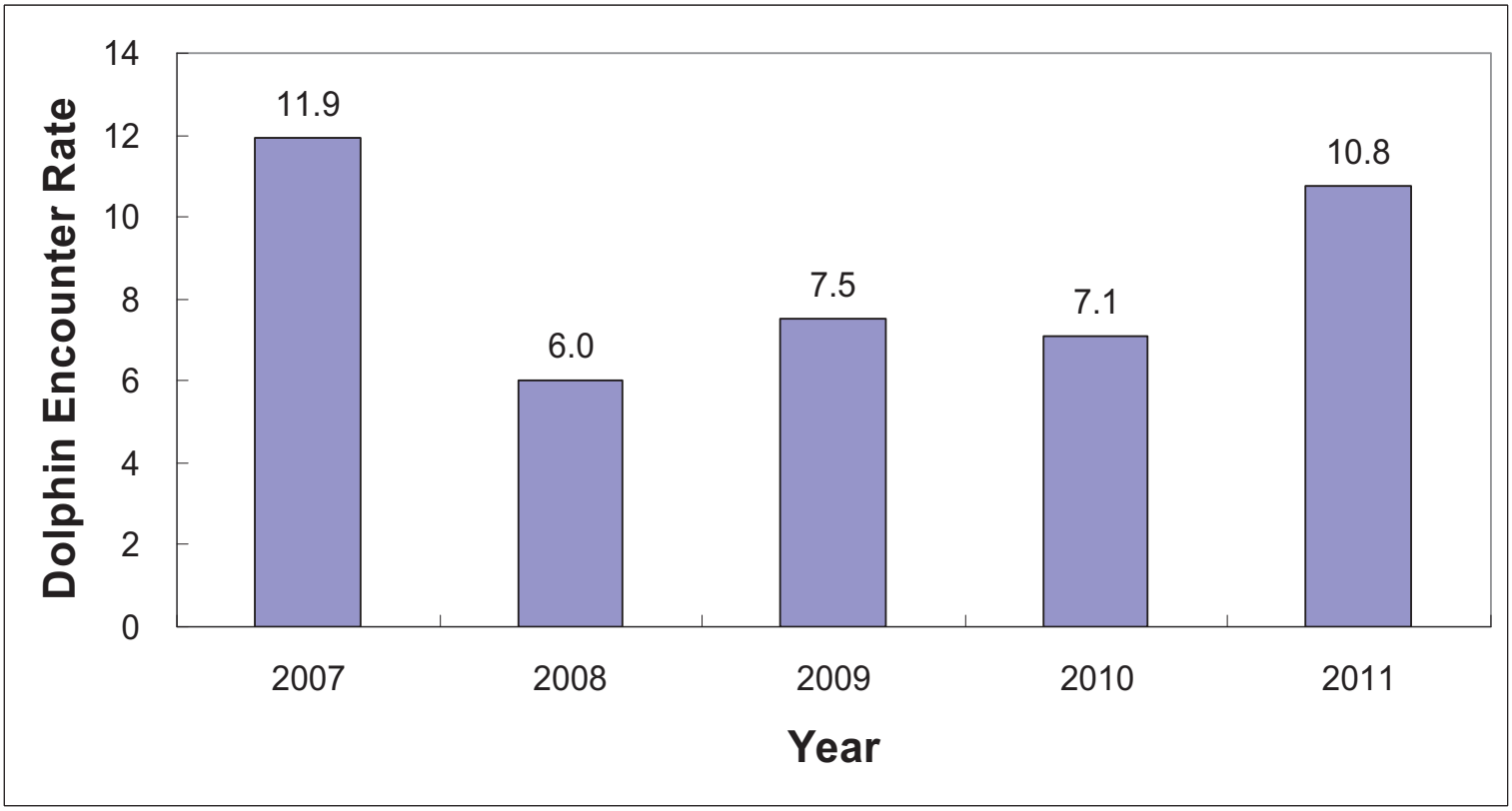



Figure 4a. Temporal trend of encounter rate of Chinese white dolphins (combined from Northwest, Northeast and West Lantau survey areas) during the same 3-month period of September to November from 2007-2011

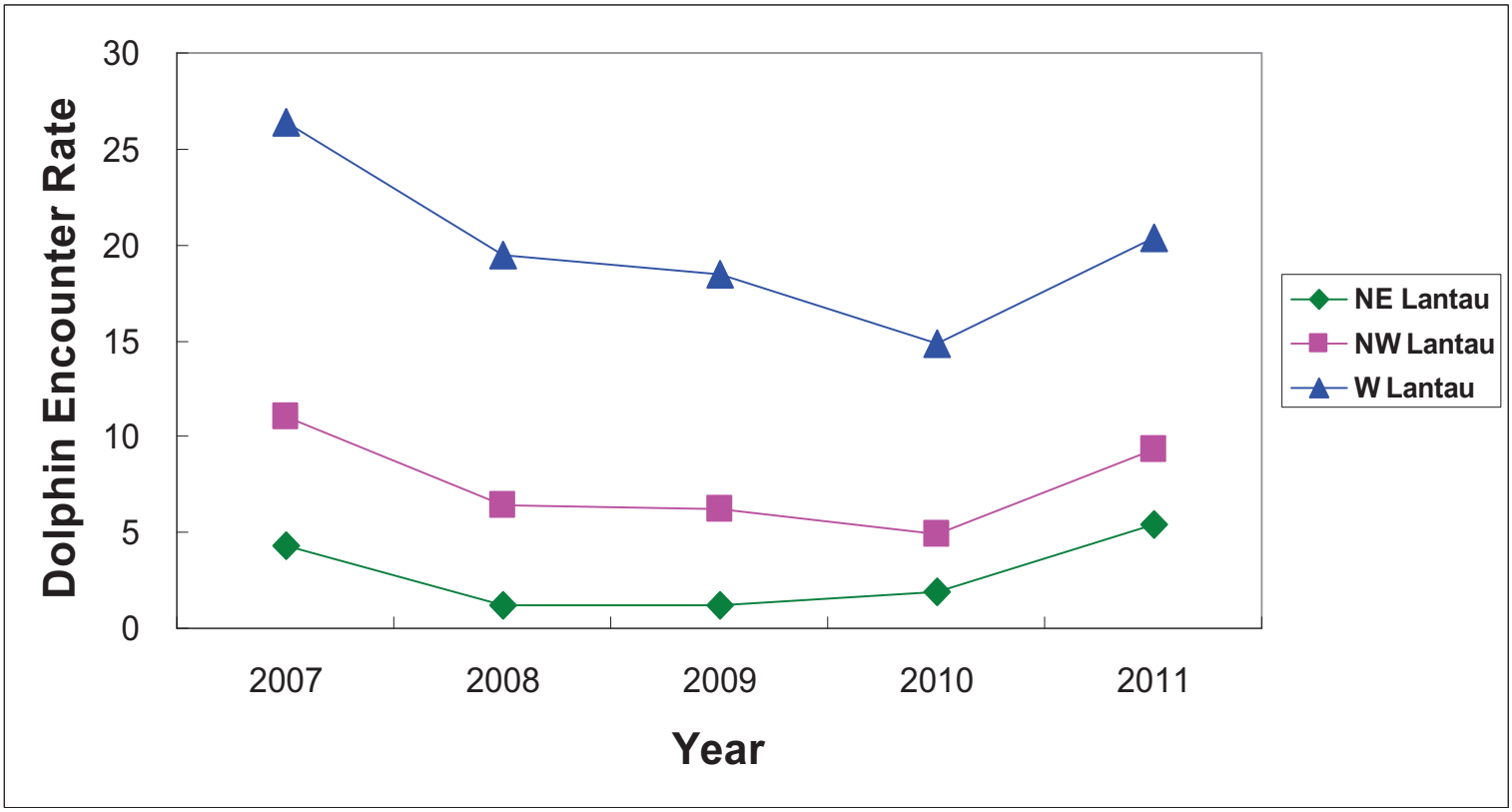



Figure 4b. Temporal trend of encounter rate of Chinese white dolphins in each of the three survey areas during the same 3-month period of September to November from 2007-2011

Figure 5. Distribution of Chinese white dolphins with larger group sizes during HZMB baseline monitoring surveys (green dots: group sizes of 5 or more; purple dots: group sizes of 10 or more)

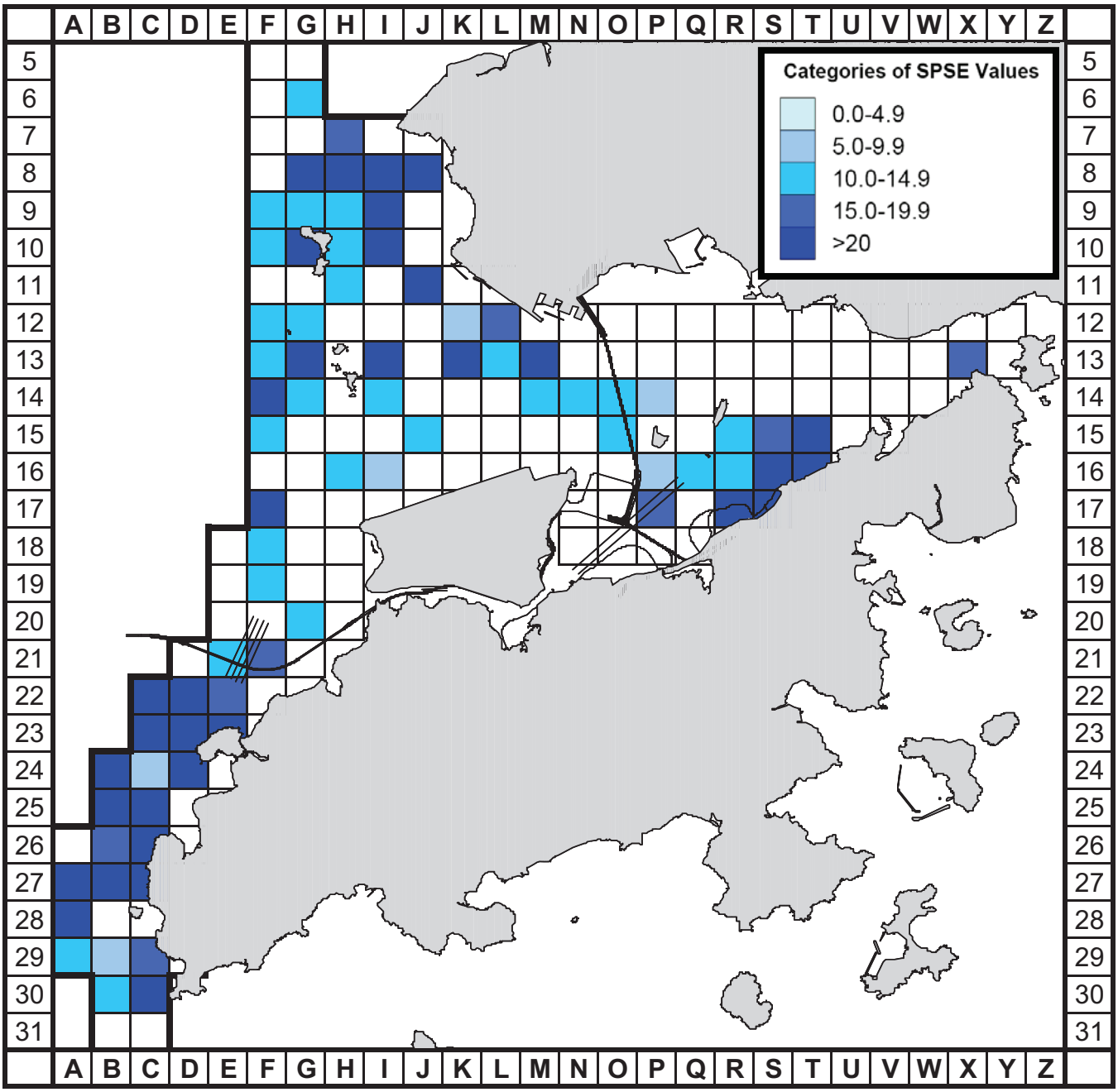



Figure 6. Sighting density of Chinese white dolphins with corrected survey effort per $km^2$ in Northwest, Northeast and West Lantau survey areas, using data collected during HZMB baseline monitoring period (September to November 2011) (SPSE = no. of on-effort sightings per 100 units of survey effort)

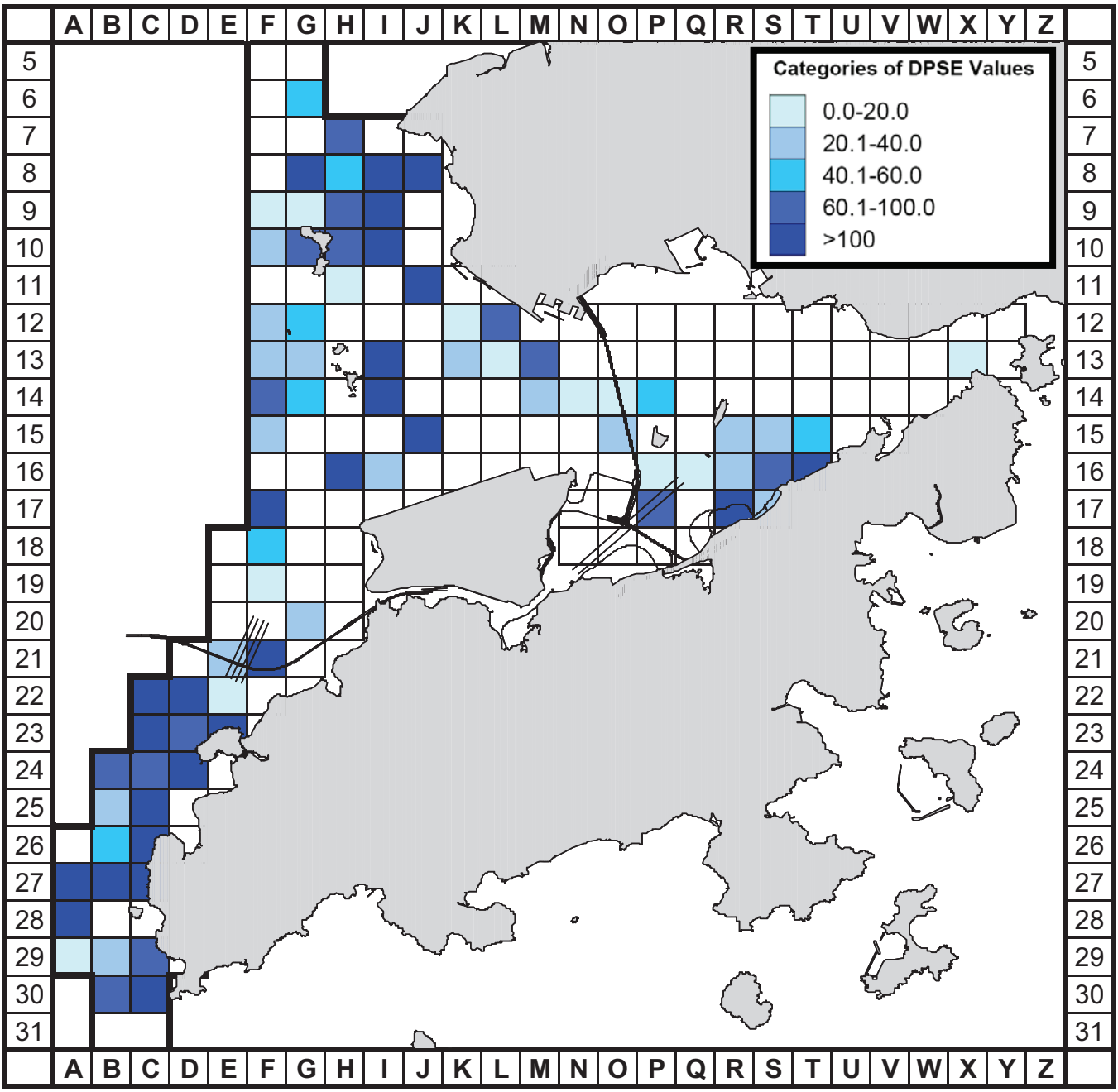



Figure 7. Density of Chinese white dolphins with corrected survey effort per $km^2$ in Northwest, Northeast and West Lantau survey areas, using data collected during HZMB baseline monitoring period (September to November 2011) (DPSE = no. of dolphins per 100 units of survey effort)

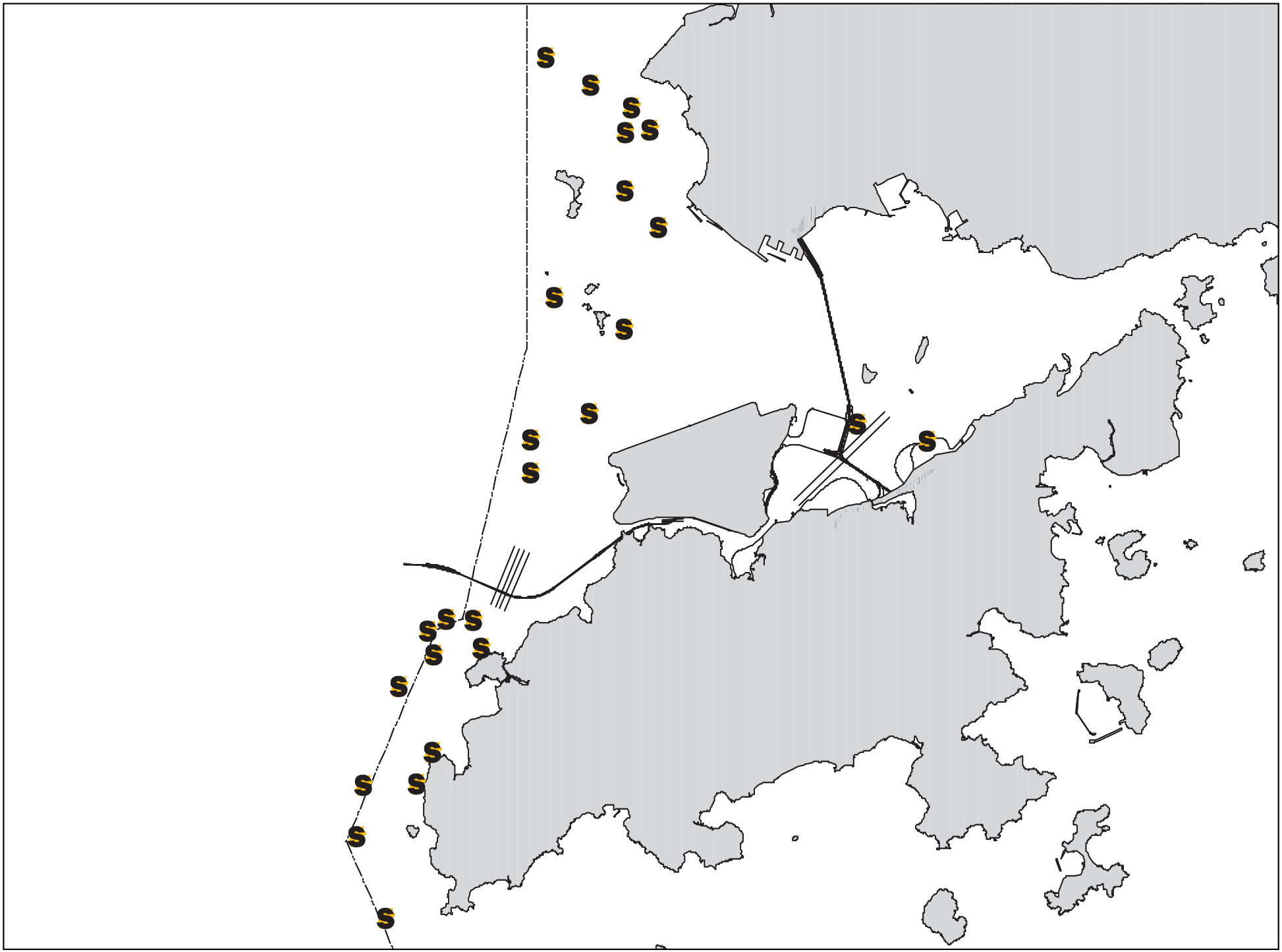


Figure 8. Distribution of young calves of Chinese white dolphins during HZMB baseline monitoring surveys

Figure 9. Distribution of Chinese white dolphins engaged in feeding (blue dots), socializing (pink dots) and traveling (green dots) activities during HZMB baseline monitoring surveys

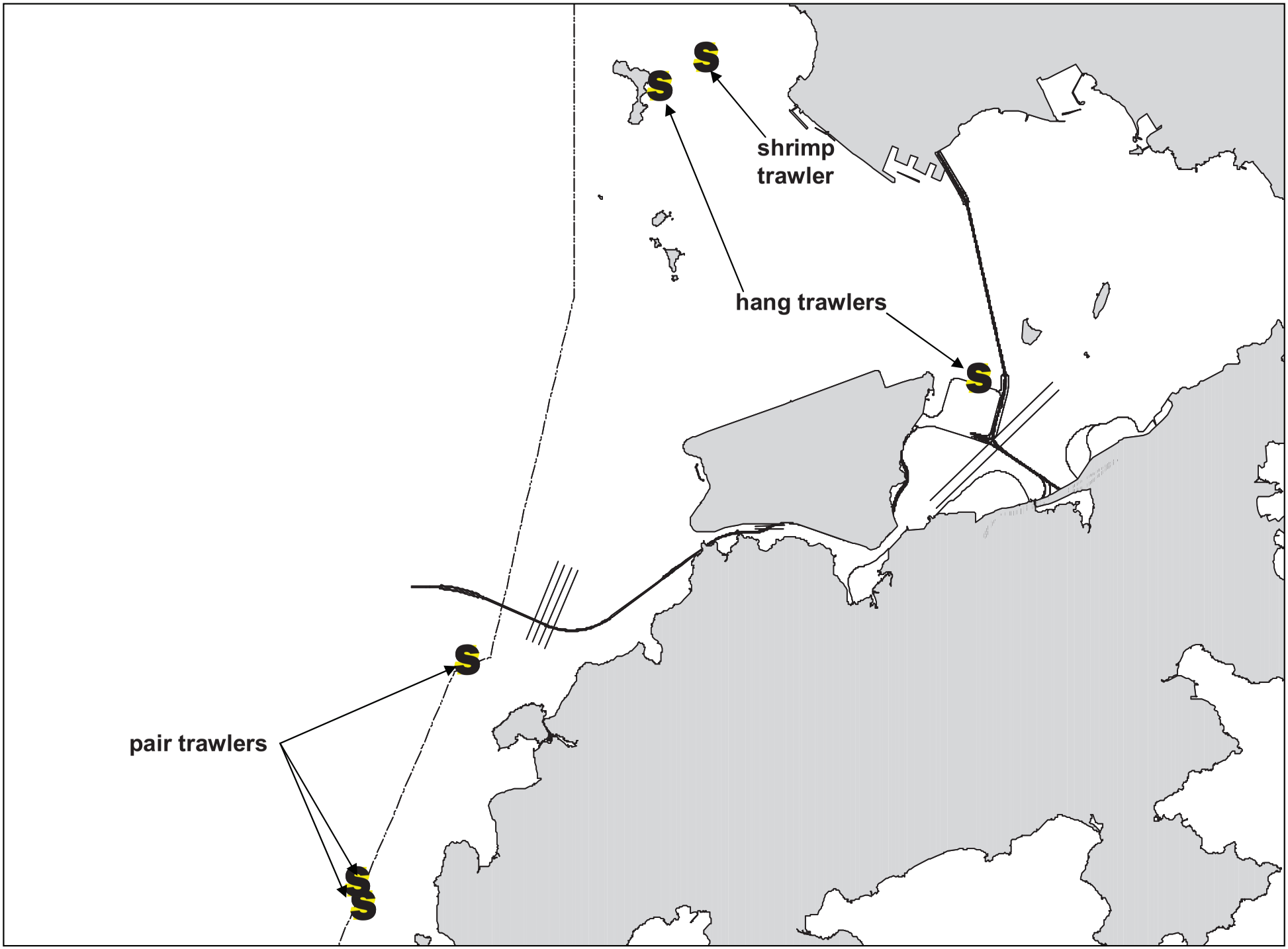



Figure 10. Distribution of dolphin sightings associated with fishing boats during HZMB baseline monitoring surveys

## Appendix I. HYD-HZMB Survey Schedule and Details (September-November 2011)

| DATE | AREA | SURVEY TIME | # SURVEY HOURS | SEASON | TYPE |
|---|---|---|---|---|---|
| 5-Sep-11 | W LANTAU + NW LANTAU | 09:30 - 18:30 | 9.0 | AUTUMN | HYD-HZMB |
| 7-Sep-11 | NW LANTAU + NE LANTAU | 09:30 - 18:30 | 9.0 | AUTUMN | HYD-HZMB |
| 16-Sep-11 | NW LANTAU + NE LANTAU | 09:30 - 18:30 | 9.0 | AUTUMN | HYD-HZMB |
| 23-Sep-11 | W LANTAU + NW LANTAU | 09:30 - 18:30 | 9.0 | AUTUMN | HYD-HZMB |
| 6-Oct-11 | NE LANTAU + NW LANTAU | 09:00 - 18:00 | 9.0 | AUTUMN | HYD-HZMB |
| 10-Oct-11 | NW LANTAU + NE LANTAU | 09:30 - 17:00 | 7.5 | AUTUMN | HYD-HZMB |
| 13-Oct-11 | NE LANTAU | 14:00 - 17:00 | 3.0 | AUTUMN | HYD-HZMB |
| 17-Oct-11 | W LANTAU + NW LANTAU | 09:30 - 18:30 | 9.0 | AUTUMN | HYD-HZMB |
| 28-Oct-11 | NW LANTAU + W LANTAU | 09:30 - 17:30 | 8.0 | AUTUMN | HYD-HZMB |
| 1-Nov-11 | NW LANTAU + NE LANTAU | 09:30 - 18:00 | 8.5 | AUTUMN | HYD-HZMB |
| 2-Nov-11 | W LANTAU + NW LANTAU | 09:00 - 17:30 | 8.5 | AUTUMN | HYD-HZMB |
| 5-Nov-11 | NW LANTAU + NE LANTAU | 09:30 - 18:30 | 9.0 | AUTUMN | HYD-HZMB |
| 6-Nov-11 | NE LANTAU | 14:00 - 17:30 | 3.5 | AUTUMN | HYD-HZMB |
| 7-Nov-11 | NW LANTAU + W LANTAU | 09:00 - 17:30 | 8.5 | AUTUMN | HYD-HZMB |

## Appendix II. HYD-HZMB Survey Effort Database (September-November 2011)

(Abbreviations: BEAU = Beaufort Sea State; P = Primary Line Effort; S = Secondary Line Effort)

| DATE | AREA | BEAU | EFFORT | SEASON | VESSEL | TYPE | P/S |
|---|---|---|---|---|---|---|---|
| 5-Sep-11 | W LANTAU | 2 | 8.3 | AUTUMN | STANDARD31516 | HYD-HZMB | P |
| 5-Sep-11 | W LANTAU | 3 | 12.0 | AUTUMN | STANDARD31516 | HYD-HZMB | P |
| 5-Sep-11 | W LANTAU | 2 | 11.1 | AUTUMN | STANDARD31516 | HYD-HZMB | S |
| 5-Sep-11 | W LANTAU | 3 | 7.6 | AUTUMN | STANDARD31516 | HYD-HZMB | S |
| 5-Sep-11 | NW LANTAU | 2 | 10.7 | AUTUMN | STANDARD31516 | HYD-HZMB | P |
| 5-Sep-11 | NW LANTAU | 3 | 28.0 | AUTUMN | STANDARD31516 | HYD-HZMB | P |
| 5-Sep-11 | NW LANTAU | 2 | 4.4 | AUTUMN | STANDARD31516 | HYD-HZMB | S |
| 5-Sep-11 | NW LANTAU | 3 | 2.1 | AUTUMN | STANDARD31516 | HYD-HZMB | S |
| 7-Sep-11 | NW LANTAU | 2 | 14.1 | AUTUMN | STANDARD31516 | HYD-HZMB | P |
| 7-Sep-11 | NW LANTAU | 3 | 19.4 | AUTUMN | STANDARD31516 | HYD-HZMB | P |
| 7-Sep-11 | NW LANTAU | 4 | 3.6 | AUTUMN | STANDARD31516 | HYD-HZMB | P |
| 7-Sep-11 | NW LANTAU | 2 | 1.9 | AUTUMN | STANDARD31516 | HYD-HZMB | S |
| 7-Sep-11 | NW LANTAU | 3 | 10.3 | AUTUMN | STANDARD31516 | HYD-HZMB | S |
| 7-Sep-11 | NW LANTAU | 4 | 0.7 | AUTUMN | STANDARD31516 | HYD-HZMB | S |
| 7-Sep-11 | NE LANTAU | 2 | 8.2 | AUTUMN | STANDARD31516 | HYD-HZMB | P |
| 7-Sep-11 | NE LANTAU | 3 | 21.7 | AUTUMN | STANDARD31516 | HYD-HZMB | P |
| 7-Sep-11 | NE LANTAU | 2 | 7.9 | AUTUMN | STANDARD31516 | HYD-HZMB | S |
| 7-Sep-11 | NE LANTAU | 3 | 3.1 | AUTUMN | STANDARD31516 | HYD-HZMB | S |
| 16-Sep-11 | NW LANTAU | 1 | 2.9 | AUTUMN | STANDARD31516 | HYD-HZMB | P |
| 16-Sep-11 | NW LANTAU | 2 | 27.5 | AUTUMN | STANDARD31516 | HYD-HZMB | P |
| 16-Sep-11 | NW LANTAU | 3 | 6.3 | AUTUMN | STANDARD31516 | HYD-HZMB | P |
| 16-Sep-11 | NW LANTAU | 1 | 0.8 | AUTUMN | STANDARD31516 | HYD-HZMB | S |
| 16-Sep-11 | NW LANTAU | 2 | 5.1 | AUTUMN | STANDARD31516 | HYD-HZMB | S |
| 16-Sep-11 | NW LANTAU | 3 | 0.9 | AUTUMN | STANDARD31516 | HYD-HZMB | S |
| 16-Sep-11 | NE LANTAU | 2 | 4.1 | AUTUMN | STANDARD31516 | HYD-HZMB | P |
| 16-Sep-11 | NE LANTAU | 3 | 22.8 | AUTUMN | STANDARD31516 | HYD-HZMB | P |
| 16-Sep-11 | NE LANTAU | 4 | 2.4 | AUTUMN | STANDARD31516 | HYD-HZMB | P |
| 16-Sep-11 | NE LANTAU | 2 | 6.7 | AUTUMN | STANDARD31516 | HYD-HZMB | S |
| 16-Sep-11 | NE LANTAU | 3 | 3.9 | AUTUMN | STANDARD31516 | HYD-HZMB | S |
| 23-Sep-11 | W LANTAU | 2 | 9.0 | AUTUMN | STANDARD31516 | HYD-HZMB | P |
| 23-Sep-11 | W LANTAU | 3 | 12.0 | AUTUMN | STANDARD31516 | HYD-HZMB | P |
| 23-Sep-11 | W LANTAU | 2 | 11.7 | AUTUMN | STANDARD31516 | HYD-HZMB | S |
| 23-Sep-11 | W LANTAU | 3 | 7.2 | AUTUMN | STANDARD31516 | HYD-HZMB | S |
| 23-Sep-11 | NW LANTAU | 2 | 9.7 | AUTUMN | STANDARD31516 | HYD-HZMB | P |
| 23-Sep-11 | NW LANTAU | 3 | 7.9 | AUTUMN | STANDARD31516 | HYD-HZMB | P |
| 23-Sep-11 | NW LANTAU | 2 | 5.2 | AUTUMN | STANDARD31516 | HYD-HZMB | S |
| 23-Sep-11 | NW LANTAU | 3 | 4.0 | AUTUMN | STANDARD31516 | HYD-HZMB | S |
| 6-Oct-11 | NE LANTAU | 0 | 1.6 | AUTUMN | STANDARD31516 | HYD-HZMB | P |
| 6-Oct-11 | NE LANTAU | 1 | 13.5 | AUTUMN | STANDARD31516 | HYD-HZMB | P |
| 6-Oct-11 | NE LANTAU | 2 | 18.0 | AUTUMN | STANDARD31516 | HYD-HZMB | P |
| 6-Oct-11 | NE LANTAU | 1 | 5.3 | AUTUMN | STANDARD31516 | HYD-HZMB | S |
| 6-Oct-11 | NE LANTAU | 2 | 4.9 | AUTUMN | STANDARD31516 | HYD-HZMB | S |
| 6-Oct-11 | NW LANTAU | 1 | 0.9 | AUTUMN | STANDARD31516 | HYD-HZMB | P |
| 6-Oct-11 | NW LANTAU | 2 | 21.7 | AUTUMN | STANDARD31516 | HYD-HZMB | P |
| 6-Oct-11 | NW LANTAU | 1 | 12.7 | AUTUMN | STANDARD31516 | HYD-HZMB | S |
| 10-Oct-11 | NW LANTAU | 2 | 16.7 | AUTUMN | STANDARD31516 | HYD-HZMB | P |
| 10-Oct-11 | NW LANTAU | 3 | 17.9 | AUTUMN | STANDARD31516 | HYD-HZMB | P |
| 10-Oct-11 | NW LANTAU | 2 | 11.8 | AUTUMN | STANDARD31516 | HYD-HZMB | S |
| 10-Oct-11 | NW LANTAU | 3 | 2.2 | AUTUMN | STANDARD31516 | HYD-HZMB | S |
| 10-Oct-11 | NE LANTAU | 2 | 6.8 | AUTUMN | STANDARD31516 | HYD-HZMB | P |
| 10-Oct-11 | NE LANTAU | 3 | 10.2 | AUTUMN | STANDARD31516 | HYD-HZMB | P |
| 10-Oct-11 | NE LANTAU | 4 | 1.3 | AUTUMN | STANDARD31516 | HYD-HZMB | P |
| 10-Oct-11 | NE LANTAU | 2 | 2.1 | AUTUMN | STANDARD31516 | HYD-HZMB | S |
| 10-Oct-11 | NE LANTAU | 3 | 2.1 | AUTUMN | STANDARD31516 | HYD-HZMB | S |
| 13-Oct-11 | NE LANTAU | 2 | 15.0 | AUTUMN | STANDARD31516 | HYD-HZMB | P |
| 13-Oct-11 | NE LANTAU | 3 | 1.8 | AUTUMN | STANDARD31516 | HYD-HZMB | P |
| 13-Oct-11 | NE LANTAU | 2 | 10.3 | AUTUMN | STANDARD31516 | HYD-HZMB | S |
| 13-Oct-11 | NE LANTAU | 3 | 1.0 | AUTUMN | STANDARD31516 | HYD-HZMB | S |
| 17-Oct-11 | W LANTAU | 2 | 5.2 | AUTUMN | STANDARD31516 | HYD-HZMB | P |
| 17-Oct-11 | W LANTAU | 3 | 10.3 | AUTUMN | STANDARD31516 | HYD-HZMB | P |
| 17-Oct-11 | W LANTAU | 4 | 3.6 | AUTUMN | STANDARD31516 | HYD-HZMB | P |

## Appendix II. (cont'd)

(Abbreviations: BEAU = Beaufort Sea State; P = Primary Line Effort; S = Secondary Line Effort)

| DATE | AREA | BEAU | EFFORT | SEASON | VESSEL | TYPE | P/S |
|---|---|---|---|---|---|---|---|
| 17-Oct-11 | W LANTAU | 2 | 3.5 | AUTUMN | STANDARD31516 | HYD-HZMB | S |
| 17-Oct-11 | W LANTAU | 3 | 10.1 | AUTUMN | STANDARD31516 | HYD-HZMB | S |
| 17-Oct-11 | W LANTAU | 4 | 5.2 | AUTUMN | STANDARD31516 | HYD-HZMB | S |
| 17-Oct-11 | NW LANTAU | 2 | 24.9 | AUTUMN | STANDARD31516 | HYD-HZMB | P |
| 17-Oct-11 | NW LANTAU | 3 | 2.6 | AUTUMN | STANDARD31516 | HYD-HZMB | P |
| 17-Oct-11 | NW LANTAU | 2 | 4.5 | AUTUMN | STANDARD31516 | HYD-HZMB | S |
| 17-Oct-11 | NW LANTAU | 3 | 2.1 | AUTUMN | STANDARD31516 | HYD-HZMB | S |
| 28-Oct-11 | NW LANTAU | 1 | 1.5 | AUTUMN | STANDARD31516 | HYD-HZMB | P |
| 28-Oct-11 | NW LANTAU | 2 | 9.3 | AUTUMN | STANDARD31516 | HYD-HZMB | P |
| 28-Oct-11 | NW LANTAU | 3 | 20.9 | AUTUMN | STANDARD31516 | HYD-HZMB | P |
| 28-Oct-11 | NW LANTAU | 1 | 3.9 | AUTUMN | STANDARD31516 | HYD-HZMB | S |
| 28-Oct-11 | NW LANTAU | 2 | 2.5 | AUTUMN | STANDARD31516 | HYD-HZMB | S |
| 28-Oct-11 | NW LANTAU | 3 | 0.9 | AUTUMN | STANDARD31516 | HYD-HZMB | S |
| 28-Oct-11 | W LANTAU | 2 | 1.3 | AUTUMN | STANDARD31516 | HYD-HZMB | P |
| 28-Oct-11 | W LANTAU | 3 | 14.9 | AUTUMN | STANDARD31516 | HYD-HZMB | P |
| 28-Oct-11 | W LANTAU | 4 | 0.9 | AUTUMN | STANDARD31516 | HYD-HZMB | P |
| 28-Oct-11 | W LANTAU | 2 | 1.1 | AUTUMN | STANDARD31516 | HYD-HZMB | S |
| 28-Oct-11 | W LANTAU | 3 | 12.1 | AUTUMN | STANDARD31516 | HYD-HZMB | S |
| 28-Oct-11 | W LANTAU | 4 | 3.6 | AUTUMN | STANDARD31516 | HYD-HZMB | S |
| 1-Nov-11 | NW LANTAU | 1 | 2.4 | AUTUMN | STANDARD31516 | HYD-HZMB | P |
| 1-Nov-11 | NW LANTAU | 2 | 21.1 | AUTUMN | STANDARD31516 | HYD-HZMB | P |
| 1-Nov-11 | NW LANTAU | 3 | 7.9 | AUTUMN | STANDARD31516 | HYD-HZMB | P |
| 1-Nov-11 | NW LANTAU | 1 | 1.8 | AUTUMN | STANDARD31516 | HYD-HZMB | S |
| 1-Nov-11 | NW LANTAU | 2 | 6.1 | AUTUMN | STANDARD31516 | HYD-HZMB | S |
| 1-Nov-11 | NW LANTAU | 3 | 2.1 | AUTUMN | STANDARD31516 | HYD-HZMB | S |
| 1-Nov-11 | NE LANTAU | 2 | 21.8 | AUTUMN | STANDARD31516 | HYD-HZMB | P |
| 1-Nov-11 | NE LANTAU | 2 | 9.9 | AUTUMN | STANDARD31516 | HYD-HZMB | S |
| 2-Nov-11 | W LANTAU | 2 | 9.0 | AUTUMN | STANDARD31516 | HYD-HZMB | P |
| 2-Nov-11 | W LANTAU | 3 | 6.6 | AUTUMN | STANDARD31516 | HYD-HZMB | P |
| 2-Nov-11 | W LANTAU | 4 | 3.2 | AUTUMN | STANDARD31516 | HYD-HZMB | P |
| 2-Nov-11 | W LANTAU | 2 | 12.1 | AUTUMN | STANDARD31516 | HYD-HZMB | S |
| 2-Nov-11 | W LANTAU | 3 | 7.8 | AUTUMN | STANDARD31516 | HYD-HZMB | S |
| 2-Nov-11 | NW LANTAU | 2 | 17.9 | AUTUMN | STANDARD31516 | HYD-HZMB | P |
| 2-Nov-11 | NW LANTAU | 3 | 4.0 | AUTUMN | STANDARD31516 | HYD-HZMB | P |
| 2-Nov-11 | NW LANTAU | 2 | 7.2 | AUTUMN | STANDARD31516 | HYD-HZMB | S |
| 5-Nov-11 | NW LANTAU | 0 | 2.2 | AUTUMN | STANDARD31516 | HYD-HZMB | P |
| 5-Nov-11 | NW LANTAU | 1 | 10.6 | AUTUMN | STANDARD31516 | HYD-HZMB | P |
| 5-Nov-11 | NW LANTAU | 2 | 19.4 | AUTUMN | STANDARD31516 | HYD-HZMB | P |
| 5-Nov-11 | NW LANTAU | 1 | 3.0 | AUTUMN | STANDARD31516 | HYD-HZMB | S |
| 5-Nov-11 | NW LANTAU | 2 | 4.5 | AUTUMN | STANDARD31516 | HYD-HZMB | S |
| 5-Nov-11 | NE LANTAU | 1 | 1.2 | AUTUMN | STANDARD31516 | HYD-HZMB | P |
| 5-Nov-11 | NE LANTAU | 2 | 15.2 | AUTUMN | STANDARD31516 | HYD-HZMB | P |
| 5-Nov-11 | NE LANTAU | 1 | 1.2 | AUTUMN | STANDARD31516 | HYD-HZMB | S |
| 5-Nov-11 | NE LANTAU | 2 | 8.2 | AUTUMN | STANDARD31516 | HYD-HZMB | S |
| 6-Nov-11 | NE LANTAU | 3 | 10.2 | AUTUMN | STANDARD31516 | HYD-HZMB | P |
| 6-Nov-11 | NE LANTAU | 4 | 3.5 | AUTUMN | STANDARD31516 | HYD-HZMB | P |
| 6-Nov-11 | NE LANTAU | 2 | 4.3 | AUTUMN | STANDARD31516 | HYD-HZMB | S |
| 6-Nov-11 | NE LANTAU | 3 | 7.2 | AUTUMN | STANDARD31516 | HYD-HZMB | S |
| 6-Nov-11 | NE LANTAU | 4 | 1.2 | AUTUMN | STANDARD31516 | HYD-HZMB | S |
| 7-Nov-11 | NW LANTAU | 2 | 14.6 | AUTUMN | STANDARD31516 | HYD-HZMB | P |
| 7-Nov-11 | NW LANTAU | 3 | 16.0 | AUTUMN | STANDARD31516 | HYD-HZMB | P |
| 7-Nov-11 | NW LANTAU | 4 | 7.6 | AUTUMN | STANDARD31516 | HYD-HZMB | P |
| 7-Nov-11 | NW LANTAU | 2 | 3.6 | AUTUMN | STANDARD31516 | HYD-HZMB | S |
| 7-Nov-11 | NW LANTAU | 3 | 3.3 | AUTUMN | STANDARD31516 | HYD-HZMB | S |
| 7-Nov-11 | NW LANTAU | 4 | 0.8 | AUTUMN | STANDARD31516 | HYD-HZMB | S |
| 7-Nov-11 | NE LANTAU | 2 | 0.6 | AUTUMN | STANDARD31516 | HYD-HZMB | P |
| 7-Nov-11 | NE LANTAU | 3 | 13.9 | AUTUMN | STANDARD31516 | HYD-HZMB | P |
| 7-Nov-11 | NE LANTAU | 4 | 5.1 | AUTUMN | STANDARD31516 | HYD-HZMB | P |
| 7-Nov-11 | NE LANTAU | 5 | 0.2 | AUTUMN | STANDARD31516 | HYD-HZMB | P |
| 7-Nov-11 | NE LANTAU | 2 | 4.3 | AUTUMN | STANDARD31516 | HYD-HZMB | S |
| 7-Nov-11 | NE LANTAU | 3 | 9.0 | AUTUMN | STANDARD31516 | HYD-HZMB | S |
| 7-Nov-11 | NE LANTAU | 4 | 6.1 | AUTUMN | STANDARD31516 | HYD-HZMB | S |

## Appendix III. HYD-HZMB Chinese White Dolphin Sighting Database (September-November 2011)

(Abberviations: STG# = Sighting Number; HRD SZ = Dolphin Herd Size; BEAU = Beaufort Sea State; PSD = Perpendicular Distance; BOAT ASSOC. = Fishing Boat Associa

| DATE | STG # | TIME | HRD SZ | AREA | BEAU | PSD | EFFORT | TYPE | NORTHING | EASTING | SEASON | BOAT ASSOC. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 05-Sep-11 | 1 | 1111 | 2 | W LANTAU | 3 | ND | OFF | HYD-HZMB | 811890 | 800623 | AUTUMN | NONE |
| 05-Sep-11 | 2 | 1143 | 2 | W LANTAU | 2 | 230 | ON | HYD-HZMB | 809851 | 801299 | AUTUMN | NONE |
| 05-Sep-11 | 3 | 1155 | 4 | W LANTAU | 2 | 44 | ON | HYD-HZMB | 809434 | 799865 | AUTUMN | PAIR |
| 05-Sep-11 | 4 | 1244 | 6 | W LANTAU | 2 | 179 | ON | HYD-HZMB | 806232 | 800373 | AUTUMN | NONE |
| 05-Sep-11 | 5 | 1324 | 8 | W LANTAU | 2 | 883 | ON | HYD-HZMB | 809910 | 799722 | AUTUMN | PAIR |
| 07-Sep-11 | 1 | 1055 | 2 | NW LANTAU | 2 | 349 | ON | HYD-HZMB | 824052 | 804669 | AUTUMN | NONE |
| 07-Sep-11 | 2 | 1657 | 1 | NE LANTAU | 2 | 179 | ON | HYD-HZMB | 821661 | 817387 | AUTUMN | NONE |
| 16-Sep-11 | 1 | 1001 | 6 | NW LANTAU | 2 | ND | OFF | HYD-HZMB | 816088 | 805652 | AUTUMN | NONE |
| 16-Sep-11 | 2 | 1013 | 2 | NW LANTAU | 2 | 330 | ON | HYD-HZMB | 816609 | 805334 | AUTUMN | NONE |
| 16-Sep-11 | 3 | 1038 | 4 | NW LANTAU | 2 | 87 | ON | HYD-HZMB | 822356 | 805335 | AUTUMN | NONE |
| 16-Sep-11 | 4 | 1102 | 2 | NW LANTAU | 1 | 59 | ON | HYD-HZMB | 826431 | 805354 | AUTUMN | NONE |
| 16-Sep-11 | 5 | 1144 | 3 | NW LANTAU | 2 | 157 | ON | HYD-HZMB | 826350 | 807424 | AUTUMN | NONE |
| 16-Sep-11 | 6 | 1204 | 1 | NW LANTAU | 2 | 4 | ON | HYD-HZMB | 823271 | 807428 | AUTUMN | NONE |
| 16-Sep-11 | 7 | 1210 | 9 | NW LANTAU | 2 | 73 | ON | HYD-HZMB | 822585 | 807406 | AUTUMN | NONE |
| 16-Sep-11 | 8 | 1350 | 1 | NW LANTAU | 2 | ND | OFF | HYD-HZMB | 824384 | 810767 | AUTUMN | NONE |
| 16-Sep-11 | 9 | 1406 | 3 | NW LANTAU | 2 | 295 | ON | HYD-HZMB | 822843 | 811548 | AUTUMN | NONE |
| 23-Sep-11 | 1 | 1104 | 1 | W LANTAU | 3 | ND | OFF | HYD-HZMB | 813867 | 803153 | AUTUMN | NONE |
| 23-Sep-11 | 2 | 1115 | 2 | W LANTAU | 3 | 130 | ON | HYD-HZMB | 813284 | 801266 | AUTUMN | NONE |
| 23-Sep-11 | 3 | 1126 | 2 | W LANTAU | 2 | 7 | ON | HYD-HZMB | 811503 | 800365 | AUTUMN | NONE |
| 23-Sep-11 | 4 | 1149 | 5 | W LANTAU | 2 | 176 | ON | HYD-HZMB | 809973 | 801299 | AUTUMN | NONE |
| 23-Sep-11 | 5 | 1211 | 1 | W LANTAU | 2 | ND | OFF | HYD-HZMB | 809444 | 800411 | AUTUMN | NONE |
| 23-Sep-11 | 6 | 1222 | 4 | W LANTAU | 2 | 21 | ON | HYD-HZMB | 808526 | 799605 | AUTUMN | NONE |
| 23-Sep-11 | 7 | 1247 | 2 | W LANTAU | 2 | 351 | ON | HYD-HZMB | 806462 | 801797 | AUTUMN | NONE |
| 23-Sep-11 | 8 | 1315 | 1 | W LANTAU | 3 | 433 | ON | HYD-HZMB | 806474 | 801322 | AUTUMN | NONE |
| 23-Sep-11 | 9 | 1417 | 9 | W LANTAU | 2 | 125 | ON | HYD-HZMB | 812465 | 801150 | AUTUMN | NONE |
| 23-Sep-11 | 10 | 1517 | 4 | NW LANTAU | 3 | 26 | ON | HYD-HZMB | 819489 | 804649 | AUTUMN | NONE |
| 23-Sep-11 | 11 | 1538 | 2 | NW LANTAU | 3 | 137 | ON | HYD-HZMB | 823011 | 804646 | AUTUMN | NONE |
| 23-Sep-11 | 12 | 1608 | 1 | NW LANTAU | 2 | 776 | ON | HYD-HZMB | 828568 | 805770 | AUTUMN | NONE |
| 6-Oct-11 | 1 | 1040 | 1 | NE LANTAU | 2 | 633 | ON | HYD-HZMB | 823250 | 822571 | AUTUMN | NONE |
| 6-Oct-11 | 2 | 1306 | 5 | NE LANTAU | 2 | 57 | ON | HYD-HZMB | 822462 | 814277 | AUTUMN | NONE |
| 6-Oct-11 | 3 | 1455 | 2 | NW LANTAU | 1 | 236 | ON | HYD-HZMB | 823764 | 810478 | AUTUMN | NONE |

## Appendix III. (cont'd)

(Abberviations: STG# = Sighting Number; HRD SZ = Dolphin Herd Size; BEAU = Beaufort Sea State; PSD = Perpendicular Distance; BOAT ASSOC. = Fishing Boat Associa

| DATE | STG # | TIME | HRD SZ | AREA | BEAU | PSD | EFFORT | TYPE | NORTHING | EASTING | SEASON | BOAT ASSOC. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6-Oct-11 | 4 | 1500 | 6 | NW LANTAU | 2 | 151 | ON | HYD-HZMB | 824185 | 810520 | AUTUMN | NONE |
| 6-Oct-11 | 5 | 1517 | 2 | NW LANTAU | 2 | 96 | ON | HYD-HZMB | 824672 | 810243 | AUTUMN | NONE |
| 6-Oct-11 | 6 | 1552 | 1 | NW LANTAU | 2 | ND | OFF | HYD-HZMB | 825827 | 808442 | AUTUMN | NONE |
| 6-Oct-11 | 7 | 1615 | 1 | NW LANTAU | 2 | ND | OFF | HYD-HZMB | 821630 | 808455 | AUTUMN | NONE |
| 10-Oct-11 | 1 | 1009 | 3 | NW LANTAU | 3 | 183 | ON | HYD-HZMB | 815702 | 804652 | AUTUMN | NONE |
| 10-Oct-11 | 2 | 1207 | 9 | NW LANTAU | 3 | 382 | ON | HYD-HZMB | 820228 | 806382 | AUTUMN | NONE |
| 10-Oct-11 | 3 | 1629 | 3 | NE LANTAU | 2 | 167 | ON | HYD-HZMB | 820354 | 817344 | AUTUMN | NONE |
| 13-Oct-11 | 3 | 1459 | 2 | NE LANTAU | 2 | 42 | ON | HYD-HZMB | 820015 | 814284 | AUTUMN | NONE |
| 17-Oct-11 | 1 | 1014 | 6 | W LANTAU | 3 | 275 | ON | HYD-HZMB | 814765 | 802774 | AUTUMN | NONE |
| 17-Oct-11 | 2 | 1023 | 10 | W LANTAU | 3 | 216 | ON | HYD-HZMB | 814545 | 802165 | AUTUMN | PAIR |
| 17-Oct-11 | 3 | 1045 | 3 | W LANTAU | 3 | 505 | ON | HYD-HZMB | 812654 | 800769 | AUTUMN | NONE |
| 17-Oct-11 | 4 | 1116 | 5 | W LANTAU | 3 | 606 | ON | HYD-HZMB | 810461 | 800888 | AUTUMN | NONE |
| 17-Oct-11 | 5 | 1131 | 2 | W LANTAU | 4 | ND | OFF | HYD-HZMB | 809301 | 799700 | AUTUMN | NONE |
| 17-Oct-11 | 6 | 1136 | 3 | W LANTAU | 3 | ND | OFF | HYD-HZMB | 808460 | 799481 | AUTUMN | NONE |
| 17-Oct-11 | 7 | 1243 | 1 | W LANTAU | 3 | 104 | ON | HYD-HZMB | 809432 | 800473 | AUTUMN | NONE |
| 17-Oct-11 | 8 | 1324 | 5 | W LANTAU | 2 | 142 | ON | HYD-HZMB | 814203 | 801628 | AUTUMN | NONE |
| 17-Oct-11 | 9 | 1402 | 1 | W LANTAU | 2 | 328 | ON | HYD-HZMB | 814443 | 803020 | AUTUMN | NONE |
| 17-Oct-11 | 10 | 1548 | 1 | NW LANTAU | 2 | 583 | ON | HYD-HZMB | 827080 | 807435 | AUTUMN | SHRIMP |
| 17-Oct-11 | 11 | 1609 | 1 | NW LANTAU | 2 | ND | OFF | HYD-HZMB | 822562 | 807416 | AUTUMN | NONE |
| 28-Oct-11 | 1 | 0953 | 1 | NW LANTAU | 2 | 662 | ON | HYD-HZMB | 823699 | 809479 | AUTUMN | NONE |
| 28-Oct-11 | 2 | 1004 | 1 | NW LANTAU | 2 | ND | OFF | HYD-HZMB | 823445 | 809004 | AUTUMN | NONE |
| 28-Oct-11 | 3 | 1044 | 8 | NW LANTAU | 3 | 0 | ON | HYD-HZMB | 823703 | 807398 | AUTUMN | NONE |
| 28-Oct-11 | 4 | 1117 | 7 | NW LANTAU | 3 | 160 | ON | HYD-HZMB | 827579 | 807426 | AUTUMN | NONE |
| 28-Oct-11 | 5 | 1129 | 4 | NW LANTAU | 3 | 93 | ON | HYD-HZMB | 828022 | 807416 | AUTUMN | NONE |
| 28-Oct-11 | 6 | 1412 | 2 | W LANTAU | 3 | 27 | ON | HYD-HZMB | 811457 | 801220 | AUTUMN | NONE |
| 28-Oct-11 | 7 | 1418 | 3 | W LANTAU | 3 | 235 | ON | HYD-HZMB | 811467 | 801859 | AUTUMN | NONE |
| 28-Oct-11 | 8 | 1518 | 4 | W LANTAU | 3 | 64 | ON | HYD-HZMB | 808482 | 799512 | AUTUMN | NONE |
| 1-Nov-11 | 1 | 0952 | 2 | NW LANTAU | 2 | ND | OFF | HYD-HZMB | 816794 | 806746 | AUTUMN | NONE |
| 1-Nov-11 | 2 | 1021 | 4 | NW LANTAU | 2 | 161 | ON | HYD-HZMB | 819534 | 804649 | AUTUMN | NONE |
| 1-Nov-11 | 3 | 1135 | 2 | NW LANTAU | 1 | 524 | ON | HYD-HZMB | 828356 | 806387 | AUTUMN | NONE |
| 1-Nov-11 | 4 | 1153 | 1 | NW LANTAU | 2 | ND | OFF | HYD-HZMB | 826950 | 806395 | AUTUMN | NONE |

## Appendix III. (cont'd)

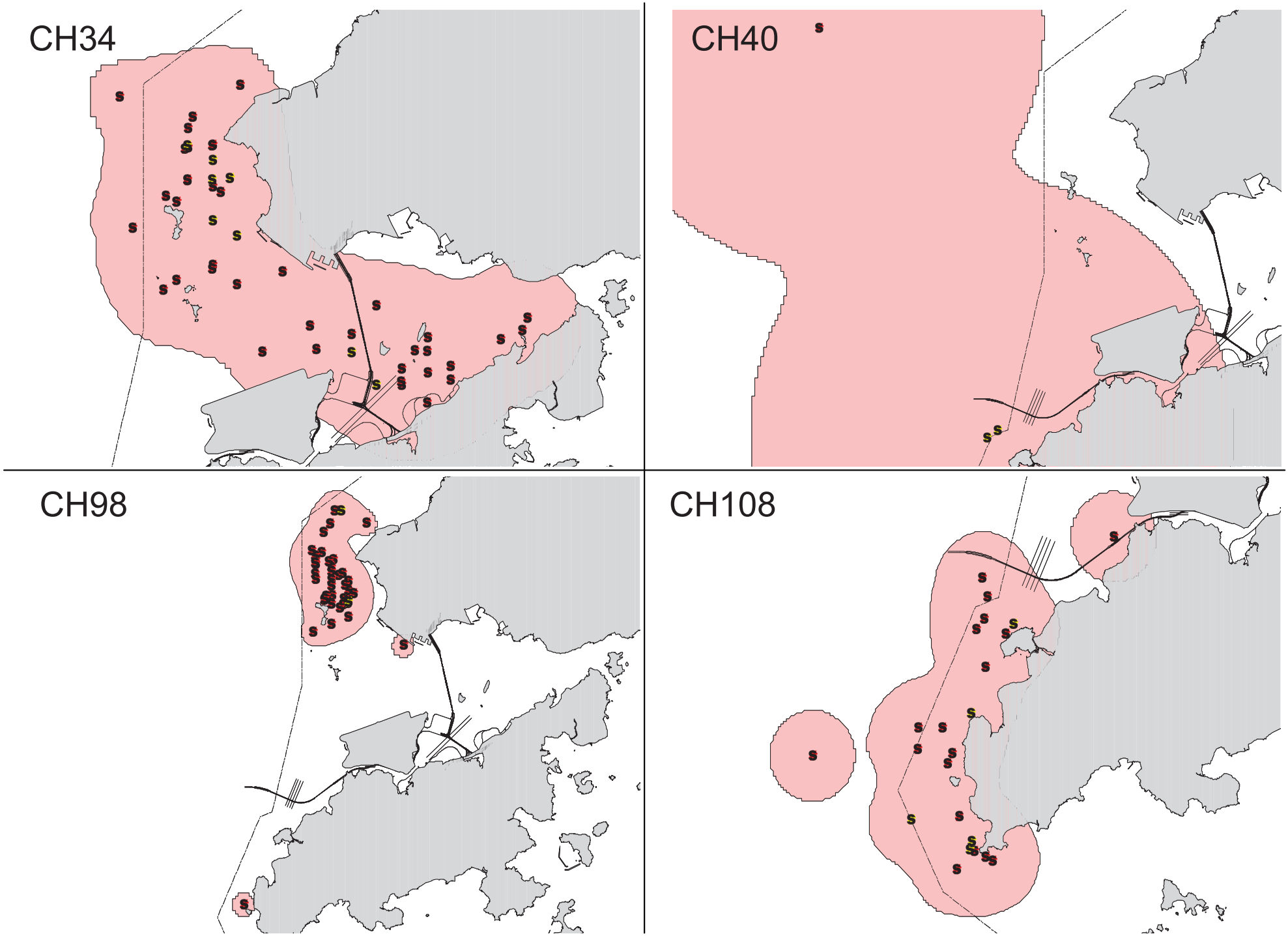
(Abberviations: STG# = Sighting Number; HRD SZ = Dolphin Herd Size; BEAU = Beaufort Sea State; PSD = Perpendicular Distance; BOAT ASSOC. = Fishing Boat Associa

| DATE | STG # | TIME | HRD SZ | AREA | BEAU | PSD | EFFORT | TYPE | NORTHING | EASTING | SEASON | BOAT ASSOC. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1-Nov-11 | 5 | 1156 | 5 | NW LANTAU | 2 | 161 | ON | HYD-HZMB | 826473 | 806394 | AUTUMN | HANG |
| 1-Nov-11 | 6 | 1405 | 4 | NE LANTAU | 2 | 350 | ON | HYD-HZMB | 821213 | 813245 | AUTUMN | NONE |
| 1-Nov-11 | 7 | 1416 | 1 | NE LANTAU | 2 | ND | OFF | HYD-HZMB | 820404 | 813440 | AUTUMN | HANG |
| 1-Nov-11 | 8 | 1505 | 8 | NE LANTAU | 2 | 277 | ON | HYD-HZMB | 819926 | 814273 | AUTUMN | NONE |
| 1-Nov-11 | 9 | 1612 | 4 | NE LANTAU | 2 | 159 | ON | HYD-HZMB | 819702 | 816406 | AUTUMN | NONE |
| 2-Nov-11 | 1 | 0957 | 2 | W LANTAU | 2 | 564 | ON | HYD-HZMB | 815660 | 803796 | AUTUMN | NONE |
| 2-Nov-11 | 2 | 1021 | 1 | W LANTAU | 2 | 29 | ON | HYD-HZMB | 814454 | 803072 | AUTUMN | NONE |
| 2-Nov-11 | 3 | 1026 | 10 | W LANTAU | 2 | 561 | ON | HYD-HZMB | 813723 | 803204 | AUTUMN | NONE |
| 2-Nov-11 | 4 | 1044 | 4 | W LANTAU | 2 | 316 | ON | HYD-HZMB | 813560 | 801782 | AUTUMN | NONE |
| 2-Nov-11 | 5 | 1114 | 1 | W LANTAU | 3 | 746 | ON | HYD-HZMB | 809386 | 801246 | AUTUMN | NONE |
| 2-Nov-11 | 6 | 1120 | 8 | W LANTAU | 3 | 112 | ON | HYD-HZMB | 809409 | 800793 | AUTUMN | NONE |
| 2-Nov-11 | 7 | 1144 | 1 | W LANTAU | 2 | 92 | ON | HYD-HZMB | 808449 | 799615 | AUTUMN | NONE |
| 2-Nov-11 | 8 | 1301 | 14 | W LANTAU | 2 | 303 | ON | HYD-HZMB | 810847 | 801745 | AUTUMN | NONE |
| 2-Nov-11 | 9 | 1343 | 4 | W LANTAU | 2 | 259 | ON | HYD-HZMB | 812455 | 800903 | AUTUMN | NONE |
| 2-Nov-11 | 10 | 1403 | 6 | W LANTAU | 2 | 243 | ON | HYD-HZMB | 814510 | 802959 | AUTUMN | NONE |
| 2-Nov-11 | 11 | 1501 | 2 | NW LANTAU | 2 | 30 | ON | HYD-HZMB | 826309 | 805353 | AUTUMN | NONE |
| 2-Nov-11 | 12 | 1513 | 18 | NW LANTAU | 2 | 282 | ON | HYD-HZMB | 828303 | 805357 | AUTUMN | NONE |
| 2-Nov-11 | 13 | 1555 | 3 | NW LANTAU | 2 | 262 | ON | HYD-HZMB | 827025 | 807425 | AUTUMN | NONE |
| 2-Nov-11 | 14 | 1601 | 12 | NW LANTAU | 2 | 263 | ON | HYD-HZMB | 826405 | 807424 | AUTUMN | NONE |
| 5-Nov-11 | 1 | 1018 | 1 | NW LANTAU | 2 | 204 | ON | HYD-HZMB | 817540 | 804645 | AUTUMN | NONE |
| 5-Nov-11 | 2 | 1025 | 4 | NW LANTAU | 2 | 220 | ON | HYD-HZMB | 818581 | 804647 | AUTUMN | NONE |
| 5-Nov-11 | 3 | 1110 | 2 | NW LANTAU | 2 | 220 | ON | HYD-HZMB | 826255 | 804663 | AUTUMN | NONE |
| 5-Nov-11 | 4 | 1121 | 1 | NW LANTAU | 2 | 534 | ON | HYD-HZMB | 827651 | 804666 | AUTUMN | NONE |
| 5-Nov-11 | 5 | 1138 | 6 | NW LANTAU | 1 | 453 | ON | HYD-HZMB | 830119 | 805104 | AUTUMN | NONE |
| 5-Nov-11 | 6 | 1153 | 7 | NW LANTAU | 1 | 248 | ON | HYD-HZMB | 829353 | 806389 | AUTUMN | NONE |
| 5-Nov-11 | 7 | 1208 | 5 | NW LANTAU | 1 | 21 | ON | HYD-HZMB | 827946 | 806397 | AUTUMN | NONE |
| 5-Nov-11 | 8 | 1321 | 8 | NW LANTAU | 2 | 312 | ON | HYD-HZMB | 825384 | 808431 | AUTUMN | NONE |
| 5-Nov-11 | 9 | 1516 | 4 | NE LANTAU | 1 | 195 | ON | HYD-HZMB | 820189 | 816376 | AUTUMN | NONE |
| 5-Nov-11 | 10 | 1524 | 3 | NE LANTAU | 2 | ND | OFF | HYD-HZMB | 821141 | 816768 | AUTUMN | NONE |
| 5-Nov-11 | 11 | 1537 | 2 | NE LANTAU | 1 | 136 | ON | HYD-HZMB | 821828 | 816409 | AUTUMN | NONE |
| 5-Nov-11 | 12 | 1614 | 2 | NE LANTAU | 2 | 193 | ON | HYD-HZMB | 821172 | 818396 | AUTUMN | NONE |

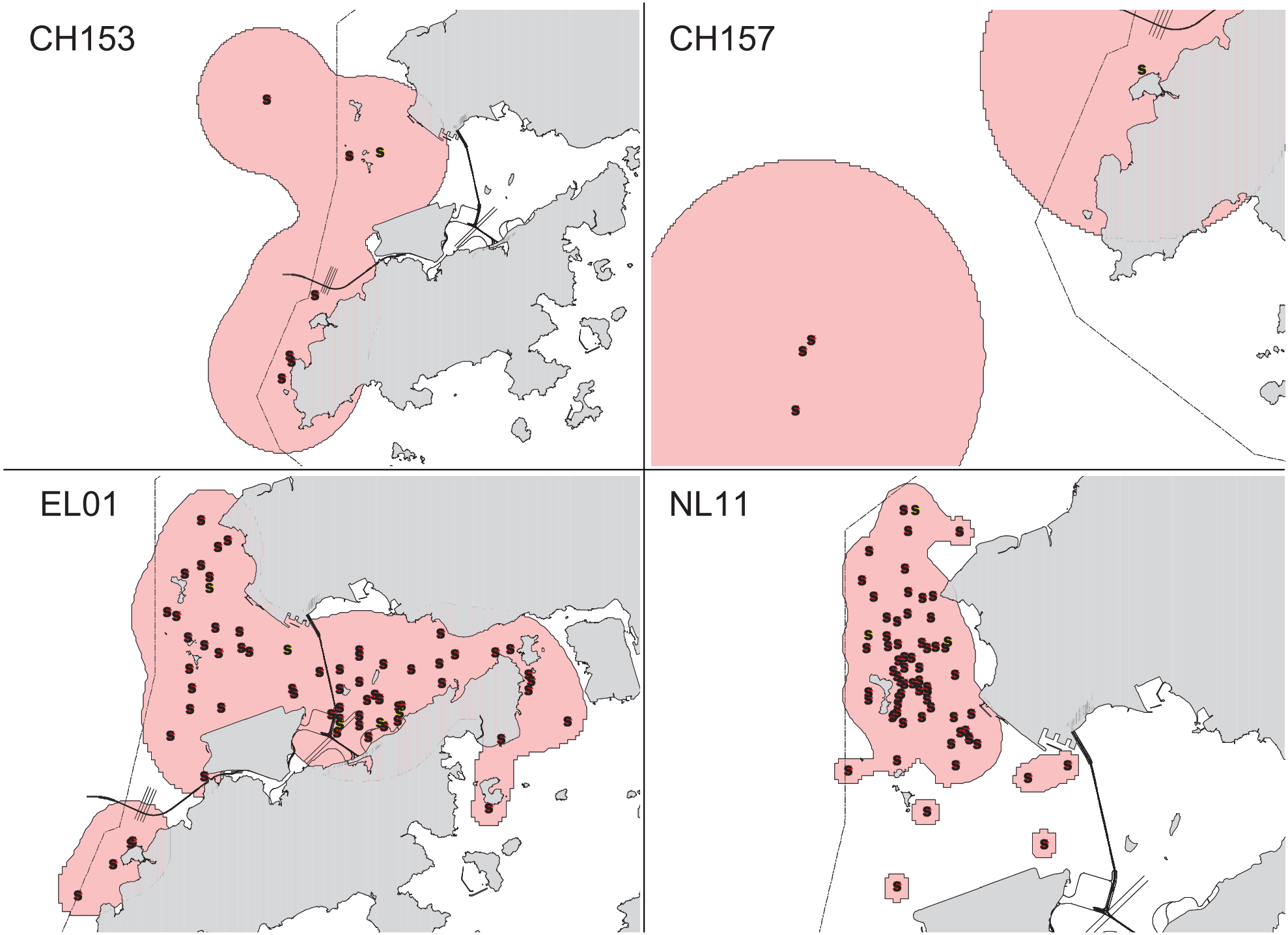
## Appendix III. (cont'd)

(Abberviations: STG# = Sighting Number; HRD SZ = Dolphin Herd Size; BEAU = Beaufort Sea State; PSD = Perpendicular Distance; BOAT ASSOC. = Fishing Boat Associa

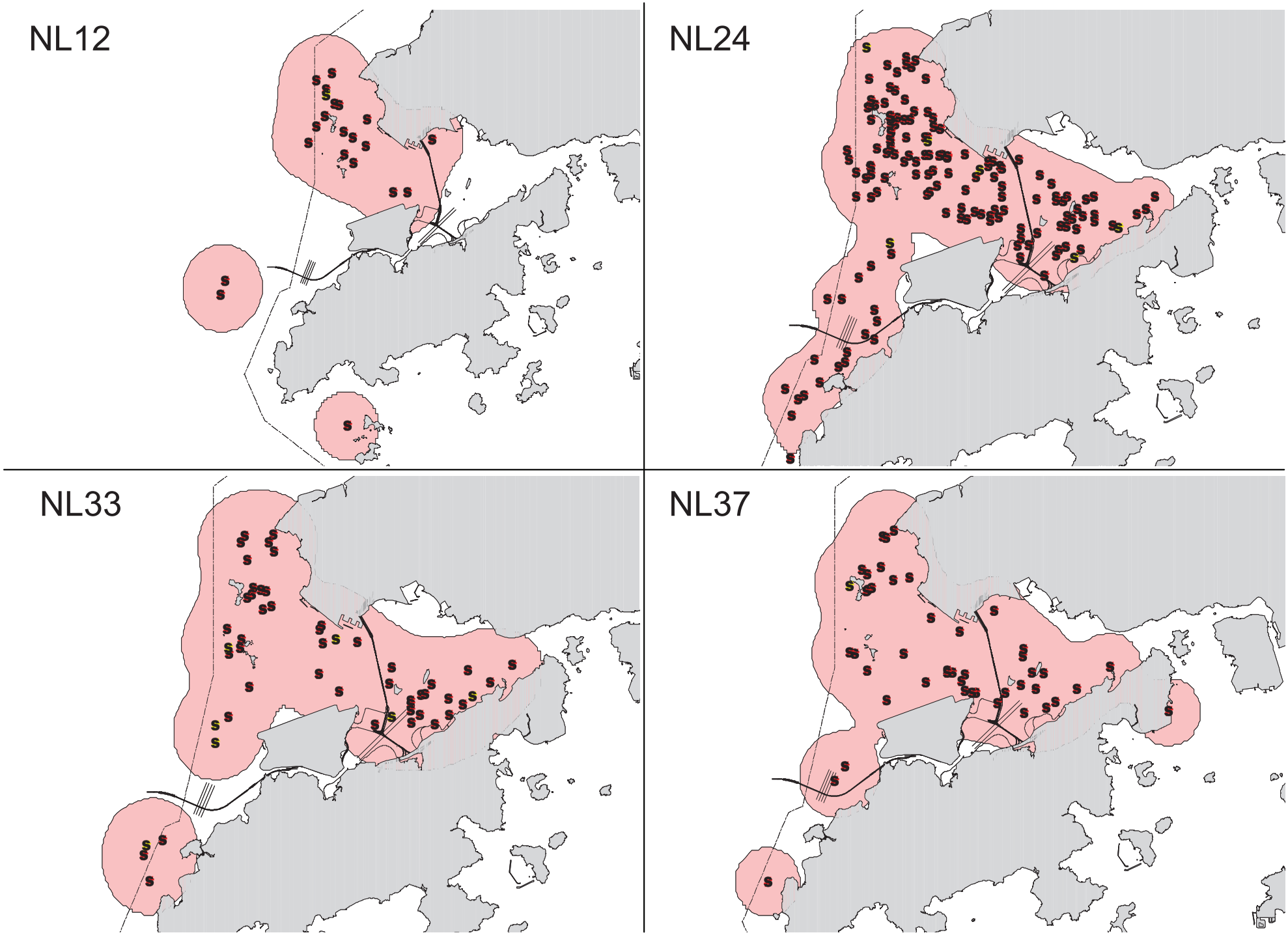
| DATE | STG # | TIME | HRD SZ | AREA | BEAU | PSD | EFFORT | TYPE | NORTHING | EASTING | SEASON | BOAT ASSOC. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6-Nov-11 | 1 | 1447 | 2 | NE LANTAU | 4 | 92 | ON | HYD-HZMB | 822951 | 813237 | AUTUMN | NONE |
| 6-Nov-11 | 2 | 1543 | 8 | NE LANTAU | 3 | 44 | ON | HYD-HZMB | 819459 | 816292 | AUTUMN | NONE |
| 6-Nov-11 | 3 | 1605 | 2 | NE LANTAU | 2 | 163 | ON | HYD-HZMB | 819668 | 816808 | AUTUMN | NONE |
| 6-Nov-11 | 4 | 1611 | 2 | NE LANTAU | 2 | 18 | ON | HYD-HZMB | 819956 | 817303 | AUTUMN | NONE |
| 7-Nov-11 | 1 | 0922 | 1 | NW LANTAU | 2 | ND | OFF | HYD-HZMB | 821258 | 812720 | AUTUMN | NONE |
| 7-Nov-11 | 2 | 1116 | 8 | NW LANTAU | 2 | 790 | ON | HYD-HZMB | 828087 | 808158 | AUTUMN | NONE |
| 7-Nov-11 | 3 | 1136 | 4 | NW LANTAU | 2 | 59 | ON | HYD-HZMB | 828708 | 807603 | AUTUMN | NONE |
| 7-Nov-11 | 4 | 1146 | 3 | NW LANTAU | 2 | 160 | ON | HYD-HZMB | 829607 | 806637 | AUTUMN | NONE |
| 7-Nov-11 | 5 | 1226 | 6 | NW LANTAU | 3 | ND | OFF | HYD-HZMB | 823463 | 805358 | AUTUMN | NONE |
| 7-Nov-11 | 6 | 1411 | 1 | W LANTAU | 3 | 245 | ON | HYD-HZMB | 811458 | 800921 | AUTUMN | NONE |
| 7-Nov-11 | 7 | 1421 | 1 | W LANTAU | 2 | ND | OFF | HYD-HZMB | 811189 | 802075 | AUTUMN | NONE |
| 7-Nov-11 | 8 | 1424 | 5 | W LANTAU | 2 | 52 | ON | HYD-HZMB | 810991 | 801838 | AUTUMN | NONE |
| 7-Nov-11 | 9 | 1436 | 4 | W LANTAU | 3 | 68 | ON | HYD-HZMB | 809464 | 801195 | AUTUMN | NONE |
| 7-Nov-11 | 10 | 1507 | 3 | W LANTAU | 2 | 48 | ON | HYD-HZMB | 807450 | 800438 | AUTUMN | NONE |
| 7-Nov-11 | 11 | 1518 | 3 | W LANTAU | 2 | 105 | ON | HYD-HZMB | 806694 | 801756 | AUTUMN | NONE |
| 7-Nov-11 | 12 | 1537 | 2 | W LANTAU | 3 | ND | OFF | HYD-HZMB | 806488 | 799775 | AUTUMN | NONE |
| 7-Nov-11 | 13 | 1545 | 1 | W LANTAU | 3 | 49 | ON | HYD-HZMB | 806484 | 801755 | AUTUMN | NONE |
| 7-Nov-11 | 14 | 1554 | 1 | W LANTAU | 2 | ND | OFF | HYD-HZMB | 808368 | 801193 | AUTUMN | NONE |
| 7-Nov-11 | 15 | 1625 | 1 | W LANTAU | 3 | ND | OFF | HYD-HZMB | 812463 | 802150 | AUTUMN | NONE |



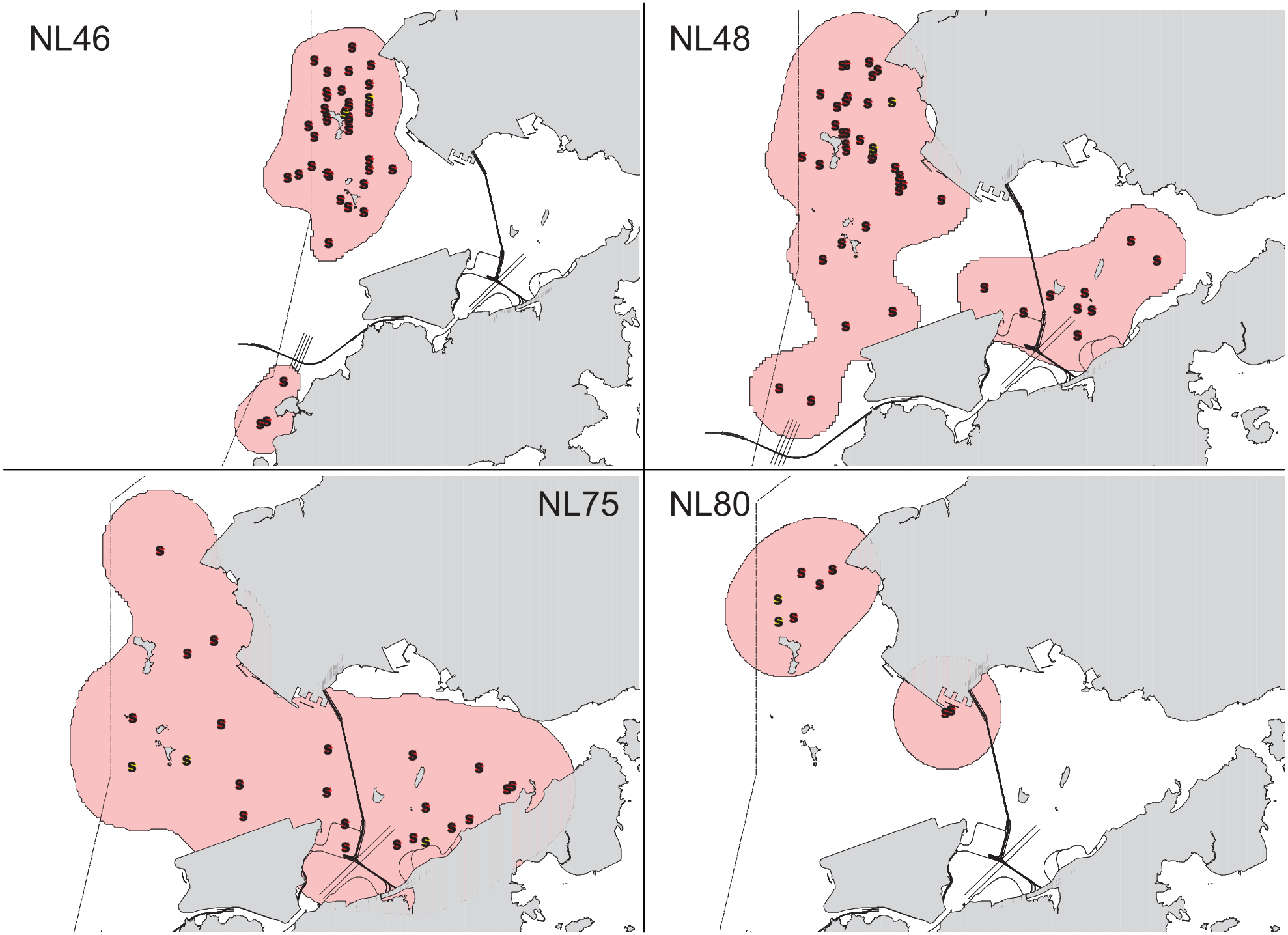

Appendix IV. Ranging patterns (95% kernel ranges) of 96 individual dolphins that were identified during HYD-HZMB baseline monitoring surveys (yellow dots: sightings made during September to November 2011)



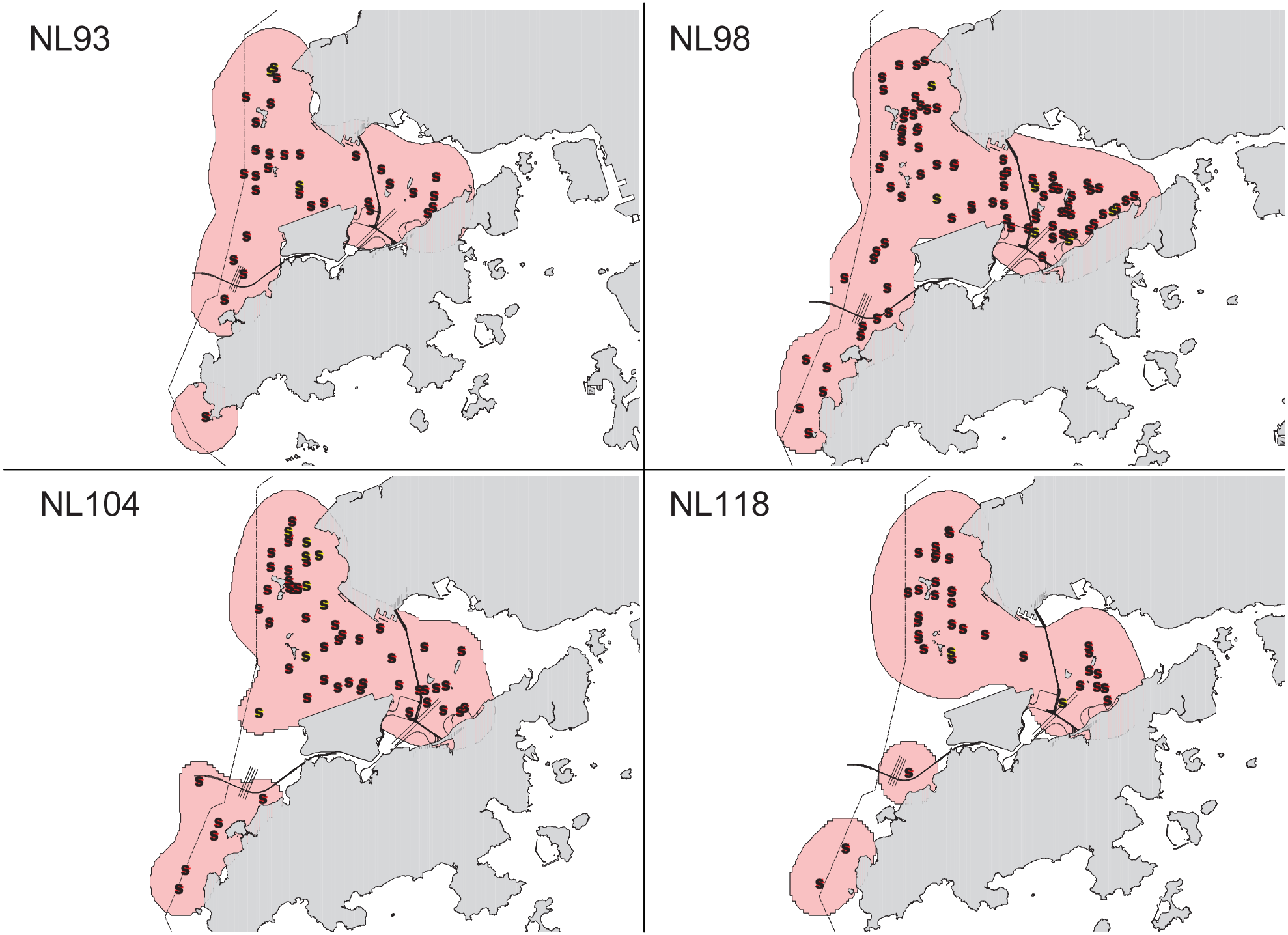

Appendix IV. (cont'd)



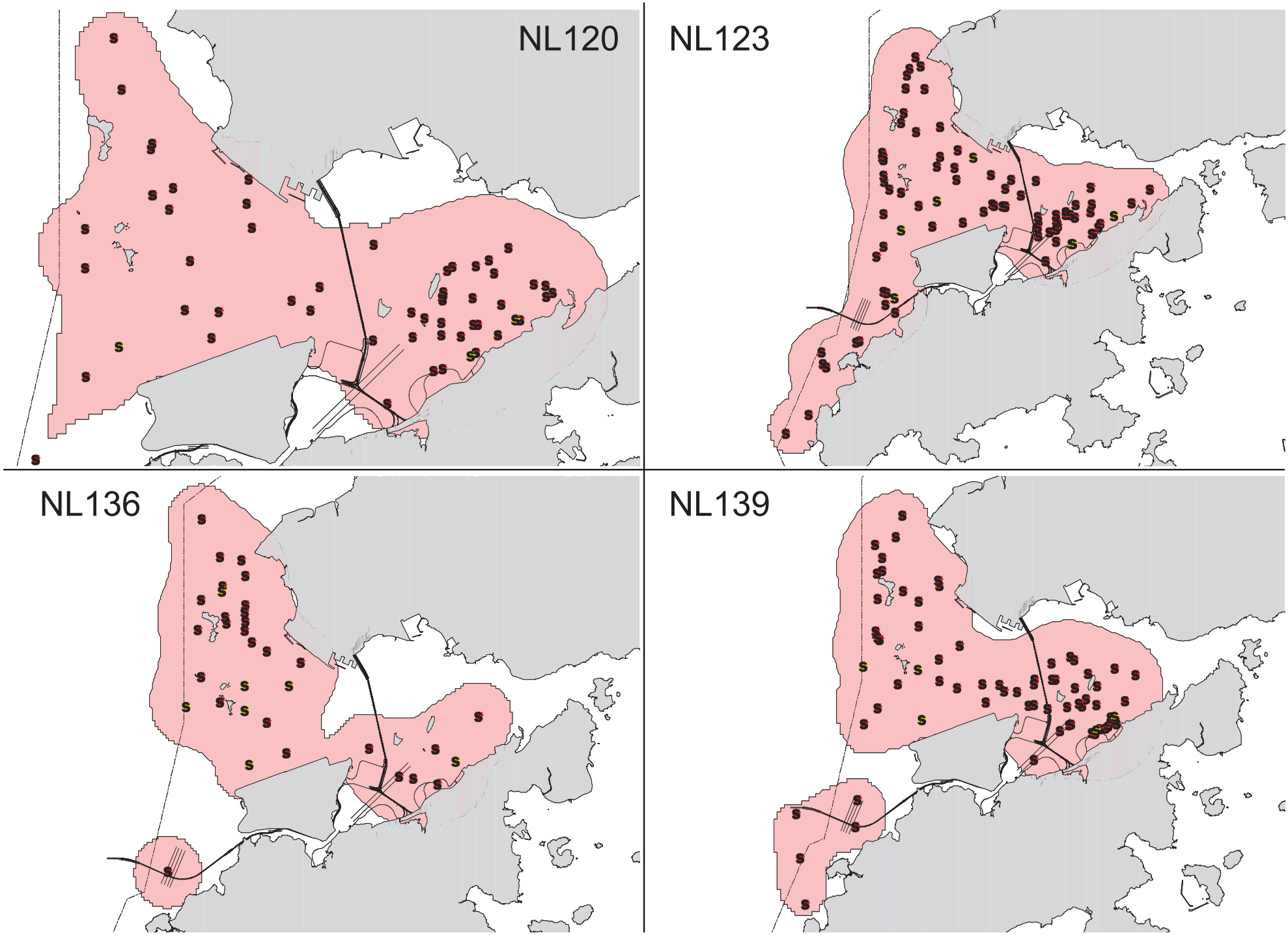

Appendix IV. (cont'd)



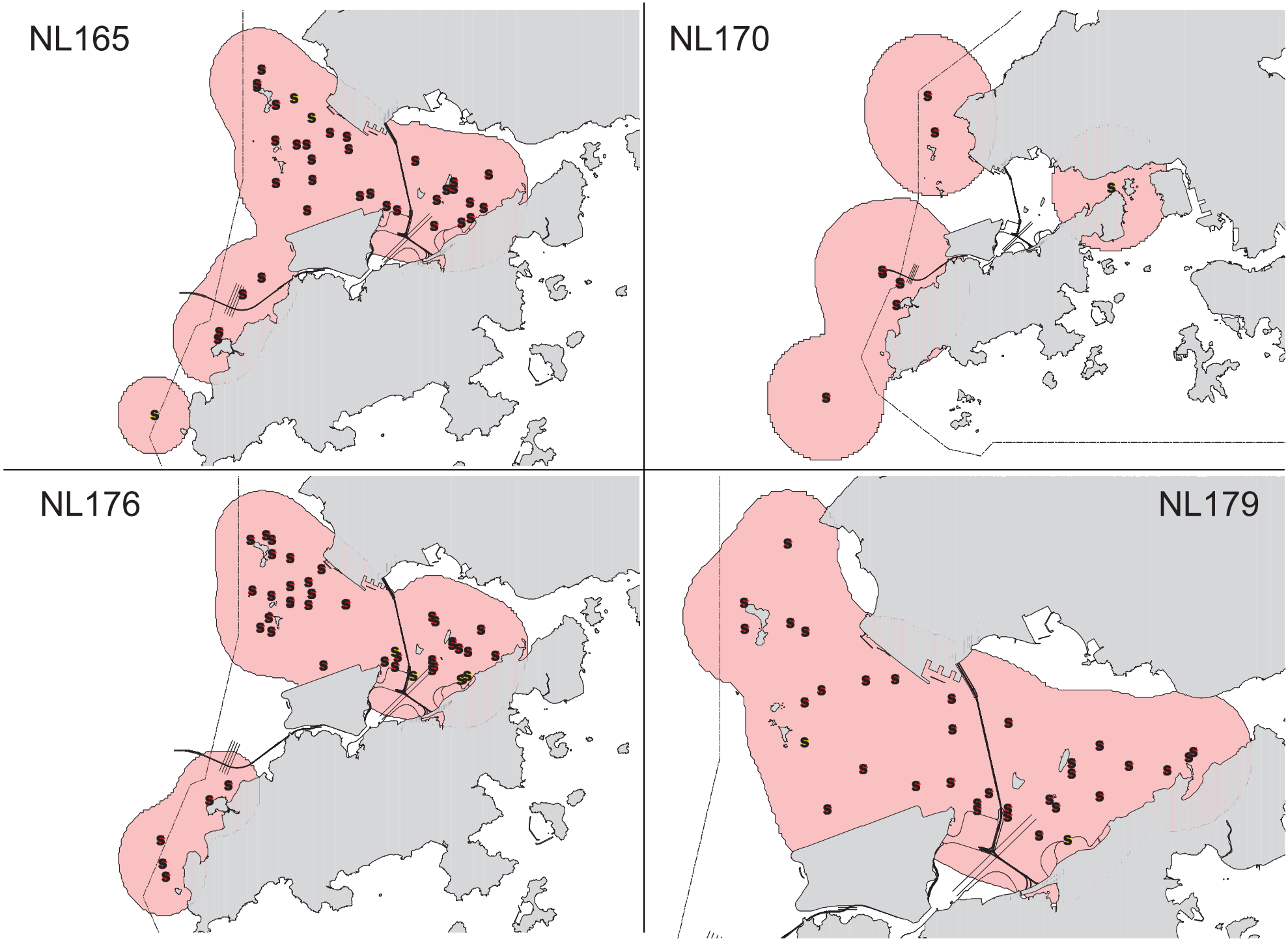

Appendix IV. (cont'd)



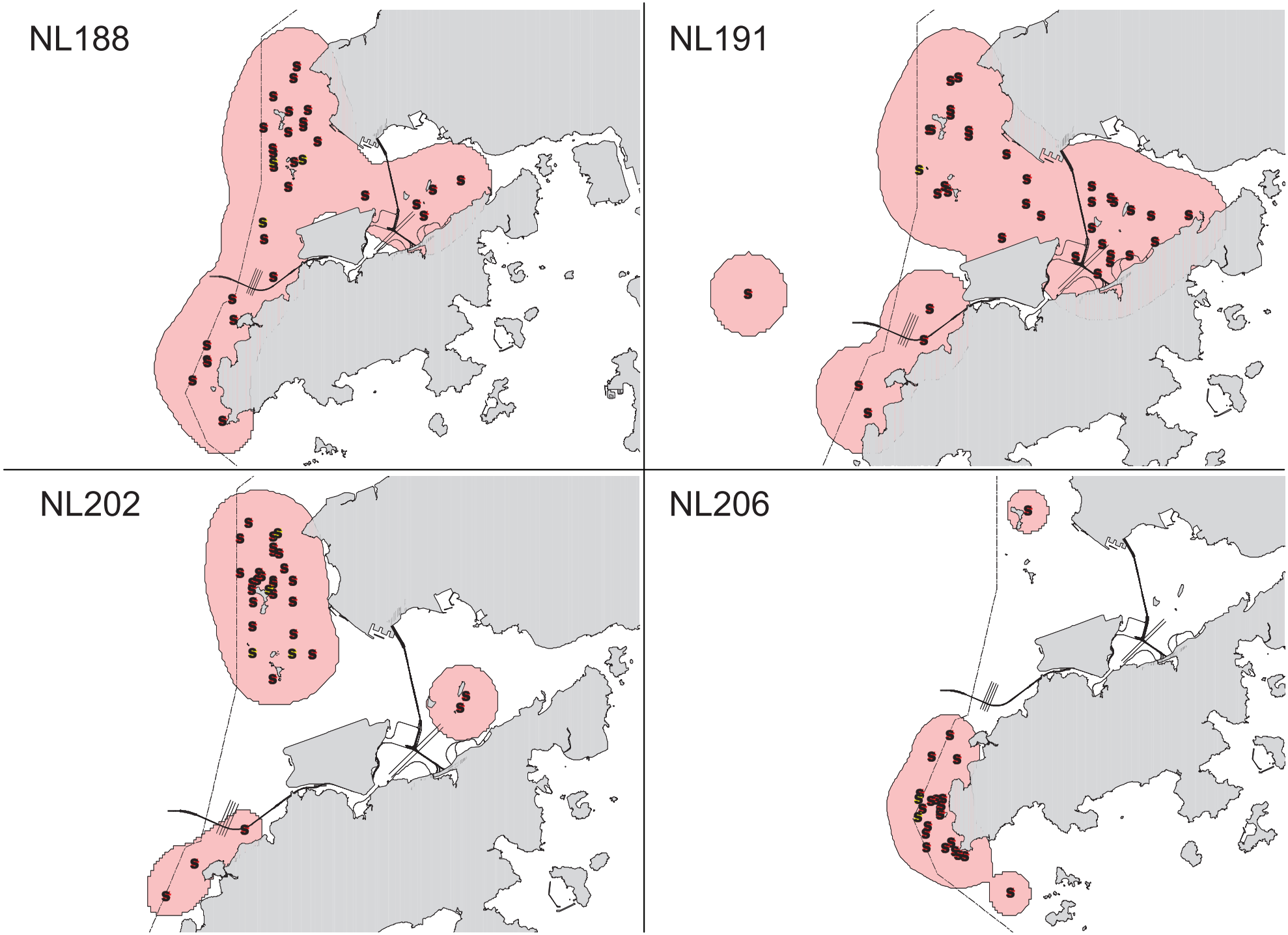

Appendix IV. (cont'd)



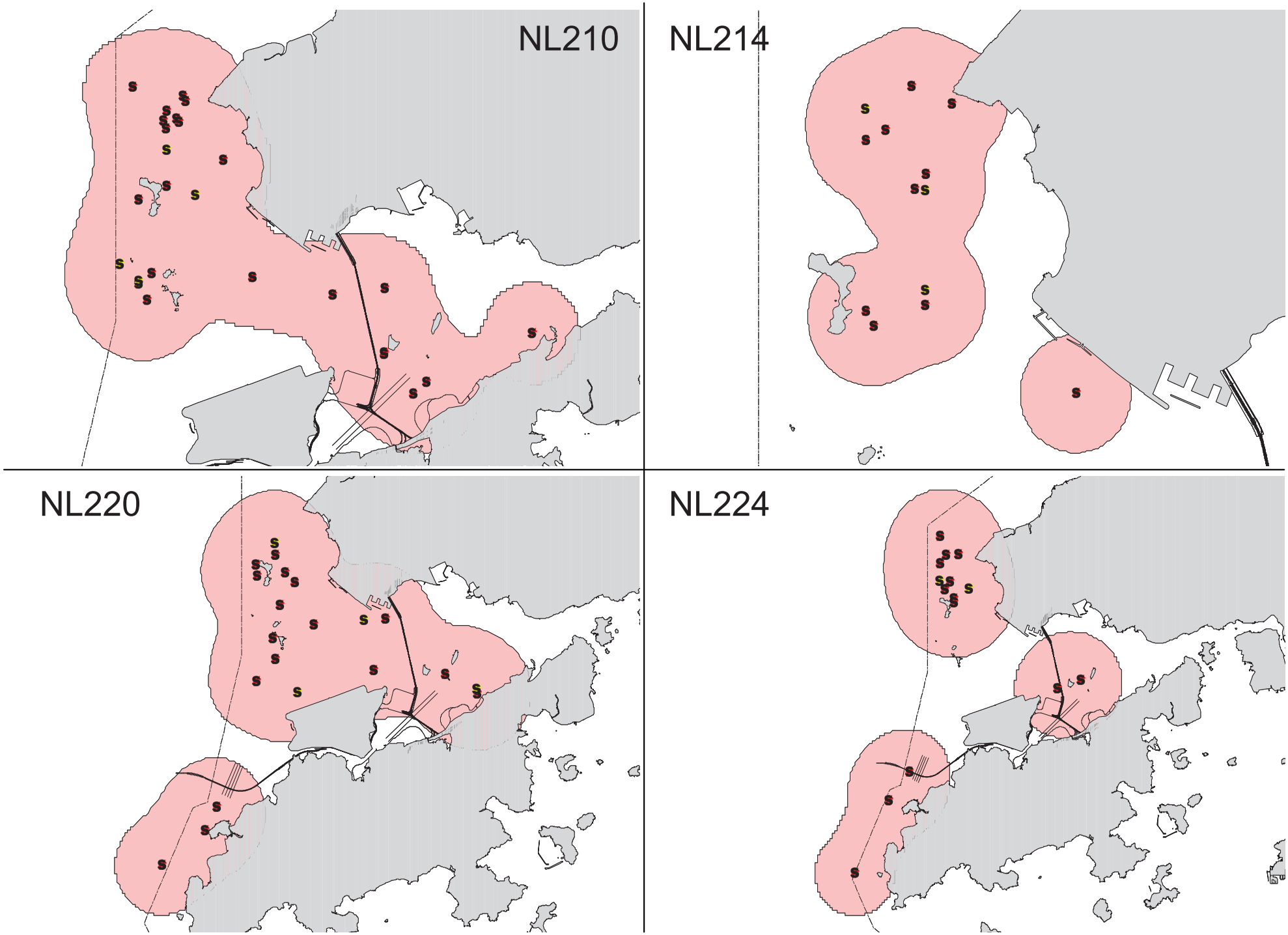

Appendix IV. (cont'd)



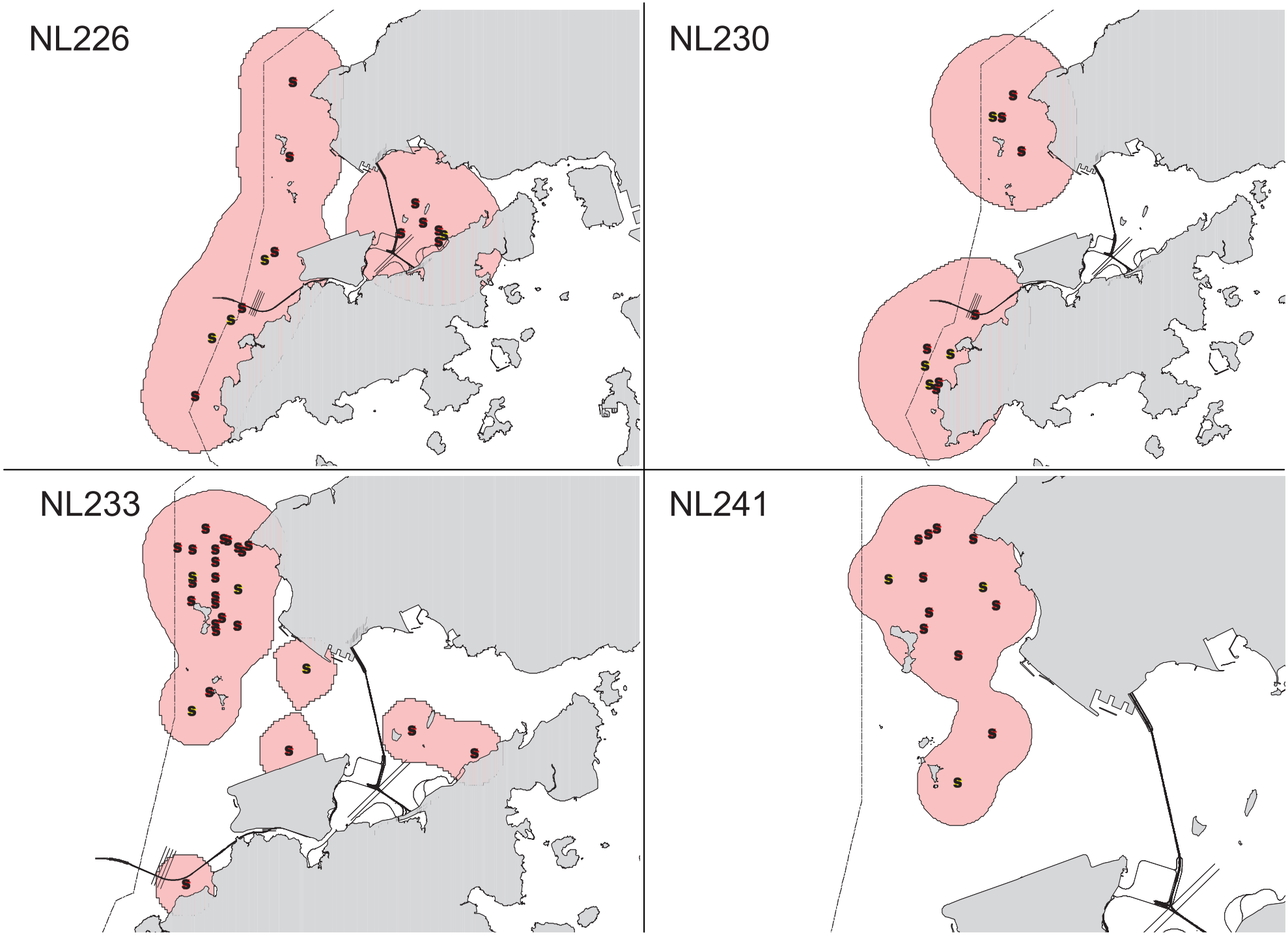

Appendix IV. (cont'd)



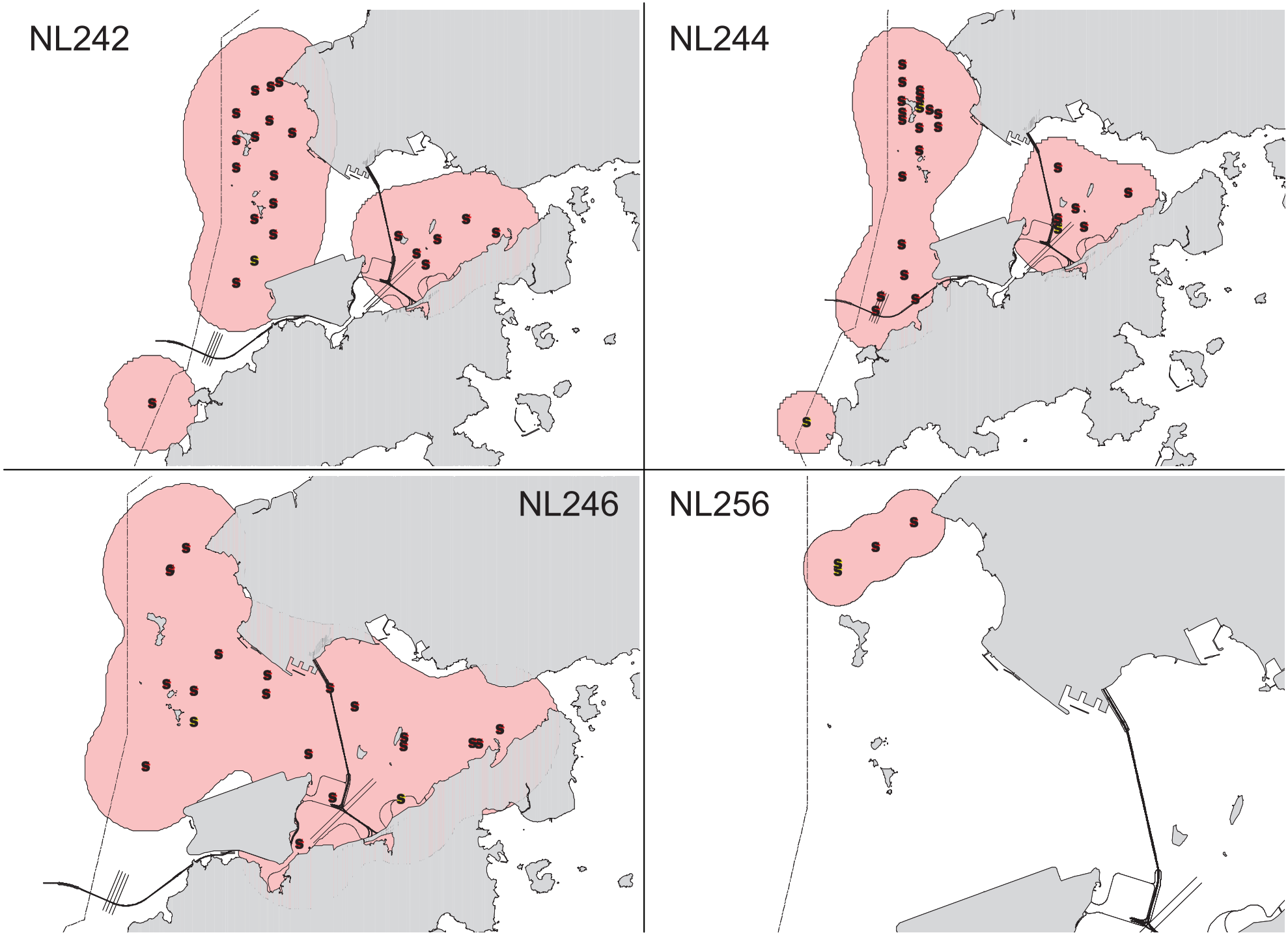

Appendix IV. (cont'd)



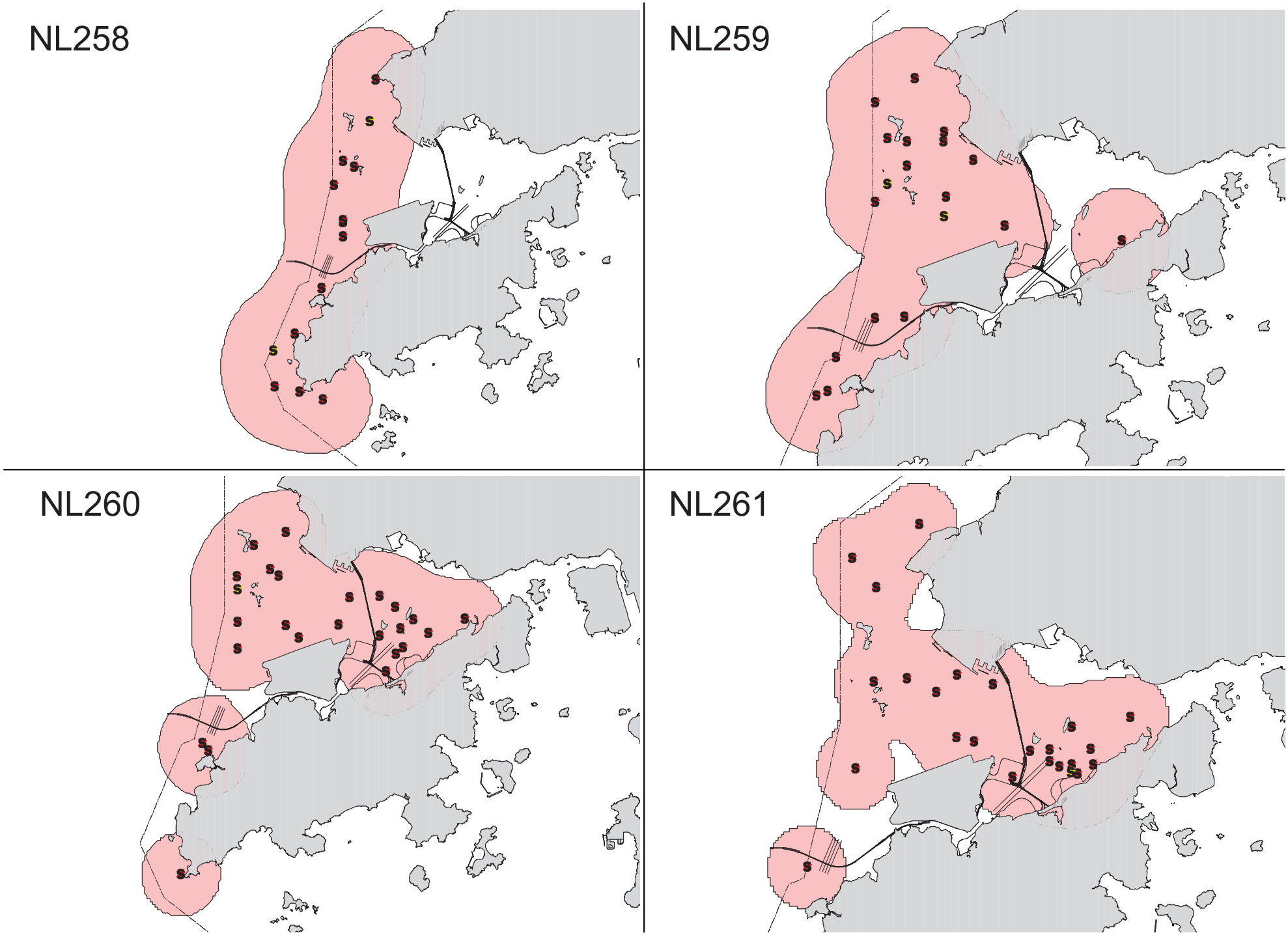

Appendix IV. (cont'd)



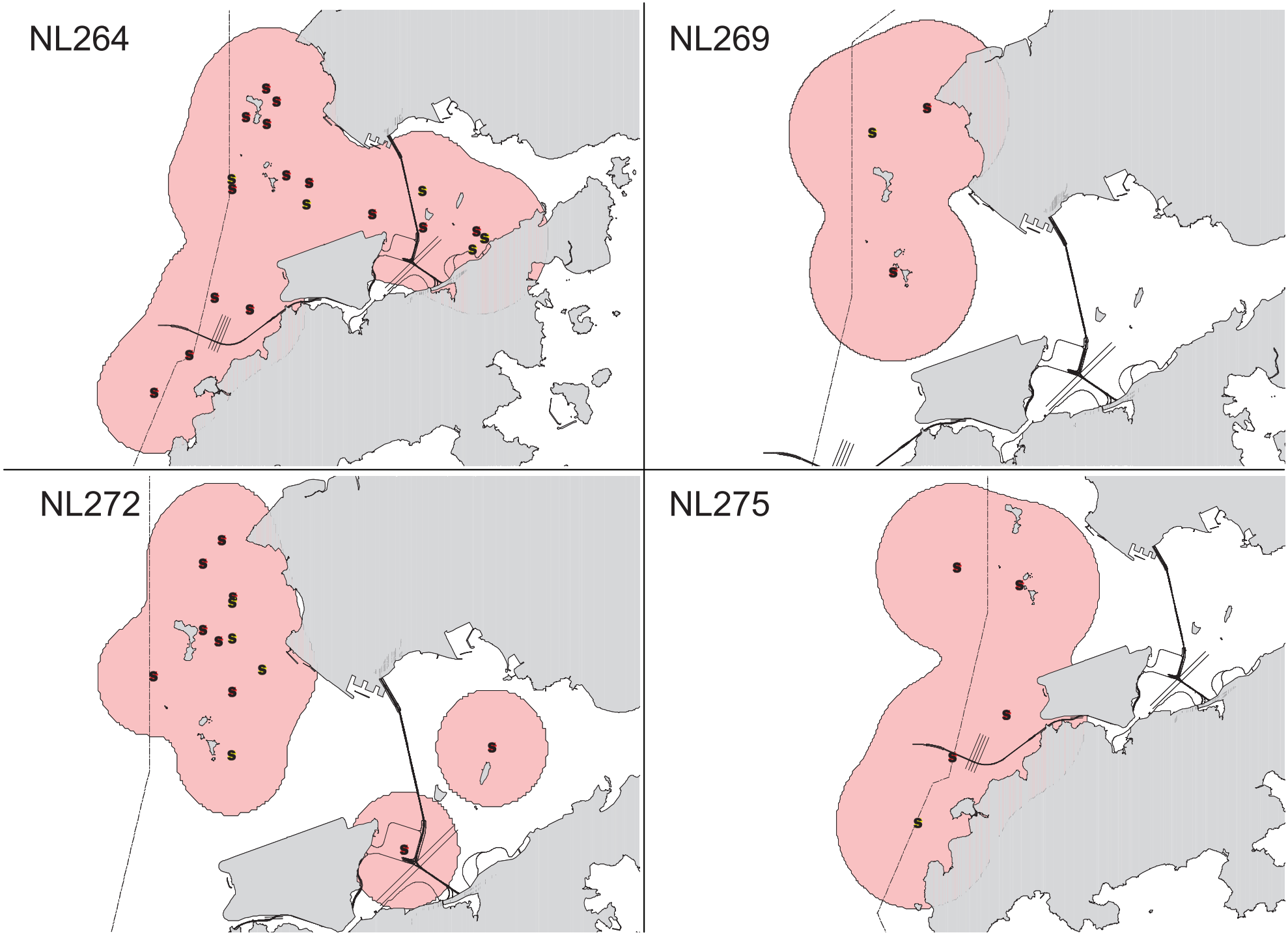

Appendix IV. (cont'd)



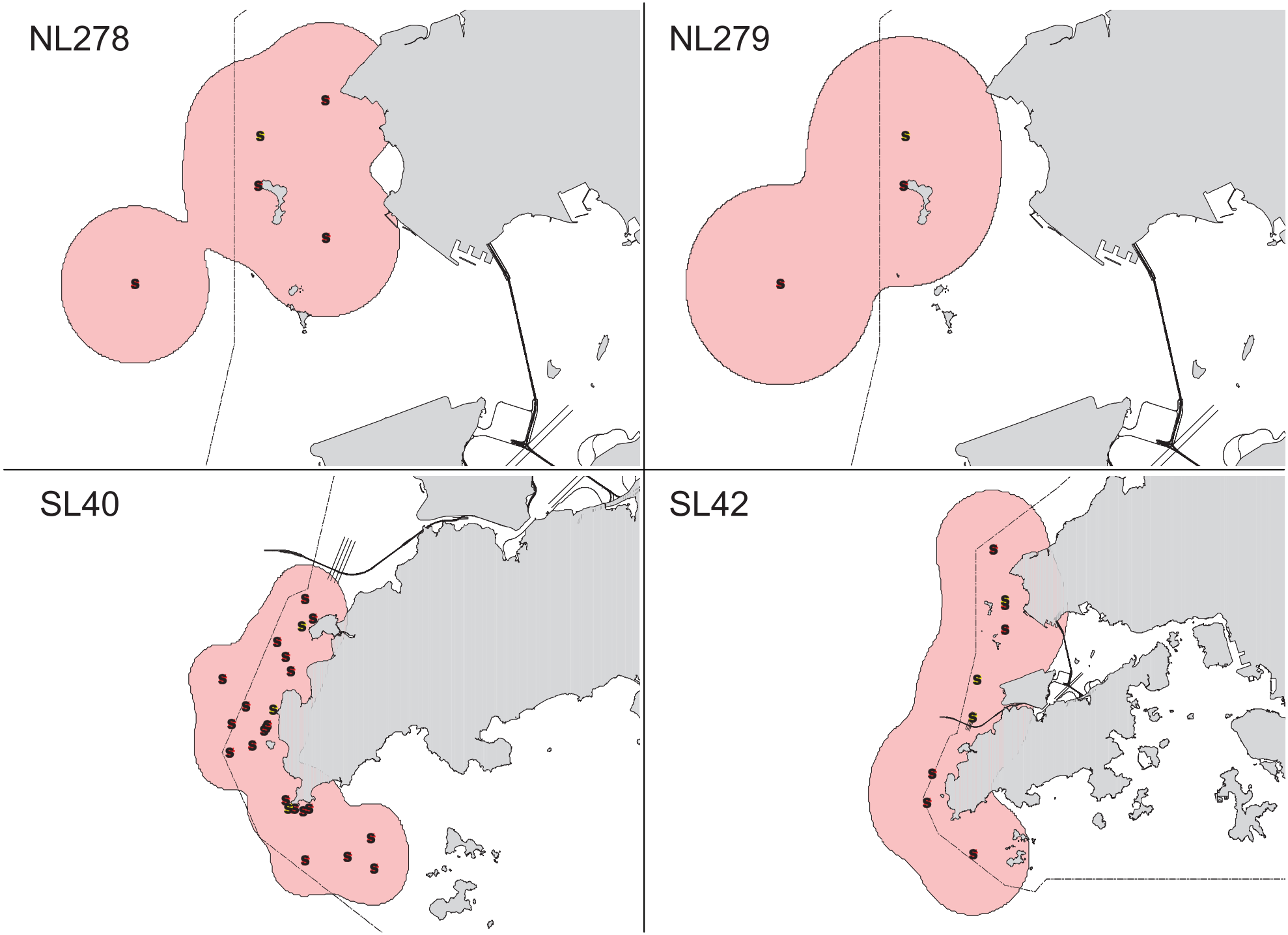

Appendix IV. (cont'd)




Appendix IV. (cont'd)




Appendix IV. (cont'd)

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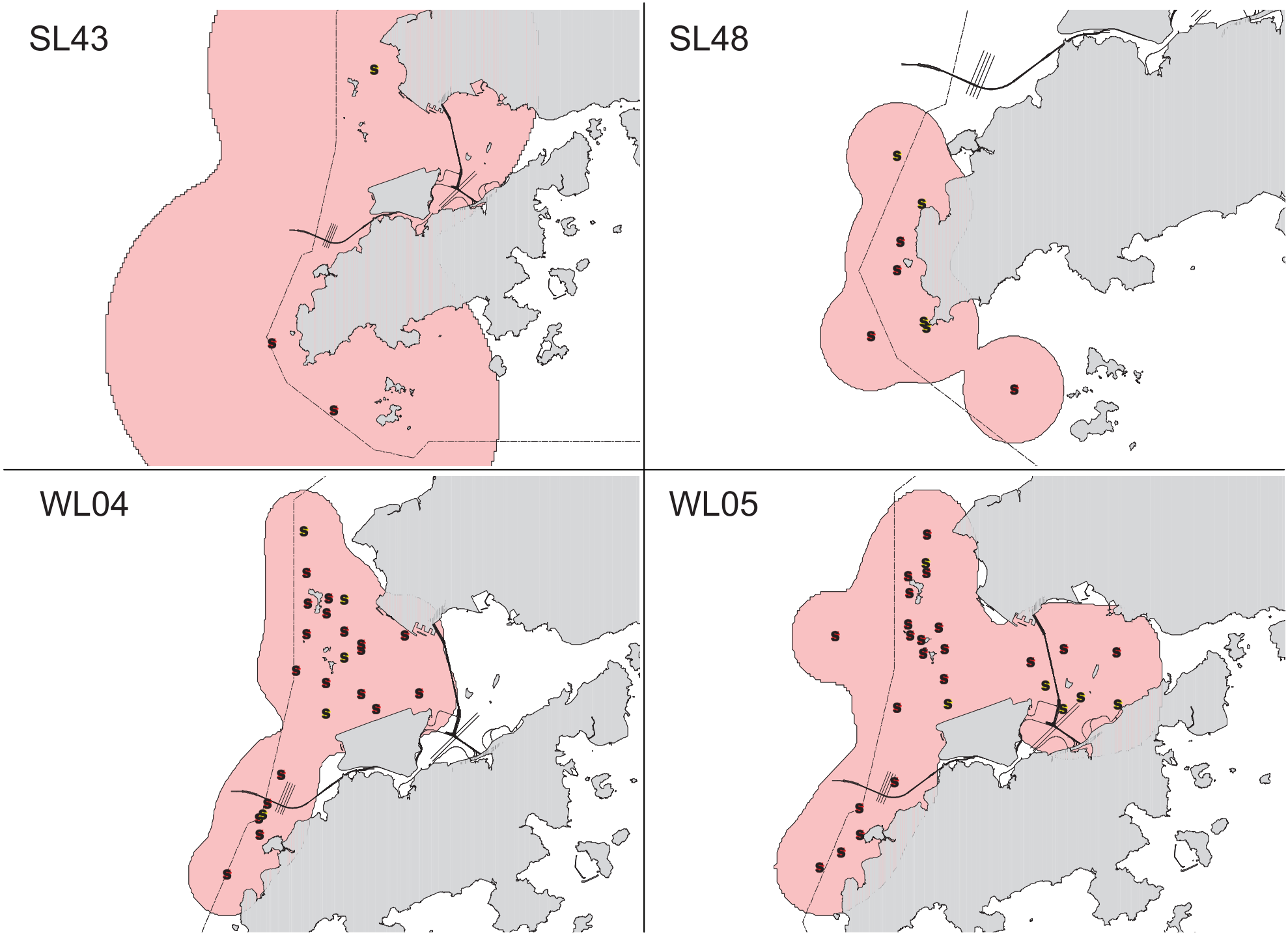


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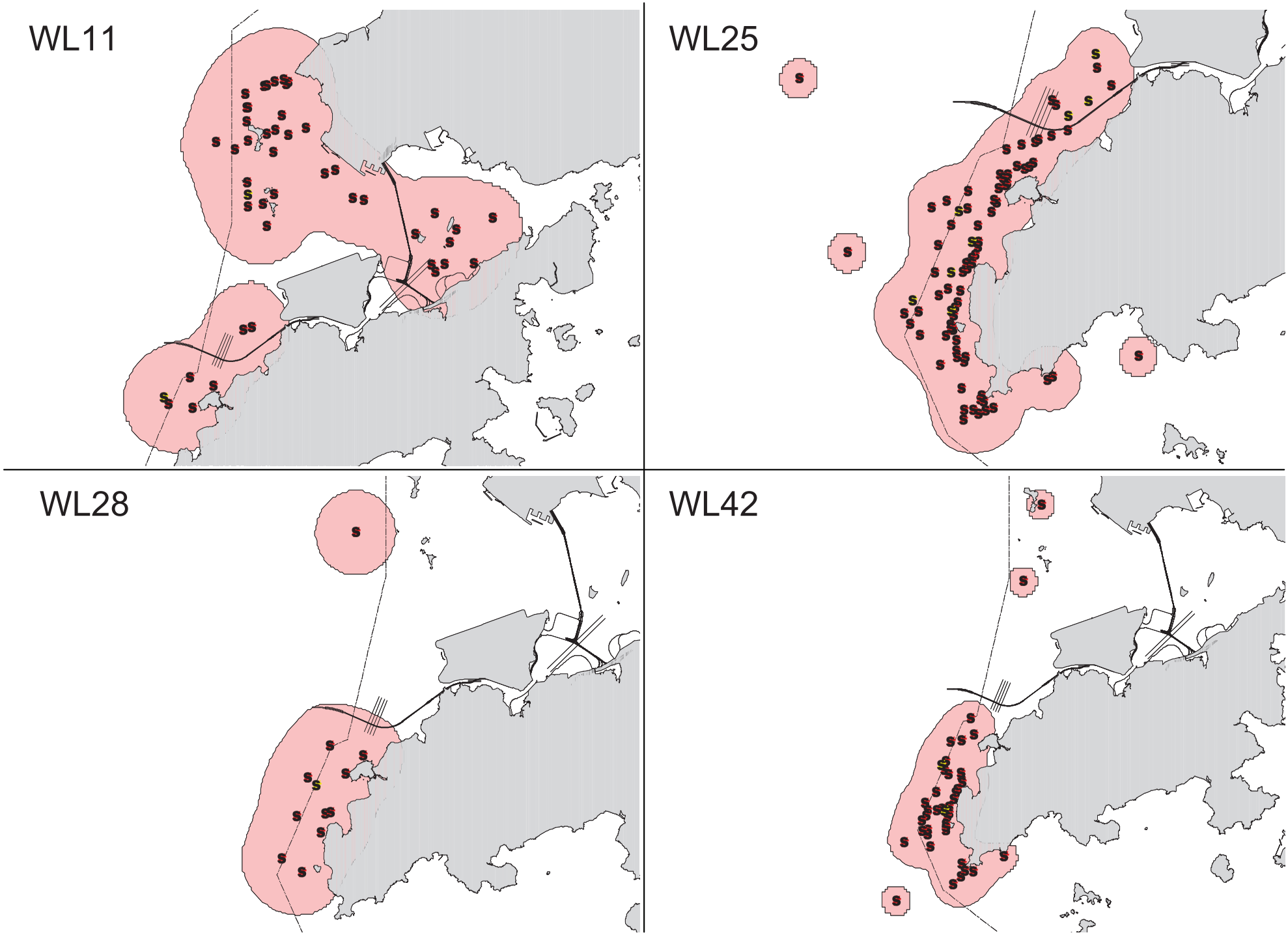


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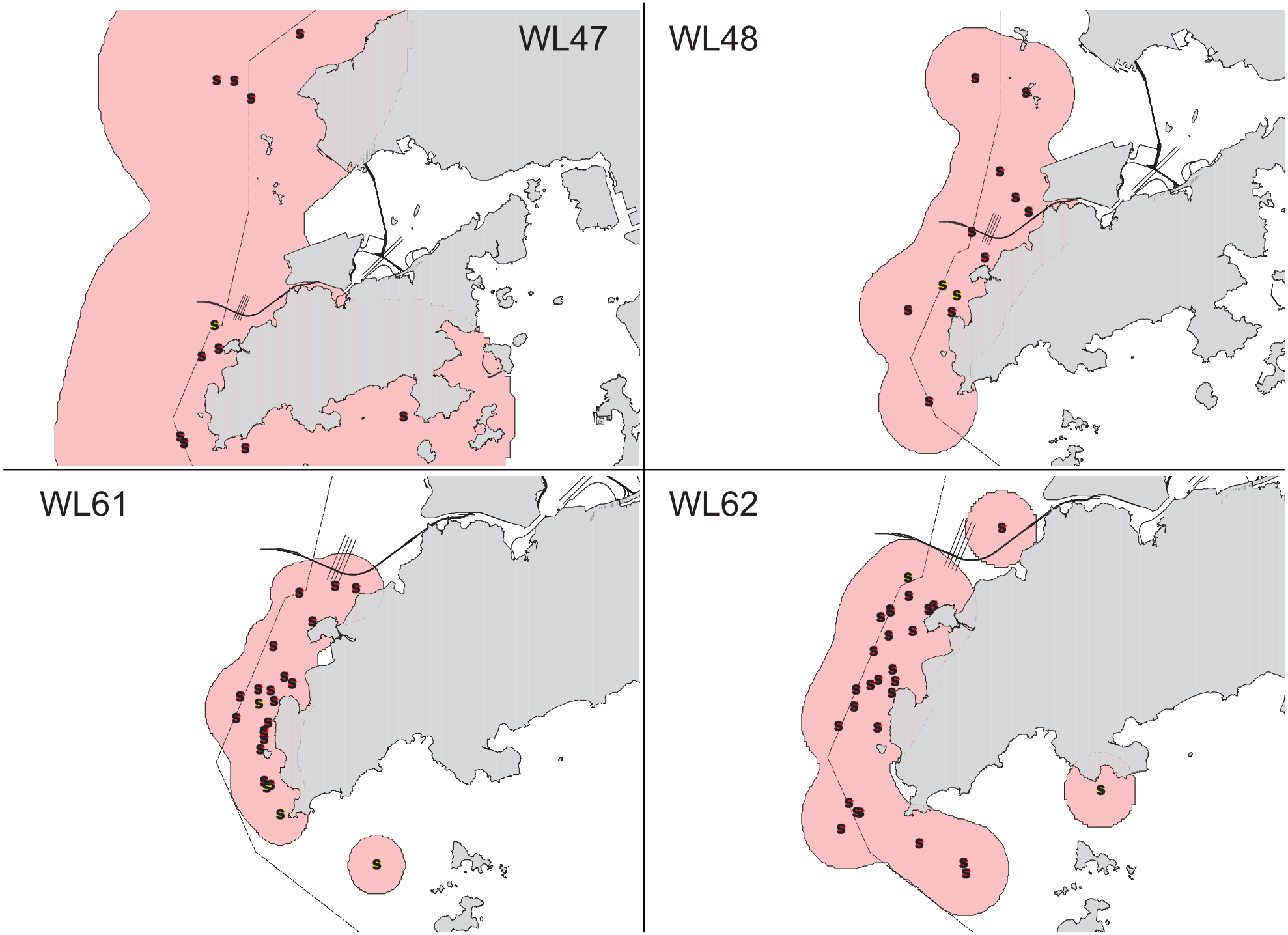


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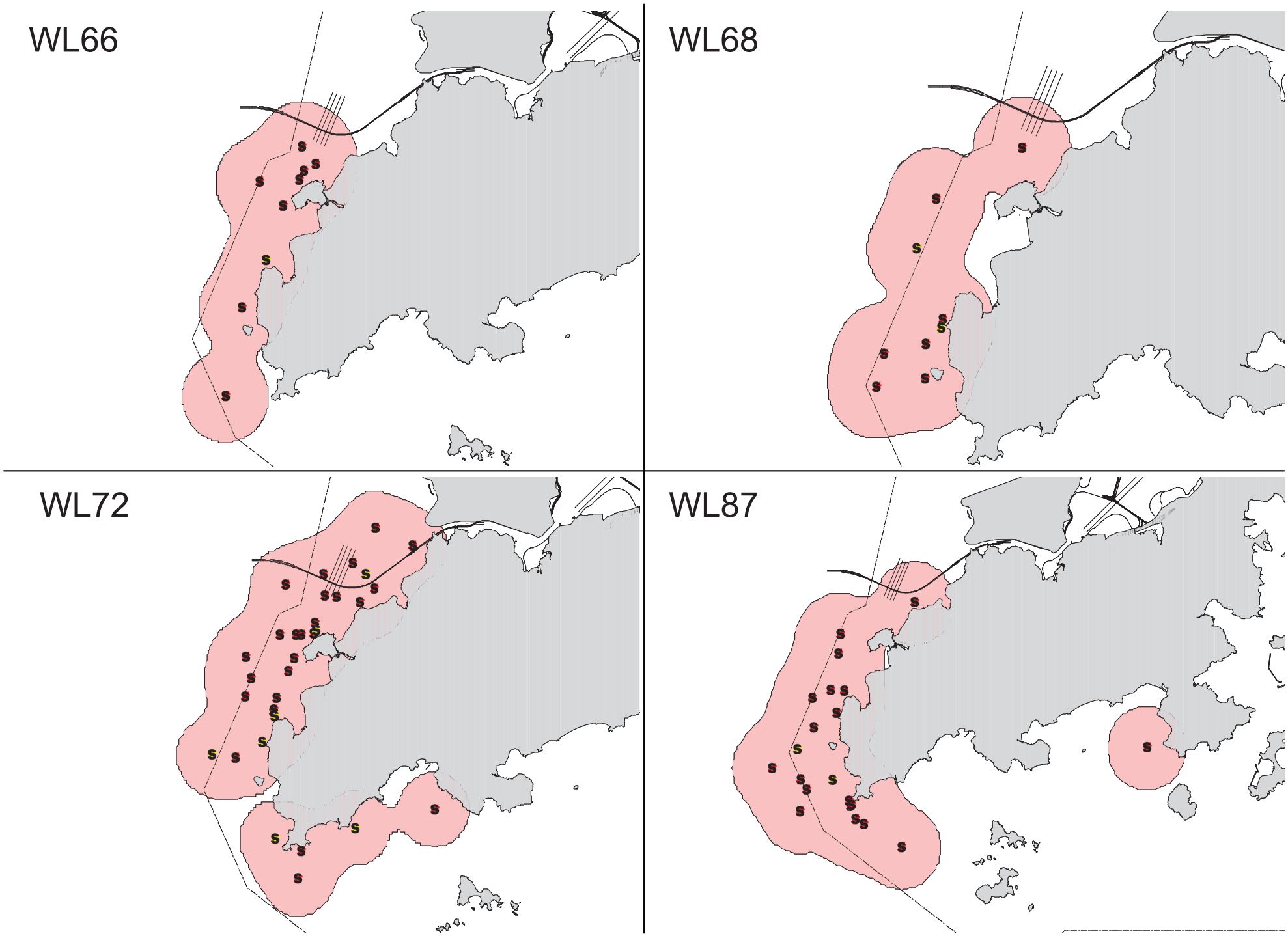


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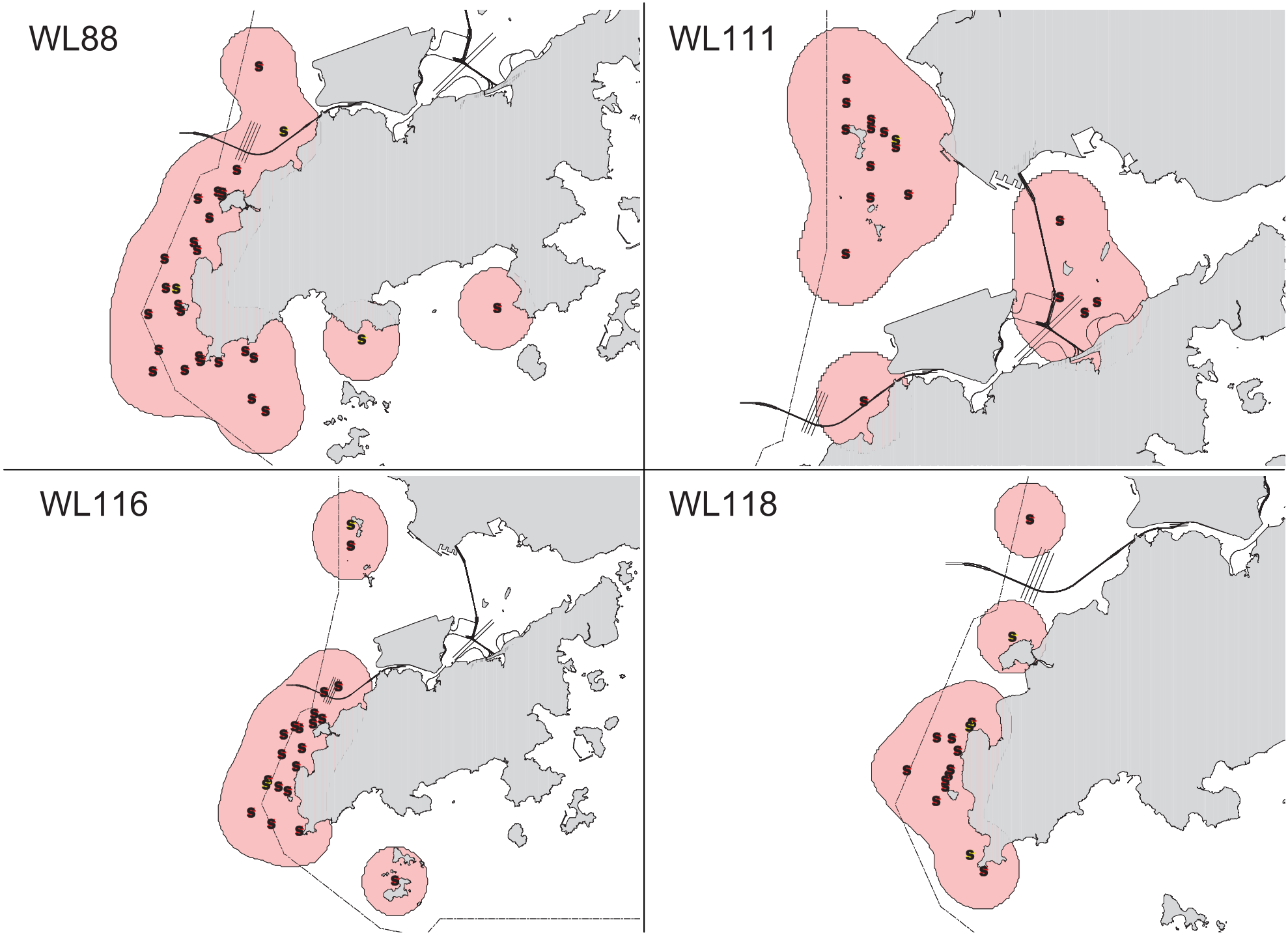


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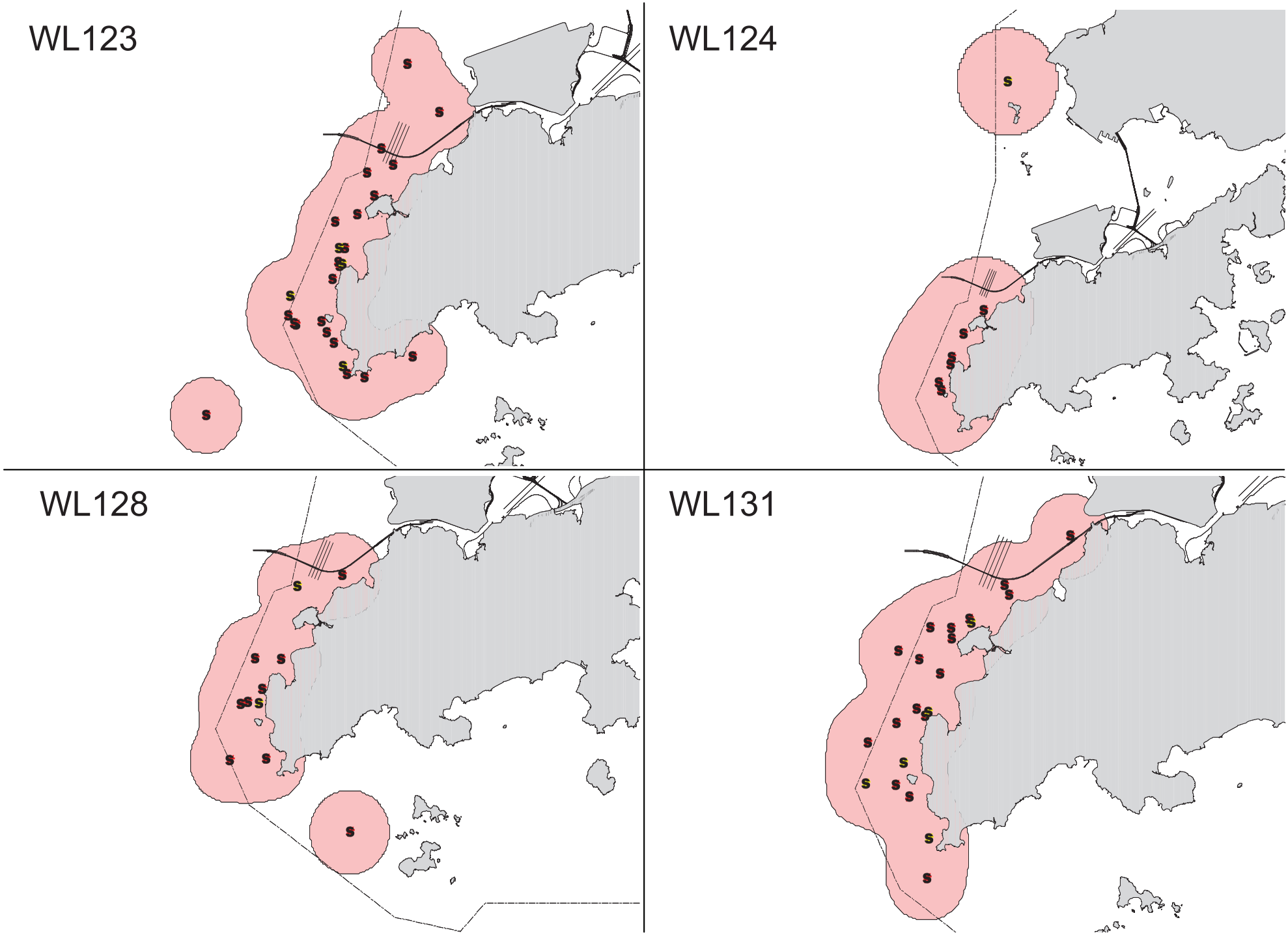


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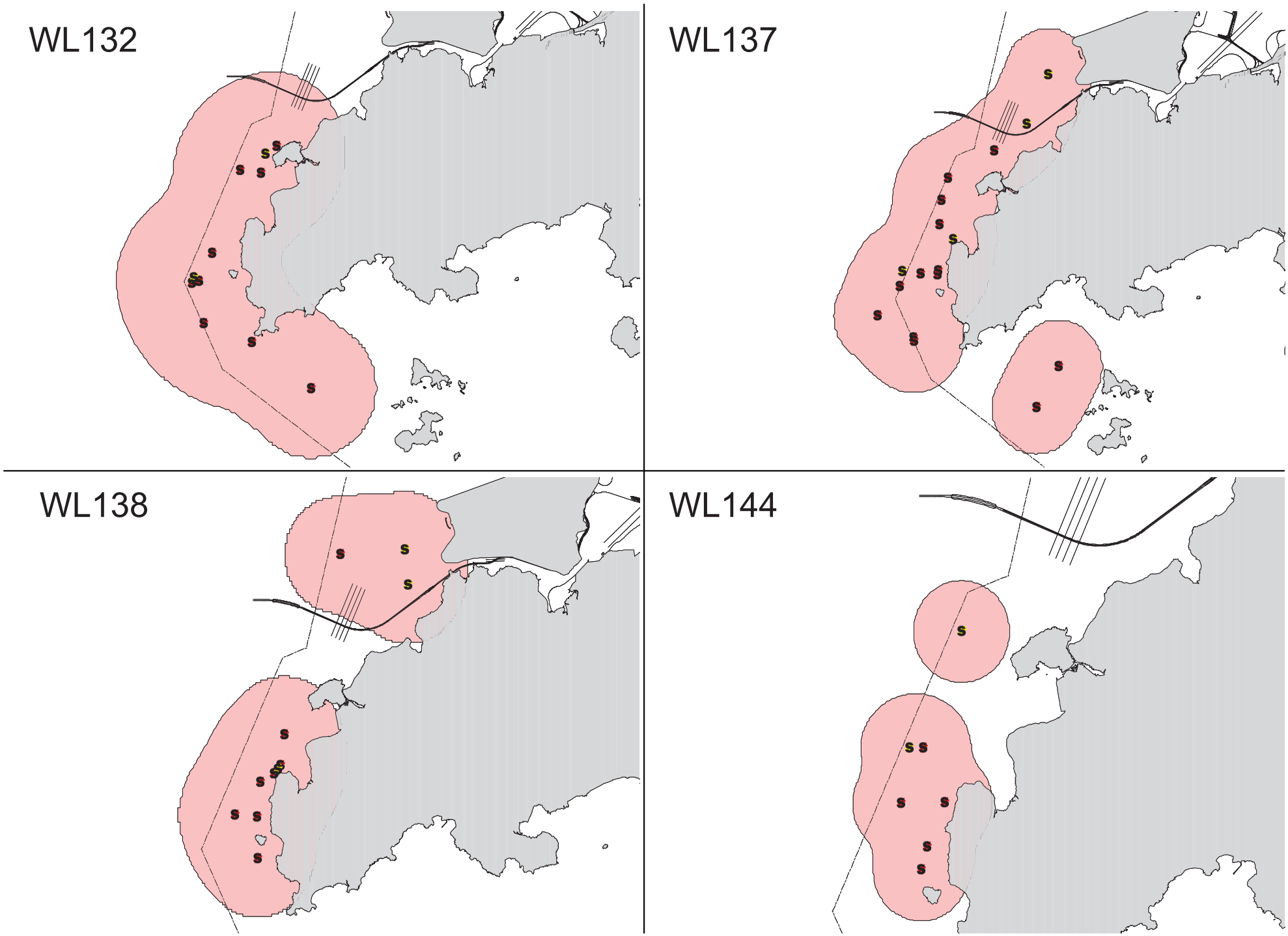


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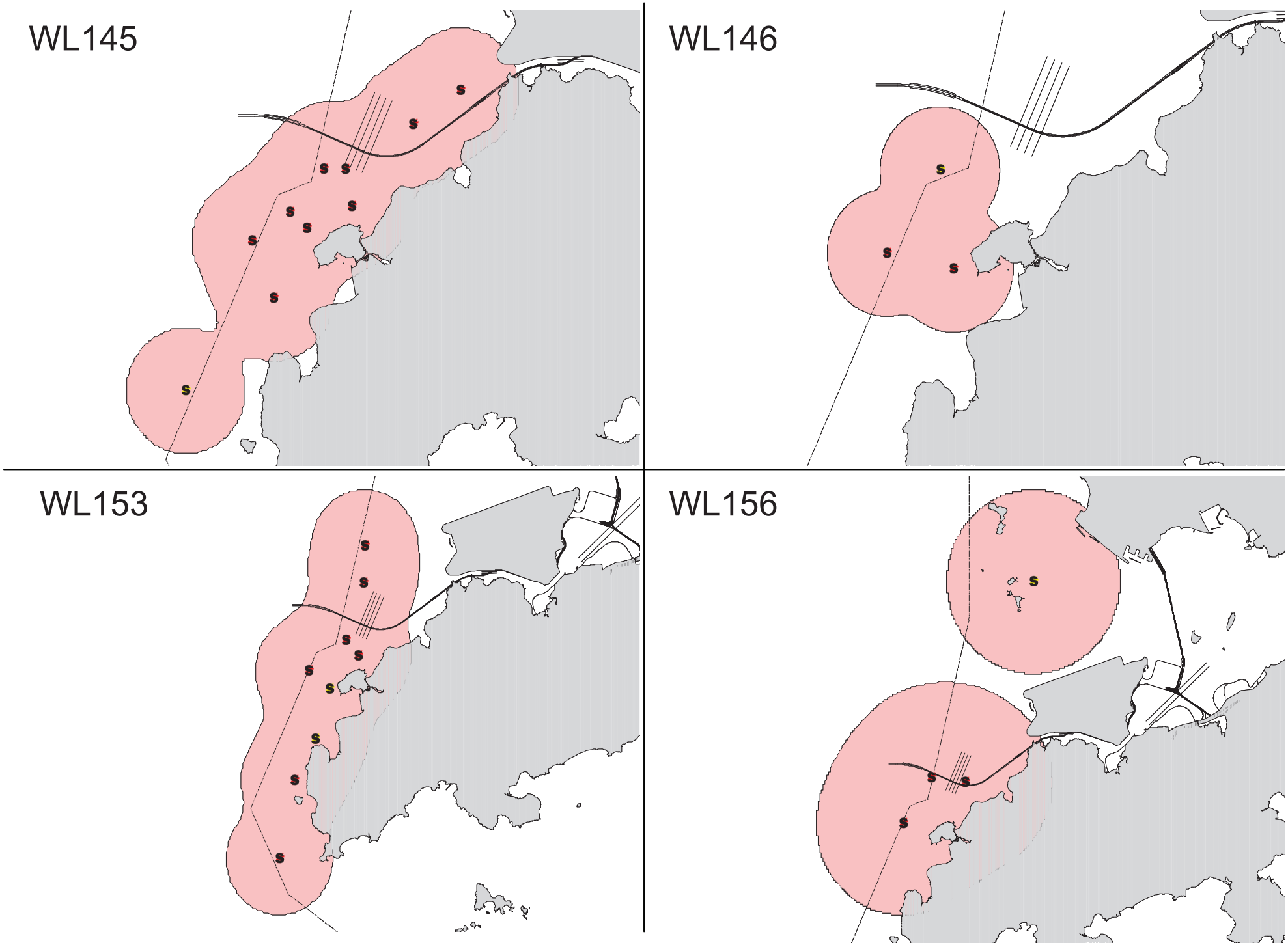
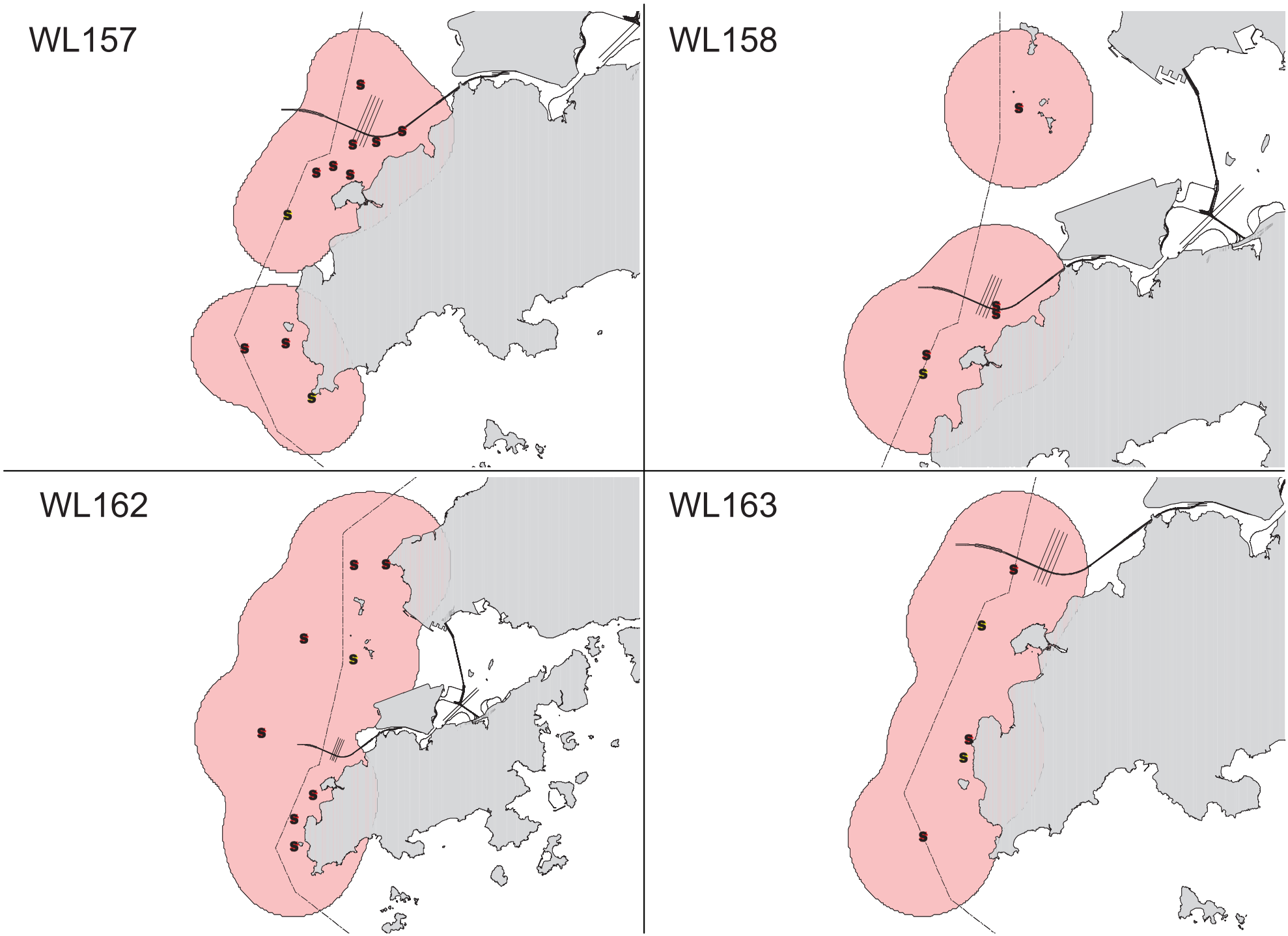



Appendix IV. (cont'd)

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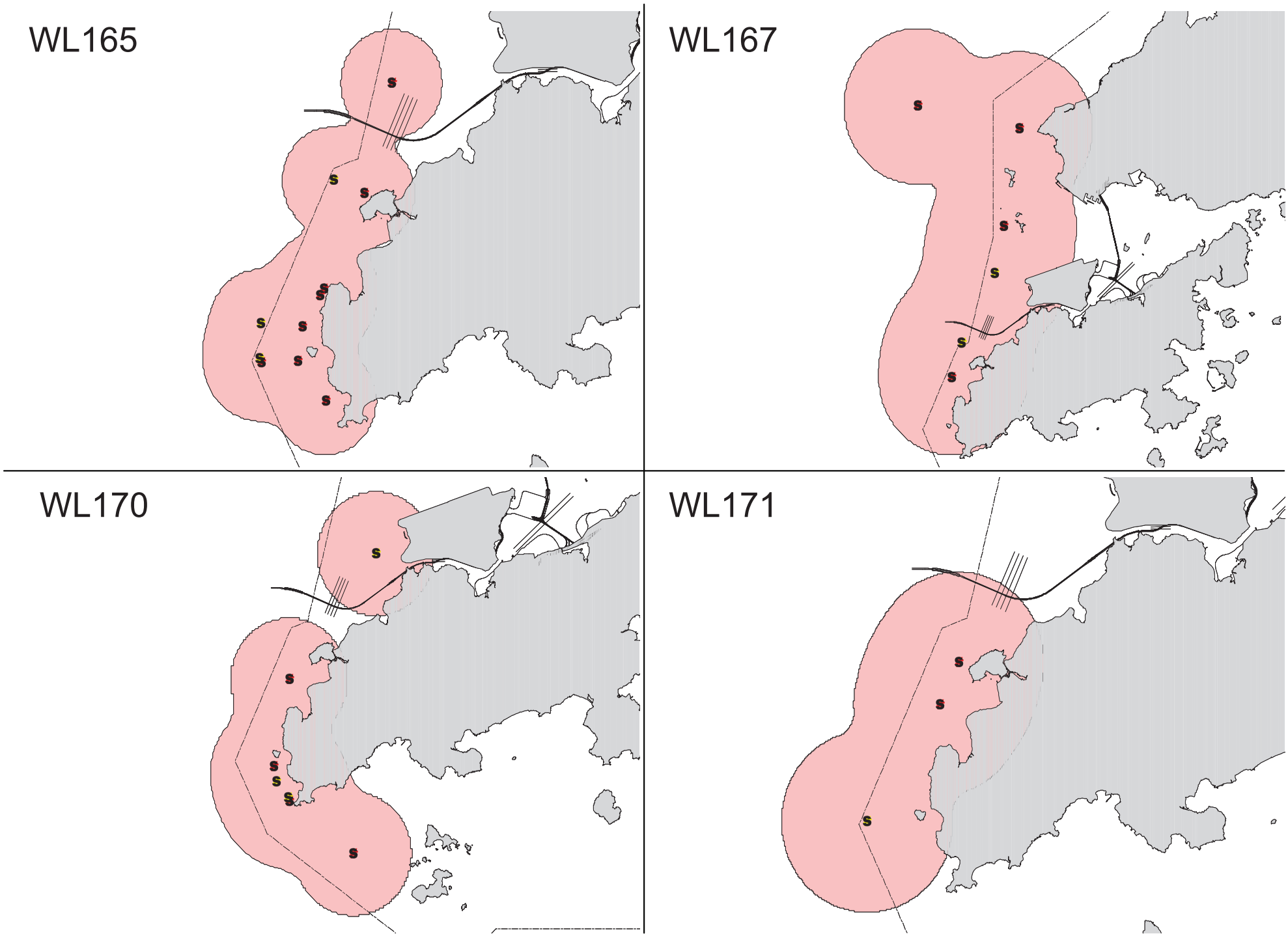


Appendix IV. (cont'd)