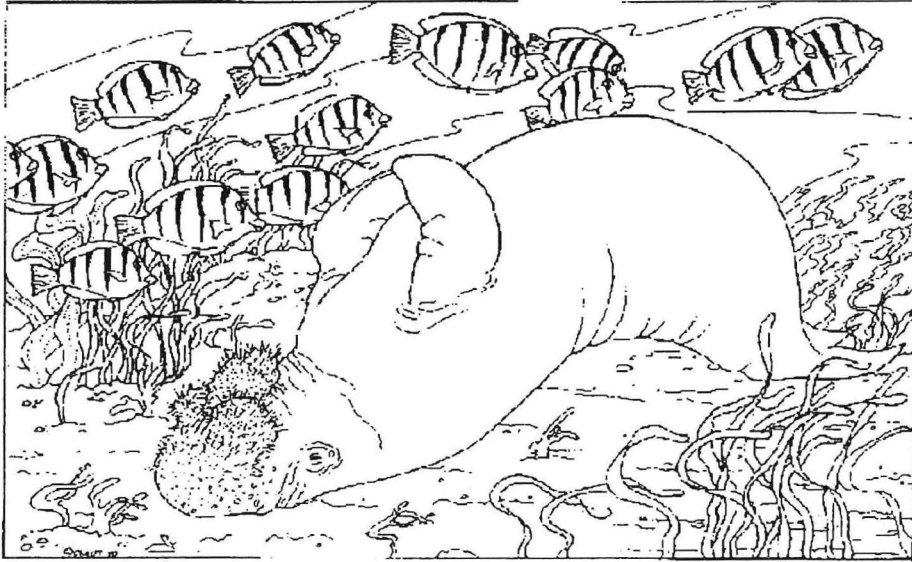


## Dugong Data: Shark Bay



Prepared by Timothy Grubba

## INTRODUCTION

The primary aim of this report is to consolidate the data from a number of surveys (Table. 1) into a format that will form the basis for the development of a user-friendly database. This report focuses primarily on the data provided by two charter boat operators in Shark Bay, which logged their dugong interactions and recorded habitat data. The report also summarizes some of the previous aerial surveys carried out in Shark Bay. The available data has been entered into a spreadsheet (Excel) and the coordinates of observations were plotted on a map of Shark Bay using a geographical information system (GIS) software package ARCVIEW. A secondary aim was to identify the distribution of dugongs in the southeastern region of Dirk Hartog Island. This information will be used to make comments on a proposed aquaculture development in this area.

## DATA DESCRIPTION

The data presented and discussed in this report has been obtained from two sources: 1) charter boat logs and 2) aerial surveys. Table 1 lists the data sources referred to in this report. Two charter boat operators provided logs, compiled during dugong interaction activities. The logs provide data on dugong numbers, distribution, behavior and habitat characteristics. The logs provided by James Scheerer Research Charter cover three years providing a great deal of information. The logs provided by the operator of Hartog Explorer covered two years and used a standard "CALM Dugong Watching Log". The raw data from aerial surveys was not accessible during the writing of this report. Instead reference is made to data summarized in scientific papers (Table 1.).

**Table 1. Dugong data sources.**

<b>Charter Boat Operator Logs</b>
James Scheerer Research Charter Dugong Sightings: Shark Bay James Scheerer, SPV 371 July 1995 to mid July 1998 Marine Mammal License: DU000004
Hartog Explorer, SPV 401 Marine Mammal License: DU000002
<b>Aerial Surveys: Scientific Literature</b>
Distribution and abundance of Dugongs, Turtles, Dolphins and other megafauna in Shark Bay, Ningaloo Reed and Exmouth Gulf, Western Australia. A.R. Preen, H. Marsh, I.R. Lawler, R.I.T Prince and R. Shepard Wildlife Research: 1997. vol. 24
The Distribution and Abundance of the Dugong in Shark Bay, Western Australia H. Marsh, R.I.T. Prince, W.K. Saalfeld and R. Shepherd Wildlife Research: 1994 vol. 21
Dugong Distribution, the Seagrass <i>Halophila spinulosa</i> , and Thermal Environment in Winter in deeper water of eastern Shark Bay, Western Australia. P.K. Anderson Wildlife Research: 1994. vol. 21
The Dugong Edited by H. Marsh Proceedings of a Seminar/Workshop held at James Cook University in north Queensland 8 to 13 May 1979

The logs provided by James Scheerer Research Charter formed the bulk of data that was used in this report. This extensive data set covers a three-year period from 05/07/1995 to 14/07/1998. During this period a total of 381 separate observations were made, of which 375 were Dugong observations and 6 observations on other species (megafauna: including whale sharks, whales and dolphins). The collection of data was seasonally dependent, with the majority of observations made during winter and the beginning of spring. This corresponds to the “peak season” when weather conditions are ideal and charter work is at a peak. During summer and autumn fewer observations were made due to adverse weather conditions and less charter work. A yearly and seasonal breakdown of the numbers of observations and days is provided in table 2. The log data from the charter boat Hartog Explorer is also broken down seasonally. This is a smaller data set that covers only two years. It follows the same seasonal trends as the other charter operator’s data.

**Table 2. Charter Boat Observations.**

<b>James Scheerer Research Charter</b>				
	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>
Winter	44 obs ( 33 days)	19 obs (13days)	93 obs (33 days)	47 obs (19 days)
Spring	20 obs (15 days)	18 obs (12 days)	67 obs (30 days)	
Summer	-	-	19 obs (12 days)	7 obs (6 days)
Autumn	-	11 obs (10 days)	-	16 obs (12 days)
<b>Hartog Explorer</b>				
Winter	-	-	10 obs (10 days)	7 obs (7 days)
Spring	-	-	3 obs (3 days)	-
Summer	-	-	-	-
Autumn	-	-	-	7 obs (7 days)

When a charter operator makes contact with a dugong or group of dugongs the following information was recorded in their logs:

- Date
- Time
- Location (latitude and longitude)
- Habitat data including: water temperature, water depth, benthic habitat
- Dugong information including: numbers of adults/groups with and without calves and their behaviors.

The data collected by the two charter operators differed in regards to information recorded on dugongs and collection of habitat data. James Scheerer Research Charter recorded numbers of dugongs with calves and without calves using the following format:

**groups with calves**      1 cow and calf      2-5 cows and calves      ≥ 6 cows and calves  
**groups without calves**      1 cow and calf      2-5 cows and calves      ≥ 6 cows and calves

Hartog Explorer recorded numbers of adults with calves and without calves using the following format:

**adults with calves**      1-5                      >5  
**adults without calves**      1-5                      >5

The “CALM Dugong Watching Log” used by the operators of Hartog Explorer did not require the recording of habitat characteristics such as water depth, temperature and benthic habitat.

## METHODS

The data logs from the two charter operations were entered into a spreadsheet (excel). The data from the two charter operators could not be combined due to incompatibility of the collected data. The James Scheerer Research Charter recorded number of groups of dugongs while the Hartog Explorer recorded numbers of adult dugongs with or without calves. In Excel the coordinates (longitude and latitude) of each observation were converted to decimal degrees, a standard unit used in GIS. The Excel file was then saved in DBF format, which was imported into ARCVIEW a GIS software package. The coordinates recorded by James Scheerer Research Charter were then plotted on a line map of Shark Bay in ARCVIEW. Various plots were produced including a total plot including all years, individual years, and seasonally combinations.

## RESULTS

A hard copy of the Excel spreadsheets is provided in Appendix 1.

The coordinates from the observations of James Scheerer Research charter were plotted on a map of Shark Bay using ARCVIEW. Combinations of plots based on yearly and seasonal temporal scale were produced and are listed in table 3. Figure 1. plots all observations made between 1995 and 1998. The majority of observations were located in the area to the north of Bellefin Prong. This area includes both Bellefin flats and Heirsson flats. To the north of the flats are the Denham Channel and the Bar flats. This area is located to the west of Denham. Figures 2 to 5 plot the observations from 1995 to 1998. Figures 6 to 17 plot the observations seasonally. Figures 18 to 23 are enlarged views of the seasonal data plotted in figures 1,13,14,16, and 17. Figure 23 plots the data of James Scheerer Research Charter and dugong numbers that were extracted from aerial surveys. The positions of the aerial surveys are not accurate, as coordinates were not available for this data.

Table. List of Figures.

<b>Total</b>	<b>Figure number</b>
Dugong Observations: Total 1995 to 1998.	1
<b>Year Combinations</b>	
Dugong Observations: 1995	2
Dugong Observations: 1996	3
Dugong Observations: 1997	4
Dugong Observations: 1998	5
<b>Seasonal Combinations</b>	
Dugong Observations: Winter 1995	6
Dugong Observations: Spring 1995	7
Dugong Observations: Autumn 1996	8
Dugong Observations: Winter 1996	9
Dugong Observations: Spring 1996	10
Dugong Observations: Summer 1997	11
Dugong Observations: Autumn 1997	12
Dugong Observations: Winter 1997	13
Dugong Observations: Spring 1997	14
Dugong Observations: Summer 1997/1998	15
Dugong Observations: Autumn 1998	16
Dugong Observations: Winter 1998	17
<b>Enlarged View</b>	
Dugong Observations: 1995 to 1998	18

Dugong Observations: Winter 1997	19
Dugong Observations: Spring 1997	20
Dugong Observations: Autumn 1998	21
Dugong Observations: Winter 1998	22
Dugong Observations: (Numbers)	23

## CONCLUSION

The data extracted from the charter boat logs provides a comprehensive database on Dugongs. When drawing conclusion from this data it is important to remember that the data displays temporal and spatial biases. The spatial bias is related to the generally limited operational areas of the charter boats. Based on this data the main operating area of the charter boats seems to be centered in the region north of Bellefin Prong. The data implies that dugong distribution is highest in this area, however the data does not show the distribution of dugongs thus misrepresenting the overall distribution of dugongs. The temporal bias is related to the seasonal operation of the charter boats. The summer and autumn seasons are not represented to the same extent as the winter season. Therefore the data doesn't represent the summer distribution of dugongs. Despite these biases the data provides important information on the local distribution of dugongs during the winter months. The data also presents information on dugong behavior and habitat.

Dugongs are distributed throughout the southeastern waters of Dirk Hartog Island during winter. It is apparent that both aerial surveys and charter boat logs misrepresent the true distribution and density of dugongs in this region. This is due to the low use of the region by charter boat operators and the infrequent number of aerial surveys. Figure 23. does show that there are congregations of dugongs in the region, and it is not uncommon for congregations of 20+ animals. There appears that significant concentrations of dugongs occur at Surf Point, Broken Down Head and off Dirk Hartog Homestead.

Figure 1.

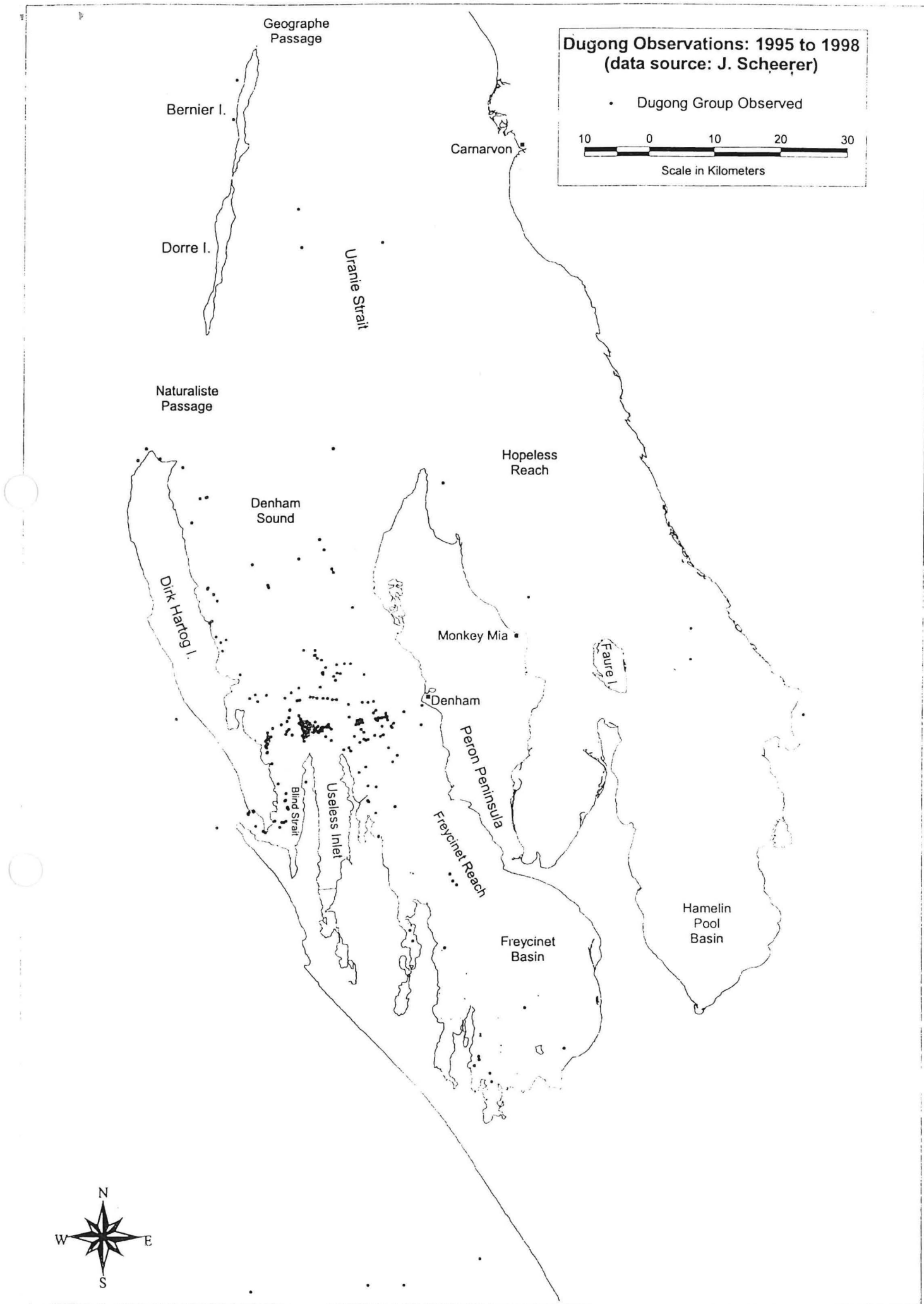


Figure 2.

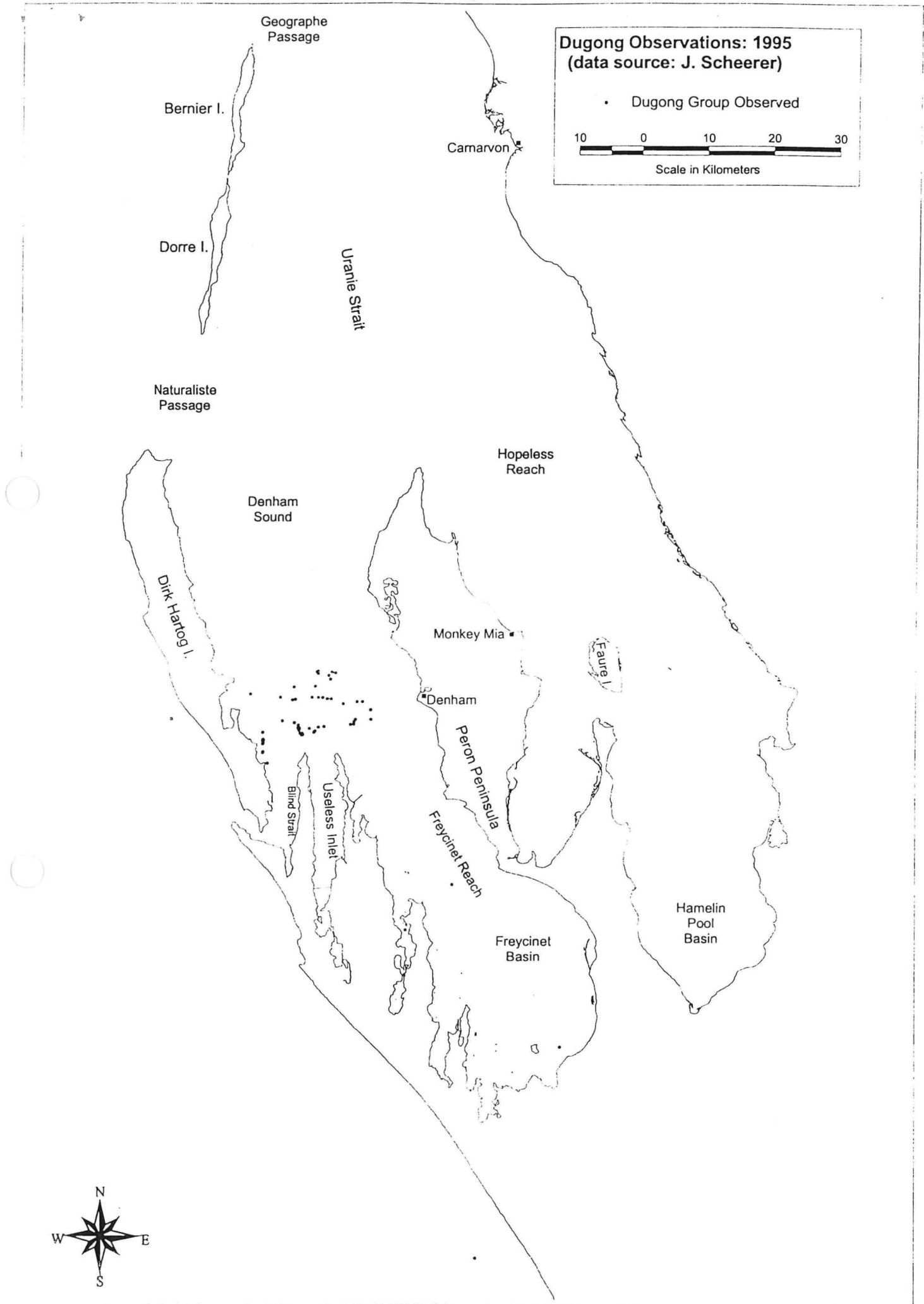


Figure 3.

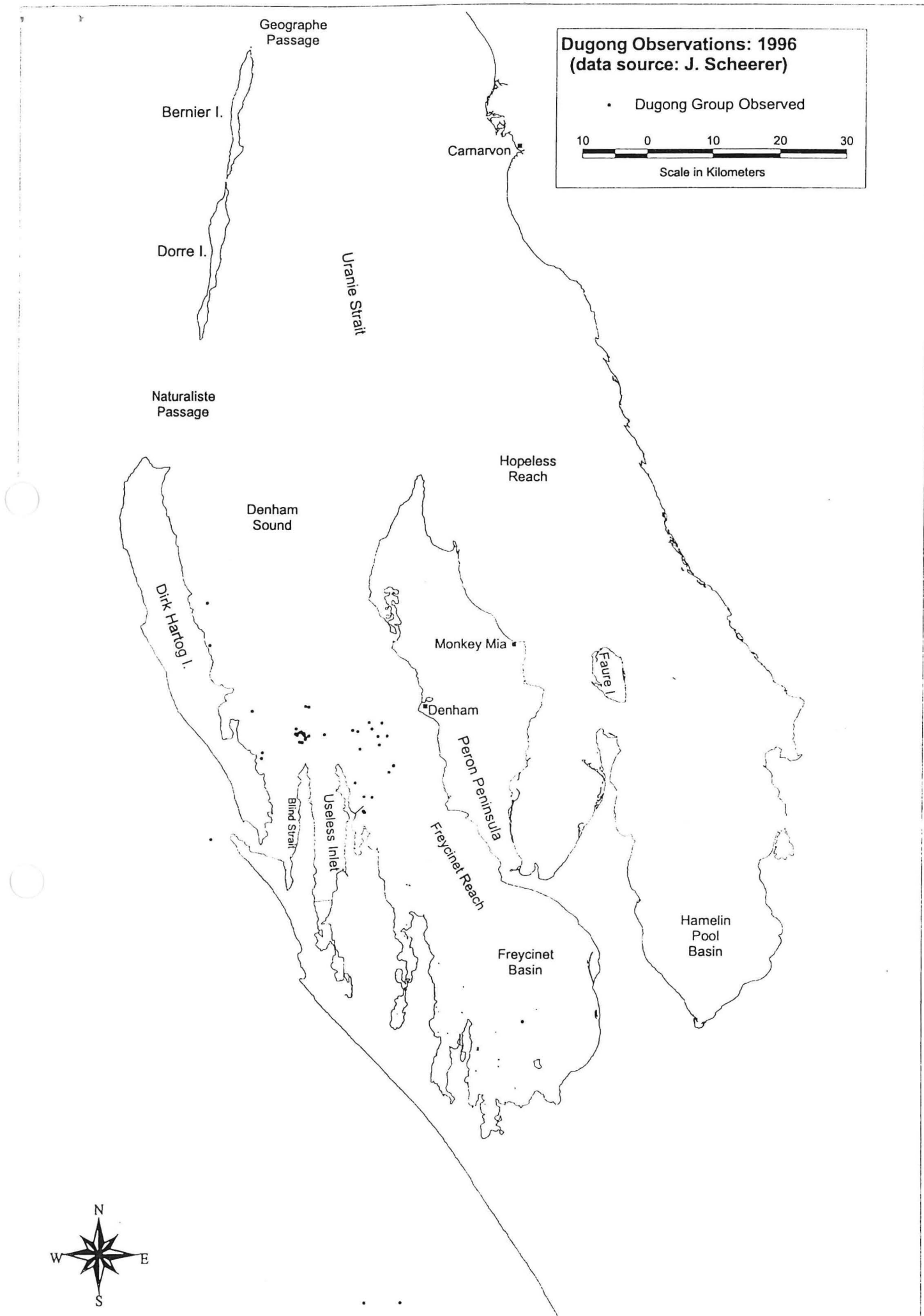




Figure 4.

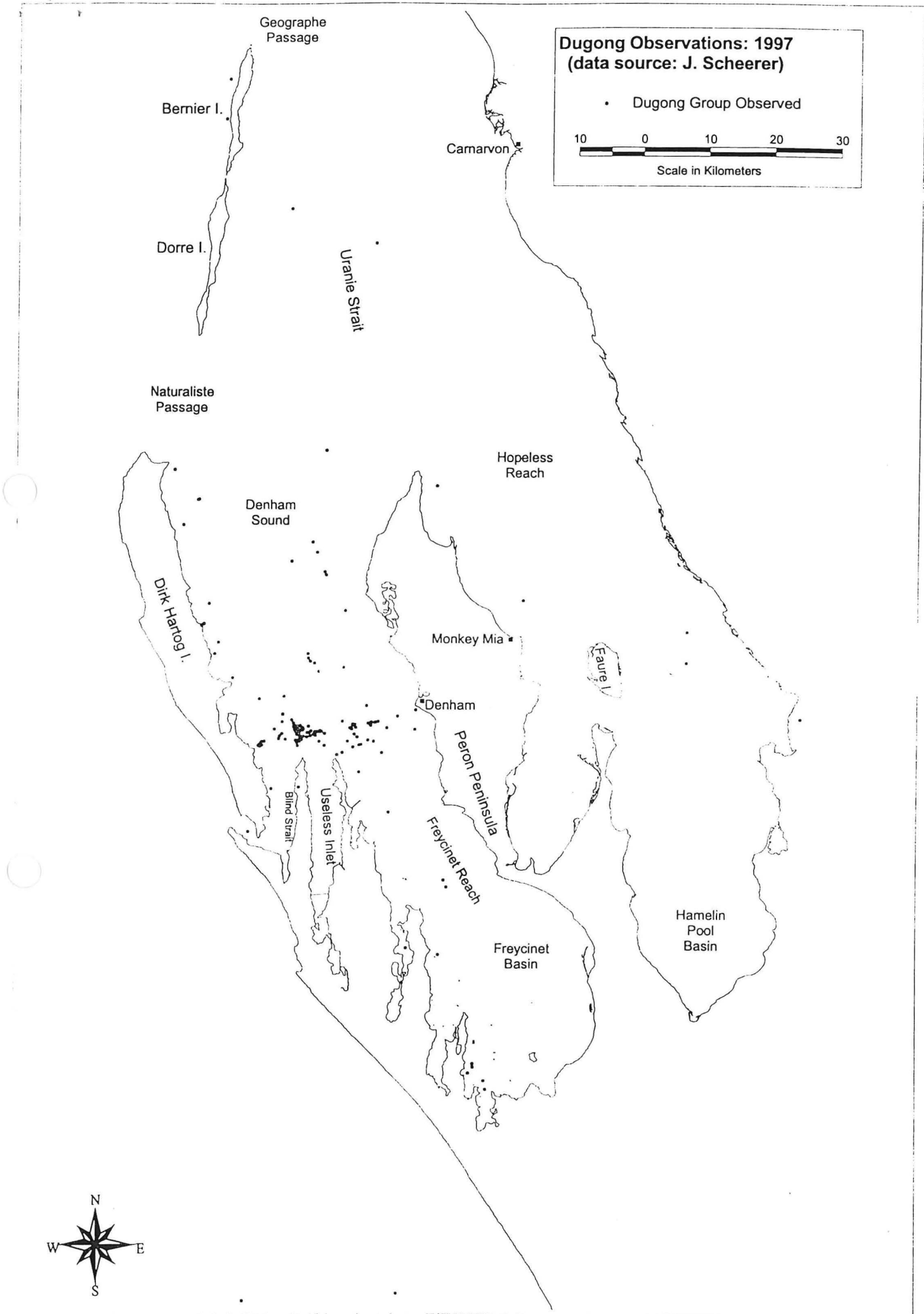


Figure 5.

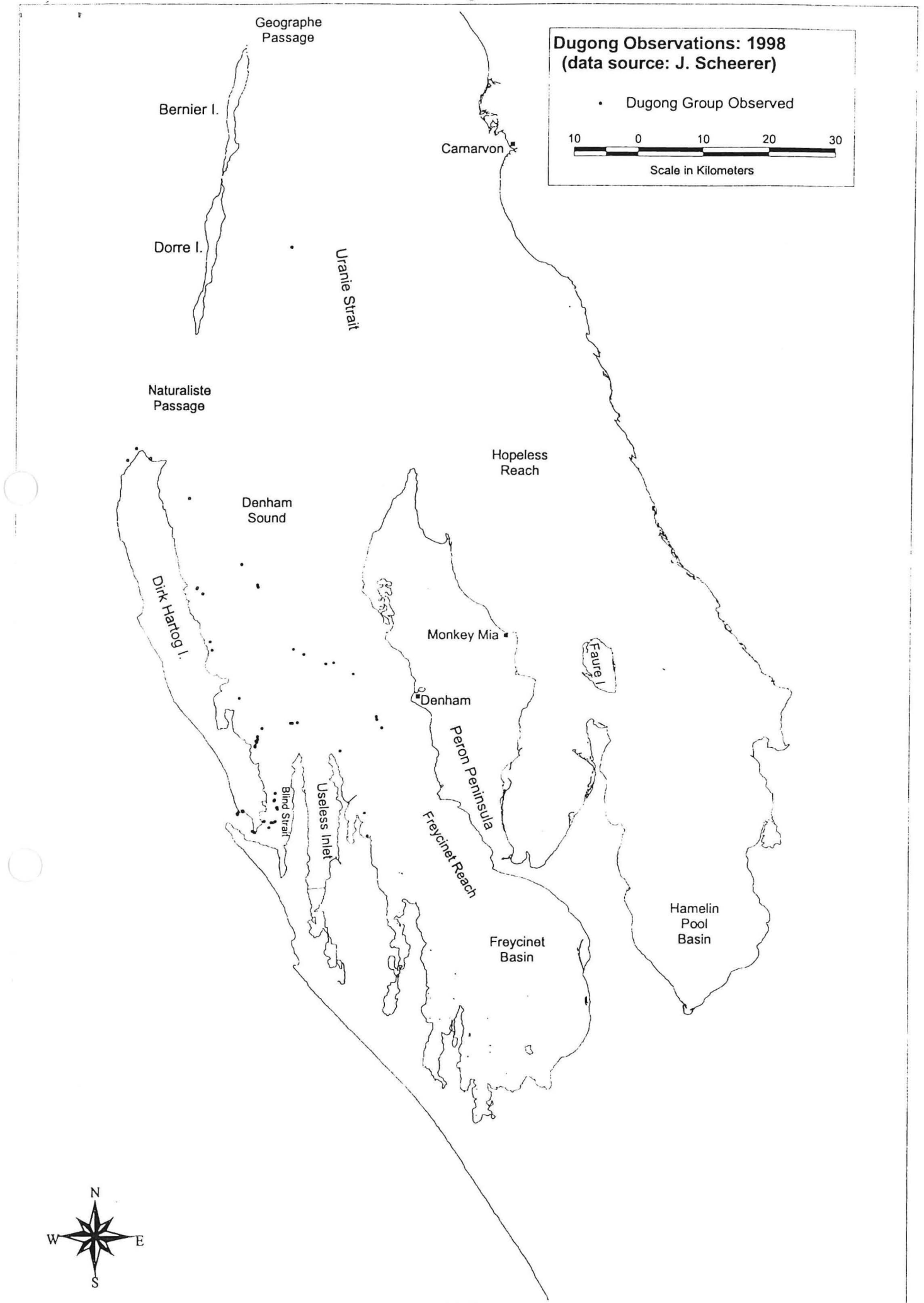


Figure 6.

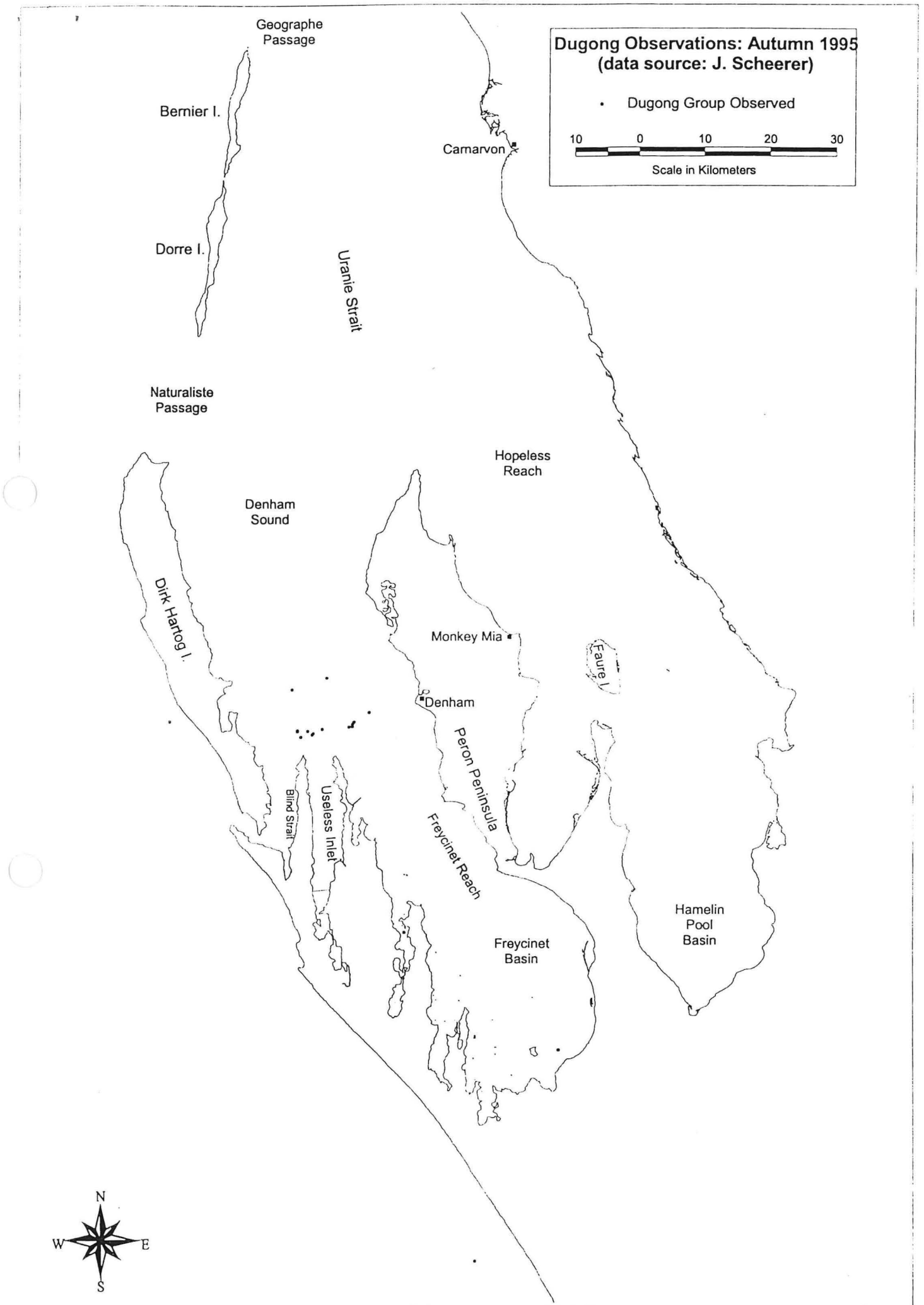


Figure 1.

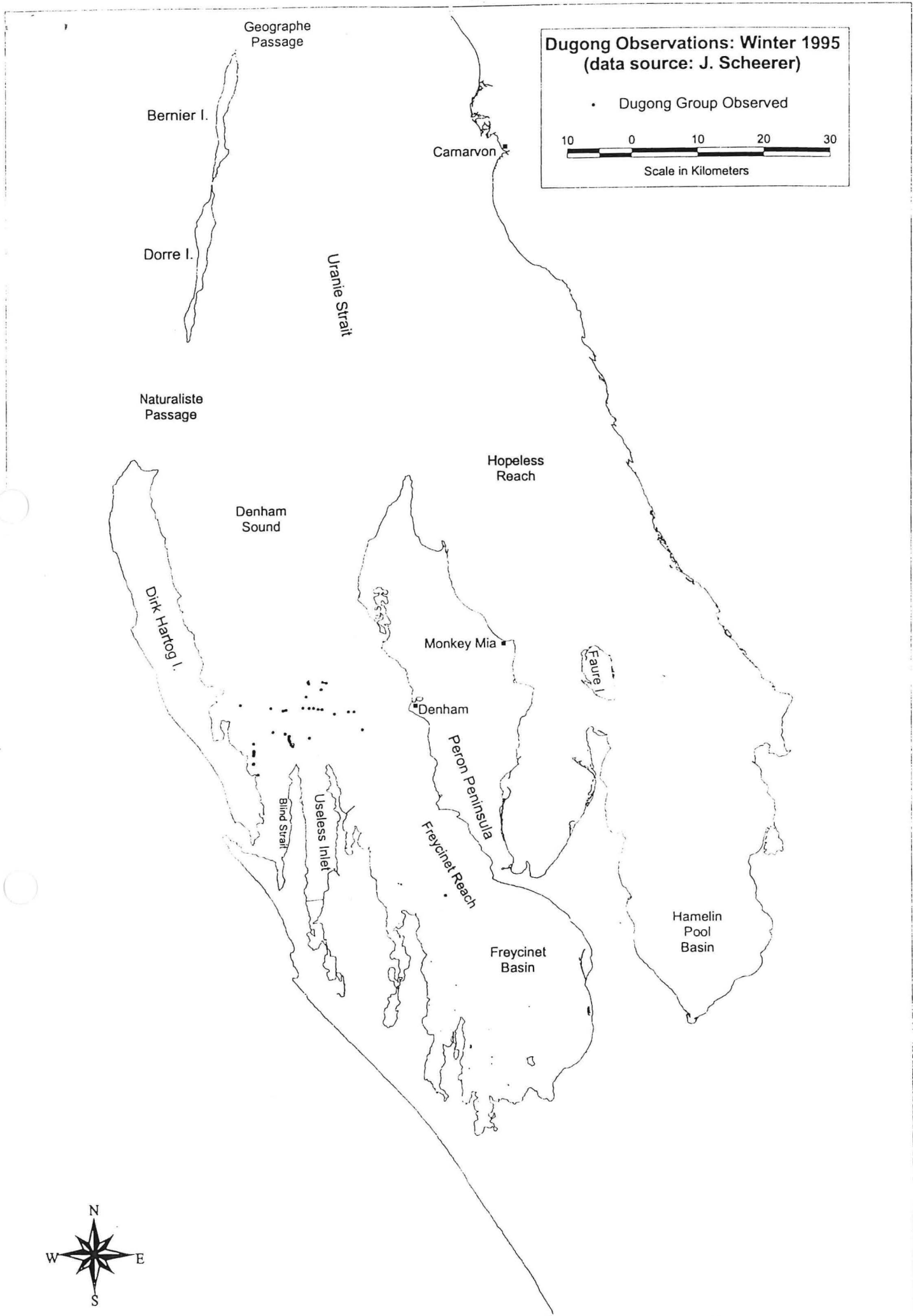


Figure 8.

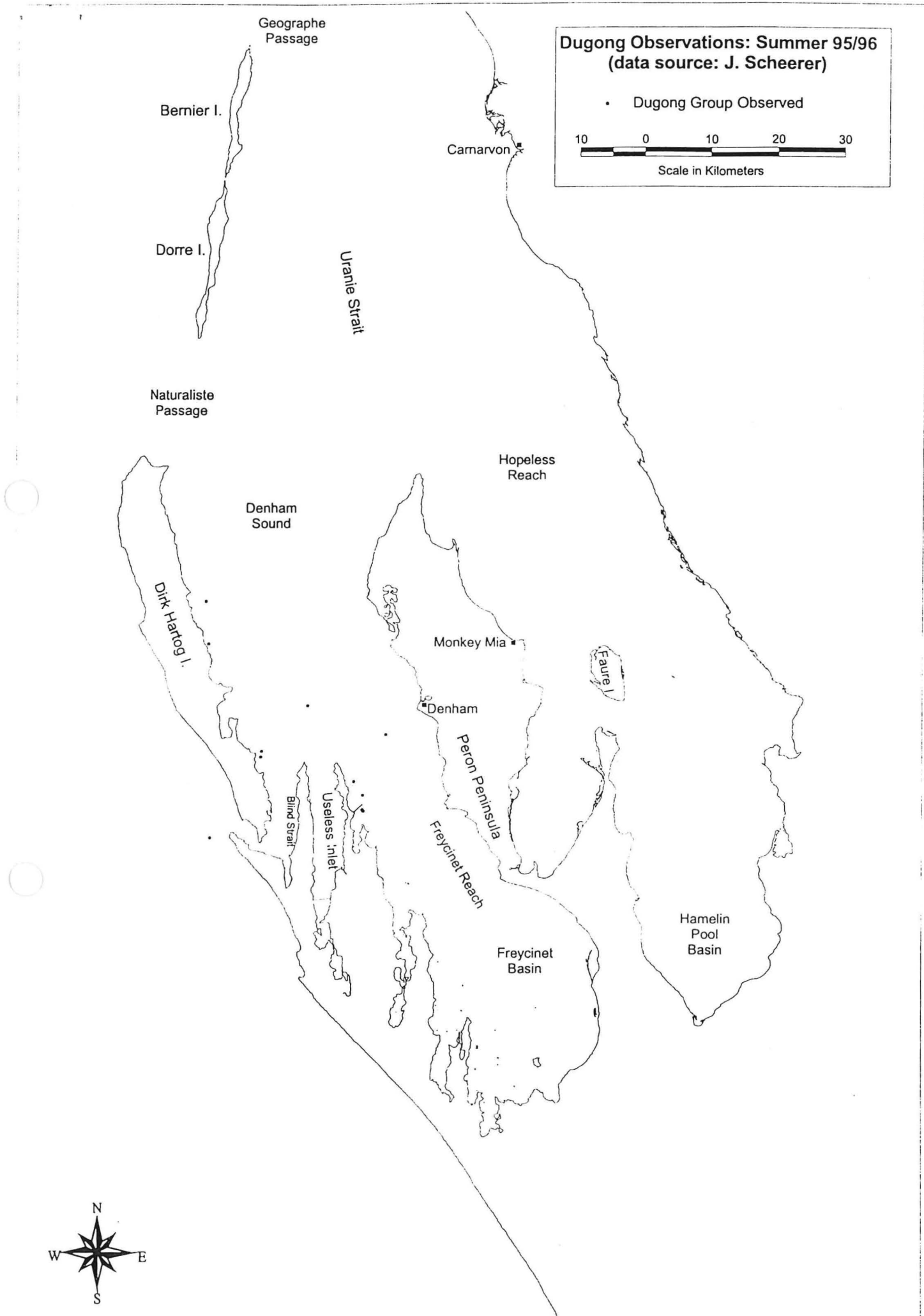


Figure 9.

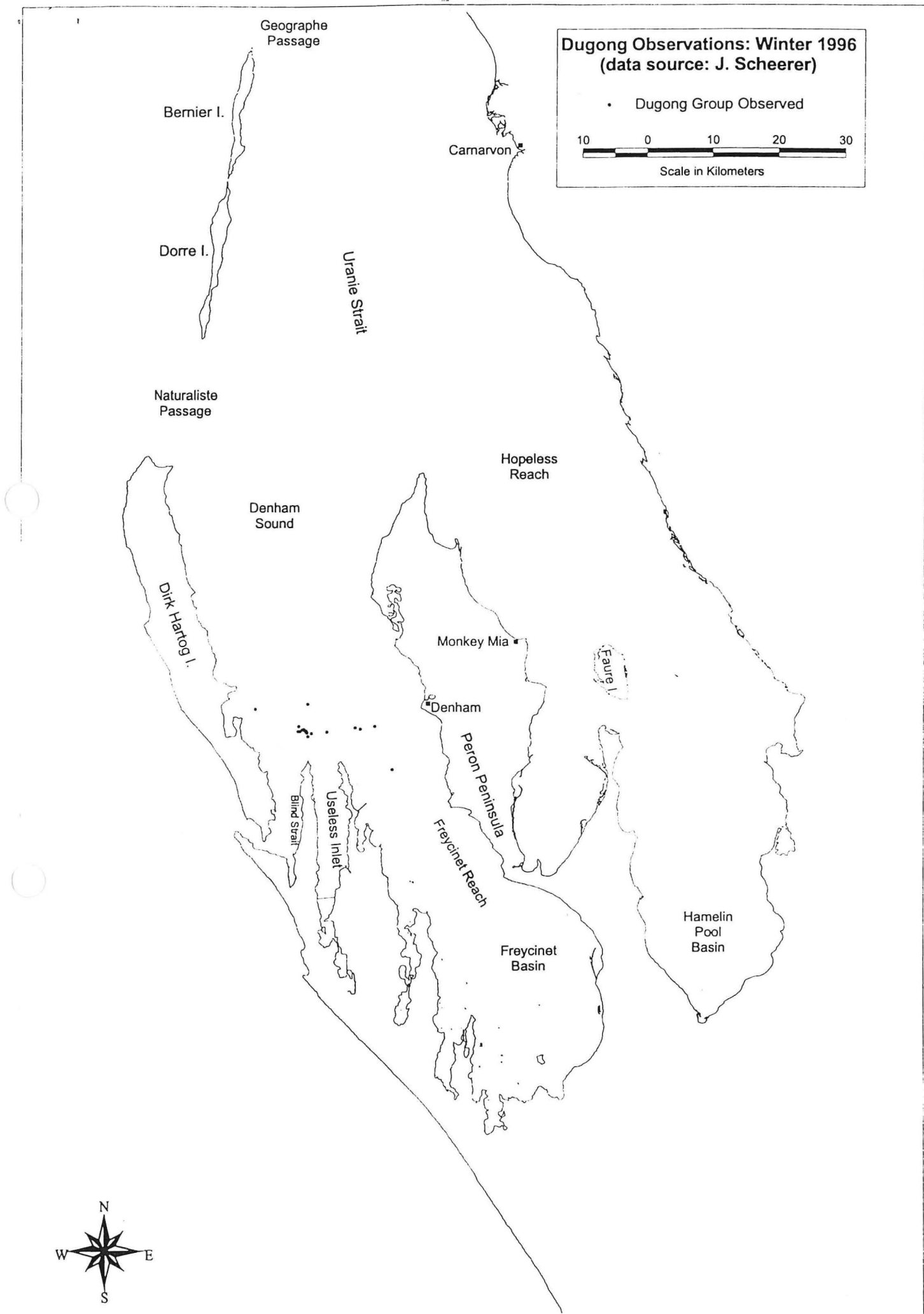
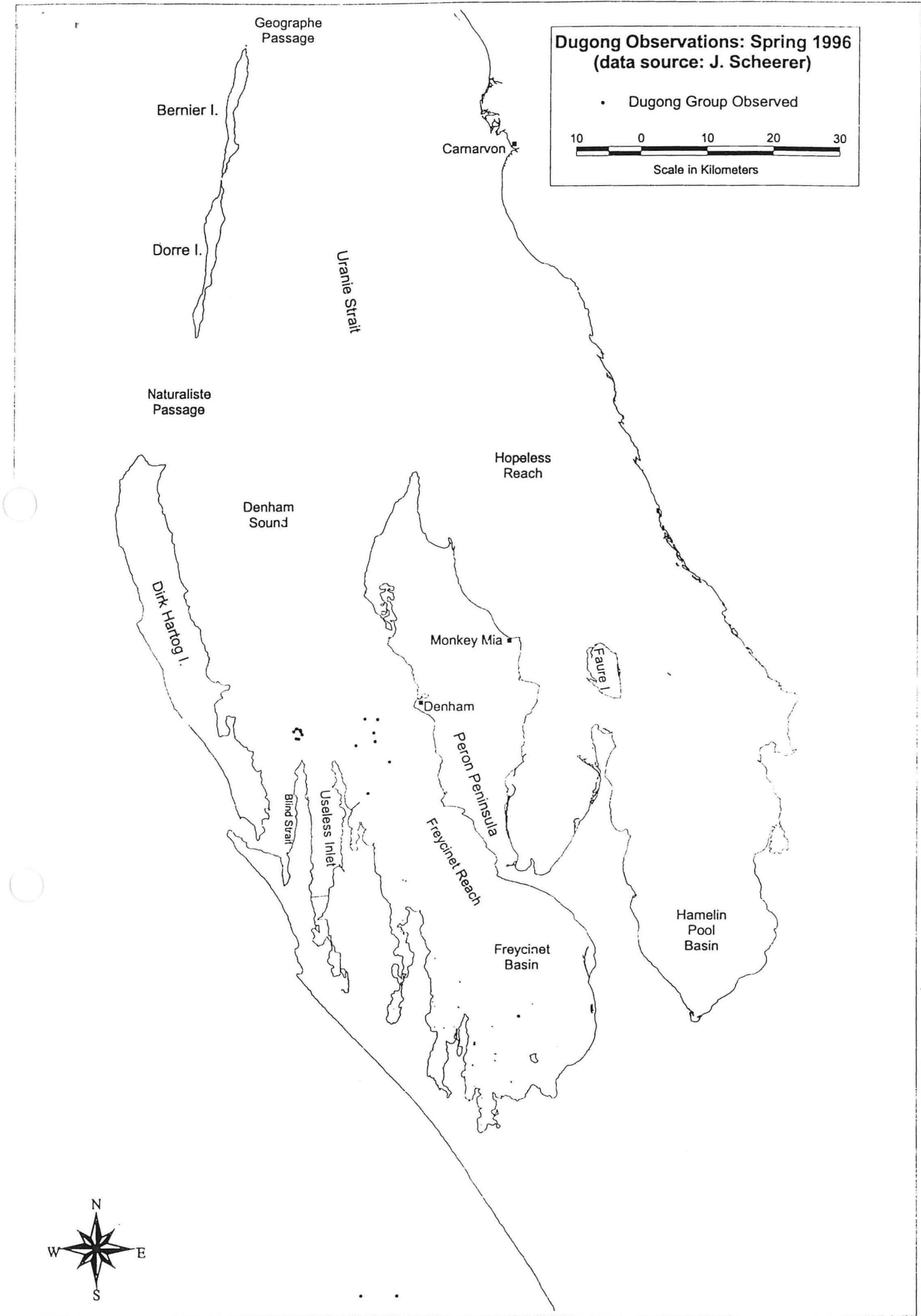


Figure 10.



### Dugong Observations: Summer 1997 (data source: J. Scheerer)

• Dugong Group Observed

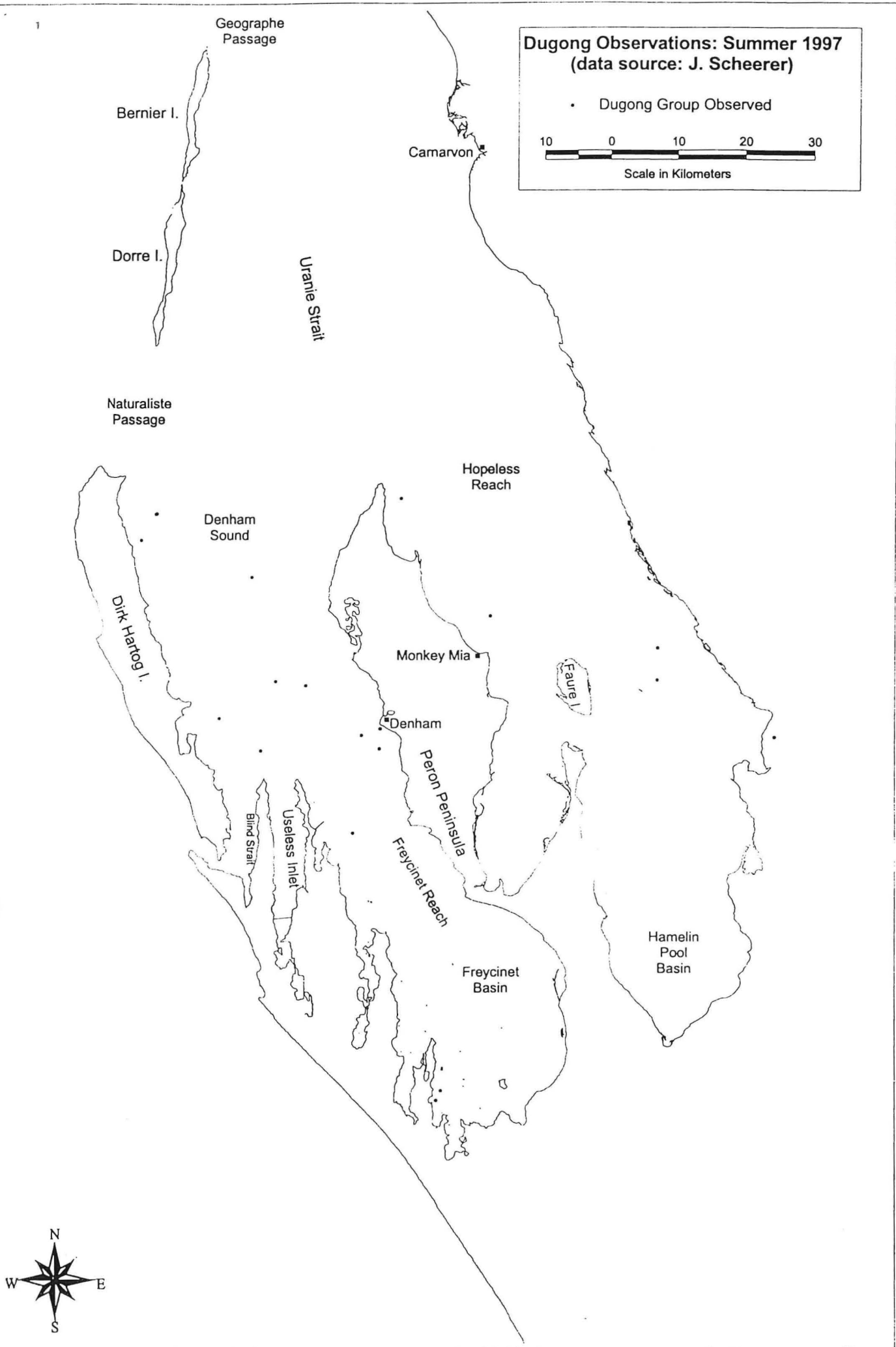
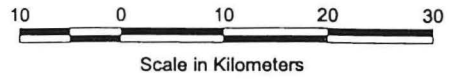




Figure 12.

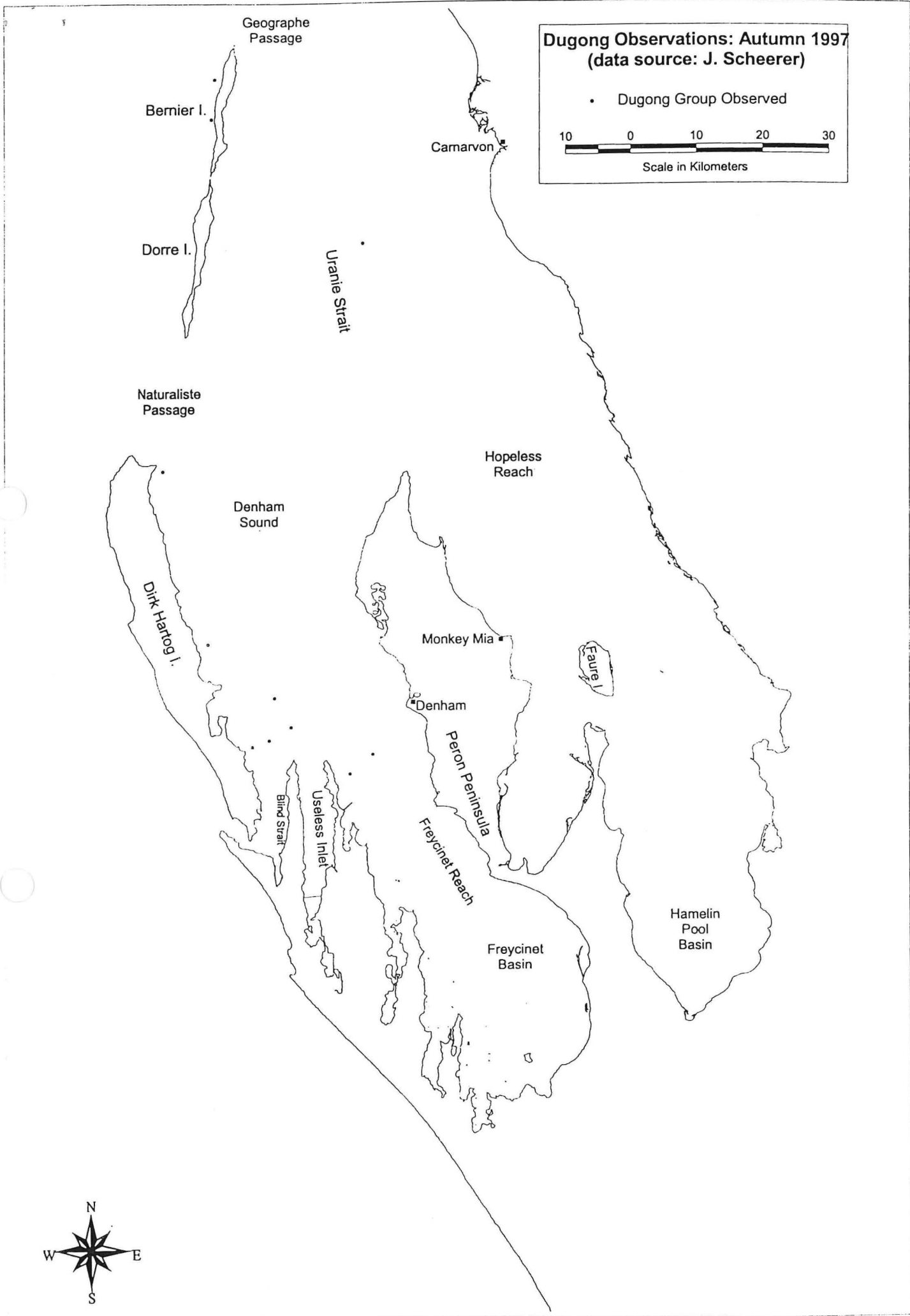


Figure 14.

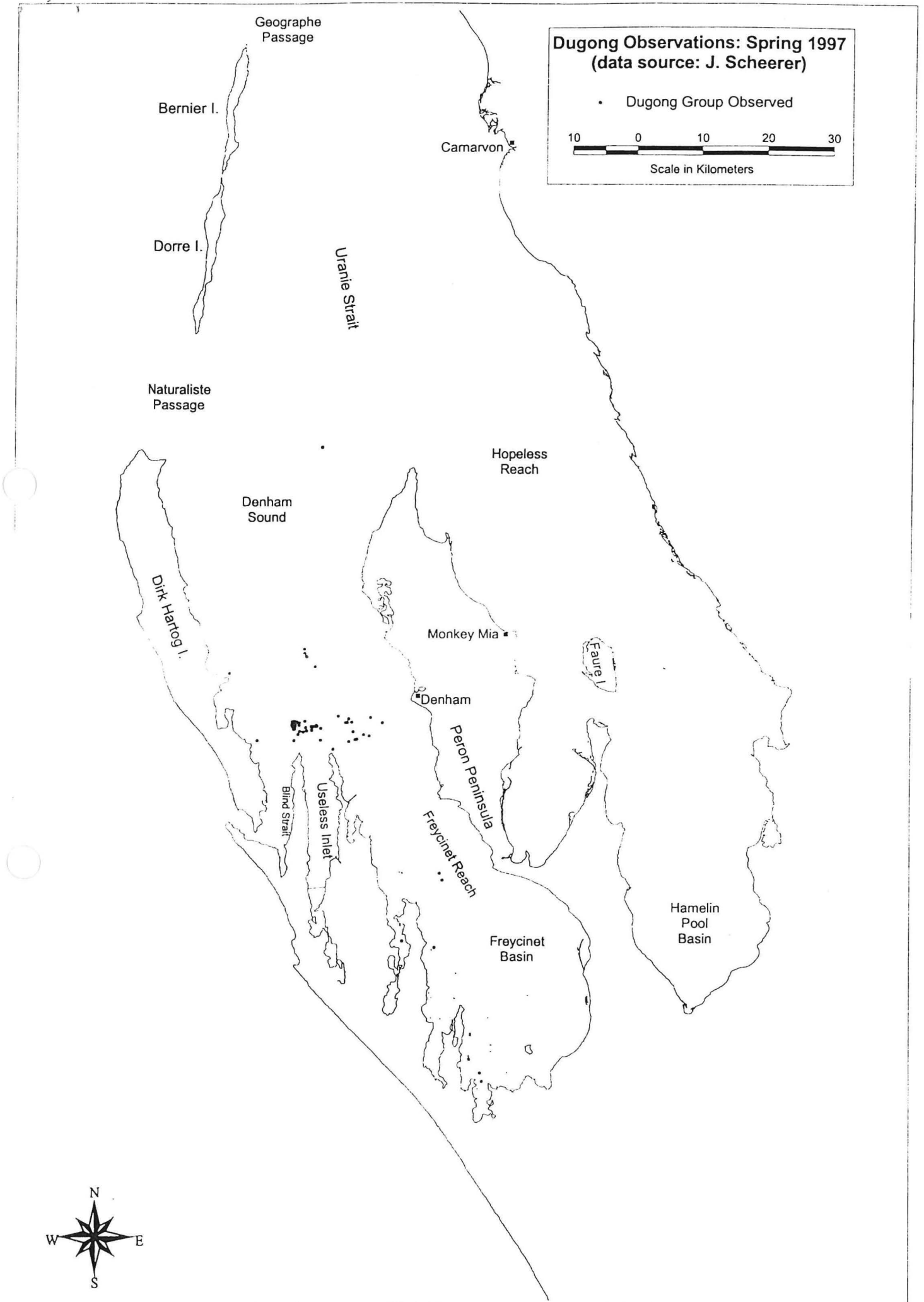


Figure 15.

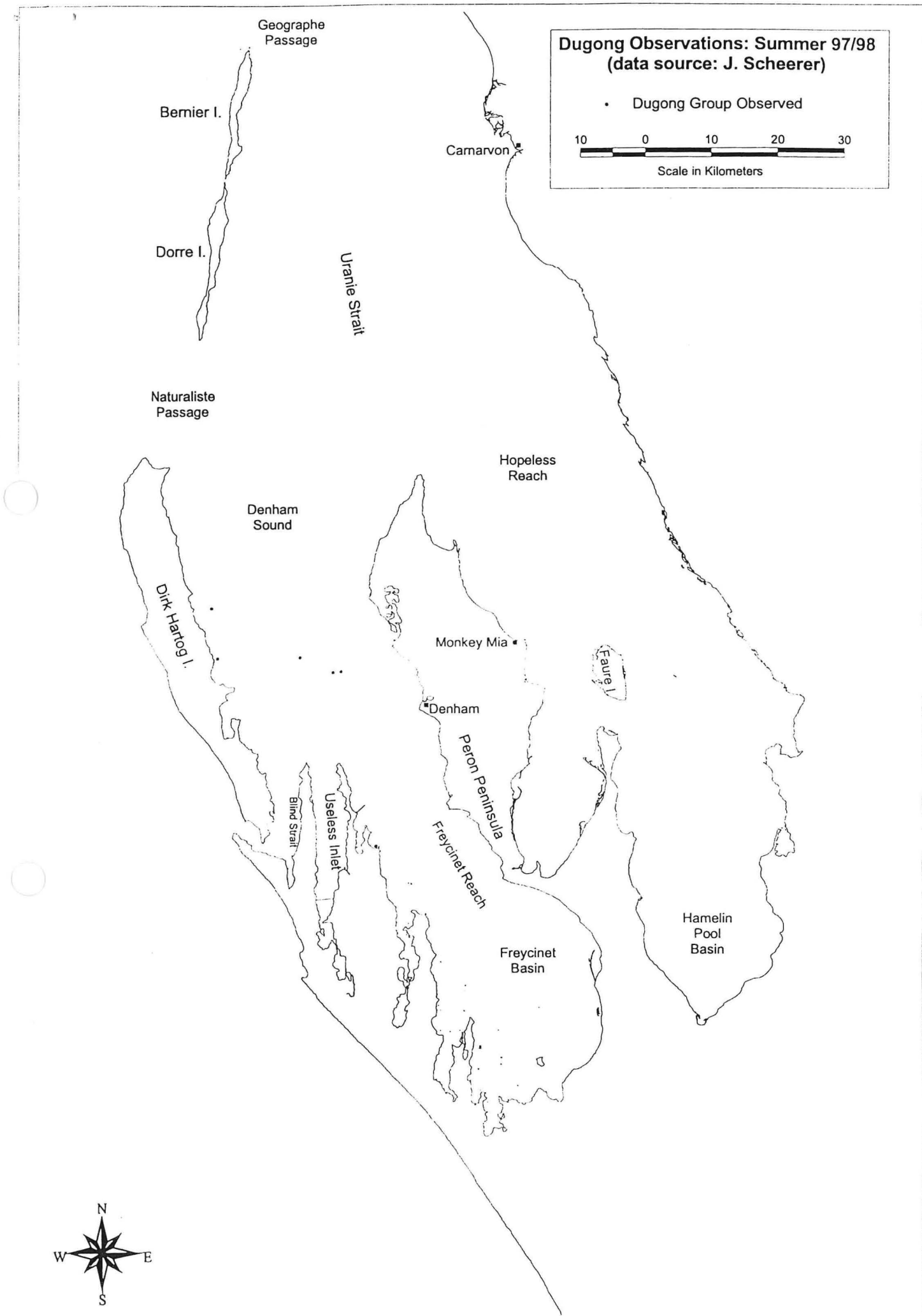


Figure 16.

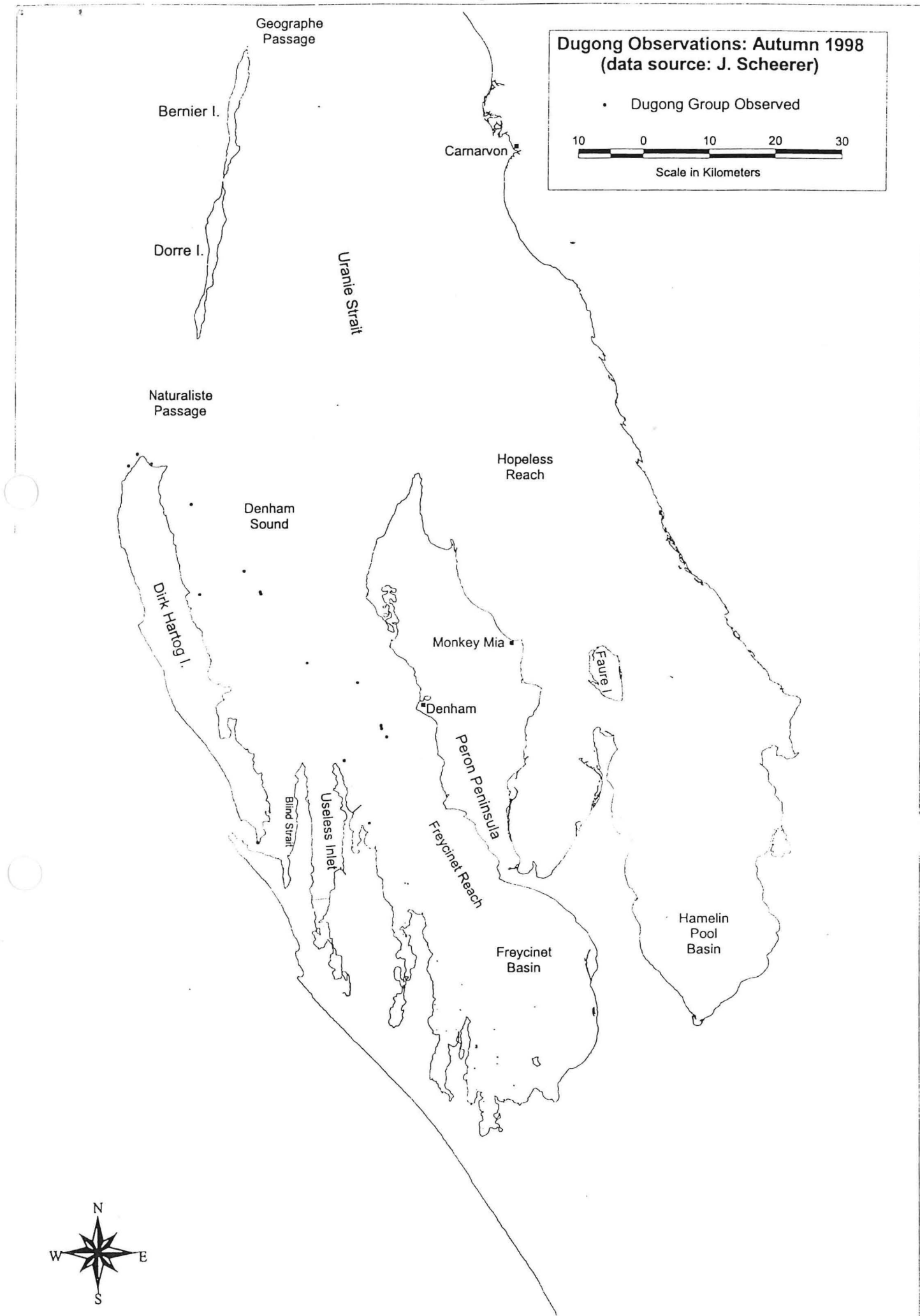


Figure 17.

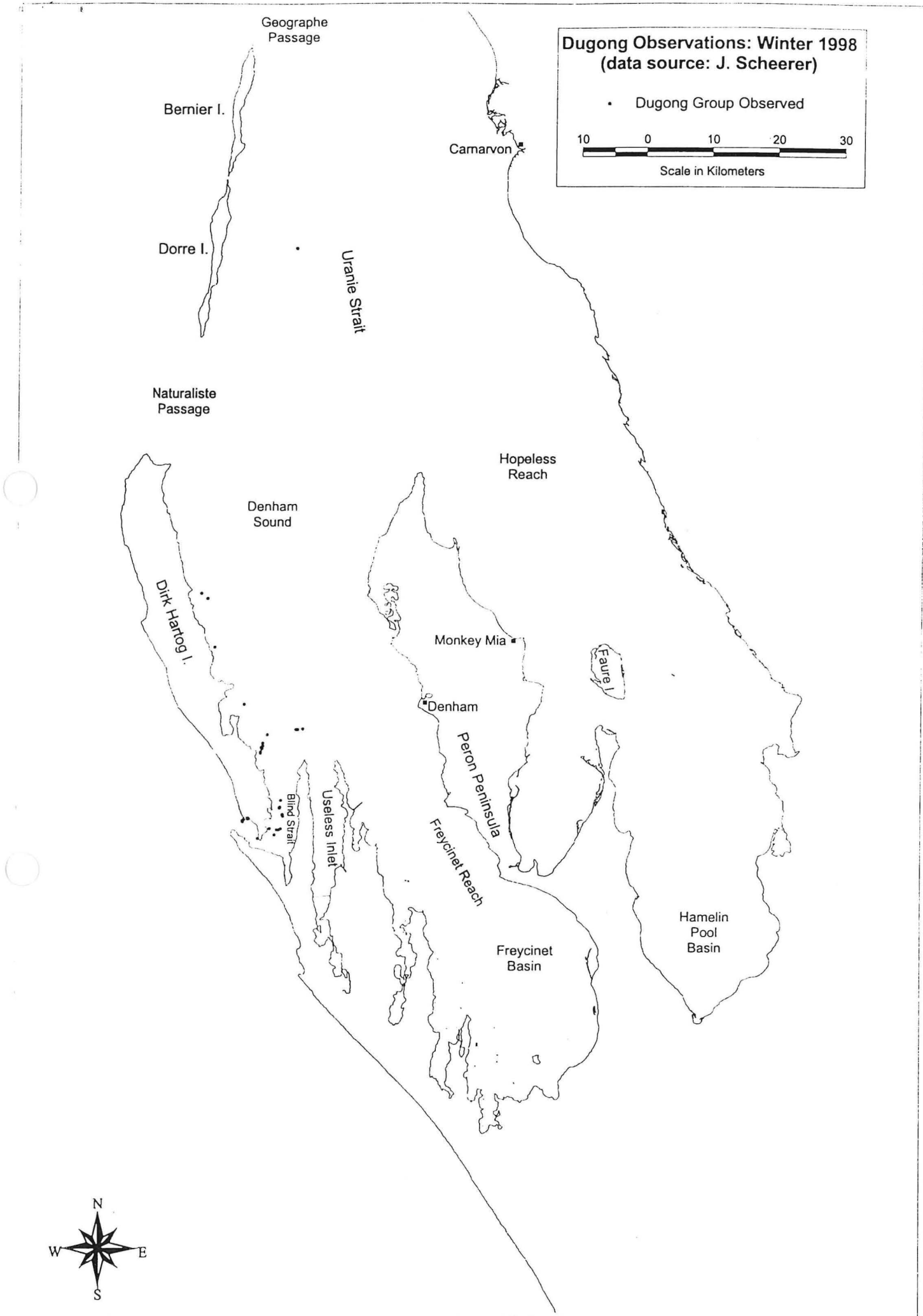


Figure 18.

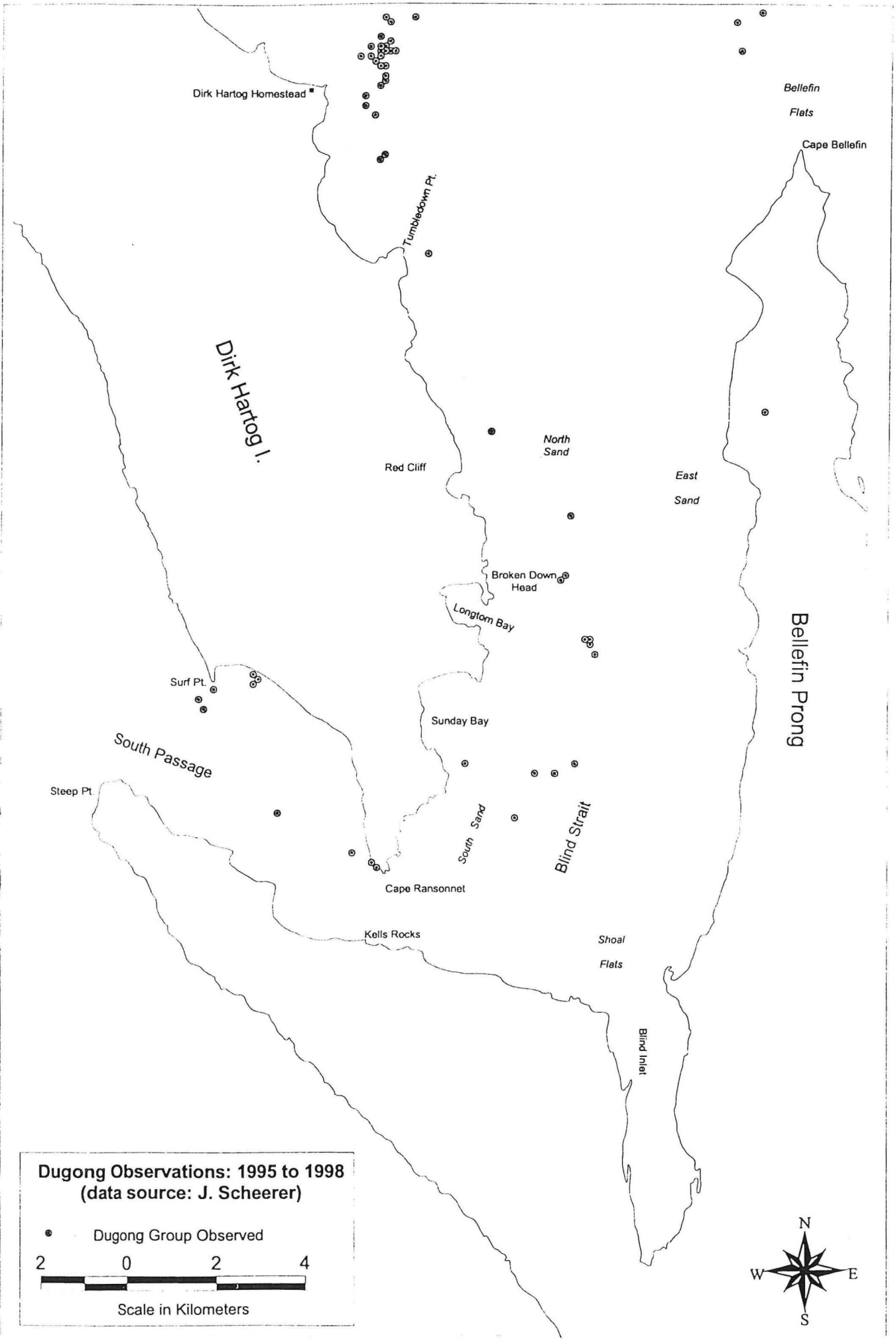


Figure 19.

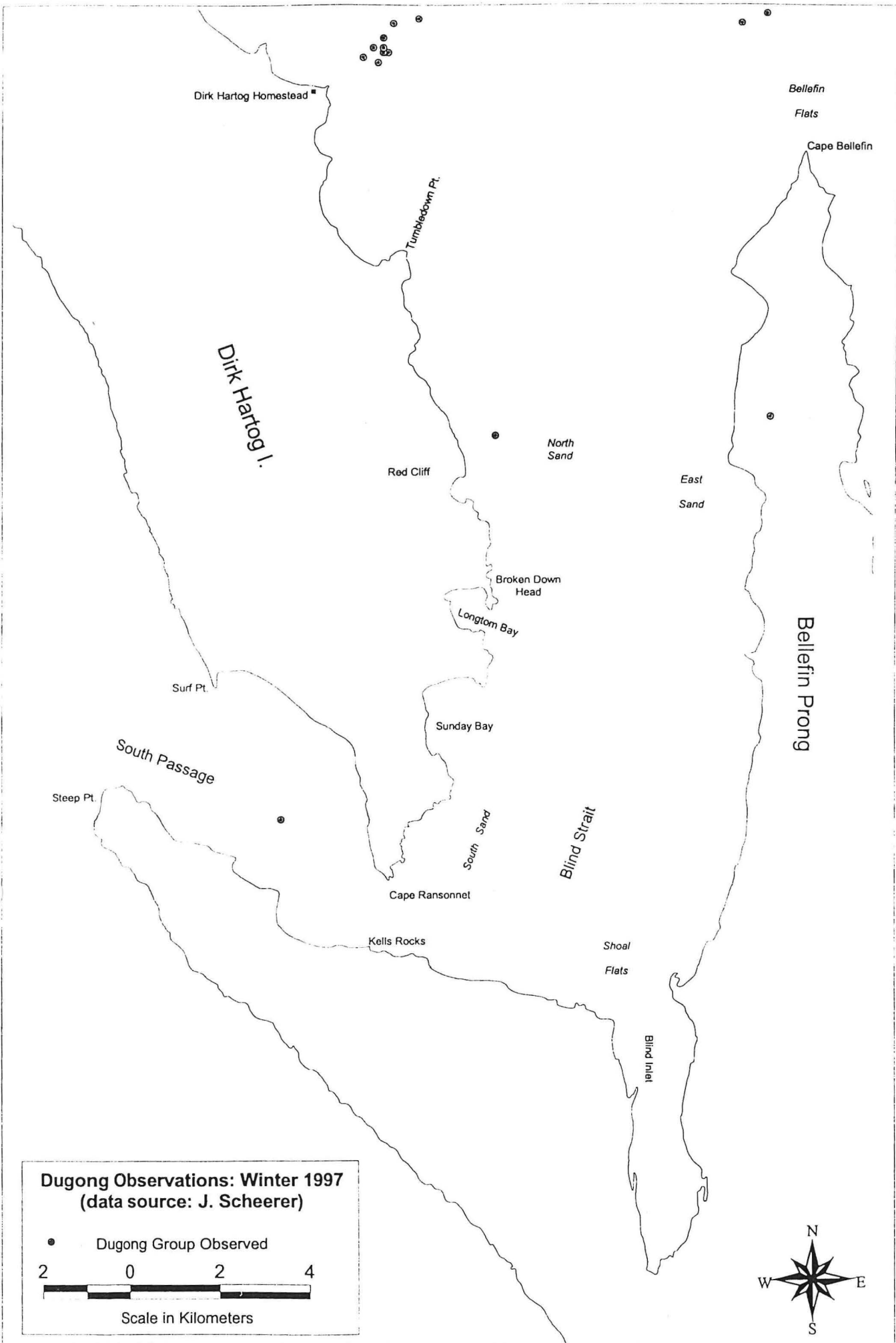


Figure 20.

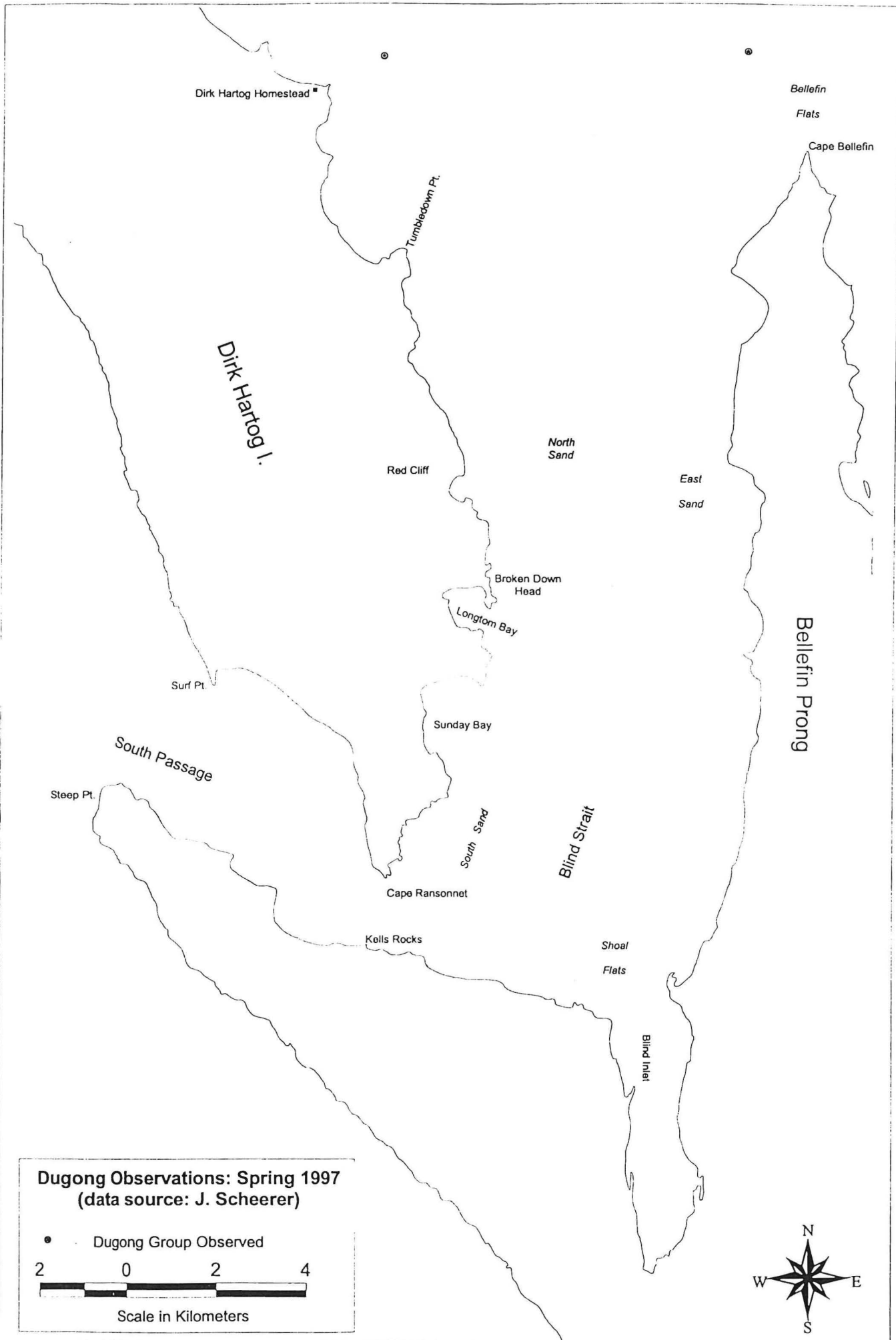




Figure 21.

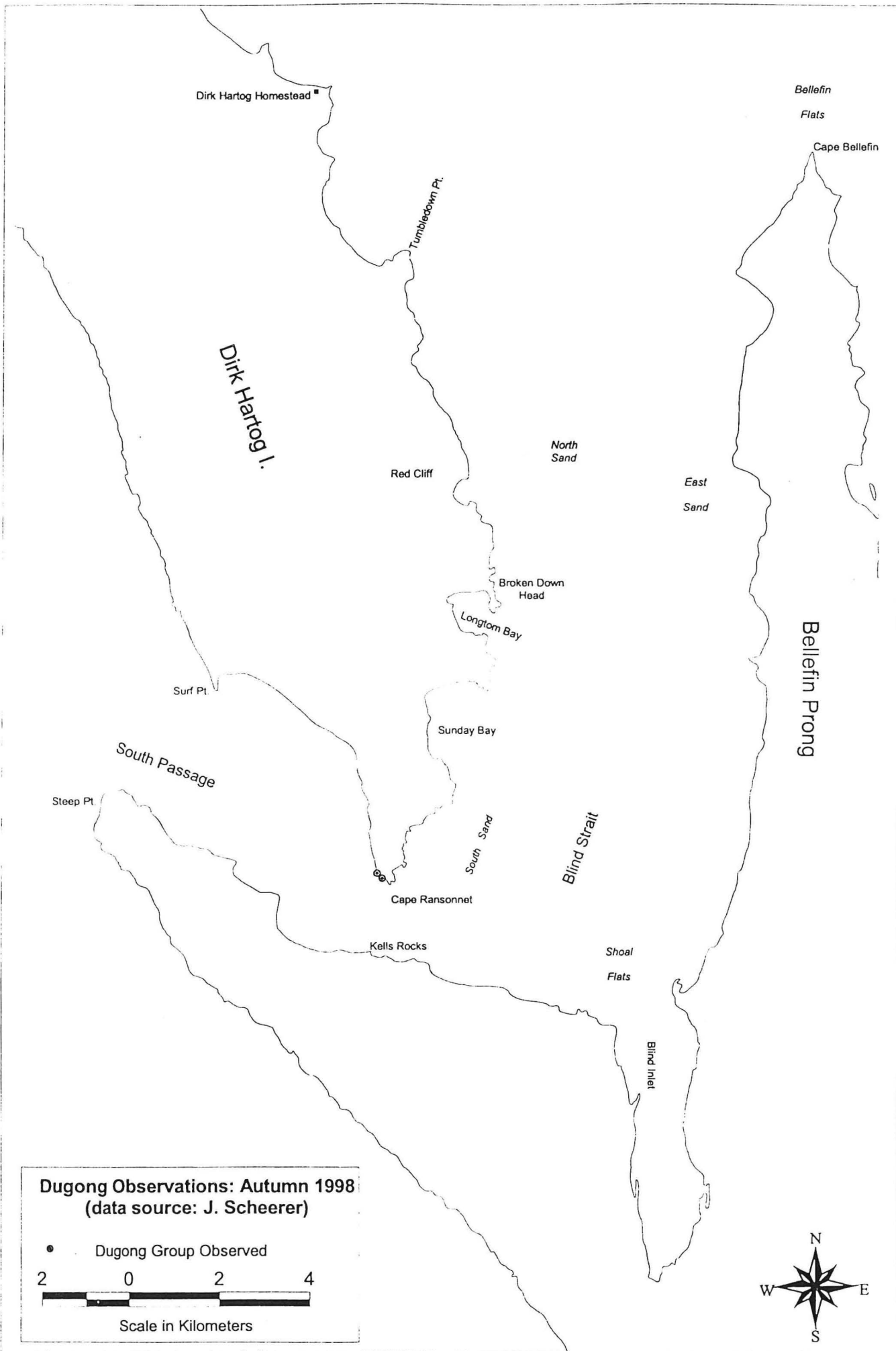


Figure 22.

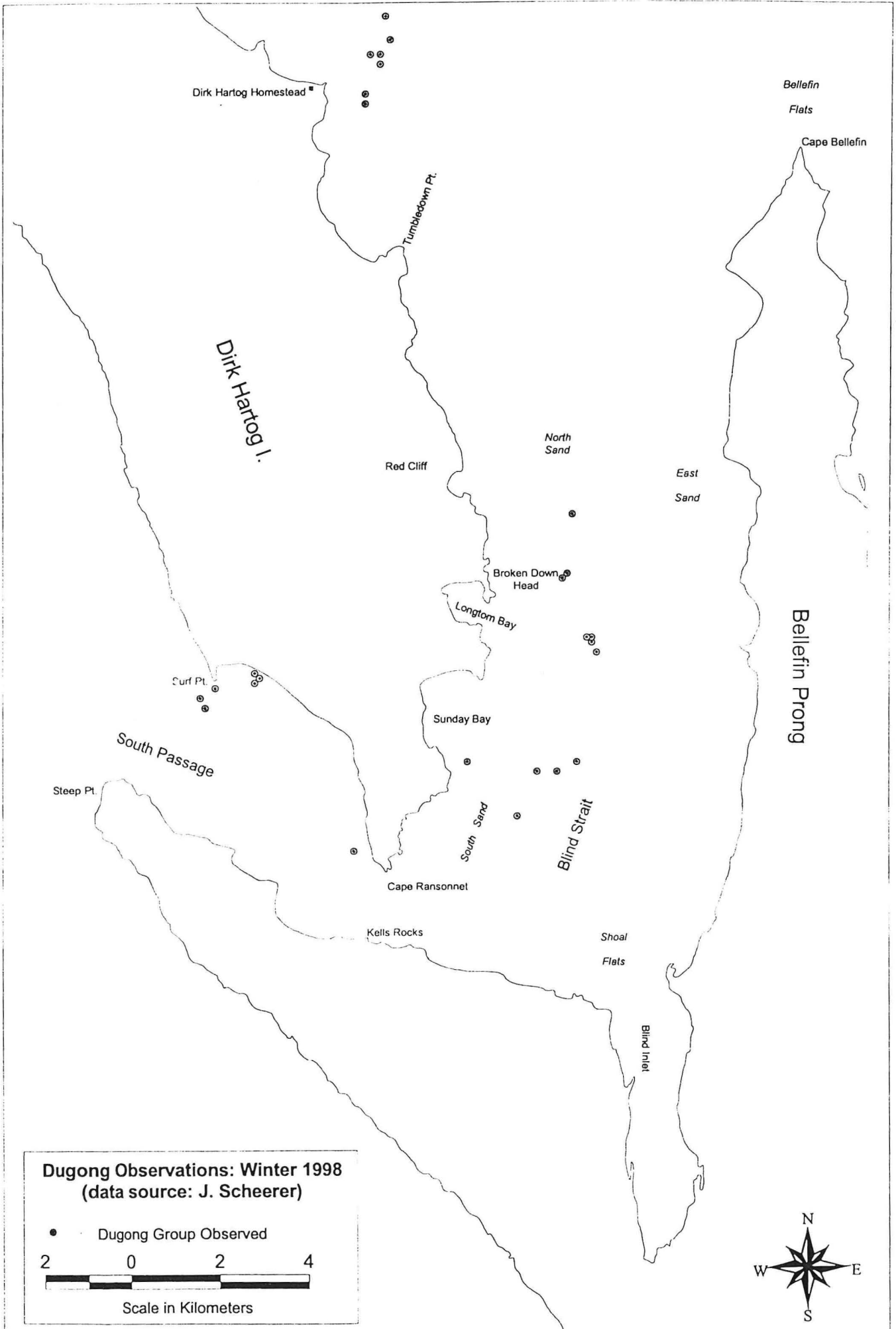
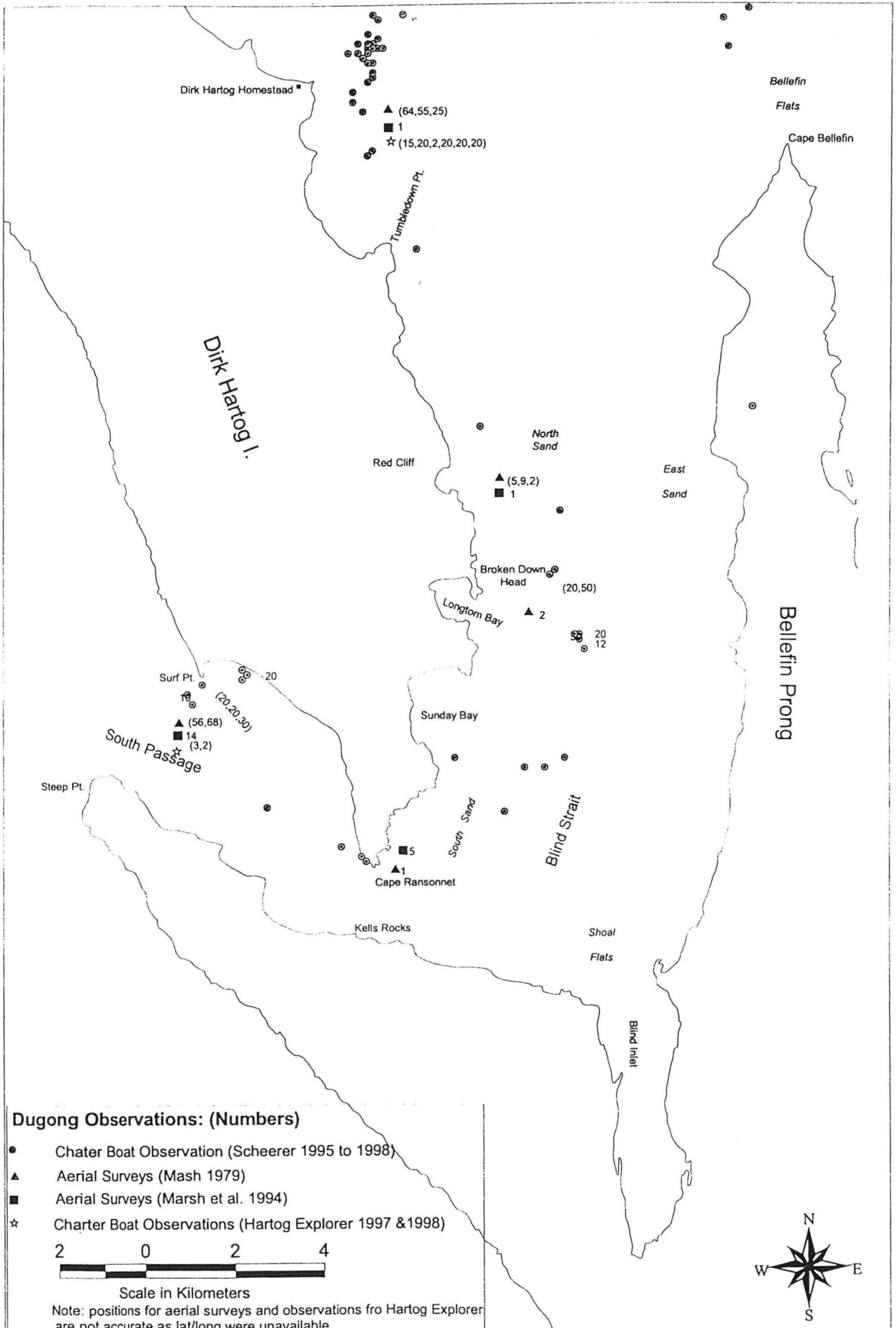


Figure 23.



ALL YEARS

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
1			Latitude	Dec. Deg.	Longitude	Dec. Deg.									Groups with cows & calves			Groups without cows & calves		
2	Date	Time	S	E	E		Location	Depth	Temperature	Weather	Community Type	Abundance	1	2-5	>6	1	2-5	>6		
3	05/07/95	14:02	25	55.217	-25.920	113	14.779	113.246				seagrass	scattered				1			
4	06/07/95	10:17	25	58.312	-25.972	113	19.366	113.323				Amphibolis					1			
5	06/07/95	10:53	25	59.061	-25.984	113	17.196	113.287						1						
6	06/07/95	11:10	25	58.682	-25.978	113	17.037	113.284									1			
7	06/07/95	11:14	25	58.430	-25.974	113	16.911	113.282									1			
8	06/07/95	12:50	25	54.928	-25.915	113	11.239	113.187										1		
9	09/07/95	11:30	25	57.901	-25.965	113	16.501	113.275				Amphibolis	high density	1					1	
10	09/07/95		25	57.710	-25.962	113	15.070	113.251				sand							1	
11	13/07/95	10:30	25	55.126	-25.919	113	19.250	113.321				Amphibolis	medium density				1			
12	13/07/95	10:45	25	55.138	-25.919	113	18.546	113.309				Amphibolis	scattered				2			
13	13/07/95	11:05	25	55.398	-25.923	113	16.545	113.276				Amphibolis	scattered	1						
14	16/07/95	14:30	25	59.060	-25.984	113	17.450	113.291				sand	dominated	1						
15	21/07/95	11:52	25	59.854	-25.998	113	12.808	113.213				seagrass	high density		1					
16	22/07/95	11:20	25	58.152	-25.969	113	17.000	113.283				seagrass	sparse				1			
17	22/07/95	12:10	25	59.814	-25.997	113	12.874	113.215				Amphibolis	high density						1	
18	22/07/95	14:10	25	59.196	-25.987	113	17.415	113.290				Amphibolis	medium density				1			
19	23/07/95		26	0.150	-26.003	113	12.845	113.214				Amphibolis	medium density						1	
20	23/07/95		26	2.296	-26.038	113	13.361	113.223											1	
21	26/07/95	11:45	25	59.831	-25.997	113	12.827	113.214				Amphibolis	high density				1			
22	26/07/95	11:53	26	0.000	-26.000	113	12.822	113.214				Amphibolis	high density				1			
23	26/07/95	11:55	26	0.100	-26.002	113	12.820	113.214												
24	26/07/95	13:10	26	2.104	-26.035	113	10.292	113.172				?	high density		1			1		
25	27/07/95	12:15	26	0.220	-26.004	113	12.770	113.213												
26	02/08/95	11:30	26	1.062	-26.018	113	12.866	113.214				Amphibolis			1					
27	02/08/95	11:43	26	0.227	-26.004	113	12.781	113.213				Amphibolis				1				
28	02/08/95	11:50	25	59.768	-25.996	113	12.860	113.214				Amphibolis								
29	02/08/95	13:50	25	59.006	-25.983	113	12.782	113.213				Amphibolis	medium density				1			
30		12:35	26	0.090	-26.002	113	12.849	113.214												
31	04/08/95	11:45	26	1.136	-26.019	113	12.805	113.213				Amphibolis				1				
32	09/08/95	9:40	25	57.349	-25.956	113	25.560	113.426				sand							1	
33	10/08/95	9:30	25	55.480	-25.925	113	24.550	113.409					sparse				1			
34	10/08/95	10:26	25	55.260	-25.921	113	20.790	113.347					sparse				1			
35	10/08/95	10:35	25	55.250	-25.921	113	20.310	113.339					medium density				1			
36	10/08/95	11:11	25	55.140	-25.919	113	19.780	113.330									1			
37	10/08/95	11:48	25	53.181	-25.886	113	20.650	113.344												
38	10/08/95	13:33	25	52.464	-25.874	113	21.216	113.354				sand						1		
39	13/08/95	9:36	26	14.925	-26.249	113	35.639	113.594				sand								
40	16/08/95	11:01	25	53.170	-25.886	113	20.700	113.345				Amphibolis	high density				1			
41	16/08/95	11:51	25	52.382	-25.873	113	20.815	113.347				Amphibolis	high density		1					
42	17/08/95	9:42	25	55.715	-25.929	113	22.284	113.371					scattered						1	
43	17/08/95	10:35	25	52.586	-25.876	113	19.220	113.320				sand						1		
44	17/08/95	10:41	25	52.367	-25.873	113	19.090	113.318				sand							1	
45	17/08/95	11:16	25	52.308	-25.872	113	19.175	113.320				Amphibolis	high density					1		
46	23/08/95	10:15	25	55.516	-25.925	113	23.896	113.398				Sand								
47	23/08/95	11:42	25	53.910	-25.899	113	18.900	113.315				seagrass					1			
48	23/08/95	13:51	25	55.420	-25.924	113	16.210	113.270				Amphibolis	high density				1			
49	04/09/95	10:55	25	58.450	-25.974	113	17.129	113.285				Amphibolis	patchy				1			
50	08/09/95	14:50	25	59.166	-25.986	113	17.525	113.292				Amphibolis	patchy						1	
51	10/09/95	13:16	25	57.700	-25.962	113	1.943	113.032				Amphibolis	patchy							
52	15/09/95	10:30	25	58.528	-25.975	113	17.127	113.285									1			
53	15/09/95	14:40	25	57.969	-25.966	113	23.150	113.386				seagrass	scattered						1	
54	17/09/95	10:22	25	58.850	-25.981	113	18.850	113.314										1		
55	17/09/95	10:49	25	58.516	-25.975	113	17.124	113.285									1			
56	17/09/95	14:30	25	54.050	-25.901	113	16.400	113.273												
57	19/09/95	12:00	25	58.532	-25.976	113	17.088	113.285									1			
58	28/09/95	7:15	26	32.241	-26.537	113	48.853	113.814				Posidonia; Halodule; Halophila ovalis	sparse					1		
59	28/09/95	8:50	26	33.288	-26.555	113	63.875	114.065				Amphibolis						1		
60	28/09/95	14:00	26	55.160	-26.919	113	39.420	113.657				Amphibolis	patches					1		
61	03/10/95	14:10	25	58.756	-25.979	113	18.988	113.316				Amphibolis	patches							
62	07/10/95	9:35	25	57.896	-25.965	113	23.559	113.393				Amphibolis						1		
63	10/10/95	10:10	25	57.640	-25.961	113	23.570	113.393				Amphibolis	scattered					1		

	U	V	W	X	Y
1					
2	Obs. Dugong No.	Activity	Other Species	Source	Notes
3				J. Scheerer	
4				J. Scheerer	
5				J. Scheerer	
6				J. Scheerer	
7				J. Scheerer	
8				J. Scheerer	
9				J. Scheerer	
10				J. Scheerer	
11				J. Scheerer	
12				J. Scheerer	
13				J. Scheerer	
14				J. Scheerer	
15				J. Scheerer	
16				J. Scheerer	
17				J. Scheerer	
18				J. Scheerer	
19				J. Scheerer	
20				J. Scheerer	
21				J. Scheerer	
22				J. Scheerer	
23				J. Scheerer	
24				J. Scheerer	
25				J. Scheerer	
26				J. Scheerer	
27				J. Scheerer	
28				J. Scheerer	
29				J. Scheerer	
30				J. Scheerer	
31				J. Scheerer	
32		travelling NW		J. Scheerer	
33		travelling north		J. Scheerer	
34		travelling west		J. Scheerer	
35		feeding		J. Scheerer	
36				J. Scheerer	
37				J. Scheerer	
38		several travelling 200-400 m apart		J. Scheerer	
39		?		J. Scheerer	
40	11+ group in distance			J. Scheerer	
41	-10	-10 in total scattered c/c + singles feeding		J. Scheerer	
42		travelling south		J. Scheerer	
43				J. Scheerer	
44		travelling just below surface		J. Scheerer	
45		floating faces over sand		J. Scheerer	
46		travelling south		J. Scheerer	
47				J. Scheerer	
48	20+ adults	feeding; traveling south		J. Scheerer	
49	20+ cows/calves	feeding		J. Scheerer	
50		feeding		J. Scheerer	
51		feeding		J. Scheerer	
52				J. Scheerer	
53				J. Scheerer	
54		travelling SE in company with dolphins	Dolphins	J. Scheerer	
55		feeding		J. Scheerer	
56		Humpback Whales travelling north	Humpback Whales	J. Scheerer	
57		feeding		J. Scheerer	
58		??		J. Scheerer	
59				J. Scheerer	
60		??		J. Scheerer	
61		feeding		J. Scheerer	
62				J. Scheerer	
63				J. Scheerer	

ALL YEARS

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
64	10/10/95	10:20	25	58.260	-25.971	113	20.065	113.334			3.0	18.6	Amphibolis		I					
65	11/10/95	10:05	25	56.317	-25.939	113	25.506	113.425			7.9	20.5	seagrass	scattered					I	
66	15/10/95	11:40	25	52.760	-25.879	113	20.480	113.341			1.5	20.5	Amphibolis					I	I	
67	20/10/95	9:05	26	19.901	-26.332	113	30.176	113.503			3.1	20.0	Halodule; Halophila ovalis					I		
68	28/10/95	9:52	25	57.403	-25.957	113	23.738	113.396			7.6	22.0	seagrass	sparse				I		
69	04/11/95	10:51	25	58.500	-25.975	113	18.290	113.305			10.6	22.0	Amphibolis	scattered	I					
70	06/12/95	9:21	25	58.037	-25.967	113	27.372	113.456			7.6	23.5	seagrass	scattered	I					
71	16/01/96	14:47	25	55.064	-25.918	113	18.140	113.302			10.3	25.0			I					
72	05/04/96	11:30	26	6.155	-26.103	113	24.923	113.415			2.4	22.5	seagrass					I		
73	07/04/96	12:00	26	6.155	-26.103	113	24.922	113.415			2.6	22.5	seagrass					I		
74	16/04/96	14:15	26	6.077	-26.101	113	24.784	113.413			1.5	23.5	seagrass					I		
75	21/04/96	12:15	26	4.500	-26.075	113	24.760	113.413			5.2	22.5	spe??		I					
76	25/04/96	12:45	26	0.581	-26.010	113	12.699	113.212			3.1	22.0	Amphibolis						I	
77	27/04/96	12:50	25	44.196	-25.737	113	5.980	113.100			6.1	23.0	seagrass		I					
78	15/05/96	13:30	26	3.071	-26.051	113	23.679	113.395			4.6	22.0	Amphibolis		I					
79	18/05/96	12:00	25	59.980	-26.000	113	12.804	113.213			1.2	21.5	Amphibolis							
80	28/05/96	11:37	25	48.740	-25.812	113	6.420	113.107			1.8	20.0	Amphibolis					I		
81	28/05/96	12:00	25	69.295	-26.155	113	6.978	113.116			4.3	20.0	seagrass					I		
82	09/06/96	10:15	25	58.120	-25.969	113	18.180	113.303			9.8	20.0	undetermined			I				
83	13/06/96	10:42	25	55.020	-25.917	113	17.698	113.295			1.8	19.6	Amphibolis						I	
84	16/06/96	12:55	25	58.507	-25.975	113	17.736	113.296			1.8	19.6	Amphibolis						I	
85	16/06/96	13:10	25	58.019	-25.967	113	17.560	113.293			0.9	19.6	Amphibolis			I			I	
86	02/07/96	11:00	25	57.770	-25.963	113	17.269	113.288			1.5	19.1	Amphibolis					I		
87	05/07/86	11:15	25	57.770	-25.963	113	17.269	113.288			1.5	18.7	Amphibolis					I		
88	07/07/96	10:00	25	57.930	-25.966	113	16.640	113.277			4.0	18.2	Amphibolis							
89	07/07/96	15:05	25	57.595	-25.960	113	23.881	113.398			8.8	18.2	seagrass	scattered					I	
90	09/07/96	11:00	25	57.975	-25.966	113	16.853	113.281			1.3	18.2	Amphibolis							
91	09/07/96	14:55	25	57.495	-25.958	113	23.260	113.388			7.2	18.2	?		I	I*				
92	12/07/96	12:00	25	57.946	-25.966	113	19.965	113.333			8.2	18.5	Amphibolis		I					
93	12/07/96	13:30	25	57.772	-25.963	113	17.120	113.285			2.1	18.2	Amphibolis				I			
94	19/07/96	11:29	25	57.820	-25.964	113	17.396	113.290			0.9	17.8	Amphibolis				I			
95	19/07/96	11:45	25	58.063	-25.968	113	17.662	113.294			1.2	18.2	Amphibolis				I			
96	19/07/96	15:25	26	1.861	-26.031	113	27.666	113.461			6.1	18.2	?					I		
97	21/07/96	11:00	25	57.424	-25.957	113	16.680	113.278			3.1	19.8	Amphibolis				I			
98	25/07/96	10:41	25	57.890	-25.965	113	17.520	113.292			1.0	17.8	Amphibolis						I	
99	25/07/96	10:50	25	57.690	-25.962	113	17.290	113.288			1.5	17.8	Amphibolis				I			
100	04/08/96	14:52	25	57.299	-25.955	113	25.577	113.426			9.1	17.8	??							
101	08/08/96	15:00	25	55.640	-25.927	113	11.520	113.192			3.9	18.2	??				I*			I
102	18/09/96	13:50	25	57.767	-25.963	113	17.127	113.285			1.2	20.0	Amphibolis				I			
103	19/09/96	9:50	25	56.616	-25.944	113	26.708	113.445			6.4	20.5	seagrass	scattered	I					
104	19/09/96	10:00	25	56.650	-25.944	113	25.195	113.420			8.8	20.0	?				I			
105	21/09/96	10:10	26	4.550	-26.076	113	25.740	113.429			11.2	20.0	sand??		I					
106	24/09/96	9:30			*						*	19.1						I		
107	24/09/96	11:30	25	57.750	-25.963	113	17.142	113.286			1.2	19.1	Amphibolis??						I	
108	24/09/96	11:50	25	57.911	-25.965	113	17.604	113.293			<1	19.1	Amphibolis				I			
109	25/09/96	15:05	26	1.131	-26.019	113	28.211	113.470			7.9	19.6	?						I	
110	28/09/96	11:00	25	58.011	-25.967	113	17.663	113.294			3.4	19.1	Amphibolis					I		
111	28/09/96	15:35	25	58.063	-25.968	113	26.271	113.438			7.9	18.7	?					I		I
112	30/09/96	11:30	26	27.978	-26.466	113	44.071	113.735			10.0	18.7	?							
113	02/10/09	15:20	25	59.005	-25.983	113	26.481	113.441			7.9	19.0	seagrass	scattered			I			
114	05/10/96	11:15	25	58.053	-25.968	113	16.792	113.280			2.1	18.7	Amphibolis				I			
115	05/10/96	11:20	25	58.777	-25.980	113	17.107	113.285			2.1	19.1	Amphibolis				I			
116	09/10/96	10:30	25	58.379	-25.973	113	17.812	113.297			0.9	20.5	Amphibolis				I			
117	09/10/96	14:30	25	58.840	-25.981	113	17.416	113.290			4.0	21.0	Amphibolis							
118	10/11/96	10:00	25	59.460	-25.991	113	24.160	113.403			10.0	22.0	?	scattered			I			
119	11/11/96	13:15	26	58.270	-26.971	113	25.975	113.433			2.7	24.5	Posidonia	high density					I	
120	11/11/96	15:40	26	58.206	-26.970	113	30.310	113.505			5.0	23.5	Posidonia	scattered					I	
121	02/01/97	11:45	25	51.370	-25.856	113	22.400	113.373			10.0	26.0	?						I	
122	07/01/97	9:40	26	6.630	-26.111	113	28.100	113.468			10.0	26.5								
123	07/01/97	16:00	25	57.830	-25.964	113	30.940	113.516			1.2	25.0	Amphibolis						I	
124	09/01/97	9:45	25	56.480	-25.941	113	28.860	113.481			3.0	27.2	?							
125	11/01/97	14:45	25	54.920	-25.915	113	12.530	113.209			9.1	25.8	sand						I	
126	11/01/97	15:40	25	58.190	-25.970	113	17.370	113.290			3.1	25.8	Amphibolis; sand						I	

## ALL YEARS

	U	V	W	X	Y
64	calf and cow	travelling east		J. Scheerer	
65				J. Scheerer	
66	adult	feeding		J. Scheerer	
67		??		J. Scheerer	
68				J. Scheerer	
69				J. Scheerer	
70				J. Scheerer	
71				J. Scheerer	
72				J. Scheerer	
73				J. Scheerer	
74		feeding/??		J. Scheerer	
75		??		J. Scheerer	
76		??		J. Scheerer	
77		?		J. Scheerer	
78				J. Scheerer	
79	1	feeding		J. Scheerer	large animal 2 scars on body
80		feeding		J. Scheerer	
81				J. Scheerer	
82				J. Scheerer	
83		?		J. Scheerer	
84				J. Scheerer	
85		feeding		J. Scheerer	
86		feeding		J. Scheerer	
87		feeding		J. Scheerer	
88				J. Scheerer	
89				J. Scheerer	
90		feeding		J. Scheerer	*small calf
91		??		J. Scheerer	
92		feeding		J. Scheerer	
93	20+	feeding ??		J. Scheerer	
94				J. Scheerer	
95				J. Scheerer	
96				J. Scheerer	
97				J. Scheerer	
98		feeding		J. Scheerer	
99		feeding		J. Scheerer	
100		feeding		J. Scheerer	
101	20-60	feeding		J. Scheerer	
102				J. Scheerer	
103				J. Scheerer	
104		animals scattered over large area ??		J. Scheerer	
105				J. Scheerer	several sited in deep water in transect to deep??
106		feeding; deep diving		J. Scheerer	
107		feeding (3 individuals site between)		J. Scheerer	
108		feeding		J. Scheerer	
109		feeding		J. Scheerer	
110		fighting, feeding, ???		J. Scheerer	
111		deep diving		J. Scheerer	
112				J. Scheerer	
113				J. Scheerer	
114		feeding		J. Scheerer	
115		feeding		J. Scheerer	
116		??		J. Scheerer	
117		feeding		J. Scheerer	
118		feeding		J. Scheerer	
119		travelling slow		J. Scheerer	
120		feeding		J. Scheerer	
121		?		J. Scheerer	
122				J. Scheerer	cow & very young calf
123				J. Scheerer	
124				J. Scheerer	large light colour probably a male
125				J. Scheerer	large animal
126	1			J. Scheerer	lone animal

ALL YEARS

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T		
127	12/01/97	16:00	26	33.320	-26.555	113	38.780	113.646	Three Bays Is.	2.0										1		
128	13/01/97	12:30	26	34.300	-26.572	113	38.280	113.638	S of Three Bays Is	5.0	29.0								1			
129	15/01/97	14:15	25	33.800	-25.563	113	4.990	113.083		16.0	28.0		?									
130	16/01/97	10:45	25	33.850	-25.564	113	4.860	113.081		16.0	27.0		?									
131	16/01/97	15:00	25	55.730	-25.929	113	31.029	113.517	off town	2.7	29.3		Amphibolis									
132	10/02/97	10:35	25	50.986	-25.850	113	18.966	113.316		11.6	24.5		?									
133	10/02/97	15:30	25	36.566	-25.609	113	3.262	113.054		6.7	25.8		seagrass	scattered								
134	23/02/97	12:35	25	31.840	-25.531	113	32.810	113.547	E. Peron	9.2	24.0		?									
135	23/02/97	15:20	25	46.820	-25.780	113	62.610	114.044	Monkey Mia ??	5.6	25.8		Amphibolis									
136	23/02/97	15:45	25	43.860	-25.731	113	43.310	113.722		8.2	25.8		?									
137	23/02/97	18:05	25	50.118	-25.835	114	2.677	114.045		8.2	24.5		seagrass		1							
138	24/02/97	10:00	25	55.755	-25.929	114	16.166	114.269		1??			??		1							
139	24/02/97	12:00								2.0	27.2		??									
140	25/02/97	18:30	25	40.211	-25.670	113	16.004	113.267		16.4	24.0		sand								1	
141	09/03/97	11:25	25	54.580	-25.910	113	15.460	113.258		5.0	23.5		??									
142	10/03/97	17:00	25	30.670	-25.511	113	2.010	113.034		18.0	23.0			patchy								
143	20/03/97	11:15	25	6.160	-25.103	113	24.900	113.415		2.7	22.5		??									
144	30/03/97	14:15	26	2.462	-26.041	113	24.506	113.408		13.7	22.5		sand									
145	30/03/97	15:50	26	0.366	-26.006	113	27.131	113.452		5.5	23.0		Amphibolis									
146	08/04/97	7:00	25	49.045	-25.817	113	7.618	113.127		8.5	21.0		seagrass									
147	18/04/97	9:45	24	48.840	-24.814	113	7.350	113.123	W of Bernier Is	45.0	21.0		?									
148	18/04/97	10:45	24	53.140	-24.886	113	7.060	113.118		30.0	21.5											
149	30/04/97	11:15	25	59.100	-25.985	113	14.930	113.249		14.0			seagrass	patchy								
150	12/05/97	13:00	25	59.800	-25.997	113	12.950	113.216		3.0			Amphibolis									
151	27/05/97	11:56	25	57.680	-25.961	113	17.462	113.291		9.1												
152	02/06/97	9:00	25	45.320	-25.755	113	22.410	113.374		2.7			Amphibolis									
153	02/06/97	9:30	25	41.600	-25.693	113	20.090	113.335		6.0			seagrass									
154	02/06/97	9:41	25	41.210	-25.687	113	19.910	113.332		5.6					1							
155	02/06/97	10:00	25	39.180	-25.653	113	18.960	113.316		13.0			seagrass									
156	02/06/97	10:06	25	38.090	-25.635	113	18.444	113.307		14.7			?									
157	02/06/97	10:40	25	57.830	-25.964	113	17.400	113.290		2.0			Amphibolis									
158	11/06/97	11:30	25	59.740	-25.996	113	12.770	113.213		2.4			Amphibolis									
159	16/06/97	10:25	25	57.730	-25.962	113	17.050	113.284		3.5			Amphibolis									
160	16/06/97	11:08	25	58.790	-25.980	113	15.030	113.251		13.5			?									
161	16/06/97	14:00	25	59.130	-25.986	113	15.720	113.262		14.6			?									
162	16/06/97	14:10	25	59.200	-25.987	113	16.900	113.282		10.0												
163	20/06/97	11:30	25	59.200	-25.987	113	23.050	113.384		6.0												
164	20/06/97	12:00	25	58.200	-25.970	113	19.890	113.332		2.6			Amphibolis									
165	20/06/97	14:30	25	57.770	-25.963	113	16.700	113.278		5.5			Amphibolis									
166	22/06/97	9:00	26	59.220	-26.987	113	11.970	113.200		5.0												
167	22/06/97	14:30	25	58.530	-25.976	113	19.040	113.317		2.5			Amphibolis									
168	22/06/97	13:00	26	4.430	-26.074	113	14.130	113.236		6.0												
169	23/06/97	15:00	25	47.010	-25.784	113	5.870	113.098		1.2-4			Amphibolis									
170	23/06/97	16:00	25	47.200	-25.787	113	5.620	113.094		1.0			sand									
171	24/06/97	11:45	26	9.080	-26.151	113	11.570	113.193		8.2			Amphibolis									
172	26/06/97	15:00	25	58.630	-25.977	113	17.360	113.289		2.6			Amphibolis									
173	26/06/97	10:30	25	58.260	-25.971	113	17.440	113.291		4.0			Amphibolis									
174	26/06/97	11:00	25	57.680	-25.961	113	16.790	113.280		4.0			Amphibolis									
175	27/06/97	9:00			*				Billin Banks ??	*			*									
176	28/06/97	9:40	25	57.940	-25.966	113	17.560	113.293		1.2			Amphibolis									
177	28/06/97	12:40	25	56.450	-25.941	113	15.380	113.256		1.8			Amphibolis									
178	29/06/97	9:00			*				Belfin Banks??	*			*									
179	30/06/97	11:30	25	57.390	-25.957	113	16.650	113.278		3.7			Amphibolis									
180	30/06/97	13:50	25	58.230	-25.971	113	17.190	113.287		1.5			Amphibolis									
181	01/07/97	9:45	26	4.210	-26.070	113	17.450	113.291		4.6												
182	03/07/97	15:00	25	55.370	-25.923	113	25.170	113.420		8.0												
183	07/07/97	10:30	25	57.950	-25.966	113	17.610	113.294		0.9			Amphibolis									
184	07/07/97	11:10	25	57.070	-25.951	113	16.410	113.274		1.5			Amphibolis									
185	09/07/97	10:45	25	56.490	-25.942	113	15.360	113.256		2.0												
186	09/07/97	11:00	25	56.450	-25.941	113	15.380	113.256		2.1			Amphibolis									
187	09/07/97	13:30	25	59.730	-25.996	113	12.800	113.213	South of Medge Is ??	2.4			Amphibolis									
188	11/07/97	11:00	25	58.100	-25.968	113	14.390	113.240		13.2			?									
189	11/07/97	13:30	25	59.830	-25.997	113	12.830	113.214		1.5			Amphibolis									



## ALL YEARS

	U	V	W	X	Y
127				J. Scheerer	u. dark color 2 with large white scars??
128				J. Scheerer	very dark color
129		Top of DNI??		J. Scheerer	
130		2nd day in this area	Minke Whale	J. Scheerer	Minke Whale 7m in length
131				J. Scheerer	
132				J. Scheerer	
133				J. Scheerer	
134				J. Scheerer	
135				J. Scheerer	
136				J. Scheerer	
137				J. Scheerer	
138		feeding		J. Scheerer	
139	-15	feeding		J. Scheerer	large sediment plumes
140		?		J. Scheerer	
141				J. Scheerer	
142			Whale Shark (female)	J. Scheerer	whale shark; female scar on back
143		travelling south		J. Scheerer	
144		dolphin carrying sponge ??	Dolphin	J. Scheerer	
145		feeding		J. Scheerer	
146				J. Scheerer	
147		Sei Whale travelling south	Sei Whale	J. Scheerer	
148		Sei whales feeding	Sei Whales	J. Scheerer	
149		?		J. Scheerer	
150		feeding		J. Scheerer	
151				J. Scheerer	
152				J. Scheerer	
153				J. Scheerer	
154				J. Scheerer	
155				J. Scheerer	
156				J. Scheerer	
157		feeding		J. Scheerer	
158		feeding		J. Scheerer	
159		feeding		J. Scheerer	
160		feeding		J. Scheerer	
161				J. Scheerer	
162				J. Scheerer	
163		feeding		J. Scheerer	
164		feeding		J. Scheerer	
165		??		J. Scheerer	
166				J. Scheerer	
167				J. Scheerer	
168				J. Scheerer	
169	-20	feeding and travelling		J. Scheerer	herd - calves and cows
170				J. Scheerer	
171		feeding		J. Scheerer	
172		feeding		J. Scheerer	
173		?		J. Scheerer	
174		feeding		J. Scheerer	
175	20-30			J. Scheerer	(filmed 9:00 to 16:00)
176		feeding; travelling south		J. Scheerer	
177	-20	feeding; travelling south		J. Scheerer	
178	15-20			J. Scheerer	(filmed 9:00 to 13:00) calves and cows and individuals
179		feeding; travelling slowly south		J. Scheerer	
180				J. Scheerer	
181			1 Black Manta Ray	J. Scheerer	
182		possibly feeding		J. Scheerer	
183		feeding		J. Scheerer	
184				J. Scheerer	small calf less >90cm
185		very flighty		J. Scheerer	
186		feeding		J. Scheerer	
187	*20			J. Scheerer	
188		?		J. Scheerer	
189	-20	feeding		J. Scheerer	

ALL YEARS

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
190	12/07/97	11:00	25	59.730	-25.996	113	12.780	113.213					Amphibolis				I			
191	12/07/97	13:15	25	2.700	-25.045	113	15.020	113.250					?	scattered				I		
192	12/07/97	14:00	25	59.250	-25.988	113	19.680	113.328					Amphibolis					I		
193	17/07/97	10:50	25	59.790	-25.997	113	12.750	113.213					Amphibolis				I			
194	17/07/97	13:15	25	59.460	-25.991	113	17.100	113.285						scattered				I		
195	17/07/97	13:45	25	58.640	-25.977	113	17.260	113.288					Amphibolis					I		
196	20/07/97	11:30	25	59.730	-25.996	113	12.640	113.211					Amphibolis				I			
197	20/07/97	14:00	25	59.660	-25.994	113	12.800	113.213					Amphibolis				I			
198	22/07/97	10:20	25	59.210	-25.987	113	17.150	113.286												
199	22/07/97	11:10	25	59.870	-25.998	113	12.530	113.209					Amphibolis					I		
200	22/07/97	11:25	25	59.950	-25.999	113	12.700	113.212					Amphibolis				I			
201	22/07/97	14:18	25	58.360	-25.973	113	18.280	113.305					Amphibolis	I						
202	23/07/97	14:30	25	58.660	-25.978	113	17.420	113.290					Amphibolis				I			
203	25/07/97	9:00	25	57.120	-25.952	113	26.250	113.438					seagrass	I						
204	25/07/97	10:50	25	57.810	-25.964	113	17.650	113.294					Amphibolis					I		
205	25/07/97	11:15	25	57.990	-25.967	113	16.890	113.282					Amphibolis			I				
206	25/07/97	11:30	25	58.560	-25.976	113	15.300	113.255					?	new growth		I		I		
207	25/07/97	15:30	25	57.870	-25.965	113	23.490	113.392					seagrass				I			
208	27/07/97	12:20	25	57.140	-25.952	113	26.230	113.437					seagrass					I		
209	27/07/97	12:25	25	57.280	-25.955	113	25.710	113.429					Amphibolis						I	
210	27/07/97	13:00	25	57.210	-25.954	113	25.440	113.424					Amphibolis & softcoral - dendronephthya sp.; sand					I		
211	27/07/97	14:00	25	57.490	-25.958	113	23.650	113.394					Amphibolis						I	
212	27/07/97	14:20	25	58.430	-25.974	113	23.820	113.397					Amphibolis					I		
213	27/07/97	16:00	26	0.400	-26.007	113	22.440	113.374					Amphibolis	I						
214	30/07/97	9:30	25	57.750	-25.963	113	23.290	113.388					Amphibolis					I		
215	30/07/97	10:15	25	57.840	-25.964	113	17.560	113.293					Amphibolis					I		
216	30/07/97	13:10	25	59.730	-25.996	113	12.750	113.213					Amphibolis				I			
217	30/07/97	14:05	25	59.320	-25.989	113	17.390	113.290					Amphibolis				I			
218	30/07/97	14:30	25	58.290	-25.972	113	19.210	113.320					Amphibolis			I				
219	30/07/97	15:20	25	57.220	-25.954	113	25.790	113.430					seagrass					I		I
220	05/08/97	11:50	25	57.760	-25.963	113	17.430	113.291					Amphibolis						I	
221	05/08/97	12:00	25	57.950	-25.966	113	17.630	113.294					Amphibolis						I	
222	07/08/97	10:42	25	58.060	-25.968	113	16.790	113.280					Amphibolis				I			
223	07/08/97	10:20	25	58.140	-25.969	113	17.290	113.288					Amphibolis					I		
224	07/08/97	11:15	25	59.420	-25.990	113	13.170	113.220					Amphibolis						I	
225	07/08/97	11:30	25	59.460	-25.991	113	12.900	113.215					Amphibolis						I	
226	11/08/97	10:20	25	57.880	-25.965	113	16.900	113.282					Amphibolis				I			
227	13/08/97	10:30	25	58.170	-25.970	113	18.730	113.312					Amphibolis				I			
228	13/08/97	10:40	25	58.030	-25.967	113	17.810	113.297					?				I			
229	13/08/97	11:00	25	58.020	-25.967	113	16.860	113.281					Amphibolis					I		
230	13/08/97	14:40	25	58.940	-25.982	113	17.440	113.291					Amphibolis							
231	13/08/97	16:05	25	57.100	-25.952	113	25.820	113.430					Amphibolis?	I						
232	16/08/97	9:00	25	57.240	-25.954	113	25.650	113.428					Amphibolis?						I	
233	16/08/97	10:20	25	57.750	-25.963	113	17.440	113.291					Amphibolis						I	
234	16/08/97	10:30	25	57.690	-25.962	113	17.020	113.284					Amphibolis				I			
235	16/08/97	10:40	25	58.010	-25.967	113	16.950	113.283					Amphibolis				I			
236	16/08/97	14:30	25	58.940	-25.982	113	17.480	113.291					Amphibolis				I			
237	18/08/97	9:00							Bellefin Banks											
238	25/08/97	9:00	25	57.070	-25.951	113	26.580	113.443					Amphibolis							
239	25/08/97	10:50	25	57.820	-25.964	113	16.930	113.282					Amphibolis				I			
240	25/08/97	14:30	25	57.420	-25.957	113	23.890	113.398					Amphibolis				I			
241	26/08/97	10:30	25	57.690	-25.962	113	17.050	113.284					Amphibolis				I			
242	26/08/97	15:15	25	57.480	-25.958	113	25.720	113.429					Amphibolis						I	
243	28/08/97	10:00			*				Bellefin Banks									I		
244	28/08/97	11:00	25	57.320	-25.955	113	15.310	113.255									I			
245	28/08/97	13:30	25	52.730	-25.879	113	9.360	113.156					Amphibolis				I			
246	03/09/97	10:30			*				Bellefin banks											I
247	03/09/97	13:10	25	59.900	-25.998	113	12.800	113.213					Amphibolis				I			
248	03/09/97	14:35	25	59.700	-25.995	113	20.320	113.339					Amphibolis							
249	03/09/97	15:35	25	57.730	-25.962	113	27.640	113.461					Knights Bank					I		
250	04/09/97	10:00	25	58.140	-25.969	113	17.740	113.296					Amphibolis						I	
251	04/09/97	11:35	25	59.160	-25.986	113	17.650	113.294					Amphibolis				I			
252	07/09/97	14:45	25	59.160	-25.986	113	26.110	113.435					?				I			

ALL YEARS

	U	V	W	X	Y
190	-20+	feeding		J. Scheerer	
191		travelling north		J. Scheerer	
192		feeding		J. Scheerer	
193		feeding		J. Scheerer	
194		?		J. Scheerer	
195		feeding		J. Scheerer	
196		feeding		J. Scheerer	
197		feeding		J. Scheerer	
198		dolphin carrying baler shell	juv. dolphin	J. Scheerer	
199		hanging under surface		J. Scheerer	
200		hanging under surface		J. Scheerer	
201				J. Scheerer	small calf
202		feeding		J. Scheerer	
203		young mother hanging under surface		J. Scheerer	small calf
204				J. Scheerer	
205				J. Scheerer	small calf
206				J. Scheerer	
207		feeding		J. Scheerer	
208		deep diving		J. Scheerer	
209		deep diving		J. Scheerer	
210		deep diving		J. Scheerer	
211		deep diving		J. Scheerer	
212				J. Scheerer	
213				J. Scheerer	
214		deep diving		J. Scheerer	
215		feeding (female)		J. Scheerer	
216	'13			J. Scheerer	1 neo natal. imm.
217		feeding		J. Scheerer	
218		feeding		J. Scheerer	
219				J. Scheerer	
220		feeding		J. Scheerer	
221		feeding		J. Scheerer	
222		feeding small calves		J. Scheerer	
223		moving onto bank		J. Scheerer	
224		?		J. Scheerer	
225		feeding		J. Scheerer	
226		feeding		J. Scheerer	
227		feeding		J. Scheerer	
228				J. Scheerer	
229		feeding		J. Scheerer	
230		feeding		J. Scheerer	small calves
231		on surface		J. Scheerer	small calf
232		deep dive		J. Scheerer	
233		feeding		J. Scheerer	
234		feeding		J. Scheerer	
235		feeding		J. Scheerer	
236		feeding		J. Scheerer	
237				J. Scheerer	filming from 9:00 to 16:00
238		feeding; deep dives		J. Scheerer	
239		feeding; deep dives		J. Scheerer	
240		feeding; deep dives		J. Scheerer	
241	-20+	feeding		J. Scheerer	small calves
242		deep dive		J. Scheerer	
243				J. Scheerer	neonat. calf
244		diving		J. Scheerer	
245		feeding		J. Scheerer	
246		feeding		J. Scheerer	
247		feeding		J. Scheerer	
248		feeding		J. Scheerer	
249		on surface		J. Scheerer	
250				J. Scheerer	
251		feeding		J. Scheerer	
252		feeding		J. Scheerer	

ALL YEARS

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
253	07/09/97	14:55	25	59.030	-25.984	113	25.440	113.424		8.8			?				I			
254	07/09/97	15:50	25	58.870	-25.981	113	18.220	113.304		7.3								I		
255	08/09/97	8:30	25	57.910	-25.965	113	16.890	113.282		1.2			Amphibolis		I					
256	08/09/97	15:45	26	21.050	-26.351	113	30.540	113.509		5.0			seagrass				I			
257	10/09/97	10:31	25	57.730	-25.962	113	17.160	113.286		1.2			Amphibolis		I					
258	10/09/97	10:35	25	59.800	-25.997	113	17.160	113.286		1.0			Amphibolis		I					
259	10/09/97	15:00	25	58.280	-25.971	113	19.680	113.328		0.8			Amphibolis		I					
260	12/09/97	10:25	25	58.260	-25.971	113	19.220	113.320		1.1			Amphibolis		I					
261	12/09/97	14:25	25	57.380	-25.956	113	23.630	113.394		7.3			Amphibolis		I	I				
262	15/09/97	9:05	25	57.170	-25.953	113	26.190	113.437		9.0			Amphibolis		I					
263	15/09/97	10:45	25	57.800	-25.963	113	17.470	113.291		0.9			Amphibolis		I				I	
264	15/09/97	14:50	25	58.270	-25.971	113	19.430	113.324		1.1			Amphibolis		I					
265	16/09/97	10:40	25	57.780	-25.963	113	17.460	113.291		3.0			Amphibolis					I		
266	16/09/97	11:00	25	57.760	-25.963	113	16.910	113.282		3.0			Amphibolis		I					
267	18/09/97	10:30	25	57.810	-25.964	113	17.460	113.291		1.0			Amphibolis				I			
268	18/09/97	14:30	25	58.390	-25.973	113	18.560	113.309		10.0			?				I			
269	18/09/97	14:50	25	58.150	-25.969	113	19.810	113.330		2.5			Amphibolis		I					
270	21/09/97	9:45	25	59.830	-25.997	113	23.690	113.395		9.0			?						I	
271	21/09/97	10:30								1.0			Amphibolis		I					
272	21/09/97	10:45	25	57.760	-25.963	113	17.120	113.285		1.1			Amphibolis		I					
273	21/09/97	11:16	25	58.110	-25.969	113	16.830	113.281		1.9			Amphibolis			I				
274	21/09/97	14:50	25	58.760	-25.979	113	18.670	113.311		7.0			Amphibolis		I					
275	23/09/97	10:30			*				Bellefin Banks	1.0			Amphibolis		I	I				
276	23/09/97	14:40	25	58.660	-25.978	113	19.260	113.321		3.0			Amphibolis		I					
277	23/09/97	15:25	25	57.790	-25.963	113	23.450	113.391		7.3			Amphibolis					I		
278	27/09/97	10:10	25	58.430	-25.974	113	20.310	113.339		3.0			Amphibolis						I	
279	27/09/97	15:00	25	58.340	-25.972	113	19.300	113.322		1.3			Amphibolis		I					
280	28/09/97	10:50	25	57.700	-25.962	113	18.440	113.307		2.3			Amphibolis			I				
281	28/09/97	11:25			*				Bellefin Banks	2.0			Amphibolis						I	
282	28/09/97	15:30	25	57.710	-25.962	113	24.000	113.400		9.6									I	
283	30/09/97	10:37	25	57.880	-25.965	113	17.760	113.296		10.6			?						I	
284	30/09/97	10:50	25	58.140	-25.969	113	17.290	113.288		2.0			Amphibolis							I
285	01/10/98	15:20	25	58.260	-25.971	113	19.800	113.330		1.1			Amphibolis		I					
286	03/10/97	10:00			*				Bellefin Banks	1 to 3			Amphibolis					I + I		
287	04/10/97	10:00			*				Bellefin Banks	2.0			Amphibolis		I					
288	04/10/97	14:40	25	58.780	-25.980	113	17.830	113.297		2.3			sand		I					
289	06/10/97	9:30	25	57.090	-25.952	113	22.400	113.373		8.8			seagrass						I	
290	06/10/97	9:40	25	57.750	-25.963	113	23.410	113.390		7.4			seagrass					I		
291	06/10/97	11:00			*				Bellefin Banks	2.0			Amphibolis							I
292	07/10/97	10:10	25	58.200	-25.970	113	19.840	113.331		1.7			Amphibolis		I					
293	19/10/97	10:00	26	0.630	-26.011	113	21.840	113.364		10.0			Amphibolis							I
294	19/10/97	15:30	25	59.580	-25.993	113	24.420	113.407		9.8			seagrass				I			
295	20/10/97	13:10	25	58.740	-25.979	113	24.150	113.403		7.6			Amphibolis				I			
296	20/10/97	14:40	25	59.530	-25.992	113	24.660	113.411		10.5										
297	21/10/97	8:05	26	13.780	-26.230	113	34.820	113.580		12.3			Amphibolis						I	
298	21/10/97	9:00	26	14.530	-26.242	113	35.180	113.586		12.5			seagrass		scattered					
299	21/10/97	11:05	26	21.700	-26.362	113	34.350	113.573		3.0			Halophila in understory, Amphibolis & Posidonia		I				I	
300	22/10/97	8:10	26	33.670	-26.561	113	38.820	113.647		4.5			Halophila		I					
301	22/10/97	9:25	26	35.970	-26.600	113	40.370	113.673		4.6			Halophila: Halophila ovalis				I			
302	22/10/97	13:00	26	35.090	-26.585	113	40.120	113.669		1.0			sand, sea pens & Virgularia sp.				I			
303	31/10/97	10:05	25	57.790	-25.963	113	23.300	113.388		6.4			Amphibolis						I	
304	07/11/97	10:30	25	58.290	-25.972	113	17.250	113.288		3.0			sand		I					
305	07/11/97	10:40	25	58.310	-25.972	113	17.190	113.287		2.3			Amphibolis						I	
306	07/11/97	10:50	25	58.620	-25.977	113	17.070	113.285		1.0			Amphibolis						I	
307	09/11/97	10:20	25	28.300	-25.472	113	19.760	113.329		2.6			Amphibolis						I	
308	09/11/97	11:00	25	58.320	-25.972	113	16.960	113.283		2.9			Amphibolis							I
309	10/11/97	11:00	25	58.550	-25.976	113	17.200	113.287		0.8			Amphibolis							I
310	18/11/97	12:20	25	50.790	-25.847	113	18.490	113.308		7.8			seagrass		scattered		I			
311	20/11/97	15:10	25	50.480	-25.841	113	18.250	113.304		5.9			seagrass		scattered			I		
312	20/11/97	15:30	25	51.850	-25.864	113	19.500	113.325		9.0			seagrass		scattered			I		
313	25/11/97	10:30	25	49.980	-25.833	113	18.180	113.303		7.5			Amphibolis		I				I	
314	06/12/97	12:30	25	44.900	-25.748	113	6.440	113.107		8.0	23.0		Amphibolis			I				
315	18/12/97	17:30	25	50.220	-25.837	113	7.180	113.120		3.4			?						I	

	U	V	W	X	Y
253	-20			J. Scheerer	
254		?		J. Scheerer	
255		feeding		J. Scheerer	
256		??		J. Scheerer	
257				J. Scheerer	
258		feeding		J. Scheerer	
259		feeding under small calves		J. Scheerer	
260		feeding		J. Scheerer	
261		?		J. Scheerer	
262		deep dive		J. Scheerer	
263		feeding		J. Scheerer	faeces collected
264		feeding		J. Scheerer	
265		feeding and rolling over		J. Scheerer	
266		feeding		J. Scheerer	
267		feeding		J. Scheerer	
268		deep dive		J. Scheerer	
269		feeding		J. Scheerer	
270		feeding		J. Scheerer	
271		feeding		J. Scheerer	
272		feeding, small shelf		J. Scheerer	
273		feeding		J. Scheerer	
274		feeding		J. Scheerer	
275		feeding		J. Scheerer	
276		feeding		J. Scheerer	
277		on surface		J. Scheerer	
278		travelling		J. Scheerer	
279		feeding		J. Scheerer	
280		travelling slowly		J. Scheerer	
281		feeding		J. Scheerer	
282		deep dive		J. Scheerer	
283		travelling SE		J. Scheerer	
284		feeding - animal distressed by others		J. Scheerer	
285		feeding		J. Scheerer	
286		feeding		J. Scheerer	
287		feeding		J. Scheerer	
288		travelling		J. Scheerer	
289		feeding		J. Scheerer	
290		deep dive		J. Scheerer	
291		feeding		J. Scheerer	
292		feeding		J. Scheerer	
293		deep dive		J. Scheerer	
294		deep dive		J. Scheerer	
295		deep dive		J. Scheerer	
296		dolphin carrying sponge	dolphin	J. Scheerer	
297		travelling south		J. Scheerer	
298		travelling north		J. Scheerer	
299		feeding		J. Scheerer	faeces collected
300		feeding		J. Scheerer	
301		deep dive		J. Scheerer	
302		feeding in shallows		J. Scheerer	faeces collected
303		feeding		J. Scheerer	
304		travelling through channel		J. Scheerer	
305		feeding		J. Scheerer	
306		feeding		J. Scheerer	
307		travelling		J. Scheerer	
308		feeding		J. Scheerer	
309		feeding, hanging below surface		J. Scheerer	
310		feeding, deep dive		J. Scheerer	
311		feeding		J. Scheerer	
312		feeding		J. Scheerer	
313		travelling, calf and cow feeding		J. Scheerer	
314		?		J. Scheerer	
315		?		J. Scheerer	

ALL YEARS

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
316	12/02/98	14:00	26	9.820	-26.164	113	26.130	113.436		2.0			Posidonia; Halophila	scattered				1		
317	21/02/98	11:00	25	50.000	-25.833	113	16.870	113.281		8.2	?							1		
318	22/02/98	14:00				*			Cape Inscription	8.2								1		
319	28/02/98	11:30	25	51.370	-25.856	113	21.660	113.361		7.0	25.5		seagrass	high density	1					
320	28/02/98	13:15	25	51.480	-25.858	113	20.770	113.346		6.7	25.5		seagrass	high density				1		
321	02/03/98	9:00	25	43.470	-25.725	113	5.310	113.089	Sandy Pt.	1.5			Halodule	scattered						
322	07/03/98	10:05	25	52.510	-25.875	113	24.020	113.400		7.8			seagrass	scattered				1		
323	07/03/98	14:10	25	43.320	-25.722	113	12.560	113.209		18.0	25.0							1		
324	07/03/98	14:11	25	43.060	-25.718	113	12.390	113.207		17.5			?					1		
325	07/03/98	16:00	25	33.980	-25.566	113	4.150	113.069		16.0			?					1		
326	09/03/98	13:10	25	50.540	-25.842	113	18.125	113.302		4.0			seagrass	high density				1		
327	17/03/98	11:32	25	40.910	-25.682	113	10.490	113.175		21.3			?					1		
328	18/03/98	11:30	25	30.020	-25.500	112	56.370	112.940		28.3										
329	08/04/98	6:30	25	29.770	-25.496	112	59.290	112.988	Turtle Bay											
330	08/04/98	14:30	25	28.760	-25.479	112	57.410	112.957	Cape Inscription											
331	25/04/98	10:25	25	58.200	-25.970	113	27.530	113.459		9.1	24.0		seagrass	scattered	1					
332	26/04/98	16:25	26	0.790	-26.013	113	22.680	113.378		3.4	24.5		Amphibolis		1					
333	26/04/98	17:35	26	7.370	-26.123	113	25.760	113.429		5.2	24.6		Amphibolis					1		
334	07/05/98	17:50	25	56.970	-25.950	113	26.900	113.448		7.5			seagrass	scattered				1		
335	24/05/98	10:00	25	57.330	-25.956	113	26.910	113.449		7.3			?		1					
336	14/06/98	12:00	25	57.830	-25.964	113	17.540	113.292		2.0	20.2		Amphibolis						1	
337	14/06/98	13:06	25	58.510	-25.975	113	13.370	113.223		14.0			?					1	1	
338	14/06/98	13:14	25	59.390	-25.990	113	12.850	113.214		4.0	21.5		Amphibolis							
339	14/06/98	13:21	25	59.870	-25.998	113	12.780	113.213		1.5			sand				1			1
340	17/06/98	9:55	25	57.920	-25.965	113	16.730	113.279		7.3			?					1		
341	17/06/98	11:30	25	59.890	-25.998	113	12.800	113.213		1.8	20.5		Amphibolis					1		
342	19/06/98	9:40	25	6.810	-25.114	113	15.480	113.258		9.3			?						1	
343	19/06/98	10:00	26	6.930	-26.116	113	15.370	113.256		2.8			Amphibolis				1			
344	19/06/98	15:00				*			Bellefin Banks	5.0			Amphibolis				1			
345	20/06/98	7:30	25	57.900	-25.965	113	16.900	113.282		1.6			Amphibolis					1		
346	20/06/98	11:20	26	5.470	-26.091	113	15.090	113.252		5.8							1			
347	20/06/98	14:30	26	6.990	-26.117	113	15.380	113.256		2 to 6	24.5		Amphibolis				1			
348	21/06/98	9:00	26	6.980	-26.116	113	15.370	113.256		2.0	24.0		Amphibolis						1	
349	21/06/98	13:00	25	55.320	-25.922	113	10.580	113.176		2.4								1		
350	22/06/98	11:00	26	0.460	-26.008	113	12.610	113.210		1.5	21.3		Amphibolis				1			
351	22/06/98	12:15	25	59.890	-25.998	113	12.670	113.211		1.8			Amphibolis				1			
352	22/06/98	13:00	26	7.570	-26.126	113	10.770	113.180	Surf Pt	8.0	24.9		algae				1			
353	23/06/98	12:00	26	7.570	-26.126	113	10.770	113.180		8.0	24.6		algae				1			
354	24/06/98	12:30	26	7.570	-26.126	113	10.770	113.180		8.0	24.6		algae				1			
355	27/06/98	14:00	25	59.990	-26.000	113	12.770	113.213		1.8	20.2		Amphibolis				1			
356	01/07/98	12:20	26	6.150	-26.103	113	15.060	113.251		4.9	18.5							1		
357	01/07/98	13:45	26	7.670	-26.128	113	10.620	113.177		9.0	23.9		NE swell 2m seas 1m							1
358	02/07/98	8:15	26	8.430	-26.141	113	13.860	113.231		5.1	17.8							1		
359	02/07/98	9:00	26	7.470	-26.125	113	11.290	113.188		1.5 to 2.0	24.0		sand, rock, algae					1		
360	03/07/98	9:00	26	7.460	-26.124	113	11.310	113.189		1.5 to 2.0	24.3		sand, rock, algae					1		
361	05/07/98	10:00	26	6.250	-26.104	113	14.970	113.250	Blind Strait	2.4	23.5		Amphibolis							1
362	05/07/98	12:20	26	7.430	-26.124	113	11.310	113.189	Inside Surf Pt	1.2	23.8		sand, rock, algae						1	
363	05/07/98	14:00	26	6.980	-26.116	113	15.320	113.255		1.4	22.7		Amphibolis					1		
364	09/07/98	10:50	26	6.250	-26.104	113	14.970	113.250	Blind Strait	2.0	21.6		Amphibolis					1		
365	09/07/98	12:00	26	7.560	-26.126	113	10.780	113.180	Outside Surf Pt	7.0	23.6		rock, algae					1		
366	09/07/98	10:30	26	8.450	-26.141	113	15.160	113.253		2 to 6	19.5 to 20.6		Amphibolis					1		
367	10/07/98	9:00	26	7.400	-26.123	113	11.260	113.188	Inside Surf Pt	1.5	23.2		sand, rock, algae							1
368	10/07/98	12:00				*			Outside Surf Pt	5.0	23.4							1		
369	10/07/98	15:00	26	8.560	-26.143	113	14.680	113.245	Blind Strait	3.3	19.3		Amphibolis					1		
370	10/07/98					*			Outside of Steep Pt											
371	11/07/98	10:00	26	0.360	-26.006	113	12.620	113.210	South of Meade Is. ??	1.1	17.9		Amphibolis					1		
372	11/07/98	12:20	26	7.140	-26.119	113	15.390	113.257	Blind Strait	4.5	20.3									1
373	11/07/98	14:00				*			Outside Surf Pt	5 to 7	23.9								1	
374	11/07/98	15:40	26	8.560	-26.143	113	14.960	113.249	Blind Strait	3.0	20.0		Amphibolis					1		
375	12/07/98	15:50	25	43.590	-25.727	113	5.260	113.088	Sandy Pt	3.7	19.0		Halophila ovalis, Amphibolis, sand, coral					1		
376	12/07/98	16:40	25	44.170	-25.736	113	6.010	113.100	Louise Bay	3.7	19.6		Amphibolis					1		
377	12/07/98	17:15	25	49.320	-25.822	113	6.930	113.116		4.5	18.7		Amphibolis					1		
378	13/07/98	8:00	25	59.710	-25.995	113	12.890	113.215	Bank of Meade Is.	3.6	17.9		Amphibolis					1		

ALL YEARS

	U	V	W	X	Y
316		feeding		J. Scheerer	
317		on surface		J. Scheerer	
318			Whale Shark -4m	J. Scheerer	1 mile -8 deg from lighthouse
319		feeding		J. Scheerer	
320		feeding		J. Scheerer	
321		evidence of feeding		J. Scheerer	faeces collected
322		travelling		J. Scheerer	
323		on surface, initially belly up		J. Scheerer	
324		deep dive		J. Scheerer	
325		deep dive		J. Scheerer	
326		?		J. Scheerer	
327		near surface		J. Scheerer	
328			Whale Sharks 2 @ 7m & 1	J. Scheerer	
329			2 Indo-Pacific Humpback	J. Scheerer	
330			3 male Whale Sharks	J. Scheerer	1 x 6m, 2 x 9-10m
331		deep dive		J. Scheerer	large calf
332		travelling south		J. Scheerer	
333		feeding		J. Scheerer	
334		deep dive		J. Scheerer	
335		deep dive		J. Scheerer	
336		feeding		J. Scheerer	
337		travelling south		J. Scheerer	
338	30+	feeding		J. Scheerer	
339	30+	feeding		J. Scheerer	
340				J. Scheerer	large animal
341				J. Scheerer	
342		travelling south into Blind Strait		J. Scheerer	
343	-20			J. Scheerer	(observed from 10:00 to 12:00)
344	-40			J. Scheerer	(observed from 15:00 to 17:00)
345				J. Scheerer	
346		hanging below surface		J. Scheerer	
347	-12	feeding		J. Scheerer	
348		moved out of deep water onto Amphibolis bank		J. Scheerer	
349				J. Scheerer	water very turbid??
350	-20	feeding		J. Scheerer	
351	20+			J. Scheerer	
352		feeding		J. Scheerer	(observed from 13:00 to 17:00)
353	-20	Dugong moved out of bay behind surf line		J. Scheerer	(observed from 12:00 to 17:00)
354	-20	hanging in water column		J. Scheerer	
355		feeding		J. Scheerer	
356		travelling north		J. Scheerer	
357	10+			J. Scheerer	unable to get close enough to determine cow/calf units
358				J. Scheerer	
359	-20			J. Scheerer	(observed from 9:00 to 17:00)??
360	-20			J. Scheerer	(observed from 9:00 to 16:00)
361	-20			J. Scheerer	
362				J. Scheerer	
363	-30	feeding		J. Scheerer	(observed from 14:00 to 16:30)
364	-50	travelling south, starting to feed		J. Scheerer	
365	30+			J. Scheerer	neonat. calf (observed from 12:00 to 14:30)
366		hanging in water column		J. Scheerer	(observed from 15:30 to 17:00)
367		hanging in water column		J. Scheerer	
368	-20			J. Scheerer	(observed from 12:00 to 14:00)
369		feeding		J. Scheerer	(observed from 15:00 to 16:30)
370			Whale Shark	J. Scheerer	
371		feeding		J. Scheerer	
372				J. Scheerer	
373	50+	hanging in water column		J. Scheerer	small calves
374		feeding		J. Scheerer	
375				J. Scheerer	
376	20+			J. Scheerer	
377	15+			J. Scheerer	
378				J. Scheerer	

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
379	13/07/98	10:20	26	9.550	-26.159	113	12.490	113.208	South Passage	5.5	22.5		sand					1		
380	13/07/98	13:20	26	7.780	-26.130	113	10.700	113.178	Outside Surf Pt.	8.0	23.9		rock.algae				1			
381	13/07/98	14:00				*			Inside Surf Pt.	2.0	23.8		sand.rock.algae				1			
382	13/07/98	15:15	26	9.110	-26.152	113	14.440	113.241	Blind Strait	<6.5	22.3		Amphibolis				1			
383	14/07/98	14:00	26	9.110	-26.152	113	14.440	113.241	Blind Strait	4.0			Amphibolis				1			



	U	V	W	X	Y
379				J. Scheerer	
380	few animals			J. Scheerer	
381	10+			J. Scheerer	
382				J. Scheerer	
383		feeding		J. Scheerer	