WHALE SIGHTING EFFICIENCY OF THE CREW ON BOARD OCEAN RESEARCH VESSELS IN BIOMASS/FIBEX

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As the mathematical census model of the whale sighting observation has been improved recently, the sighting method became one of the most important methods in the whale population study, and this method is widely adopted in the whale population study such as IDCR (International Decade of Cetacean Research). This method is very useful when competent observers such as well experienced whalers are engaged in the field survey. Otherwise, the field data are not much reliable and would result in a low sighting rate and involve some bias. Therefore, it was required that some data conversion formula should be deviced.

On an occasion of BIOMASS/FIBEX study, the cetacean sighting programme was included from the viewpoint of the important role of cetaceans in the Antarctic ecosystem. In this programme the data conversion study was also included. T/S Umitaka Maru and R/V Kaiyo Maru participated in this study, in the Indian Ocean Sector and the Pacific Ocean Sector respectively, and well experienced whalers and some of the ship crew or apprentice

students in each ship were engaged in the survey. Data were obtained by the whalers and the non-experienced group separately and the sighting efficiency was compared between the two groups.

The whale sighting observations were made from the bridge 13.0 m and 9.9 m high of R/V Kaiyo Maru and T/S Umitaka Maru respectively. The whalers in this study have been engaged in the whaling operation for 20-30 years. On the other hand, the crew and students have no experience in the whale sighting, so that the whalers trained them in the whale species identification on the way to the research area. All the observations for this study were carried out only in the daytime.

Table 1. Sighting of whales by R/V Kaiyo Maru.

	Date	Ship's time	Position	Cruising distance (mile)	Weather	Visibility (mile)	Wind velocity	Surface temperature (°C)	Species of whales sighted												Sighting direction	Distance from the ship (mile)	Number of observers	* Sighted by the whalers
									BA	BB	BE	BP	MN	OO	PM	ZX	UD	US	UO	UX				
	1980 Dec.																							
1	4	06:00	33°50'S,111°46'E		O	8	4	+17.9	-	-	-	-	-	-	-	-	-	-	-	-			2	
	4	07:30	34°00'S,111°26'E	19	O	8	4	+17.7																
2	4	08:30	34°07'S,111°11'E		C	9	3	+17.5	-	-	-	-	-	-	-	-	-	-	-	-			3	
	4	11:30	34°30'S,110°30'E	41	O	9	3	+18.0																
3	4	13:00	34°42'S,110°09'E		A	10	2	+17.8	-	-	-	-	-	-	-	-	-	-	-	-			3	
	4	18:00	35°12'S,109°04'E	60	A	10	4	+16.5																
4	5	06:00	37°13'S,107°42'E		A	10	5	+13.1															3	
	5	07:02	37°22'S,107°35'E		A	10	3	+14.0	-	-	-	-	-	-	1	-	-	-	-	-	L20	1.5	4	*
	5	07:30	37°28'S,107°33'E	17	A	10	3	+13.9																
5	5	08:00	37°33'S,107°28'E		A	10	3	+13.9	-	-	-	-	-	-	-	-	-	-	-	-			4	
	5	11:30	38°10'S,107°11'E	39	B	10	3	+14.0																
6	5	13:00	38°26'S,107°02'E		C	10	3	+13.0															3	
	5	13:00	38°26'S,107°02'E		C	10	3	+13.0	1	-	-	-	-	-	-	-	-	-	-	-	R45	0.1	3	
	5	15:50	38°56'S,106°45'E		A	10	4	+13.5	-	-	-	-	-	-	-	-	1	-	-	-	L90	0.2	2	
	5	18:00	39°19'S,106°32'E	57	C	10	5	+13.4																
7	6	06:00	41°28'S,105°20'E		O	5	6	+11.5	-	-	-	-	-	-	-	-	-	-	-	-			4	
	6	07:30	41°41'S,105°13'E	16	O	5	7	+11.4																

	Date	Ship's time	Position	Cruising distance (mile)	Weather	Visibility (mile)	Wind velocity	Surface temperature (°C)	Species of whales sighted												Sighting direction	Distance from the ship (mile)	Number of observers
									BA	BB	BE	BP	MN	OO	PM	ZX	UD	US	UO	UX			
	1980 Dec.																						
8	6	08:30	41°54'S,105°13'E		O	4	7	+11.3	-	-	-	-	-	-	-	-	-	-	-	-			4
	6	11:30	42°30'S,105°11'E	36	O	3	6	+11.2															
9	6	13:00	42°48'S,105°11'E		O	1	6	+10.9	-	-	-	-	-	-	-	-	-	-	-	-			4
	6	16:30	43°20'S,104°47'E	38	A	9	6	+11.0															
10	6	17:00	43°22'S,104°40'E		A	9	6	+10.9	-	-	-	-	-	-	-	-	-	-	-	-			4
	6	18:00	43°30'S,104°32'E	12	A	9	6	+10.8															
11	7	06:00	45°14'S,103°33'E		A	9	5	+9.9	-	-	-	-	-	-	-	-	-	-	-	-			4
	7	07:30	45°29'S,103°34'E	15	A	9	6	+9.5															
12	7	08:00	45°34'S,103°35'E		A	10	5	+8.6	-	-	-	-	-	-	-	-	-	-	-	-			4
	7	11:30	46°08'S,103°26'E	34	A	10	5	+8.5															
13	7	13:00	46°27'S,103°18'E		A	10	5	+8.4	-	-	-	-	-	-	-	-	-	-	-	-			4
	7	16:30	47°06'S,103°05'E	41	A	10	5	+6.7															
14	7	17:00	47°10'S,103°01'E		A	10	6	+6.7	-	-	-	-	-	-	-	-	-	-	-	-			4
	7	18:00	47°19'S,102°51'E	11	A	10	5	+6.6															
15	8	06:00	49°08'S,100°25'E		R	4	6	+5.9	-	-	-	-	-	-	-	-	-	-	-	-			4
	8	07:30	49°24'S,100°08'E	18	R	7	6	+5.0															
16	8	08:00	49°28'S,100°03'E		O	7	4	+4.7	-	-	-	-	-	-	-	-	-	-	-	-			4
	8	11:30	50°00'S, 99°25'E	41	O	8	4	+4.6															

	Date	Ship's time	Position	Cruising distance (mile)	Weather	Visibility (mile)	Wind velocity	Surface temperature (°C)	Species of whales sighted												Sighting direction	Distance from the ship (mile)	Number of observers
									BA	BB	BE	BP	MN	OO	PM	ZX	UD	US	UO	UX			
	1980 Dec.																						
17	8	13:00	50°12'S, 99°05'E		O	10	3	+4.7	-	-	-	-	-	-	-	-	-	-	-	-			4
	8	16:30	50°45'S, 98°17'E	45	A	10	3	+5.0															
18	8	17:00	50°50'S, 98°09'E		C	10	3	+4.7	-	-	-	-	-	-	-	-	-	-	-	-			4
	8	18:00	51°00'S, 97°56'E	12	O	10	5	+4.0															
19	9	06:00	52°52'S, 95°13'E		O	9	4	+4.0	-	-	-	-	-	-	-	-	-	-	-	-			3
	9	07:30	53°05'S, 94°57'E	17	O	9	5	+3.9															
20	9	08:00	53°11'S, 94°55'E		C	9	5	+3.3	-	-	-	-	-	-	-	-	-	-	-	-			4
	9	11:30	53°50'S, 94°28'E	40	C	10	5	+3.2															
21	9	13:00	54°06'S, 94°18'E		O	10	4	+3.0	-	-	-	-	-	-	-	-	-	-	-	-			4
	9	16:30	54°45'S, 93°47'E	43	A	10	5	+3.3															
22	9	17:00	54°51'S, 93°44'E		A	10	5	+3.2	-	-	-	-	-	-	-	-	-	-	-	-			4
	9	18:00	55°01'S, 93°36'E	10	O	10	4	+3.4															
23	10	06:00	56°05'S, 89°59'E		S	0	4	+2.0	-	-	-	-	-	-	-	-	-	-	-	-			4
	10	07:30	56°19'S, 89°35'E	18	S	0	5	+2.1															
24	10	08:30	56°29'S, 89°18'E		S	1	5	+2.0	-	-	-	-	-	-	-	-	-	-	-	-			4
	10	11:30	56°56'S, 88°30'E	44	S	1	5	+1.7															
25	10	13:00	57°09'S, 88°10'E		S	2	5	+1.8	-	-	-	-	-	-	-	-	-	-	-	-			4
	10	16:30	57°40'S, 87°15'E	42	O	4	5	+1.8															

	Date	Ship's time	Position	Cruising distance (mile)	Weather	Visibility (mile)	Wind velocity	Surface temperature (°C)	BA	BB	BE	BP	MN	OO	PM	ZX	UD	US	UO	UX	Sighting direction	Distance from the ship (mile)	Number of observers	* Sighted by the whalers
	1980 Dec.								Species of whales sighted															
26	10	17:00	57°43'S, 87°10'E		O	8	5	+2.0	-	-	-	-	-	-	-	-	-	-	-	-			4	
	10	18:00	57°53'S, 86°51'E	12	O	7	5	+1.9																
27	11	05:50	59°44'S, 84°48'E		O	2	4	-0.7															4	
	11	07:13	60°00'S, 84°50'E		O	3	5	-0.5	1	-	-	-	-	-	-	-	-	-	-	-	R20	1.0	4	*
	11	07:30	60°02'S, 84°50'E	17	O	4	5	-0.5																
28	11	08:00	60°08'S, 84°53'E		O	4	5	-0.5															4	
	11	09:35	60°28'S, 84°59'E		O	3	5	-0.5	4	-	-	-	-	-	-	-	-	-	-	-	L40	2.0	4	*
	11	11:04	60°40'S, 84°48'E		O	3	5	-1.0	1	-	-	-	-	-	-	-	-	-	-	-	L90	0.1	5	
	11	11:04	60°40'S, 84°48'E		O	3	5	-1.0	1	-	-	-	-	-	-	-	-	-	-	-	L45	0.5	5	*
	11	11:30	60°46'S, 84°42'E	37	O	3	5	-1.0																
29	11	13:00	61°01'S, 84°31'E		O	3	6	-0.6																
	11	14:22	61°17'S, 84°42'E		O	3	6	-0.6	3	-	-	-	-	-	-	-	-	-	-	-	L5	1.0	4	*
	11	14:30	61°19'S, 84°42'E	15	O	3	6	-0.6																
30	11	17:00	61°14'S, 84°42'E		S	2	6	-0.8																
	11	17:20	61°16'S, 84°41'E		S	1	6	-0.8	1	-	-	-	-	-	-	-	-	-	-	-	L10	0.4	4	*
	11	18:00	61°19'S, 84°34'E	5	O	1	6	-1.4																
31	12	05:30	61°44'S, 83°22'E		O	3	6	-1.4	-	-	-	-	-	-	-	-	-	-	-	-			4	
	12	06:00	61°46'S, 83°16'E	4	O	2	5	-1.5																
32	12	15:30	61°45'S, 83°20'E		O	2	4	-1.2															4	
	12	15:45	61°48'S, 83°20'E		O	2	4	-1.2	-	-	-	-	-	-	-	1	-	-	-	-	L5	0.1	4	*
	12	18:30	62°14'S, 82°42'E	32	O	2	4	-1.0																

	Date	Ship's time	Position	Cruising distance (mile)	Weather	Visibility (mile)	Wind velocity	Surface temperature (°C)	Species of whales sighted												Sighting direction	Distance from the ship (mile)	Number of observers * Sighted by the whalers
									BA	BB	BE	BP	MN	OO	PM	ZX	UD	US	UO	UX			
	1980 Dec.																						
33	13	05:45	62°43'S, 81°31'E		S	2	3	-1.0	-	-	-	-	-	-	-	-	-	-	-	-			4
	13	07:30	62°55'S, 80°55'E	19	S	2	3	-0.9															
34	13	08:00	62°58'S, 80°45'E		O	5	4	-0.7															
	13	09:35	63°11'S, 80°14'E		O	6	3	-0.7	-	-	-	-	-	-	1	-	-	-	-	-	L50	0.3	4 *
	13	11:30	63°35'S, 80°07'E	42	O	9	3	-0.5															
35	13	13:00	63°53'S, 80°03'E		O	9	3	-0.6															4
	13	13:10	63°56'S, 80°02'E		O	9	3	-0.6	2	-	-	-	-	-	-	-	-	-	-	-	L5	1.5	4 *
	13	14:00	64°05'S, 80°02'E	12	O	9	3	-0.6															
36	14	06:00	63°00'S, 79°59'E		S	1	2	-0.6	-	-	-	-	-	-	-	-	-	-	-	-			4
	14	07:30	62°46'S, 79°59'E	14	S	1	2	-0.6															
37	14	08:00	62°40'S, 80°00'E		S	1	2	-0.7															4
	14	08:25	62°34'S, 79°59'E		S	1	2	-0.7	1	-	-	-	-	-	-	-	-	-	-	-	R90	0.2	4
	14	10:35	62°08'S, 79°59'E		O	7	3	-0.3	2	-	-	-	-	-	-	-	-	-	-	-	R30	0.2	5
	14	11:15	62°00'S, 80°00'E	39	O	7	4	-0.2															
38	14	13:00	62°00'S, 80°00'E		C	7	4	-0.6	-	-	-	-	-	-	-	-	-	-	-	-			4
	14	16:30	61°20'S, 80°00'E	39	C	7	4	-0.5															
39	14	17:00	61°15'S, 80°00'E		C	7	4	-0.3	-	-	-	-	-	-	-	-	-	-	-	-			4
	14	18:00	61°04'S, 79°56'E	11	O	2	5	-0.3															
40	15	06:00	61°00'S, 77°03'E		C	7	4	-0.6															4
	15	07:15	61°00'S, 76°34'E		C	8	4	-0.5	-	-	-	-	-	-	1	-	-	-	-	-	R40	0.8	4 *
	15	07:30	61°00'S, 76°30'E	16	C	9	4	-0.5															

	Date	Ship's time	Position	Cruising distance (mile)	Weather	Visibility (mile)	Wind velocity	Surface temperature (°C)	Species of whales sighted												Sighting direction	Distance from the ship (mile)	Number of observers	* Sighted by the whalers
									BA	BB	BE	BP	MN	OO	PM	ZX	UD	US	UO	UX				
	1980 Dec.																							
41	15	08:00	61°00'S, 76°20'E		C	9	4	-0.6	-	-	-	-	-	-	-	-	-	-	-				4	
	15	11:15	61°00'S, 75°04'E	36	C	10	3	-0.4																
42	15	13:10	61°00'S, 75°02'E		S	1	4	-0.3	-	-	-	-	-	-	-	-	-	-	-				4	
	15	16:30	61°40'S, 75°00'E	40	S	1	4	-0.4																
43	15	17:00	61°45'S, 75°00'E		S	1	4	-0.2															4	
	15	17:50	61°55'S, 74°59'E		O	7	4	-0.3	1	-	-	-	-	-	-	-	-	-	-		R5	1.5	4	*
	15	18:00	62°00'S, 74°59'E	12	O	7	4	-0.3																
44	16	06:50	63°02'S, 75°01'E		C	8	4	-0.3	-	-	-	-	-	-	-	-	-	-	-				4	
	16	07:30	63°07'S, 75°00'E	7	C	8	4	-0.3																
45	16	08:00	63°13'S, 75°00'E		S	3	4	-0.5	-	-	-	-	-	-	-	-	-	-	-				4	
	16	11:30	63°46'S, 74°30'E	36	C	8	4	-0.6																
46	16	12:00	63°53'S, 74°27'E		C	8	4	-0.6															4	
	16	12:17	63°55'S, 74°24'E		C	8	4	-0.6	2	-	-	-	-	-	-	-	-	-	-		R10	1.5	4	*
	16	12:43	63°54'S, 74°26'E		C	8	4	-0.6	2	-	-	-	-	-	-	-	-	-	-		L50	1.0	4	*
	16	13:20	63°57'S, 74°26'E		C	8	4	-0.6	3	-	-	-	-	-	-	-	-	-	-		R35	1.0	4	*
	16	14:00	64°00'S, 74°19'E	9	O	7	5	-0.6																
47	16	15:45	64°00'S, 74°19'E		O	8	5	-0.7																
	16	16:00	64°03'S, 74°15'E		O	8	5	-0.7	2	-	-	-	-	-	-	-	-	-	-		L45	2.0	4	*
	16	18:30	64°09'S, 74°15'E	10	O	8	4	-0.8																

	Date	Ship's time	Position	Cruising distance (mile)	Weather	Visibility (mile)	Wind velocity	Surface temperature (°C)	Species of whales sighted												Sighting direction	Distance from the ship (mile)	Number of observers
									BA	BB	BE	BP	MN	OO	PM	ZX	UD	US	UO	UX			* Sighted by the whalers
	1980 Dec.																						
48	17	08:00	64°22'S, 73°29'E		O	7	4	-0.7															4
	17	08:45	64°22'S, 73°26'E		O	7	4	-0.7	2	-	-	-	-	-	-	-	-	-	-	-	0	2.0	4*
	17	10:10	64°21'S, 73°34'E		O	7	4	-0.6	-	-	-	-	-	-	-	-	-	3	-	-	R10	2.0	4*
	17	10:23	64°20'S, 73°38'E		O	7	4	-0.6	1	-	-	-	-	-	-	-	-	-	-	-	L30	0.3	4*
	17	11:30	64°11'S, 73°36'E	21	O	8	5	-1.1															
49	17	12:30	64°05'S, 73°35'E		O	6	4	-1.0															
	17	14:05	64°06'S, 74°17'E		S	3	4	-0.6	1	-	-	-	-	-	-	-	-	-	-	-	L35	0.2	4*
	17	14:10	64°07'S, 74°18'E		S	3	4	-0.6	1	-	-	-	-	-	-	-	-	-	-	-	R100	0.3	4
	17	15:37	64°21'S, 74°05'E		S	2	4	-0.6	2	-	-	-	-	-	-	-	-	-	-	-	L30	1.0	4*
	17	15:50	64°22'S, 74°06'E		S	1	4	-0.6	-	-	-	-	-	-	-	-	-	1	-	-	L20	0.5	4*
	17	16:30	64°26'S, 73°56'E	44	S	1	4	-0.7															
50	18	08:00	64°27'S, 73°44'E		F	2	1	-0.8															
	18	08:35	64°27'S, 73°44'E		F	2	1	-0.8	10	-	-	-	-	-	-	-	-	-	-	-	L90	0.5	4
	18	08:55	64°25'S, 73°43'E		F	1	1	-0.8	1	-	-	-	-	-	-	-	-	-	-	-	R45	0.4	4*
	18	09:13	64°23'S, 73°42'E		F	2	1	-0.8	1	-	-	-	-	-	-	-	-	-	-	-	L50	1.0	4*
	18	09:20	64°21'S, 73°41'E		O	4	1	-0.8	1	-	-	-	-	-	-	-	-	-	-	-	R30	1.5	4*
	18	09:48	64°16'S, 73°38'E		O	7	1	-0.4	3	-	-	-	-	-	-	-	-	-	-	-	L15	3.0	4*
	18	10:27	64°10'S, 73°27'E		O	7	1	-0.4	1	-	-	-	-	-	-	-	-	-	-	-	L30	2.0	4*
	18	10:40	64°07'S, 73°24'E		O	8	1	-0.4	3	-	-	-	-	-	-	-	-	-	-	-	L25	3.5	4*
	18	11:00	64°03'S, 73°23'E		O	8	1	-0.9	1	-	-	-	-	-	-	-	-	-	-	-	0	2.5	4*
	18	11:17	64°01'S, 73°25'E		O	8	1	-0.9	1	-	-	-	-	-	-	-	-	-	-	-	R15	2.7	4*
	18	11:30	63°59'S, 73°25'E	29	O	8	1	-0.9															

	Date	Ship's time	Position	Cruising distance (mile)	Weather	Visibility (mile)	Wind velocity	Surface temperature (°C)	BA	BB	BE	BP	MN	OO	PM	ZX	UD	US	UO	UX	Sighting direction	Distance from the ship (mile)	Number of observers	* Sighted by the whalers
	1980 Dec.								Species of whales sighted															
51	18	13:00	63°52'S, 73°48'E		O	8	0	-0.5															4	
	18	13:05	63°50'S, 73°47'E		O	8	0	-0.5	2	-	-	-	-	-	-	-	-	-	-	-	0	1.5	4	*
	18	13:15	63°49'S, 73°44'E		O	8	0	-0.5	2	-	-	-	-	-	-	-	-	-	-	-	R5	3.0	4	*
	18	13:25	63°48'S, 73°48'E		O	8	0	-0.4	2	-	-	-	-	-	-	-	-	-	-	-	L5	1.0	5	
	18	13:35	63°47'S, 73°38'E		O	8	0	-0.4	3	-	-	-	-	-	-	-	-	-	-	-	L5	2.5	5	*
	18	15:00	63°43'S, 73°12'E	20	O	6	1	-0.9																
52	19	06:00	63°12'S, 72°22'E		O	8	5	-0.4	-	-	-	-	-	-	-	-	-	-	-	-			4	
	19	07:30	63°20'S, 71°53'E	17	O	8	5	-0.5																
53	19	08:30	63°27'S, 71°37'E		O	8	5	-0.5	-	-	-	-	-	-	-	-	-	-	-	-			4	
	19	11:30	63°48'S, 70°59'E	31	O	8	6	-0.7																
54	19	13:00	64°05'S, 70°54'E		O	8	5	-0.6															4	
	19	13:30	64°08'S, 70°45'E		O	7	5	-0.6	-	-	-	-	1	-	-	-	-	-	-	-	L45	2.0	4	*
	19	14:32	64°10'S, 70°20'E		O	7	5	-0.4	1	-	-	-	-	-	-	-	-	-	-	-	R10	1.5	4	*
	19	15:15	64°12'S, 70°14'E		O	7	5	-0.7	1	-	-	-	-	-	-	-	-	-	-	-	R5	0.5	5	*
	19	15:40	64°12'S, 70°12'E	20	O	7	5	-0.7																
55	19	17:30	64°12'S, 70°09'E		O	7	5	-0.7	-	-	-	-	-	-	-	-	-	-	-	-			4	
	19	19:00	64°05'S, 70°03'E	12	O	7	5	-0.6																
56	20	06:00	63°04'S, 70°29'E		O	8	3	-0.7	-	-	-	-	-	-	-	-	-	-	-	-			4	
	20	07:00	63°00'S, 70°37'E	5	O	8	3	-0.8																
57	20	10:35	62°59'S, 70°41'E		O	8	0	-0.7	-	-	-	-	-	-	-	-	-	-	-	-			4	
	20	11:30	62°48'S, 70°32'E	12	O	8	0	-0.7																

	Date	Ship's time	Position	Cruising distance (mile)	Weather	Visibility (mile)	Wind velocity	Surface temperature (°C)	Species of whales sighted												Sighting direction	Distance from the ship (mile)	Number of observers	* Sighted by the whalers
									BA	BB	BE	BP	MN	OO	PM	ZX	UD	US	UO	UX				
	1980 Dec.																							
58	20	12:30	62°37'S, 70°17'E		O	8	2	-0.5	-	-	-	-	-	-	-	-	-	-	-	-			4	
	20	16:00	62°00'S, 70°00'E	38	O	8	6	-0.5																
59	21	06:00	60°59'S, 68°14'E		O	8	6	+0.1	-	-	-	-	-	-	-	-	-	-	-	-			4	
	21	07:30	60°59'S, 67°37'E	18	O	8	5	+0.2																
60	21	08:00	60°59'S, 67°26'E		O	8	4	0.0	-	-	-	-	-	-	-	-	-	-	-	-			4	
	21	11:30	60°59'S, 66°05'E	39	O	8	5	+0.1																
61	21	12:00	61°00'S, 65°55'E		O	8	5	+0.3	-	-	-	-	-	-	-	-	-	-	-	-			4	
	21	14:30	61°00'S, 65°00'E	27	O	9	5	0.0																
62	21	17:00	61°05'S, 64°58'E		O	9	4	+0.1															4	
	21	18:45	61°22'S, 64°59'E		A	9	4	+0.1	1	-	-	-	-	-	-	-	-	-	-	-	R30	1.5	4	*
	21	19:00	61°26'S, 64°59'E	24	A	9	4	+0.2																
63	22	07:30	63°01'S, 64°59'E		O	9	0	-0.5															4	
	22	07:30	63°01'S, 64°59'E		O	9	0	-0.5	1	-	-	-	-	-	-	-	-	-	-	-	R10	1.5	4	*
	22	08:50	63°18'S, 64°54'E		O	9	2	-0.9	1	-	-	-	-	-	-	-	-	-	-	-	R10	1.5	4	*
	22	09:10	63°21'S, 64°50'E		O	7	2	-0.7	2	-	-	-	-	-	-	-	-	-	-	-	R50	1.5	4	
	22	11:08	63°31'S, 64°35'E		O	8	3	-1.1	3	-	-	-	-	-	-	-	-	-	-	-	R45	2.0	4	*
	22	11:20	63°33'S, 64°37'E		O	8	3	-1.1	2	-	-	-	-	-	-	-	-	-	-	-	L90	1.0	4	*
	22	11:30	63°35'S, 64°49'E	33	O	8	3	-1.1																

	Date	Ship's time	Position	Cruising distance (mile)	Weather	Visibility (mile)	Wind velocity	Surface temperature (°C)	Species of whales sighted												Sighting direction	Distance from the ship (mile)	Number of observers * Sighted by the whalers
									BA	BB	BE	BP	MN	OO	PM	ZX	UD	US	UO	UX			
	1980 Dec.																						
64	22	12:00	63°40'S, 64°45'E																				4
	22	12:10	63°42'S, 64°47'E		O	8	3	-0.8	1	-	-	-	-	-	-	-	-	-	-	-	L50	1.0	4 *
	22	12:25	63°44'S, 64°45'E		O	8	3	-0.8	3	-	-	-	-	-	-	-	-	-	-	-	R35	1.0	4 *
	22	12:55	63°46'S, 64°39'E		O	8	3	-1.1	2	-	-	-	-	-	-	-	-	-	-	-	0	0.5	4
	22	14:07	63°57'S, 64°40'E		O	8	0	-0.9	2	-	-	-	-	-	-	-	-	-	-	-	R5	1.5	4 *
	22	14:20	63°58'S, 64°42'E		O	8	0	-0.9	1	-	-	-	-	-	-	-	-	-	-	-	R10	2.0	4 *
	22	16:30	64°15'S, 64°57'E	35	O	8	2	-0.5															
65	23	10:30	64°37'S, 65°18'E		S	1	4	-0.8	-	-	-	-	-	-	-	-	-	-	-	-			4
	23	11:30	64°33'S, 65°02'E	10	S	1	4	-0.8															
66	23	12:00	64°29'S, 64°52'E		S	1	4	-0.7															4
	23	12:05	64°28'S, 64°49'E		S	1	4	-0.7	3	-	-	-	-	-	-	-	-	-	-	-	R70	0.2	4
	23	12:25	64°28'S, 64'52'E		S	1	4	-0.7	4	-	-	-	-	-	-	-	-	-	-	-	L45	0.4	4 *
	23	15:19	64°20'S, 64°32'E		F	0	4	-0.6	5	-	-	-	-	-	-	-	-	-	-	-	0	0.1	4
	23	16:02	64°15'S, 64°18'E		O	5	3	-0.9	2	-	-	-	-	-	-	-	-	-	-	-	R10	1.0	4
	23	16:30	64°12'S, 64°10'E	26	O	6	3	-0.6															
67	23	17:00	64°08'S, 64°01'E		C	6	2	-0.3	-	-	-	-	-	-	-	-	-	-	-	-			4
	23	19:00	63'56'S, 63°22'E	22	C	8	2	-0.5															
68	24	08:00	64°01'S, 60°00'E		O	3	4	+0.3															
	24	08:15	64°02'S, 60°00'E		O	3	4	+0.3	-	-	-	-	-	-	-	3	-	-	-	-	0	1.0	4 *
	24	08:50	64°10'S, 60°09'E		O	5	4	+0.3	-	-	-	-	-	10	-	-	-	-	-	-	L20	1.0	4 *
	24	11:00	64°24'S, 60°31'E	28	O	5	3	-1.5															

	Date	Ship's time	Position	Cruising distance (mile)	Weather	Visibility (mile)	Wind velocity	Surface temperature (°C)	Species of whales sighted												Sighting direction	Distance from the ship (mile)	Number of observers
									BA	BB	BE	BP	MN	OO	PM	ZX	UD	US	UO	UX			
	1980 Dec.																						
69	24	12:00	64°24'S, 60°31'E		O	5	3	-1.3	-	-	-	-	-	-	-	-	-	-	-	-			4
	24	14:00	64°28'S, 60°01'E	14	O	5	3	-1.2															
70	25	06:00	63°39'S, 60°00'E		O	6	2	0.0	-	-	-	-	-	-	-	-	-	-	-	-			4
	25	07:30	63°22'S, 60°00'E	17	O	6	2	-0.1															
71	25	08:00	63°17'S, 59°59'E		O	6	3	0.0	-	-	-	-	-	-	-	-	-	-	-	-			4
	25	09:30	63°00'S, 60°00'E	17	S	1	4	-0.1															
72	25	14:30	63°01'S, 60°00'E		S	1	4	0.0	-	-	-	-	-	-	-	-	-	-	-	-			4
	25	16:30	62°40'S, 60°00'E	21	S	1	3	0.0															
73	25	17:00	62°35'S, 59°59'E		O	6	4	0.0	-	-	-	-	-	-	-	-	-	-	-	-			4
	25	19:00	62°13'S, 60°00'E	22	S	1	5	+0.3															
74	26	06:30	60°59'S, 60°01'E		A	7	5	+0.9	-	-	-	-	-	-	-	-	-	-	-	-			4
	26	07:30	60°59'S, 59°44'E	8	A	7	5	+0.9															
75	26	08:00	60°59'S, 59°33'E		A	8	5	+0.9	-	-	-	-	-	-	-	-	-	-	-	-			4
	26	11:30	61°00'S, 58°23'E	35	A	8	5	+0.5															
76	26	13:00	61°00'S, 57°55'E		A	8	5	+0.9															
	26	13:55	60°59'S, 57°34'E		A	9	4	+0.4	-	-	-	-	-	-	-	-	-	-	-	1	L30	0.8	4
	26	16:30	61°00'S, 56°40'E	36	C	9	4	+0.5															
77	26	17:00	61°00'S, 56°30'E		A	9	4	+0.5															4
	26	17:47	61°00'S, 56°13'E		A	9	4	+0.5	-	-	-	10	-	-	-	-	-	-	-	-	L30	5.0	4 *
	26	18:00	61°00'S, 56°09'E	11	A	9	4	+0.5															

* Sighted by the whalers

	Date	Ship's time	Position	Cuising distance (mile)	Weather	Visibility (mile)	Wind velocity	Surface temperature (°C)	Species of whales sighted												Sighting direction	Distance from the ship (mile)	Number of observers * Sighted by the whalers
									BA	BB	BE	BP	MN	OO	PM	ZX	UD	US	UO	UX			
	1980 Dec.																						
78	27	06:00	60°29'S, 52°04'E		O	7	3	+0.3	-	-	-	-	-	-	-	-	-	-	-	-			4
	27	07:30	60°21'S, 51°35'E	16	O	7	3	+0.4															
79	27	08:00	60°20'S, 51°24'E		C	7	3	+0.3	-	-	-	-	-	-	-	-	-	-	-	-			4
	27	11:30	60°09'S, 50°38'E	25	C	9	3	+0.3															
80	27	13:00	60°02'S, 50°13'E		C	9	3	+0.5															
	27	13:05	60°01'S, 50°11'E		C	9	3	+0.5	1	-	-	-	-	-	-	-	-	-	-	-	L60	0.5	4 *
	27	15:07	59°47'S, 49°41'E		C	8	3	+0.5	1	-	-	-	-	-	-	-	-	-	-	-	L120	0.1	4
	27	15:15	59°46'S, 49°39'E		C	8	3	+0.5	1	-	-	-	-	-	-	-	-	-	-	-	L40	0.8	4 *
	27	16:30	59°37'S, 49°18'E	37	O	8	+	+0.5															
81	28	06:00	57°41'S, 46°13'E		F	0	2	+1.1															4
	28	07:00	57°24'S, 46°06'E		O	8	3	+1.2	-	-	-	1	-	-	-	-	-	-	-	-	L10	4.0	4 *
	28	07:30	57°17'S, 46°04'E	17	F	1	3	+1.2															
82	28	08:00	57°11'S, 46°02'E		F	0	3	+1.3	-	-	-	-	-	-	-	-	-	-	-	-			4
	28	11:30	56°28'S, 45°47'E	43	O	7	4	+1.2															
83	28	13:00	56°11'S, 45°42'E		S	4	4	+1.3	-	-	-	-	-	-	-	-	-	-	-	-			4
	28	16:30	55°42'S, 45°17'E	37	O	8	4	+1.3															
84	28	17:00	55°38'S, 45°08'E		O	8	3	+1.3	-	-	-	-	-	-	-	-	-	-	-	-			4
	28	18:00	55°33'S, 44°52'E	11	O	7	3	+1.3															

	Date	Ship's time	Position	Cruising distance (mile)	Weather	Visibility (mile)	Wind velocity	Surface temperature (°C)	Species of whales sighted												Sighting direction	Distance from the ship (mile)	Number of observers	* Sighted by the whalers
									BA	BB	BE	BP	MN	OO	PM	ZX	UD	US	UO	UX				
	1981 Jan.																							
85	11	06:00	37°39'S, 26°50'E		B	10	4	+19.7	-	-	-	-	-	-	-	-	-	-	-	-			4	
	11	07:30	37°59'S, 26°49'E	20	B	10	4	+18.6																
86	11	08:30	38°13'S, 26°50'E		B	10	4	+19.0	-	-	-	-	-	-	-	-	-	-	-	-			4	
	11	11:30	38°57'S, 26°56'E	44	B	10	4	+18.9																
87	11	13:00	39°16'S, 26°59'E		C	9	5	+19.1															4	
	11	13:28	39°22'S, 27°00'E		C	9	5	+19.1	-	-	-	1	-	-	-	-	-	-	-	-	L55	1.5	4	*
	11	16:30	39°58'S, 27°08'E	40	C	10	5	+16.8																
88	11	17:00	40°03'S, 27°10'E		C	10	5	+16.7	-	-	-	-	-	-	-	-	-	-	-	-			4	
	11	18:00	40°14'S, 27°13'E	11	C	5	6	+16.9																
89	12	06:00	41°57'S, 26°53'E		C	9	3	+13.9	-	-	-	-	-	-	-	-	-	-	-	-			4	
	12	07:30	42°11'S, 26°52'E	14	A	8	3	+14.6																
90	12	08:30	42°21'S, 26°50'E		A	8	2	+14.8	-	-	-	-	-	-	-	-	-	-	-	-			4	
	12	11:30	42°51'S, 26°46'E	30	C	8	5	+14.3																
91	12	13:00	43°05'S, 26°44'E		C	9	5	+14.2	-	-	-	-	-	-	-	-	-	-	-	-			4	
	12	16:30	43°44'S, 26°42'E	39	A	9	5	+14.2																
92	12	17:00	43°50'S, 26°42'E		A	9	4	+10.4	-	-	-	-	-	-	-	-	-	-	-	-			4	
	12	18:00	44°01'S, 26°42'E	11	O	9	4	+9.9																

	Date	Ship's time	Position	Cruising distance (mile)	Weather	Visibility (mile)	Wind velocity	Surface temperature (°C)	Species of whales sighted												Sighting direction	Distance from the ship (mile)	Number of observers * Sighted by the whalers
									BA	BB	BE	BP	MN	OO	PM	ZX	UD	US	UO	UX			
	1981 Jan.																						
93	13	06:00	46°31'S, 27°05'E		A	9	3	+6.8															4
	13	07:18	46°48'S, 27°08'E		A	9	3	+6.7	-	-	-	-	-	-	-	-	10	-	-	-	R5	0.1	4 *
	13	07:30	46°50'S, 27°07'E	19	A	9	3	+6.7															
94	13	08:30	47°02'S, 27°10'E		A	9	3	+6.3	-	-	-	-	-	-	-	-	-	-	-	-			4
	13	11:30	47°43'S, 27°16'E	41	A	10	3	+5.7															
95	13	13:00	48°04'S, 27°20'E		C	10	2	+5.6															4
	13	13:57	48°16'S, 27°23'E		C	10	2	+5.7	-	-	-	-	-	-	-	-	10	-	-	-	L10	1.0	4
	13	14:27	48°23'S, 27°24'E		A	10	2	+5.8	-	-	3	-	-	-	-	-	-	-	-	-	R30	0.1	4
	13	14:40	48°26'S, 27°25'E		A	10	2	+5.9	-	-	-	-	-	-	-	-	14	-	-	-	L70	0.2	3
	13	14:55	48°30'S, 27°25'E		A	10	2	+5.8	-	-	-	-	-	-	-	-	4	-	-	-	L45	0.5	4
	13	15:15	48°35'S, 27°26'E		A	10	2	+5.8	-	-	-	-	-	-	-	-	2	-	-	-	L30	0.2	4 *
	13	15:55	48°43'S, 27°27'E		A	10	2	+5.6	-	-	-	-	-	-	-	-	-	-	1	-	R30	0.1	4
	13	16:18	48°48'S, 27°28'E		A	10	2	+5.6	-	-	-	-	-	-	-	-	1	-	-	-	R45	0.1	4
	13	16:30	48°51'S, 27°28'E	47	A	10	2	+5.6															
96	13	17:00	48°57'S, 27°29'E		A	10	2	+5.5	-	-	-	-	-	-	-	-	-	-	-	-			4
	13	19:00	49°22'S, 27°33'E	25	A	10	2	+4.6															
97	14	06:00	51°37'S, 27°53'E		O	7	4	+3.3															4
	14	06:41	51°47'S, 27°54'E		O	7	4	+3.4	-	-	-	-	-	-	-	1	-	-	-	-	R15	1.0	4 *
	14	07:30	51°58'S, 27°56'E	21	O	7	4	+3.4															
98	14	08:30	52°10'S, 27°57'E		C	7	4	+3.5															4
	14	10:40	52°37'S, 27°59'E		C	5	5	+3.6	-	-	-	-	-	-	-	-	2	-	-	-	R10	0.1	4
	14	11:30	52°48'S, 28°01'E	38	C	6	5	+3.6															

	Date	Ship's time	Position	Cruising distance (mile)	Weather	Visibility (mile)	Wind velocity	Surface temperature (°C)	Species of whales sighted												Sighting direction	Distance from the ship (mile)	Number of observers	* Sighted by the whalers
									BA	BB	BE	BP	MN	OO	PM	ZX	UD	US	UO	UX				
	1981 Jan.																							
99	14	13:00	53°06'S, 28°05'E		O	7	5	+3.4															4	
	14	13:00	53°06'S, 28°05'E		O	7	5	+3.4	1	-	-	-	-	-	-	-	-	-	-	-	L10	0.2	3	
	14	14:00	53°19'S, 28°05'E		O	7	5	+3.4	1	-	-	-	-	-	-	-	-	-	-	-	R10	1.0	4	
	14	14:30	53°24'S, 28°05'E		O	7	5	+3.4	1	-	-	-	-	-	-	-	-	-	-	-	R45	0.1	5	
	14	16:30	53°48'S, 28°08'E	42	C	8	6	+3.3																
100	14	17:00	53°54'S, 28°08'E		C	8	6	+3.3	-	-	-	-	-	-	-	-	-	-	-	-			4	
	14	18:00	54°05'S, 28°11'E	11	C	8	6	+3.0																
101	15	06:00	56°24'S, 28°25'E		C	9	5	+2.0															4	
	15	06:10	56°27'S, 28°25'E		C	9	5	+2.0	1	-	-	-	-	-	-	-	-	-	-	-	L5	1.5	4	*
	15	07:30	56°42'S, 28°22'E	18	O	8	5	+1.6																
102	15	08:30	56°54'S, 28°16'E		O	8	4	+2.1															4	
	15	09:53	57°09'S, 28°10'E		O	9	4	+2.7	-	-	-	-	-	-	-	-	2	-	-	-	R10	0.1	4	*
	15	11:30	57°29'S, 28°03'E	35	O	9	4	+2.0																
103	15	13:00	57°46'S, 27°56'E		O	9	4	+1.8	-	-	-	-	-	-	-	-	-	-	-	-			4	
	15	16:30	58°26'S, 27°49'E	40	O	9	4	+1.7																
104	15	17:00	58°31'S, 27°51'E		A	9	4	+2.0	-	-	-	-	-	-	-	-	-	-	-	-			4	
	15	18:00	58°41'S, 27°55'E	10	O	9	4	+2.2																
105	16	06:00	60°45'S, 28°50'E		O	8	5	+1.2	-	-	-	-	-	-	-	-	-	-	-	-			4	
	16	07:30	61°01'S, 28°57'E	16	C	8	4	+1.0																

	Date	Ship's time	Position	Cruising distance (mile)	Weather	Visibility (mile)	Wind velocity	Surface temperature (°C)	Species of whales sighted												Sighting direction	Distance from the ship (mile)	Number of observers	* Sighted by the whalers
									BA	BB	BE	BP	MN	OO	PM	ZX	UD	US	UO	UX				
	1981 Jan.																							
106	16	08:00	61°07'S, 29°01'E		O	9	4	+1.2	-	-	-	-	-	-	-	-	-	-	-	-			4	
	16	09:00	61°17'S, 29°05'E	10	O	9	3	+1.2																
107	16	10:00	61°15'S, 29°03'E		O	9	4	+1.2	-	-	-	-	-	-	-	-	-	-	-	-			4	
	16	11:30	61°31'S, 29°12'E	16	O	9	4	+1.7																
108	16	13:00	61°47'S, 29°21'E		C	10	4	+1.7															4	
	16	16:00	62°20'S, 29°38'E		C	8	4	+1.8	-	-	-	-	-	-	1	-	-	-	-	-	L25	1.0	4	*
	16	16:30	62°26'S, 29°42'E	39	C	8	4	+1.8																
109	16	17:00	62°32'S, 29°46'E		A	8	4	+1.3	-	-	-	-	-	-	-	-	-	-	-	-			4	
	16	18:00	62°43'S, 29°52'E	11	O	9	4	+1.3																
110	17	08:00	64°03'S, 30°00'E		S	1	6	+1.0	-	-	-	-	-	-	-	-	-	-	-	-			4	
	17	11:30	64°32'S, 29°59'E	29	S	2	6	+0.8																
111	17	12:00	64°37'S, 29°59'E		O	5	6	+0.9	-	-	-	-	-	-	-	-	-	-	-	-			4	
	17	14:35	65°00'S, 30°00'E	23	A	6	6	+0.8																
112	17	17:30	65°00'S, 30°00'E		C	8	5	+0.9	-	-	-	-	-	-	-	-	-	-	-	-			4	
	17	19:30	65°17'S, 30°01'E	17	O	8	4	+0.5																
113	18	05:50	66°30'S, 30°01'E		B	10	4	+0.3															4	
	18	06:00	66°33'S, 30°02'E		B	10	4	+0.3	1	-	-	-	-	-	-	-	-	-	-	-	L30	2.0	4	*
	18	06:10	66°35'S, 30°02'E		B	10	4	+0.3	2	-	-	-	-	-	-	-	-	-	-	-	L35	1.5	4	*
	18	06:25	66°37'S, 30°00'E		B	10	4	+0.3	2	-	-	-	-	-	-	-	-	-	-	-	L40	1.0	4	*

	Date	Ship's time	Position	Cruising distance (mile)	Weather	Visibility (mile)	Wind velocity	Surface temperature (°C)	Species of whales sighted												Sighting direction	Distance from the ship (mile)	Number of observers * Sighted by the whalers
									BA	BB	BE	BP	MN	OO	PM	ZX	UD	US	UO	UX			
	1981 Jan.																						
113	18	06:34	66°39'S, 30°00'E		B	10	4	+0.3	3	-	-	-	-	-	-	-	-	-	-	-	L30	2.0	4 *
(cont.)	18	06:55	66°42'S, 30°00'E		B	10	4	0.0	2	-	-	-	-	-	-	-	-	-	-	-	R10	1.5	4 *
	18	07:05	66°44'S, 30°00'E		B	10	4	0.0	2	-	-	-	-	-	-	-	-	-	-	-	L5	1.0	4
	18	07:23	66°47'S, 29°59'E		B	10	4	+0.2	3	-	-	-	-	-	-	-	-	-	-	-	L60	3.0	4
	18	07:29	66°49'S, 29°59'E		B	10	4	+0.2	1	-	-	-	-	-	-	-	-	-	-	-	L20	1.0	4 *
	18	07:30	66°49'S, 29°59'E	19	B	10	4	+0.2															
114	18	07:45	66°52'S, 29°59'E		B	10	4	+0.2															
	18	07:55	55°54'S, 29°59'E		B	10	4	+0.2	1	-	-	-	-	-	-	-	-	-	-	-	L40	0.5	4 *
	18	08:05	66°56'S, 29'59'E		B	10	4	+0.2	3	-	-	-	-	-	-	-	-	-	-	-	L30	1.5	4 *
	18	08:15	66°58'S, 29°59'E		B	10	4	+0.2	1	-	-	-	-	-	-	-	-	-	-	-	R10	1.0	4 *
	18	08:30	67°00'S, 30°00'E		B	10	4	+0.2	1	-	-	-	-	-	-	-	-	-	-	-	L80	1.2	4 *
	18	08:30	67°00'S, 30°00'E	8	B	10	4	+0.2															
115	18	12:00	67°10'S, 29°58'E		B	10	4	0.0															4
	18	13:18	67°25'S, 29°59'E		A	10	4	+0.2	1	-	-	-	-	-	-	-	-	-	-	-	L45	4.0	4
	18	16:30	67°35'S, 30°02'E	43	C	10	3	-0.3															
116	19	05:45	67°16'S, 30°54'E		O	10	2	+0.1															4
	19	06:15	67°12'S, 31°08'E		O	10	0	+0.4	3	-	-	-	-	-	-	-	-	-	-	-	L45	1.0	4 *
	19	06:42	67°10'S, 31°20'E		O	10	0	+0.2	4	-	-	-	-	-	-	-	-	-	-	-	L30	1.0	4 *
	19	07:30	67°10'S, 31°46'E	22	O	10	2	-0.5															
117	19	08:00	67°09'S, 32°04'E		O	10	2	-0.8															
	19	09:00	67°04'S, 32°30'E		O	10	1	-1.0	4	-	-	-	-	-	-	-	-	-	-	-	L10	2.0	4 *

	Date	Ship's time	Position	Cruising distance (mile)	Weather	Visibility (mile)	Wind velocity	Surface temperature (°C)	Species of whales sighted												Sighting direction	Distance from the ship (mile)	Number of observers	* Sighted by the whalers
									BA	BB	BE	BP	MN	OO	PM	ZX	UD	US	UO	UX				
	1981 Jan.																							
117	19	09:20	67°04'S, 32°35'E		O	10	1	-1.0	1	-	-	-	-	-	-	-	-	-	-	-	R60	0.1	5	
(cont)	19	09:25	67°03'S, 32°37'E		O	10	1	-0.8	5	-	-	-	-	-	-	-	-	-	-	-	R30	1.5	4	*
	19	09:38	67°02'S, 32°44'E		O	10	1	-0.6	2	-	-	-	-	-	-	-	-	-	-	-	R60	1.0	4	*
	19	09:45	67°02'S, 32°48'E		O	10	1	-0.6	2	-	-	-	-	-	-	-	-	-	-	-	L40	1.0	4	*
	19	09:50	67°01'S, 32°49'E		O	10	1	-0.6	5	-	-	-	-	-	-	-	-	-	-	-	R20	1.5	4	*
	19	10:05	67°00'S, 32°53'E		O	10	1	-0.6	1	-	-	-	-	-	-	-	-	-	-	-	R45	4.0	4	*
	19	10:17	66°59'S, 32°59'E		O	10	1	-0.5	4	-	-	-	-	-	-	-	-	-	-	-	R25	2.5	4	*
	19	10:28	66°59'S, 33°04'E		O	10	1	+0.2	7	-	-	-	-	-	-	-	-	-	-	-	L30	1.5	4	*
	19	10:35	66°58'S, 33°11'E		O	10	0	+0.2	2	-	-	-	-	-	-	-	-	-	-	-	0	1.0	4	
	19	10:50	66°57'S, 33°16'E		O	10	0	+0.2	10	-	-	-	-	-	-	-	-	-	-	-	R20	1.0	4	
	19	11:15	66°53'S, 33°28'E		O	10	1	-0.4	2	-	-	-	-	-	-	-	-	-	-	-	L20	2.0	4	*
	19	11:24	66°53'S, 33°31'E		O	10	1	-0.3	1	-	-	-	-	-	-	-	-	-	-	-	R10	1.0	4	*
	19	11:30	66°52'S, 33°35'E	40	O	10	1	-0.4																
118	19	14:20	66°50'S, 33°46'E		O	10	1	-0.4																
	19	14:49	66°48'S, 33°51'E		O	10	1	-0.8	10	-	-	-	-	-	-	-	-	-	-	-	R20	2.0	4	*
	19	15:00	66°47'S, 33°56'E		O	10	1	-0.6	3	-	-	-	-	-	-	-	-	-	-	-	L10	0.5	4	*
	19	15:45	66°40'S, 34°02'E		O	10	1	-0.2	6	-	-	-	-	-	-	-	-	-	-	-	R10	3.0	4	*
	19	15:55	66°39'S, 34°02'E		O	10	1	-0.2	1	-	-	-	-	-	-	-	-	-	-	-	R30	1.0	4	*
	19	16:15	66°36'S, 34°07'E		O	10	1	-0.4	3	-	-	-	-	-	-	-	-	-	-	-	L5	2.5	4	*
	19	16:27	66°35'S, 34°11'E		O	10	1	0.0	4	-	-	-	-	-	-	-	-	-	-	-	0	1.0	4	
	19	16:30	66°34'S, 34°13'E	19	O	10	1	0.0																
119	19	16:50	66°30'S, 34°19'E		O	10	1	+0.1															4	
	19	16:55	66°29'S, 34°20'E		O	10	1	+0.2	1	-	-	-	-	-	-	-	-	-	-	-	R40	1.5	4	*
	19	17:15	66°26'S, 34°24'E		O	10	1	+0.1	3	-	-	-	-	-	-	-	-	-	-	-	L15	3.0	4	
	19	17:25	66°24'S, 34°26'E	7	O	10	1	+0.2																

	Date	Ship's time	Position	Cruising distance (mile)	Weather	Visibility (mile)	Wind velocity	Surface temperature (°C)	Species of whales sighted												Sighting direction	Distance from the ship (mile)	Number of observers * Sighted by the whalers
									BA	BB	BE	BP	MN	OO	PM	ZX	UD	US	UO	UX			
	1981 Jan.																						
120	20	06:40	66°00'S, 35°01'E		O	10	1	-0.5															4
	20	06:55	65°57'S, 35°01'E		O	10	1	-0.9	2	-	-	-	-	-	-	-	-	-	-	-	R15	1.5	4 *
	20	07:17	65°53'S, 34°59'E		O	10	2	-1.0	3	-	-	-	-	-	-	-	-	-	-	-	R15	1.0	4 *
	20	07:30	65°50'S, 34°59'E	10	O	10	1	-0.7															
121	20	08:00	65°45'S, 35°00'E		O	10	1	-0.8															
	20	09:30	65°29'S, 35°00'E		O	9	1	-0.2	3	-	-	-	-	-	-	-	-	-	-	-	L60	1.0	4 *
	20	11:20	65°07'S, 34°58'E		O	9	2	0.0	-	-	-	-	-	-	-	2	-	-	-	-	L15	1.0	4 *
	20	11:30	65°05'S, 34°58'E	40	O	9	2	+0.1															
122	20	14:40	64°56'S, 34°58'E		O	9	0	+0.2	-	-	-	-	-	-	-	-	-	-	-	-			4
	20	16:30	64°35'S, 35°00'E	21	O	10	0	+1.0															
123	20	17:00	64°30'S, 35°00'E		O	10	1	+1.0															
	20	17:03	64°29'S, 35°00'E		O	9	1	+0.9	-	-	-	-	-	-	-	1	-	-	-	-	R10	0.6	4
	20	18:00	64°18'S, 34°59'E	12	O	9	1	+0.8															
124	21	06:30	63°00'S, 34°57'E		O	9	3	+0.8	-	-	-	-	-	-	-	-	-	-	-	-			4
	21	07:30	63°00'S, 35°19'E	9	O	9	4	+0.7															
125	21	08:30	63°00'S, 35'45'E		O	9	4	+0.9	-	-	-	-	-	-	-	-	-	-	-	-			4
	21	11:30	63°00'S, 36°55'E	32	O	9	4	+1.3															
126	21	13:00	63°00'S, 37°30'E		O	9	5	+1.3	-	-	-	-	-	-	-	-	-	-	-	-			4
	21	16:30	63°00'S, 38°48'E	35	A	9	6	+1.3															

	Date	Ship's time	Position	Cruising distance (mile)	Weather	Visibility (mile)	Wind velocity	Surface temperature (°C)	BA	BB	BE	BP	MN	OO	PM	ZX	UD	US	UO	UX	Sighting direction	Distance from the ship (mile)	Number of observers	* Sighted by the whalers
	1981 Jan.																							
127	21	17:00	63°00'S, 38°58'E		A	9	6	+1.4	-	-	-	-	-	-	-	-	-	-	-	-			4	
	21	18:00	63°00'S, 39°19'E	9	C	9	6	+1.4																
128	22	06:00	64°07'S, 39°55'E		C	9	5	+1.1	-	-	-	-	-	-	-	-	-	-	-	-			4	
	22	07:30	64°21'S, 39°59'E	14	C	9	6	+0.6																
129	22	08:30	64°31'S, 39°58'E		C	9	5	+1.0															4	
	22	08:35	64°32'S, 39°58'E		C	9	5	+1.0	1	-	-	-	-	-	-	-	-	-	-	-	R60	0.1	4	*
	22	11:20	65°00'S, 40°00'E	29	O	9	5	+0.8																
130	22	14:30	64°58'S, 39°57'E		C	9	5	+0.8	-	-	-	-	-	-	-	-	-	-	-	-			4	
	22	16:30	65°20'S, 40°00'E	22	O	9	5	+0.1																
131	22	17:00	65°25'S, 40°00'E		O	9	5	0.0	-	-	-	-	-	-	-	-	-	-	-	-			4	
	22	19:00	65°46'S, 40°00'E	21	O	9	5	+0.6																
132	23	08:40	66°55'S, 40°06'E		C	10	3	0.0																
	23	08:45	66°54'S, 40°06'E		C	10	3	0.0	5	-	-	-	-	-	-	-	-	-	-	-	L5	2.0	4	*
	23	09:40	66°51'S, 39°59'E		C	10	3	+0.1	10	-	-	-	-	-	-	-	-	-	-	-	L5	1.0	4	*
	23	10:20	66°45'S, 40°01'E		C	10	3	+0.8	2	-	-	-	-	-	-	-	-	-	-	-	L60	0.5	4	*
	23	11:00	66°38'S, 40°08'E		C	10	2	0.0	1	-	-	-	-	-	-	-	-	-	-	-	R40	0.2	5	
	23	11:20	66°37'S, 40°12'E		C	10	2	+0.6	2	-	-	-	-	-	-	-	-	-	-	-	R10	1.5	5	*
	23	11:30	66°36'S, 40°13'E	20	C	10	2	+0.6																
133	23	12:00	66°35'S, 40°27'E		O	10	2	+0.5	-	-	-	-	-	-	-	-	-	-	-	-			4	
	23	14:10	66°31'S, 41°23'E	23	O	10	2	-0.7																

Species of whales sighted

	Date	Ship's time	Position	Cruising distance (mile)	Weather	Visibility (mile)	Wind velocity	Surface temperature (°C)	Species of whales sighted												Sighting direction	Distance from the ship (mile)	Number of observers	* Sighted by the whalers
									BA	BB	BE	BP	MN	OO	PM	ZX	UD	US	UO	UX				
	1981 Jan.																							
134	23	16:45	66°31'S, 41°13'E		O	10	3	0.0	-	-	-	-	-	-	-	-	-	-	-	-			4	
	23	19:00	66°44'S, 42°07'E	25	O	7	3	-1.0																
135	24	09:30	66°35'S, 43°38'E		S	2	2	+0.8	-	-	-	-	-	-	-	-	-	-	-	-			4	
	24	11:30	66°16'S, 44°10'E	21	S	2	2	+0.4																
136	24	12:00	66°13'S, 44°21'E		S	2	2	+0.4	-	-	-	-	-	-	-	-	-	-	-	-			4	
	24	13:40	66°00'S, 45°00'E	20	S	2	2	+0.4																
137	24	16:50	65°55'S, 45°02'E		S	2	3	+0.4	-	-	-	-	-	-	-	-	-	-	-	-			4	
	24	19:00	65°28'S, 45°01'E	27	S	2	2	+0.5																
138	25	15:30	64°05'S, 44°57'E		S	3	4	+1.2															4	
	25	16:19	63°55'S, 44°59'E		O	9	4	+1.0	2	-	-	-	-	-	-	-	-	-	-	-	L60	1.0	4	*
	25	16:30	63°53'S, 44°59'E	12	O	9	4	+1.0																
139	25	17:00	63°46'S, 44°59'E		A	9	4	+1.1	-	-	-	-	-	-	-	-	-	-	-	-			4	
	25	19:00	63°26'S, 45°00'E	20	A	10	4	+1.2																
140	26	06:00	63°00'S, 47°29'E		C	10	2	+1.2															4	
	26	07:13	63°00'S, 48°02'E		A	10	2	+1.1	2	-	-	-	-	-	-	-	-	-	-	-	R45	1.3	4	*
	26	07:30	63°00'S, 48°10'E	18	A	10	2	+1.1																
141	26	08:00	63°00'S, 48°23'E		A	10	2	+1.4															4	
	26	11:00	63°00'S, 49°45'E		A	10	3	+1.4	-	-	-	-	-	-	-	3	-	-	-	-	R20	1.5	4	*
	26	11:30	63°00'S, 49°58'E	43	A	10	3	+1.4																

	Date	Ship's time	Position	Cruising distance (mile)	Weather	Visibility (mile)	Wind velocity	Surface temperature (°C)	Species of whales sighted												Sighting direction	Distance from the ship (mile)	Number of observers	* Sighted by the whalers
									BA	BB	BE	BP	MN	OO	PM	ZX	UD	US	UO	UX				
	1981 Jan.																							
142	26	15:10	13°01'S, 50°02'E		C	10	2	+1.6	-	-	-	-	-	-	-	-	-	-	-	-			4	
	26	16:30	63°16'S, 50°00'E	15	C	10	0	+1.6																
143	26	17:00	63°21'S, 50°00'E		C	10	0	+1.4															4	
	26	17:00	63°21'S, 50°00'E		C	10	0	+1.4	1	-	-	-	-	-	-	-	-	-	-	-	L40	0.1	4	
	26	17:52	63°31'S, 49°59'E		C	10	0	+1.1	-	-	-	-	-	-	1	-	-	-	-	-	R40	0.8	4	
	26	18:00	63°33'S, 49°59'E	12	C	10	0	+1.1																
144	27	06:50	65°00'S, 49°54'E		C	8	3	+0.4	-	-	-	-	-	-	-	-	-	-	-	-			4	
	27	07:30	65°07'S, 49°55'E	7	C	10	3	+0.2																
145	27	07:50	65°11'S, 49°56'E		A	10	3	+0.4															4	
	27	08:00	65°13'S, 49°56'E		A	10	3	+0.4	3	-	-	-	-	-	-	-	-	-	-	-	R50	2.0	4	*
	27	10:05	65°38'S, 50°00'E		A	10	4	+0.1	3	-	-	-	-	-	-	-	-	-	-	-	L5	2.5	4	*
	27	10:40	65°45'S, 50°00'E	34	B	10	4	-0.2																
146	27	13:00	65°47'S, 50°03'E		B	10	3	0.0															4	
	27	13:10	65°48'S, 50°06'E		B	10	3	0.0	2	-	-	-	-	-	-	-	-	-	-	-	L20	3.0	4	*
	27	13:20	65°49'S, 50°09'E		B	10	3	0.0	-	-	-	-	-	-	-	3	-	-	-	-	R20	3.0	4	*
	27	14:15	65°56'S, 50°31'E	15	A	10	3	-0.2																
147	27	15:15	65°56'S, 50°29'E		A	10	2	-0.2															4	
	27	15:35	65°55'S, 50°29'E		A	10	2	-0.2	3	-	-	-	-	-	-	-	-	-	-	-	R30	1.0	4	*
	27	16:10	65°56'S, 50°35'E		A	10	2	+0.1	3	-	-	-	-	-	-	-	-	-	-	-	R25	1.5	4	*
	27	16:20	65°57'S, 50°39'E		A	10	2	-0.2	1	-	-	-	-	-	-	-	-	-	-	-	L35	2.0	4	*
	27	16:30	65°59'S, 50°43'E	9	A	10	2	-0.9																

	Date	Ship's time	Position	Cruising distance (mile)	Weather	Visibility (mile)	Wind velocity	Surface temperature (°C)	Species of whales sighted												Sighting direction	Distance from the ship (mile)	Number of observers	* Sighted by the whalers
									BA	BB	BE	BP	MN	OO	PM	ZX	UD	US	UO	UX				
	1981 Jan.																							
148	27	16:55	65°57'S, 50°51'E		A	10	2	-0.1															4	
	27	17:00	65°57'S, 50°52'E		A	10	2	0.0	2	-	-	-	-	-	-	-	-	-	-	-	L80	1.5	4	*
	27	17:20	65°54'S, 50°56'E		A	10	2	-0.4	1	-	-	-	-	-	-	-	-	-	-	-	L5	1.5	4	*
	27	17:30	65°52'S, 50°57'E		A	10	2	-0.4	2	-	-	-	-	-	-	-	-	-	-	-	L5	2.0	4	*
	27	18:10	65°54'S, 51°10'E		A	10	2	-1.1	2	-	-	-	-	-	-	-	-	-	-	-	R10	2.0	4	*
	27	18:25	65°56'S, 51°16'E		B	10	2	-1.1	3	-	-	-	-	-	-	-	-	-	-	-	L70	1.5	4	*
	27	18:35	65°55'S, 51°19'E		B	10	2	-1.1	2	-	-	-	-	-	-	-	-	-	-	-	L50	2.5	4	*
	27	18:40	65°55'S, 51°22'E		B	10	2	-0.1	10	-	-	-	-	-	-	-	-	-	-	-	R20	2.0	4	
	27	18:40	65°55'S, 51°22'E		B	10	2	-0.1	10	-	-	-	-	-	-	-	-	-	-	-	R40	2.0	4	*
	27	18:50	65°54'S, 51°26'E		B	10	2	-0.4	4	-	-	-	-	-	-	-	-	-	-	-	L40	1.0	4	*
	27	19:20	65°50'S, 51°36'E	27	B	10	2	-0.7																
149	28	06:00	65°17'S, 53°45'E		C	10	2	0.0															4	
	28	06:54	65°17'S, 54°07'E		C	10	3	+0.1	1	-	-	-	-	-	-	-	-	-	-	-	L10	2.0	4	
	28	07:30	65°18'S, 54'21'E	17	C	10	3	+0.2																
	28	09:00	65°17'S, 54'21'E		C	10	3	+0.2	-	-	-	-	-	-	-	-	-	-	-	-			4	
	28	11:00	65°27'S, 55°02'E	21	C	10	4	+0.2																
150	29	10:30	65°00'S, 54°57'E		O	7	5	+0.7	-	-	-	-	-	-	-	-	-	-	-	-			4	
	29	11:30	64°50'S, 54°56'E	10	O	7	6	+0.7																
151	29	12:00	64°45'S, 54°59'E		O	7	5	+0.7	-	-	-	-	-	-	-	-	-	-	-	-			4	
	29	16:15	64°00'S, 55°00'E	45	C	9	5	+0.9																

	Date	Ship's time	Position	Cruising distance (mile)	Weather	Visibility (mile)	Wind velocity	Surface temperature (°C)	BA	BB	BE	BP	MN	OO	PM	ZX	UD	US	UO	UX	Sighting direction	Distance from the ship (mile)	Number of observers * Sighted by the whalers
	1981 Jan.								Species of whales sighted														
152	30	06:00	63°36'S, 56°07'E		O	10	1	+1.7															4
	30	06:10	63°38'S, 56°12'E		O	10	1	+1.7	1	-	-	-	-	-	-	-	-	-	-	-	0	1.5	4 *
	30	07:20	63°48'S, 56°32'E		C	10	2	+2.0	1	-	-	-	-	-	-	-	-	-	-	-	L30	0.5	4 *
	30	07:30	63°51'S, 56°37'E	20	C	10	2	+2.0															
153	30	08:00	63°56'S, 56°47'E		A	10	2	+1.9															4
	30	11:15	64°28'S, 57°57'E		C	10	4	+1.2	-	-	-	-	-	2	-	-	-	-	-	-	L45	1.0	4 *
	30	11:30	64°30'S, 58°01'E	46	C	10	4	+1.3															
154	30	12:00	64°35'S, 58°11'E		C	10	5	+1.3															4
	30	12:35	64°42'S, 58°26'E		C	10	5	+1.3	5	-	-	-	-	-	-	-	-	-	-	-	L20	1.5	4 *
	30	12:50	64°43'S, 58°29'E		C	10	5	+1.3	6	-	-	-	-	-	-	-	-	-	-	-	L45	2.0	4 *
	30	13:10	64°47'S, 58°37'E		A	10	5	+1.3	-	-	-	-	-	-	-	2	-	-	-	-	L15	1.0	4 *
	30	13:35	64°51'S, 58°46'E		A	10	5	+1.0	-	-	-	-	3	-	-	-	-	-	-	-	L40	1.5	4 *
	30	13:50	64°52'S, 58°50'E		A	10	5	+1.0	1	-	-	-	-	-	-	-	-	-	-	-	R10	1.0	4 *
	30	14:40	65°01'S, 59°08'E		A	10	5	+1.2	-	-	-	-	-	-	-	1	-	-	-	-	L30	1.0	4 *
	30	15:35	65°10'S, 59°29'E		A	10	3	+1.1	1	-	-	-	-	-	-	-	-	-	-	-	R35	1.0	4 *
	30	15:55	65°12'S, 59°37'E		A	10	3	+1.0	2	-	-	-	-	-	-	-	-	-	-	-	L45	0.5	4 *
	30	16:05	65°13'S, 59°42'E		A	10	3	+1.1	5	-	-	-	-	-	-	-	-	-	-	-	L10	2.0	4 *
	30	16:30	65°16'S, 59°53'E	59	A	10	3	+1.1															
	30	17:00	65°19'S, 60°05'E		A	10	3	+1.2															4
	30	17:25	65°23'S, 60°18'E		A	10	3	+1.3	1	-	-	-	-	-	-	-	-	-	-	-	L5	2.0	4 *
	30	19:00	65°34'S, 60°58'E	26	A	10	3	+1.5															

	Date	Ship's time	Position	Cruising distance (mile)	Weather	Visibility (mile)	Wind velocity	Surface temperature (°C)	Species of whales sighted												Sighting direction	Distance from the ship (mile)	Number of observers * Sighted by the whalers
									BA	BB	BE	BP	MN	OO	PM	ZX	UD	US	UO	UX			
	1981																						
	Jan.																						
155	31	12:00	66°35'S, 63°24'E		S	2	5	+0.5															4
	31	15:50	66°31'S, 64°01'E		O	3	6	+0.4	1	-	-	-	-	-	-	-	-	-	-	-	R45	0.1	4 *
	31	16:30	66°26'S, 64°11'E	24	O	3	7	+0.4															
156	31	17:00	66°22'S, 64°19'E		O	4	7	+0.4	-	-	-	-	-	-	-	-	-	-	-	-			4
	31	18:00	66°13'S, 64°33'E	10	O	2	6	+0.3															
	Feb.																						
157	1	06:00	65°41'S, 67°08'E		O	2	7	0.0	-	-	-	-	-	-	-	-	-	-	-	-			4
	1	07:30	65°48'S, 67°19'E	10	O	3	7	0.0															
158	1	08:00	65°51'S, 67°24'E		O	3	6	+0.1	-	-	-	-	-	-	-	-	-	-	-	-			4
	1	11:30	66°07'S, 68°00'E	21	S	2	7	+0.2															
159	1	12:00	66°08'S, 68°06'E		S	2	7	+0.1	-	-	-	-	-	-	-	-	-	-	-	-			4
	1	16:00	66°28'S, 68°27'E	20	S	1	8	0.0															
160	2	06:00	66°33'S, 68°44'E		S	0	6	-0.1	-	-	-	-	-	-	-	-	-	-	-	-			4
	2	07:30	66°38'S, 68°32'E	10	S	0	6	-0.1															
161	2	08:00	66°34'S, 68°29'E		S	0	6	-0.1	-	-	-	-	-	-	-	-	-	-	-	-			4
	2	11:30	66°29'S, 67°41'E	13	S	1	7	-0.3															
162	3	06:00	66°48'S, 70°25'E		C	9	6	-0.7															4
	3	06:05	66°48'S, 70°27'E		C	9	6	-0.4	1	-	-	-	-	-	-	-	-	-	-	-	R20	1.0	5 *
	3	07:30	66°48'S, 71°02'E		C	9	5	-0.6	1	-	-	-	-	-	-	-	-	-	-	-	R20	1.5	4 *
	3	07:30	66°48'S, 71°02'E	14	C	9	5	-0.6															

	Date	Ship's time	Position	Cruising distance (mile)	Weather	Visibility (mile)	Wind velocity	Surface temperature (°C)	Species of whales sighted												Sighting direction	Distance from the ship (mile)	Number of observers * Sighted by the whalers
									BA	BB	BE	BP	MN	OO	PM	ZX	UD	US	UO	UX			
	1981 Feb.																						
163	3	08:00	66°48'S, 71°16'E		A	9	4	-0.7															4
	3	08:25	66°50'S, 71°16'E		A	9	4	-0.7	1	-	-	-	-	-	-	-	-	-	-	-	L5	0.5	4 *
	3	08:45	66°50'S, 71°06'E	9	A	9	4	-0.9															
164	3	09:45	66°50'S, 71°06'E		A	9	5	-0.9															4
	3	10:30	66°50'S, 70°52'E		A	9	5	-0.8	1	-	-	-	-	-	-	-	-	-	-	-	R15	1.0	4 *
	3	10:35	66°50'S, 70°47'E		A	9	5	-0.8	1	-	-	-	-	-	-	-	-	-	-	-	R10	1.0	4 *
	3	11:30	66°50'S, 70°19'E	19	A	9	5	-0.7															
165	3	17:30	66°50'S, 69°58'E		A	9	4	-0.7	-	-	-	-	-	-	-	-	-	-	-	-			4
	3	18:30	66°47'S, 69°32'E	11	A	9	4	-0.2															
166	4	05:30	66°58'S, 69°30'E		B	10	5	-1.0															
	4	06:20	66°58'S, 69°50'E		B	10	5	-1.2	1	-	-	-	-	-	-	-	-	-	-	-	R40	3.0	4 *
	4	07:30	67°00'S, 69°22'E	21	B	10	5	-1.0															
167	4	08:00	67°01'S, 69°10'E		B	10	5	-1.0															4
	4	09:10	67°02'S, 69°39'E		B	10	5	-1.0	1	-	-	-	-	-	-	-	-	-	-	-	L10	1.0	4 *
	4	09:20	67°02'S, 69°43'E	13	B	10	5	-1.0															
168	4	12:00	67°02'S, 69°47'E		A	10	3	-1.0															4
	4	15:15	67°06'S, 69°14'E		A	10	3	-0.7	-	-	-	-	-	-	1	-	-	-	-	-	L60	1.0	5
	4	16:30	67°07'S, 69°45'E	44	C	10	3	-1.0															
169	4	17:00	67°06'S, 69°55'E		A	10	3	-0.8															
	4	17:05	67°06'S, 69°57'E		A	10	3	-0.8	1	-	-	-	-	-	-	-	-	-	-	-	L5	1.5	4 *
	4	18:00	67°08'S, 69°34'E	10	C	10	4	-0.9															

	Date	Ship's time	Position	Cruising distance (mile)	Weather	Visibility (mile)	Wind velocity	Surface temperature (°C)	Species of whales sighted												Sighting direction	Distance from the ship (mile)	Number of observers * Sighted by the whalers
									BA	BB	BE	BP	MN	OO	PM	ZX	UD	US	UO	UX			
	1981 Feb.																						
170	5	14:00	67°14'S, 68°55'E		O	9	5	-0.4															
	5	15:45	66°57'S, 68°37'E		O	9	4	-0.6	-	-	-	-	-	10	-	-	-	-	-	-	L5	2.0	4 *
	5	16:30	66°48'S, 68°34'E	28	O	9	4	-0.6															
171	5	17:00	66°46'S, 68°27'E		O	9	4	-0.2	-	-	-	-	-	-	-	-	-	-	-	-			4
	5	18:00	66°46'S, 68°00'E	11	O	8	5	-0.1															
172	6	05:30	66°58'S, 68°15'E		A	10	3	-0.8	-	-	-	-	-	-	-	-	-	-	-	-			4
	6	06:30	67°00'S, 68°11'E	12	A	10	3	-0.4															
173	6	08:00	66°59'S, 68°16'E		A	10	3	-0.4															
	6	10:05	67°01'S, 68°35'E		A	10	3	-0.9	1	-	-	-	-	-	-	-	-	-	-	-	R40	2.5	5 *
	6	10:55	67°06'S, 68°50'E		B	10	2	-0.9	3	-	-	-	-	-	-	-	-	-	-	-	L35	2.0	4 *
	6	11:00	67°07'S, 68°50'E	16	B	10	2	-0.8															
174	7	08:00	66°27'S, 68°13'E		S	1	6	-0.3	-	-	-	-	-	-	-	-	-	-	-	-			4
	7	11:30	66°22'S, 69°43'E	37	O	2	6	+0.1															
175	7	12:00	66°20'S, 69°57'E		A	5	6	+0.2	-	-	-	-	-	-	-	-	-	-	-	-			4
	7	16:30	65°43'S, 69°59'E	37	C	4	5	+0.3															
176	7	17:00	65°40'S, 70°00'E		A	4	5	+0.4															4
	7	17:23	65°36'S, 70°02'E		A	4	5	+0.3	1	-	-	-	-	-	-	-	-	-	-	-	L30	1.0	5 *
	7	18:30	65°25'S, 70°00'E	15	C	5	4	+0.3															

	Date	ship's time	Position	Cruising distance (mile)	Weather	Visibility (mile)	Wind velocity	Surface temperature (°C)	Sighting of whales sighted												Sighting direction	Distance from the ship (mile)	Number of observers
									BA	BB	BE	BP	MN	OO	PM	ZX	UD	US	UO	UX			
	1981 Feb.																						
177	8	06:00	64°14'S, 69°59'E		S	1	4	+1.0	-	-	-	-	-	-	-	-	-	-	-	-			4
	8	07:30	64°00'S, 70°00'E	14	S	1	3	+1.1															
178	8	08:00	63°56'S, 70°00'E		S	1	3	+1.0	-	-	-	-	-	-	-	-	-	-	-	-			4
	8	11:30	63°20'S, 70°00'E	36	C	8	2	+1.9															
179	8	13:00	63°16'S, 69°55'E		O	8	3	+2.0	-	-	-	-	-	-	-	-	-	-	-	-			4
	8	16:30	62°42'S, 69°59'E	34	O	8	4	+2.0															
180	8	17:00	62°38'S, 70°00'E		O	8	4	+1.8	-	-	-	-	-	-	-	-	-	-	-	-			4
	8	18:30	62°20'S, 70°00'E	18	O	8	4	+1.7															
181	9	06:00	62°01'S, 73°05'E		C	8	6	+2.0															
	9	06:00	62°01'S, 73°05'E		C	8	6	+2.0	-	-	-	-	-	-	-	-	6	-	-	-	R90	0.1	4
	9	07:30	62°01'S, 73°43'E	17	C	8	6	+1.9															
182	9	09:30	61°51'S, 73°59'E		A	8	6	+2.1	-	-	-	-	-	-	-	-	-	-	-	-			4
	9	11:30	61°27'S, 74°24'E	26	A	8	6	+1.9															
183	9	12:30	61°16'S, 74°34'E		A	8	6	+2.2	-	-	-	-	-	-	-	-	-	-	-	-			4
	9	16:30	60°39'S, 75°44'E	52	C	8	6	+2.1															
184	9	17:00	60°35'S, 75°53'E		C	8	6	+2.2	-	-	-	-	-	-	-	-	-	-	-	-			4
	9	18:30	60°21'S, 76°17'E	20	A	8	6	+1.9															

	Date	Ship's time	Position	Cruising distance (mile)	Weather	Visibility (mile)	Wind velocity	Surface temperature (°C)	Species of whales sighted												Sighting direction	Distance from the ship (mile)	Number of observers	* Sighted by the whalers
									BA	BB	BE	BP	MN	OO	PM	ZX	UD	US	UO	UX				
	1981 Feb.																							
185	10	06:00	59°08'S, 78°51'E		C	8	5	+1.9	-	-	-	-	-	-	-	-	-	-	-	-			4	
	10	07:30	58°54'S, 79°16'E	20	C	8	4	+1.7																
186	10	08:00	58°50'S, 79°25'E		C	8	4	+1.7	-	-	-	-	-	-	-	-	-	-	-	-			4	
	10	09:00	58°40'S, 79°40'E	13	C	8	4	+2.0																
187	10	10:00	58°40'S, 79°40'E		A	8	4	+2.0	-	-	-	-	-	-	-	-	-	-	-	-			4	
	10	11:30	58°26'S, 80°06'E	19	A	9	5	+2.1																
188	10	12:30	58°17'S, 80°23'E		A	9	4	+2.0															4	
	10	16:12	57°43'S, 81°25'E		C	8	5	+2.2	-	1	-	-	-	-	-	-	-	-	-	-	L5	0.1	4	*
	10	16:30	57°40'S, 81°31'E	50	C	8	5	+1.7																
189	10	17:00	57°36'S, 81°40'E		C	8	5	+1.7	-	-	-	-	-	-	-	-	-	-	-	-			4	
	10	18:00	57°25'S, 81°52'E	13	C	8	5	+1.6																
190	11	06:00	55°41'S, 85°24'E		O	3	4	+2.6	-	-	-	-	-	-	-	-	-	-	-	-			4	
	11	07:30	55°29'S, 85°50'E	20	F	2	5	+2.9																
191	11	08:00	55°24'S, 86°01'E		F	2	5	+3.1	-	-	-	-	-	-	-	-	-	-	-	-			4	
	11	11:30	54°51'S, 87°04'E	48	F	2	5	+2.6																

Table 2. Sighting of whales by T/S Umitaka Maru.

Date	Ship's time	Position	Cruising distance (mile)	Weather	Visibility (mile)	Wind velocity	Surface temperature (°C)	Species of whales sighted														Sighting direction	Distance from the ship (mile)	Number of observers
								BA	BG	BL	BP	BX	OO	PC	PM	ZX	UD	US	UO	UX	UZ			
1980 Nov. 30	06:55	08°22'S,115°47'E		A	9	2	+30.1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	L20	0.5	
30	07:15	08°28'S,115°46'E		A	9	2	+30.1	-	-	-	-	-	-	-	1	-	-	-	-	-	-	R40	1.5	
Dec. 9	14:20	15°34'S,105°08'E		A	9	5	+26.7	-	-	-	-	2	-	-	-	-	-	-	-	-	-	R45	1.5	
27	03:40	55°10'S,125°04'E		F	0	5	+5.0	-	-	-	-	-	-	-	-	-	-	-	-	4	-	R10	0.1	4
1981 Jan. 1	02:25	64°52'S,124°49'E		O	10	1	-1.2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	R125	0.2	3
1	14:20	64°54'S,124°31'E		A	15	1	+0.2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	L80	0.2	4
2	03:00	64°57'S,124°27'E		O	15	1	+0.2	3	-	-	-	-	-	-	-	-	-	-	-	-	-	L70	0.3	4
2	18:30	64°55'S,124°41'E		O	15	1	0.0	1	-	-	-	-	-	-	-	-	-	-	-	-	-	L20	0.4	4
9	03:25	56°25'S,125°07'E		O	5	6	+4.2	-	-	-	-	-	-	-	-	-	-	-	-	1	-	R30	0.2	1
11	19:15	47°35'S,130°10'E		C	5	5	+11.0	-	-	-	-	-	2	-	-	-	-	-	-	-	-	R80	0.5	8
12	05:35	46°25'S,132°24'E		A	15	5	+11.2	-	-	-	-	-	-	-	-	-	-	-	-	1	-	R40	0.8	3
27	05:10	62°57'S,154°59'E		O	9	2	+0.9	2	-	-	-	-	-	-	-	-	-	-	-	-	-	L30	1.0	4
27	16:35	65°08'S,155°01'E		C	9			1	-	-	-	-	-	-	-	-	-	-	-	-	-	R30	0.1	6
27	17:21	65°17'S,155°01'E		C	9			2	-	-	-	-	-	-	-	-	-	-	-	-	-	R35	1.0	2
27	17:45	65°26'S,155°06'E		C	9	3	+1.0	3	-	-	-	-	-	-	-	-	-	-	-	-	-	L15	1.5	5

Date	Ship's time	Position	Cruising distance (mile)	Weather	Visibility (mile)	Wind velocity	Surface temperature (°C)	Species of whales sighted														Sighting direction	Distance from the ship (mile)	Number of observers
								BA	BG	BL	BP	BX	OO	PC	PM	ZX	UD	US	UO	UX	UZ			
1981 Jan. 28	08:00	65°49'S,155°11'E		C	10	4	+0.2	-	-	-	5	-	-	-	-	-	-	-	-	-	-			
28	08:00	65°49'S,155°11'E		C	10	4	+0.2	-	-	-	8	-	-	-	-	-	-	-	-	-	-			
28	08:00	65°49'S,155°11'E		C	10	4	+0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	2			
28	10:30	65°49'S,155°15'E		C	8	4	+0.4	-	-	-	2	-	-	-	-	-	-	-	-	-	-			
28	12:00	65°51'S,155°21'E		C	9	4	+0.7	-	-	-	-	-	-	-	-	-	-	-	-	-	1			
29	10:07	65°13'S,159°21'E		O	4	3	-0.7	1	-	-	-	-	-	-	-	-	-	-	-	-	-	L40	0.5	11
30	03:20	66°40'S,162°33'E		O	9	2	-0.6	-	-	-	-	-	-	-	1	-	-	-	-	-	-	L25	1.0	6
31	20:23	66°34'S,162°14'E		S	5	2	-0.4	1	-	-	-	-	-	-	-	-	-	-	-	-	-	L50	0.2	6
Feb. 3	21:40	64°41'S,160°10'E		F	0	2	-0.2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	L30	0.1	5
3	23:57	64°13'S,160°01'E		F	2	2	+0.4	3	-	-	-	-	-	-	-	-	-	-	-	-	-	R20	1.0	3
4	05:55	63°00'S,160°00'E		C	7	3	+1.8	1	-	-	-	-	-	-	-	-	-	-	-	-	-	L5	1.0	1
10	10:24	46°40'S,157°46'E		B	10	3	+13.4	-	-	-	-	-	-	-	-	-	-	-	1	-	-	R35	0.0	7
13	12:40	34°34'S,151°43'E		B	10	4	+23.8	-	-	1	-	-	-	-	-	-	-	-	-	-	-	L40	1.0	5

	Date	Ship's time	Position	Cruising distance (mile)	Weather	Visibility (mile)	Wind velocity	Surface temperature (°C)	Species of whales sighted														Sighting direction	Distance from the ship (mile)	Number of observers
									BA	BG	BL	BP	BX	OO	PC	PM	ZX	UD	US	UO	UX	UZ			
	1980 Dec.																								
1	21	06:00	34°58'S,115°23'E		A	9	6	+18.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4
	21	09:00	35°29'S,115°49'E	38	A	9	6	+16.7																	
2	21	10:30	35°42'S,116°01'E		A	9	6	+16.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4
	21	11:30	35°54'S,116°12'E	13	A	9	6	+16.7																	
3	21	12:30	36°04'S,116°21'E		A	9	6	+16.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4
	21	14:40	36°27'S,116°42'E	28	A	9	5	+17.8																	
4	21	16:00	36°41'S,116°53'E		A	8	5	+18.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4
	21	19:20	37°14'S,117°24'E	41	A	8	5	+17.1																	
5	22	06:00	39°01'S,119°03'E		A	8	4	+14.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4
	22	10:00	39°43'S,119°43'E	52	C	8	4	+14.0																	
6	22	12:00	40°04'S,120°01'E		A	9	5	+14.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4
	22	14:00	40°26'S,120°22'E	26	A	9	5	+13.9																	
7	22	15:30	40°42'S,120°37'E		A	9	5	+13.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4
	22	18:00	41°04'S,121°04'E	36	C	6	4	+13.3																	
8	23	06:00	43°10'S,123°14'E		O	5	7	+12.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4
	23	10:00	43°55'S,123°57'E	55	O	5	7	+11.2																	

	Date	Ship's time	Position	Cruising distance (mile)	Weather	Visibility (mile)	Wind velocity	Surface temperature (°C)	BA	BG	BL	BP	BX	OO	PC	PM	ZX	UD	US	UO	UX	UZ	Sighting direction	Distance from the ship (mile)	Number of observers
	1980 Dec.								Species of whales sighted																
9	23	12:00	44°16'S,124°18'E		D	2	7	+11.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4
	23	13:00	44°26'S,124°30'E	13	D	1	7	+11.0																	
10	24	06:00	47°02'S,125°02'E		A	9	7	+10.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4
	24	10:00	47°52'S,125°02'E	50	A	9	7	+10.5																	
11	24	12:00	48°10'S,125°02'E		A	9	7	+10.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4
	24	14:15	48°30'S,125°00'E	20	A	9	7	+10.3																	
12	24	16:00	48°33'S,125°06'E		A	9	5	+9.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4
	24	18:00	48°59'S,125°09'E	25	O	5	6	+7.7																	
13	25	08:20	52°00'S,125°00'E		R	2	7	+7.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4
	25	15:00	53°00'S,125°00'E	64	O	6	4	+5.0																	
14	25	17:00	53°17'S,125°00'E		O	7	5	+5.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4
	25	20:00	53°47'S,125°00'E	32	O	8	2	+5.4																	
15	26	10:00	53°08'S,125°01'E		F	1	6	+5.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4
	26	12:10	54°32'S,125°01'E	24	F	1	6	+5.5																	
16	26	13:30	54°31'S,125°04'E		F	1	6	+5.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4
	26	16:00	54°58'S,125°00'E	28	F	2	5	+5.1																	
17	27	18:30	55°45'S,125°00'E		F	2	5	+5.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4
	27	19:45	56°01'S,125°00'E	16	F	2	5	+5.1																	

	Date	Ship's time	Position	Cruising distance (mile)	Weather	Visibility (mile)	Wind velocity	Surface temperature (°C)	BA	BG	BL	BP	BX	OO	PC	PM	ZX	UD	US	UO	UX	UZ	Sighting direction	Distance from the ship (mile)	Number of observers	* Sighted by the whalers
	1980 Dec.								Species of whales sighted																	
18	28	04:45	56°32'S,125°04'E		F	2	6	+4.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4	
	28	10:00	57°26'S,125°02'E	57	O	6	7	+4.1																		
19	28	12:00	57°45'S,125°02'E		O	6	7	+3.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4	
	28	14:00	58°00'S,125°03'E	15	O	6	7	+3.4																		
20	28	16:00	58°11'S,125°03'E		A	6	7	+3.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4	
	28	19:00	58°25'S,125°04'E	15	C	7	7	+2.8																		
21	29	12:30	59°03'S,125°20'E		A	7	5	+3.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4	
	29	20:00	60°24'S,125°05'E	82	A	10	3	+2.4																		
22	30	04:30	61°12'S,124°59'E		O	15	2	+2.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4	
	30	07:30	61°42'S,125°00'E	31	O	15	2	+1.7																		
23	30	08:30	61°55'S,125°00'E		O	15	2	+1.7																	4	
	30	13:55	62°54'S,124°57'E		O	15	4	+1.3	2	-	-	-	-	-	-	-	-	-	-	-	-	-	L30	1.0	4	*
	30	14:10	62°57'S,124°57'E		O	15	4	+1.3	-	-	-	-	-	-	-	-	1	-	-	-	-	-	R10	1.0	4	*
	30	14:30	63°01'S,124°57'E	66	O	15	4	+1.3																		
24	31	07:30	63°59'S,125°00'E		O	6	4	+0.9																	4	
	31	10:15	64°28'S,125°00'E		O	10	4	+0.7	-	-	-	-	-	-	-	1	-	-	-	-	-	-	L10	1.0	4	*
	31	10:30	64°30'S,125°00'E	31	O	10	4	+0.7																		
25	31	12:20	64°29'S,124°57'E		O	15	3	+0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4	
	31	15:00	64°57'S,125°00'E	28	O	15	3	-1.1																		

	Date	Ship's time	Position	Cruising distance (mile)	Weather	Visibility (mile)	Wind velocity	Surface temperature (°C)	Species of whales sighted														Sighting direction	Distance from the ship (mile)	Number of observers
									BA	BG	BL	BP	BX	OO	PC	PM	ZX	UD	US	UO	UX	UZ			
	1981 Jan.																								
26	3	11:15	65°04'S,124°25'E		O	10	4	+0.2																	4
	3	13:15	64°54'S,124°45'E		O	10	5	-0.1	10	-	-	-	-	-	-	-	-	-	-	-	-	-	R65	3.0	6
	3	13:20	64°54'S,124°44'E	13	O	10	5	-0.1																	
27	3	17:25	64°55'S,124°47'E		S	3	7	-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4
	3	18:30	64°55'S,124°14'E	14	S	6	6	-0.3																	
28	6	16:00	64°55'S,122°10'E		C	15	4	-0.3																	4
	6	17:15	65°06'S,122°38'E		C	15	4	+0.7	1	-	-	-	-	-	-	-	-	-	-	-	-	-	R50	0.2	5
	6	17:50	65°12'S,122°51'E	23	B	15	3	+0.2																	4
29	7	02:00	65°07'S,123°24'E		C	10	4	+0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4
	7	05:35	65°13'S,124°19'E	45	O	10	5	-1.5																	
30	7	07:00	65°10'S,124°14'E		C	10	5	-0.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4
	7	10:00	65°11'S,124°11'E	30	O	8	5	-1.4																	
31	7	12:00	64°58'S,125°02'E		O	8	5	-0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4
	7	15:00	64°18'S,124°59'E	40	O	8	6	+1.1																	
32	7	17:00	63°51'S,124°59'E		O	8	5	+1.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4
	7	19:00	63°26'S,124°37'E	25	O	8	5	+1.6																	
33	8	06:00	60°58'S,124°55'E		O	8	2	+2.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4
	8	08:00	60°31'S,124°57'E	27	O	8	1	+3.1																	

	Date	Ship's time	Position	Cruising distance (mile)	Weather	Visibility (mile)	Wind velocity	Surface temperature (°C)	Species of whales sighted														Sighting direction	Distance from the ship (mile)	Number of observers
									BA	BG	BL	BP	BX	OO	PC	PM	ZX	UD	US	UO	UX	UZ			
	1981 Jan.																								
34	8	10:00	60°05'S,125°03'E		F	5	3	+3.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4
	8	14:00	59°13'S,125°06'E	53	O	10	3	+3.8																	
35	8	16:00	58°47'S,125°05'E		O	5	4	+3.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4
	8	19:00	58°08'S,125°05'E	38	C	7	4	+3.9																	
36	9	06:00	55°52'S,125°08'E		O	10	6	+4.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4
	9	09:00	55°14'S,125°11'E	45	C	10	5	+5.4																	
37	9	10:30	54°55'S,125°11'E		C	8	5	+5.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4
	9	14:00	54°10'S,125°09'E	45	O	8	5	+5.7																	
38	9	16:00	53°45'S,125°06'E		O	8	5	+5.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4
	9	19:00	53°05'S,125°02'E	40	O	8	5	+5.8																	
39	10	06:00	50°42'S,125°00'E		F	2	6	+8.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4
	10	09:00	50°06'S,125°00'E	37	F	2	6	+8.3																	
40	10	10:30	49°52'S,125°14'E		C	6	6	+8.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4
	10	14:30	49°24'S,126°08'E	46	C	8	5	+8.8																	
41	10	16:00	49°13'S,126°29'E		C	7	5	+9.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4
	10	18:30	48°57'S,127°08'E	31	C	9	5	+9.4																	
42	11	07:45	48°56'S,127°30'E		F	1	6	+10.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4
	11	11:30	48°30'S,128°25'E	45	C	4	6	+11.0																	

	Date	Ship's time	Position	Cruising distance (mile)	Weather	Visibility (mile)	Wind velocity	Surface temperature (°C)	Species of whales sighted														Sighting direction	Distance from the ship (mile)	Number of observers
									BA	BG	BL	BP	BX	OO	PC	PM	ZX	UD	US	UO	UX	UZ			* Sighted by the whalers
	1981 Jan.																								
43	11	13:00	48°19'S,128°48'E		D	5	6	+11.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4
	11	15:30	48°01'S,129°26'E	32	O	5	6	+11.5																	
44	11	17:00	47°50'S,129°45'E		C	7	6	+12.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4
	11	19:00	47°38'S,130°10'E	22	B	7	6	+11.0																	
45	12	06:00	46°23'S,132°28'E		O	10	5	+11.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4
	12	08:40	46°07'S,132°56'E	23	O	10	4	+11.9																	
46	13	10:10	46°11'S,132°59'E		F	2	5	+12.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4
	13	13:30	45°41'S,133°46'E	44	F	2	4	+12.6																	
47	13	14:30	45°33'S,134°00'E		F	4	5	+12.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4
	13	17:00	45°09'S,134°37'E		F	0	1	+12.9																	
48	14	06:00	43°25'S,137°35'E		M	5	4	+14.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4
	14	09:30	43°02'S,138°14'E	37	F	2	5	+14.9																	
49	14	10:30	42°53'S,138°28'E		C	5	5	+15.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4
	14	13:30	42°29'S,139°16'E	55	C	7	6	+15.8																	
50	14	15:00	42°18'S,139°38'E		C	7	6	+15.8																	4
	14	18:20	41°50'S,140°26'E		B	8	5	+16.4	-	1	-	-	-	-	-	-	-	-	-	-	-	-	R40	3.0	3 *
	14	19:30	41°40'S,140°37'E	58	B	8	5	+16.4																	4

	Date	Ship's time	Position	Cruising distance (mile)	Weather	Visibility (mile)	Wind velocity	Surface temperature (°C)	Species of whales sighted														Sighting direction	Distance from the ship (mile)	Number of observers	* Sighted by the whalers
									BA	BG	BL	BP	BX	OO	PC	PM	ZX	UD	US	UO	UX	UZ				
	1981 Jan.																									
51	15	06:00	39°58'S,142°55'E		O	8	5	+17.9																	4	
	15	08:40	39°42'S,143°24'E		O	8	4	+17.9	-	-	1	-	-	-	-	-	-	-	-	-	-	-	R30	2.0	7	*
	15	10:15	39°26'S,143°46'E	51	O	8	5	+18.3																	4	
52	22	09:00	40°52'S,148°30'E		O	5	7	+16.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4	
	22	12:00	41°31'S,148°42'E	40	C	9	5	+18.0																		
53	22	14:00	41°55'S,148°48'E		B	10	2	+18.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4	
	22	19:00	42°59'S,149°07'E	65	C	10	4	+18.0																		
54	23	06:30	45°01'S,149°37'E		C	7	7	+13.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4	
	23	09:00	45°28'S,149°51'E	30	O	5	6	+15.1																		
55	23	11:00	45°52'S,149°59'E		O	5	7	+15.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4	
	23	13:30	46°23'S,150°06'E	32	B	7	6	+12.8																		
56	23	15:00	46°42'S,150°11'E		B	7	7	+13.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4	
	23	19:00	47°28'S,150°29'E	49	B	7	6	+10.6																		
57	24	06:30	49°37'S,151°11'E		R	1	5	+9.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4	
	24	08:00	49°56'S,151°16'E	19	F	0	4	+9.3																		
58	24	10:00	50°22'S,151°25'E		C	6	4	+9.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4	
	24	13:30	51°02'S,151°39'E	42	C	9	7	+9.7																		
59	24	15:00	51°19'S,151°46'E		B	9	7	+9.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4	
	24	19:00	52°02'S,152°05'E	45	C	8	6	+8.4																		

	Date	Ship's time	Position	Cruising distance (mile)	Weather	Visibility (mile)	Wind velocity	Surface temperature (°C)	Species of whales sighted														Sighting direction	Distance from the ship (mile)	Number of observers
									BA	BG	BL	BP	BX	OO	PC	PM	ZX	UD	US	UO	UX	UZ			
	1981 Jan.																								
60	25	06:30	54°08'S,152°45'E		M	4	6	+6.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4
	25	09:00	54°37'S,152°57'E	30	M	5	4	+5.5																	
61	25	10:00	54°49'S,153°01'E		C	8	4	+5.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4
	25	12:00	55°13'S,153°11'E	24	O	8	5	+5.2																	
62	25	13:30	55°30'S,153°17'E		O	8	6	+6.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4
	25	15:30	55°53'S,153°26'E	24	B	8	6	+6.5																	
63	25	16:30	56°05'S,153°28'E		B	8	6	+4.8																	4
	25	16:45	56°08'S,153°30'E		B	9	6	+4.2	-	-	-	-	-	-	-	-	4	-	-	-	-	-	L40	0.1	5
	25	19:00	56°33'S,153°40'E	29	B	9	6	+3.5																	4
64	26	06:30	58°31'S,154°36'E		C	9	7	+3.2																	4
	26	07:10	58°38'S,154°39'E		C	9	7	+3.4	-	-	-	-	-	-	15	-	-	-	-	-	-	-	L80	0.5	6
	26	09:00	58°54'S,154°42'E	23	C	9	6	+3.0																	4
65	26	10:30	59°08'S,154°48'E		C	9	6	+3.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4
	26	14:00	59°49'S,154°58'E	48	B	9	5	+2.9																	
66	26	16:00	60°11'S,154°58'E		C	9	5	+2.6																	4
	26	19:25	60°52'S,155°00'E		B	9	3	+2.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	26	20:00	60°59'S,155°00'E	48	B	9	3	+2.3																	

	Date	Ship's time	Position	Cruising distance (mile)	Weather	Visibility (mile)	Wind velocity	Surface temperature (°C)	Species of whales sighted														Sighting direction	Distance from the ship (mile)	Number of observers * Sighted by the whalers
									BA	BG	BL	BP	BX	OO	PC	PM	ZX	UD	US	UO	UX	UZ			
	1981 Jan.																								
67	27	03:10	62°32'S,154°58'E		O	9	2	+1.0																	4
	27	03:10	62°32'S,154°58'E		O	9	2	+1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	1	L40	2.5	5
	27	03:10	62°32'S,154°58'E		O	9	2	+1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	1	L50	2.0	4
	27	03:35	62°37'S,154°58'E		O	9	2	+1.0	2	-	-	-	-	-	-	-	-	-	-	-	-	-	R70	0.5	4
	27	03:40	62°38'S,154°58'E		O	9	2	+1.0	1	-	-	-	-	-	-	-	-	-	-	-	-	-	R50	1.0	4 *
	27	03:55	62°42'S,154°58'E		O	9	2	+1.0	1	-	-	-	-	-	-	-	-	-	-	-	-	-	L40	1.0	2
	27	04:15	62°46'S,154°58'E	14	O	9	2	+1.0																	
68	27	05:30	63°02'S,155°00'E		O	9	2	+0.9																	4
	27	05:40	63°03'S,155°00'E		O	9	2	+0.9	2	-	-	-	-	-	-	-	-	-	-	-	-	-	L5	1.5	5 *
	27	05:50	63°05'S,155°00'E		O	9	2	+0.9	10	-	-	-	-	-	-	-	-	-	-	-	-	-	R5	1.5	4 *
	27	06:00	63°07'S,155°00'E		O	9	2	+0.8	-	-	-	-	-	-	-	-	-	10	-	-	-	-	R30	0.1	4 *
	27	06:08	63°09'S,155°00'E		O	9	2	+0.8	3	-	-	-	-	-	-	-	-	-	-	-	-	-	R40	1.0	4 *
	27	06:08	63°09'S,155°00'E		O	9	2	+0.8	1	-	-	-	-	-	-	-	-	-	-	-	-	-	R40	0.5	4 *
	27	06:13	63°10'S,155°00'E		O	9	2	+0.8	6	-	-	-	-	-	-	-	-	-	-	-	-	-	R10	2.5	5 *
	27	06:15	63°10'S,155°00'E		O	9	2	+0.8	10	-	-	-	-	-	-	-	-	-	-	-	-	-	R5	1.5	5 *
	27	06:15	63°10'S,155°00'E		O	9	2	+0.8	2	-	-	-	-	-	-	-	-	-	-	-	-	-	L5	1.5	4 *
	27	06:15	63°10'S,155°00'E		O	9	2	+0.8	1	-	-	-	-	-	-	-	-	-	-	-	-	-	L30	1.0	4 *
	27	06:30	63°13'S,155°00'E		O	9	2	+0.8	1	-	-	-	-	-	-	-	-	-	-	-	-	-	0	2.0	4 *
	27	06:30	63°13'S,155°00'E		O	9	2	+0.8	1	-	-	-	-	-	-	-	-	-	-	-	-	-	L20	1.0	4
	27	07:30	63°25'S,155°00'E	24	C	10	2	+1.0																	
69	27	09:30	63°50'S,154°59'E		C	10	2	+1.9																	4
	27	11:30	64°15'S,154°58'E		S	5	2	+0.7	6	-	-	-	-	-	-	-	-	-	-	-	-	-	R10	2.0	4 *
	27	11:30	64°15'S,154°58'E		S	5	2	+0.7	1	-	-	-	-	-	-	-	-	-	-	-	-	-	R30	0.5	8

	Date	Ship's time	Position	Cruising distance (mile)	Weather	Visibility (mile)	Wind velocity	Surface temperature (°C)	Species of whales sighted														Sighting direction	Distance from the ship (mile)	Number of observers * Sighted by the whalers
									BA	BG	BL	BP	BX	OO	PC	PM	ZX	UD	US	UO	UX	UZ			
	1981 Jan.																								
69	27	11:52	64°20'S,154°58'E		S	1	2	+0.7	20	-	-	-	-	-	-	-	-	-	-	-	-	-	R10	0.5	10 *
(cont.)	27	11:58	64°22'S,154°58'E		S	1	2	+0.7	50	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0.5	10
	27	12:25	64°27'S,154°58'E		C	9	2	+1.0	1	-	-	-	-	-	-	-	-	-	-	-	-	-	L40	0.5	6
	27	12:30	64°28'S,154°58'E		C	9	2	+1.0	2	-	-	-	-	-	-	-	-	-	-	-	-	-	L30	1.5	4 *
	27	12:43	64°30'S,154°58'E		C	9	2	+1.0	1	-	-	-	-	-	-	-	-	-	-	-	-	-	L40	0.5	2
	27	12:45	64°31'S,154°58'E		C	9	2	+1.0	10	-	-	-	-	-	-	-	-	-	-	-	-	-	R40	1.0	8
	27	12:50	64°32'S,154°58'E		C	9	2	+1.1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	L20	1.0	3
	27	12:55	64°33'S,154°58'E		C	9	2	+1.1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	L40	1.0	5
	27	13:00	64°34'S,154°58'E		C	9	2	+1.1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	R30	1.5	3 *
	27	13:18	64°34'S,155°03'E		C	9	2	+1.1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	L05	1.5	2 *
	27	16:00		74	C	9	.																		
70	27	18:00																							
	27	18:20	65°32'S,155°05'E		C	9	3	+1.1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	L20	1.0	2
	27	18:20	65°32'S,155°05'E		C	9	3	+1.1	5	-	-	-	-	-	-	-	-	-	-	-	-	-	L10	1.5	4
	27	19:05	65°34'S,155°05'E		C	9	3	+1.0	2	-	-	-	-	-	-	-	-	-	-	-	-	-	R45	1.5	2
	27	19:10	65°35'S,155°05'E		C	9	3	+1.0	2	-	-	-	-	-	-	-	-	-	-	-	-	-	R40	2.0	3 *
	27	19:15	65°36'S,155°05'E		C	9	3	+1.0	2	-	-	-	-	-	-	-	-	-	-	-	-	-	R10	1.5	3
	27	19:27	65°39'S,155°05'E		B	10	2	+0.8	1	-	-	-	-	-	-	-	-	-	-	-	-	-	L40	1.0	5
	27	20:00	65°46'S,155°05'E	19	B	10	2	+0.8																	4
71	28	12:17	65°54'S,155°21'E		C	9	4	+0.7																	4
	28	13:06	65°46'S,155°21'E		C	6	4	+0.4	2	-	-	-	-	-	-	-	-	-	-	-	-	-	L35	1.5	5 *
	28	15:00	65°42'S,155°50'E	25	S	3	4	-1.2																	4

	Date	Ship's time	Position	Cruising distance (mile)	Weather	Visibility (mile)	Wind velocity	Surface temperature (°C)	Species of whales sighted														Sighting direction	Distance from the ship (mile)	Number of observers * Sighted by the whalers
									BA	BG	BL	BP	BX	OO	PC	PM	ZX	UD	US	UO	UX	UZ			
	1981 Jan.																								
72	28	16:00	65°32'S,155°47'E		S	3	4	-0.9																	4
	28	17:06	65°29'S,156°06'E		S	3	4	-0.7	-	-	-	-	-	10	-	-	-	-	-	-	-	-	R20	1.5	6 *
	28	18:31	65°20'S,156°10'E		S	3	4	-0.8	-	-	-	-	-	-	-	-	-	-	-	-	1	-	R15	0.1	1
	28	18:41	65°19'S,156°10'E		S	2	2	-0.8	-	-	-	-	-	-	-	-	-	-	1	-	-	-	R05	0.1	6
	28	20:00	65°10'S,156°03'E		S	3	2	-0.7	-	-	3	-	-	-	-	-	-	-	-	-	-	-	0	1.0	many
	28	20:00	65°10'S,156°03'E	36	S	3	2	-0.7																	4
73	29	06:00	65°07'S,157°37'E		S	2	2	-1.2																	4
	29	08:20	65°07'S,158°21'E		S	4	3	-0.7	-	-	-	-	-	-	-	-	1	-	-	-	-	-	L30	0.5	8
	29	09:00	65°07'S,158°48'E	32	F	3	3	-0.5																	4
74	29	10:30	65°14'S,159°28'E		F	4	3	-0.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4
	29	13:00	65°07'S,160°10'E	24	B	9	2	-0.3																	
75	29	14:00	64°52'S,160°14'E		B	9	2	-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4
	29	16:00	64°56'S,160°40'E	23	B	10	3	-0.3																	
76	29	18:00	65°06'S,160°56'E		C	9	3	+0.7																	4
	29	19:35	65°20'S,161°06'E		C	10	3	+0.4	-	-	-	-	-	-	-	2	-	-	-	-	-	-	L50	1.5	6
	29	19:50	65°22'S,161°08'E		C	10	3	+0.1	-	-	-	-	-	-	-	1	-	-	-	-	-	-	R30	3.0	5 *
	29	19:50	65°22'S,161°08'E		C	10	3	+0.1	-	-	-	-	-	5	-	-	-	-	-	-	-	-	R20	4.0	4 *
	29	20:10	65°26'S,161°12'E		C	10	3	+0.1	-	-	-	-	-	-	-	1	-	-	-	-	-	-	0	4.0	6 *
	29	20:50	65°31'S,161°20'E	26	C	10	3	+0.1																	

	Date	Ship's time	Position	Cruising distance (mile)	Weather	Visibility (mile)	Wind velocity	Surface temperature (°C)	Species of whales sighted														Sighting direction	Distance from the ship (mile)	Number of observers	* Sighted by the whalers
									BA	BG	BL	BP	BX	OO	PC	PM	ZX	UD	US	UO	UX	UZ				
	1981 Jan.																									
77	30	06:00	67°05'S,163°26'E		O	10	3	-0.5																	4	
	30	09:00	67°30'S,164°30'E		O	10	0	-0.2	-	-	-	-	-	-	-	-	-	-	5	-	-	-	R25	0.5	5	
	30	09:10	67°32'S,164°34'E		O	10	0	-0.2	-	-	-	-	-	-	-	-	-	-	1	-	-	-	R20	0.1	4	
	30	10:00	67°30'S,164°32'E	43	O	10	0	-0.1																		
78	31	13:00	67°11'S,164°45'E		S	1	5	-0.8																	4	
	31	15:55	66°48'S,162°34'E		S	4	6	-0.4	1	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0.2	4	*
	31	16:10	66°35'S,162°29'E		S	4	6	-0.4	-	-	-	-	-	-	-	1	-	-	-	-	-	-	R30	1.0	5	
	31	16:30	66°41'S,162°25'E	42	S	4	6	-0.5																	4	
	Feb.																									
79	4	10:55	62°58'S,160°02'E		M	4	4	+2.3																	4	
	4	11:33	62°52'S,160°04'E		M	4	4	+2.3	-	-	-	-	-	-	-	-	-	1	-	-	-	-	L90	0.2	5	
	4	12:50	62°36'S,160°03'E		O	9	4	+2.3	1	-	-	-	-	-	-	-	-	-	-	-	-	-	L10	0.2	3	
	4	15:55	62°01'S,160°02'E	57	C	9	4	+2.7																	4	
80	4	18:35	62°01'S,160°04'E		O	9	3	+2.3																	4	
	4	19:00	61°56'S,160°05'E		O	9	3	+2.3	-	-	-	-	-	-	-	-	-	2	-	-	-	-	L40	0.3	4	
	4	20:00	61°43'S,160°04'E	17	R	5	4	+2.2																		
81	5	07:50	60°56'S,160°10'E		D	0	3	+2.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4	
	5	13:00	60°01'S,160°01'E	60	O	4	3	+2.7																		
82	5	16:40	59°57'S,159°54'E		O	8	2	+3.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4	
	5	20:00	59°14'S,160°00'E	43	O	4	4	+3.9																		

	Date	Ship's time	Position	Cruising distance (mile)	Weather	Visibility (mile)	Wind velocity	Surface temperature (°C)	Species of whales sighted														Sighting direction	Distance from the ship (mile)	Number of observers
									BA	BG	BL	BP	BX	OO	PC	PM	ZX	UD	US	UO	UX	UZ			
	1981 Feb.																								
83	6	08:15	57°59'S,160°04'E		C	8	5	+4.4																	4
	6	12:35	57°04'S,160°00'E		C	8	6	+4.9	-	-	-	-	-	-	-	-	1	-	-	-	-	-	L30	0.2	3
	6	13:00	57°00'S,160°00'E	59	O	8	6	+5.0																	4
84	6	17:50	57°03'S,159°58'E		O	8	6	+4.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4
	6	20:00	56°37'S,159°57'E	26	O	8	6	+4.4																	
85	7	05:30	55°13'S,160°02'E		B	8	6	+5.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4
	7	06:35	55°00'S,160°01'E	13	B	8	6	+5.4																	
86	7	15:30	54°55'S,160°09'E		C	4	5	+5.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4
	7	20:00	54°04'S,160°01'E	52	R	4	7	+6.9																	
87	8	11:30	53°04'S,160°06'E		F	2	6	+8.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4
	8	15:00	52°30'S,160°00'E	35	O	5	6	+9.1																	
88	8	16:00	52°21'S,160°03'E		O	5	6	+9.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4
	8	17:30	51°46'S,160°03'E	35	O	5	6	+10.0																	
89	9	06:00	50°32'S,160°03'E		C	5	6	+10.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4
	9	12:00	49°56'S,159°34'E	42	C	7	6	+11.0																	
90	9	14:00	49°39'S,159°36'E		F	3	6	+11.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4
	9	16:00	49°22'S,159°27'E	20	F	3	6	+11.1																	

	Date	Ship's time	Position	Cruising distance (mile)	Weather	Visibility (mile)	Wind velocity	Surface temperature (°C)	Species of whales sighted														Sighting direction	Distance from the ship (mile)	Number of observers
									BA	BG	BL	BP	BX	OO	PC	PM	ZX	UD	US	UO	UX	UZ			
	1981 Feb.																								
91	9	18:00	49°06'S,159°16'E		F	2	6	+11.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4
	9	19:00	49°00'S,159°12'E	8	F	2	6	+11.3																	
92	10	06:00	47°30'S,158°19'E		B	10	4	+12.2																	4
	10	06:45	47°22'S,158°14'E		B	10	4	+12.2	-	-	-	-	-	-	-	-	-	-	-	1	-	-	R05	0.0	3
	10	08:35	47°01'S,158°01'E		B	10	3	+14.7	-	-	-	-	-	-	-	-	-	-	-	1	-	-	R50	0.1	5
	10	09:30	46°50'S,157°53'E	44	B	10	3	+14.7																	4
93	10	10:30	46°39'S,157°46'E		B	9	3	+13.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4
	10	12:00	46°21'S,157°33'E	20	O	9	4	+13.4																	
94	10	14:00	45°58'S,157°20'E		C	9	6	+13.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4
	10	16:00	45°37'S,157°08'E	22	B	9	7	+13.5																	
95	10	18:00	45°20'S,156°58'E		B	8	7	+13.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4
	10	19:30	45°08'S,156°52'E	13	B	8	7	+13.2																	
96	11	06:30	43°26'S,156°13'E		B	9	5	+15.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4
	11	09:00	42°59'S,156°07'E	28	B	10	4	+16.7																	
97	11	10:30	42°44'S,156°01'E		B	10	3	+16.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4
	11	12:00	42°28'S,155°56'E	16	B	10	3	+17.8																	
98	11	13:00	42°18'S,155°50'E		B	10	3	+18.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4
	11	16:00	41°46'S,155°35'E	33	B	10	3	+17.9																	

	Date	Ship's time	Position	Cruising distance (mile)	Weather	Visibility (mile)	Wind velocity	Surface temperature (°C)	Species of whales sighted														Sighting direction	Distance from the ship (mile)	Number of observers
									BA	BG	BL	BP	BX	OO	PC	PM	ZX	UD	US	UO	UX	UZ			
	1981 Feb.																								
99	11	18:00	41°26'S,155°23'E		B	10	2	+17.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4
	11	19:30	41°10'S,155°13'E	17	B	10	3	+18.2																	
100	12	06:30	39°16'S,154°08'E		C	9	5	+20.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4
	12	09:00	38°49'S,153°53'E	30	C	9	6	+21.2																	
101	12	10:30	38°33'S,153°45'E		C	9	6	+21.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4
	12	12:00	38°16'S,153°37'E	18	O	9	6	+21.6																	
102	12	13:30	38°02'S,153°30'E		O	7	6	+21.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-			4
	12	18:00	37°24'S,153°15'E	40	R	3	6	+21.8																	

Table 3. Abbreviation of the whale species.

BA	ミンククジラ	Balaenoptera acutorostrata	(Little piked whale)
BB	イワシクジラ	Balaenoptera borealis	(Sei whale)
BE	ツチクジラ	Berardius bairdi	(Baird's beaked whale)
BG	セミクジラ	Eubalaena glacialis	(Right whale)
BL	シロナガスクジラ	Balaenoptera musculus	(Blue whale)
BP	ナガスクジラ	Balaenoptera physalus	(Fin whale)
BX	ニタリクジラ	Balaenoptera edeni	(Bryde's whale)
MN	ザトウクジラ	Megaptera novaeangliae	(Humpback whale)
OO	シャチ	Orcinus orca	(Killer whale)
PC	オキゴンドウ	Pseudorca crassidens	(False killer whale)
PM	マッコウクジラ	Physeter catodon	(Sperm whale)
ZX	アカボウクジラ	Ziphius cavirostris	(Cuvier's beaked whale)
UD	種不明イルカ	Unidentified dolphin	
US	種不明アザラシ	Unidentified seal	
UO	種不明アシカ	Unidentified eared seal	
UX	種不明小型鯨	Unidentified toothed whale	
UZ	種不明大型鯨	Unidentified larger cetacean	