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Herring purse seine fishing activity in the southern Gulf of St. Lawrence, 1995-1998

R. R. Claytor¹, S. Power², K. Leroux², A. Clay³, and C. LeBlanc²

¹Department of Fisheries and
Oceans
P.O. Box 1006
Dartmouth, NS B2Y 4A2

²Department of Fisheries
and Oceans
P.O. Box 5030
Moncton, NB E1C 9B6

³ Femto Electronics Ltd.
P.O. Box 690
Lower Sackville, NS
B4C 3J1

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R.R. Claytor¹, S. Power² K. Leroux², A. Clay³, and C. LeBlanc²

¹Department of Fisheries
and Oceans
P.O. Box 1006
Datmouth, NS B2Y 4A2

²Department of Fisheries
and Oceans
P.O. Box 5030
Moncton, NB E1C 9B6

³ Femto Electronics Ltd.
P.O. Box 690
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B4C 3J1

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Abstract

The 1995 to 1998 fishing activities of a herring purse seiner in the southern Gulf of St. Lawrence are presented in summary tables and maps. The activity data was collected as part of an ongoing project with the southern Gulf of St. Lawrence herring fleet to record position and acoustic signals while fishing boats are searching for herring schools during regular fishing activity. Latitudes and longitudes collected using GPS are automatically recorded to a computer file during operation of the data collection system. The recording system is activated by the vessel captain upon leaving port and is turned off upon returning to port. Fishing activity is identified as traversing (traveling to, from, and between fishing grounds), searching (searching for fish on the fishing grounds), fishing (setting the net), pumping (pumping fish into the boat), surveying (sailing over pre-determined survey transects), and other (any activities identified as not relating to the fishing activity, such as waiting in port, drifting and sleeping during daylight hours). Activities were identified using visual cues based on pattern, speed of boat, and captain logbooks. The fishing track was then divided by activity into 100m intervals and the distance and time spent during each activity was determined for each fishing trip. A summary of the activities indicated that the average number of hours for searching ranged from 5 to 15. The summer months were those with the highest average searching.

Résumé

Les activités de pêche de 1995 à 1998 d'un grand seineur de hareng dans le sud du golfe du Saint-Laurent sont présentées dans des tableaux et des cartes sommaires. Les données sur l'activité de pêche ont été recueillies dans le cadre d'un projet en cours avec la flottille de pêche du hareng du sud du golfe du Saint-Laurent visant à enregistrer la position et les signaux acoustiques des bancs de harengs au cours des recherches menées par les bateaux de pêche durant l'activité de pêche régulière. La latitude et les longitudes recueillies à l'aide du système de positionnement global (GPS) sont automatiquement enregistrées dans un fichier informatique durant le fonctionnement du système de collecte de données. L'appareil d'enregistrement est mis en marche par le capitaine du navire au moment de quitter le port et est arrêté au retour au port. L'activité de pêche est définie de la manière suivante : déplacement (se déplacer depuis et vers les lieux de pêche ou entre ces lieux), recherche (chercher du poisson dans les lieux de pêche), pêche (tendre le filet), pompage (pomper le poisson dans le bateau), relevé (naviguer au-dessus de transects de relevés prédéterminés) et autres (toutes les activités définies comme n'étant pas liées à l'activité de pêche, comme attendre au port, dériver et dormir durant les heures de clarté). Les activités ont été déterminées à l'aide d'indices visuels basés sur la configuration, la vitesse du bateau et les journaux de bord des capitaines. La route de l'activité de pêche a ensuite été divisée par activité en intervalles de 100 m et la distance couverte et le temps passé au cours de chaque activité ont été établis pour chaque expédition de pêche. Un résumé des activités a indiqué que le nombre moyen d'heures de recherche variait de cinq à quinze. Les mois d'été étaient ceux qui avaient la moyenne de recherche la plus élevée.

1. Introduction

Understanding fleet dynamics is an important part of fisheries stock assessment and management. This understanding is important to interpret data provided by the fishing fleet for stock assessments. These data may include catch rates or qualitative information on fish behaviour and abundance. Often data provided by the fishing industry is qualitative in nature or not reported in sufficient detail for the interaction of fish abundance, fishing behaviour, and fishing regulations to be studied. One of the reasons for this lack of detail is that typically only locations and amount of catch are recorded in fishing logbooks, while the time spent traveling to fish or searching for fish is not available. This report summarizes in tabular and mapping formats detailed information that was collected by a herring purse seiner in the southern Gulf of St. Lawrence. It is hoped that these data will improve interpretation of catch rate and qualitative information provided by the fishing industry for stock assessments.

2. Data description

The information collected consists of latitude and longitude determined by GPS units and recorded automatically to computer files. These data were collected as part of on-going acoustic projects with this herring fleet (Claytor et al. 1999). The hardware systems and data collection methods have been described elsewhere (Clay and Claytor 1998, Claytor et al. 1998). This system provides an objective means of collecting data. The vessel captain activates the system upon leaving port and turns it off upon returning to port. While the system is operating, positional and acoustic data are automatically recorded to a computer file.

Software processing consists of identifying the fishing activity as **traversing** (traveling to, from, and between fishing grounds), **searching** (searching for fish on the fishing grounds), **fishing** (setting the net), **pumping** (pumping fish into the boat), **surveying** (sailing over pre-determined survey transects), and **other** (any activities identified as not relating to the fishing activity, such as waiting in port, drifting and sleeping during daylight hours). Activities were identified using visual cues based on pattern, speed of boat, and captain logbooks. The fishing track was then divided into 100m intervals by activity and the distance and time spent during each activity was determined for each fishing trip (Claytor et al. 1998). FEMTO HDPS hardware and software was used for the collection and processing of the positional data prior to mapping and tabular summaries.

Tables 1 - 6 summarize the fishing activities from 1995 to 1998. The maps consist of the fishing track, with activity identified by the line font as indicated in the legend for each map. Where activity warranted a more detailed view, an inset of selected portions of the track is provided.

3. Fisheries and biology of 4T southern Gulf of St. Lawrence herring

NAFO Division 4T encompasses the southern Gulf of St. Lawrence (Appendix 1). Herring originating in this area consist of two seasonally defined spawning components. Spring spawning occurs primarily in May but extends from April to June, at depths < 10m. Fall spawning occurs from mid-August to late September at depths from 5 to 20m. First spawning for both seasonal components occurs primarily at age 4 but 50% of age 3 herring sampled on 4T spawning grounds are in spawning condition. The largest spring spawning populations are in the Northumberland Strait, between New Brunswick and Prince Edward Island, and in the Magdalen Islands. Relatively small spring spawning populations occur in Chaleur Bay (New Brunswick-Québec), eastern Prince Edward Island, and Pictou, Nova Scotia (Appendix 1). The largest fall spawning population is in Chaleur Bay. Smaller fall populations are found in the Northumberland Strait between New Brunswick and Prince Edward Island, eastern Prince Edward Island, Pictou, Nova Scotia, and the Magdalen Islands (Appendix 1), (Claytor et al. 1998).

After spawning, herring form large schools in Chaleur Bay and on the north side of Prince Edward Island (Claytor et al. 1998). They remain in these areas until mid-October when they begin to migrate to eastern Cape Breton (4Vn) where they overwinter (Appendix 1). Herring return to 4T from 4Vn overwintering areas in the spring, as the ice begins to recede. Herring age 2 and less

possess anti-freeze proteins (Chadwick et al. 1990) which allows them to remain in the Gulf of St. Lawrence for the winter or migrate later in the fall to 4Vn.

Southern Gulf of St. Lawrence herring are harvested by an inshore gillnet fleet on spring and fall spawning grounds for a food and bait market in the spring and a roe market in the fall. The inshore fleet is allocated 77% of the 4T herring quota. Larger purse seiners harvest pre- or post-spawning aggregations in the spring and fall for a food market. In late fall and early winter, the purse seiners follow 4T herring into 4Vn where a fishery on the overwintering portion of the population occurs (Claytor et al. 1998).

The majority of the purse seine harvest comes from the Chaleur Bay fishery where mixed schools of spring and fall spawners are caught. The overwintering fishery in 4Vn has occurred from November 1 to mid-December in recent years and harvests primarily fall spawners. Catches are variable in the spring fishery (1000 - 4000 t), which occurs from April to June between the Magdalen Islands and Cape Breton. The purse seine fleet usually fishes as a group and so the fishing area and activity of one boat is representative of the fleet (Claytor and Clay 2001).

4. Use in stock assessments

Using fishing activity data combined with biomass estimates from acoustic soundings recorded by the purse seine vessel indicates that catch per meter searched is linearly related to density (Claytor and Clay 2001). As a result, these data represent the basis for an abundance index derived from purse seine fishing activity. This result is important because it has generally been observed that catch per set by purse seiners is not indicative of abundance. Although these data are more time consuming to collect than catch per set information, they have the potential to greatly improve stock assessments by contributing an abundance index that has not previously been available.

5. Acknowledgments

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6. Literature Cited

- Clay, A. and R. Claytor. 1998. Hydroacoustic calibration techniques used for southern Gulf of St. Lawrence herring fishing vessels. 1997. Canadian Stock Assessment Secretariat Research Document 98/96. Canadian Stock Assessment Secretariat, 200 Kent St. Ottawa, Ontario, Canada, K1A 0E6.
- Claytor, R., A. Clay, and C. LeBlanc. 1998. Area assessment methods for 4T fall spawning herring. Canadian Stock Assessment Secretariat Research Document 98/97. Canadian Stock Assessment Secretariat, 200 Kent St. Ottawa, Ontario, Canada, K1A 0E6.
- Claytor, R., A. Clay, E. Walter, J. Jorgenson, M. Clément, and A. St-Hilaire. 1999. National Hydroacoustic Program Client Participation Projects: Fleet Acoustics, Partnership Review, Potential Users, Equipment Inventory. Can. Tech. Rep. Fish. Aq. Sci. No. 2272.
- Claytor, R., and A. Clay. 2001 (in press). Distributing fishing mortality in time and space to prevent overfishing. p. xx-xx. In. D. Pelletier, G. Kruse, T. Booth, S. Smith, R. Lipcius, S. Hills, C. Roy, N. Bez, and D. Witherell [ed.] Symposium proceedings: Spatial Analysis of fisheries data, 17th Lowell Wakefield Conference

Table 1. Summary of mobile herring vessel fishing activities for 1995.

Date	Hours Activity				Kilometers Activity			
	Searching	Fishing	Pumping	Traversing	Searching	Fishing	Pumping	Traversing
Summer 4T								
23-Aug	5.2	0.1	1.7	11.0	68.9	0.6	3.1	210.5
26-Aug	6.8			10.0	101.9			179.0
27-Aug	7.2	0.1	1.5	4.2	78.4	1.0	1.9	81.4
28-Aug	6.8	0.1	2.8	2.6	141.4	0.6	1.3	50.2
29-Aug	1.1			2.4	2.8			46.5
31-Aug	4.7	0.2	2.7	1.7	64.0	1.6	4.4	34.1
Sum	31.8	0.6	8.7	31.9	457.4	3.8	10.7	601.7
Average	6.3	0.1	2.2	6.3	76.2	1.0	2.7	100.3
Fall 4T								
1-Sep	7.2	0.2	2.3	5.0	121.3	1.5	1.9	97.4
2-Sep	8.3	0.3	2.2	4.3	123.0	2.4	3.5	83.5
3-Sep	1.1	0.2	2.3	3.9	8.2	1.9	3.6	74.2
4-Sep	8.4	0.2	2.0	4.2	141.2	1.7	3.4	85.9
5-Sep	4.6			7.0	67.0			88.8
11-Sep	3.4	0.5	5.3	4.8	49.4	4.6	8.6	91.1
12-Sep	0.6	0.2	2.4	5.7	8.8	1.7	4.5	110.0
13-Sep	6.4	0.1	1.8	4.9	88.7	0.2	2.7	97.8
14-Sep	6.4	0.4	3.5	5.0	96.6	3.0	5.2	97.3
15-Sep	5.9	0.2	4.7	4.8	87.5	1.3	7.7	93.4
Sum	52.3	2.3	26.5	49.6	791.7	18.3	41.1	919.4
Average	6.2	0.3	2.9	6.0	79.2	2.0	4.6	91.9

Table 1.(cont.) Summary of mobile herring vessel fishing activities for 1995.

1995 Date	Hours Activity				Kilometers Activity			
	Searchin g	Fishing	Pumping	Traversing	Searching	Fishing	Pumping	Traversing
Fall 4T								
16-Sep	1.1			3.9	16.8			76.2
18-Sep	8.5	0.3	2.7	4.4	128.4	2.6	5.1	83.2
19-Sep	10.5	0.2	1.0	1.5	58.7	1.4	1.5	27.4
20-Sep	2.6	0.4	3.4	2.1	36.5	2.3	4.6	42.3
21-Sep	5.3	0.2	2.0	6.0	72.2	1.2	3.7	113.8
24-Sep	4.0	0.3	3.5	3.3	62.8	2.1	5.2	63.1
25-Sep	3.5	0.4	2.6	4.5	28.0	2.3	3.8	91.6
16-Sep	3.2	0.5	5.0	3.9	41.2	3.4	7.0	75.2
27-Sep	7.4	0.4	4.4	3.9	124.7	3.5	6.4	65.5
29-Sep	6.4	0.4	4.6	3.2	85.1	3.5	6.7	47.1
30-Sep	4.7	0.1	1.1	11.9	74.3	0.7	1.7	215.9
Sum	67.2	3.2	30.3	48.6	728.7	23.0	45.7	901.3
Average	6.2	0.3	3.0	4.4	66.2	2.3	4.6	81.9
September								
Sum	109.6	6.6	56.8	98.2	1620.4	41.3	86.8	1820.7
Average	6.2	0.3	3.0	4.7	72.4	2.2	4.6	86.7

Table 1.(cont.) Summary of mobile herring vessel fishing activities for 1995.

1995 Date	Hours Activity				Kilometers Activity			
	Searching	Fishing	Pumping	Traversing	Searching	Fishing	Pumping	Traversing
Fall 4T								
1-Oct	8.1	0.6	4.5		115.3	4.1	7.1	
2-Oct	14.7			4.3	81.1			80.5
3-Oct	4.8	0.7	6.6	4.1	66.9	5.1	9.8	78.0
4-Oct	7.0	0.4	3.4	4.1	99.2	2.6	5.0	77.1
5-Oct	7.0	0.3	3.5	1.6	103.0	2.7	4.9	29.8
9-Oct	4.4	0.6	5.2	2.2	49.3	3.9	7.4	40.8
10-Oct	2.7	0.5	5.5	1.7	33.3	4.2	10.9	29.9
11-Oct	3.6	0.6	6.2	2.9	38.2	4.2	14.1	53.7
12-Oct	4.4	0.6	6.1	2.9	61.6	4.3	11.6	53.4
15-Oct	11.2			2.3	142.9			43.7
Sum	67.9	4.3	41.0	26.1	790.8	31.1	70.8	486.9
Average	6.8	0.6	5.1	2.9	79.1	3.9	8.9	54.1
19-Oct	8.4	0.1	2.0	5.9	151.1	1.1	2.9	121.0
20-Oct	8.4	0.3	4.8	0.8	120.6	2.7	7.7	15.7
23-Oct	24.4	0.1	1.7		381.3	0.3	2.6	
24-Oct	10.3				143.2			
26-Oct	14.6				286.6			
Sum	66.1	0.6	8.5	6.7	1082.8	4.1	13.2	136.7
Average	13.2	0.2	2.8	3.4	216.6	1.4	4.4	68.4
October								
Sum	134.0	4.8	49.5	32.8	1873.6	35.2	84.0	623.6
Average	8.9	0.4	4.5	3.0	124.9	3.2	7.6	56.7

Table 1. (cont.) Summary of mobile herring vessel fishing activities for 1995.

Date	Hours				Kilometers			
	Activity				Activity			
	Searching	Fishing	Pumping	Traversing	Searching	Fishing	Pumping	Traversing
4T Sum	275.3	10.8	115.0	162.9	3851.4	80.3	181.5	3046.0
Average	6.5	0.3	3.2	4.3	91.2	2.1	6.0	81.2
4Vn								
31-Oct	2.8	0.3	3.6	4.5	37.8	2.5	6.3	88.4
1-Nov	9.9	0.1	1.1	6.3	87.4	1.1	1.8	118.7
2-Nov	2.1	0.2	1.5	4.8	26.1	1.2	3.2	90.0
6-Nov	7.5	0.3	3.0	6.7	108.7	2.7	5.8	126.9
9-Nov	5.3	0.6	6.8	8.9	80.5	4.5	12.8	145.0
10-Nov	2.7	0.1	1.5	10.0	42.9	0.9	3.6	81.7
11-Nov	6.0	0.3	4.2	6.9	82.0	3.0	6.1	120.0
13-Nov	19.6				111.5			
Sum	66.9	1.9	21.7	48.1	576.9	16.9	39.6	770.7
Average	7.0	0.3	3.1	6.9	72.1	2.3	6.7	110.1
17-Nov	6.0	0.3	9.0	7.0	77.9	2.4	13.1	137.4
18-Nov	7.9	0.4	5.2	2.5	101.3	3.0	7.5	50.0
19-Nov	4.0	0.7	6.2	7.0	57.4	5.7	9.8	133.5
23-Nov	6.7	0.4	3.6	14.1	88.6	2.8	4.9	192.1
Sum	24.6	1.8	24.0	30.6	325.2	13.9	35.3	513.0
Average	6.2	0.5	6.0	7.7	81.3	3.5	8.8	128.3
4Vn Sum	80.5	3.7	45.7	78.7	902.1	29.8	74.9	1283.7
Average	6.6	0.4	4.6	7.3	76.7	2.9	7.2	119.2
1995 Total	365.8	14.5	160.7	241.6	4753.5	110.1	256.4	4329.7
Average	6.5	0.3	3.6	5.1	87.6	2.3	5.5	90.7

Table 2. Summary of mobile herring vessel fishing activity 1996.

1996 Date	Hours Activity					Kilometers Activity				
	Searching	Fishing	Pumping	Traversing	Other	Searching	Fishing	Pumping	Traversing	Other
Spring MW										
13-Apr	15.9	0.2	2.6	5.5		131.8	0.9	4.0	93.4	
28-Apr	5.9	0.3	2.7	4.1		96.3	2.5	4.6	69.5	
29-Apr	5.8	0.3	4.0	3.1		50.7	2.7	8.0	63.3	
Sum	27.6	0.8	9.3	12.7		278.8	6.1	16.6	226.2	
Average	9.2	0.3	3.1	4.2		92.9	2.0	5.5	76.4	
1-May				2.2					39.5	
2-May	7.7	0.3	1.1		4.2	137.9	2.3	2.1		5.1
3-May	14.6					278.3				
5-May	7.5				0.7	126.4				1.1
14-May	11.6	0.2	1.2			203.5	0.9	1.8		
15-May	6.0					105.2				
Sum	47.4	0.6	2.3	2.2	4.9	851.3	3.2	3.9	39.5	6.2
Average	9.5	0.3	1.2	2.2	2.6	170.3	1.6	2.0	39.5	3.1
16-May	9.3					157.1				
19-May	8.8					158.7				
20-May	4.9					97.9				
Sum	23.0					413.7				
Average	7.7					137.9				
May										
Sum	70.4	0.6	2.3	2.2	4.9	1266.0	3.2	3.9	39.5	6.2
Average	8.8	0.3	1.2	2.2	2.6	168.1	1.6	2.0	39.5	3.1

*MW = Midwater trawl

Table 2. (cont.) Summary of mobile herring vessel fishing activity 1996.

1996 Date	Hours Activity					Kilometers Activity				
	Searching	Fishing	Pumping	Traversing	Other	Searching	Fishing	Pumping	Traversing	Other
14-Jun	7.9	6.9	2.6	5.7		61.2	50.7	6.3	102.0	
15-Jun	9.3	7.4	2.2	4.3		85.4	57.5	5.2	84.2	
16-Jun				6.3						118.3
18-Jun	17.0	1.6				128.6	12.2			
20-Jun	4.1					83.1				
21-Jun	5.2					85.1				
23-Jun	8.5	3.3	2.2	4.5		157.6	25.3			91.9
June										
Sum	52.0	19.2	7.0	20.8		601.0	145.7	11.5	396.4	
Average	8.7	4.8	2.3	5.2		100.2	36.4	5.8	99.1	
Spring										
Sum	150.0	20.6	18.6	35.7	4.9	2144.8	155.0	32.0	662.1	6.2
Average	8.8	2.3	2.3	4.6	2.6	126.2	17.2	4.6	82.8	3.1
Summer										
MW										
7-Jul	3.0					52.0				
9-Jul	7.2	3.9				120.2	26.3			
10-Jul	0.4	3.3		2.9		7.2	23.2			53.2
Sum	10.6	7.2		2.9		179.4	49.5			53.2
Average	3.5	3.6		2.9		59.8	24.8			53.2
17-Jul	6.3	8.3		11.1		122.9	31.8			210.3
18-Jul	2.5			11.5		31.8				210.5
29-Jul				4.1						80.3
Sum	8.8	8.3		26.7		154.7	31.8			501.1
Average	4.4	4.1		8.9		77.4	31.8			167.0
July										
Sum	19.4	15.6		29.6		334.1	81.3			564.3
Average	4.0	6.0		5.9		68.6	28.3			110.1

*MW = Midwater trawl

Table 2. (cont.) Summary of mobile herring vessel fishing activity 1996.

1996 Date	Hours Activity					Kilometers Activity				
	Searching	Fishing	Pumping	Traversing	Other	Searching	Fishing	Pumping	Traversing	Other
4-Aug	10.1	4.9		8.6		161.4	35.2		164.9	
11-Aug	13.8		3.5			224.4		5.8		
12-Aug	16.8	1.0				300.9	5.5			
Sum	40.7	6.9	3.5	8.6		686.7	40.7	6.8	164.9	
Average	13.6	3.0	3.5	8.6		228.9	20.4	6.8	164.9	
20-Aug	4.6	1.8	8.0	5.3		41.7	12.1	15.4	102.4	
21-Aug	2.8	8.8	1.6	6.5		42.6	64.1	2.9	97.1	
23-Aug	4.1	7.5	1.7	11.0		52.2	65.2	4.2	210.9	
26-Aug	6.8		0.2	4.3		124.4		0.7	84.4	
31-Aug	3.9	4.9	2.4	7.2	0.2	46.9	28.7	5.4	131.1	0.4
Sum	22.2	23.0	13.9	34.3	0.2	307.8	170.1	28.6	625.9	0.4
Average	4.4	5.8	2.8	6.9	0.2	61.6	42.6	6.7	125.2	0.4
August										
Sum	62.9	28.9	17.4	42.9	0.2	994.6	210.8	34.4	790.8	0.4
Average	7.9	4.8	2.9	7.2	0.2	124.3	35.1	6.7	131.8	0.4
1-Sep	4.3	2.3	2.0	4.0		33.7	16.9	4.3	70.5	
4-Sep	1.4			2.3		17.5			43.1	
Sum	5.7	2.3	2.0	6.3		61.2	16.9	4.3	113.6	
Average	2.9	2.3	2.0	3.2		26.6	16.9	4.3	56.8	
Summer										
Sum	88.0	46.7	19.4	78.8	0.2	1379.8	309.0	38.7	1458.7	0.4
Average	5.9	4.7	2.8	6.6	0.2	92.0	30.9	6.6	121.6	0.4

Table 2. (cont.) Summary of mobile herring vessel fishing activity 1996.

1996 Date	Hours Activity					Kilometers Activity				
	Searching	Fishing	Pumping	Traversing	Other	Searching	Fishing	Pumping	Traversing	Other
Fall 4T PS										
7-Sep	3.9	0.3	3.0	10.7		59.9	2.2	5.2	191.4	
8-Sep	0.3	0.1	1.8	2.0		3.4	0.8	3.1	35.4	
9-Sep	8.6	0.2	1.4	2.5		135.9	1.0	3.2	45.8	
10-Sep	5.1	0.5	3.0	7.4		82.0	3.5	5.2	130.6	
11-Sep	8.7	0.4	3.3	3.9		100.8	2.0	5.5	67.0	
15-Sep	9.5	0.3	3.5	2.2		144.5	2.5	5.9	41.2	
Sum	36.1	1.8	16.0	28.7		526.5	12.0	28.1	611.4	
Average	6.0	0.3	2.7	4.8		87.8	2.0	4.7	85.2	
16-Sep	13.1			1.5		210.1				28.9
20-Sep	8.4	0.4	2.9	3.0		104.4	3.1	5.5	59.2	
22-Sep	3.5	0.2	3.2	2.3		51.8	1.7	4.9	42.7	
24-Sep	3.2	0.6	5.8	4.3		48.5	3.7	11.4	78.8	
25-Sep	7.9	0.6	2.3	3.0		120.6	4.5	4.0	56.2	
27-Sep	3.0	0.5	4.3	4.5		43.2	3.5	6.9	73.8	
29-Sep	9.9	0.4	2.2	3.8		140.3	3.8	4.7	69.5	
Sum	49.0	2.7	20.7	22.4		718.9	20.3	37.4	409.1	
Average	7.0	0.6	3.6	3.2		102.7	3.4	6.2	58.4	
September										
Sum	86.1	4.5	36.7	51.1		1245.4	32.3	65.5	920.5	
Average	6.5	0.4	3.1	3.9		95.8	2.7	5.5	70.8	

*PS = Purse Seine

Table 2. (cont.) Summary of mobile herring vessel fishing activity 1996.

1996 Date	Hours Activity					Kilometers Activity				
	Searching	Fishing	Pumping	Traversing	Other	Searching	Fishing	Pumping	Traversing	Other
1-Oct	9.2			14.7	0.9	127.0			272.2	1.8
4-Oct	7.2	0.6	5.5	1.8		109.8	4.7	8.3	35.5	
5-Oct	5.4	0.1	0.2	3.7		83.6	0.9	0.7	71.4	
7-Oct	15.5	0.2	4.4	1.6	8.7	242.4	1.5	6.4	31.3	15.6
10-Oct	4.4	0.5	4.8	3.7		59.2	2.9	7.2	64.6	
11-Oct	6.1	1.5	3.1	4.0		90.8	4.0	5.8	73.6	
12-Oct	7.1	0.2	3.0	2.3		82.8	1.5	4.4	10.9	
18-Oct	12.6	0.1	0.8	5.1		214.4	1.3	1.4	91.1	
Sum	67.5	3.2	21.8	36.9	9.6	1010.0	16.8	34.2	650.6	17.4
Average	8.4	0.6	3.1	4.6	4.8	126.3	2.4	4.9	81.3	8.7
Fall 4T PS										
Sum	152.6	7.7	58.5	88.0	9.6	2256.4	49.1	99.7	1571.1	17.4
Average	7.5	0.4	3.1	4.3	4.8	111.0	2.6	5.2	76.1	8.7
4Vn										
1-Nov	4.1	0.4	3.5	7.0	2.9	52.2	3.1	7.4	135.3	5.3
6-Nov	8.9	0.6	3.4	8.3		129.3	4.5	5.1	160.2	
13-Nov	0.5	0.1	1.3	8.3		6.2	0.7	1.9	152.1	
Sum	13.5	1.1	8.2	23.6	2.9	187.7	8.3	14.4	447.6	6.3
Average	4.5	0.4	2.7	7.9	2.9	62.6	2.8	4.8	149.2	6.3
22-Nov	2.7	0.8	6.3	7.0		34.4	5.4	8.9	114.5	180.0
23-Nov	0.9	0.1	1.2	6.3		6.3	0.9	1.9	117.0	134.6
Sum	3.6	0.9	7.5	13.3		40.7	6.3	10.8	231.5	314.6
Average	1.8	0.6	3.8	6.7		20.4	3.2	5.4	115.8	157.3
4Vn										
Sum	17.1	2.0	15.7	36.9	2.9	228.4	14.6	26.2	679.1	319.9
Average	3.2	0.4	3.2	7.3	2.9	41.6	3.0	6.1	132.6	81.3
1996 Total										
Sum	407.7	76.9	112.2	239.4	17.6	6008.4	627.7	196.6	4371.0	62.0
Average	6.3	1.9	2.9	6.6	2.6	92.7	13.6	6.1	103.2	4.7

*PS = Purse Seine

Table 3. Summary of mobile herring vessel fishing activity 1997.

1997 Date	Hours Activity					Kilometers Activity				
	Searching	Fishing	Pumping	Traversing	Other	Searching	Fishing	Pumping	Traversing	Other
Spring 4T										
24-Apr	11.4			5.8		117.8			122.4	
25-Apr	1.9	6.5				32.1	10.7			
27-Apr	19.1	2.3			21.0	329.2	15.7			345.0
Sum	32.4	8.8		5.8	21.0	479.1	26.4		122.4	345.0
Average	10.8	4.4		5.8	21.0	159.7	13.2		122.4	345.0
9-May	16.9	5.0				259.6	6.0			
11-May	8.0			26.1		90.3			496.3	
15-May	12.5					257.8				
31-May	4.0			13.9		70.1			276.6	
May										
Sum	41.4	5.0		40.0		677.8			772.9	
Average	10.4	5.0		20.0		169.5			386.5	
3-Jun	4.5					68.5				
5-Jun	16.7	4.9		38.5		153.6	6.5		255.2	
7-Jun	3.3	2.9		26.6		47.2	20.3		526.9	
20-Jun	6.6	2.5		15.2		48.7	17.5		287.2	
June										
Sum	31.1	10.3		80.3		318.0	44.3		1069.3	
Average	7.8	3.4		26.8		79.5	14.8		366.4	
Spring										
Sum	104.9	24.1		126.1	21.0	1474.9	70.7		1964.6	345.0
Average	9.5	4.0		21.0	21.0	134.1	12.8		327.4	345.0

Table 3. (cont.) Summary of mobile herring vessel fishing activity 1997.

1997 Date	Hours Activity					Kilometers Activity				
	Searching	Fishing	Pumping	Traversing	Other	Searching	Fishing	Pumping	Traversing	Other
Summer										
T										
1-Jul	1.9	3.6		3.8		35.5	26.7		64.8	
7-Jul	4.8	1.9		16.2		90.9	13.5		287.2	
15-Jul	2.4	5.4		19.7		43.2	36.0		357.9	
22-Jul	3.2	2.8		18.3		58.1	24.6		319.0	
July										
Sum	12.3	13.7		68.0		227.7	100.8		1028.9	
Average	3.1	3.4		14.6		66.9	25.2		267.2	
4-Aug	6.7	1.0		14.5		114.4	6.5		258.5	
11-Aug	11.1	3.2		12.3		146.5	20.4		233.9	
24-Aug	3.6	0.1	1.2	18.7		56.6	0.7	2.1	206.5	
25-Aug	3.0	0.3	2.8	15.0		49.8	1.9	4.5	282.2	
26-Aug	6.7	0.2	0.3	6.6	1.4	91.9	0.8	0.8	129.0	1.8
27-Aug	7.8	0.1	1.6	5.8		94.9	0.3	2.3	113.6	
31-Aug	8.7			7.3		121.1			125.7	
Aug										
Sum	47.6	4.9	6.9	80.2	1.4	676.2	30.6	9.7	1349.4	1.8
Average	6.8	0.8	1.5	11.5	1.4	96.5	6.1	2.4	192.8	1.8
Summer										
Sum	69.9	18.6	6.9	138.2	1.4	902.9	131.4	9.7	2378.3	1.8
Average	5.4	1.9	1.5	12.6	1.4	82.1	13.1	2.4	216.2	1.8
Fall 4T										
1-Sep	11.4	0.1	0.9	3.3		173.2	0.7	2.4	60.1	
2-Sep	2.9			3.1		42.0			46.4	
7-Sep	13.5	0.2	6.1	3.9	6.9	187.2	0.6	10.9	56.3	14.2
Sum	27.8	0.3	7.0	10.3	6.9	402.4	1.3	13.3	162.8	14.2
Average	9.3	0.2	3.5	3.4	6.9	134.1	0.7	6.7	54.3	14.2

Table 3. (cont.) Summary of mobile herring vessel fishing activity 1997

1997 Date	Hours Activity					Kilometers Activity				
	Searching	Fishing	Pumping	Traversing	Other	Searching	Fishing	Pumping	Traversing	Other
16-Sep	9.1	2.2	4.4		1.0	113.8	36.4	57.9		18.7
18-Sep	7.0	0.7	6.5	1.1		104.1	5.4	12.5	17.4	
20-Sep	4.7	0.3	1.4	3.7		75.6	1.9	2.4	71.7	
22-Sep	7.9	0.3	2.5	1.7		111.6	1.9	8.1	29.9	
23-Sep	6.0	0.2	1.7	4.6		101.4	1.5	3.4	77.4	
25-Sep	7.9	0.2	0.9	4.0		118.1	1.7	1.8	68.5	
27-Sep	8.3	0.6	5.3	4.3		122.9	4.7	11.2	79.8	
28-Sep	8.2	0.2	1.6	1.3		142.3	1.6	2.8	24.5	
30-Sep	5.8	0.6	5.4	4.3		99.8	4.2	11.4	78.1	
Sum	64.9	5.3	29.7	26.0	1.0	989.6	69.3	111.5	447.3	18.7
Average	7.2	0.6	3.3	3.1	1.0	110.0	6.6	12.4	55.9	18.7
September										
Sum	92.7	5.6	36.7	36.3	7.9	1392.0	60.6	124.8	610.1	32.9
Average	7.7	0.6	3.3	3.2	4.0	116.0	6.6	11.3	55.5	16.5
1-Oct	7.1	0.7	7.2	3.1		100.3	5.0	11.4	52.0	
2-Oct	13.3	0.3	3.4	3.0		225.0	1.1	5.1	47.9	
3-Oct	11.9	0.6	3.8	2.1		185.7	4.6	7.1	35.8	
4-Oct	6.3	0.4	4.4	7.0	1.9	98.3	3.0	7.9	103.8	3.1
5-Oct	9.4	0.4	0.9	2.6		136.1	1.3	1.5	50.1	
8-Oct	9.6	0.5	3.8	1.2		120.0	3.6	6.0	18.2	
9-Oct	7.3	0.3	3.1	2.3		107.8	2.0	6.4	41.0	
10-Oct	3.1	0.2	2.0	1.5		40.5	1.5	3.4	24.1	
12-Oct	5.6	0.5	3.3	2.5		74.9	3.4	5.3	46.1	
13-Oct	7.9	0.4	2.1	2.2		121.3	2.1	3.0	42.1	
14-Oct	14.6	0.1	2.1	2.7	5.9	185.4	1.2	4.2	41.0	7.8
Sum	96.1	4.4	36.1	30.2	7.8	1395.3	28.8	61.3	502.1	10.9
Average	8.7	0.4	3.3	2.7	3.9	126.8	2.6	5.6	45.6	5.5

Table 3. (cont.) Summary of mobile herring vessel fishing activity 1997.

1997 Date	Hours Activity					Kilometers Activity				
	Searching	Fishing	Pumping	Traversing	Other	Searching	Fishing	Pumping	Traversing	Other
17-Oct	7.9			4.0		123.7			71.4	
19-Oct	12.4			6.4		165.4			121.6	
22-Oct	10.4	0.1	1.2	2.5		168.1	1.1	2.1	38.9	
30-Oct	9.4					183.1				
31-Oct	10.9	0.3	2.7	14.9	2.2	88.1	2.2	4.9	279.2	3.5
Sum	51.0	0.4	3.9	27.8	2.2	728.4	3.3	7.0	511.1	3.5
Average	10.2	0.2	2.0	7.0	2.2	145.7	1.7	3.5	127.8	3.5
October										
Sum	147.1	4.8	40.0	58.0	10.0	2123.7	32.1	68.3	1013.2	14.4
Average	9.2	0.4	3.1	3.9	3.3	132.7	2.6	6.3	67.6	4.8
Fall 4T										
Sum	239.8	10.4	76.7	93.3	17.9	3615.7	92.7	193.1	1623.3	47.3
Average	8.6	0.4	3.2	3.6	3.6	125.6	3.9	8.0	62.4	9.6
Fall 4Vn										
3-Nov	5.8	0.3	2.8	8.6		51.1	2.0	4.1	148.9	
4-Nov	1.6			5.1		18.5			90.3	
6-Nov	5.8	0.4	4.6	8.3		74.1	3.3	8.8	153.1	
11-Nov	7.1	0.9	6.5	8.9		98.9	7.5	12.1	130.3	
14-Nov	8.0	0.3	1.8	9.2		72.6	2.3	3.4	161.0	
Sum	28.3	1.9	15.7	40.1		315.2	15.1	28.4	683.6	
Average	6.7	0.6	3.9	8.0		63.0	3.8	7.1	136.7	
16-Nov	5.3	0.9	6.5	8.0		61.5	6.1	11.4	150.0	
18-Nov	4.1	0.7	4.8	8.7		51.9	4.3	7.0	158.7	
Sum	9.4	1.6	11.3	16.7		113.4	10.4	18.4	308.7	
Average	4.7	0.8	5.7	8.4		56.7	5.2	9.2	154.4	
4Vn										
Sum	37.7	3.6	27.0	56.8		428.6	25.6	46.8	992.3	
Average	5.4	0.6	4.5	8.1		61.2	4.3	7.8	141.8	

Table 3. (cont.) Summary of mobile herring vessel fishing activity 1997

Date	Hours Activity					Kilometers Activity				
	Searching	Fishing	Pumping	Traversing	Other	Searching	Fishing	Pumping	Traversing	Other
1997										
Total										
Sum	442.3	56.6	109.6	414.4	40.3	6322.1	326.3	249.6	6958.6	394.1
Average	7.8	1.2	3.2	8.3	6.8	110.9	7.1	7.3	139.2	66.3
Survey 4Vn										
21-Nov	2.0			2.0	3.4	38.6			36.4	64.4
22-Nov	0.6	0.4	2.0	2.5	0.9	8.5	2.6	3.7	46.2	16.5
25-Nov	0.4			3.7	9.1	8.0			70.3	175.1
Sum	3.0	0.4	2.0	8.2	13.4	66.1	2.6	3.7	162.9	266.0
Average	1.0	0.4	2.0	2.7	4.6	18.4	2.6	3.7	61.0	86.3

Table 4. Summary of mobile herring vessel fishing activity, 1998.

1998	Hours Activity					Kilometers Activity					
	Date	Searching	Fishing	Pumping	Traversing	Other	Searching	Fishing	Pumping	Traversing	Other
Summer 4T											
27-Jul		11.8	6.5	0.5	3.3		219.2	48.2	1.2	66.8	
11-Aug		9.5			2.7		188.5			57.3	
Summer											
Sum		21.3	6.5	0.5	6.0		407.7	48.2	1.2	124.1	
Average		10.7	6.5	0.5	3.0		203.9	48.2	1.2	62.1	
Fall 4T											
31-Aug		5.3	0.3	2.4	5.4		73.4	1.9	4.1	100.0	
1-Sep		2.8	0.1	1.5	6.9		34.8	1.2	1.6	133.2	
2-Sep		9.3	0.4	1.7	1.9		110.9	3.1	2.6	35.4	
4-Sep		7.2	0.3	2.8	2.7		128.9	2.2	2.9	51.3	
6-Sep		6.2	0.3	2.8	4.2		100.7	2.5	3.7	77.6	
7-Sep		10.9	0.1	0.8	4.1		172.2	1.0	1.2	78.6	
10-Sep		7.7	0.4	3.1	2.7		127.8	3.6	4.3	53.8	
11-Sep		13.0			0.4		198.5			8.4	
12-Sep		10.7	0.5	3.7	6.0		181.5	3.7	5.6	114.2	
13-Sep		4.3	0.2	2.0	8.8		33.6	1.6	2.9	170.1	
15-Sep		11.4	0.5	3.7	1.5		187.9	3.7	5.6	30.6	
Sum		83.5	2.8	22.1	39.2		1276.8	22.6	30.4	763.2	
Average		8.4	0.3	2.5	3.9		127.7	2.6	3.4	76.3	

Table 4. (cont.) Summary of mobile herring vessel fishing activity, 1998

1998	Hours Activity					Kilometers Activity					
	Date	Searching	Fishing	Pumping	Traversing	Other	Searching	Fishing	Pumping	Traversing	Other
17-Sep	24.4	0.4	4.4	3.0	6.0		401.5	3.1	7.6	51.1	9.5
19-Sep	8.6	0.1	0.7	2.1			125.0	1.0	0.9	40.2	
20-Sep	13.1	0.5	3.1	1.0			222.6	4.2	6.6	19.0	
24-Sep	10.5	0.1	1.1	2.4			150.7	0.9	2.9	45.2	
25-Sep	9.7	0.2	1.7	13.6			136.5	1.6	2.4	273.4	
26-Sep	7.6	0.4	2.5	2.9			126.0	3.1	4.4	56.2	
28-Sep	5.4	0.2	1.8	5.4			77.6	1.2	2.3	105.0	
29-Sep	8.7			9.5			128.5			179.9	
Sum	88.0	1.9	16.3	39.9	6.0		1368.4	16.1	27.1	770.0	9.5
Average	11.0	0.3	2.2	5.0	6.0		171.1	2.2	3.9	96.3	9.5
September											
Sum	171.5	4.7	37.4	79.1	6.0		2645.2	37.7	67.5	1523.2	9.5
Average	9.7	0.3	2.3	4.5	6.0		149.4	2.3	3.6	86.8	9.5
4-Oct	6.0	0.3	2.2	4.4			99.9	1.9	4.4	86.5	
6-Oct	6.8	0.6	4.2	2.5			89.9	4.4	6.6	43.6	
7-Oct	9.1	0.1	0.7	2.9			106.4	0.9	2.2	48.8	
8-Oct	3.9	0.1	2.5	1.9			73.4	1.0	4.7	34.5	
9-Oct	9.1			10.8			153.4			216.1	
10-Oct	13.1			1.8			212.0			35.7	
12-Oct	8.8	0.5	3.6	1.6			148.6	3.9	6.0	30.5	
13-Oct	6.1	0.7	4.8	3.5			89.8	4.4	6.4	67.2	
14-Oct	13.9			1.2			243.4			23.7	
Sum	76.8	2.3	18.0	30.6			1216.8	16.5	30.3	586.6	
Average	8.5	0.4	3.0	3.4			136.2	2.8	5.1	65.2	

Table 4. (cont.) Summary of mobile herring vessel fishing activity, 1998

1998	Hours Activity					Kilometers Activity					
	Date	Searching	Fishing	Pumping	Traversing	Other	Searching	Fishing	Pumping	Traversing	Other
17-Oct		7.9			3.3		127.8			64.6	
18-Oct		7.5			9.9		135.5			165.4	
20-Oct		2.8			7.7		13.6			130.6	
27-Oct		2.8			7.7		13.6	130.6			
Sum		21.0			28.6		290.5	130.6		360.6	
Average		6.3			7.2		72.6	130.6		120.2	
Fall 4T											
Sum		103.1	2.6	20.4	64.6	6.0	1580.7	149.0	34.4	1047.2	9.5
Average		7.2	0.3	2.6	6.1	6.0	107.6	34.4	4.3	92.8	9.5
1998 Total											
Sum		124.4	9.1	20.9	70.6	6.0	1988.4	197.2	36.6	1171.3	9.5
Average		8.9	3.4	1.6	4.1	6.0	155.7	41.3	2.7	77.4	9.5

Table 5. Sum of fishing activity time and distance by season and area, 1995 - 1998.

Season and area	Year	Hours					Sum				
		Searching	Fishing	Pumping	Traversing	Other	Searching	Fishing	Pumping	Traversing	Other
Spring 4T	1996	150.0	20.5	18.6	35.7	4.9	2144.8	155.0	32.0	662.1	6.2
	1997	104.9	24.18		126.1	21.0	1474.9	70.7		1964.6	345.0
Summer 4T	1995	31.8	0.5	8.7	31.9		457.4	3.8	10.7	601.7	
	1996	88.0	46.7	19.4	78.8	0.2	1379.8	309.0	38.7	1458.7	0.4
	1997	59.9	18.6	5.9	138.2	1.4	902.9	131.4	9.7	2378.3	1.8
	1998	21.3	6.5	0.5	3.0		407.7	48.2	1.2	124.1	
Fall 4T	1995	275.3	10.8	115.0	162.9		3851.4	80.3	181.5	3046.0	
	1996	152.6	7.7	58.5	88.0	9.6	2255.4	49.1	99.7	1571.1	17.4
	1997	239.8	10.4	76.7	93.3	17.9	3515.7	92.7	193.1	1623.3	47.3
	1998	103.1	2.6	20.4	64.6		1580.7	149.0	34.4	1047.2	
4Vn	1995	80.5	3.7	45.7	78.7		902.1	29.8	74.9	1283.7	
	1996	17.1	2.0	15.7	36.9	2.9	228.4	14.6	25.2	679.1	319.9
	1997	37.7	3.5	27.0	56.8		428.6	25.5	46.8	992.3	

Table 6. Average fishing activity time and distance by season and area, 1995 – 1998.

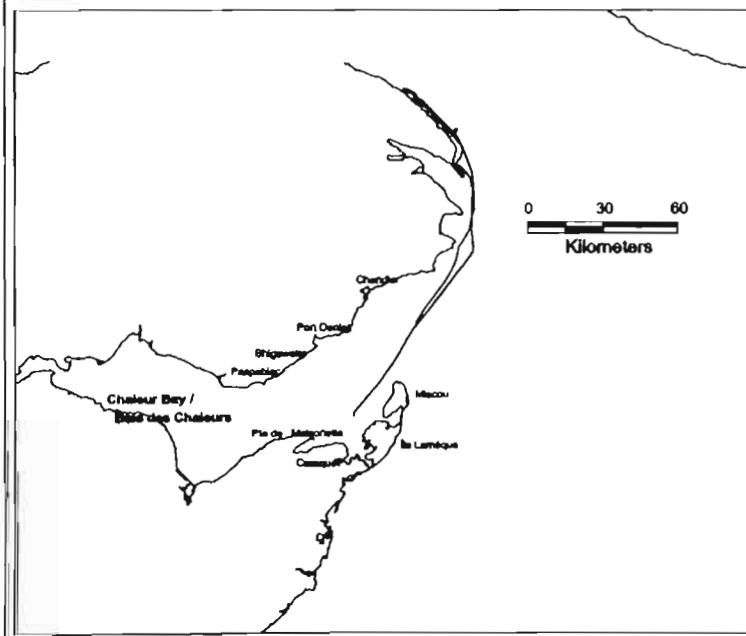
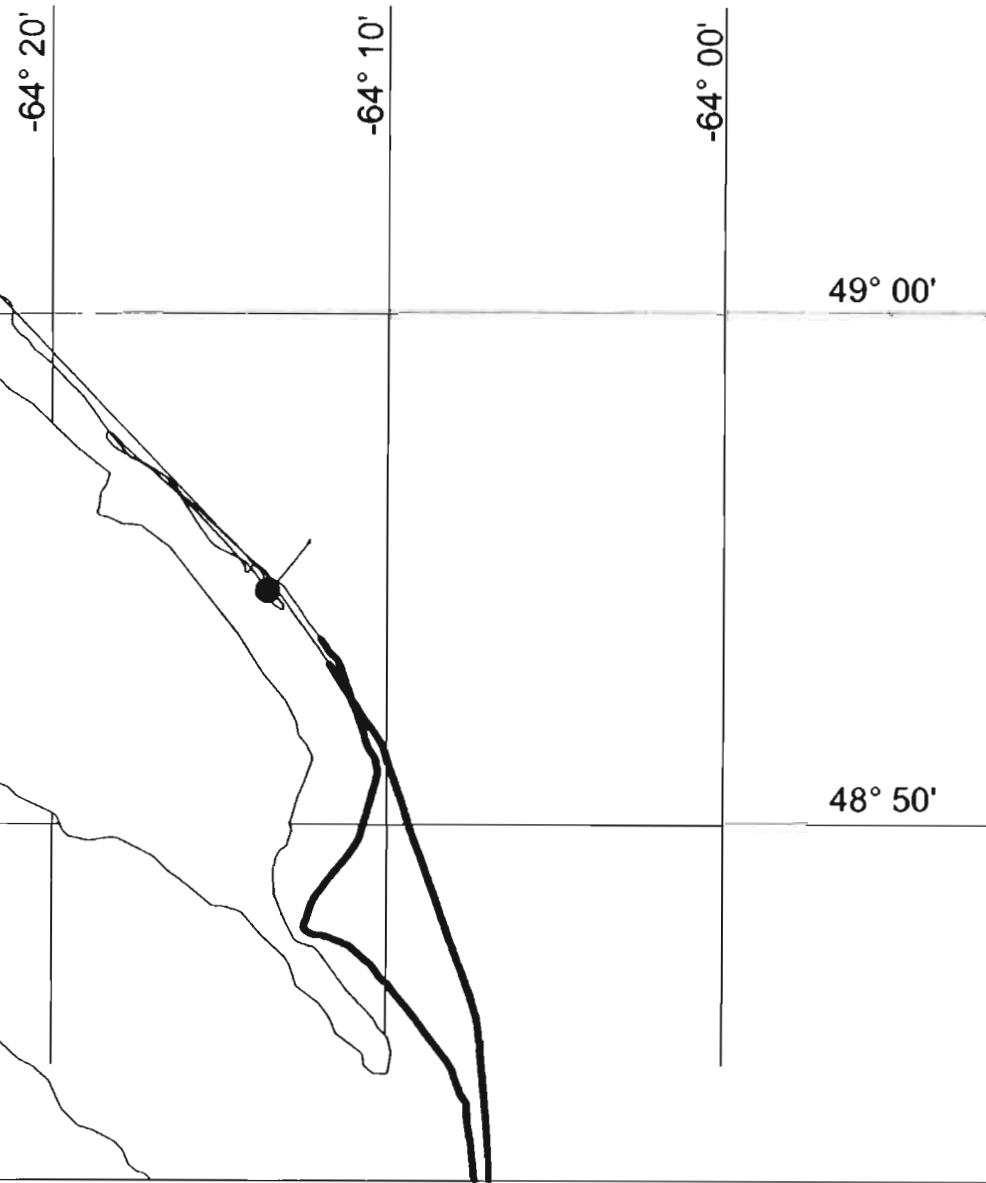
Season and area	Year	Average Hours					Kilometers				
		Searching	Fishing	Pumping	Traversing	Other	Searching	Fishing	Pumping	Traversing	Other
Spring 4T	1996	8.8	2.3	2.3	4.5	2.5	126.2	17.2	4.6	82.8	3.1
	1997	9.5	4.0		21.0	21	134.1	12.8		327.4	345.0
Summer 4T	1995	5.3	0.1	2.2	5.3		76.2	1.0	2.7	100.3	
	1996	5.9	4.7	2.8	6.6	0.2	92.0	30.9	5.5	121.6	0.4
	1997	5.4	1.9	1.5	12.6	1.4	82.1	13.1	2.4	216.2	1.8
	1998	10.7	6.5	0.5	3		203.9	48.2	1.2	62.1	
Fall 4T	1995	6.5	0.3	3.2	4.3		91.2	2.1	5	81.2	
	1996	7.5	0.4	3.1	4.3	4.8	111	2.5	5.2	76.1	8.7
	1997	8.6	0.4	3.2	3.6	3.6	125.6	3.9	8.0	62.4	9.5
	1998	7.2	0.3	2.6	5.1	6	107.6	34.4	4.3	92.8	
4Vn	1995	6.6	0.4	4.6	7.3		76.7	2.9	7.2	119.2	
	1996	3.2	0.4	3.2	7.3	2.9	41.5	3	5.1	132.5	81.3
	1997	5.4	0.6	4.5	8.1		61.2	4.3	7.8	141.8	

23 August 1995

	Hr	Km
Searching	5.2	68.9
Fishing	0.1	0.6
Pump/Retrieve	1.7	3.1
Traversing	11.0	210.5

Boat Name - Gemini

- = Searching
- = Fishing
- = Traversing

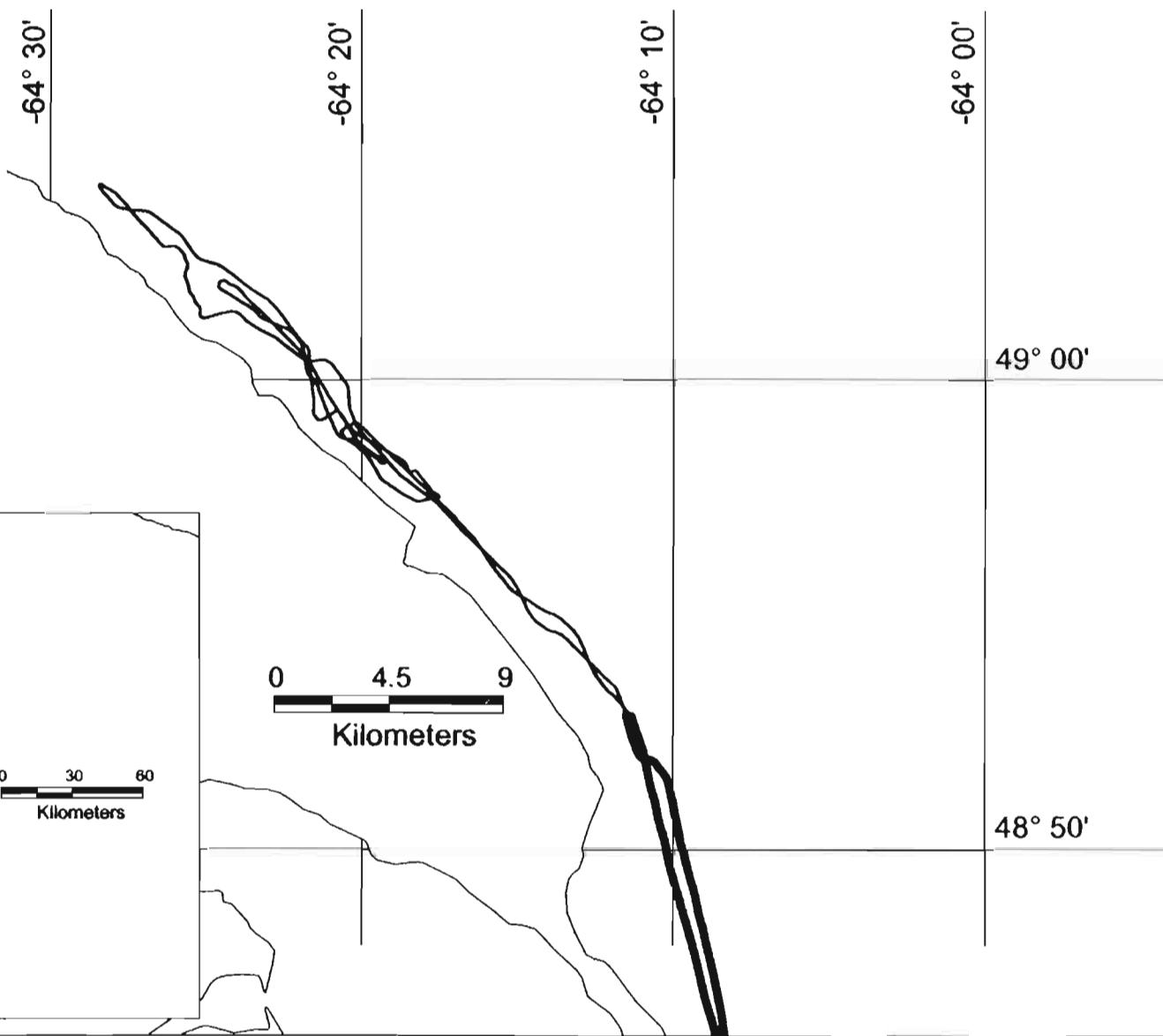
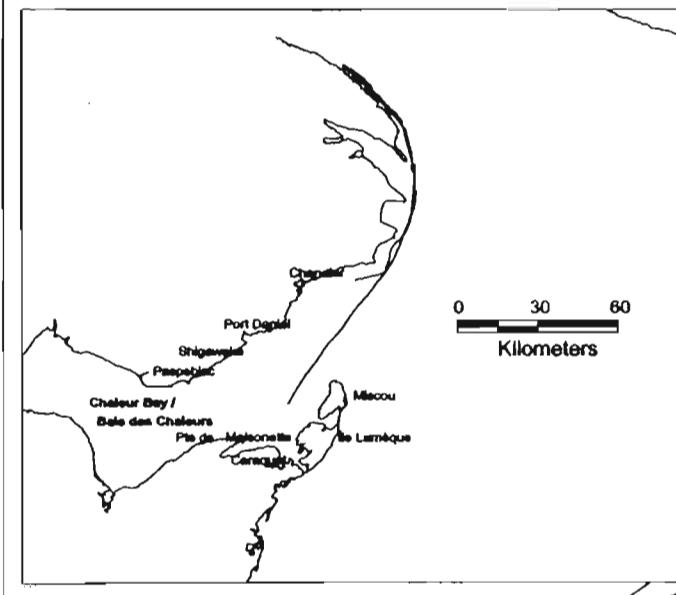


26 August 1995

	Hr	Km
Searching	6.8	101.9
Traversing	10.0	179.0

Boat Name - Gemini

- = Searching
- = Traversing



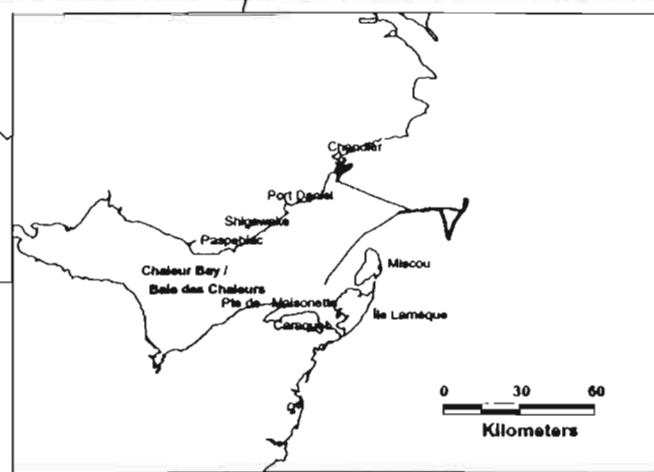
27 August 1995

0 5 10
Kilometers

	Hr	Km
Searching	7.2	78.4
Fishing	0.1	1.0
Pump/Retrieve	1.5	1.9
Traversing	4.2	81.4

Boat Name - Gemini

- = Searching
- = Fishing
- = Traversing



48° 20'

48° 10'

48° 00'

-63° 50'

-64° 00' -64° 10'

-64° 20' -64° 40'

-64° 50'

28 August 1995

	Hr	Km
Searching	6.8	141.4
Fishing	0.1	0.6
Pump/Retrieve	2.8	1.3
Traversing	2.6	50.2

Boat Name - Gemini

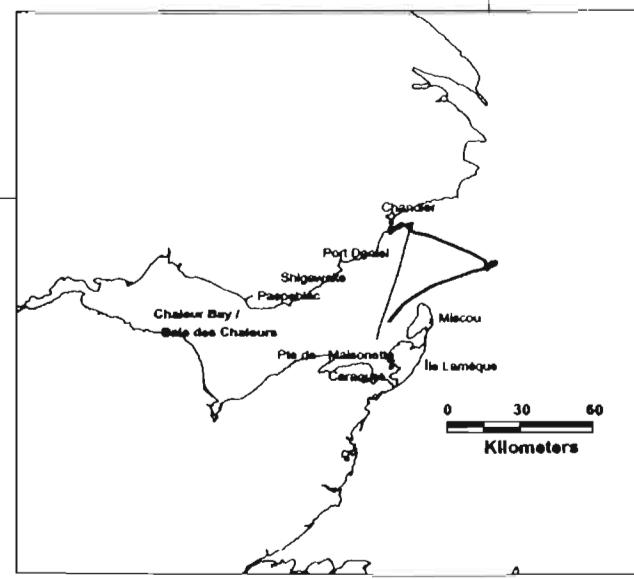
- = Searching
- = Fishing
- = Traversing

0 5 10
Kilometers

48° 00'

-64° 20'

64° 00'



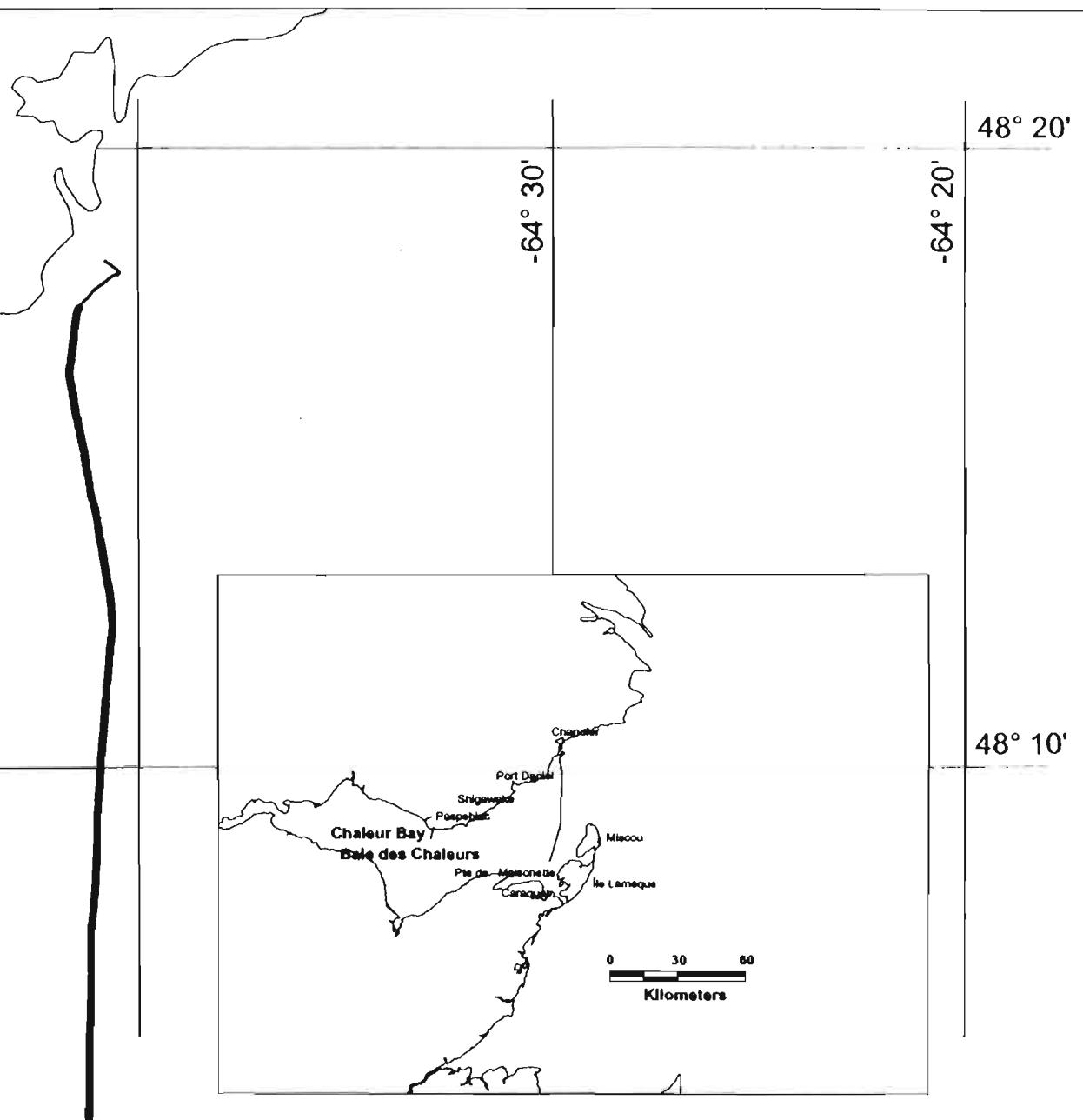
29 August 1995

	Hr	Km
Searching	1.1	2.8
Traversing	2.4	46.5

Boat Name - Gemini

— = Searching
— = Traversing

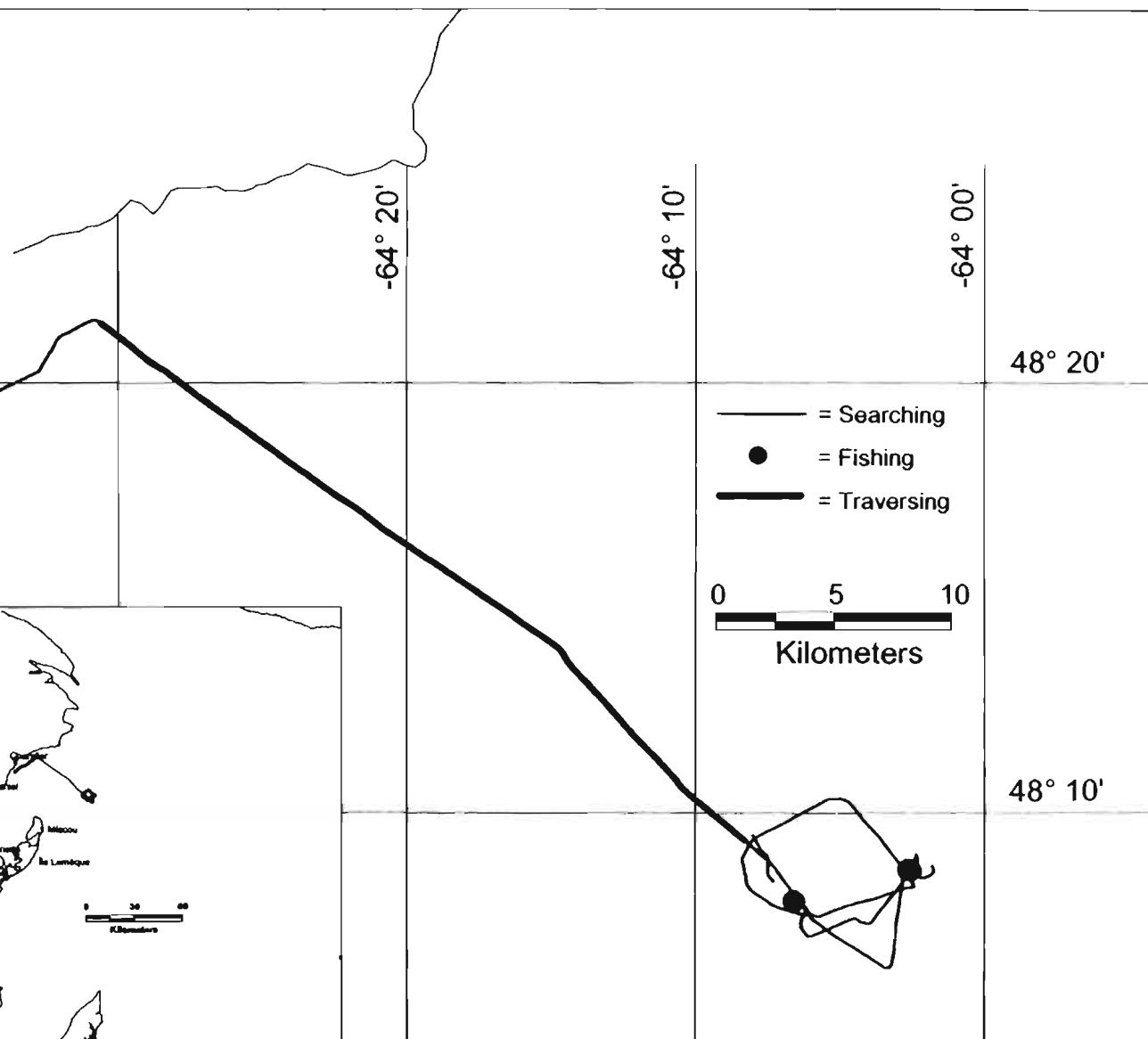
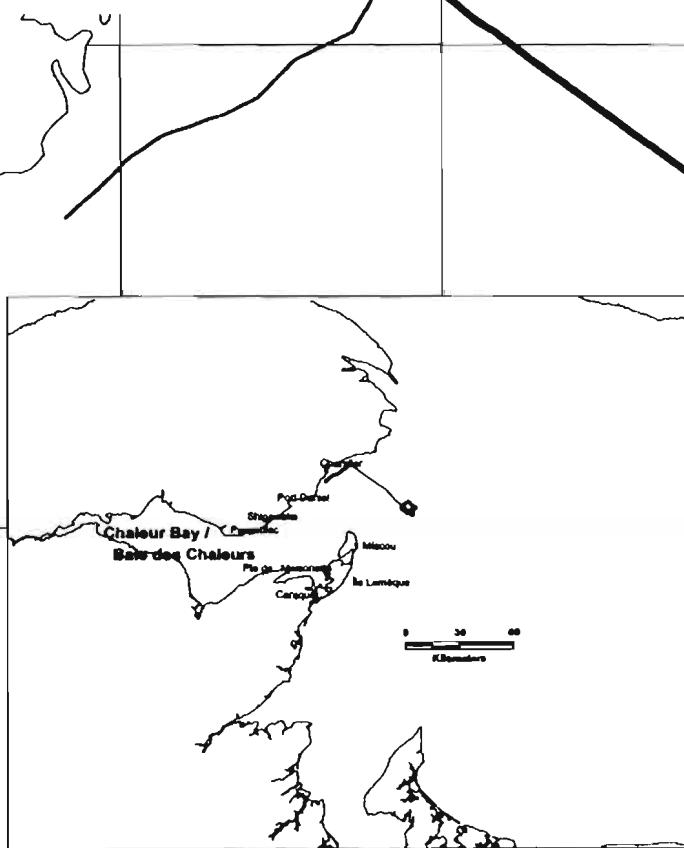
0 3.5 7
Kilometers



31 August 1995

	Hr	Km
Searching	4.7	64.0
Fishing	0.2	1.6
Pump/Retrieve	2.7	4.4
Traversing	1.7	34.1

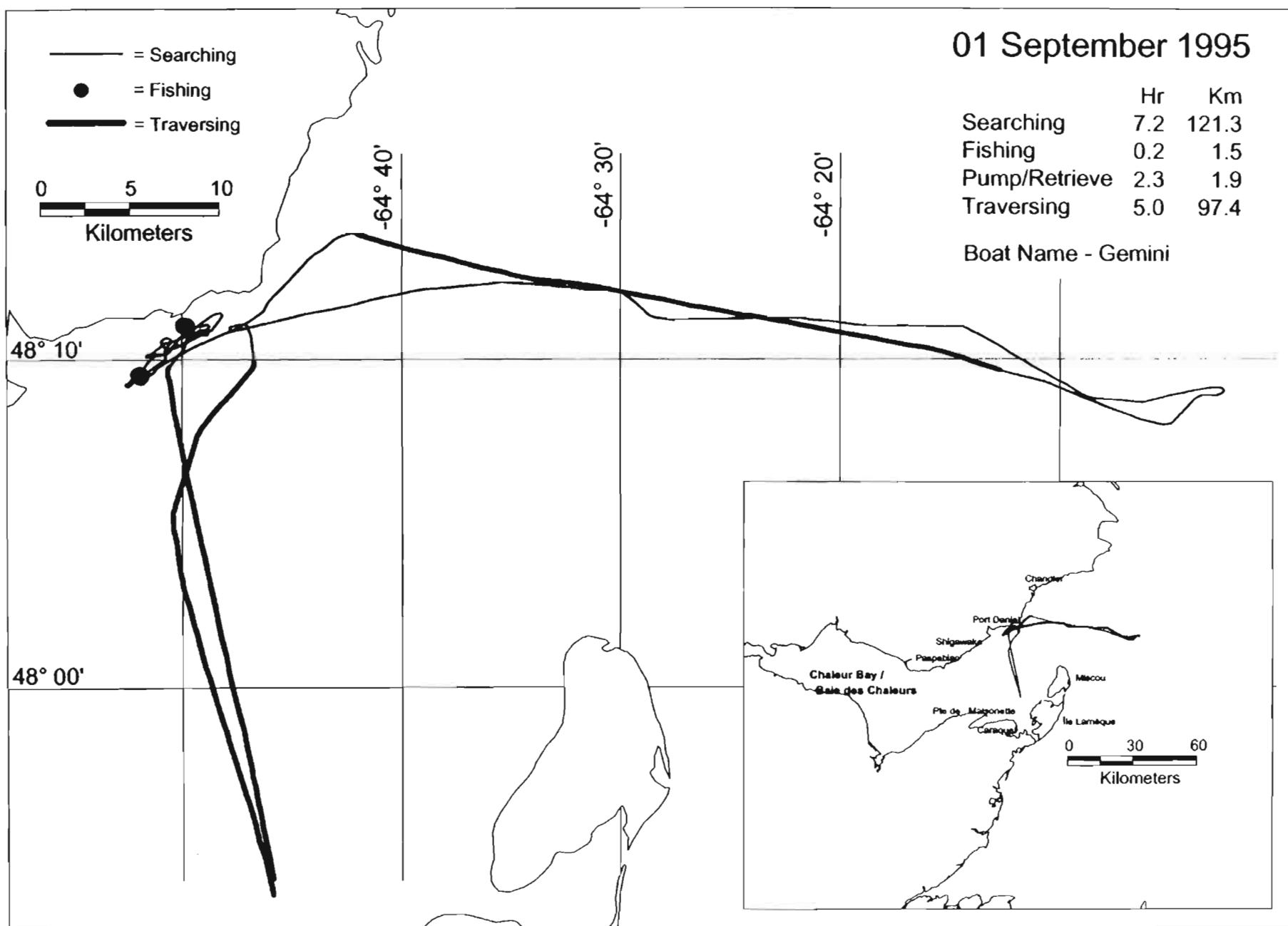
Boat Name - Gemini



01 September 1995

	Hr	Km
Searching	7.2	121.3
Fishing	0.2	1.5
Pump/Retrieve	2.3	1.9
Traversing	5.0	97.4

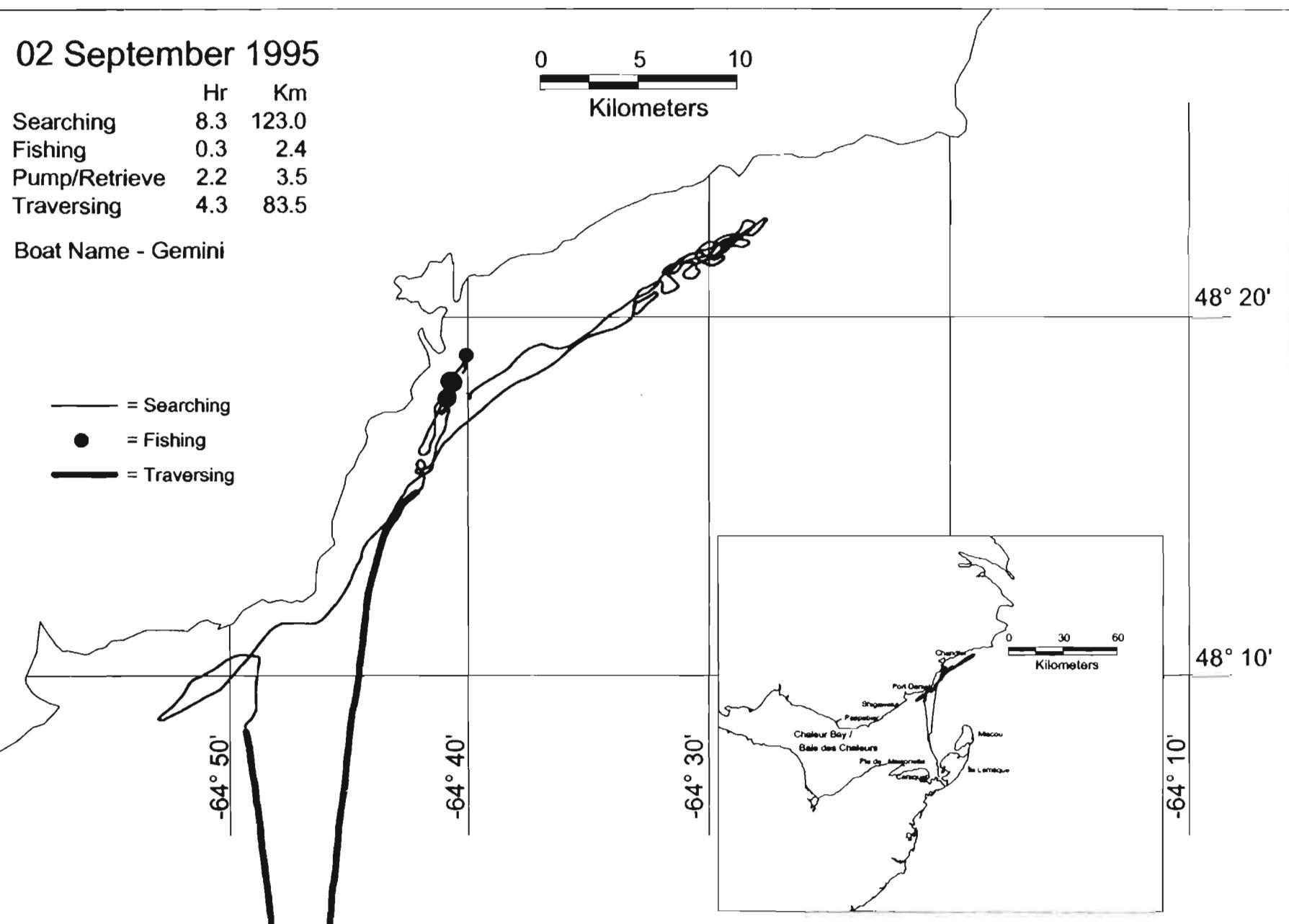
Boat Name - Gemini



02 September 1995

	Hr	Km
Searching	8.3	123.0
Fishing	0.3	2.4
Pump/Retrieve	2.2	3.5
Traversing	4.3	83.5

Boat Name - Gemini



03 September 1995

	Hr	Km
Searching	1.1	8.2
Fishing	0.2	1.9
Pump/Retrieve	2.3	3.6
Traversing	3.9	74.2

Boat Name - Gemini

- = Searching
- = Fishing
- = Traversing

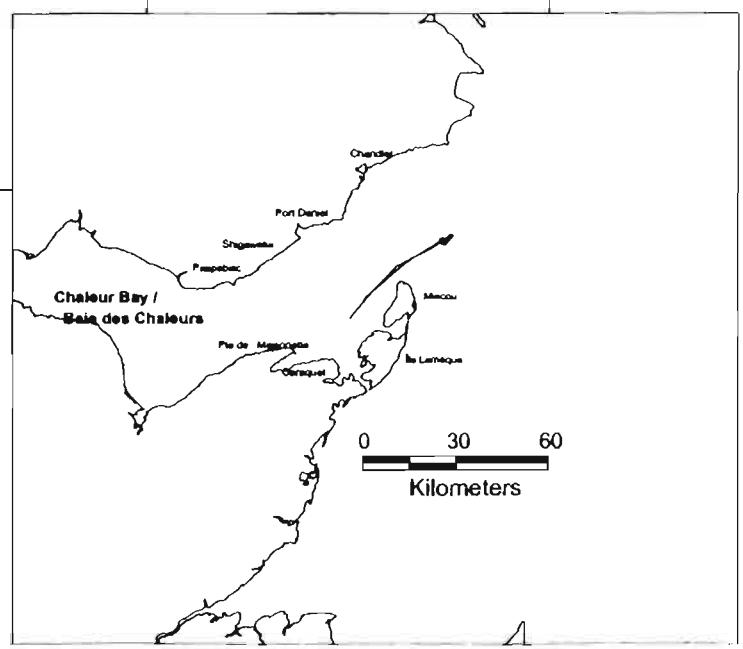


48° 00'

-64° 30'

-64° 20'

-64° 10'



04 September 1995

	Hr	Km
Searching	8.4	141.2
Fishing	0.2	1.7
Pump/Retrieve	2.0	3.4
Traversing	4.2	85.9

Boat Name - Gemini



Kilometers

- = Searching
- = Fishing
- = Traversing

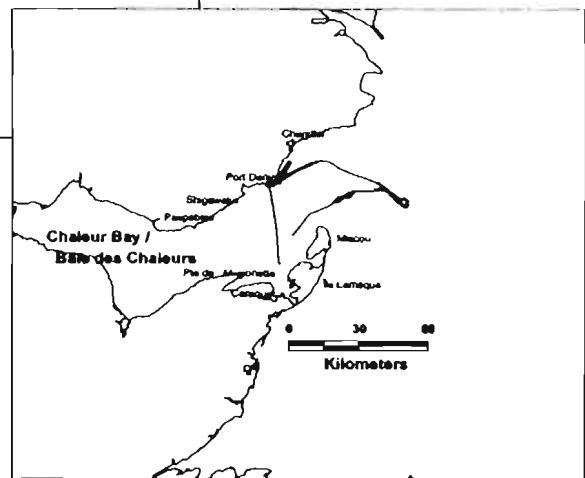
-65° 00'

-64° 40'

-64° 00'

48° 20'

48° 00'

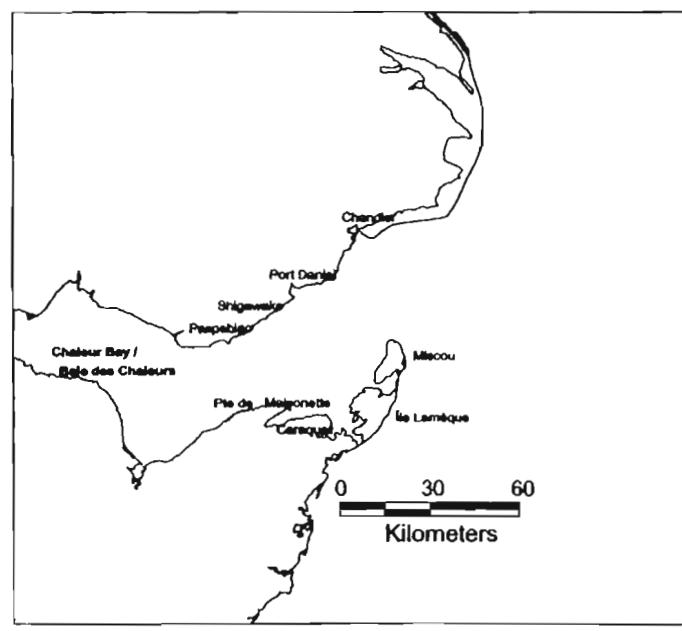
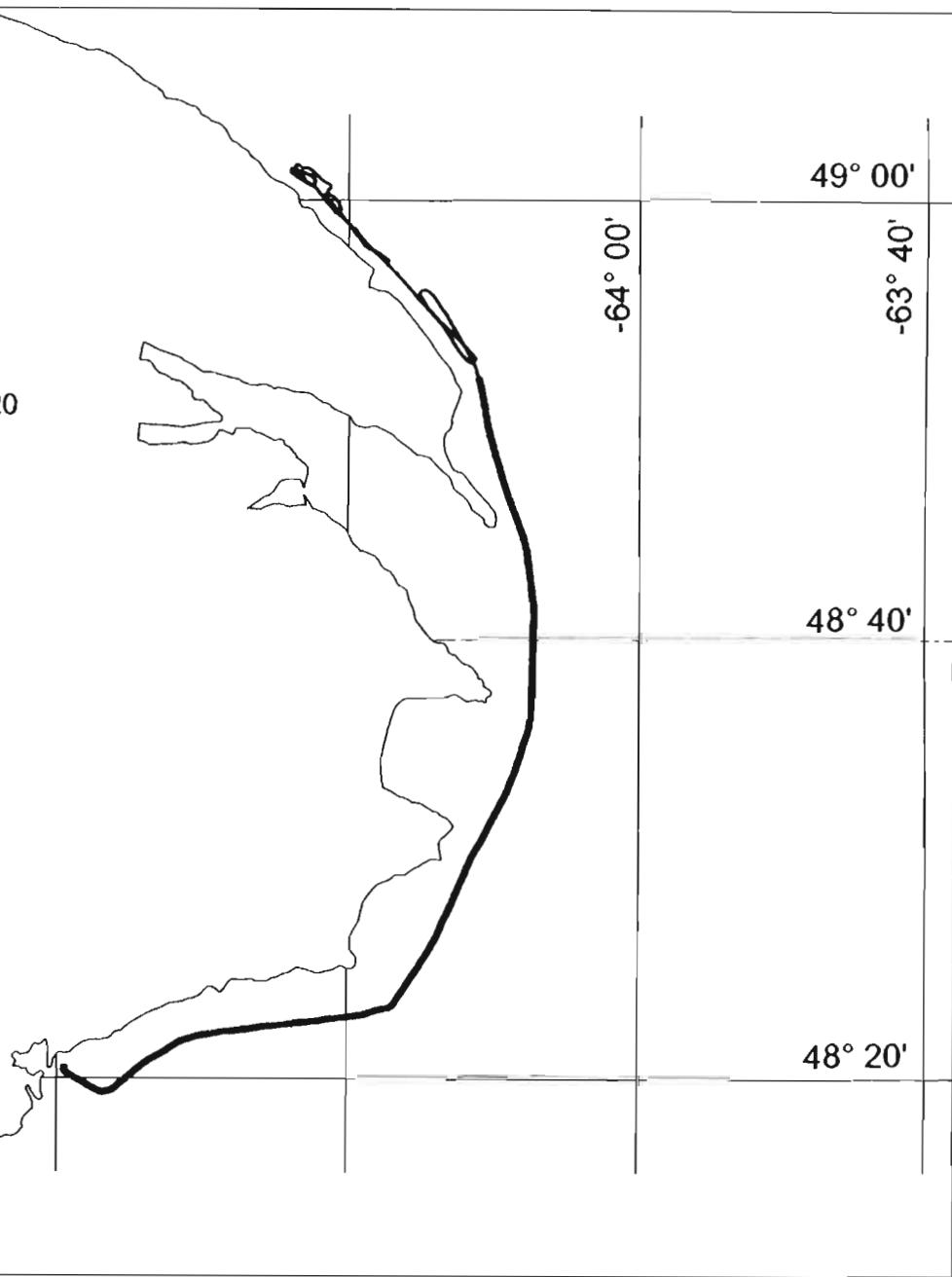


05 September 1995

	Hr	Km
Searching	4.6	67.0
Traversing	7.0	88.8

Boat Name - Gemini

— = Searching
— = Traversing



11 September 1995

0 5 10
Kilometers

	Hr	Km
Searching	3.4	49.4
Fishing	0.5	4.6
Pump/Retrieve	5.3	8.6
Traversing	4.8	91.1

Boat Name - Gemini

- = Searching
- = Fishing
- = Traversing

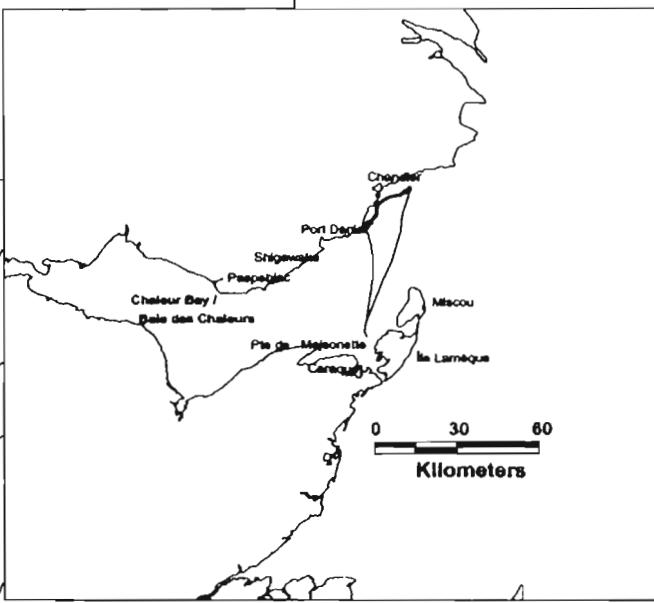
-64° 20'

48° 20'

-64° 00'

48° 00'

0 30 60
Kilometers



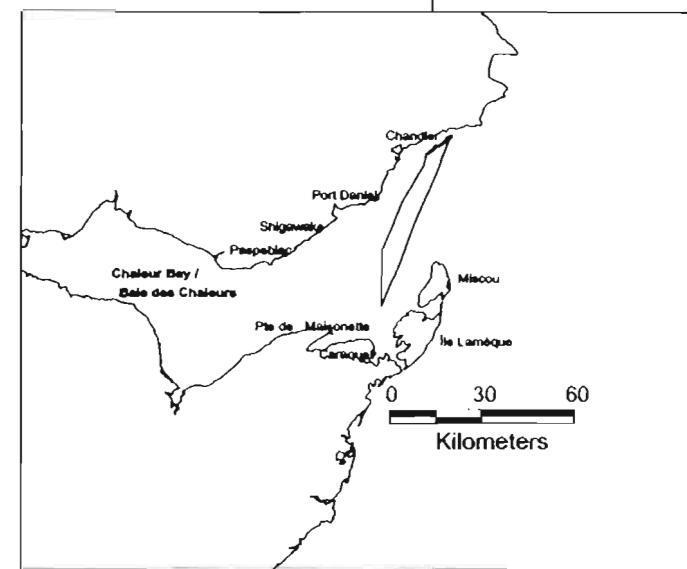
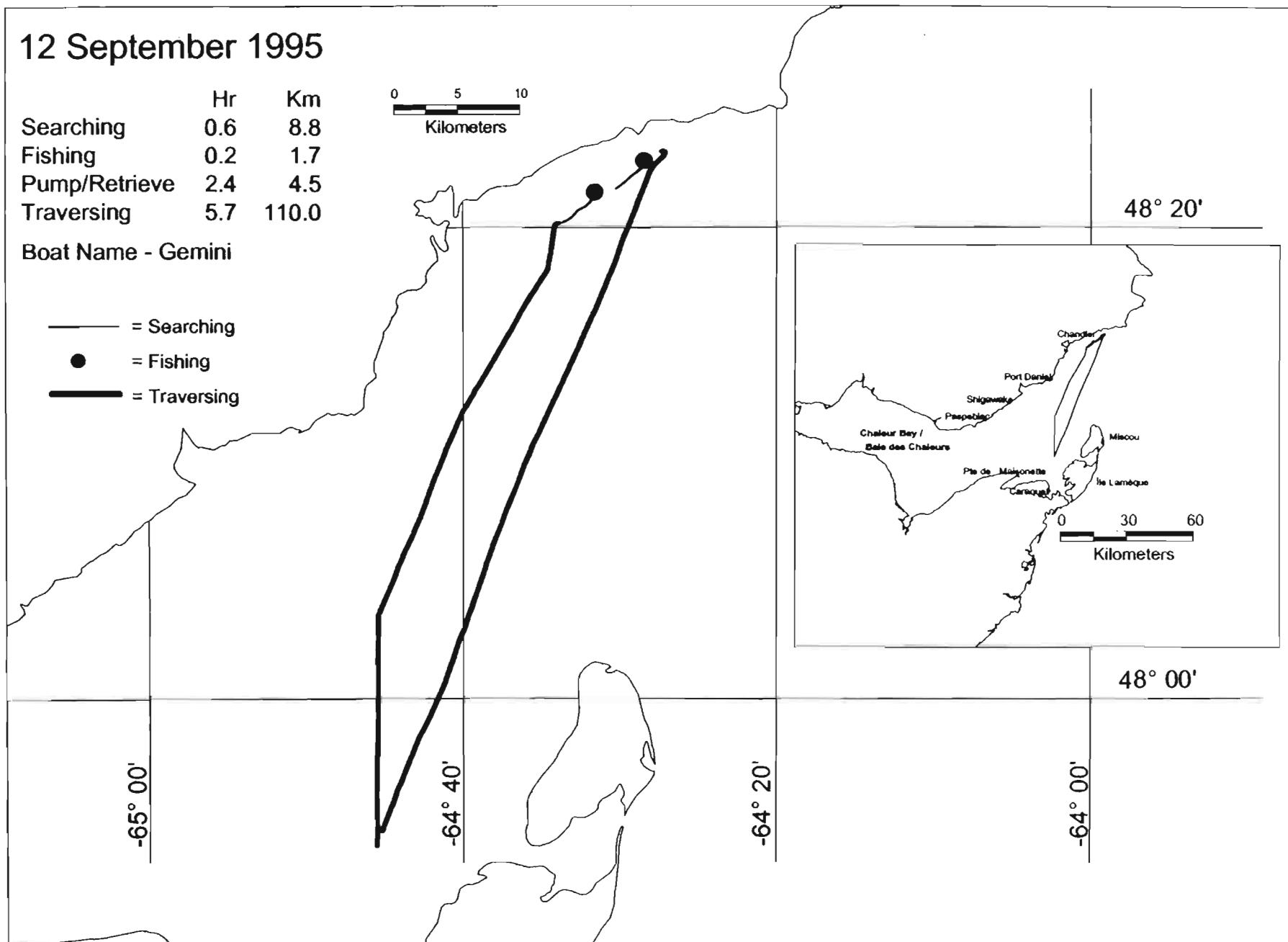
12 September 1995

	Hr	Km
Searching	0.6	8.8
Fishing	0.2	1.7
Pump/Retrieve	2.4	4.5
Traversing	5.7	110.0

0 5 10
Kilometers

Boat Name - Gemini

- = Searching
- = Fishing
- = Traversing



13 September 1995

	Hr	Km
Searching	6.4	88.7
Fishing	0.1	0.2
Pump/Retrieve	1.8	2.7
Traversing	4.9	97.8

Boat Name - Gemini

0 10 20
Kilometers

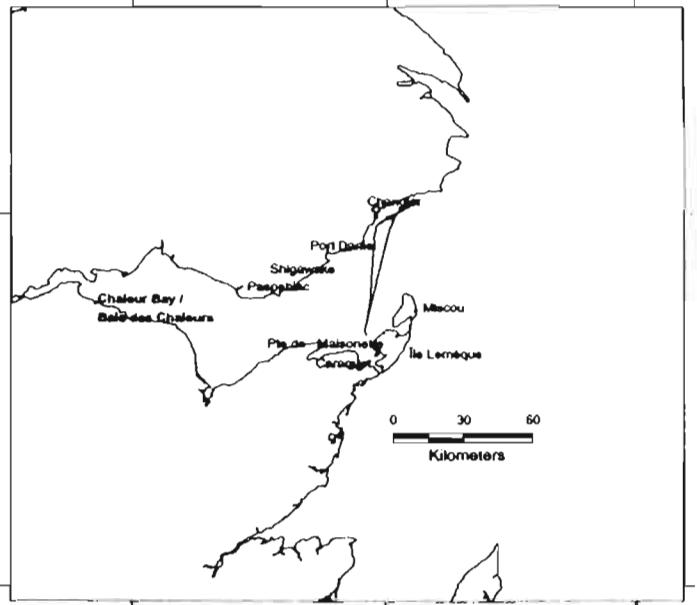
-64° 15'

-64° 00'

-63° 45'

48° 15'

- = Searching
- = Fishing
- = Traversing



14 September 1995

	Hr	Km
Searching	6.4	96.6
Fishing	0.4	3.0
Pump/Retrieve	3.5	5.2
Traversing	5.0	97.3

Boat Name - Gemini



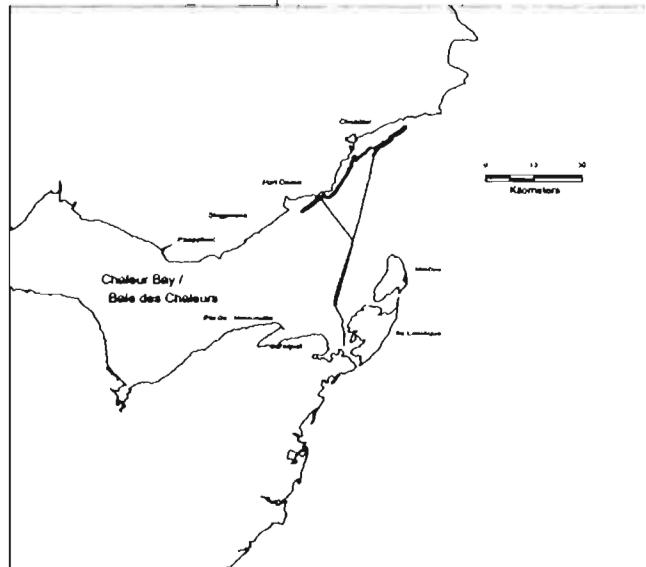
48° 20'

- = Searching
- = Fishing
- = Traversing

-65° 00'

-64° 40'

-64° 20'



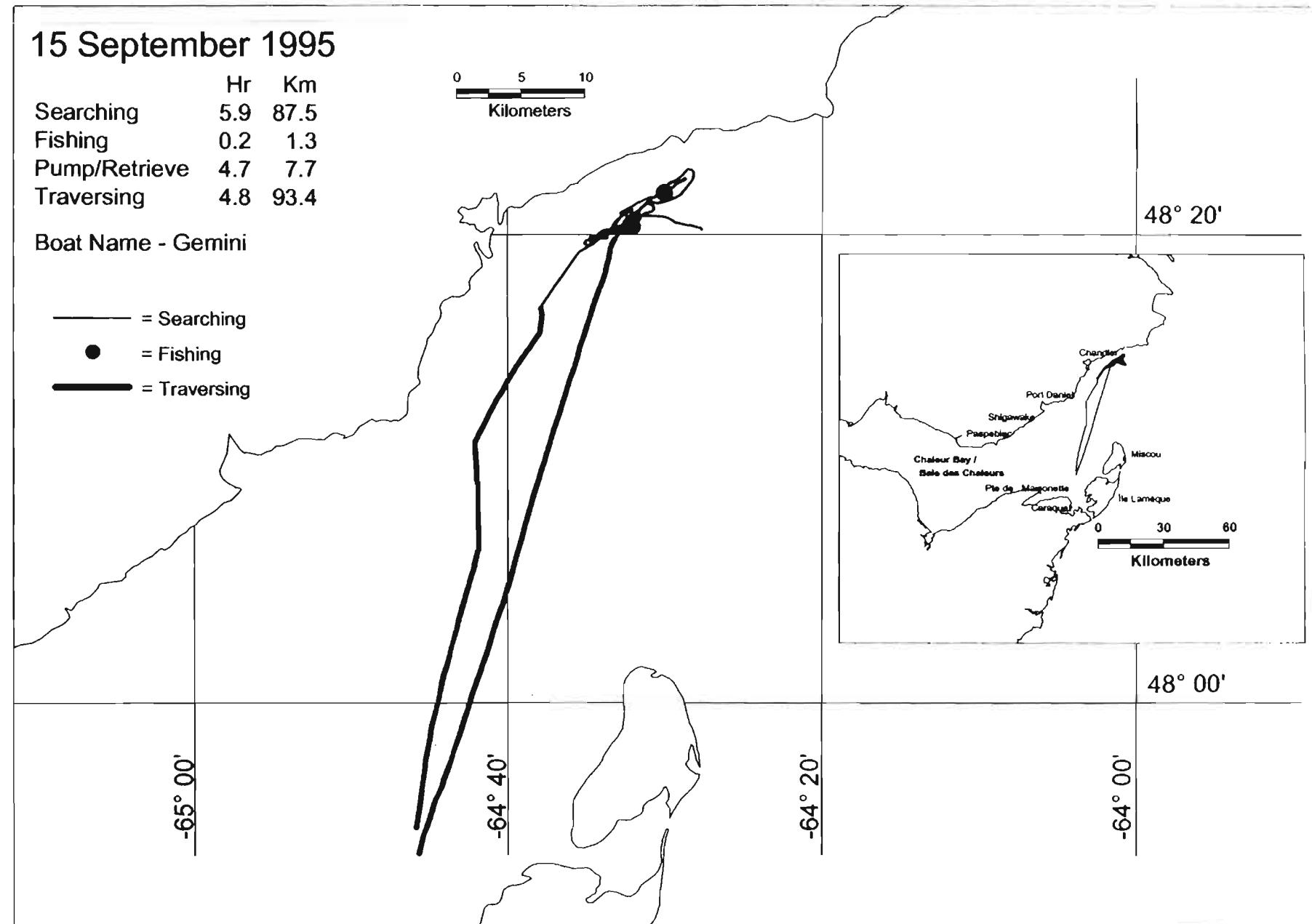
15 September 1995

	Hr	Km
Searching	5.9	87.5
Fishing	0.2	1.3
Pump/Retrieve	4.7	7.7
Traversing	4.8	93.4

0 5 10
Kilometers

Boat Name - Gemini

- = Searching
- = Fishing
- = Traversing



16 September 1995

	Hr	Km
Searching	1.1	16.8
Traversing	3.9	76.2

0 5 10
Kilometers

Boat Name - Gemini

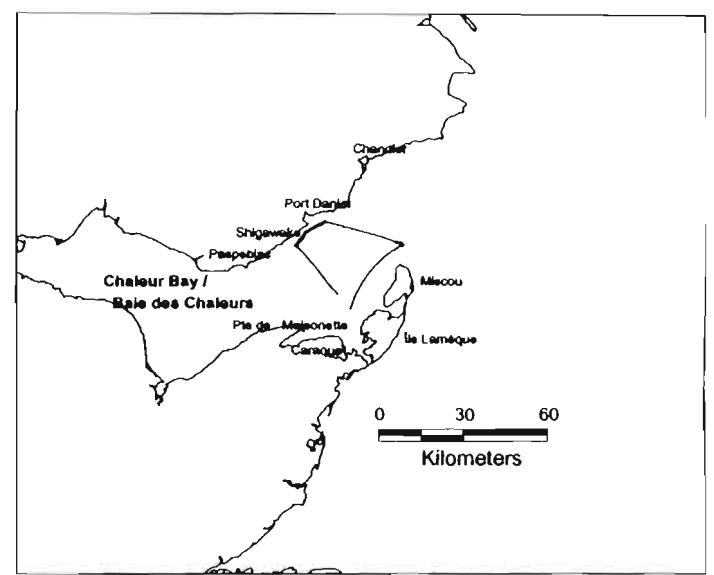
— = Searching
— = Traversing

48° 00'

-65° 00'

-64° 40'

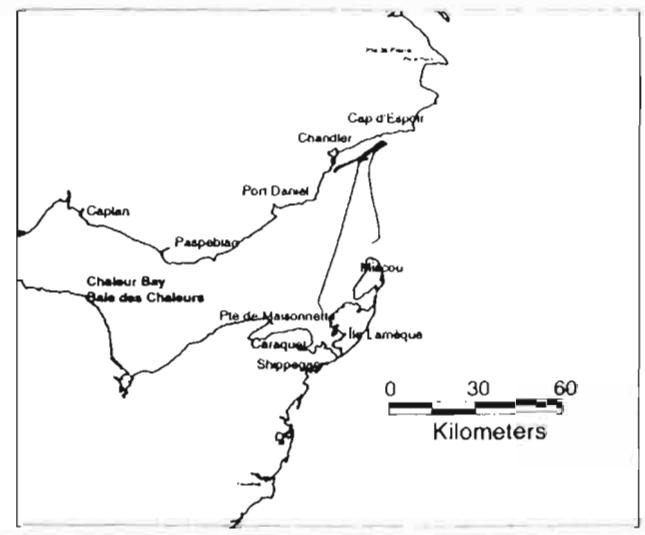
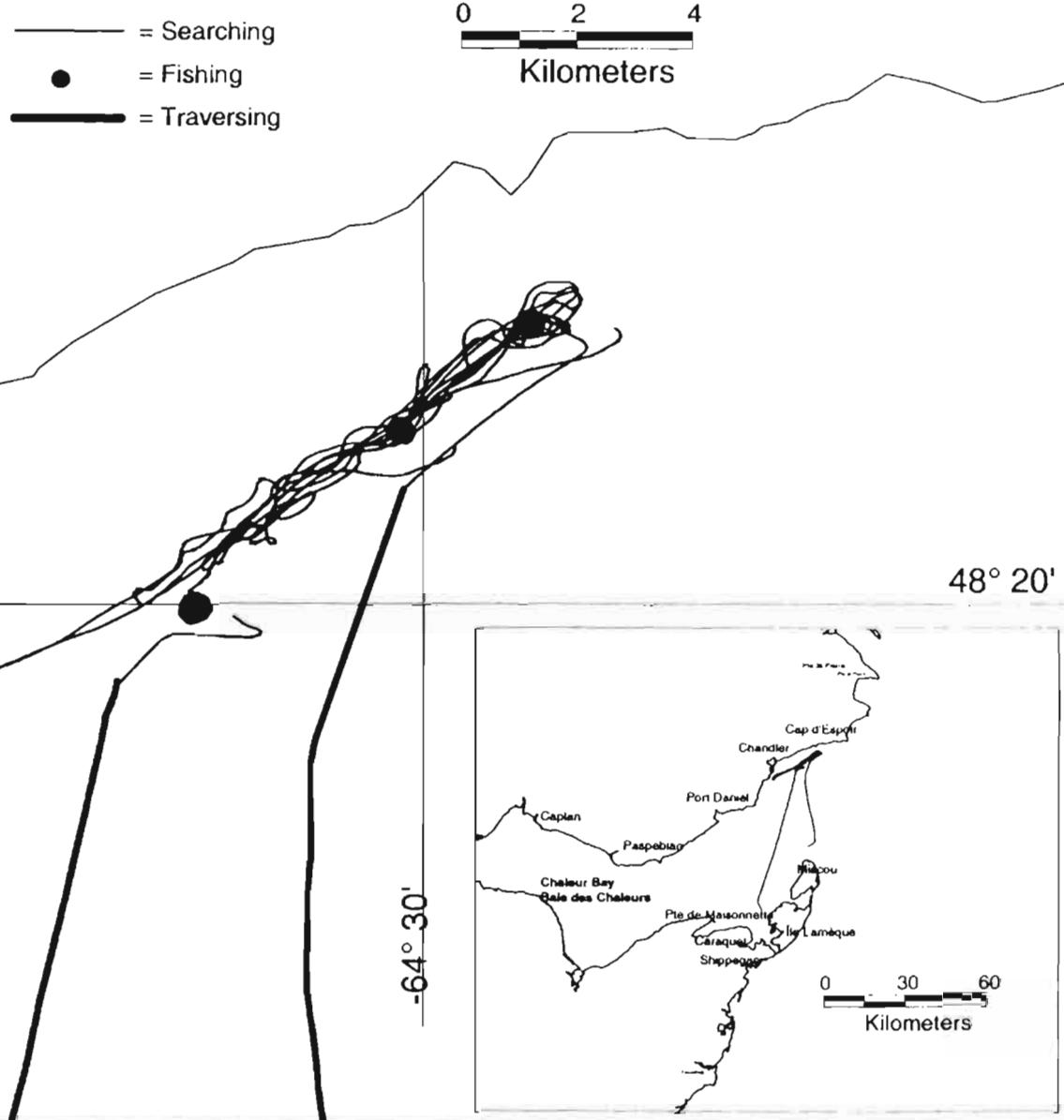
-64° 20'



18 September 1995

	Hr	Km
Searching	8.5	128.4
Fishing	0.3	2.6
Pump/Retrieve	2.7	5.1
Traversing	4.4	83.2

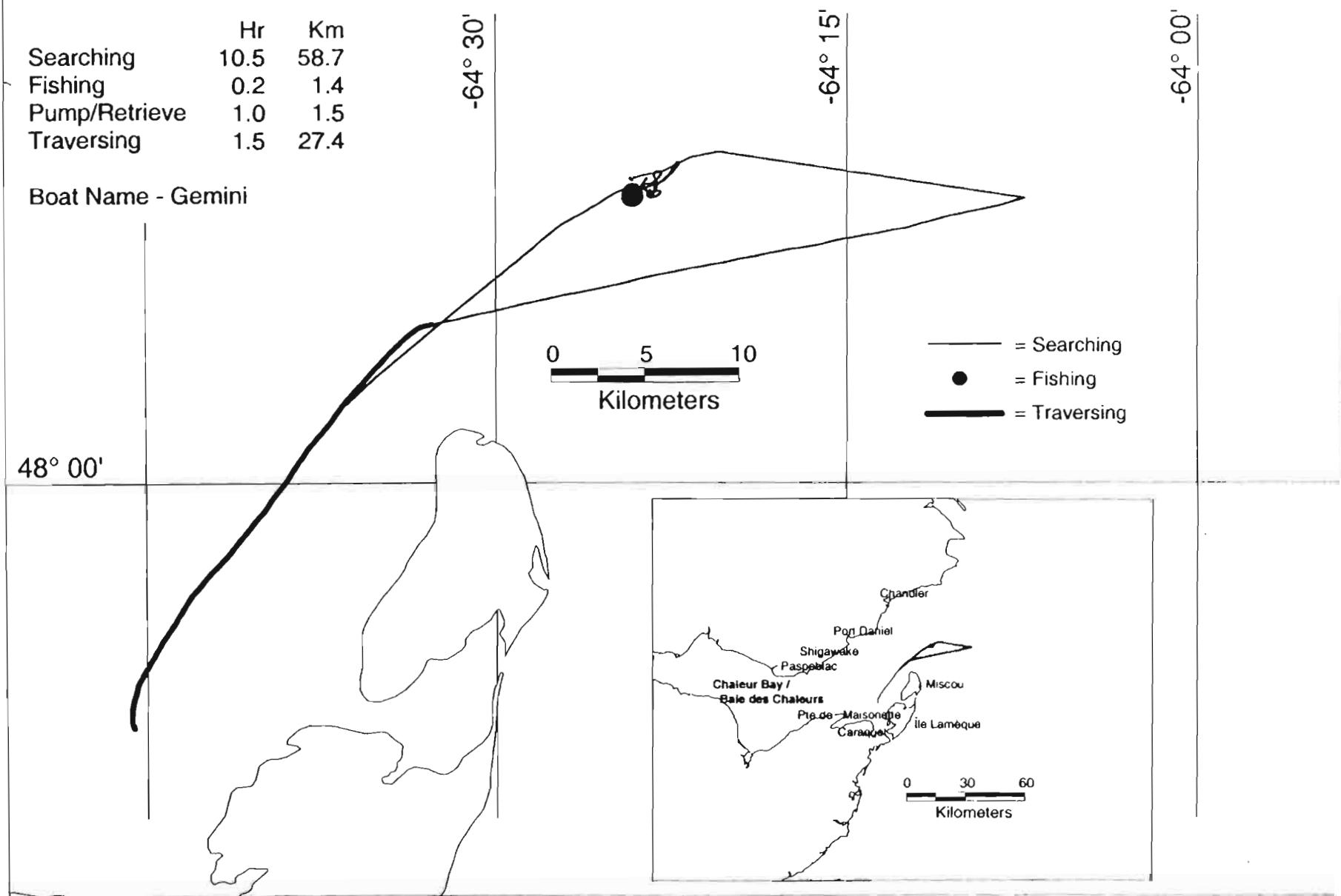
Boat Name - Gemini



19 September 1995

	Hr	Km
Searching	10.5	58.7
Fishing	0.2	1.4
Pump/Retrieve	1.0	1.5
Traversing	1.5	27.4

Boat Name - Gemini



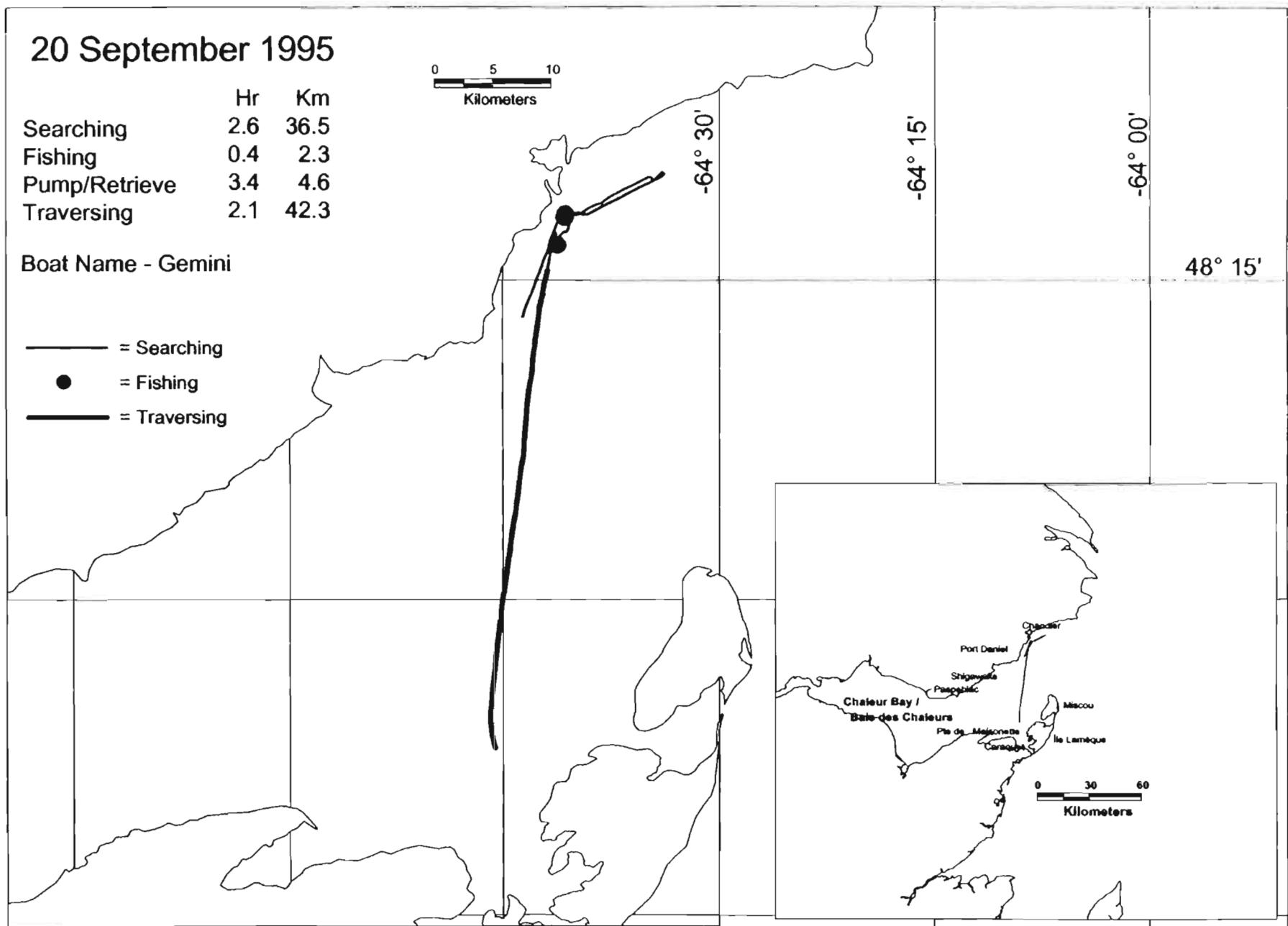
20 September 1995

	Hr	Km
Searching	2.6	36.5
Fishing	0.4	2.3
Pump/Retrieve	3.4	4.6
Traversing	2.1	42.3

0 5 10
Kilometers

Boat Name - Gemini

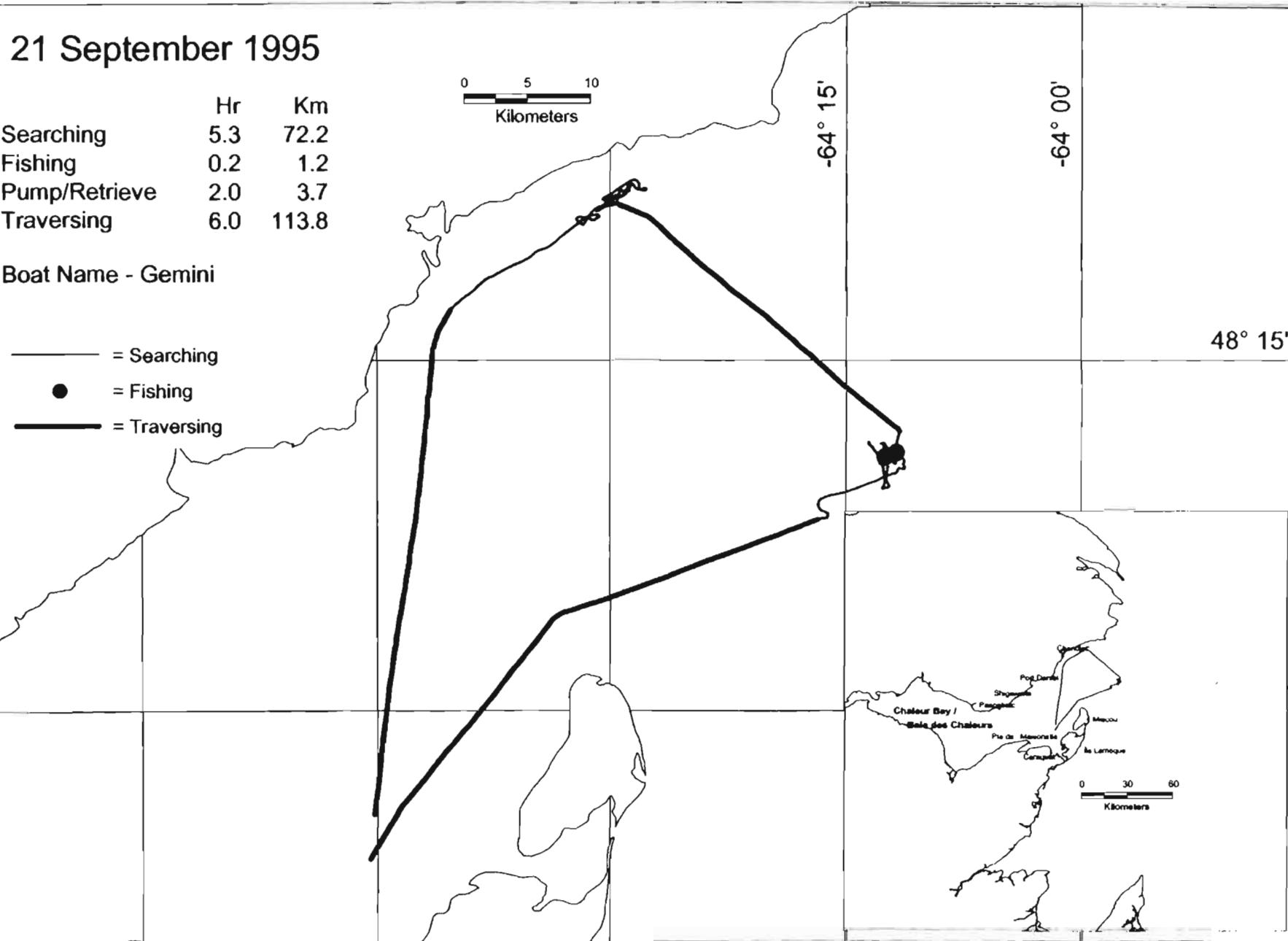
- = Searching
- = Fishing
- = Traversing



21 September 1995

	Hr	Km
Searching	5.3	72.2
Fishing	0.2	1.2
Pump/Retrieve	2.0	3.7
Traversing	6.0	113.8

Boat Name - Gemini

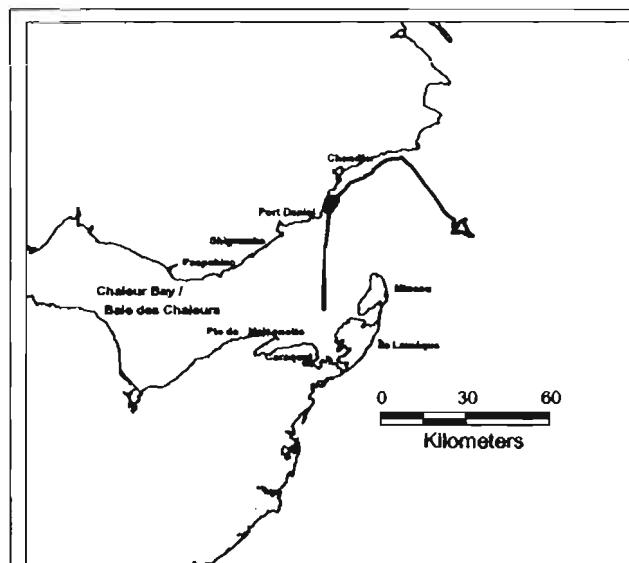


24 September 1995

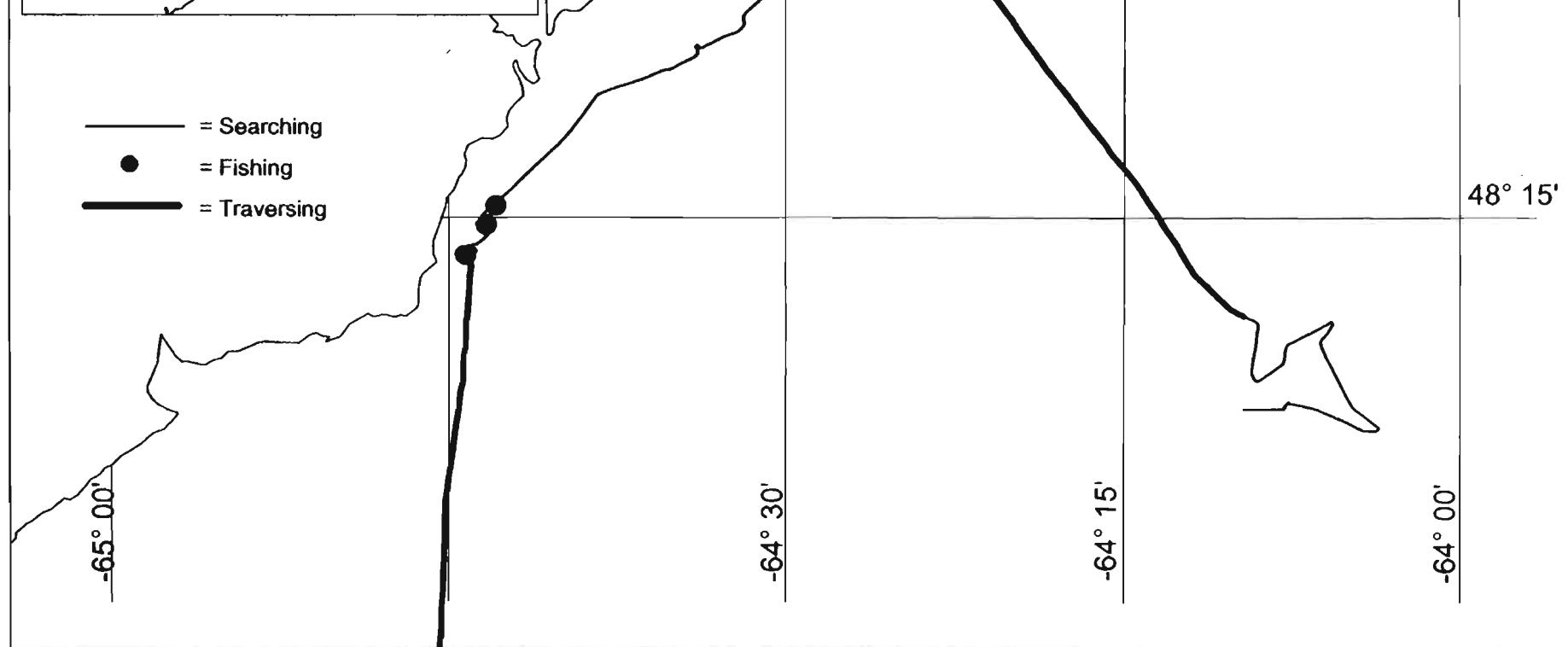
	Hr	Km
Searching	4.0	62.8
Fishing	0.3	2.1
Pump/Retrieve	3.5	5.2
Traversing	3.3	63.1

Boat Name - Gemini

0 5 10
Kilometers



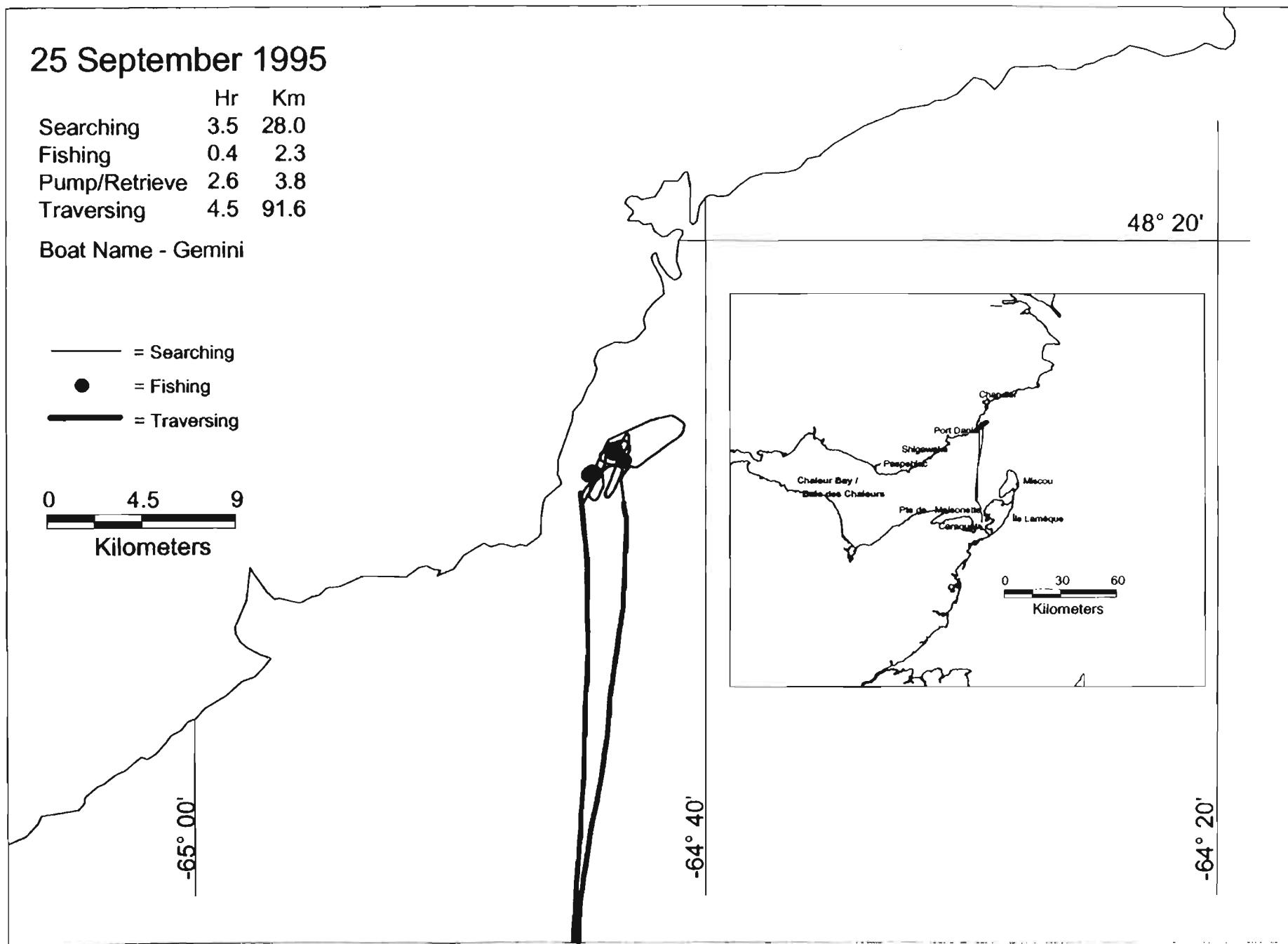
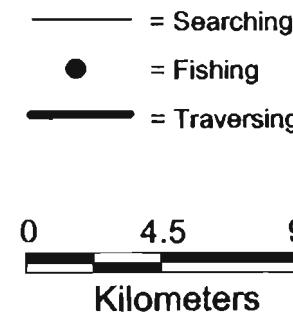
- = Searching
- = Fishing
- = Traversing



25 September 1995

	Hr	Km
Searching	3.5	28.0
Fishing	0.4	2.3
Pump/Retrieve	2.6	3.8
Traversing	4.5	91.6

Boat Name - Gemini



26 September 1995



	Hr	Km
Searching	3.2	41.2
Fishing	0.5	3.4
Pump/Retrieve	5.0	7.0
Traversing	3.9	75.2

Boat Name - Gemini

48° 20'

48° 10'

-64° 20'

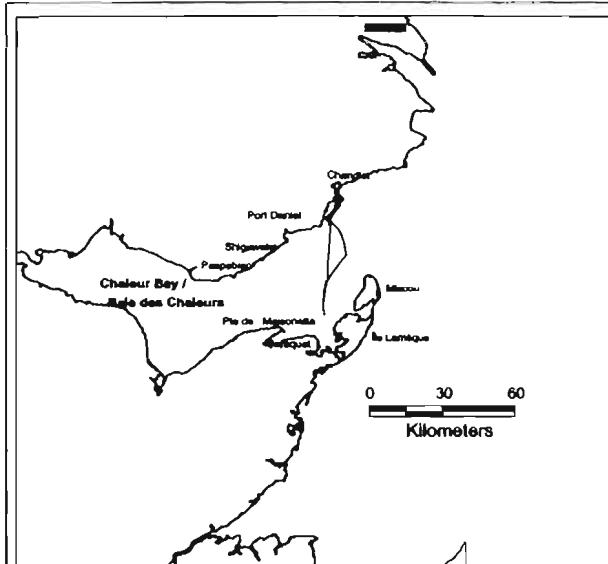
-64° 30'

-64° 40'

-64° 50'

-65° 00'

- = Searching
- = Fishing
- = Traversing

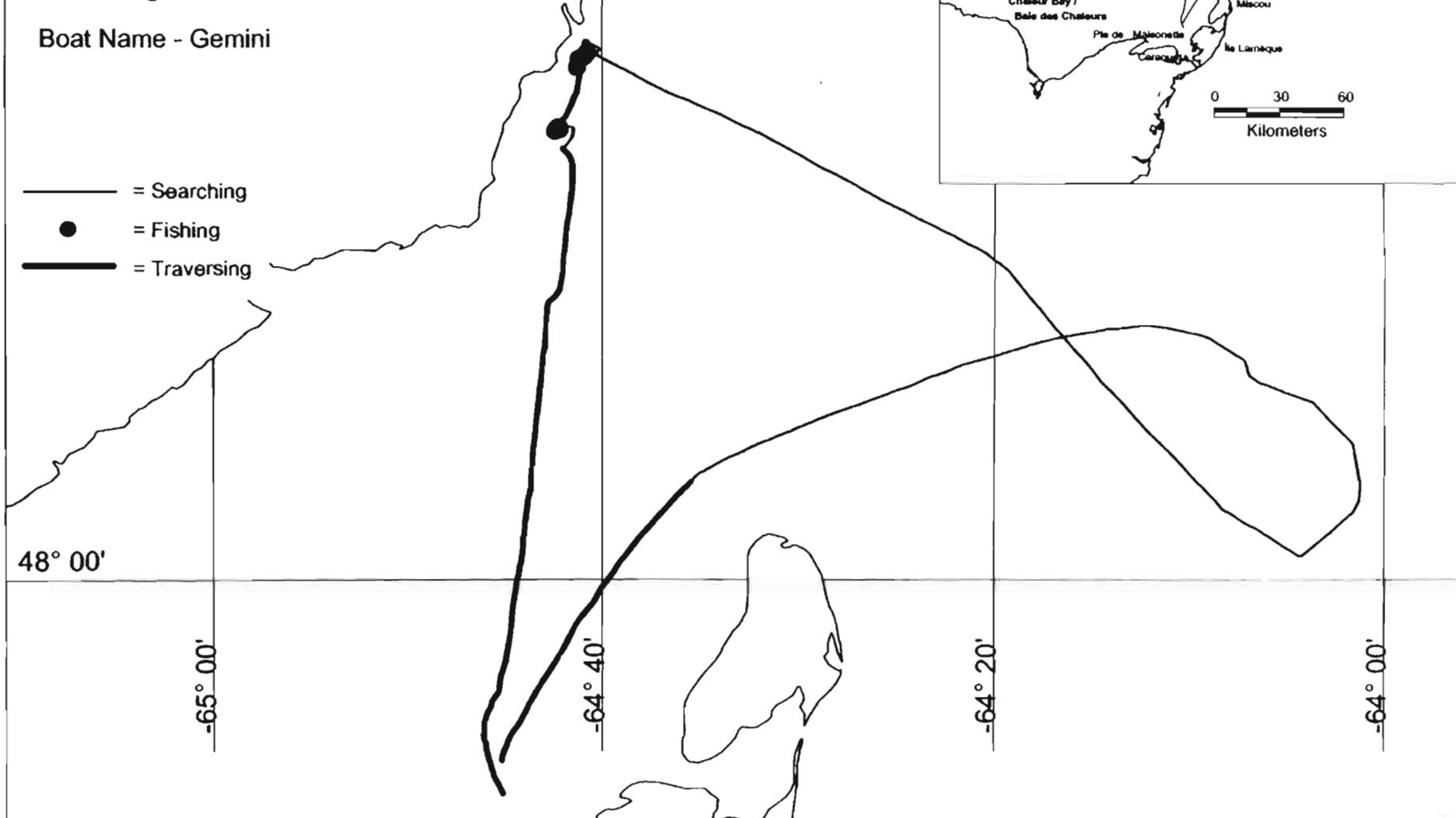


27 September 1995

	Hr	Km
Searching	7.4	124.7
Fishing	0.4	3.5
Pump/Retrieve	4.4	6.4
Traversing	3.9	65.5

Boat Name - Gemini

0 5 10
Kilometers



29 September 1995

	Hr	Km
Searching	6.4	85.1
Fishing	0.4	3.5
Pump/Retrieve	4.6	6.7
Traversing	3.2	47.1

Boat Name - Gemini

- = Searching
- = Fishing
- = Traversing



Kilometers

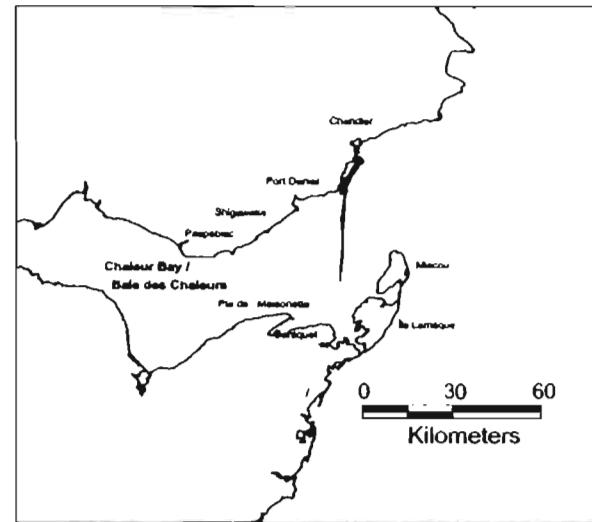
-65° 00'

Hr

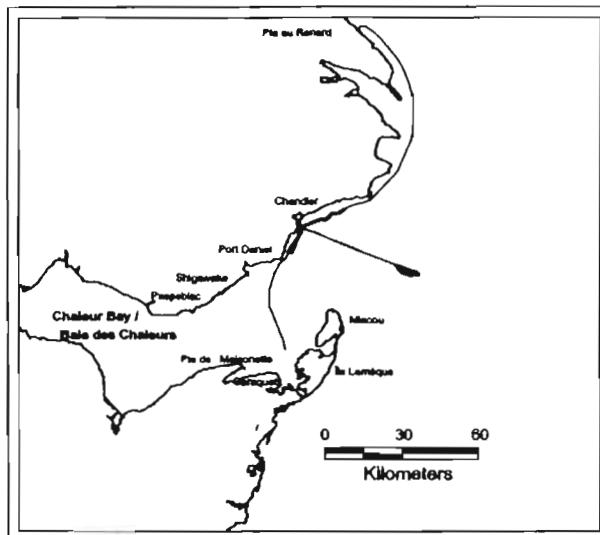
Km

-64° 40'

48° 20'



-64° 20'



0 5 10
Kilometers

30 September 1995

	Hr	Km
Searching	4.7	74.3
Fishing	0.1	0.7
Pump/Retrieve	1.1	1.7
Traversing	11.9	215.9

Boat Name - Gemini

48° 20'

- = Searching
- = Fishing
- = Traversing

-65° 00'

-64° 40'

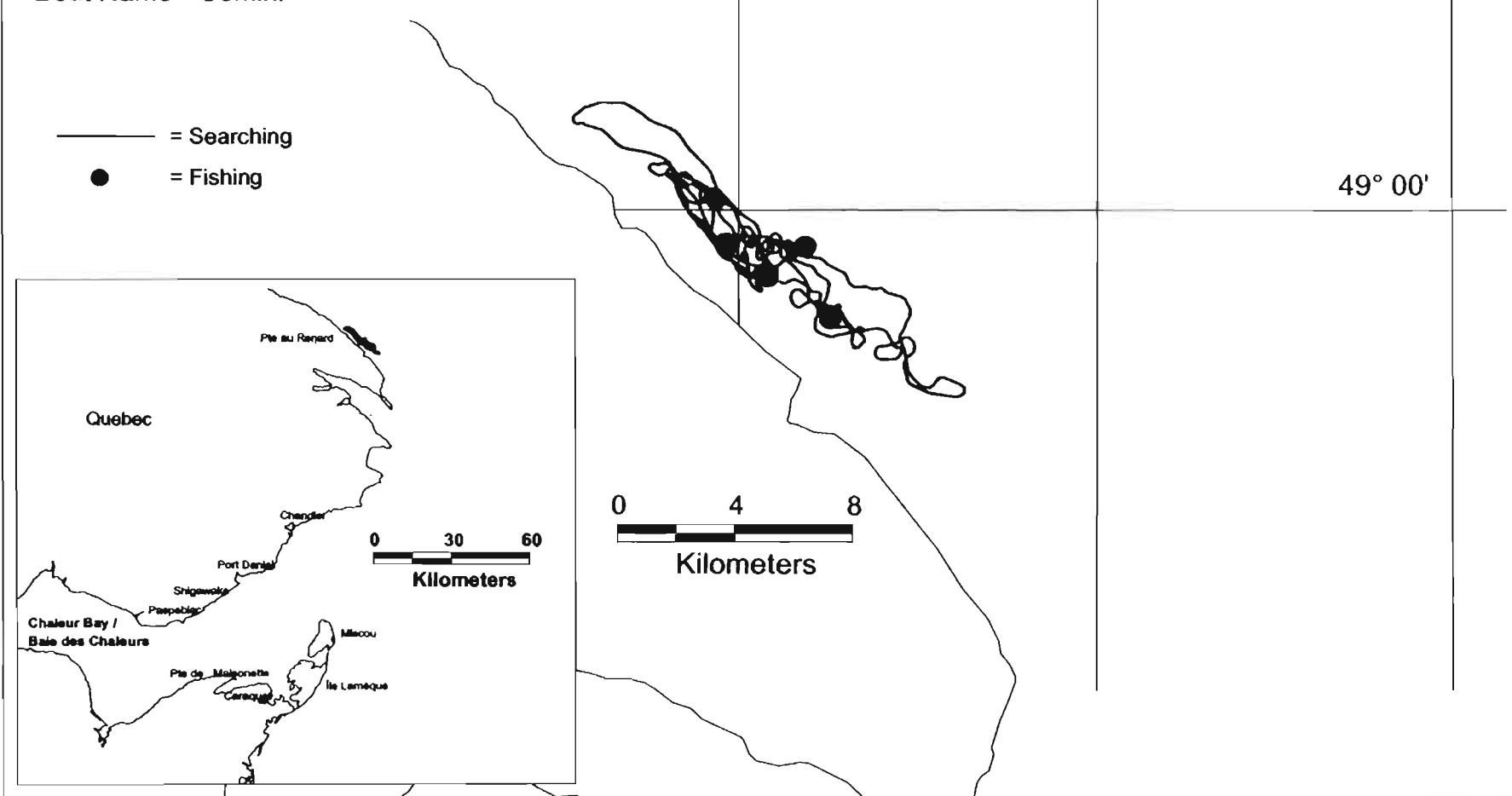
-64° 20'

-64° 00'

01 October 1995

	Hr	Km
Searching	8.1	115.3
Fishing	0.6	4.1
Pump/Retrieve	4.5	7.1

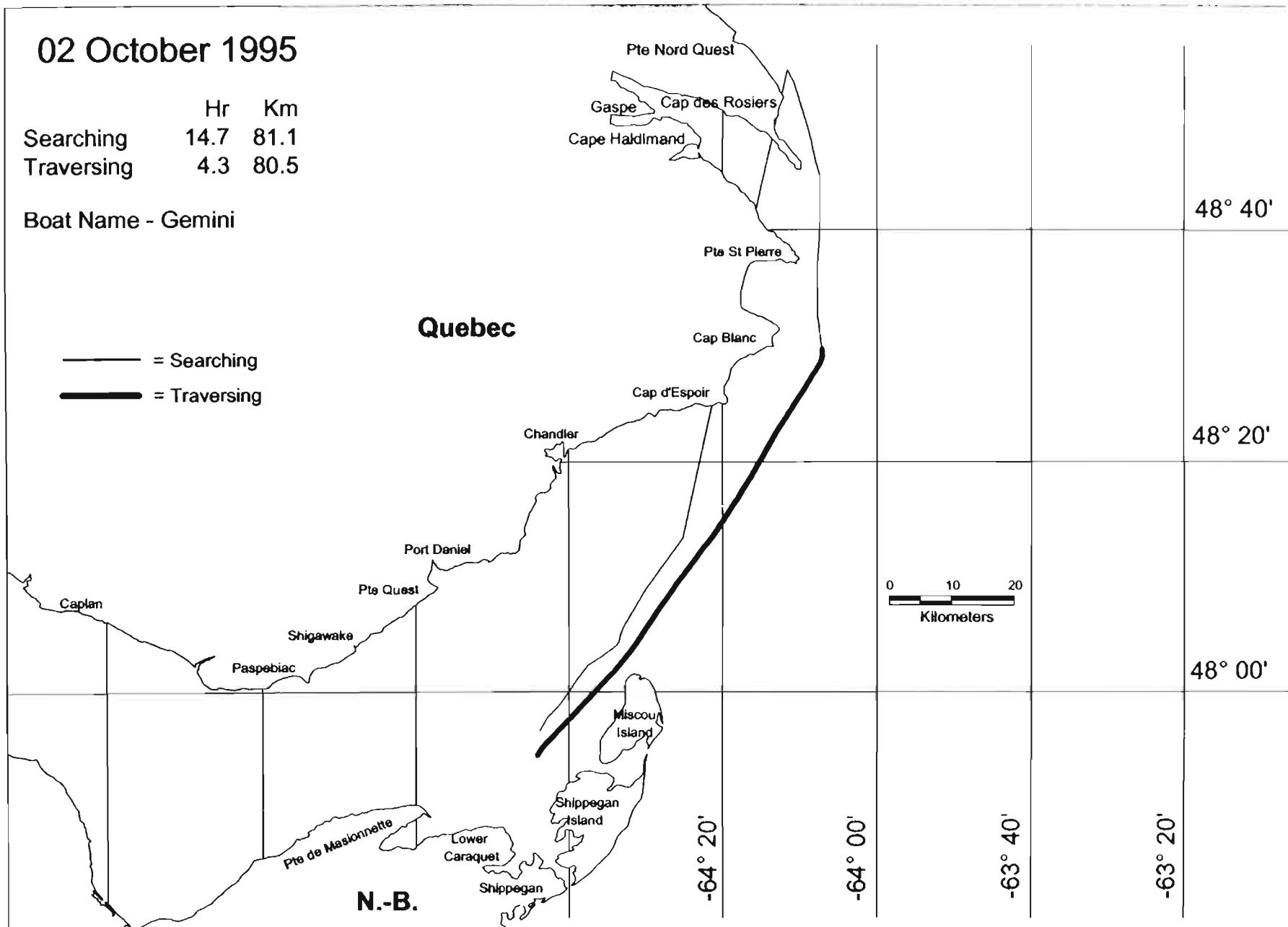
Boat Name - Gemini



02 October 1995

	Hr	Km
Searching	14.7	81.1
Traversing	4.3	80.5

Boat Name - Gemini



03 October 1995

	Hr	Km
Searching	4.8	66.9
Fishing	0.7	5.1
Pump/Retrieve	6.6	9.8
Traversing	4.1	78.0

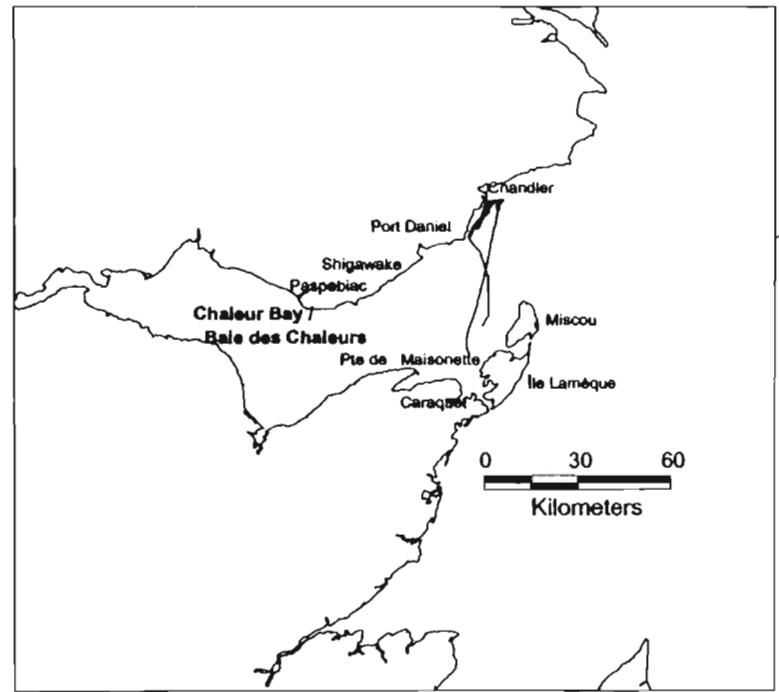
Boat Name - Gemini

- = Searching
- = Fishing
- = Traversing



48° 20'

-64° 35'



04 October 1995

	Hr	Km
Searching	7.0	99.2
Fishing	0.4	2.6
Pump/Retrieve	3.4	5.0
Traversing	4.1	77.1

Boat Name - Gemini

— = Searching

● = Fishing

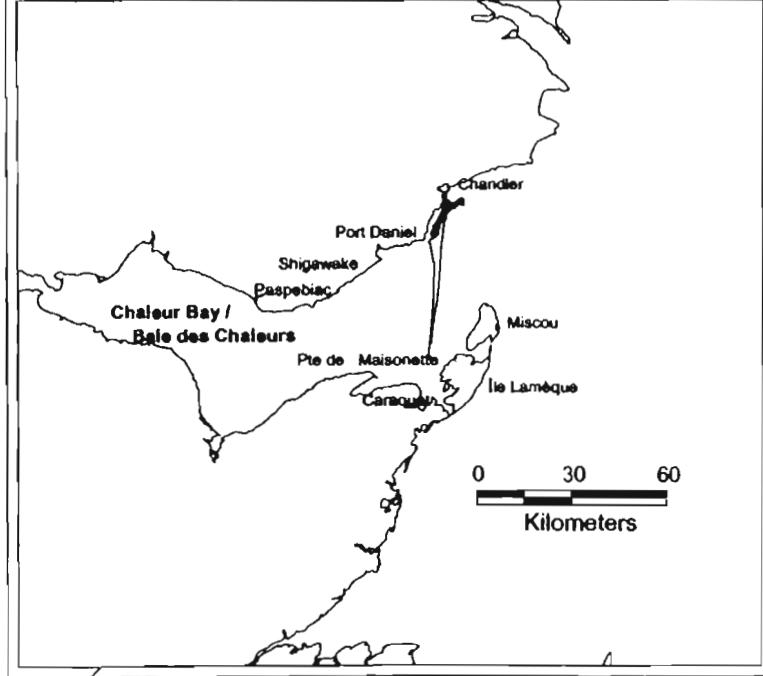
— = Traversing



Kilometers

48° 20'

-64° 40'



05 October 1995

	Hr	Km
Searching	7.0	103.0
Fishing	0.3	2.7
Pump/Retrieve	3.5	4.9
Traversing	1.6	29.8



Boat Name - Gemini

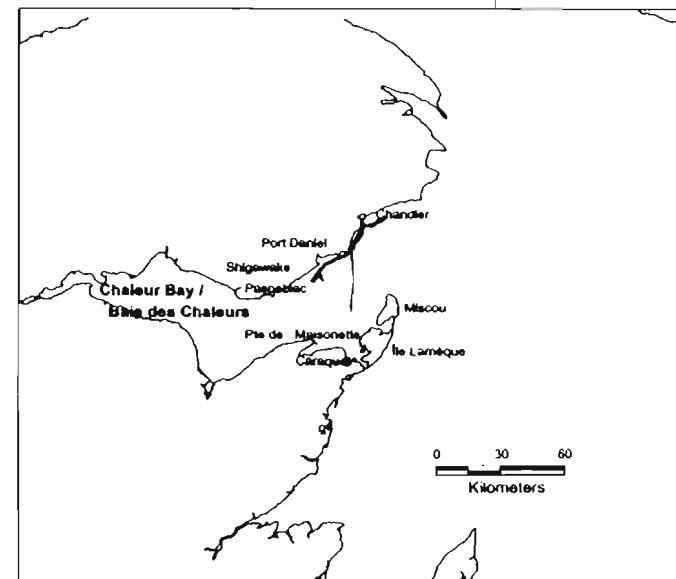
- = Searching
- = Fishing
- = Traversing

-65° 00'

-64° 40'

-64° 20'
48° 00'

48° 20'



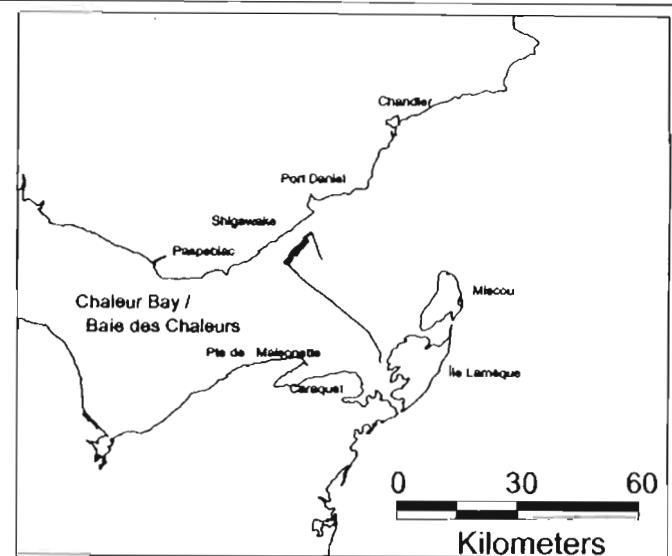
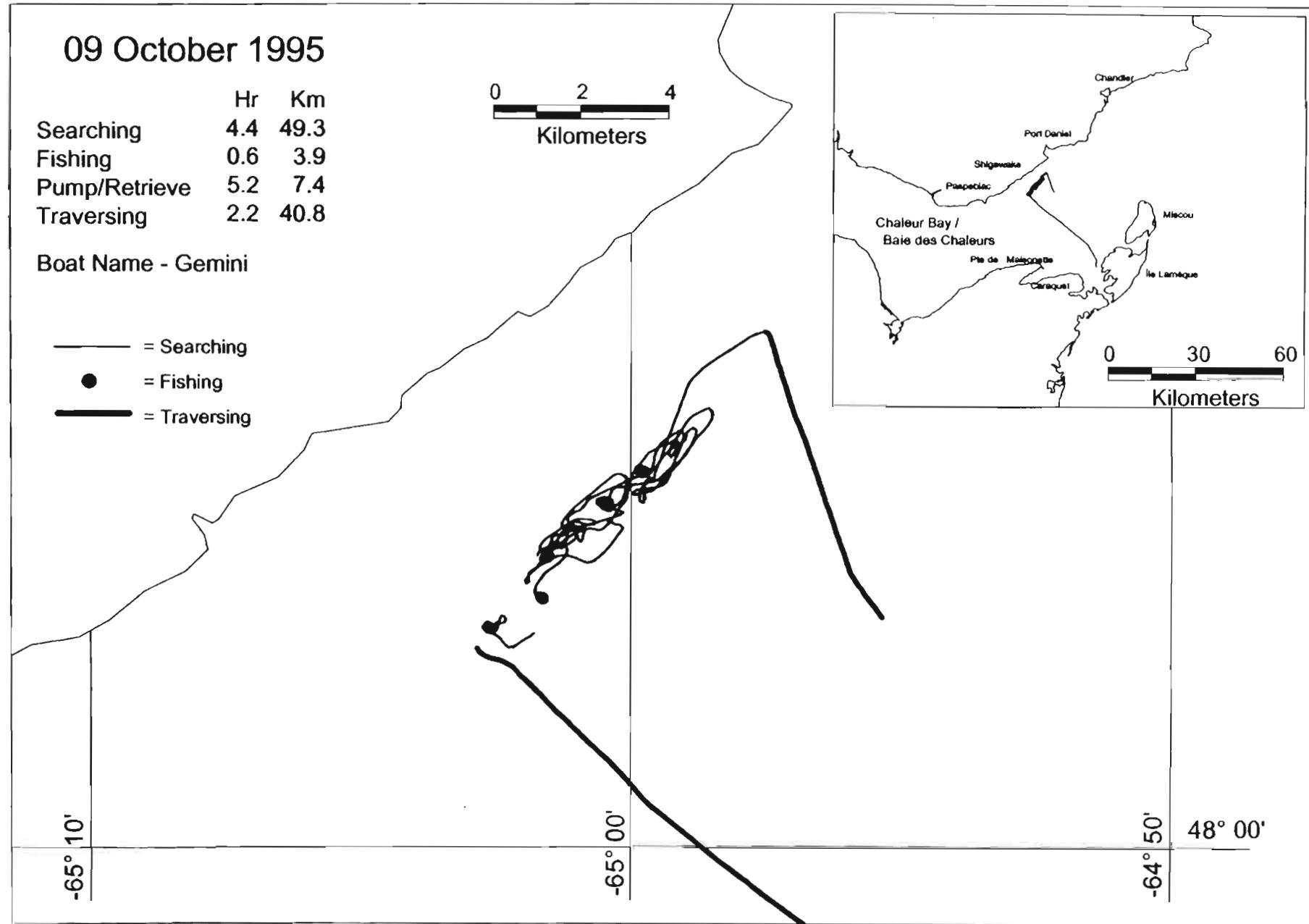
09 October 1995

	Hr	Km
Searching	4.4	49.3
Fishing	0.6	3.9
Pump/Retrieve	5.2	7.4
Traversing	2.2	40.8

0 2 4
Kilometers

Boat Name - Gemini

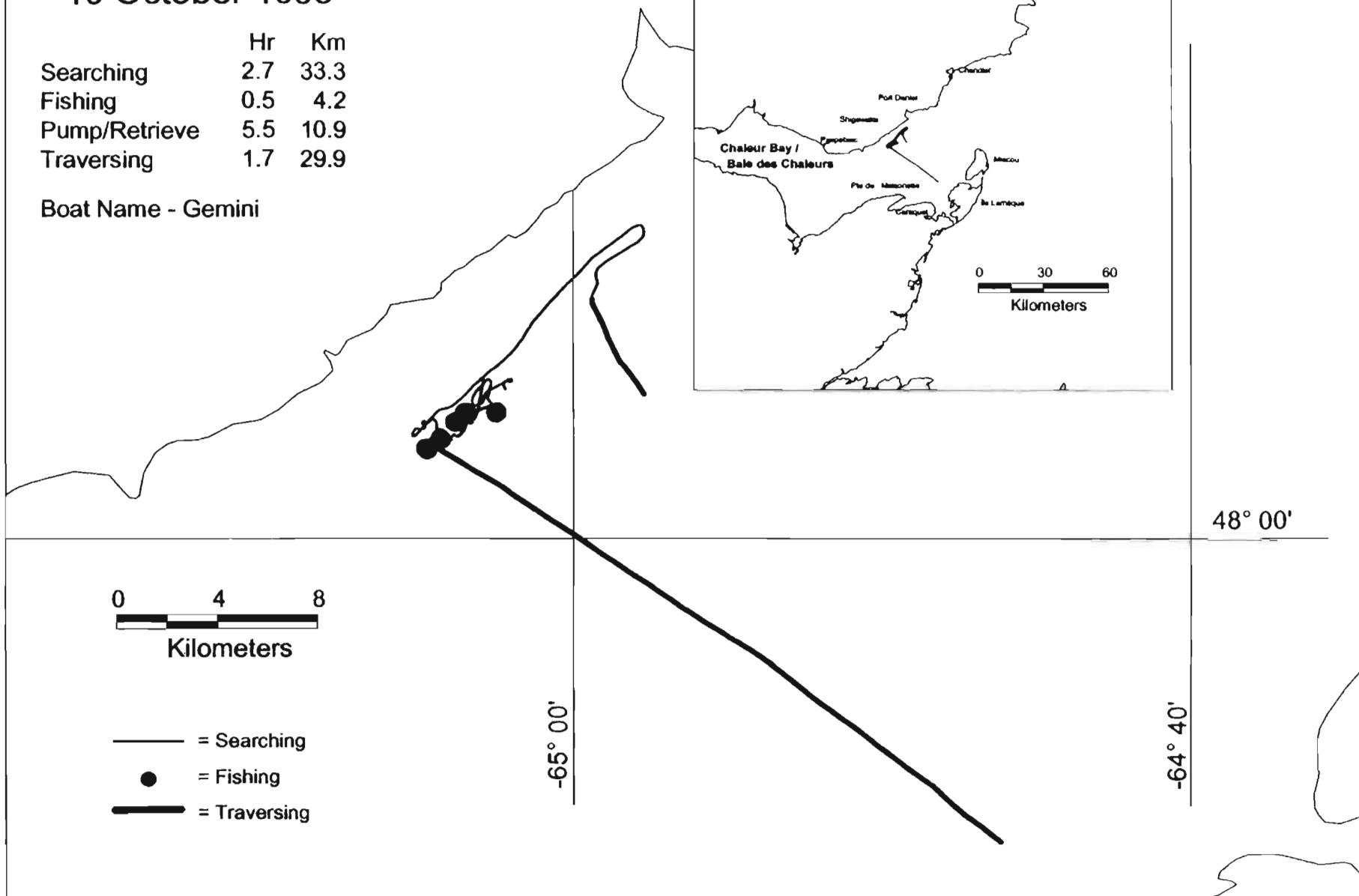
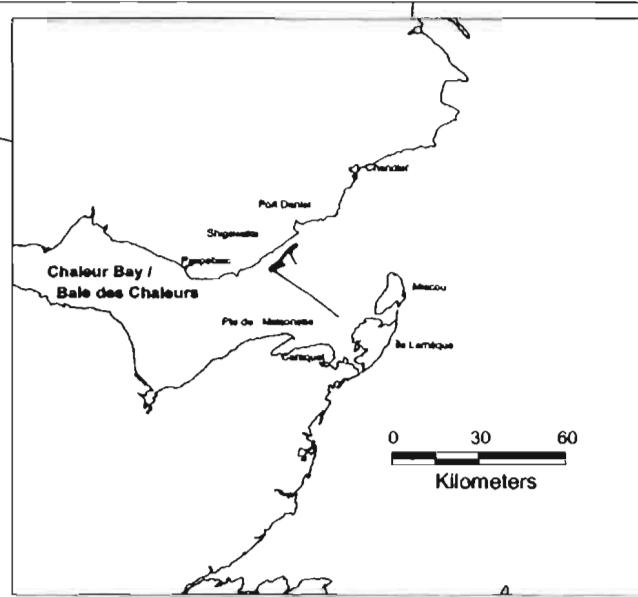
- = Searching
- = Fishing
- = Traversing



10 October 1995

	Hr	Km
Searching	2.7	33.3
Fishing	0.5	4.2
Pump/Retrieve	5.5	10.9
Traversing	1.7	29.9

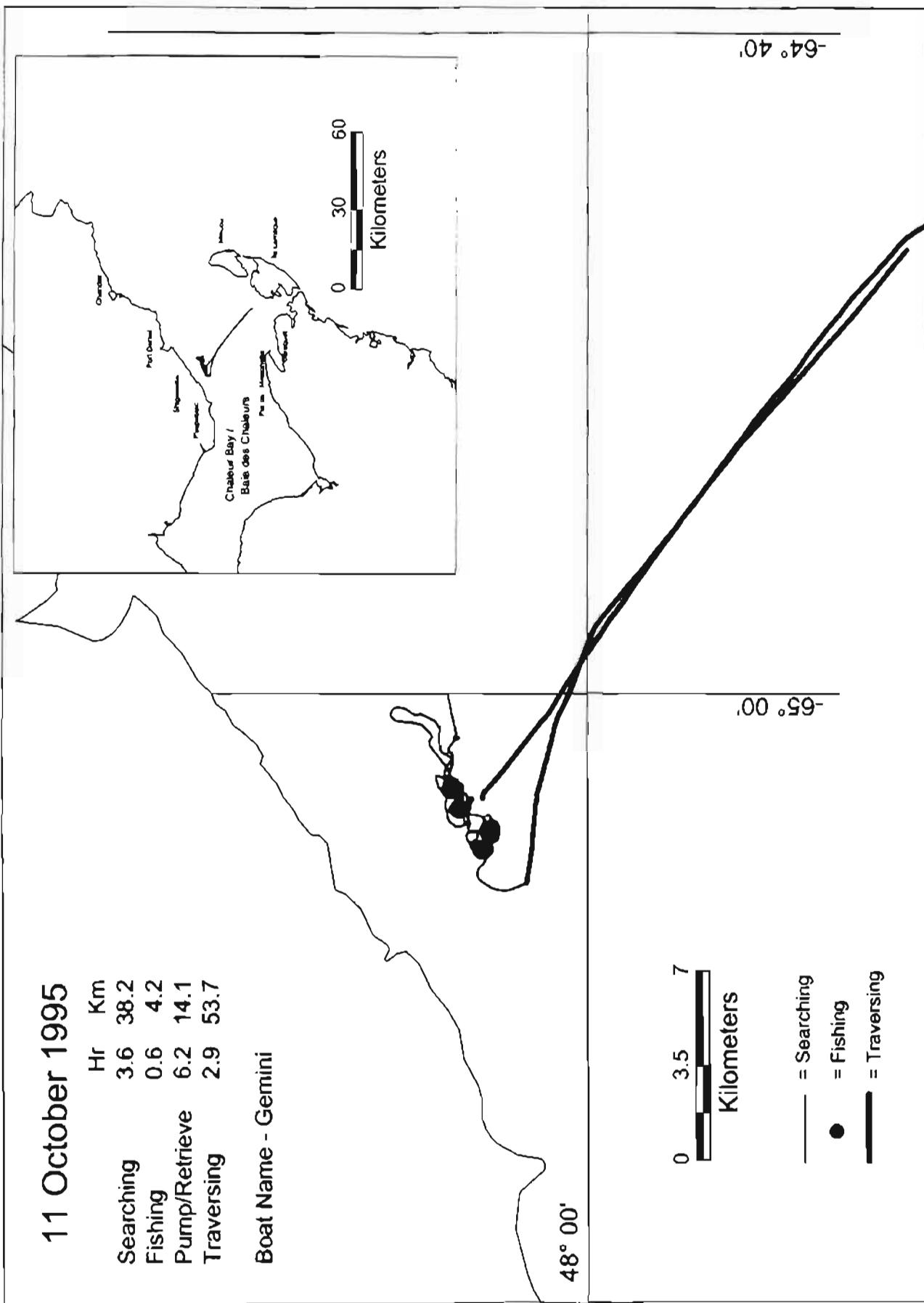
Boat Name - Gemini



11 October 1995

	Hr	Km
Searching	3.6	38.2
Fishing	0.6	4.2
Pump/Retrieve	6.2	14.1
Traversing	2.9	53.7

Boat Name - Gemini

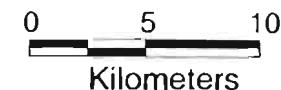


12 October 1995

	Hr	Km
Searching	4.4	61.6
Fishing	0.6	4.3
Pump/Retrieve	6.1	11.6
Traversing	2.9	53.4

Boat Name - Gemini

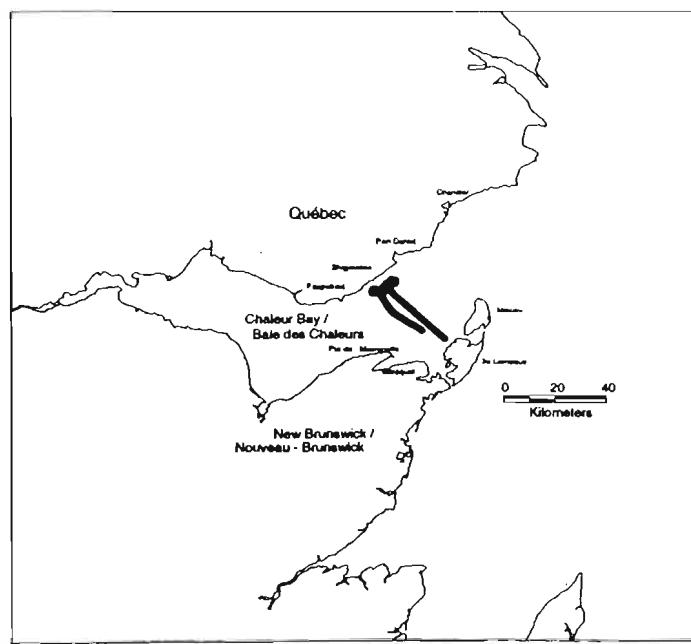
- = Searching
- = Fishing
- = Traversing



48° 00'

-65 00'

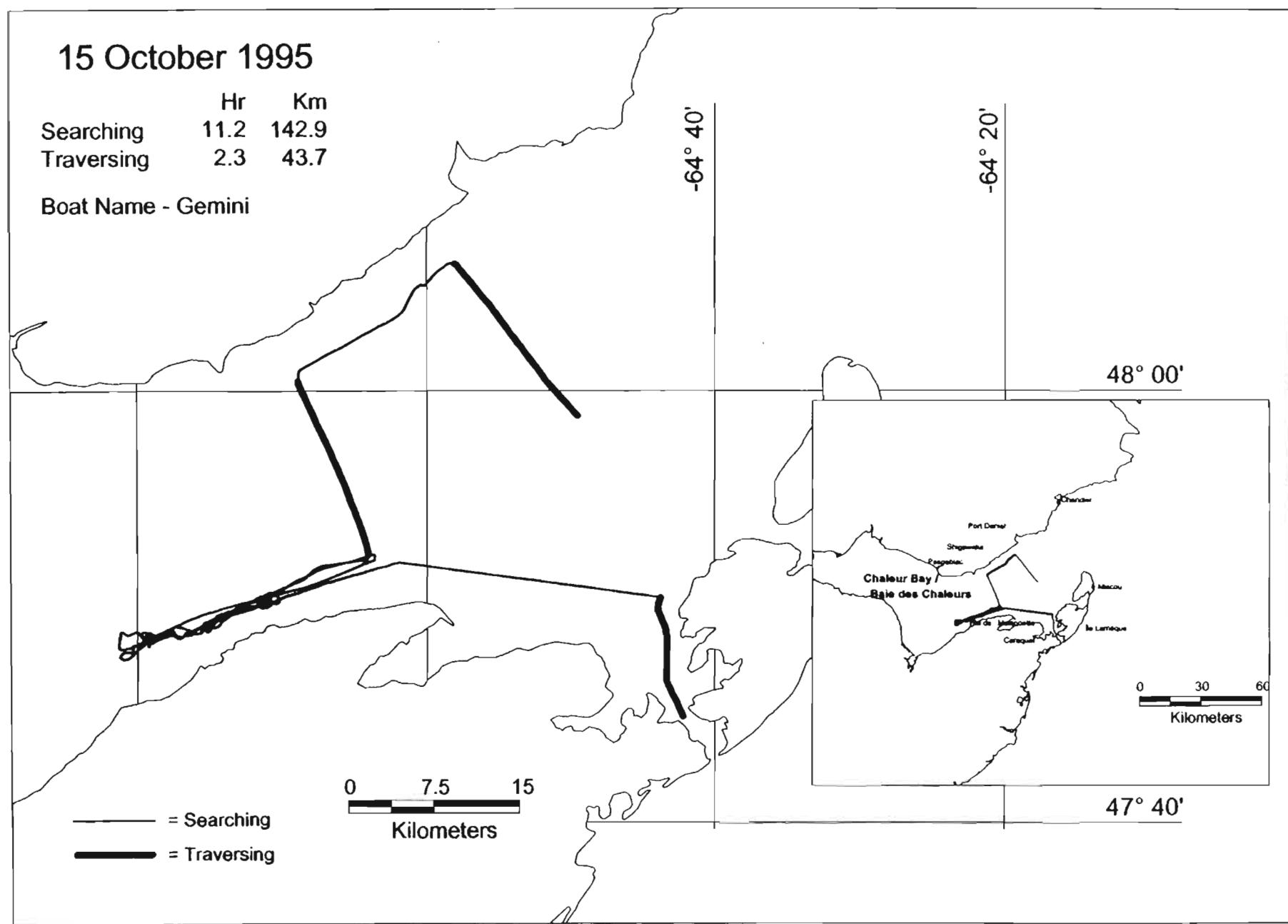
-64 30'



15 October 1995

	Hr	Km
Searching	11.2	142.9
Traversing	2.3	43.7

Boat Name - Gemini



19 October 1995

	Hr	Km
Searching	8.4	151.1
Fishing	0.1	1.1
Pump/Retrieve	2.0	2.9
Traversing	5.9	121.0

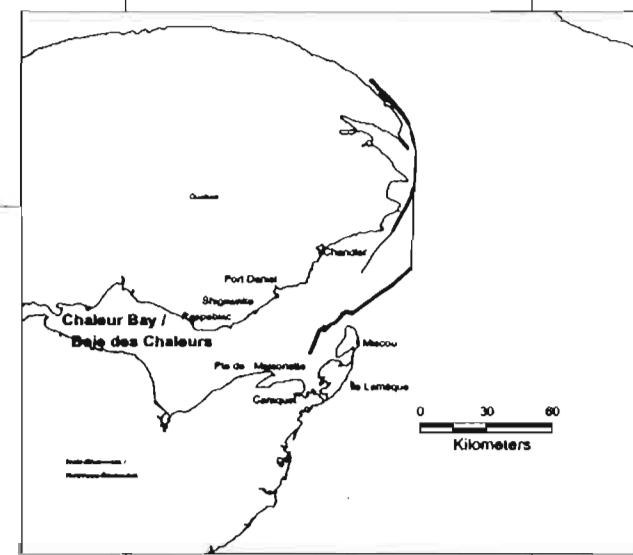
Boat Name - Gemini

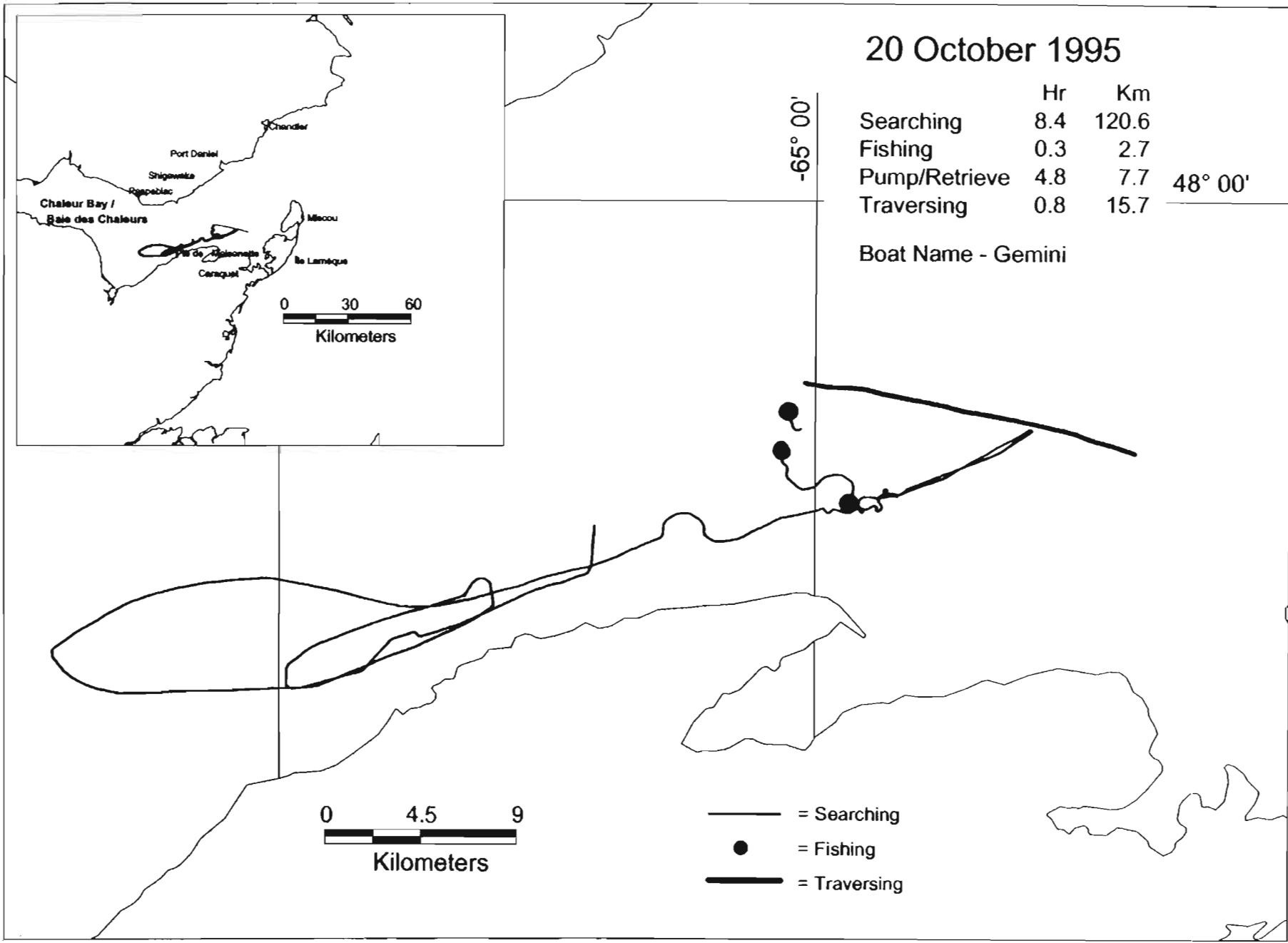
0 7.5 15
Kilometers

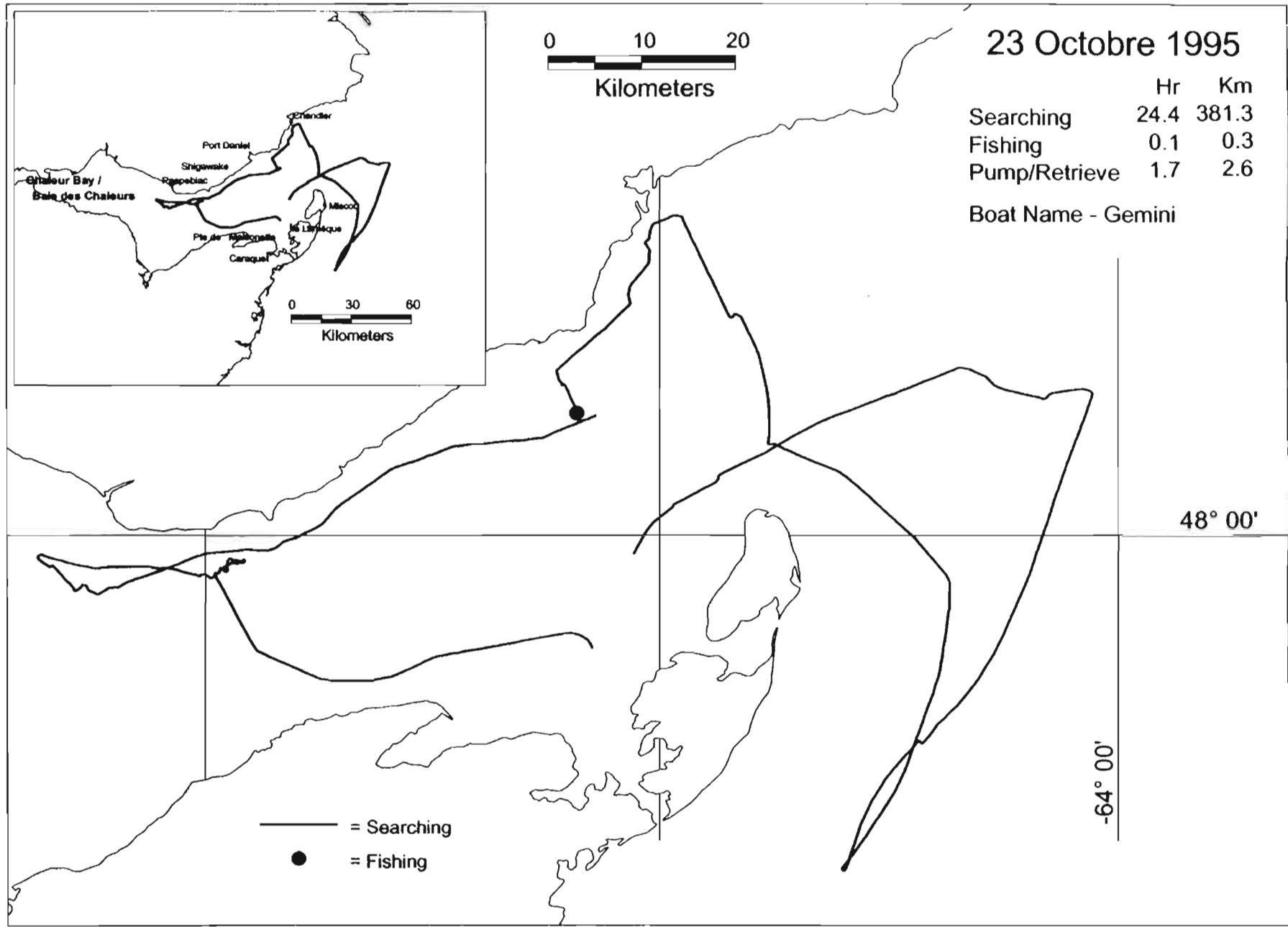
- = Searching
- = Fishing
- = Traversing

-64° 00'

-63° 30'







24 October 1995

Searching Hr Km
 10.3 143.2

Boat Name - Gemini

Gaspésie (Qué.)

0 7.5 15
Kilometers

— = Searching

Port Daniel

Shigawake

Paspebiac

Pte de Maisonneuve

Caraquet

Miscou

Île Lamèque

N.-B.

64° 30'

48° 10'

48° 00'

47° 50'

47° 40'

26 October 1995

Hr Km
Searching 14.6 286.6

Boat Name - Gemini

48° 00'

Chaleur Bay /
Baie des Chaleurs

Pte de Maisonette

Caraquet

Miscou

Île Lameque

= Searching

0 10 20
Kilometers

47° 30'

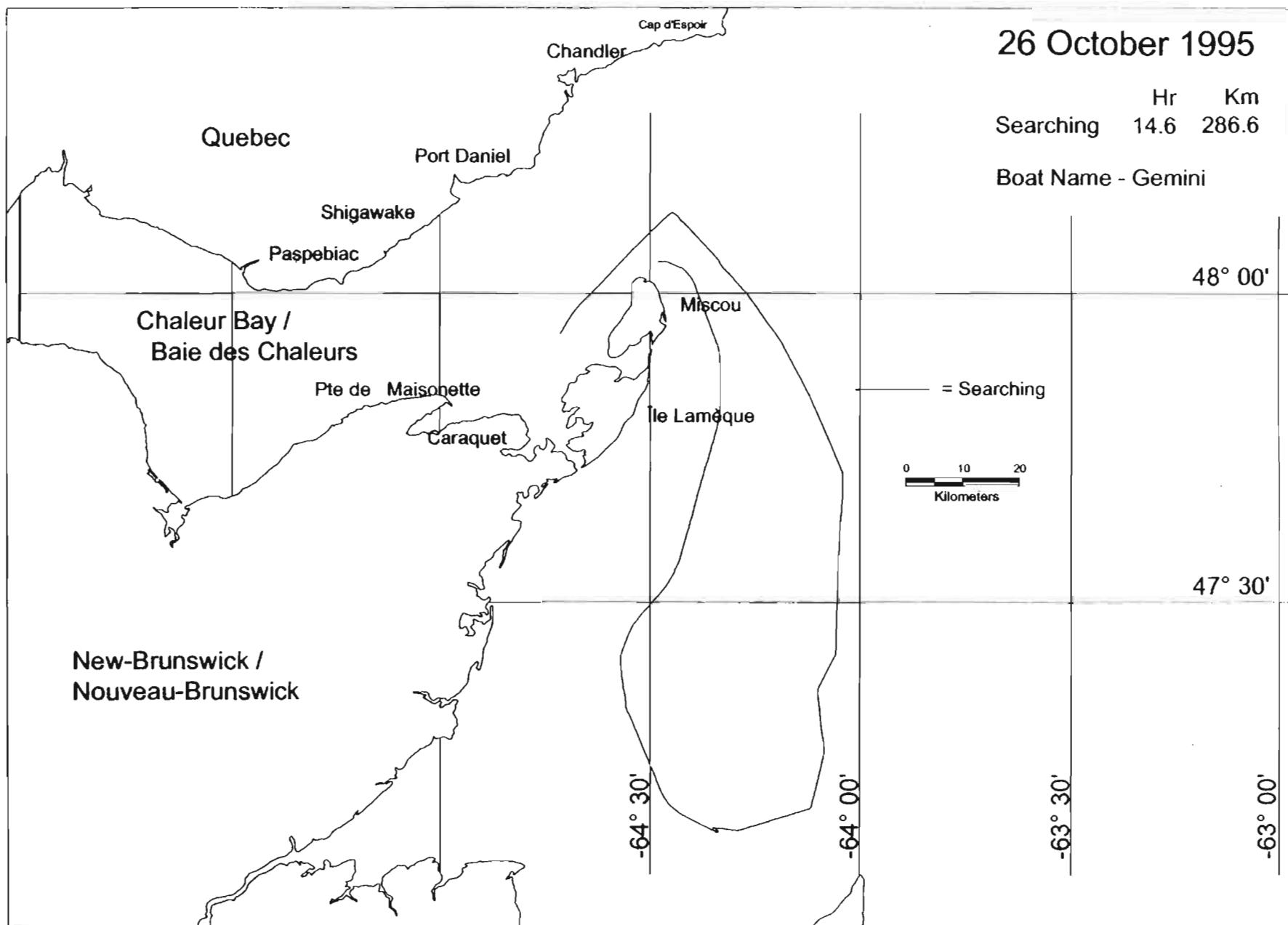
New-Brunswick /
Nouveau-Brunswick

-64° 30'

-64° 00'

-63° 30'

-63° 00'



31 October 1995

	Hr	Km
Searching	2.8	37.8
Fishing	0.3	2.5
Pump/Retrieve	3.6	6.3
Traversing	4.5	88.4

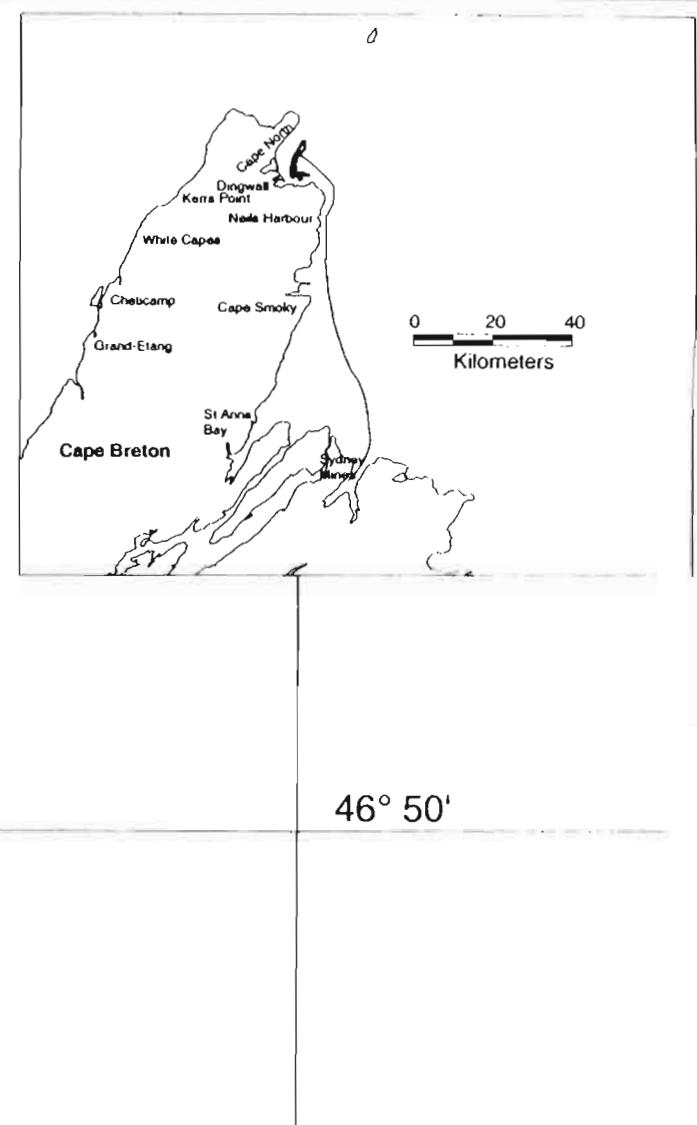
Boat Name - Gemini



- = Searching
- = Fishing
- = Traversing

-60° 20'

46° 50'

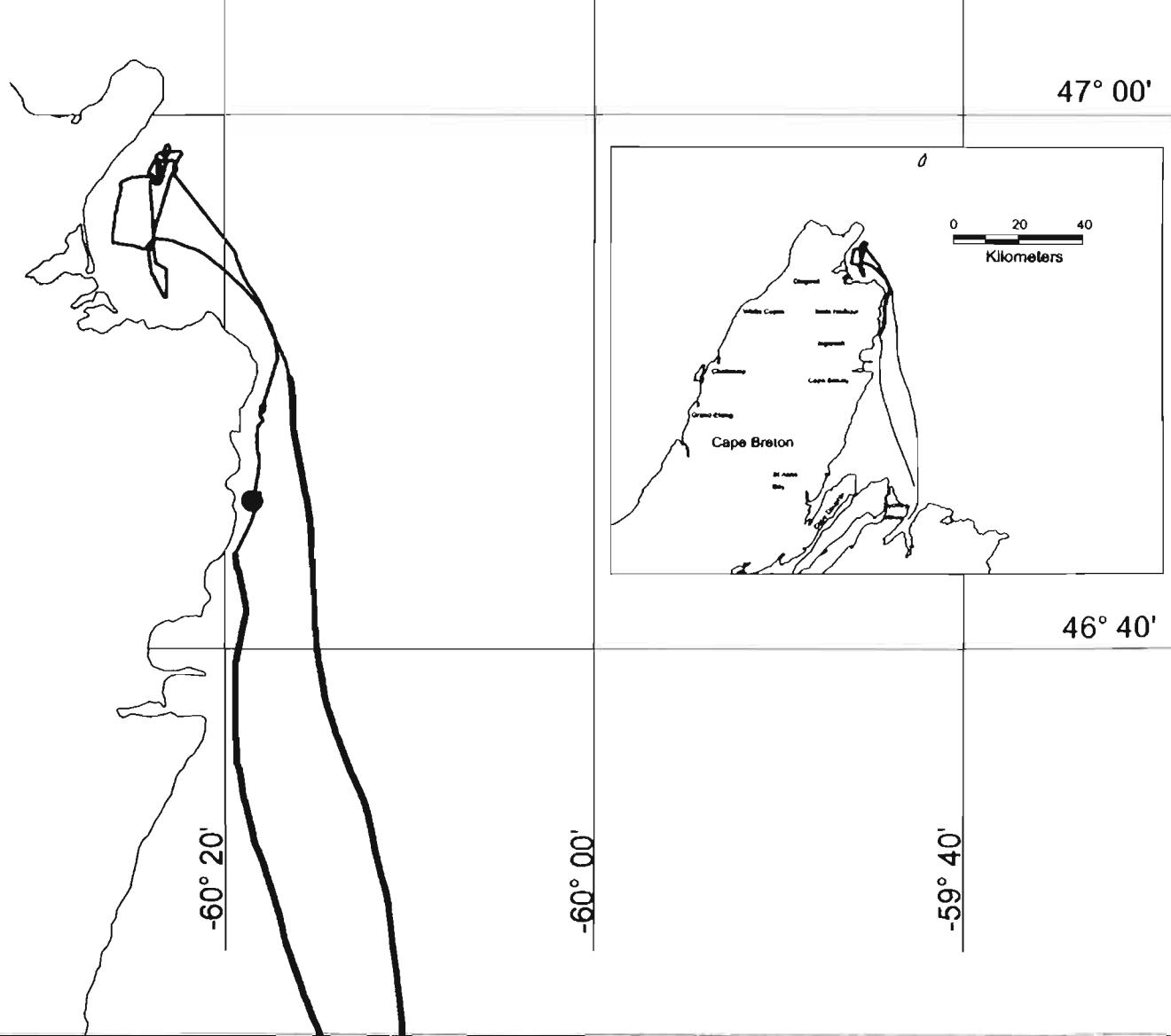


01 November 1995

	Hr	Km
Searching	9.9	87.4
Fishing	0.1	1.1
Pump/Retrieve	1.1	1.8
Traversing	6.3	118.7

Boat Name - Gemini

- = Searching
 - = Fishing
 - = Traversing
- 0 5 10
Kilometers

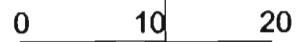


02 November 1995

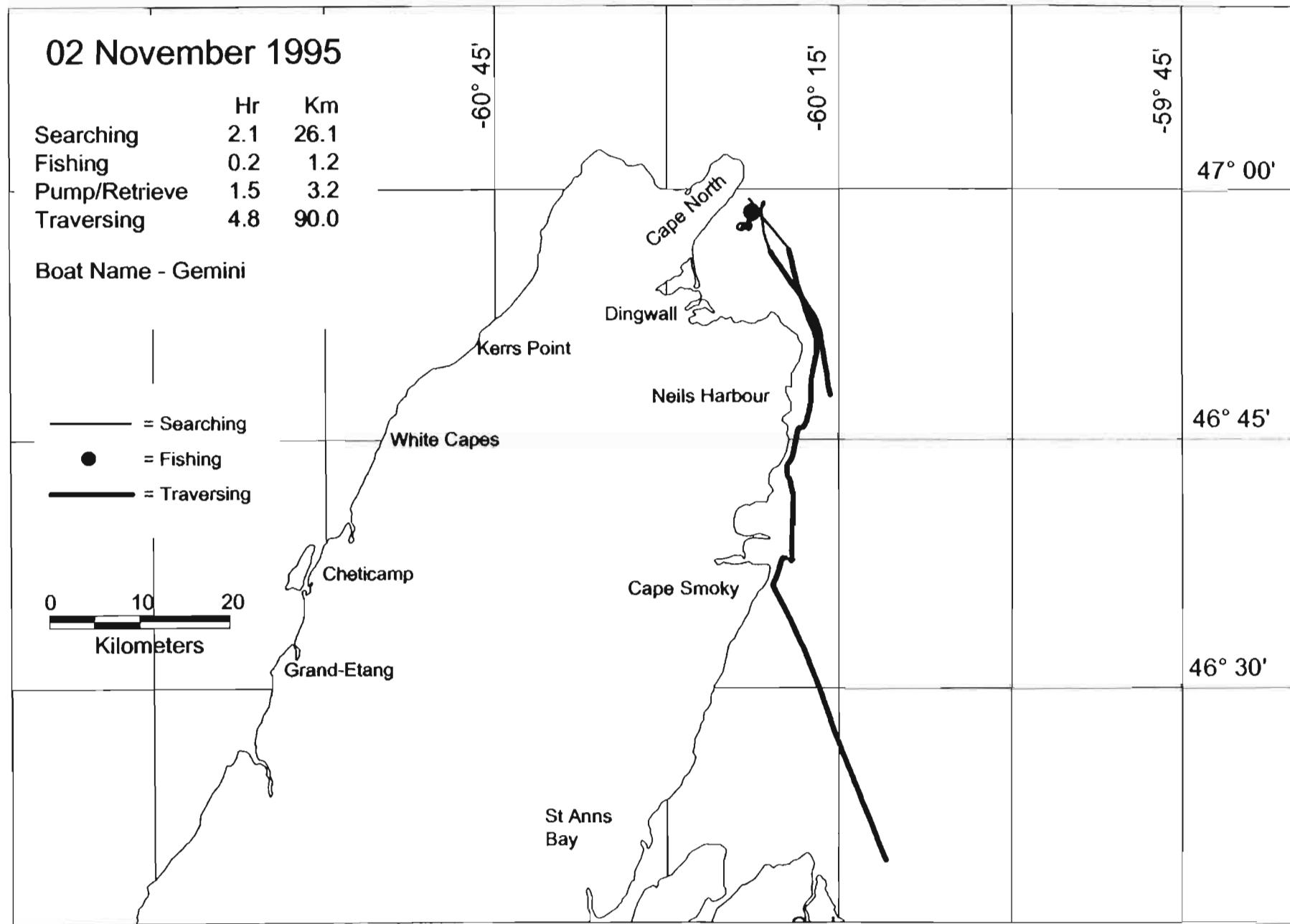
	Hr	Km
Searching	2.1	26.1
Fishing	0.2	1.2
Pump/Retrieve	1.5	3.2
Traversing	4.8	90.0

Boat Name - Gemini

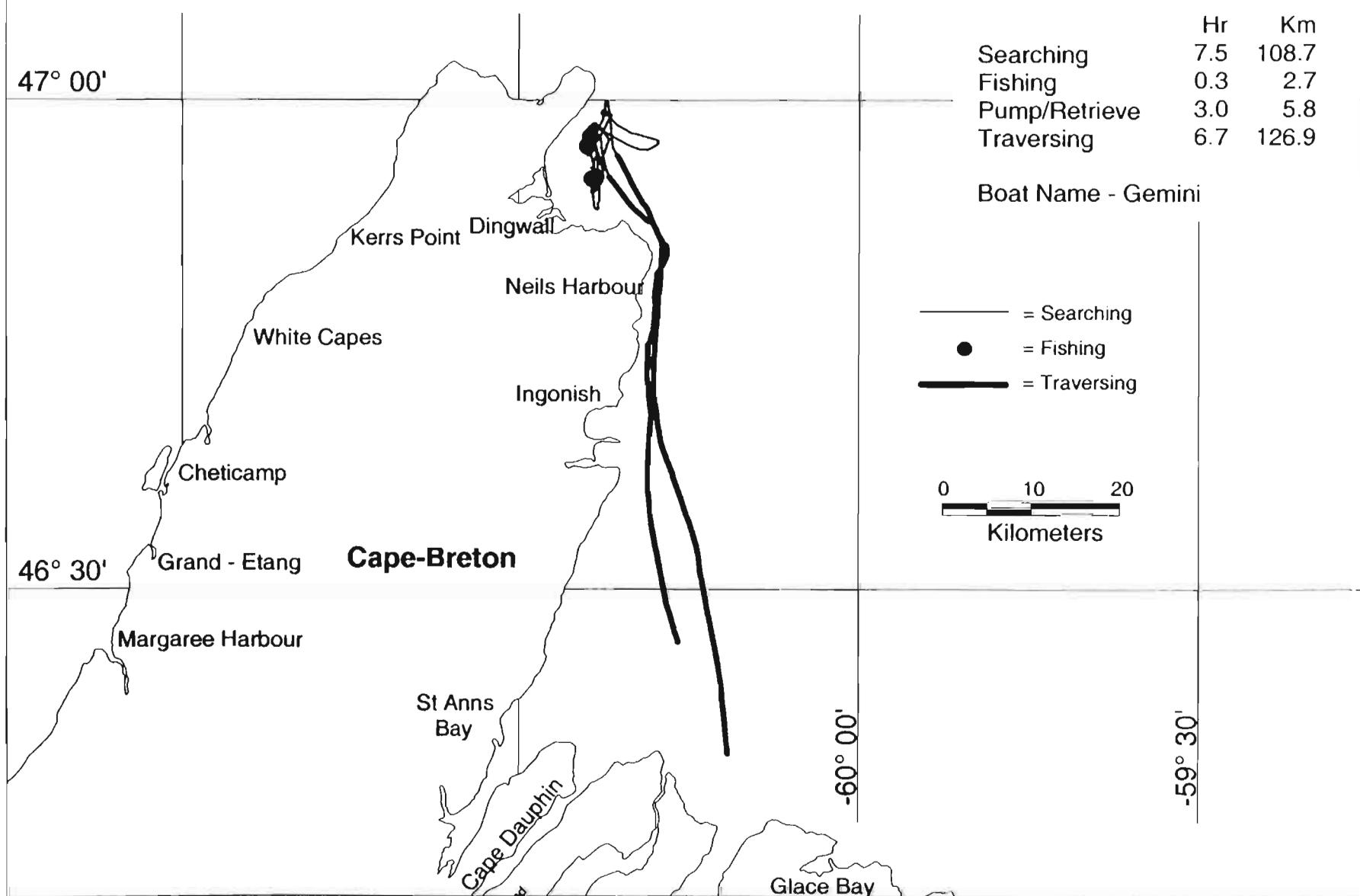
- = Searching
- = Fishing
- = Traversing



Kilometers



06 November 1995



09 November 1995

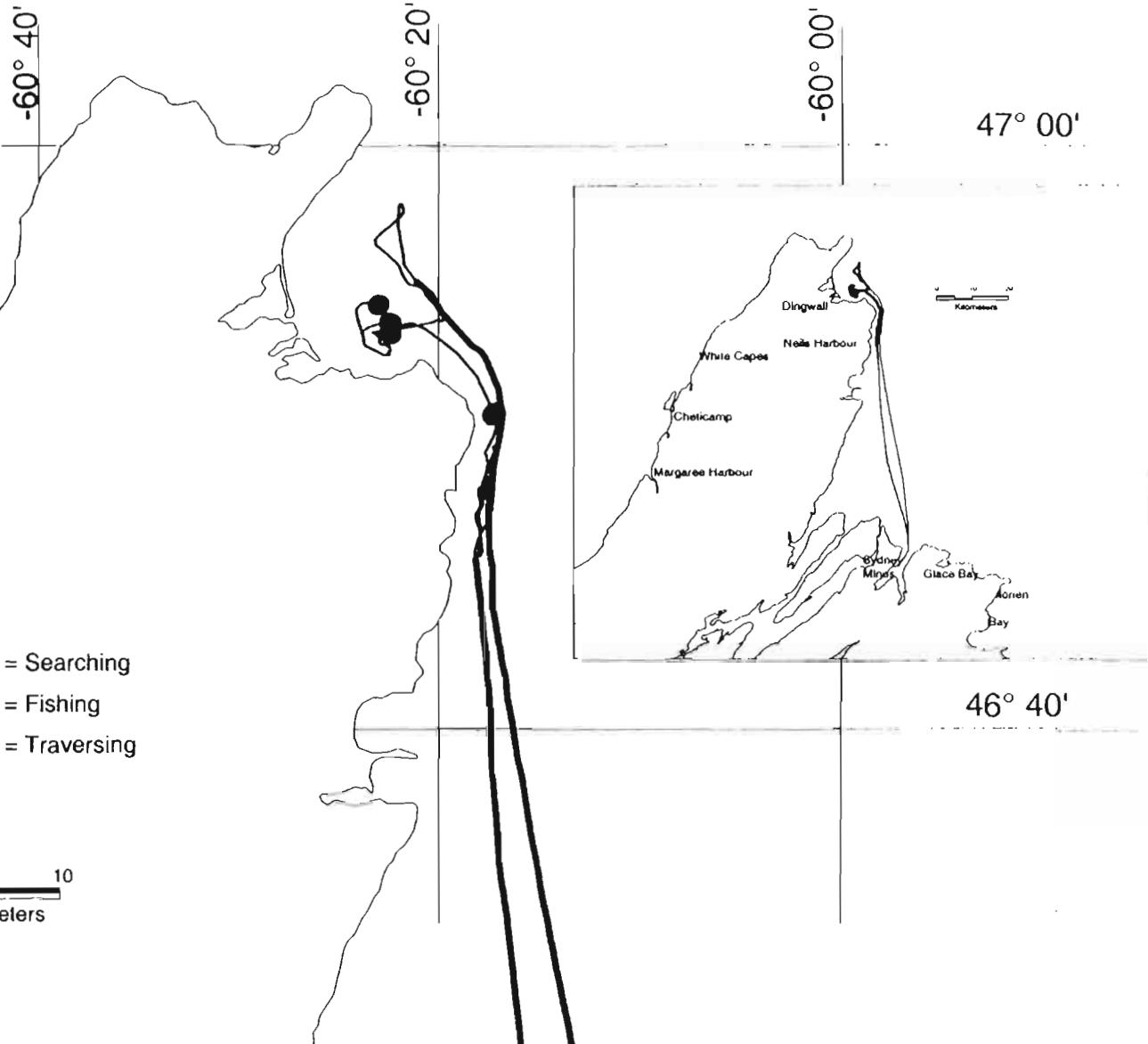
	Hr	Km
Searching	5.3	80.5
Fishing	0.6	4.5
Pump/Retrieve	6.8	12.8
Traversing	8.9	145.0

Boat Name - Gemini

- = Searching
- = Fishing
- = Traversing



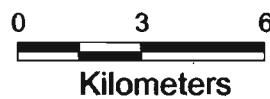
Kilometers



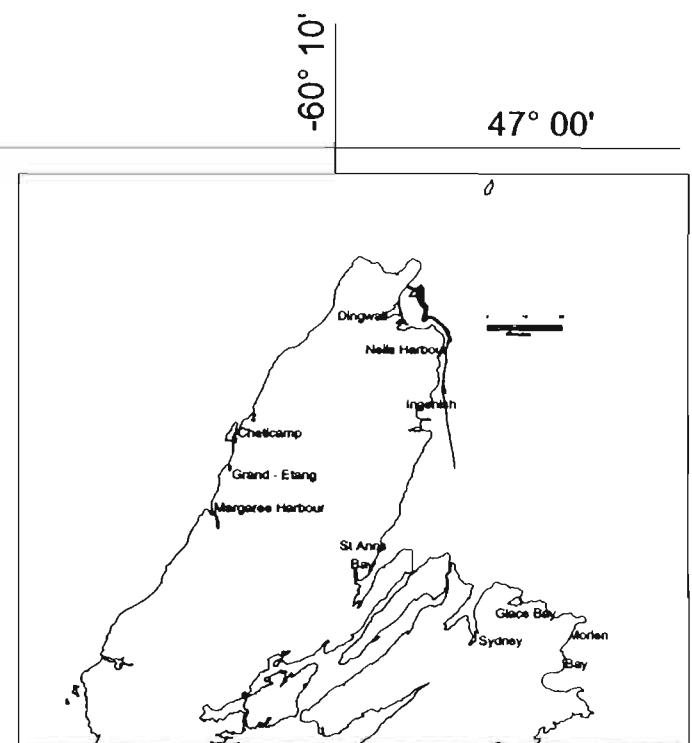
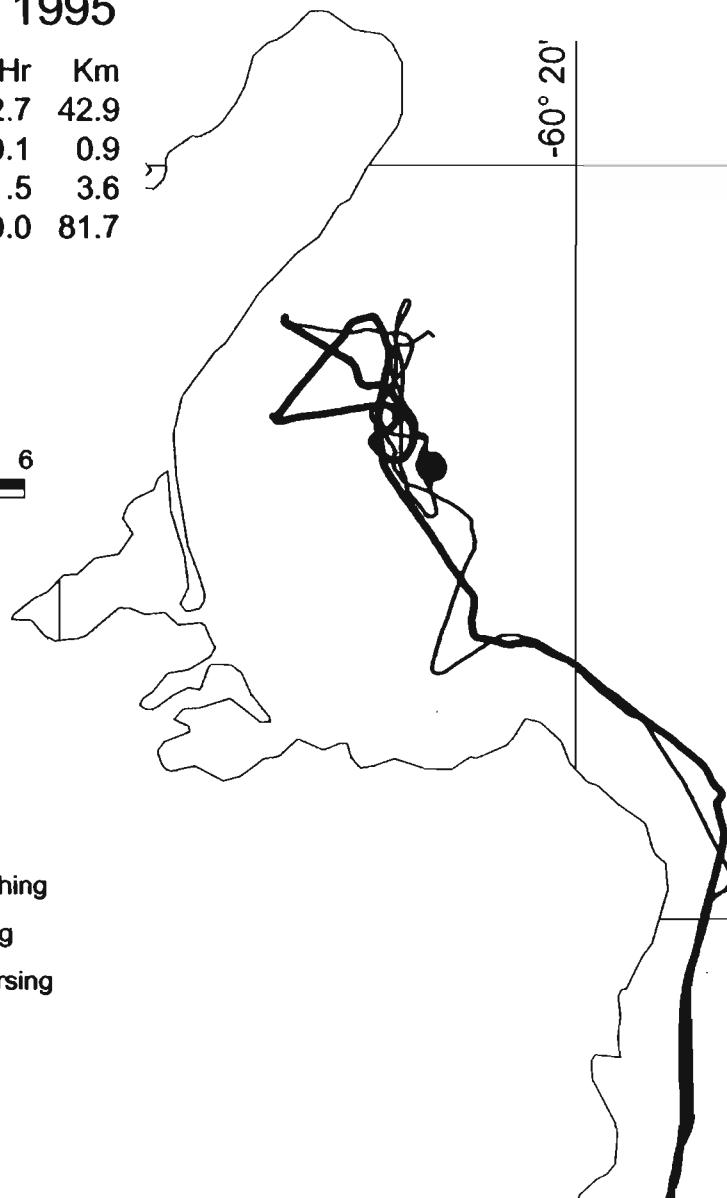
10 November 1995

	Hr	Km
Searching	2.7	42.9
Fishing	0.1	0.9
Pump/Retrieve	1.5	3.6
Traversing	10.0	81.7

Boat Name - Gemini



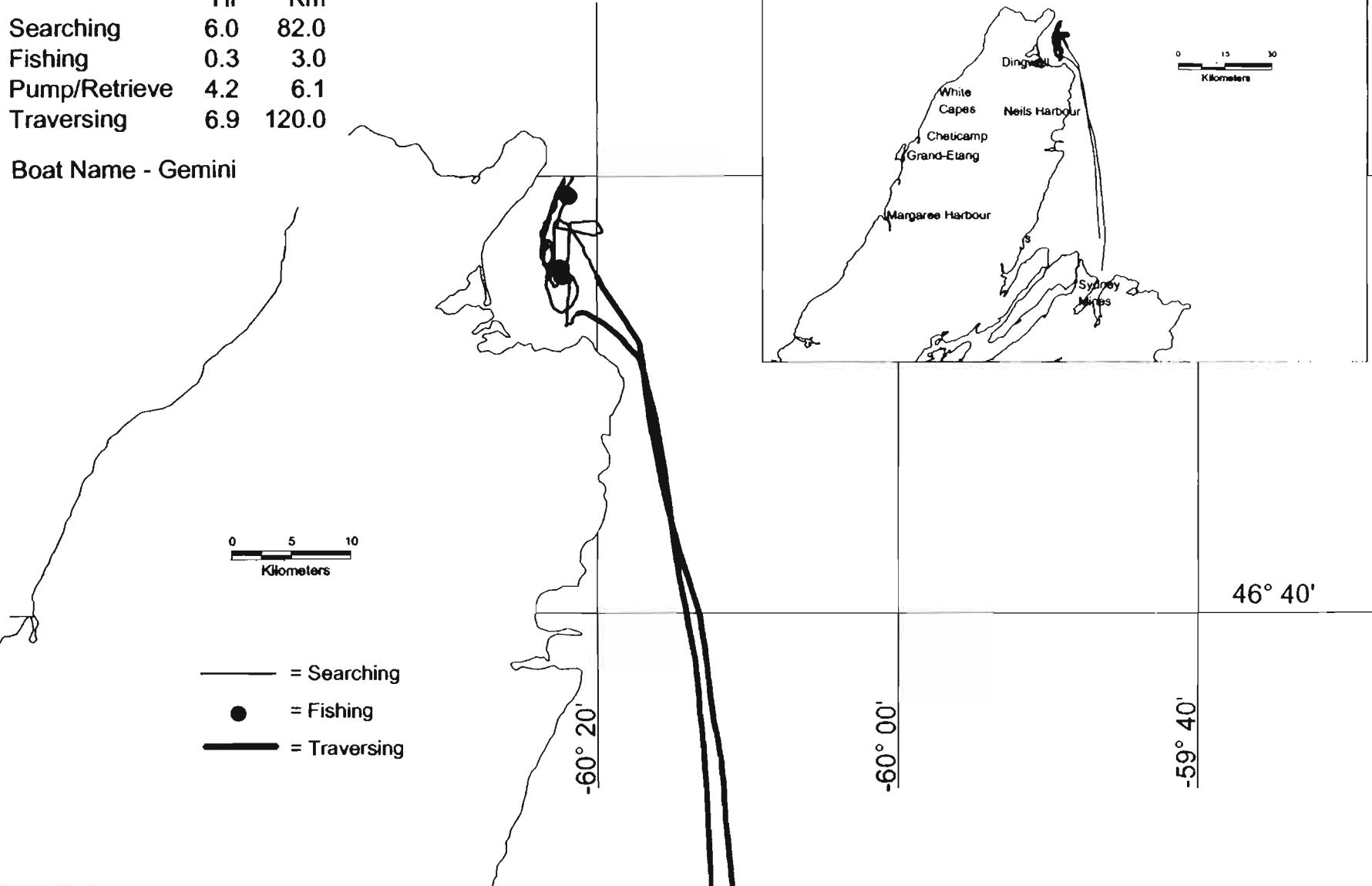
- = Searching
- = Fishing
- = Traversing



11 November 1995

	Hr	Km
Searching	6.0	82.0
Fishing	0.3	3.0
Pump/Retrieve	4.2	6.1
Traversing	6.9	120.0

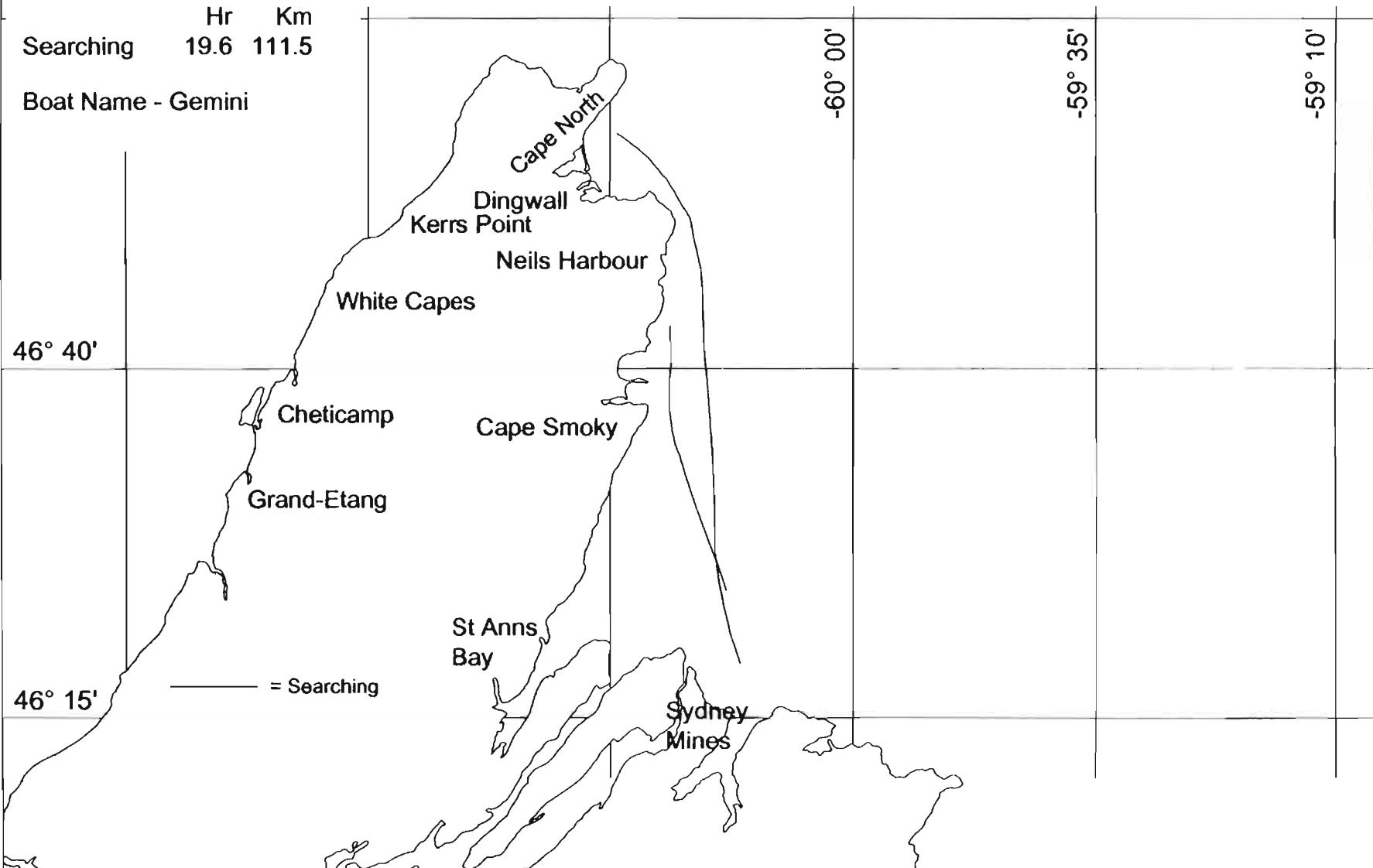
Boat Name - Gemini



13 November 1995

Searching Hr Km
 19.6 111.5

Boat Name - Gemini

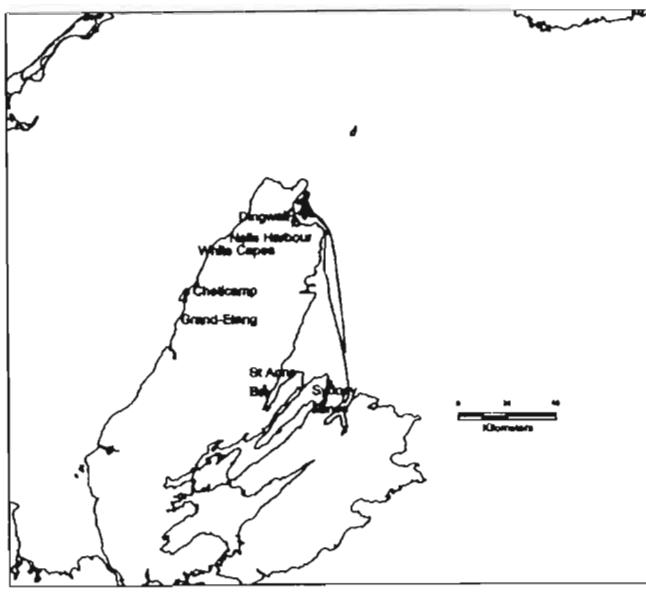
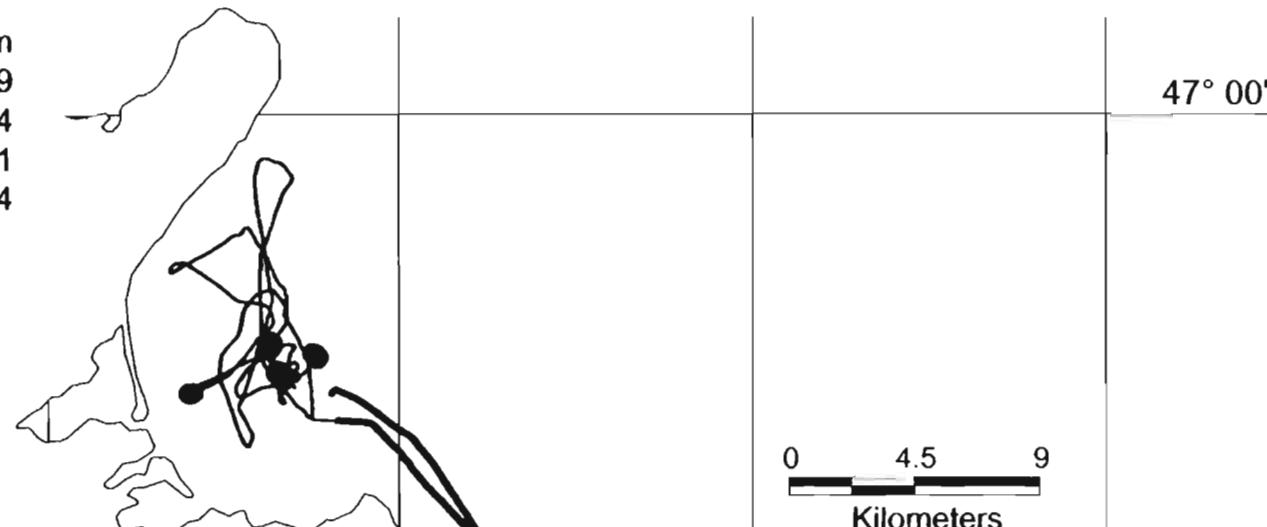


17 November 1995

	Hr	Km
Searching	6.0	77.9
Fishing	0.3	2.4
Pump/Retrieve	9.0	13.1
Traversing	7.0	137.4

Boat Name - Gemini

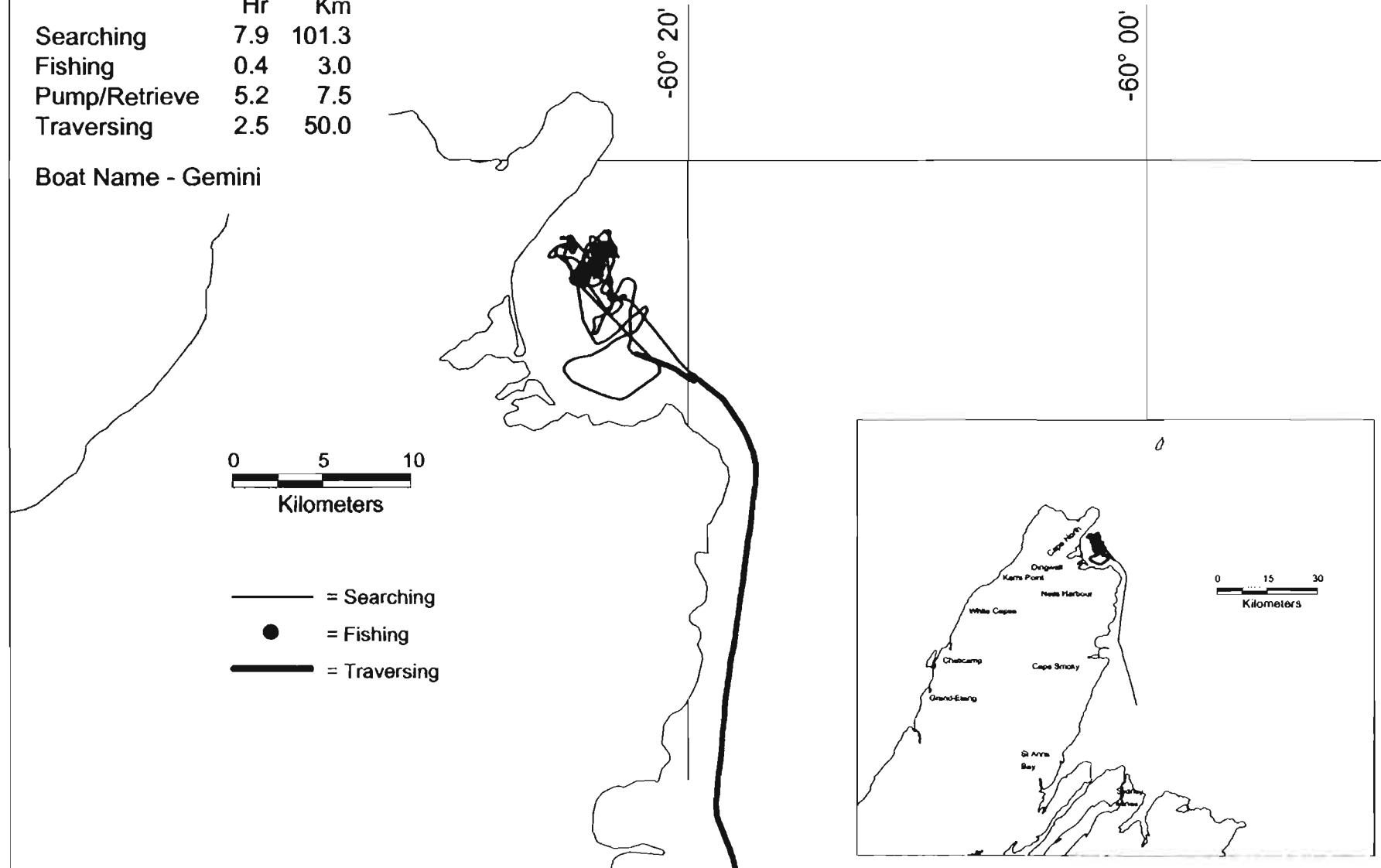
- = Searching
- = Fishing
- = Traversing



18 November 1995

	Hr	Km
Searching	7.9	101.3
Fishing	0.4	3.0
Pump/Retrieve	5.2	7.5
Traversing	2.5	50.0

Boat Name - Gemini

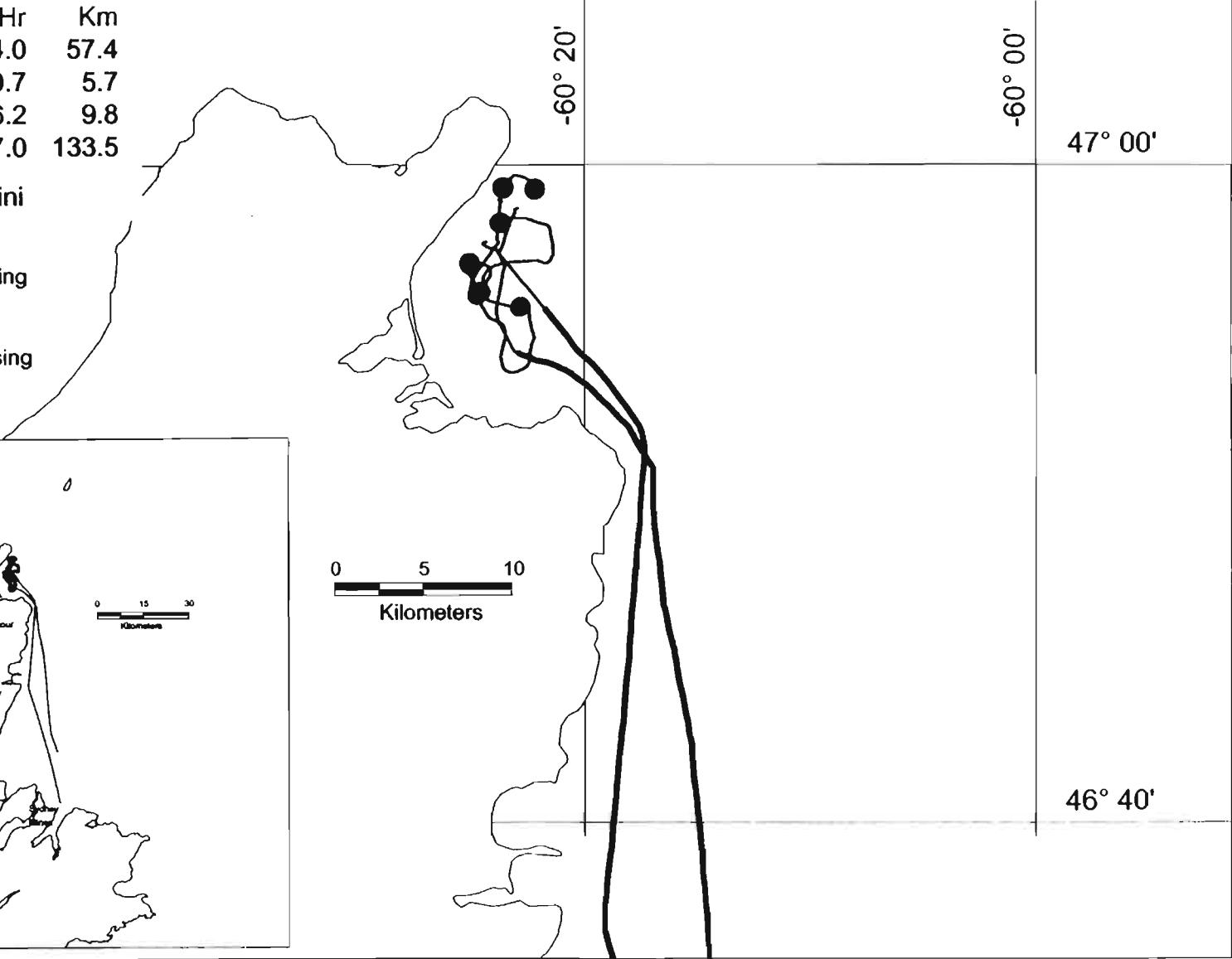
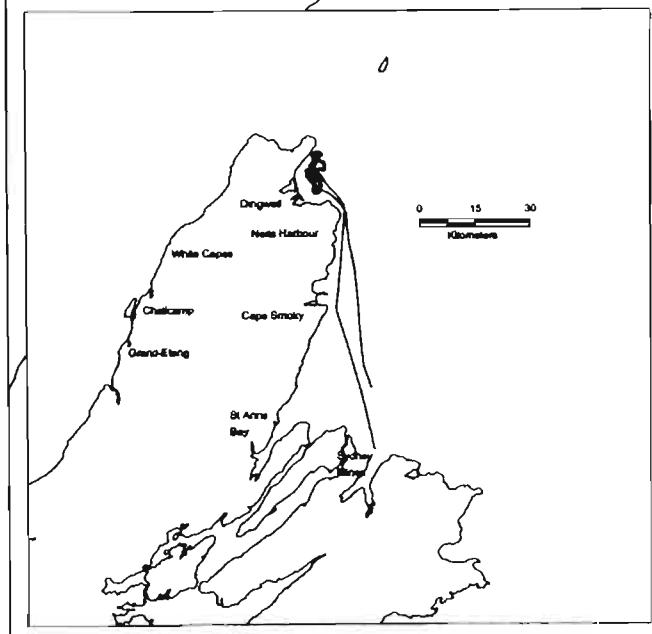


19 November 1995

	Hr	Km
Searching	4.0	57.4
Fishing	0.7	5.7
Pump/Retrieve	6.2	9.8
Traversing	7.0	133.5

Boat Name - Gemini

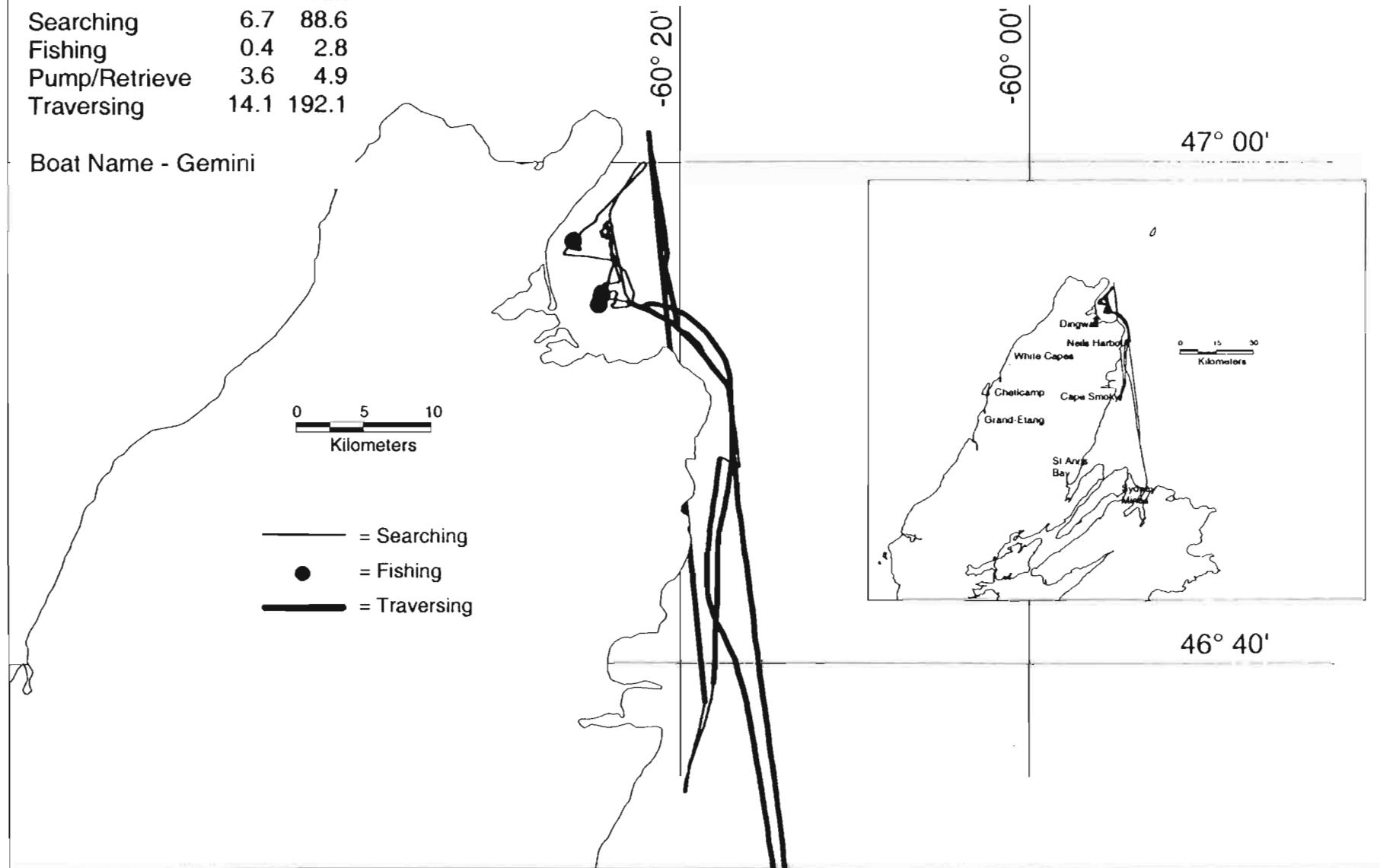
- = Searching
- = Fishing
- = Traversing



23 November 1995

	Hr	Km
Searching	6.7	88.6
Fishing	0.4	2.8
Pump/Retrieve	3.6	4.9
Traversing	14.1	192.1

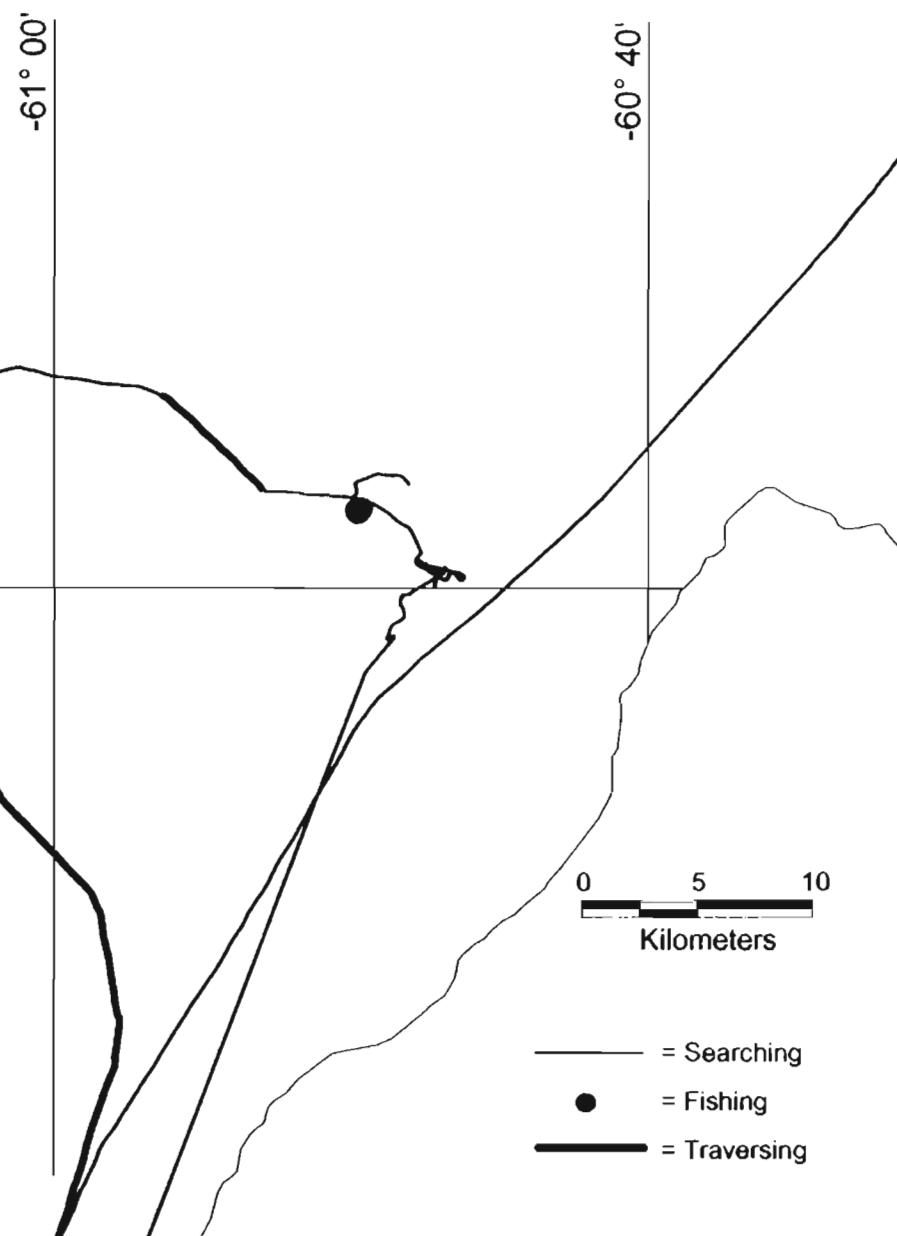
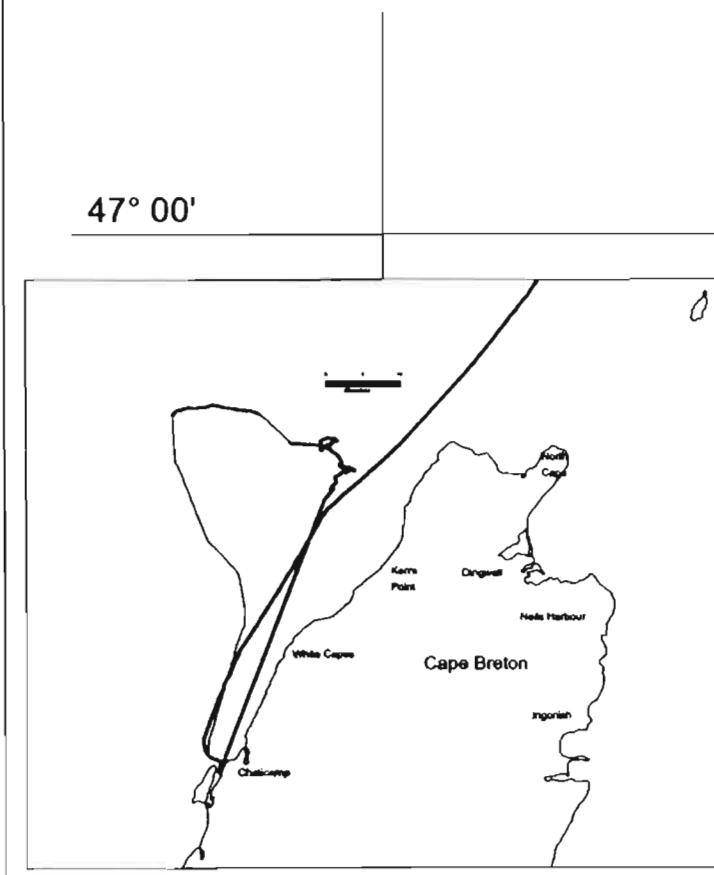
Boat Name - Gemini



13 April 1996

	Hr	Km
Searching	15.9	131.8
Fishing	0.2	0.9
Pump/Retrieve	2.6	4.0
Traversing	5.5	93.4

Boat Name - Gemini



28 April 1996

	Hr	Km
Searching	5.9	96.3
Fishing	0.3	2.5
Pump/Retrieve	2.7	4.6
Traversing	4.1	69.4

Boat Name - Gernini



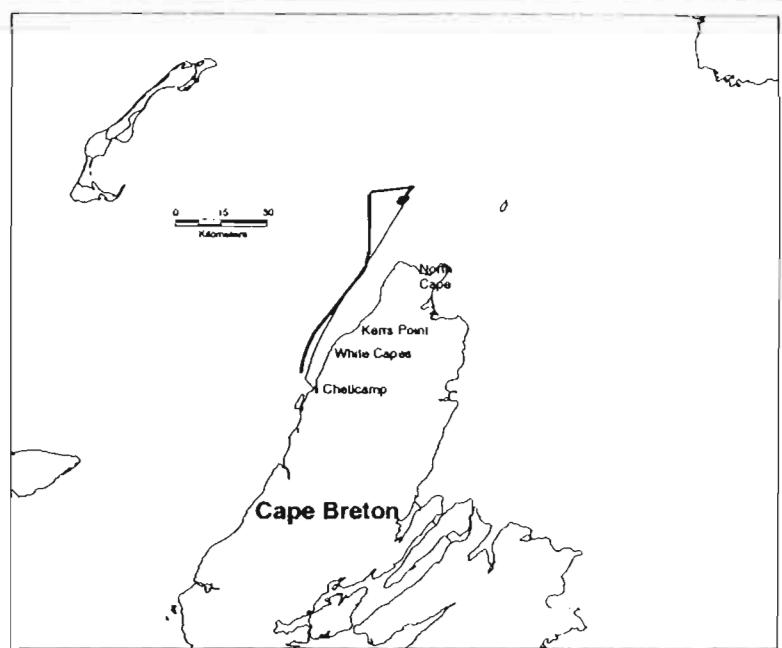
Kilometers

- = Searching
- = Fishing
- = Traversing

47° 00'

-60° 40'

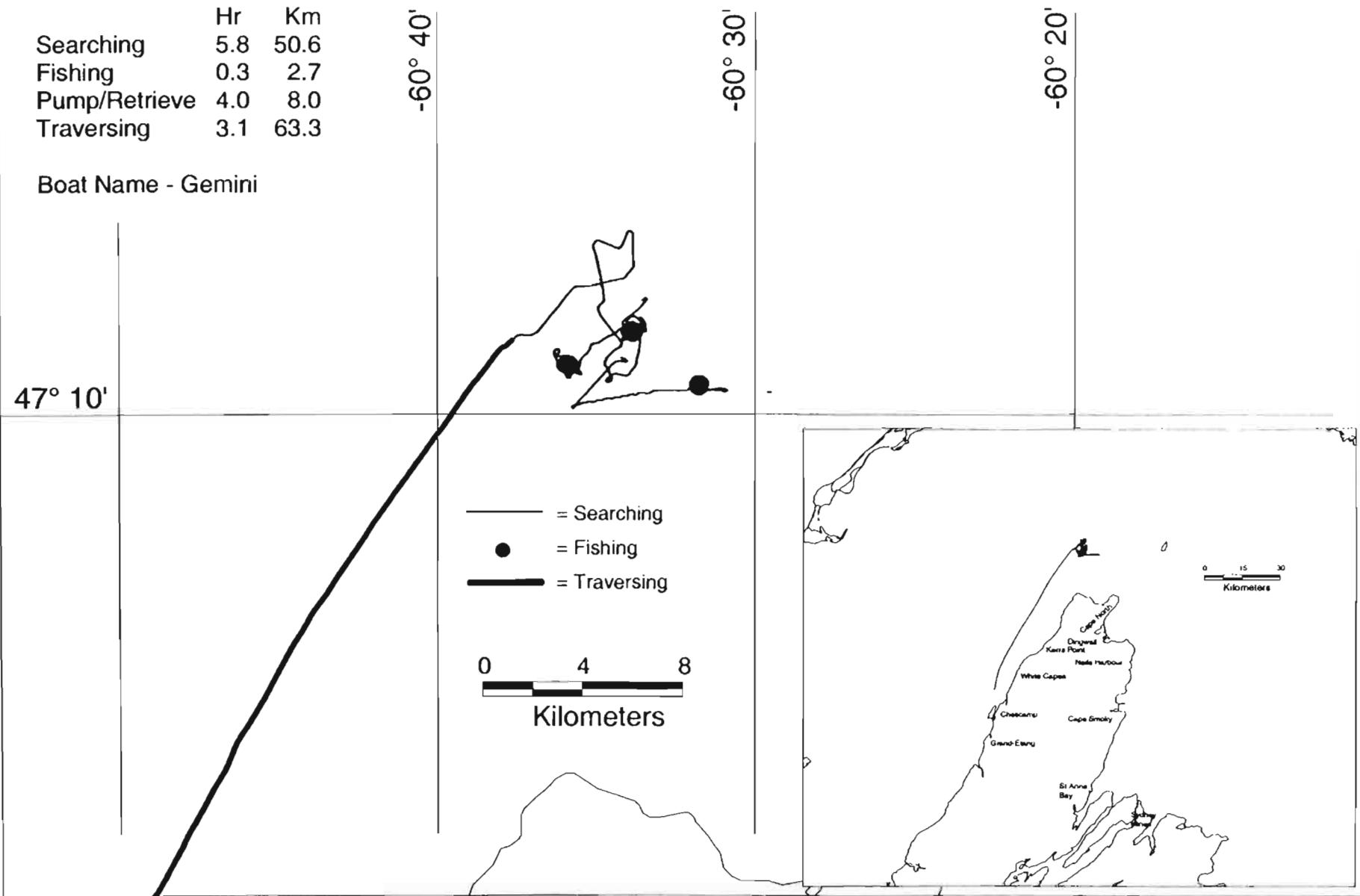
-60° 20'



29 April 1996

	Hr	Km
Searching	5.8	50.6
Fishing	0.3	2.7
Pump/Retrieve	4.0	8.0
Traversing	3.1	63.3

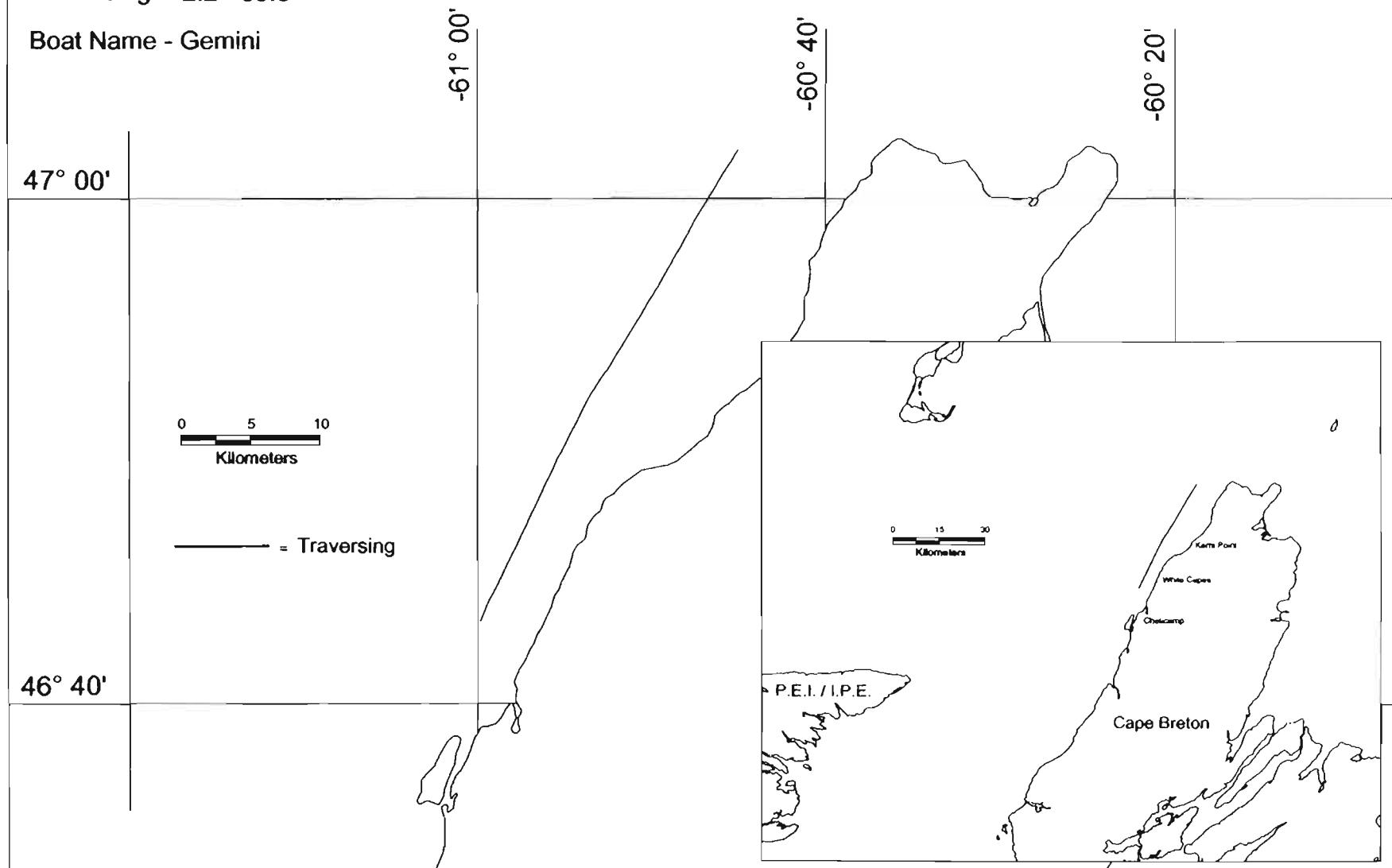
Boat Name - Gemini



01 May 1996

Hr Km
Traversing 2.2 39.5

Boat Name - Gemini



02 May 1996

	Hr	Km
Searching	7.7	137.9
Fishing	0.3	2.3
Pump/Retrieve	1.1	2.1
Other	4.2	5.1

Boat Name - Gemini

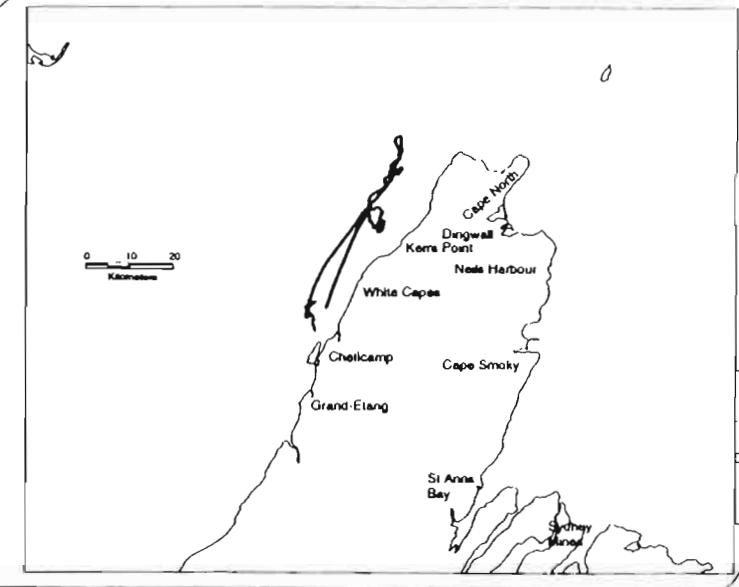
— = Searching
● = Fishing



46° 40'

-61° 00'

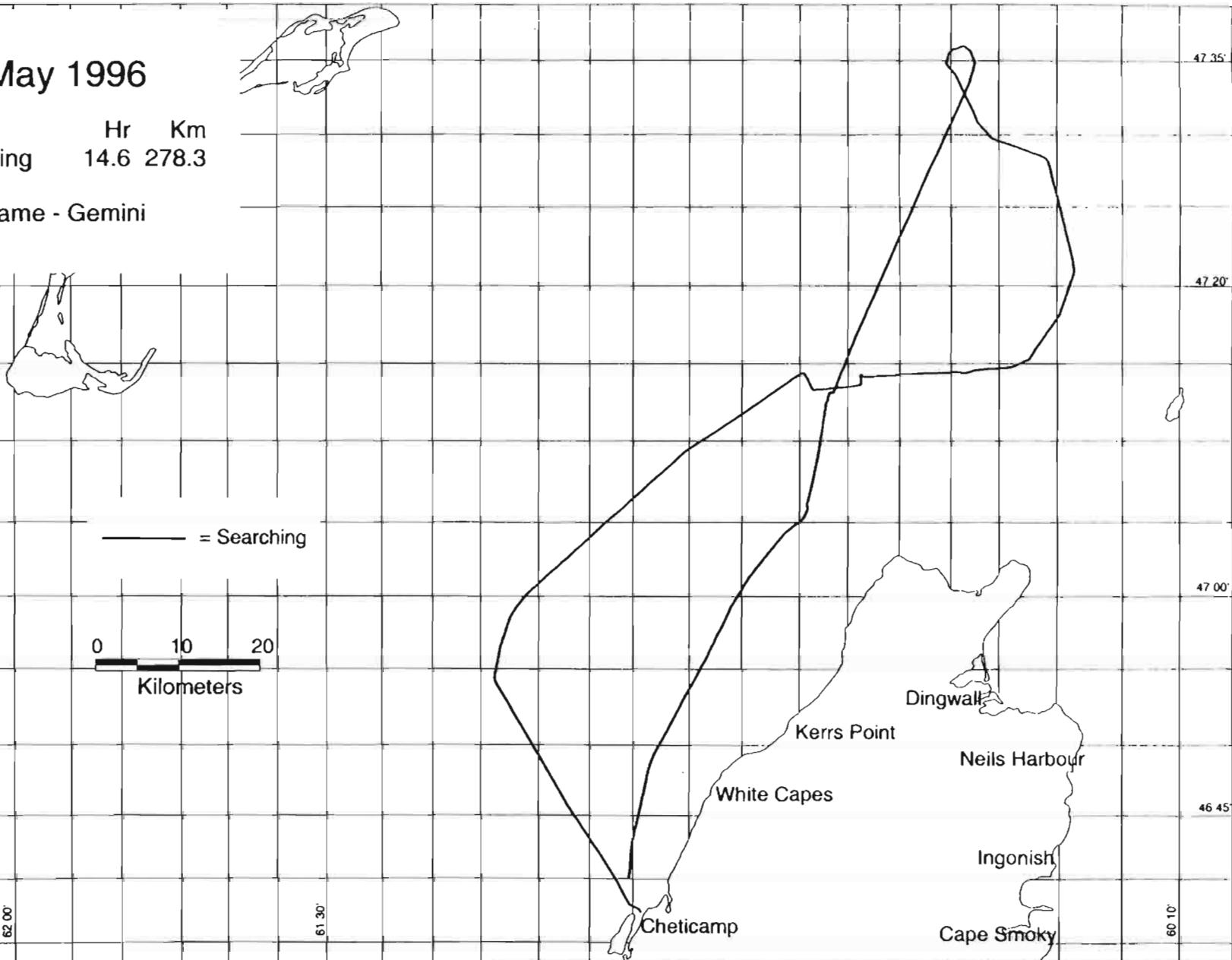
-60° 40'



03 May 1996

Searching Hr Km
 14.6 278.3

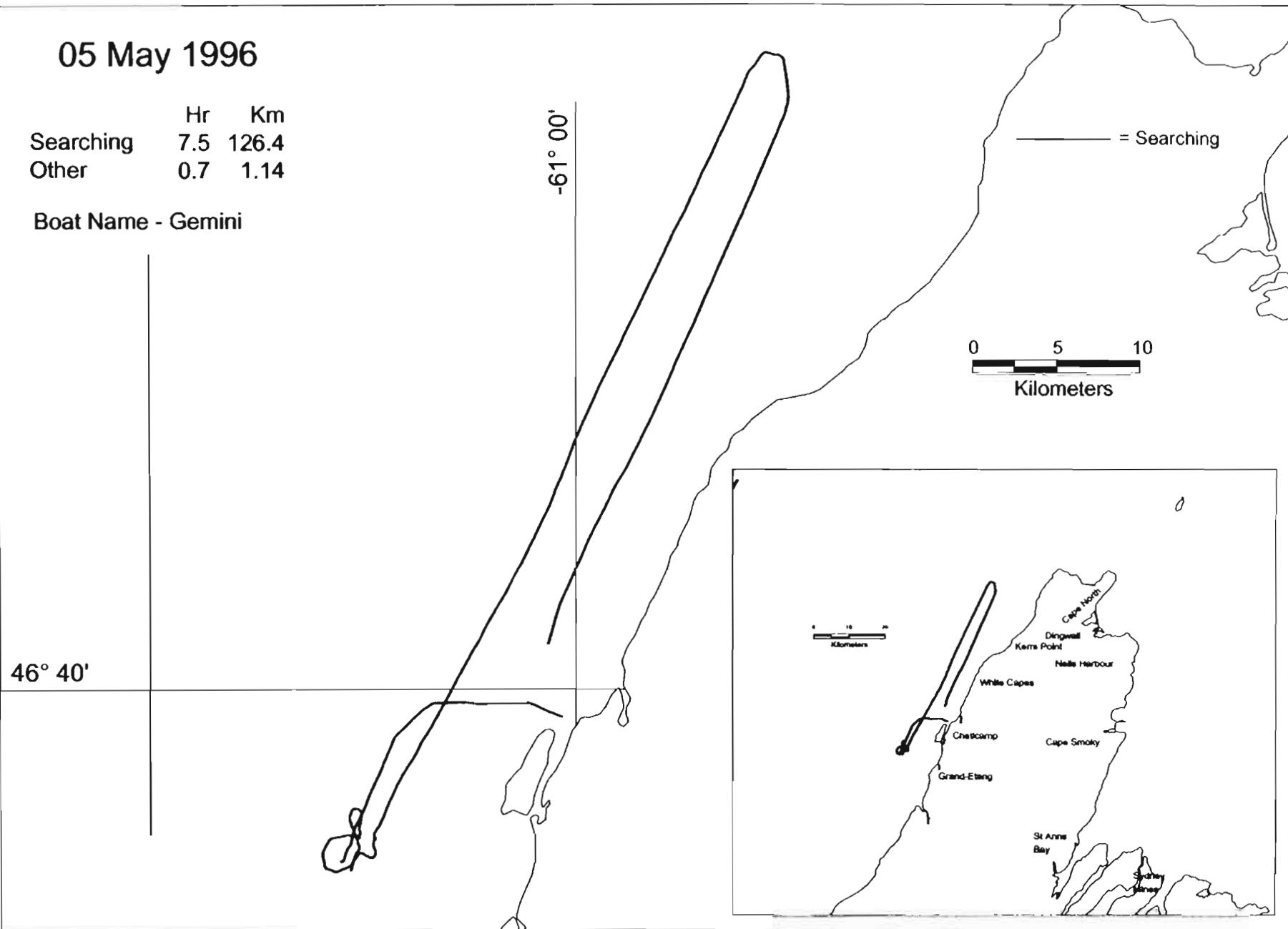
Boat Name - Gemini



05 May 1996

	Hr	Km
Searching	7.5	126.4
Other	0.7	1.14

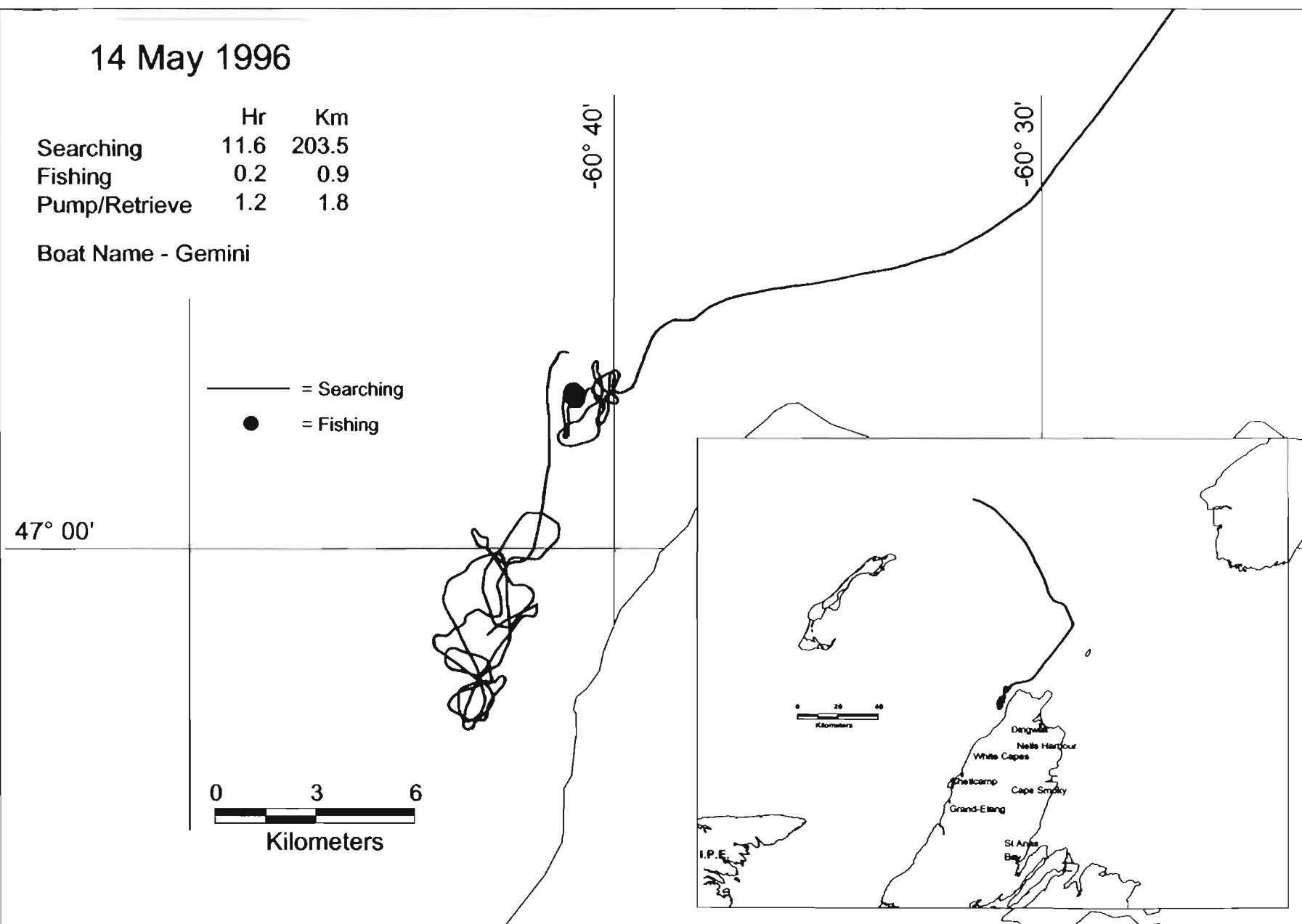
Boat Name - Gemini



14 May 1996

	Hr	Km
Searching	11.6	203.5
Fishing	0.2	0.9
Pump/Retrieve	1.2	1.8

Boat Name - Gemini



15 May 1996

Searching Hr Km
6.0 105.2

Boat Name - Gemini

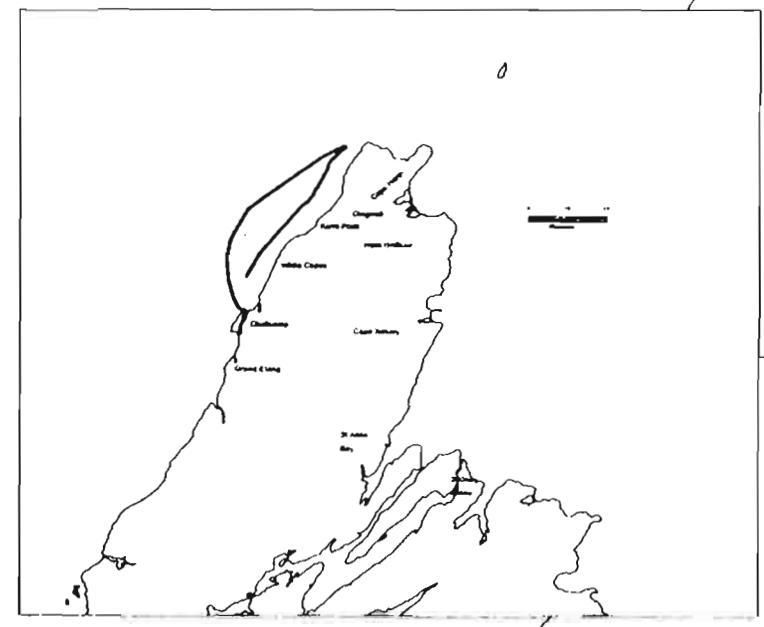
47° 00'

-61° 00'

46° 40'

0 5 10
Kilometers

— = Searching



16 May 1996

Hr Km
Searching 9.3 157.1

Boat Name - Gemini

— = Searching

Kerrs Point

White Capes

Cape Breton

Cheticamp

Grand - Etang

Margaree Harbour

Marsh Point

0 7.5 15
Kilometers

Dingwall

Neils Harbour

Ingonish

Cape Smoky

St Anns Bay

47 00'

46 40'

46 20'

19 May 1996

Searching Hr Km
 8.8 158.7

Boat Name - Gemini

— = Searching
0 10 20
Kilometers

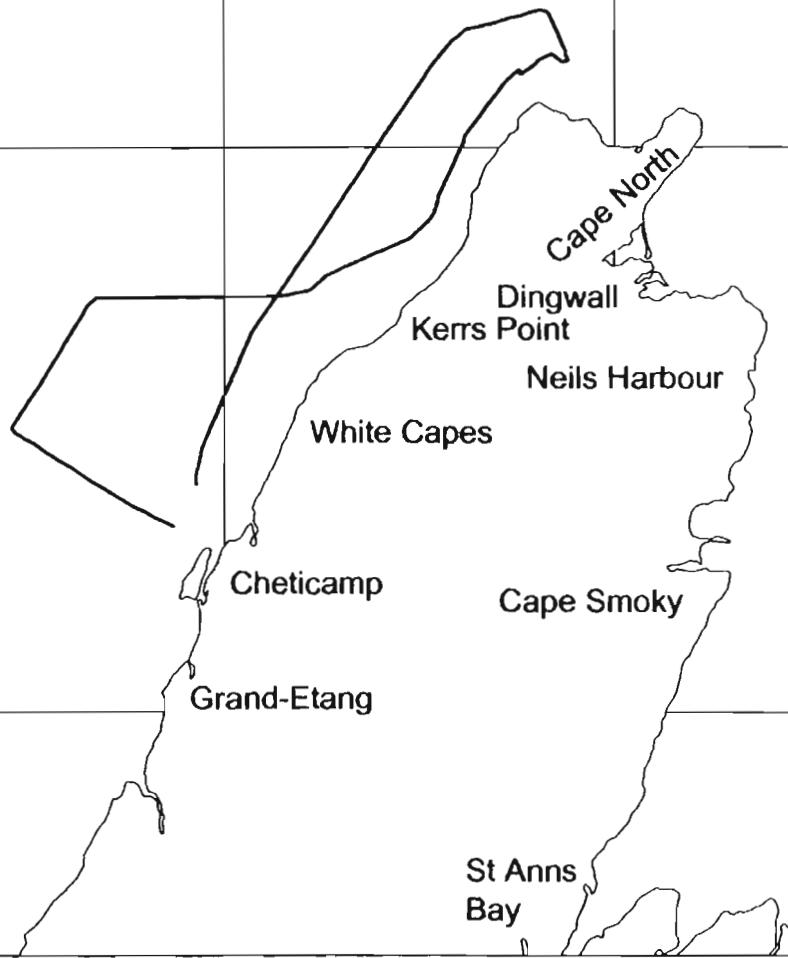
-61° 00'

-60° 30'

-60° 00'

47° 00'

46° 30'



20 May 1996

Searching Hr Km
 4.9 97.9

Boat Name - Gemini

Gaspésie (Qué.)

Chandler

Port Daniel

Shigawake

Paspebiac

**Chaleur Bay /
Baie des Chaleurs**

Pte de Maisonette

Caraquet

Miscou

Île Lamèque

N.-B.



48° 30'

48° 00'

47° 30'

-64° 30'

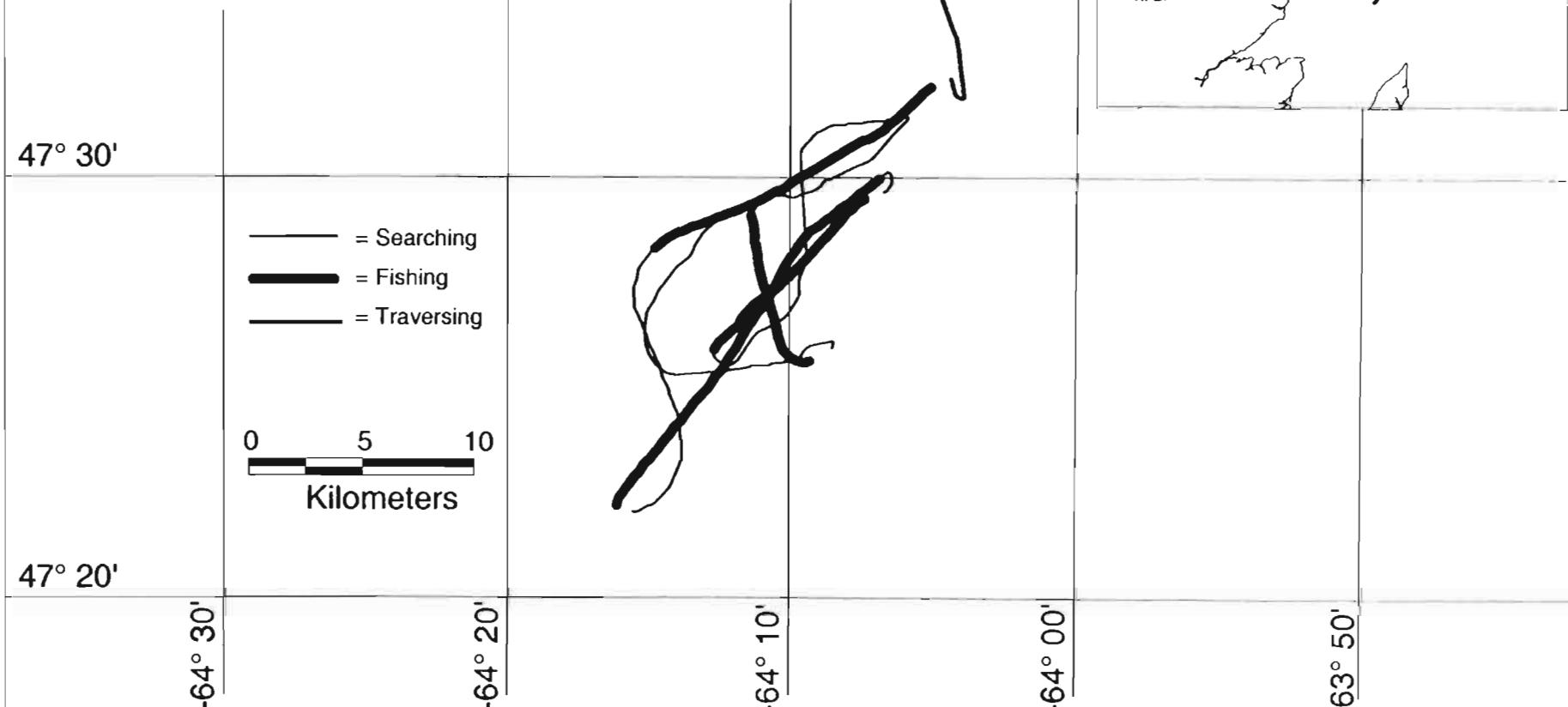
-64° 00'

-63° 30'

14 June 1996

	Hr	Km
Searching	7.9	61.2
Fishing	6.9	50.7
Pump/Retrieve	2.6	6.3
Traversing	5.7	102

Boat Name - Gemini



15 June 1996

	Hr	Km
Searching	9.3	85.4
Fishing	7.4	57.5
Pump/Retrieve	2.2	5.2
Traversing	4.3	84.2

Boat Name - Gemini

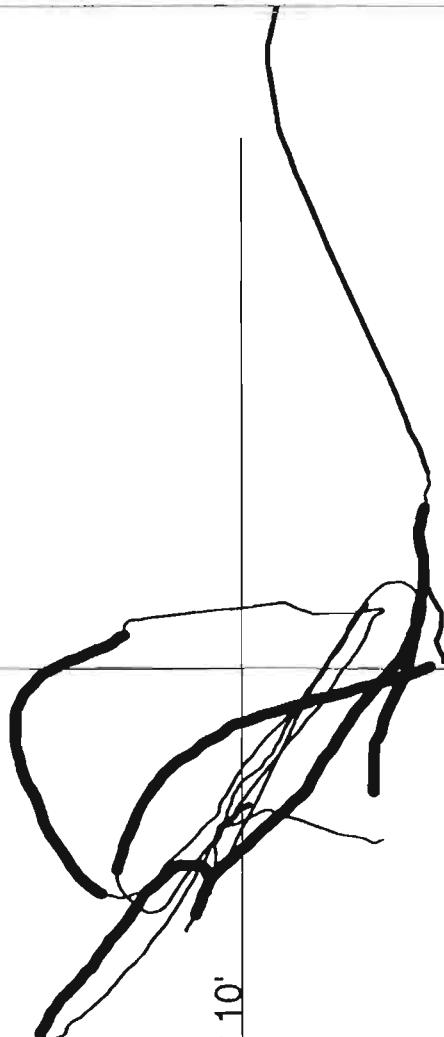
47° 30'

-64° 20'

-64° 10'

-64° 00'

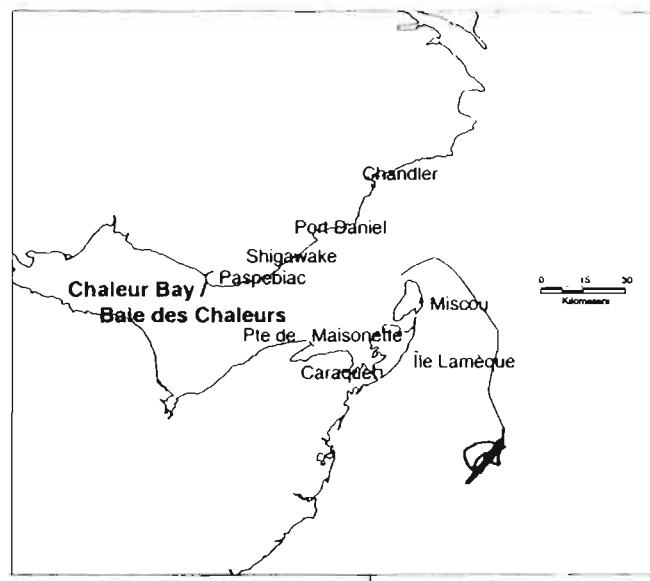
-63° 50'



- = Searching
- = Fishing
- = Traversing



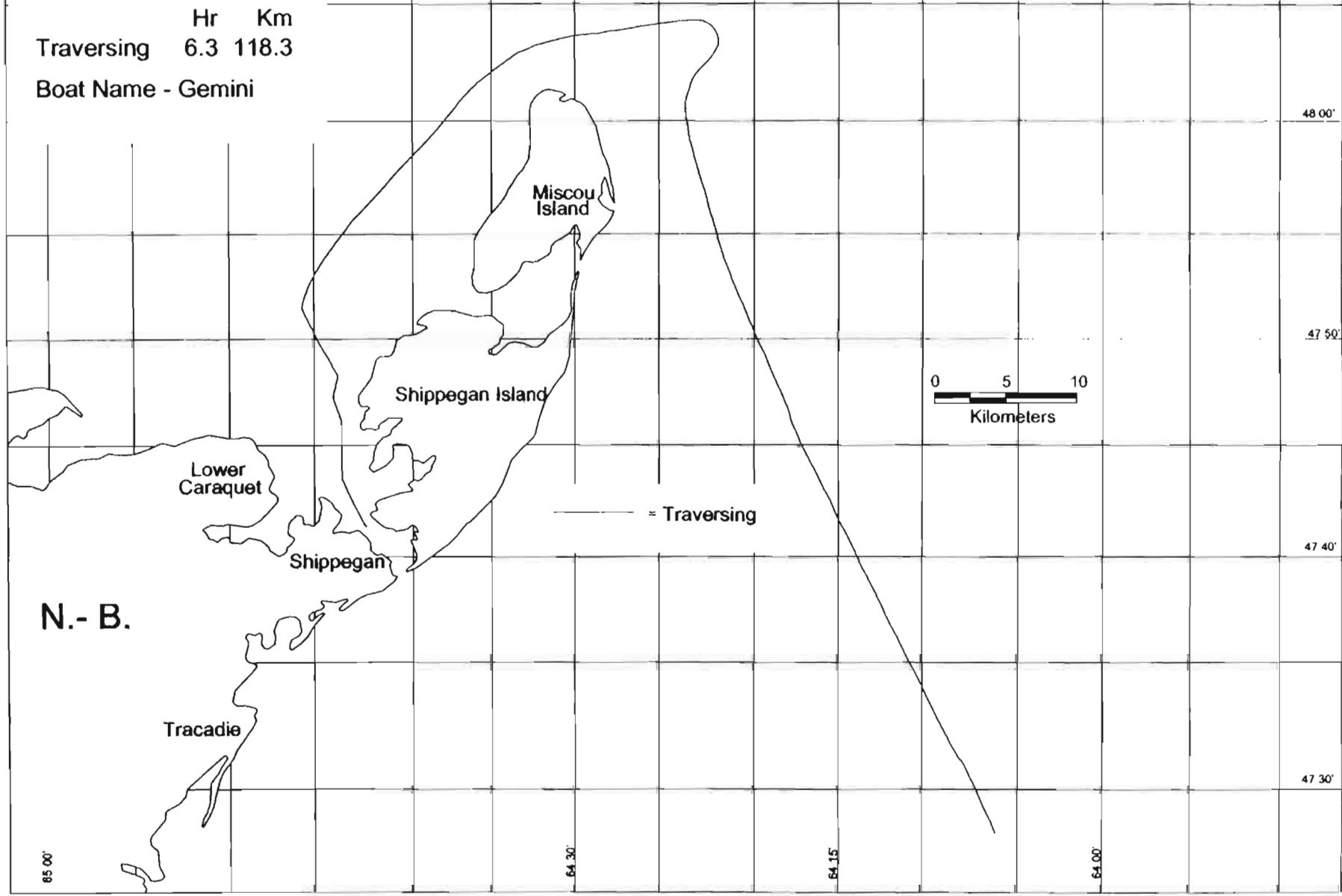
Kilometers



16 June 1996

Hr Km
Traversing 6.3 118.3

Boat Name - Gemini

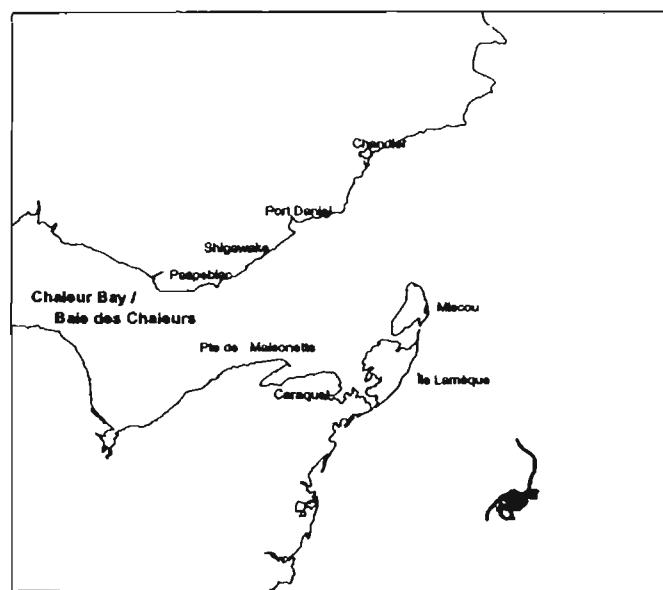


18 June 1996

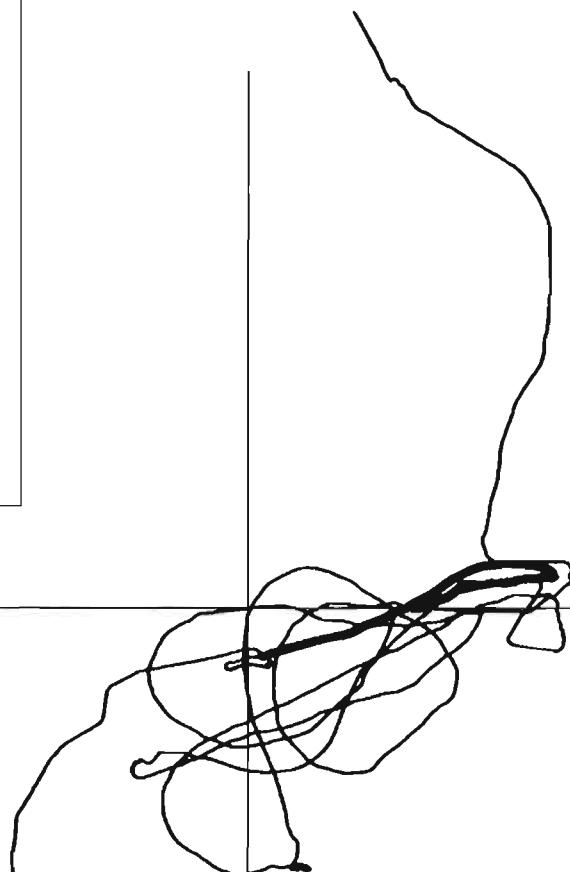
	Hr	Km
Searching	17	128.2
Fishing	1.6	12.2

Boat Name - Gemini

— = Searching
— = Fishing



47° 30'



-64° 20'

-64° 10'

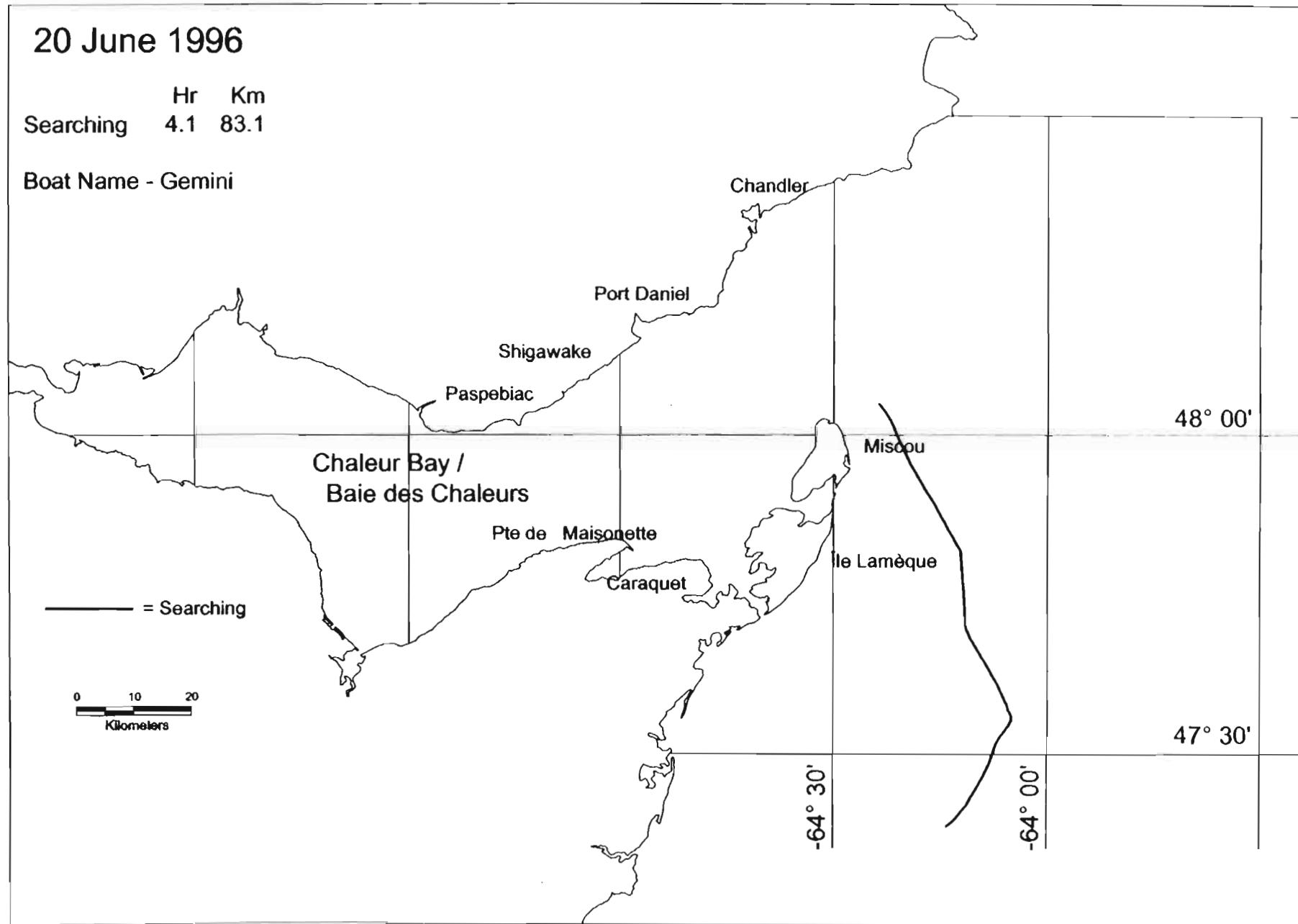
-64° 00'

0 3.5 7
Kilometers

20 June 1996

Hr Km
Searching 4.1 83.1

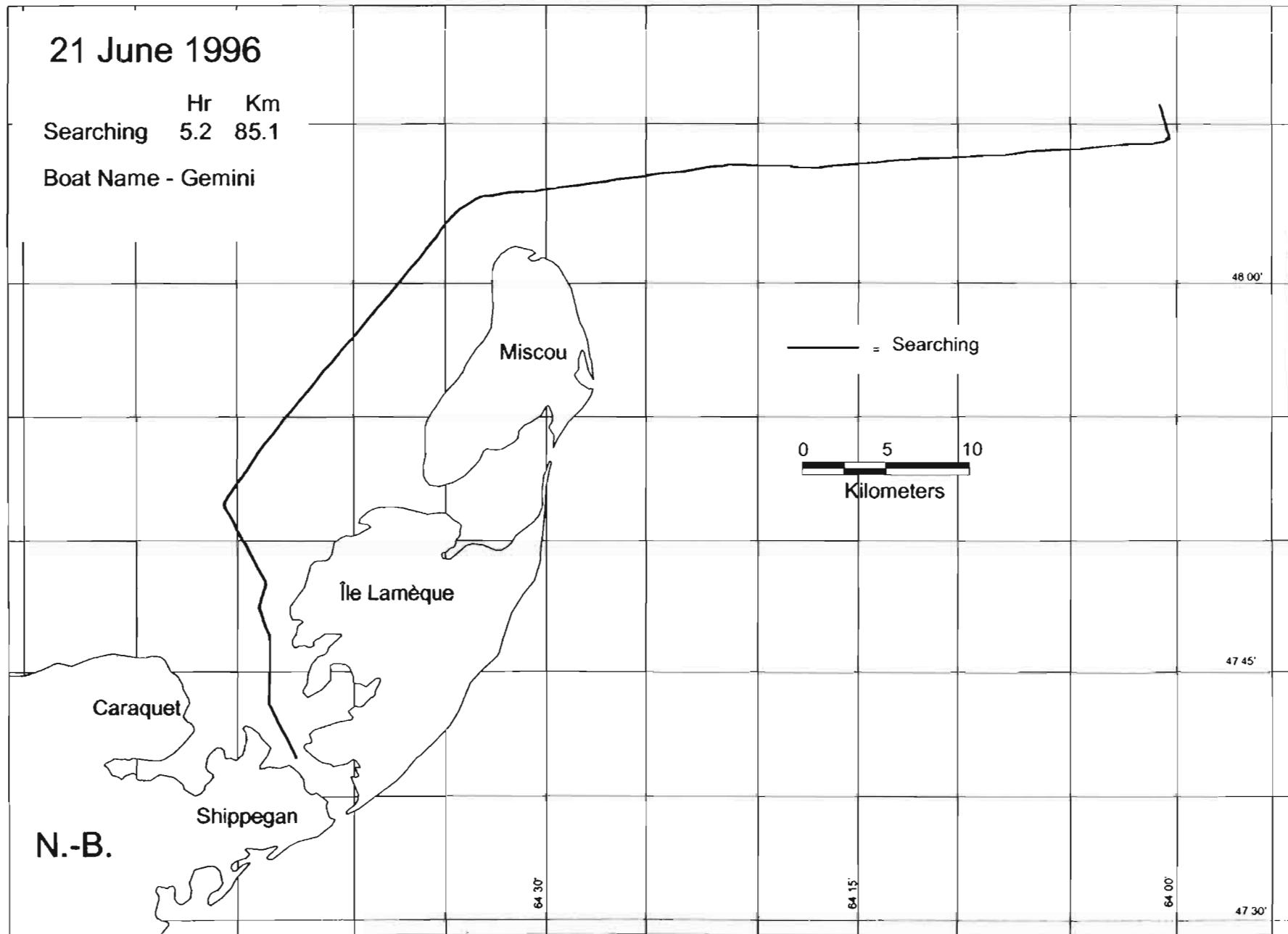
Boat Name - Gemini



21 June 1996

Hr Km
Searching 5.2 85.1

Boat Name - Gemini



23 June 1996

	Hr	Km
Searching	8.5	157.6
Fishing	3.3	25.3
Traversing	2.2	91.9

Boat Name - Gemini

47° 40'



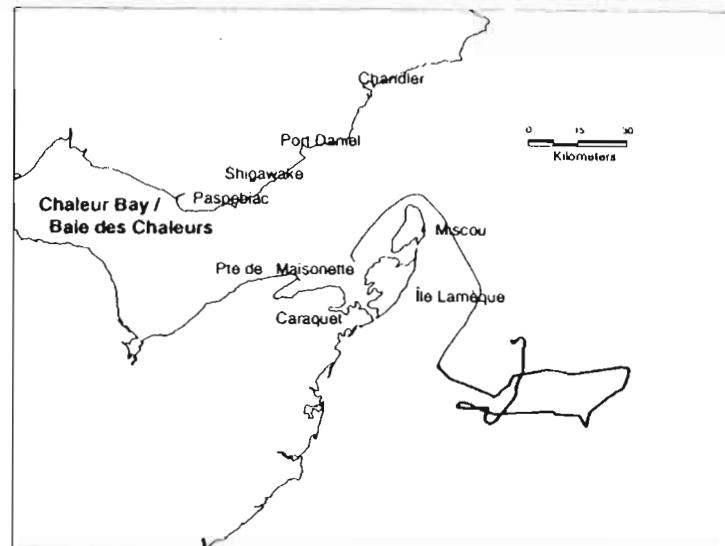
Kilometers

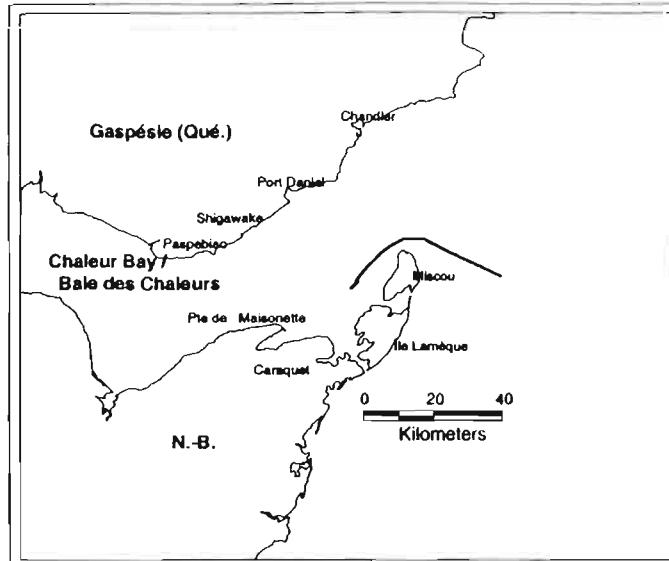
- = Searching
- = Fishing
- = Traversing

-64° 20'

-64° 00'

-63° 40'





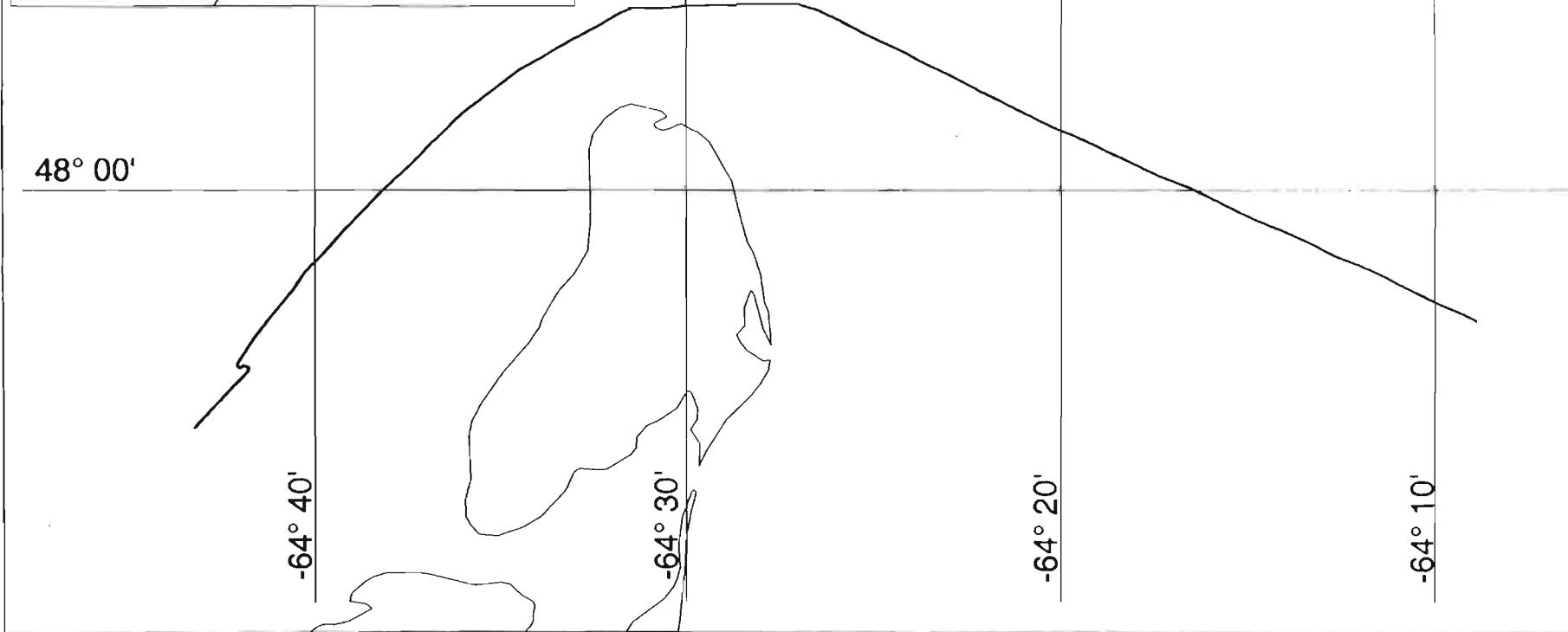
07 July 1996

Searching Hr Km
 2.9 51.9

Boat Name - Gemini

— = Searching

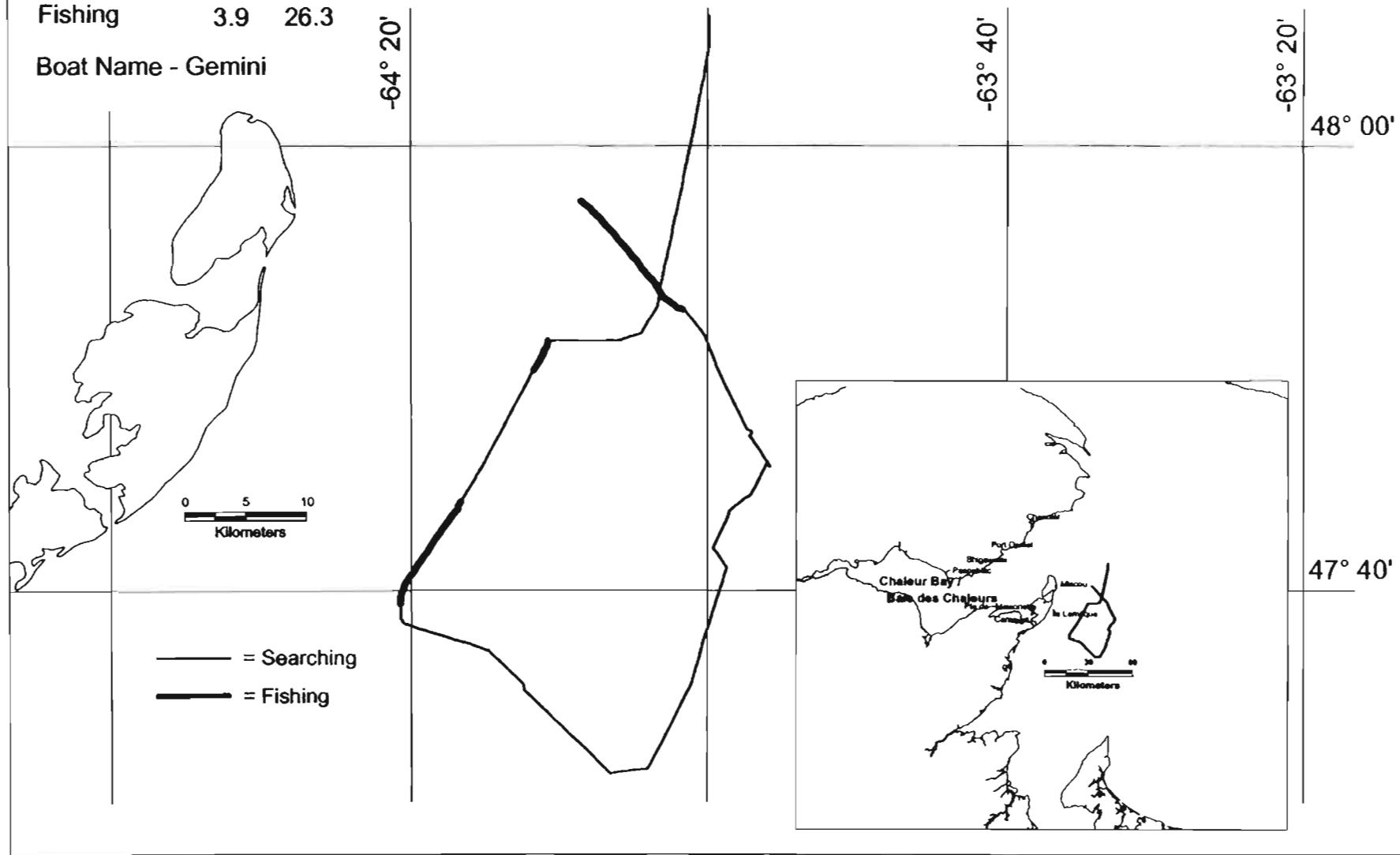
0 4 8
Kilometers

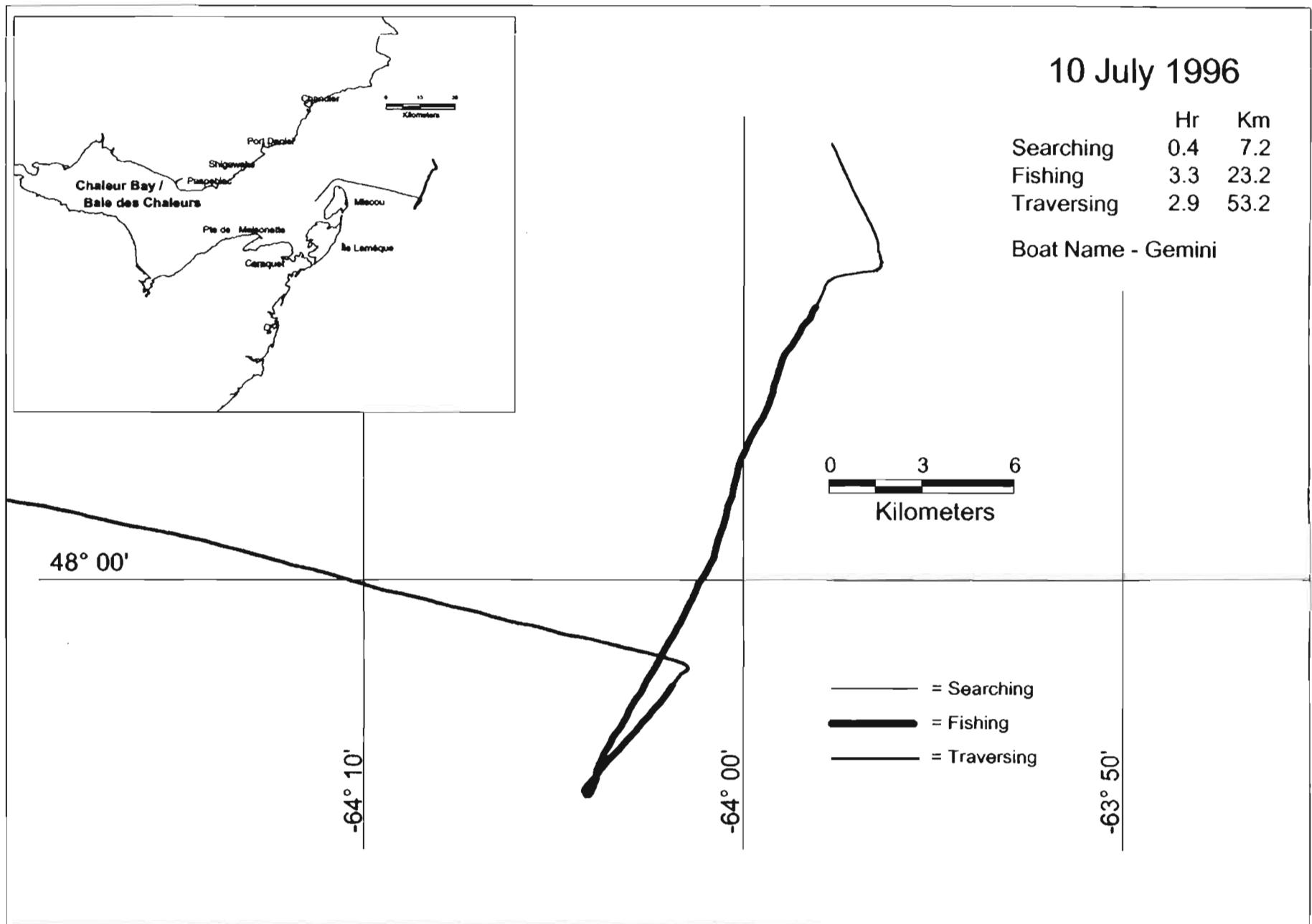


09 July 1996

	Hr	Km
Searching	7.2	120.2
Fishing	3.9	26.3

Boat Name - Gemini





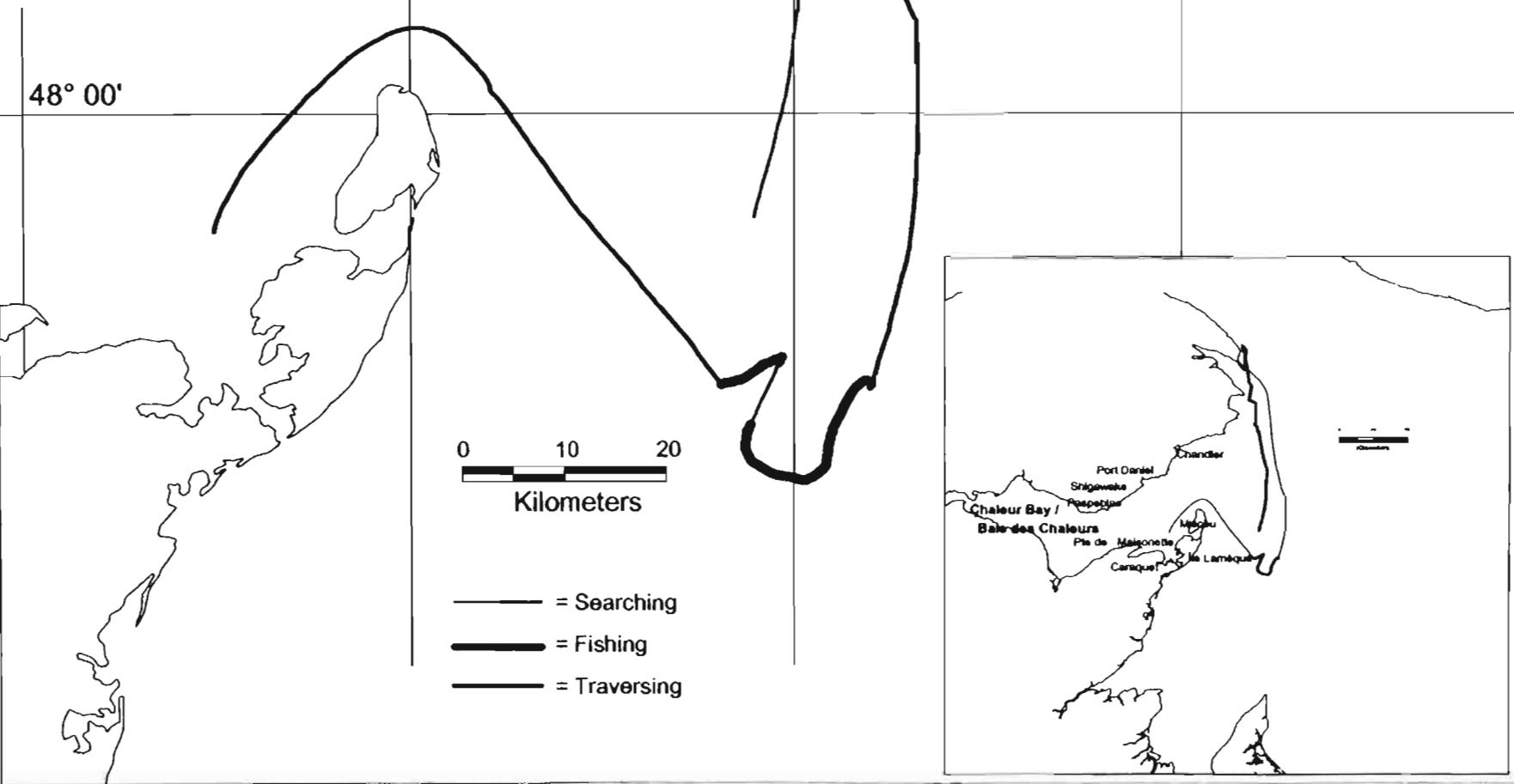
17 July 1996

	Hr	Km
Searching	6.3	122.9
Fishing	8.3	31.8
Traversing	11.1	210.3

-64° 30'

-63° 30'

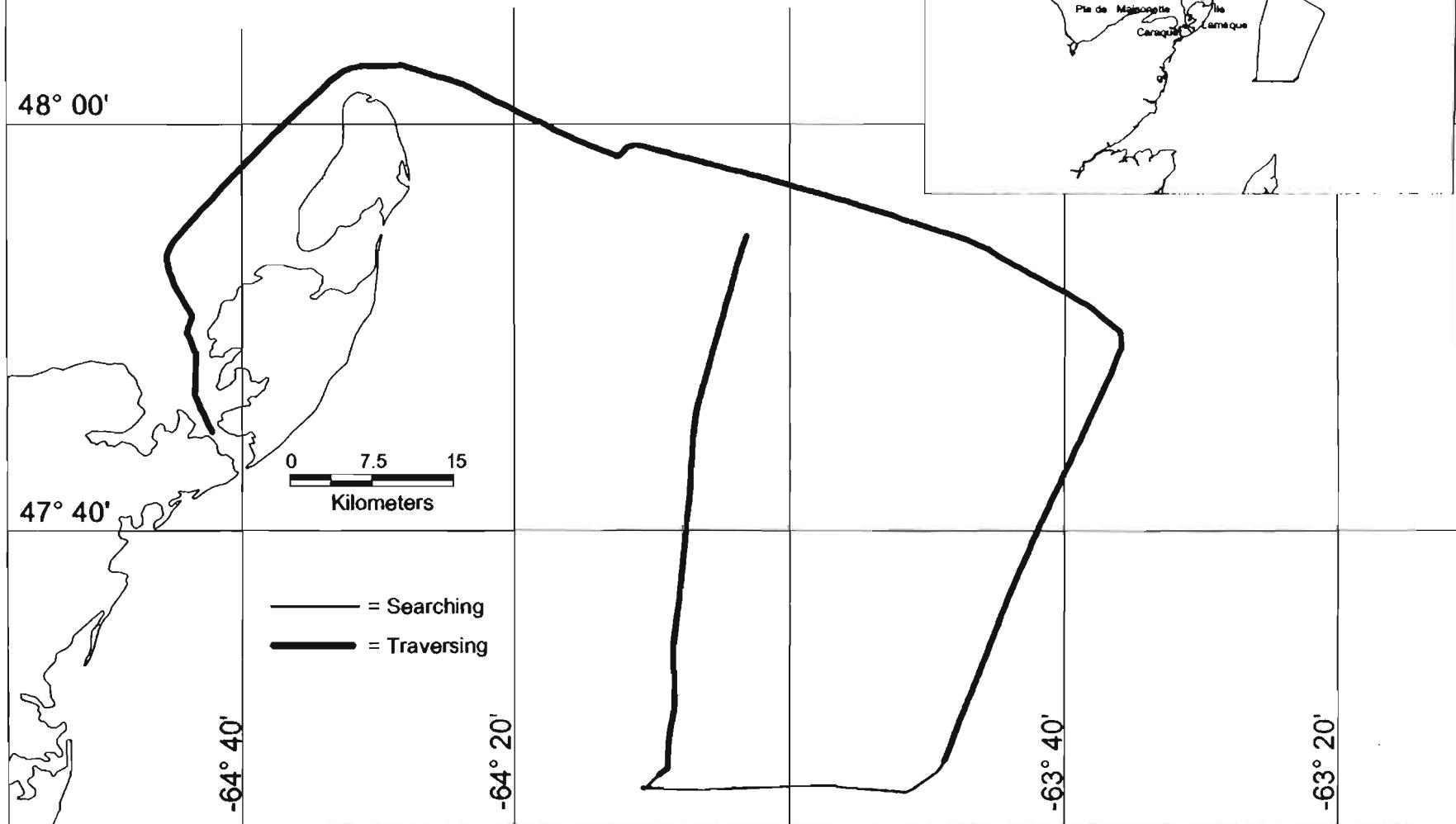
Boat Name - Gemini



18 July 1996

	Hr	Km
Searching	2.5	31.8
Traversing	11.5	210.5

Boat Name - Gemini



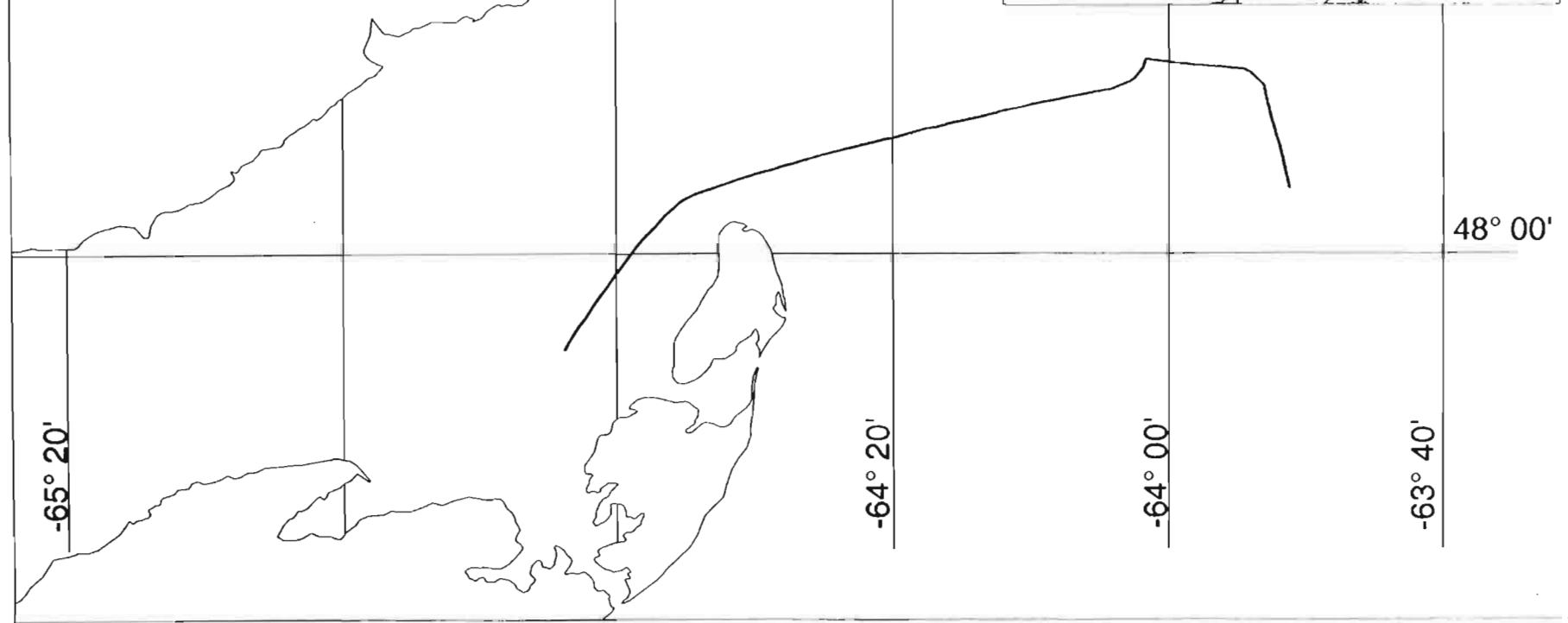
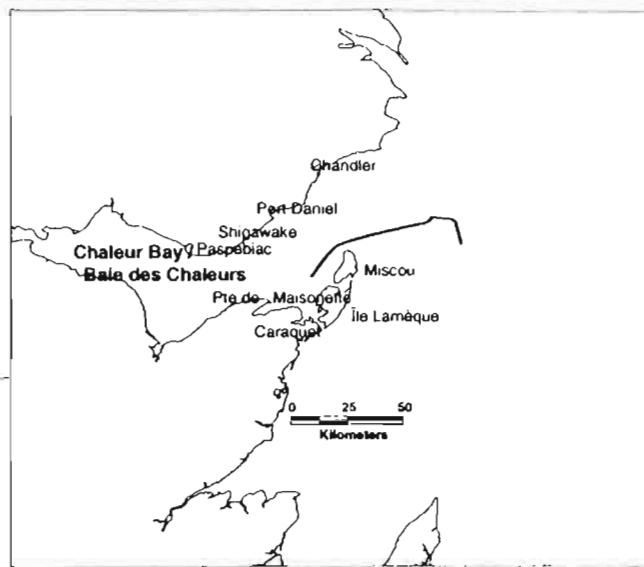
29 July 1996

Traversing Hr Km
 4.1 80.3

Boat Name - Gemini

0 7.5 15
Kilometers

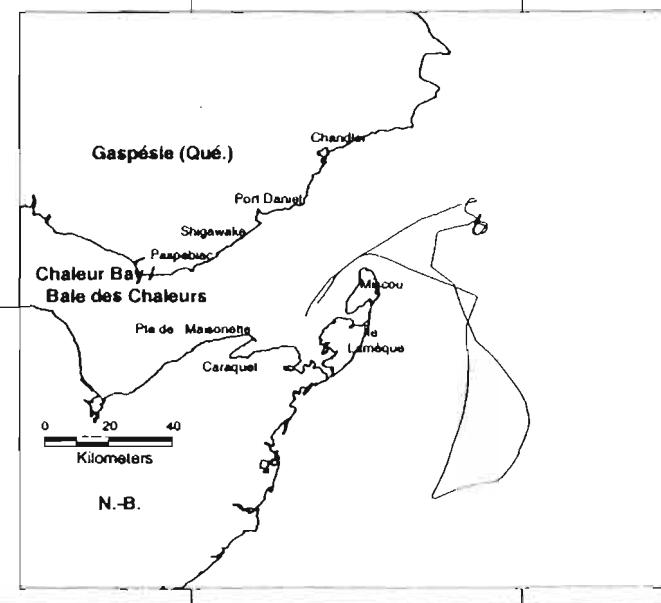
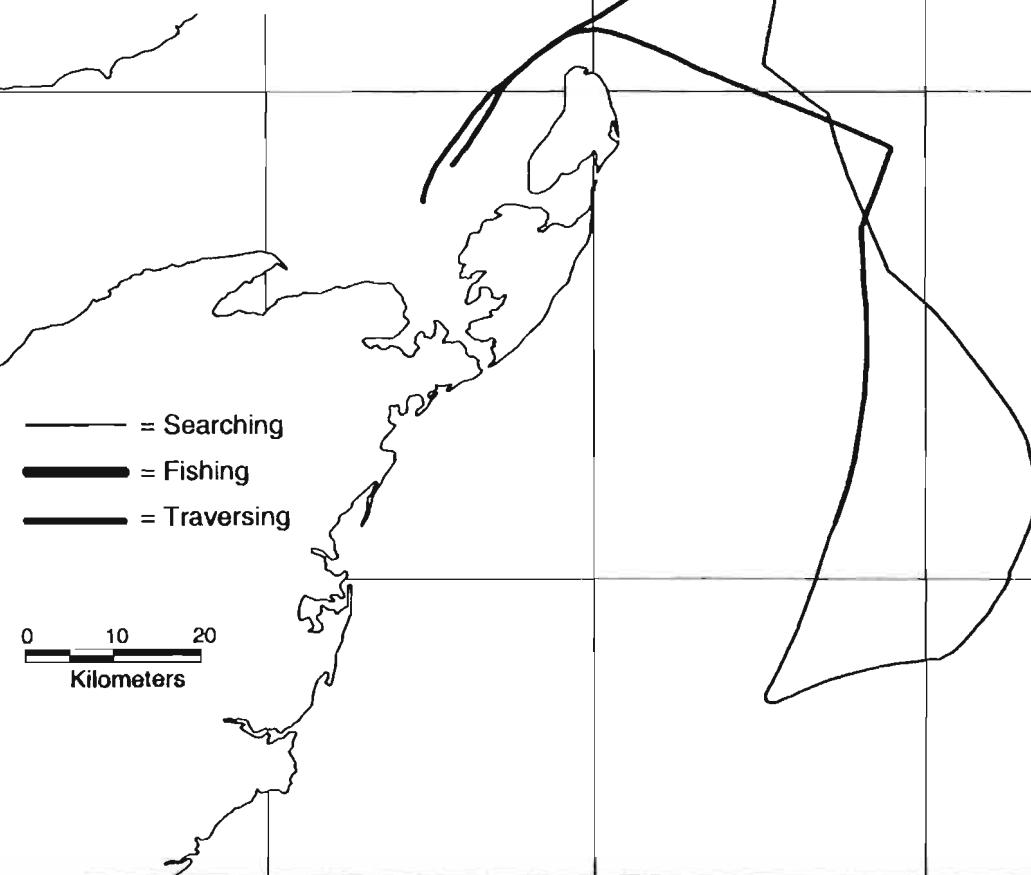
— = Traversing



04 August 1996

	Hr	Km
Searching	10.1	161.4
Fishing	4.9	35.2
Traversing	8.6	164.9

Boat Name - Gemini



11 August 1996

	Hr	Km
Searching	13.8	224.4
Fishing	3.5	5.8

Boat Name - Gemini

Chandler

Québec

Port Daniel

Shigawake

Aspebiac

48 00

Pte de Maisonneuve

Caraquet

New Brunswick /
eau - Brunswick

Miscou

Île Leméque

-64 30

-64 00

-63 30

— = Searching
● = Fishing

0 10 20
Kilometers

12 August 1996

	Hr	Km
Searching	16.8	301.0
Fishing	1	5.5

Boat Name - Gemini

0 15 30
Kilometers

49° 00'

48° 30'

— = Searching
— = Fishing

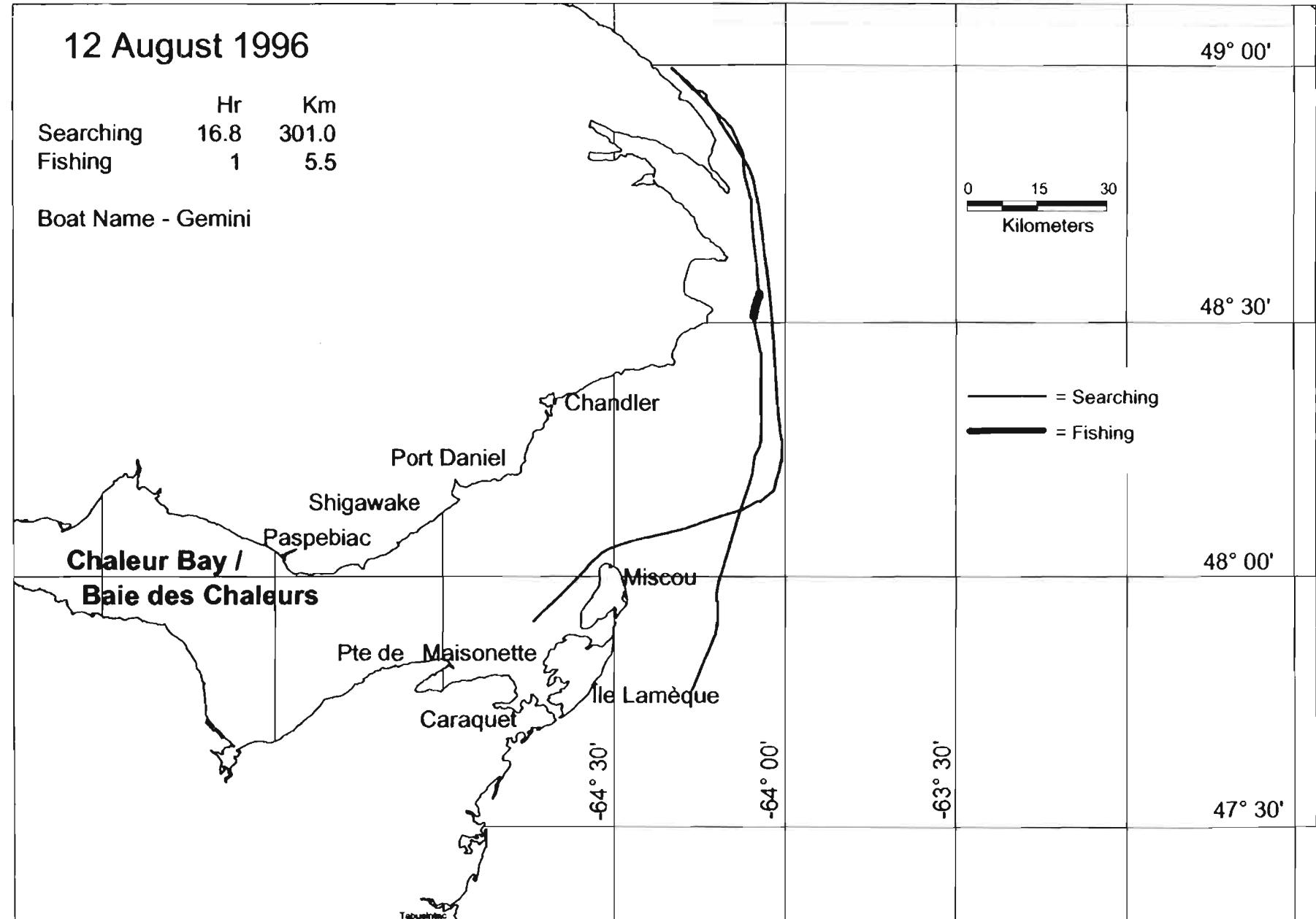
48° 00'

47° 30'

-63° 30'

-64° 00'

Tadoussac



20 August 1996

	Hr	Km
Searching	4.6	41.7
Fishing	1.8	12.1
Pump/Retrieve	8.0	15.4
Traversing	5.3	102.4

Boat Name - Gemini

— = Searching

— = Fishing

— = Traversing

0 7.5 15
Kilometers

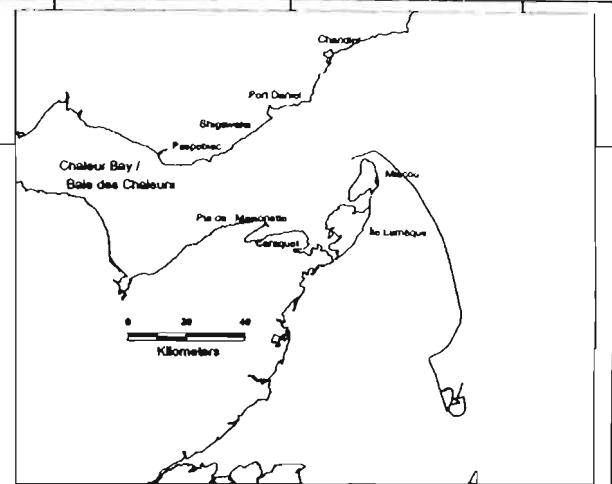
-64° 45'

-64° 15'

-63° 45'

47° 30'

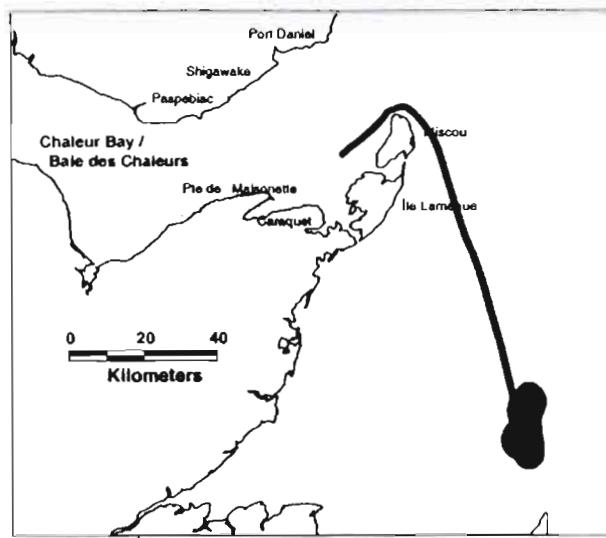
47° 15'



21 August 1996

	Hr	Km
Searching	2.8	42.6
Fishing	8.8	64.1
Pump/Retrieve	1.6	2.9
Traversing	6.5	97.1

Boat Name - Gemini



47° 20'

- = Searching
- = Fishing
- = Pump/Retrieve
- = Traversing

0 5 10
Kilometers

-64° 40'

-64° 20'

-64° 00'

23 August 1996

	Hr	Km
Searching	4.1	52.2
Fishing	7.5	65.2
Pump/Retrieve	1.7	4.2
Traversing	11	210.9

Boat Name - Gemini

— = Searching

— = Fishing

— = Traversing

0 10 20

Kilometers

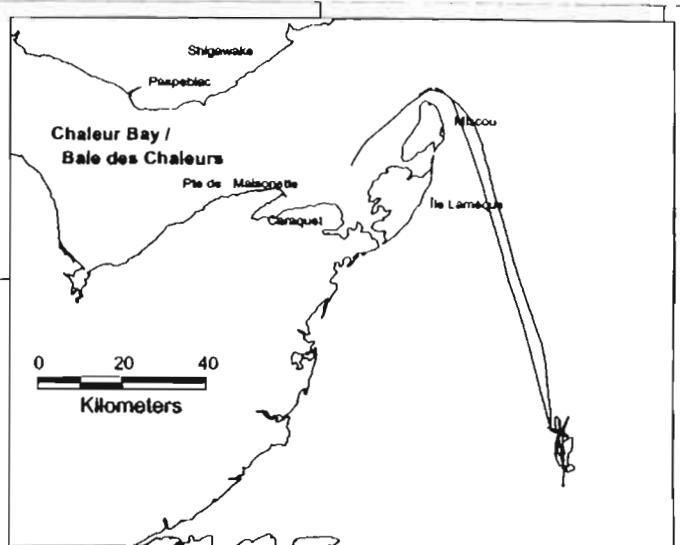
-64° 30'

-64° 00'

-63° 30'

-63° 00'

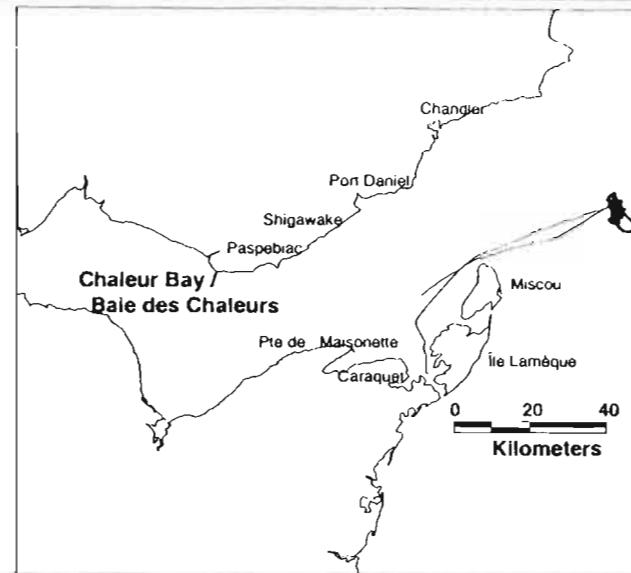
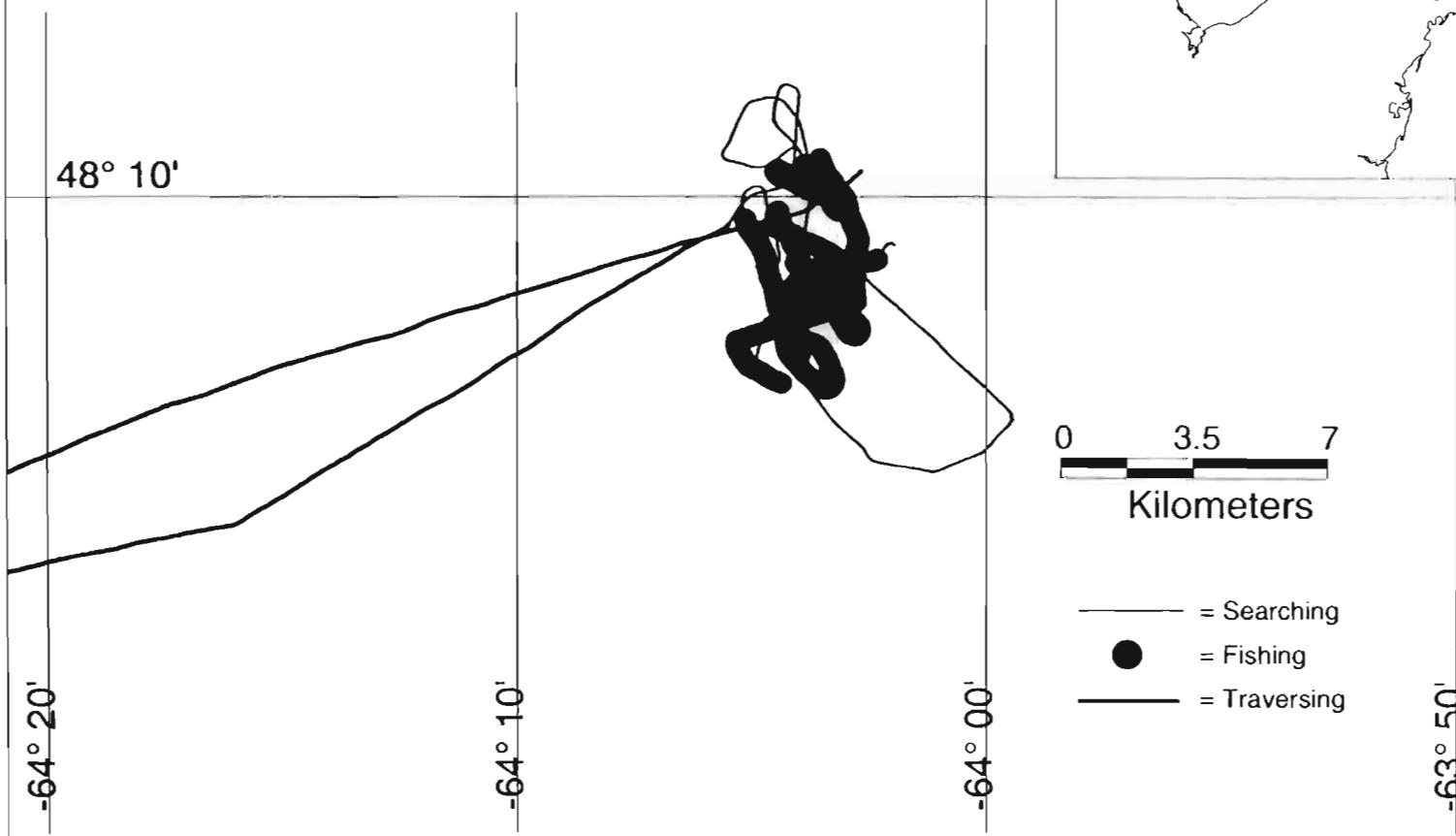
47° 30'



26 August 1996

	Hr	Km
Searching	6.8	124.4
Pump/Retrieve	0.2	0.7
Traversing	4.3	84.4

Boat Name - Gemini



0 3.5 7
Kilometers

- = Searching
- = Fishing
- = Traversing

31 August 1996

	Hr	Km
Searching	3.9	46.9
Fishing	4.9	28.7
Pump/Retrieve	2.4	5.4
Traversing	7.2	131.1
Other	0.2	0.4

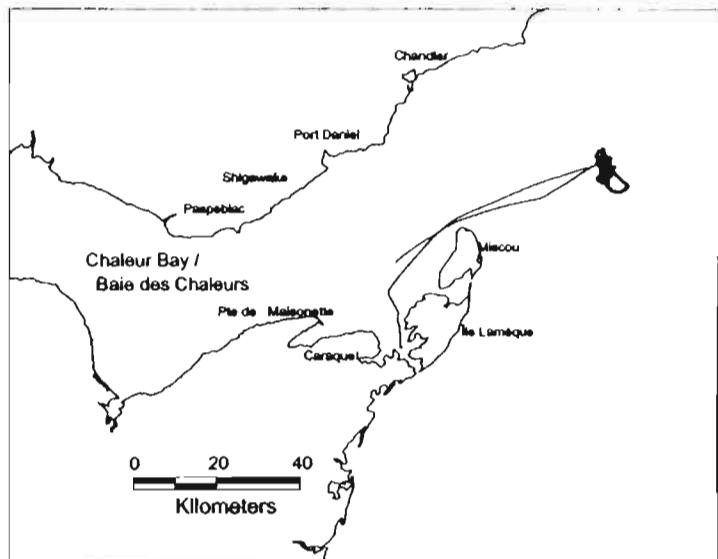
Boat Name - Gemini

48° 10'

-64° 10'

-64° 00'

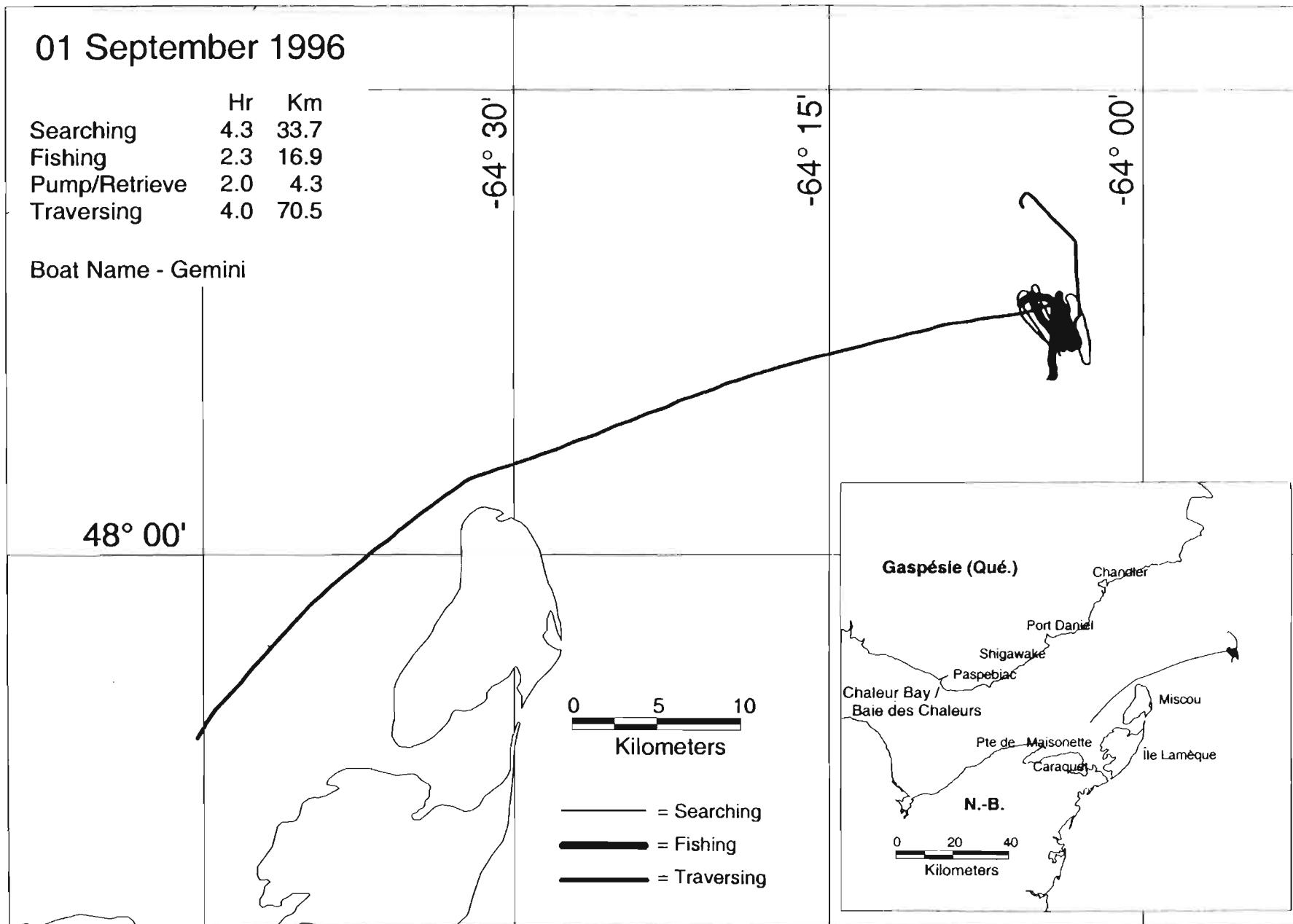
- = Searching
- = Fishing
- = Traversing



01 September 1996

	Hr	Km
Searching	4.3	33.7
Fishing	2.3	16.9
Pump/Retrieve	2.0	4.3
Traversing	4.0	70.5

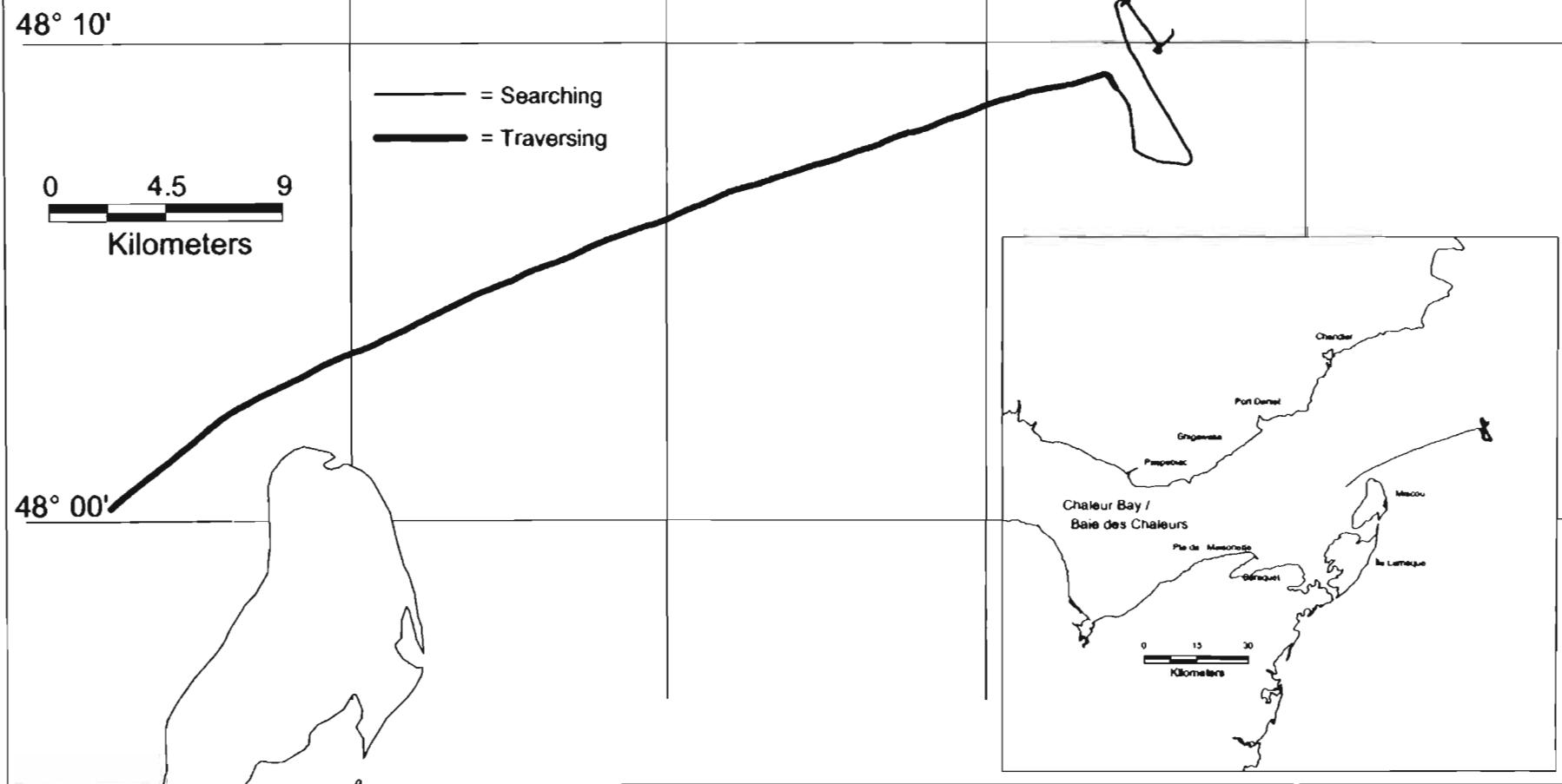
Boat Name - Gemini



04 September 1996

	Hr	Km
Searching	1.4	17.5
Traversing	2.3	43.1

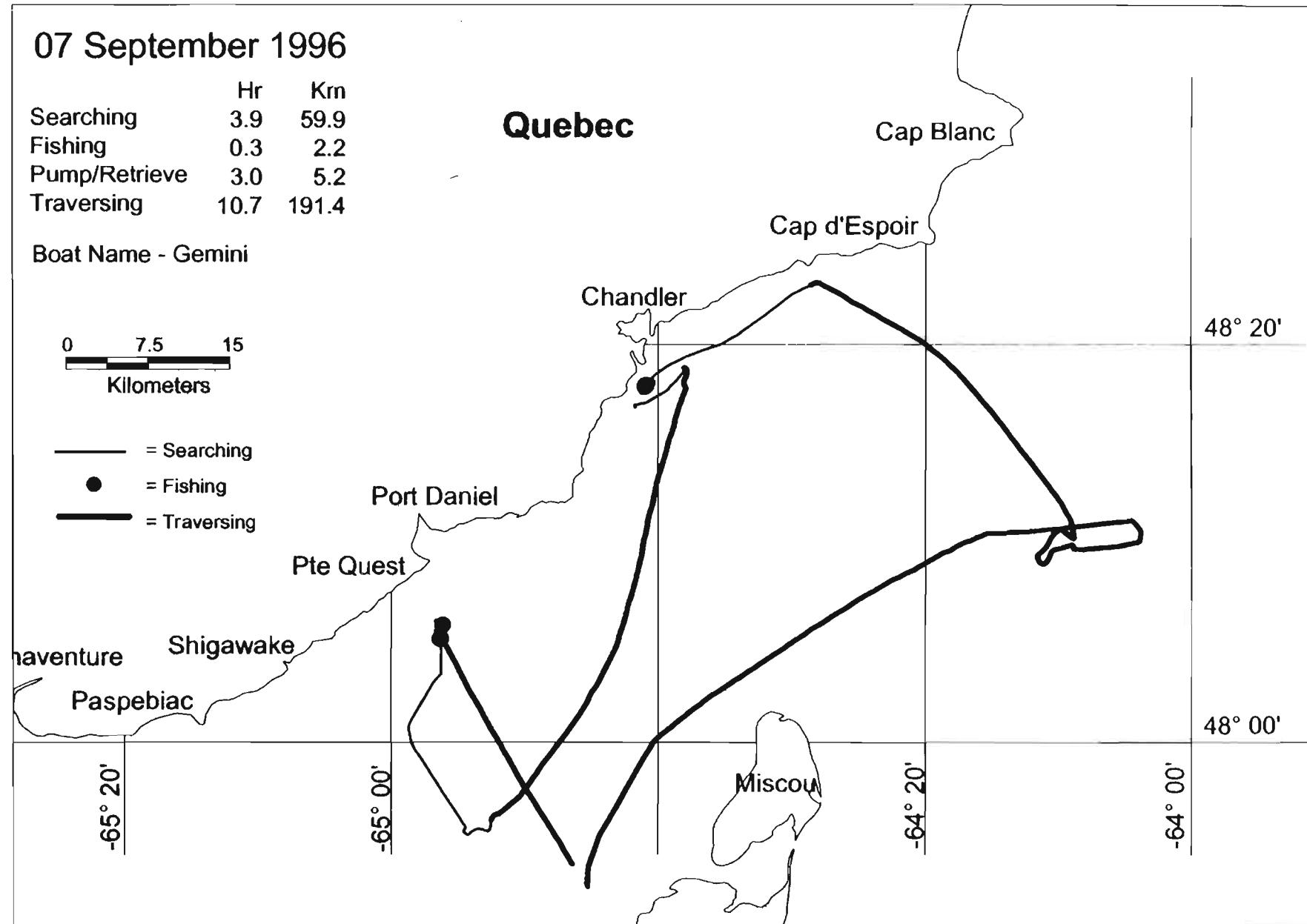
Boat Name - Gemini



07 September 1996

	Hr	Km
Searching	3.9	59.9
Fishing	0.3	2.2
Pump/Retrieve	3.0	5.2
Traversing	10.7	191.4

Boat Name - Gemini

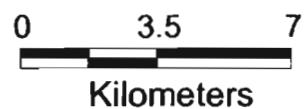


08 September 1996

	Hr	Km
Searching	0.3	3.4
Fishing	0.1	0.8
Pump/Retrieve	1.8	3.1
Traversing	2.0	35.4

Boat Name - Gemini

48° 00'



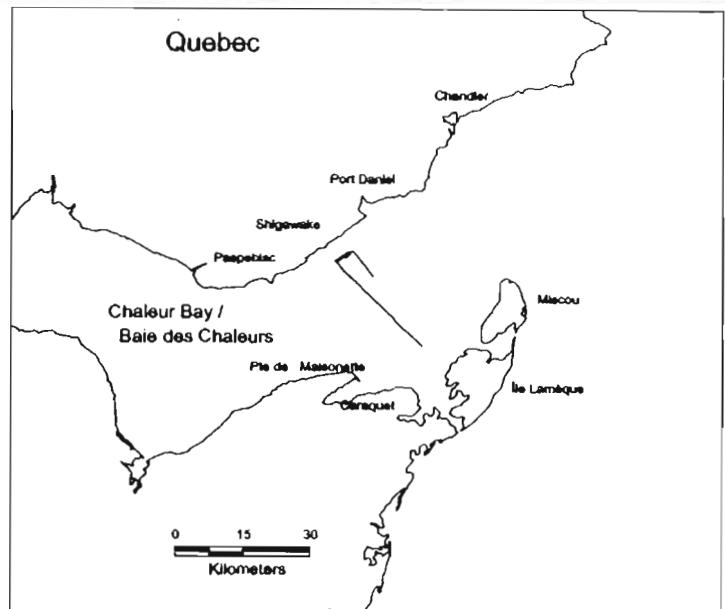
- = Searching
- = Fishing
- = Traversing

-65° 10'

-65° 00'

-64° 50'

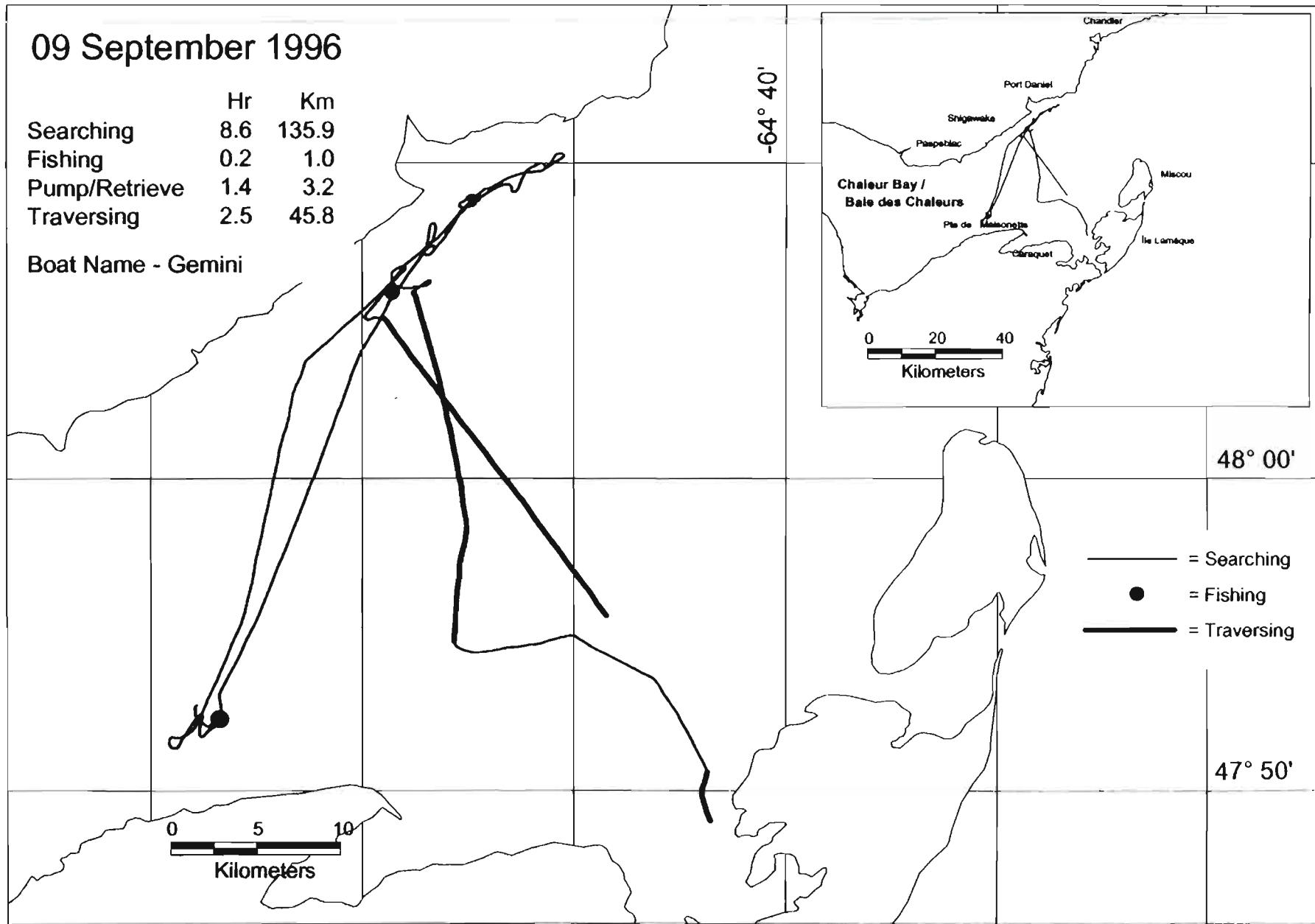
-64° 40'



09 September 1996

	Hr	Km
Searching	8.6	135.9
Fishing	0.2	1.0
Pump/Retrieve	1.4	3.2
Traversing	2.5	45.8

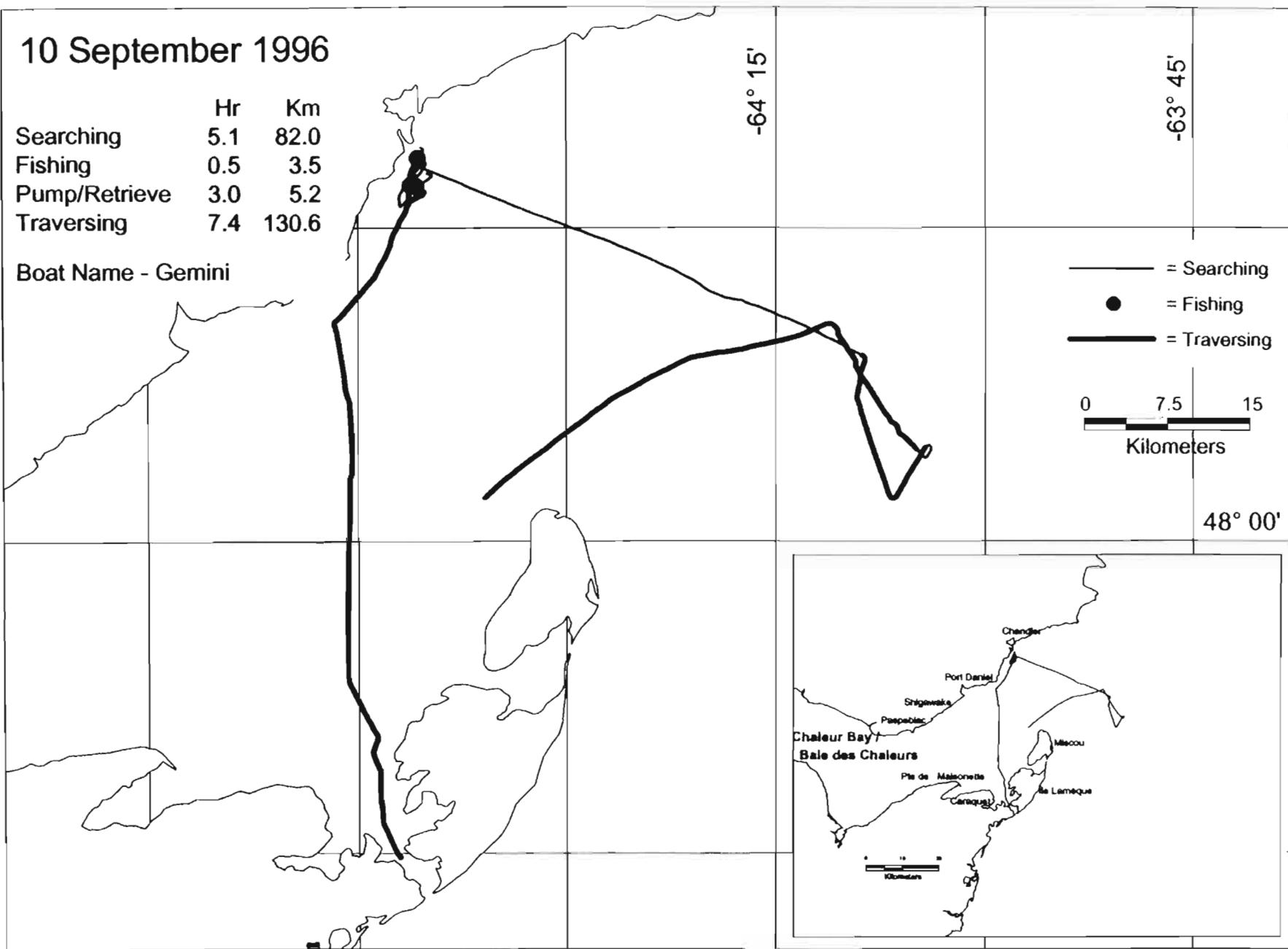
Boat Name - Gemini



10 September 1996

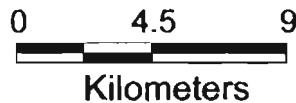
	Hr	Km
Searching	5.1	82.0
Fishing	0.5	3.5
Pump/Retrieve	3.0	5.2
Traversing	7.4	130.6

Boat Name - Gemini



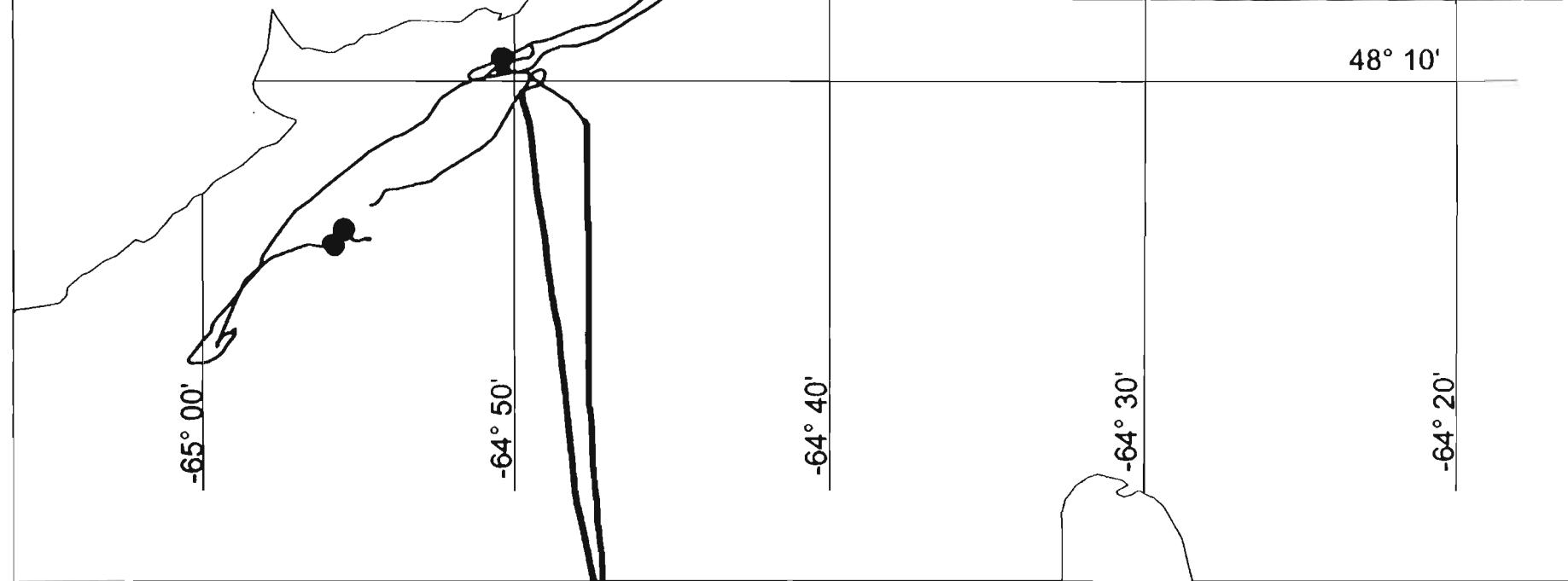
11 September 1996

	Hr	Km
Searching	8.7	100.8
Fishing	0.4	2.0
Pump/Retrieve	3.3	5.5
Traversing	3.9	67.0



Boat Name - Gemini

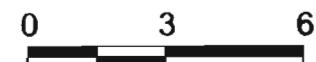
- = Searching
- = Fishing
- = Traversing



15 September 1996

	Hr	Km
Searching	9.5	144.5
Fishing	0.3	2.5
Pump/Retrieve	3.5	5.9
Traversing	2.2	41.2

Boat Name - Gemini



Kilometers

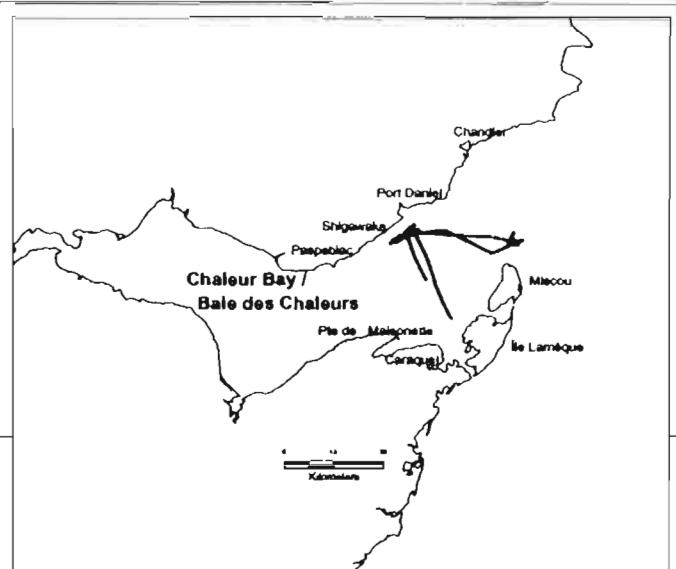
- = Searching
- = Fishing
- = Traversing

48° 10'

-65° 00'

-64° 50'

-64° 40'



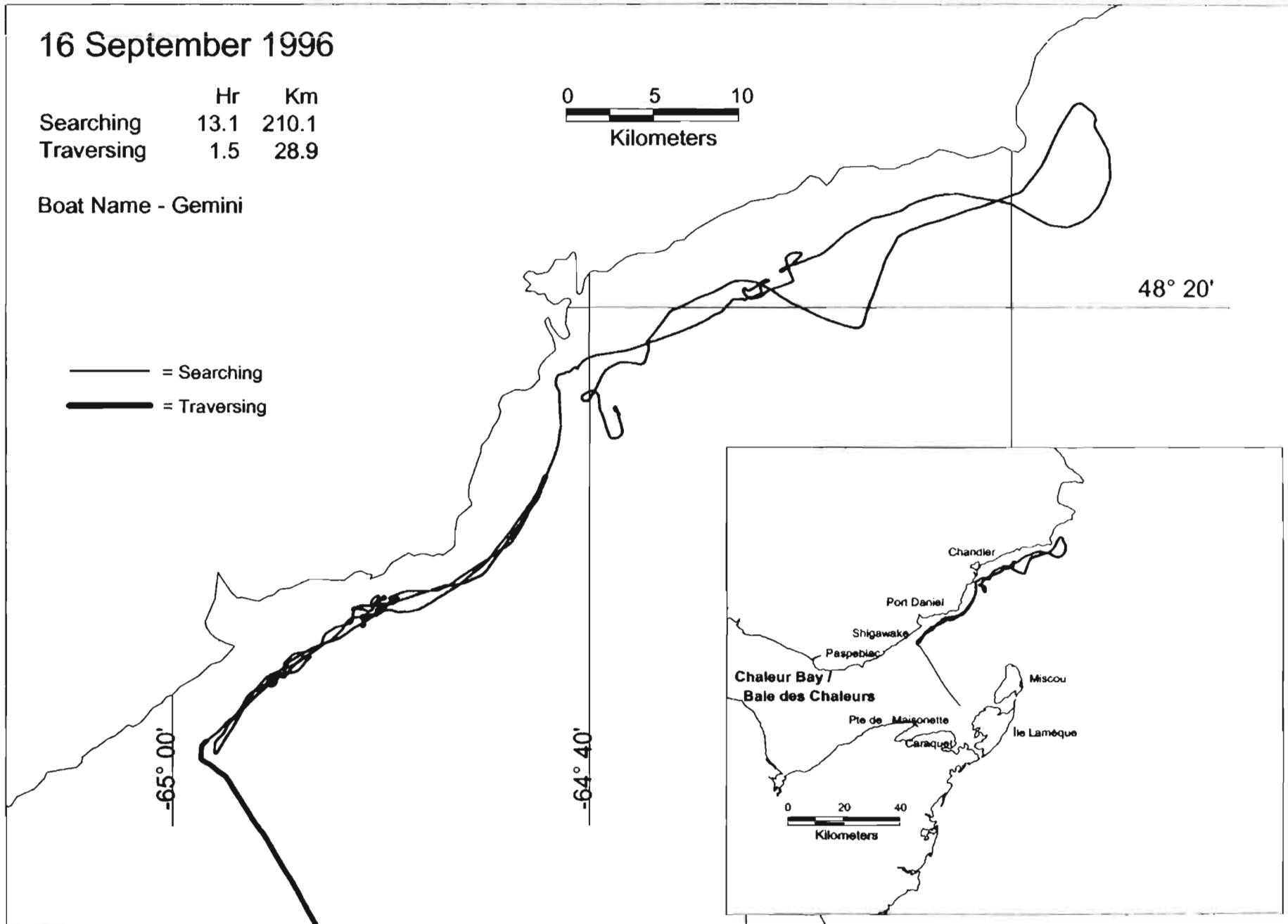
16 September 1996

	Hr	Km
Searching	13.1	210.1
Traversing	1.5	28.9



Boat Name - Gemini

— = Searching
— = Traversing



20 September 1996

	Hr	Km
Searching	8.4	104.4
Fishing	0.4	3.1
Pump/Retrieve	2.9	5.5
Traversing	3.0	59.2

Boat Name - Gemini

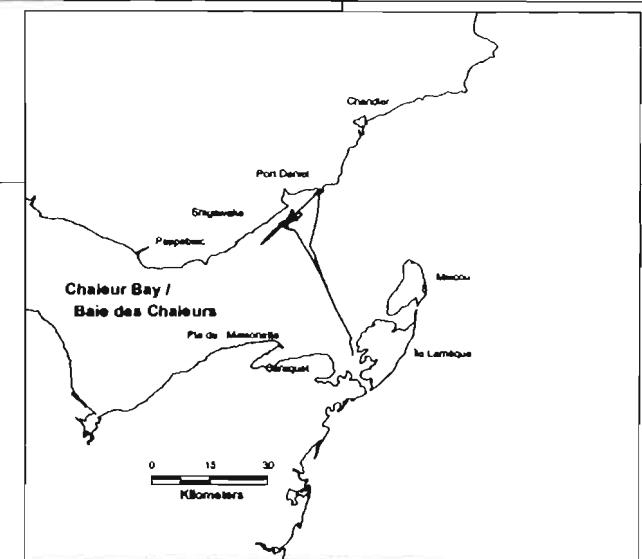


- = Searching
- = Fishing
- = Traversing

-64° 30'

48° 00'

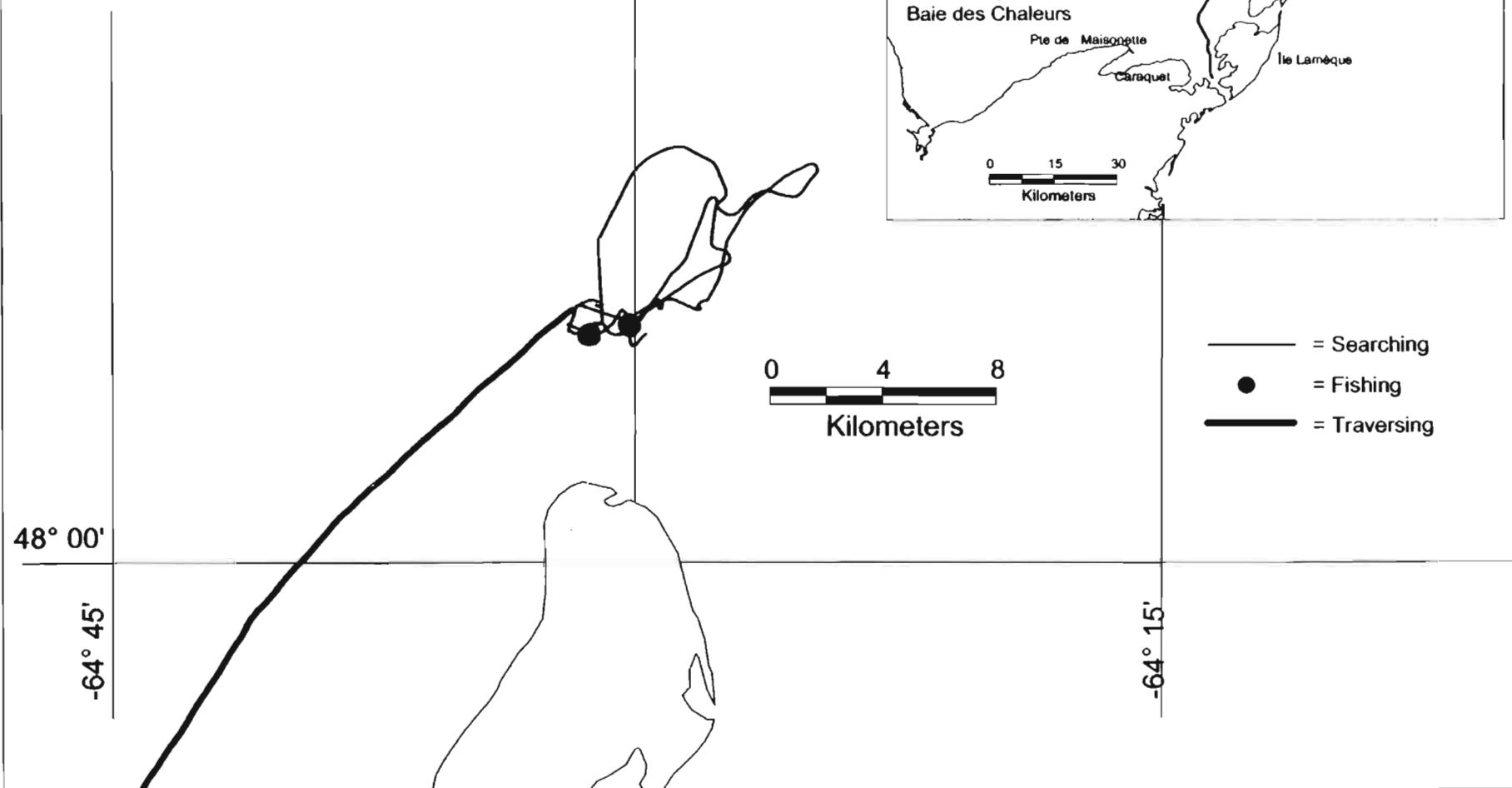
47° 45'



22 September 1996

	Hr	Km
Searching	3.5	51.8
Fishing	0.2	1.7
Pump/Retrieve	3.2	4.9
Traversing	2.3	42.7

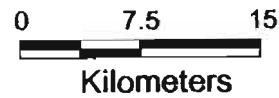
Boat Name - Gemini



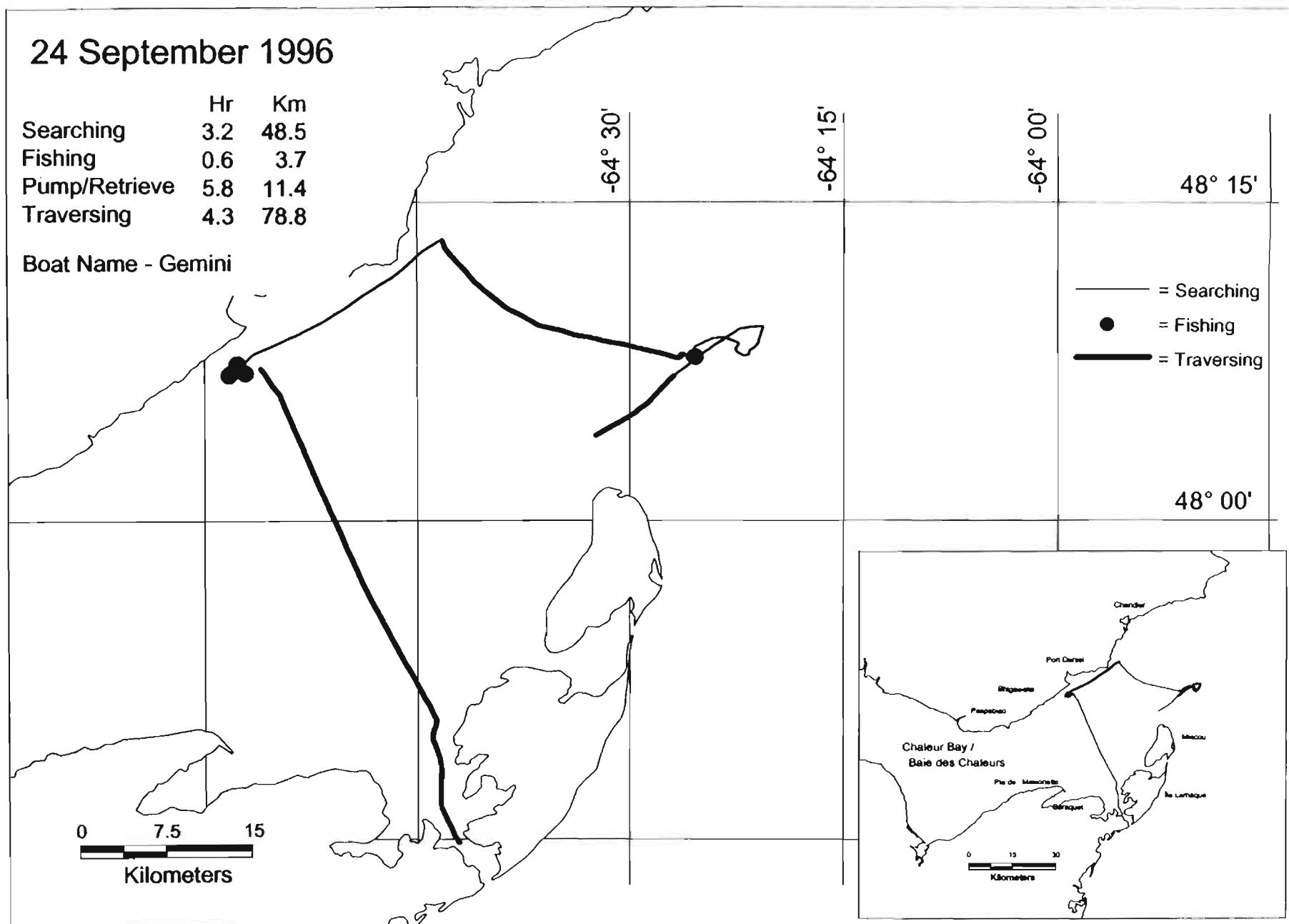
24 September 1996

	Hr	Km
Searching	3.2	48.5
Fishing	0.6	3.7
Pump/Retrieve	5.8	11.4
Traversing	4.3	78.8

Boat Name - Gemini



Kilometers



25 September 1996

	Hr	Km
Searching	7.9	120.6
Fishing	0.6	4.5
Pump/Retrieve	2.3	4.0
Traversing	3.0	56.2



Kilometers

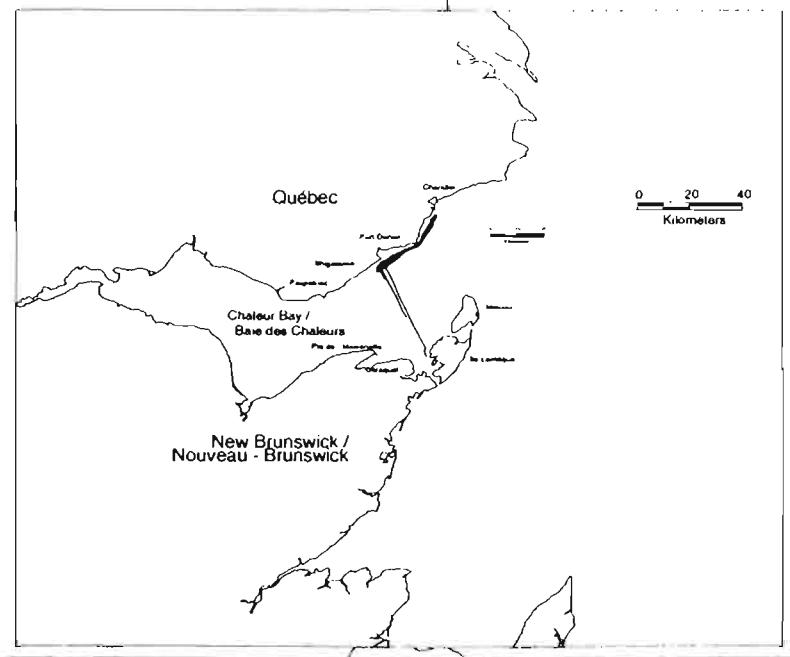
Boat Name - Gemini

- = Searching
- = Fishing
- = Traversing

-65° 00'

-64° 45'

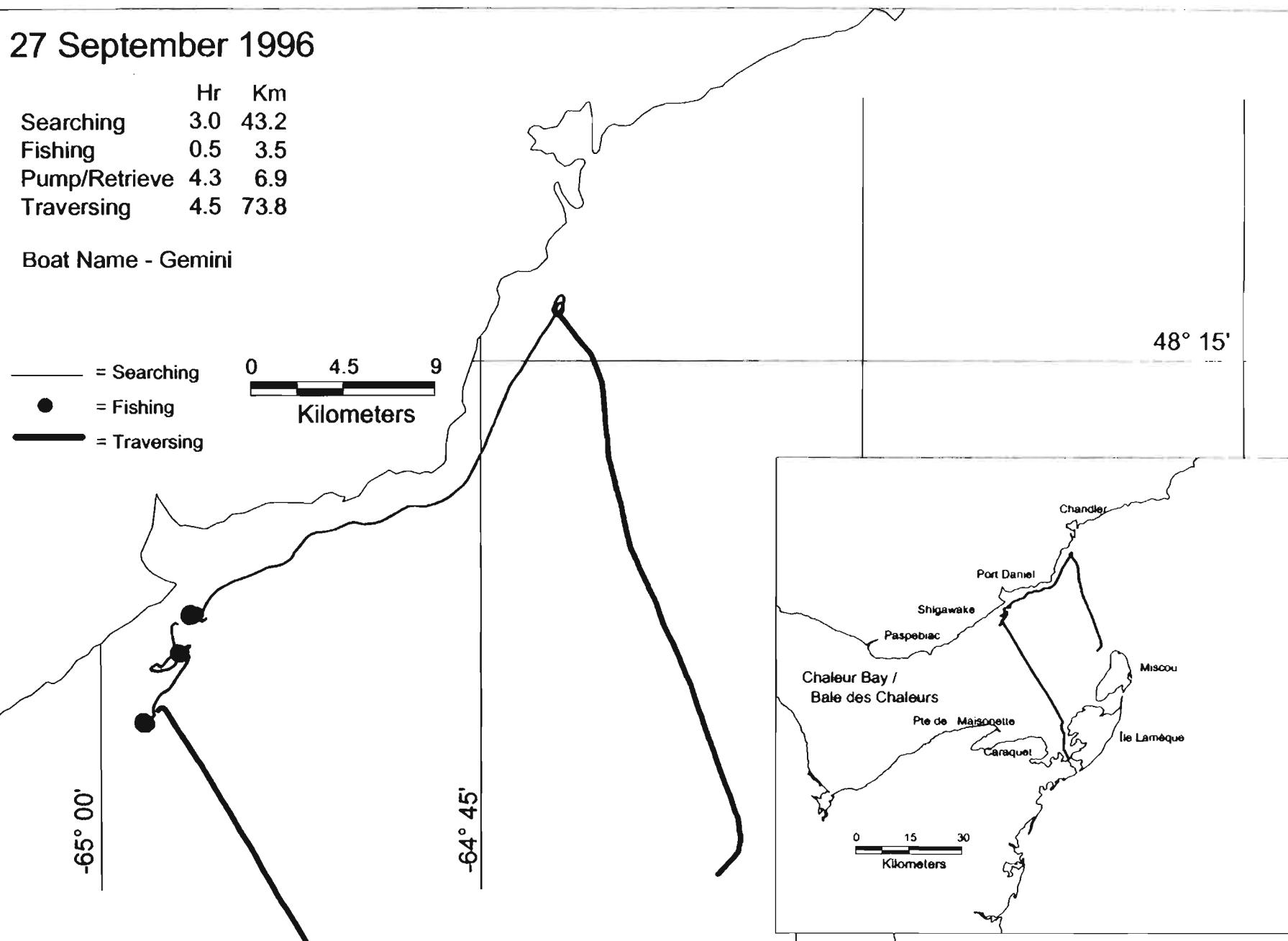
48° 15'



27 September 1996

	Hr	Km
Searching	3.0	43.2
Fishing	0.5	3.5
Pump/Retrieve	4.3	6.9
Traversing	4.5	73.8

Boat Name - Gemini



29 September 1996

	Hr	Km
Searching	9.9	140.3
Fishing	0.4	3.8
Pump/Retrieve	2.2	4.7
Traversing	3.8	69.5

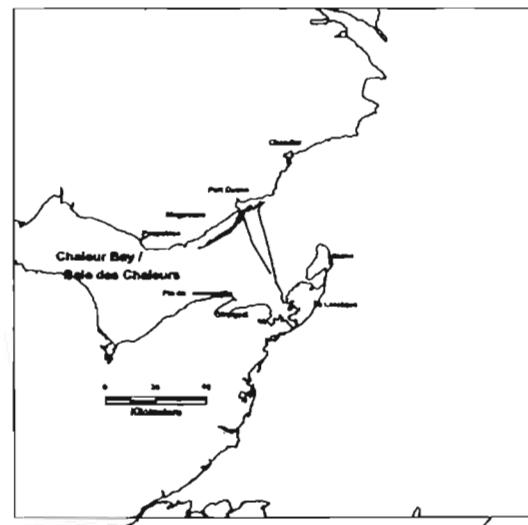
Boat Name - Gemini

- = Searching
- = Fishing
- = Traversing



48° 00'

-64° 30'

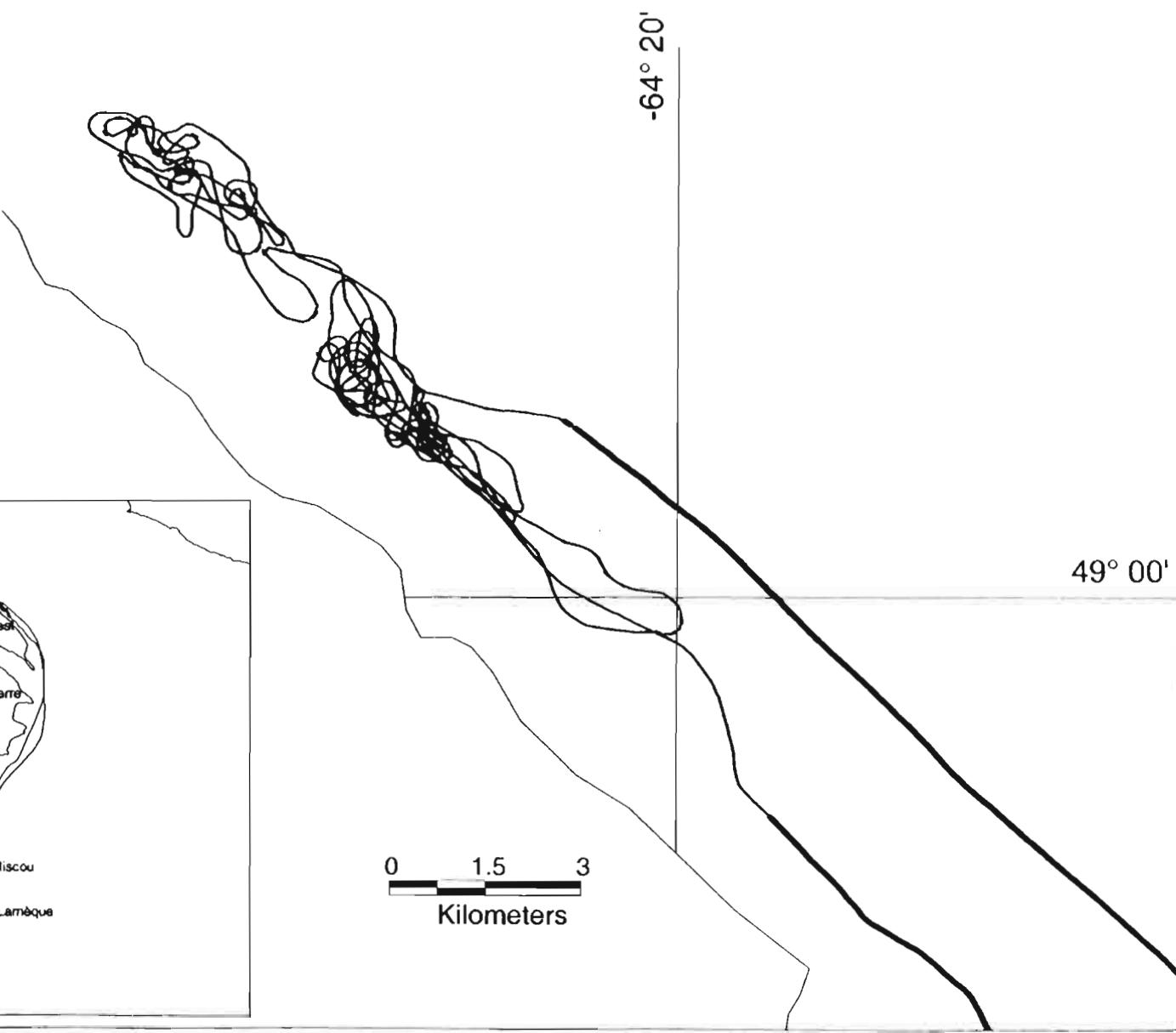
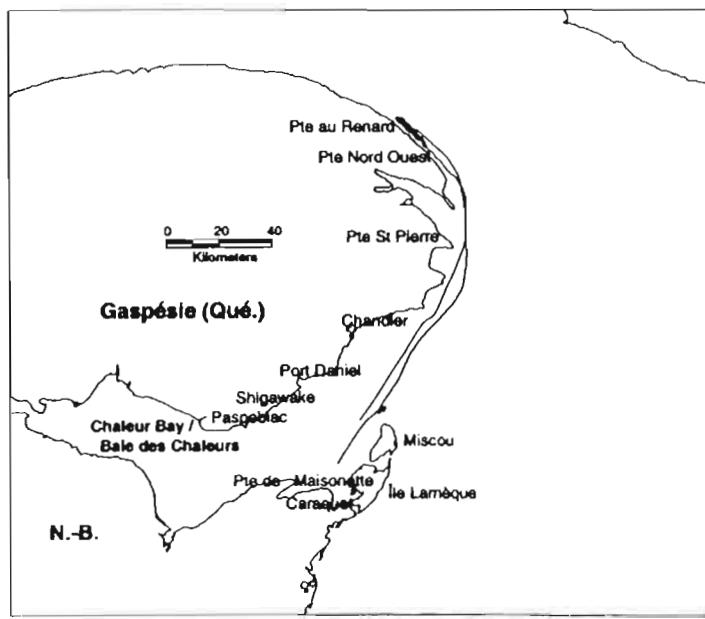


01 October 1996

	Hr	Km
Searching	9.2	127.0
Traversing	14.7	272.2
Other	0.9	1.8

Boat Name - Gemini

— = Searching
— = Traversing



04 October 1996

	Hr	Km
Searching	7.2	109.8
Fishing	0.6	4.7
Pump/Retrieve	5.5	8.3
Traversing	1.8	35.5



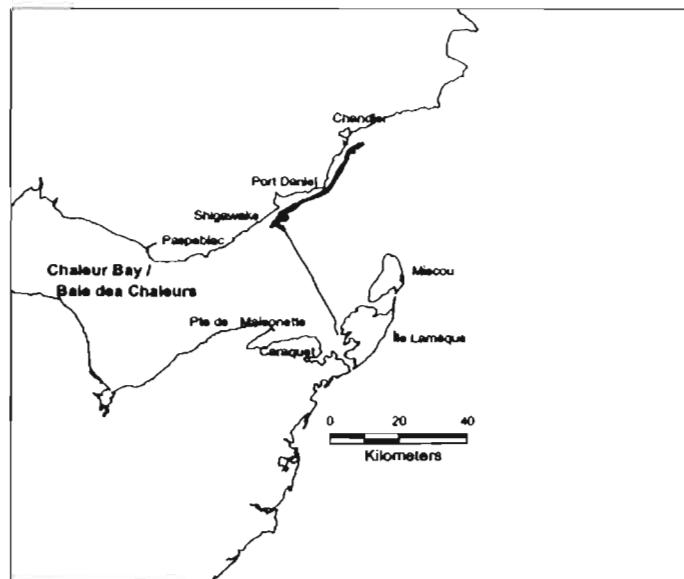
48° 20'

Boat Name - Gemini

- = Searching
- = Fishing
- = Traversing

-65° 00'

-64° 40'

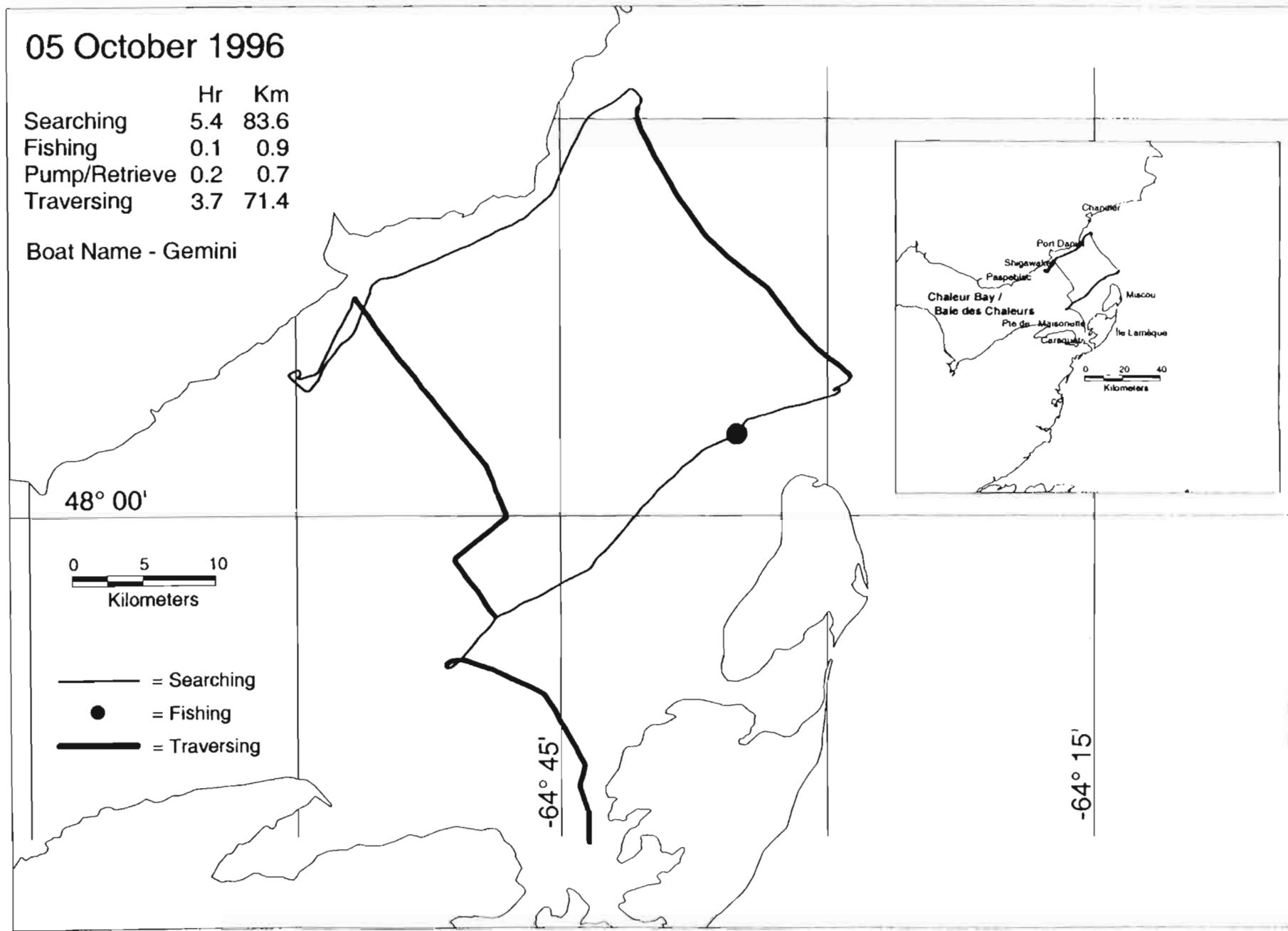


-64° 20'

05 October 1996

	Hr	Km
Searching	5.4	83.6
Fishing	0.1	0.9
Pump/Retrieve	0.2	0.7
Traversing	3.7	71.4

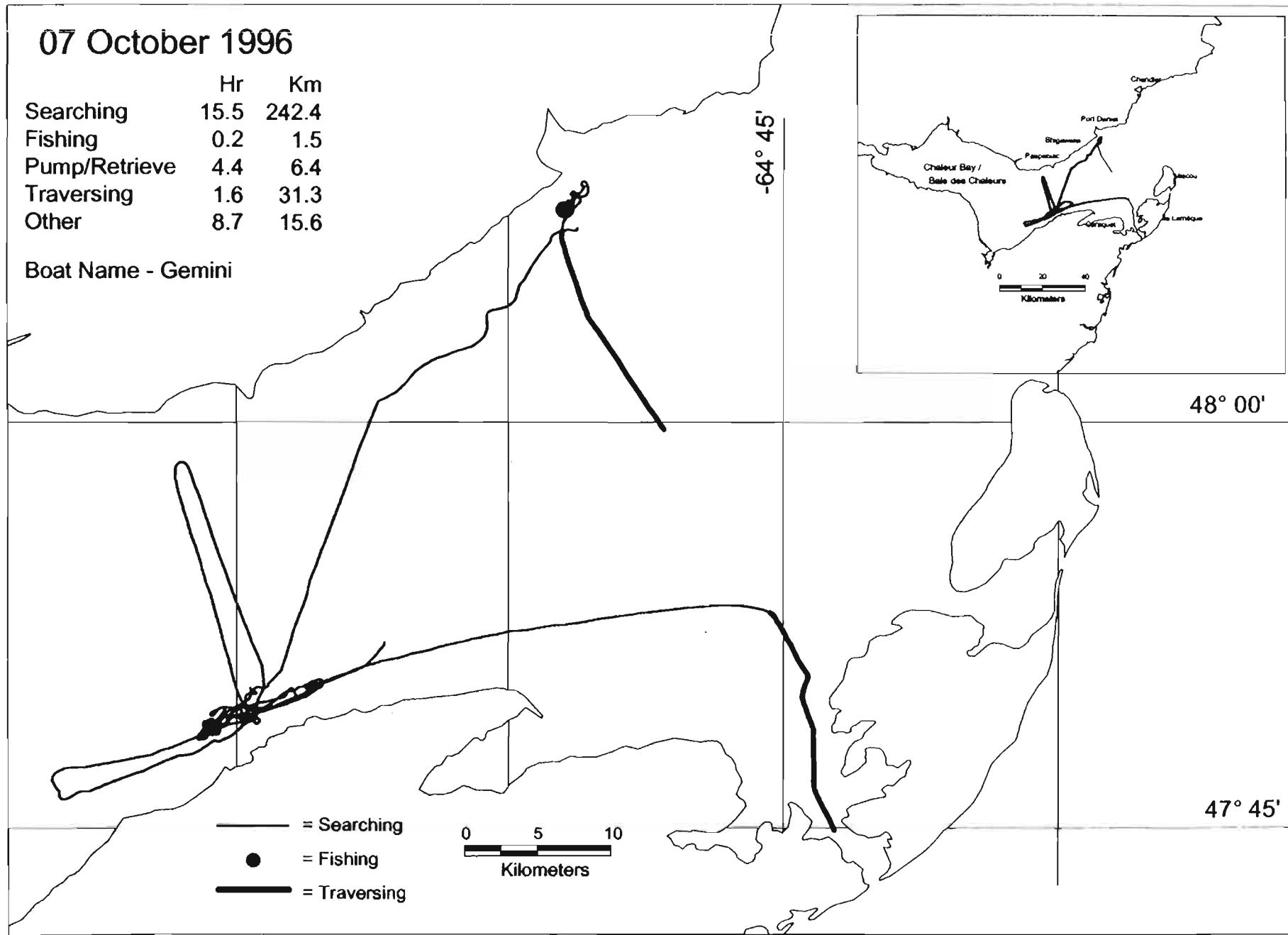
Boat Name - Gemini



07 October 1996

	Hr	Km
Searching	15.5	242.4
Fishing	0.2	1.5
Pump/Retrieve	4.4	6.4
Traversing	1.6	31.3
Other	8.7	15.6

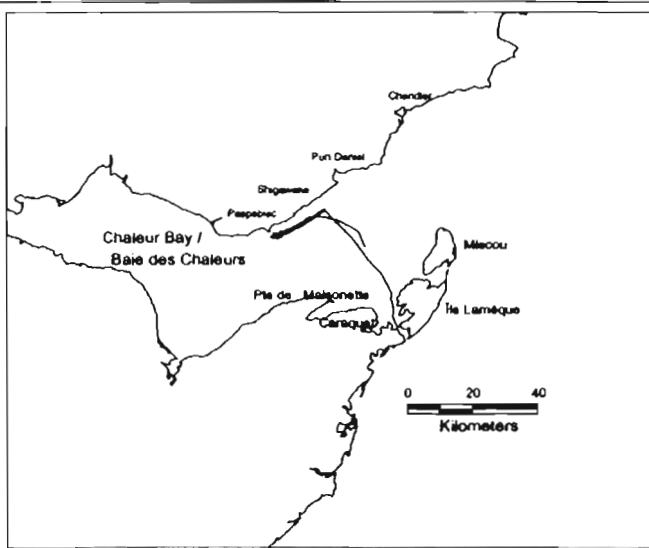
Boat Name - Gemini



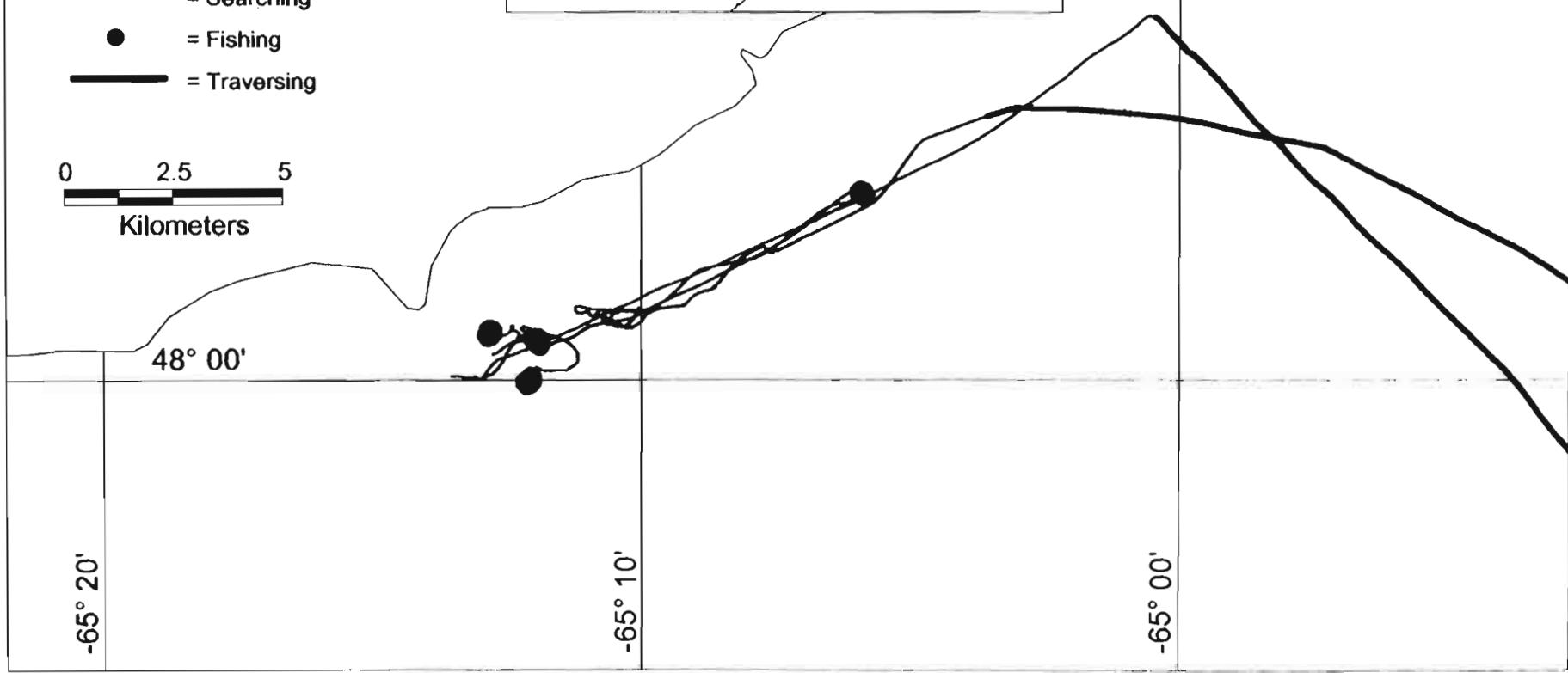
10 October 1996

	Hr	Km
Searching	4.4	59.2
Fishing	0.5	2.9
Pump/Retrieve	4.8	7.2
Traversing	3.7	64.6

Boat Name - Gemini



- = Searching
- = Fishing
- = Traversing



11 October 1996

	Hr	Km
Searching	6.1	90.8
Fishing	0.5	4.0
Pump/Retrieve	3.1	5.8
Traversing	4.0	73.6

Boat Name - Gemini

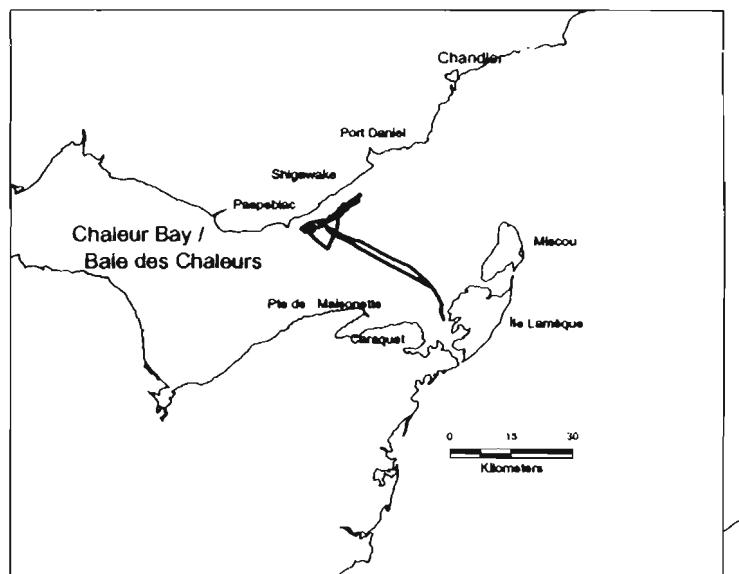
48° 00'

- = Searching
- = Fishing
- = Traversing



-65° 15'

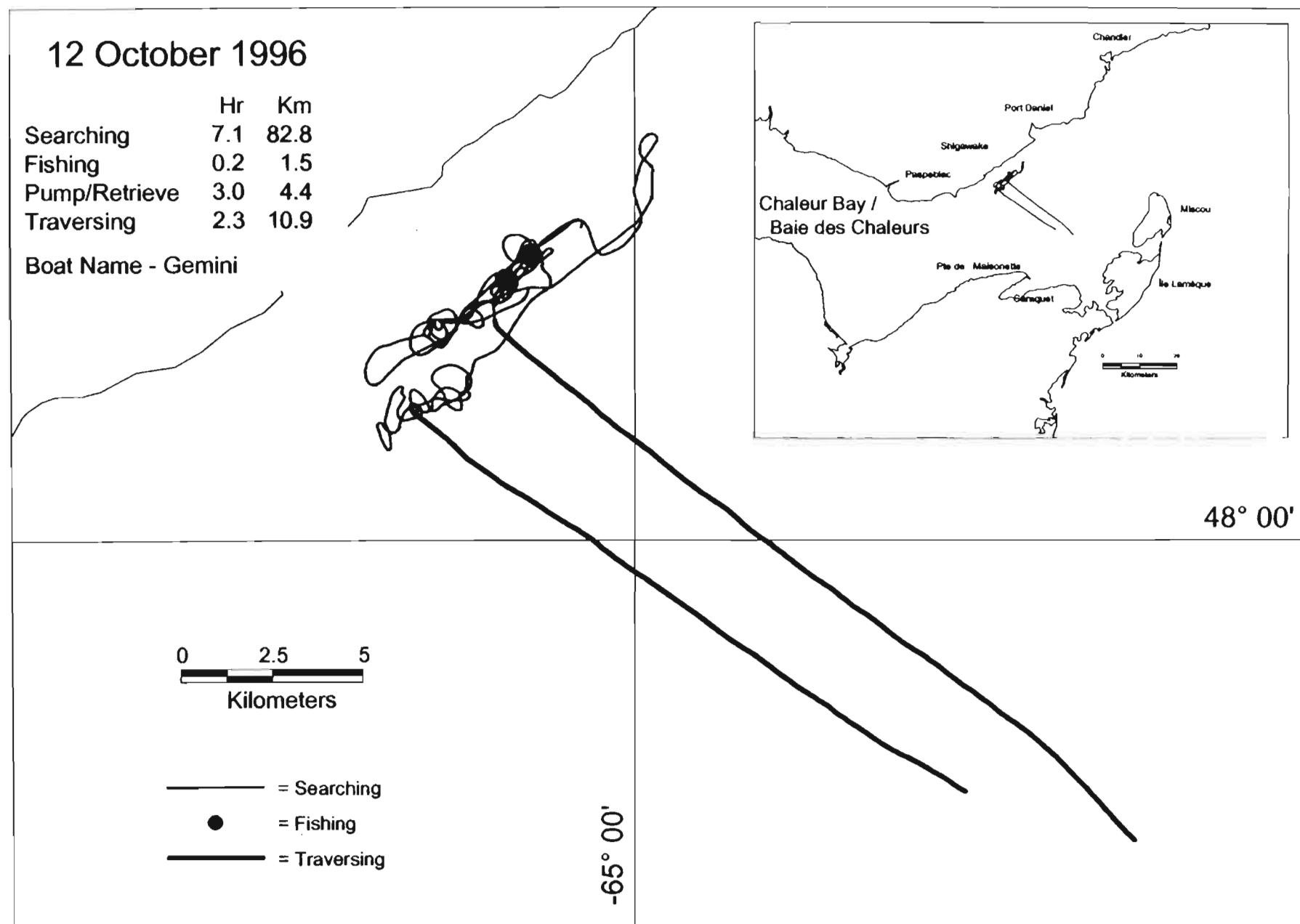
-64° 45'



12 October 1996

	Hr	Km
Searching	7.1	82.8
Fishing	0.2	1.5
Pump/Retrieve	3.0	4.4
Traversing	2.3	10.9

Boat Name - Gemini

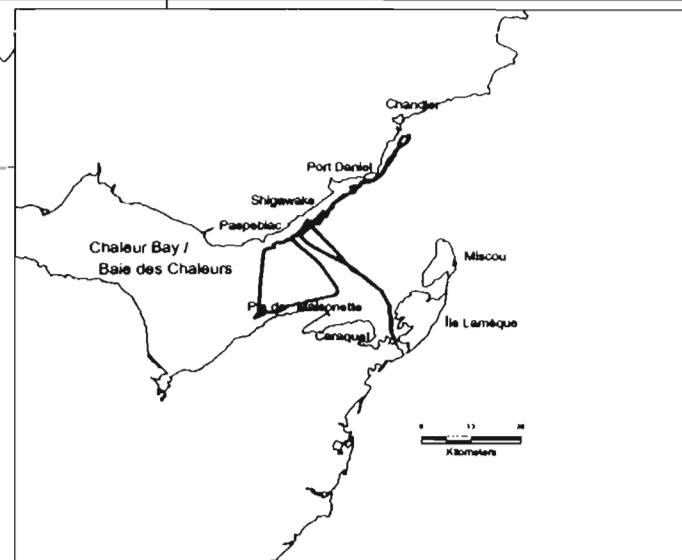


18 October 1996

	Hr	Km
Searching	12.6	214.4
Fishing	0.1	1.3
Pump/Retrieve	0.8	1.4
Traversing	5.1	91.1

Boat Name - Gemini

0 7.5 15
Kilometers



48° 00'

-64° 20'

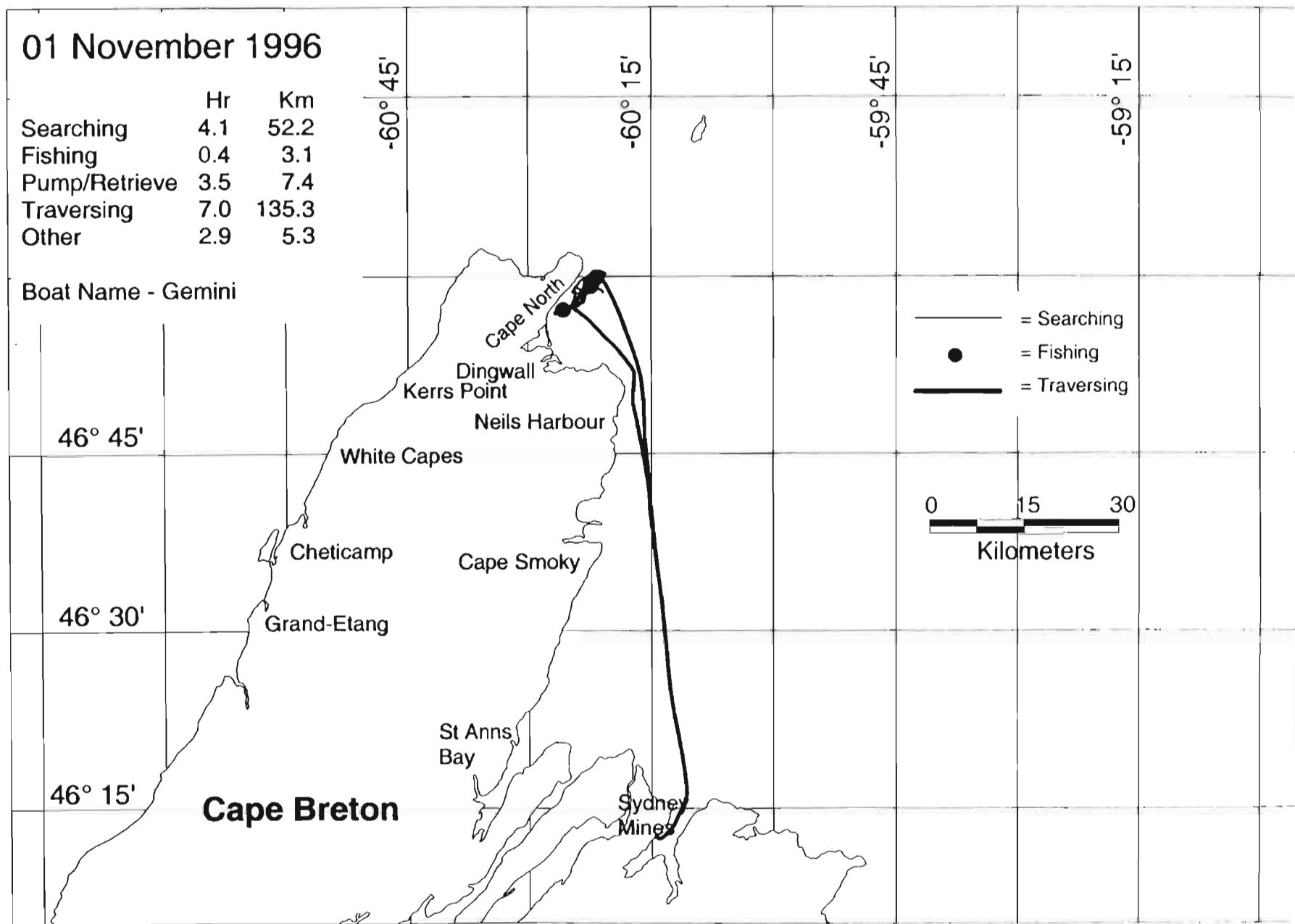
-64° 00'

- = Searching
- = Fishing
- = Traversing

01 November 1996

	Hr	Km
Searching	4.1	52.2
Fishing	0.4	3.1
Pump/Retrieve	3.5	7.4
Traversing	7.0	135.3
Other	2.9	5.3

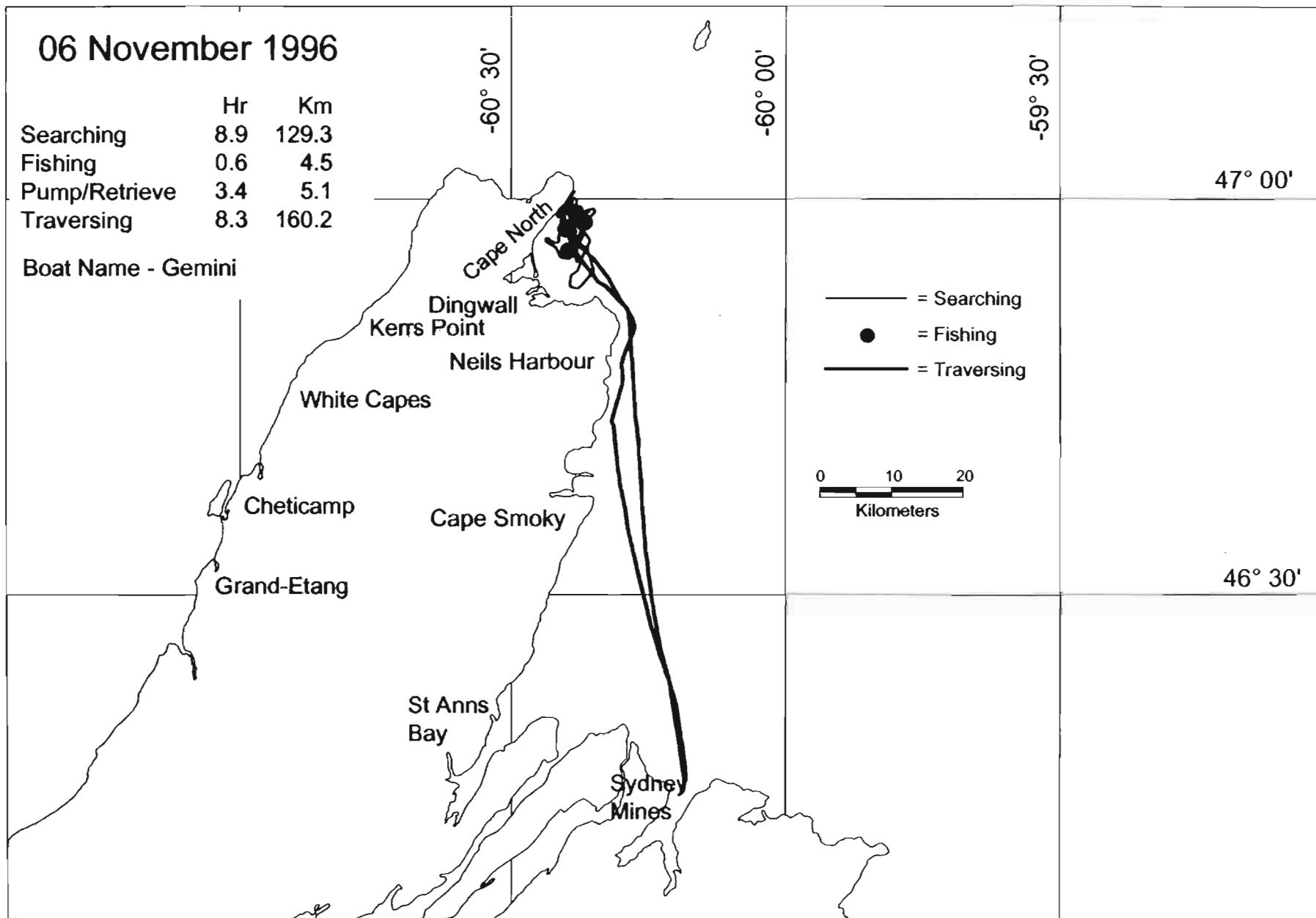
Boat Name - Gemini



06 November 1996

	Hr	Km
Searching	8.9	129.3
Fishing	0.6	4.5
Pump/Retrieve	3.4	5.1
Traversing	8.3	160.2

Boat Name - Gemini

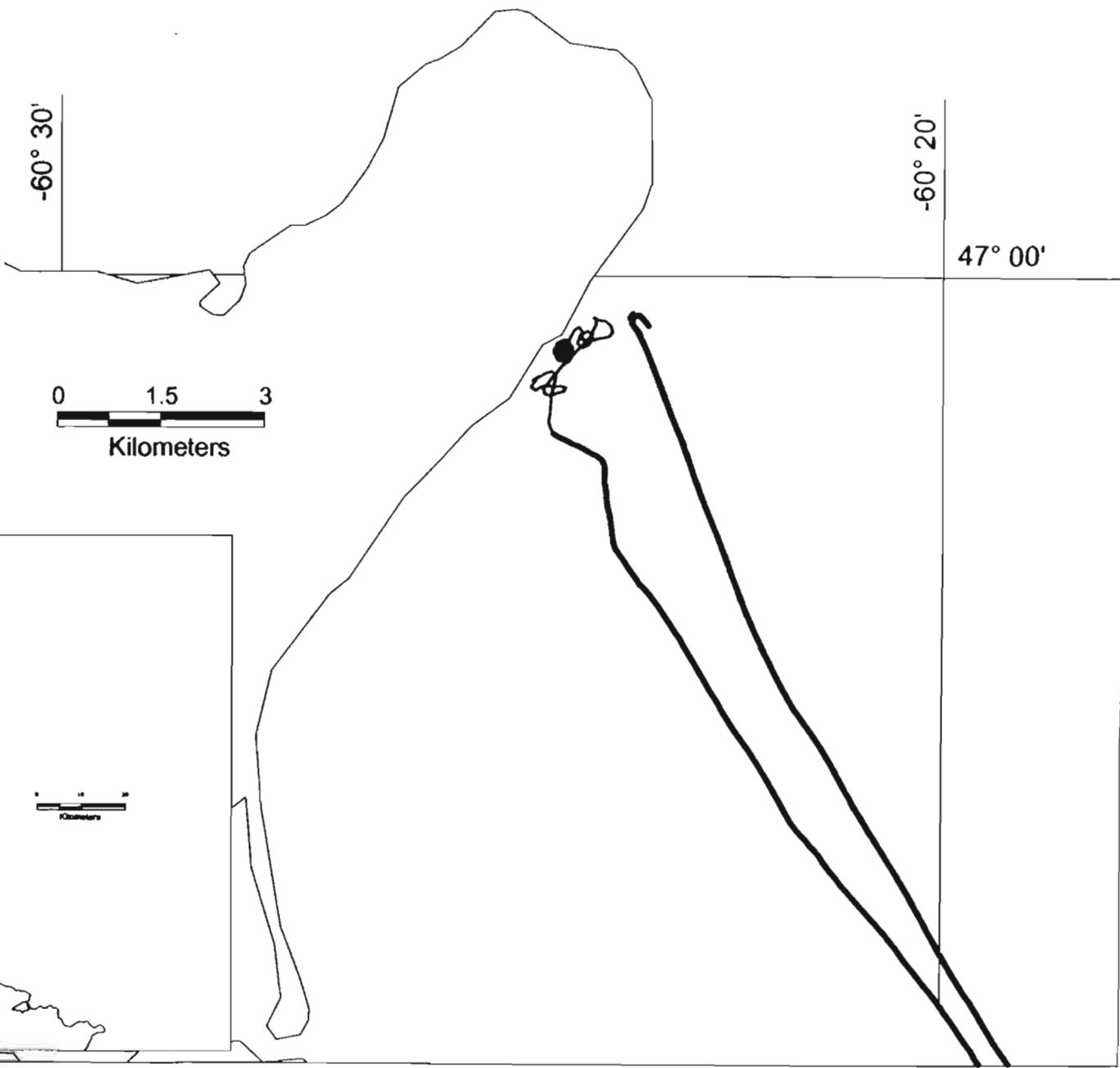
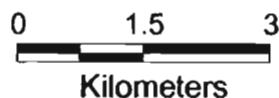


13 November 1996

	Hr	Km
Searching	0.5	6.2
Fishing	0.1	0.7
Pump/Retrieve	1.3	1.9
Traversing	8.3	152.1

Boat Name - Gemini

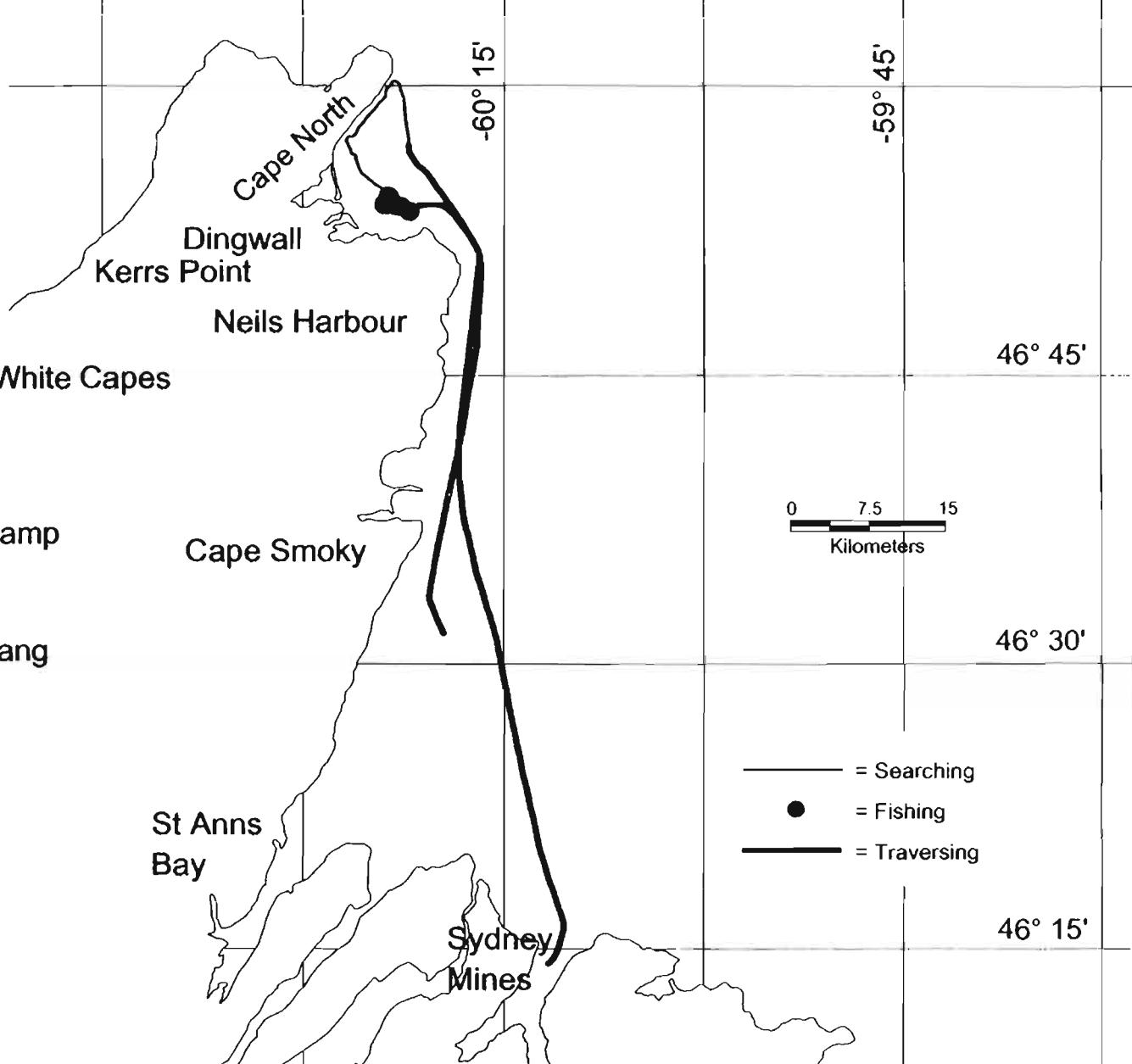
- = Searching
- = Fishing
- = Traversing



22 November 1996

	Hr	Km
Searching	2.7	34.4
Fishing	0.8	5.4
Pump/Retrieve	6.3	8.9
Traversing	7.0	114.5

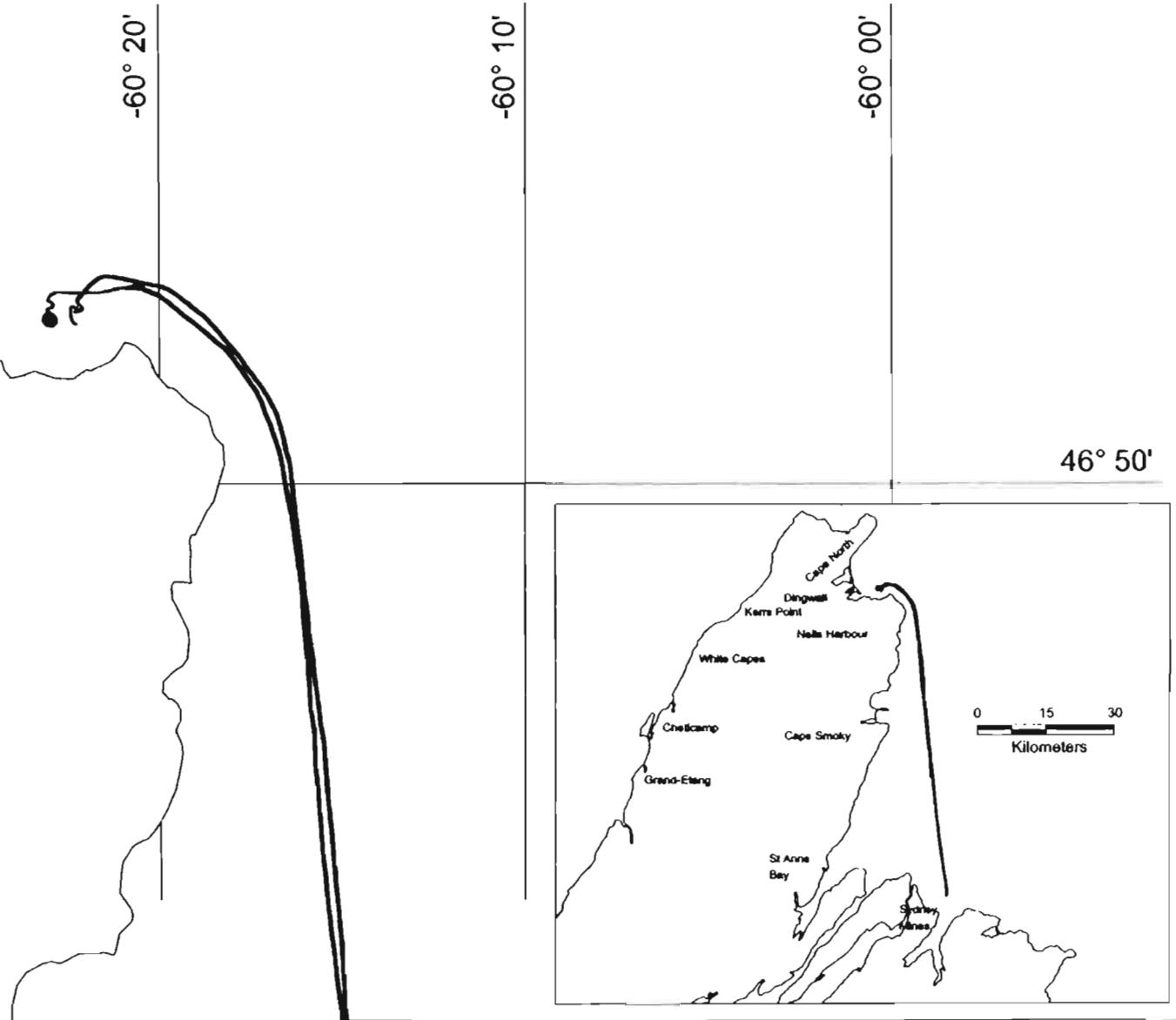
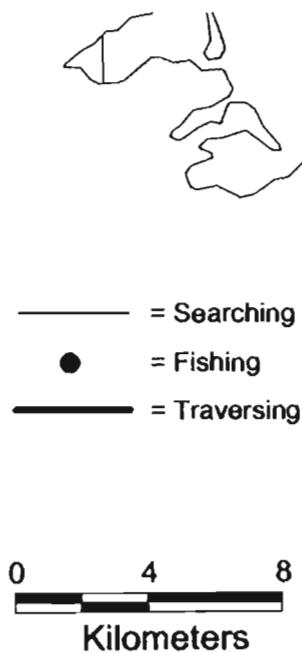
Boat Name - Gemini



23 November 1996

	Hr	Km
Searching	0.9	6.3
Fishing	0.1	0.9
Pump/Retrieve	1.2	1.9
Traversing	6.3	117.0

Boat Name - Gemini



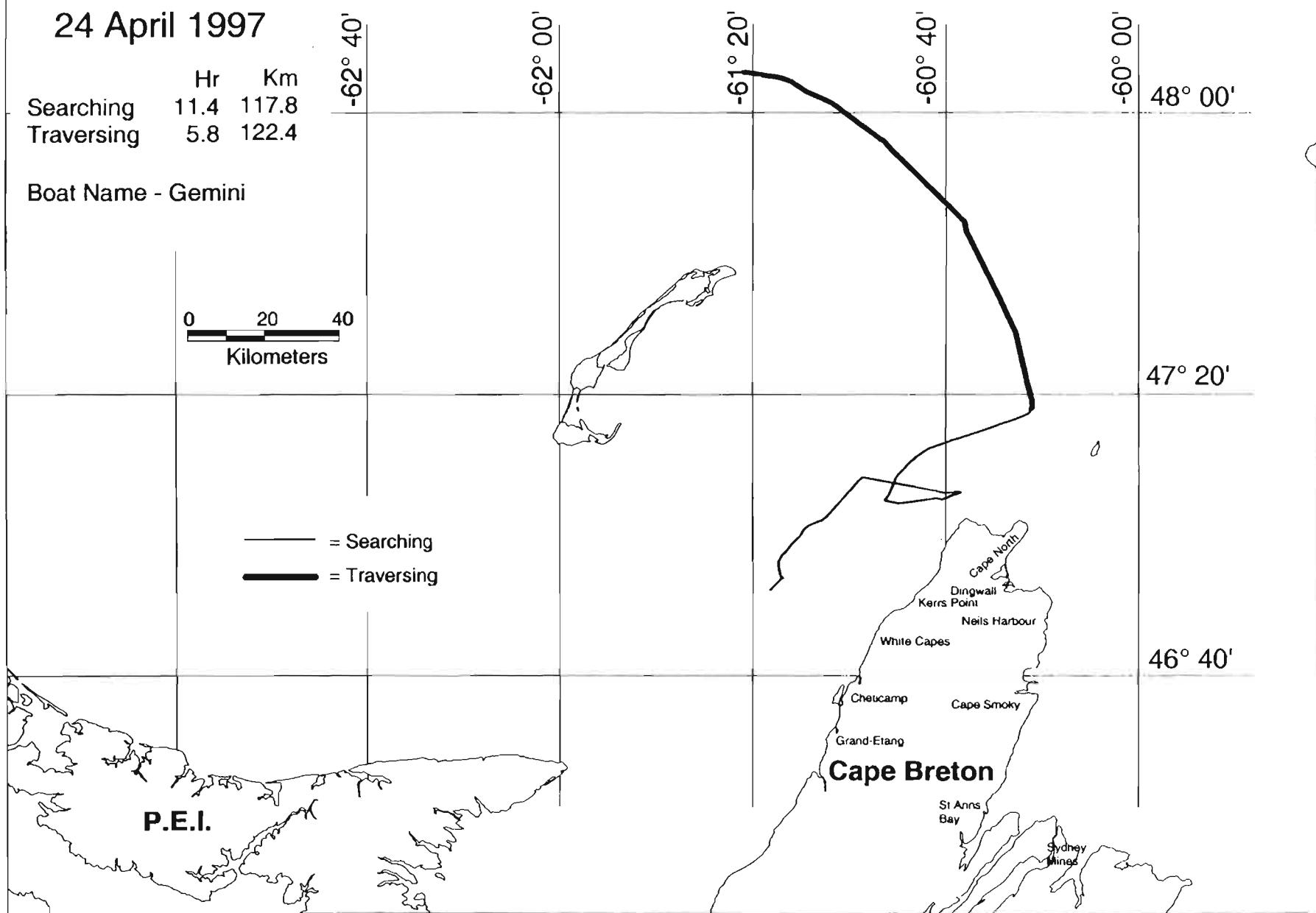
24 April 1997

	Hr	Km
Searching	11.4	117.8
Traversing	5.8	122.4

Boat Name - Gemini

0 20 40
Kilometers

— = Searching
— = Traversing



25 April 1997

	Hr	Km
Searching	1.9	32.1
Fishing	6.5	10.7

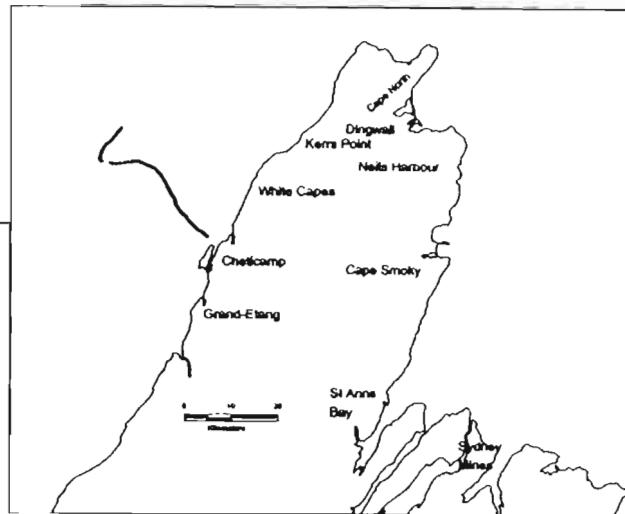
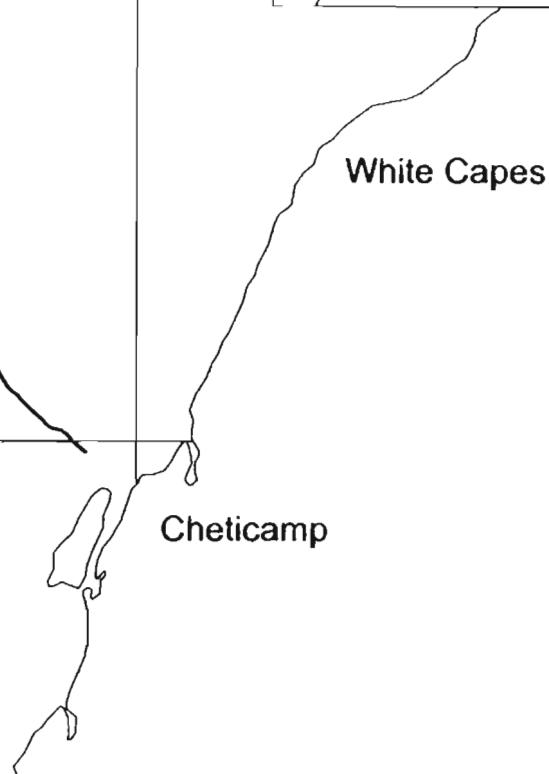
Boat Name - Gemini

— = Searching
— = Fishing

0 5 10
Kilometers

46° 40'
-61° 40'

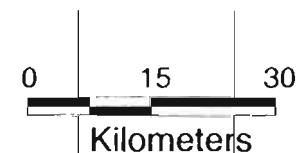
-61° 20'



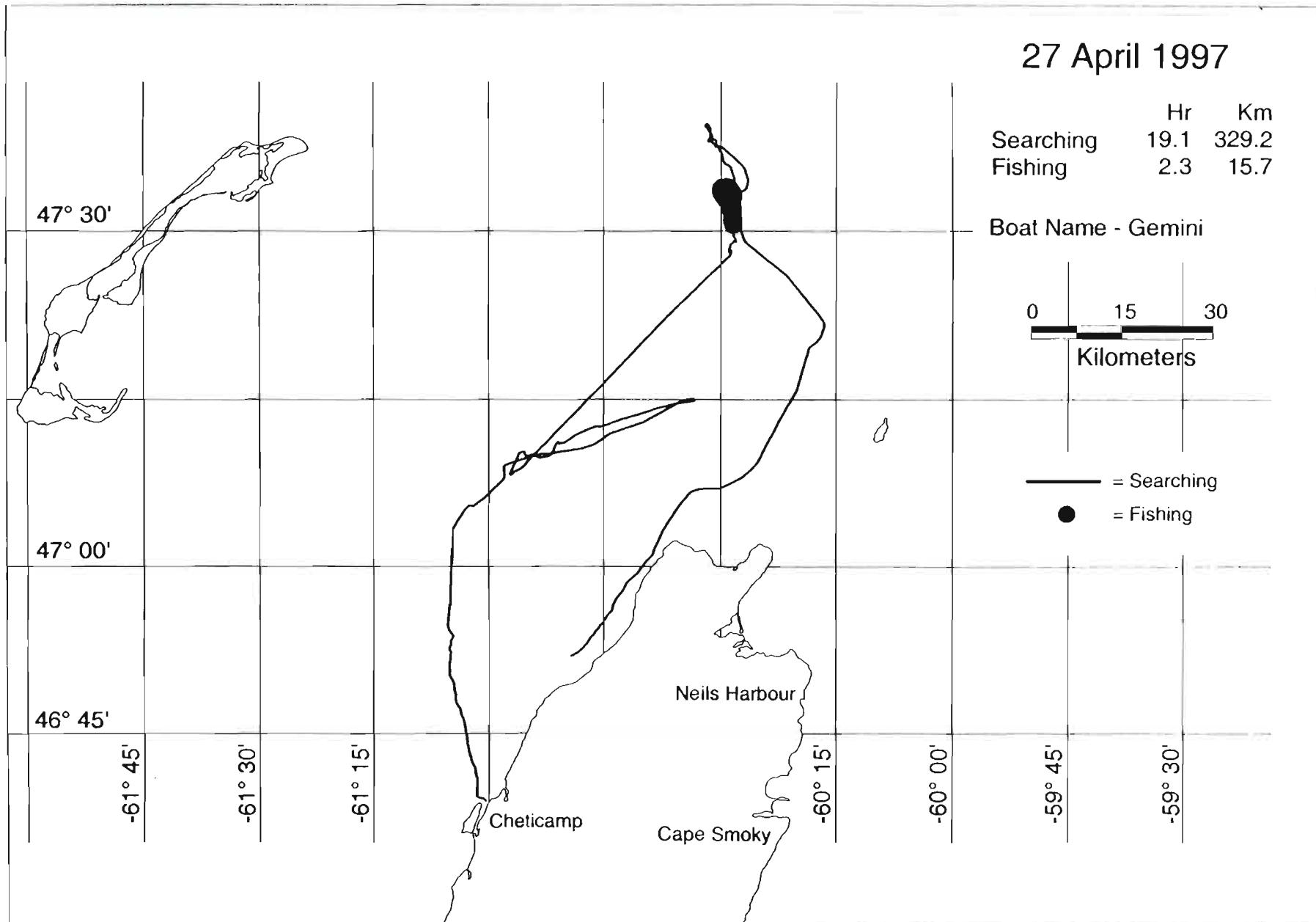
27 April 1997

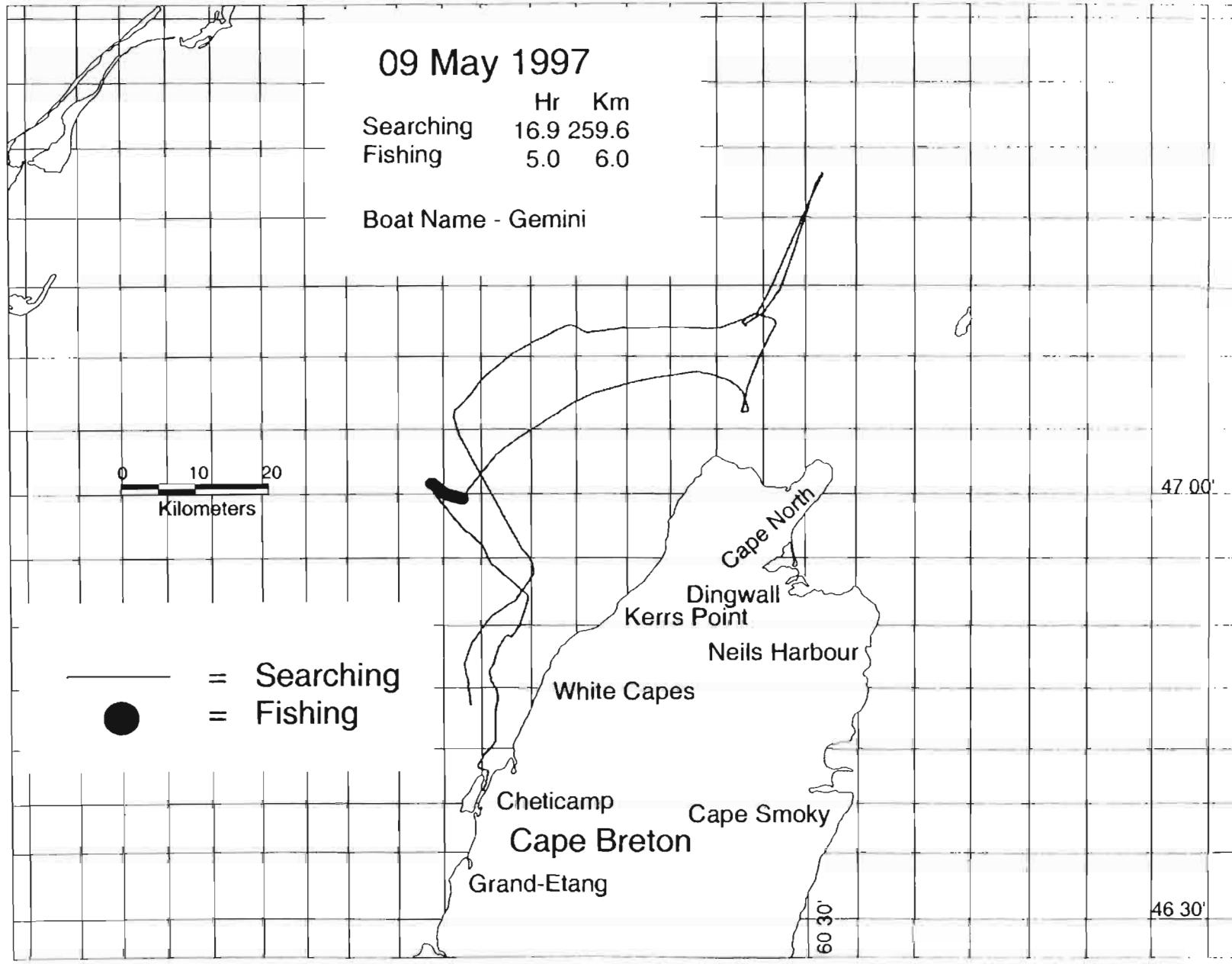
	Hr	Km
Searching	19.1	329.2
Fishing	2.3	15.7

Boat Name - Gemini



— = Searching
● = Fishing





11 May 1997

	Hr	Km
Searching	8.0	90.3
Traversing	26.1	496.3

Boat Name - Gemini

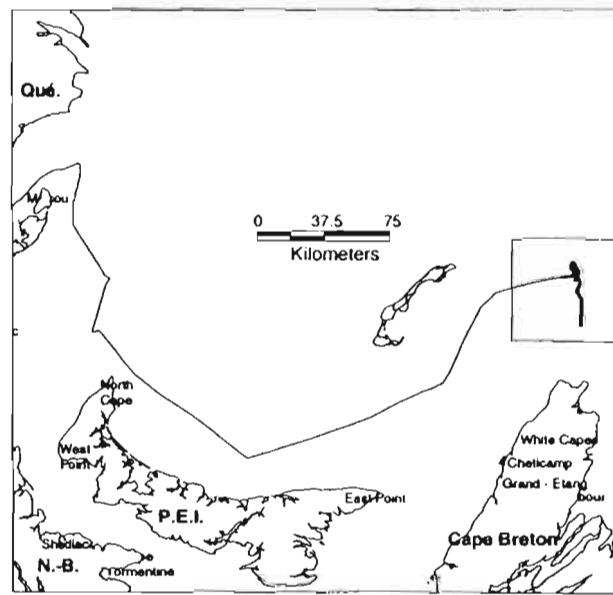
— = Searching
— = Traversing

0 5 10
Kilometers

47° 30'

-61° 00'

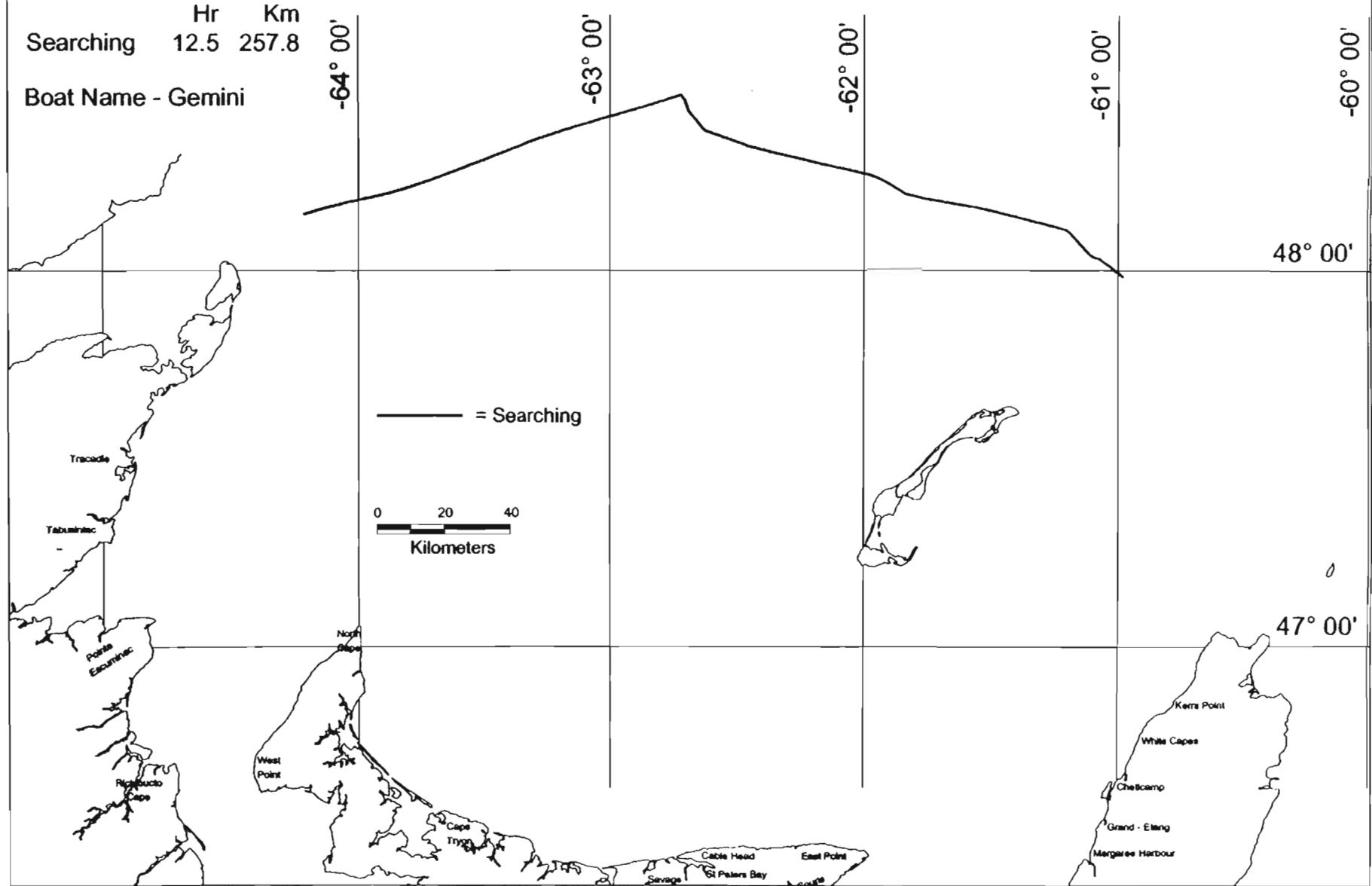
-60° 30'



15 May 1997

Searching Hr Km
Searching 12.5 257.8

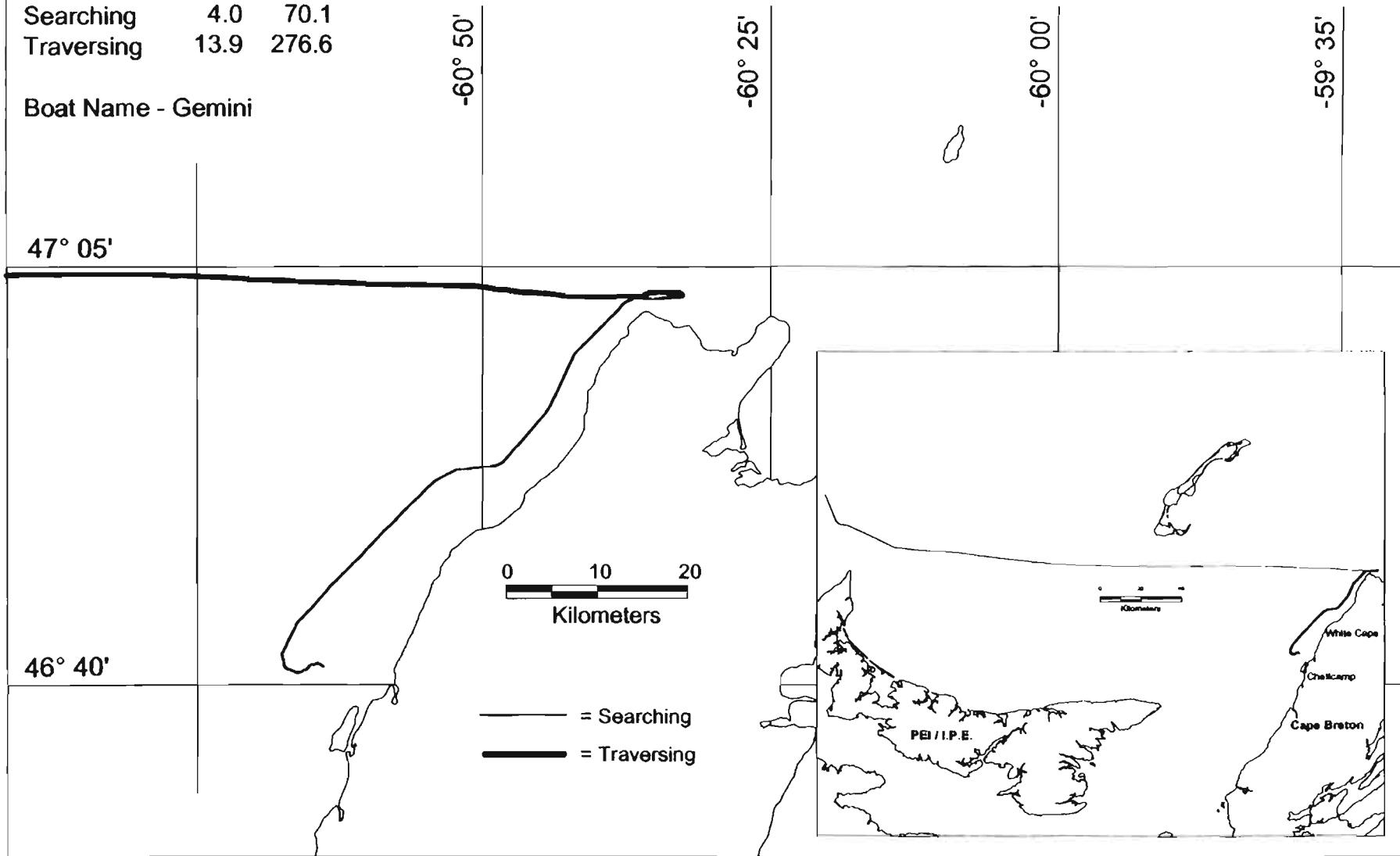
Boat Name - Gemini



31 May 1997

	Hr	Km
Searching	4.0	70.1
Traversing	13.9	276.6

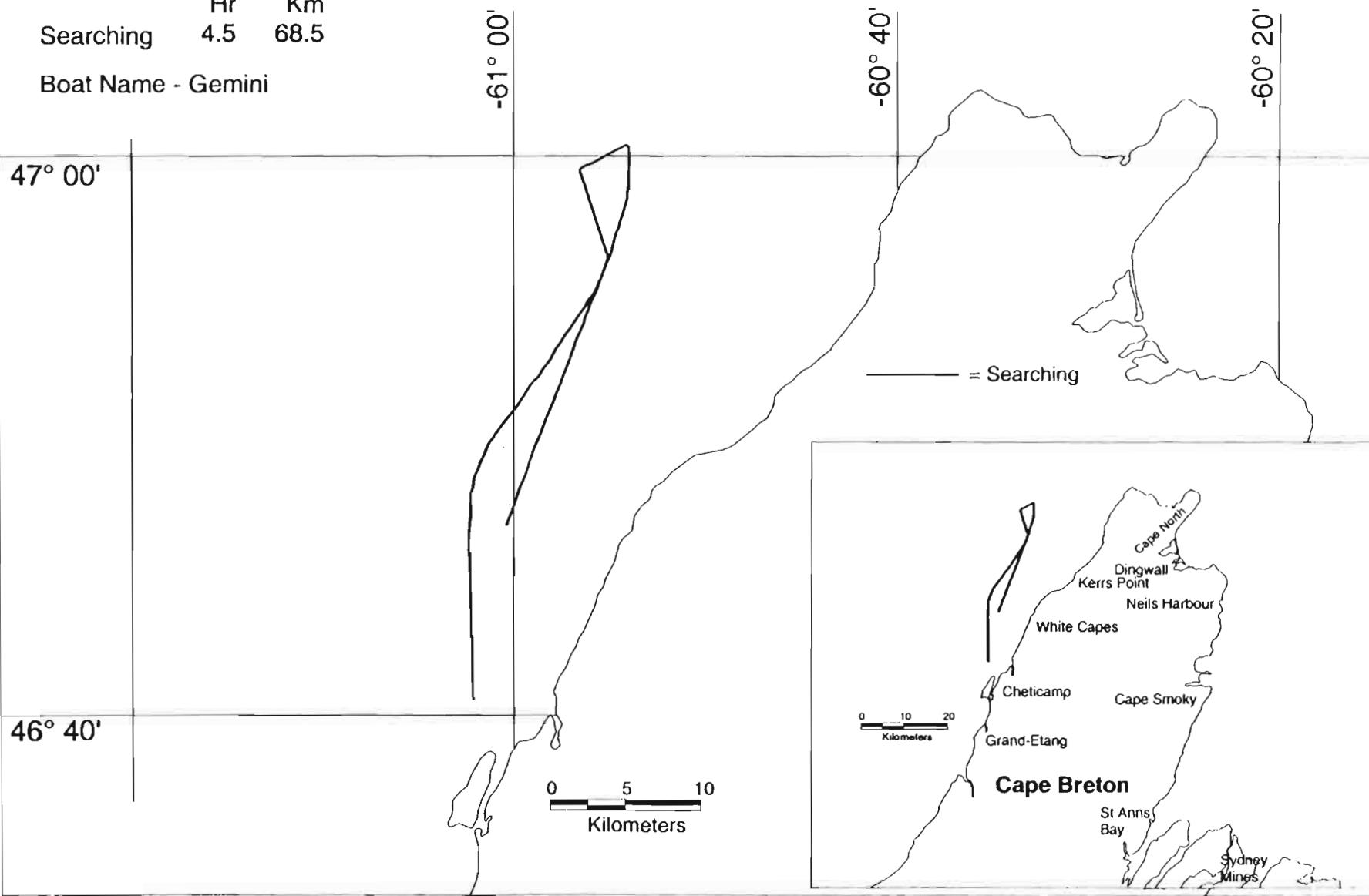
Boat Name - Gemini



03 June 1997

Searching Hr Km
 4.5 68.5

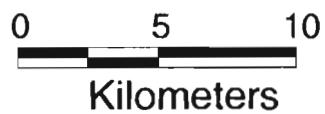
Boat Name - Gemini



05 June 1997

	Hr	Km
Searching	16.7	153.6
Fishing	4.9	6.5
Traversing	38.5	255.2

Boat Name - Gemini

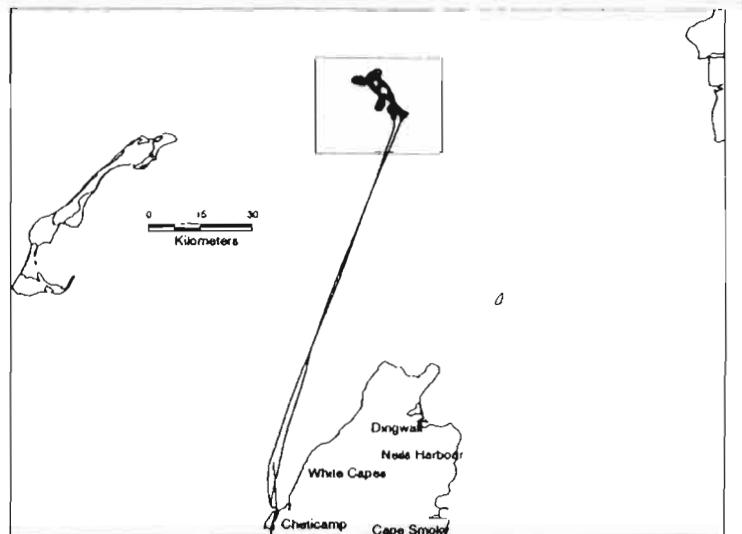


47° 40'

- = Searching
- = Fishing
- = Traversing

-60° 40'

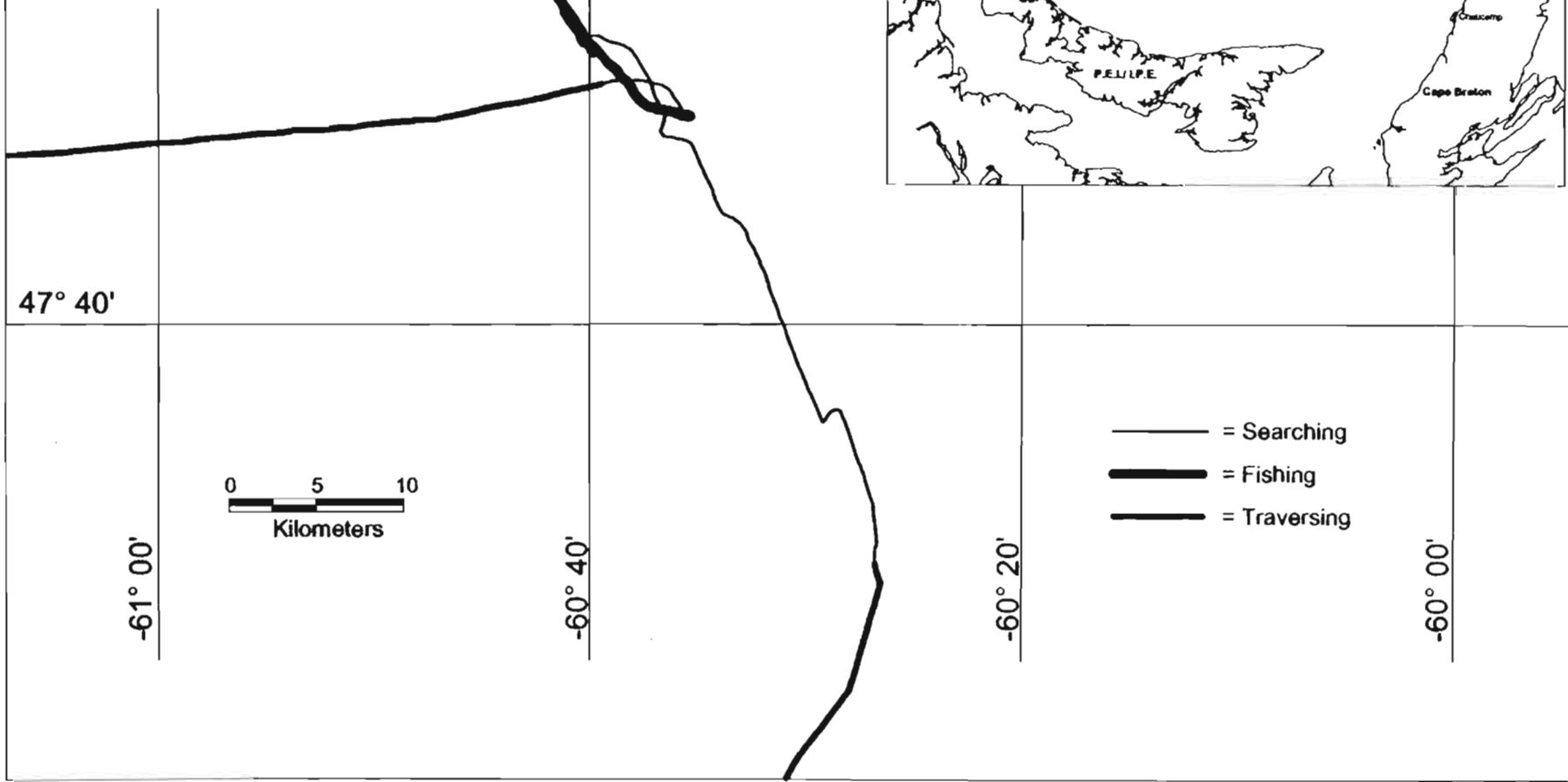
-60° 20'



07 June 1997

	Hr	Km
Searching	3.3	47.2
Fishing	2.9	20.3
Traversing	26.6	526.9

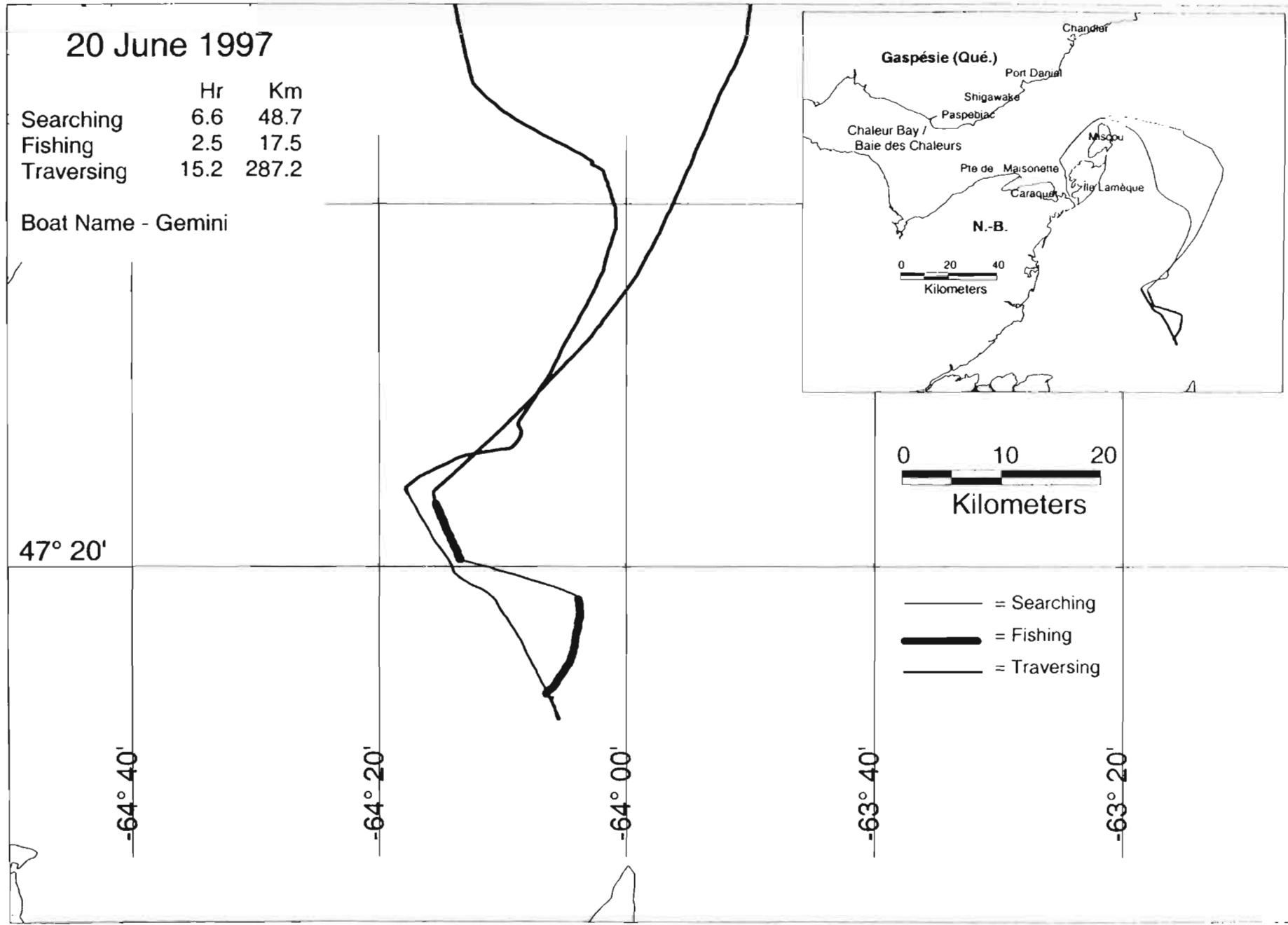
Boat Name - Gemini



20 June 1997

	Hr	Km
Searching	6.6	48.7
Fishing	2.5	17.5
Traversing	15.2	287.2

Boat Name - Gemini

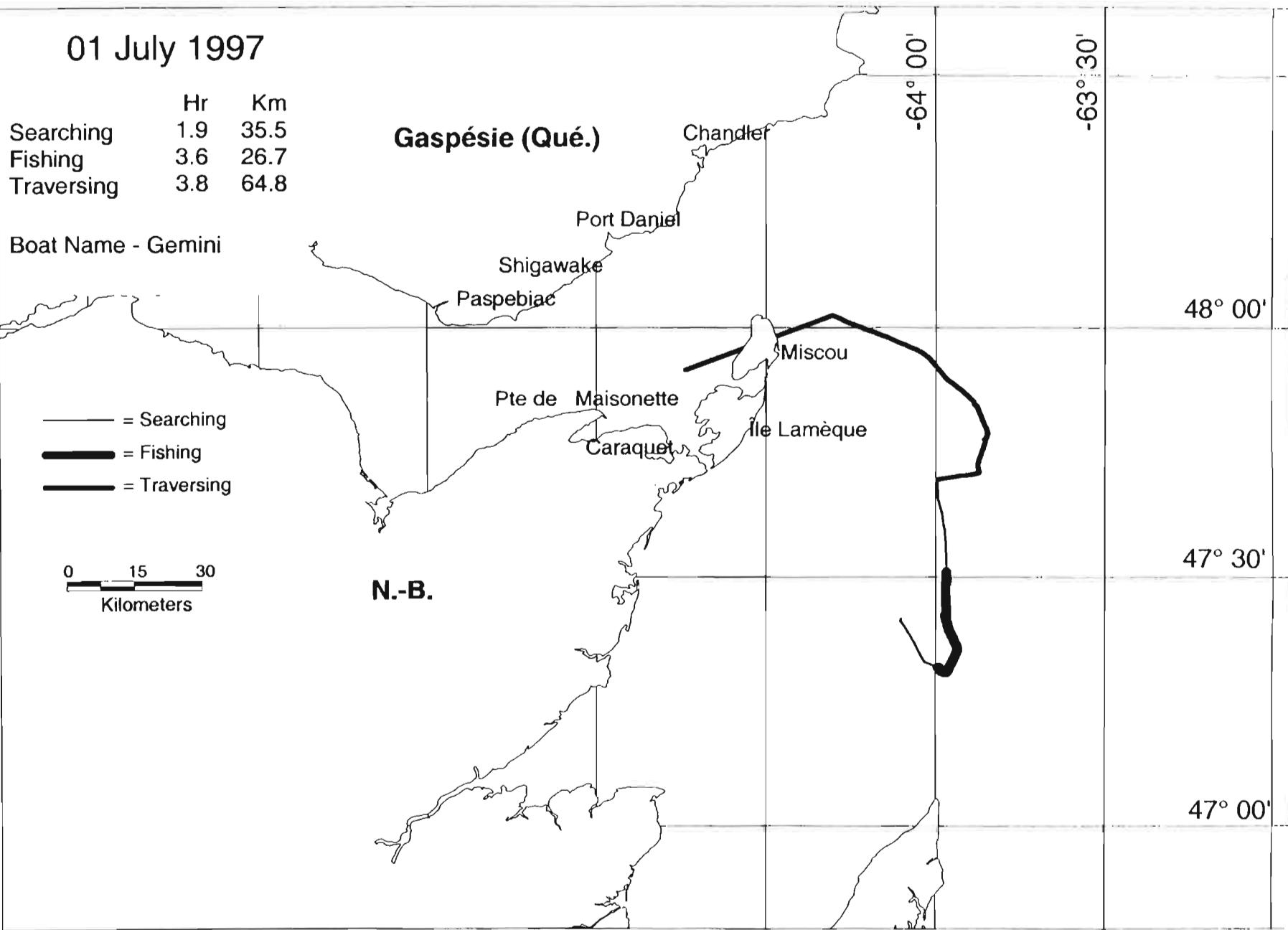


01 July 1997

	Hr	Km
Searching	1.9	35.5
Fishing	3.6	26.7
Traversing	3.8	64.8

Boat Name - Gemini

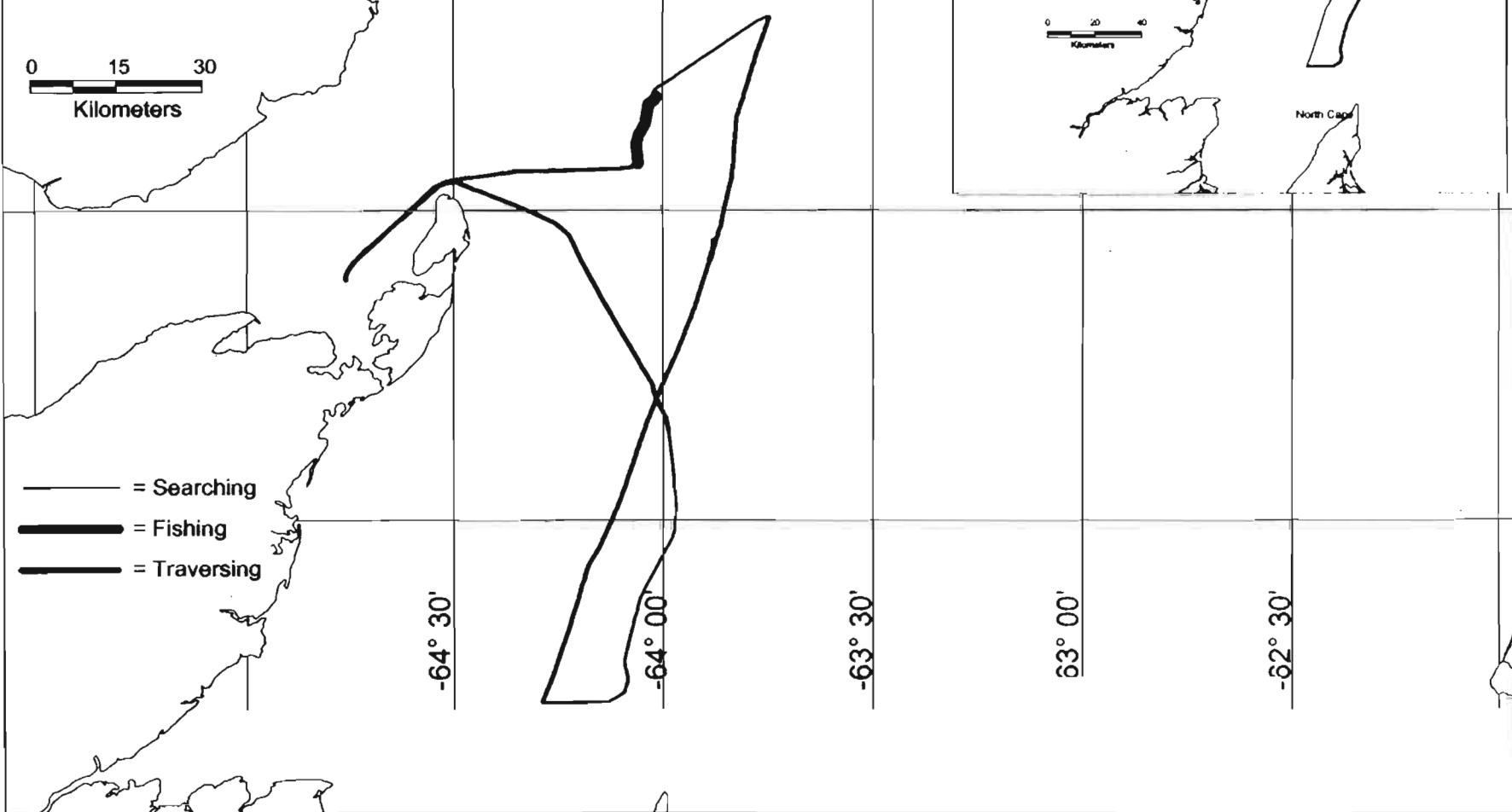
Gaspésie (Qué.)



07 July 1997

	Hr	Km
Searching	4.8	90.9
Fishing	1.9	13.5
Traversing	16.2	287.2

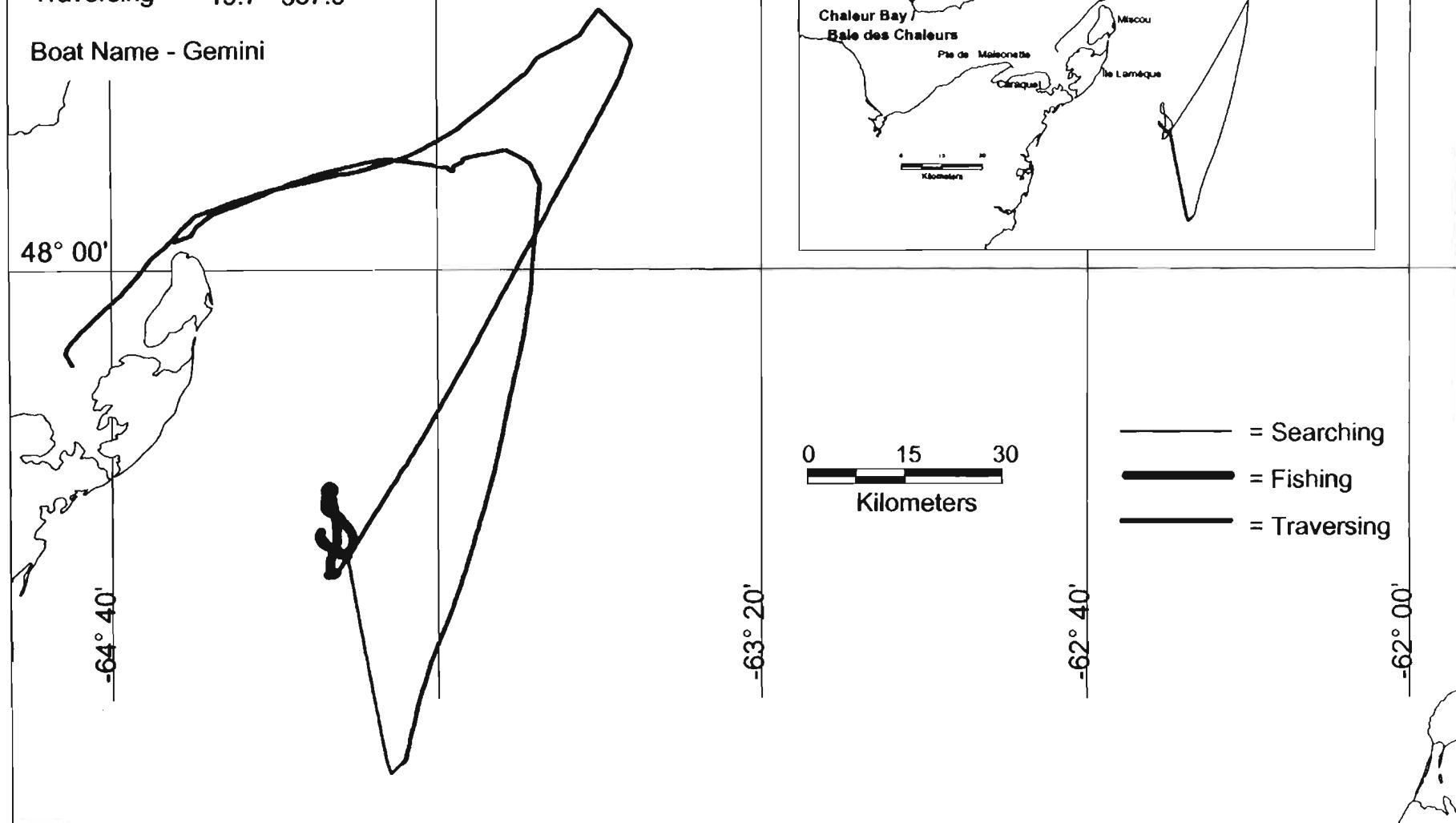
Boat Name - Gemini



15 July 1997

	Hr	Km
Searching	2.4	43.2
Fishing	5.4	36.0
Traversing	19.7	357.9

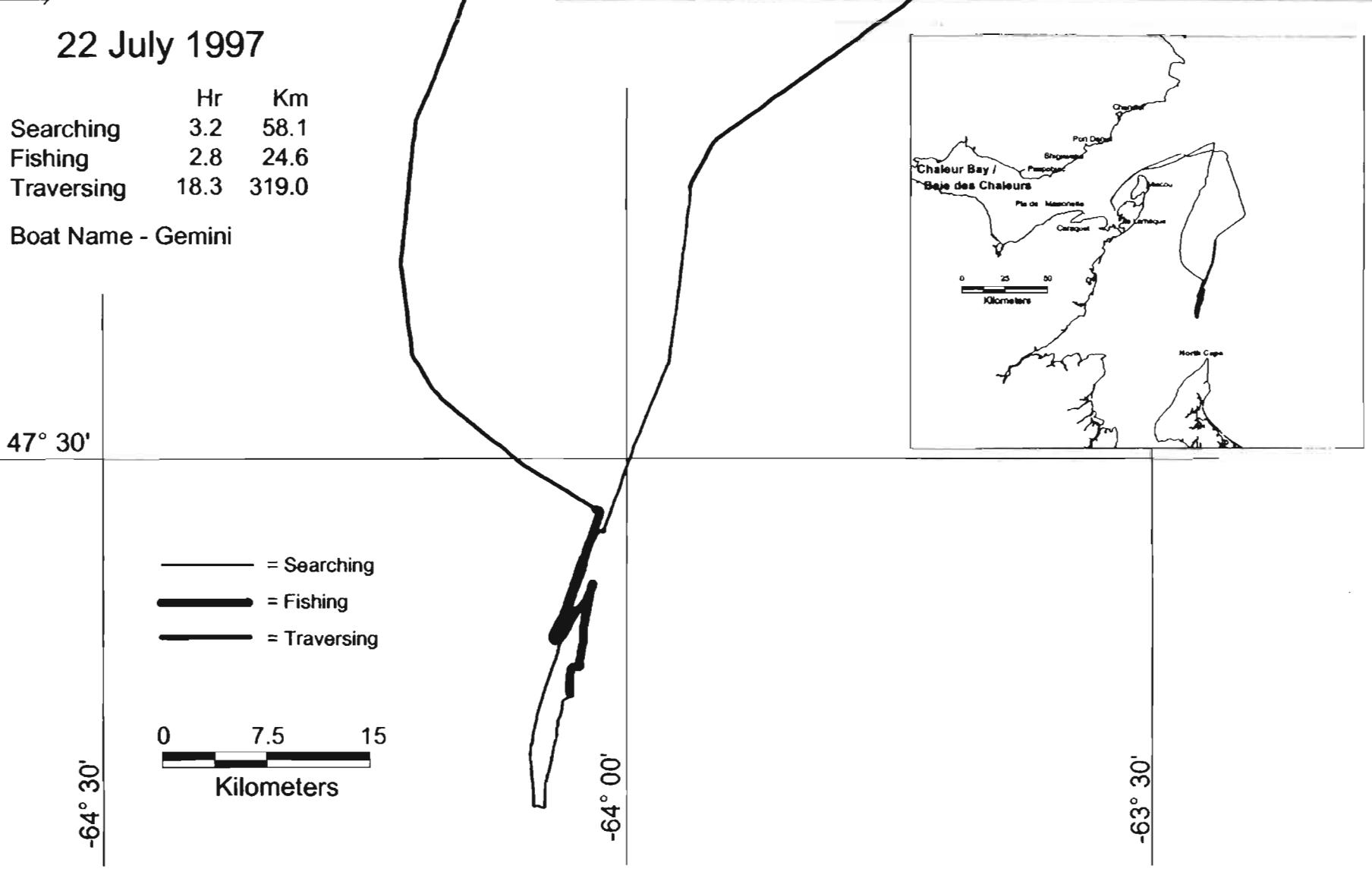
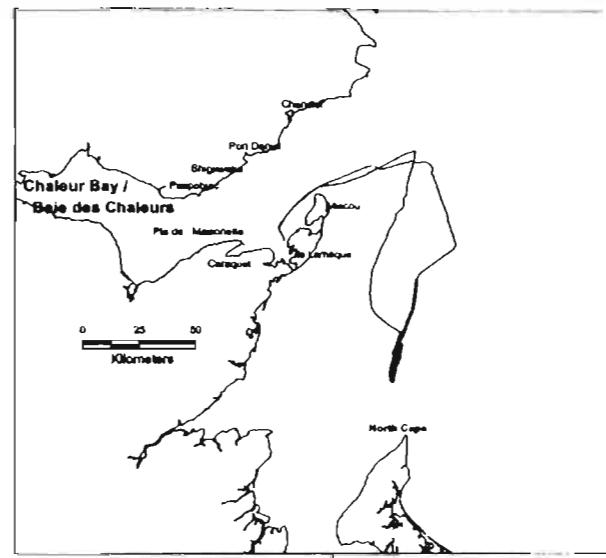
Boat Name - Gemini



22 July 1997

	Hr	Km
Searching	3.2	58.1
Fishing	2.8	24.6
Traversing	18.3	319.0

Boat Name - Gemini

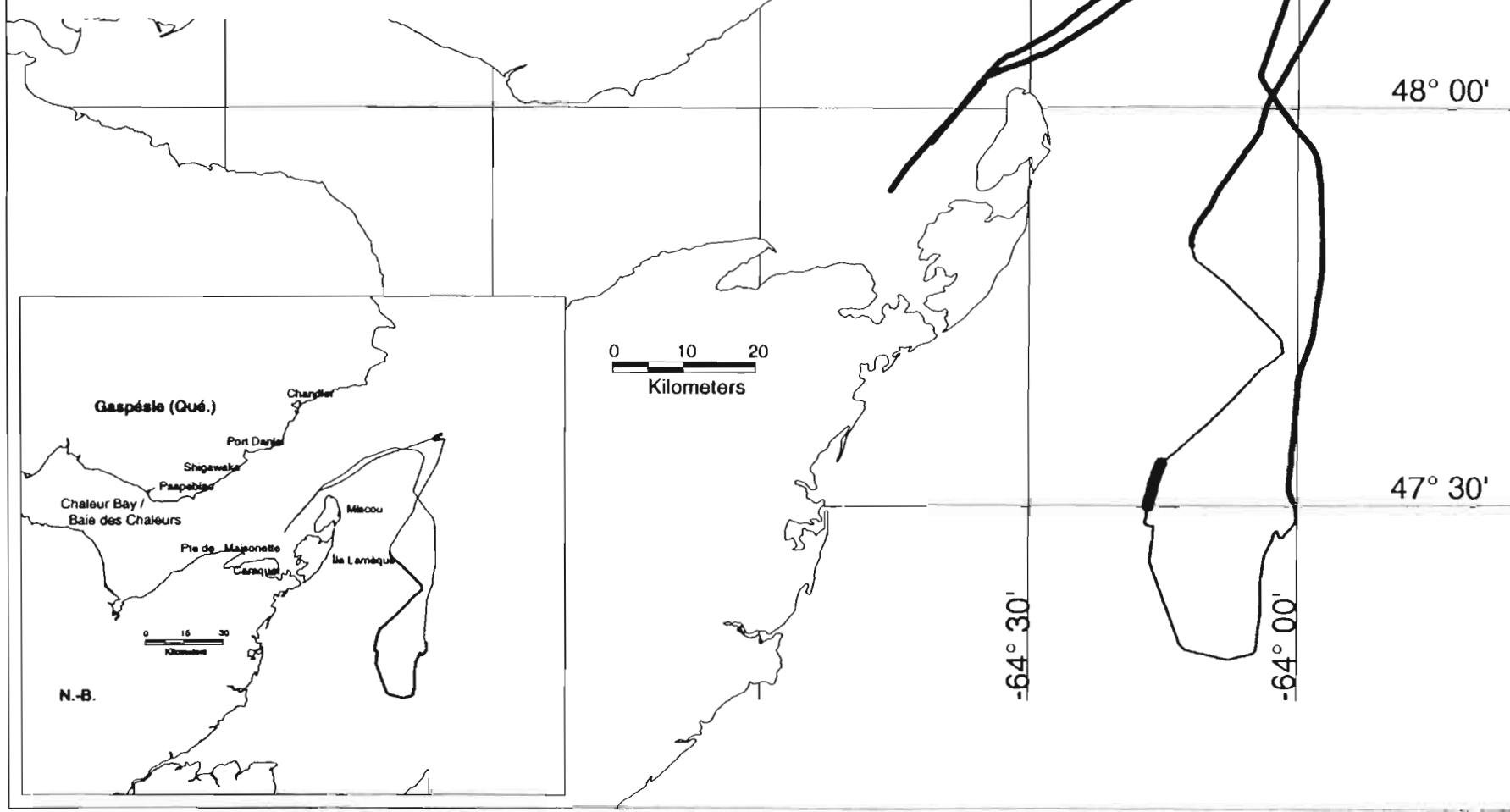


04 August 1997

	Hr	Km
Searching	6.7	114.4
Fishing	1.0	6.5
Traversing	14.5	258.5

Boat Name - Gemini

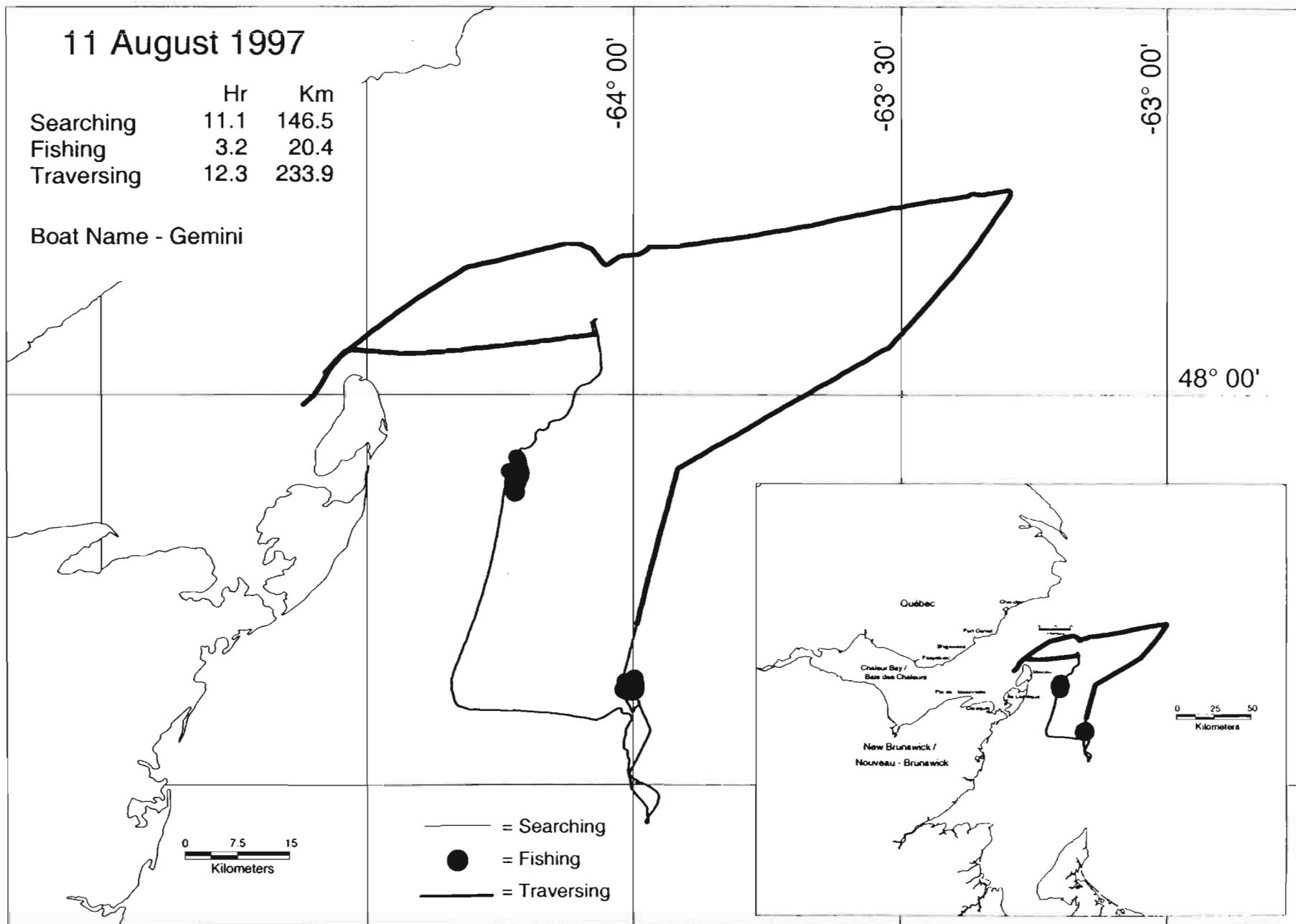
- = Searching
- = Fishing
- = Traversing



11 August 1997

	Hr	Km
Searching	11.1	146.5
Fishing	3.2	20.4
Traversing	12.3	233.9

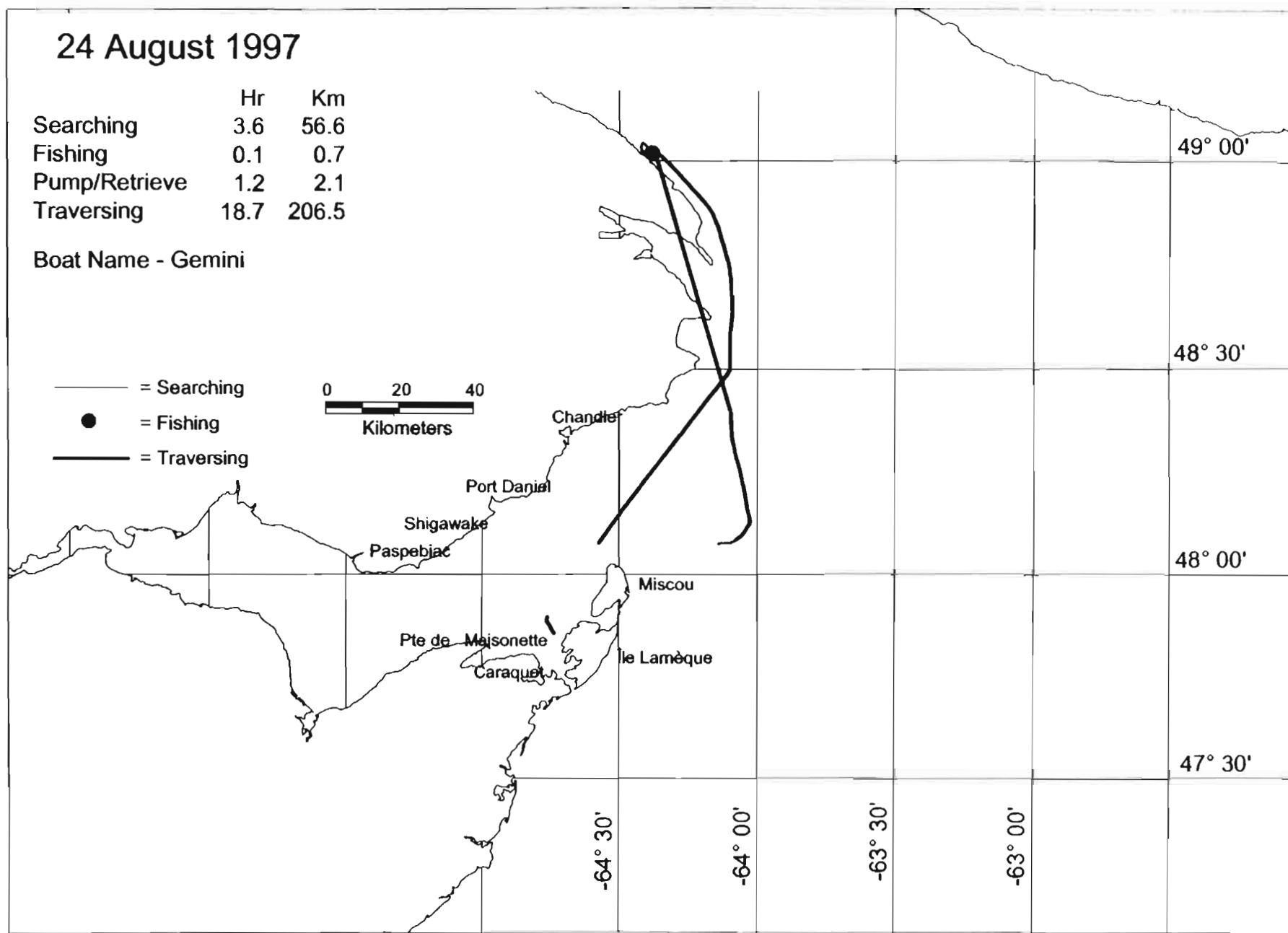
Boat Name - Gemini



24 August 1997

	Hr	Km
Searching	3.6	56.6
Fishing	0.1	0.7
Pump/Retrieve	1.2	2.1
Traversing	18.7	206.5

Boat Name - Gemini

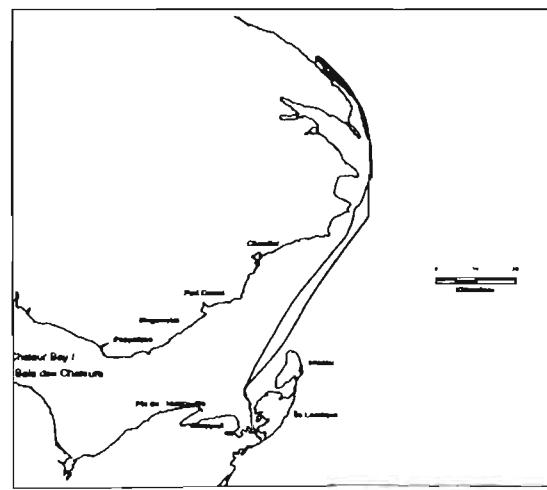
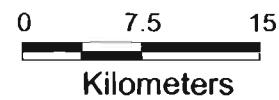


25 August 1997

	Hr	Km
Searching	3.0	49.8
Fishing	0.3	1.9
Pump/Retrieve	2.8	4.5
Traversing	15.0	282.2

Boat Name - Gemini

- = Searching
- = Fishing
- = Traversing

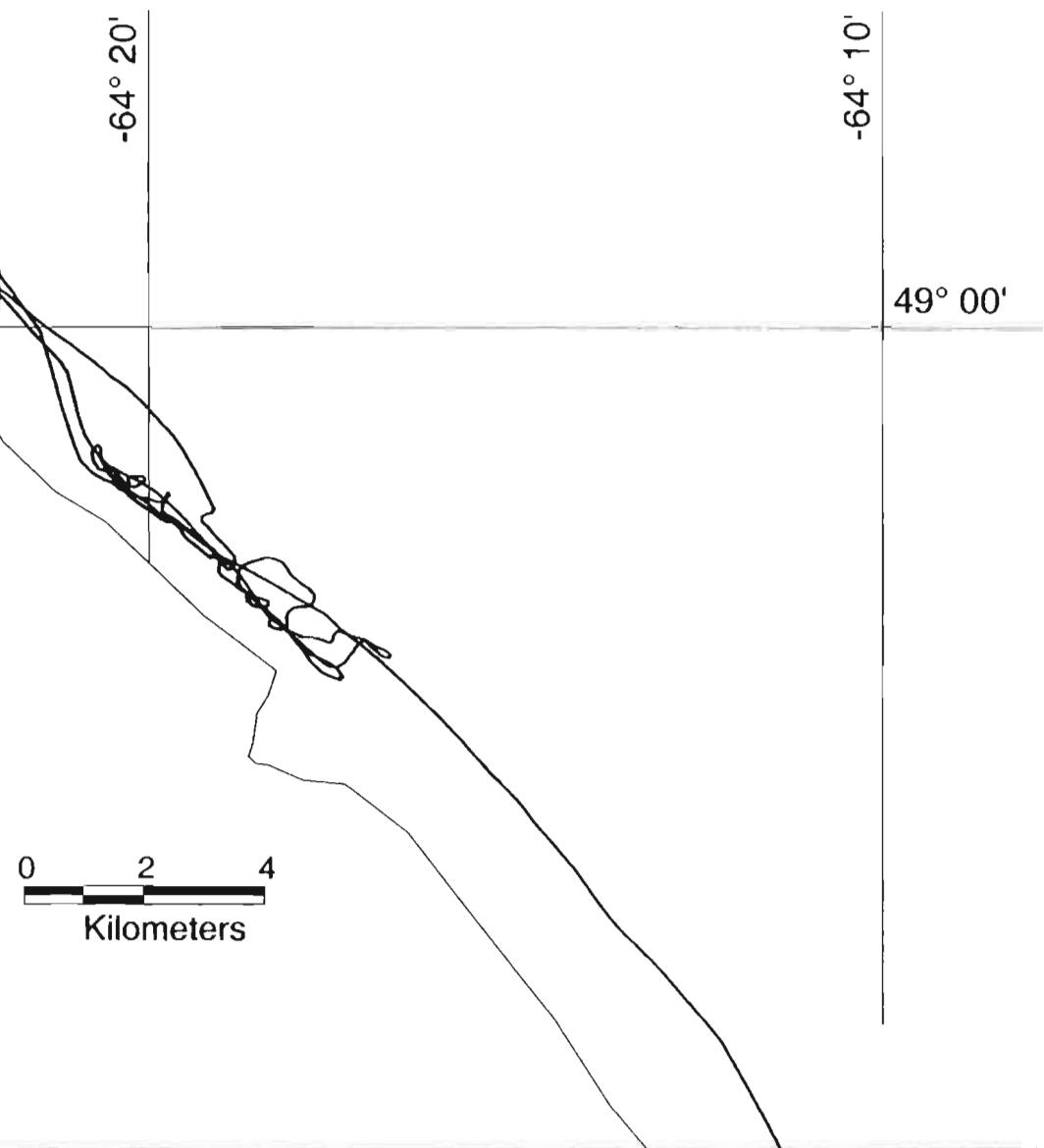
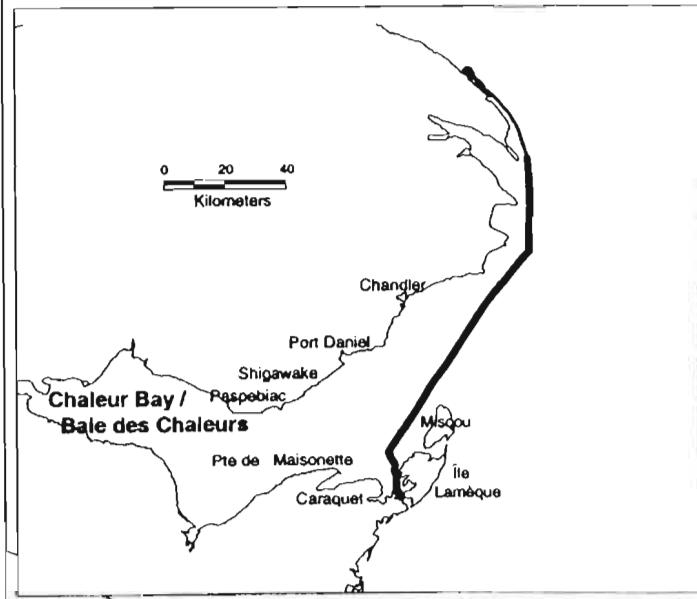


26 August 1997

	Hr	Km
Searching	6.7	91.9
Fishing	0.2	0.8
Pump/Retrieve	0.3	0.8
Waiting	1.4	1.8
Traversing	6.6	129.0

Boat Name - Gemini

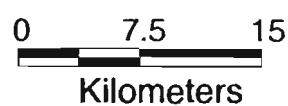
- = Searching
- = Fishing
- = Traversing



27 August 1997

	Hr	Km
Searching	7.8	94.9
Fishing	0.1	0.3
Pump/Retrieve	1.6	2.3
Traversing	5.8	113.6

Boat Name - Gemini



- = Searching
- = Fishing
- = Traversing

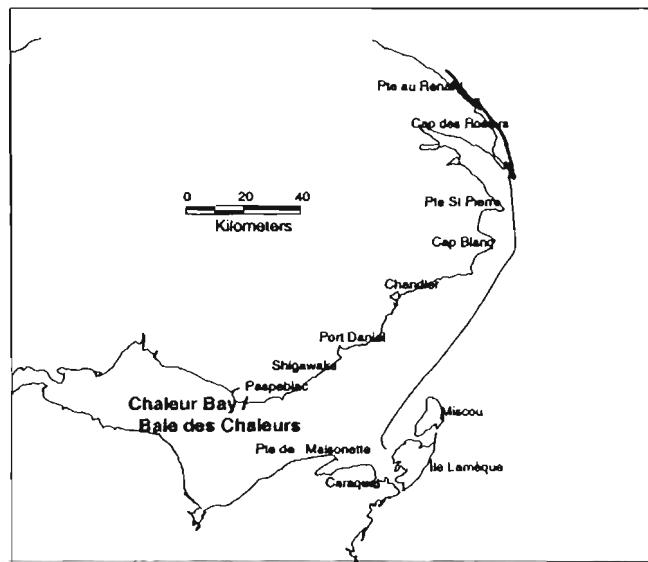
-64° 15'

-64° 00'

-63° 45'

49° 00'

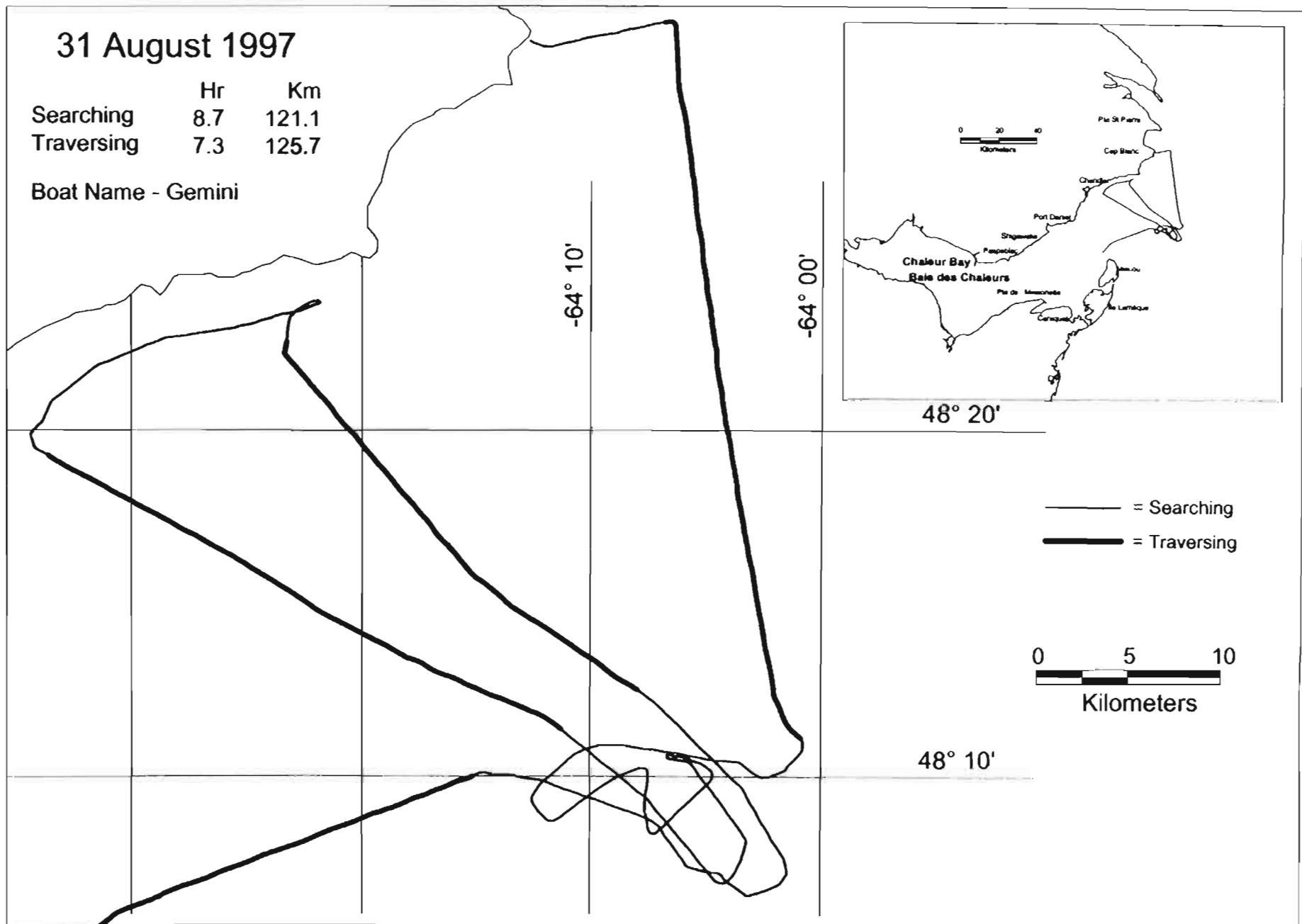
48° 45'



31 August 1997

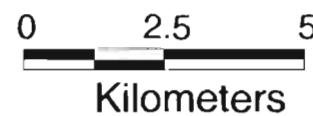
	Hr	Km
Searching	8.7	121.1
Traversing	7.3	125.7

Boat Name - Gemini



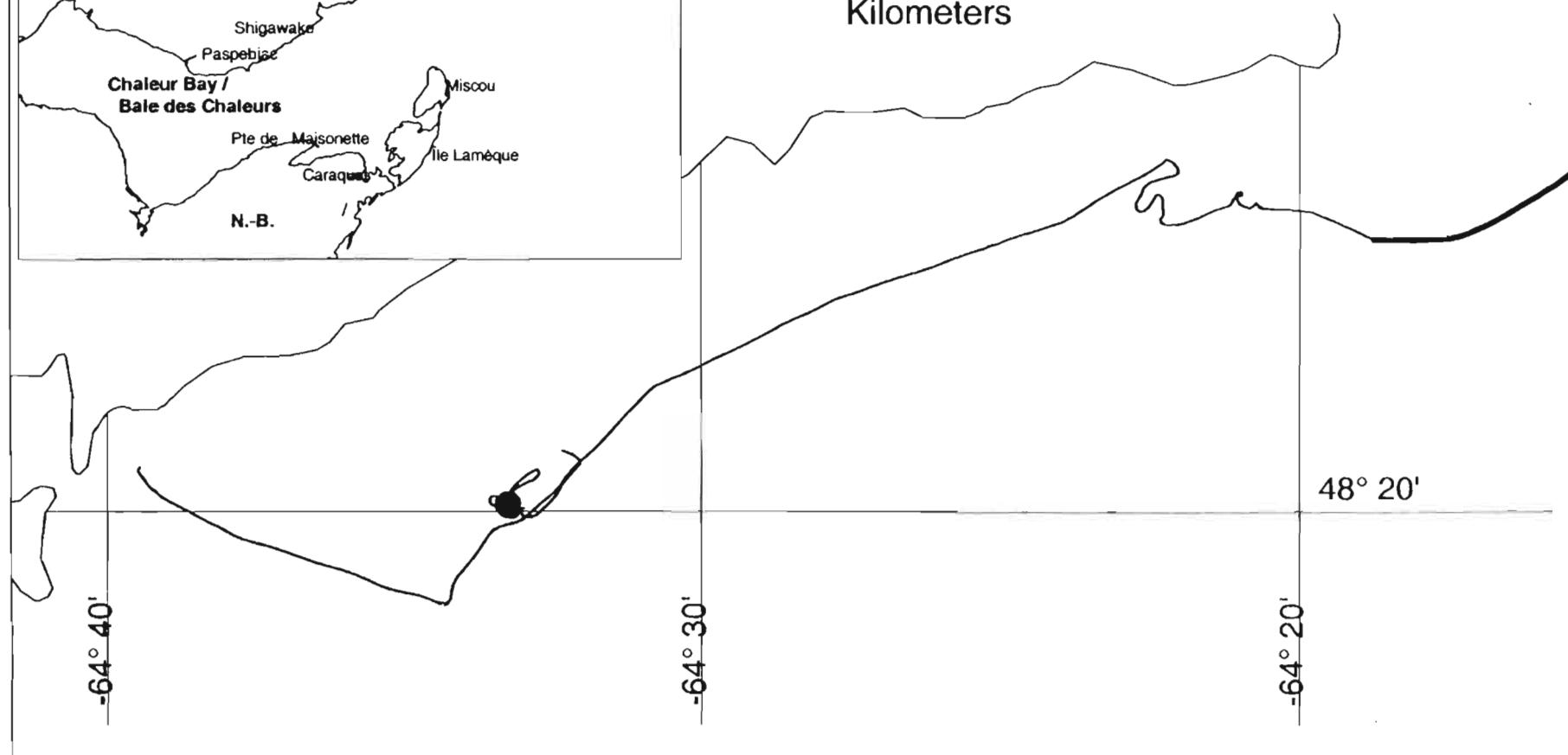
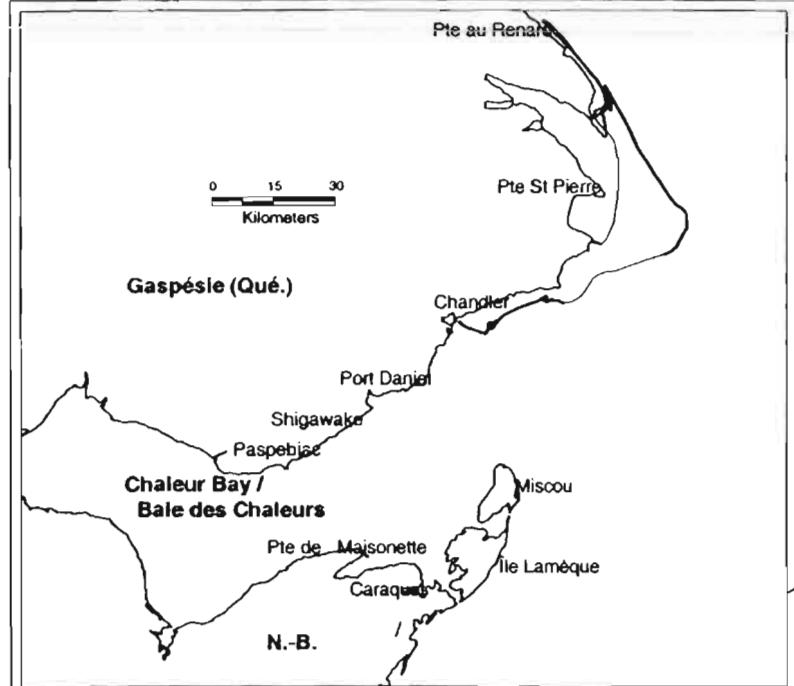
01 September 1997

- = Searching
- = Fishing
- = Traversing



	Hr	Km
Searching	11.4	173.2
Fishing	0.1	0.7
Pump/Retrieve	0.9	2.4
Traversing	3.3	60.1

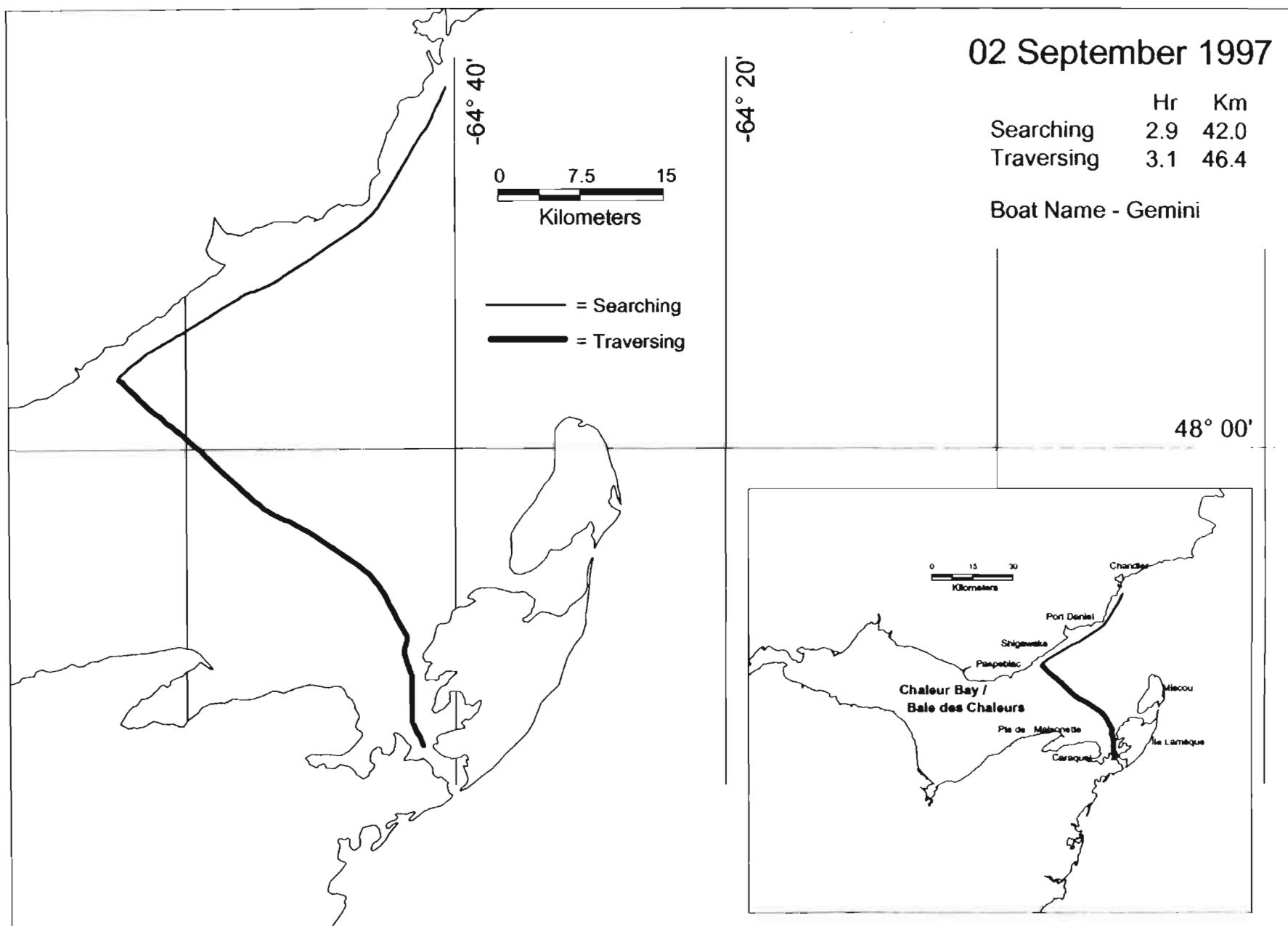
Boat Name - Gemini



02 September 1997

	Hr	Km
Searching	2.9	42.0
Traversing	3.1	46.4

Boat Name - Gemini

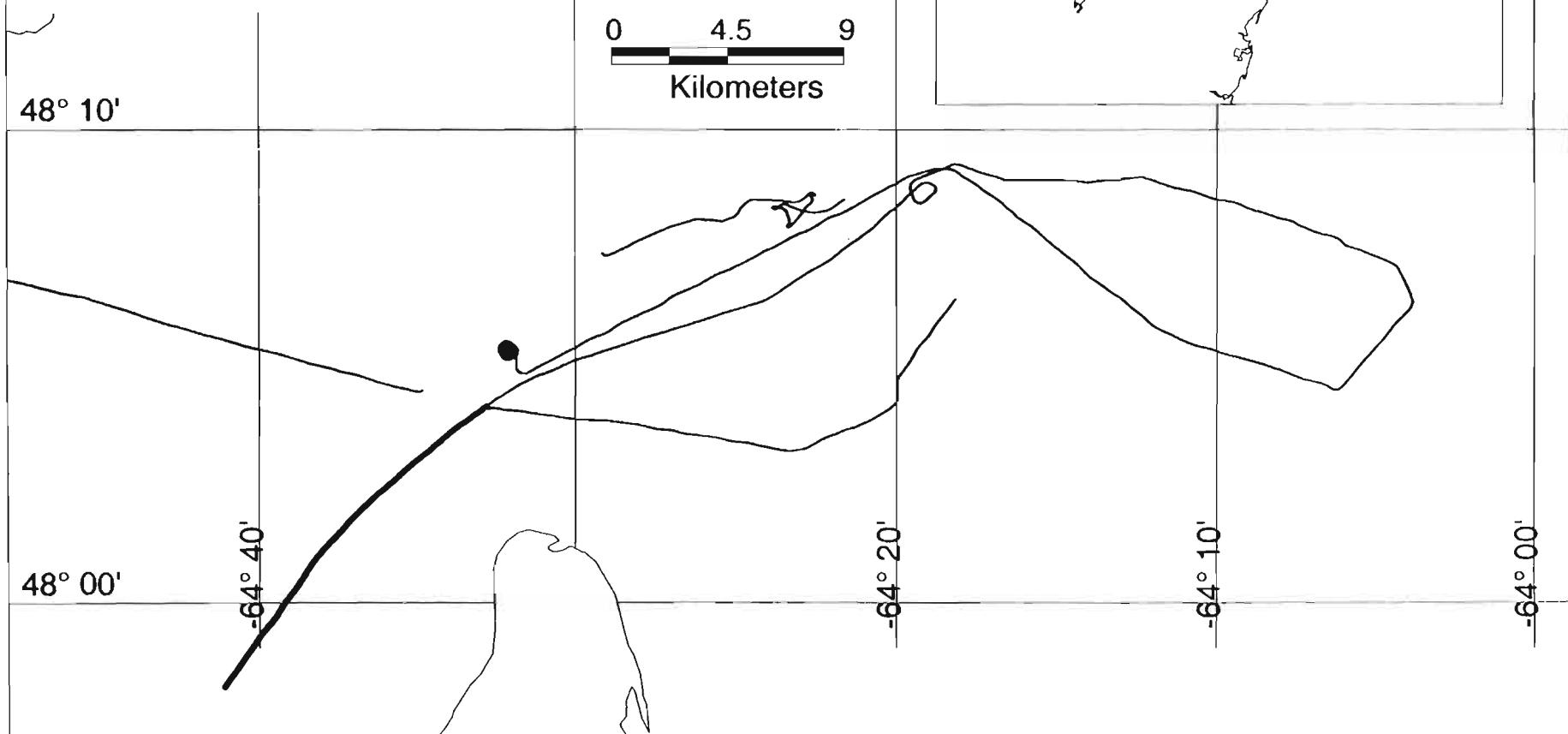
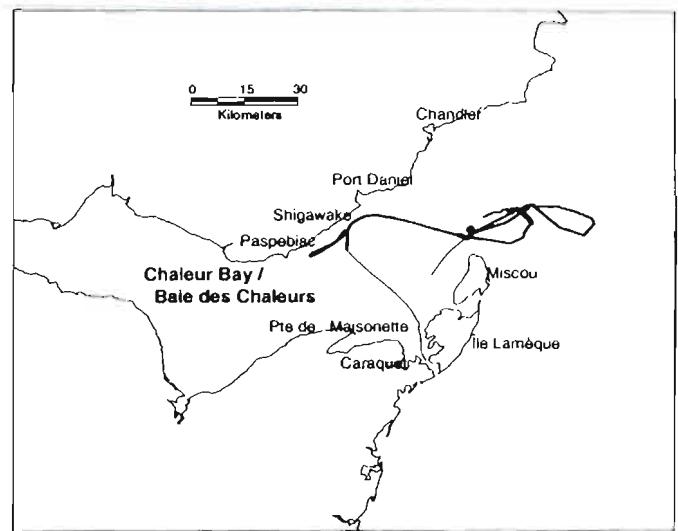


07 September 1997

	Hr	Km
Searching	13.5	187.2
Fishing	0.2	0.6
Pump/Retrieve	6.1	10.9
Traversing	3.9	56.3
Other	6.9	14.2

Boat Name - Gemini

- = Searching
- = Fishing
- = Traversing

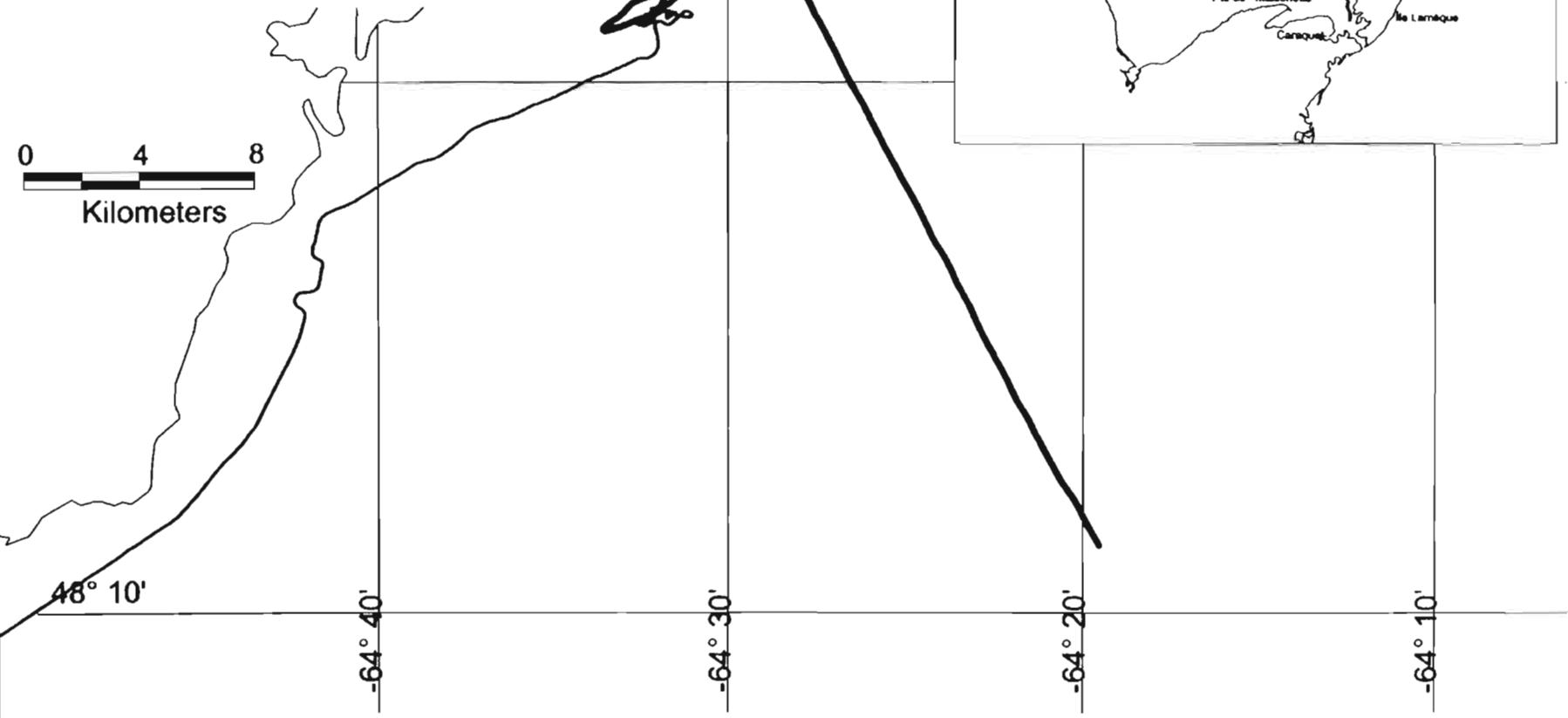


16 September 1997

	Hr	Km
Searching	9.1	113.8
Fishing	2.2	36.4
Pump/Retrieve	4.4	57.9
Waiting	1.0	18.7

— = Searching
— = Fishing

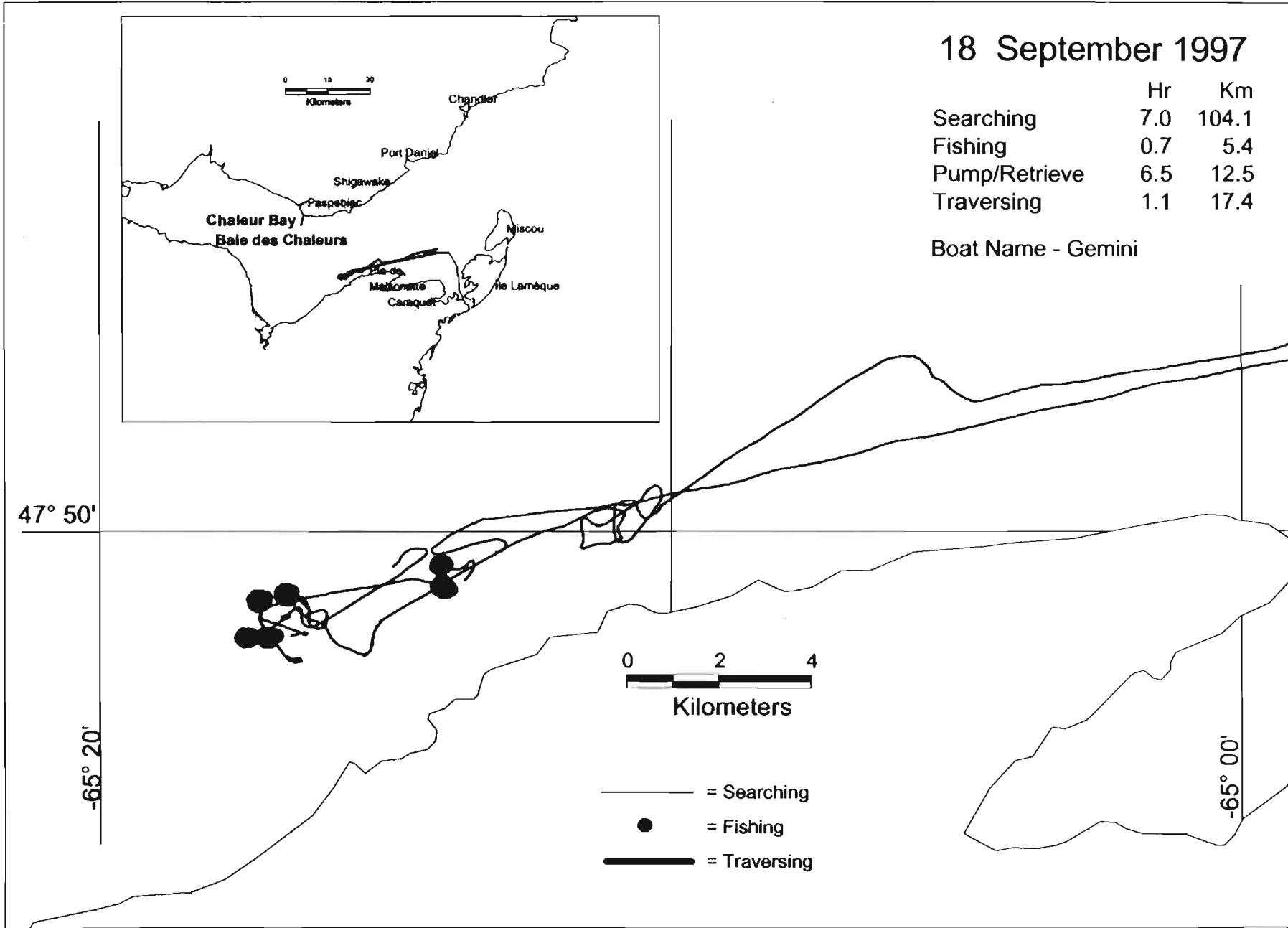
Boat Name - Gemini

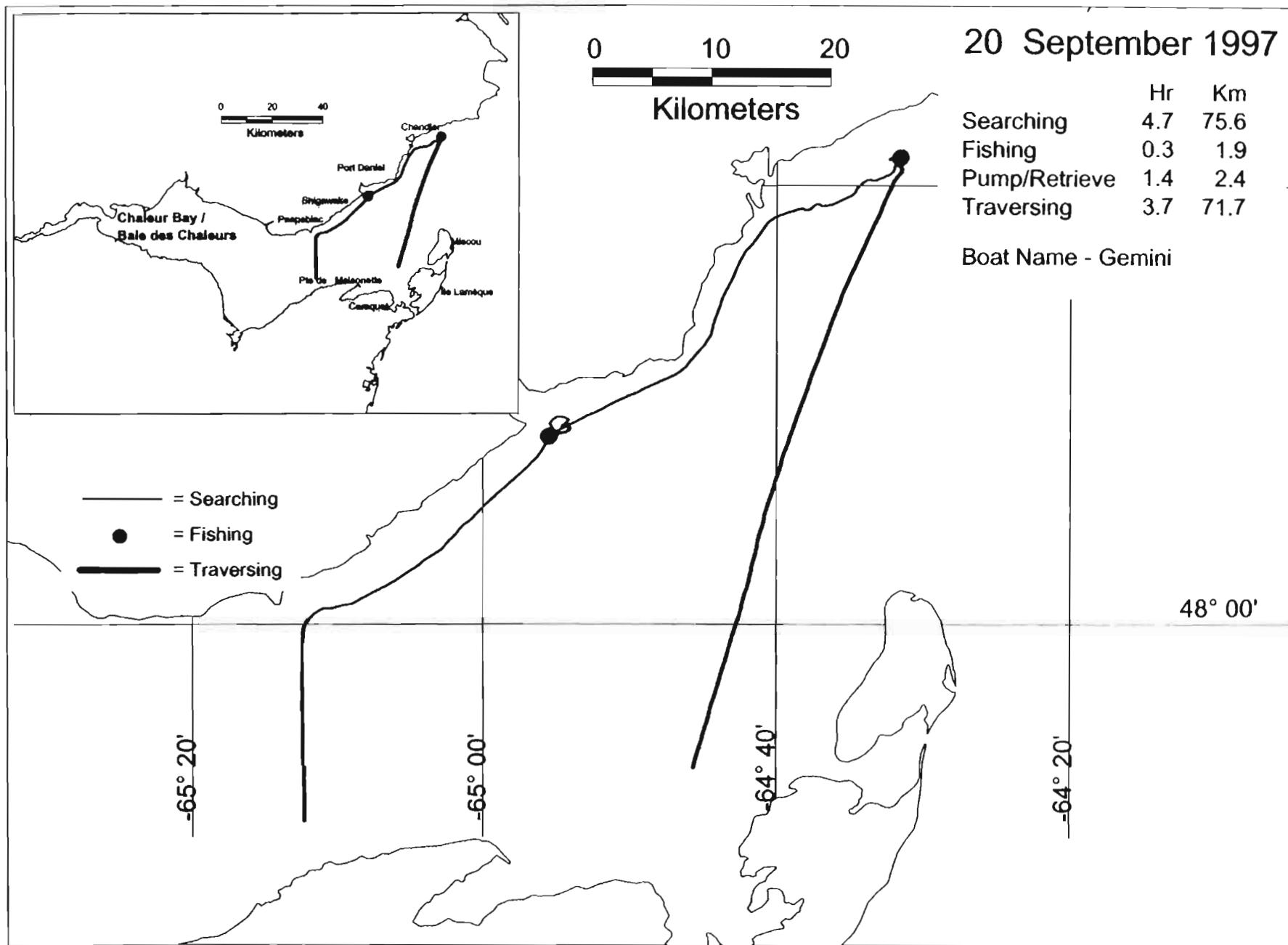


18 September 1997

	Hr	Km
Searching	7.0	104.1
Fishing	0.7	5.4
Pump/Retrieve	6.5	12.5
Traversing	1.1	17.4

Boat Name - Gemini

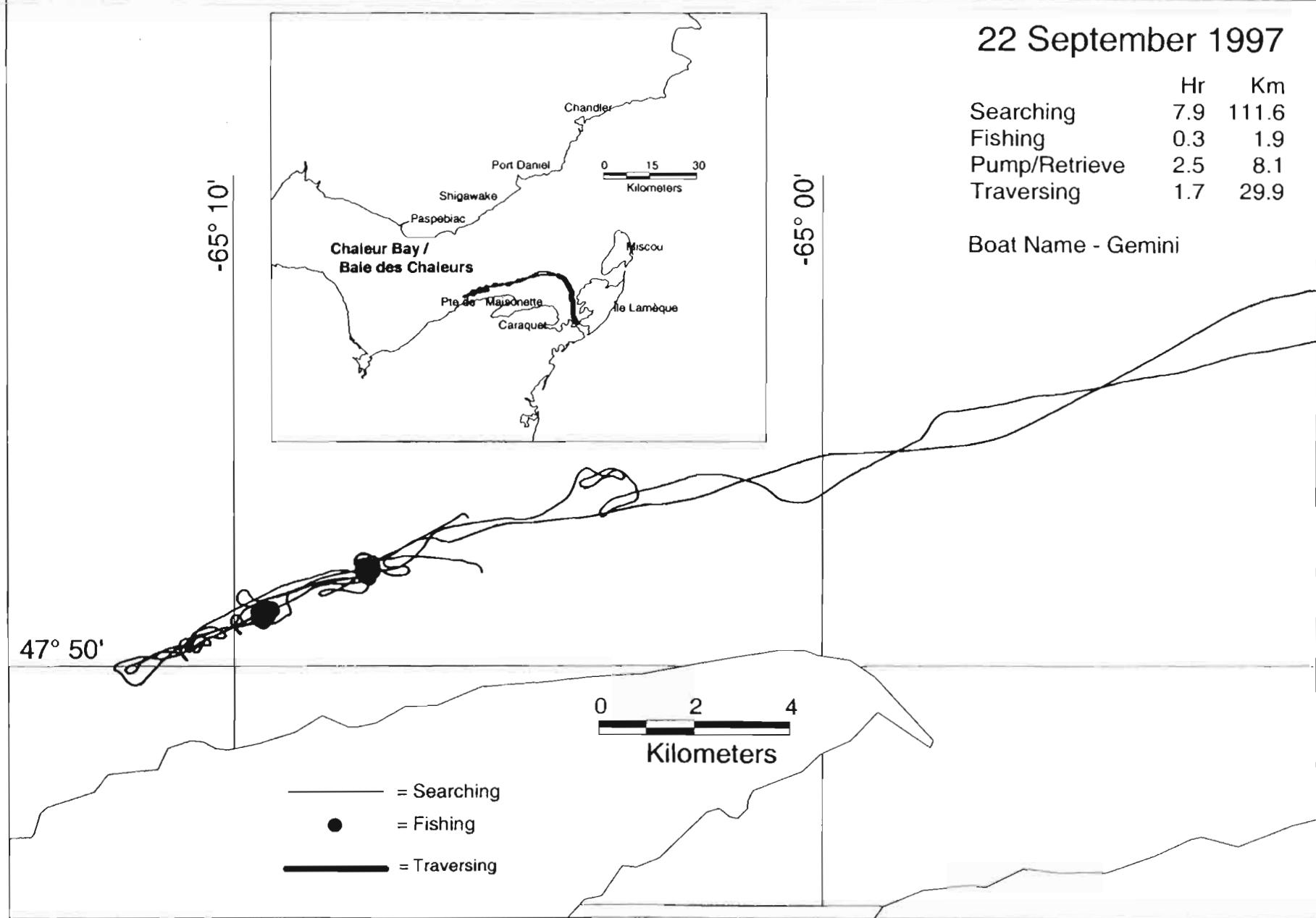




22 September 1997

	Hr	Km
Searching	7.9	111.6
Fishing	0.3	1.9
Pump/Retrieve	2.5	8.1
Traversing	1.7	29.9

Boat Name - Gemini



23 September 1997

	Hr	Km
Searching	6.0	101.4
Fishing	0.2	1.5
Pump/Retrieve	1.7	3.4
Traversing	4.6	77.4

Boat Name - Gemini

48° 20'

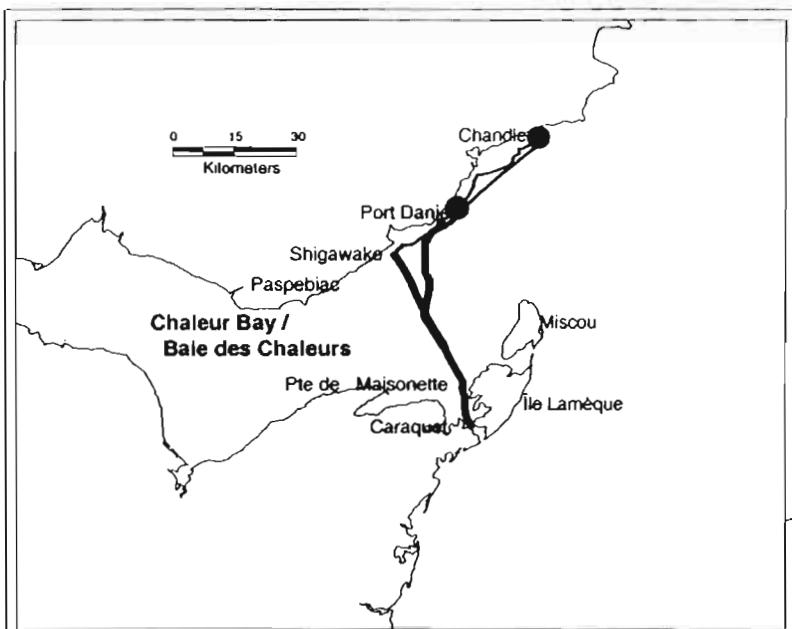
- = Searching
- = Fishing
- = Traversing



Kilometers

-64° 40'

-64° 30'

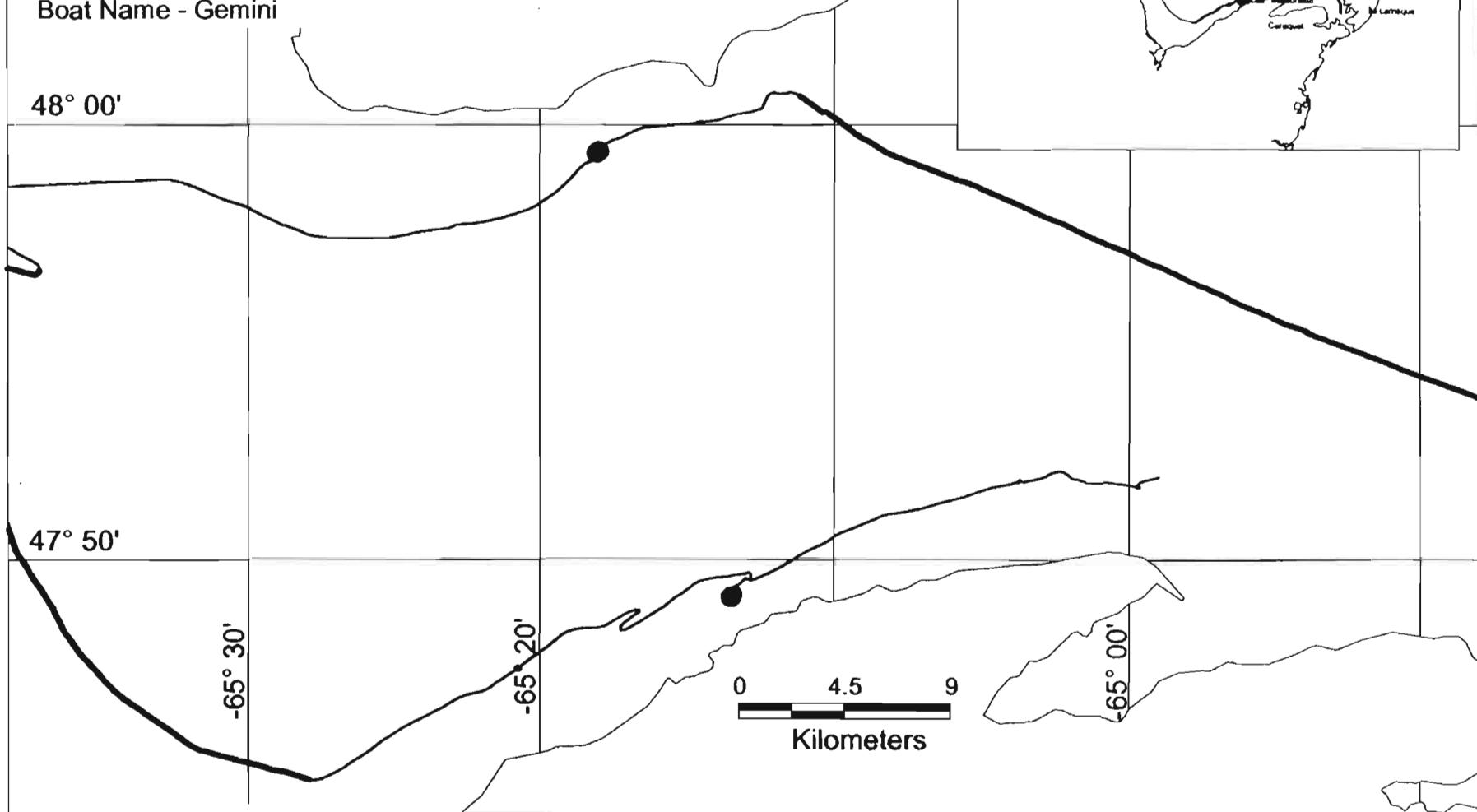


25 September 1997

	Hr	Km
Searching	7.9	118.1
Fishing	0.2	1.7
Pump/Retrieve	0.9	1.8
Traversing	4.0	68.5

- = Searching
- = Fishing
- = Traversing

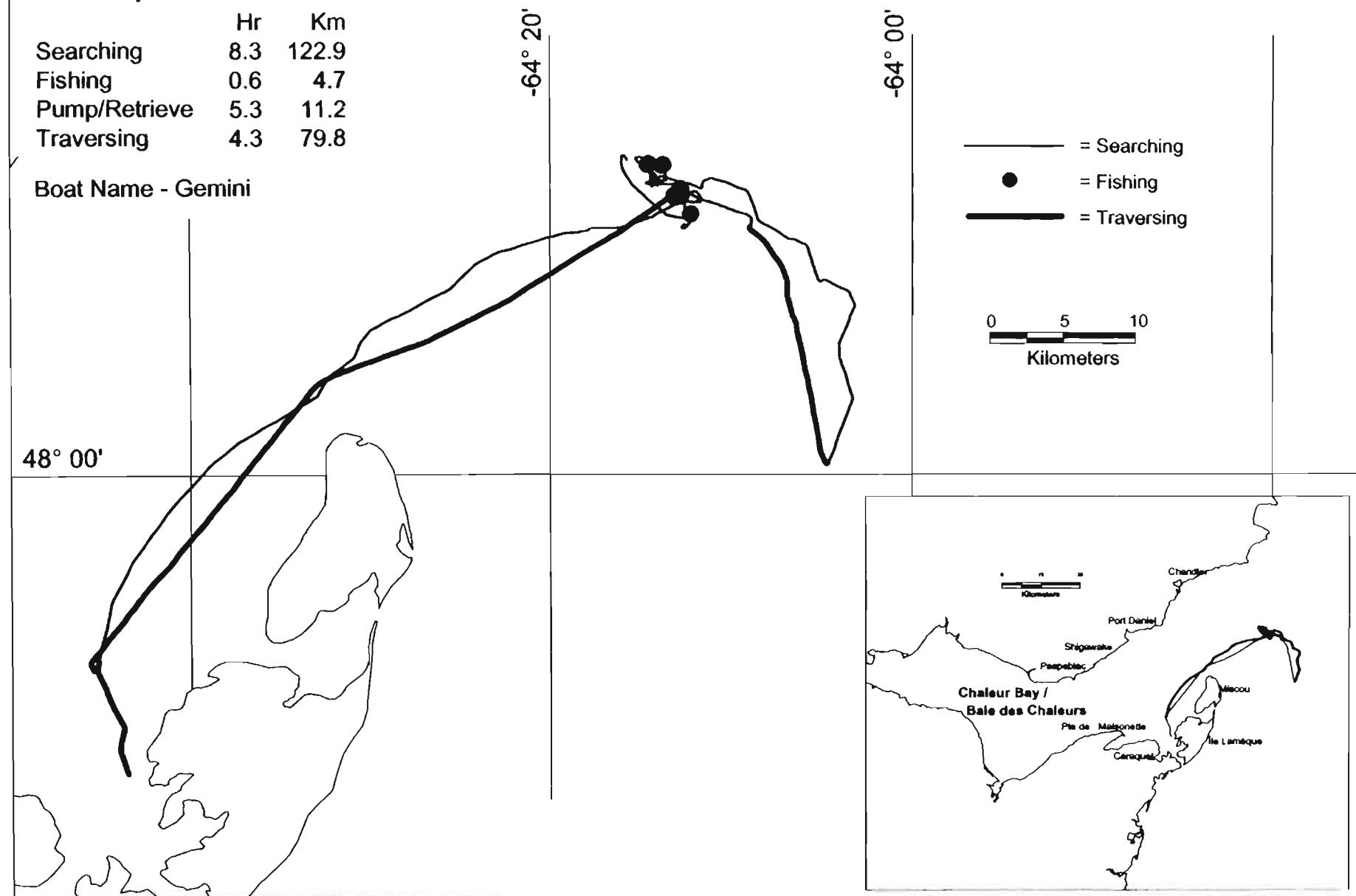
Boat Name - Gemini



27 September 1997

	Hr	Km
Searching	8.3	122.9
Fishing	0.6	4.7
Pump/Retrieve	5.3	11.2
Traversing	4.3	79.8

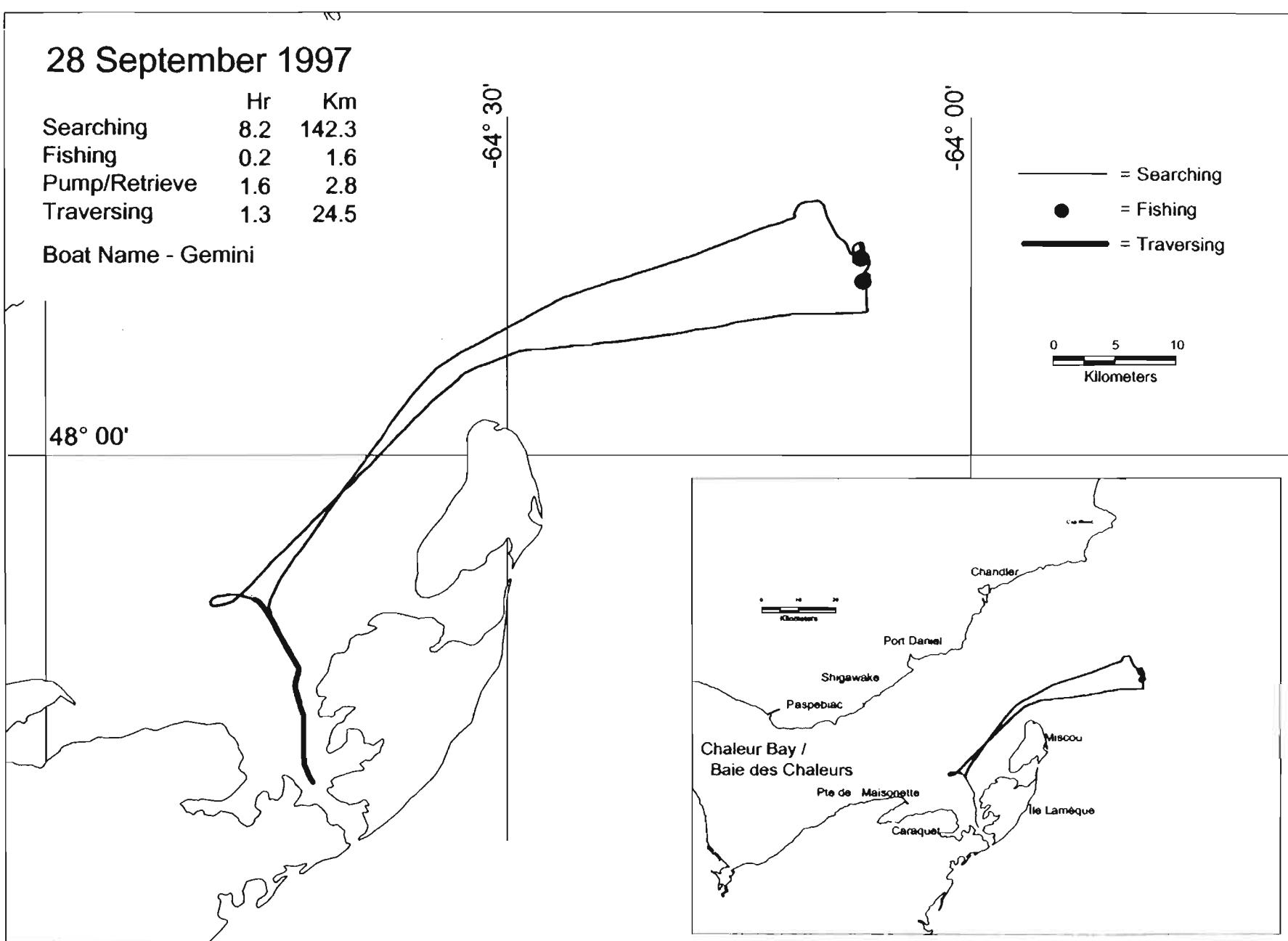
Boat Name - Gemini



28 September 1997

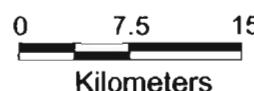
	Hr	Km
Searching	8.2	142.3
Fishing	0.2	1.6
Pump/Retrieve	1.6	2.8
Traversing	1.3	24.5

Boat Name - Gemini



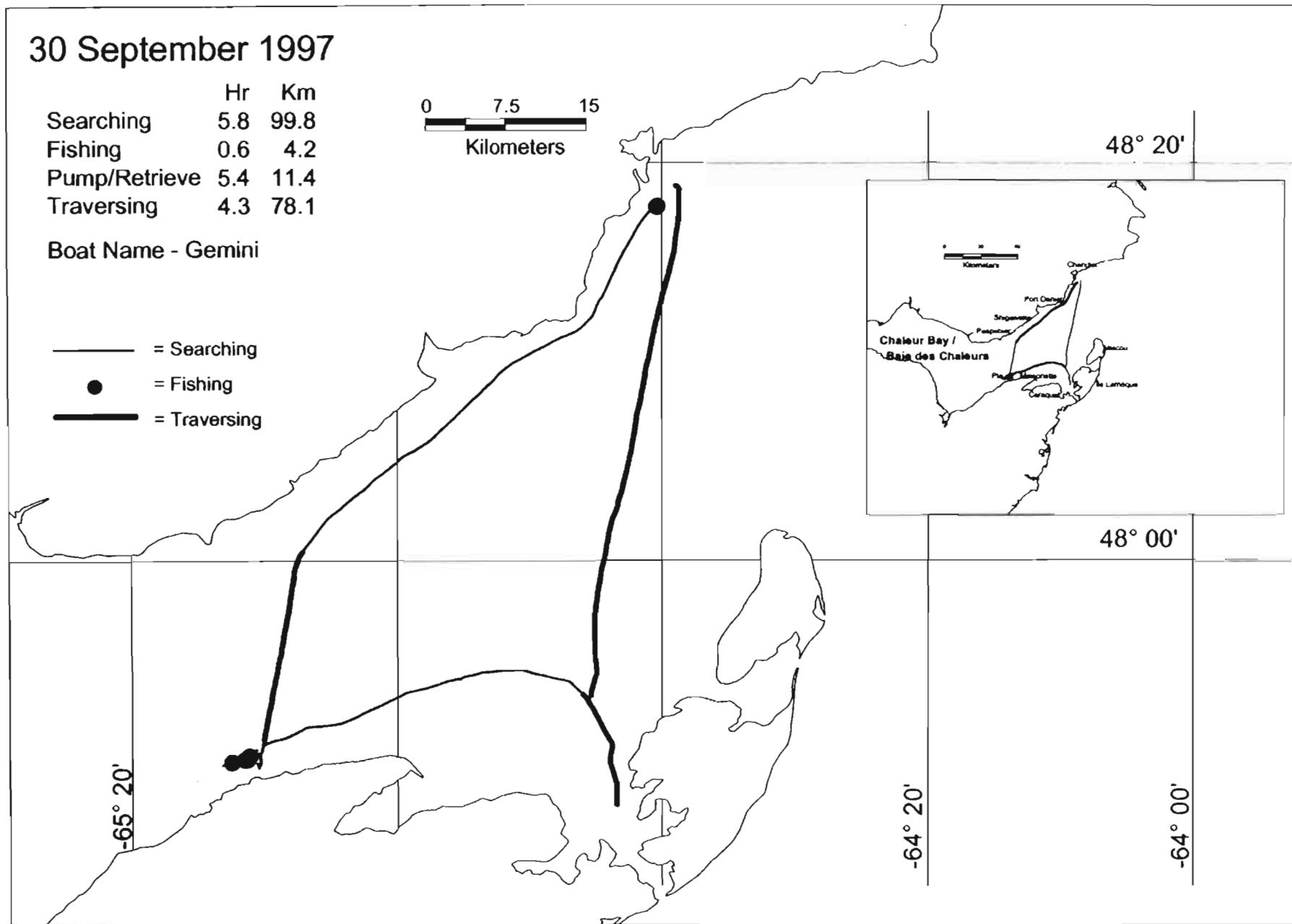
30 September 1997

	Hr	Km
Searching	5.8	99.8
Fishing	0.6	4.2
Pump/Retrieve	5.4	11.4
Traversing	4.3	78.1



Boat Name - Gemini

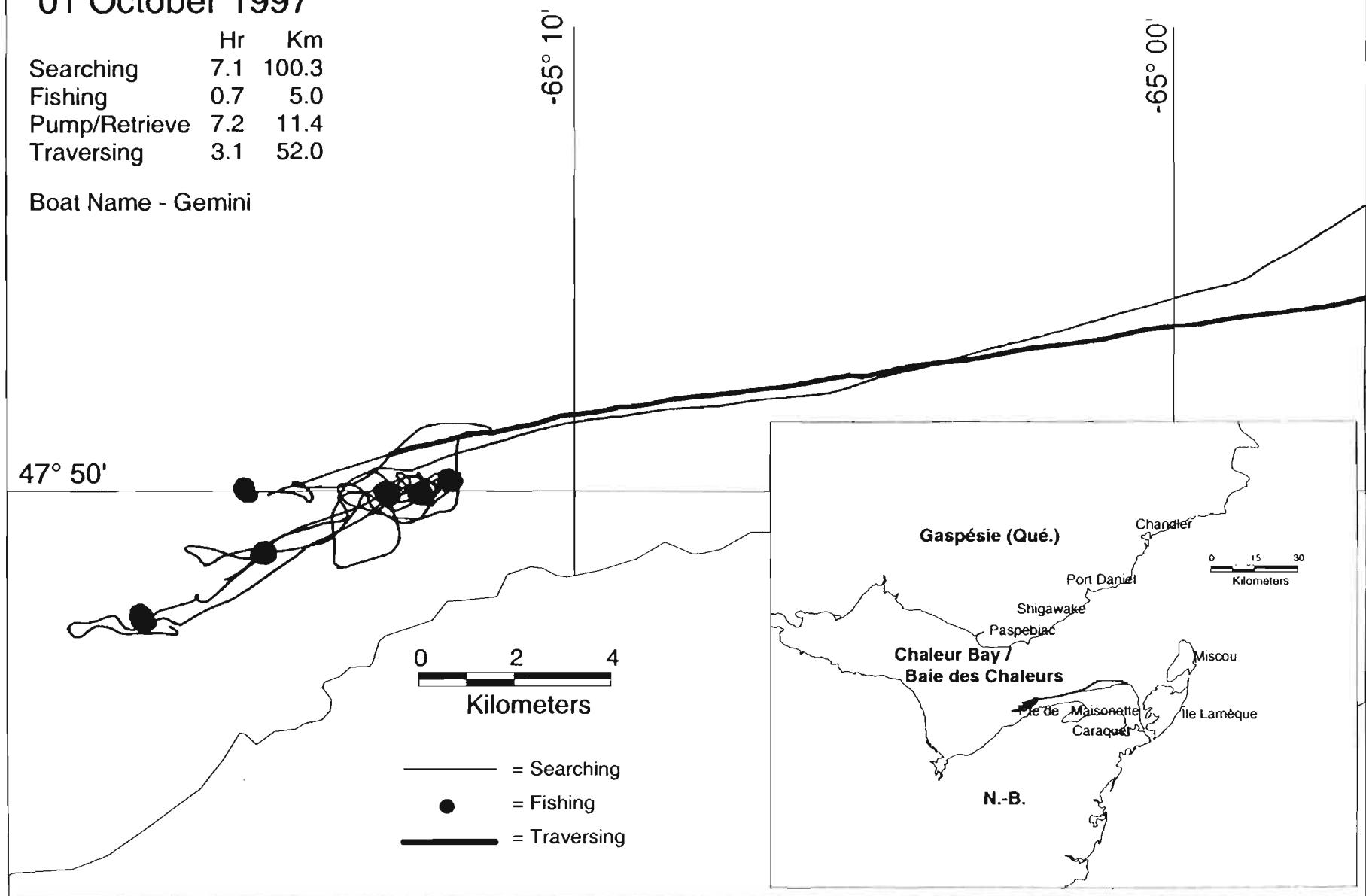
- = Searching
- = Fishing
- = Traversing



01 October 1997

	Hr	Km
Searching	7.1	100.3
Fishing	0.7	5.0
Pump/Retrieve	7.2	11.4
Traversing	3.1	52.0

Boat Name - Gemini



02 October 1997

	Hr	Km
Searching	13.3	225.0
Fishing	0.3	1.1
Pump/Retrieve	3.4	5.1
Traversing	3.0	47.9

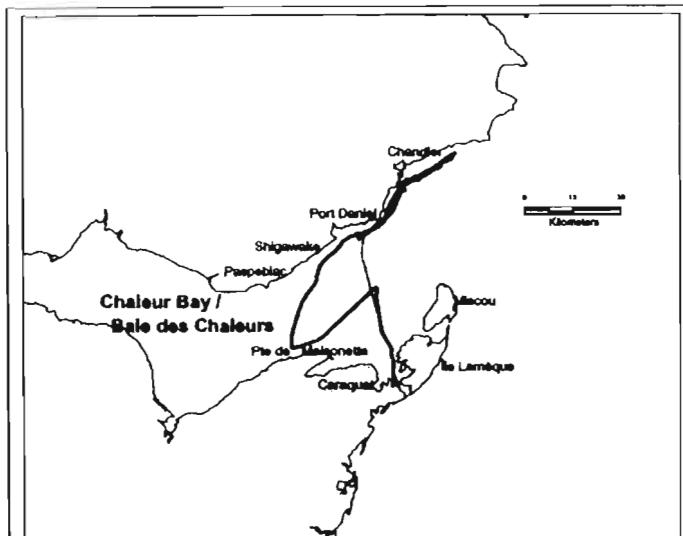
Boat Name - Gemini

48° 20'

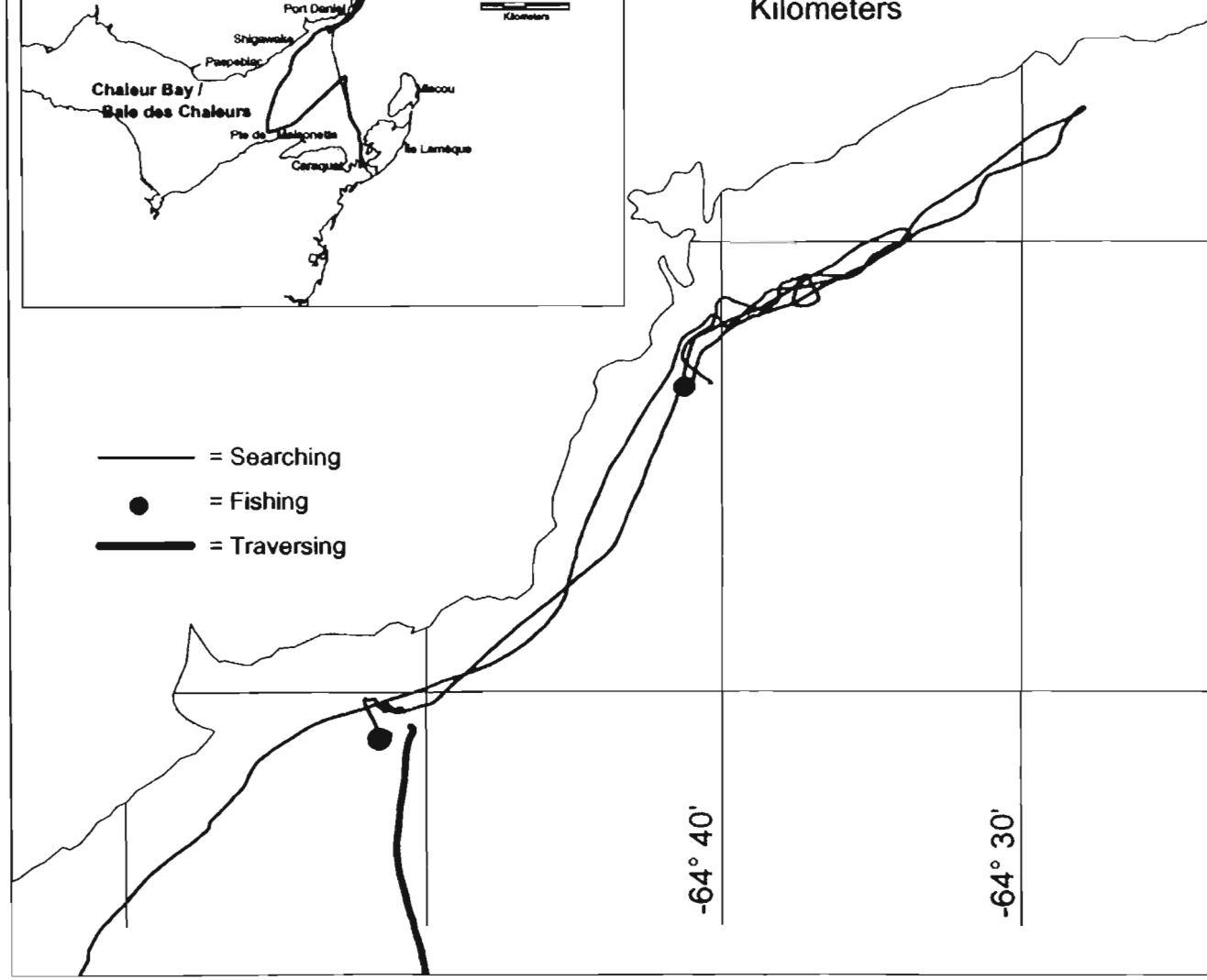
48° 10'

-64° 20'

-64° 40'



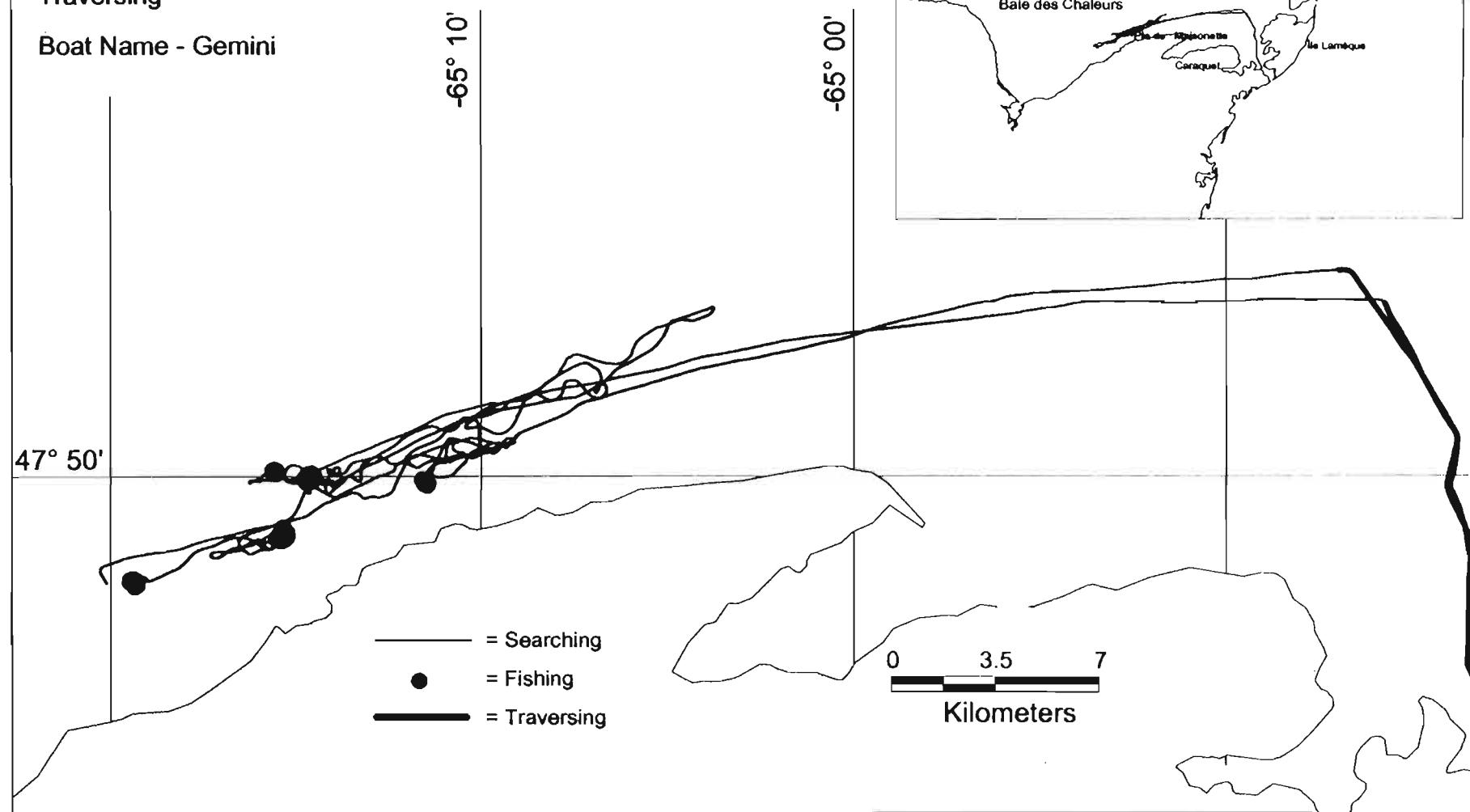
- = Searching
- = Fishing
- = Traversing



03 October 1997

	Hr	Km
Searching	11.9	185.7
Fishing	0.6	4.6
Pump/Retrieve	3.8	7.1
Traversing	2.1	35.8

Boat Name - Gemini



04 October 1997

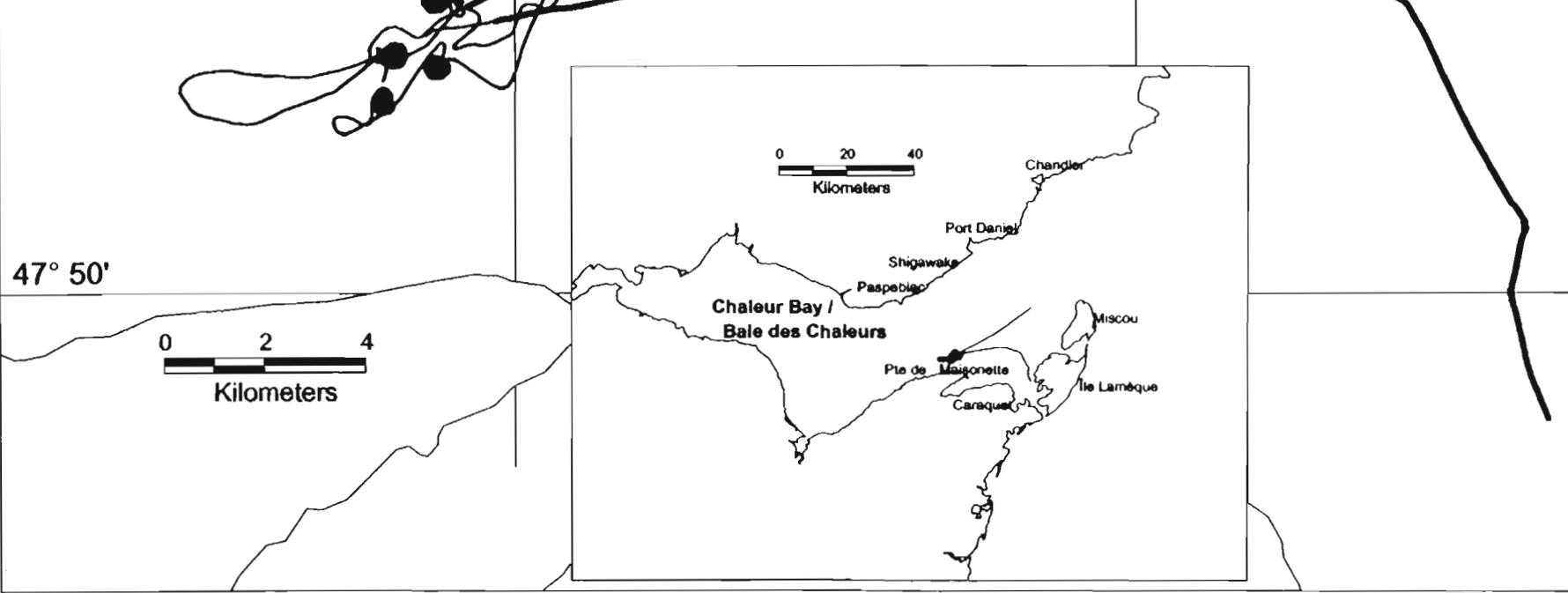
	Hr	Km
Searching	6.3	98.3
Fishing	0.4	3.0
Pump/Retrieve	4.4	7.9
Traversing	7.0	103.8
Other	1.9	3.1

Boat Name - Gemini

-65° 00'

-64° 50'

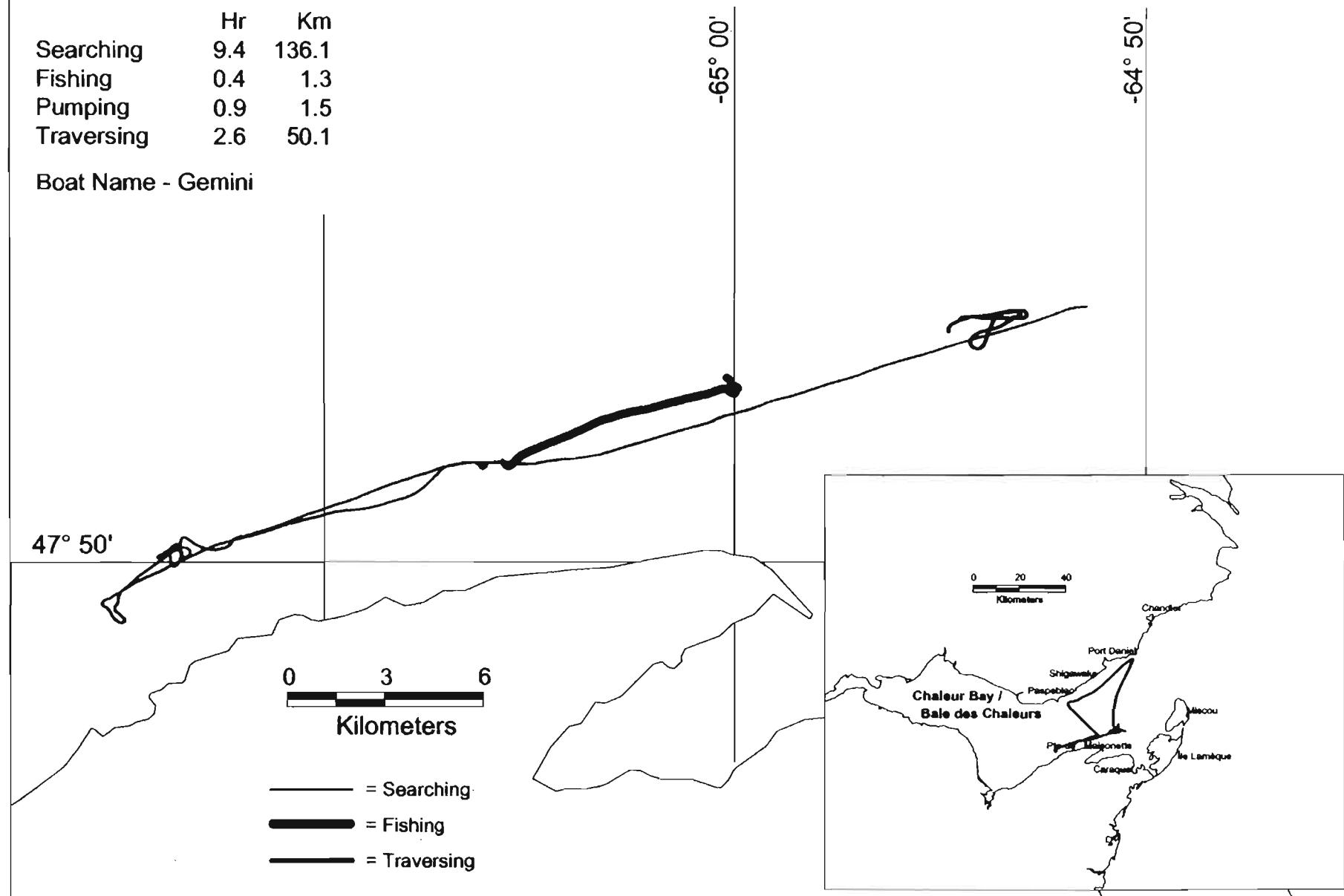
- = Searching
- = Fishing
- = Traversing



05 October 1997

	Hr	Km
Searching	9.4	136.1
Fishing	0.4	1.3
Pumping	0.9	1.5
Traversing	2.6	50.1

Boat Name - Gemini

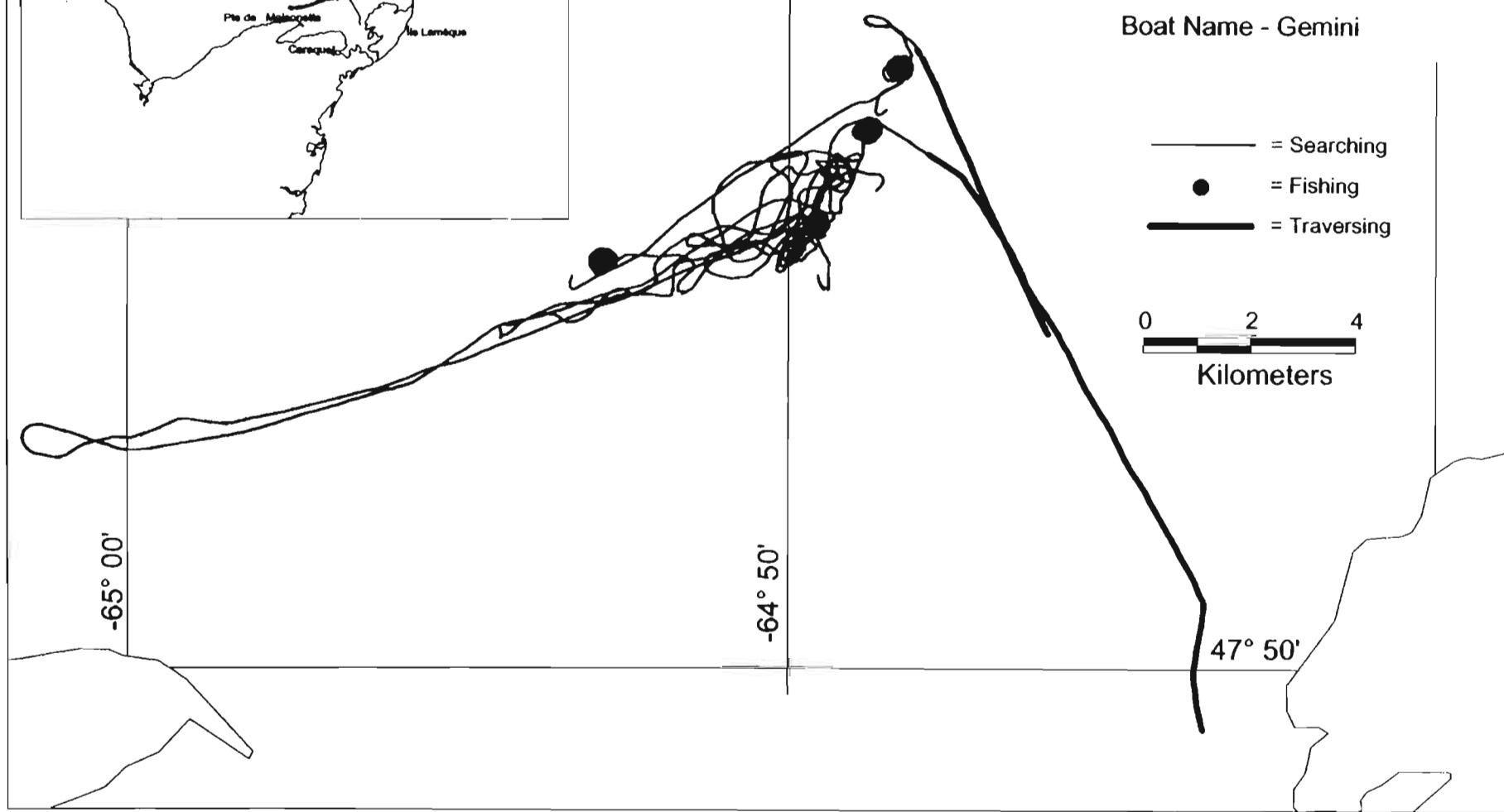
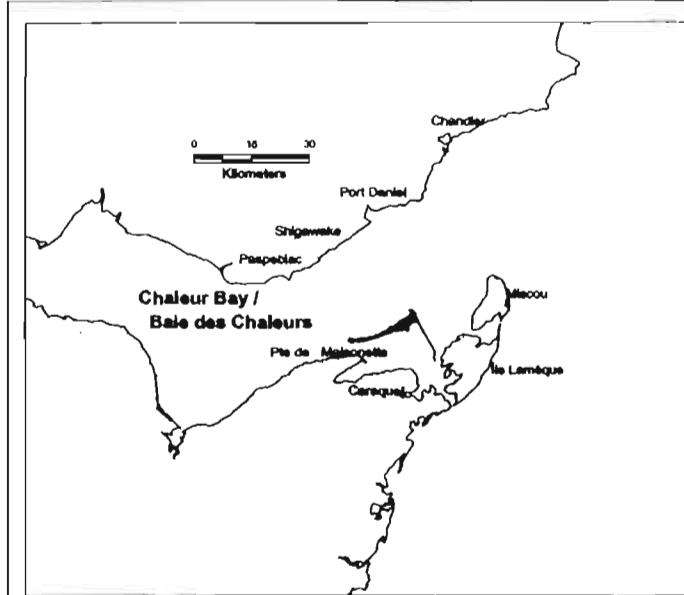


08 October 1997

	Hr	Km
Searching	9.6	120.0
Fishing	0.5	3.6
Pump/Retrieve	3.8	6.0
Traversing	1.2	18.2

Boat Name - Gemini

- = Searching
- = Fishing
- = Traversing

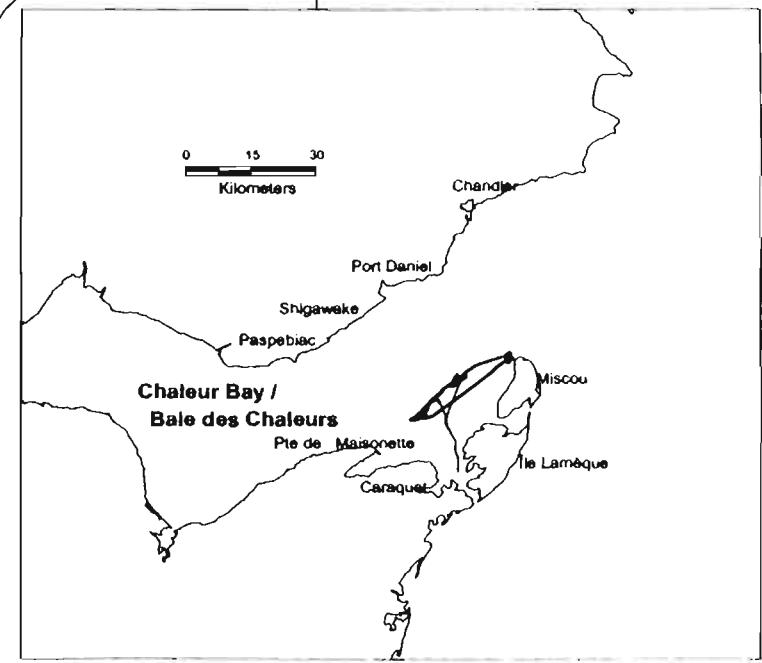
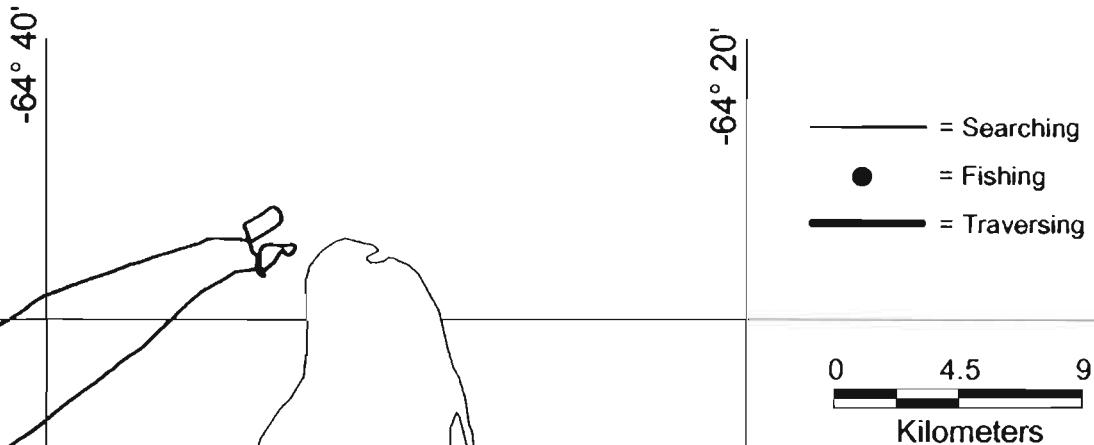


09 October 1997

	Hr	Km
Searching	7.3	107.8
Fishing	0.3	2.0
Pump/Retrieve	3.1	6.4
Traversing	2.3	41.0

Boat Name - Gemini

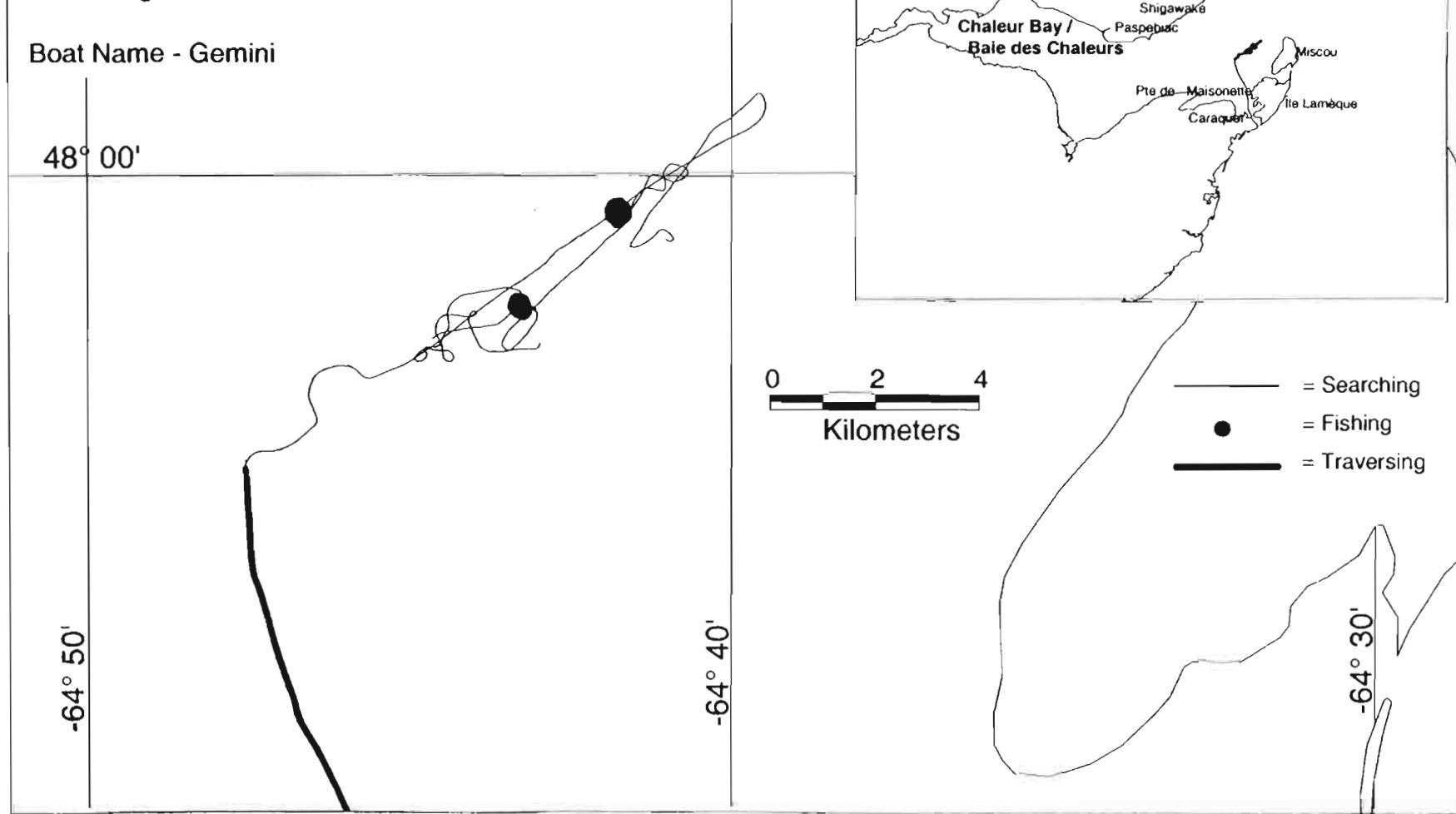
48° 00'



10 October 1997

	Hr	Km
Searching	3.1	40.5
Fishing	0.2	1.5
Pump/Retrieve	2.0	3.4
Traversing	1.5	24.1

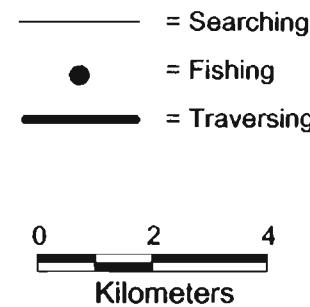
Boat Name - Gemini



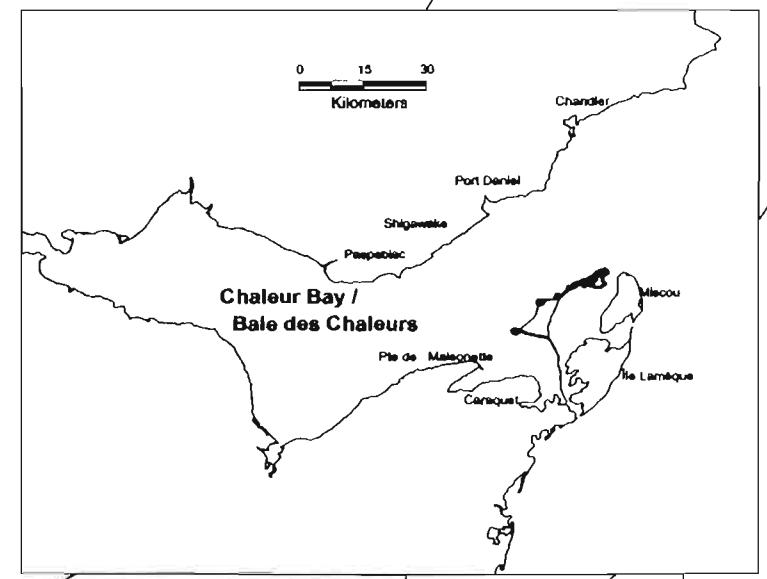
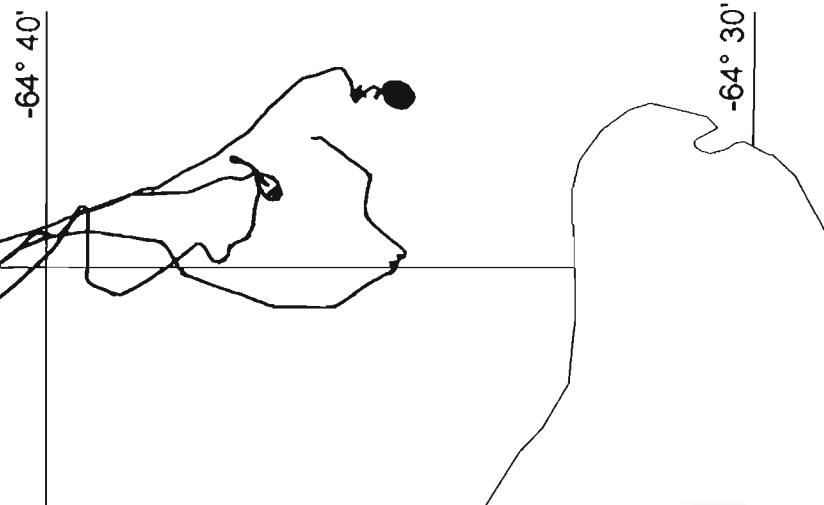
12 October 1997

	Hr	Km
Searching	5.6	74.9
Fishing	0.5	3.4
Pump/Retrieve	3.3	5.3
Traversing	2.5	46.1

Boat Name - Gemini



48° 00'

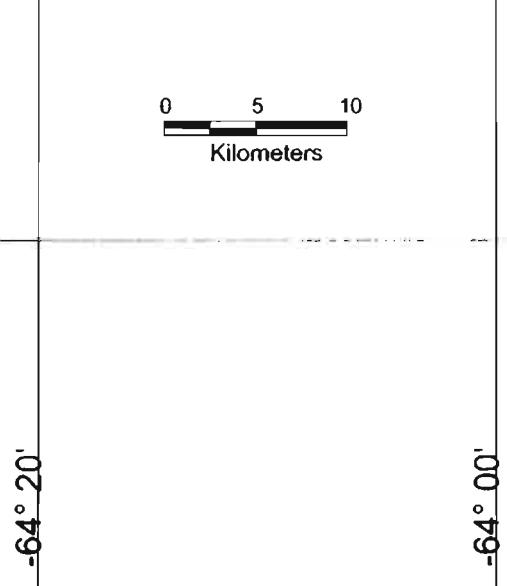
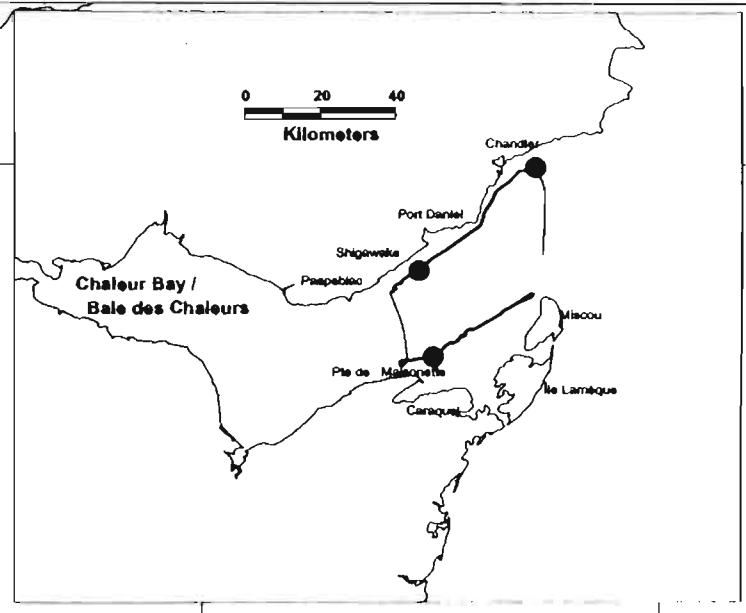
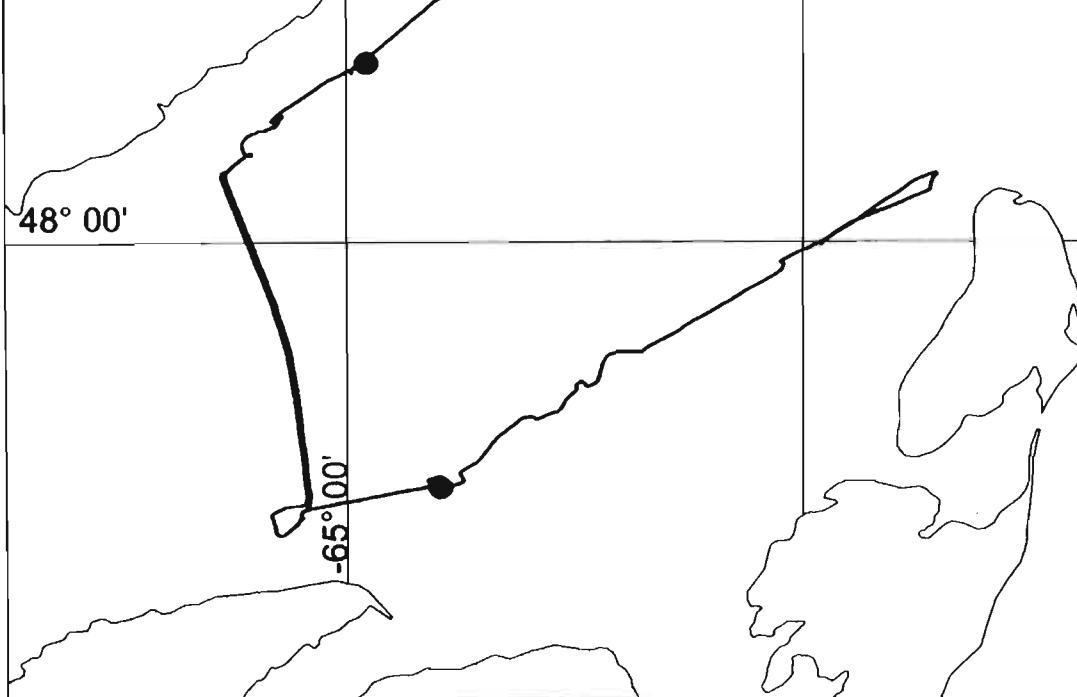


13 October 1997

	Hr	Km
Searching	7.9	121.3
Fishing	0.4	2.1
Pump/Retrieve	2.1	3.0
Traversing	2.2	42.1

Boat Name - Gemini

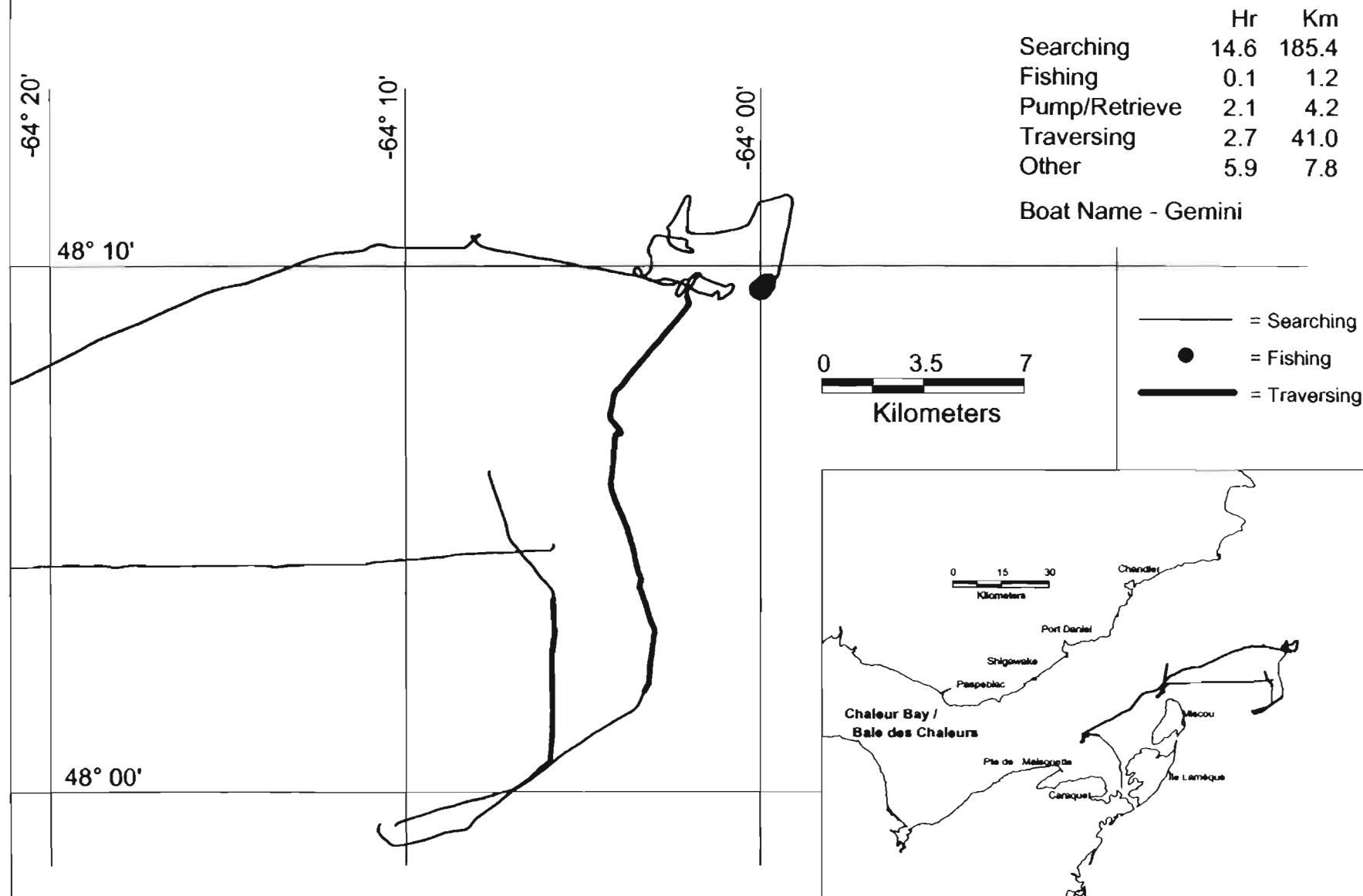
- = Searching
- = Fishing
- = Traversing



14 October 1997

	Hr	Km
Searching	14.6	185.4
Fishing	0.1	1.2
Pump/Retrieve	2.1	4.2
Traversing	2.7	41.0
Other	5.9	7.8

Boat Name - Gemini



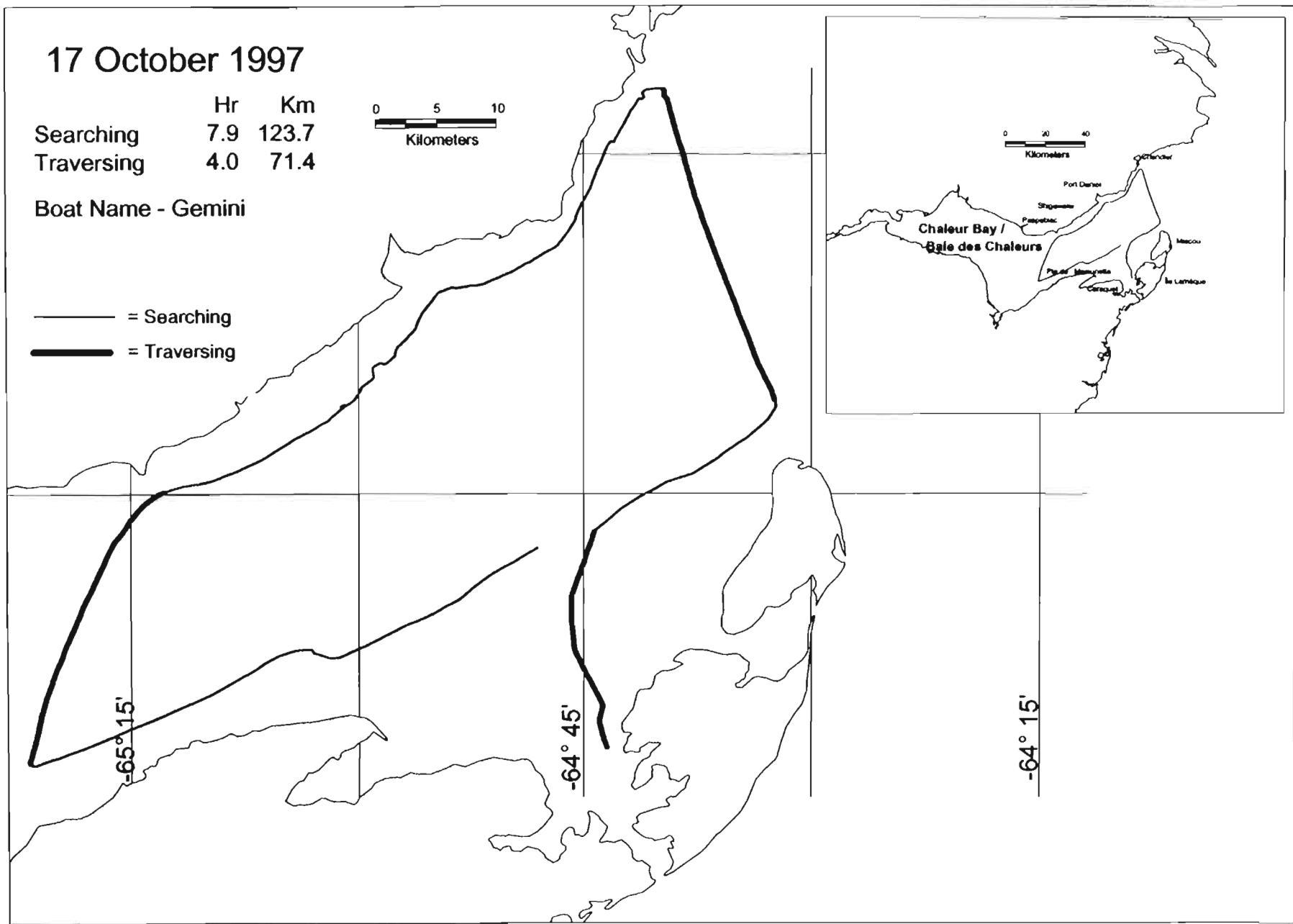
17 October 1997

	Hr	Km
Searching	7.9	123.7
Traversing	4.0	71.4

0 5 10
Kilometers

Boat Name - Gemini

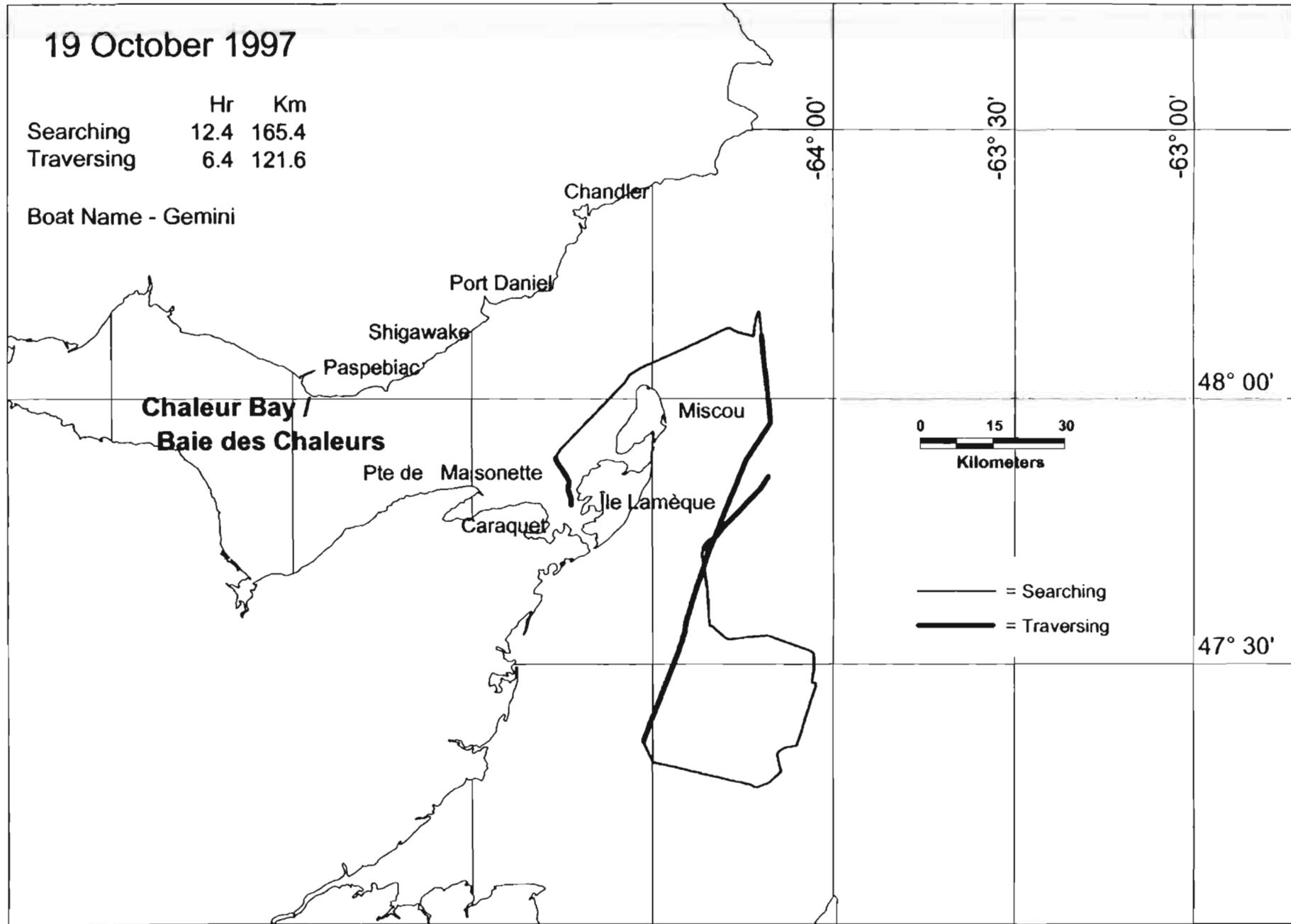
— = Searching
— = Traversing

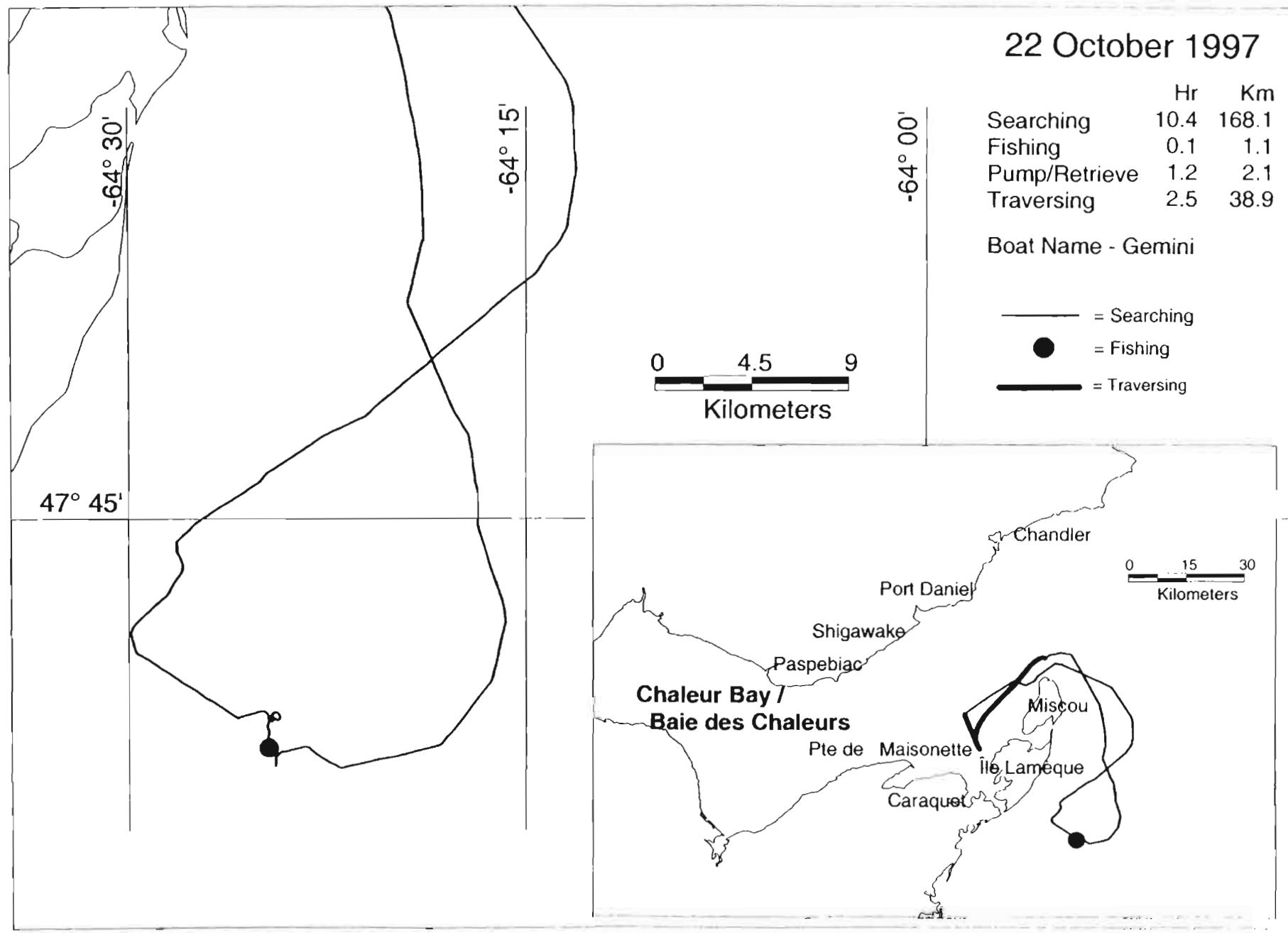


19 October 1997

	Hr	Km
Searching	12.4	165.4
Traversing	6.4	121.6

Boat Name - Gemini

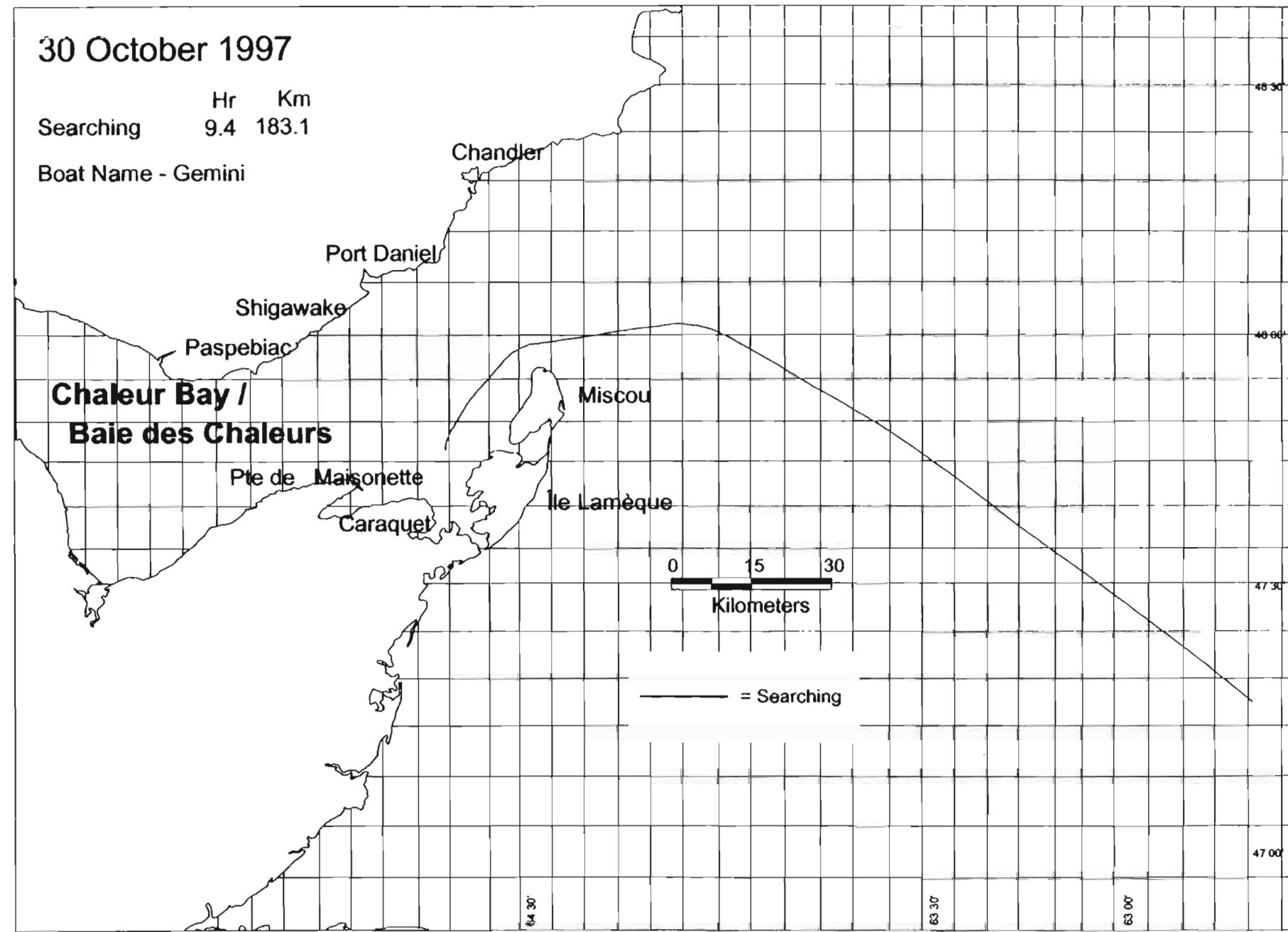




30 October 1997

Hr Km
Searching 9.4 183.1

Boat Name - Gemini

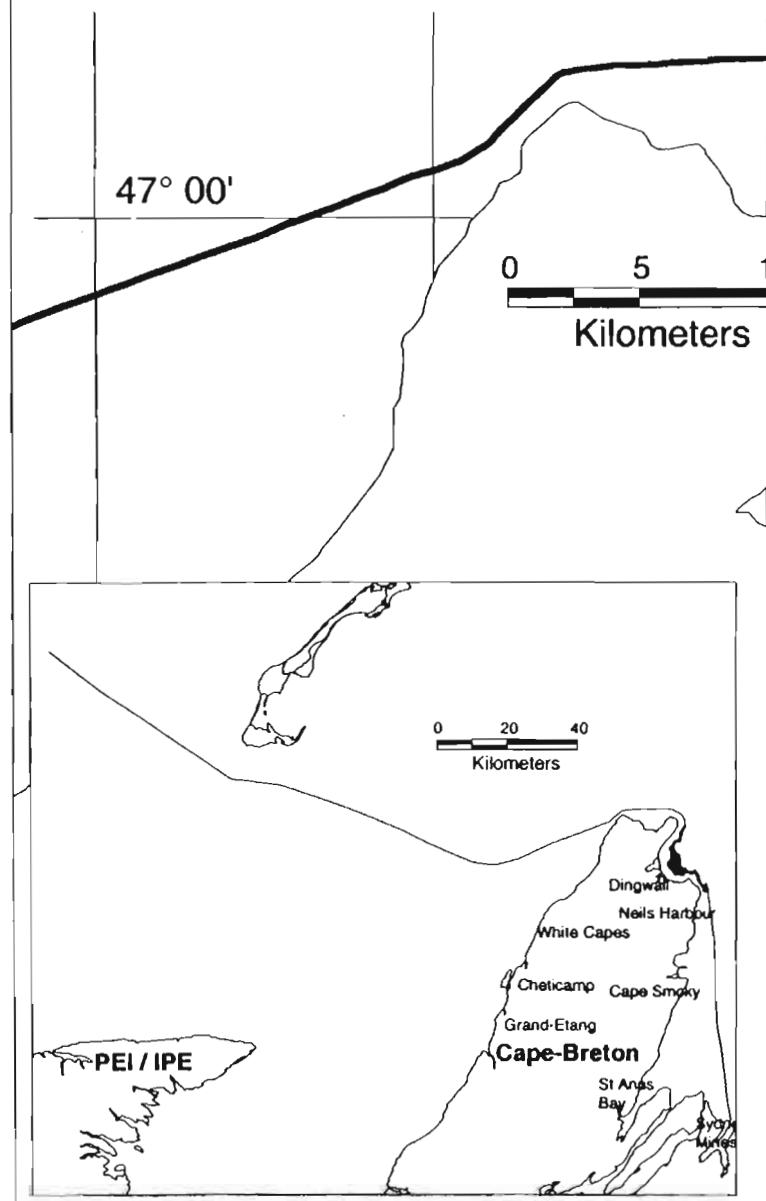


31 October 1997

	Hr	Km
Searching	10.9	88.1
Fishing	0.3	2.2
Pump/Retrieve	2.7	4.9
Waiting	2.2	3.5
Traversing	14.9	279.2

Boat Name - Gemini

- = Searching
- = Fishing
- = Traversing



03 November 1997

	Hr	Km
Searching	5.8	51.1
Fishing	0.3	2.0
Pump/Retrieve	2.8	4.1
Traversing	8.6	148.9

Boat Name - Gemini

— = Searching

● = Fishing

— = Traversing

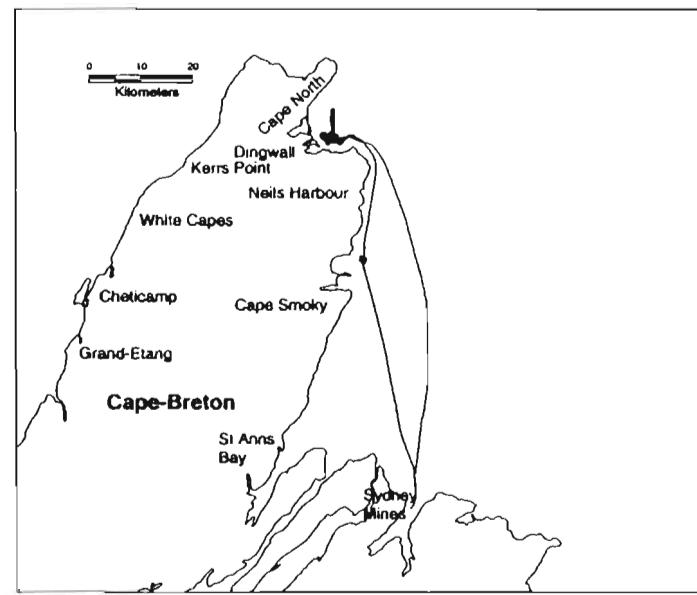


-60° 20'

-60° 10'

Dingwall

46° 50'

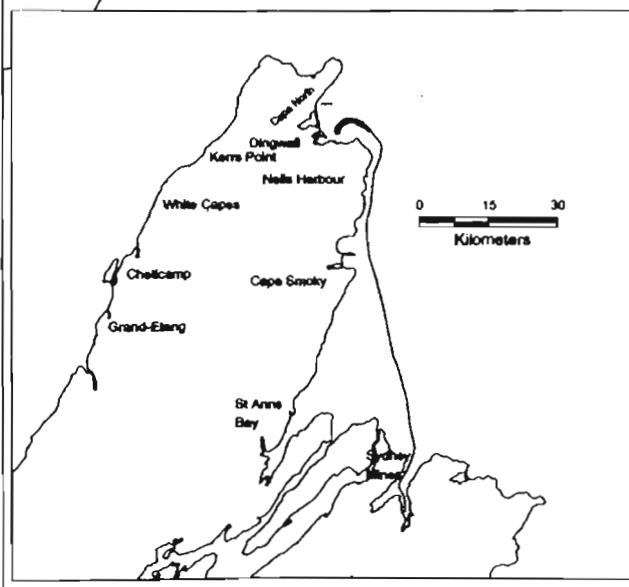
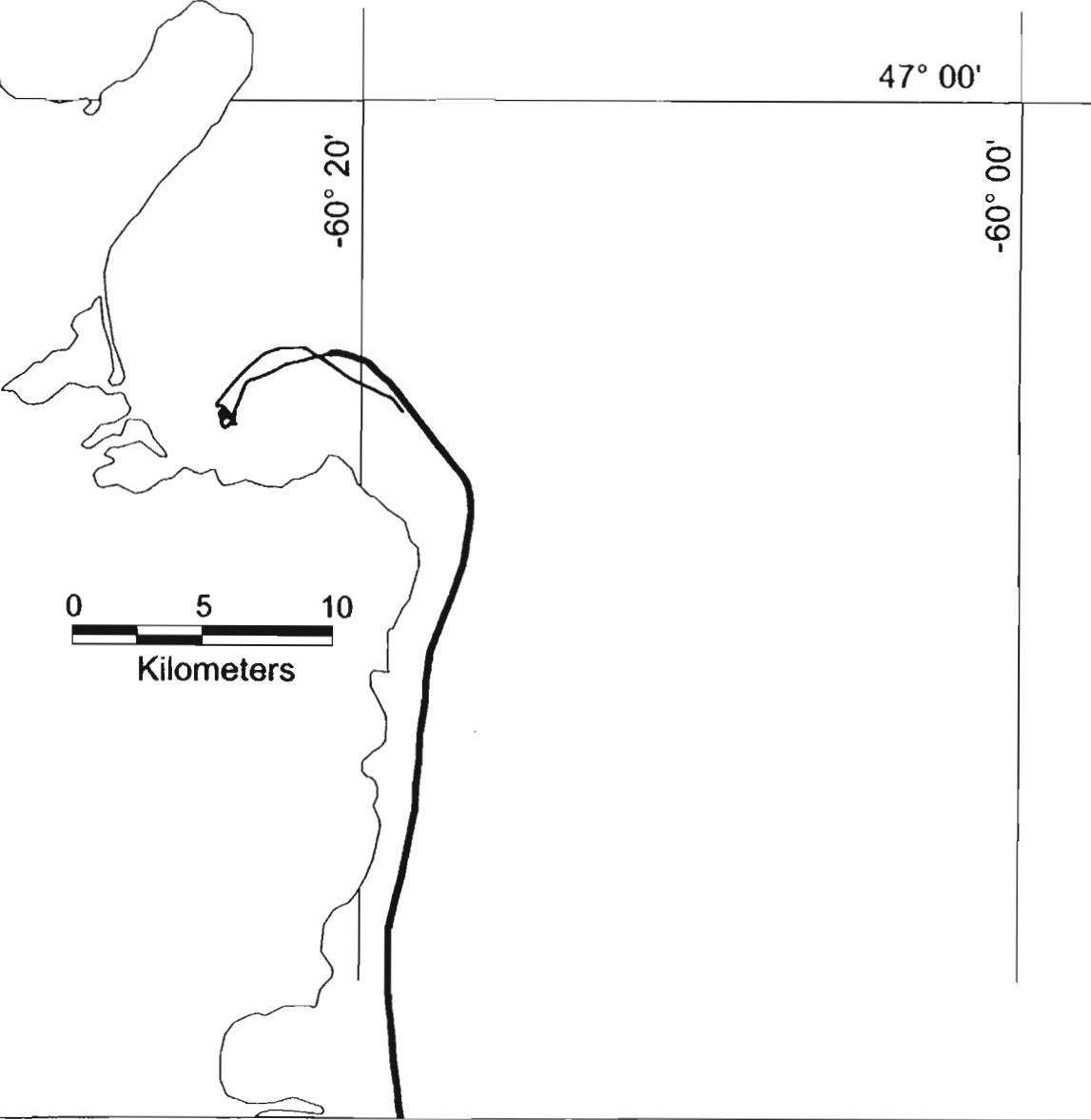


04 November 1997

	Hr	Km
Searching	1.6	18.5
Traversing	5.1	90.3

Boat Name - Gemini

— = Searching
— = Traversing

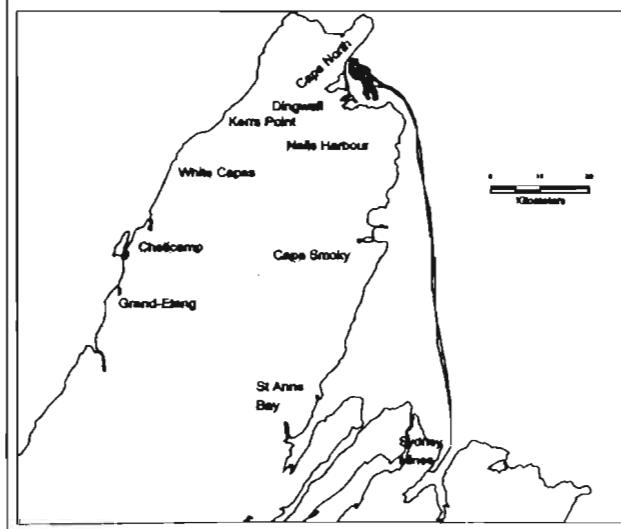
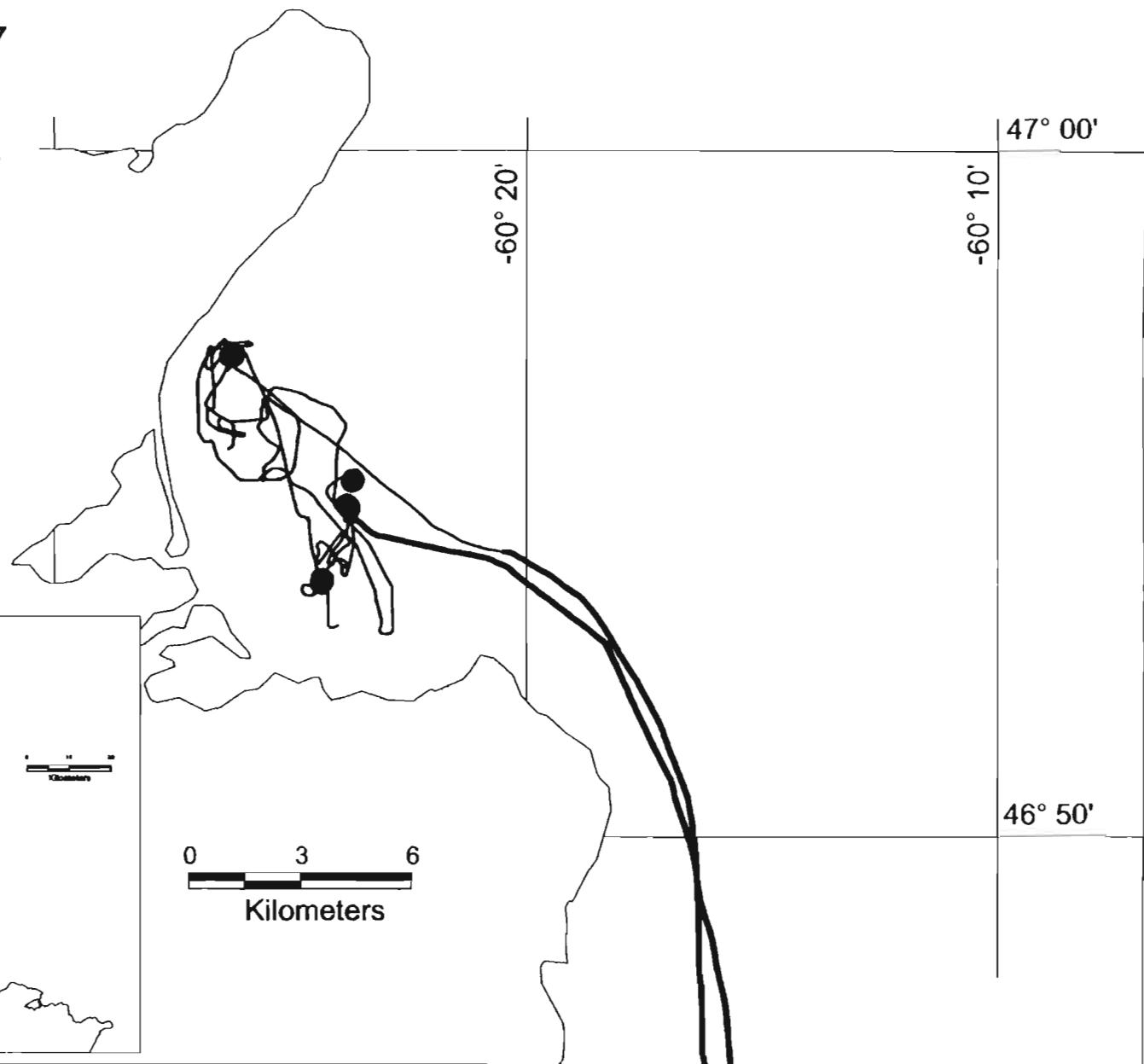


06 November 1997

	Hr	Km
Searching	5.8	74.1
Fishing	0.4	3.3
Pump/Retrieve	4.6	8.8
Traversing	8.3	153.1

Boat Name - Gemini

- = Searching
- = Fishing
- = Traversing

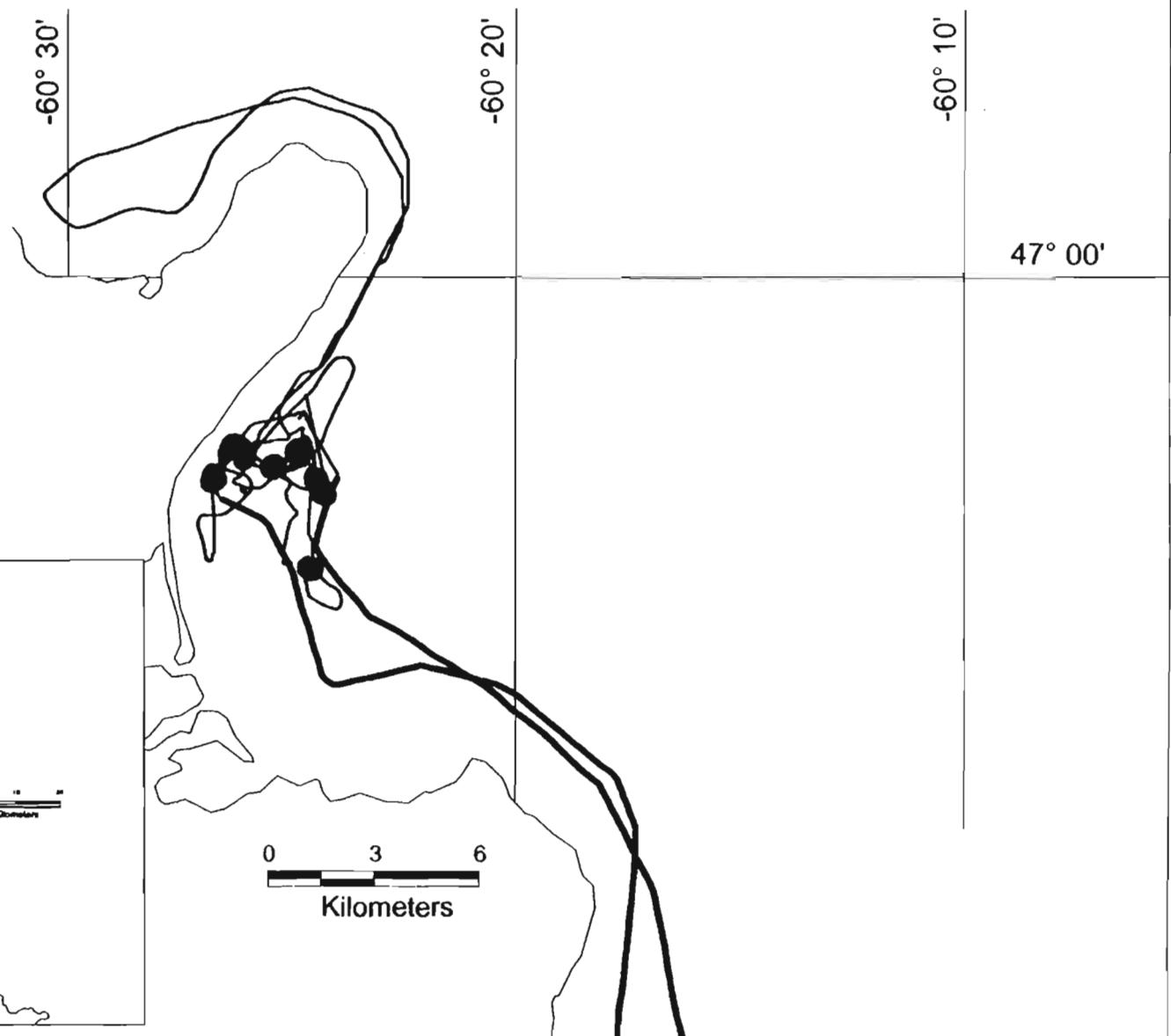
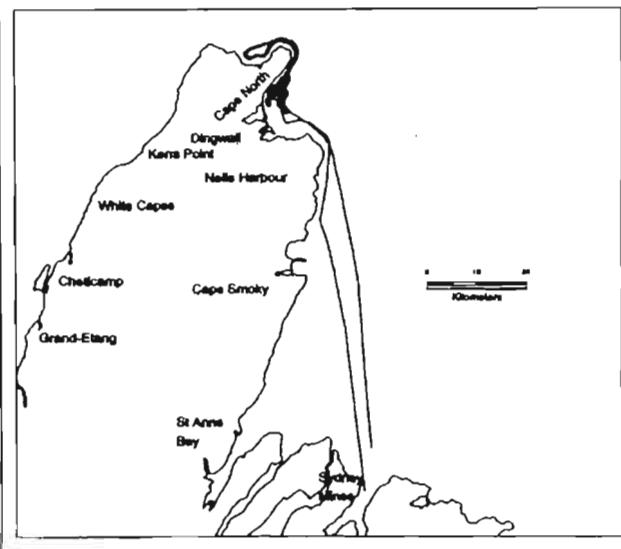


11 November 1997

	Hr	Km
Searching	7.1	98.9
Fishing	0.9	7.5
Pump/Retrieve	6.5	12.1
Traversing	8.9	130.3

Boat Name - Gemini

- = Searching
- = Fishing
- = Traversing

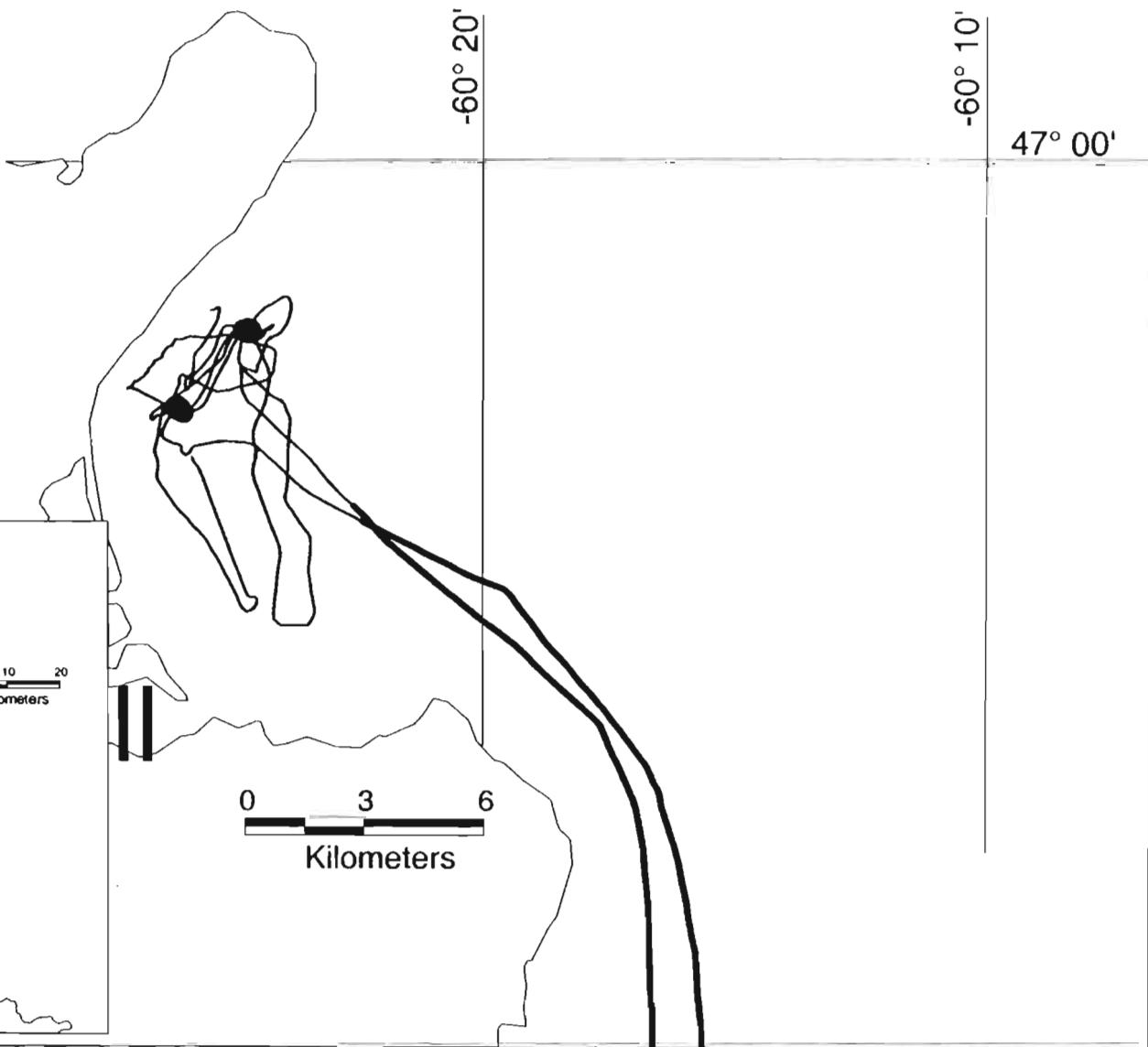
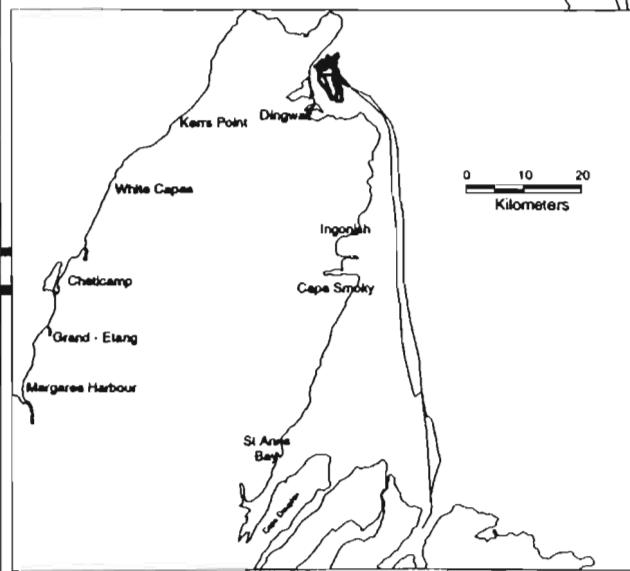


14 November 1997

	Hr	Km
Searching	8.0	72.6
Fishing	0.3	2.3
Pump/Retrieve	1.8	3.4
Traversing	9.2	161.0

Boat Name - Gemini

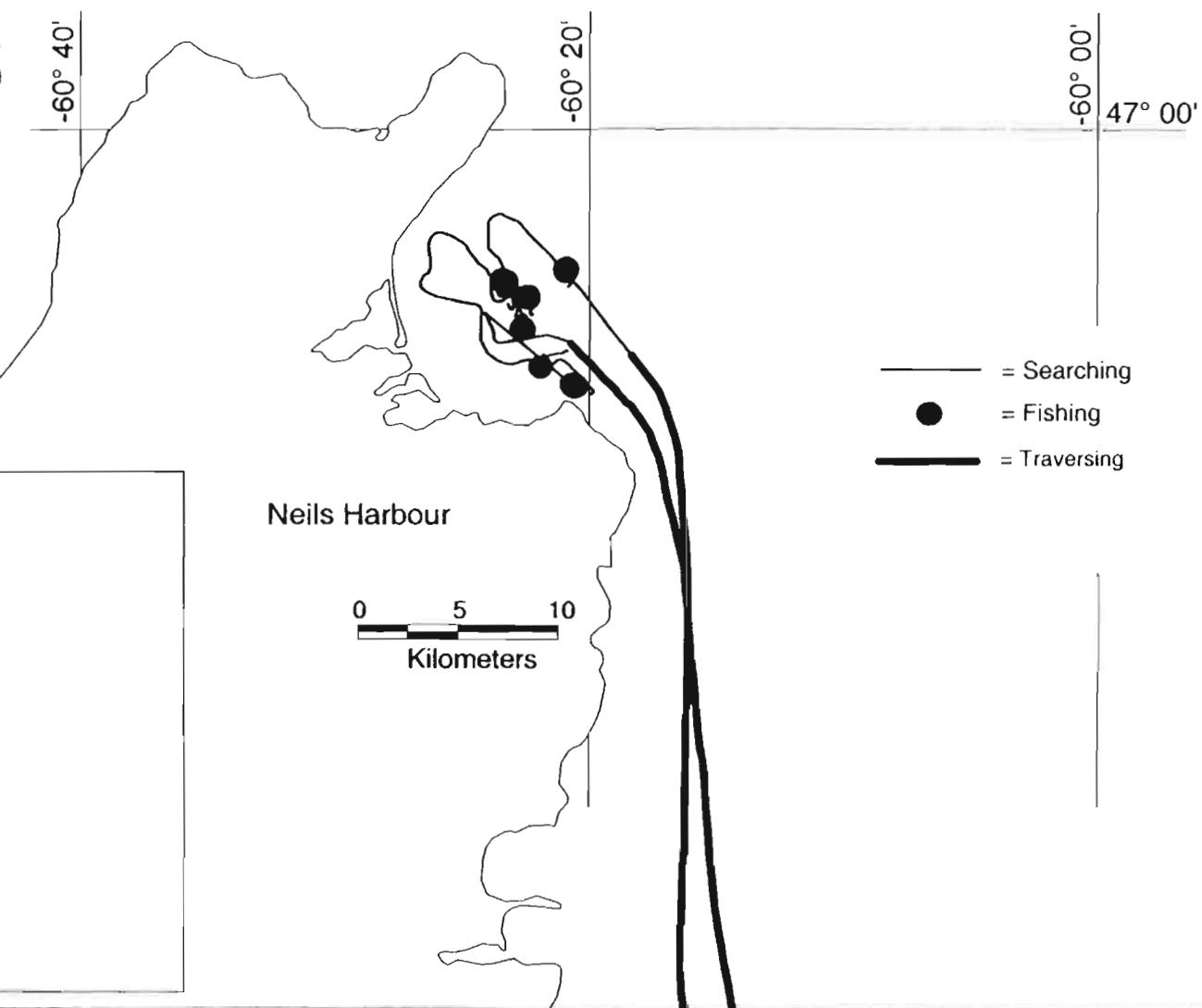
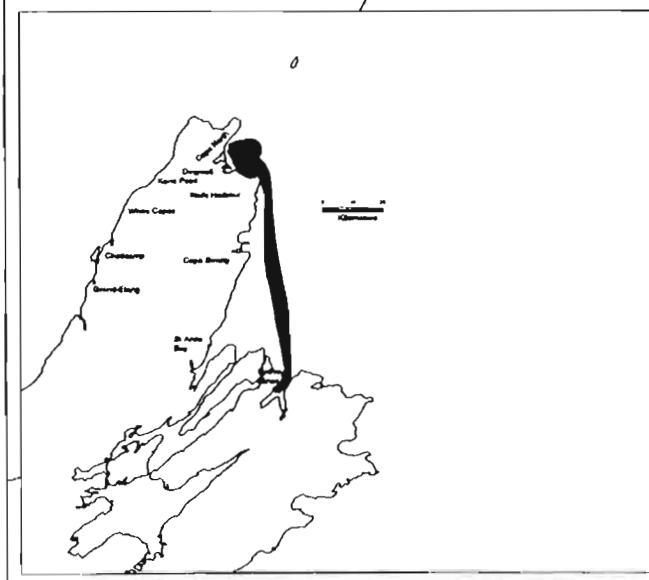
- = Searching
- = Fishing
- = Traversing



16 November 1997

	Hr	Km
Searching	5.3	61.5
Fishing	0.9	6.1
Pump/Retrieve	6.5	11.4
Traversing	8.0	150.0

Boat Name - Gemini

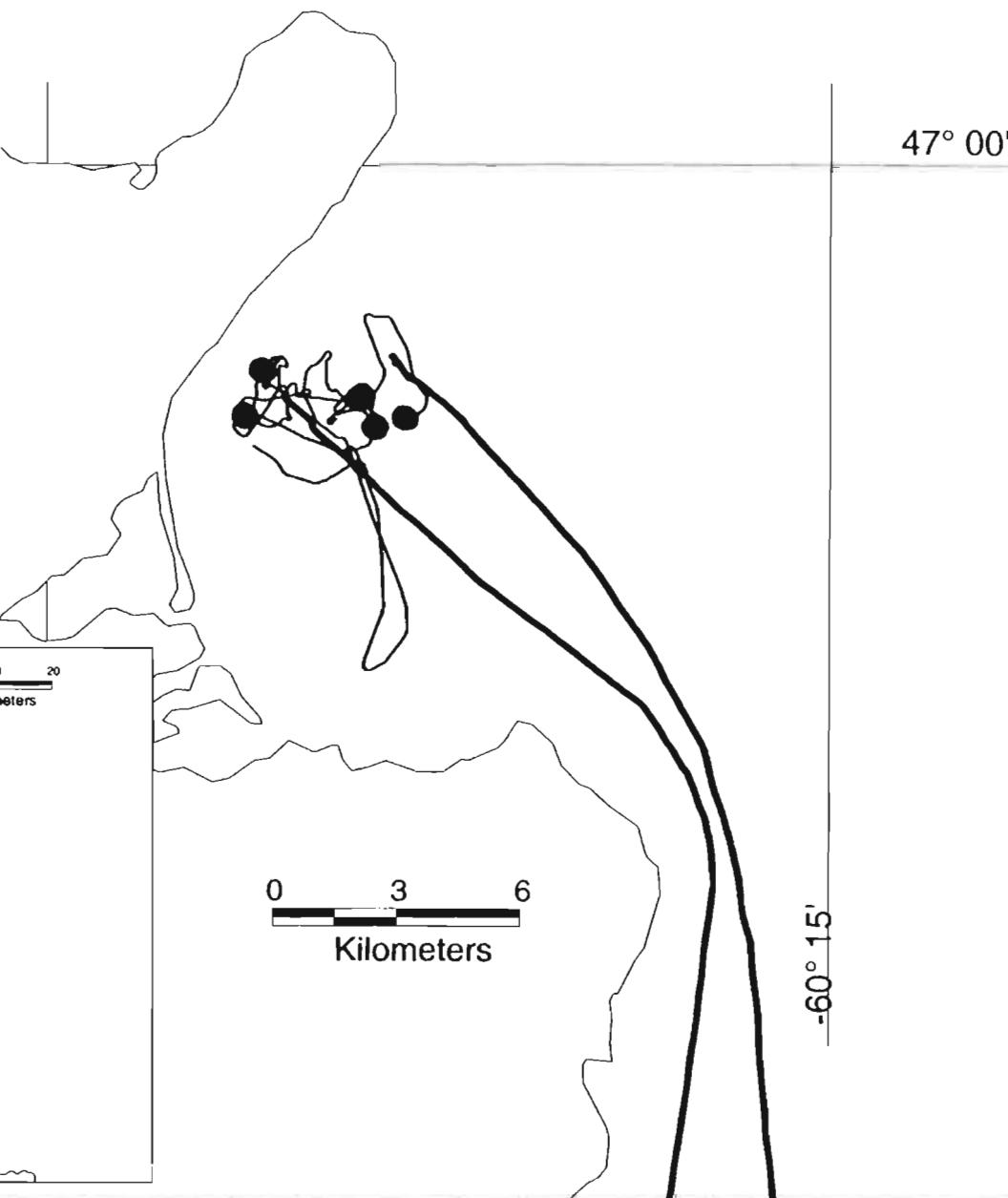
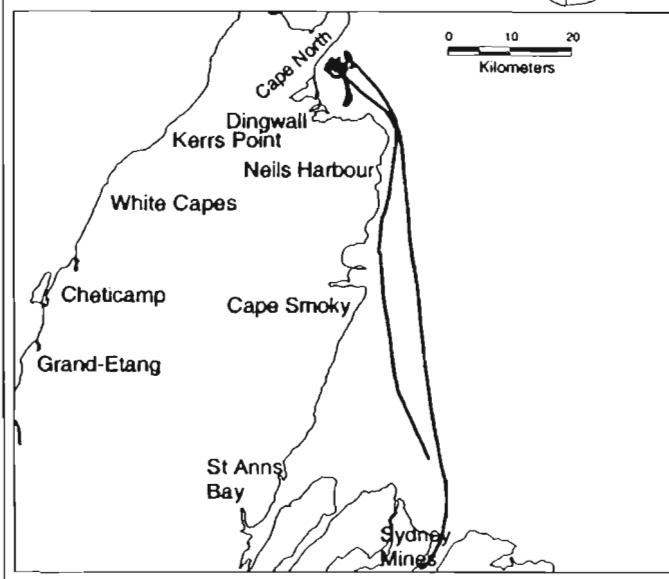


18 November 1997

	Hr	Km
Searching	4.1	51.9
Fishing	0.7	4.3
Pump/Retrieve	4.8	7.0
Traversing	8.7	158.7

Boat Name - Gemini

- = Searching
- = Fishing
- = Traversing



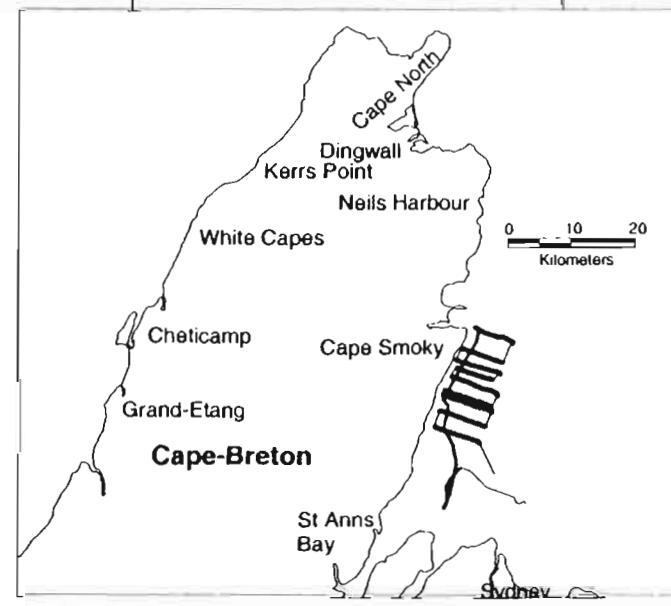
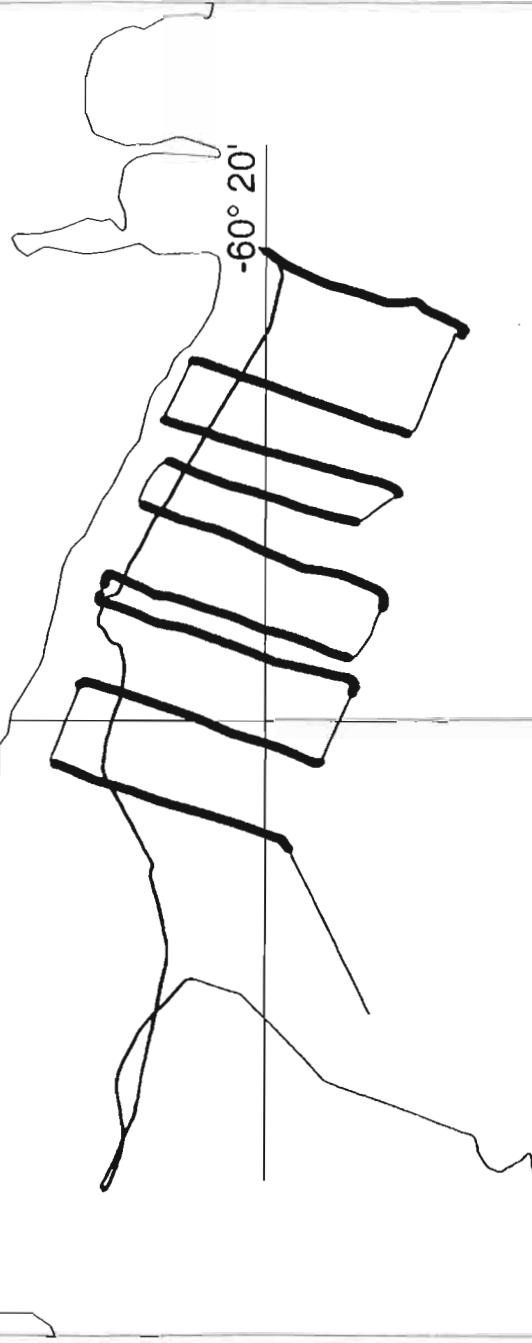
21 November 1997

	Hr	Km
Searching	2.0	38.6
Surveying	3.4	64.4
Traversing	2.0	36.4

Boat Name - Gemini

- = Searching
- = Surveying
- = Traversing

0 4 8
Kilometers



22 November 1997

	Hr	Km
Searching	0.6	8.5
Fishing	0.4	2.6
Pump/Retrieve	2.0	3.7
Surveying	0.9	16.5
Traversing	2.5	46.2

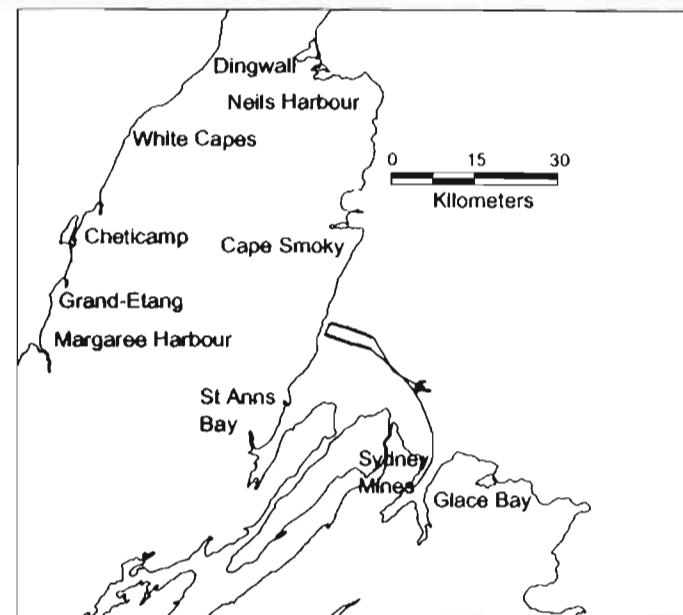
Boat Name - Gemini

- = Searching
- = Fishing
- = Traversing



-60° 20'

46° 20'



25 November 1997

	Hr	Km
Searching	0.4	8.0
Surveying	9.1	175.1
Traversing	3.7	70.3

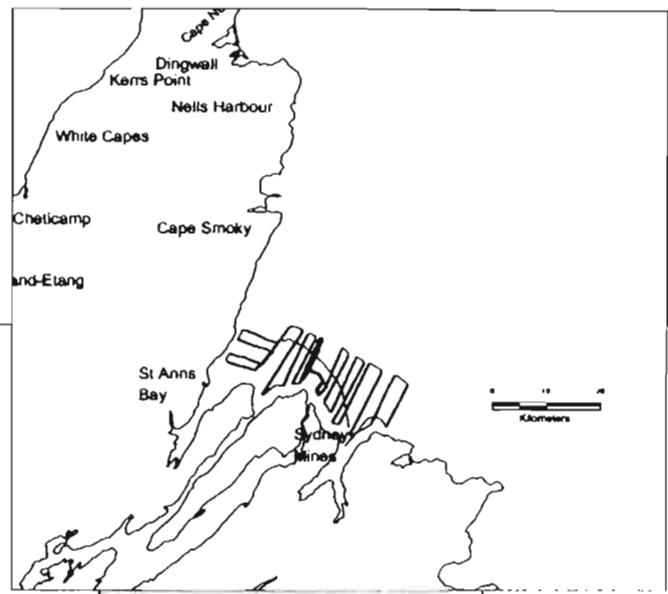
Boat Name - Gemini

- = Searching
- = Surveying
- = Traversing



60° 20'

46° 20'



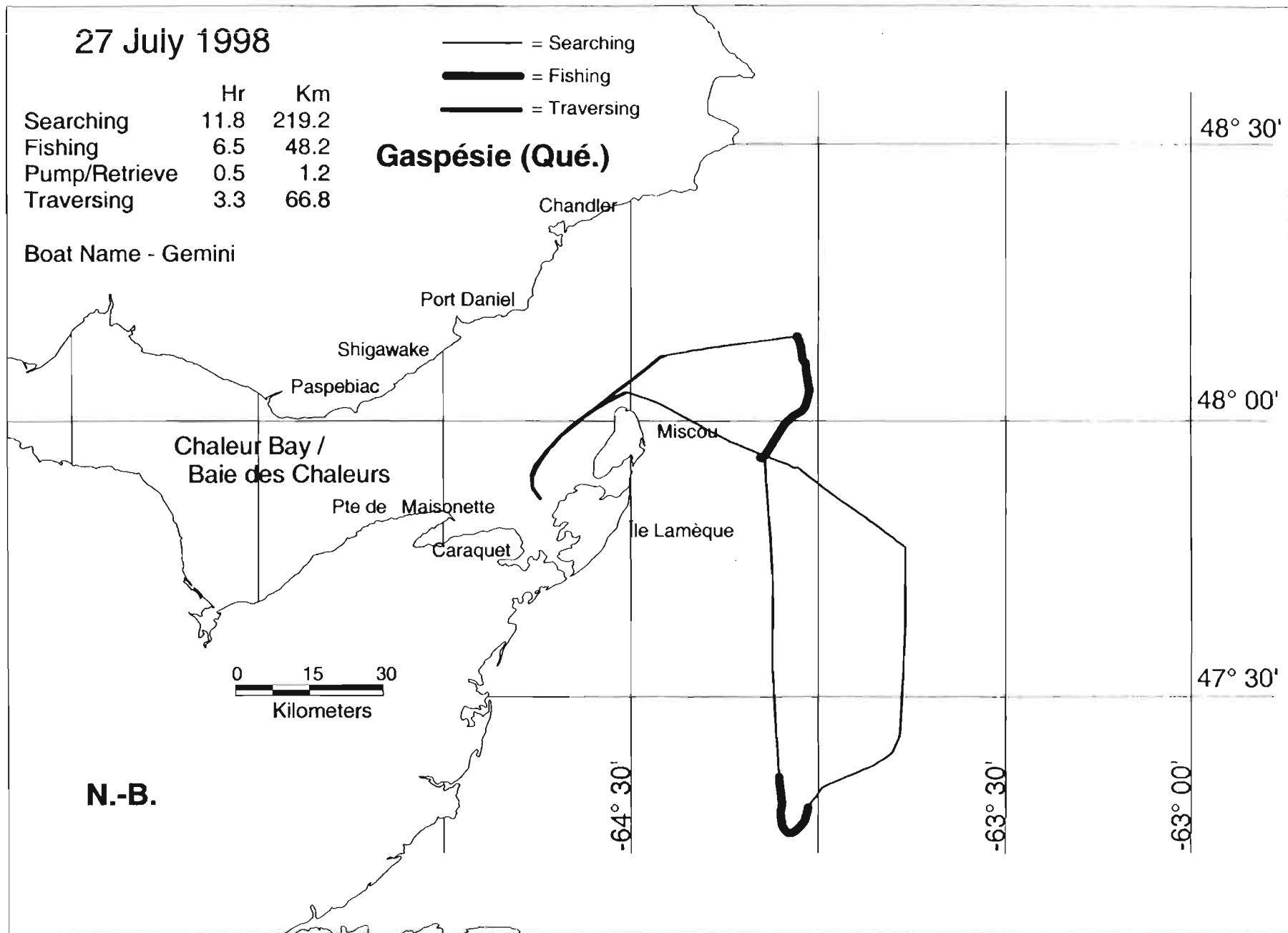
27 July 1998

	Hr	Km
Searching	11.8	219.2
Fishing	6.5	48.2
Pump/Retrieve	0.5	1.2
Traversing	3.3	66.8

Boat Name - Gemini

- = Searching
- = Fishing
- = Traversing

Gaspésie (Qué.)

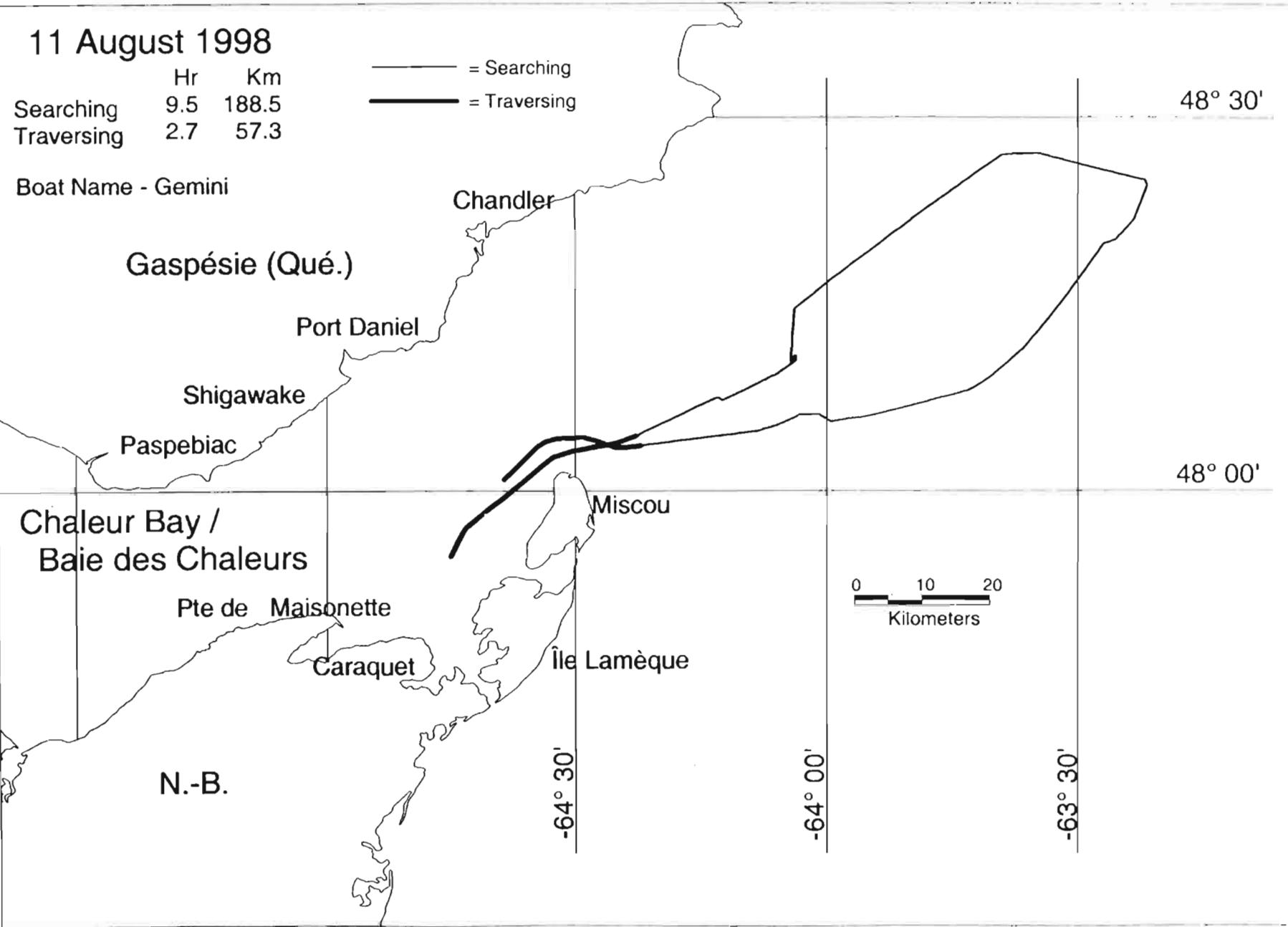


11 August 1998

	Hr	Km
Searching	9.5	188.5
Traversing	2.7	57.3

— = Searching
— = Traversing

Boat Name - Gemini



0 10 20
Kilometers

31 August 1998

	Hr	Km
Searching	5.3	73.4
Fishing	0.3	1.9
Pump/Retrieve	2.4	4.1
Traversing	5.4	100.0

Boat Name - Gemini

- = Searching
- = Fishing
- = Traversing

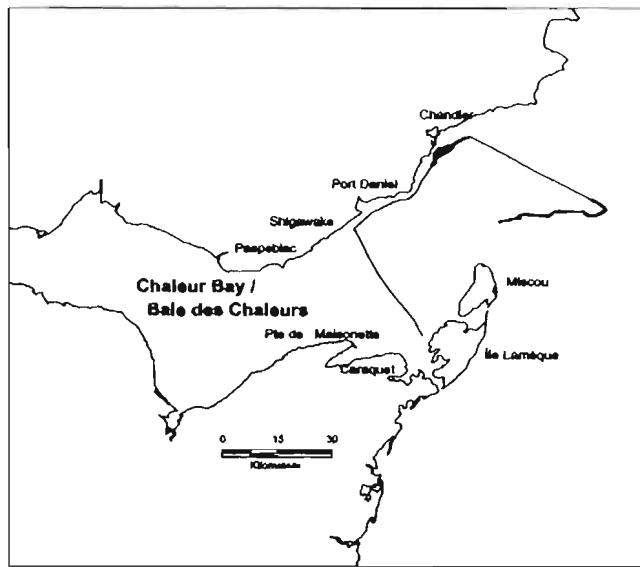


Kilometers

-64° 40'

-64° 30'

48° 20'



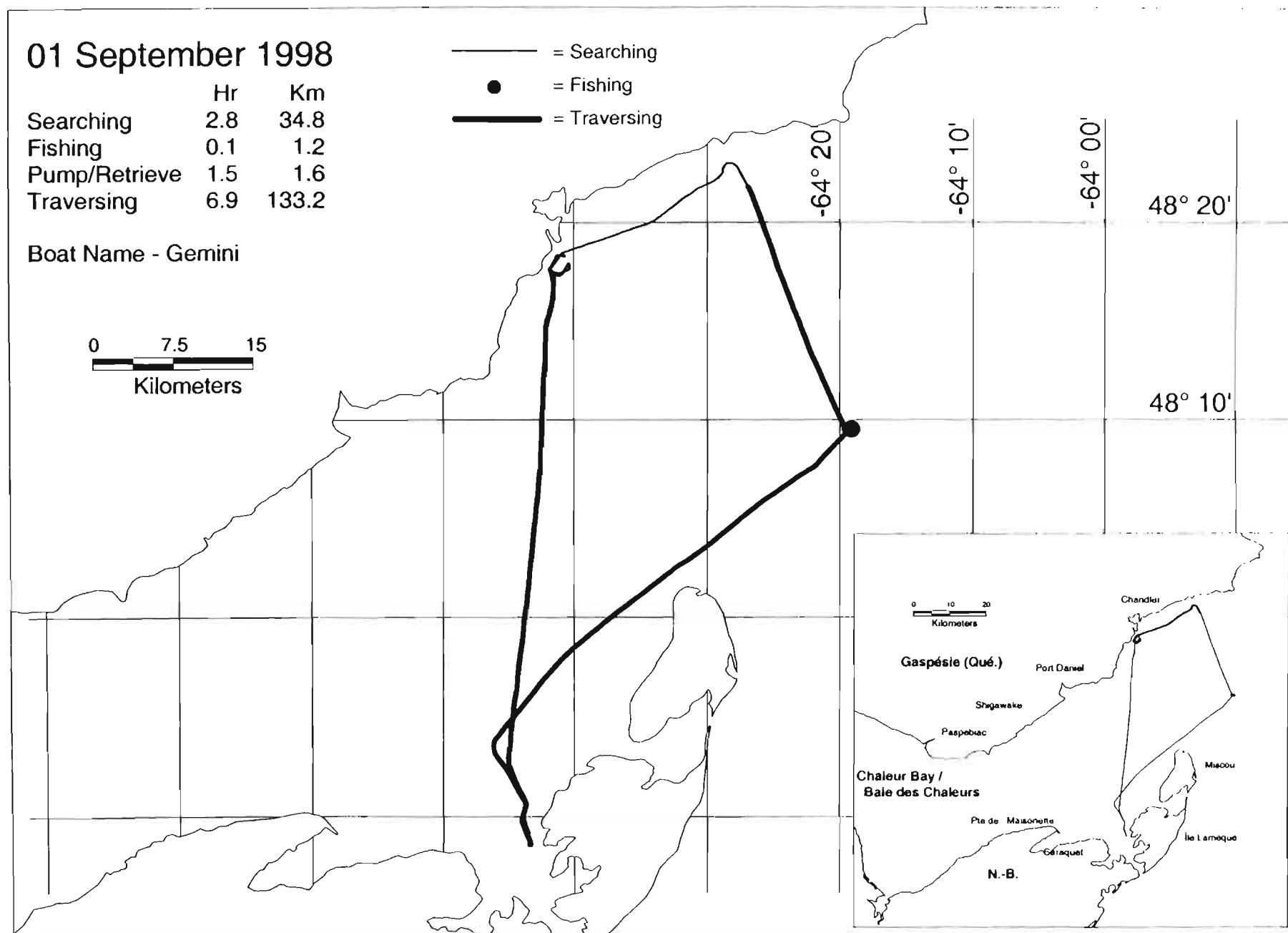
01 September 1998

	Hr	Km
Searching	2.8	34.8
Fishing	0.1	1.2
Pump/Retrieve	1.5	1.6
Traversing	6.9	133.2

Boat Name - Gemini



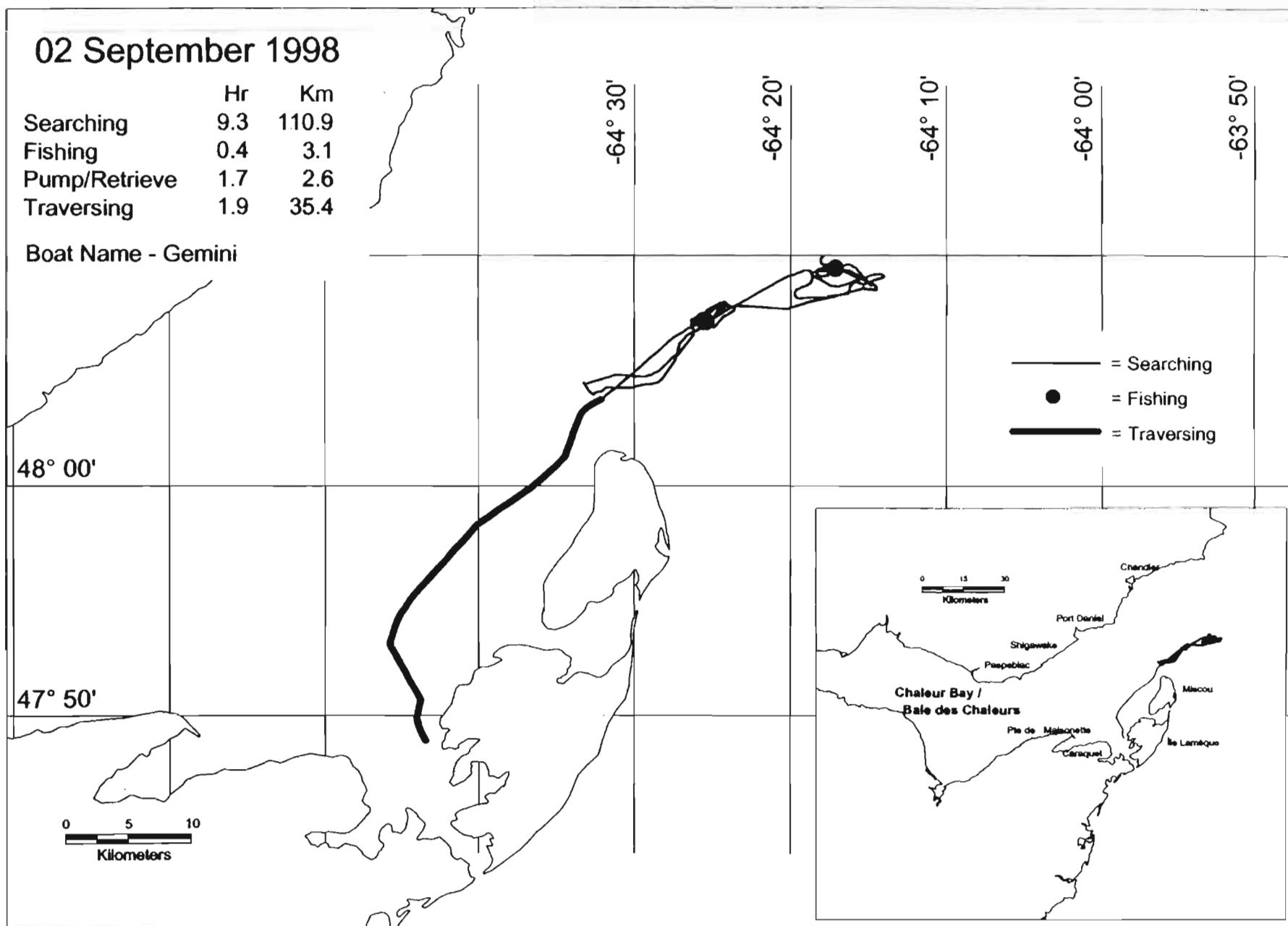
- = Searching
- = Fishing
- = Traversing



02 September 1998

	Hr	Km
Searching	9.3	110.9
Fishing	0.4	3.1
Pump/Retrieve	1.7	2.6
Traversing	1.9	35.4

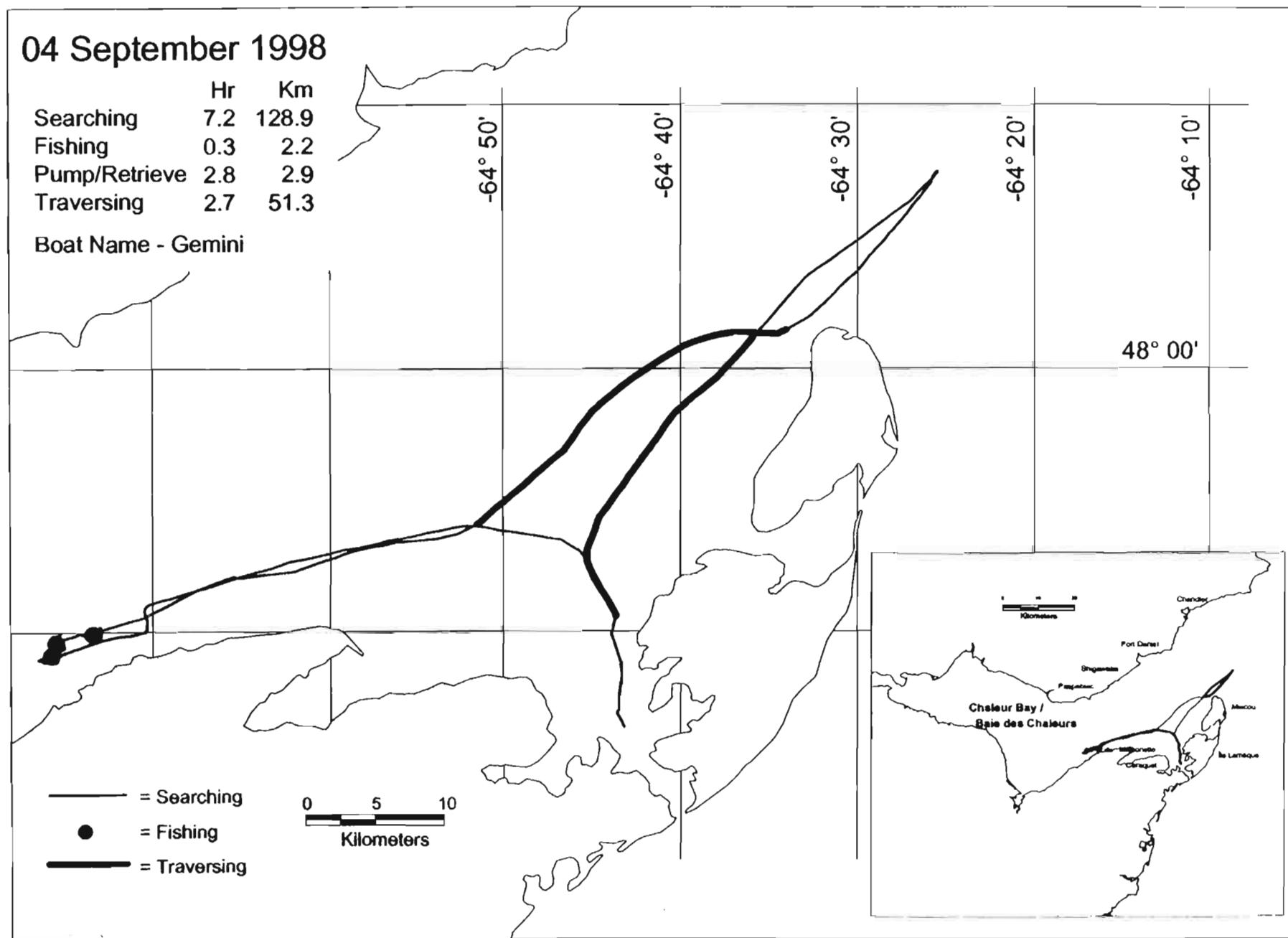
Boat Name - Gemini



04 September 1998

	Hr	Km
Searching	7.2	128.9
Fishing	0.3	2.2
Pump/Retrieve	2.8	2.9
Traversing	2.7	51.3

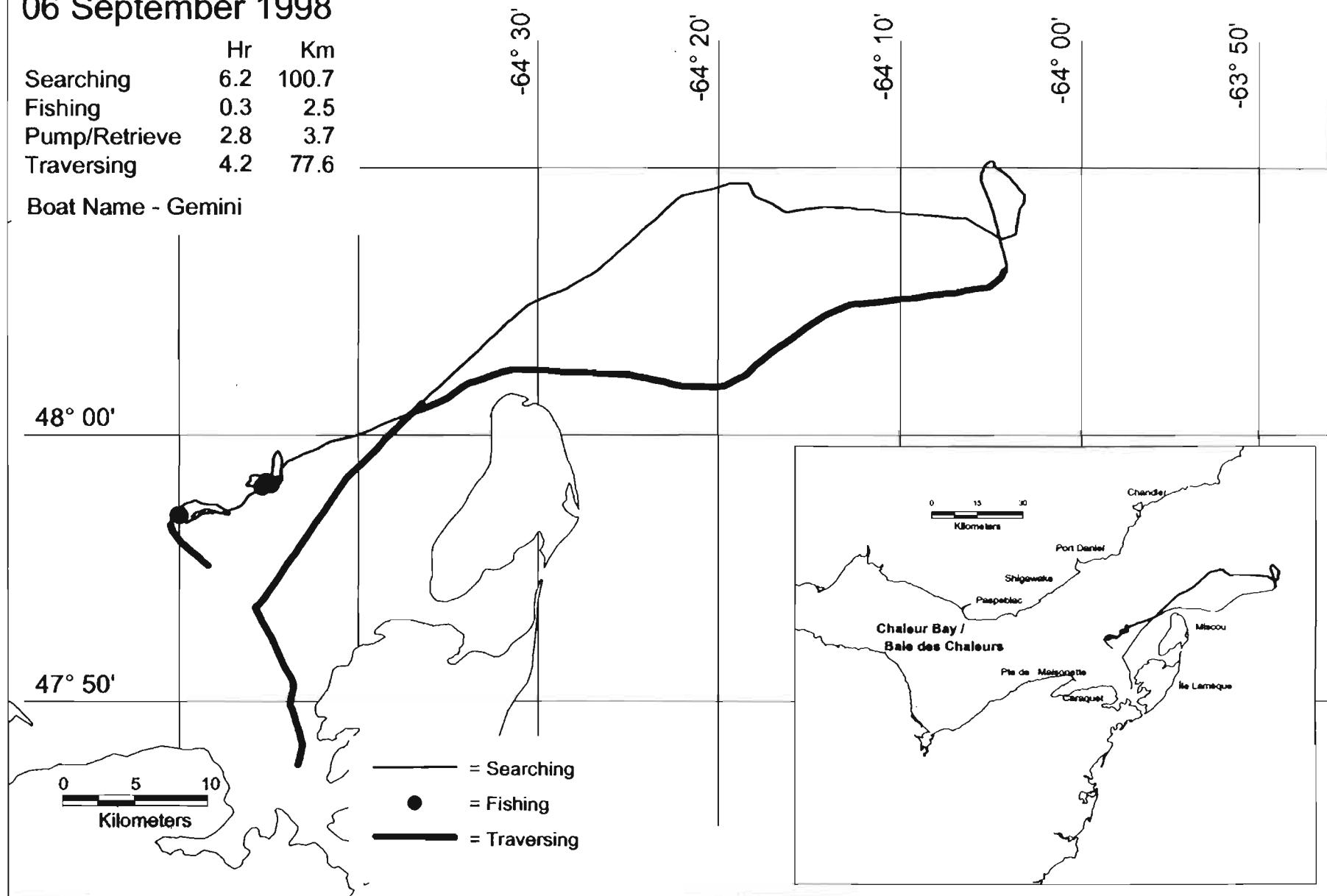
Boat Name - Gemini



06 September 1998

	Hr	Km
Searching	6.2	100.7
Fishing	0.3	2.5
Pump/Retrieve	2.8	3.7
Traversing	4.2	77.6

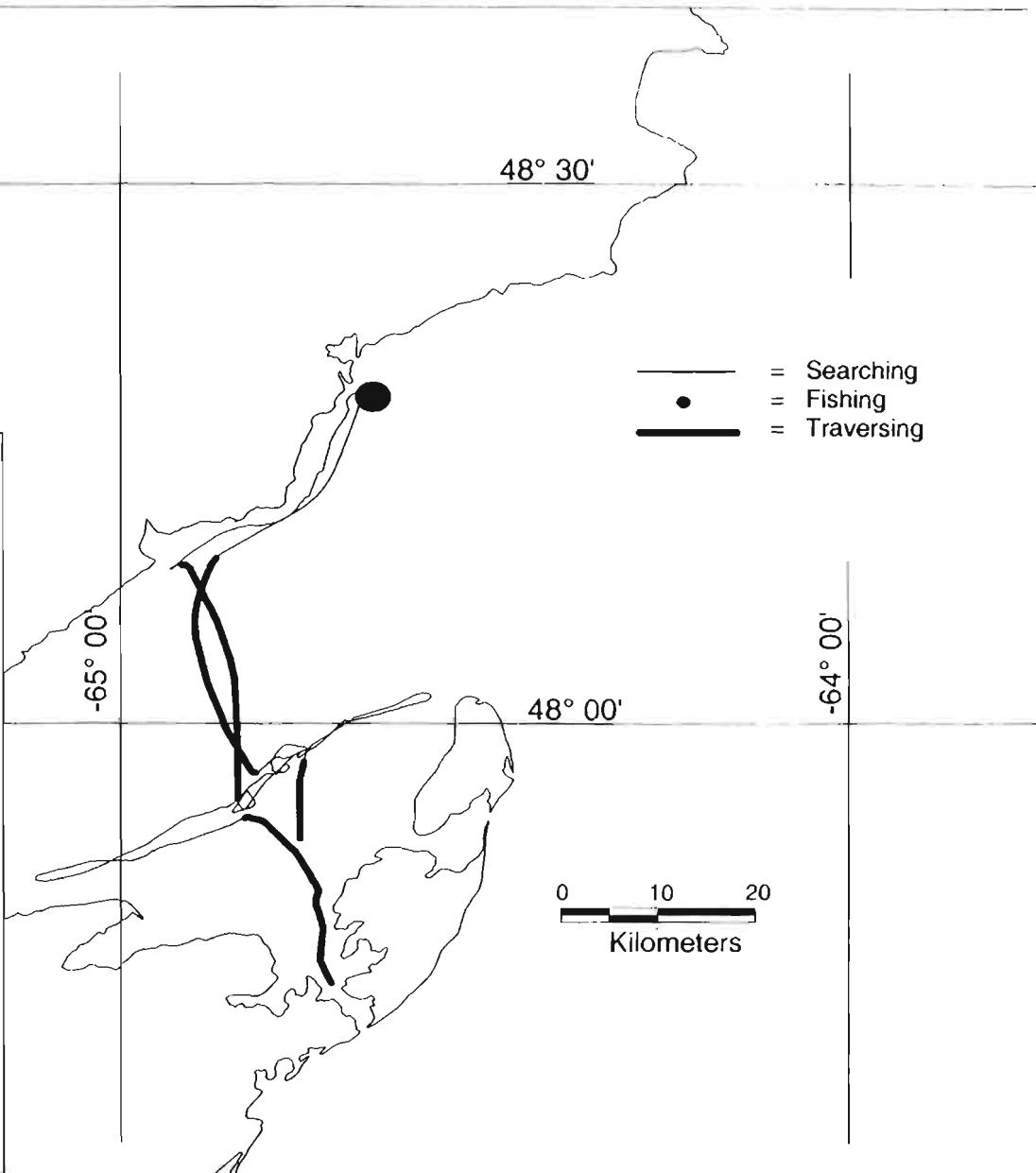
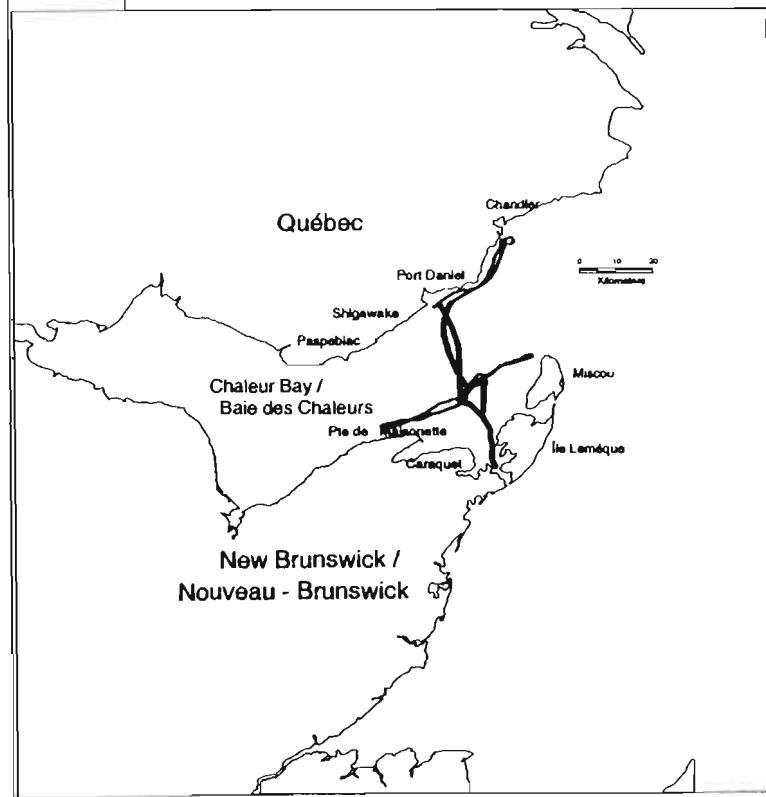
Boat Name - Gemini



07 September 1998

	Hr	Km
Searching	10.9	172.2
Fishing	0.1	1.0
Pump/Retrieve	0.8	1.2
Traversing	4.1	78.6

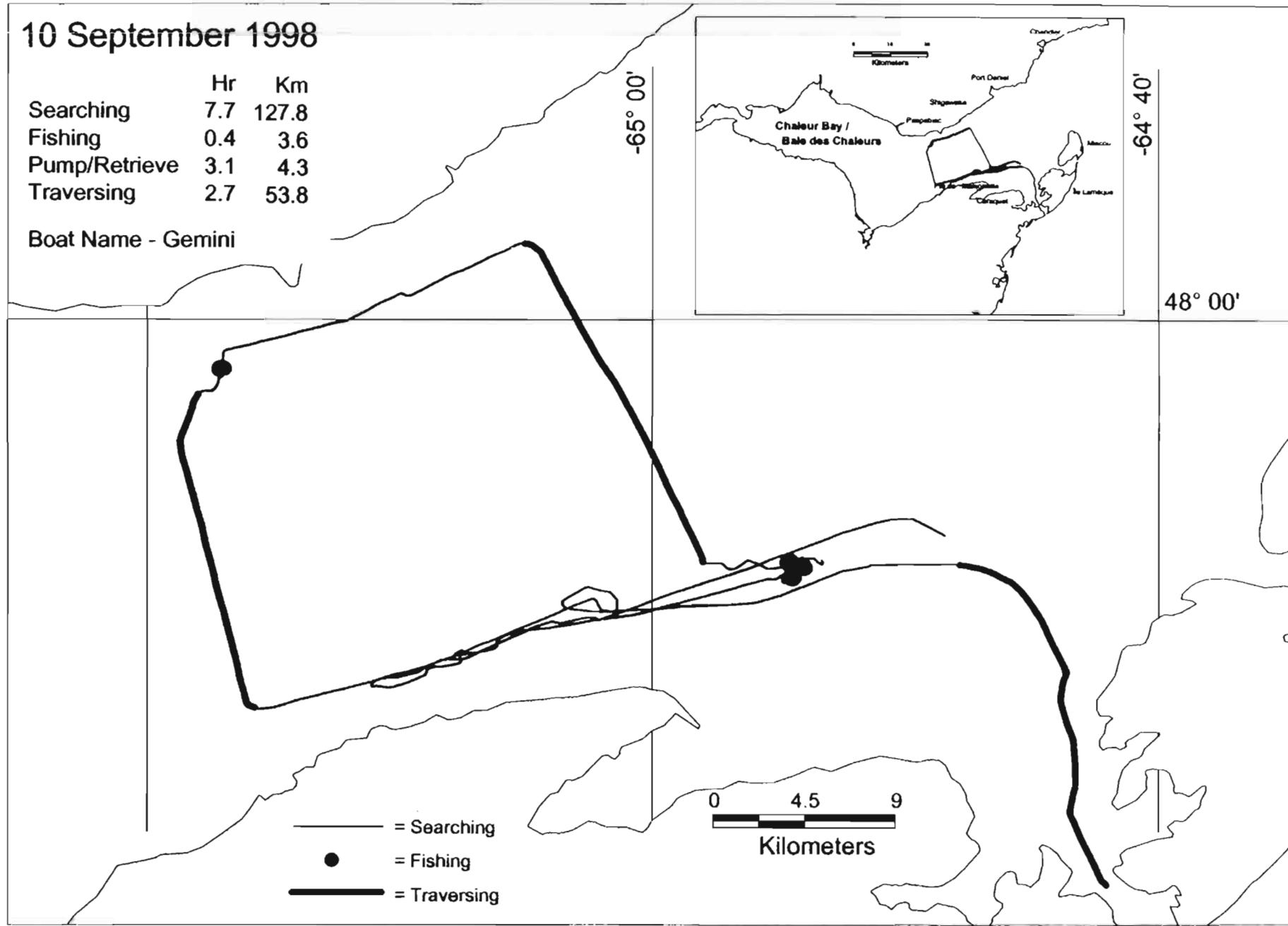
Boat Name - Gemini



10 September 1998

	Hr	Km
Searching	7.7	127.8
Fishing	0.4	3.6
Pump/Retrieve	3.1	4.3
Traversing	2.7	53.8

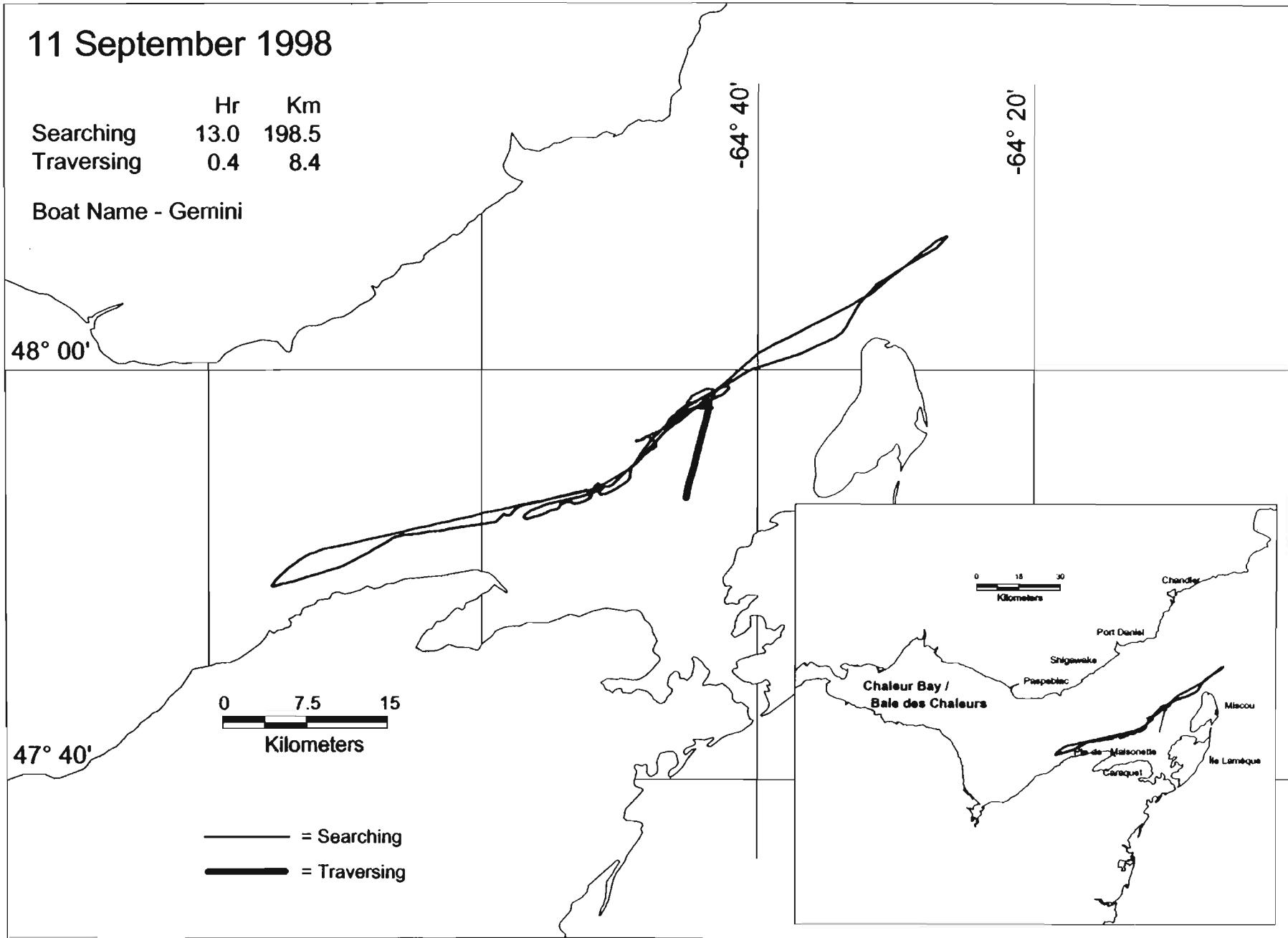
Boat Name - Gemini



11 September 1998

	Hr	Km
Searching	13.0	198.5
Traversing	0.4	8.4

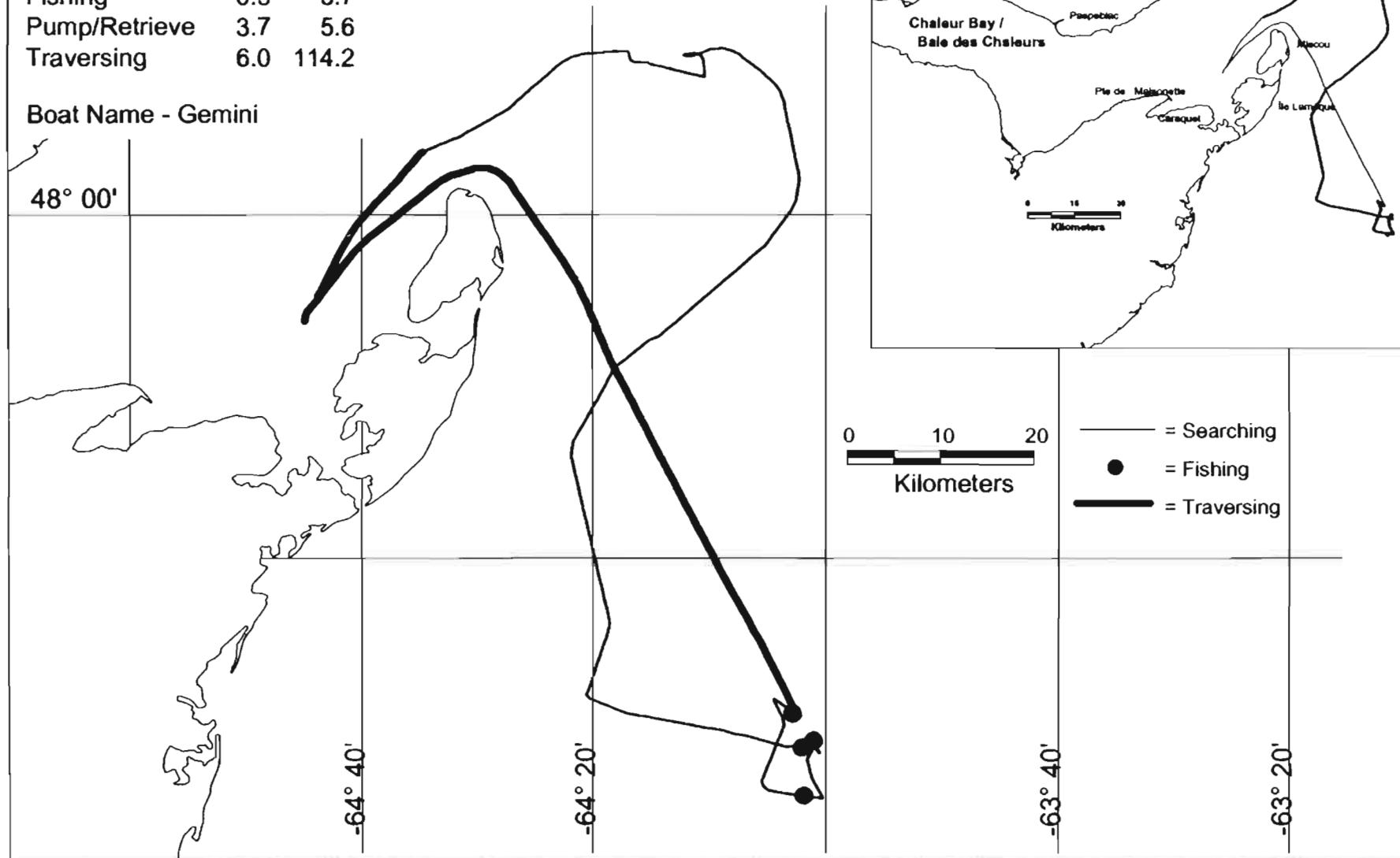
Boat Name - Gemini



12 September 1998

	Hr	Km
Searching	10.7	181.5
Fishing	0.5	3.7
Pump/Retrieve	3.7	5.6
Traversing	6.0	114.2

Boat Name - Gemini



13 September 1998

	Hr	Km
Searching	4.3	33.6
Fishing	0.2	1.6
Pump/Retrieve	2.0	2.9
Traversing	8.8	170.1

Boat Name - Gemini

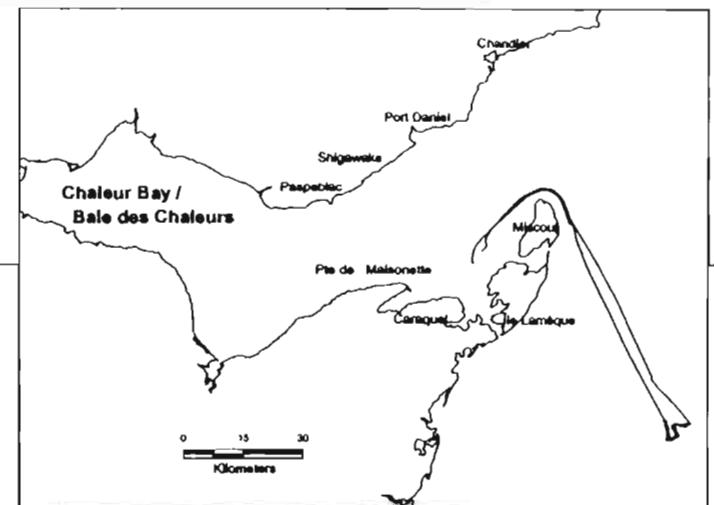
- = Searching
- = Fishing
- = Traversing

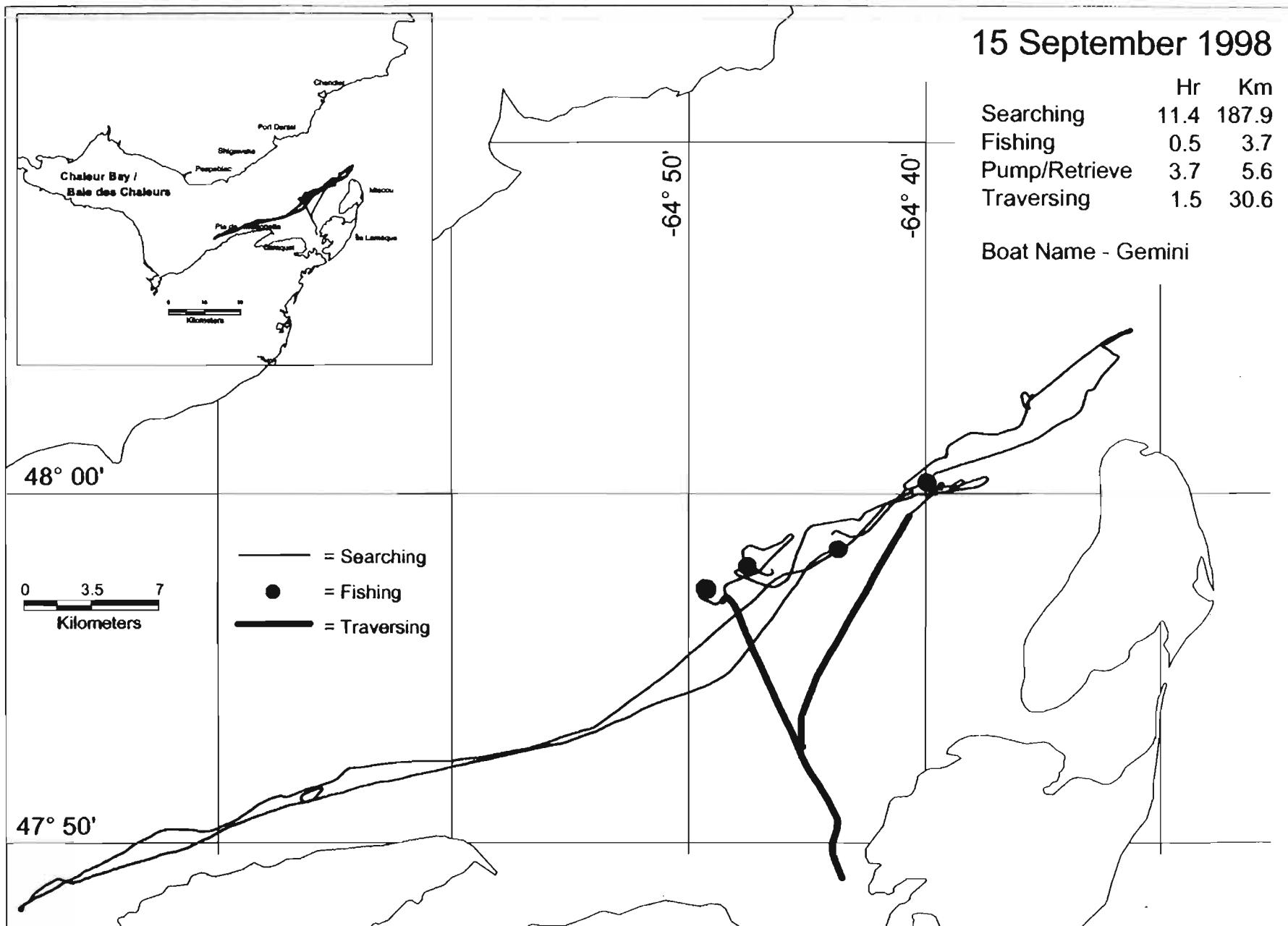


-64° 40'

-64° 20'

47° 40'

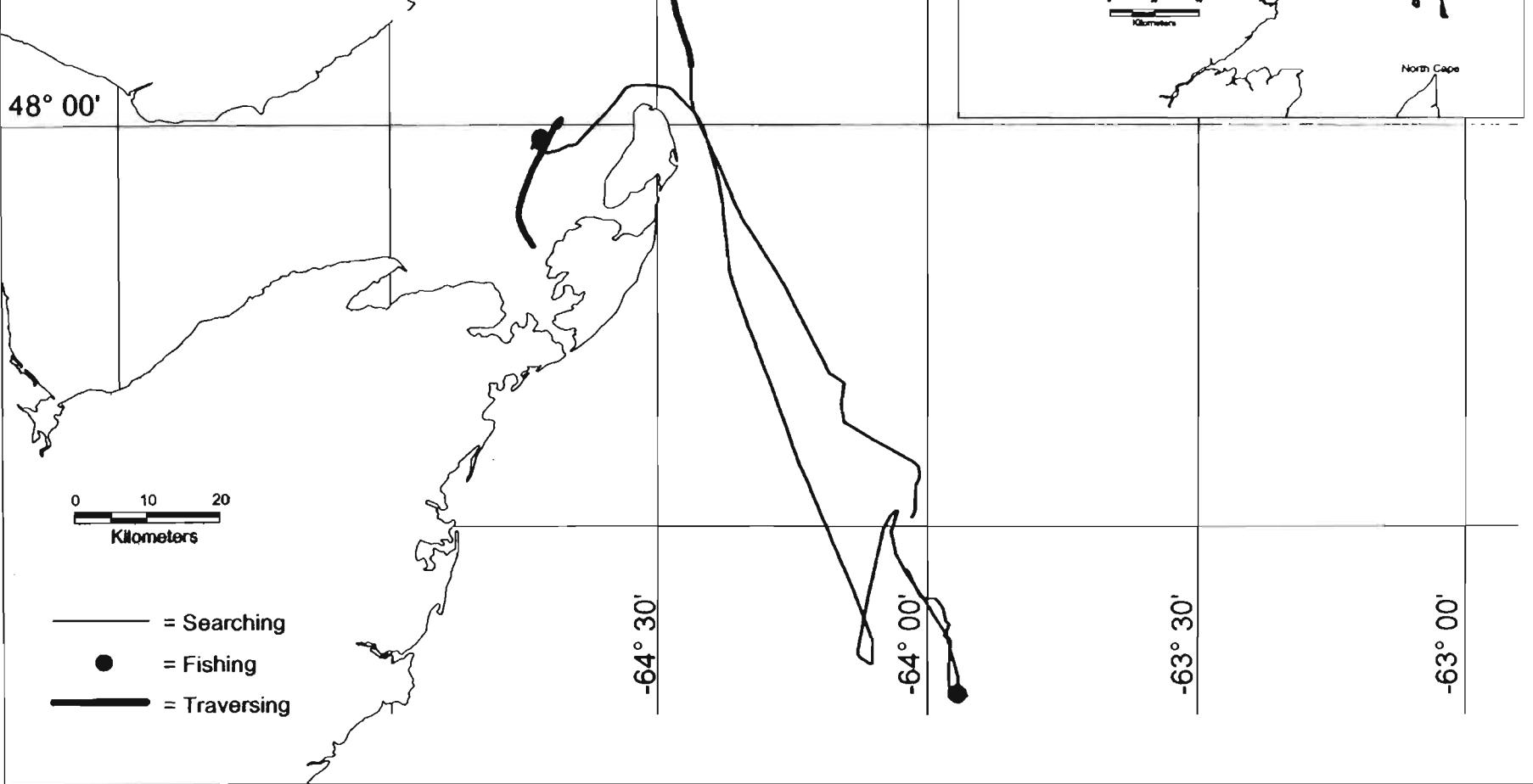




17 September 1998

	Hr	Km
Searching	24.4	401.5
Fishing	0.4	3.1
Pump/Retrieve	4.4	7.6
Traversing	3.0	51.1
Other	6.0	9.5

Boat Name - Gemini



19 September 1998

0 7.5 15
Kilometers

	Hr	Km
Searching	8.6	125.0
Fishing	0.1	1.0
Pump/Retrieve	0.7	0.9
Traversing	2.1	40.2

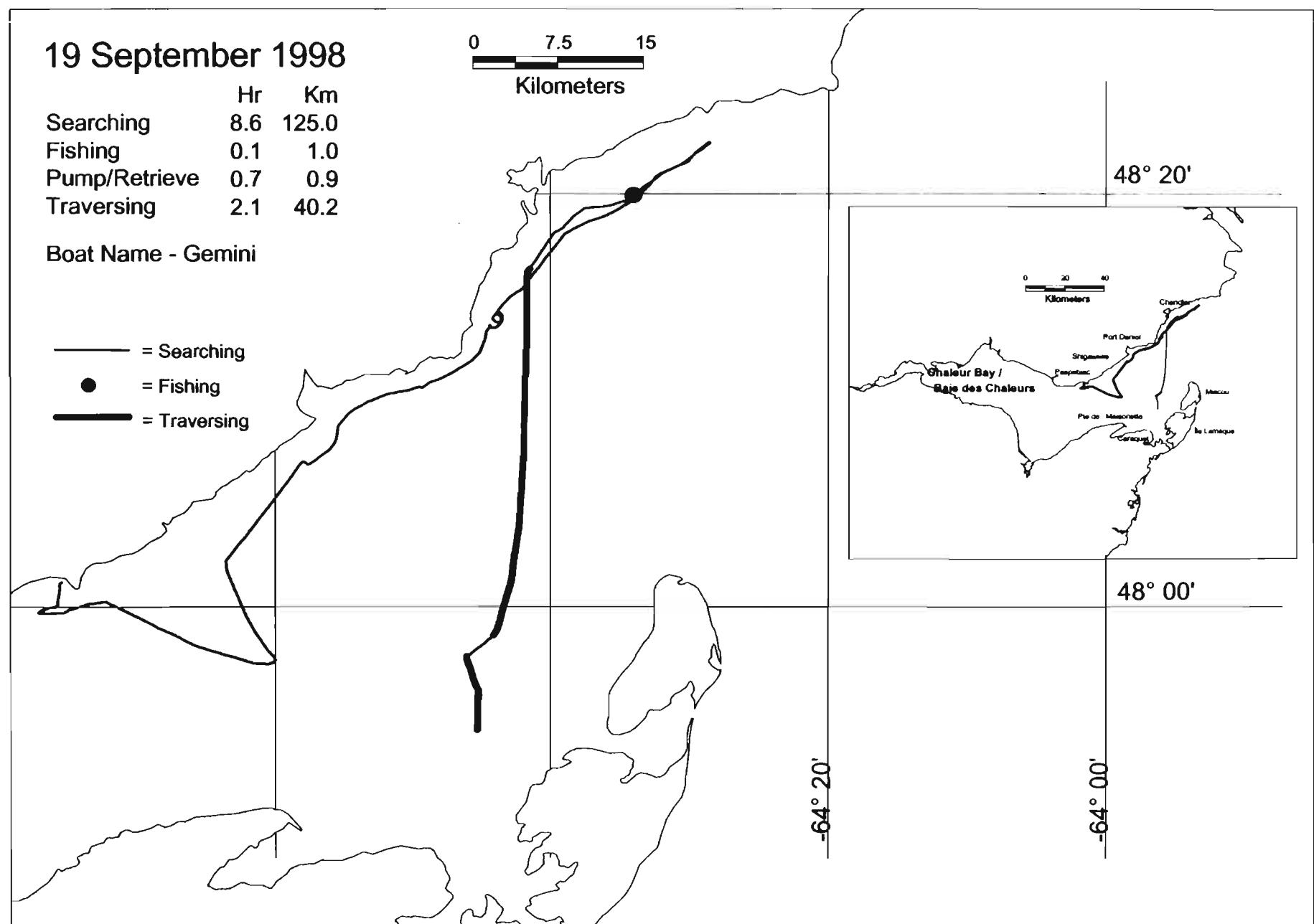
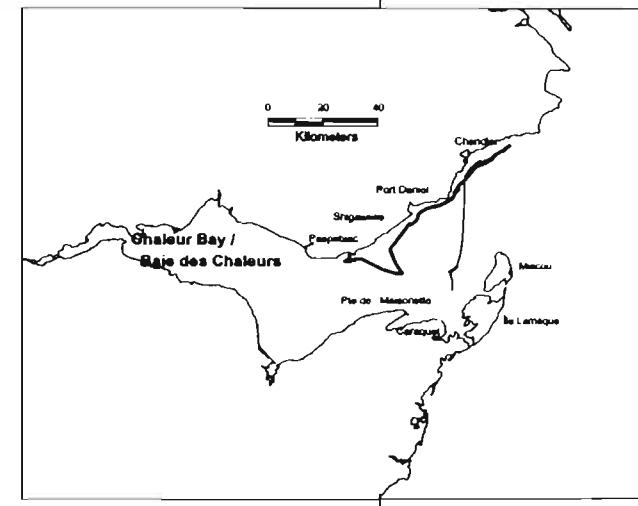
Boat Name - Gemini

- = Searching
- = Fishing
- = Traversing

-64° 20'

-64° 00'

48° 20'



20 September 1998

	Hr	Km
Searching	13.1	222.6
Fishing	0.5	4.2
Pump/Retrieve	3.1	6.6
Traversing	1.0	19.0

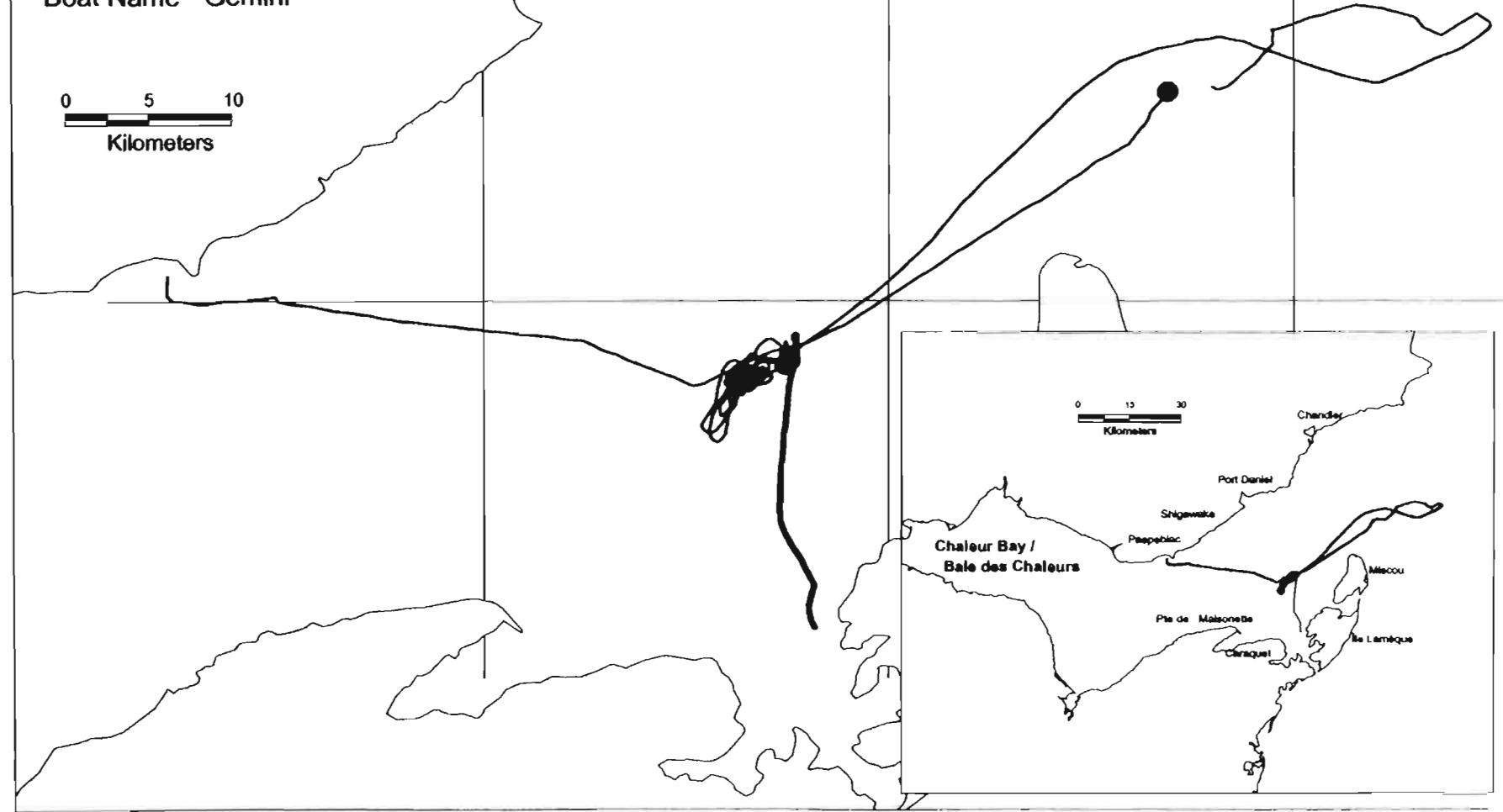
Boat Name - Gemini



- = Searching
- = Fishing
- = Traversing

-64° 40'

-64° 20'

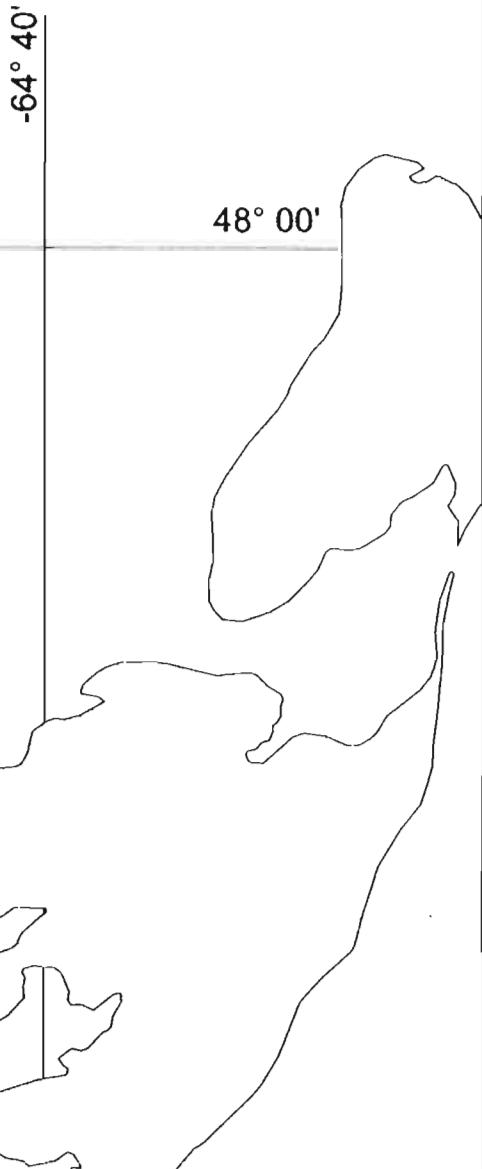
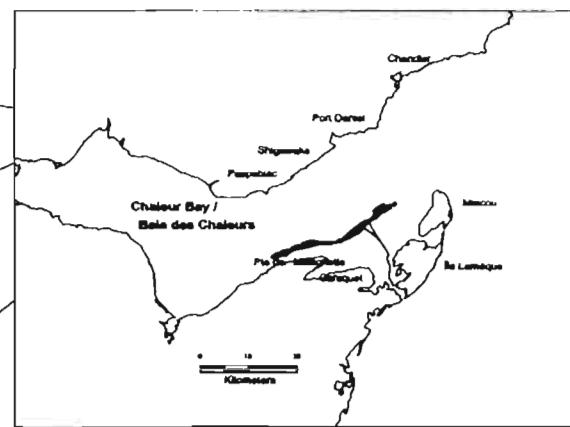


24 September 1998

	Hr	Km
Searching	10.5	150.7
Fishing	0.1	0.9
Pump/Retrieve	1.1	2.9
Traversing	2.4	45.2

Boat Name - Gemini

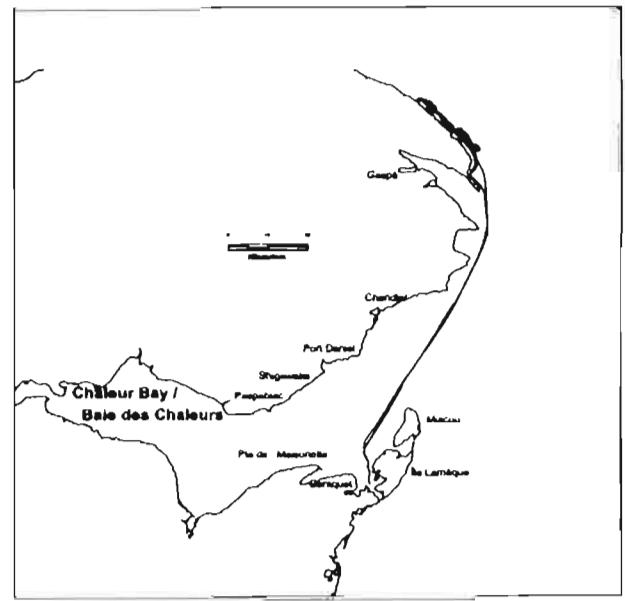
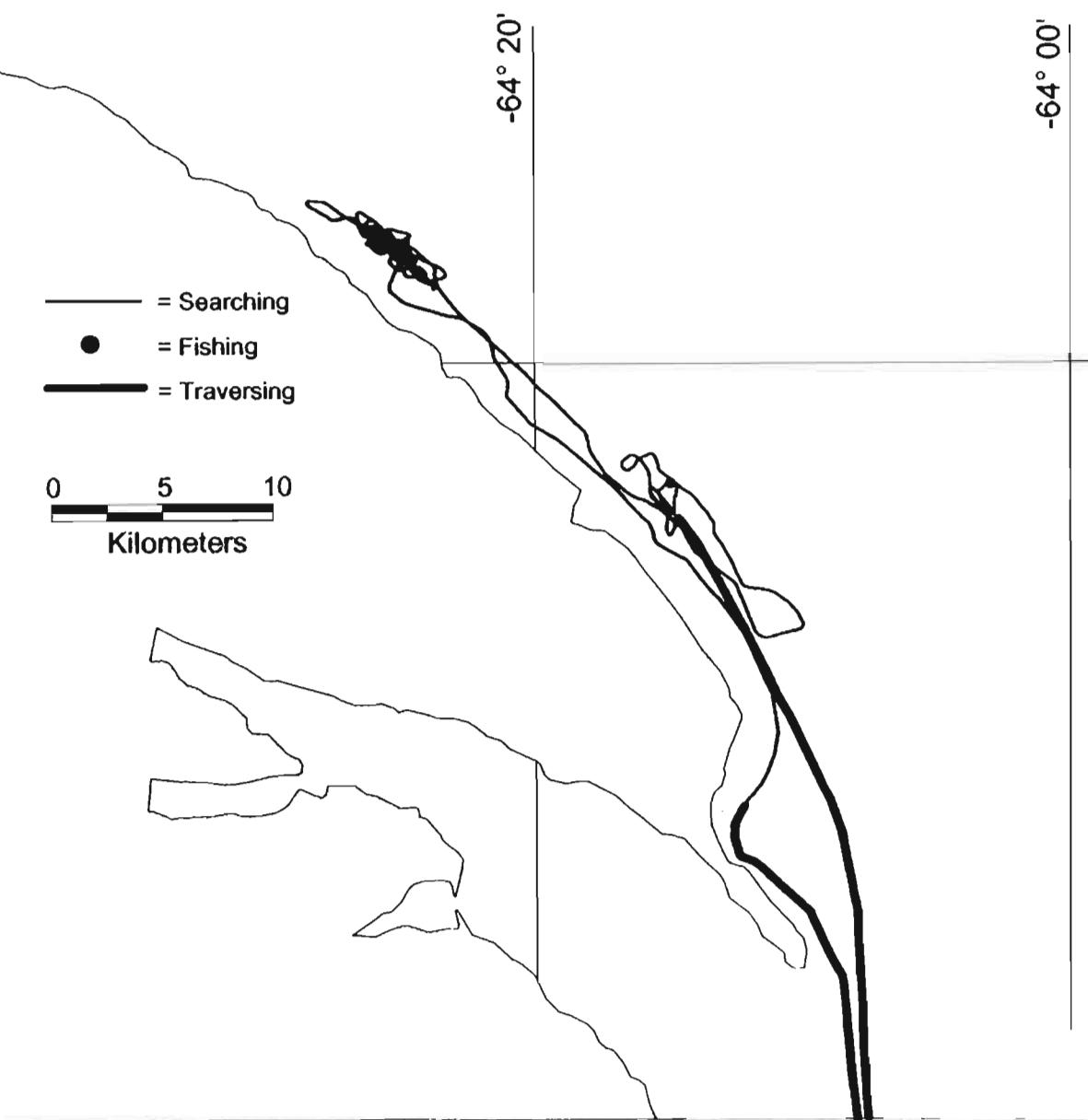
- = Searching
- = Fishing
- = Traversing



25 September 1998

	Hr	Km
Searching	9.7	136.5
Fishing	0.2	1.6
Pump/Retrieve	1.7	2.4
Traversing	13.6	273.4

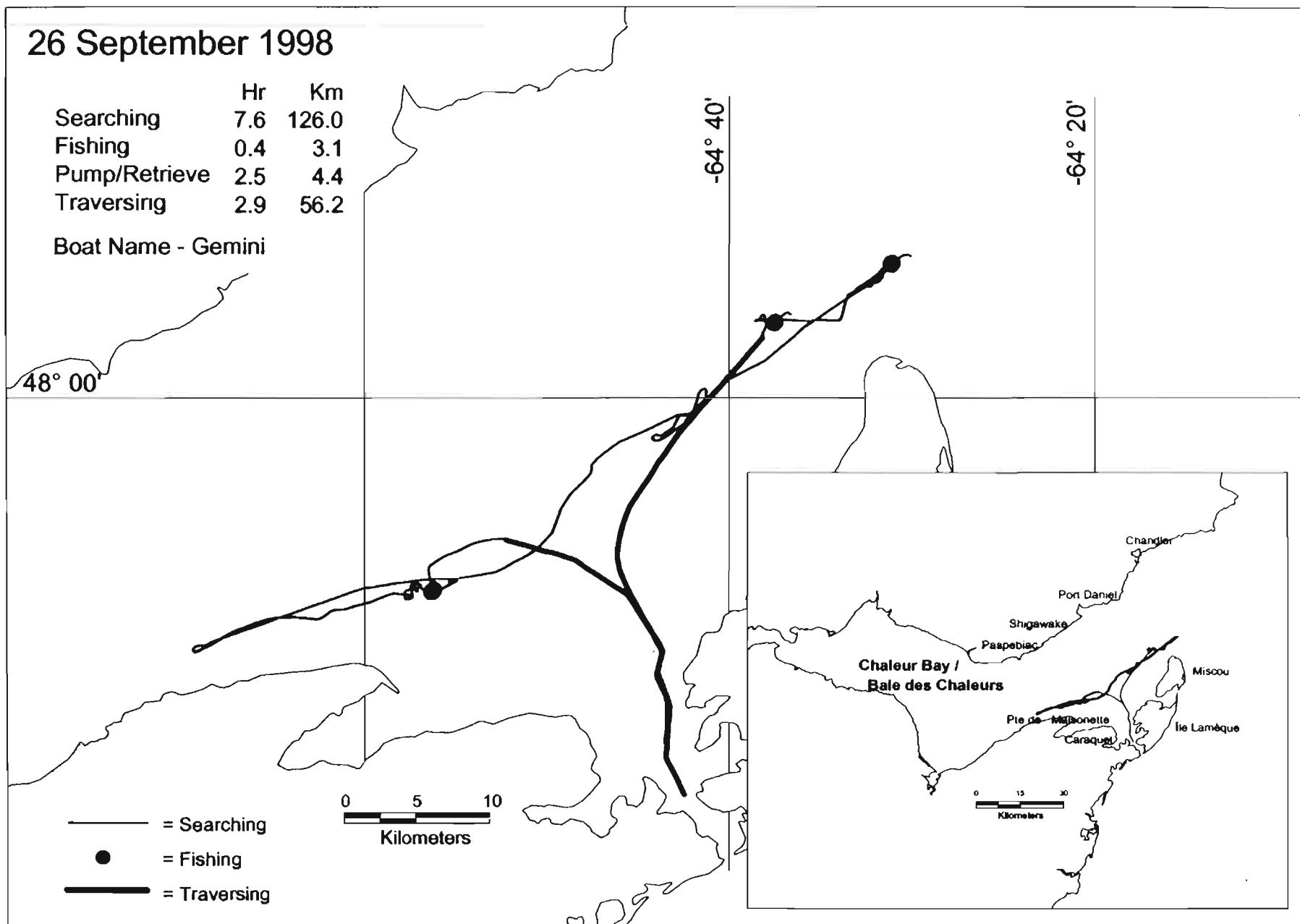
Boat Name - Gemini



26 September 1998

	Hr	Km
Searching	7.6	126.0
Fishing	0.4	3.1
Pump/Retrieve	2.5	4.4
Traversing	2.9	56.2

Boat Name - Gemini



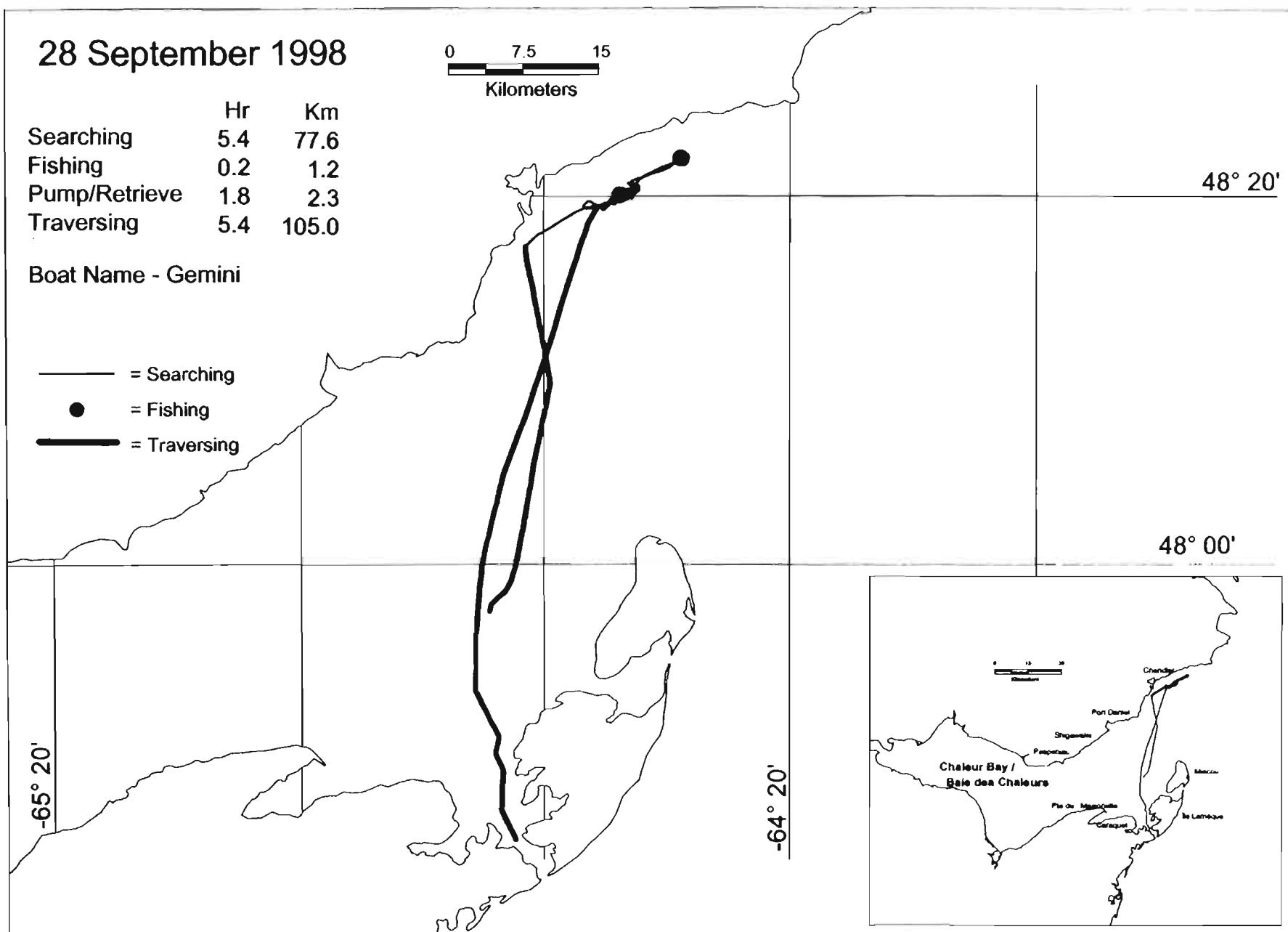
28 September 1998

0 7.5 15
Kilometers

	Hr	Km
Searching	5.4	77.6
Fishing	0.2	1.2
Pump/Retrieve	1.8	2.3
Traversing	5.4	105.0

Boat Name - Gemini

- = Searching
- = Fishing
- = Traversing



29 September 1998

0 6 12
Kilometers

	Hr	Km
Searching	8.7	128.5
Traversing	9.5	179.9

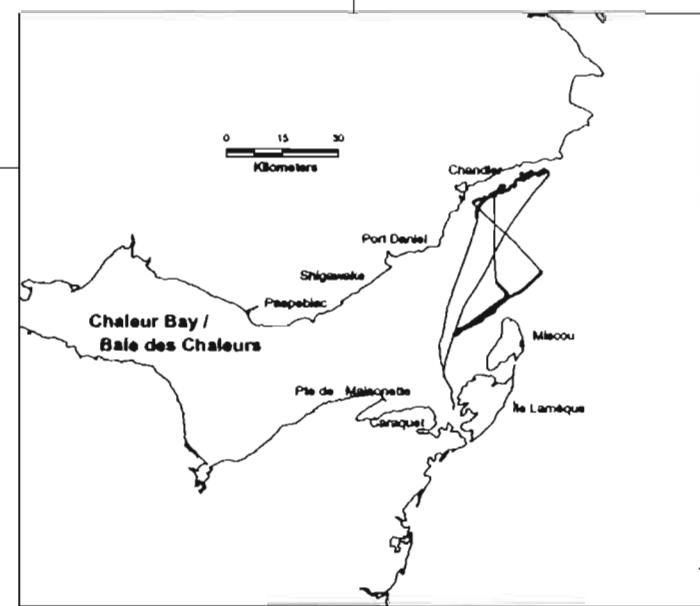
Boat Name - Gemini

— = Searching
— = Traversing

48° 00'

-64° 00'

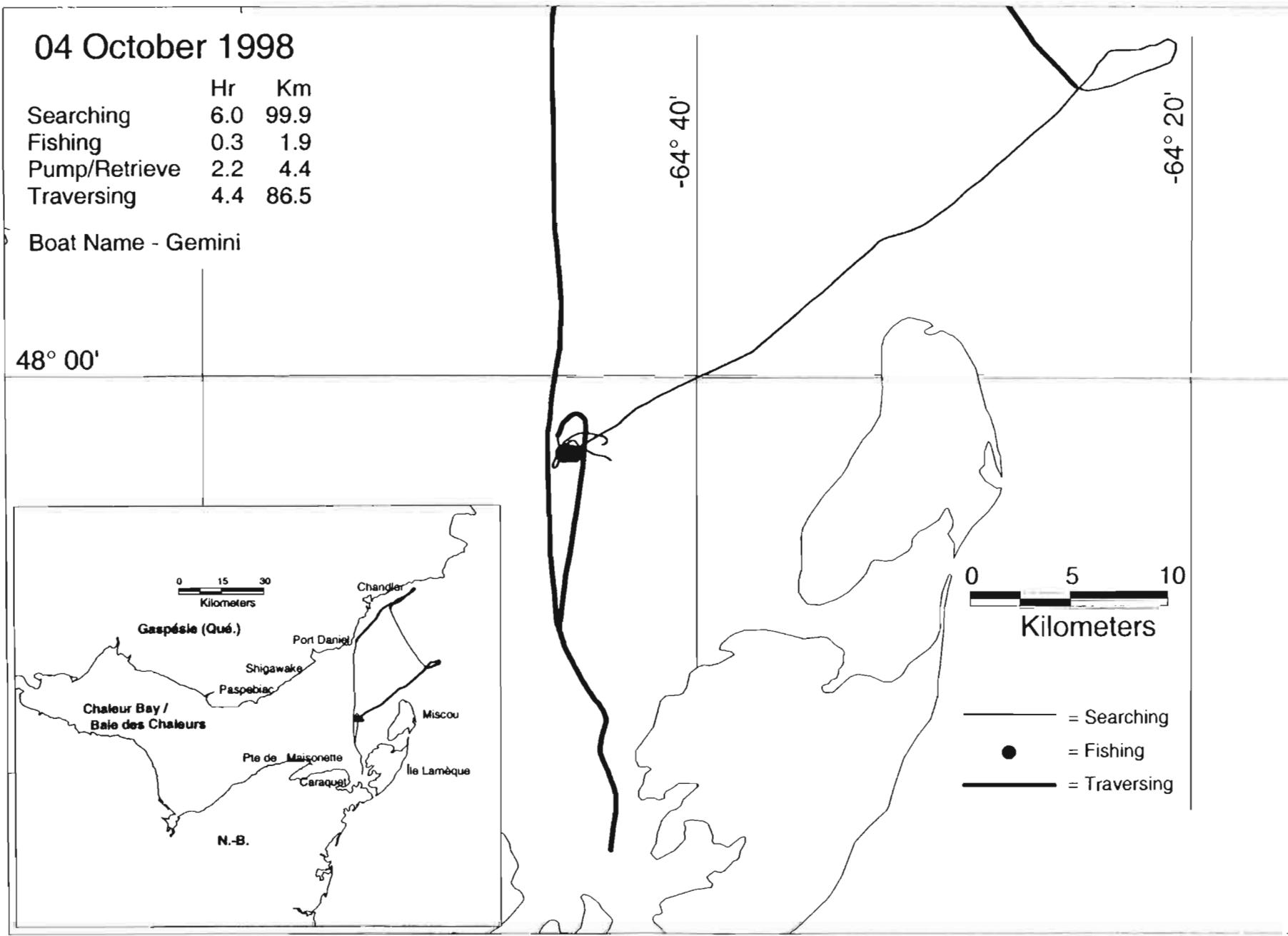
-63° 40'



04 October 1998

	Hr	Km
Searching	6.0	99.9
Fishing	0.3	1.9
Pump/Retrieve	2.2	4.4
Traversing	4.4	86.5

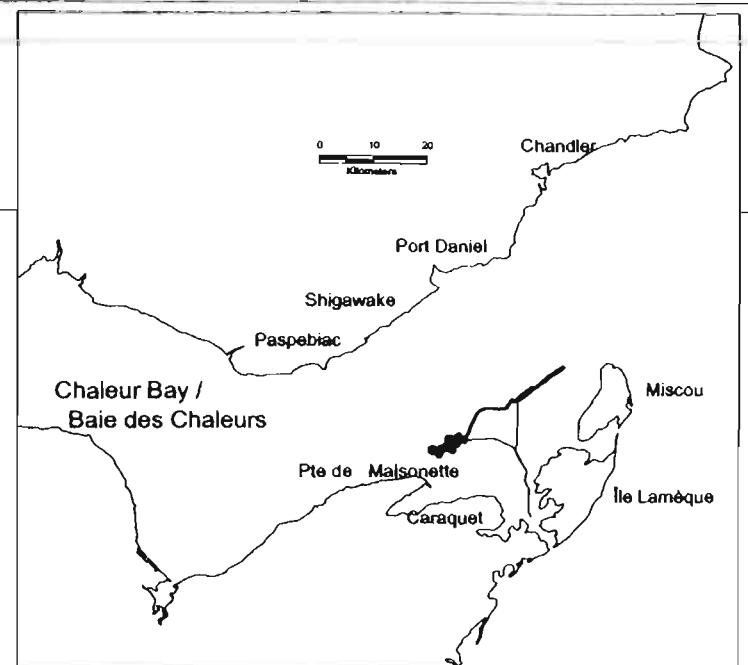
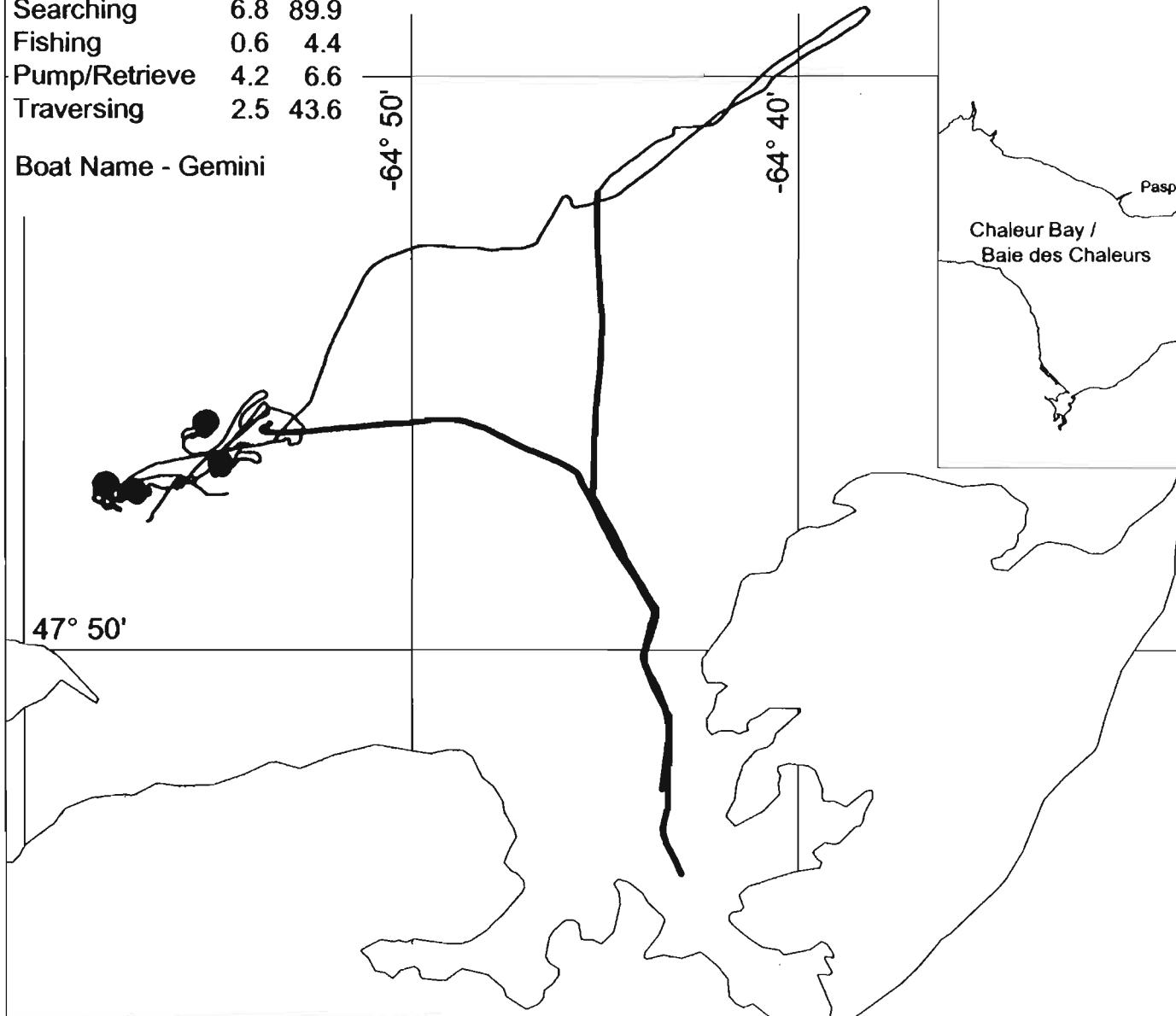
Boat Name - Gemini



06 October 1998

	Hr	Km
Searching	6.8	89.9
Fishing	0.6	4.4
Pump/Retrieve	4.2	6.6
Traversing	2.5	43.6

Boat Name - Gemini



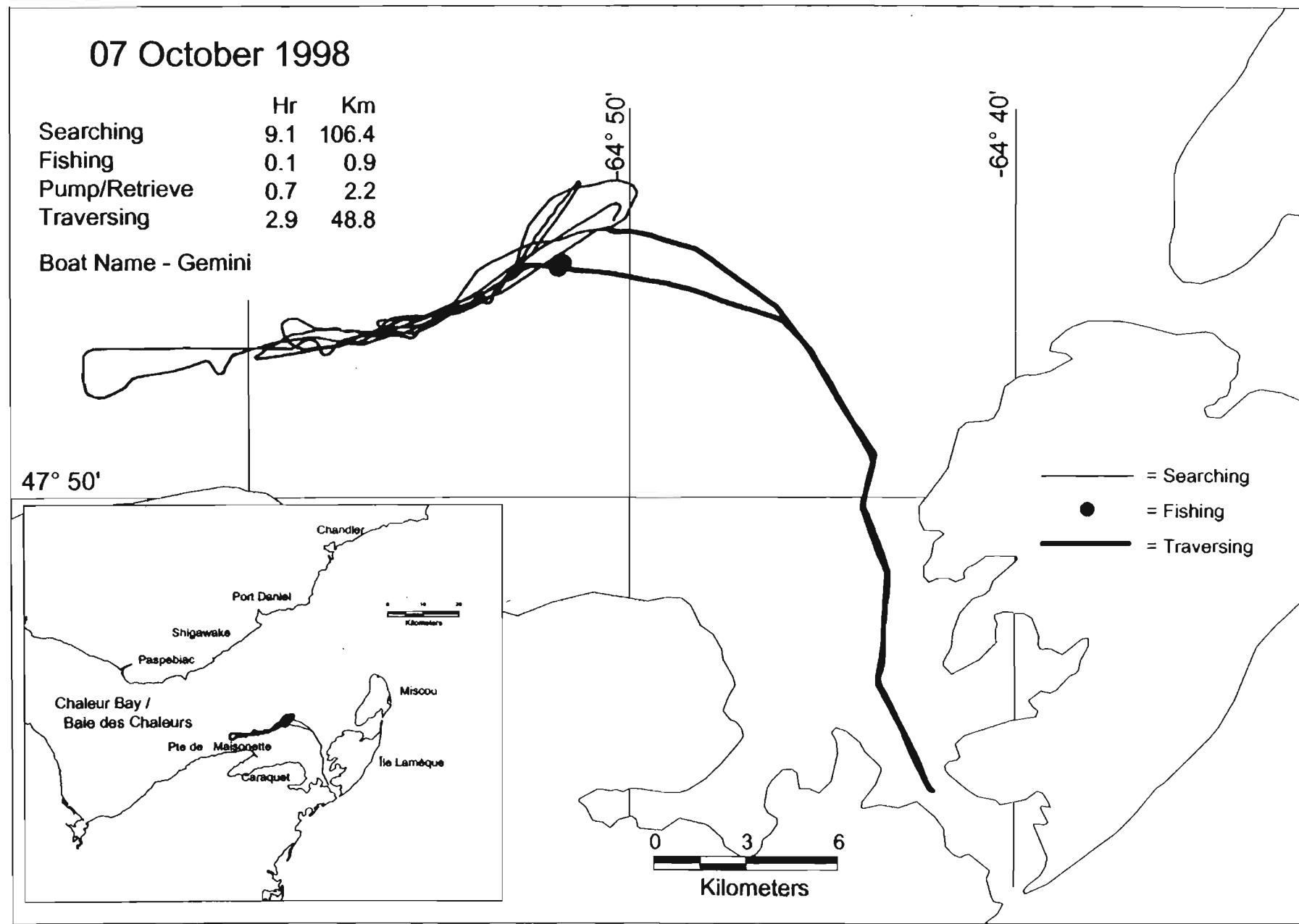
0 3.5 7
Kilometers

- = Searching
- = Fishing
- = Traversing

07 October 1998

	Hr	Km
Searching	9.1	106.4
Fishing	0.1	0.9
Pump/Retrieve	0.7	2.2
Traversing	2.9	48.8

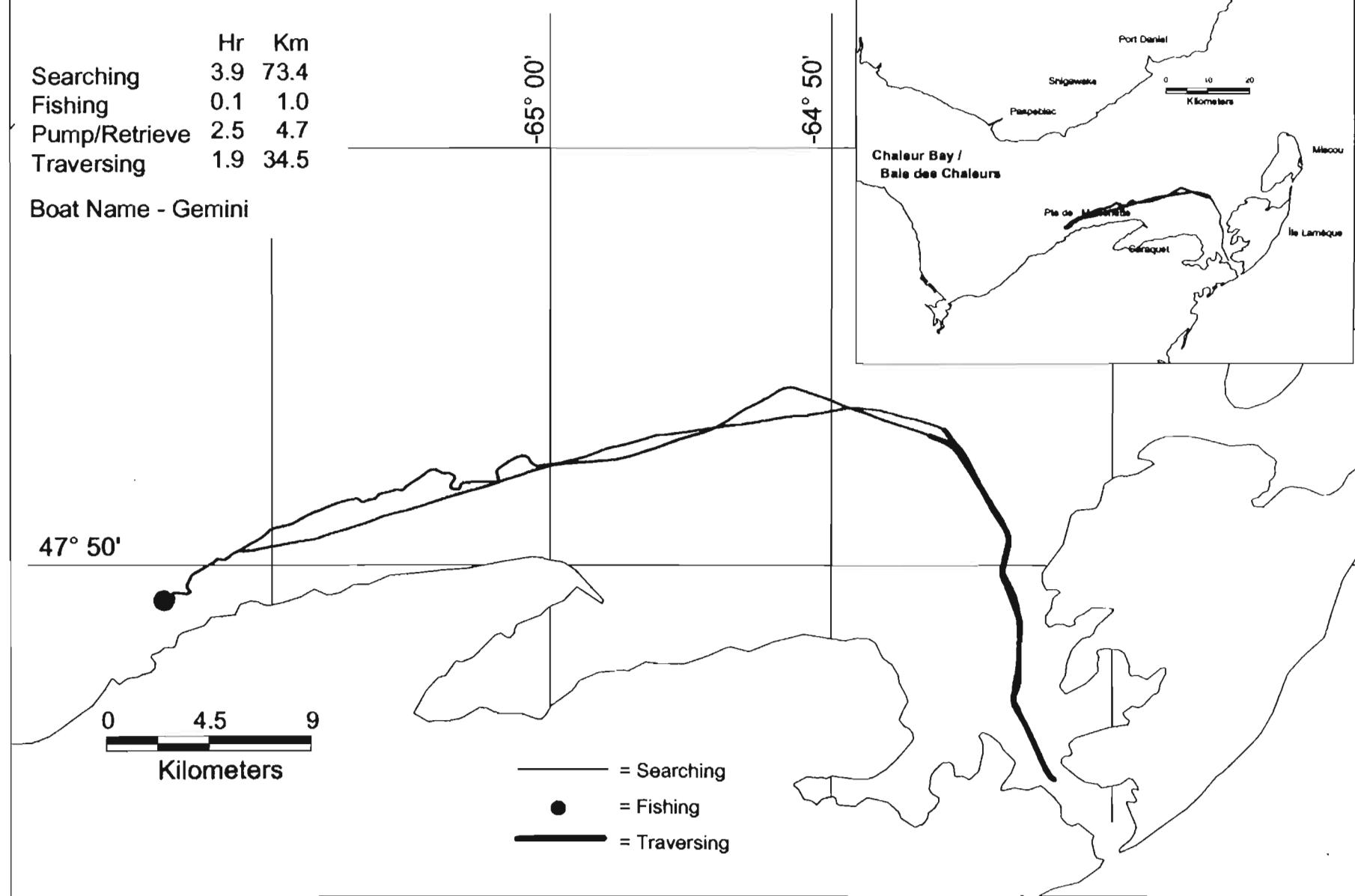
Boat Name - Gemini



08 October 1998

	Hr	Km
Searching	3.9	73.4
Fishing	0.1	1.0
Pump/Retrieve	2.5	4.7
Traversing	1.9	34.5

Boat Name - Gemini

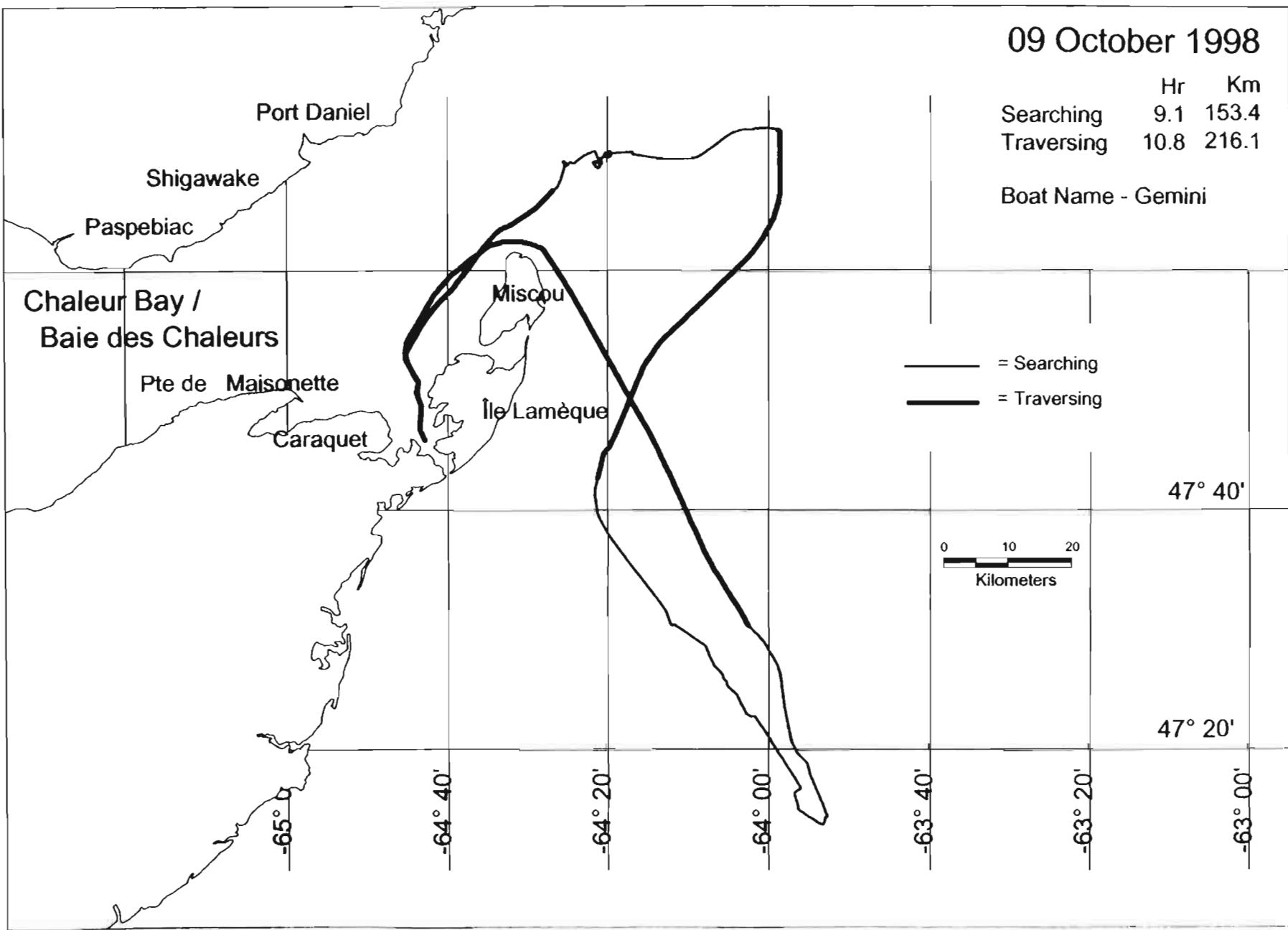


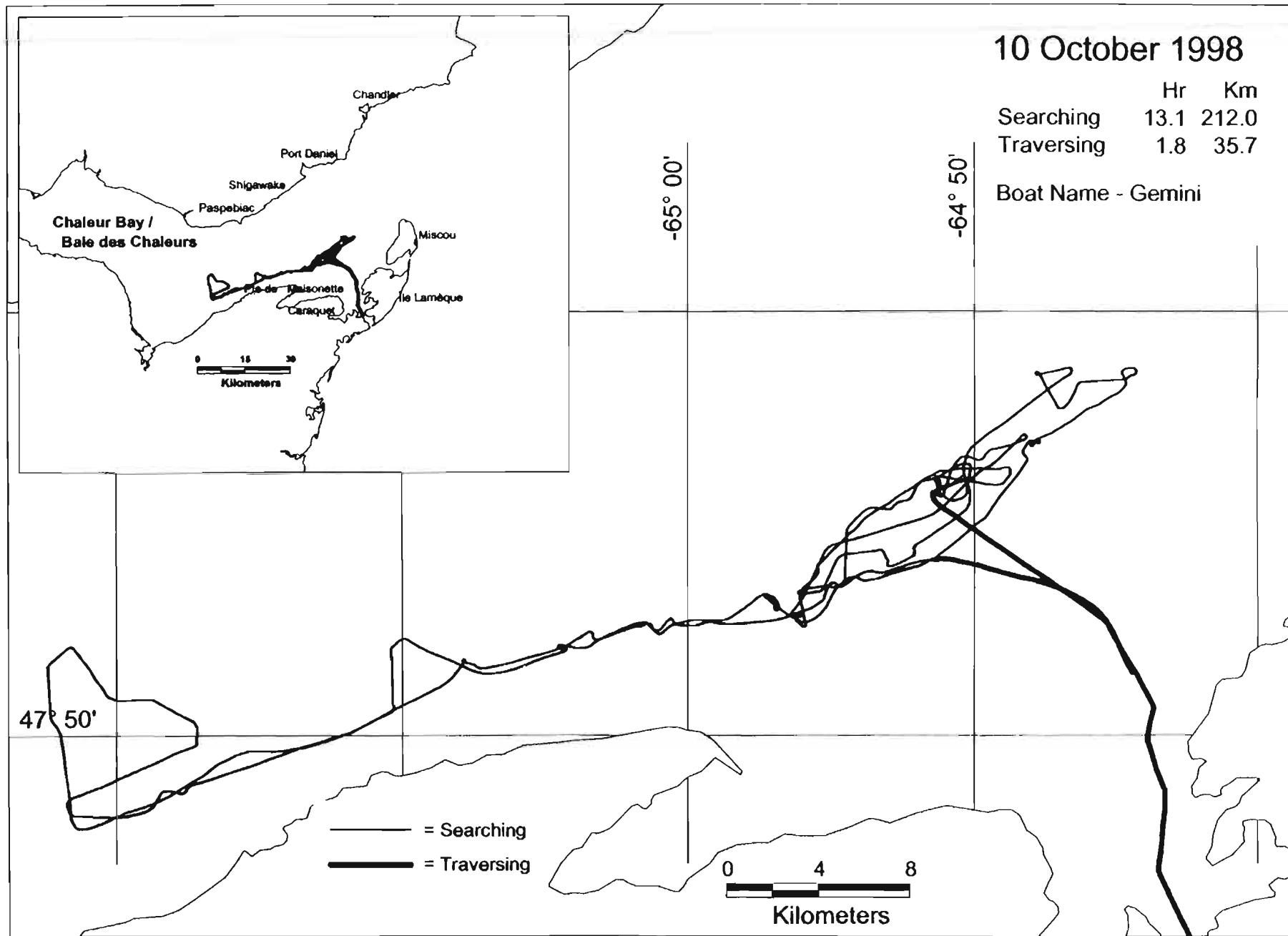
09 October 1998

	Hr	Km
Searching	9.1	153.4
Traversing	10.8	216.1

Boat Name - Gemini

- = Searching
- = Traversing





12 October 1998

	Hr	Km
Searching	8.8	148.6
Fishing	0.5	3.9
Pump/Retrieve	3.6	6.0
Traversing	1.6	30.5

Boat Name - Gemini

48° 00'

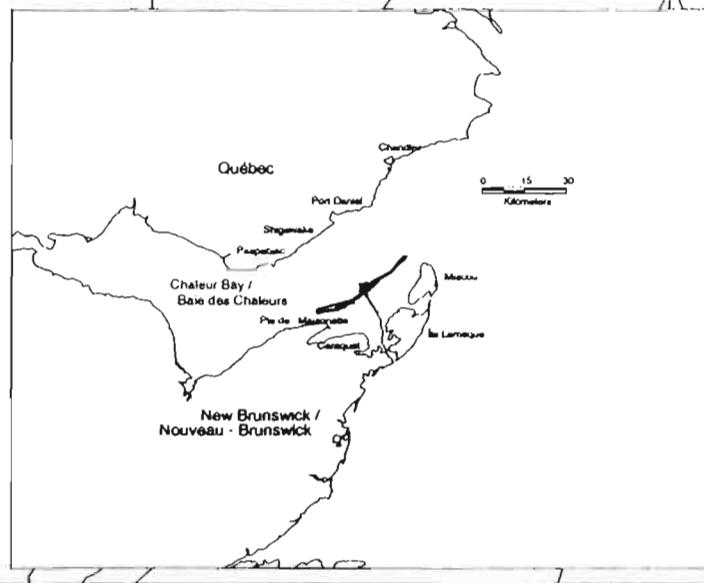
0 3 6
Kilometers

-64° 50'

- = Searching
- = Fishing
- = Traversing

-64° 40'

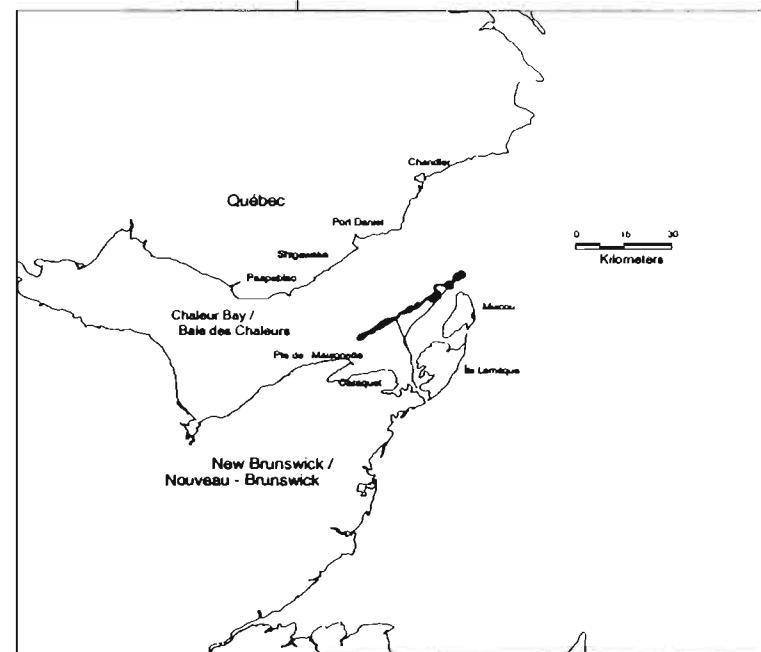
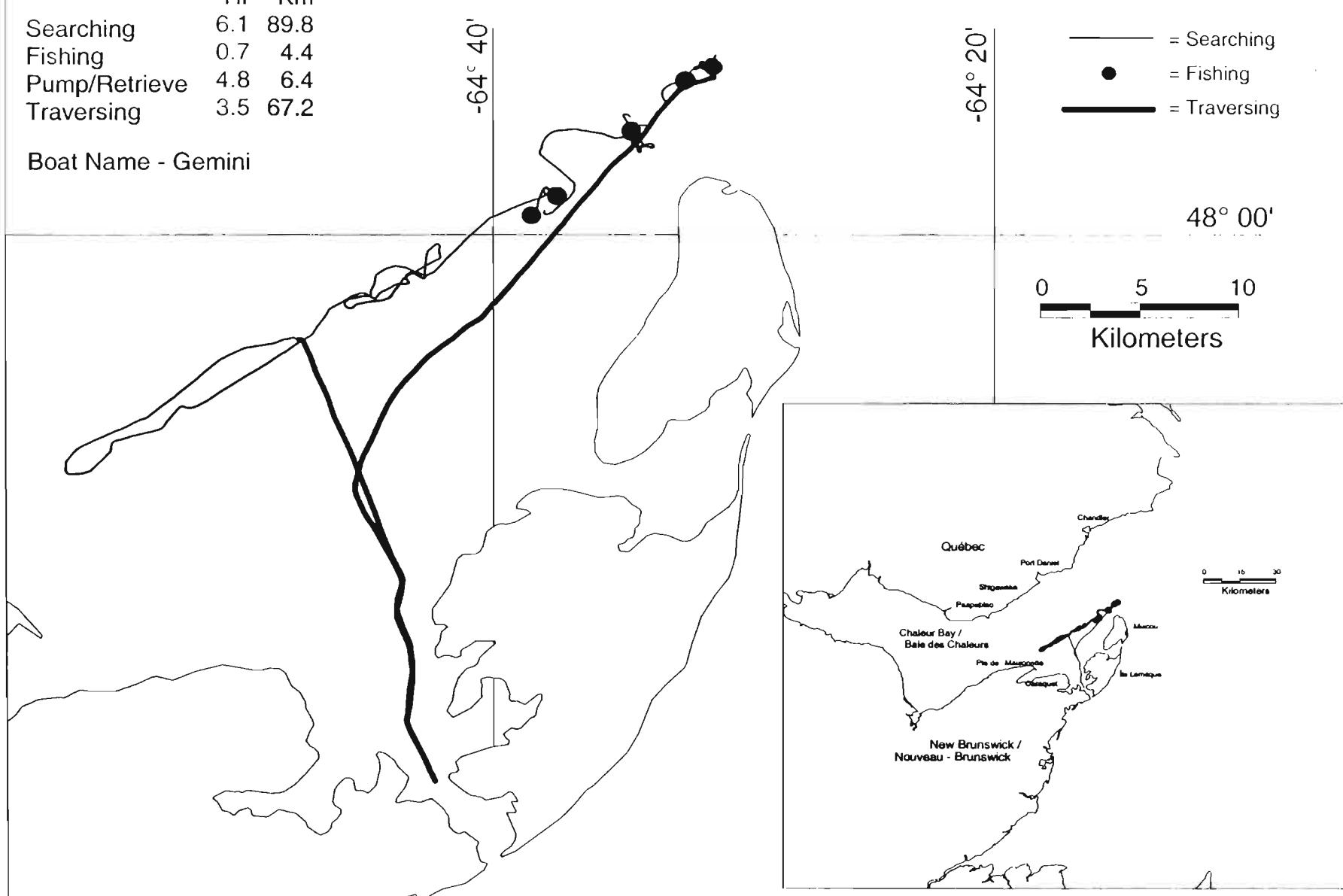
-64° 30'



13 October 1998

	Hr	Km
Searching	6.1	89.8
Fishing	0.7	4.4
Pump/Retrieve	4.8	6.4
Traversing	3.5	67.2

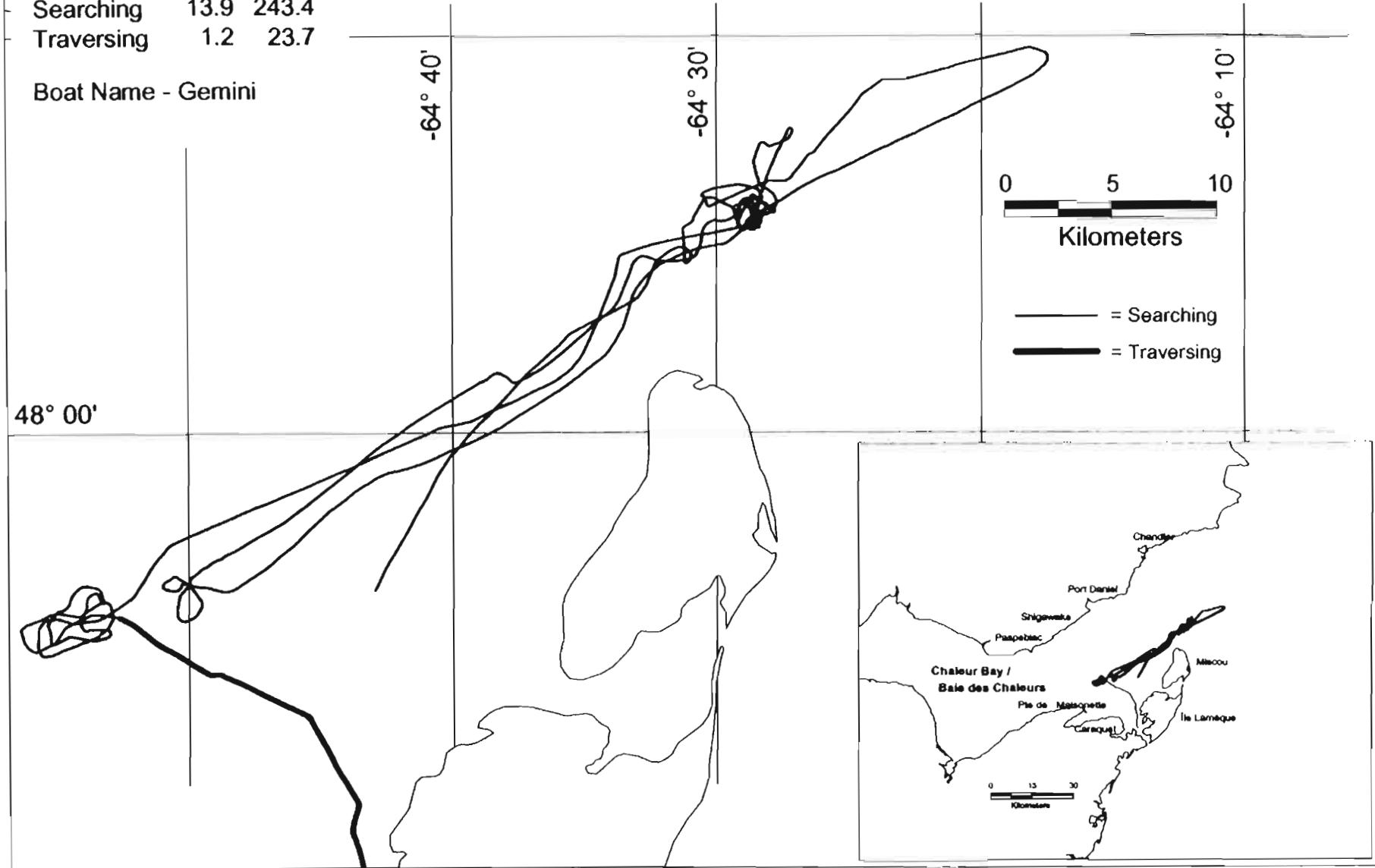
Boat Name - Gemini



14 October 1998

	Hr	Km
Searching	13.9	243.4
Traversing	1.2	23.7

Boat Name - Gemini



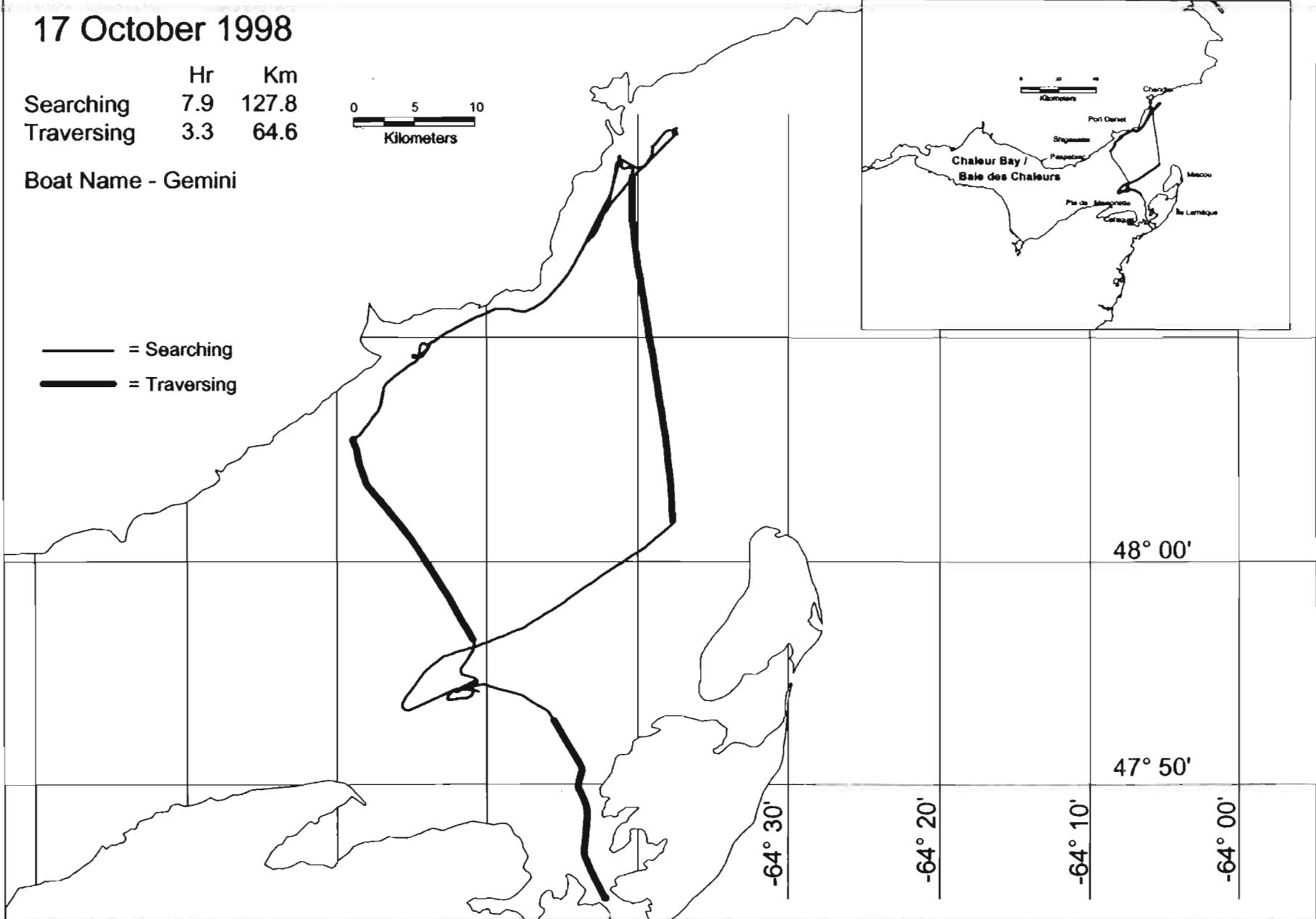
17 October 1998

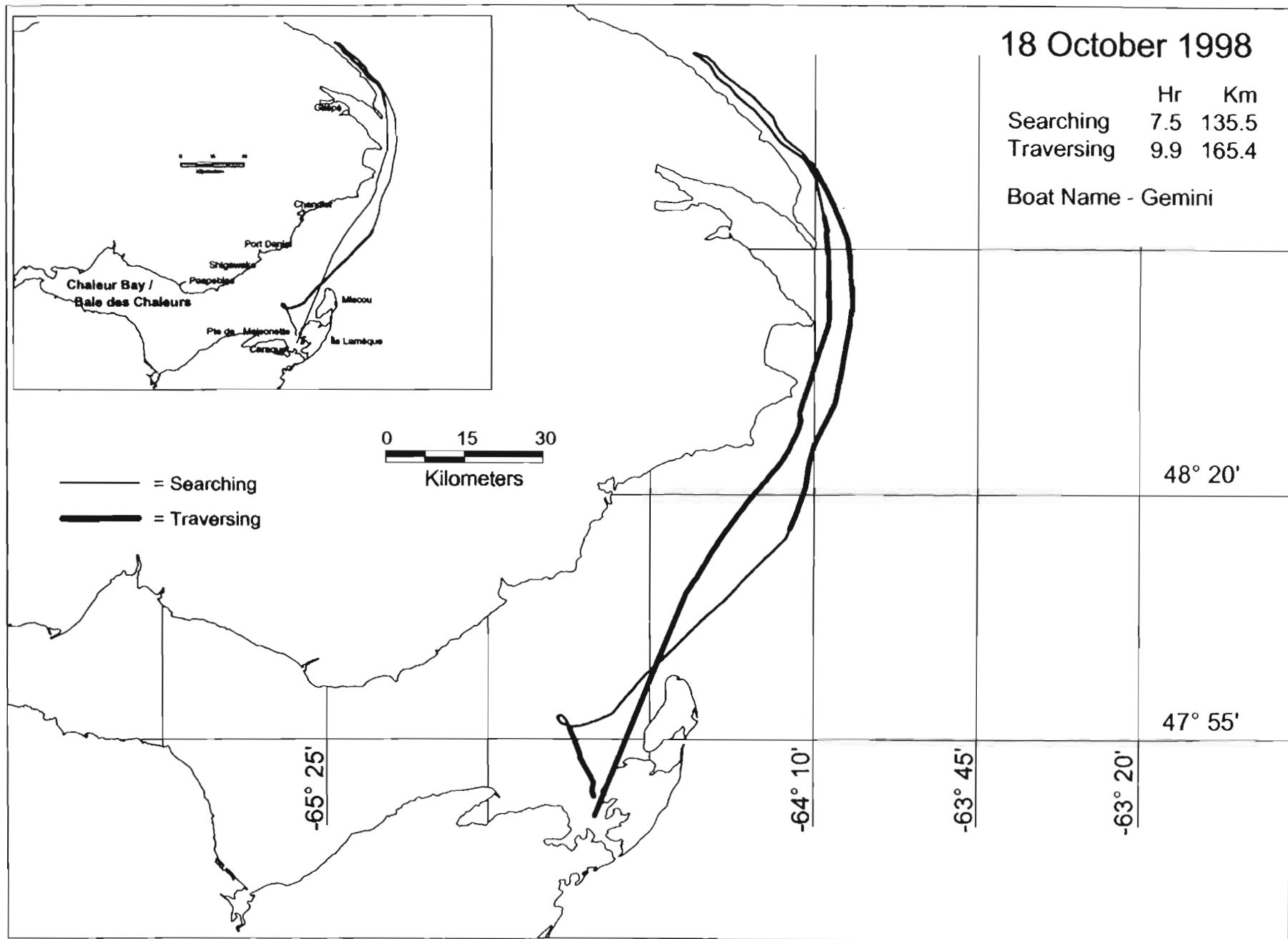
	Hr	Km
Searching	7.9	127.8
Traversing	3.3	64.6

0 5 10
Kilometers

Boat Name - Gemini

— = Searching
— = Traversing

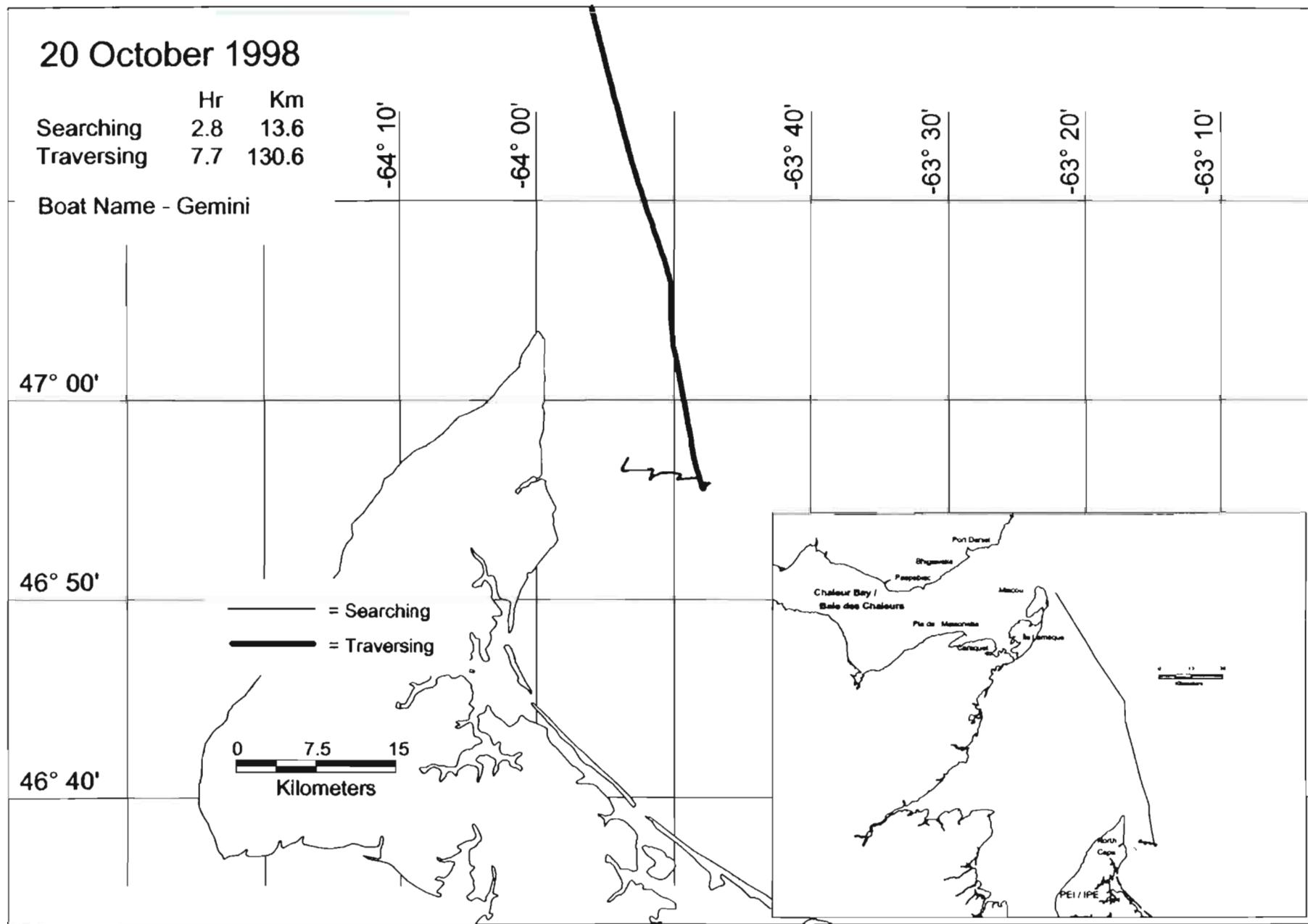


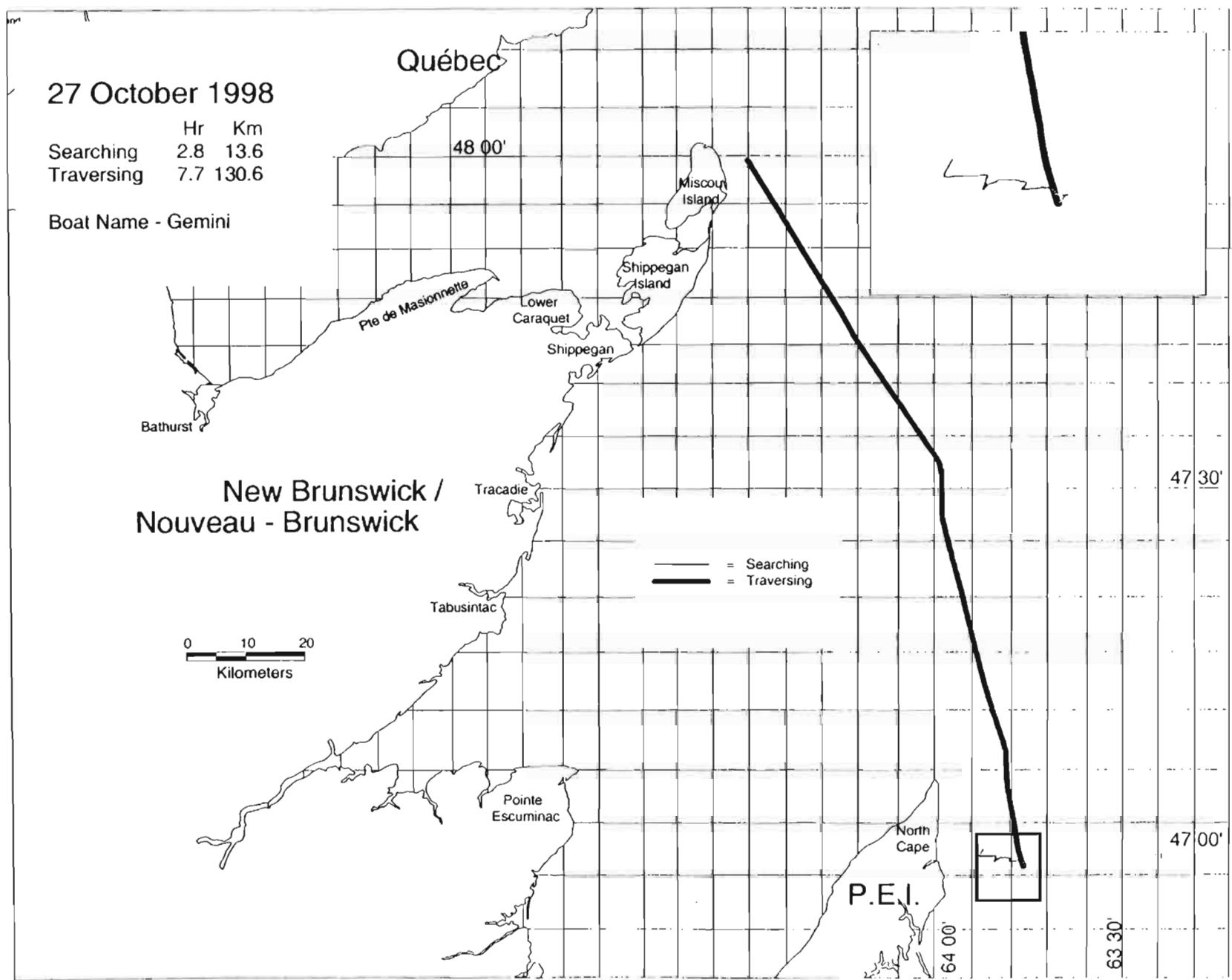


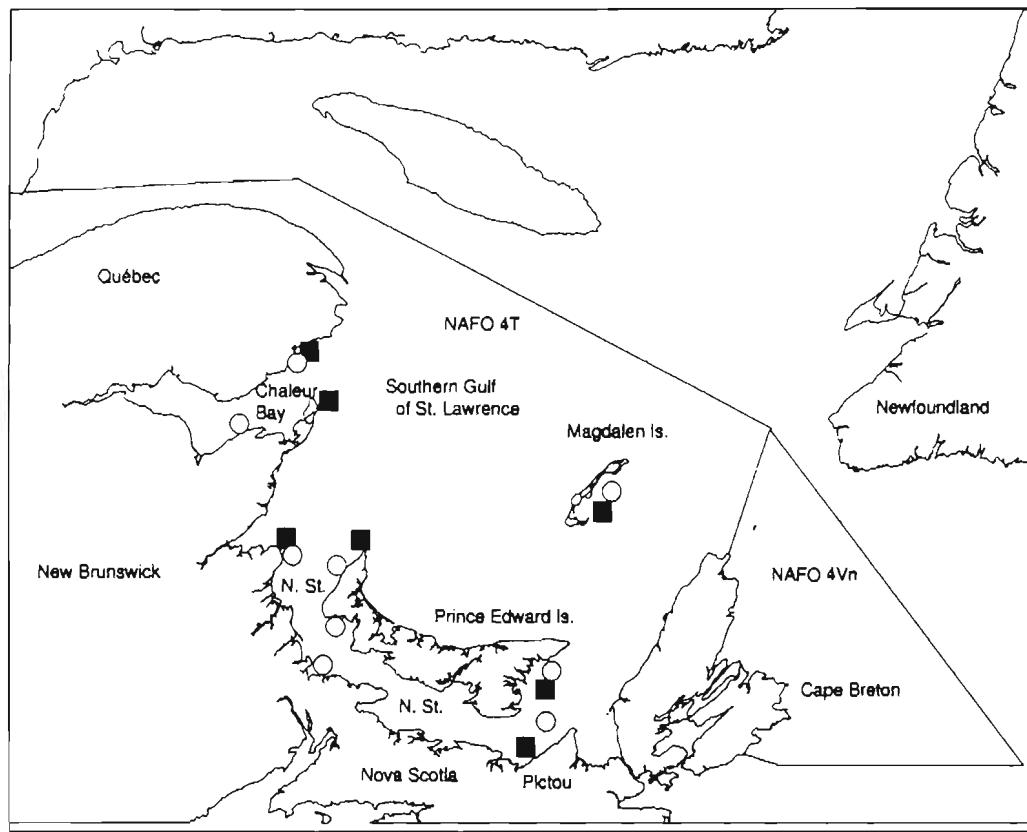
20 October 1998

	Hr	Km
Searching	2.8	13.6
Traversing	7.7	130.6

Boat Name - Gemini







Appendix 1. Southern Gulf of St. Lawrence place names mentioned in the text and location of spring and fall herring spawning areas. Squares represent fall spawning areas, open circles spring spawning areas.

* N. St.; Northumberland Strait.

