CONTRACT NO. HY/2012/07
Hong Kong-Zhuhai-Macao Bridge Tuen Mun – Chek Lap Kok Link (Southern Connection Viaduct Section)
Chinese White Dolphin Monitoring

First Annual Progress Report (November 2013 - October 2014)
submitted to Gammon Construction Limited

Submitted by
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1. Introduction

1.1. The Tuen Mun-Chek Lap Kok Link (TM-CLKL) comprises a 1.6 km long dual 2-lane viaduct section between the Hong Kong Boundary Crossing Facilities (HKBCF) and the North Lantau Highway and associated roads at Tai Ho. Gammon Construction Limited (hereinafter called the "Contractor") was awarded as the main contractor of "Contract No. HY/2012/07 – Hong Kong-Zhuhai-Macao Bridge Tuen Mun-Chek Lap Kok Link – Southern Connection Viaduct Section".

1.2. According to the updated Environmental Monitoring and Audit (EM&A) Manual (for TM-CLKL), monthly line-transect vessel surveys for Chinese White Dolphin should be conducted to cover the Northwest (NWL) and Northeast Lantau (NEL) survey areas as in AFCD annual marine mammal monitoring programme. However, as such surveys have been undertaken by the HKLR03 and HKBCF projects in the same areas (i.e. NWL and NEL), a combined monitoring approach is recommended by the Highways Department, that the TM-CLKL EM&A project can utilize the monitoring data collected by HKLR03 or HKBCF project to avoid any redundancy in monitoring effort. Such exemption for the dolphin monitoring will end upon the completion of the dolphin monitoring carried out by HKLR03 contract as well as the TM-CLKL Northern Connection Sub-Sea Tunnel Section (HY/2012/08)

1.3. In November 2013, the Director of Hong Kong Cetacean Research Project (HKCRP), Dr. Samuel Hung, has been appointed by Gammon Construction Limited as their dolphin specialist for the TM-CLKL Southern Viaduct Section EM&A project. He is responsible for the dolphin monitoring study, including the data collection on Chinese White Dolphins during the construction phase (i.e. impact period) of the TM-CLKL project in Northwest Lantau (NWL) and Northeast Lantau (NEL) survey areas.

1.4. During the construction period of HKLR, the dolphin specialist would be in charge of reviewing and collating information collected by HKLR03 dolphin monitoring programme to

examine any potential impacts of TM-CLKL construction works on the dolphins.

1.5. From the monitoring results, any changes in dolphin occurrence within the study area will be examined for possible causes, and appropriate actions and additional mitigation measures will be recommended as necessary.

1.6. This report is the first annual progress report under the TM-CLKL construction phase dolphin monitoring programme submitted to the Gammon Construction Limited, summarizing the results of the surveys findings during the period of November 2013 to October 2014, utilizing the survey data collected by HKLR03 project.

2. Monitoring Methodology

2.1. Vessel-based Line-transect Survey

2.1.1. According to the requirement of the updated EM&A manual, dolphin monitoring programme should cover all transect lines in NEL and NWL survey areas (see Figure 1) twice per month throughout the entire construction period of HZMB. The co-ordinates of all transect lines conducted during the HKLR03 dolphin monitoring surveys are shown in Table 1.

Table 1 Co-ordinates of transect lines conducted by HKLR03 project

Line No.		Easting	Northing		Line No.		Easting	Northing
1	Start Point	804671	814577		13	Start Point	816506	819480
1	End Point	804671	831404		13	End Point	816506	824859
2	Start Point	805475	815457		14	Start Point	817537	820220
2	End Point	805477	826654		14	End Point	817537	824613
3	Start Point	806464	819435		15	Start Point	818568	820735
3	End Point	806464	822911		15	End Point	818568	824433
4	Start Point	807518	819771		16	Start Point	819532	821420
4	End Point	807518	829230		16	End Point	819532	824209
5	Start Point	808504	820220		17	Start Point	820451	822125
5	End Point	808504	828602		17	End Point	820451	823671
6	Start Point	809490	820466		18	Start Point	821504	822371
6	End Point	809490	825352		18	End Point	821504	823761
7	Start Point	810499	820690		19	Start Point	822513	823268
7	End Point	810499	824613		19	End Point	822513	824321
8	Start Point	811508	820847		20	Start Point	823477	823402
8	End Point	811508	824254		20	End Point	823477	824613
9	Start Point	812516	820892		21	Start Point	805476	827081
9	End Point	812516	824254		21	End Point	805476	830562

10	Start Point	813525	820872		22	Start Point	806464	824033
10	End Point	813525	824657		22	End Point	806464	829598
11	Start Point	814556	818449		23	Start Point	814559	821739
11	End Point	814556	820992		23	End Point	814559	824768
12	Start Point	815542	818807					
12	End Point	815542	824882					

2.1.2. The HKLR03 survey team used standard line-transect methods (Buckland et al. 2001) to conduct the systematic vessel surveys, and followed the same technique of data collection that has been adopted over the last 17 years of marine mammal monitoring surveys in Hong Kong developed by HKCRP (see Hung 2013, 2014). For each monitoring vessel survey, a 15-m inboard vessel with an open upper deck (about 4.5 m above water surface) was used to make observations from the flying bridge area.

2.1.3. 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 *Fujinon* 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.

2.1.4. During on-effort survey periods, the survey team recorded effort data including time, positions (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*).

2.1.5. Data including time, position and vessel speed were also automatically and continuously logged by handheld GPS throughout the entire survey for subsequent review.

2.1.6. When dolphins were sighted, the survey team would end the survey effort, and immediately record 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.

2.1.7. Survey effort being conducted along the parallel transect lines that were perpendicular to the coastlines (as indicated in Figure 1) was labeled as “primary” survey effort, while the survey effort conducted along the connecting lines between parallel lines was labeled as “secondary” survey effort. According to HKCRP long-term dolphin monitoring data, encounter rates of Chinese white dolphins deduced from effort and sighting data collected

along primary and secondary lines were similar in NEL and NWL survey areas. Therefore, both primary and secondary survey effort were presented as on-effort survey effort in this report.

2.2. Photo-identification Work

2.2.1. When a group of Chinese White Dolphins were sighted during the line-transect survey, the HKLR03 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.

2.2.2. A professional digital camera (*Canon* EOS 7D or 60D model), 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.

2.2.3. 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 detail, and were carefully compared to the existing Chinese White Dolphin photo-identification catalogue maintained by HKCRP since 1995.

2.2.4. 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).

2.2.5. 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.

2.3. Data Analysis

2.3.1. The following analyses were performed utilizing the HKLR03 dolphin monitoring data collected under the present impact phase (the first year of TMCLKL construction; i.e. November 2013 to October 2014). In addition, these analyses were also conducted for the one-year baseline phase (one year before any HZMB construction works have commenced; i.e. February 2011 to January 2012), as well as the one-year transitional phase (one year after the HZMB construction works (HKBCF and HKLR works) have commenced, but before the commencement of TMCLKL construction works; i.e. November 2012 to October 2013).

2.3.2. Along with the analyzed results from the baseline and transitional phases, results from the impact phase can then be interpreted from the examination of any temporal changes before and during the construction activities of TMCLKL on dolphin usage in North Lantau waters.

For the baseline phase, both baseline monitoring data collected under HZMB contract as well as the AFCD long-term dolphin monitoring data were included to increase the sample size in order to match the similar amount of survey effort in transitional and impact phases, both of which only HKLR03 monitoring data were included for the various analyses.

Distribution analysis

2.3.3. 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.

Encounter rate analysis

2.3.4. Encounter rate analysis – Encounter rates of Chinese white dolphins (number of on-effort sightings per 100 km of survey effort, and total number of dolphins sighted on-effort per 100 km of survey effort) were calculated in NEL and NWL survey areas in relation to the amount of survey effort conducted during each month of monitoring survey. Only data collected under Beaufort 3 or below condition would be used for the encounter rate analyses. Dolphin encounter rates during the impact phase were calculated in two ways for comparisons with the HZMB baseline and transitional period monitoring results as well as to the AFCD long-term marine mammal monitoring results.

2.3.5. Firstly, for the comparison with the HZMB monitoring results, the encounter rates were calculated using primary survey effort alone. The average encounter rate of sightings (STG) and average encounter rate of dolphins (ANI) were deduced based on the encounter rates from the 24 set events during the present 12-month study period (i.e. 24 sets of line-transect surveys in North Lantau), which was also compared with the one deduced from the events during the transitional period and baseline period.

2.3.6. Secondly, the encounter rates were also calculated using both primary and secondary survey effort as in AFCD long-term monitoring study. The encounter rate of sightings and dolphins were deduced by dividing the total number of on-effort sightings (STG) and total number of dolphins (ANI) by the amount of survey effort for the present 12-month study period.

Quantitative grid analysis on habitat use

2.3.7. To conduct quantitative grid analysis of habitat use, positions of on-effort sightings of Chinese White Dolphins collected during the quarterly impact phase monitoring period were plotted onto 1-km^2 grids among NWL and NEL 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.

2.3.8. 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).

2.3.9. 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

Behavioural analysis

2.3.10. When dolphins were sighted during vessel surveys, their behaviour was observed. Different activities were categorized (i.e. feeding, socializing, traveling, and milling/resting) 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. Sighting distribution 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.

Ranging pattern analysis

2.3.11. Location data of individual dolphins that occurred during the 12-month impact phase 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, 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. Monitoring Results

3.1. Summary of survey effort and dolphin sightings

3.1.1. During the first year of TMCLKL impact phase monitoring (November 2013 to October

2014), a total of 24 sets of systematic line-transect vessel surveys were conducted under the HKLR03 monitoring works to cover all transect lines in NWL and NEL survey areas twice per month.

3.1.2. From these HKLR03 surveys, a total of 3,520.41 km of survey effort was collected, with 93.2% of the total survey effort being conducted under favourable weather conditions (i.e. Beaufort Sea State 3 or below with good visibility). Among the two areas, 1,353.42 km and 2,166.99 km of survey effort were conducted in NEL and NWL survey areas respectively.

3.1.3. The total survey effort conducted on primary lines was 2,569.49 km, while the effort on secondary lines was 950.92 km. Both survey effort conducted on primary and secondary lines were considered as on-effort survey data. Summary table of the survey effort is shown in Appendix I.

3.1.4. During the 24 sets of HKLR03 monitoring surveys from November 2013 to October 2014, a total of 136 groups of 512 Chinese White Dolphins were sighted. All except eight dolphin sightings were made during on-effort search. Among the 128 on-effort sightings, 110 of them were made on primary lines, while the other 18 sightings were made on secondary lines. In this 12-month period, 97% of the dolphin sightings were made in NWL, while only four groups of 20 dolphins were sighted in NEL. A summary table of the dolphin sightings is shown in Appendix II.

3.2. Distribution

3.2.1. Distribution of dolphin sightings made during the HKLR03 monitoring surveys in November 2013 to October 2014 is shown in Figure 1.

3.2.2. The majority of dolphin sightings made in the 12-month period were concentrated in the northwestern end of the North Lantau region, with higher concentration all around Lung Kwu Chau, to the west of Sha Chau, near Black Point as well as between Lung Kwu Chau and Pillar Point (Figure 1). Other dolphin sightings were scattered to the northeast and west of the airport. The few sightings made in NEL were located near Siu Ho Wan, Shum Shui Kok, Yam O and Tuen Mun (Figure 1).

3.2.3. Notably, none of the dolphin groups were sighted in the vicinity of TMCLKL southern viaduct, as well as the HKLR03 and HKBCF reclamation sites. One sighting was made near the TMCLKL northern landfall, and a few sightings were made in the vicinity of the HKLR09 alignment. Generally speaking, dolphin appeared to have avoided the five construction areas of HZMB works during the present impact phase monitoring period.

3.2.4. Dolphin sighting distribution of the present impact phase monitoring period (November 2013 to October 2014) was compared to the ones during the baseline phase (February 2011 to January 2012) and transitional phase (November 2012 to October 2013). In the present impact phase period, dolphins have nearly vacated from the NEL region, which was in stark contrast to their very frequent occurrence around the Brothers Islands, Shum Shui Kok, and the vicinity of HZMB-associated work sites during the baseline period (Figure 2). Even in the transitional phase, dolphins still utilized NEL waters in a

moderate extent, while they mostly avoided this area during the impact phase.

3.2.5. On the contrary, dolphin occurrence was similar across the three phases in NWL survey area, with the high concentration of dolphin sightings around Sha Chau and Lung Kwu Chau as well as near Black Point (Figure 2). However, there were two subtle differences observed among the three phases in NWL waters. Dolphins appeared to occur in much lower extent to the west of the airport platform and less frequently between Pillar Point and the airport platform during the impact phase when compared to the baseline and transitional phases (Figure 2).

3.3. Encounter rate

3.3.1. During the present 12-month impact phase monitoring period, the average daily encounter rates of Chinese White Dolphins were deduced in NEL and NWL survey areas, and compared to the ones deduced from the baseline and transitional phases (Table 2).

Table 2. Comparison of average daily dolphin encounter rates from impact phase (November 2013 – October 2014), transitional phase (November 2012 – October 2013) and baseline phase monitoring periods (February 2011 – January 2012) (Note: encounter rates deduced from the three periods were calculated based on survey and on-effort sighting data made along the primary transect lines under favourable conditions; ± denotes the standard deviation of the average encounter rates)

	Encounter rate (STG) (no. of on-effort dolphin sightings per 100 km of survey effort)		**Encounter rate (ANI)** (no. of dolphins from all on-effort sightings per 100 km of survey effort)	
	Northeast Lantau	**Northwest Lantau**	**Northeast Lantau**	**Northwest Lantau**
Impact Phase (2013-14)	0.22 ± 0.74	6.93 ± 4.08	0.76 ± 2.59	26.31 ± 17.56
Transitional Phase (2012-13)	1.70 ± 2.26	7.68 ± 4.36	4.75 ± 7.61	27.51 ± 18.06
Baseline Phase (2011-12)	6.05 ± 5.04	7.75 ± 5.69	19.91 ± 21.30	29.57 ± 26.96

3.3.2. To facilitate the comparison with the AFCD long-term monitoring results, the encounter rates were also calculated for the present 12-month study period using both primary and secondary survey effort. The encounter rates of sightings (STG) and dolphins (ANI) in NWL were 6.24 sightings and 22.93 dolphins per 100 km of survey effort respectively, while the encounter rates of sightings (STG) and dolphins (ANI) in NEL were 0.23 sightings and 1.23 dolphins per 100 km of survey effort respectively.

3.3.3. In NEL, the dolphin encounter rates (both STG and ANI) in the present 12-month impact monitoring period were exceptionally low, which was only a small fraction of the averages during the baseline phase (Table 2). In fact, such decline already existed in this area during the transitional phase (i.e. well before the TMCLKL construction works commenced), with the averages in the transitional phase being much lower than the ones in the baseline phase (reductions of 71.9% for STG and 76.1% respectively). Since then,

dolphin occurrence has further diminished to a very low level after the construction works of TMCLKL have commenced.

3.3.4. In NWL, the average dolphin encounter rates (STG and ANI) during the present impact phase monitoring period were also slightly lower (reductions of 10.6% and 11.0% respectively) than the ones recorded in the baseline period, indicating a slight decline in dolphin usage of this survey area during the present impact phase monitoring period (Table 2). Such decline was persistent since the commencement of HZMB construction in 2012, with a slight decline in transitional phase followed by a further decline in the impact phase (Table 2).

3.3.5. A two-way ANOVA with repeated measures and unequal sample size was conducted to examine whether there were any significant differences in the average encounter rates between the three monitoring periods (i.e. baseline, transitional and impact). The two variables that were examined included the two periods and the two locations (i.e. NEL and NWL).

3.3.6. For the comparison between the three periods, the p-value for the differences in average dolphin encounter rates of STG and ANI were 0.0043 and 0.0426 respectively. If the alpha value is set at 0.05, significant differences were detected among the three periods in both dolphin encounter rates of STG and ANI.

3.4. Group size

3.4.1. Group size of Chinese White Dolphins ranged from one to 13 individuals per group in North Lantau region during November 2013 – October 2014. The average dolphin group sizes from the 12-month impact phase monitoring period were compared with the ones deduced from baseline and transitional phases, as shown in Table 3.

3.4.2. The average dolphin group sizes in the entire North Lantau region as well as in NWL waters during the present impact phase monitoring period were slightly higher than the ones recorded during the baseline and transitional phases (Table 3). Among the 136 dolphin groups sighted during the impact phase, 93 of them were composed of 1-4 individuals only, while there were only four dolphin groups with more than 10 individuals.

Table 3. Comparison of average dolphin group sizes from impact phase (November 2013 – October 2014), transitional phase (November 2012 – October 2013) and baseline phase monitoring periods (February 2011 – January 2012) (± denotes the standard deviation of the average group sizes)

	Average Dolphin Group Size		
	Overall	**Northeast Lantau**	**Northwest Lantau**
Impact Phase (2013-14)	3.76 ± 2.57 (n = 136)	5.00 ± 2.71 (n = 4)	3.73 ± 2.57 (n = 132)
Transitional Phase (2012-13)	3.37 ± 2.98 (n = 186)	2.64 ± 2.38 (n = 22)	3.47 ± 3.05 (n = 164)
Baseline Phase (2011-12)	3.32 ± 2.86 (n = 288)	2.80 ± 2.35 (n = 79)	3.52 ± 3.01 (n = 209)

3.4.3. Distribution of dolphins with larger group sizes (i.e. five individuals or more per group) during the present quarter is shown in Figure 3, with comparison to the ones in transitional phase and baseline phase. During the TMCLKL impact phase in 2013-14, distribution of the larger dolphin groups were mainly concentrated around Lung Kwu Chau, Sha Chau and near Black Point (Figure 3). This distribution pattern was similar to the one during the transitional phase, but was very different from the baseline phase, when the larger dolphin groups were distributed more evenly in NWL waters with many also sighted in NEL waters (Figure 3). Moreover, fewer large dolphin groups with more than 10 animals were sighted during the impact phase when compared with the transitional and baseline phases.

3.5. Habitat use

3.5.1. During the impact phase monitoring period in 2013-14, the most heavily utilized habitats by Chinese White Dolphins mainly concentrated around Lung Kwu Chau (Figures 4a and 4b). For the rest of North Lantau region, only a few grids in NEL as well as the eastern and southwestern sections of NWL recorded the presence of dolphins in very low density. Moreover, all grids near TMCLKL and HKLR09 alignments as well as the HKLR03/HKBCF reclamation sites rarely recorded the presence of dolphins in the present 12-month impact monitoring period (Figures 4a and 4b).

3.5.2. When compared with the habitat use patterns during the baseline phase, dolphin usage in NEL was dramatically different from the present impact monitoring period (Figure 5). During the baseline period, a number of grids between Siu Mo To and Shum Shui Kok recorded moderately high to high dolphin densities, which was in stark contrast to the rare dolphin usage during the present impact phase period (Figure 5).

3.5.3. On the other hand, the density patterns in NWL were similar between the baseline and impact phase monitoring periods, with the exception that dolphin rarely utilized the waters to the west of airport during the impact phase, while their densities were relatively much higher during the baseline phase in the same area.

3.5.4. Notably, the habitat use patterns between the present impact phase in 2013-14 and transitional phase in 2012-13 were largely similar, indicating that the declining usage by the dolphins in NEL have already persisted before the commencement of TMCLKL construction works. Nevertheless, the declining usage of NEL waters and the central portion of NL waters have further worsened during the present impact monitoring period with the on-going TMCLK construction works in addition to other HZMB-related construction activities.

3.6. Mother-calf pairs

3.6.1. During the present 12-month impact phase monitoring period, a total of two unspotted calves and 27 unspotted juveniles (UJ) were sighted in North Lantau waters. These young calves comprised of 5.7% of all animals sighted, which was slightly higher than the percentage recorded during the baseline period (4.5%) but slightly lower than the one during the transitional phase (6.7%).

3.6.2. In NWL, the young calves were mainly sighted within and in the vicinity of Lung Kwu Chau during the impact phase monitoring period, which was drastically different from the distribution patterns during the baseline and transitional phases when young calves were sighted throughout NWL waters (Figure 6). Moreover, only one young calf was sighted near Siu Ho Wan in NEL during the impact phase, but they were regularly sighted in this area during baseline and transitional phases (Figure 6).

3.6.3. Notably, none of the young calves were sighted in the vicinity of the TMCLKL/HKLR09 alignments and HKBCF/HKLR03 reclamation sites during the present impact phase monitoring period (Figure 6).

3.7. Activities and associations with fishing boats

3.7.1. Eight dolphin sightings of each were associated with feeding and socializing activities respectively during the 12-month impact phase monitoring period. The percentage of sightings associated with feeding activities during the present impact phase (5.9%) was much lower than the ones recorded during the baseline period (12.8%) as well as transitional phase (8.6%) On the contrary, the percentage of socializing activities during the present impact phase monitoring period (5.9%) was higher than the one recorded during the baseline period (3.8%), but slightly lower than the one during the transitional period (6.4%). Notably, four other groups were also engaged in traveling activity during the present impact phase monitoring period.

3.7.2. Distribution of dolphins engaged in feeding, socializing and traveling activities during the present impact phase monitoring period is shown in Figure 7. The sightings associated with feeding activities occurred near Lung Kwu Chau, Sha Chau, Pillar Point and Siu Ho Wan, while the ones associated with socializing activities could be found along the Urmston Road between Pillar Point and the marine park as well as near Lung Kwu Chau and Sha Chau (Figure 7). On the contrary, feeding activities were frequently sighted along the Urmston Road, within the marine park, to the west of airport platform and around the Brothers Islands during the baseline phase, while the socializing activities were more scattered throughout the North Lantau region in the same period as well as in the transitional phase (Figure 7).

3.7.3. Dolphin sightings associated with traveling activities were concentrated to the north and east of Lung Kwu Chau during the impact phase monitoring period (Figure 7). This was very different from the pattern observed in baseline phase when traveling activities were primarily found near Pillar Point and to the west of the airport platform (Figure 7).

3.7.4. During the impact phase monitoring period in 2013-14, only one of the 136 dolphin groups were found to be associated with an operating fishing vessel (a hang trawler) in North Lantau waters. The extremely rare event of fishing boat association in the impact phase as well as the transitional phase (3 of 186 groups associated with fishing boats) was quite different from the baseline period with 14 of 288 dolphin groups associated with fishing boats. This was likely related to the trawl ban being implemented in December 2012 in Hong Kong waters.

3.8. Summary of photo-identification works

3.8.1. During the 12-month impact phase monitoring period, a total of 77 individuals sighted 291 times altogether were identified (see Appendix III). Only 17 of the 291 re-sightings (from 11 individuals) were made in NEL, while the rest were made in NWL.

3.8.2. About half of the 77 identified individuals were sighted only once or twice, while many individuals were also sighted frequently during the 12-month period. For example, 17 individuals were sighted more than five times, while five individuals (NL24, NL48, NL136, NL261 and NL272) were sighted ten times or more. Their frequent occurrences indicated strong reliance of North Lantau waters as their home ranges during the impact phase monitoring period, which should be continuously monitored for the rest of the impact phase monitoring period.

3.8.3. Notably, fifteen recognized females (i.e. NL33, NL46, NL80, NL93, NL98, NL104, NL123, NL145, NL182, NL202, NL221, NL233, NL256, WL124 and WL172) were accompanied with their calves during their re-sightings.

3.9. Individual range use

3.9.1. Ranging patterns of the 77 individuals identified during the 12-month impact phase monitoring period in 2013-14 were determined by fixed kernel method, and are shown in Appendix IV.

3.9.2. All identified dolphins sighted in this 12-month period were utilizing their ranges primarily in NWL, while some have extended their range use to West Lantau waters (e.g. CH34, NL33, NL150, WL15, WL124) based on the HKLR09 monitoring data collected during the same period (Appendix IV). The majority of identified dolphins have avoided the NEL waters, the area where many of them have utilized as their core areas of activities in the past.

3.9.3. An examination on temporal changes in range use of individual dolphins across the baseline, transitional and impact phases revealed that a number of dolphins have gradually shifted their range use away from their previously important habitat in NEL (especially around the Brothers) (see examples in Appendix V). Several individuals have expanded their range use into West Lantau waters (e.g. CH34, EL01, NL33, NL37, NL49, NL98, NL136, NL188, NL259, NL272, NL296, WL05) during the impact phase, while others have either increased their utilization of NWL (e.g. NL48, NL123, NL165, NL284) or possibly moved away from Hong Kong waters more often with only a few sightings despite their frequent occurrence here in the past (e.g. NL191, NL244, WL11).

3.9.4. Such range shifts of identified individual dolphins were also documented in Hung (2014), and could be related to the disturbance of construction activities and other existing threats in the NEL region. This should be continuously monitored for the rest of the TMCLKL impact phase monitoring period, as the waters around the Brothers Islands is scheduled to be established as a marine park in 2016 as an important compensation measure for the dolphins.

4. Conclusion

4.1. During the first year of TMCLKL impact phase monitoring of Chinese white dolphins, no adverse impact from the activities of the TMCLKL construction project on the dolphins was noticeable from general observations.

4.2. Although the dolphins infrequently occurred along the alignment of TMCLKL southern connection viaduct in the past and during the baseline monitoring period, it is apparent that dolphin usage has been significantly reduced in NEL, and many individuals have shifted away from the important habitat around the Brothers Islands.

4.3. It is critical to monitor the dolphin usage in North Lantau region for the rest of the impact phase monitoring period, to determine whether the dolphins are continuously affected by the various construction activities in relation to the HZMB-related works, and whether suitable mitigation measure can be applied to revert the situation.

5. References

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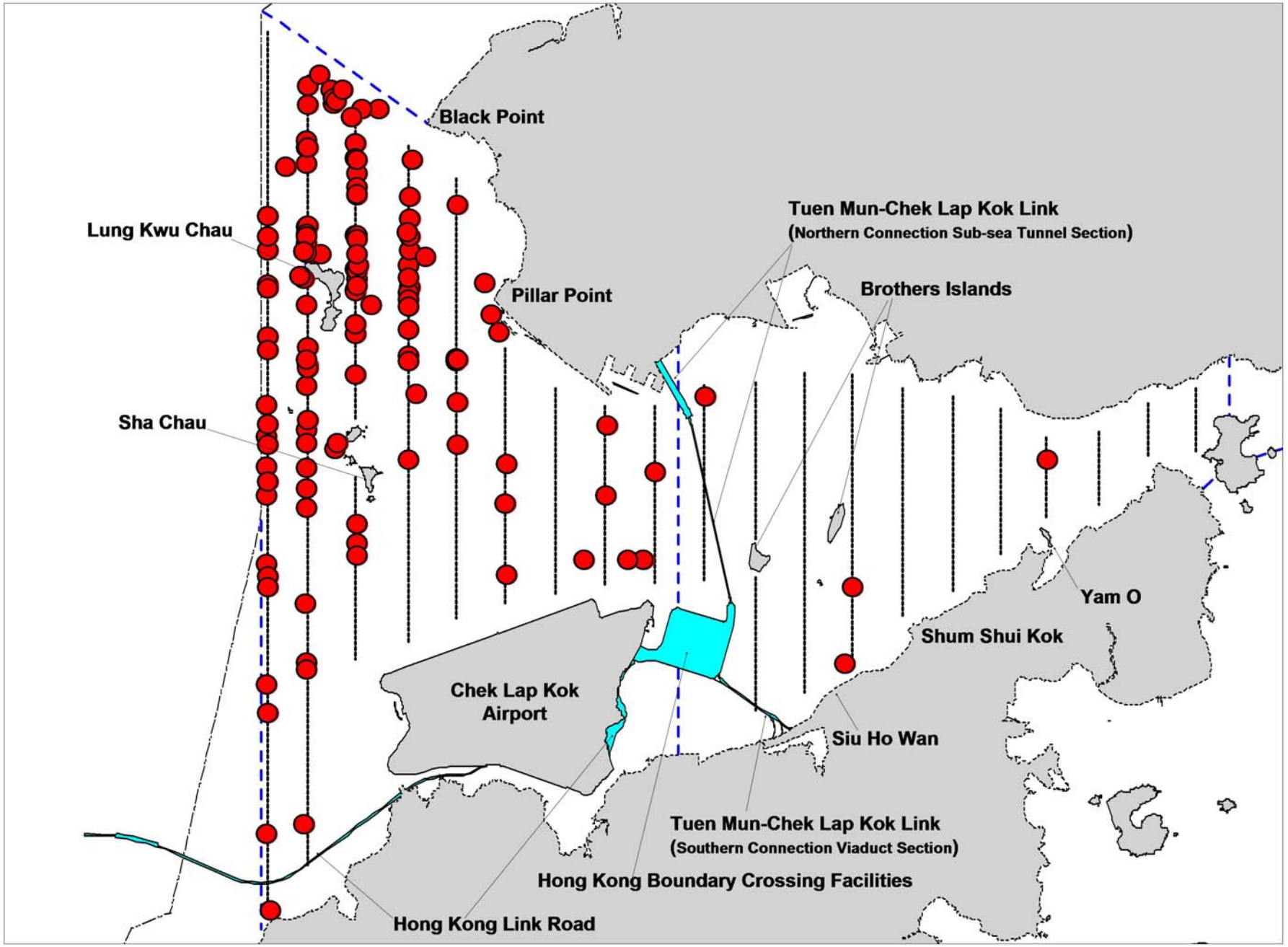


Figure 1. Distribution of Chinese white dolphin sightings in North Lantau region during the first year of TMCLKL construction works (November 2013 to October 2014), utilizing the HKLR03 monitoring data

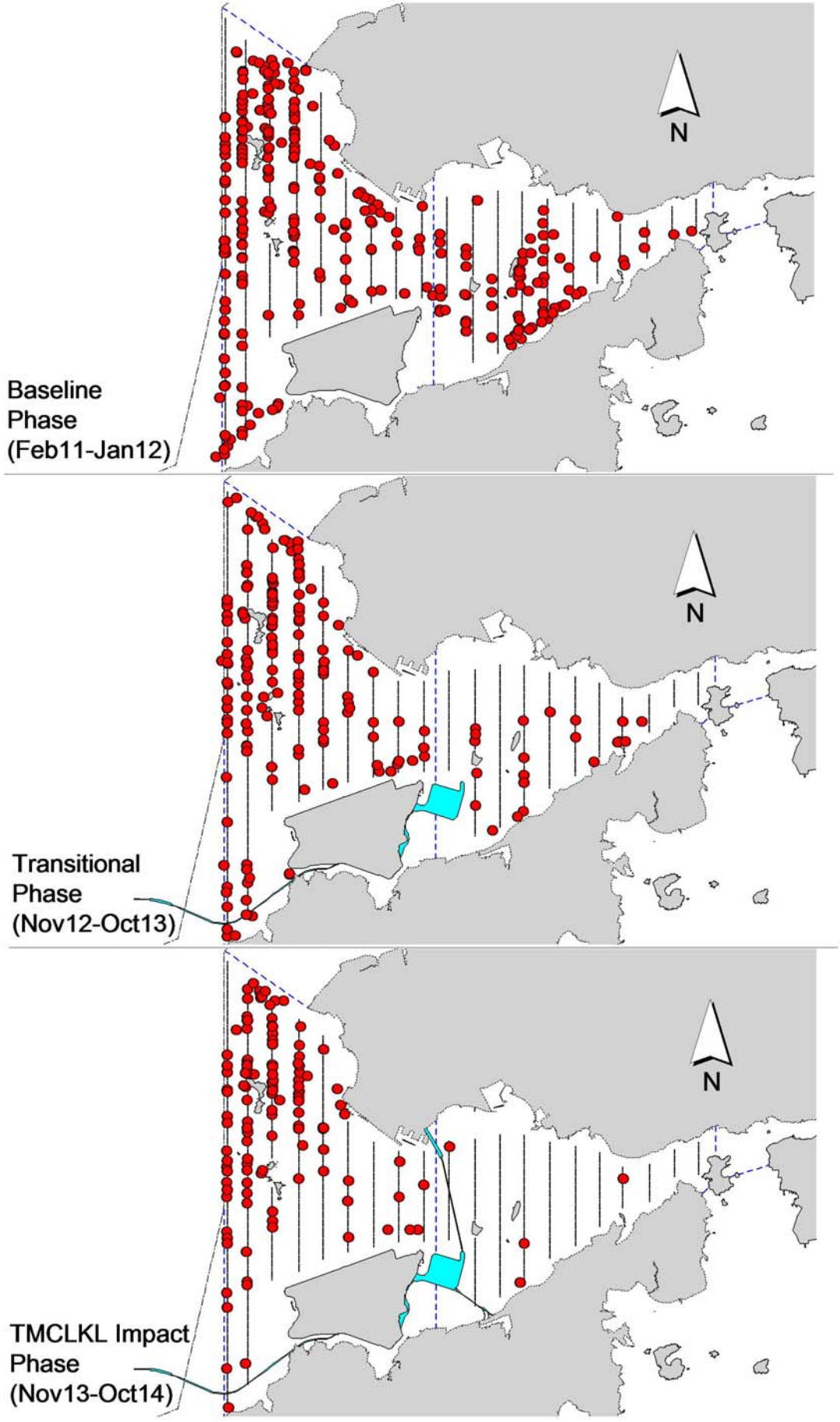


Figure 2. A comparison on distribution of Chinese white dolphin sightings in North Lantau region during the baseline, transitional and impact phases of TMCLKL construction works

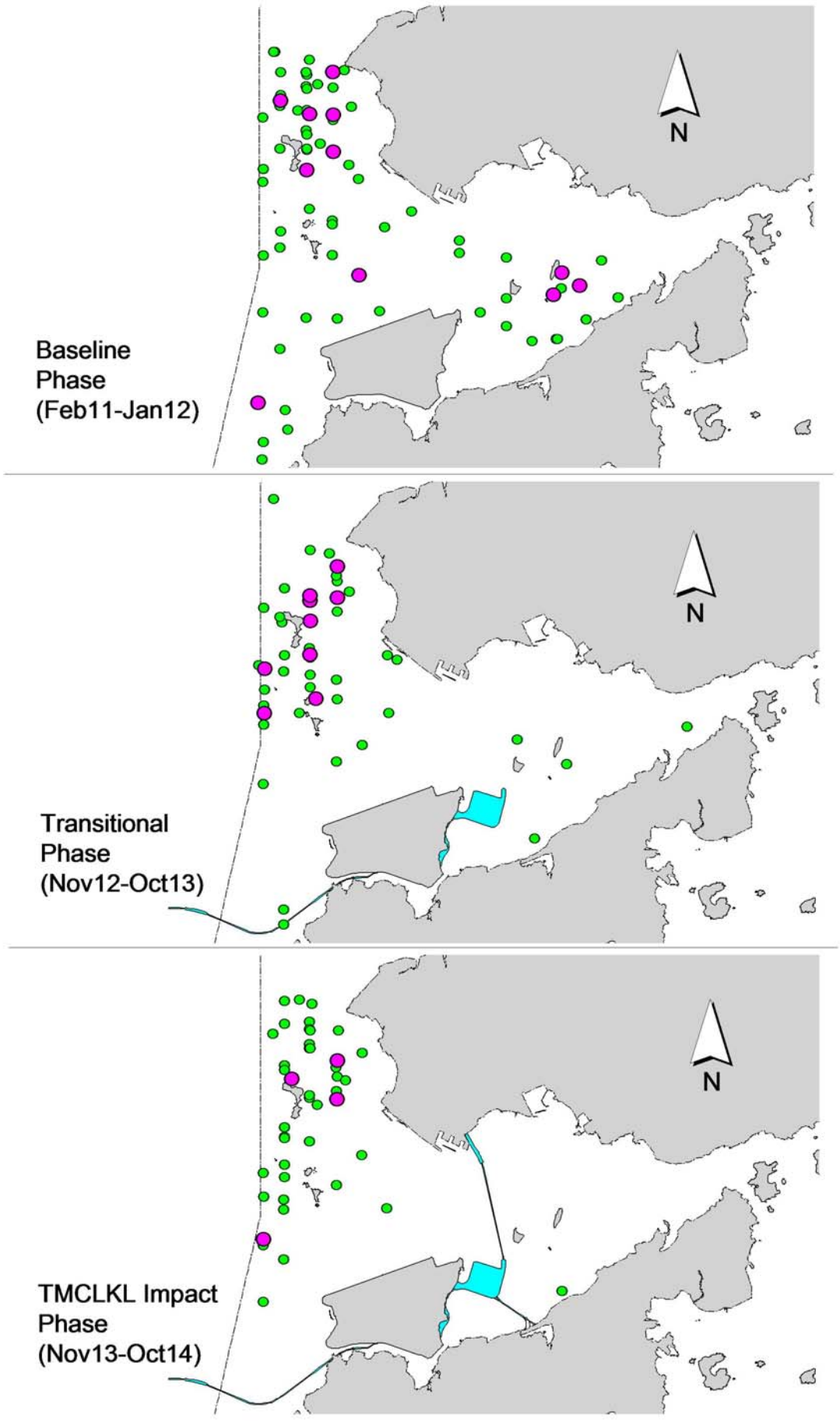


Figure 3. Distribution of dolphins with larger group sizes during different phases of TMCLKL construction works (green dots: group sizes of 5 or more; purple dots: group sizes of 10 or more)

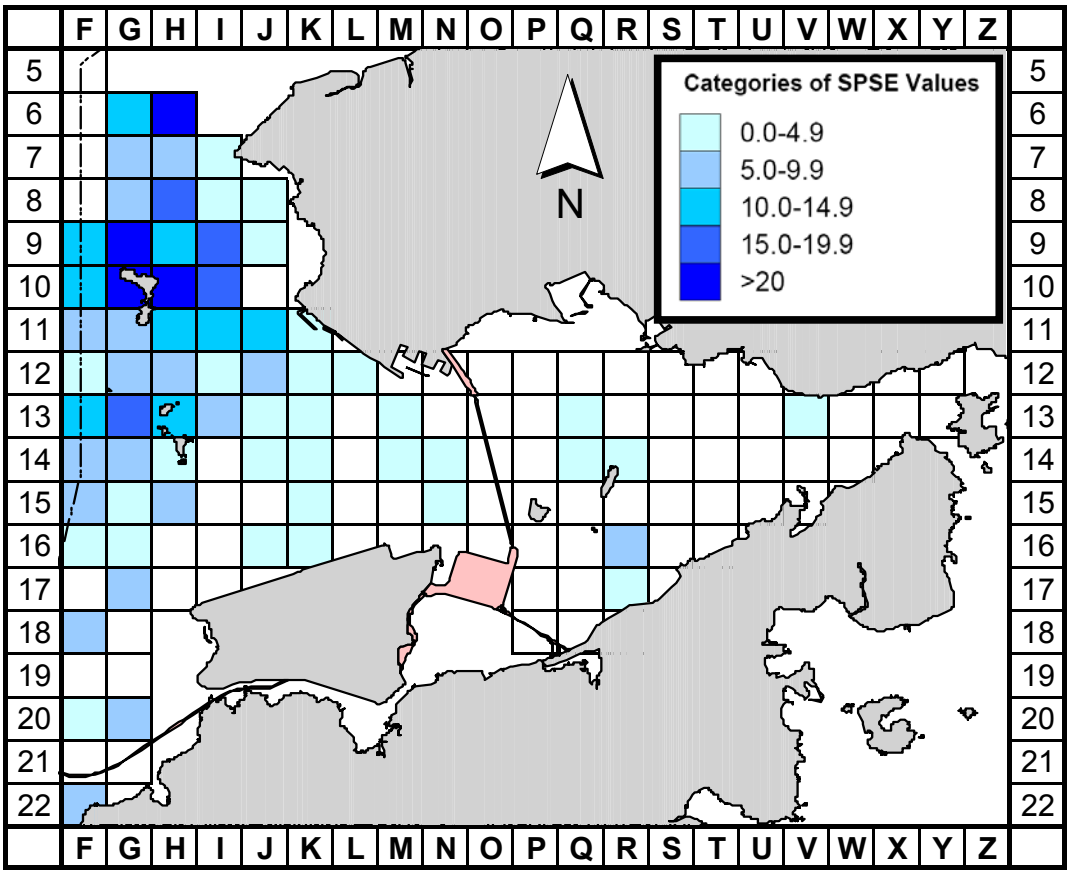


Figure 4a. Sighting density of Chinese white dolphins with corrected survey effort per km^2 in Northeast and Northwest Lantau survey areas, using data collected during HKLR03 impact monitoring period monitoring period (Nov13 - Oct14) (SPSE = no. of on-effort sightings per 100 units of survey effort)

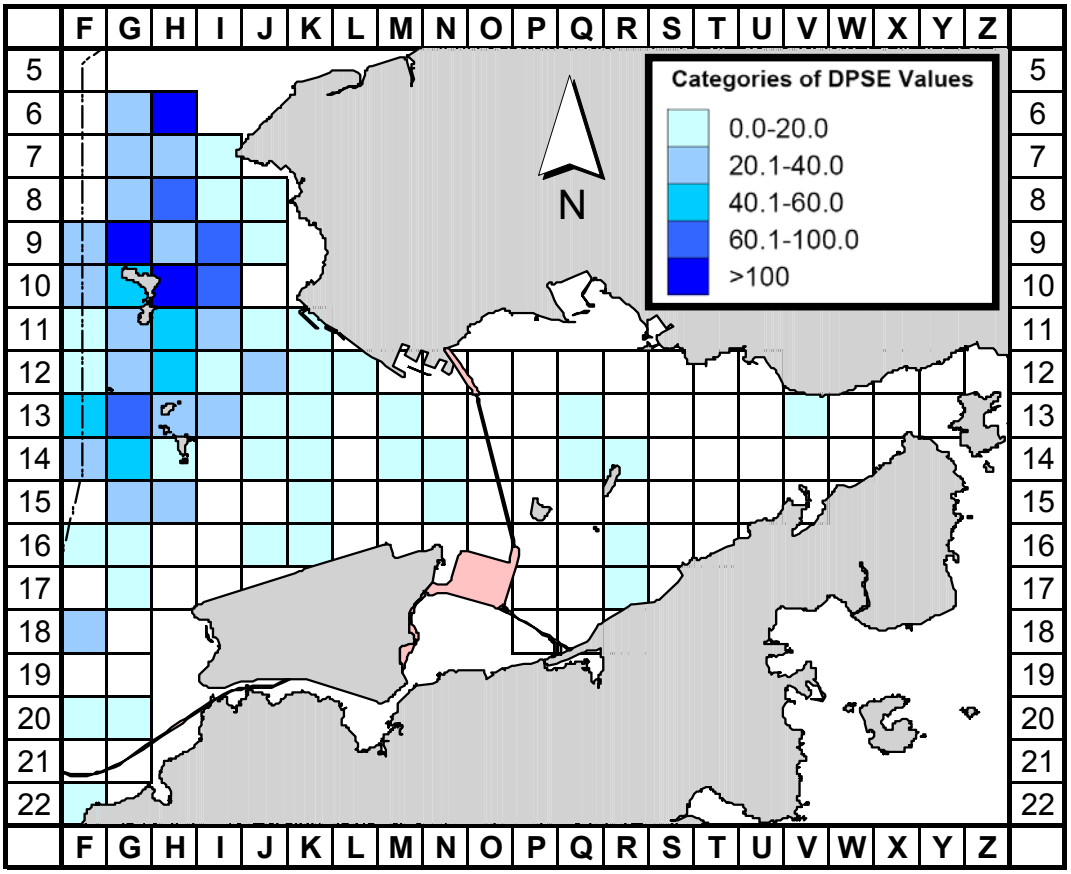


Figure 4b. Density of Chinese white dolphins with corrected survey effort per km^2 in Northeast and Northwest Lantau survey areas, using data collected during HKLR03 impact monitoring period (Nov13 -Oct14) (DPSE = no. of dolphins per 100 units of survey effort)

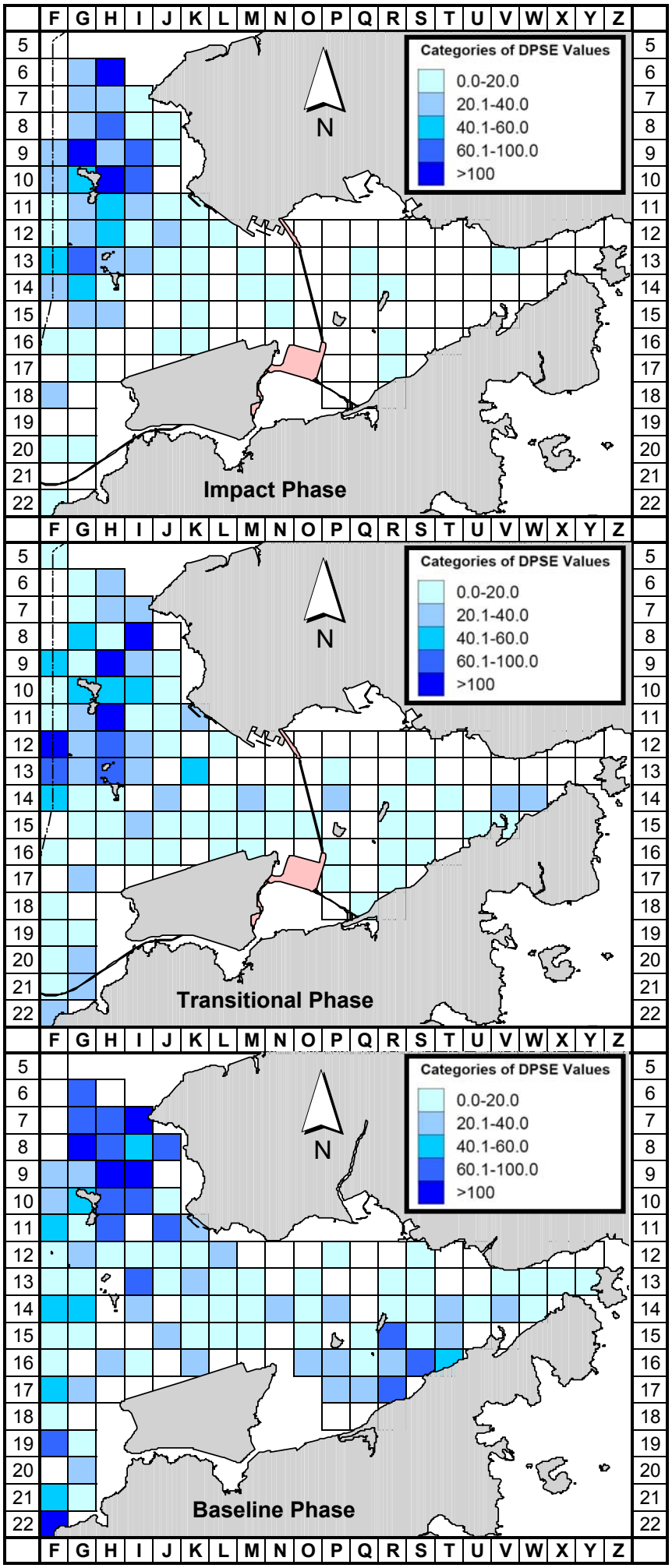


Figure 5. Comparison of density of Chinese white dolphins with corrected survey effort per km^2 in NWL and NEL survey areas between the impact phase (Nov13-Oct14), transitional phase (Nov12-Oct13) and baseline phase (Feb11-Jan12) monitoring periods (DPSE = no. of dolphins per 100 units of survey effort)

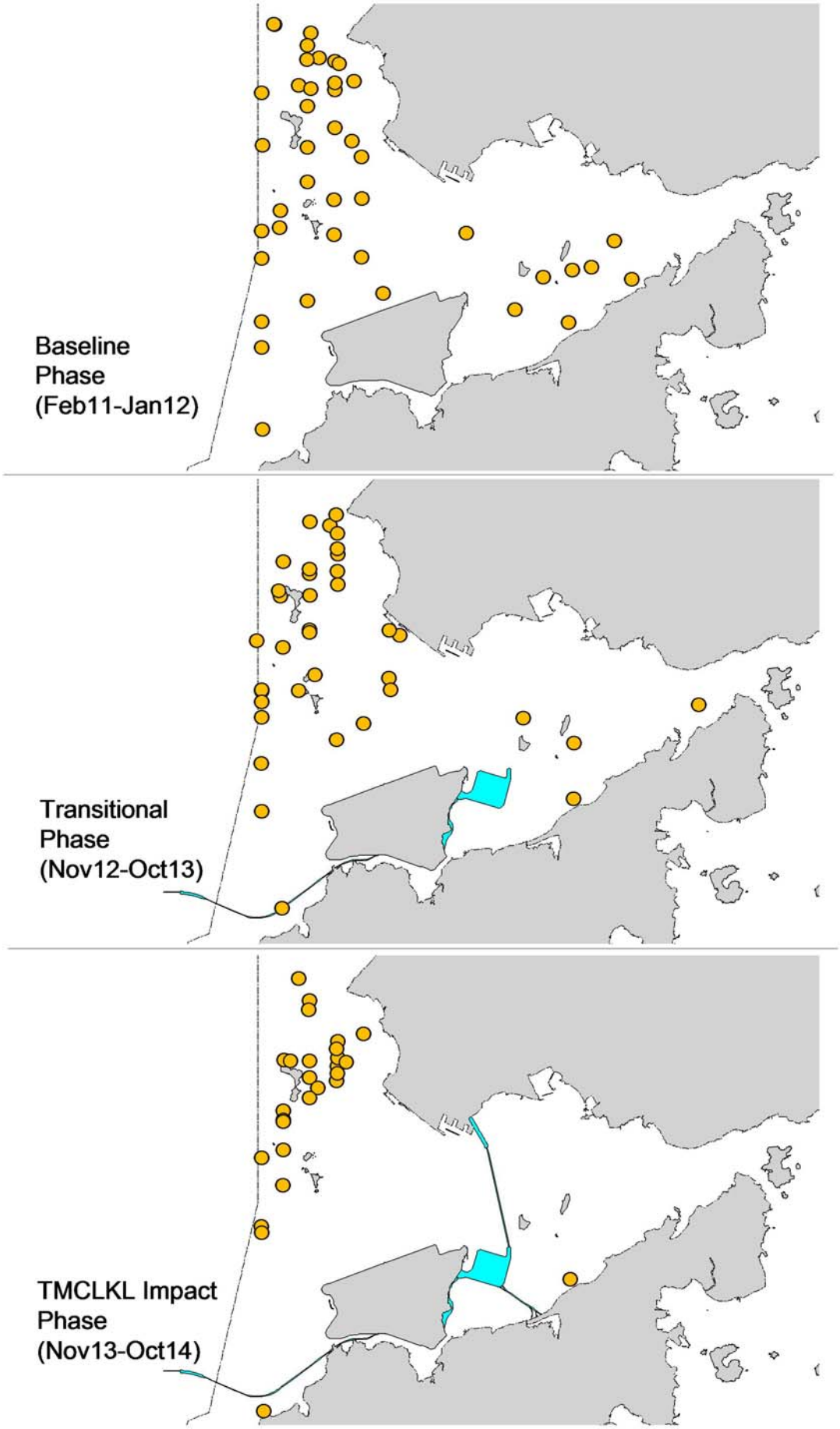


Figure 6. Distribution of young calves of Chinese white dolphins during different phases of TMCLKL construction works

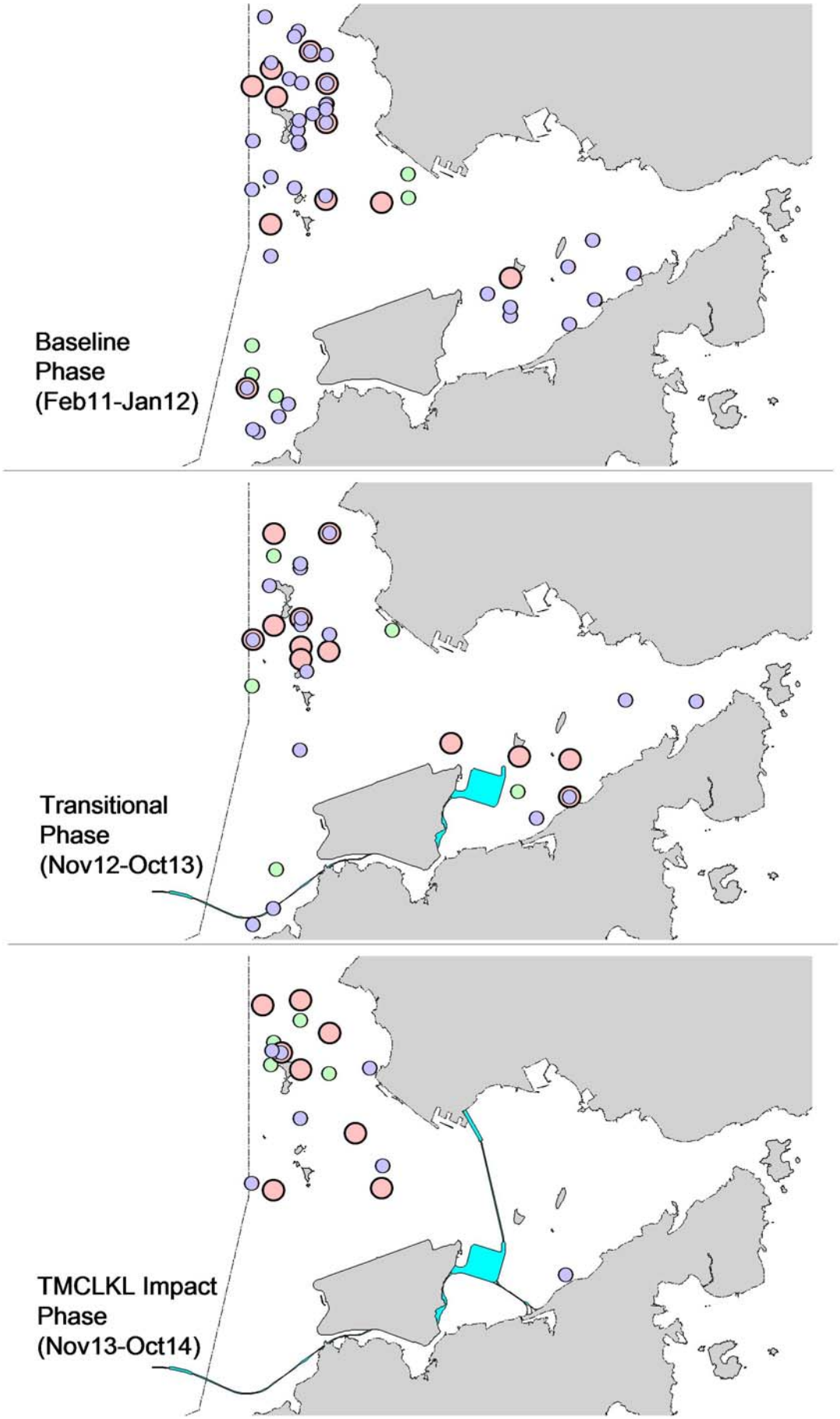


Figure 7. Distribution of dolphins engaged in feeding (purple dots), socializing (pink dots) and traveling (green dots) activities during different phases of TMCLKL construction works

Appendix I. HKLR03 Survey Effort Database (November 2013 - October 201

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

DATE	AREA	BEAU	EFFORT	SEASON	VESSEL	TYPE	P/S
1-Nov-13	NW LANTAU	1	6.43	AUTUMN	STANDARD31516	HKLR	P
1-Nov-13	NW LANTAU	2	28.32	AUTUMN	STANDARD31516	HKLR	P
1-Nov-13	NW LANTAU	3	19.23	AUTUMN	STANDARD31516	HKLR	P
1-Nov-13	NW LANTAU	1	2.25	AUTUMN	STANDARD31516	HKLR	S
1-Nov-13	NW LANTAU	2	5.73	AUTUMN	STANDARD31516	HKLR	S
1-Nov-13	NW LANTAU	3	4.87	AUTUMN	STANDARD31516	HKLR	S
1-Nov-13	NE LANTAU	2	3.67	AUTUMN	STANDARD31516	HKLR	P
5-Nov-13	NE LANTAU	2	34.75	AUTUMN	STANDARD31516	HKLR	P
5-Nov-13	NE LANTAU	2	10.65	AUTUMN	STANDARD31516	HKLR	S
5-Nov-13	NW LANTAU	2	13.99	AUTUMN	STANDARD31516	HKLR	P
5-Nov-13	NW LANTAU	2	6.61	AUTUMN	STANDARD31516	HKLR	S
8-Nov-13	NW LANTAU	0	1.73	AUTUMN	STANDARD31516	HKLR	P
8-Nov-13	NW LANTAU	1	10.57	AUTUMN	STANDARD31516	HKLR	P
8-Nov-13	NW LANTAU	2	39.88	AUTUMN	STANDARD31516	HKLR	P
8-Nov-13	NW LANTAU	3	1.50	AUTUMN	STANDARD31516	HKLR	P
8-Nov-13	NW LANTAU	1	1.29	AUTUMN	STANDARD31516	HKLR	S
8-Nov-13	NW LANTAU	2	5.53	AUTUMN	STANDARD31516	HKLR	S
8-Nov-13	NW LANTAU	3	2.36	AUTUMN	STANDARD31516	HKLR	S
13-Nov-13	NE LANTAU	1	5.70	AUTUMN	STANDARD31516	HKLR	P
13-Nov-13	NE LANTAU	2	21.79	AUTUMN	STANDARD31516	HKLR	P
13-Nov-13	NE LANTAU	3	9.60	AUTUMN	STANDARD31516	HKLR	P
13-Nov-13	NE LANTAU	2	11.71	AUTUMN	STANDARD31516	HKLR	S
13-Nov-13	NE LANTAU	3	1.10	AUTUMN	STANDARD31516	HKLR	S
13-Nov-13	NW LANTAU	1	1.93	AUTUMN	STANDARD31516	HKLR	P
13-Nov-13	NW LANTAU	2	5.89	AUTUMN	STANDARD31516	HKLR	P
13-Nov-13	NW LANTAU	3	6.87	AUTUMN	STANDARD31516	HKLR	P
13-Nov-13	NW LANTAU	2	4.22	AUTUMN	STANDARD31516	HKLR	S
5-Dec-13	NE LANTAU	1	21.06	WINTER	STANDARD31516	HKLR	P
5-Dec-13	NE LANTAU	2	16.22	WINTER	STANDARD31516	HKLR	P
5-Dec-13	NE LANTAU	1	6.64	WINTER	STANDARD31516	HKLR	S
5-Dec-13	NE LANTAU	2	5.18	WINTER	STANDARD31516	HKLR	S
5-Dec-13	NW LANTAU	2	11.53	WINTER	STANDARD31516	HKLR	P
5-Dec-13	NW LANTAU	3	3.89	WINTER	STANDARD31516	HKLR	P
5-Dec-13	NW LANTAU	2	3.87	WINTER	STANDARD31516	HKLR	S
5-Dec-13	NW LANTAU	3	2.51	WINTER	STANDARD31516	HKLR	S
9-Dec-13	NW LANTAU	2	19.03	WINTER	STANDARD31516	HKLR	P
9-Dec-13	NW LANTAU	3	37.52	WINTER	STANDARD31516	HKLR	P
9-Dec-13	NW LANTAU	2	5.22	WINTER	STANDARD31516	HKLR	S
9-Dec-13	NW LANTAU	3	6.78	WINTER	STANDARD31516	HKLR	S
13-Dec-13	NE LANTAU	1	4.50	WINTER	STANDARD31516	HKLR	P
13-Dec-13	NE LANTAU	2	31.16	WINTER	STANDARD31516	HKLR	P
13-Dec-13	NE LANTAU	1	3.90	WINTER	STANDARD31516	HKLR	S
13-Dec-13	NE LANTAU	2	9.44	WINTER	STANDARD31516	HKLR	S
13-Dec-13	NW LANTAU	2	8.88	WINTER	STANDARD31516	HKLR	P
13-Dec-13	NW LANTAU	3	6.40	WINTER	STANDARD31516	HKLR	P
13-Dec-13	NW LANTAU	2	4.12	WINTER	STANDARD31516	HKLR	S
19-Dec-13	NW LANTAU	3	14.06	WINTER	STANDARD31516	HKLR	P
19-Dec-13	NW LANTAU	4	36.79	WINTER	STANDARD31516	HKLR	P
19-Dec-13	NW LANTAU	5	6.10	WINTER	STANDARD31516	HKLR	P
19-Dec-13	NW LANTAU	3	8.79	WINTER	STANDARD31516	HKLR	S
19-Dec-13	NW LANTAU	4	2.91	WINTER	STANDARD31516	HKLR	S
19-Dec-13	NW LANTAU	5	0.90	WINTER	STANDARD31516	HKLR	S

Appendix I. (cont'd)

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

DATE	AREA	BEAU	EFFORT	SEASON	VESSEL	TYPE	P/S
7-Jan-14	NE LANTAU	2	1.09	WINTER	STANDARD31516	HKLR	P
7-Jan-14	NE LANTAU	3	14.05	WINTER	STANDARD31516	HKLR	P
7-Jan-14	NE LANTAU	4	1.01	WINTER	STANDARD31516	HKLR	P
7-Jan-14	NE LANTAU	2	3.39	WINTER	STANDARD31516	HKLR	**S**
7-Jan-14	NE LANTAU	3	7.60	WINTER	STANDARD31516	HKLR	S
7-Jan-14	NW LANTAU	2	9.81	WINTER	STANDARD31516	HKLR	P
7-Jan-14	NW LANTAU	3	28.88	WINTER	STANDARD31516	HKLR	P
7-Jan-14	NW LANTAU	2	8.13	WINTER	STANDARD31516	HKLR	S
7-Jan-14	NW LANTAU	3	3.43	WINTER	STANDARD31516	HKLR	S
9-Jan-14	NE LANTAU	1	4.79	WINTER	STANDARD31516	HKLR	P
9-Jan-14	NE LANTAU	2	14.76	WINTER	STANDARD31516	HKLR	P
9-Jan-14	NE LANTAU	1	2.30	WINTER	STANDARD31516	HKLR	S
9-Jan-14	NE LANTAU	2	8.28	WINTER	STANDARD31516	HKLR	S
9-Jan-14	NW LANTAU	2	10.13	WINTER	STANDARD31516	HKLR	P
9-Jan-14	NW LANTAU	3	21.20	WINTER	STANDARD31516	HKLR	P
9-Jan-14	NW LANTAU	2	5.02	WINTER	STANDARD31516	HKLR	S
9-Jan-14	NW LANTAU	3	2.06	WINTER	STANDARD31516	HKLR	S
21-Jan-14	NE LANTAU	2	4.00	WINTER	STANDARD 31516	HKLR	P
21-Jan-14	NE LANTAU	3	15.27	WINTER	STANDARD 31516	HKLR	P
21-Jan-14	NE LANTAU	4	1.50	WINTER	STANDARD 31516	HKLR	P
21-Jan-14	NE LANTAU	3	10.76	WINTER	STANDARD 31516	HKLR	S
21-Jan-14	NE LANTAU	4	0.40	WINTER	STANDARD 31516	HKLR	S
21-Jan-14	NW LANTAU	2	13.76	WINTER	STANDARD 31516	HKLR	P
21-Jan-14	NW LANTAU	3	14.44	WINTER	STANDARD 31516	HKLR	P
21-Jan-14	NW LANTAU	4	1.29	WINTER	STANDARD 31516	HKLR	P
21-Jan-14	NW LANTAU	2	4.95	WINTER	STANDARD 31516	HKLR	S
21-Jan-14	NW LANTAU	3	3.95	WINTER	STANDARD 31516	HKLR	S
23-Jan-14	NW LANTAU	1	4.93	WINTER	STANDARD31516	HKLR	P
23-Jan-14	NW LANTAU	2	29.22	WINTER	STANDARD31516	HKLR	P
23-Jan-14	NW LANTAU	3	5.21	WINTER	STANDARD31516	HKLR	P
23-Jan-14	NW LANTAU	1	2.20	WINTER	STANDARD31516	HKLR	S
23-Jan-14	NW LANTAU	2	10.18	WINTER	STANDARD31516	HKLR	S
23-Jan-14	NE LANTAU	1	1.41	WINTER	STANDARD31516	HKLR	P
23-Jan-14	NE LANTAU	2	12.52	WINTER	STANDARD31516	HKLR	P
23-Jan-14	NE LANTAU	3	2.59	WINTER	STANDARD31516	HKLR	P
23-Jan-14	NE LANTAU	1	0.47	WINTER	STANDARD31516	HKLR	S
23-Jan-14	NE LANTAU	2	9.53	WINTER	STANDARD31516	HKLR	S
6-Feb-14	NW LANTAU	1	1.68	WINTER	STANDARD 31516	HKLR	P
6-Feb-14	NW LANTAU	2	35.03	WINTER	STANDARD 31516	HKLR	P
6-Feb-14	NW LANTAU	3	2.90	WINTER	STANDARD 31516	HKLR	P
6-Feb-14	NW LANTAU	2	11.99	WINTER	STANDARD 31516	HKLR	S
6-Feb-14	NW LANTAU	3	1.20	WINTER	STANDARD 31516	HKLR	S
6-Feb-14	NE LANTAU	1	5.59	WINTER	STANDARD 31516	HKLR	P
6-Feb-14	NE LANTAU	2	8.66	WINTER	STANDARD 31516	HKLR	P
6-Feb-14	NE LANTAU	3	2.60	WINTER	STANDARD 31516	HKLR	P
6-Feb-14	NE LANTAU	1	4.45	WINTER	STANDARD 31516	HKLR	S
6-Feb-14	NE LANTAU	2	6.50	WINTER	STANDARD 31516	HKLR	S
12-Feb-14	NE LANTAU	2	13.78	WINTER	STANDARD 31516	HKLR	P
12-Feb-14	NE LANTAU	3	5.91	WINTER	STANDARD 31516	HKLR	P
12-Feb-14	NE LANTAU	1	2.02	WINTER	STANDARD 31516	HKLR	S
12-Feb-14	NE LANTAU	2	5.36	WINTER	STANDARD 31516	HKLR	S
12-Feb-14	NE LANTAU	3	3.53	WINTER	STANDARD 31516	HKLR	S
12-Feb-14	NW LANTAU	2	11.72	WINTER	STANDARD 31516	HKLR	P
12-Feb-14	NW LANTAU	3	15.87	WINTER	STANDARD 31516	HKLR	P

Appendix I. (cont'd)

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

DATE	AREA	BEAU	EFFORT	SEASON	VESSEL	TYPE	P/S
12-Feb-14	NW LANTAU	2	3.67	WINTER	STANDARD 31516	HKLR	S
12-Feb-14	NW LANTAU	3	7.72	WINTER	STANDARD 31516	HKLR	S
14-Feb-14	NE LANTAU	2	11.72	WINTER	STANDARD 31516	HKLR	P
14-Feb-14	NE LANTAU	3	5.58	WINTER	STANDARD 31516	HKLR	P
14-Feb-14	NE LANTAU	2	7.68	WINTER	STANDARD 31516	HKLR	S
14-Feb-14	NE LANTAU	3	2.72	WINTER	STANDARD 31516	HKLR	S
14-Feb-14	NW LANTAU	2	17.02	WINTER	STANDARD 31516	HKLR	P
14-Feb-14	NW LANTAU	3	24.77	WINTER	STANDARD 31516	HKLR	P
14-Feb-14	NW LANTAU	2	9.82	WINTER	STANDARD 31516	HKLR	S
14-Feb-14	NW LANTAU	3	2.18	WINTER	STANDARD 31516	HKLR	S
20-Feb-14	NW LANTAU	3	22.68	WINTER	STANDARD 31516	HKLR	P
20-Feb-14	NW LANTAU	4	6.16	WINTER	STANDARD 31516	HKLR	P
20-Feb-14	NW LANTAU	3	7.31	WINTER	STANDARD 31516	HKLR	S
20-Feb-14	NE LANTAU	2	17.92	WINTER	STANDARD 31516	HKLR	P
20-Feb-14	NE LANTAU	3	2.19	WINTER	STANDARD 31516	HKLR	P
20-Feb-14	NE LANTAU	1	0.97	WINTER	STANDARD 31516	HKLR	S
20-Feb-14	NE LANTAU	2	8.94	WINTER	STANDARD 31516	HKLR	S
5-Mar-14	NW LANTAU	1	3.88	SPRING	STANDARD31516	HKLR	P
5-Mar-14	NW LANTAU	2	20.76	SPRING	STANDARD31516	HKLR	P
5-Mar-14	NW LANTAU	3	5.93	SPRING	STANDARD31516	HKLR	P
5-Mar-14	NW LANTAU	2	5.25	SPRING	STANDARD31516	HKLR	S
5-Mar-14	NW LANTAU	3	1.96	SPRING	STANDARD31516	HKLR	S
5-Mar-14	NE LANTAU	2	17.99	SPRING	STANDARD31516	HKLR	P
5-Mar-14	NE LANTAU	3	1.69	SPRING	STANDARD31516	HKLR	P
5-Mar-14	NE LANTAU	2	11.02	SPRING	STANDARD31516	HKLR	S
11-Mar-14	NE LANTAU	2	1.40	SPRING	STANDARD31516	HKLR	P
11-Mar-14	NE LANTAU	3	11.82	SPRING	STANDARD31516	HKLR	P
11-Mar-14	NE LANTAU	4	2.90	SPRING	STANDARD31516	HKLR	P
11-Mar-14	NE LANTAU	2	6.16	SPRING	STANDARD31516	HKLR	S
11-Mar-14	NE LANTAU	3	4.12	SPRING	STANDARD31516	HKLR	S
11-Mar-14	NE LANTAU	4	1.40	SPRING	STANDARD31516	HKLR	S
11-Mar-14	NW LANTAU	1	1.70	SPRING	STANDARD31516	HKLR	P
11-Mar-14	NW LANTAU	2	5.31	SPRING	STANDARD31516	HKLR	P
11-Mar-14	NW LANTAU	3	9.08	SPRING	STANDARD31516	HKLR	P
11-Mar-14	NW LANTAU	4	18.01	SPRING	STANDARD31516	HKLR	P
11-Mar-14	NW LANTAU	5	6.14	SPRING	STANDARD31516	HKLR	P
11-Mar-14	NW LANTAU	2	6.91	SPRING	STANDARD31516	HKLR	S
11-Mar-14	NW LANTAU	3	1.40	SPRING	STANDARD31516	HKLR	S
11-Mar-14	NW LANTAU	4	4.25	SPRING	STANDARD31516	HKLR	S
17-Mar-14	NW LANTAU	0	4.79	SPRING	STANDARD31516	HKLR	P
17-Mar-14	NW LANTAU	1	25.40	SPRING	STANDARD31516	HKLR	P
17-Mar-14	NW LANTAU	2	8.51	SPRING	STANDARD31516	HKLR	P
17-Mar-14	NW LANTAU	0	2.51	SPRING	STANDARD31516	HKLR	S
17-Mar-14	NW LANTAU	1	7.24	SPRING	STANDARD31516	HKLR	S
17-Mar-14	NW LANTAU	2	3.21	SPRING	STANDARD31516	HKLR	S
17-Mar-14	NE LANTAU	1	14.20	SPRING	STANDARD31516	HKLR	P
17-Mar-14	NE LANTAU	2	2.36	SPRING	STANDARD31516	HKLR	P
17-Mar-14	NE LANTAU	1	9.07	SPRING	STANDARD31516	HKLR	S
17-Mar-14	NE LANTAU	2	2.17	SPRING	STANDARD31516	HKLR	S
25-Mar-14	NE LANTAU	1	13.41	SPRING	STANDARD31516	HKLR	P
25-Mar-14	NE LANTAU	2	6.67	SPRING	STANDARD31516	HKLR	P
25-Mar-14	NE LANTAU	1	6.73	SPRING	STANDARD31516	HKLR	S
25-Mar-14	NE LANTAU	2	4.19	SPRING	STANDARD31516	HKLR	S
25-Mar-14	NW LANTAU	1	7.45	SPRING	STANDARD31516	HKLR	P

Appendix I. (cont'd)

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

DATE	AREA	BEAU	EFFORT	SEASON	VESSEL	TYPE	P/S
25-Mar-14	NW LANTAU	2	22.31	SPRING	STANDARD31516	HKLR	P
25-Mar-14	NW LANTAU	1	0.96	SPRING	STANDARD31516	HKLR	S
25-Mar-14	NW LANTAU	2	6.58	SPRING	STANDARD31516	HKLR	S
4-Apr-14	NW LANTAU	1	1.41	SPRING	STANDARD31516	HKLR	P
4-Apr-14	NW LANTAU	2	8.57	SPRING	STANDARD31516	HKLR	P
4-Apr-14	NW LANTAU	3	14.93	SPRING	STANDARD31516	HKLR	P
4-Apr-14	NW LANTAU	4	3.00	SPRING	STANDARD31516	HKLR	P
4-Apr-14	NW LANTAU	2	3.16	SPRING	STANDARD31516	HKLR	S
4-Apr-14	NW LANTAU	3	3.00	SPRING	STANDARD31516	HKLR	S
4-Apr-14	NW LANTAU	4	1.00	SPRING	STANDARD31516	HKLR	S
4-Apr-14	NE LANTAU	2	0.80	SPRING	STANDARD31516	HKLR	P
4-Apr-14	NE LANTAU	3	15.53	SPRING	STANDARD31516	HKLR	P
4-Apr-14	NE LANTAU	4	4.16	SPRING	STANDARD31516	HKLR	P
4-Apr-14	NE LANTAU	2	2.20	SPRING	STANDARD31516	HKLR	S
4-Apr-14	NE LANTAU	3	8.51	SPRING	STANDARD31516	HKLR	S
14-Apr-14	NE LANTAU	2	0.90	SPRING	STANDARD31516	HKLR	P
14-Apr-14	NE LANTAU	3	9.61	SPRING	STANDARD31516	HKLR	P
14-Apr-14	NE LANTAU	4	6.20	SPRING	STANDARD31516	HKLR	P
14-Apr-14	NE LANTAU	2	1.80	SPRING	STANDARD31516	HKLR	S
14-Apr-14	NE LANTAU	3	6.39	SPRING	STANDARD31516	HKLR	S
14-Apr-14	NE LANTAU	4	2.90	SPRING	STANDARD31516	HKLR	S
14-Apr-14	NW LANTAU	2	1.40	SPRING	STANDARD31516	HKLR	P
14-Apr-14	NW LANTAU	3	14.62	SPRING	STANDARD31516	HKLR	P
14-Apr-14	NW LANTAU	4	23.91	SPRING	STANDARD31516	HKLR	P
14-Apr-14	NW LANTAU	2	2.10	SPRING	STANDARD31516	HKLR	S
14-Apr-14	NW LANTAU	3	7.86	SPRING	STANDARD31516	HKLR	S
14-Apr-14	NW LANTAU	4	2.99	SPRING	STANDARD31516	HKLR	S
16-Apr-14	NW LANTAU	2	4.27	SPRING	STANDARD31516	HKLR	P
16-Apr-14	NW LANTAU	3	24.56	SPRING	STANDARD31516	HKLR	P
16-Apr-14	NW LANTAU	4	2.91	SPRING	STANDARD31516	HKLR	P
16-Apr-14	NW LANTAU	2	2.45	SPRING	STANDARD31516	HKLR	S
16-Apr-14	NW LANTAU	3	4.20	SPRING	STANDARD31516	HKLR	S
16-Apr-14	NE LANTAU	2	3.94	SPRING	STANDARD31516	HKLR	P
16-Apr-14	NE LANTAU	3	15.37	SPRING	STANDARD31516	HKLR	P
16-Apr-14	NE LANTAU	4	1.10	SPRING	STANDARD31516	HKLR	P
16-Apr-14	NE LANTAU	2	1.20	SPRING	STANDARD31516	HKLR	S
16-Apr-14	NE LANTAU	3	9.49	SPRING	STANDARD31516	HKLR	S
24-Apr-14	NW LANTAU	2	1.91	SPRING	STANDARD31516	HKLR	P
24-Apr-14	NW LANTAU	3	29.94	SPRING	STANDARD31516	HKLR	P
24-Apr-14	NW LANTAU	4	8.44	SPRING	STANDARD31516	HKLR	P
24-Apr-14	NW LANTAU	2	0.80	SPRING	STANDARD31516	HKLR	S
24-Apr-14	NW LANTAU	3	9.72	SPRING	STANDARD31516	HKLR	S
24-Apr-14	NW LANTAU	4	2.20	SPRING	STANDARD31516	HKLR	S
24-Apr-14	NE LANTAU	2	5.03	SPRING	STANDARD31516	HKLR	P
24-Apr-14	NE LANTAU	3	10.14	SPRING	STANDARD31516	HKLR	P
24-Apr-14	NE LANTAU	4	1.31	SPRING	STANDARD31516	HKLR	P
24-Apr-14	NE LANTAU	2	7.37	SPRING	STANDARD31516	HKLR	S
24-Apr-14	NE LANTAU	3	3.65	SPRING	STANDARD31516	HKLR	S
2-May-14	NW LANTAU	1	8.33	SPRING	STANDARD31516	HKLR	P
2-May-14	NW LANTAU	2	20.71	SPRING	STANDARD31516	HKLR	P
2-May-14	NW LANTAU	3	11.20	SPRING	STANDARD31516	HKLR	P
2-May-14	NW LANTAU	1	8.11	SPRING	STANDARD31516	HKLR	S
2-May-14	NW LANTAU	2	2.77	SPRING	STANDARD31516	HKLR	S
2-May-14	NW LANTAU	3	1.30	SPRING	STANDARD31516	HKLR	S

Appendix I. (cont'd)

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

DATE	AREA	BEAU	EFFORT	SEASON	VESSEL	TYPE	P/S
2-May-14	NE LANTAU	2	8.93	SPRING	STANDARD31516	HKLR	P
2-May-14	NE LANTAU	3	8.38	SPRING	STANDARD31516	HKLR	P
2-May-14	NE LANTAU	2	7.68	SPRING	STANDARD31516	HKLR	S
2-May-14	NE LANTAU	3	2.51	SPRING	STANDARD31516	HKLR	S
19-May-14	NE LANTAU	1	2.45	SPRING	STANDARD31516	HKLR	P
19-May-14	NE LANTAU	2	13.17	SPRING	STANDARD31516	HKLR	P
19-May-14	NE LANTAU	3	2.63	SPRING	STANDARD31516	HKLR	P
19-May-14	NE LANTAU	4	1.40	SPRING	STANDARD31516	HKLR	P
19-May-14	NE LANTAU	1	1.44	SPRING	STANDARD31516	HKLR	S
19-May-14	NE LANTAU	2	4.97	SPRING	STANDARD31516	HKLR	S
19-May-14	NE LANTAU	3	3.94	SPRING	STANDARD31516	HKLR	S
19-May-14	NW LANTAU	3	14.57	SPRING	STANDARD31516	HKLR	P
19-May-14	NW LANTAU	4	16.43	SPRING	STANDARD31516	HKLR	P
19-May-14	NW LANTAU	3	4.87	SPRING	STANDARD31516	HKLR	S
19-May-14	NW LANTAU	4	2.01	SPRING	STANDARD31516	HKLR	S
21-May-14	NW LANTAU	1	1.40	SPRING	STANDARD31516	HKLR	P
21-May-14	NW LANTAU	2	13.43	SPRING	STANDARD31516	HKLR	P
21-May-14	NW LANTAU	3	16.59	SPRING	STANDARD31516	HKLR	P
21-May-14	NW LANTAU	1	0.60	SPRING	STANDARD31516	HKLR	S
21-May-14	NW LANTAU	2	4.20	SPRING	STANDARD31516	HKLR	S
21-May-14	NW LANTAU	3	2.50	SPRING	STANDARD31516	HKLR	S
21-May-14	NE LANTAU	2	13.25	SPRING	STANDARD31516	HKLR	P
21-May-14	NE LANTAU	3	6.78	SPRING	STANDARD31516	HKLR	P
21-May-14	NE LANTAU	2	9.07	SPRING	STANDARD31516	HKLR	S
21-May-14	NE LANTAU	3	1.50	SPRING	STANDARD31516	HKLR	S
26-May-14	NW LANTAU	2	21.21	SPRING	STANDARD31516	HKLR	P
26-May-14	NW LANTAU	3	19.14	SPRING	STANDARD31516	HKLR	P
26-May-14	NW LANTAU	2	3.70	SPRING	STANDARD31516	HKLR	S
26-May-14	NW LANTAU	3	9.05	SPRING	STANDARD31516	HKLR	S
26-May-14	NE LANTAU	1	3.10	SPRING	STANDARD31516	HKLR	P
26-May-14	NE LANTAU	2	13.43	SPRING	STANDARD31516	HKLR	P
26-May-14	NE LANTAU	2	10.87	SPRING	STANDARD31516	HKLR	S
3-Jun-14	NE LANTAU	2	14.31	SUMMER	STANDARD31516	HKLR	P
3-Jun-14	NE LANTAU	3	2.60	SUMMER	STANDARD31516	HKLR	P
3-Jun-14	NE LANTAU	2	10.89	SUMMER	STANDARD31516	HKLR	S
3-Jun-14	NW LANTAU	2	6.52	SUMMER	STANDARD31516	HKLR	P
3-Jun-14	NW LANTAU	3	23.00	SUMMER	STANDARD31516	HKLR	P
3-Jun-14	NW LANTAU	4	10.70	SUMMER	STANDARD31516	HKLR	P
3-Jun-14	NW LANTAU	2	3.78	SUMMER	STANDARD31516	HKLR	S
3-Jun-14	NW LANTAU	3	9.70	SUMMER	STANDARD31516	HKLR	S
5-Jun-14	NE LANTAU	1	5.65	SUMMER	STANDARD31516	HKLR	P
5-Jun-14	NE LANTAU	2	10.52	SUMMER	STANDARD31516	HKLR	P
5-Jun-14	NE LANTAU	3	4.20	SUMMER	STANDARD31516	HKLR	P
5-Jun-14	NE LANTAU	1	2.20	SUMMER	STANDARD31516	HKLR	S
5-Jun-14	NE LANTAU	2	6.23	SUMMER	STANDARD31516	HKLR	S
5-Jun-14	NE LANTAU	3	2.10	SUMMER	STANDARD31516	HKLR	S
5-Jun-14	NW LANTAU	2	13.90	SUMMER	STANDARD31516	HKLR	P
5-Jun-14	NW LANTAU	3	16.56	SUMMER	STANDARD31516	HKLR	P
5-Jun-14	NW LANTAU	2	3.70	SUMMER	STANDARD31516	HKLR	S
5-Jun-14	NW LANTAU	3	3.61	SUMMER	STANDARD31516	HKLR	S
10-Jun-14	NW LANTAU	2	6.21	SUMMER	STANDARD31516	HKLR	P
10-Jun-14	NW LANTAU	3	31.70	SUMMER	STANDARD31516	HKLR	P
10-Jun-14	NW LANTAU	4	2.50	SUMMER	STANDARD31516	HKLR	P
10-Jun-14	NW LANTAU	2	9.29	SUMMER	STANDARD31516	HKLR	S

Appendix I. (cont'd)

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

DATE	AREA	BEAU	EFFORT	SEASON	VESSEL	TYPE	P/S
10-Jun-14	NW LANTAU	3	4.10	SUMMER	STANDARD31516	HKLR	S
10-Jun-14	NE LANTAU	2	12.34	SUMMER	STANDARD31516	HKLR	P
10-Jun-14	NE LANTAU	3	3.50	SUMMER	STANDARD31516	HKLR	P
10-Jun-14	NE LANTAU	2	10.53	SUMMER	STANDARD31516	HKLR	S
10-Jun-14	NE LANTAU	3	0.73	SUMMER	STANDARD31516	HKLR	S
16-Jun-14	NW LANTAU	2	3.11	SUMMER	STANDARD31516	HKLR	P
16-Jun-14	NW LANTAU	3	13.98	SUMMER	STANDARD31516	HKLR	P
16-Jun-14	NW LANTAU	4	14.31	SUMMER	STANDARD31516	HKLR	P
16-Jun-14	NW LANTAU	3	4.28	SUMMER	STANDARD31516	HKLR	S
16-Jun-14	NW LANTAU	4	3.43	SUMMER	STANDARD31516	HKLR	S
16-Jun-14	NE LANTAU	1	1.40	SUMMER	STANDARD31516	HKLR	P
16-Jun-14	NE LANTAU	2	18.35	SUMMER	STANDARD31516	HKLR	P
16-Jun-14	NE LANTAU	1	0.30	SUMMER	STANDARD31516	HKLR	S
16-Jun-14	NE LANTAU	2	10.55	SUMMER	STANDARD31516	HKLR	S
3-Jul-14	NE LANTAU	2	1.89	SUMMER	STANDARD31516	HKLR	P
3-Jul-14	NE LANTAU	2	2.14	SUMMER	STANDARD31516	HKLR	S
3-Jul-14	NW LANTAU	2	7.87	SUMMER	STANDARD31516	HKLR	P
3-Jul-14	NW LANTAU	3	23.09	SUMMER	STANDARD31516	HKLR	P
3-Jul-14	NW LANTAU	4	5.90	SUMMER	STANDARD31516	HKLR	P
3-Jul-14	NW LANTAU	2	2.90	SUMMER	STANDARD31516	HKLR	S
3-Jul-14	NW LANTAU	3	7.84	SUMMER	STANDARD31516	HKLR	S
3-Jul-14	NW LANTAU	4	0.60	SUMMER	STANDARD31516	HKLR	S
9-Jul-14	NW LANTAU	1	1.80	SUMMER	STANDARD31516	HKLR	P
9-Jul-14	NW LANTAU	2	9.28	SUMMER	STANDARD31516	HKLR	P
9-Jul-14	NW LANTAU	2	3.22	SUMMER	STANDARD31516	HKLR	S
10-Jul-14	NW LANTAU	1	8.81	SUMMER	STANDARD31516	HKLR	P
10-Jul-14	NW LANTAU	2	12.85	SUMMER	STANDARD31516	HKLR	P
10-Jul-14	NW LANTAU	3	2.29	SUMMER	STANDARD31516	HKLR	P
10-Jul-14	NW LANTAU	1	0.73	SUMMER	STANDARD31516	HKLR	S
10-Jul-14	NW LANTAU	2	6.69	SUMMER	STANDARD31516	HKLR	S
10-Jul-14	NE LANTAU	1	14.94	SUMMER	STANDARD31516	HKLR	P
10-Jul-14	NE LANTAU	2	16.33	SUMMER	STANDARD31516	HKLR	P
10-Jul-14	NE LANTAU	3	6.20	SUMMER	STANDARD31516	HKLR	P
10-Jul-14	NE LANTAU	1	3.93	SUMMER	STANDARD31516	HKLR	S
10-Jul-14	NE LANTAU	2	6.90	SUMMER	STANDARD31516	HKLR	S
10-Jul-14	NE LANTAU	3	0.80	SUMMER	STANDARD31516	HKLR	S
14-Jul-14	NW LANTAU	2	19.59	SUMMER	STANDARD31516	HKLR	P
14-Jul-14	NW LANTAU	3	11.09	SUMMER	STANDARD31516	HKLR	P
14-Jul-14	NW LANTAU	2	2.05	SUMMER	STANDARD31516	HKLR	S
14-Jul-14	NW LANTAU	3	3.80	SUMMER	STANDARD31516	HKLR	S
14-Jul-14	NW LANTAU	4	0.93	SUMMER	STANDARD31516	HKLR	S
14-Jul-14	NE LANTAU	1	2.00	SUMMER	STANDARD31516	HKLR	P
14-Jul-14	NE LANTAU	2	14.57	SUMMER	STANDARD31516	HKLR	P
14-Jul-14	NE LANTAU	3	2.40	SUMMER	STANDARD31516	HKLR	P
14-Jul-14	NE LANTAU	4	1.20	SUMMER	STANDARD31516	HKLR	P
14-Jul-14	NE LANTAU	2	10.51	SUMMER	STANDARD31516	HKLR	S
14-Jul-14	NE LANTAU	3	0.30	SUMMER	STANDARD31516	HKLR	S
21-Jul-14	NW LANTAU	1	5.90	SUMMER	STANDARD31516	HKLR	P
21-Jul-14	NW LANTAU	2	31.10	SUMMER	STANDARD31516	HKLR	P
21-Jul-14	NW LANTAU	3	3.70	SUMMER	STANDARD31516	HKLR	P
21-Jul-14	NW LANTAU	2	7.90	SUMMER	STANDARD31516	HKLR	S
21-Jul-14	NW LANTAU	3	4.90	SUMMER	STANDARD31516	HKLR	S
21-Jul-14	NE LANTAU	1	2.80	SUMMER	STANDARD31516	HKLR	P
21-Jul-14	NE LANTAU	2	13.70	SUMMER	STANDARD31516	HKLR	P

Appendix I. (cont'd)

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

DATE	AREA	BEAU	EFFORT	SEASON	VESSEL	TYPE	P/S
21-Jul-14	NE LANTAU	2	10.70	SUMMER	STANDARD31516	HKLR	S
5-Aug-14	NE LANTAU	1	8.40	SUMMER	STANDARD31516	HKLR	P
5-Aug-14	NE LANTAU	2	5.80	SUMMER	STANDARD31516	HKLR	P
5-Aug-14	NE LANTAU	3	2.10	SUMMER	STANDARD31516	HKLR	P
5-Aug-14	NE LANTAU	1	6.20	SUMMER	STANDARD31516	HKLR	S
5-Aug-14	NE LANTAU	2	4.80	SUMMER	STANDARD31516	HKLR	S
5-Aug-14	NW LANTAU	1	8.00	SUMMER	STANDARD31516	HKLR	P
5-Aug-14	NW LANTAU	2	30.30	SUMMER	STANDARD31516	HKLR	P
5-Aug-14	NW LANTAU	3	1.70	SUMMER	STANDARD31516	HKLR	P
5-Aug-14	NW LANTAU	1	1.50	SUMMER	STANDARD31516	HKLR	S
5-Aug-14	NW LANTAU	2	9.90	SUMMER	STANDARD31516	HKLR	S
6-Aug-14	NW LANTAU	1	4.30	SUMMER	STANDARD31516	HKLR	P
6-Aug-14	NW LANTAU	2	21.55	SUMMER	STANDARD31516	HKLR	P
6-Aug-14	NW LANTAU	3	5.21	SUMMER	STANDARD31516	HKLR	P
6-Aug-14	NW LANTAU	1	2.30	SUMMER	STANDARD31516	HKLR	S
6-Aug-14	NW LANTAU	2	4.05	SUMMER	STANDARD31516	HKLR	S
6-Aug-14	NW LANTAU	3	0.30	SUMMER	STANDARD31516	HKLR	S
6-Aug-14	NE LANTAU	1	17.62	SUMMER	STANDARD31516	HKLR	P
6-Aug-14	NE LANTAU	2	2.26	SUMMER	STANDARD31516	HKLR	P
6-Aug-14	NE LANTAU	1	10.52	SUMMER	STANDARD31516	HKLR	S
15-Aug-14	NW LANTAU	2	7.71	SUMMER	STANDARD31516	HKLR	P
15-Aug-14	NW LANTAU	3	29.93	SUMMER	STANDARD31516	HKLR	P
15-Aug-14	NW LANTAU	3	9.92	SUMMER	STANDARD31516	HKLR	S
15-Aug-14	NW LANTAU	4	2.64	SUMMER	STANDARD31516	HKLR	S
15-Aug-14	NE LANTAU	2	17.22	SUMMER	STANDARD31516	HKLR	P
15-Aug-14	NE LANTAU	3	0.58	SUMMER	STANDARD31516	HKLR	P
15-Aug-14	NE LANTAU	2	8.54	SUMMER	STANDARD31516	HKLR	S
15-Aug-14	NE LANTAU	3	1.26	SUMMER	STANDARD31516	HKLR	S
19-Aug-14	NE LANTAU	1	1.46	SUMMER	STANDARD31516	HKLR	P
19-Aug-14	NE LANTAU	2	11.20	SUMMER	STANDARD31516	HKLR	P
19-Aug-14	NE LANTAU	3	5.91	SUMMER	STANDARD31516	HKLR	P
19-Aug-14	NE LANTAU	4	0.80	SUMMER	STANDARD31516	HKLR	P
19-Aug-14	NE LANTAU	2	4.35	SUMMER	STANDARD31516	HKLR	S
19-Aug-14	NE LANTAU	3	6.48	SUMMER	STANDARD31516	HKLR	S
19-Aug-14	NW LANTAU	2	1.16	SUMMER	STANDARD31516	HKLR	P
19-Aug-14	NW LANTAU	3	23.08	SUMMER	STANDARD31516	HKLR	P
19-Aug-14	NW LANTAU	4	3.24	SUMMER	STANDARD31516	HKLR	P
19-Aug-14	NW LANTAU	5	3.69	SUMMER	STANDARD31516	HKLR	P
19-Aug-14	NW LANTAU	3	4.32	SUMMER	STANDARD31516	HKLR	S
19-Aug-14	NW LANTAU	4	7.12	SUMMER	STANDARD31516	HKLR	S
2-Sep-14	NW LANTAU	1	7.96	AUTUMN	STANDARD31516	HKLR	P
2-Sep-14	NW LANTAU	2	14.28	AUTUMN	STANDARD31516	HKLR	P
2-Sep-14	NW LANTAU	3	16.44	AUTUMN	STANDARD31516	HKLR	P
2-Sep-14	NW LANTAU	2	7.13	AUTUMN	STANDARD31516	HKLR	S
2-Sep-14	NW LANTAU	3	5.72	AUTUMN	STANDARD31516	HKLR	S
2-Sep-14	NE LANTAU	2	15.63	AUTUMN	STANDARD31516	HKLR	P
2-Sep-14	NE LANTAU	3	2.18	AUTUMN	STANDARD31516	HKLR	P
2-Sep-14	NE LANTAU	2	8.31	AUTUMN	STANDARD31516	HKLR	S
2-Sep-14	NE LANTAU	3	1.28	AUTUMN	STANDARD31516	HKLR	S
11-Sep-14	NW LANTAU	1	4.75	AUTUMN	STANDARD31516	HKLR	P
11-Sep-14	NW LANTAU	2	23.23	AUTUMN	STANDARD31516	HKLR	P
11-Sep-14	NW LANTAU	3	3.33	AUTUMN	STANDARD31516	HKLR	P
11-Sep-14	NW LANTAU	1	0.70	AUTUMN	STANDARD31516	HKLR	S
11-Sep-14	NW LANTAU	2	5.11	AUTUMN	STANDARD31516	HKLR	S

Appendix I. (cont'd)

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

DATE	AREA	BEAU	EFFORT	SEASON	VESSEL	TYPE	P/S
11-Sep-14	NW LANTAU	3	1.50	AUTUMN	STANDARD31516	HKLR	S
11-Sep-14	NE LANTAU	1	1.64	AUTUMN	STANDARD31516	HKLR	P
11-Sep-14	NE LANTAU	2	18.53	AUTUMN	STANDARD31516	HKLR	P
11-Sep-14	NE LANTAU	2	10.73	AUTUMN	STANDARD31516	HKLR	S
19-Sep-14	NW LANTAU	2	30.50	AUTUMN	STANDARD31516	HKLR	P
19-Sep-14	NW LANTAU	3	0.60	AUTUMN	STANDARD31516	HKLR	P
19-Sep-14	NW LANTAU	2	8.90	AUTUMN	STANDARD31516	HKLR	S
19-Sep-14	NW LANTAU	3	0.80	AUTUMN	STANDARD31516	HKLR	S
19-Sep-14	NE LANTAU	2	18.62	AUTUMN	STANDARD31516	HKLR	P
19-Sep-14	NE LANTAU	3	1.43	AUTUMN	STANDARD31516	HKLR	P
19-Sep-14	NE LANTAU	2	10.55	AUTUMN	STANDARD31516	HKLR	S
22-Sep-14	NE LANTAU	2	14.44	AUTUMN	STANDARD31516	HKLR	P
22-Sep-14	NE LANTAU	3	2.95	AUTUMN	STANDARD31516	HKLR	P
22-Sep-14	NE LANTAU	2	10.11	AUTUMN	STANDARD31516	HKLR	S
22-Sep-14	NW LANTAU	1	1.20	AUTUMN	STANDARD31516	HKLR	P
22-Sep-14	NW LANTAU	2	36.86	AUTUMN	STANDARD31516	HKLR	P
22-Sep-14	NW LANTAU	2	12.01	AUTUMN	STANDARD31516	HKLR	S
22-Sep-14	NW LANTAU	3	1.10	AUTUMN	STANDARD31516	HKLR	S
7-Oct-14	NE LANTAU	2	11.15	AUTUMN	STANDARD 31516	HKLR	P
7-Oct-14	NE LANTAU	3	6.75	AUTUMN	STANDARD 31516	HKLR	P
7-Oct-14	NE LANTAU	2	8.44	AUTUMN	STANDARD 31516	HKLR	S
7-Oct-14	NE LANTAU	3	1.46	AUTUMN	STANDARD 31516	HKLR	S
7-Oct-14	NW LANTAU	1	1.90	AUTUMN	STANDARD 31516	HKLR	P
7-Oct-14	NW LANTAU	2	25.80	AUTUMN	STANDARD 31516	HKLR	P
7-Oct-14	NW LANTAU	3	11.94	AUTUMN	STANDARD 31516	HKLR	P
7-Oct-14	NW LANTAU	2	9.13	AUTUMN	STANDARD 31516	HKLR	S
7-Oct-14	NW LANTAU	3	3.26	AUTUMN	STANDARD 31516	HKLR	S
13-Oct-14	NE LANTAU	2	10.59	AUTUMN	STANDARD 31516	HKLR	P
13-Oct-14	NE LANTAU	3	8.72	AUTUMN	STANDARD 31516	HKLR	P
13-Oct-14	NE LANTAU	2	7.91	AUTUMN	STANDARD 31516	HKLR	S
13-Oct-14	NE LANTAU	3	2.38	AUTUMN	STANDARD 31516	HKLR	S
13-Oct-14	NW LANTAU	2	4.96	AUTUMN	STANDARD 31516	HKLR	P
13-Oct-14	NW LANTAU	3	16.34	AUTUMN	STANDARD 31516	HKLR	P
13-Oct-14	NW LANTAU	4	4.95	AUTUMN	STANDARD 31516	HKLR	P
13-Oct-14	NW LANTAU	2	3.81	AUTUMN	STANDARD 31516	HKLR	S
13-Oct-14	NW LANTAU	3	7.23	AUTUMN	STANDARD 31516	HKLR	S
13-Oct-14	NW LANTAU	4	1.20	AUTUMN	STANDARD 31516	HKLR	S
16-Oct-14	NE LANTAU	2	12.51	AUTUMN	STANDARD 31516	HKLR	P
16-Oct-14	NE LANTAU	3	6.72	AUTUMN	STANDARD 31516	HKLR	P
16-Oct-14	NE LANTAU	2	8.04	AUTUMN	STANDARD 31516	HKLR	S
16-Oct-14	NE LANTAU	3	2.53	AUTUMN	STANDARD 31516	HKLR	S
16-Oct-14	NW LANTAU	2	3.81	AUTUMN	STANDARD 31516	HKLR	P
16-Oct-14	NW LANTAU	3	21.23	AUTUMN	STANDARD 31516	HKLR	P
16-Oct-14	NW LANTAU	4	6.50	AUTUMN	STANDARD 31516	HKLR	P
16-Oct-14	NW LANTAU	2	4.30	AUTUMN	STANDARD 31516	HKLR	S
16-Oct-14	NW LANTAU	3	3.56	AUTUMN	STANDARD 31516	HKLR	S
23-Oct-14	NE LANTAU	2	15.42	AUTUMN	STANDARD 31516	HKLR	P
23-Oct-14	NE LANTAU	3	1.90	AUTUMN	STANDARD 31516	HKLR	P
23-Oct-14	NE LANTAU	2	9.28	AUTUMN	STANDARD 31516	HKLR	S
23-Oct-14	NE LANTAU	3	0.70	AUTUMN	STANDARD 31516	HKLR	S
23-Oct-14	NW LANTAU	2	30.11	AUTUMN	STANDARD 31516	HKLR	P
23-Oct-14	NW LANTAU	3	10.91	AUTUMN	STANDARD 31516	HKLR	P
23-Oct-14	NW LANTAU	1	1.60	AUTUMN	STANDARD 31516	HKLR	S
23-Oct-14	NW LANTAU	2	9.19	AUTUMN	STANDARD 31516	HKLR	S
23-Oct-14	NW LANTAU	3	1.99	AUTUMN	STANDARD 31516	HKLR	S

Appendix II. HKLR03 Chinese White Dolphin Sighting Database (November 2013 - October 2014)

(Abberviations: STG# = Sighting Number; HRD SZ = Dolphin Herd Size; BEAU = Beaufort Sea State; PSD = Perpendicular Distance; BOAT ASSOC. = Fishing Boat Association; P/S: Sighting Made on Primary/Secondary Lines)

DATE	STG #	TIME	HRD SZ	AREA	BEAU	PSD	EFFORT	TYPE	NORTHING	EASTING	SEASON	BOAT ASSOC.	P/S
1-Nov-13	1	1049	4	NW LANTAU	2	74	ON	HKLR	823145	809509	AUTUMN	NONE	P
1-Nov-13	2	1152	3	NW LANTAU	3	214	ON	HKLR	826947	807517	AUTUMN	NONE	P
1-Nov-13	3	1203	7	NW LANTAU	3	159	ON	HKLR	827235	807539	AUTUMN	NONE	P
1-Nov-13	4	1225	1	NW LANTAU	2	137	ON	HKLR	827490	807539	AUTUMN	NONE	P
1-Nov-13	5	1236	3	NW LANTAU	2	358	ON	HKLR	828232	807530	AUTUMN	NONE	P
1-Nov-13	6	1252	7	NW LANTAU	2	ND	OFF	HKLR	828941	807583	AUTUMN	NONE	
1-Nov-13	7	1312	4	NW LANTAU	2	72	ON	HKLR	830018	805999	AUTUMN	NONE	S
1-Nov-13	8	1458	11	NW LANTAU	3	60	ON	HKLR	821228	804642	AUTUMN	NONE	P
5-Nov-13	1	1421	5	NW LANTAU	2	378	ON	HKLR	828097	808508	AUTUMN	NONE	P
8-Nov-13	1	1041	4	NW LANTAU	1	302	ON	HKLR	824489	807678	AUTUMN	NONE	P
8-Nov-13	2	1103	8	NW LANTAU	2	694	ON	HKLR	827091	807858	AUTUMN	NONE	P
8-Nov-13	3	1152	7	NW LANTAU	3	299	ON	HKLR	827660	805459	AUTUMN	NONE	P
8-Nov-13	4	1215	9	NW LANTAU	2	756	ON	HKLR	825357	805465	AUTUMN	NONE	P
8-Nov-13	5	1232	5	NW LANTAU	2	ND	OFF	HKLR	825025	805464	AUTUMN	NONE	
8-Nov-13	6	1249	4	NW LANTAU	2	7	ON	HKLR	823806	805462	AUTUMN	NONE	P
8-Nov-13	7	1400	2	NW LANTAU	2	155	ON	HKLR	818382	804657	AUTUMN	NONE	P
8-Nov-13	8	1426	8	NW LANTAU	2	149	ON	HKLR	823675	804648	AUTUMN	NONE	P
8-Nov-13	9	1526	1	NW LANTAU	2	45	ON	HKLR	826872	806446	AUTUMN	NONE	P
8-Nov-13	10	1536	4	NW LANTAU	1	225	ON	HKLR	825643	806454	AUTUMN	NONE	P
8-Nov-13	11	1606	4	NW LANTAU	2	223	ON	HKLR	821988	806457	AUTUMN	NONE	P
13-Nov-13	1	1451	1	NW LANTAU	3	343	ON	HKLR	825118	808482	AUTUMN	NONE	P
5-Dec-13	1	1127	3	NE LANTAU	1	275	ON	HKLR	820787	816500	WINTER	NONE	P
9-Dec-13	1	1119	1	NW LANTAU	3	77	ON	HKLR	822544	811516	WINTER	NONE	P
9-Dec-13	2	1238	4	NW LANTAU	2	132	ON	HKLR	826515	807547	WINTER	NONE	P
9-Dec-13	3	1256	12	NW LANTAU	2	103	ON	HKLR	827833	807540	WINTER	NONE	P
9-Dec-13	4	1518	4	NW LANTAU	3	177	ON	HKLR	823088	804646	WINTER	NONE	P
9-Dec-13	5	1539	1	NW LANTAU	2	866	ON	HKLR	826577	804664	WINTER	NONE	P
19-Dec-13	1	1203	2	NW LANTAU	3	73	ON	HKLR	824648	805453	WINTER	NONE	P
19-Dec-13	2	1216	6	NW LANTAU	3	150	ON	HKLR	823972	805483	WINTER	NONE	P
7-Jan-14	1	1258	2	NW LANTAU	3	87	ON	HKLR	825659	809348	WINTER	NONE	S
7-Jan-14	2	1337	1	NW LANTAU	3	125	ON	HKLR	825152	808472	WINTER	NONE	P
7-Jan-14	3	1452	3	NW LANTAU	2	1171	ON	HKLR	826673	806456	WINTER	NONE	P

Appendix II. (cont'd)

(Abberviations: STG# = Sighting Number; HRD SZ = Dolphin Herd Size; BEAU = Beaufort Sea State; PSD = Perpendicular Distance; BOAT ASSOC. = Fishing Boat Association; P/S: Sighting Made on Primary/Secondary Lines)

DATE	STG #	TIME	HRD SZ	AREA	BEAU	PSD	EFFORT	TYPE	NORTHING	EASTING	SEASON	BOAT ASSOC.	P/S
7-Jan-14	4	1515	6	NW LANTAU	2	5	ON	HKLR	829275	806451	WINTER	NONE	P
9-Jan-14	1	1336	6	NW LANTAU	3	24	ON	HKLR	823238	807510	WINTER	NONE	P
9-Jan-14	2	1407	10	NW LANTAU	2	62	ON	HKLR	826405	807506	WINTER	NONE	P
9-Jan-14	3	1435	1	NW LANTAU	3	56	ON	HKLR	826272	807526	WINTER	NONE	P
9-Jan-14	4	1534	3	NW LANTAU	2	131	ON	HKLR	826675	805395	WINTER	NONE	S
9-Jan-14	5	1546	1	NW LANTAU	2	113	ON	HKLR	826176	805446	WINTER	NONE	P
21-Jan-14	1	1407	2	NW LANTAU	2	99	ON	HKLR	829916	806916	WINTER	NONE	S
21-Jan-14	2	1426	7	NW LANTAU	2	260	ON	HKLR	830008	805474	WINTER	NONE	P
21-Jan-14	3	1444	2	NW LANTAU	2	84	ON	HKLR	829188	805452	WINTER	NONE	P
21-Jan-14	4	1521	9	NW LANTAU	2	434	ON	HKLR	824969	805464	WINTER	NONE	P
23-Jan-14	1	1015	2	NW LANTAU	2	977	ON	HKLR	816090	804642	WINTER	NONE	P
23-Jan-14	2	1101	4	NW LANTAU	2	329	ON	HKLR	826576	804674	WINTER	NONE	P
23-Jan-14	3	1133	3	NW LANTAU	1	957	ON	HKLR	830195	806061	WINTER	NONE	P
23-Jan-14	4	1202	5	NW LANTAU	1	199	ON	HKLR	828976	806450	WINTER	NONE	P
23-Jan-14	5	1250	2	NW LANTAU	2	372	ON	HKLR	821623	806467	WINTER	NONE	P
23-Jan-14	6	1538	9	NE LANTAU	2	365	ON	HKLR	819337	816344	WINTER	NONE	S
6-Feb-14	1	1040	2	NW LANTAU	2	895	ON	HKLR	822535	804645	WINTER	HANG	P
6-Feb-14	2	1049	4	NW LANTAU	2	515	ON	HKLR	823908	804658	WINTER	NONE	P
6-Feb-14	3	1109	2	NW LANTAU	2	422	ON	HKLR	825591	804672	WINTER	NONE	P
6-Feb-14	4	1204	3	NW LANTAU	1	888	ON	HKLR	826473	806445	WINTER	NONE	P
6-Feb-14	5	1428	4	NE LANTAU	2	ND	OFF	HKLR	824423	813528	WINTER	NONE	
12-Feb-14	1	1449	1	NW LANTAU	2	290	ON	HKLR	828878	805462	WINTER	NONE	P
14-Feb-14	1	1237	1	NW LANTAU	2	ND	OFF	HKLR	826601	809051	WINTER	NONE	
14-Feb-14	2	1348	4	NW LANTAU	3	133	ON	HKLR	821401	806466	WINTER	NONE	P
14-Feb-14	3	1525	1	NW LANTAU	3	112	ON	HKLR	824262	804649	WINTER	NONE	P
20-Feb-14	1	1046	7	NW LANTAU	3	72	ON	HKLR	822688	805449	WINTER	NONE	P
20-Feb-14	2	1135	7	NW LANTAU	3	648	ON	HKLR	828813	805029	WINTER	NONE	P
5-Mar-14	1	1053	3	NW LANTAU	2	64	ON	HKLR	827173	805499	SPRING	NONE	P
5-Mar-14	2	1126	13	NW LANTAU	2	ND	OFF	HKLR	827150	805736	SPRING	NONE	
5-Mar-14	3	1323	6	NW LANTAU	2	28	ON	HKLR	827568	807488	SPRING	NONE	P
11-Mar-14	1	1518	2	NW LANTAU	3	86	ON	HKLR	827525	806437	SPRING	NONE	P
17-Mar-14	1	1159	2	NW LANTAU	2	151	ON	HKLR	822985	812516	SPRING	NONE	P

Appendix II. (cont'd)

(Abberviations: STG# = Sighting Number; HRD SZ = Dolphin Herd Size; BEAU = Beaufort Sea State; PSD = Perpendicular Distance; BOAT ASSOC. = Fishing Boat Association; P/S: Sighting Made on Primary/Secondary Lines)

DATE	STG #	TIME	HRD SZ	AREA	BEAU	PSD	EFFORT	TYPE	NORTHING	EASTING	SEASON	BOAT ASSOC.	P/S
17-Mar-14	2	1411	5	NW LANTAU	1	277	ON	HKLR	824834	806452	SPRING	NONE	P
17-Mar-14	3	1439	1	NW LANTAU	1	36	ON	HKLR	826839	806456	SPRING	NONE	P
17-Mar-14	4	1509	2	NW LANTAU	2	72	ON	HKLR	830273	805938	SPRING	NONE	S
17-Mar-14	5	1541	1	NW LANTAU	1	194	ON	HKLR	827219	804675	SPRING	NONE	P
17-Mar-14	6	1551	1	NW LANTAU	1	125	ON	HKLR	825325	804672	SPRING	NONE	P
25-Mar-14	1	1249	1	NW LANTAU	2	131	ON	HKLR	821041	809495	SPRING	NONE	P
25-Mar-14	2	1452	2	NW LANTAU	2	72	ON	HKLR	826927	806498	SPRING	NONE	P
25-Mar-14	3	1535	3	NW LANTAU	2	299	ON	HKLR	829321	805462	SPRING	NONE	P
25-Mar-14	4	1549	1	NW LANTAU	2	349	ON	HKLR	827693	805469	SPRING	NONE	P
4-Apr-14	1	1021	3	NW LANTAU	3	43	ON	HKLR	819355	805442	SPRING	NONE	P
14-Apr-14	1	1438	8	NW LANTAU	3	94	ON	HKLR	826451	806445	SPRING	NONE	P
14-Apr-14	2	1517	2	NW LANTAU	4	273	ON	HKLR	830117	806010	SPRING	NONE	S
16-Apr-14	1	1048	4	NW LANTAU	2	541	ON	HKLR	825124	805454	SPRING	NONE	P
16-Apr-14	2	1113	1	NW LANTAU	2	385	ON	HKLR	827306	805458	SPRING	NONE	P
16-Apr-14	3	1137	2	NW LANTAU	2	17	ON	HKLR	830362	805465	SPRING	NONE	P
16-Apr-14	4	1150	9	NW LANTAU	2	49	ON	HKLR	830073	806051	SPRING	NONE	S
24-Apr-14	1	1328	1	NW LANTAU	3	123	ON	HKLR	825992	809184	SPRING	NONE	S
2-May-14	1	1128	3	NW LANTAU	3	22	ON	HKLR	830572	805712	SPRING	NONE	S
2-May-14	2	1154	2	NW LANTAU	2	27	ON	HKLR	828677	806460	SPRING	NONE	P
2-May-14	3	1213	7	NW LANTAU	2	522	ON	HKLR	826540	806456	SPRING	NONE	P
2-May-14	4	1333	1	NW LANTAU	1	1233	ON	HKLR	825129	808503	SPRING	NONE	P
19-May-14	1	1405	5	NW LANTAU	4	177	ON	HKLR	829177	805472	SPRING	NONE	P
19-May-14	2	1451	5	NW LANTAU	4	28	ON	HKLR	823530	805461	SPRING	NONE	P
21-May-14	1	1257	1	NW LANTAU	2	242	ON	HKLR	823873	811529	SPRING	NONE	P
26-May-14	1	1209	5	NW LANTAU	3	362	ON	HKLR	828433	806460	SPRING	NONE	P
26-May-14	2	1232	1	NW LANTAU	3	1066	ON	HKLR	827514	806458	SPRING	NONE	P
5-Jun-14	1	1400	3	NW LANTAU	3	184	ON	HKLR	827350	805448	SUMMER	NONE	P
5-Jun-14	2	1413	3	NW LANTAU	3	20	ON	HKLR	826719	805344	SUMMER	NONE	S
16-Jun-14	1	1408	1	NW LANTAU	3	ND	OFF	HKLR	827538	805459	SUMMER	NONE	
3-Jul-14	1	958	4	NE LANTAU	2	317	ON	HKLR	823230	820459	SUMMER	NONE	P
3-Jul-14	2	1302	4	NW LANTAU	3	ND	OFF	HKLR	821327	811071	SUMMER	NONE	
3-Jul-14	3	1642	2	NW LANTAU	3	161	ON	HKLR	814628	804722	SUMMER	NONE	P

Appendix II. (cont'd)

(Abberviations: STG# = Sighting Number; HRD SZ = Dolphin Herd Size; BEAU = Beaufort Sea State; PSD = Perpendicular Distance; BOAT ASSOC. = Fishing Boat Association; P/S: Sighting Made on Primary/Secondary Lines)

DATE	STG #	TIME	HRD SZ	AREA	BEAU	PSD	EFFORT	TYPE	NORTHING	EASTING	SEASON	BOAT ASSOC.	P/S
10-Jul-14	1	1110	5	NW LANTAU	2	588	ON	HKLR	827483	805459	SUMMER	NONE	P
10-Jul-14	2	1150	5	NW LANTAU	2	0	ON	HKLR	829928	806565	SUMMER	NONE	S
14-Jul-14	1	1022	3	NW LANTAU	2	572	ON	HKLR	816276	805395	SUMMER	NONE	P
14-Jul-14	2	1036	1	NW LANTAU	2	866	ON	HKLR	819222	805442	SUMMER	NONE	P
14-Jul-14	3	1044	5	NW LANTAU	2	118	ON	HKLR	820484	805434	SUMMER	NONE	P
14-Jul-14	4	1105	7	NW LANTAU	2	471	ON	HKLR	822311	805448	SUMMER	NONE	P
14-Jul-14	5	1144	2	NW LANTAU	2	819	ON	HKLR	827173	805448	SUMMER	NONE	P
21-Jul-14	1	1113	1	NW LANTAU	2	694	ON	HKLR	823509	804668	SUMMER	NONE	P
21-Jul-14	2	1436	2	NW LANTAU	2	325	ON	HKLR	821325	812267	SUMMER	NONE	S
5-Aug-14	1	1413	8	NW LANTAU	2	428	ON	HKLR	826185	806764	SUMMER	NONE	P
5-Aug-14	2	1435	4	NW LANTAU	2	0	ON	HKLR	827426	806458	SUMMER	NONE	P
5-Aug-14	3	1444	2	NW LANTAU	2	990	ON	HKLR	828943	806461	SUMMER	NONE	P
5-Aug-14	4	1515	2	NW LANTAU	2	452	ON	HKLR	827872	804667	SUMMER	NONE	P
6-Aug-14	1	1110	3	NW LANTAU	3	10	ON	HKLR	826730	805323	SUMMER	NONE	S
6-Aug-14	2	1151	1	NW LANTAU	2	17	ON	HKLR	829773	806359	SUMMER	NONE	S
15-Aug-14	1	1029	5	NW LANTAU	3	393	ON	HKLR	818936	804648	SUMMER	NONE	P
15-Aug-14	2	1041	7	NW LANTAU	3	15	ON	HKLR	821006	804652	SUMMER	NONE	P
15-Aug-14	3	1218	3	NW LANTAU	3	0	ON	HKLR	823429	806027	SUMMER	NONE	S
15-Aug-14	4	1305	2	NW LANTAU	2	749	ON	HKLR	823524	808510	SUMMER	NONE	P
15-Aug-14	5	1310	6	NW LANTAU	3	83	ON	HKLR	824321	808501	SUMMER	NONE	P
19-Aug-14	1	1338	2	NW LANTAU	3	105	ON	HKLR	825220	807514	SUMMER	NONE	P
19-Aug-14	2	1536	3	NW LANTAU	2	113	ON	HKLR	823076	805450	SUMMER	NONE	P
2-Sep-14	1	1106	3	NW LANTAU	1	201	ON	HKLR	827206	805396	AUTUMN	NONE	P
2-Sep-14	2	1215	5	NW LANTAU	2	562	ON	HKLR	828278	806459	AUTUMN	NONE	P
11-Sep-14	1	1132	6	NW LANTAU	2	374	ON	HKLR	826693	807517	AUTUMN	NONE	P
11-Sep-14	2	1215	6	NW LANTAU	2	1742	ON	HKLR	822381	809476	AUTUMN	NONE	P
19-Sep-14	1	1336	1	NW LANTAU	2	ND	OFF	HKLR	821325	811947	AUTUMN	NONE	
22-Sep-14	1	1432	5	NW LANTAU	2	198	ON	HKLR	828289	806480	AUTUMN	NONE	P
22-Sep-14	2	1559	6	NW LANTAU	2	955	ON	HKLR	822811	804656	AUTUMN	NONE	P
22-Sep-14	3	1612	2	NW LANTAU	2	153	ON	HKLR	820785	804662	AUTUMN	NONE	P
7-Oct-14	1	1403	3	NW LANTAU	2	284	ON	HKLR	823528	806089	AUTUMN	NONE	S
7-Oct-14	2	1423	4	NW LANTAU	2	130	ON	HKLR	825820	806454	AUTUMN	NONE	P

Appendix II. (cont'd)

(Abberviations: STG# = Sighting Number; HRD SZ = Dolphin Herd Size; BEAU = Beaufort Sea State; PSD = Perpendicular Distance; BOAT ASSOC. = Fishing Boat Association; P/S: Sighting Made on Primary/Secondary Lines)

DATE	STG #	TIME	HRD SZ	AREA	BEAU	PSD	EFFORT	TYPE	NORTHING	EASTING	SEASON	BOAT ASSOC.	P/S
7-Oct-14	3	1445	4	NW LANTAU	2	75	ON	HKLR	827149	806457	AUTUMN	NONE	P
7-Oct-14	4	1515	6	NW LANTAU	2	125	ON	HKLR	828943	806471	AUTUMN	NONE	P
7-Oct-14	5	1556	1	NW LANTAU	2	300	ON	HKLR	827474	804666	AUTUMN	NONE	P
7-Oct-14	6	1603	2	NW LANTAU	2	707	ON	HKLR	826499	804664	AUTUMN	NONE	P
13-Oct-14	1	1207	4	NW LANTAU	3	116	ON	HKLR	825098	807514	AUTUMN	NONE	P
13-Oct-14	2	1220	2	NW LANTAU	3	252	ON	HKLR	825707	807525	AUTUMN	NONE	P
13-Oct-14	3	1232	3	NW LANTAU	3	335	ON	HKLR	826161	807516	AUTUMN	NONE	P
13-Oct-14	4	1258	1	NW LANTAU	2	311	ON	HKLR	830272	806185	AUTUMN	NONE	S

Appendix III. Individual dolphins identified during HKLR03 monitoring surveys in November 2013-October 2014

ID#	DATE	STG#	AREA
CH34	05/11/13	1	NW LANTAU
	08/11/13	4	NW LANTAU
	08/11/13	5	NW LANTAU
	09/12/13	3	NW LANTAU
	23/01/14	4	NW LANTAU
	20/02/14	1	NW LANTAU
	26/05/14	1	NW LANTAU
	10/07/14	1	NW LANTAU
	13/10/14	4	NW LANTAU
CH98	25/03/14	3	NW LANTAU
CH112	23/01/14	2	NW LANTAU
CH153	22/09/14	3	NW LANTAU
EL01	05/11/13	1	NW LANTAU
	05/12/13	1	NE LANTAU
	21/01/14	1	NW LANTAU
	23/01/14	6	NE LANTAU
	06/02/14	5	NE LANTAU
	17/03/14	1	NW LANTAU
	16/04/14	2	NW LANTAU
	21/05/14	1	NW LANTAU
NL11	23/01/14	3	NW LANTAU
NL24	08/11/13	4	NW LANTAU
	08/11/13	5	NW LANTAU
	05/12/13	1	NE LANTAU
	09/12/13	4	NW LANTAU
	19/12/13	2	NW LANTAU
	09/01/14	2	NW LANTAU
	23/01/14	6	NE LANTAU
	20/02/14	1	NW LANTAU
	05/03/14	3	NW LANTAU
	14/04/14	1	NW LANTAU
NL33	05/11/13	1	NW LANTAU
	08/11/13	4	NW LANTAU
	08/11/13	5	NW LANTAU
	08/11/13	11	NW LANTAU
	09/01/14	2	NW LANTAU
	23/01/14	6	NE LANTAU
	02/05/14	3	NW LANTAU
NL37	08/11/13	2	NW LANTAU

ID#	DATE	STG#	AREA
NL46	01/11/13	3	NW LANTAU
	23/01/14	4	NW LANTAU
	05/03/14	2	NW LANTAU
	19/05/14	1	NW LANTAU
	05/08/14	2	NW LANTAU
	11/09/14	1	NW LANTAU
NL48	08/11/13	9	NW LANTAU
	09/12/13	3	NW LANTAU
	07/01/14	4	NW LANTAU
	09/01/14	2	NW LANTAU
	09/01/14	3	NW LANTAU
	21/01/14	1	NW LANTAU
	23/01/14	3	NW LANTAU
	11/03/14	1	NW LANTAU
	25/03/14	4	NW LANTAU
	16/04/14	4	NW LANTAU
	02/05/14	1	NW LANTAU
	05/08/14	1	NW LANTAU
	19/08/14	1	NW LANTAU
	19/09/14	1	NW LANTAU
	13/10/14	1	NW LANTAU
NL49	08/11/13	2	NW LANTAU
	09/12/13	3	NW LANTAU
	05/03/14	2	NW LANTAU
NL80	01/11/13	3	NW LANTAU
	01/11/13	6	NW LANTAU
	08/11/13	6	NW LANTAU
	21/01/14	2	NW LANTAU
	14/07/14	4	NW LANTAU
	11/09/14	2	NW LANTAU
NL93	01/11/13	8	NW LANTAU
	20/02/14	2	NW LANTAU
	10/07/14	1	NW LANTAU
	05/08/14	1	NW LANTAU
NL98	01/11/13	2	NW LANTAU
	19/12/13	2	NW LANTAU
	09/01/14	2	NW LANTAU
	20/02/14	1	NW LANTAU
NL103	08/11/13	3	NW LANTAU
	07/01/14	4	NW LANTAU

Appendix III. (cont'd)

ID#	DATE	STG#	AREA
NL104	09/12/13	3	NW LANTAU
	23/01/14	4	NW LANTAU
	05/03/14	2	NW LANTAU
	05/03/14	3	NW LANTAU
	16/04/14	4	NW LANTAU
	05/08/14	1	NW LANTAU
	02/09/14	1	NW LANTAU
NL120	09/01/14	2	NW LANTAU
	23/01/14	6	NE LANTAU
	06/02/14	5	NE LANTAU
	14/04/14	1	NW LANTAU
NL123	08/11/13	11	NW LANTAU
	23/01/14	2	NW LANTAU
	23/01/14	5	NW LANTAU
	03/07/14	1	NE LANTAU
	15/08/14	5	NW LANTAU
NL136	01/11/13	8	NW LANTAU
	09/12/13	2	NW LANTAU
	07/01/14	1	NW LANTAU
	09/01/14	1	NW LANTAU
	20/02/14	2	NW LANTAU
	11/03/14	1	NW LANTAU
	17/03/14	2	NW LANTAU
	25/03/14	3	NW LANTAU
	05/06/14	2	NW LANTAU
	07/10/14	1	NW LANTAU
	13/10/14	1	NW LANTAU
NL139	01/11/13	8	NW LANTAU
	08/11/13	1	NW LANTAU
	09/12/13	2	NW LANTAU
	07/01/14	1	NW LANTAU
	09/01/14	1	NW LANTAU
	23/01/14	6	NE LANTAU
	20/02/14	1	NW LANTAU
	03/07/14	1	NE LANTAU
NL145	01/11/13	3	NW LANTAU
	16/04/14	1	NW LANTAU
	02/05/14	3	NW LANTAU
	14/07/14	3	NW LANTAU
NL150	08/11/13	3	NW LANTAU
	22/09/14	3	NW LANTAU

ID#	DATE	STG#	AREA
NL165	01/11/13	8	NW LANTAU
	08/11/13	1	NW LANTAU
	09/12/13	3	NW LANTAU
	20/02/14	1	NW LANTAU
	05/03/14	2	NW LANTAU
NL182	01/11/13	6	NW LANTAU
	24/04/14	1	NW LANTAU
	10/07/14	2	NW LANTAU
	11/09/14	1	NW LANTAU
	07/10/14	1	NW LANTAU
	13/10/14	2	NW LANTAU
NL188	08/11/13	8	NW LANTAU
NL191	25/03/14	1	NW LANTAU
NL202	06/02/14	3	NW LANTAU
	16/04/14	4	NW LANTAU
	19/08/14	1	NW LANTAU
	19/08/14	2	NW LANTAU
NL210	14/02/14	1	NW LANTAU
	02/05/14	2	NW LANTAU
	10/07/14	2	NW LANTAU
	11/09/14	2	NW LANTAU
NL212	08/11/13	3	NW LANTAU
NL213	25/03/14	3	NW LANTAU
	13/10/14	1	NW LANTAU
NL214	07/01/14	4	NW LANTAU
	21/01/14	4	NW LANTAU
	16/04/14	3	NW LANTAU
	02/05/14	1	NW LANTAU
	02/09/14	1	NW LANTAU
	07/10/14	3	NW LANTAU
	13/10/14	2	NW LANTAU
NL220	09/01/14	1	NW LANTAU
	05/03/14	3	NW LANTAU
NL221	07/01/14	4	NW LANTAU
	21/01/14	4	NW LANTAU
NL224	16/04/14	3	NW LANTAU
	02/05/14	1	NW LANTAU
	21/01/14	3	NW LANTAU
NL226	01/11/13	1	NW LANTAU
	05/12/13	1	NE LANTAU
	21/01/14	4	NW LANTAU
	04/04/14	1	NW LANTAU

Appendix III. (cont'd)

ID#	DATE	STG#	AREA
NL233	05/03/14	1	NW LANTAU
	11/09/14	1	NW LANTAU
	22/09/14	1	NW LANTAU
	07/10/14	2	NW LANTAU
NL236	01/11/13	7	NW LANTAU
	08/11/13	2	NW LANTAU
	21/01/14	3	NW LANTAU
	05/03/14	2	NW LANTAU
	22/09/14	3	NW LANTAU
NL242	08/11/13	4	NW LANTAU
	08/11/13	5	NW LANTAU
	19/12/13	2	NW LANTAU
	09/01/14	2	NW LANTAU
	23/01/14	6	NE LANTAU
	05/08/14	1	NW LANTAU
NL244	09/12/13	1	NW LANTAU
NL247	14/07/14	4	NW LANTAU
	15/08/14	2	NW LANTAU
NL256	07/10/14	3	NW LANTAU
NL259	01/11/13	8	NW LANTAU
	23/01/14	4	NW LANTAU
	20/02/14	2	NW LANTAU
	04/04/14	1	NW LANTAU
	16/04/14	4	NW LANTAU
	13/10/14	1	NW LANTAU
NL260	20/02/14	2	NW LANTAU
	19/05/14	2	NW LANTAU
NL261	01/11/13	1	NW LANTAU
	08/11/13	1	NW LANTAU
	08/11/13	10	NW LANTAU
	09/12/13	3	NW LANTAU
	23/01/14	4	NW LANTAU
	06/02/14	5	NE LANTAU
	05/03/14	3	NW LANTAU
	17/03/14	1	NW LANTAU
	16/04/14	4	NW LANTAU
	02/05/14	3	NW LANTAU
	19/05/14	1	NW LANTAU
	03/07/14	1	NE LANTAU
	05/08/14	1	NW LANTAU

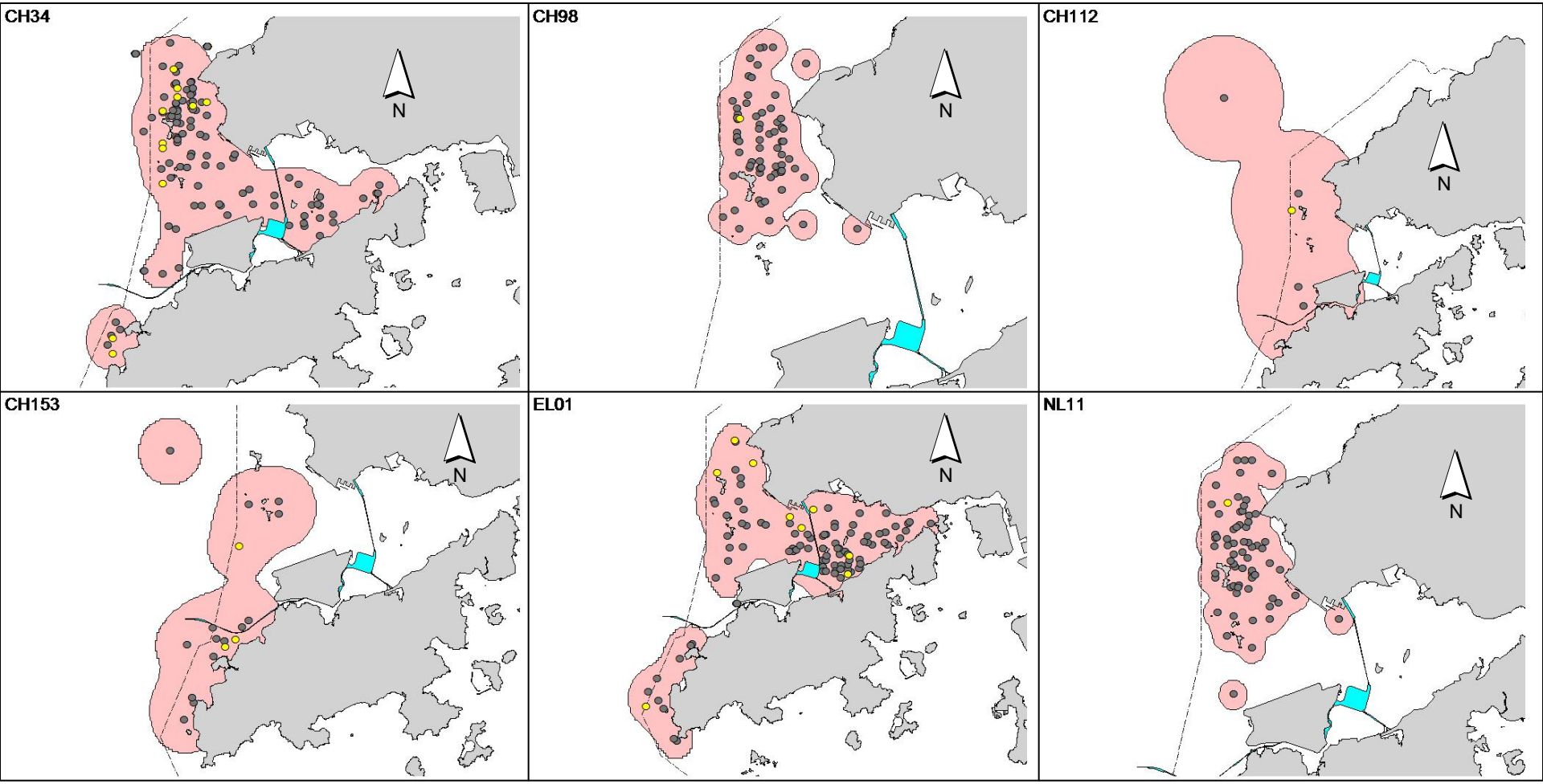
ID#	DATE	STG#	AREA
NL262	01/11/13	8	NW LANTAU
	09/12/13	3	NW LANTAU
	05/03/14	3	NW LANTAU
	16/04/14	4	NW LANTAU
	19/05/14	1	NW LANTAU
NL269	01/11/13	8	NW LANTAU
	19/05/14	2	NW LANTAU
NL272	01/11/13	1	NW LANTAU
	08/11/13	4	NW LANTAU
	09/01/14	1	NW LANTAU
	21/01/14	2	NW LANTAU
	23/01/14	6	NE LANTAU
	05/03/14	2	NW LANTAU
	02/05/14	3	NW LANTAU
	05/06/14	1	NW LANTAU
	05/06/14	2	NW LANTAU
	15/08/14	5	NW LANTAU
NL278	15/08/14	2	NW LANTAU
	07/10/14	2	NW LANTAU
NL284	01/11/13	1	NW LANTAU
	09/12/13	3	NW LANTAU
	21/01/14	4	NW LANTAU
	20/02/14	1	NW LANTAU
	17/03/14	2	NW LANTAU
	19/05/14	1	NW LANTAU
	15/08/14	5	NW LANTAU
NL285	08/11/13	11	NW LANTAU
	23/01/14	2	NW LANTAU
	03/07/14	1	NE LANTAU
	15/08/14	5	NW LANTAU
NL286	06/02/14	3	NW LANTAU
	16/04/14	4	NW LANTAU
	15/08/14	5	NW LANTAU
	19/08/14	2	NW LANTAU
NL287	16/04/14	1	NW LANTAU
	02/05/14	3	NW LANTAU
	14/07/14	3	NW LANTAU
	15/08/14	5	NW LANTAU
NL295	05/03/14	2	NW LANTAU
	19/05/14	2	NW LANTAU
	26/05/14	1	NW LANTAU
	07/10/14	1	NW LANTAU

Appendix III. (cont'd)

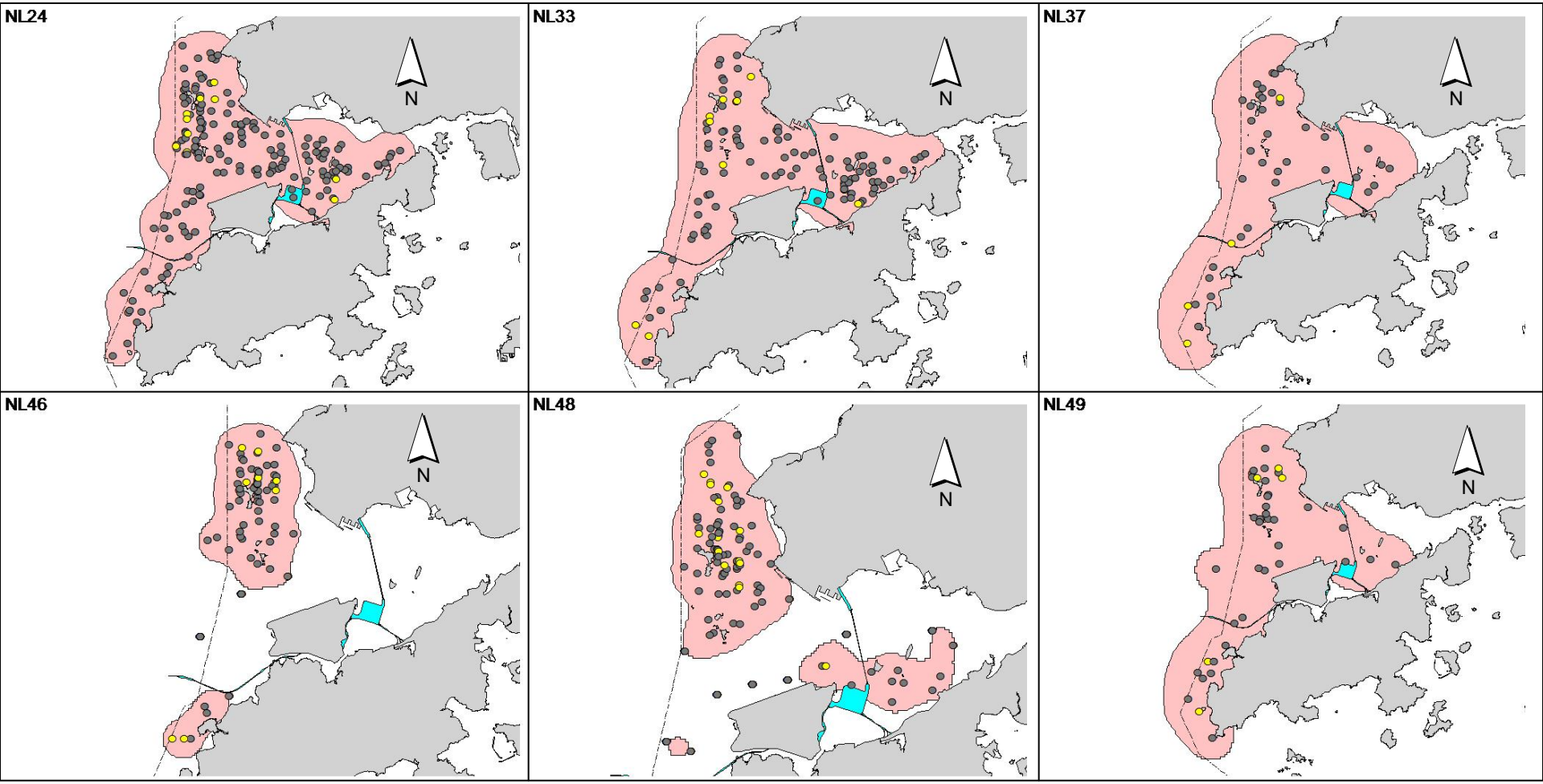
ID#	DATE	STG#	AREA
NL296	05/11/13	1	NW LANTAU
	20/02/14	2	NW LANTAU
	05/03/14	1	NW LANTAU
	05/03/14	2	NW LANTAU
	26/05/14	1	NW LANTAU
NL300	08/11/13	6	NW LANTAU
	26/05/14	1	NW LANTAU
	14/07/14	4	NW LANTAU
	07/10/14	5	NW LANTAU
NL301	01/11/13	4	NW LANTAU
	01/11/13	6	NW LANTAU
	14/07/14	4	NW LANTAU
	11/09/14	2	NW LANTAU
NL302	19/05/14	1	NW LANTAU
	11/09/14	2	NW LANTAU
NL303	19/05/14	1	NW LANTAU
NL306	16/04/14	1	NW LANTAU
NL307	17/03/14	2	NW LANTAU
	15/08/14	5	NW LANTAU
NL308	21/01/14	2	NW LANTAU
SL35	08/11/13	10	NW LANTAU
WL04	01/11/13	8	NW LANTAU
	09/12/13	2	NW LANTAU
	05/03/14	2	NW LANTAU
WL05	01/11/13	8	NW LANTAU
	09/12/13	3	NW LANTAU
	05/03/14	2	NW LANTAU
WL11	08/11/13	2	NW LANTAU
	05/03/14	2	NW LANTAU
WL15	08/11/13	10	NW LANTAU
WL28	15/08/14	2	NW LANTAU
WL30	10/07/14	1	NW LANTAU
WL46	09/12/13	3	NW LANTAU
	15/08/14	2	NW LANTAU
WL79	08/11/13	4	NW LANTAU
WL98	08/11/13	4	NW LANTAU
WL124	08/11/13	8	NW LANTAU
	03/07/14	3	NW LANTAU
	15/08/14	2	NW LANTAU
WL188	15/08/14	2	NW LANTAU

ID#	DATE	STG#	AREA
WL179	09/12/13	4	NW LANTAU
	17/03/14	2	NW LANTAU
	16/04/14	1	NW LANTAU
WL188	06/08/14	1	NW LANTAU
WL199	05/03/14	2	NW LANTAU
WL214	09/01/14	4	NW LANTAU
	15/08/14	2	NW LANTAU

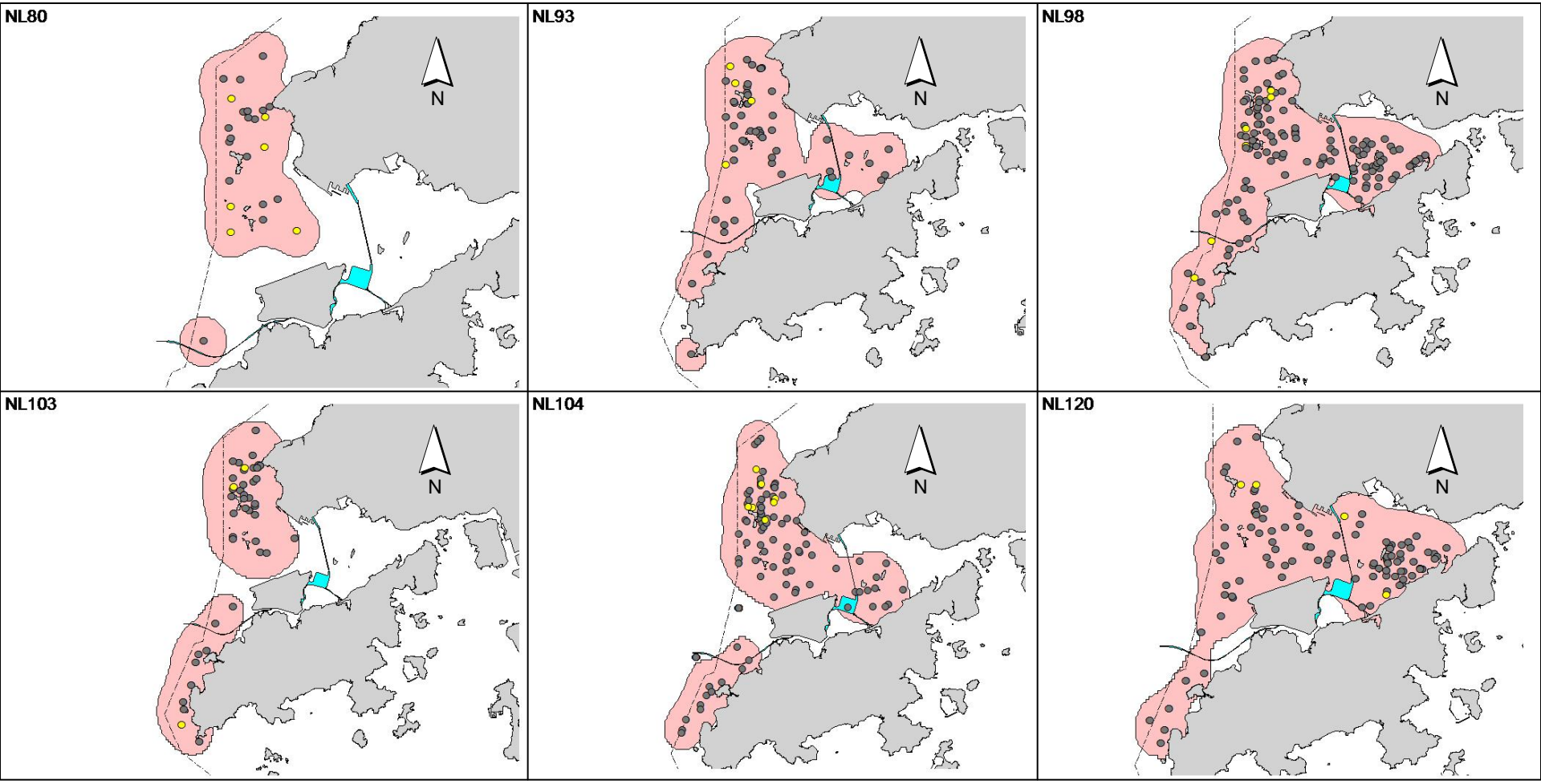
Appendix IV. Ranging patterns (95% kernel ranges) of 77 individual dolphins that were sighted during the first year of TMCLKL construction works, utilizing the HKLR03 monitoring data
(note: yellow dots indicates sightings made in November 2013 to October 2014)



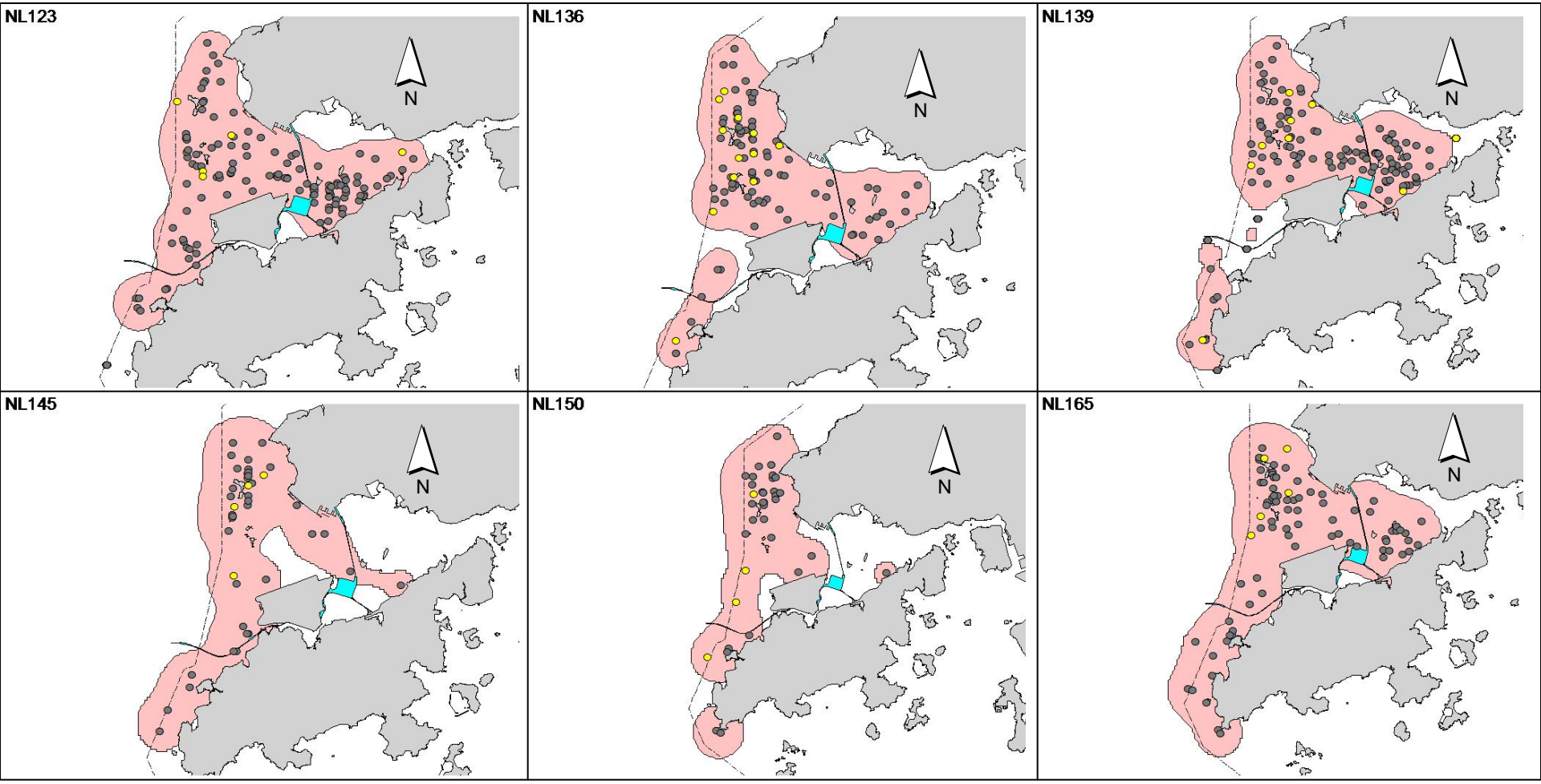
Appendix IV. (cont'd)



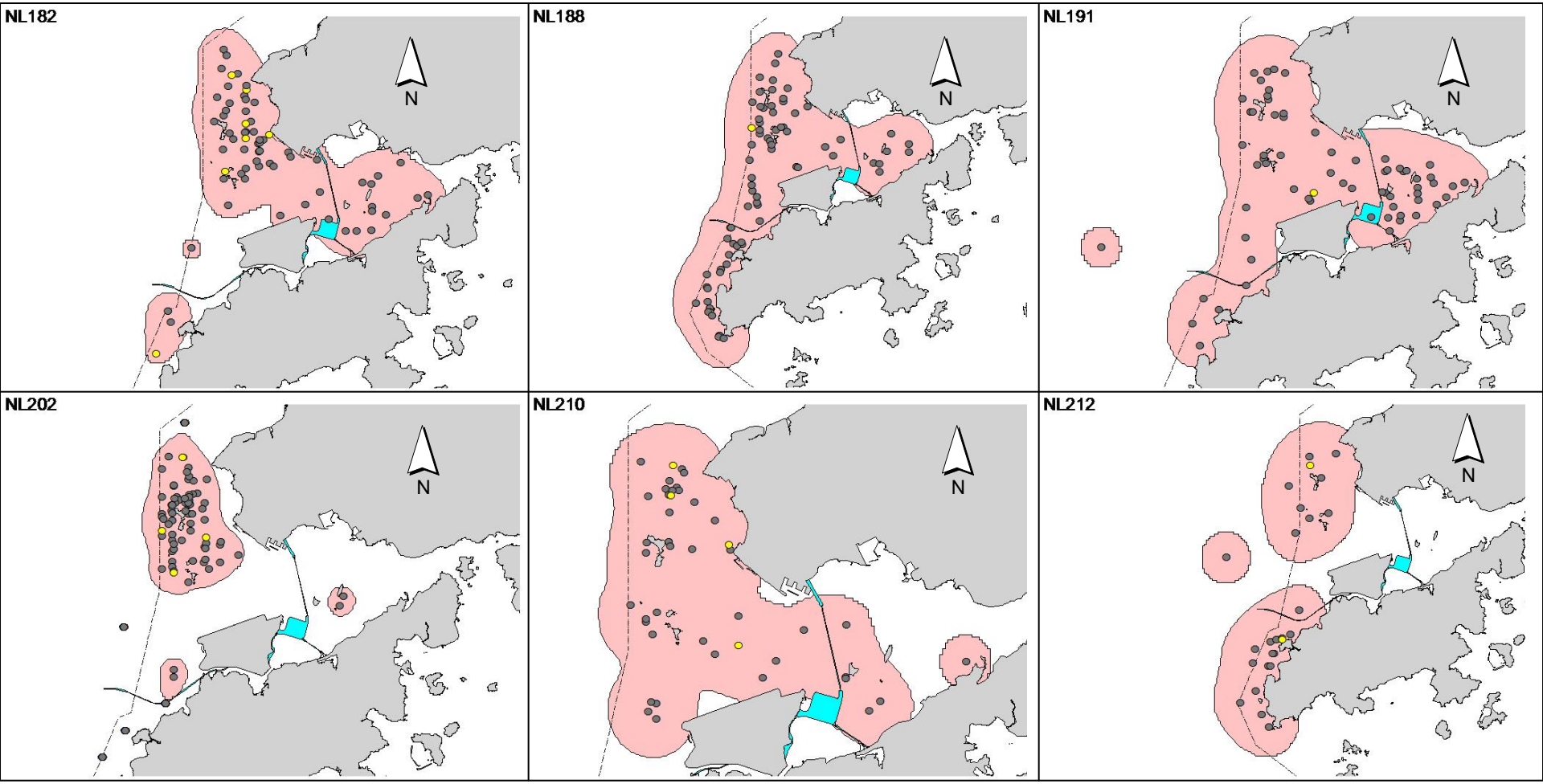
Appendix IV. (cont'd)



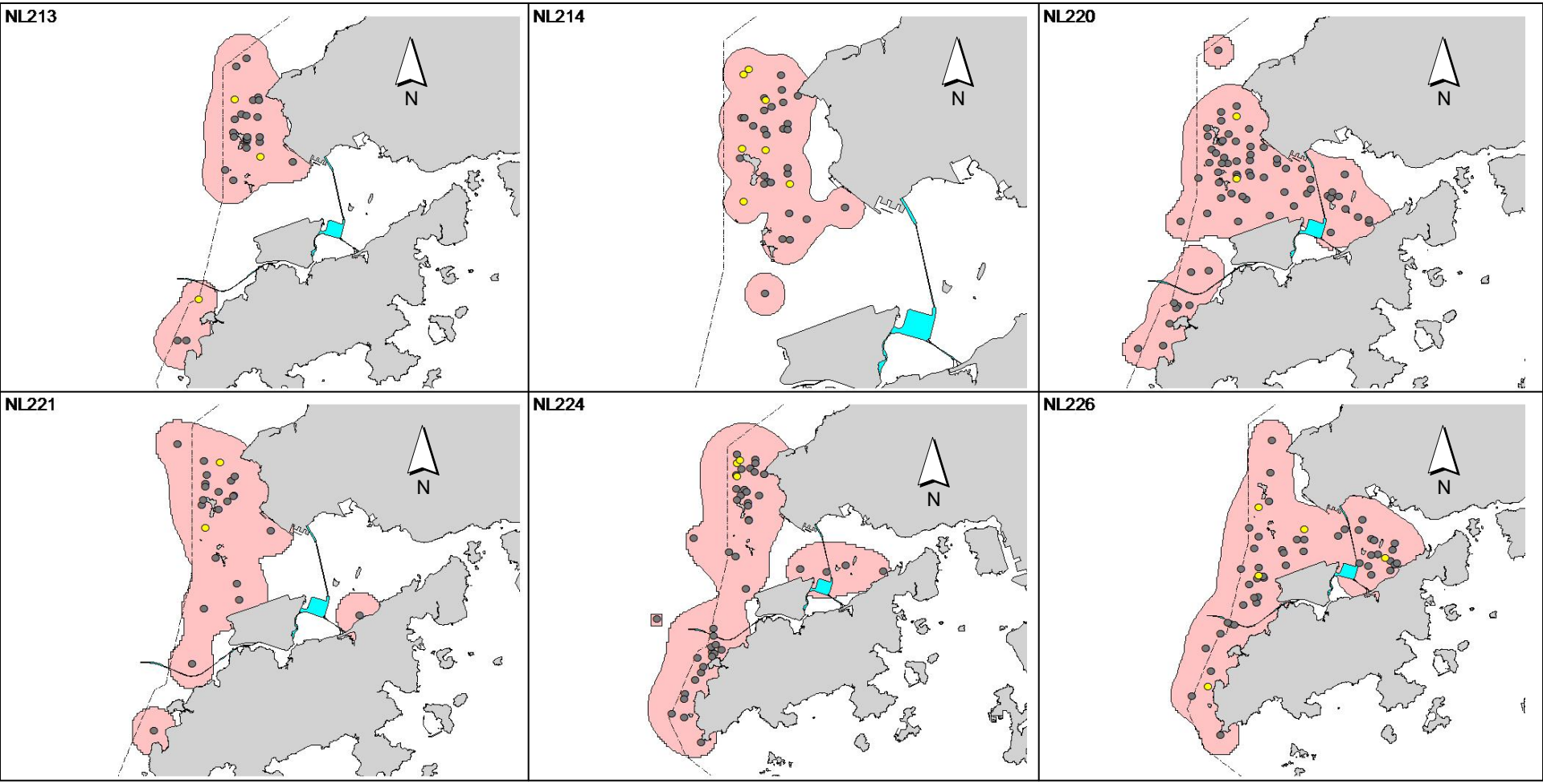
Appendix IV. (cont'd)



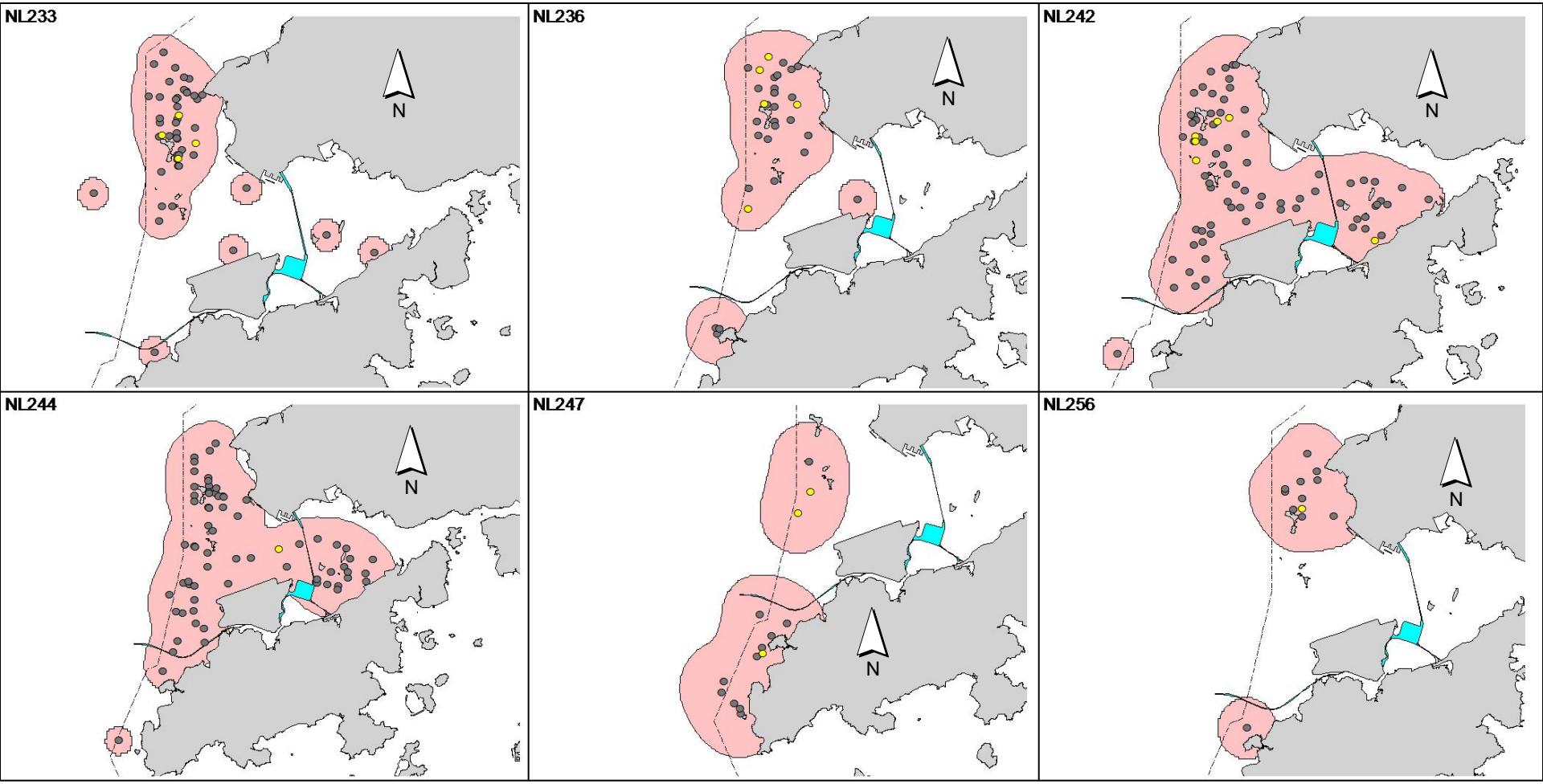
Appendix IV. (cont'd)



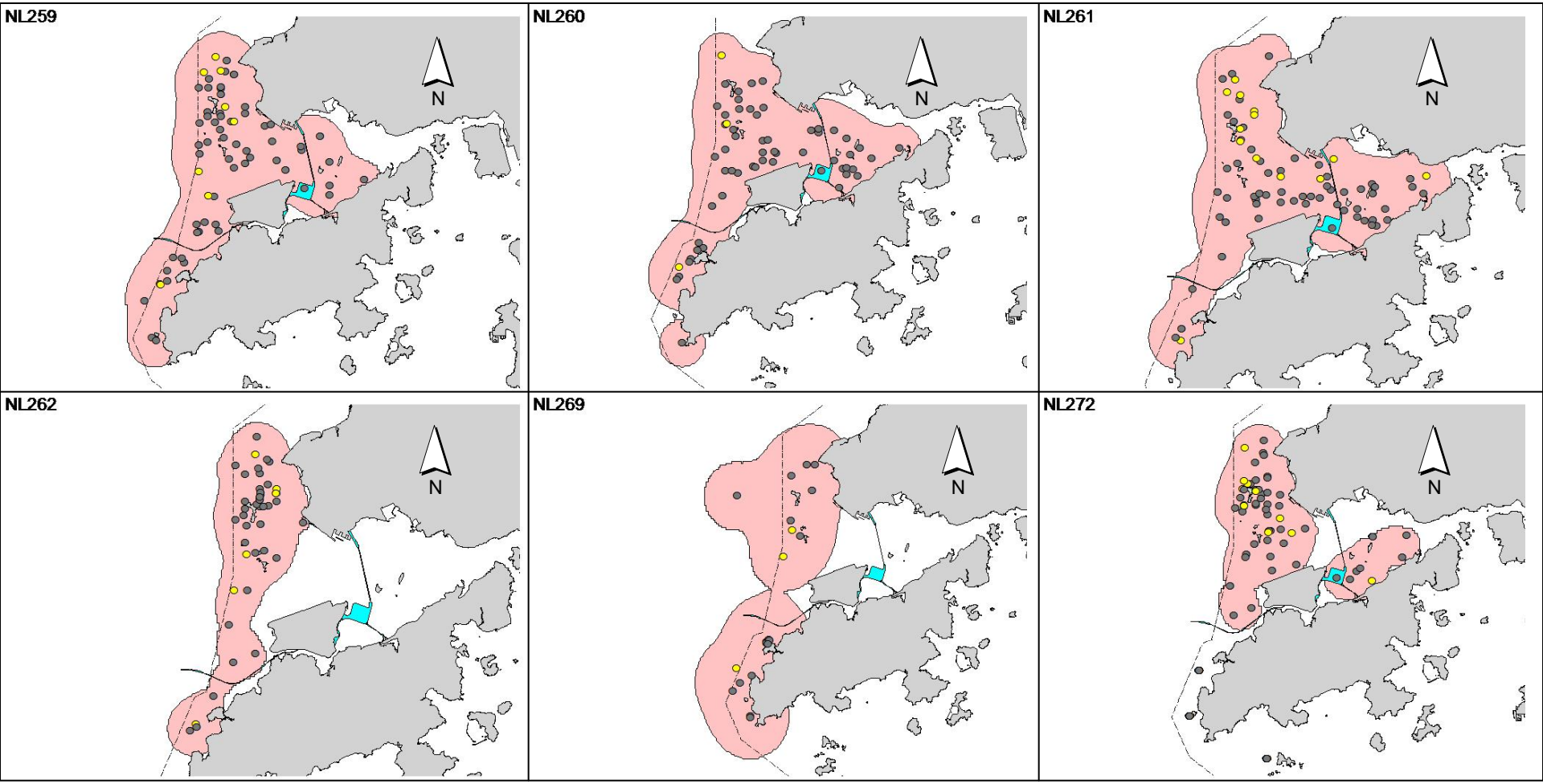
Appendix IV. (cont'd)



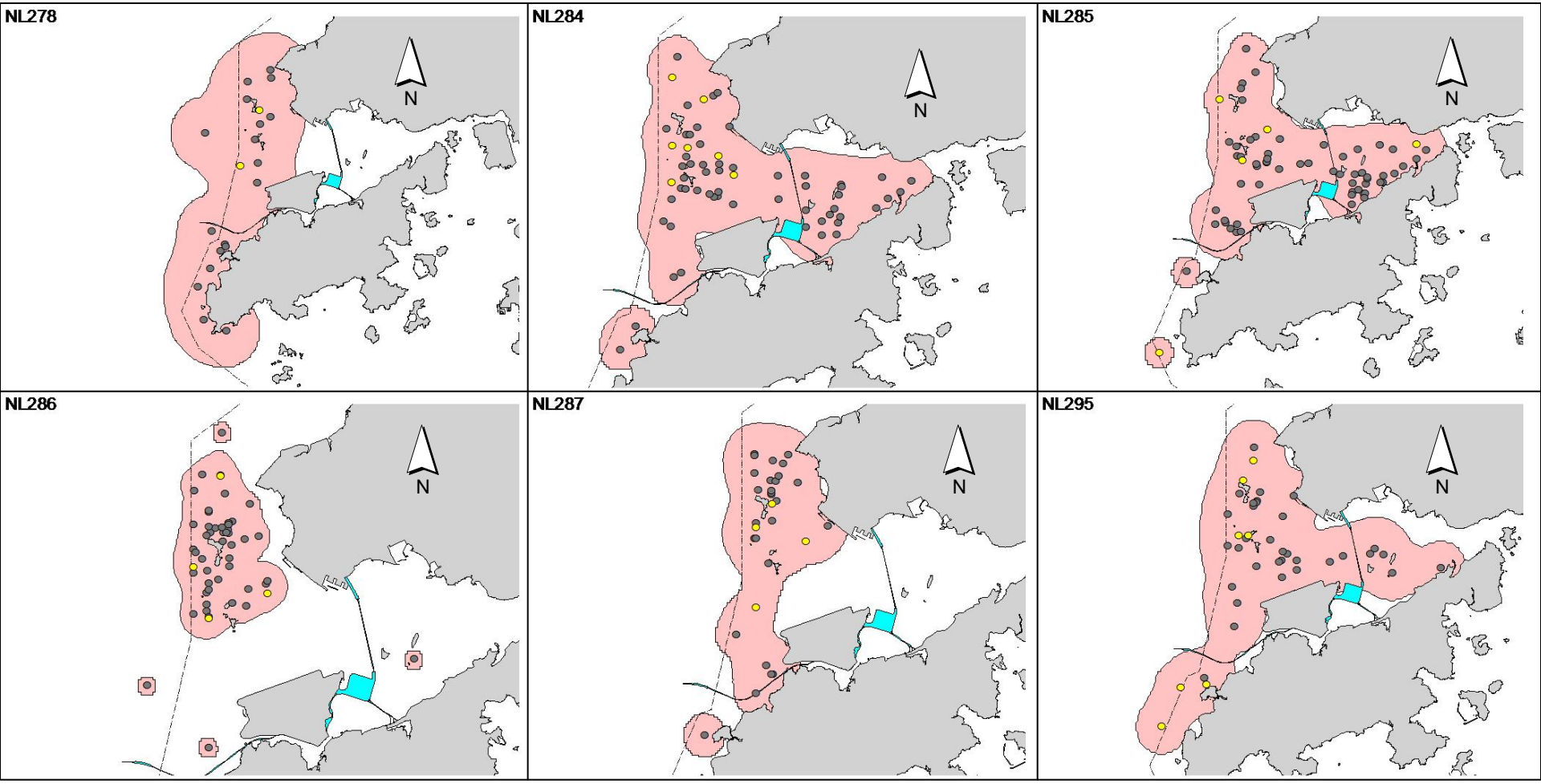
Appendix IV. (cont'd)



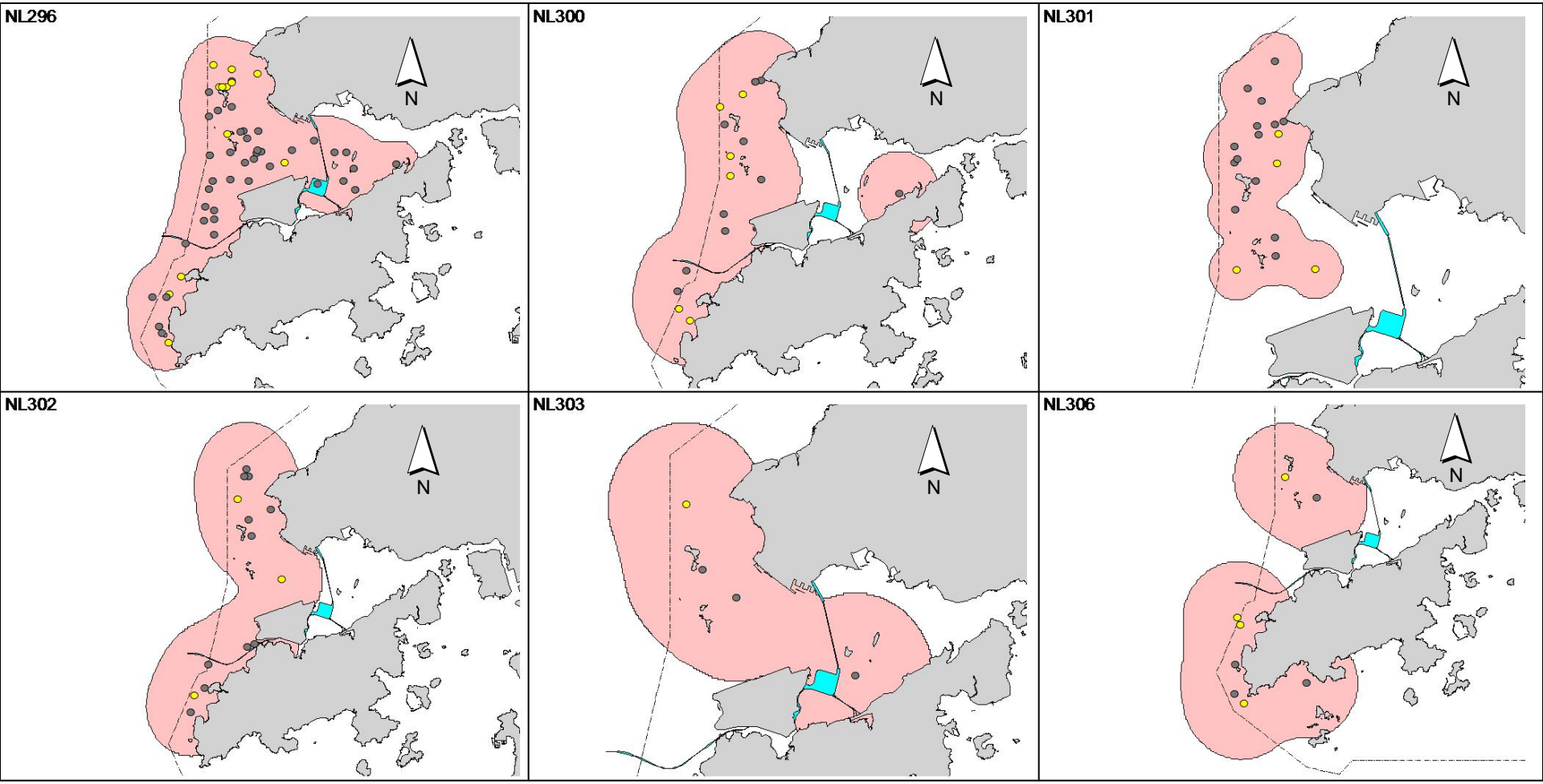
Appendix IV. (cont'd)



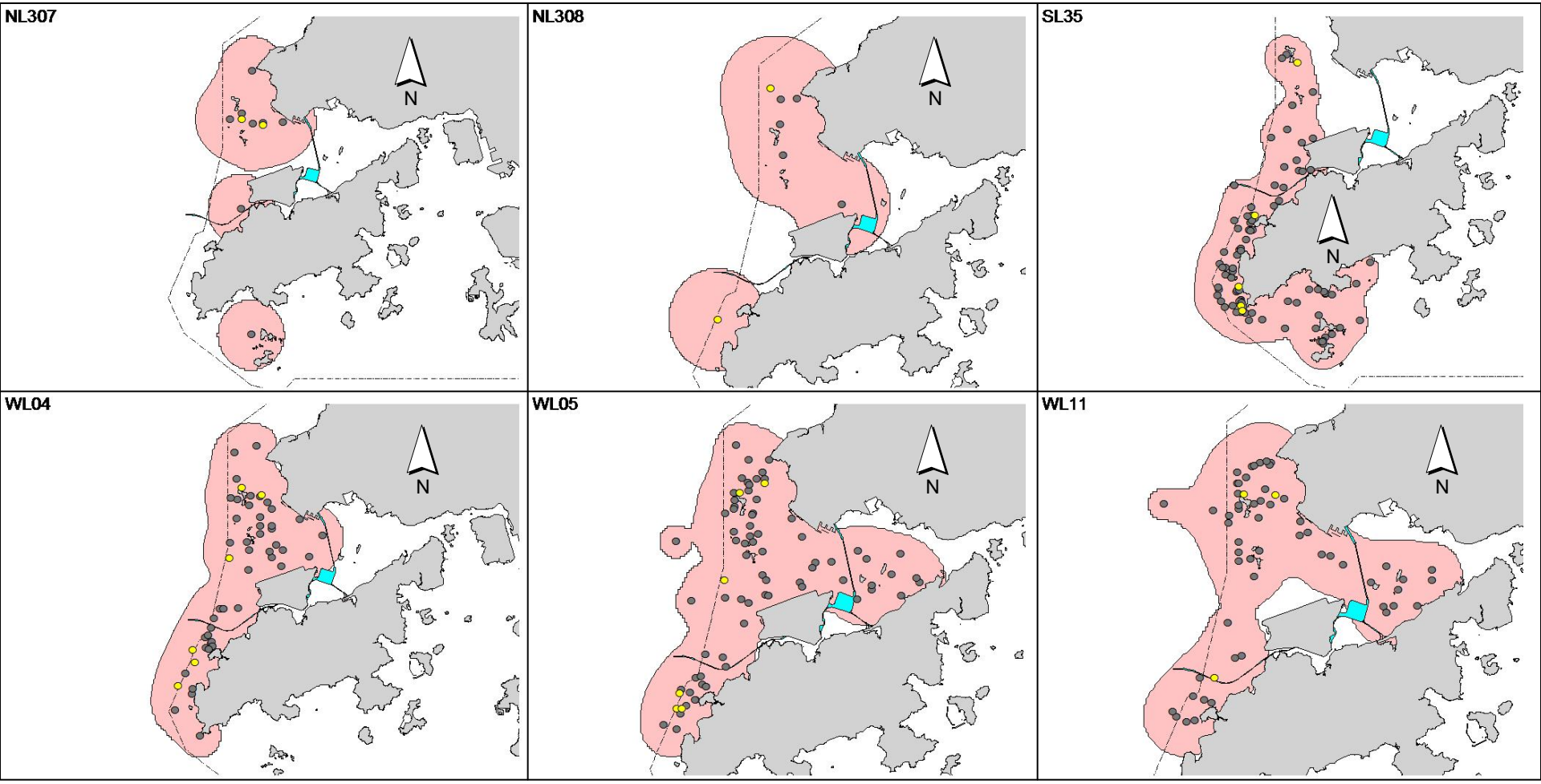
Appendix IV. (cont'd)



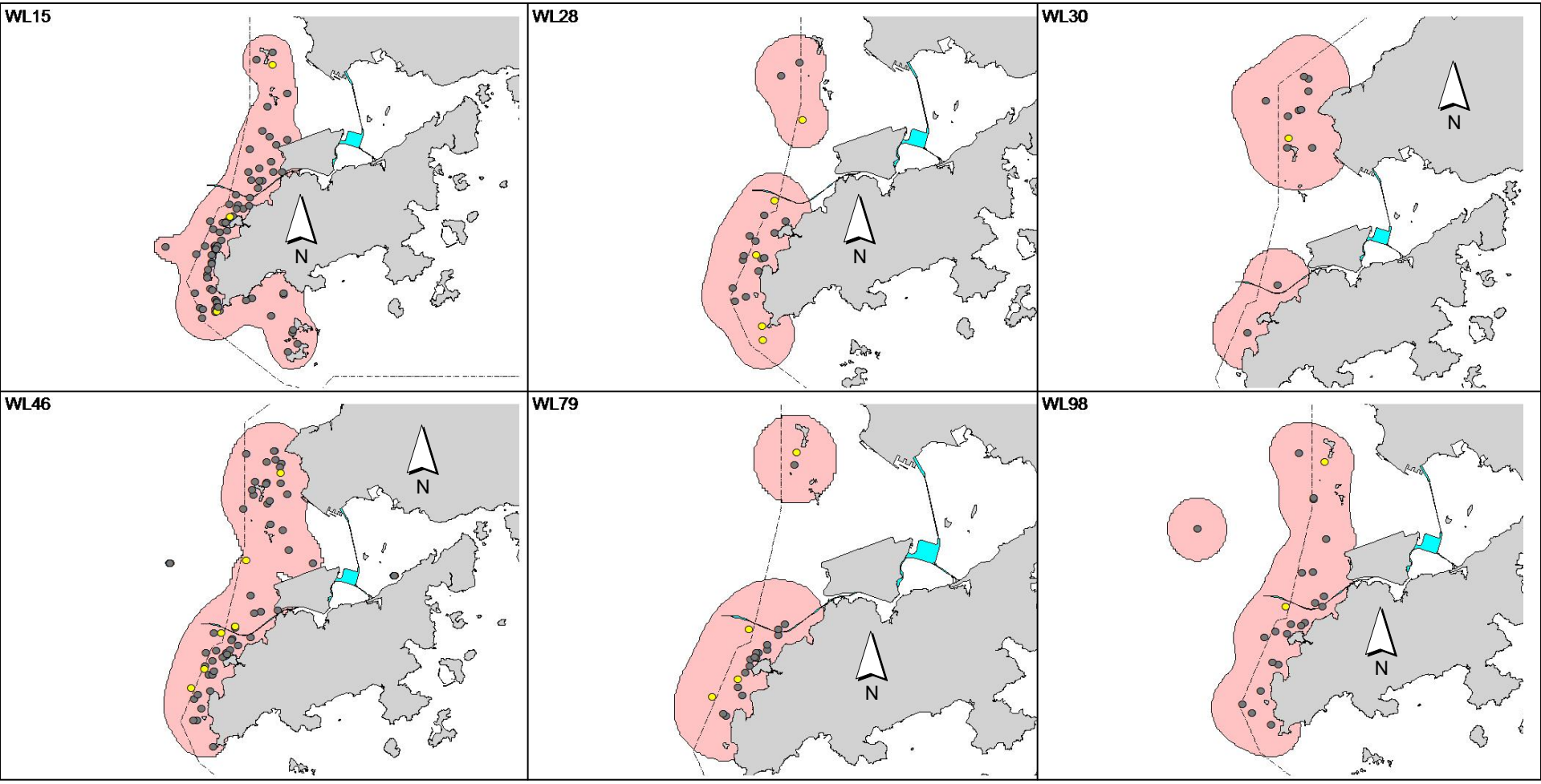
Appendix IV. (cont'd)



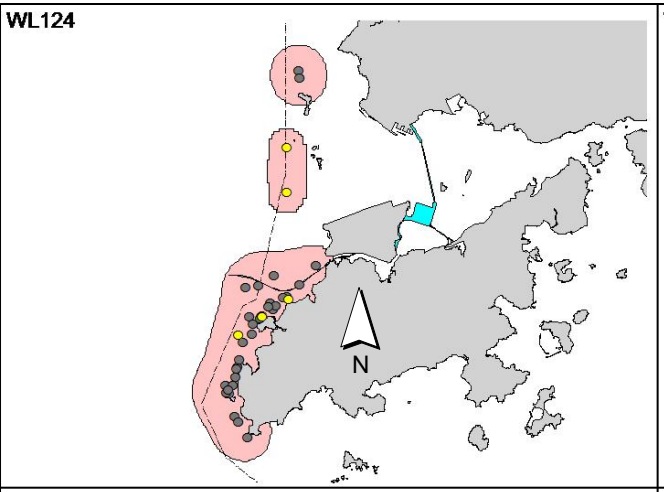
Appendix IV. (cont'd)

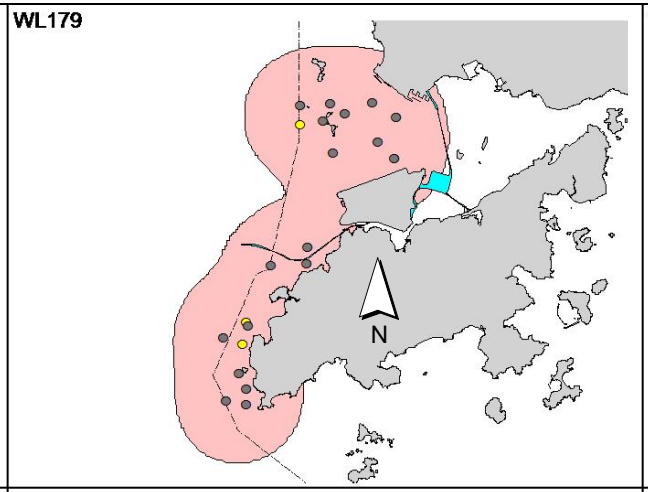


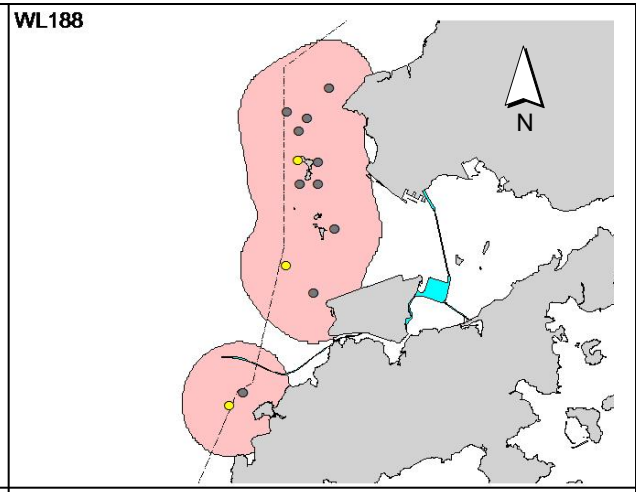
Appendix IV. (cont'd)

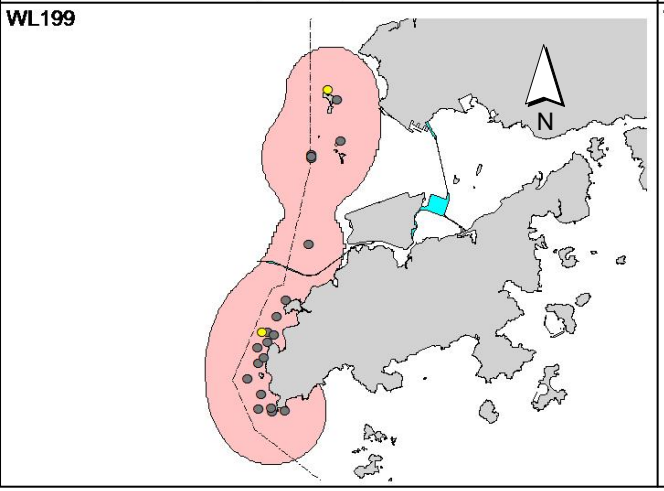


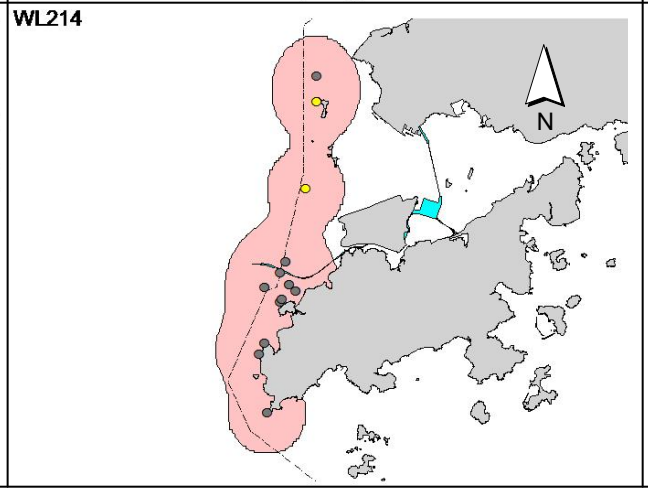
Appendix IV. (cont'd)

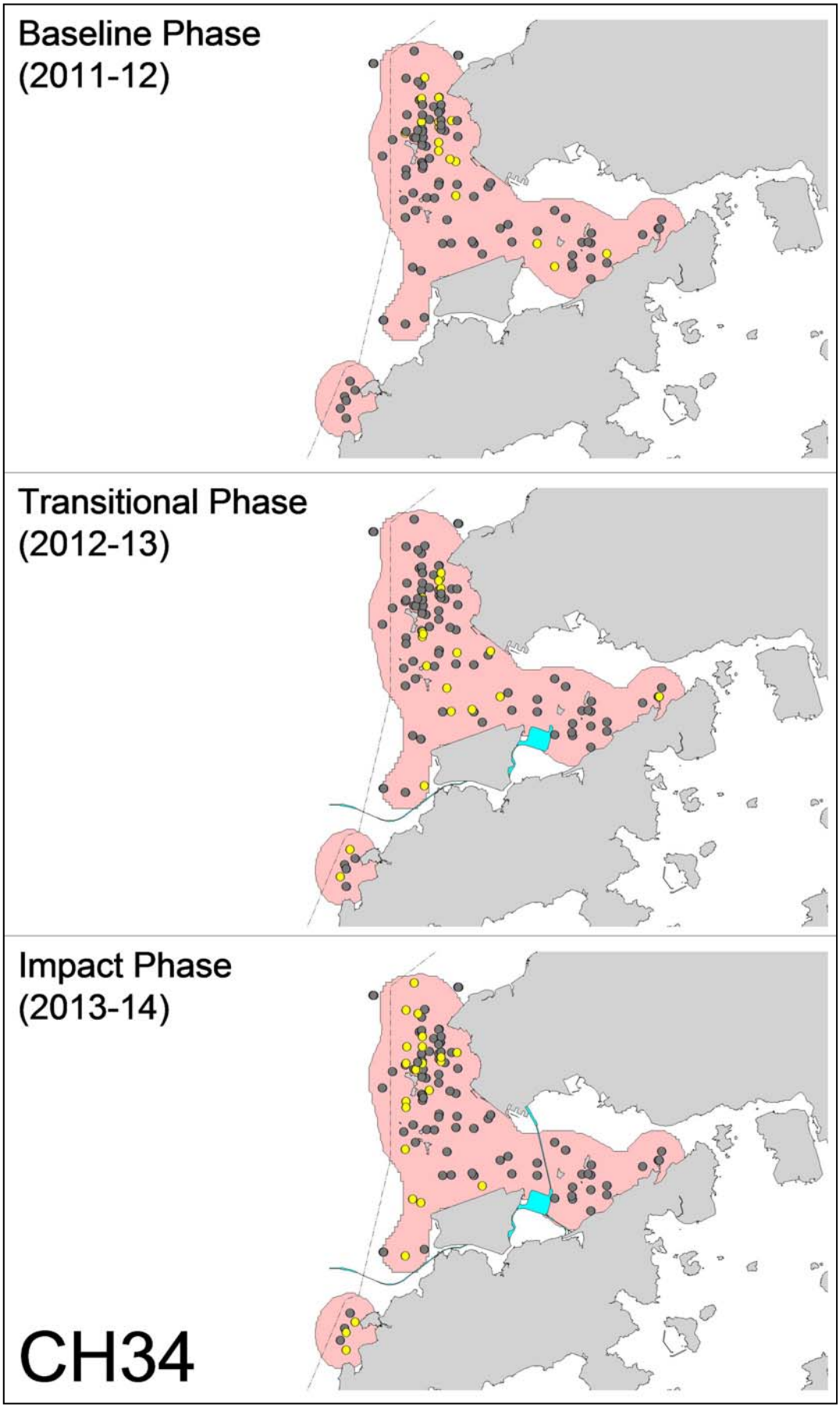




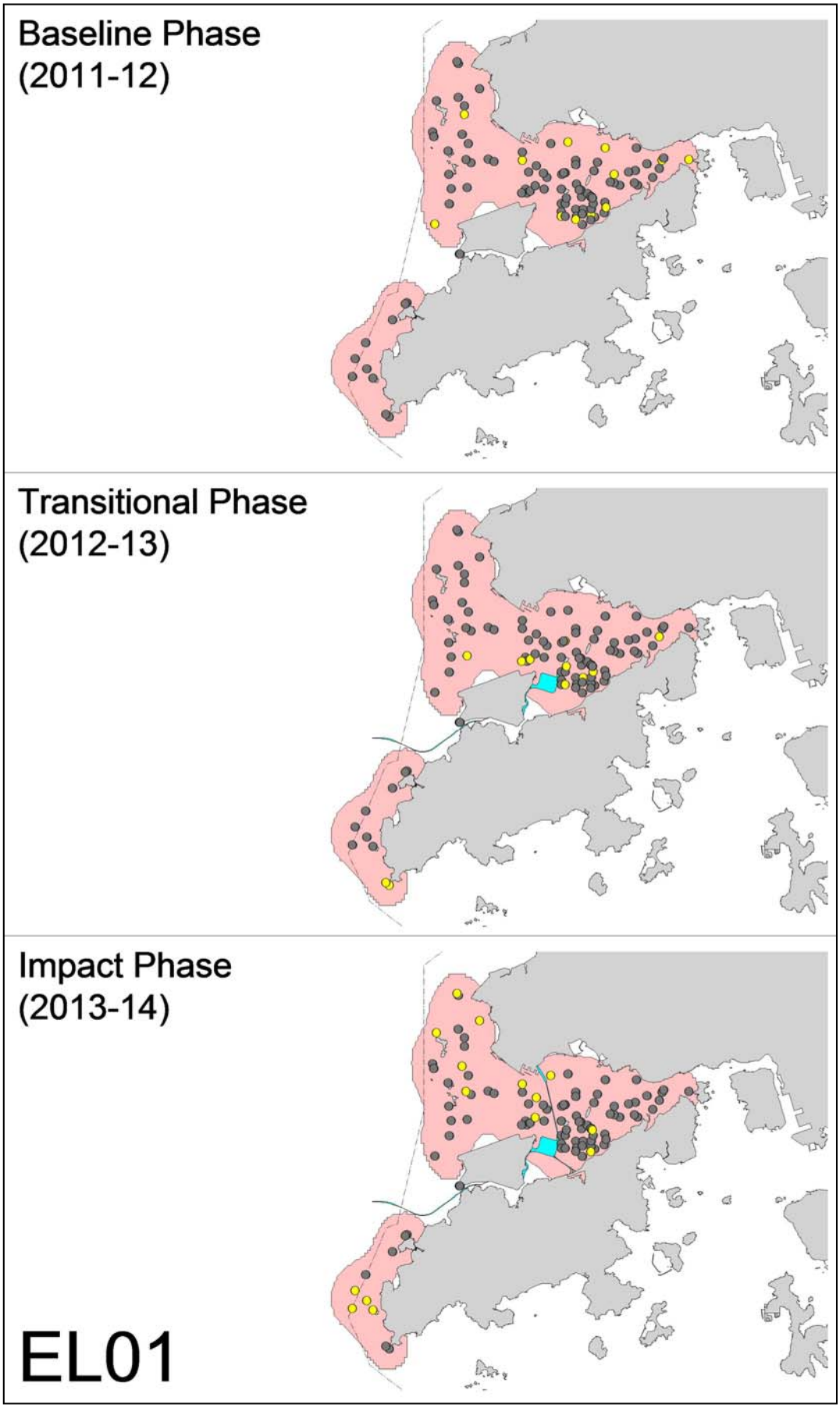




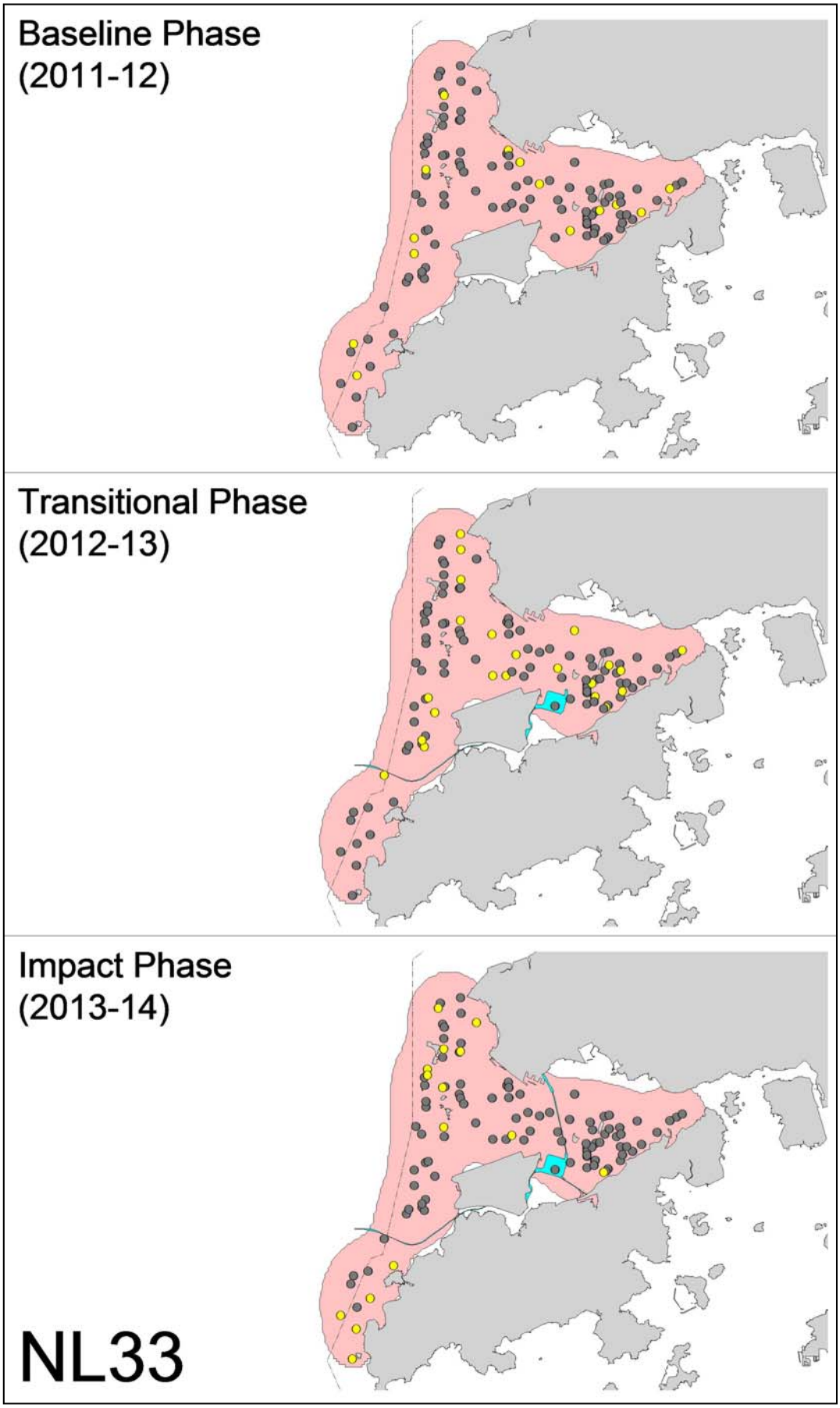




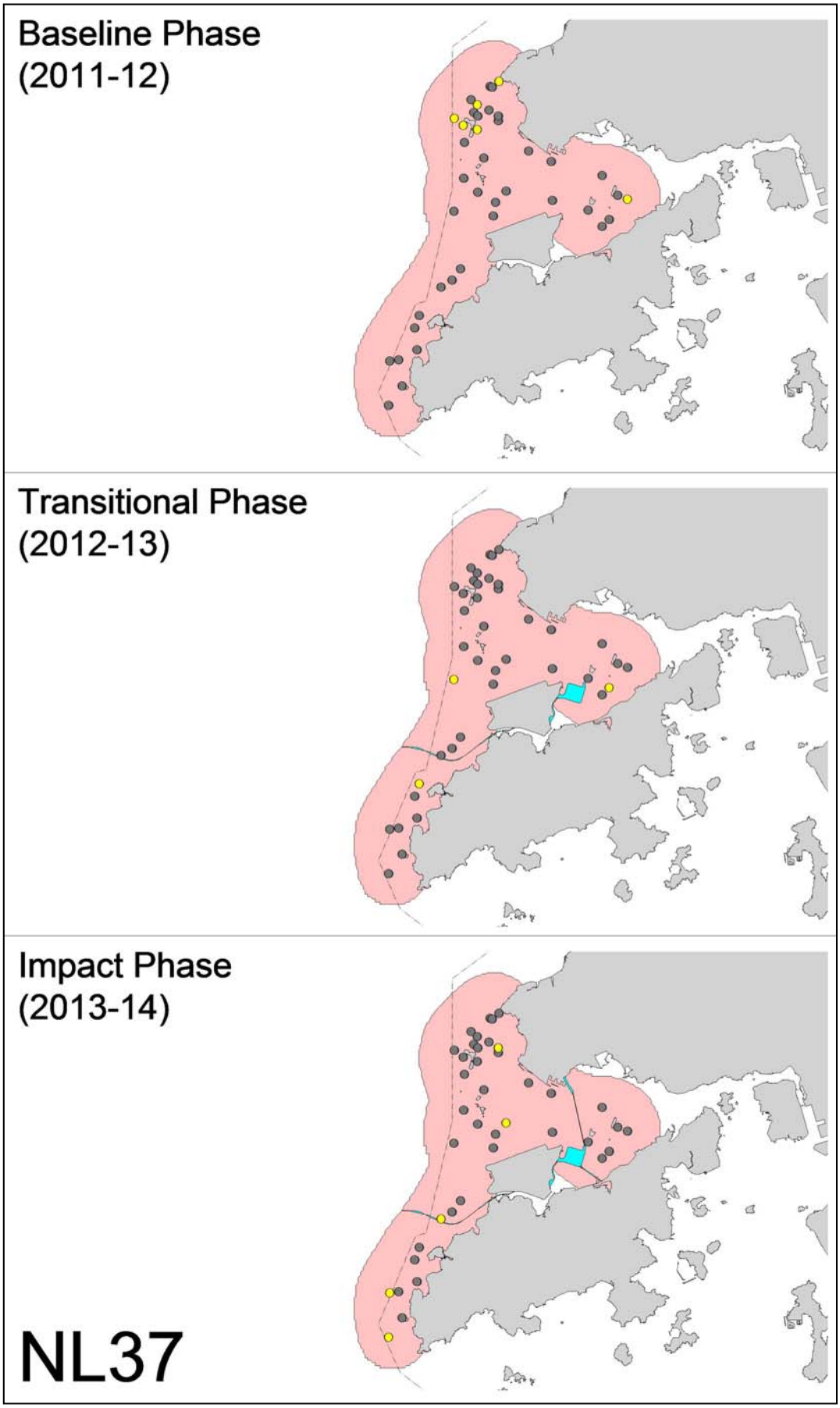
Appendix V. Temporal changes in range use of individual dolphins during baseline, transitional & impact phase of TMCLKL construction (note: yellow dots indicates sightings made in corresponding period)



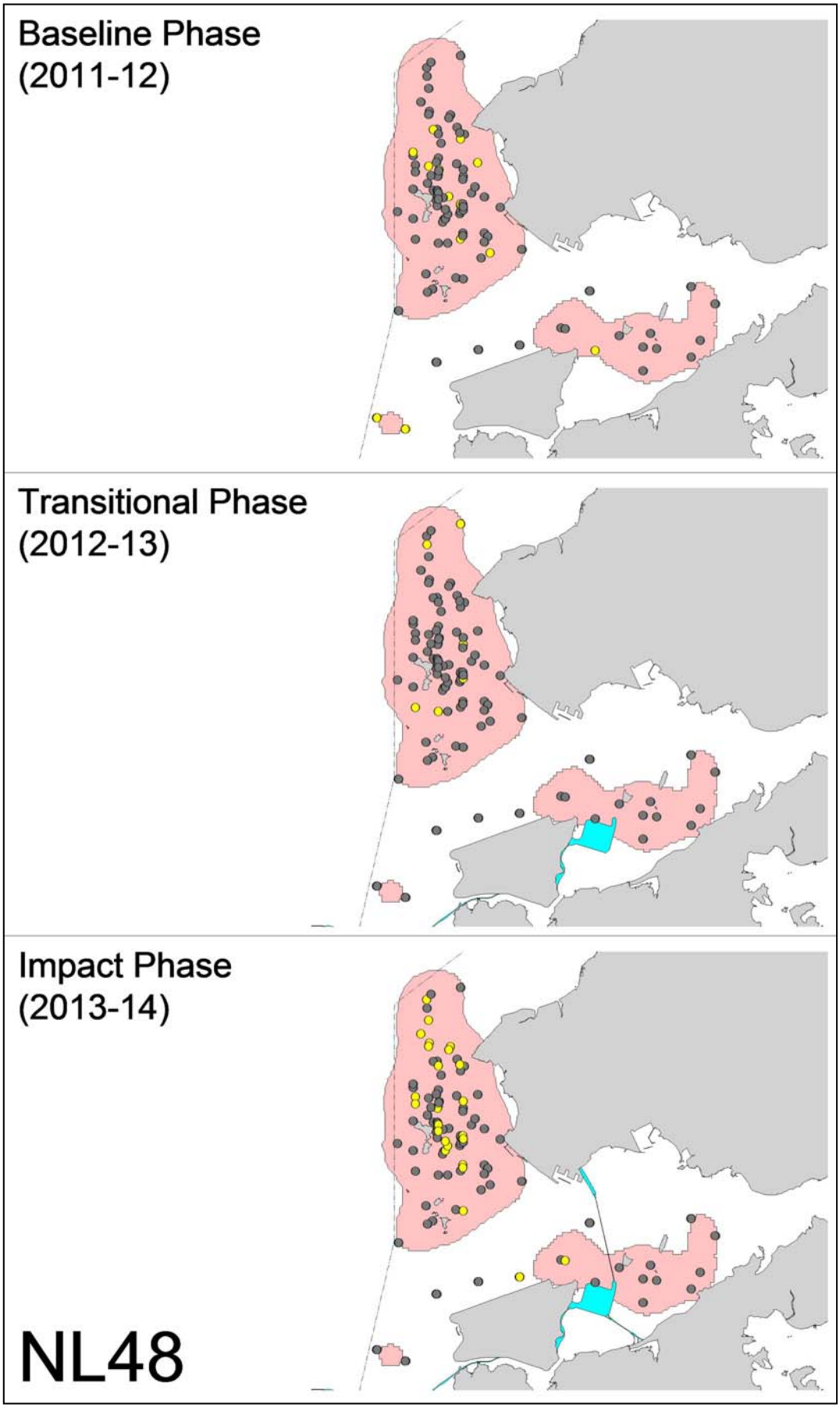
Appendix V. (cont'd)



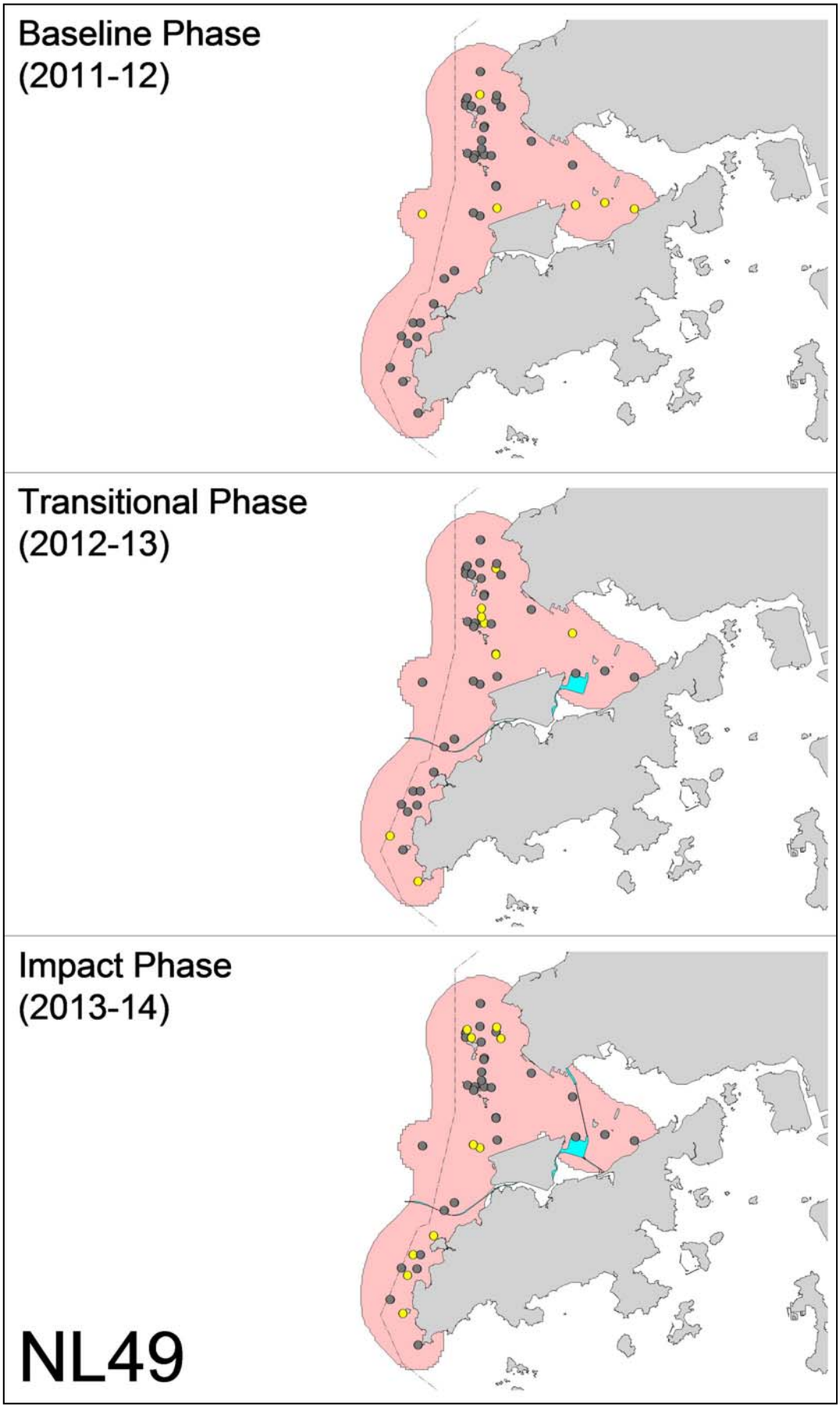
Appendix V. (cont'd)



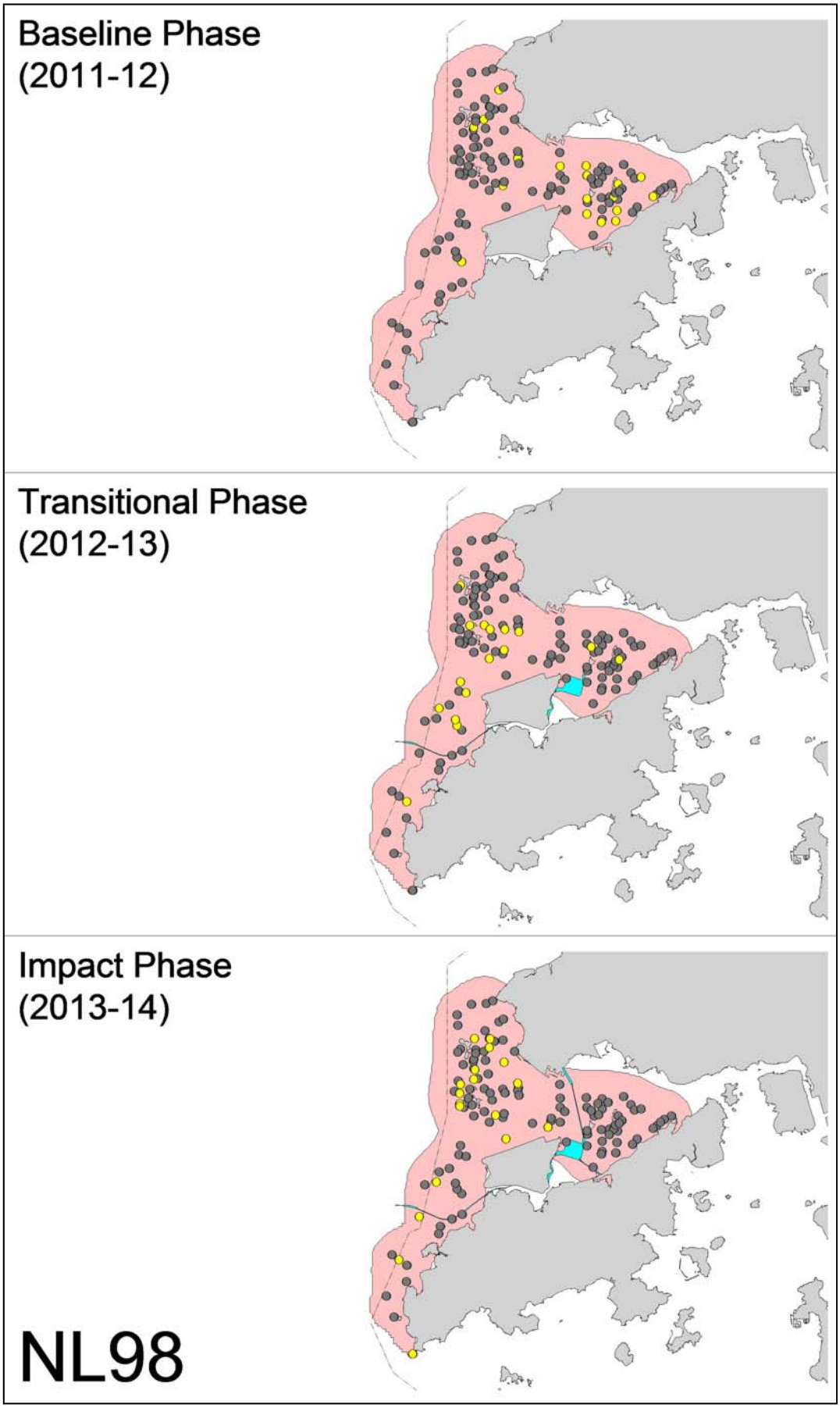
Appendix V. (cont'd)



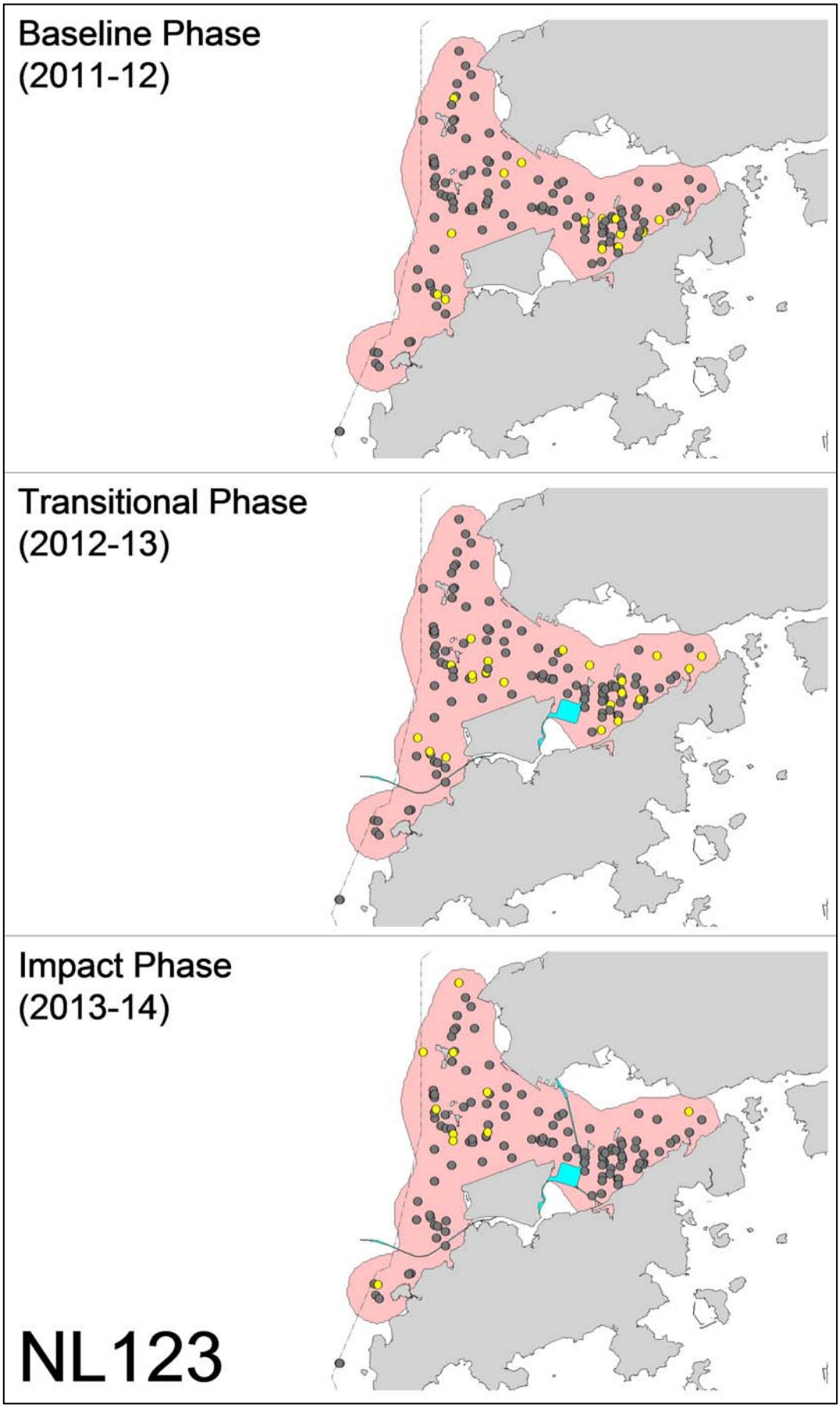
Appendix V. (cont'd)



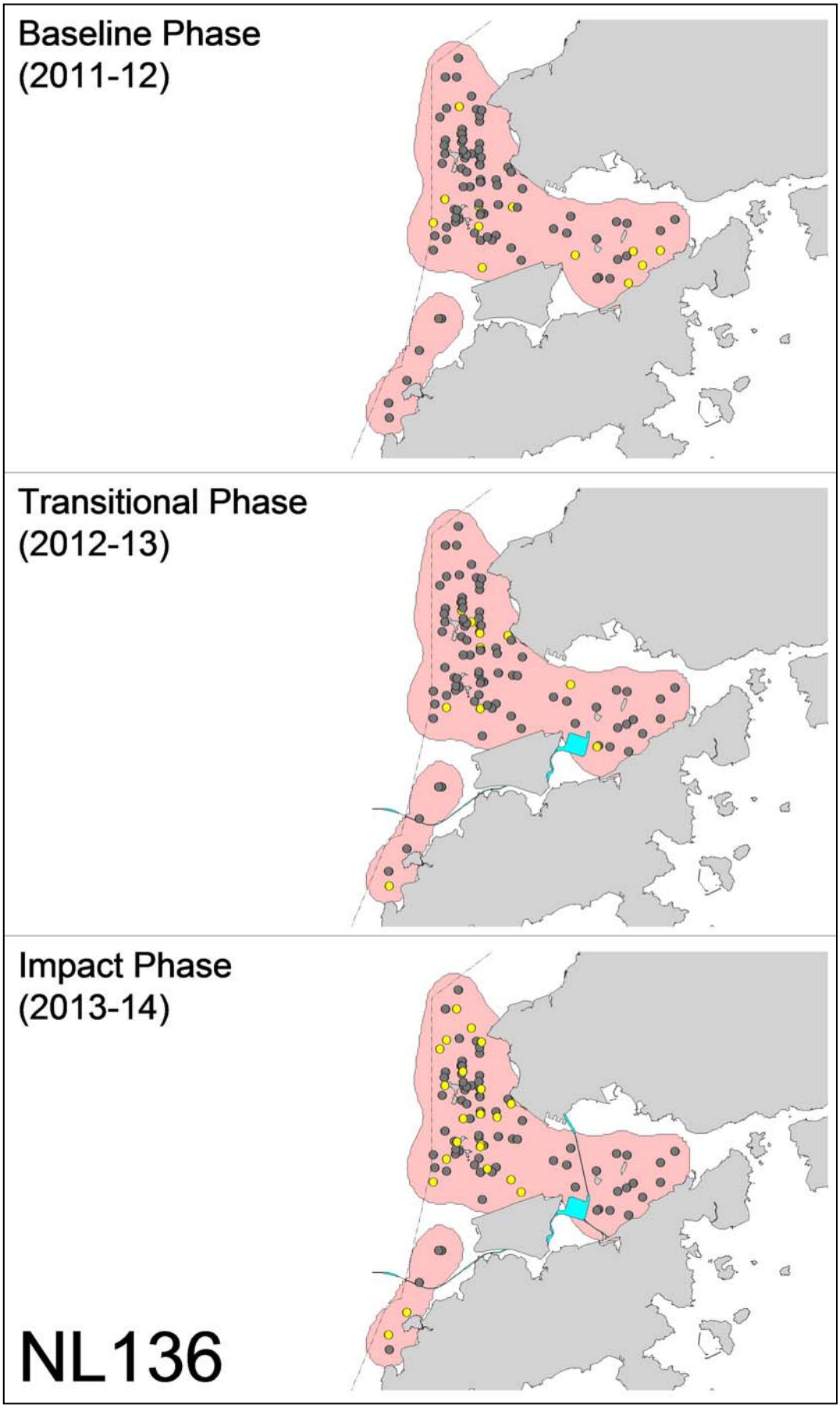
Appendix V. (cont'd)



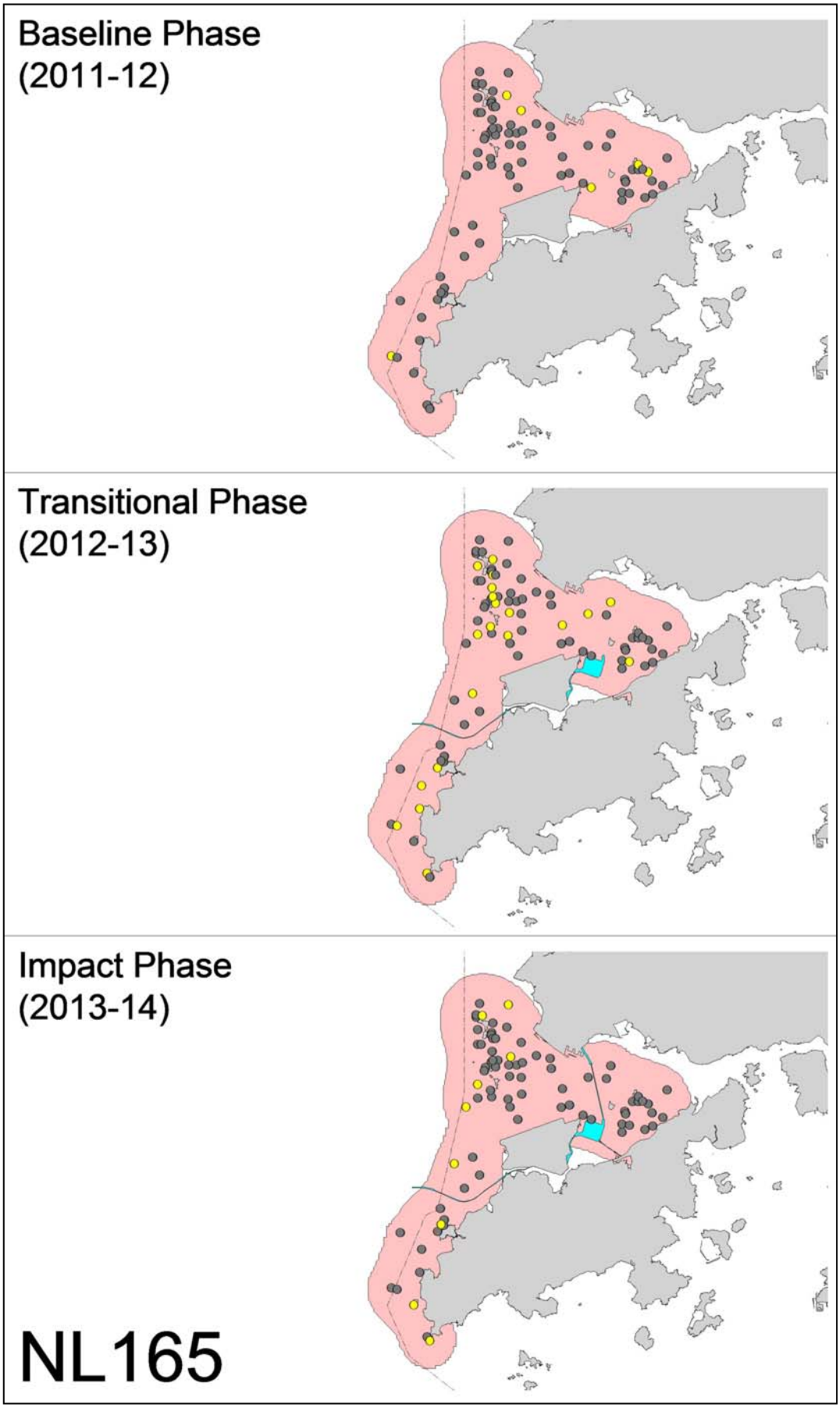
Appendix V. (cont'd)



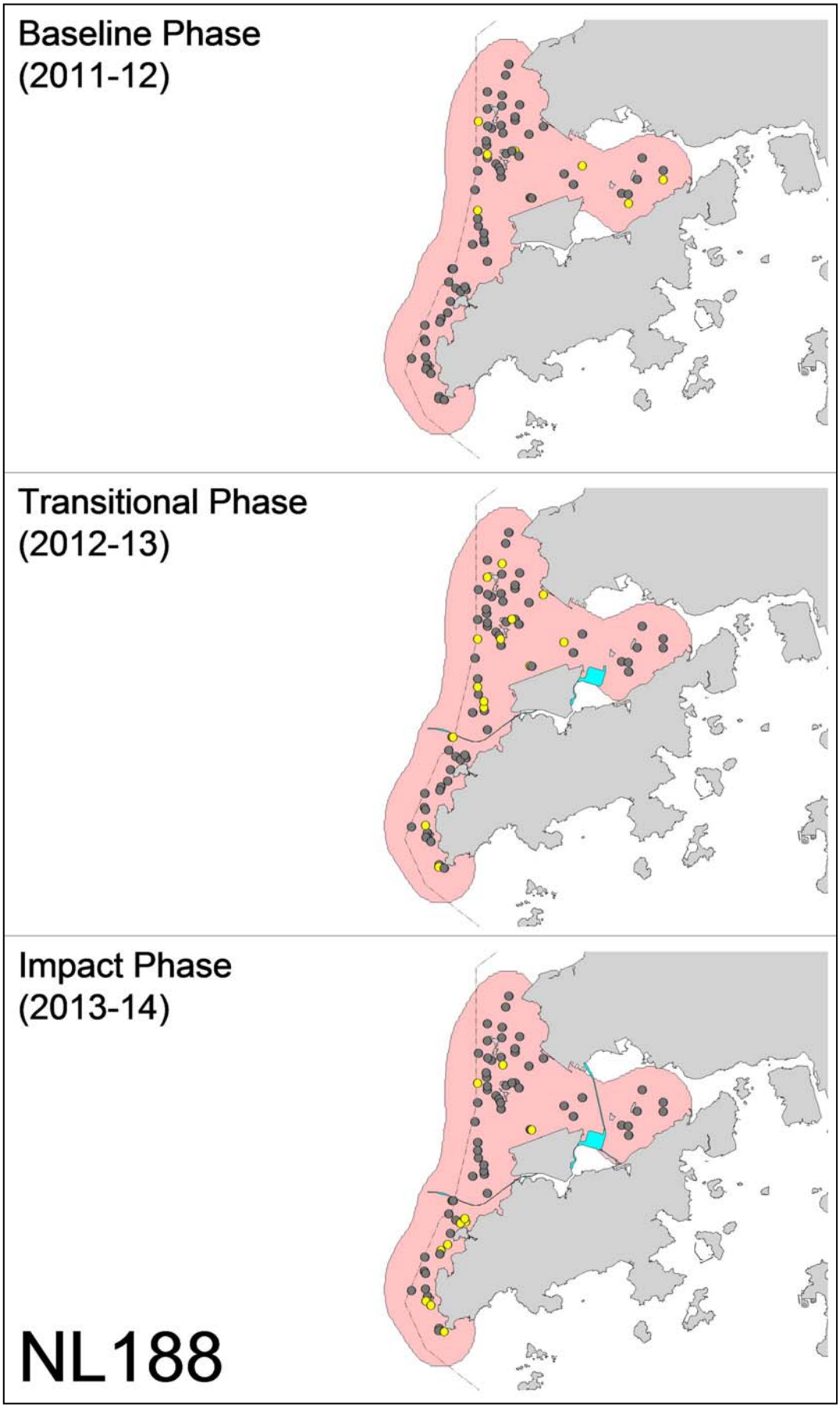
Appendix V. (cont'd)



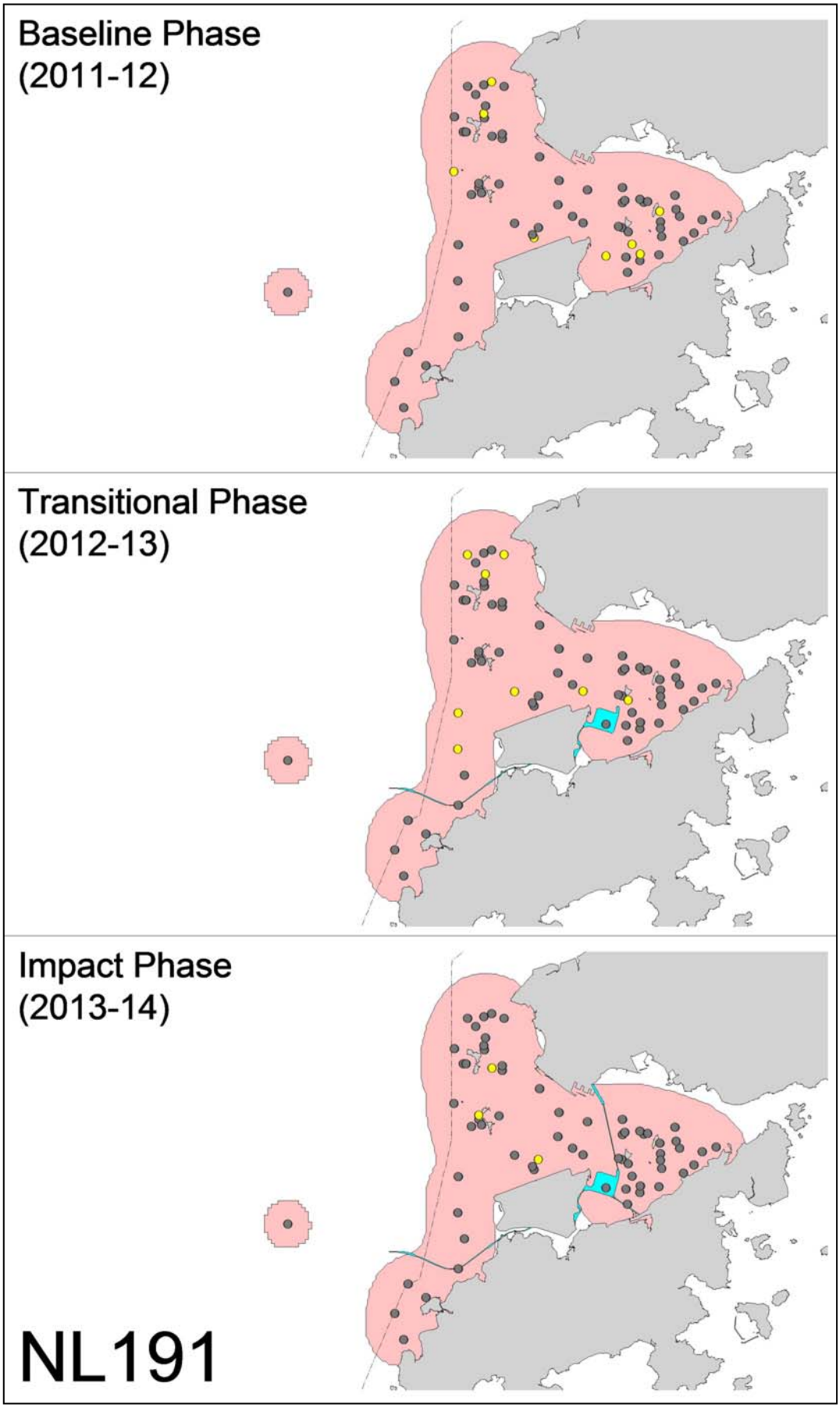
Appendix V. (cont'd)



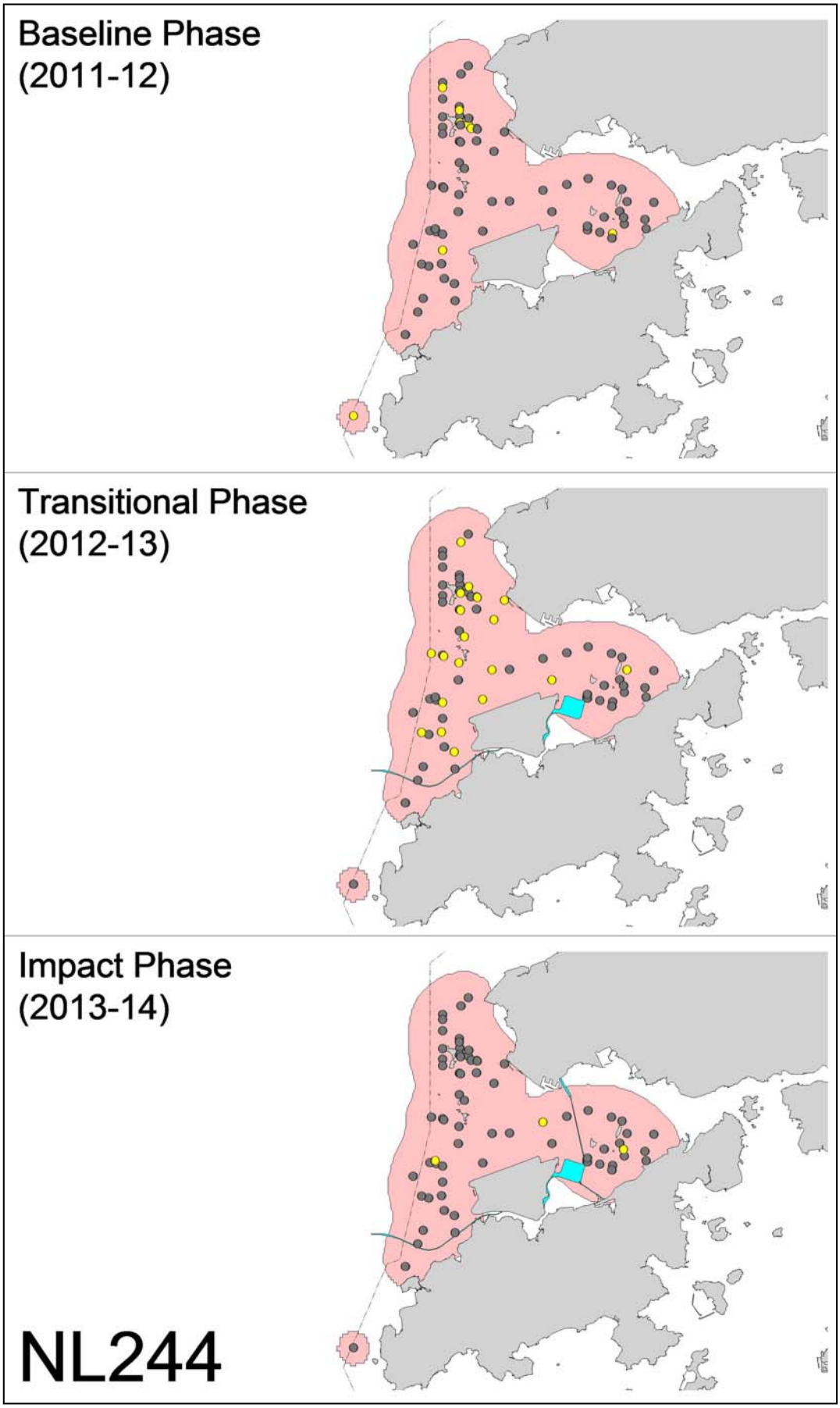
Appendix V. (cont'd)



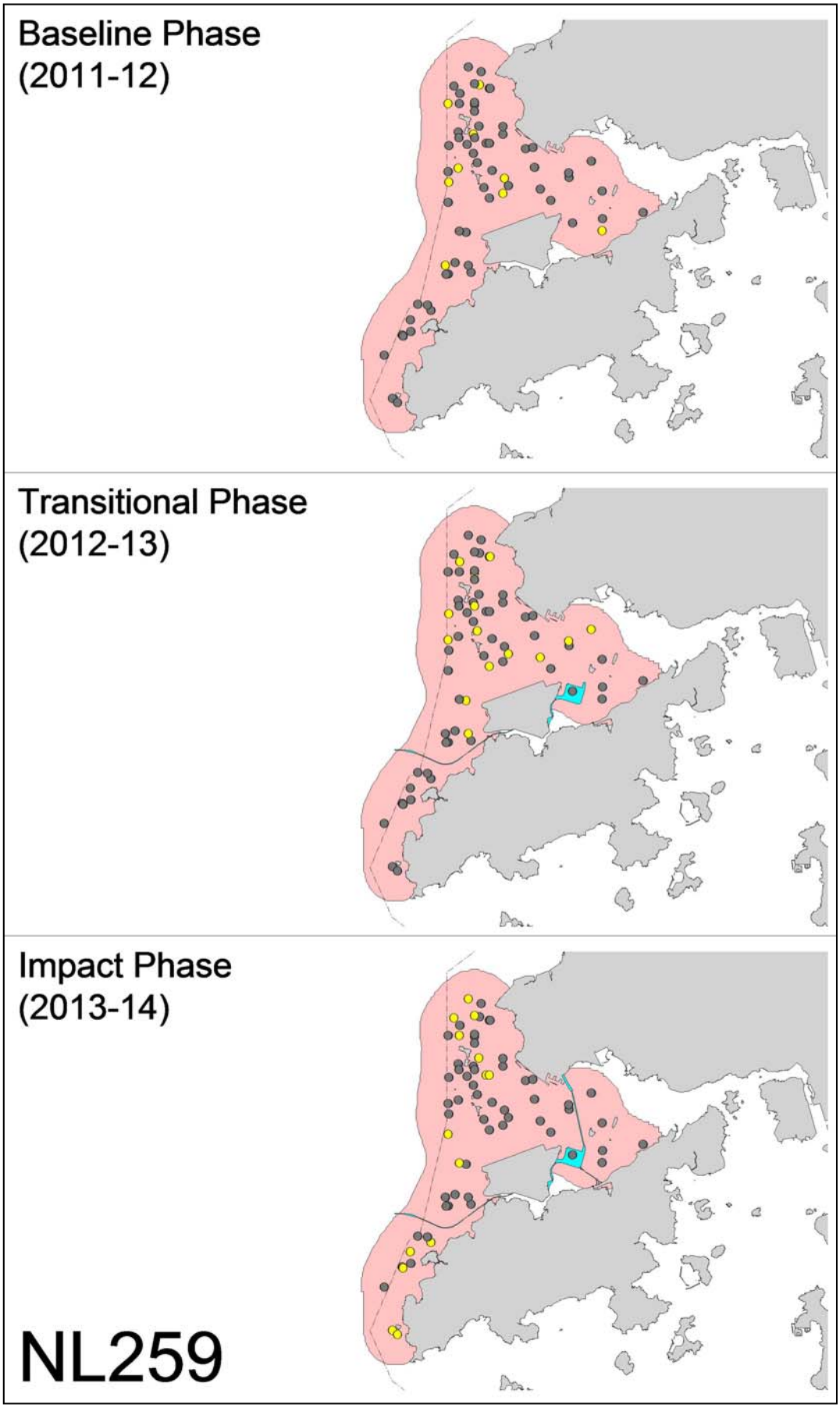
Appendix V. (cont'd)



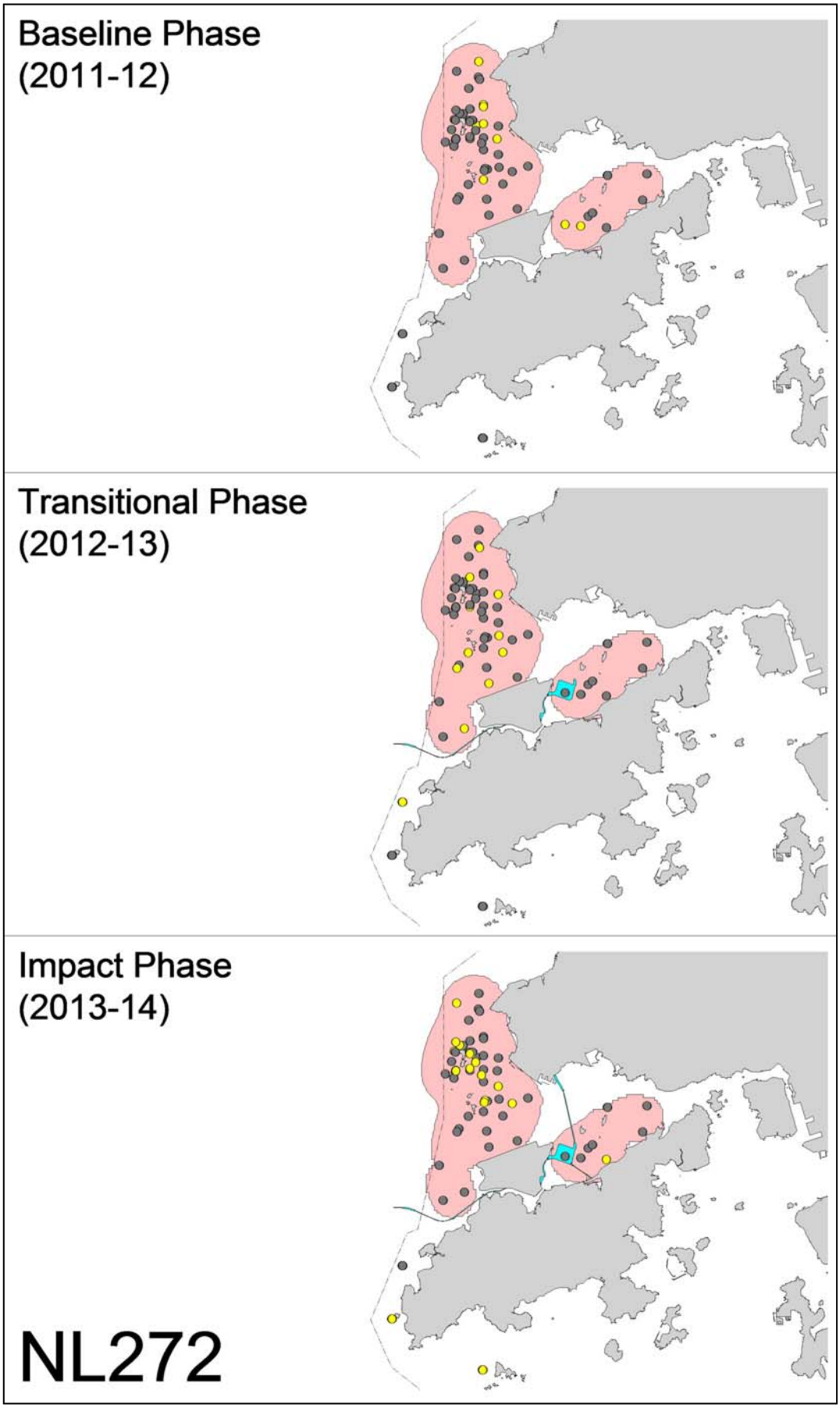
Appendix V. (cont'd)



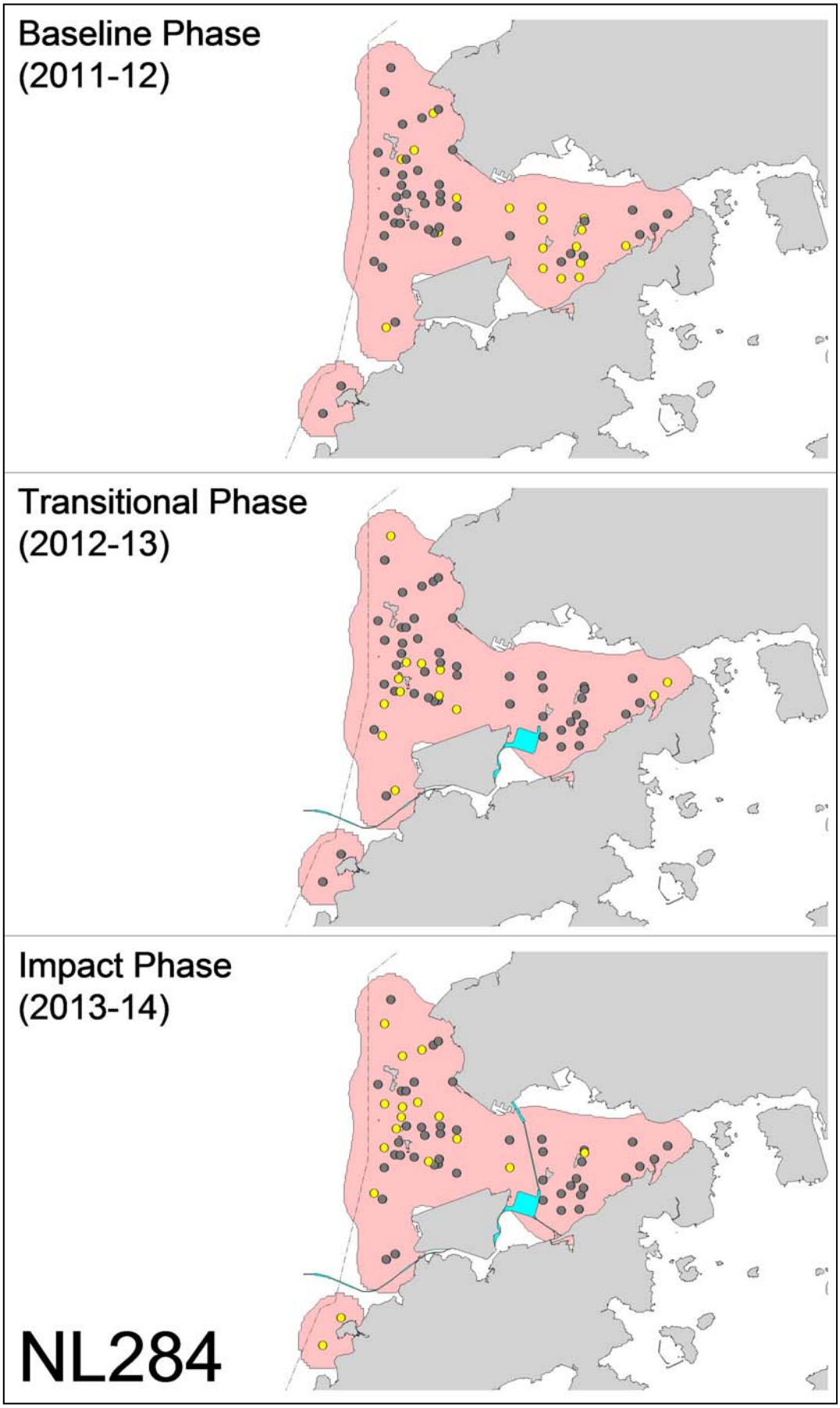
Appendix V. (cont'd)



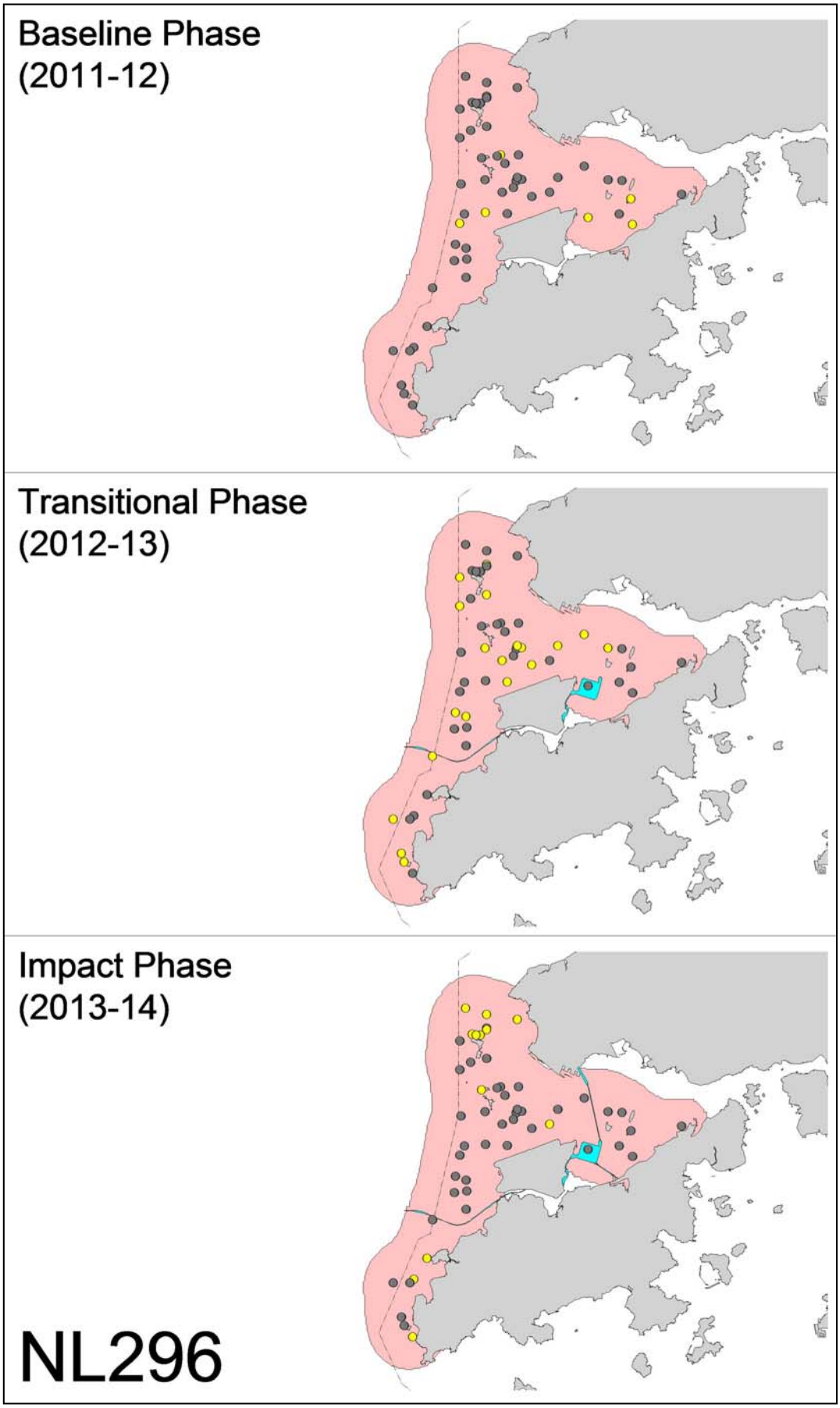
Appendix V. (cont'd)



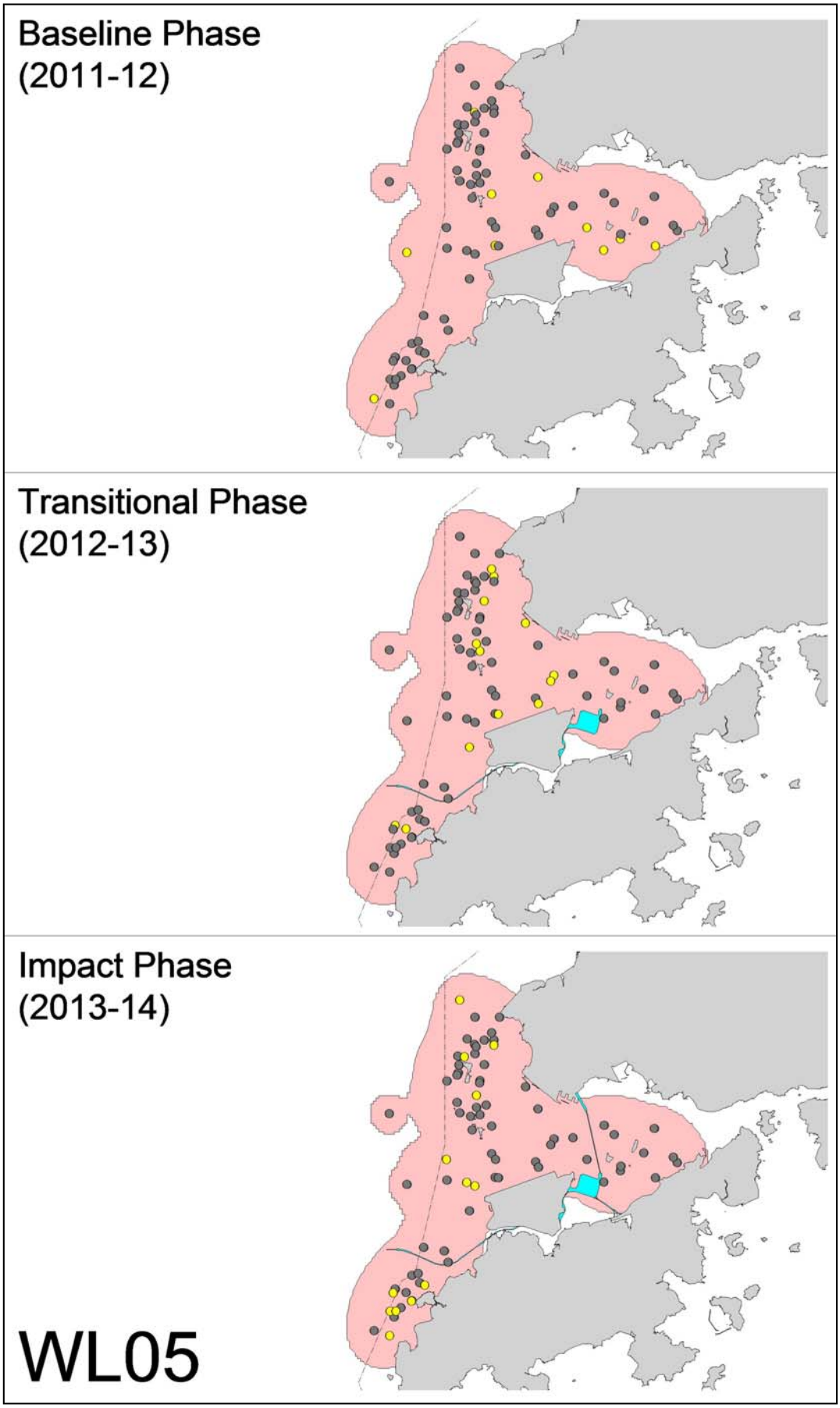
Appendix V. (cont'd)



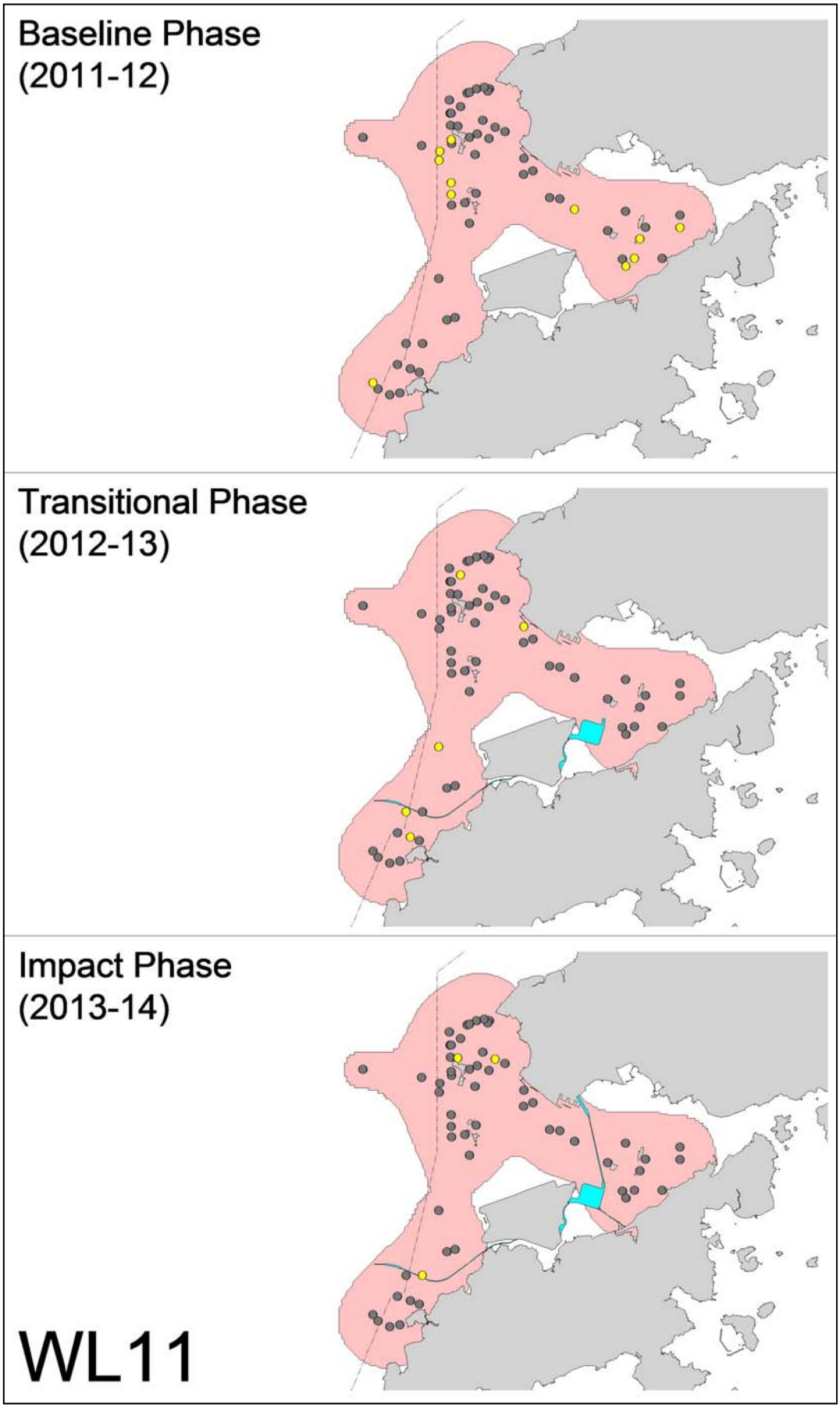
Appendix V. (cont'd)



Appendix V. (cont'd)



Appendix V. (cont'd)



Appendix V. (cont'd)