Monitoring of Chinese White Dolphins in Southwest Lantau Waters

12th Monthly Progress Report (February 2016)
submitted to Environmental Project Office for the HZMB HKLR, HZMB HKBCF and TM-CLKL – Investigation

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1. Introduction

1.1. In March 2015, Hong Kong Cetacean Research Project (HKCRP) was appointed by the Environmental Project Office for the HZMB Hong Kong Projects to undertake a monitoring study of Chinese White Dolphins in Southwest Lantau (SWL) waters.

1.2. The objectives of the monitoring study are to quantify the abundance and density of Chinese White Dolphins in SWL waters, to identify individuals during the monitoring surveys, and to analyze their range use and movement patterns in Hong Kong and the wider Pearl River Estuary waters.

1.3. The monitoring study will supplement the on-going EM&A monitoring results of the HZMB Hong Kong Projects in North and West Lantau waters, and provide a more complete picture of dolphin usage and movements between different survey areas in western Hong Kong waters.

1.4. The present report is the 12th monthly progress report under this dolphin monitoring study submitted to the Environmental Project Office, summarizing the survey findings during the month of February 2016.

2. Monitoring Methodology

2.1. Vessel-based Line-transect Survey

2.1.1. According to the requirement of the technical proposal submitted to the Environmental

Project Office, dolphin monitoring programme should cover all transect lines in SWL survey area (see Figure 1) once per month upon instruction. The co-ordinates of all transect lines conducted during the dolphin monitoring survey are shown in Table 1.

Table 1. Co-ordinates of transect lines in SWL survey area (corresponding to transect line layout as shown in Figure 1)

Line #		Northing	Easting		Line #		Northing	Easting
SWL001	1	806180	802510		SWL007	13	807380	808520
	2	804250	802510			14	805600	808520
SWL002	3	806710	803480			15	804400	808520
	4	803450	803480			16	803000	808520
SWL003	5	807270	804500			17	802100	808520
	6	802690	804500			18	800470	808520
SWL004	7	807590	805450		SWL008	19	807380	809550
	8	802295	805450			20	805050	809550
SWL005	9	808490	806500			21	804400	809550
	10	801410	806500			22	800470	809550
SWL006	11	808500	807430		SWL009	23	807380	810550
	12	801250	807430			24	800470	810550
					SWL010	25	809410	811510
						26	801470	811510

2.1.2. The HKCRP 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 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 from HKCRP (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° and 90° (in relation to the bow, which is defined as 0°). One to two additional experienced observer was 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, position (latitude and longitude), weather conditions (Beaufort sea state and visibility), and distance traveled in each series (a continuous period of search effort) with the assistance of a handheld GPS (*Garmin eTrex Legend*).

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 as well as the section around the Soko Islands was labeled as “secondary” survey effort. Both primary and secondary survey effort were presented as on-effort survey effort in this report.

2.1.8. Encounter rates of Chinese White Dolphins (number of on-effort sightings per 100 km of survey effort and number of dolphins from all on-effort sightings per 100 km of survey effort) were calculated in SWL survey area 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 encounter rate analysis. Dolphin encounter rates were calculated using the combined survey effort from both primary and secondary lines for comparison to the historical data collected by HKCRP in this survey area. For the historical data, the encounter rates were calculated by pooling all relevant survey effort

and dolphin sightings to calculate a single index.

2.2. Photo-identification Work

2.2.1. When a group of Chinese White Dolphins were sighted during the line-transect survey, the survey team would end effort and approach the group slowly from the side and behind to take photographs of them. Every attempt was made to photograph every dolphin in the group, and even photograph both sides of the dolphins, since the colouration and markings on both sides may not be symmetrical.

2.2.2. A professional digital camera (*Canon* EOS 7D 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. For individual dolphins that are not readily identifiable from the catalogue but have distinct features on their bodies, they will be placed in a pool of "potential new individuals", with decision being made at the end of each year on whether any of them should be incorporated into the photo-ID catalogue.

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.

3. Monitoring Results

3.1. Vessel-based Line-transect Survey

3.1.1. One set of systematic line-transect vessel survey was conducted under the present

monitoring study on February 17th to cover all transect lines in SWL survey area once. The route and track log of this survey are presented in Figure 2 and Appendix I respectively).

3.1.2. In addition, three line-transect surveys were also conducted under the AFCD long-term marine mammal monitoring programme in SWL survey area on February 4th (with lines no. SWL004, SWL006 and SWL008 covered), February 19th (with lines no. SWL003, SWL005 and SWL007 covered), and February 23rd (with lines no. SWL005, SWL007 and SWL009 covered). Such monitoring data were also incorporated into the present study for various analyses.

3.1.3. For the present study alone, a total of 70.87 km of survey effort was collected from 10:55 to 16:25 (i.e. 5 hours and 30 minutes of survey time) on February 17th, with 100% of the total survey effort being conducted under favourable weather conditions (i.e. Beaufort Sea State 3 or below with good visibility) (Appendix II). The total survey effort conducted on primary and secondary lines were 55.03 km and 15.84 km respectively.

3.1.4. For the combined monitoring dataset from both the present study and AFCD monitoring study, a total of 140.10 km of survey effort was collected in SWL waters in February 2016.

3.1.5. During this month, five groups of 10 Chinese White Dolphins were sighted from the present study's survey and one of the AFCD monitoring surveys conducted in SWL survey area (Appendix III). All five dolphin groups were sighted during on-effort search, and only one of them was made on primary line. One of these dolphin groups was associated with an operating gill-netter.

3.1.6. Notably, five groups of 22 finless porpoises were also sighted in SWL survey area during this monitoring month.

3.1.7. Distribution of dolphin sightings made in February 2016 is shown in Figure 3. These dolphin groups were all sighted near the coastline from Kau Ling Chau to Shui Hau Peninsula, with no particular concentration (Figure 3).

3.1.8. Encounter rates of Chinese White Dolphins deduced from the survey effort and on-effort sighting data made under favourable conditions (Beaufort 3 or below) in February 2016 are shown in Table 2. Comparison of encounter rates was also made to the one deduced in winter months (December-February) in the past decade (2005-14) (Table 2).

Table 2. Overall dolphin encounter rates (sightings per 100 km of survey effort) from the present monitoring survey and combined database with AFCD monitoring survey conducted in February 2016 (primary lines only, as well as both primary lines and secondary lines were used) in SWL survey area in comparison to the ones deduced during winter months (December-February 2005-14) in the past decade

	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)	
	Primary Lines Only	Both Primary and Secondary Lines	Primary Lines Only	Both Primary and Secondary Lines
HYD-HZMB data (February 2016)	1.82	4.23	5.45	9.88
Combined data (February 2016)	1.11	3.79	3.32	7.58
Historical Data (Winter 2005-14)		3.32		10.88

3.1.9. From the combined data of HYD-HZMB and AFCD monitoring surveys, the overall encounter rates based on the number of dolphin sightings (ER(STG)) and the total number of dolphins (ER(ANI)) deduced in February 2016 in SWL waters were similar to the ones deduced from the historical data during the winter months of 2005-14 (Table 2).

3.1.10. The average group size of Chinese White Dolphins in February 2016 was 2.0 animals per group, which was lower than the average group size in winter months of 2005-14 (3.3). All five dolphin groups were quite small with only 1-3 animals per group.

3.2. Photo-identification Work

3.2.1. Attempts were made to photograph the dolphins sighted during all surveys conducted in February 2016.

3.2.2. Among the 10 dolphins sighted during this month's surveys, four individual dolphins were identified and re-sighted six times in total (Appendices IV and V). None of these individuals was accompanied by her young calf.

3.2.3. The locations where all four individuals being re-sighted were well within their past home ranges in SWL and WL waters.

4. References

Buckland, S. T., Anderson, D. R., Burnham, K. P., Laake, J. L., Borchers, D. L., and Thomas, L.

2001. Introduction to distance sampling: estimating abundance of biological populations. Oxford University Press, London.

Hung, S. K. 2014. Monitoring of Marine Mammals in Hong Kong waters: final report (2013-14). An unpublished report submitted to the Agriculture, Fisheries and Conservation Department, 231 pp.

Jefferson, T. A. 2000. Population biology of the Indo-Pacific hump-backed dolphin in Hong Kong waters. Wildlife Monographs 144:1-65.

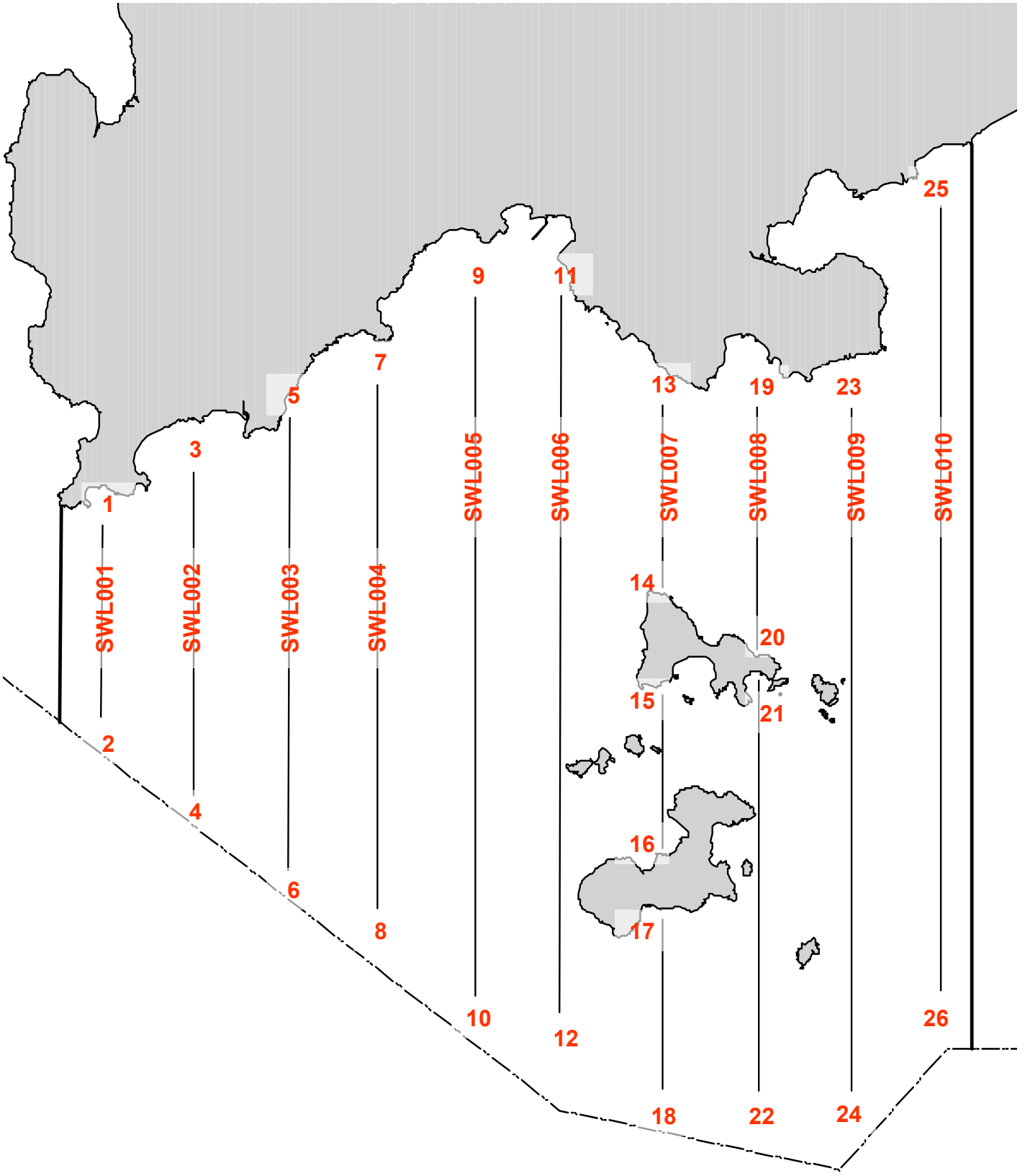

Figure 1. Survey Lines and associated coordinates in Southwest Lantau survey area

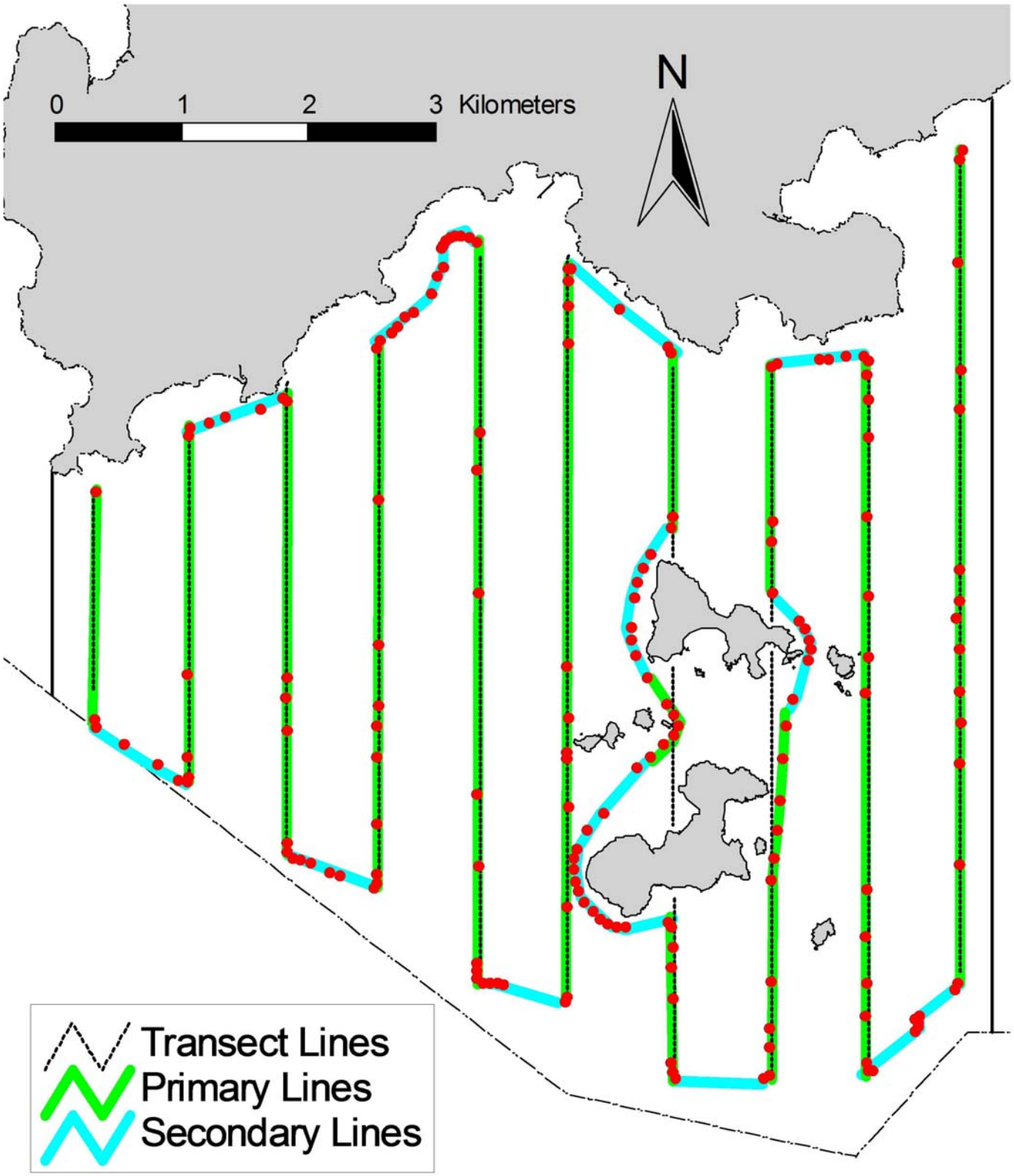

Figure 2. Survey Route on February 17th, 2016 (note: red dots represent the tracked positions of survey boat logged continuously by GPS throughout the course of the survey)

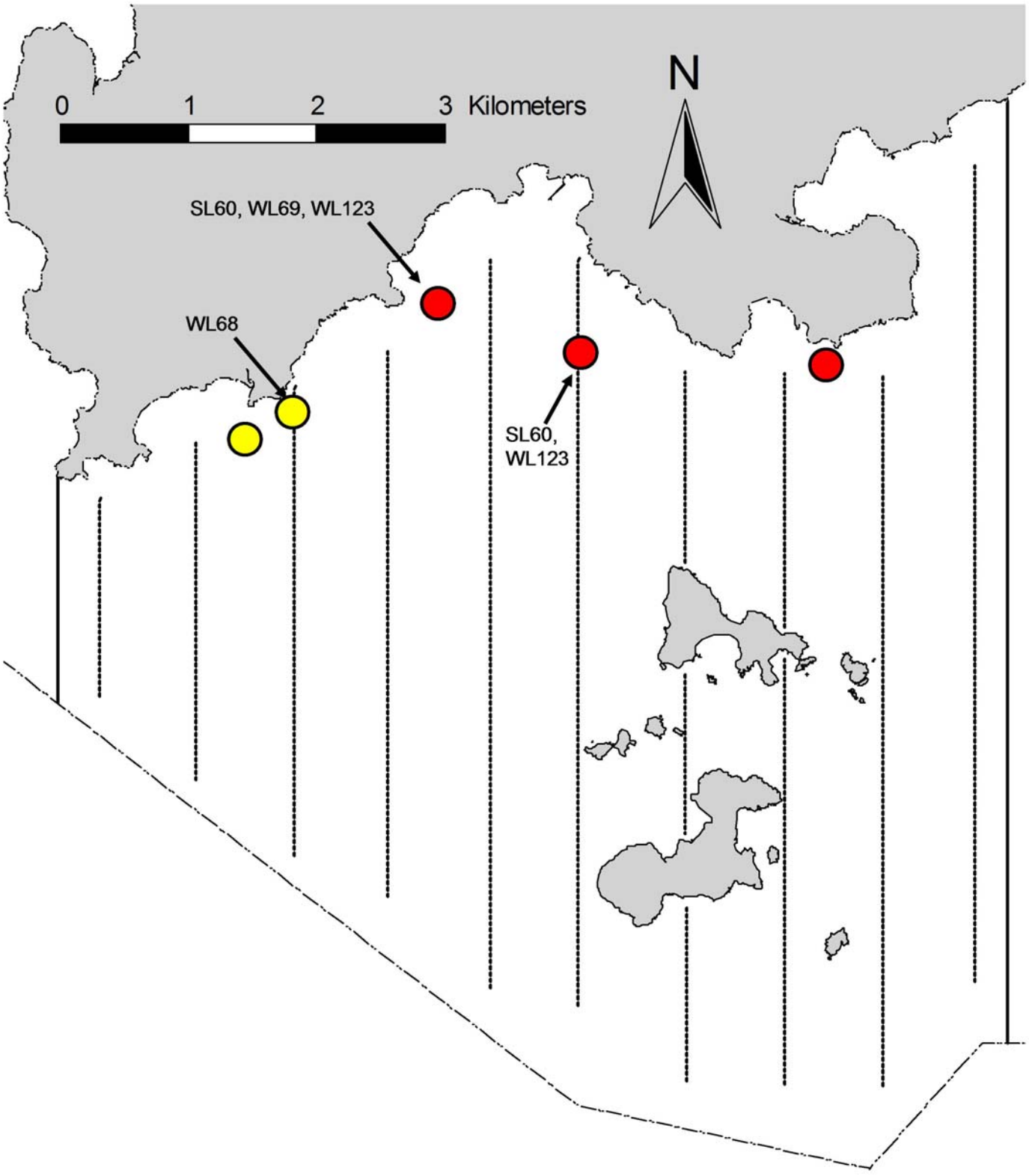

Figure 3. Distribution of Chinese White Dolphin sightings during February 2016 monitoring surveys in Southwest Lantau survey area, with identified individuals indicated for their corresponding sightings (red dot: HYD-HZMB sighting; yellow dot: AFCD sighting)

Appendix I. Track Log of Southwest Lantau Survey on Feb. 17th, 2016

Date & Time	EFFORT	Position	Leg Length	Leg Time	Leg Speed
17/2/2016 10:55	ON	N22.19393 E113.84964			
17/2/2016 10:55	ON	N22.19343 E113.84969	56 m	0:00:19	11 kph
17/2/2016 10:55	ON	N22.19321 E113.84970	25 m	0:00:13	7 kph
17/2/2016 10:55	ON	N22.19311 E113.84969	11 m	0:00:07	6 kph
17/2/2016 10:56	ON	N22.19275 E113.84966	40 m	0:00:23	6 kph
17/2/2016 10:56	ON	N22.19221 E113.84963	61 m	0:00:22	10 kph
17/2/2016 10:57	ON	N22.19142 E113.84956	88 m	0:00:23	14 kph
17/2/2016 10:57	ON	N22.19073 E113.84959	76 m	0:00:19	14 kph
17/2/2016 10:57	ON	N22.18985 E113.84958	98 m	0:00:24	15 kph
17/2/2016 10:58	ON	N22.18885 E113.84956	111 m	0:00:27	15 kph
17/2/2016 10:58	ON	N22.18792 E113.84957	103 m	0:00:25	15 kph
17/2/2016 10:58	ON	N22.18724 E113.84954	77 m	0:00:19	15 kph
17/2/2016 10:59	ON	N22.18627 E113.84955	108 m	0:00:26	15 kph
17/2/2016 10:59	ON	N22.18541 E113.84956	95 m	0:00:23	15 kph
17/2/2016 11:00	ON	N22.18442 E113.84954	111 m	0:00:27	15 kph
17/2/2016 11:00	ON	N22.18346 E113.84950	107 m	0:00:26	15 kph
17/2/2016 11:01	ON	N22.18246 E113.84949	111 m	0:00:27	15 kph
17/2/2016 11:01	ON	N22.18175 E113.84949	78 m	0:00:19	15 kph
17/2/2016 11:01	ON	N22.18135 E113.84947	45 m	0:00:11	15 kph
17/2/2016 11:01	ON	N22.18064 E113.84948	79 m	0:00:19	15 kph
17/2/2016 11:02	ON	N22.17972 E113.84953	103 m	0:00:25	15 kph
17/2/2016 11:02	ON	N22.17861 E113.84950	123 m	0:00:30	15 kph
17/2/2016 11:03	ON	N22.17750 E113.84954	124 m	0:00:30	15 kph
17/2/2016 11:03	ON	N22.17661 E113.84954	98 m	0:00:24	15 kph
17/2/2016 11:04	ON	N22.17557 E113.84958	117 m	0:00:28	15 kph
17/2/2016 11:04	ON	N22.17449 E113.84953	119 m	0:00:29	15 kph
17/2/2016 11:05	ON	N22.17368 E113.84952	91 m	0:00:22	15 kph
17/2/2016 11:05	ON	N22.17294 E113.84974	85 m	0:00:22	14 kph
17/2/2016 11:05	ON	N22.17241 E113.85057	104 m	0:00:27	14 kph
17/2/2016 11:06	ON	N22.17195 E113.85148	107 m	0:00:27	14 kph
17/2/2016 11:06	ON	N22.17149 E113.85240	108 m	0:00:27	14 kph
17/2/2016 11:07	ON	N22.17102 E113.85329	106 m	0:00:27	14 kph
17/2/2016 11:07	ON	N22.17056 E113.85408	96 m	0:00:24	14 kph
17/2/2016 11:08	ON	N22.17008 E113.85502	111 m	0:00:28	14 kph
17/2/2016 11:08	ON	N22.16960 E113.85593	108 m	0:00:27	14 kph
17/2/2016 11:08	ON	N22.16914 E113.85670	95 m	0:00:24	14 kph
17/2/2016 11:09	ON	N22.16877 E113.85731	74 m	0:00:19	14 kph
17/2/2016 11:09	ON	N22.16834 E113.85802	87 m	0:00:22	14 kph
17/2/2016 11:09	ON	N22.16814 E113.85878	82 m	0:00:23	13 kph
17/2/2016 11:10	ON	N22.16864 E113.85901	61 m	0:00:19	12 kph
17/2/2016 11:10	ON	N22.16951 E113.85889	97 m	0:00:25	14 kph
17/2/2016 11:11	ON	N22.17037 E113.85882	96 m	0:00:25	14 kph
17/2/2016 11:11	ON	N22.17131 E113.85883	105 m	0:00:27	14 kph
17/2/2016 11:11	ON	N22.17210 E113.85889	88 m	0:00:23	14 kph
17/2/2016 11:12	ON	N22.17290 E113.85893	89 m	0:00:23	14 kph
17/2/2016 11:12	ON	N22.17365 E113.85890	84 m	0:00:22	14 kph
17/2/2016 11:13	ON	N22.17431 E113.85888	73 m	0:00:19	14 kph
17/2/2016 11:13	ON	N22.17483 E113.85889	58 m	0:00:15	14 kph
17/2/2016 11:13	ON	N22.17542 E113.85890	66 m	0:00:18	13 kph
17/2/2016 11:13	ON	N22.17616 E113.85891	83 m	0:00:22	14 kph
17/2/2016 11:14	ON	N22.17687 E113.85891	79 m	0:00:21	13 kph
17/2/2016 11:14	ON	N22.17772 E113.85889	95 m	0:00:25	14 kph
17/2/2016 11:15	ON	N22.17865 E113.85892	103 m	0:00:27	14 kph
17/2/2016 11:15	ON	N22.17949 E113.85895	93 m	0:00:24	14 kph
17/2/2016 11:15	ON	N22.18028 E113.85892	89 m	0:00:23	14 kph
17/2/2016 11:16	ON	N22.18115 E113.85892	97 m	0:00:25	14 kph
17/2/2016 11:16	ON	N22.18204 E113.85891	99 m	0:00:25	14 kph
17/2/2016 11:17	ON	N22.18299 E113.85893	106 m	0:00:27	14 kph
17/2/2016 11:17	ON	N22.18393 E113.85892	105 m	0:00:27	14 kph
17/2/2016 11:18	ON	N22.18485 E113.85887	101 m	0:00:26	14 kph
17/2/2016 11:18	ON	N22.18547 E113.85891	70 m	0:00:18	14 kph
17/2/2016 11:18	ON	N22.18650 E113.85890	114 m	0:00:29	14 kph
17/2/2016 11:19	ON	N22.18734 E113.85893	94 m	0:00:24	14 kph
17/2/2016 11:19	ON	N22.18814 E113.85895	89 m	0:00:23	14 kph

Appendix I. (cont'd)

Date & Time	EFFORT	Position	Leg Length	Leg Time	Leg Speed
17/2/2016 11:19	ON	N22.18881 E113.85893	74 m	0:00:19	14 kph
17/2/2016 11:20	ON	N22.18964 E113.85890	93 m	0:00:24	14 kph
17/2/2016 11:20	ON	N22.19037 E113.85890	81 m	0:00:21	14 kph
17/2/2016 11:21	ON	N22.19125 E113.85891	98 m	0:00:25	14 kph
17/2/2016 11:21	ON	N22.19215 E113.85892	100 m	0:00:26	14 kph
17/2/2016 11:22	ON	N22.19312 E113.85889	108 m	0:00:28	14 kph
17/2/2016 11:22	ON	N22.19419 E113.85894	119 m	0:00:31	14 kph
17/2/2016 11:23	ON	N22.19520 E113.85887	113 m	0:00:29	14 kph
17/2/2016 11:23	ON	N22.19611 E113.85885	101 m	0:00:26	14 kph
17/2/2016 11:23	ON	N22.19701 E113.85890	100 m	0:00:26	14 kph
17/2/2016 11:24	ON	N22.19801 E113.85887	112 m	0:00:29	14 kph
17/2/2016 11:24	ON	N22.19889 E113.85889	97 m	0:00:25	14 kph
17/2/2016 11:25	ON	N22.19954 E113.85908	75 m	0:00:22	12 kph
17/2/2016 11:25	ON	N22.19980 E113.86001	99 m	0:00:26	14 kph
17/2/2016 11:26	ON	N22.20002 E113.86096	101 m	0:00:26	14 kph
17/2/2016 11:26	ON	N22.20025 E113.86163	74 m	0:00:19	14 kph
17/2/2016 11:26	ON	N22.20061 E113.86269	117 m	0:00:30	14 kph
17/2/2016 11:27	ON	N22.20077 E113.86358	94 m	0:00:24	14 kph
17/2/2016 11:27	ON	N22.20090 E113.86447	93 m	0:00:24	14 kph
17/2/2016 11:28	ON	N22.20107 E113.86533	90 m	0:00:23	14 kph
17/2/2016 11:28	ON	N22.20133 E113.86615	90 m	0:00:23	14 kph
17/2/2016 11:28	ON	N22.20167 E113.86714	109 m	0:00:28	14 kph
17/2/2016 11:29	ON	N22.20191 E113.86780	73 m	0:00:19	14 kph
17/2/2016 11:29	ON	N22.20223 E113.86851	82 m	0:00:22	13 kph
17/2/2016 11:29	ON	N22.20195 E113.86886	46 m	0:00:17	10 kph
17/2/2016 11:30	ON	N22.20112 E113.86888	93 m	0:00:23	14 kph
17/2/2016 11:30	ON	N22.20024 E113.86887	98 m	0:00:24	15 kph
17/2/2016 11:31	ON	N22.19930 E113.86889	105 m	0:00:26	15 kph
17/2/2016 11:31	ON	N22.19839 E113.86884	101 m	0:00:25	15 kph
17/2/2016 11:31	ON	N22.19746 E113.86885	104 m	0:00:26	14 kph
17/2/2016 11:32	ON	N22.19645 E113.86887	113 m	0:00:28	14 kph
17/2/2016 11:32	ON	N22.19548 E113.86889	108 m	0:00:27	14 kph
17/2/2016 11:33	ON	N22.19469 E113.86889	88 m	0:00:22	14 kph
17/2/2016 11:33	ON	N22.19402 E113.86887	75 m	0:00:19	14 kph
17/2/2016 11:33	ON	N22.19308 E113.86887	104 m	0:00:26	14 kph
17/2/2016 11:34	ON	N22.19229 E113.86892	88 m	0:00:22	14 kph
17/2/2016 11:34	ON	N22.19124 E113.86891	118 m	0:00:29	15 kph
17/2/2016 11:35	ON	N22.19041 E113.86886	93 m	0:00:23	15 kph
17/2/2016 11:35	ON	N22.18965 E113.86891	84 m	0:00:21	14 kph
17/2/2016 11:35	ON	N22.18874 E113.86885	102 m	0:00:25	15 kph
17/2/2016 11:36	ON	N22.18787 E113.86881	97 m	0:00:24	15 kph
17/2/2016 11:36	ON	N22.18692 E113.86884	106 m	0:00:26	15 kph
17/2/2016 11:37	ON	N22.18600 E113.86884	102 m	0:00:25	15 kph
17/2/2016 11:37	ON	N22.18504 E113.86886	107 m	0:00:26	15 kph
17/2/2016 11:38	ON	N22.18405 E113.86883	110 m	0:00:27	15 kph
17/2/2016 11:38	ON	N22.18323 E113.86883	91 m	0:00:22	15 kph
17/2/2016 11:38	ON	N22.18225 E113.86888	110 m	0:00:27	15 kph
17/2/2016 11:39	ON	N22.18122 E113.86883	114 m	0:00:28	15 kph
17/2/2016 11:39	ON	N22.18018 E113.86888	117 m	0:00:29	14 kph
17/2/2016 11:40	ON	N22.17927 E113.86886	100 m	0:00:25	14 kph
17/2/2016 11:40	ON	N22.17840 E113.86887	97 m	0:00:24	15 kph
17/2/2016 11:41	ON	N22.17747 E113.86891	103 m	0:00:25	15 kph
17/2/2016 11:41	ON	N22.17652 E113.86882	106 m	0:00:26	15 kph
17/2/2016 11:41	ON	N22.17562 E113.86880	101 m	0:00:25	15 kph
17/2/2016 11:42	ON	N22.17475 E113.86886	97 m	0:00:24	15 kph
17/2/2016 11:42	ON	N22.17376 E113.86889	110 m	0:00:27	15 kph
17/2/2016 11:43	ON	N22.17277 E113.86893	110 m	0:00:27	15 kph
17/2/2016 11:43	ON	N22.17197 E113.86892	89 m	0:00:22	15 kph
17/2/2016 11:44	ON	N22.17110 E113.86895	97 m	0:00:24	15 kph
17/2/2016 11:44	ON	N22.17023 E113.86892	97 m	0:00:24	15 kph
17/2/2016 11:44	ON	N22.16910 E113.86890	125 m	0:00:31	15 kph
17/2/2016 11:45	ON	N22.16819 E113.86890	101 m	0:00:25	15 kph
17/2/2016 11:45	ON	N22.16729 E113.86893	101 m	0:00:25	15 kph
17/2/2016 11:46	ON	N22.16638 E113.86890	102 m	0:00:25	15 kph

Appendix I. (cont'd)

Date & Time	EFFORT	Position	Leg Length	Leg Time	Leg Speed
17/2/2016 11:46	ON	N22.16550 E113.86884	98 m	0:00:24	15 kph
17/2/2016 11:47	ON	N22.16447 E113.86887	114 m	0:00:28	15 kph
17/2/2016 11:47	ON	N22.16363 E113.86885	94 m	0:00:23	15 kph
17/2/2016 11:47	ON	N22.16283 E113.86892	89 m	0:00:22	15 kph
17/2/2016 11:48	ON	N22.16194 E113.86898	100 m	0:00:25	14 kph
17/2/2016 11:48	ON	N22.16144 E113.86953	79 m	0:00:22	13 kph
17/2/2016 11:48	ON	N22.16116 E113.87029	85 m	0:00:22	14 kph
17/2/2016 11:49	ON	N22.16095 E113.87126	103 m	0:00:27	14 kph
17/2/2016 11:49	ON	N22.16060 E113.87232	116 m	0:00:30	14 kph
17/2/2016 11:50	ON	N22.16019 E113.87332	113 m	0:00:29	14 kph
17/2/2016 11:50	ON	N22.15979 E113.87433	113 m	0:00:29	14 kph
17/2/2016 11:51	ON	N22.15948 E113.87523	99 m	0:00:26	14 kph
17/2/2016 11:51	ON	N22.15921 E113.87612	96 m	0:00:25	14 kph
17/2/2016 11:52	ON	N22.15895 E113.87706	101 m	0:00:26	14 kph
17/2/2016 11:52	ON	N22.15880 E113.87773	72 m	0:00:19	14 kph
17/2/2016 11:52	ON	N22.15920 E113.87797	51 m	0:00:18	10 kph
17/2/2016 11:53	ON	N22.16004 E113.87804	93 m	0:00:25	13 kph
17/2/2016 11:53	ON	N22.16098 E113.87801	105 m	0:00:27	14 kph
17/2/2016 11:54	ON	N22.16195 E113.87798	108 m	0:00:28	14 kph
17/2/2016 11:54	ON	N22.16284 E113.87805	100 m	0:00:26	14 kph
17/2/2016 11:54	ON	N22.16368 E113.87808	93 m	0:00:24	14 kph
17/2/2016 11:55	ON	N22.16444 E113.87812	85 m	0:00:22	14 kph
17/2/2016 11:55	ON	N22.16543 E113.87810	110 m	0:00:28	14 kph
17/2/2016 11:56	ON	N22.16637 E113.87806	106 m	0:00:27	14 kph
17/2/2016 11:56	ON	N22.16739 E113.87808	113 m	0:00:29	14 kph
17/2/2016 11:57	ON	N22.16838 E113.87813	110 m	0:00:28	14 kph
17/2/2016 11:57	ON	N22.16955 E113.87804	131 m	0:00:33	14 kph
17/2/2016 11:58	ON	N22.17044 E113.87801	98 m	0:00:25	14 kph
17/2/2016 11:58	ON	N22.17137 E113.87803	104 m	0:00:27	14 kph
17/2/2016 11:59	ON	N22.17235 E113.87804	109 m	0:00:28	14 kph
17/2/2016 11:59	ON	N22.17320 E113.87804	94 m	0:00:24	14 kph
17/2/2016 11:59	ON	N22.17418 E113.87809	109 m	0:00:28	14 kph
17/2/2016 12:00	ON	N22.17499 E113.87812	90 m	0:00:23	14 kph
17/2/2016 12:00	ON	N22.17594 E113.87813	106 m	0:00:27	14 kph
17/2/2016 12:01	ON	N22.17703 E113.87807	122 m	0:00:31	14 kph
17/2/2016 12:01	ON	N22.17819 E113.87810	129 m	0:00:33	14 kph
17/2/2016 12:02	ON	N22.17917 E113.87808	109 m	0:00:28	14 kph
17/2/2016 12:02	ON	N22.18026 E113.87808	121 m	0:00:31	14 kph
17/2/2016 12:03	ON	N22.18124 E113.87804	109 m	0:00:28	14 kph
17/2/2016 12:03	ON	N22.18237 E113.87802	125 m	0:00:32	14 kph
17/2/2016 12:04	ON	N22.18321 E113.87807	94 m	0:00:24	14 kph
17/2/2016 12:04	ON	N22.18420 E113.87808	111 m	0:00:28	14 kph
17/2/2016 12:05	ON	N22.18502 E113.87809	91 m	0:00:23	14 kph
17/2/2016 12:05	ON	N22.18568 E113.87810	73 m	0:00:19	14 kph
17/2/2016 12:05	ON	N22.18659 E113.87811	102 m	0:00:26	14 kph
17/2/2016 12:06	ON	N22.18750 E113.87807	102 m	0:00:26	14 kph
17/2/2016 12:06	ON	N22.18834 E113.87810	94 m	0:00:24	14 kph
17/2/2016 12:07	ON	N22.18936 E113.87808	113 m	0:00:29	14 kph
17/2/2016 12:07	ON	N22.19022 E113.87815	97 m	0:00:25	14 kph
17/2/2016 12:07	ON	N22.19116 E113.87810	105 m	0:00:27	14 kph
17/2/2016 12:08	ON	N22.19211 E113.87810	106 m	0:00:27	14 kph
17/2/2016 12:09	ON	N22.19334 E113.87809	137 m	0:00:35	14 kph
17/2/2016 12:09	ON	N22.19436 E113.87808	114 m	0:00:29	14 kph
17/2/2016 12:09	ON	N22.19517 E113.87814	90 m	0:00:23	14 kph
17/2/2016 12:10	ON	N22.19615 E113.87814	109 m	0:00:28	14 kph
17/2/2016 12:10	ON	N22.19713 E113.87805	110 m	0:00:28	14 kph
17/2/2016 12:11	ON	N22.19805 E113.87806	103 m	0:00:26	14 kph
17/2/2016 12:11	ON	N22.19905 E113.87804	111 m	0:00:28	14 kph
17/2/2016 12:12	ON	N22.19992 E113.87808	97 m	0:00:25	14 kph
17/2/2016 12:12	ON	N22.20100 E113.87805	121 m	0:00:31	14 kph
17/2/2016 12:13	ON	N22.20185 E113.87803	94 m	0:00:24	14 kph
17/2/2016 12:13	ON	N22.20282 E113.87809	108 m	0:00:28	14 kph
17/2/2016 12:13	ON	N22.20376 E113.87808	105 m	0:00:27	14 kph
17/2/2016 12:14	ON	N22.20459 E113.87810	93 m	0:00:24	14 kph

Appendix I. (cont'd)

Date & Time	EFFORT	Position	Leg Length	Leg Time	Leg Speed
17/2/2016 12:14	ON	N22.20560 E113.87811	112 m	0:00:29	14 kph
17/2/2016 12:15	ON	N22.20659 E113.87802	111 m	0:00:29	14 kph
17/2/2016 12:15	ON	N22.20731 E113.87831	86 m	0:00:23	13 kph
17/2/2016 12:16	ON	N22.20768 E113.87885	69 m	0:00:18	14 kph
17/2/2016 12:16	ON	N22.20807 E113.87941	72 m	0:00:21	12 kph
17/2/2016 12:16	ON	N22.20819 E113.87956	21 m	0:00:10	8 kph
17/2/2016 12:16	OFF	N22.20836 E113.87975	27 m	0:00:19	5 kph
17/2/2016 12:17	OFF	N22.20850 E113.87989	21 m	0:00:22	3 kph
17/2/2016 12:17	OFF	N22.20858 E113.87995	11 m	0:00:17	2 kph
17/2/2016 12:17	OFF	N22.20862 E113.87998	6 m	0:00:13	2 kph
17/2/2016 12:17	OFF	N22.20863 E113.88001	4 m	0:00:12	1.1 kph
17/2/2016 12:18	OFF	N22.20866 E113.88003	3 m	0:00:10	1.2 kph
17/2/2016 12:18	OFF	N22.20874 E113.88011	12 m	0:00:08	6 kph
17/2/2016 12:18	ON	N22.20902 E113.88042	45 m	0:00:15	11 kph
17/2/2016 12:18	ON	N22.20917 E113.88057	22 m	0:00:06	13 kph
17/2/2016 12:18	ON	N22.20922 E113.88062	7 m	0:00:02	13 kph
17/2/2016 12:18	ON	N22.20929 E113.88069	11 m	0:00:03	13 kph
17/2/2016 12:18	ON	N22.20937 E113.88079	13 m	0:00:04	12 kph
17/2/2016 12:18	ON	N22.20947 E113.88105	29 m	0:00:11	10 kph
17/2/2016 12:19	ON	N22.20984 E113.88164	74 m	0:00:21	13 kph
17/2/2016 12:19	ON	N22.21036 E113.88223	84 m	0:00:22	14 kph
17/2/2016 12:19	ON	N22.21077 E113.88265	62 m	0:00:16	14 kph
17/2/2016 12:20	OFF	N22.21108 E113.88299	50 m	0:00:19	9 kph
17/2/2016 12:20	OFF	N22.21132 E113.88325	37 m	0:00:24	6 kph
17/2/2016 12:20	OFF	N22.21149 E113.88342	27 m	0:00:22	4 kph
17/2/2016 12:21	OFF	N22.21206 E113.88364	67 m	0:00:27	9 kph
17/2/2016 12:21	OFF	N22.21257 E113.88381	60 m	0:00:24	9 kph
17/2/2016 12:22	OFF	N22.21296 E113.88397	47 m	0:00:23	7 kph
17/2/2016 12:22	OFF	N22.21324 E113.88412	34 m	0:00:19	6 kph
17/2/2016 12:22	OFF	N22.21336 E113.88420	16 m	0:00:13	4 kph
17/2/2016 12:23	OFF	N22.21354 E113.88436	26 m	0:00:29	3 kph
17/2/2016 12:23	OFF	N22.21370 E113.88445	20 m	0:00:25	3 kph
17/2/2016 12:24	OFF	N22.21381 E113.88451	13 m	0:00:27	2 kph
17/2/2016 12:24	OFF	N22.21384 E113.88454	5 m	0:00:23	0.8 kph
17/2/2016 12:24	OFF	N22.21392 E113.88463	13 m	0:00:27	2 kph
17/2/2016 12:25	OFF	N22.21402 E113.88465	11 m	0:00:11	4 kph
17/2/2016 12:25	OFF	N22.21438 E113.88464	40 m	0:00:29	5 kph
17/2/2016 12:26	OFF	N22.21481 E113.88463	49 m	0:00:30	6 kph
17/2/2016 12:26	OFF	N22.21520 E113.88458	43 m	0:00:30	5 kph
17/2/2016 12:27	OFF	N22.21541 E113.88453	23 m	0:00:29	3 kph
17/2/2016 12:27	OFF	N22.21549 E113.88451	9 m	0:00:29	1.1 kph
17/2/2016 12:27	OFF	N22.21549 E113.88451	1 m	0:00:25	0.1 kph
17/2/2016 12:28	OFF	N22.21550 E113.88452	1 m	0:00:28	0.1 kph
17/2/2016 12:28	OFF	N22.21551 E113.88453	2 m	0:00:30	0.2 kph
17/2/2016 12:29	OFF	N22.21568 E113.88460	21 m	0:00:26	3 kph
17/2/2016 12:29	OFF	N22.21579 E113.88460	12 m	0:00:24	2 kph
17/2/2016 12:30	OFF	N22.21580 E113.88462	2 m	0:00:30	0.3 kph
17/2/2016 12:30	OFF	N22.21594 E113.88470	17 m	0:00:19	3 kph
17/2/2016 12:31	OFF	N22.21624 E113.88493	42 m	0:00:29	5 kph
17/2/2016 12:31	OFF	N22.21646 E113.88526	41 m	0:00:27	6 kph
17/2/2016 12:31	OFF	N22.21657 E113.88546	25 m	0:00:25	4 kph
17/2/2016 12:32	OFF	N22.21663 E113.88560	16 m	0:00:25	2 kph
17/2/2016 12:32	OFF	N22.21663 E113.88568	8 m	0:00:25	1.2 kph
17/2/2016 12:33	OFF	N22.21664 E113.88577	10 m	0:00:25	1.4 kph
17/2/2016 12:33	OFF	N22.21669 E113.88635	60 m	0:00:21	10 kph
17/2/2016 12:33	OFF	N22.21645 E113.88734	105 m	0:00:27	14 kph
17/2/2016 12:34	ON	N22.21610 E113.88806	84 m	0:00:22	14 kph
17/2/2016 12:34	ON	N22.21544 E113.88807	73 m	0:00:20	13 kph
17/2/2016 12:35	ON	N22.21461 E113.88809	92 m	0:00:23	14 kph
17/2/2016 12:35	ON	N22.21371 E113.88804	101 m	0:00:25	15 kph
17/2/2016 12:35	ON	N22.21287 E113.88804	93 m	0:00:23	15 kph
17/2/2016 12:36	ON	N22.21189 E113.88809	110 m	0:00:27	15 kph
17/2/2016 12:36	ON	N22.21109 E113.88820	89 m	0:00:22	15 kph
17/2/2016 12:36	ON	N22.21044 E113.88823	73 m	0:00:18	15 kph

Appendix I. (cont'd)

Date & Time	EFFORT	Position	Leg Length	Leg Time	Leg Speed
17/2/2016 12:37	ON	N22.20975 E113.88820	77 m	0:00:19	15 kph
17/2/2016 12:37	ON	N22.20899 E113.88821	84 m	0:00:21	14 kph
17/2/2016 12:37	ON	N22.20823 E113.88823	85 m	0:00:21	14 kph
17/2/2016 12:38	ON	N22.20736 E113.88820	97 m	0:00:24	15 kph
17/2/2016 12:38	ON	N22.20672 E113.88818	71 m	0:00:18	14 kph
17/2/2016 12:39	ON	N22.20600 E113.88818	80 m	0:00:20	14 kph
17/2/2016 12:39	ON	N22.20520 E113.88820	89 m	0:00:22	15 kph
17/2/2016 12:39	ON	N22.20447 E113.88820	81 m	0:00:20	15 kph
17/2/2016 12:40	ON	N22.20368 E113.88823	88 m	0:00:22	14 kph
17/2/2016 12:40	ON	N22.20292 E113.88822	84 m	0:00:21	14 kph
17/2/2016 12:40	ON	N22.20216 E113.88821	85 m	0:00:21	14 kph
17/2/2016 12:41	ON	N22.20141 E113.88821	84 m	0:00:21	14 kph
17/2/2016 12:41	ON	N22.20065 E113.88824	85 m	0:00:21	15 kph
17/2/2016 12:41	ON	N22.19988 E113.88828	85 m	0:00:21	15 kph
17/2/2016 12:42	ON	N22.19916 E113.88828	80 m	0:00:20	14 kph
17/2/2016 12:42	ON	N22.19829 E113.88823	98 m	0:00:24	15 kph
17/2/2016 12:42	ON	N22.19745 E113.88822	93 m	0:00:23	15 kph
17/2/2016 12:43	ON	N22.19665 E113.88823	89 m	0:00:22	15 kph
17/2/2016 12:43	ON	N22.19585 E113.88813	90 m	0:00:22	15 kph
17/2/2016 12:44	ON	N22.19509 E113.88813	85 m	0:00:21	15 kph
17/2/2016 12:44	ON	N22.19418 E113.88816	100 m	0:00:25	14 kph
17/2/2016 12:44	ON	N22.19331 E113.88817	97 m	0:00:24	15 kph
17/2/2016 12:45	ON	N22.19228 E113.88818	115 m	0:00:28	15 kph
17/2/2016 12:45	ON	N22.19122 E113.88821	118 m	0:00:29	15 kph
17/2/2016 12:46	ON	N22.19019 E113.88821	114 m	0:00:28	15 kph
17/2/2016 12:46	ON	N22.18921 E113.88821	109 m	0:00:27	15 kph
17/2/2016 12:47	ON	N22.18808 E113.88822	126 m	0:00:31	15 kph
17/2/2016 12:47	ON	N22.18719 E113.88819	98 m	0:00:24	15 kph
17/2/2016 12:48	ON	N22.18610 E113.88822	121 m	0:00:30	15 kph
17/2/2016 12:48	ON	N22.18497 E113.88822	126 m	0:00:31	15 kph
17/2/2016 12:49	ON	N22.18395 E113.88820	113 m	0:00:28	15 kph
17/2/2016 12:49	ON	N22.18298 E113.88822	108 m	0:00:27	14 kph
17/2/2016 12:50	ON	N22.18201 E113.88820	108 m	0:00:27	14 kph
17/2/2016 12:50	ON	N22.18104 E113.88816	108 m	0:00:27	14 kph
17/2/2016 12:50	ON	N22.17993 E113.88817	123 m	0:00:31	14 kph
17/2/2016 12:51	ON	N22.17894 E113.88821	111 m	0:00:28	14 kph
17/2/2016 12:51	ON	N22.17800 E113.88819	105 m	0:00:26	14 kph
17/2/2016 12:52	ON	N22.17697 E113.88821	115 m	0:00:29	14 kph
17/2/2016 12:52	ON	N22.17608 E113.88821	99 m	0:00:25	14 kph
17/2/2016 12:53	ON	N22.17512 E113.88819	107 m	0:00:27	14 kph
17/2/2016 12:53	ON	N22.17426 E113.88820	96 m	0:00:24	14 kph
17/2/2016 12:54	ON	N22.17329 E113.88819	108 m	0:00:27	14 kph
17/2/2016 12:54	ON	N22.17233 E113.88818	107 m	0:00:27	14 kph
17/2/2016 12:55	ON	N22.17135 E113.88824	109 m	0:00:28	14 kph
17/2/2016 12:55	ON	N22.17040 E113.88822	106 m	0:00:27	14 kph
17/2/2016 12:55	ON	N22.16954 E113.88823	96 m	0:00:24	14 kph
17/2/2016 12:56	ON	N22.16885 E113.88817	77 m	0:00:20	14 kph
17/2/2016 12:56	ON	N22.16792 E113.88812	104 m	0:00:26	14 kph
17/2/2016 12:57	ON	N22.16705 E113.88816	97 m	0:00:25	14 kph
17/2/2016 12:57	ON	N22.16608 E113.88825	108 m	0:00:28	14 kph
17/2/2016 12:57	ON	N22.16526 E113.88826	91 m	0:00:23	14 kph
17/2/2016 12:58	ON	N22.16441 E113.88824	95 m	0:00:24	14 kph
17/2/2016 12:58	ON	N22.16341 E113.88823	111 m	0:00:28	14 kph
17/2/2016 12:59	ON	N22.16249 E113.88828	102 m	0:00:26	14 kph
17/2/2016 12:59	ON	N22.16157 E113.88827	103 m	0:00:26	14 kph
17/2/2016 13:00	ON	N22.16072 E113.88832	95 m	0:00:24	14 kph
17/2/2016 13:00	ON	N22.15983 E113.88826	99 m	0:00:25	14 kph
17/2/2016 13:00	ON	N22.15906 E113.88827	86 m	0:00:22	14 kph
17/2/2016 13:01	ON	N22.15828 E113.88825	86 m	0:00:22	14 kph
17/2/2016 13:01	ON	N22.15746 E113.88829	92 m	0:00:24	14 kph
17/2/2016 13:02	ON	N22.15651 E113.88823	105 m	0:00:27	14 kph
17/2/2016 13:02	ON	N22.15564 E113.88823	97 m	0:00:25	14 kph
17/2/2016 13:02	ON	N22.15480 E113.88824	94 m	0:00:24	14 kph
17/2/2016 13:03	ON	N22.15418 E113.88823	68 m	0:00:17	14 kph

Appendix I. (cont'd)

Date & Time	EFFORT	Position	Leg Length	Leg Time	Leg Speed
17/2/2016 13:03	ON	N22.15359 E113.88824	66 m	0:00:17	14 kph
17/2/2016 13:03	ON	N22.15292 E113.88822	75 m	0:00:19	14 kph
17/2/2016 13:04	ON	N22.15219 E113.88818	81 m	0:00:21	14 kph
17/2/2016 13:04	ON	N22.15148 E113.88815	79 m	0:00:20	14 kph
17/2/2016 13:04	ON	N22.15070 E113.88822	87 m	0:00:23	14 kph
17/2/2016 13:05	ON	N22.15038 E113.88880	70 m	0:00:21	12 kph
17/2/2016 13:05	ON	N22.15030 E113.88952	75 m	0:00:21	13 kph
17/2/2016 13:05	ON	N22.15025 E113.89018	68 m	0:00:19	13 kph
17/2/2016 13:06	ON	N22.15021 E113.89077	61 m	0:00:17	13 kph
17/2/2016 13:06	ON	N22.15000 E113.89161	89 m	0:00:25	13 kph
17/2/2016 13:06	ON	N22.14971 E113.89250	98 m	0:00:27	13 kph
17/2/2016 13:07	ON	N22.14955 E113.89336	89 m	0:00:24	13 kph
17/2/2016 13:07	ON	N22.14945 E113.89401	68 m	0:00:19	13 kph
17/2/2016 13:08	ON	N22.14921 E113.89484	90 m	0:00:25	13 kph
17/2/2016 13:08	ON	N22.14895 E113.89560	83 m	0:00:23	13 kph
17/2/2016 13:08	ON	N22.14875 E113.89639	85 m	0:00:23	13 kph
17/2/2016 13:09	ON	N22.14865 E113.89711	75 m	0:00:22	12 kph
17/2/2016 13:09	ON	N22.14909 E113.89722	50 m	0:00:17	11 kph
17/2/2016 13:09	ON	N22.14985 E113.89712	85 m	0:00:22	14 kph
17/2/2016 13:10	ON	N22.15059 E113.89713	82 m	0:00:21	14 kph
17/2/2016 13:10	ON	N22.15147 E113.89717	98 m	0:00:25	14 kph
17/2/2016 13:11	ON	N22.15238 E113.89719	101 m	0:00:26	14 kph
17/2/2016 13:11	ON	N22.15319 E113.89716	91 m	0:00:23	14 kph
17/2/2016 13:11	ON	N22.15401 E113.89715	90 m	0:00:23	14 kph
17/2/2016 13:12	ON	N22.15474 E113.89721	82 m	0:00:21	14 kph
17/2/2016 13:12	ON	N22.15549 E113.89722	83 m	0:00:21	14 kph
17/2/2016 13:12	ON	N22.15619 E113.89722	79 m	0:00:20	14 kph
17/2/2016 13:13	ON	N22.15710 E113.89721	101 m	0:00:25	15 kph
17/2/2016 13:13	ON	N22.15801 E113.89717	102 m	0:00:25	15 kph
17/2/2016 13:14	ON	N22.15878 E113.89716	85 m	0:00:21	15 kph
17/2/2016 13:14	ON	N22.15950 E113.89714	81 m	0:00:20	15 kph
17/2/2016 13:14	ON	N22.16037 E113.89715	97 m	0:00:24	15 kph
17/2/2016 13:15	ON	N22.16100 E113.89720	71 m	0:00:18	14 kph
17/2/2016 13:15	ON	N22.16177 E113.89723	86 m	0:00:22	14 kph
17/2/2016 13:15	ON	N22.16264 E113.89725	96 m	0:00:25	14 kph
17/2/2016 13:16	ON	N22.16357 E113.89730	104 m	0:00:27	14 kph
17/2/2016 13:16	ON	N22.16437 E113.89728	89 m	0:00:23	14 kph
17/2/2016 13:17	ON	N22.16512 E113.89730	84 m	0:00:22	14 kph
17/2/2016 13:17	ON	N22.16601 E113.89732	99 m	0:00:26	14 kph
17/2/2016 13:17	ON	N22.16677 E113.89724	85 m	0:00:22	14 kph
17/2/2016 13:18	ON	N22.16718 E113.89722	46 m	0:00:15	11 kph
17/2/2016 13:18	ON	N22.16797 E113.89717	88 m	0:00:23	14 kph
17/2/2016 13:18	ON	N22.16877 E113.89718	90 m	0:00:23	14 kph
17/2/2016 13:19	ON	N22.16969 E113.89720	102 m	0:00:26	14 kph
17/2/2016 13:19	ON	N22.17029 E113.89720	67 m	0:00:17	14 kph
17/2/2016 13:19	ON	N22.17090 E113.89719	67 m	0:00:17	14 kph
17/2/2016 13:20	ON	N22.17161 E113.89727	79 m	0:00:20	14 kph
17/2/2016 13:20	ON	N22.17232 E113.89727	79 m	0:00:20	14 kph
17/2/2016 13:20	ON	N22.17310 E113.89734	88 m	0:00:23	14 kph
17/2/2016 13:21	ON	N22.17386 E113.89736	85 m	0:00:22	14 kph
17/2/2016 13:21	ON	N22.17470 E113.89733	93 m	0:00:24	14 kph
17/2/2016 13:22	ON	N22.17565 E113.89727	106 m	0:00:27	14 kph
17/2/2016 13:22	ON	N22.17660 E113.89725	106 m	0:00:27	14 kph
17/2/2016 13:23	ON	N22.17759 E113.89726	110 m	0:00:28	14 kph
17/2/2016 13:23	ON	N22.17848 E113.89724	99 m	0:00:25	14 kph
17/2/2016 13:23	ON	N22.17940 E113.89727	103 m	0:00:26	14 kph
17/2/2016 13:24	ON	N22.18033 E113.89729	103 m	0:00:26	14 kph
17/2/2016 13:24	ON	N22.18122 E113.89731	100 m	0:00:25	14 kph
17/2/2016 13:25	ON	N22.18219 E113.89733	108 m	0:00:27	14 kph
17/2/2016 13:25	ON	N22.18319 E113.89731	111 m	0:00:28	14 kph
17/2/2016 13:26	ON	N22.18423 E113.89732	116 m	0:00:30	14 kph
17/2/2016 13:26	ON	N22.18521 E113.89725	109 m	0:00:28	14 kph
17/2/2016 13:27	ON	N22.18617 E113.89727	107 m	0:00:28	14 kph
17/2/2016 13:27	ON	N22.18724 E113.89731	119 m	0:00:31	14 kph

Appendix I. (cont'd)

Date & Time	EFFORT	Position	Leg Length	Leg Time	Leg Speed
17/2/2016 13:28	ON	N22.18828 E113.89731	116 m	0:00:30	14 kph
17/2/2016 13:28	ON	N22.18924 E113.89728	106 m	0:00:27	14 kph
17/2/2016 13:29	ON	N22.19019 E113.89730	106 m	0:00:27	14 kph
17/2/2016 13:29	ON	N22.19121 E113.89730	114 m	0:00:29	14 kph
17/2/2016 13:30	ON	N22.19222 E113.89730	112 m	0:00:29	14 kph
17/2/2016 13:30	ON	N22.19316 E113.89733	105 m	0:00:27	14 kph
17/2/2016 13:30	ON	N22.19389 E113.89735	81 m	0:00:21	14 kph
17/2/2016 13:31	ON	N22.19484 E113.89732	105 m	0:00:27	14 kph
17/2/2016 13:31	ON	N22.19576 E113.89728	102 m	0:00:26	14 kph
17/2/2016 13:32	ON	N22.19663 E113.89731	97 m	0:00:25	14 kph
17/2/2016 13:32	ON	N22.19765 E113.89733	113 m	0:00:29	14 kph
17/2/2016 13:32	ON	N22.19838 E113.89728	82 m	0:00:21	14 kph
17/2/2016 13:33	ON	N22.19904 E113.89726	74 m	0:00:19	14 kph
17/2/2016 13:33	ON	N22.20007 E113.89733	115 m	0:00:29	14 kph
17/2/2016 13:34	ON	N22.20100 E113.89732	103 m	0:00:26	14 kph
17/2/2016 13:34	ON	N22.20188 E113.89732	98 m	0:00:25	14 kph
17/2/2016 13:35	ON	N22.20284 E113.89733	107 m	0:00:27	14 kph
17/2/2016 13:35	ON	N22.20399 E113.89731	128 m	0:00:32	14 kph
17/2/2016 13:36	ON	N22.20492 E113.89732	104 m	0:00:26	14 kph
17/2/2016 13:36	ON	N22.20596 E113.89727	116 m	0:00:29	14 kph
17/2/2016 13:36	ON	N22.20645 E113.89723	54 m	0:00:20	10 kph
17/2/2016 13:36	ON	N22.20652 E113.89722	8 m	0:00:04	7 kph
17/2/2016 13:36	OFF	N22.20661 E113.89721	10 m	0:00:06	6 kph
17/2/2016 13:37	OFF	N22.20689 E113.89716	31 m	0:00:25	4 kph
17/2/2016 13:37	OFF	N22.20718 E113.89735	38 m	0:00:23	6 kph
17/2/2016 13:38	OFF	N22.20731 E113.89787	56 m	0:00:23	9 kph
17/2/2016 13:38	OFF	N22.20735 E113.89838	52 m	0:00:25	8 kph
17/2/2016 13:39	OFF	N22.20739 E113.89890	54 m	0:00:25	8 kph
17/2/2016 13:39	OFF	N22.20738 E113.89935	46 m	0:00:25	7 kph
17/2/2016 13:39	OFF	N22.20725 E113.89974	43 m	0:00:24	6 kph
17/2/2016 13:40	OFF	N22.20705 E113.90011	45 m	0:00:25	6 kph
17/2/2016 13:40	OFF	N22.20685 E113.90050	46 m	0:00:25	7 kph
17/2/2016 13:41	OFF	N22.20671 E113.90081	36 m	0:00:26	5 kph
17/2/2016 13:41	OFF	N22.20667 E113.90097	17 m	0:00:20	3 kph
17/2/2016 13:41	OFF	N22.20666 E113.90107	11 m	0:00:19	2 kph
17/2/2016 13:42	OFF	N22.20667 E113.90111	4 m	0:00:22	0.7 kph
17/2/2016 13:42	OFF	N22.20667 E113.90113	1 m	0:00:19	0.3 kph
17/2/2016 13:42	OFF	N22.20670 E113.90119	7 m	0:00:16	2 kph
17/2/2016 13:42	OFF	N22.20671 E113.90125	6 m	0:00:04	6 kph
17/2/2016 13:43	OFF	N22.20636 E113.90134	40 m	0:00:19	8 kph
17/2/2016 13:43	OFF	N22.20591 E113.90085	71 m	0:00:19	13 kph
17/2/2016 13:43	OFF	N22.20525 E113.90046	84 m	0:00:22	14 kph
17/2/2016 13:44	OFF	N22.20473 E113.89983	87 m	0:00:22	14 kph
17/2/2016 13:44	OFF	N22.20414 E113.89908	101 m	0:00:25	15 kph
17/2/2016 13:44	OFF	N22.20371 E113.89826	98 m	0:00:24	15 kph
17/2/2016 13:45	OFF	N22.20333 E113.89745	93 m	0:00:24	14 kph
17/2/2016 13:45	ON	N22.20367 E113.89722	45 m	0:00:17	9 kph
17/2/2016 13:46	ON	N22.20443 E113.89735	86 m	0:00:24	13 kph
17/2/2016 13:46	ON	N22.20537 E113.89727	104 m	0:00:27	14 kph
17/2/2016 13:46	ON	N22.20624 E113.89725	98 m	0:00:25	14 kph
17/2/2016 13:47	ON	N22.20710 E113.89727	96 m	0:00:24	14 kph
17/2/2016 13:47	ON	N22.20825 E113.89727	127 m	0:00:32	14 kph
17/2/2016 13:48	ON	N22.20936 E113.89725	124 m	0:00:31	14 kph
17/2/2016 13:48	ON	N22.21045 E113.89717	121 m	0:00:30	14 kph
17/2/2016 13:49	ON	N22.21168 E113.89730	138 m	0:00:34	15 kph
17/2/2016 13:49	ON	N22.21267 E113.89728	111 m	0:00:28	14 kph
17/2/2016 13:50	ON	N22.21366 E113.89724	110 m	0:00:28	14 kph
17/2/2016 13:50	ON	N22.21381 E113.89764	45 m	0:00:17	9 kph
17/2/2016 13:51	ON	N22.21327 E113.89832	93 m	0:00:25	13 kph
17/2/2016 13:51	ON	N22.21271 E113.89902	96 m	0:00:25	14 kph
17/2/2016 13:51	ON	N22.21216 E113.89982	103 m	0:00:27	14 kph
17/2/2016 13:52	ON	N22.21166 E113.90052	91 m	0:00:24	14 kph
17/2/2016 13:52	ON	N22.21122 E113.90112	79 m	0:00:21	14 kph
17/2/2016 13:53	ON	N22.21073 E113.90173	83 m	0:00:22	14 kph

Appendix I. (cont'd)

Date & Time	EFFORT	Position	Leg Length	Leg Time	Leg Speed
17/2/2016 13:53	ON	N22.21013 E113.90252	105 m	0:00:28	14 kph
17/2/2016 13:53	ON	N22.20972 E113.90310	75 m	0:00:20	14 kph
17/2/2016 13:54	ON	N22.20929 E113.90376	84 m	0:00:22	14 kph
17/2/2016 13:54	ON	N22.20879 E113.90456	98 m	0:00:26	14 kph
17/2/2016 13:54	ON	N22.20847 E113.90511	67 m	0:00:18	13 kph
17/2/2016 13:55	ON	N22.20797 E113.90588	98 m	0:00:26	14 kph
17/2/2016 13:55	ON	N22.20745 E113.90659	94 m	0:00:25	13 kph
17/2/2016 13:56	ON	N22.20687 E113.90742	107 m	0:00:29	13 kph
17/2/2016 13:56	ON	N22.20627 E113.90774	74 m	0:00:21	13 kph
17/2/2016 13:57	ON	N22.20540 E113.90778	97 m	0:00:25	14 kph
17/2/2016 13:57	ON	N22.20470 E113.90779	78 m	0:00:20	14 kph
17/2/2016 13:57	ON	N22.20385 E113.90777	95 m	0:00:24	14 kph
17/2/2016 13:58	ON	N22.20293 E113.90777	103 m	0:00:26	14 kph
17/2/2016 13:58	ON	N22.20204 E113.90782	98 m	0:00:25	14 kph
17/2/2016 13:58	ON	N22.20134 E113.90784	79 m	0:00:20	14 kph
17/2/2016 13:59	ON	N22.20055 E113.90786	88 m	0:00:22	14 kph
17/2/2016 13:59	ON	N22.19965 E113.90788	100 m	0:00:25	14 kph
17/2/2016 14:00	ON	N22.19878 E113.90785	97 m	0:00:24	15 kph
17/2/2016 14:00	ON	N22.19769 E113.90786	121 m	0:00:30	15 kph
17/2/2016 14:01	ON	N22.19672 E113.90786	108 m	0:00:27	14 kph
17/2/2016 14:01	ON	N22.19582 E113.90791	100 m	0:00:25	14 kph
17/2/2016 14:01	ON	N22.19503 E113.90789	88 m	0:00:22	14 kph
17/2/2016 14:02	ON	N22.19437 E113.90790	74 m	0:00:19	14 kph
17/2/2016 14:02	ON	N22.19346 E113.90788	102 m	0:00:26	14 kph
17/2/2016 14:02	ON	N22.19265 E113.90789	89 m	0:00:23	14 kph
17/2/2016 14:03	ON	N22.19170 E113.90786	106 m	0:00:27	14 kph
17/2/2016 14:03	ON	N22.19082 E113.90770	99 m	0:00:25	14 kph
17/2/2016 14:04	ON	N22.19012 E113.90717	95 m	0:00:23	15 kph
17/2/2016 14:04	ON	N22.18932 E113.90649	114 m	0:00:27	15 kph
17/2/2016 14:05	ON	N22.18843 E113.90564	133 m	0:00:31	15 kph
17/2/2016 14:05	ON	N22.18715 E113.90486	164 m	0:00:39	15 kph
17/2/2016 14:06	ON	N22.18588 E113.90434	150 m	0:00:37	15 kph
17/2/2016 14:07	ON	N22.18459 E113.90402	147 m	0:00:37	14 kph
17/2/2016 14:07	ON	N22.18325 E113.90378	152 m	0:00:38	14 kph
17/2/2016 14:08	ON	N22.18204 E113.90365	135 m	0:00:34	14 kph
17/2/2016 14:08	ON	N22.18084 E113.90369	133 m	0:00:33	14 kph
17/2/2016 14:09	ON	N22.17954 E113.90417	153 m	0:00:38	15 kph
17/2/2016 14:10	ON	N22.17837 E113.90478	145 m	0:00:36	14 kph
17/2/2016 14:10	ON	N22.17749 E113.90540	117 m	0:00:31	14 kph
17/2/2016 14:11	ON	N22.17670 E113.90596	105 m	0:00:28	14 kph
17/2/2016 14:11	ON	N22.17599 E113.90654	99 m	0:00:27	13 kph
17/2/2016 14:12	ON	N22.17509 E113.90728	126 m	0:00:34	13 kph
17/2/2016 14:12	ON	N22.17420 E113.90802	126 m	0:00:34	13 kph
17/2/2016 14:13	ON	N22.17324 E113.90836	112 m	0:00:29	14 kph
17/2/2016 14:13	ON	N22.17235 E113.90805	104 m	0:00:25	15 kph
17/2/2016 14:14	ON	N22.17145 E113.90701	147 m	0:00:33	16 kph
17/2/2016 14:14	ON	N22.17053 E113.90555	182 m	0:00:40	16 kph
17/2/2016 14:15	ON	N22.16953 E113.90433	168 m	0:00:38	16 kph
17/2/2016 14:16	ON	N22.16837 E113.90330	167 m	0:00:38	16 kph
17/2/2016 14:16	ON	N22.16740 E113.90248	136 m	0:00:31	16 kph
17/2/2016 14:17	ON	N22.16643 E113.90169	136 m	0:00:31	16 kph
17/2/2016 14:17	ON	N22.16548 E113.90089	133 m	0:00:31	16 kph
17/2/2016 14:18	ON	N22.16473 E113.90015	114 m	0:00:27	15 kph
17/2/2016 14:18	ON	N22.16389 E113.89932	126 m	0:00:30	15 kph
17/2/2016 14:18	ON	N22.16310 E113.89878	104 m	0:00:25	15 kph
17/2/2016 14:19	ON	N22.16234 E113.89834	96 m	0:00:23	15 kph
17/2/2016 14:19	ON	N22.16137 E113.89793	116 m	0:00:28	15 kph
17/2/2016 14:20	ON	N22.16046 E113.89789	102 m	0:00:25	15 kph
17/2/2016 14:20	ON	N22.15939 E113.89809	121 m	0:00:29	15 kph
17/2/2016 14:21	ON	N22.15853 E113.89841	102 m	0:00:24	15 kph
17/2/2016 14:21	ON	N22.15764 E113.89902	117 m	0:00:28	15 kph
17/2/2016 14:22	ON	N22.15668 E113.89987	139 m	0:00:34	15 kph
17/2/2016 14:22	ON	N22.15606 E113.90064	104 m	0:00:27	14 kph
17/2/2016 14:23	ON	N22.15562 E113.90143	95 m	0:00:26	13 kph

Appendix I. (cont'd)

Date & Time	EFFORT	Position	Leg Length	Leg Time	Leg Speed
17/2/2016 14:23	ON	N22.15536 E113.90230	95 m	0:00:27	13 kph
17/2/2016 14:23	ON	N22.15531 E113.90318	91 m	0:00:26	13 kph
17/2/2016 14:24	ON	N22.15538 E113.90394	78 m	0:00:22	13 kph
17/2/2016 14:24	ON	N22.15545 E113.90483	92 m	0:00:26	13 kph
17/2/2016 14:25	ON	N22.15556 E113.90576	97 m	0:00:27	13 kph
17/2/2016 14:25	ON	N22.15567 E113.90660	88 m	0:00:25	13 kph
17/2/2016 14:25	ON	N22.15576 E113.90745	88 m	0:00:25	13 kph
17/2/2016 14:26	ON	N22.15544 E113.90780	51 m	0:00:17	11 kph
17/2/2016 14:26	ON	N22.15457 E113.90783	97 m	0:00:24	15 kph
17/2/2016 14:27	ON	N22.15346 E113.90788	124 m	0:00:30	15 kph
17/2/2016 14:27	ON	N22.15266 E113.90785	90 m	0:00:22	15 kph
17/2/2016 14:27	ON	N22.15170 E113.90784	106 m	0:00:26	15 kph
17/2/2016 14:28	ON	N22.15075 E113.90787	106 m	0:00:26	15 kph
17/2/2016 14:28	ON	N22.14987 E113.90790	98 m	0:00:24	15 kph
17/2/2016 14:29	ON	N22.14901 E113.90796	96 m	0:00:24	14 kph
17/2/2016 14:29	ON	N22.14829 E113.90794	80 m	0:00:20	14 kph
17/2/2016 14:29	ON	N22.14764 E113.90789	73 m	0:00:18	15 kph
17/2/2016 14:30	ON	N22.14668 E113.90789	107 m	0:00:27	14 kph
17/2/2016 14:30	ON	N22.14589 E113.90788	87 m	0:00:22	14 kph
17/2/2016 14:31	ON	N22.14512 E113.90788	86 m	0:00:22	14 kph
17/2/2016 14:31	ON	N22.14415 E113.90783	108 m	0:00:27	14 kph
17/2/2016 14:31	ON	N22.14330 E113.90783	95 m	0:00:24	14 kph
17/2/2016 14:32	ON	N22.14245 E113.90785	94 m	0:00:24	14 kph
17/2/2016 14:32	ON	N22.14196 E113.90821	66 m	0:00:21	11 kph
17/2/2016 14:33	ON	N22.14191 E113.90901	83 m	0:00:24	12 kph
17/2/2016 14:33	ON	N22.14196 E113.90994	95 m	0:00:27	13 kph
17/2/2016 14:33	ON	N22.14195 E113.91087	97 m	0:00:27	13 kph
17/2/2016 14:34	ON	N22.14195 E113.91177	93 m	0:00:26	13 kph
17/2/2016 14:34	ON	N22.14196 E113.91259	85 m	0:00:24	13 kph
17/2/2016 14:35	ON	N22.14194 E113.91352	96 m	0:00:27	13 kph
17/2/2016 14:35	ON	N22.14189 E113.91445	95 m	0:00:27	13 kph
17/2/2016 14:36	ON	N22.14190 E113.91534	93 m	0:00:26	13 kph
17/2/2016 14:36	ON	N22.14191 E113.91634	103 m	0:00:29	13 kph
17/2/2016 14:36	ON	N22.14189 E113.91720	89 m	0:00:25	13 kph
17/2/2016 14:37	ON	N22.14218 E113.91770	61 m	0:00:21	10 kph
17/2/2016 14:37	ON	N22.14294 E113.91774	85 m	0:00:22	14 kph
17/2/2016 14:38	ON	N22.14377 E113.91779	92 m	0:00:23	14 kph
17/2/2016 14:38	ON	N22.14473 E113.91781	107 m	0:00:27	14 kph
17/2/2016 14:38	ON	N22.14553 E113.91772	89 m	0:00:22	15 kph
17/2/2016 14:39	ON	N22.14644 E113.91772	101 m	0:00:25	15 kph
17/2/2016 14:39	ON	N22.14734 E113.91776	101 m	0:00:25	14 kph
17/2/2016 14:40	ON	N22.14813 E113.91776	89 m	0:00:22	14 kph
17/2/2016 14:40	ON	N22.14899 E113.91783	95 m	0:00:24	14 kph
17/2/2016 14:40	ON	N22.14978 E113.91782	89 m	0:00:22	14 kph
17/2/2016 14:41	ON	N22.15054 E113.91786	85 m	0:00:21	15 kph
17/2/2016 14:41	ON	N22.15141 E113.91789	96 m	0:00:24	14 kph
17/2/2016 14:41	ON	N22.15224 E113.91792	93 m	0:00:23	14 kph
17/2/2016 14:42	ON	N22.15316 E113.91787	102 m	0:00:25	15 kph
17/2/2016 14:42	ON	N22.15417 E113.91789	113 m	0:00:28	15 kph
17/2/2016 14:43	ON	N22.15518 E113.91795	112 m	0:00:28	14 kph
17/2/2016 14:43	ON	N22.15604 E113.91786	97 m	0:00:25	14 kph
17/2/2016 14:44	ON	N22.15688 E113.91779	93 m	0:00:24	14 kph
17/2/2016 14:44	ON	N22.15787 E113.91781	111 m	0:00:28	14 kph
17/2/2016 14:45	ON	N22.15887 E113.91784	111 m	0:00:28	14 kph
17/2/2016 14:45	ON	N22.15957 E113.91787	79 m	0:00:20	14 kph
17/2/2016 14:45	ON	N22.16053 E113.91796	106 m	0:00:27	14 kph
17/2/2016 14:46	ON	N22.16146 E113.91813	105 m	0:00:27	14 kph
17/2/2016 14:46	ON	N22.16232 E113.91823	96 m	0:00:24	14 kph
17/2/2016 14:47	ON	N22.16311 E113.91831	89 m	0:00:22	15 kph
17/2/2016 14:47	ON	N22.16394 E113.91840	93 m	0:00:23	15 kph
17/2/2016 14:47	ON	N22.16485 E113.91853	102 m	0:00:25	15 kph
17/2/2016 14:48	ON	N22.16584 E113.91869	111 m	0:00:27	15 kph
17/2/2016 14:48	ON	N22.16657 E113.91881	82 m	0:00:20	15 kph
17/2/2016 14:49	ON	N22.16750 E113.91893	105 m	0:00:25	15 kph

Appendix I. (cont'd)

Date & Time	EFFORT	Position	Leg Length	Leg Time	Leg Speed
17/2/2016 14:49	ON	N22.16830 E113.91895	89 m	0:00:21	15 kph
17/2/2016 14:49	ON	N22.16917 E113.91895	97 m	0:00:23	15 kph
17/2/2016 14:50	ON	N22.17025 E113.91899	120 m	0:00:29	15 kph
17/2/2016 14:50	ON	N22.17117 E113.91913	103 m	0:00:25	15 kph
17/2/2016 14:51	ON	N22.17222 E113.91927	118 m	0:00:29	15 kph
17/2/2016 14:51	ON	N22.17317 E113.91941	107 m	0:00:26	15 kph
17/2/2016 14:52	ON	N22.17401 E113.91961	96 m	0:00:24	14 kph
17/2/2016 14:52	ON	N22.17461 E113.91977	68 m	0:00:17	14 kph
17/2/2016 14:52	ON	N22.17558 E113.92013	115 m	0:00:29	14 kph
17/2/2016 14:53	ON	N22.17635 E113.92046	91 m	0:00:23	14 kph
17/2/2016 14:53	ON	N22.17720 E113.92081	101 m	0:00:25	15 kph
17/2/2016 14:54	ON	N22.17804 E113.92119	102 m	0:00:25	15 kph
17/2/2016 14:54	ON	N22.17898 E113.92160	113 m	0:00:27	15 kph
17/2/2016 14:54	ON	N22.17996 E113.92186	112 m	0:00:27	15 kph
17/2/2016 14:55	ON	N22.18084 E113.92173	99 m	0:00:24	15 kph
17/2/2016 14:55	ON	N22.18180 E113.92123	118 m	0:00:28	15 kph
17/2/2016 14:56	ON	N22.18251 E113.92063	101 m	0:00:24	15 kph
17/2/2016 14:56	ON	N22.18316 E113.91995	101 m	0:00:24	15 kph
17/2/2016 14:56	ON	N22.18378 E113.91929	97 m	0:00:23	15 kph
17/2/2016 14:57	ON	N22.18445 E113.91856	106 m	0:00:25	15 kph
17/2/2016 14:57	ON	N22.18503 E113.91794	91 m	0:00:22	15 kph
17/2/2016 14:58	ON	N22.18569 E113.91793	75 m	0:00:19	14 kph
17/2/2016 14:58	ON	N22.18657 E113.91788	97 m	0:00:24	15 kph
17/2/2016 14:58	ON	N22.18755 E113.91789	110 m	0:00:27	15 kph
17/2/2016 14:59	ON	N22.18847 E113.91786	102 m	0:00:25	15 kph
17/2/2016 14:59	ON	N22.18950 E113.91784	114 m	0:00:28	15 kph
17/2/2016 15:00	ON	N22.19057 E113.91782	119 m	0:00:29	15 kph
17/2/2016 15:00	ON	N22.19137 E113.91785	90 m	0:00:22	15 kph
17/2/2016 15:01	ON	N22.19233 E113.91786	106 m	0:00:26	15 kph
17/2/2016 15:01	ON	N22.19328 E113.91781	107 m	0:00:26	15 kph
17/2/2016 15:01	ON	N22.19419 E113.91783	101 m	0:00:25	15 kph
17/2/2016 15:02	ON	N22.19503 E113.91781	93 m	0:00:23	15 kph
17/2/2016 15:02	ON	N22.19593 E113.91784	100 m	0:00:25	14 kph
17/2/2016 15:03	ON	N22.19691 E113.91786	110 m	0:00:27	15 kph
17/2/2016 15:03	ON	N22.19785 E113.91788	105 m	0:00:26	15 kph
17/2/2016 15:04	ON	N22.19875 E113.91785	100 m	0:00:25	14 kph
17/2/2016 15:04	ON	N22.19989 E113.91785	127 m	0:00:32	14 kph
17/2/2016 15:04	ON	N22.20065 E113.91781	84 m	0:00:21	14 kph
17/2/2016 15:05	ON	N22.20129 E113.91784	71 m	0:00:18	14 kph
17/2/2016 15:05	ON	N22.20221 E113.91788	103 m	0:00:26	14 kph
17/2/2016 15:06	ON	N22.20311 E113.91781	100 m	0:00:25	14 kph
17/2/2016 15:06	ON	N22.20404 E113.91779	104 m	0:00:26	14 kph
17/2/2016 15:06	ON	N22.20503 E113.91783	111 m	0:00:28	14 kph
17/2/2016 15:07	ON	N22.20539 E113.91841	72 m	0:00:21	12 kph
17/2/2016 15:07	ON	N22.20547 E113.91925	86 m	0:00:23	14 kph
17/2/2016 15:08	ON	N22.20553 E113.92006	84 m	0:00:23	13 kph
17/2/2016 15:08	ON	N22.20559 E113.92084	81 m	0:00:22	13 kph
17/2/2016 15:08	ON	N22.20562 E113.92115	31 m	0:00:09	12 kph
17/2/2016 15:08	ON	N22.20568 E113.92156	43 m	0:00:21	7 kph
17/2/2016 15:09	OFF	N22.20573 E113.92183	28 m	0:00:25	4 kph
17/2/2016 15:09	OFF	N22.20576 E113.92198	16 m	0:00:25	2 kph
17/2/2016 15:10	OFF	N22.20577 E113.92203	6 m	0:00:21	1.0 kph
17/2/2016 15:10	OFF	N22.20577 E113.92204	0 m	0:00:21	0.0 kph
17/2/2016 15:10	OFF	N22.20579 E113.92213	11 m	0:00:27	1.4 kph
17/2/2016 15:11	ON	N22.20581 E113.92270	59 m	0:00:19	11 kph
17/2/2016 15:11	ON	N22.20580 E113.92357	89 m	0:00:25	13 kph
17/2/2016 15:12	ON	N22.20595 E113.92442	90 m	0:00:24	13 kph
17/2/2016 15:12	ON	N22.20605 E113.92531	92 m	0:00:24	14 kph
17/2/2016 15:12	ON	N22.20608 E113.92612	84 m	0:00:22	14 kph
17/2/2016 15:13	ON	N22.20604 E113.92709	100 m	0:00:26	14 kph
17/2/2016 15:13	ON	N22.20574 E113.92761	64 m	0:00:20	11 kph
17/2/2016 15:13	ON	N22.20517 E113.92749	64 m	0:00:17	14 kph
17/2/2016 15:14	ON	N22.20439 E113.92743	88 m	0:00:22	14 kph
17/2/2016 15:14	ON	N22.20357 E113.92751	92 m	0:00:23	14 kph

Appendix I. (cont'd)

Date & Time	EFFORT	Position	Leg Length	Leg Time	Leg Speed
17/2/2016 15:14	ON	N22.20287 E113.92754	78 m	0:00:19	15 kph
17/2/2016 15:15	ON	N22.20222 E113.92760	73 m	0:00:18	15 kph
17/2/2016 15:15	ON	N22.20142 E113.92760	89 m	0:00:22	15 kph
17/2/2016 15:16	ON	N22.20040 E113.92756	114 m	0:00:28	15 kph
17/2/2016 15:16	ON	N22.19963 E113.92755	85 m	0:00:21	15 kph
17/2/2016 15:16	ON	N22.19883 E113.92755	89 m	0:00:22	15 kph
17/2/2016 15:17	ON	N22.19797 E113.92754	96 m	0:00:24	14 kph
17/2/2016 15:17	ON	N22.19732 E113.92753	72 m	0:00:18	14 kph
17/2/2016 15:17	ON	N22.19642 E113.92754	101 m	0:00:25	15 kph
17/2/2016 15:18	ON	N22.19570 E113.92756	80 m	0:00:20	14 kph
17/2/2016 15:18	ON	N22.19480 E113.92754	101 m	0:00:25	15 kph
17/2/2016 15:19	ON	N22.19397 E113.92751	92 m	0:00:23	14 kph
17/2/2016 15:19	ON	N22.19318 E113.92750	88 m	0:00:22	14 kph
17/2/2016 15:19	ON	N22.19257 E113.92746	68 m	0:00:17	14 kph
17/2/2016 15:20	ON	N22.19183 E113.92742	83 m	0:00:21	14 kph
17/2/2016 15:20	ON	N22.19104 E113.92744	88 m	0:00:22	14 kph
17/2/2016 15:20	ON	N22.19025 E113.92744	88 m	0:00:22	14 kph
17/2/2016 15:21	ON	N22.18943 E113.92745	91 m	0:00:23	14 kph
17/2/2016 15:21	ON	N22.18867 E113.92752	85 m	0:00:21	15 kph
17/2/2016 15:21	ON	N22.18789 E113.92752	87 m	0:00:22	14 kph
17/2/2016 15:22	ON	N22.18710 E113.92749	88 m	0:00:22	14 kph
17/2/2016 15:22	ON	N22.18627 E113.92745	92 m	0:00:23	14 kph
17/2/2016 15:22	ON	N22.18554 E113.92750	82 m	0:00:21	14 kph
17/2/2016 15:23	ON	N22.18469 E113.92756	94 m	0:00:24	14 kph
17/2/2016 15:23	ON	N22.18395 E113.92752	83 m	0:00:21	14 kph
17/2/2016 15:24	ON	N22.18308 E113.92751	97 m	0:00:25	14 kph
17/2/2016 15:24	ON	N22.18226 E113.92750	91 m	0:00:23	14 kph
17/2/2016 15:24	ON	N22.18159 E113.92750	74 m	0:00:19	14 kph
17/2/2016 15:25	ON	N22.18084 E113.92760	85 m	0:00:22	14 kph
17/2/2016 15:25	ON	N22.18007 E113.92758	85 m	0:00:22	14 kph
17/2/2016 15:25	ON	N22.17932 E113.92760	84 m	0:00:22	14 kph
17/2/2016 15:26	ON	N22.17854 E113.92756	86 m	0:00:22	14 kph
17/2/2016 15:26	ON	N22.17763 E113.92747	102 m	0:00:26	14 kph
17/2/2016 15:27	ON	N22.17696 E113.92741	75 m	0:00:19	14 kph
17/2/2016 15:27	ON	N22.17610 E113.92739	96 m	0:00:24	14 kph
17/2/2016 15:27	ON	N22.17536 E113.92740	83 m	0:00:21	14 kph
17/2/2016 15:28	ON	N22.17462 E113.92748	83 m	0:00:21	14 kph
17/2/2016 15:28	ON	N22.17379 E113.92745	91 m	0:00:23	14 kph
17/2/2016 15:28	ON	N22.17294 E113.92745	95 m	0:00:24	14 kph
17/2/2016 15:29	ON	N22.17206 E113.92748	98 m	0:00:25	14 kph
17/2/2016 15:29	ON	N22.17111 E113.92751	106 m	0:00:27	14 kph
17/2/2016 15:30	ON	N22.17022 E113.92751	99 m	0:00:25	14 kph
17/2/2016 15:30	ON	N22.16951 E113.92753	79 m	0:00:20	14 kph
17/2/2016 15:30	ON	N22.16887 E113.92751	71 m	0:00:18	14 kph
17/2/2016 15:31	ON	N22.16790 E113.92745	108 m	0:00:27	14 kph
17/2/2016 15:31	ON	N22.16697 E113.92747	103 m	0:00:26	14 kph
17/2/2016 15:32	ON	N22.16601 E113.92747	107 m	0:00:27	14 kph
17/2/2016 15:32	ON	N22.16510 E113.92745	102 m	0:00:26	14 kph
17/2/2016 15:33	ON	N22.16431 E113.92745	88 m	0:00:22	14 kph
17/2/2016 15:33	ON	N22.16346 E113.92746	94 m	0:00:24	14 kph
17/2/2016 15:33	ON	N22.16269 E113.92746	86 m	0:00:22	14 kph
17/2/2016 15:34	ON	N22.16182 E113.92747	97 m	0:00:25	14 kph
17/2/2016 15:34	ON	N22.16118 E113.92748	71 m	0:00:18	14 kph
17/2/2016 15:34	ON	N22.16023 E113.92749	106 m	0:00:27	14 kph
17/2/2016 15:35	ON	N22.15940 E113.92754	92 m	0:00:24	14 kph
17/2/2016 15:35	ON	N22.15867 E113.92759	82 m	0:00:21	14 kph
17/2/2016 15:36	ON	N22.15787 E113.92757	89 m	0:00:23	14 kph
17/2/2016 15:36	ON	N22.15709 E113.92751	87 m	0:00:22	14 kph
17/2/2016 15:36	ON	N22.15628 E113.92751	90 m	0:00:23	14 kph
17/2/2016 15:37	ON	N22.15541 E113.92743	98 m	0:00:25	14 kph
17/2/2016 15:37	ON	N22.15460 E113.92739	90 m	0:00:23	14 kph
17/2/2016 15:38	ON	N22.15366 E113.92743	104 m	0:00:27	14 kph
17/2/2016 15:38	ON	N22.15278 E113.92742	98 m	0:00:25	14 kph
17/2/2016 15:38	ON	N22.15197 E113.92746	90 m	0:00:23	14 kph

Appendix I. (cont'd)

Date & Time	EFFORT	Position	Leg Length	Leg Time	Leg Speed
17/2/2016 15:39	ON	N22.15121 E113.92755	85 m	0:00:22	14 kph
17/2/2016 15:39	ON	N22.15040 E113.92759	90 m	0:00:23	14 kph
17/2/2016 15:39	ON	N22.14976 E113.92754	72 m	0:00:18	14 kph
17/2/2016 15:40	ON	N22.14895 E113.92746	91 m	0:00:23	14 kph
17/2/2016 15:40	ON	N22.14816 E113.92745	87 m	0:00:22	14 kph
17/2/2016 15:41	ON	N22.14745 E113.92744	79 m	0:00:20	14 kph
17/2/2016 15:41	ON	N22.14672 E113.92746	82 m	0:00:21	14 kph
17/2/2016 15:41	ON	N22.14590 E113.92747	91 m	0:00:23	14 kph
17/2/2016 15:42	ON	N22.14498 E113.92750	103 m	0:00:26	14 kph
17/2/2016 15:42	ON	N22.14416 E113.92752	91 m	0:00:23	14 kph
17/2/2016 15:42	ON	N22.14338 E113.92755	87 m	0:00:22	14 kph
17/2/2016 15:43	ON	N22.14267 E113.92770	80 m	0:00:22	13 kph
17/2/2016 15:43	ON	N22.14270 E113.92824	56 m	0:00:19	11 kph
17/2/2016 15:43	ON	N22.14315 E113.92885	80 m	0:00:22	13 kph
17/2/2016 15:44	ON	N22.14374 E113.92955	98 m	0:00:26	14 kph
17/2/2016 15:44	ON	N22.14416 E113.93003	68 m	0:00:18	14 kph
17/2/2016 15:45	ON	N22.14456 E113.93053	68 m	0:00:18	14 kph
17/2/2016 15:45	ON	N22.14506 E113.93116	86 m	0:00:23	14 kph
17/2/2016 15:45	ON	N22.14561 E113.93186	94 m	0:00:25	14 kph
17/2/2016 15:46	ON	N22.14608 E113.93244	79 m	0:00:22	13 kph
17/2/2016 15:46	OFF	N22.14632 E113.93266	35 m	0:00:17	7 kph
17/2/2016 15:46	OFF	N22.14653 E113.93278	27 m	0:00:21	5 kph
17/2/2016 15:47	OFF	N22.14667 E113.93281	16 m	0:00:19	3 kph
17/2/2016 15:47	OFF	N22.14677 E113.93280	12 m	0:00:20	2 kph
17/2/2016 15:47	OFF	N22.14685 E113.93277	10 m	0:00:21	2 kph
17/2/2016 15:48	OFF	N22.14693 E113.93271	11 m	0:00:23	2 kph
17/2/2016 15:48	OFF	N22.14697 E113.93266	7 m	0:00:19	1.3 kph
17/2/2016 15:48	OFF	N22.14703 E113.93258	10 m	0:00:22	2 kph
17/2/2016 15:49	OFF	N22.14716 E113.93252	16 m	0:00:23	3 kph
17/2/2016 15:49	ON	N22.14748 E113.93285	49 m	0:00:18	10 kph
17/2/2016 15:49	ON	N22.14787 E113.93339	70 m	0:00:20	13 kph
17/2/2016 15:50	ON	N22.14832 E113.93401	81 m	0:00:22	13 kph
17/2/2016 15:50	ON	N22.14876 E113.93470	87 m	0:00:23	14 kph
17/2/2016 15:51	ON	N22.14929 E113.93550	101 m	0:00:27	14 kph
17/2/2016 15:51	ON	N22.14988 E113.93646	119 m	0:00:32	13 kph
17/2/2016 15:51	ON	N22.15036 E113.93681	64 m	0:00:19	12 kph
17/2/2016 15:52	ON	N22.15132 E113.93682	107 m	0:00:27	14 kph
17/2/2016 15:52	ON	N22.15208 E113.93680	85 m	0:00:21	15 kph
17/2/2016 15:53	ON	N22.15280 E113.93684	80 m	0:00:20	14 kph
17/2/2016 15:53	ON	N22.15360 E113.93687	89 m	0:00:22	15 kph
17/2/2016 15:53	ON	N22.15433 E113.93688	81 m	0:00:20	15 kph
17/2/2016 15:54	ON	N22.15506 E113.93687	81 m	0:00:20	15 kph
17/2/2016 15:54	ON	N22.15582 E113.93691	85 m	0:00:21	15 kph
17/2/2016 15:54	ON	N22.15670 E113.93688	98 m	0:00:24	15 kph
17/2/2016 15:55	ON	N22.15762 E113.93682	102 m	0:00:25	15 kph
17/2/2016 15:55	ON	N22.15842 E113.93688	89 m	0:00:22	15 kph
17/2/2016 15:55	ON	N22.15915 E113.93690	81 m	0:00:20	15 kph
17/2/2016 15:56	ON	N22.15999 E113.93692	93 m	0:00:23	15 kph
17/2/2016 15:56	ON	N22.16094 E113.93692	106 m	0:00:26	15 kph
17/2/2016 15:57	ON	N22.16178 E113.93691	94 m	0:00:23	15 kph
17/2/2016 15:57	ON	N22.16274 E113.93689	107 m	0:00:26	15 kph
17/2/2016 15:58	ON	N22.16374 E113.93685	111 m	0:00:27	15 kph
17/2/2016 15:58	ON	N22.16485 E113.93680	124 m	0:00:30	15 kph
17/2/2016 15:58	ON	N22.16577 E113.93681	102 m	0:00:25	15 kph
17/2/2016 15:59	ON	N22.16666 E113.93679	99 m	0:00:24	15 kph
17/2/2016 15:59	ON	N22.16742 E113.93686	85 m	0:00:21	15 kph
17/2/2016 16:00	ON	N22.16832 E113.93683	100 m	0:00:24	15 kph
17/2/2016 16:00	ON	N22.16920 E113.93683	99 m	0:00:24	15 kph
17/2/2016 16:00	ON	N22.16998 E113.93682	87 m	0:00:21	15 kph
17/2/2016 16:01	ON	N22.17083 E113.93684	95 m	0:00:23	15 kph
17/2/2016 16:01	ON	N22.17172 E113.93688	99 m	0:00:24	15 kph
17/2/2016 16:02	ON	N22.17266 E113.93691	104 m	0:00:26	14 kph
17/2/2016 16:02	ON	N22.17357 E113.93698	101 m	0:00:25	15 kph
17/2/2016 16:02	ON	N22.17456 E113.93686	111 m	0:00:27	15 kph

Appendix I. (cont'd)

Date & Time	EFFORT	Position	Leg Length	Leg Time	Leg Speed
17/2/2016 16:03	ON	N22.17537 E113.93683	90 m	0:00:22	15 kph
17/2/2016 16:03	ON	N22.17625 E113.93678	99 m	0:00:24	15 kph
17/2/2016 16:04	ON	N22.17709 E113.93681	94 m	0:00:23	15 kph
17/2/2016 16:04	ON	N22.17808 E113.93685	110 m	0:00:27	15 kph
17/2/2016 16:04	ON	N22.17896 E113.93688	98 m	0:00:24	15 kph
17/2/2016 16:05	ON	N22.18000 E113.93688	115 m	0:00:28	15 kph
17/2/2016 16:05	ON	N22.18088 E113.93681	99 m	0:00:24	15 kph
17/2/2016 16:06	ON	N22.18185 E113.93675	107 m	0:00:26	15 kph
17/2/2016 16:06	ON	N22.18276 E113.93664	103 m	0:00:25	15 kph
17/2/2016 16:07	ON	N22.18361 E113.93682	96 m	0:00:24	14 kph
17/2/2016 16:07	ON	N22.18437 E113.93690	85 m	0:00:21	15 kph
17/2/2016 16:07	ON	N22.18528 E113.93689	102 m	0:00:25	15 kph
17/2/2016 16:08	ON	N22.18616 E113.93681	98 m	0:00:24	15 kph
17/2/2016 16:08	ON	N22.18712 E113.93679	107 m	0:00:26	15 kph
17/2/2016 16:09	ON	N22.18796 E113.93678	93 m	0:00:23	15 kph
17/2/2016 16:09	ON	N22.18897 E113.93676	113 m	0:00:28	14 kph
17/2/2016 16:09	ON	N22.18979 E113.93675	92 m	0:00:23	14 kph
17/2/2016 16:10	ON	N22.19062 E113.93681	92 m	0:00:23	14 kph
17/2/2016 16:10	ON	N22.19149 E113.93685	97 m	0:00:24	15 kph
17/2/2016 16:11	ON	N22.19249 E113.93678	111 m	0:00:27	15 kph
17/2/2016 16:11	ON	N22.19365 E113.93685	129 m	0:00:32	15 kph
17/2/2016 16:12	ON	N22.19473 E113.93683	121 m	0:00:30	14 kph
17/2/2016 16:12	ON	N22.19563 E113.93686	101 m	0:00:25	14 kph
17/2/2016 16:12	ON	N22.19650 E113.93688	97 m	0:00:24	15 kph
17/2/2016 16:13	ON	N22.19745 E113.93689	105 m	0:00:26	15 kph
17/2/2016 16:13	ON	N22.19827 E113.93682	92 m	0:00:23	14 kph
17/2/2016 16:14	ON	N22.19932 E113.93671	117 m	0:00:29	15 kph
17/2/2016 16:14	ON	N22.20033 E113.93670	112 m	0:00:28	14 kph
17/2/2016 16:15	ON	N22.20133 E113.93680	112 m	0:00:28	14 kph
17/2/2016 16:15	ON	N22.20249 E113.93682	130 m	0:00:32	15 kph
17/2/2016 16:16	ON	N22.20361 E113.93682	124 m	0:00:31	14 kph
17/2/2016 16:16	ON	N22.20476 E113.93689	129 m	0:00:32	14 kph
17/2/2016 16:17	ON	N22.20596 E113.93683	134 m	0:00:34	14 kph
17/2/2016 16:17	ON	N22.20707 E113.93679	123 m	0:00:31	14 kph
17/2/2016 16:18	ON	N22.20805 E113.93677	108 m	0:00:27	14 kph
17/2/2016 16:18	ON	N22.20899 E113.93680	105 m	0:00:26	15 kph
17/2/2016 16:19	ON	N22.21007 E113.93680	120 m	0:00:30	14 kph
17/2/2016 16:19	ON	N22.21119 E113.93681	125 m	0:00:31	15 kph
17/2/2016 16:20	ON	N22.21225 E113.93682	117 m	0:00:29	15 kph
17/2/2016 16:20	ON	N22.21347 E113.93675	136 m	0:00:34	14 kph
17/2/2016 16:21	ON	N22.21440 E113.93668	104 m	0:00:26	14 kph
17/2/2016 16:21	ON	N22.21553 E113.93670	126 m	0:00:31	15 kph
17/2/2016 16:22	ON	N22.21662 E113.93671	121 m	0:00:30	15 kph
17/2/2016 16:22	ON	N22.21805 E113.93675	159 m	0:00:40	14 kph
17/2/2016 16:23	ON	N22.21939 E113.93681	149 m	0:00:37	15 kph
17/2/2016 16:24	ON	N22.22076 E113.93678	153 m	0:00:38	14 kph
17/2/2016 16:24	ON	N22.22213 E113.93679	153 m	0:00:38	15 kph
17/2/2016 16:25	ON	N22.22347 E113.93678	149 m	0:00:37	14 kph
17/2/2016 16:25	ON	N22.22425 E113.93714	94 m	0:00:27	13 kph

Appendix II. Survey Effort Database in SWL (February 2016)

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

DATE	AREA	BEAU	EFFORT	SEASON	VESSEL	TYPE	P/S
4-Feb-16	SW LANTAU	1	3.20	WINTER	STANDARD31516	HKCRP	P
4-Feb-16	SW LANTAU	2	6.30	WINTER	STANDARD31516	HKCRP	P
4-Feb-16	SW LANTAU	3	2.52	WINTER	STANDARD31516	HKCRP	P
4-Feb-16	SW LANTAU	1	1.10	WINTER	STANDARD31516	HKCRP	S
4-Feb-16	SW LANTAU	2	3.48	WINTER	STANDARD31516	HKCRP	S
4-Feb-16	SW LANTAU	3	4.77	WINTER	STANDARD31516	HKCRP	S
17-Feb-16	SW LANTAU	1	5.61	WINTER	STANDARD31516	HYD-HZMB	P
17-Feb-16	SW LANTAU	2	47.11	WINTER	STANDARD31516	HYD-HZMB	P
17-Feb-16	SW LANTAU	3	2.31	WINTER	STANDARD31516	HYD-HZMB	P
17-Feb-16	SW LANTAU	1	2.24	WINTER	STANDARD31516	HYD-HZMB	S
17-Feb-16	SW LANTAU	2	12.48	WINTER	STANDARD31516	HYD-HZMB	S
17-Feb-16	SW LANTAU	3	1.12	WINTER	STANDARD31516	HYD-HZMB	S
19-Feb-16	SW LANTAU	2	7.00	WINTER	STANDARD31516	HKCRP	P
19-Feb-16	SW LANTAU	3	8.67	WINTER	STANDARD31516	HKCRP	P
19-Feb-16	SW LANTAU	2	7.30	WINTER	STANDARD31516	HKCRP	S
19-Feb-16	SW LANTAU	3	2.33	WINTER	STANDARD31516	HKCRP	S
23-Feb-16	SW LANTAU	1	6.58	WINTER	STANDARD31529	HKCRP	P
23-Feb-16	SW LANTAU	3	1.10	WINTER	STANDARD31530	HKCRP	P
23-Feb-16	SW LANTAU	4	5.10	WINTER	STANDARD31531	HKCRP	P
23-Feb-16	SW LANTAU	2	2.05	WINTER	STANDARD31532	HKCRP	S
23-Feb-16	SW LANTAU	3	4.73	WINTER	STANDARD31533	HKCRP	S
23-Feb-16	SW LANTAU	4	3.00	WINTER	STANDARD31534	HKCRP	S

Appendix III. Chinese White Dolphin Sighting Database in SWL (February 2016)

(Abberviations: STG# = Sighting Number; HRD SZ = Dolphin Herd Size; BEAU = Beaufort Sea State; PSD = Perpendicular Distance; ND = Not Determined; 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
4-Feb-16	3	1354	1	SW LANTAU	2	173	ON	HKCRP	806756	803963	WINTER	NONE	S
4-Feb-16	4	1357	2	SW LANTAU	2	212	ON	HKCRP	807010	804458	WINTER	GILLNET	S
17-Feb-16	1	1220	3	SW LANTAU	2	134	ON	HYD-HZMB	808070	805956	WINTER	NONE	S
17-Feb-16	2	1336	3	SW LANTAU	2	202	ON	HYD-HZMB	807591	807429	WINTER	NONE	P
17-Feb-16	3	1509	1	SW LANTAU	2	458	ON	HYD-HZMB	807475	809966	WINTER	NONE	S

Appendix IV. Individual dolphins identified during HYD-HZMB and AFCD monitoring surveys in SWL waters in February 2016

ID#	DATE	STG#	TYPE	AREA
SL60	17/02/16	1	HYD-HZMB	SW LANTAU
	17/02/16	2	HYD-HZMB	SW LANTAU
WL68	04/02/16	4	HKCRP	SW LANTAU
WL69	17/02/16	1	HYD-HZMB	SW LANTAU
WL123	17/02/16	1	HYD-HZMB	SW LANTAU
	17/02/16	2	HYD-HZMB	SW LANTAU

Appendix V. Photographs of Identified Individual Dolphins in February 2016 in SWL waters