



**Tuna Purse seine shooting Operation Technique
of
R/V NIPPON MARU**

Compiled by

**Isara Chanrachkij
Aussanee Munprasit**

**Southeast Asian Fisheries Development Center
Training Department**

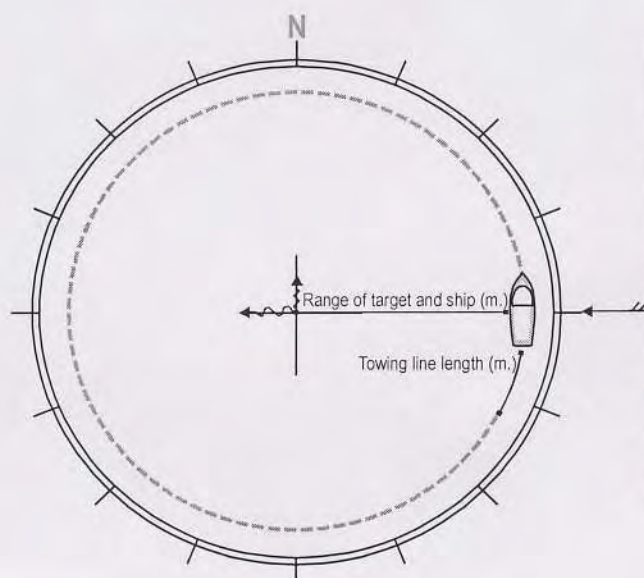


Tuna Purse seine shooting Operation Technique of R/V NIPPON MARU

Date	Position	Target	Start St.	Finish Sh.	Purse line Haul	Fin. Purse line Haul	Net Haul	Fin. Net Haul
Dd/mm/yy	Latitude Longitude	Log or FAD or Fish school	hh:mm	hh:mm	hh:mm	hh:mm	hh:mm	hh:mm

Air Information	
Wind Dir.	
Wind Force	
Weather	
Barometer	
Air Temp.	°C

Remark



Purse seiner

Current Information		
Depth (m)	Speed (knt)	Direction (°)
10		
50		
100		
Water Temp.		°C

Net depth	m.
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Catch	ton
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Isara Chanrachkij
Aussanee Munprasit

Southeast Asian Fisheries Development Center
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Preface

The fisheries technical assistances by Japan Marine Fisheries Resources Research Center (JAMARC) to Southeast Asian Fisheries Development Center (SEAFDEC/TD) to develop tuna purse seine in the Southeast Asia Region, had been carried out for 10 years. The first tuna fishing technical assistance was conducted in November 1992 to January 1993, by assigning Mr. Aussanee Munprasit to practice and observe on tuna purse seine operations onboard R/V NIPPON MARU. The objective was, to prepare the human resource for the new fisheries/training vessel, M/V SEAFDEC. *The observation report on tuna purse seine fishing operations around Seychelles water onboard R/V NIPPON MARU* has been released in February 1993. The second tuna fishing technical assistance was conducted for SEAFDEC staff development program of tuna purse seine in December 2000 to April 2001. The second tuna purse seine training had separated into 2 sections. The first section was the tuna purse seine fishing operation training. The training had been conducted by assigning Mr. Isara Chanrachkij attended onboard R/V NIPPON MARU during December 2000 to February 2001. The second section was the practice on tuna processing onboard tuna purse seiner. The training had been conducted by assigning Mr. Wirote La-ongmanee attended onboard R/V NIPPON MARU during March to April 2001. *The observation reports on tuna purse seine fishing operations around Eastern Indian Ocean water onboard R/V Nippon-maru* has been submitted to JAMARC, Japan, on July 2001.

Shooting net operation is one of the most important steps for tuna purse seine fishing operation. The successful of the catch and the trouble hauling net are indicated by the selection of net shooting. The selection is not only the direction of net shooting but also the justification of the suitable time, current and wind condition. Tuna purse seine information has been a part of the purse seine subject for training course since 1993. Fishing participants are always interested in the tuna purse seine fishing operation techniques especially for the shooting selection. This shooting operation catalogue is published to guide participant clearer understanding on net shooting of tuna purse seine.

The shooting operation details were collected when the first training/observation in 1992 by Mr. Aussanee Munprasit and the second training/observation in 2001 by Mr. Isara Chanrachkij. The net shooting information was recorded from 68 fishing operations without any serious trouble. The numbers of net shooting operation have been collected enough for publishing, aim to educate by the SEAFDEC participants on the purse seine fishing subject particularly the fishing simulator practice. Authors wish that SEAFDEC participants and people who interested in tuna purse seine fishing operation are able to understand the shooting pattern of tuna purse seine that will lead on the safety tuna purse seine fishing operation.

Acknowledgement

Authors would like to expressed the deeply appreciation to our colleagues who support this catalogue; The first is *Japan Marine Fisheries Resources Research Center (JAMARC)* and *Japan Far-Sea Purse Seine Fishing Co.,Ltd.* on the acceptable of SEAFDEC requesting for the training/observation onboard R/V NIPPON MARU twice times.

Mr. Takeheko Akeyama, Fishing-master of R/V NIPPON MARU and his crew, who sincerely explained the important information for tuna purse seine fishing techniques.

Form of shooting catalogue and details of the document are designed by *Mr. Narong Raungsivakul*, Fishing gear assistant researcher with the closely assisting by *Mr. Pratakphol prajaklitt*, Fishing gear researcher, Research Division, SEAFDEC/TD.

Special thank you to *Mr. Panu tevaratmaneekul* Secretary General of Southeast Asian Fisheries Development Center and Chief of the training department, *Dr. Somboon Siriraksophol* Research Division Head who realize how important of safety on purse seine operation and kindly support on the publishing of this information.

Details of R/V NIPPONMARU

R/V Nipponmaru is an American purse seine type, Port side NET surrounding style. She constructed by Miho Shipyard in 1986. The owner is Japan Far-sea Purse seine Co.,Ltd under the research management of Japan Marine Fisheries Resources Research Center (JAMARC). The fishing/research areas are in eastern and western Indian Ocean.

Name	R/V NIPPON MARU
Call sign	JATW
Port of register	Tokyo, Japan
Ship owner	Japan Far-Sea purse seine fisheries
Place of birth	Miho shipyard, Japan
Date of launch	June 1986
Date of delivery	August 1986
International tonnage	1788 GT
Gross tonnage	760 GT
Net tonnage	657 GT
Length overall	78.0 m.
Breadth	14.0 m.
Depth	8.27 m.
Main engine	3800 PS
Maximum speed	17.0 knot
Service speed	15.1 knot
Fish hold	1508.88 Cu.m.
Fuel oil tank	701.71 Cu.m.
Lubrication oil tank	31.51 Cu.m.
Freshwater tank	78.97 Cu.m.
Completement	22 crew



Explanation and Symbol

Date (dd/mm/yy): Date of shooting operation

Position (Latitude and Longitude): Position of start shooting operation

Target: Target for surrounding net (Drifting log, Drifting FAD, Schooling fish)

Start St (hhmm): Time for start shooting the net into the sea.

Finish St (hhmm): Time for all net is released away from net space at stern deck.

Purse line hauling (hhmm): Time for start hauling purse line.

Finish purse line hauling (hhmm): Time for finish hauling purse line.

Net hauling (hhmm): Time for start hauling net into the space at stern deck.

Finish net hauling (hhmm): Time for all fishing activities are finished. (skiff boat is hauled back at the slipway)

* Time : page 1-20 Time is GMT+ 3

: page 21-34 Time is GMT+ 6

Air Information

Wind dir.: Direction of wind.

Wind speed (Knot): Speed of wind (knot).

Weather: Weather symbol (International Meteorological Convention 1921).

Example; bc : Partly cloudy

c : Cloudy

r : Raining

Barometer (hPa): Air pressure (Hecto Pascal)

Air temp. : Air temperature in degree Celsius


Purse seiner: Name of purse seine vessel


Current information: Speed (knot) and direction of current by Doppler current indicator setting in 10 m., 50 m., and 100 m depth.

Sea surface temp. : Sea surface temperature in Degree Celsius

Net depth (m.): Ground rope of purse seine net depth by Net Sonde

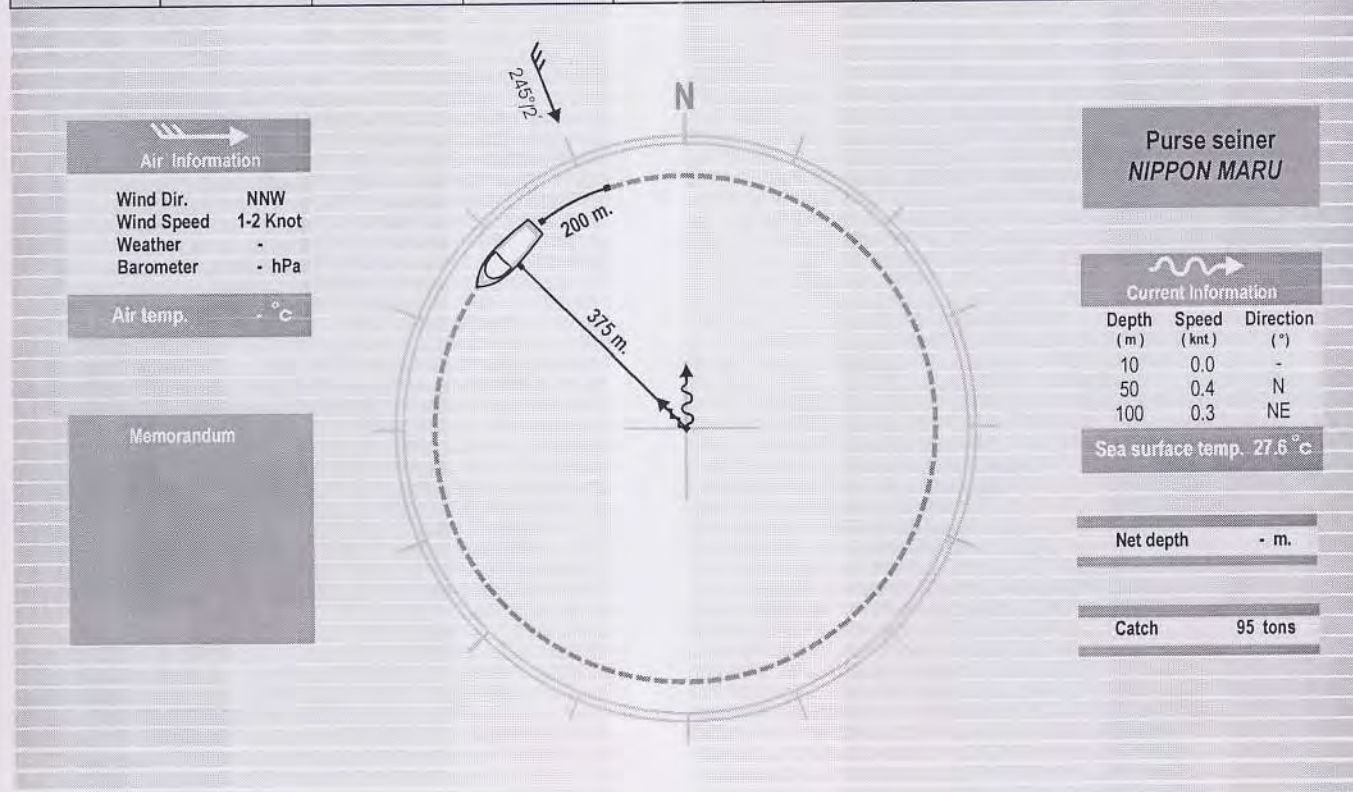
Catch: Catch of tuna and skipjack (ton)

 Current direction symbol (Direction of current from which direction is blowing to)

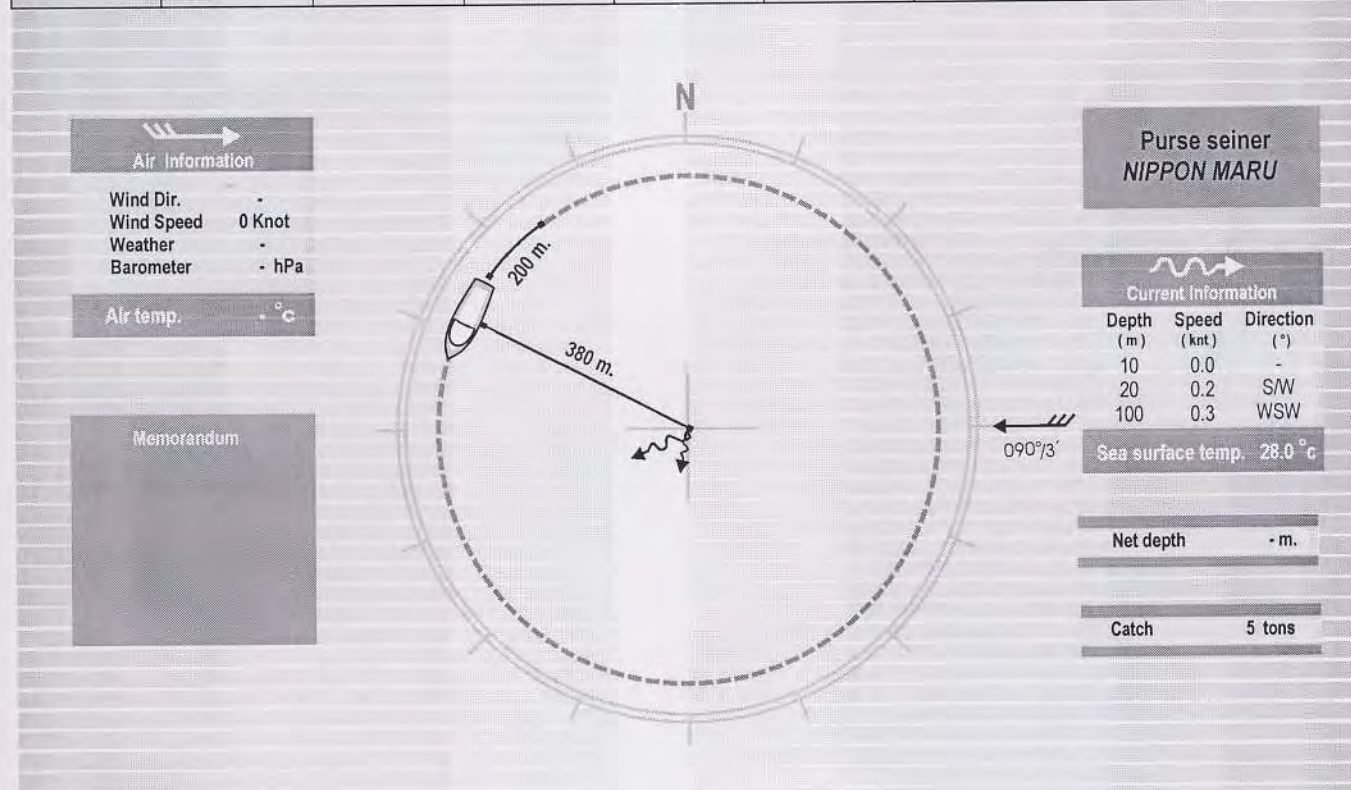
 Wind direction symbol (Wind from which the wind is blowing (Wind come from direction))

Tuna purse seine shooting operation technique

Date	Position	Target	Start St.	Finish Sh.	Purse line Haul	Fin. Purse line Haul	Net Haul	Fin. Net Haul
19/11/92	05°47'5S 058°34'6E	Drifting log	0450	0457	0458	0530	0540	1110

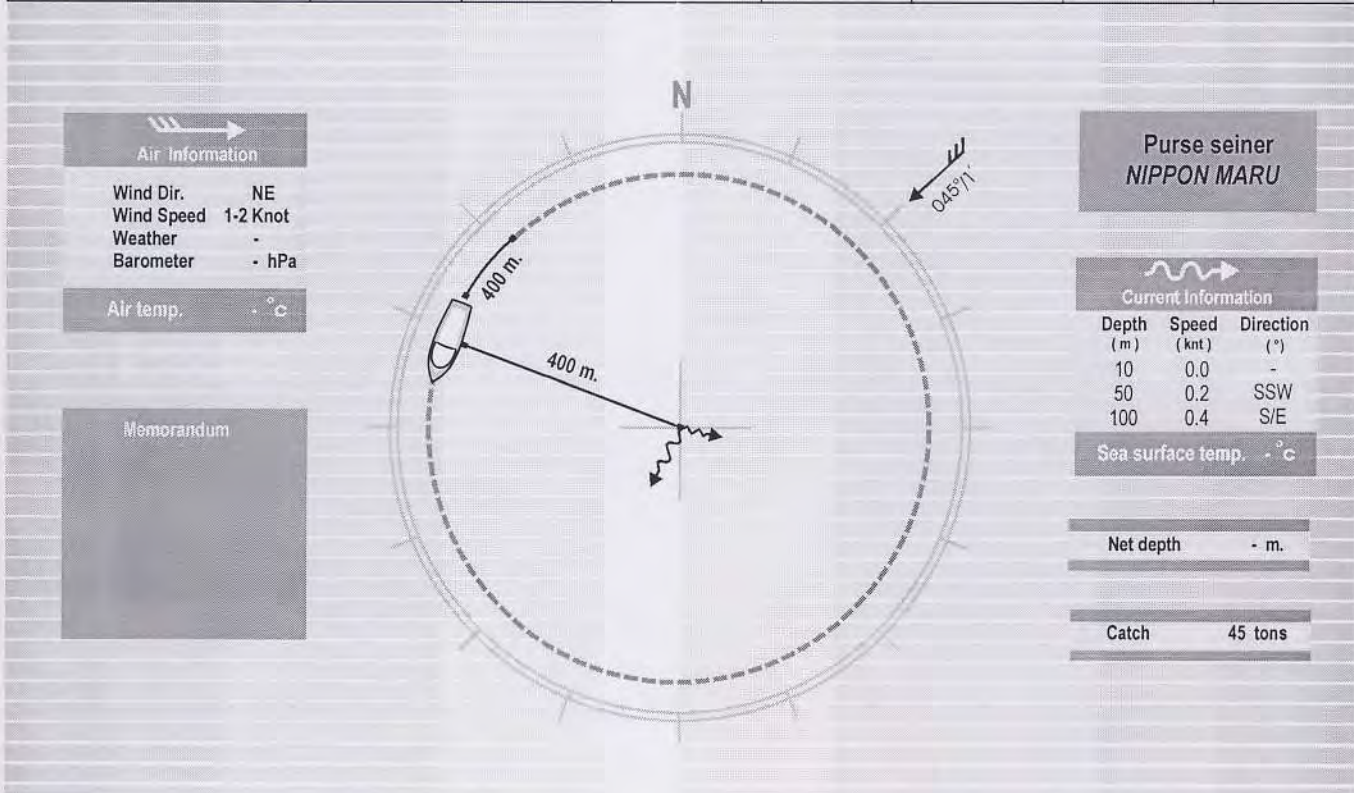


Date	Position	Target	Start St.	Finish Sh.	Purse line Haul	Fin. Purse line Haul	Net Haul	Fin. Net Haul
20/11/92	05°23'0S 058°27'6E	Drifting log	0448	0455	0457	0540	0547	0820

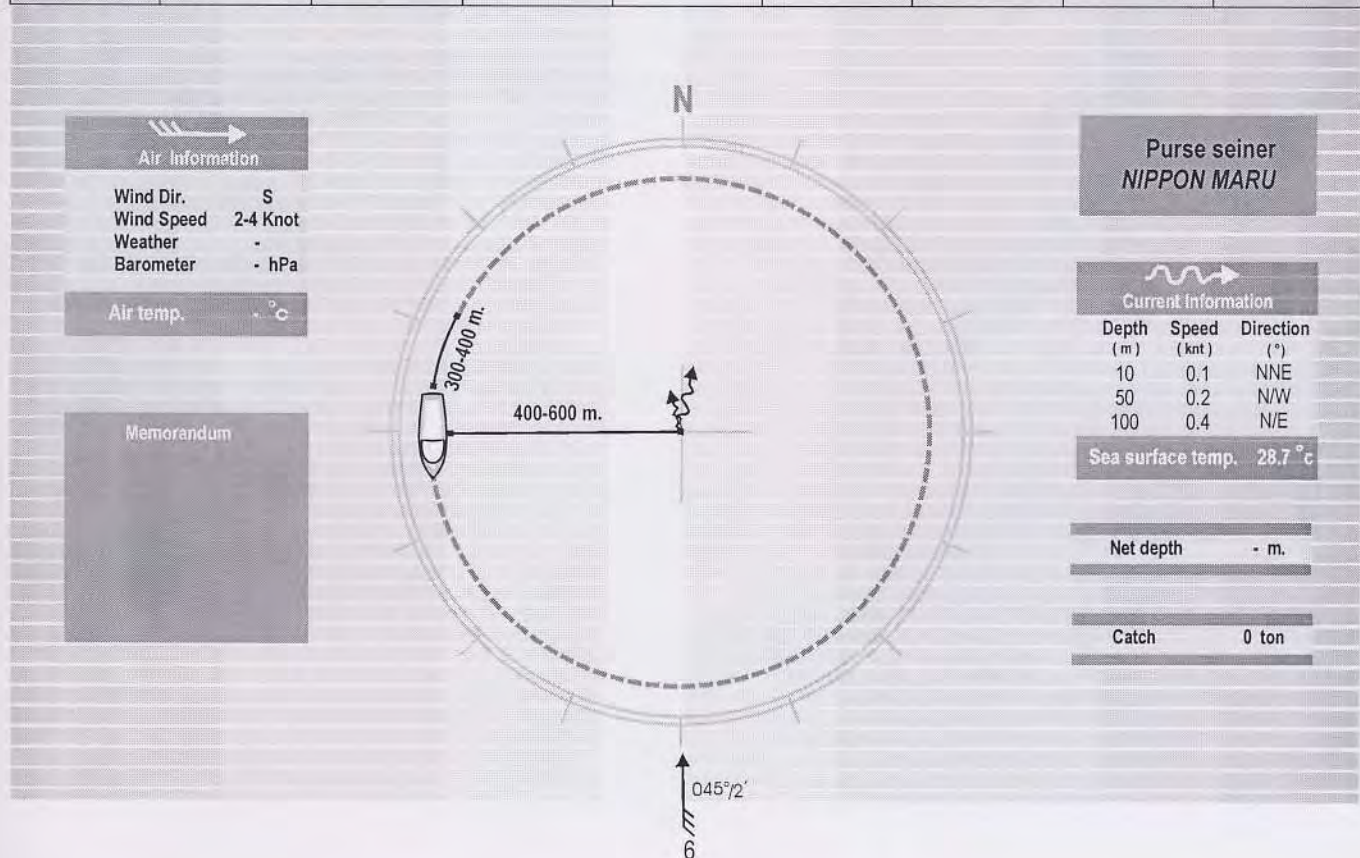


Tuna purse seine shooting operation technique

Date	Position	Target	Start St.	Finish Sh.	Purse line Haul	Fin. Purse line Haul	Net Haul	Fin. Net Haul
21/11/92	05°30.0S 062°35.0E	Schooling	0825	0830	0830	0900	0905	0930

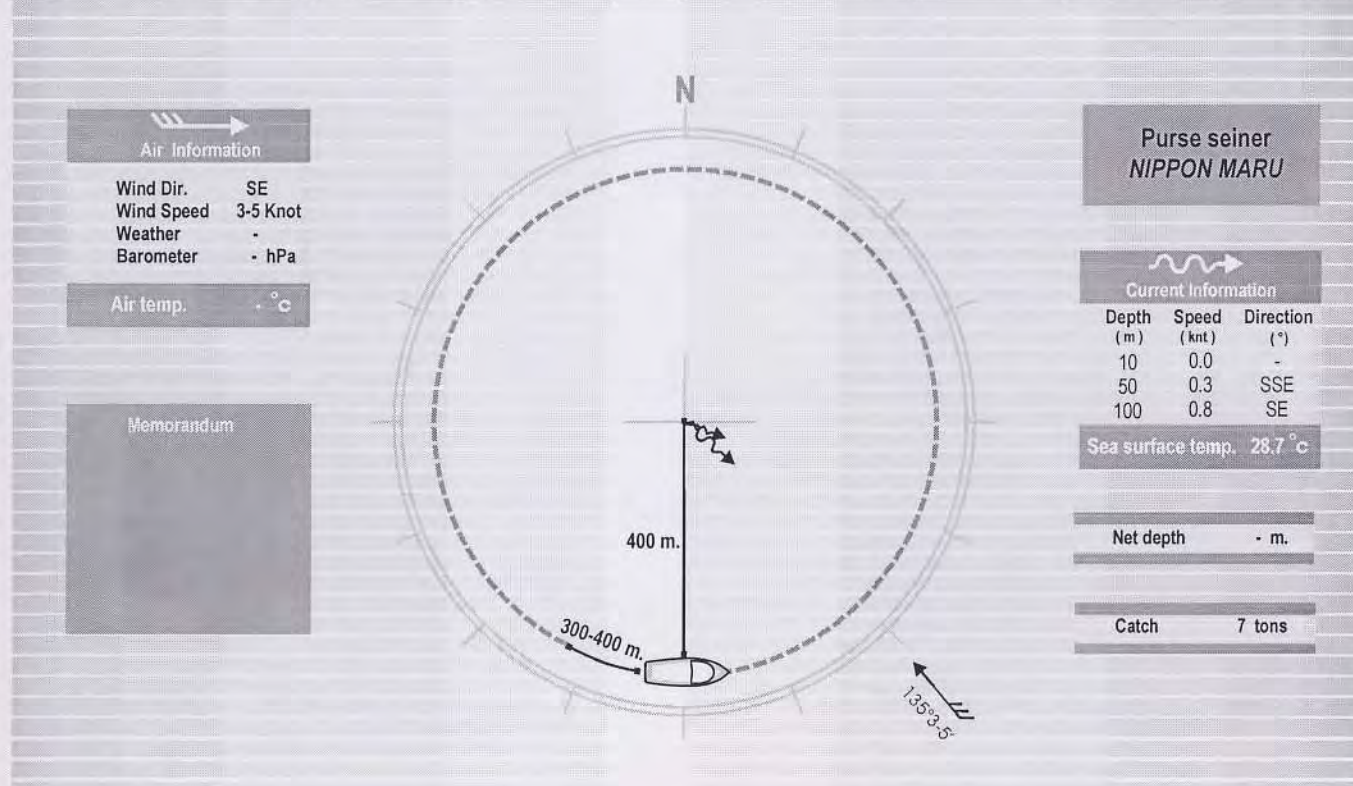


Date	Position	Target	Start St.	Finish Sh.	Purse line Haul	Fin. Purse line Haul	Net Haul	Fin. Net Haul
21/11/92	05°30.0S 062°44.4E	Schooling	1255	1302	1305	1343	1345	1530

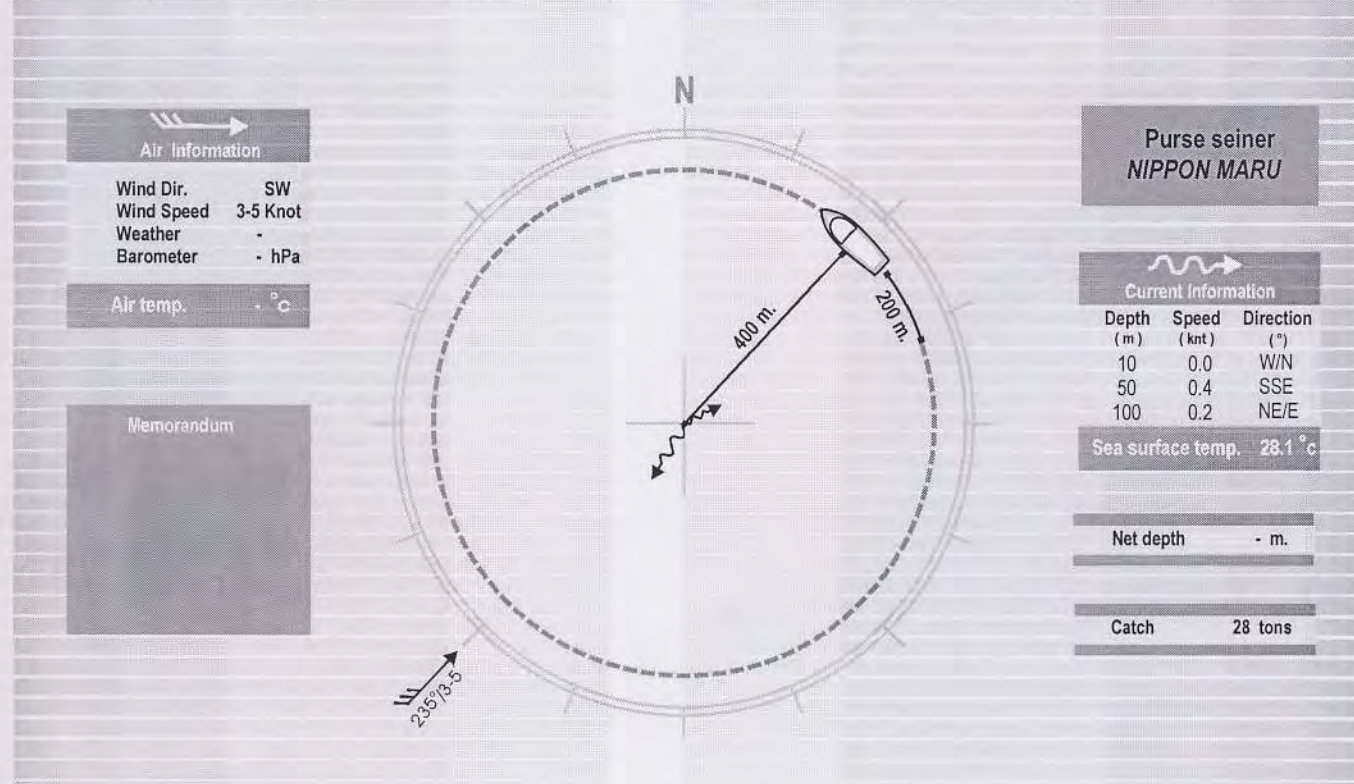


Tuna purse seine shooting operation technique

Date	Position	Target	Start St.	Finish Sh.	Purse line Haul	Fin. Purse line Haul	Net Haul	Fin. Net Haul
21/11/92	05°30.8'S 062°38.0'E	Schooling	1540	-	-	1620	1625	1830

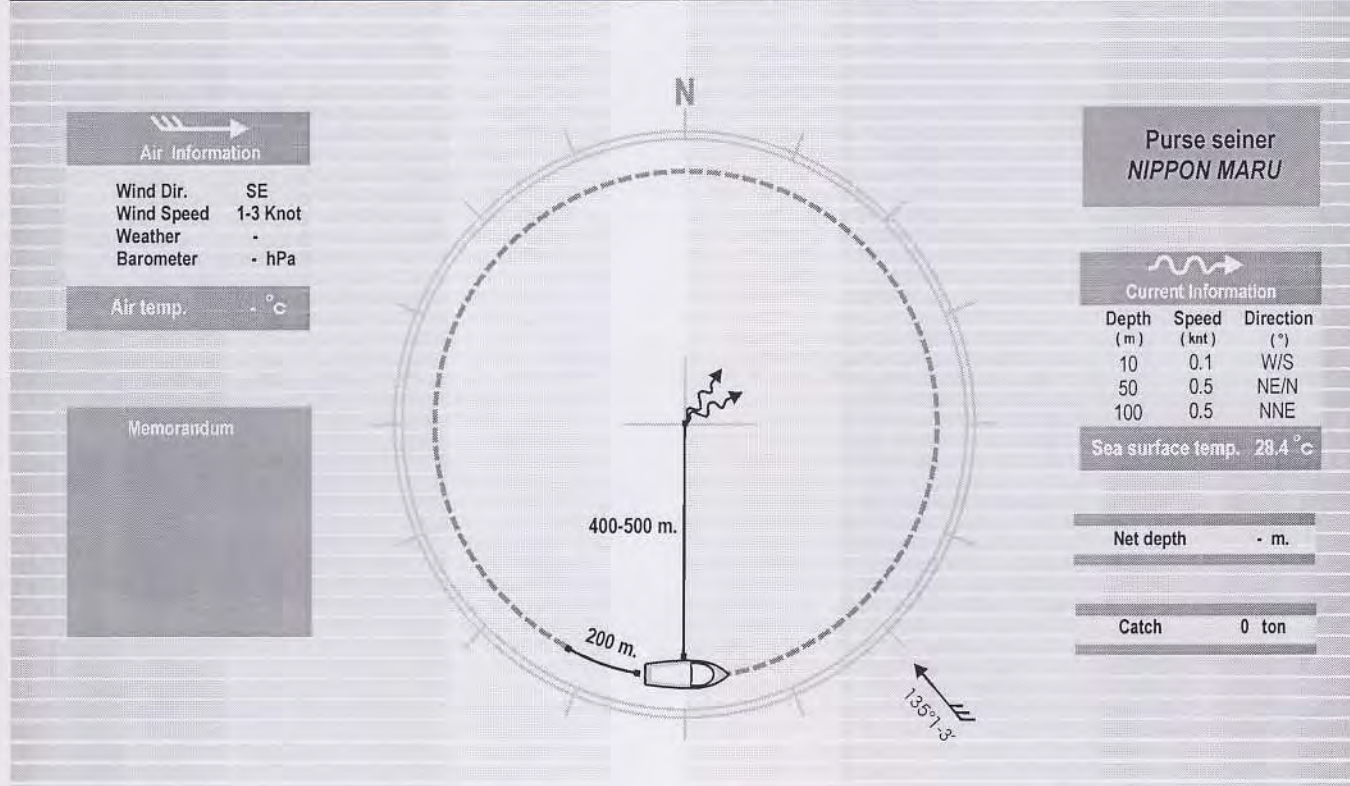


Date	Position	Target	Start St.	Finish Sh.	Purse line Haul	Fin. Purse line Haul	Net Haul	Fin. Net Haul
22/11/92	05°21.1'S 062°32.5'E	Schooling	1038	-	-	-	-	1430

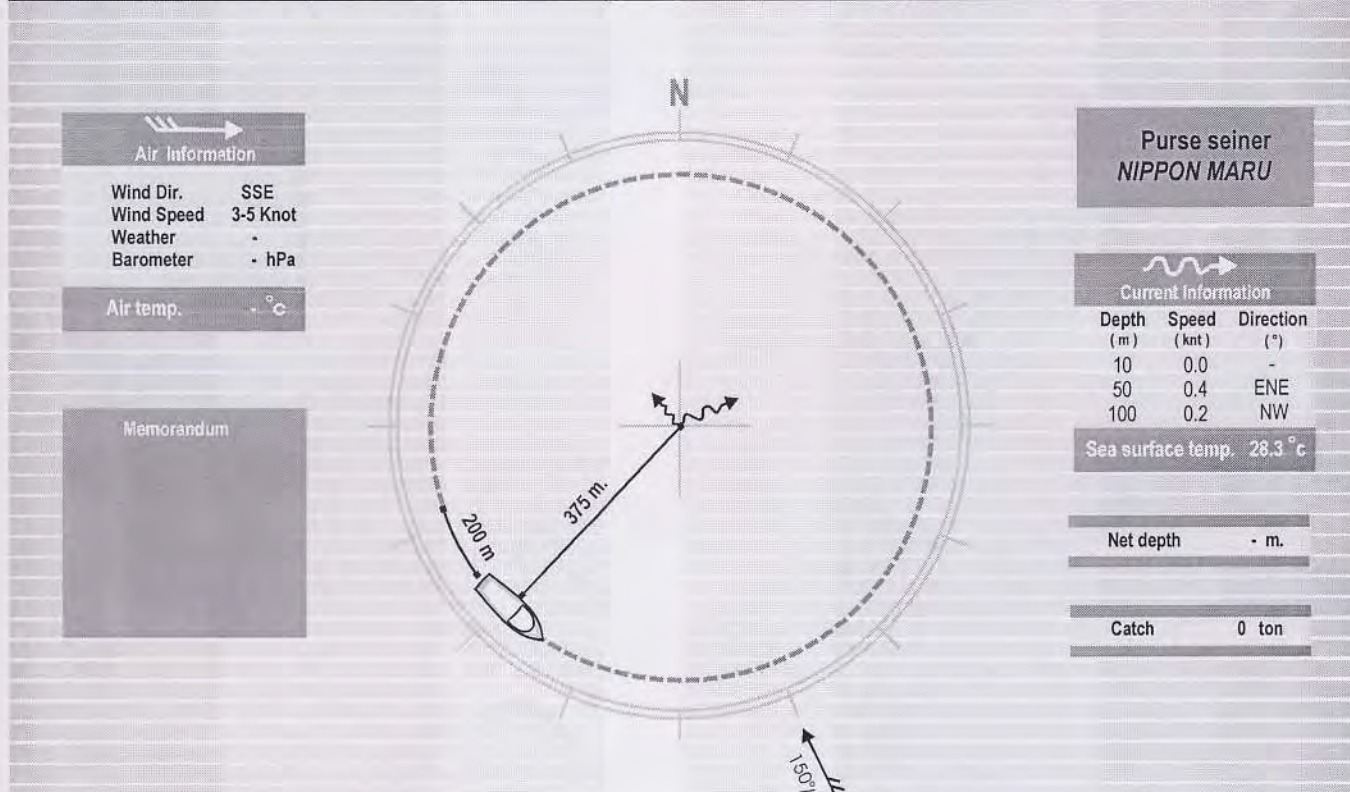


Tuna purse seine shooting operation technique

Date	Position	Target	Start St.	Finish Sh.	Purse line Haul	Fin. Purse line Haul	Net Haul	Fin. Net Haul
23/11/92	05°08.1'S 062°47.9'E	Schooling	0955	1000	1000	1030	1035	1140

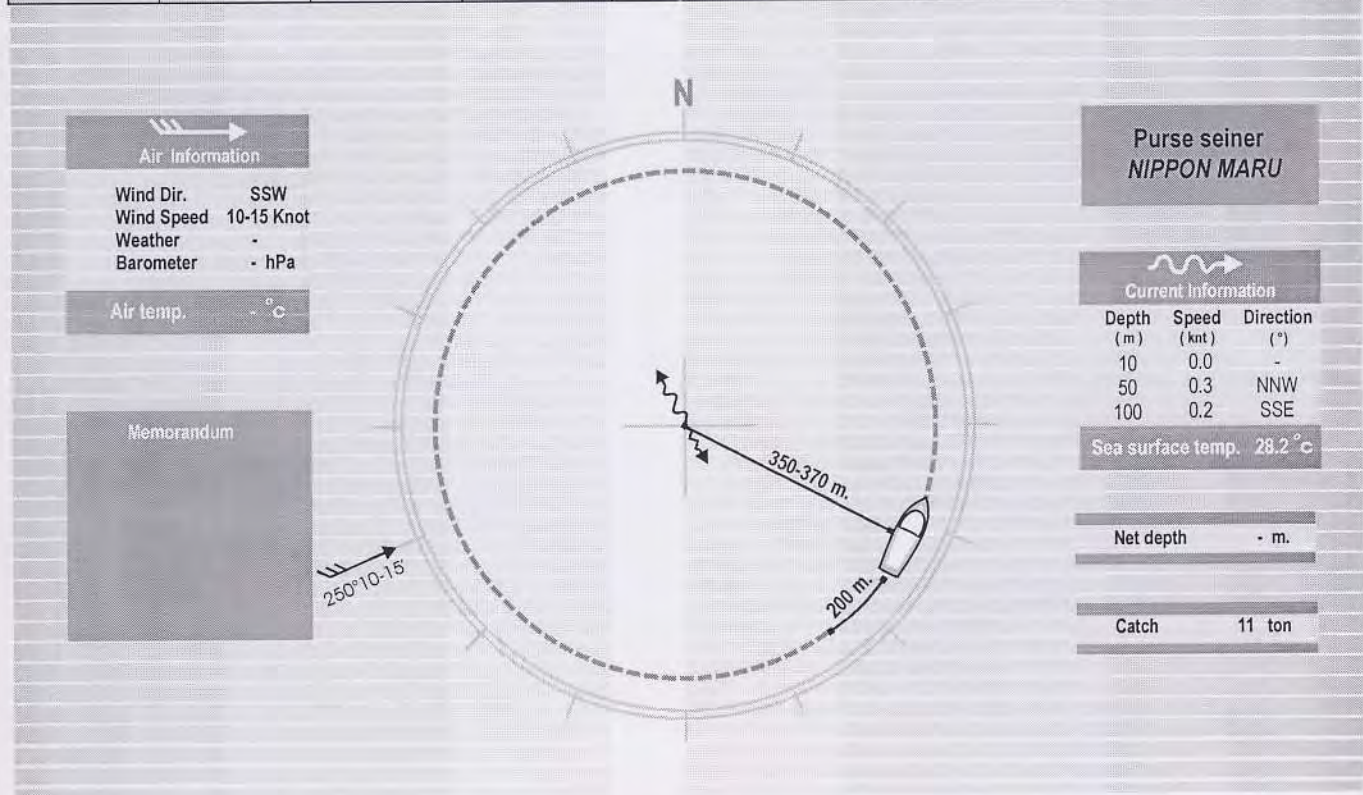


Date	Position	Target	Start St.	Finish Sh.	Purse line Haul	Fin. Purse line Haul	Net Haul	Fin. Net Haul
23/11/92	05°04.0'S 063°02.0'E	Schooling	1540	1548	1548	1617	1625	1800

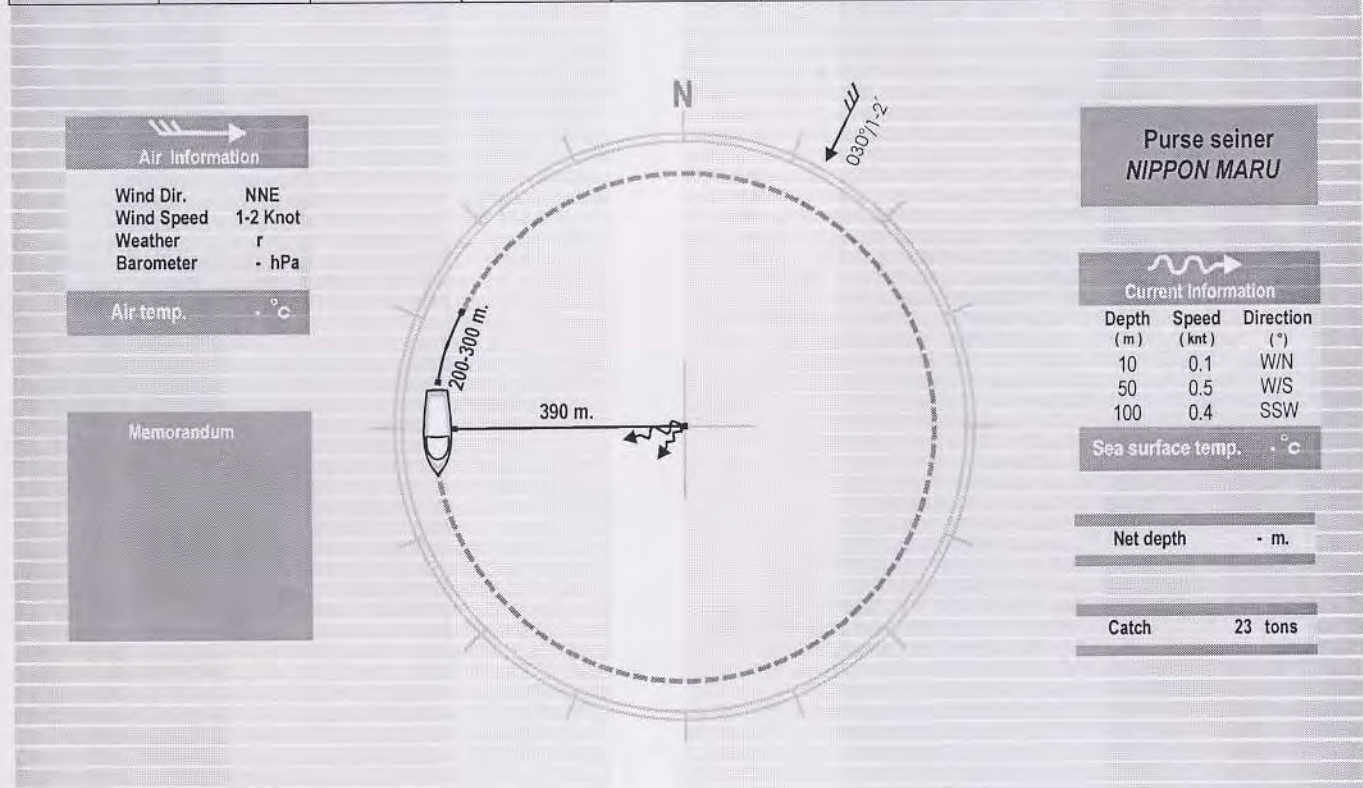


Tuna purse seine shooting operation technique

Date	Position	Target	Start St.	Finish Sh.	Purse line Haul	Fin. Purse line Haul	Net Haul	Fin. Net Haul
25/11/92	04°43'3S 063°14'1E	Schooling	0433	0440	0440	0510	0520	0815



Date	Position	Target	Start St.	Finish Sh.	Purse line Haul	Fin. Purse line Haul	Net Haul	Fin. Net Haul
27/11/92	05°46'2S 058°24'2E	Drifting log	0502	0510	0510	0541	0550	0815

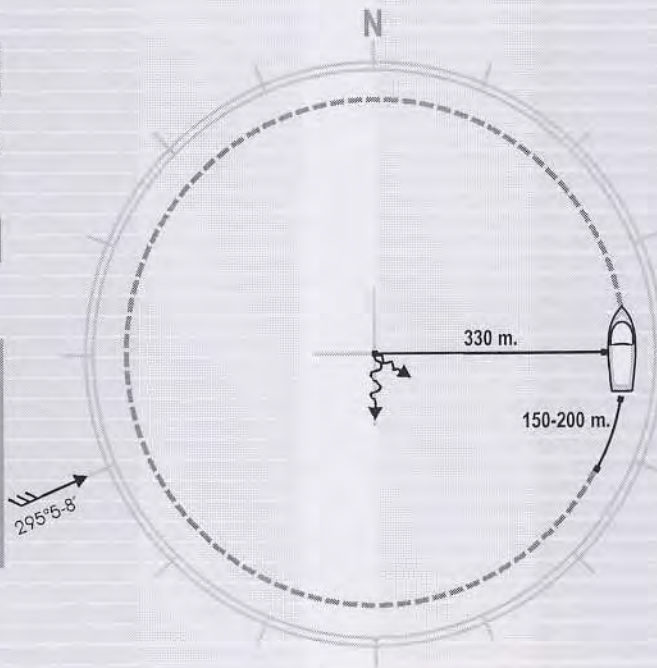


Tuna purse seine shooting operation technique

Date	Position	Target	Start St.	Finish Sh.	Purse line Haul	Fin. Purse line Haul	Net Haul	Fin. Net Haul
28/11/92	04°23.0'S 058°02.3'E	Drifting log	0455	0503	0504	0535	0545	0930

Air Information	
Wind Dir.	SSW
Wind Speed	5-8 Knot
Weather	-
Barometer	- hPa
Air temp. °C	

Memorandum



Purse seiner
NIPPON MARU

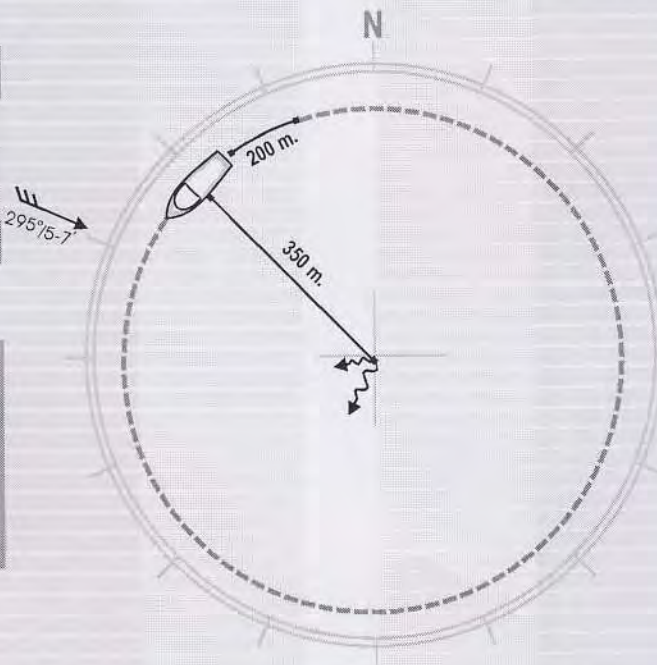
Current Information		
Depth (m)	Speed (knt)	Direction (°)
10	0.0	N
50	0.7	S
100	0.6	ESE
Sea surface temp. 27.8 °C		

Net depth	- m.
Catch	103 ton

Date	Position	Target	Start St.	Finish Sh.	Purse line Haul	Fin. Purse line Haul	Net Haul	Fin. Net Haul
29/11/92	05°39.7'S 057°58.1'E	Drifting log	0456	0503	0504	0533	0540	0740

Air Information	
Wind Dir.	WNW
Wind Speed	5-7 Knot
Weather	-
Barometer	- hPa
Air temp. °C	

Memorandum



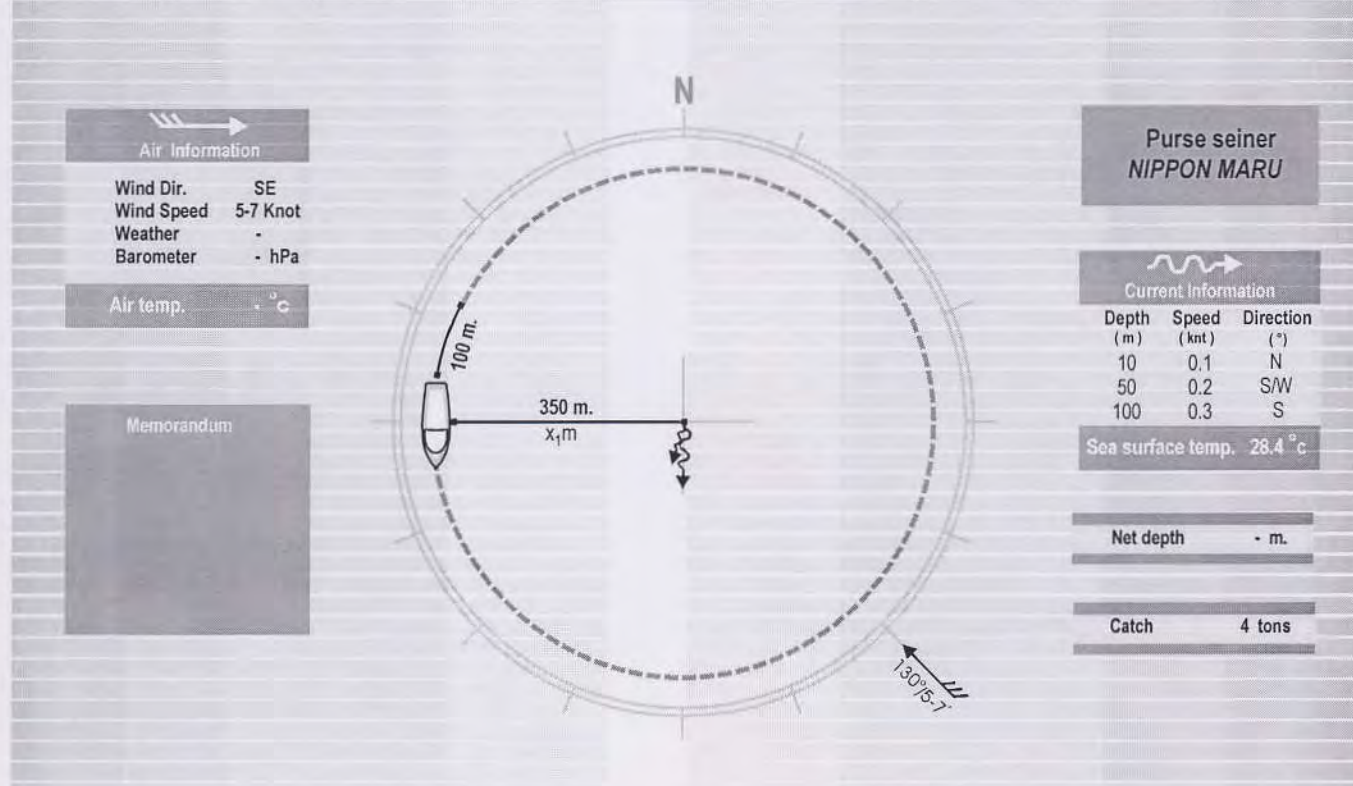
Purse seiner
NIPPON MARU

Current Information		
Depth (m)	Speed (knt)	Direction (°)
10	0.0	N
50	0.7	SW/S
100	0.5	W/S
Sea surface temp. 28.5 °C		

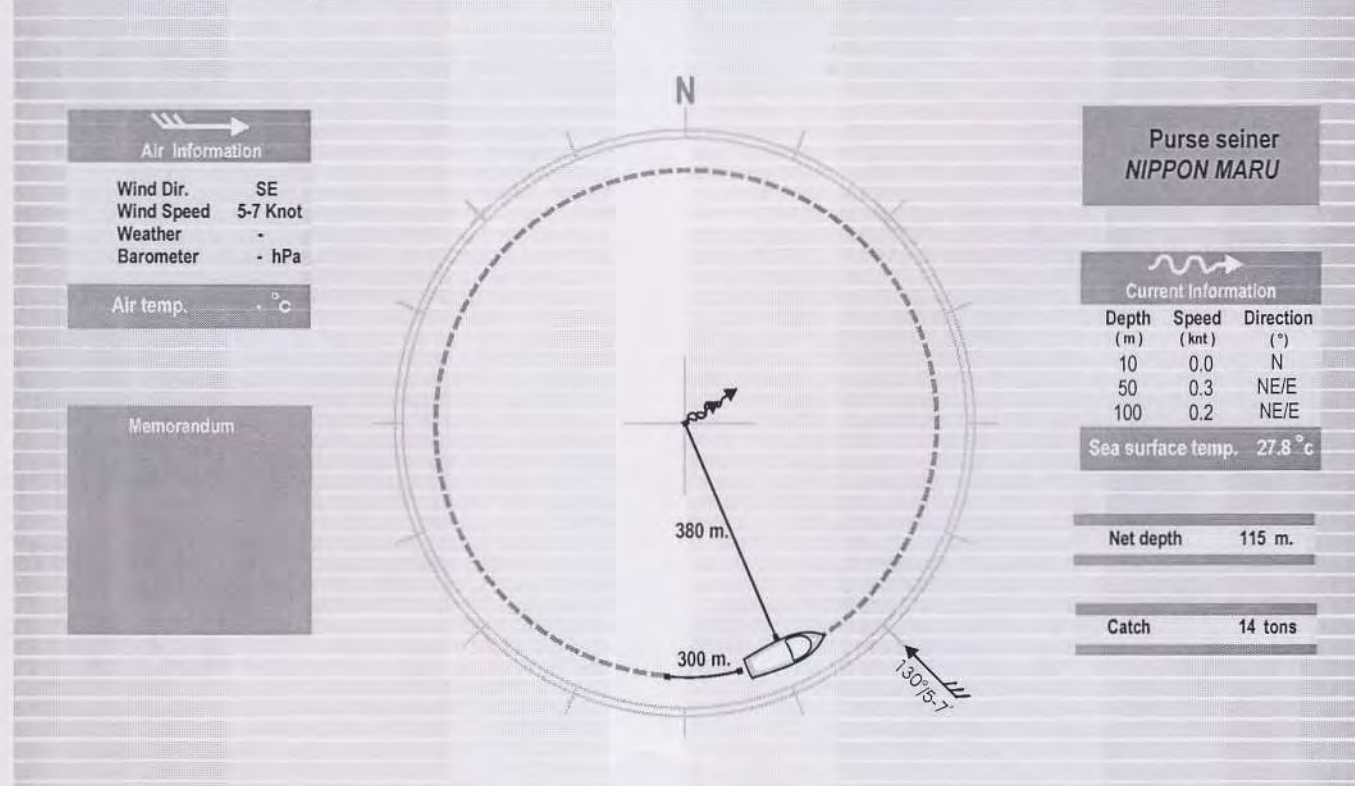
Net depth	- m.
Catch	1 ton

Tuna purse seine shooting operation technique

Date	Position	Target	Start St.	Finish Sh.	Purse line Haul	Fin. Purse line Haul	Net Haul	Fin. Net Haul
30/11/92	06°03.7'S 057°16.8'E	Drifting log	0446	0456	0456	0521	0530	0730

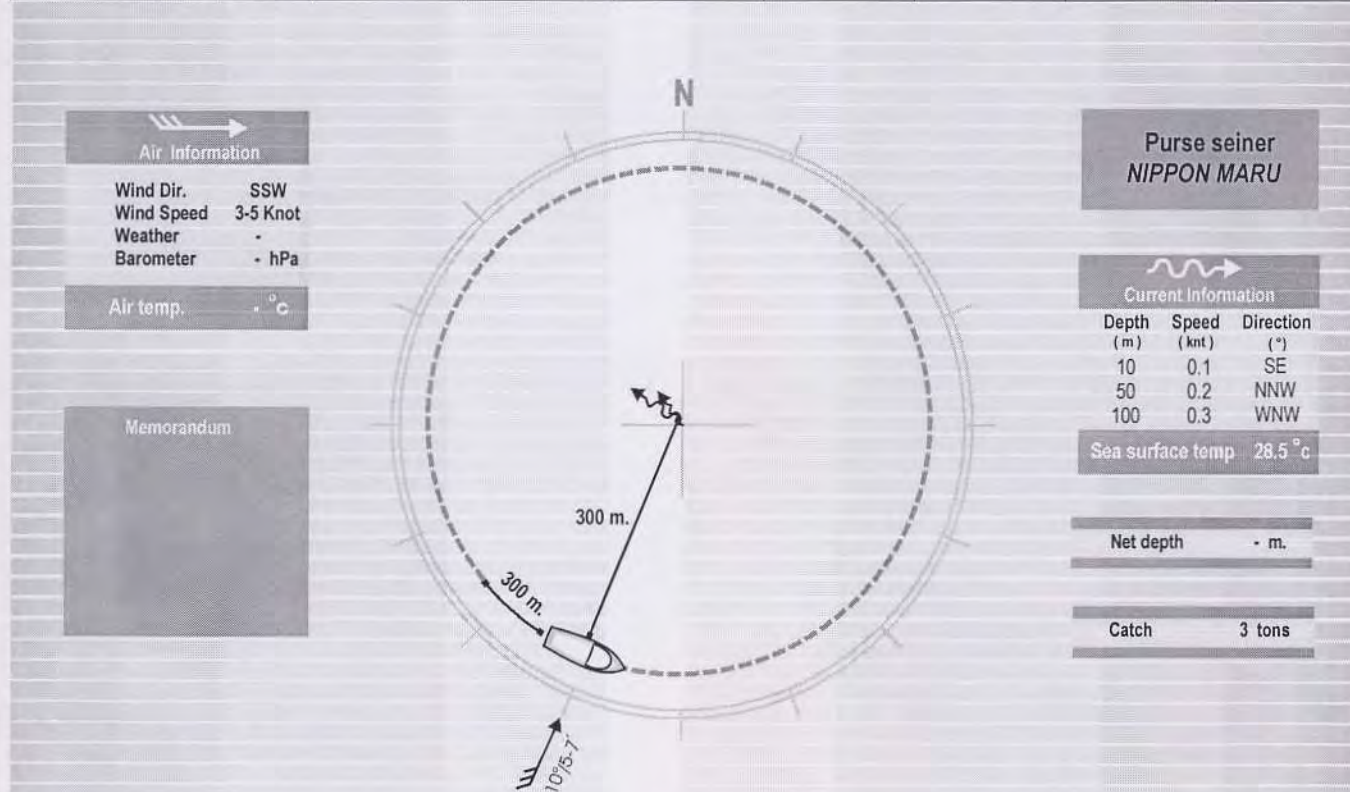


Date	Position	Target	Start St.	Finish Sh.	Purse line Haul	Fin. Purse line Haul	Net Haul	Fin. Net Haul
1/12/92	04°16.8'S 057°08.9'E	Drifting log	0433	0439	0440	0515	0610	0840

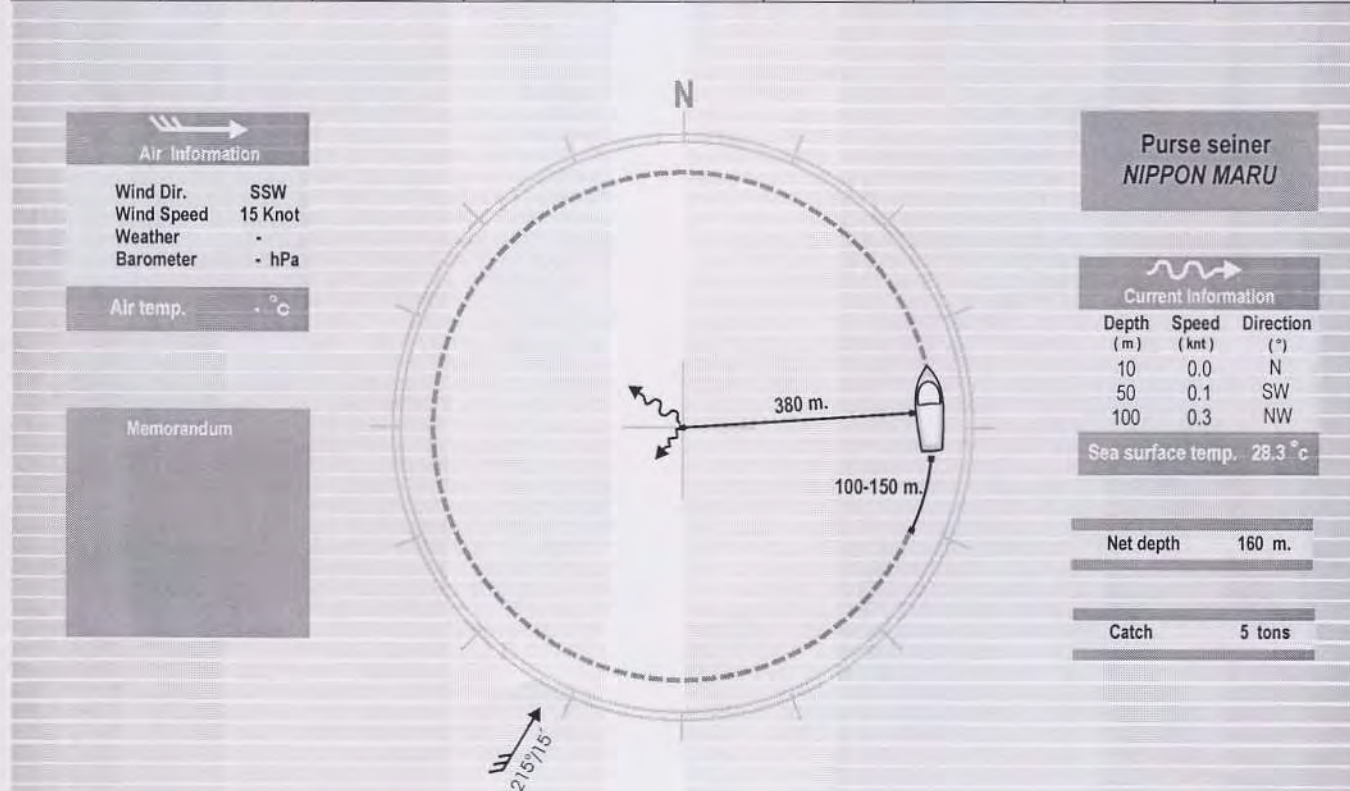


Tuna purse seine shooting operation technique

Date	Position	Target	Start St.	Finish Sh.	Purse line Haul	Fin. Purse line Haul	Net Haul	Fin. Net Haul
1/12/92	04°33.7'S 059°52.4'E	Drifting log	1245	1252	1252	1315	1330	1600

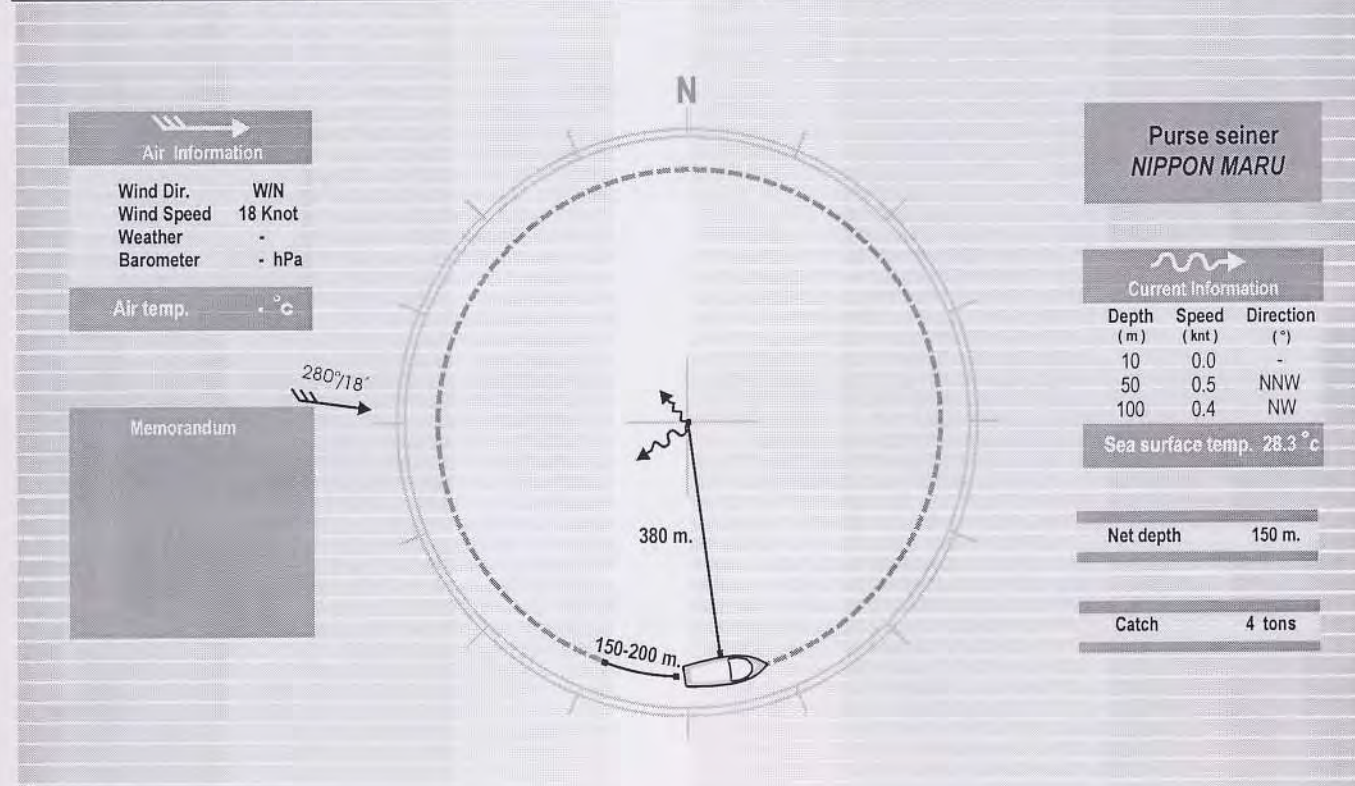


Date	Position	Target	Start St.	Finish Sh.	Purse line Haul	Fin. Purse line Haul	Net Haul	Fin. Net Haul
3/12/92	04°30.0'S 063°15.9'E	Drifting log	0433	0440	0440	0510	0515	0740

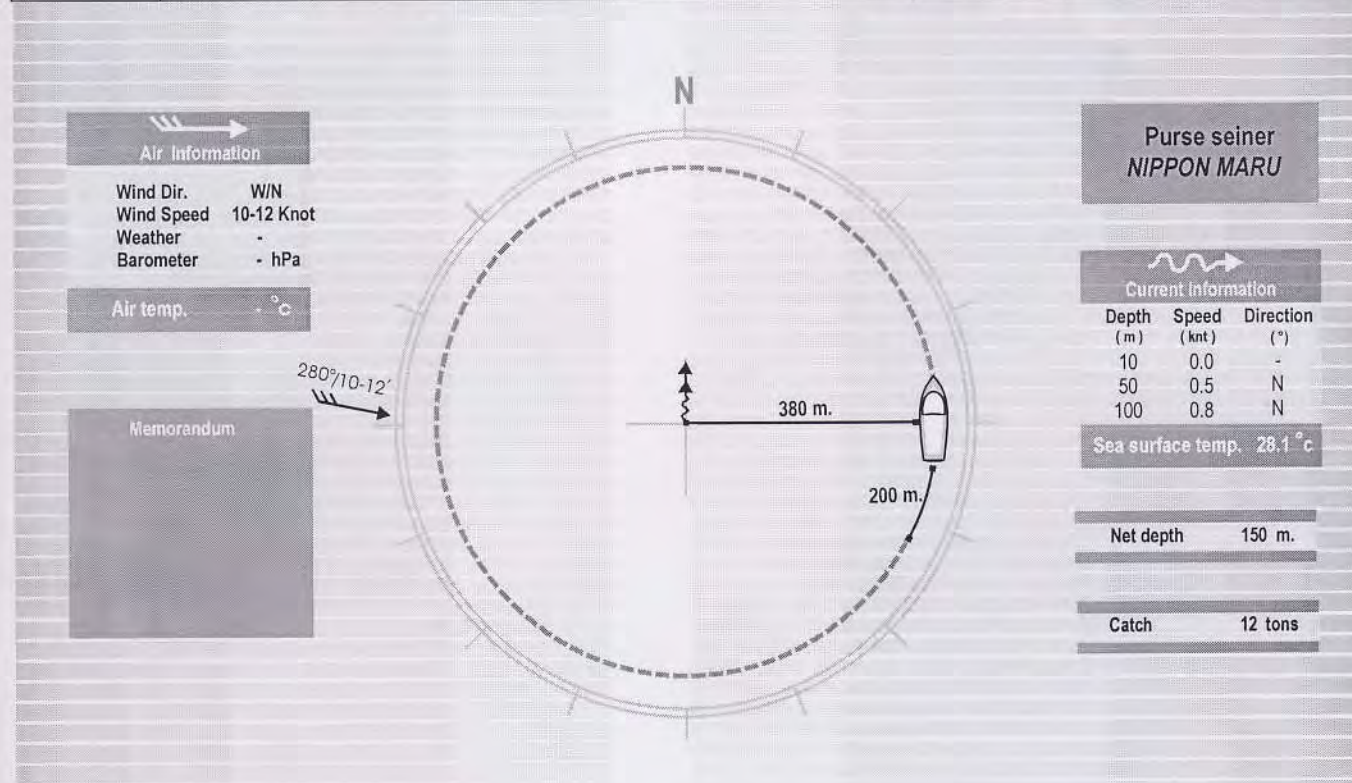


Tuna purse seine shooting operation technique

Date	Position	Target	Start St.	Finish Sh.	Purse line Haul	Fin. Purse line Haul	Net Haul	Fin. Net Haul
4/12/92	04°16'6S 064°03'3E	Drifting log	0425	0434	0435	0500	0510	0740

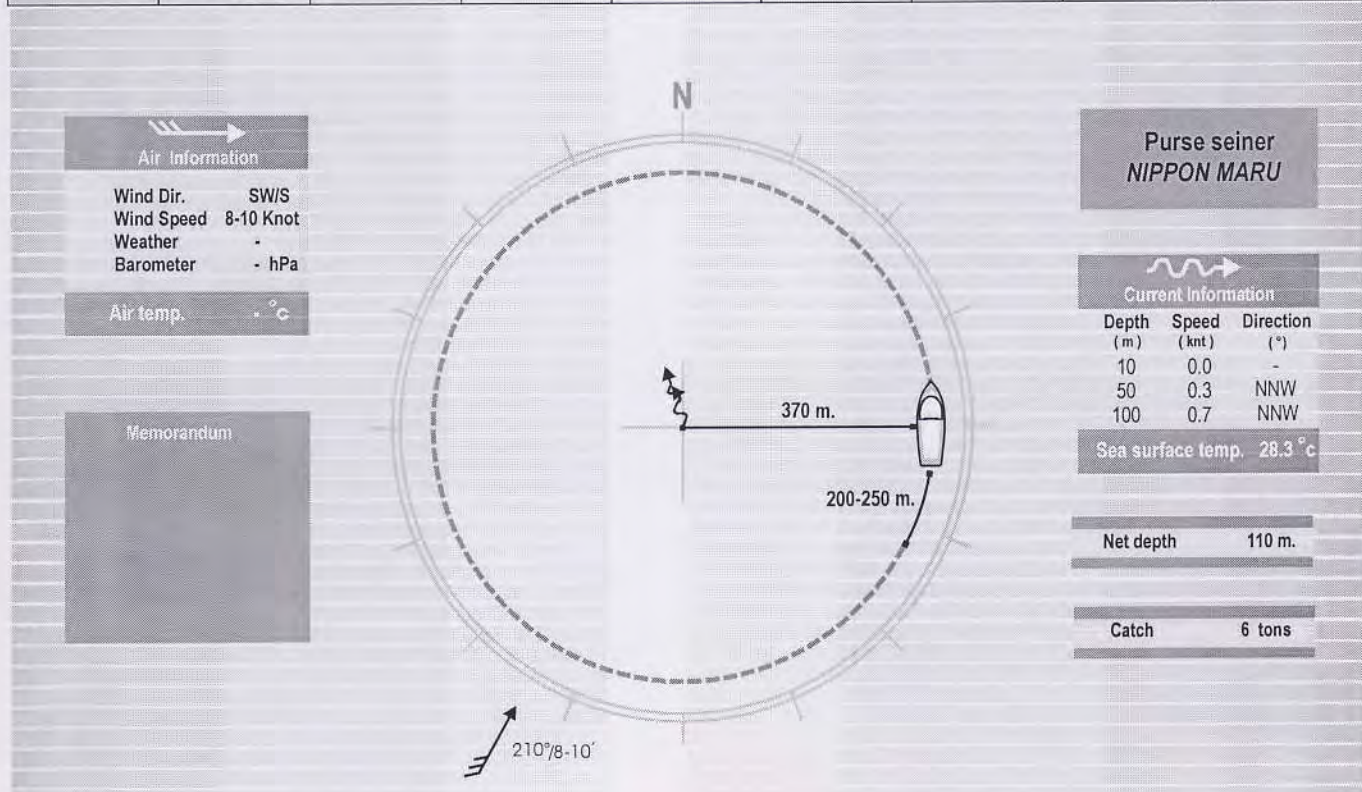


Date	Position	Target	Start St.	Finish Sh.	Purse line Haul	Fin. Purse line Haul	Net Haul	Fin. Net Haul
5/12/92	04°30'0S 063°15'9E	Drifting log	0433	0440	0440	0510	0515	0740

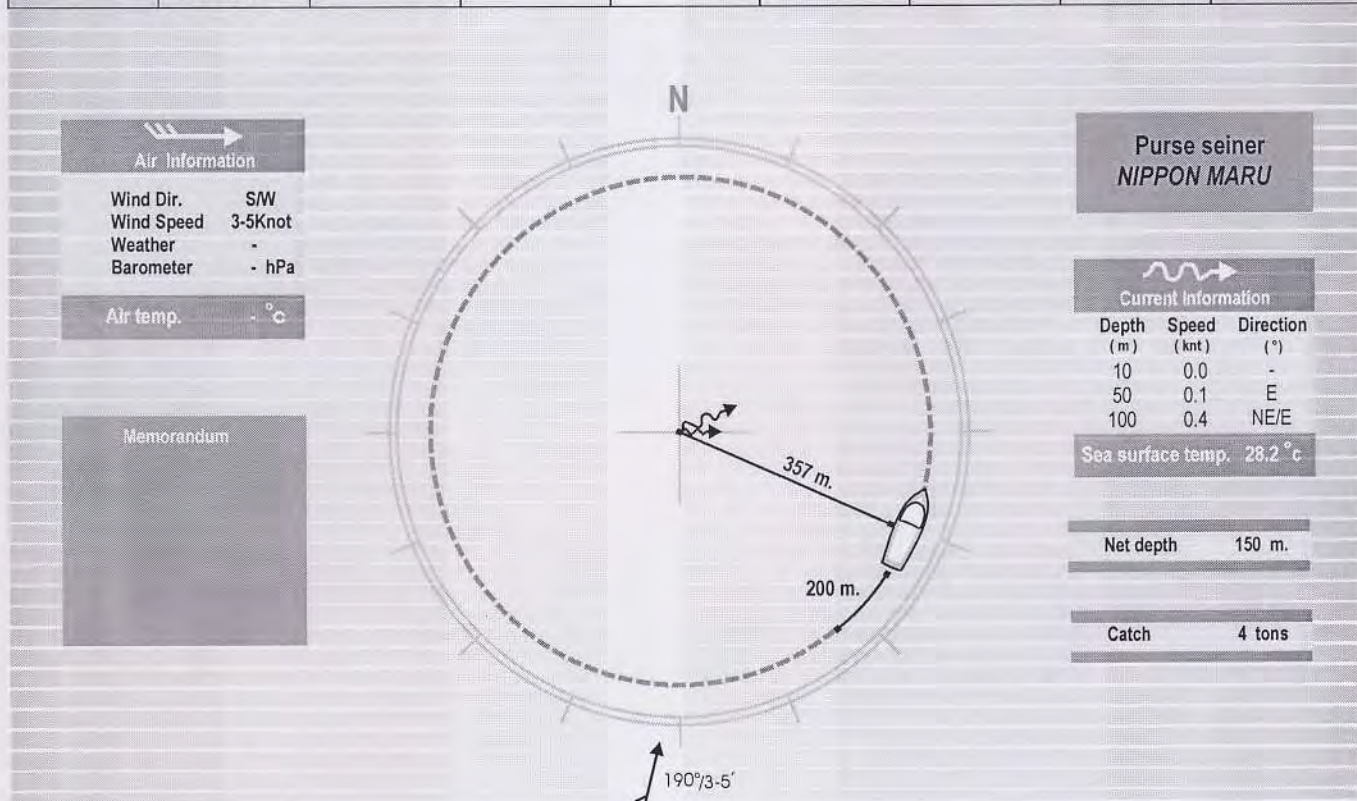


Tuna purse seine shooting operation technique

Date	Position	Target	Start St.	Finish Sh.	Purse line Haul	Fin. Purse line Haul	Net Haul	Fin. Net Haul
6/12/92	03°12.6'S 065°23.5'E	Drifting log	0425	0433	0435	0500	0510	0800

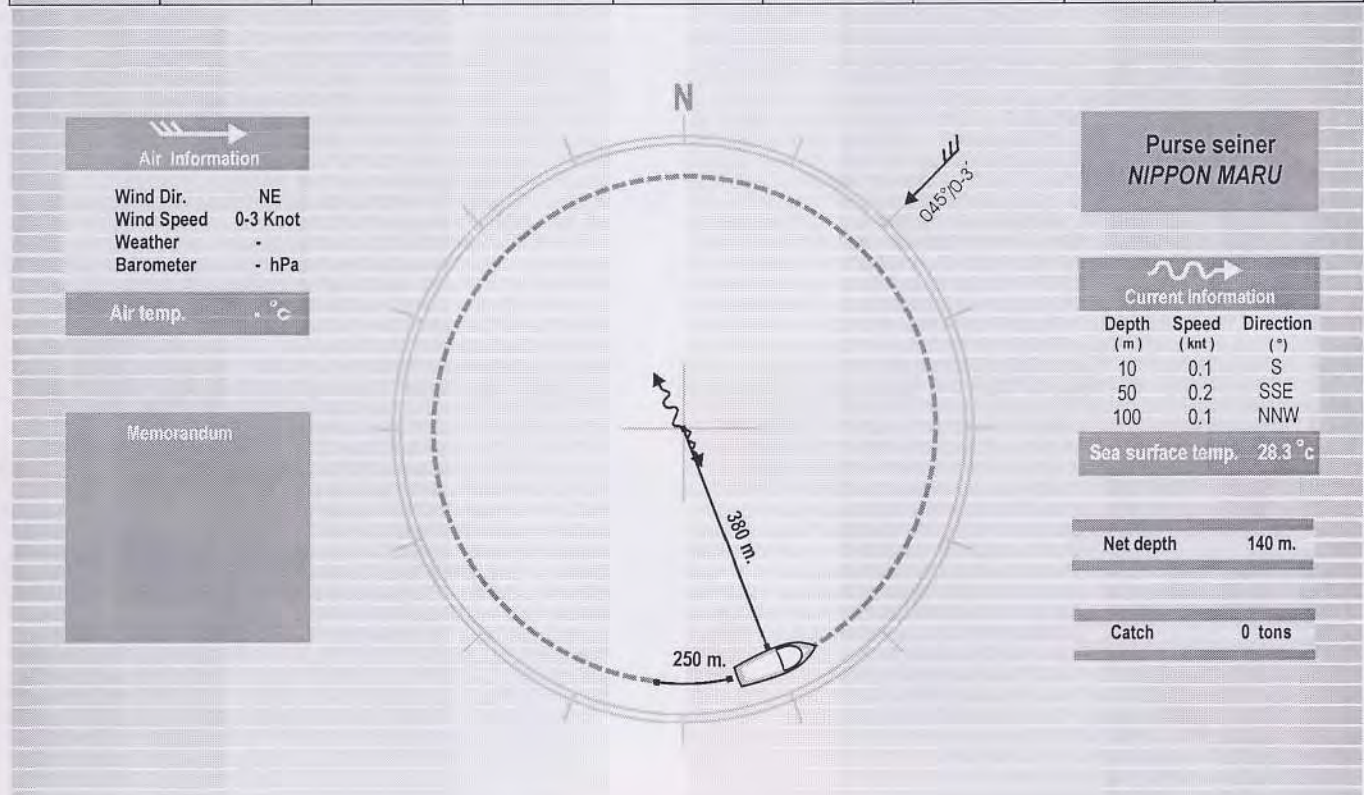


Date	Position	Target	Start St.	Finish Sh.	Purse line Haul	Fin. Purse line Haul	Net Haul	Fin. Net Haul
8/12/92	03°14.1'S 062°28.7'E	Drifting FAD	0433	0439	0440	0510	0515	0740

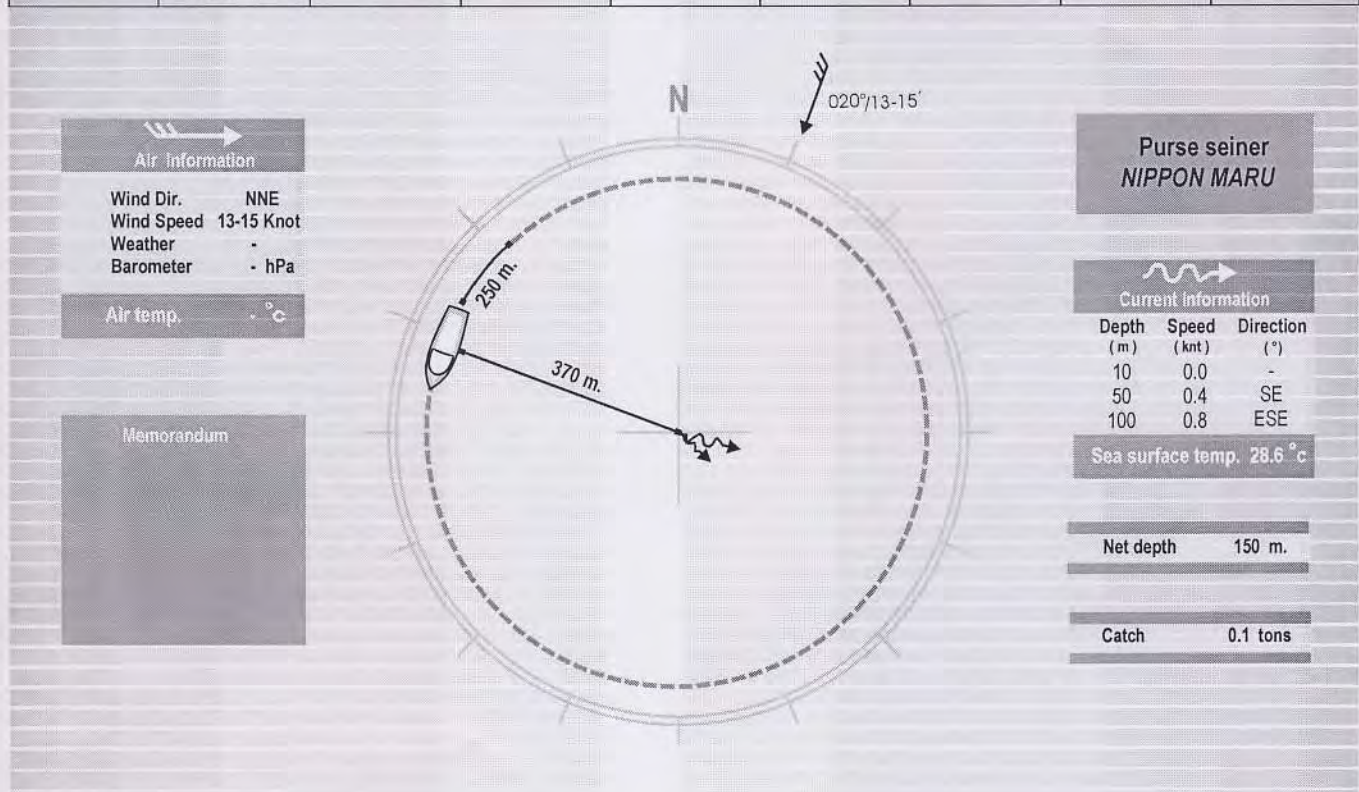


Tuna purse seine shooting operation technique

Date	Position	Target	Start St.	Finish Sh.	Purse line Haul	Fin. Purse line Haul	Net Haul	Fin. Net Haul
9/12/92	04°51.1'S 060°13.3'E	Schooling	0709	0716	0717	0753	0800	0950

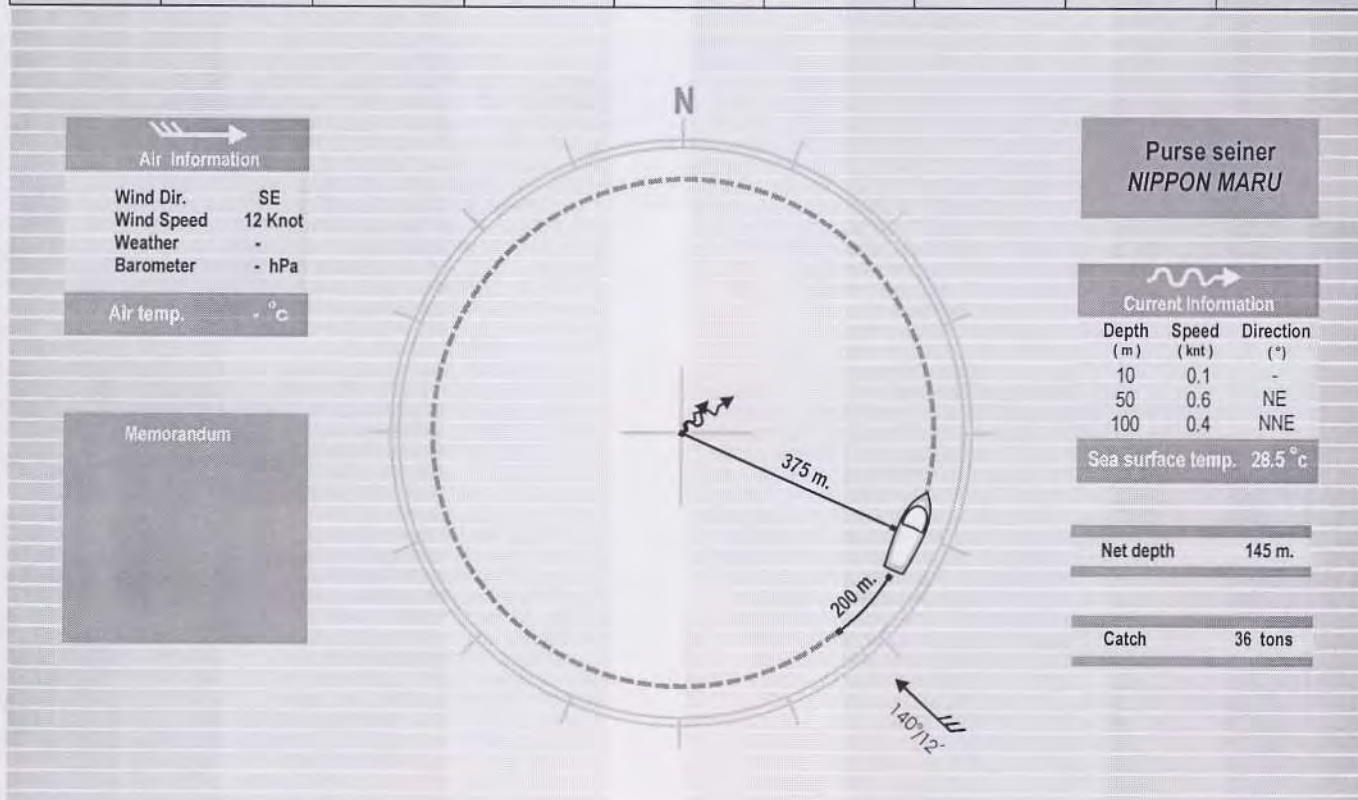


Date	Position	Target	Start St.	Finish Sh.	Purse line Haul	Fin. Purse line Haul	Net Haul	Fin. Net Haul
11/12/92	04°40.6'S 059°02.2'E	Drifting FAD	0503	0510	0510	0543	0550	0745

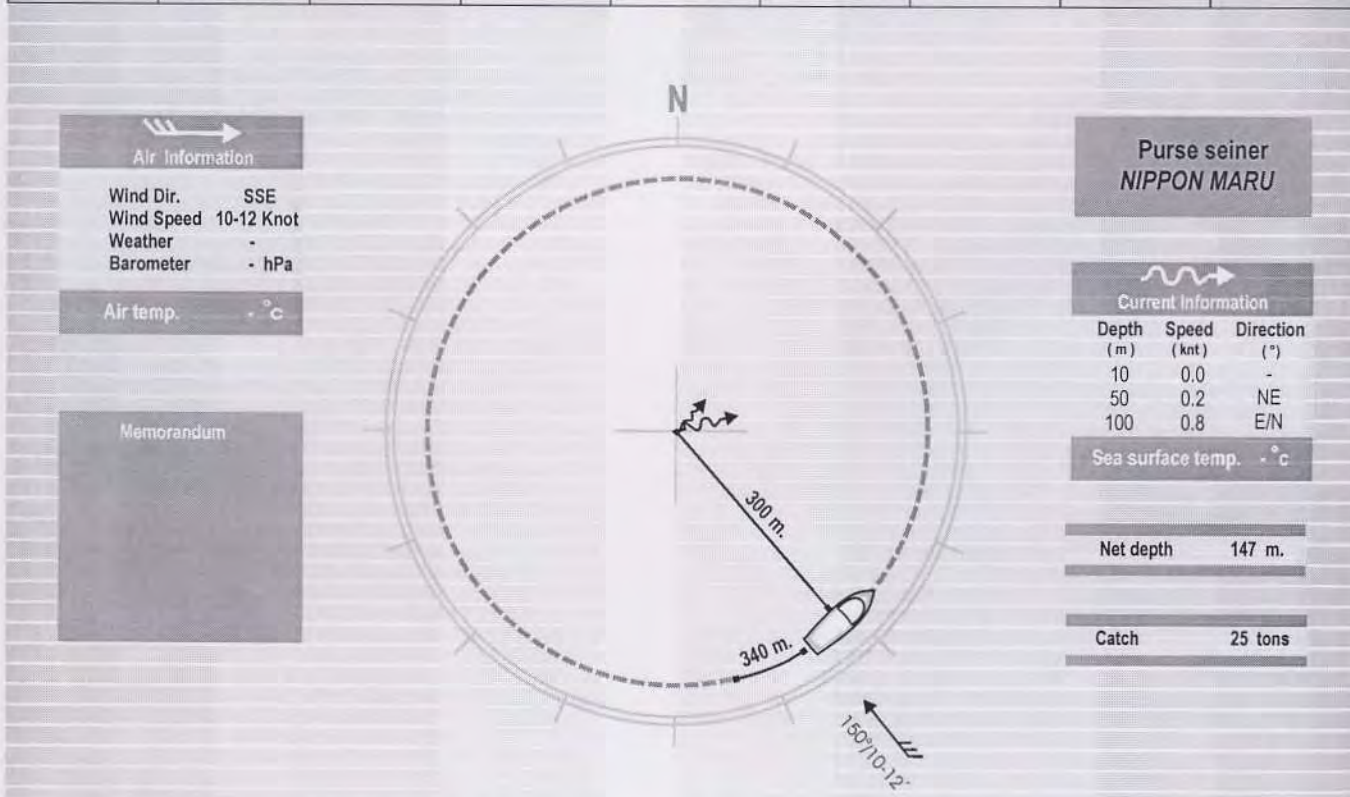


Tuna purse seine shooting operation technique

Date	Position	Target	Start St.	Finish Sh.	Purse line Haul	Fin. Purse line Haul	Net Haul	Fin. Net Haul
14/12/92	05°25.9S 049°40.6E	Drifting FAD	0540	0547	0547	0617	0620	0940

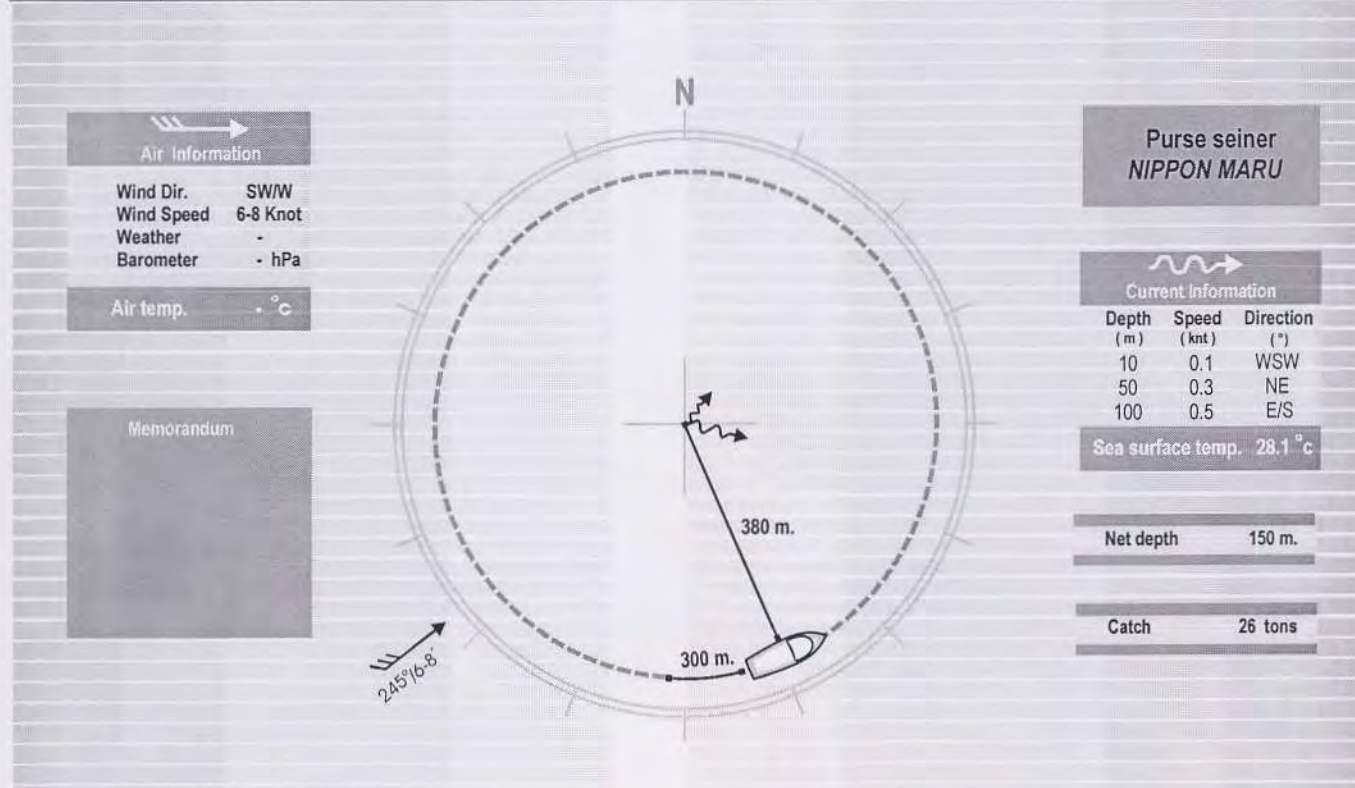


Date	Position	Target	Start St.	Finish Sh.	Purse line Haul	Fin. Purse line Haul	Net Haul	Fin. Net Haul
15/12/92	04°50.0S 045°55.6E	Drifting FAD	0551	0559	0600	0637	0640	0930

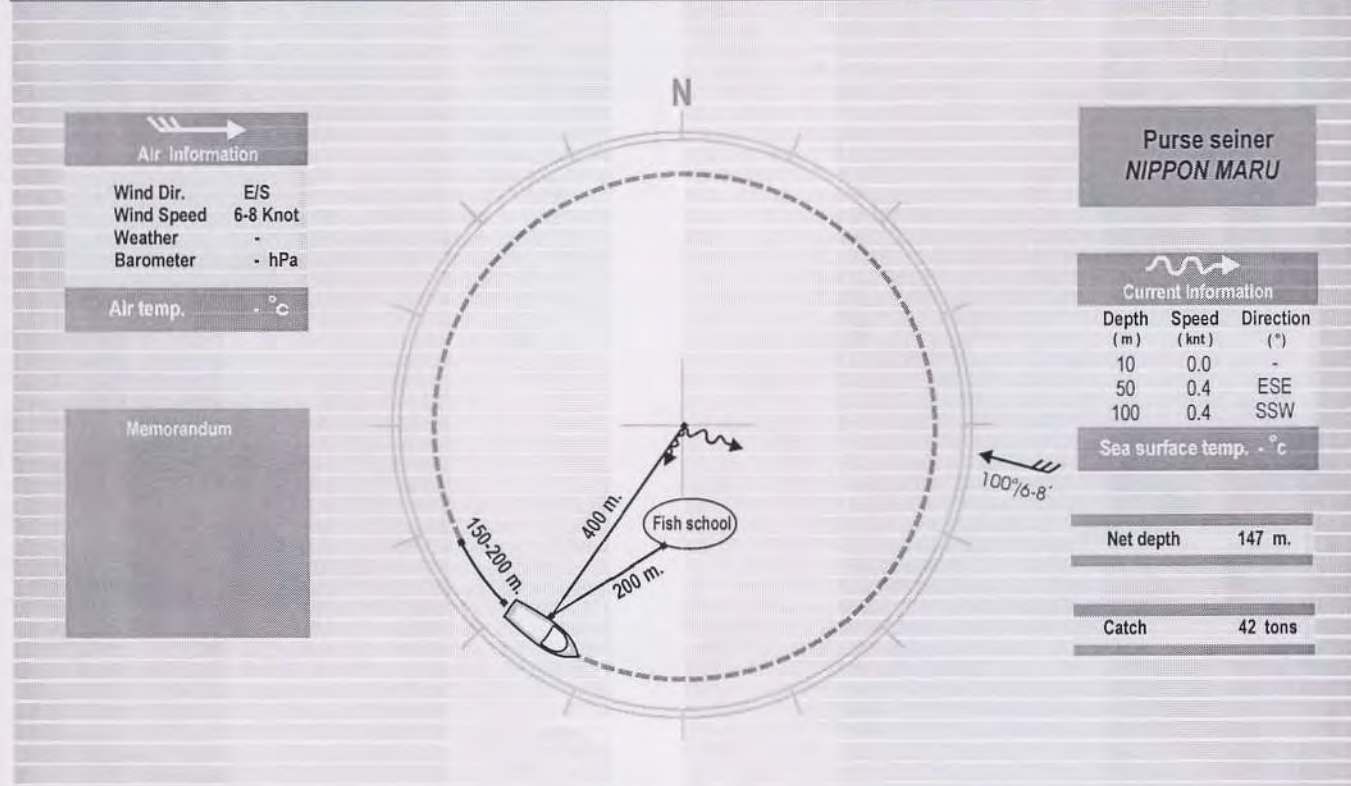


Tuna purse seine shooting operation technique

Date	Position	Target	Start St.	Finish Sh.	Purse line Haul	Fin. Purse line Haul	Net Haul	Fin. Net Haul
16/12/92	03°28.0'S 044°26.0'E	Drifting FAD	0545	0553	0553	0625	0630	0940



Date	Position	Target	Start St.	Finish Sh.	Purse line Haul	Fin. Purse line Haul	Net Haul	Fin. Net Haul
15/12/92	04°50.0'S 045°55.6'E	Drifting FAD	0547	0554	0555	0625	0630	1015



Tuna purse seine shooting operation technique

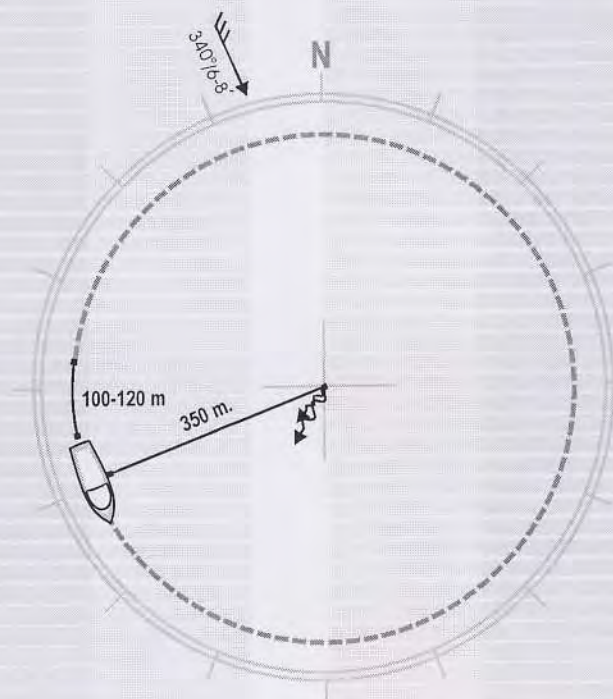
Date	Position	Target	Start St.	Finish Sh.	Purse line Haul	Fin. Purse line Haul	Net Haul	Fin. Net Haul
19/12/92	05°46'0S 045°45'8E	Drifting FAD	0545	0558	0559	0635	0640	0900

Air Information

Wind Dir. NNW
Wind Speed 6-8 Knot
Weather -
Barometer - hPa

Air temp. - °C

Memorandum



Purse seiner
NIPPON MARU

Current Information

Depth (m)	Speed (knt)	Direction (°)
10	0.0	-
50	0.3	SW/S
100	0.7	SSW

Sea surface temp. 28.4 °C

Net depth 145 m.

Catch 9 tons

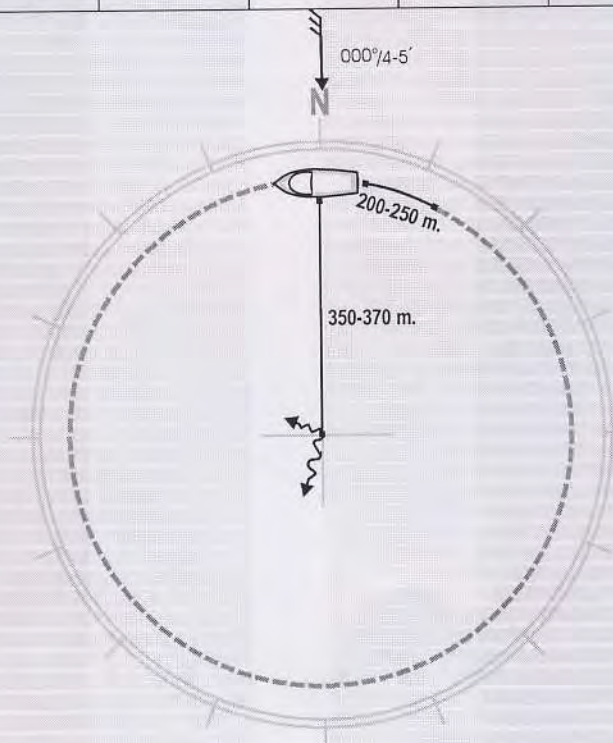
Date	Position	Target	Start St.	Finish Sh.	Purse line Haul	Fin. Purse line Haul	Net Haul	Fin. Net Haul
20/12/92	05°51'2S 044°27'6E	Drifting FAD	0555	0602	0602	0640	0643	1000

Air Information

Wind Dir. N
Wind Speed 4 Knot
Weather -
Barometer - hPa

Air temp. - °C

Memorandum



Purse seiner
NIPPON MARU

Current Information

Depth (m)	Speed (knt)	Direction (°)
10	0.1	E
50	0.6	SSW
100	0.4	W/N

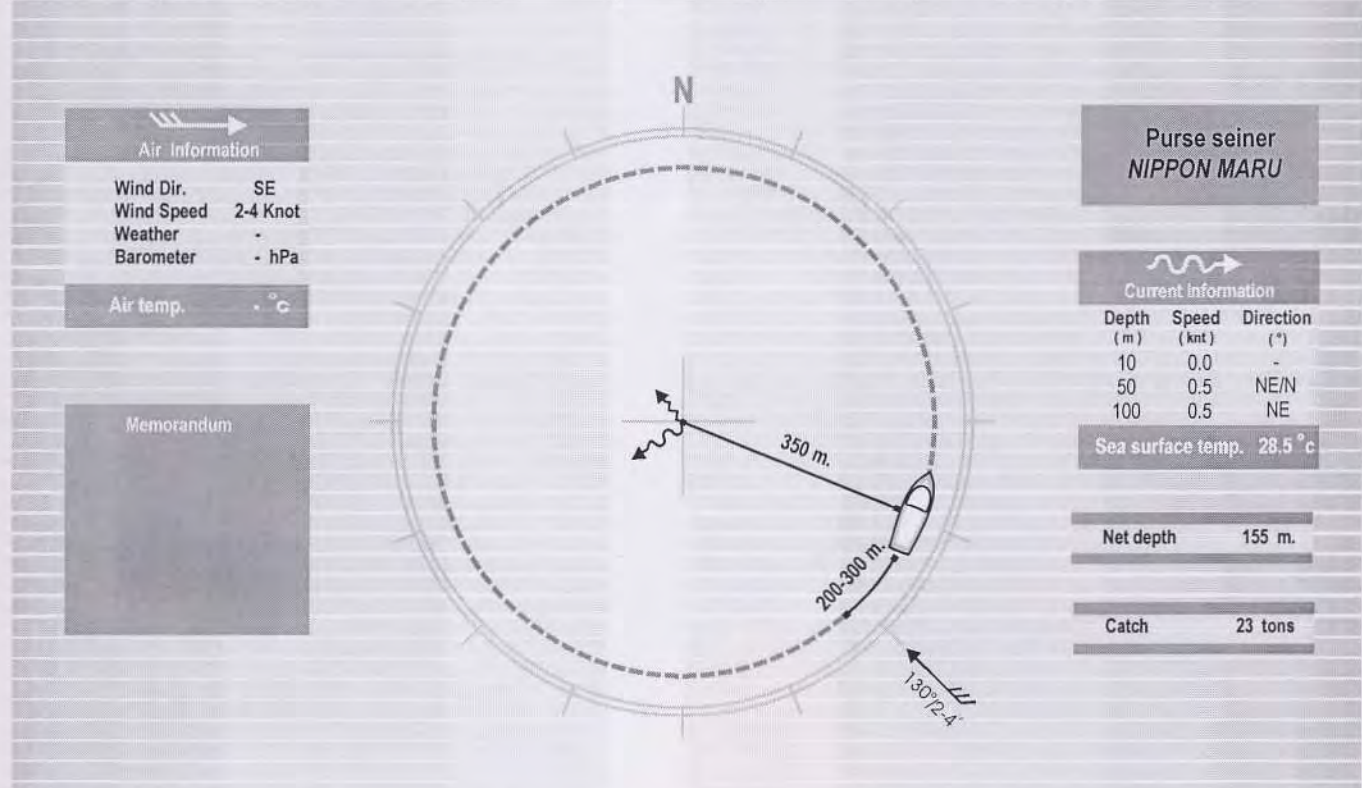
Sea surface temp. - °C

Net depth 100 m.

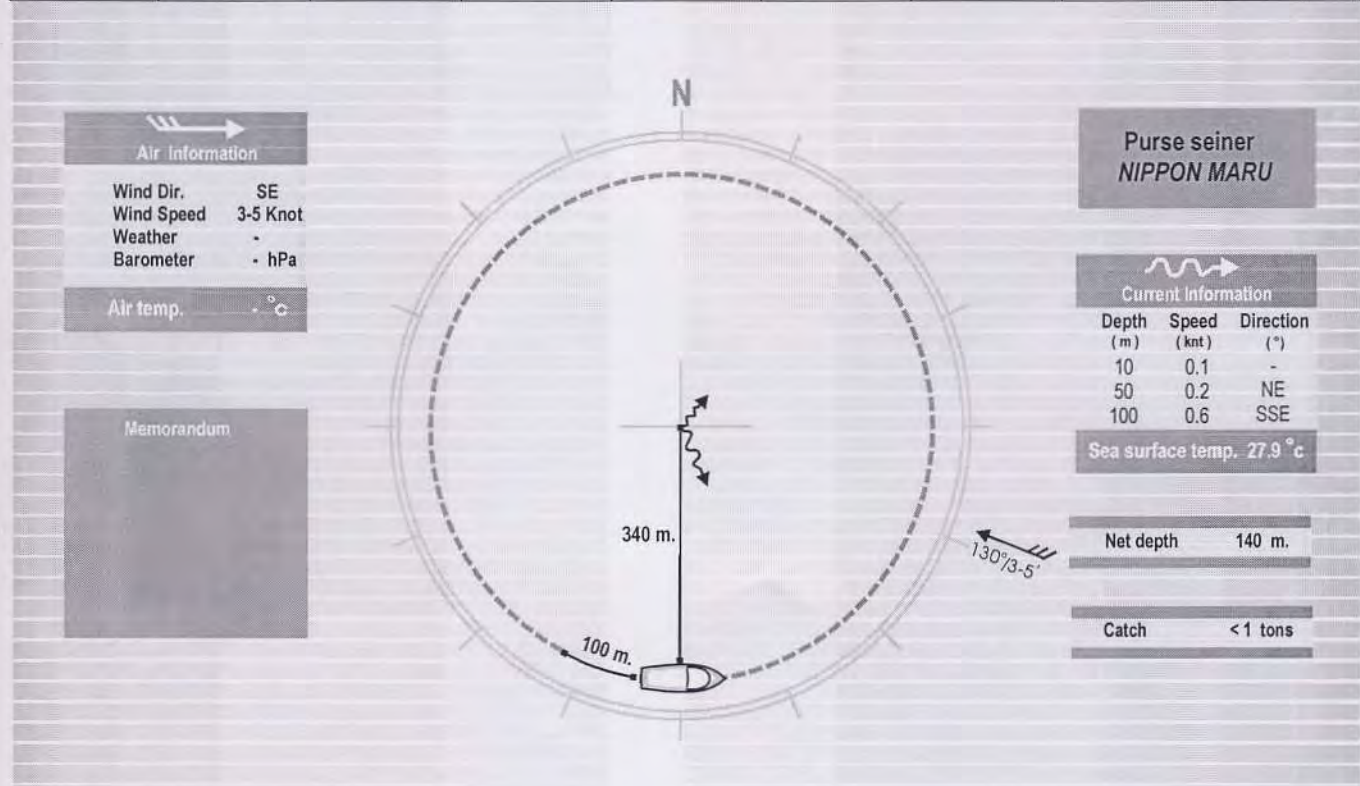
Catch 30 tons

Tuna purse seine shooting operation technique

Date	Position	Target	Start St.	Finish Sh.	Purse line Haul	Fin. Purse line Haul	Net Haul	Fin. Net Haul
22/12/92	05°13.4S 049°54.0E	Drifting FAD	0535	0542	0543	0612	0617	0905

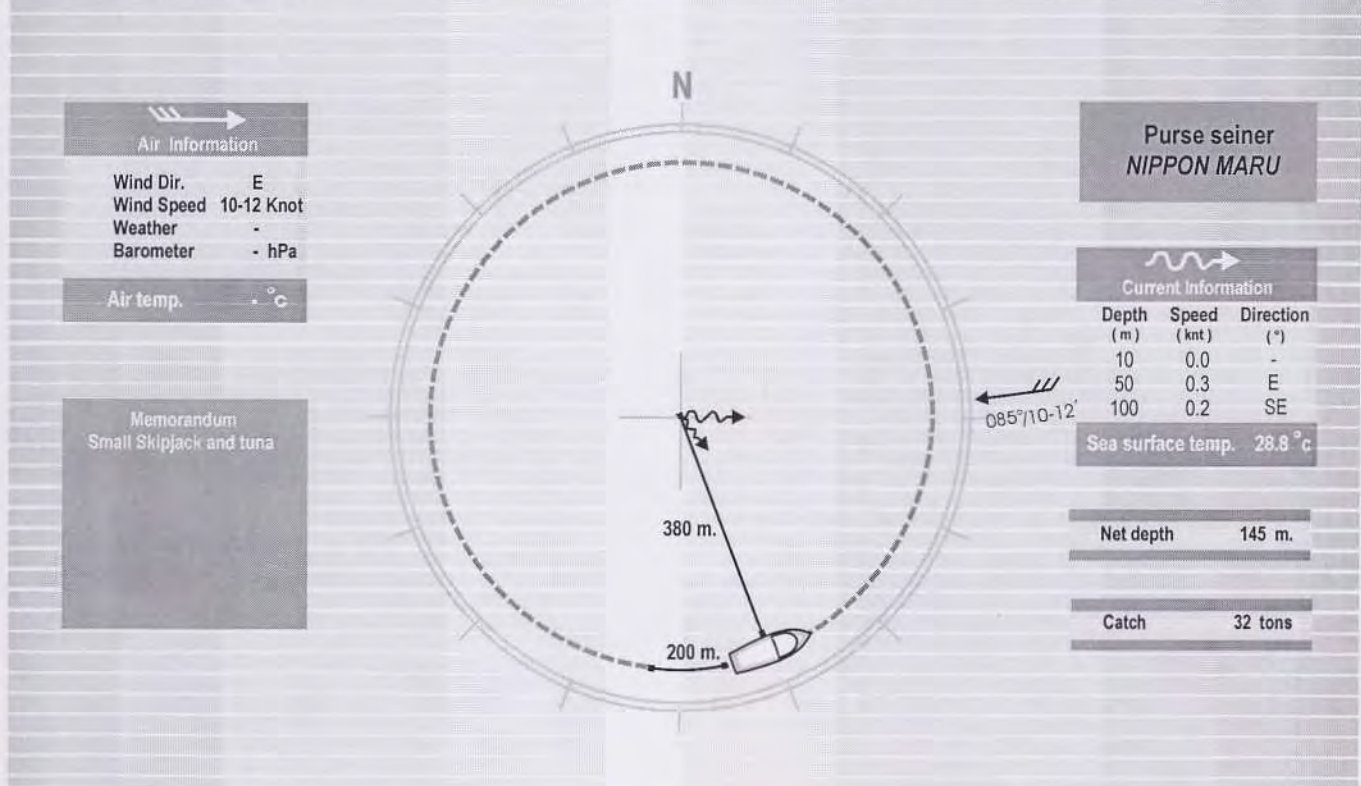


Date	Position	Target	Start St.	Finish Sh.	Purse line Haul	Fin. Purse line Haul	Net Haul	Fin. Net Haul
24/12/92	06°30.7S 051°53.7E	Drifting FAD	0529	0536	0537	0600	0610	0830

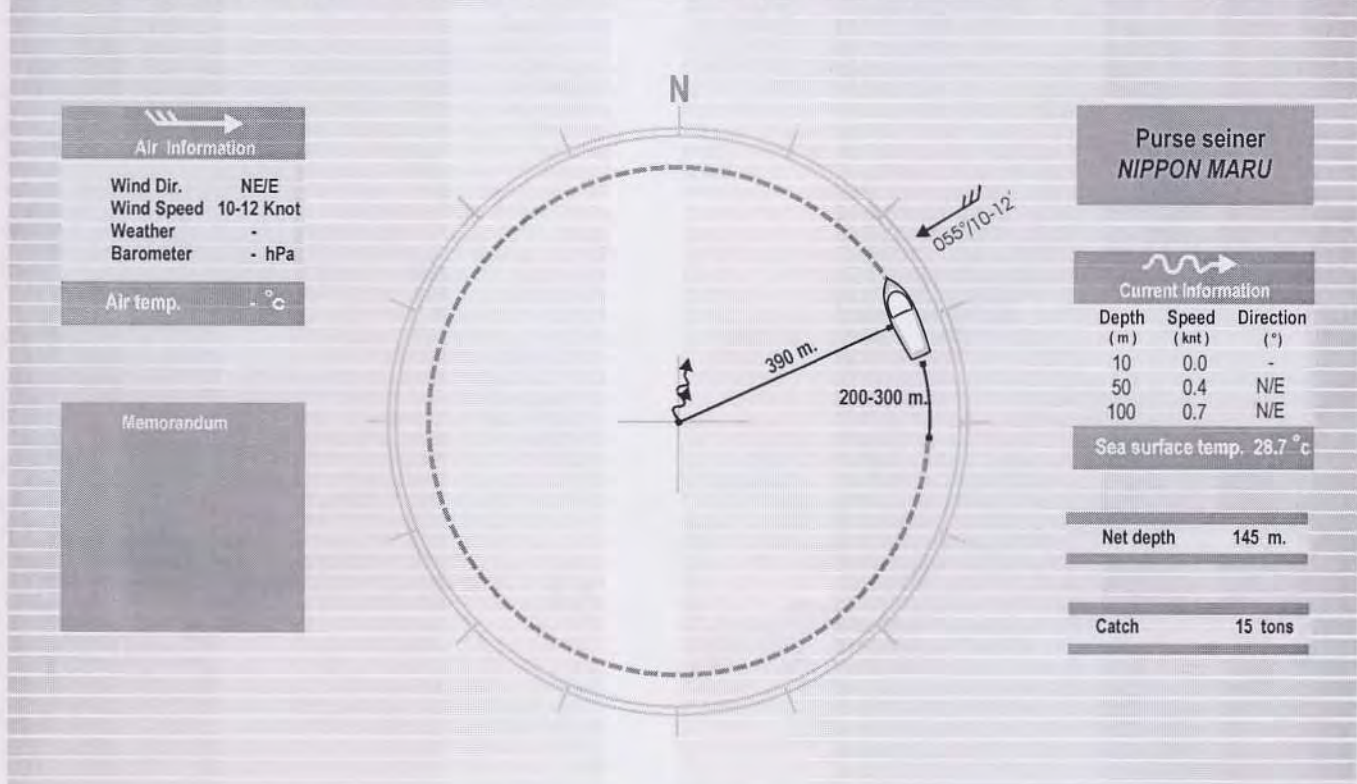


Tuna purse seine shooting operation technique

Date	Position	Target	Start St.	Finish Sh.	Purse line Haul	Fin. Purse line Haul	Net Haul	Fin. Net Haul
27/12/92	04°38'5S 046°52'0E	Drifting FAD	0545	0552	0553	0627	0630	1040

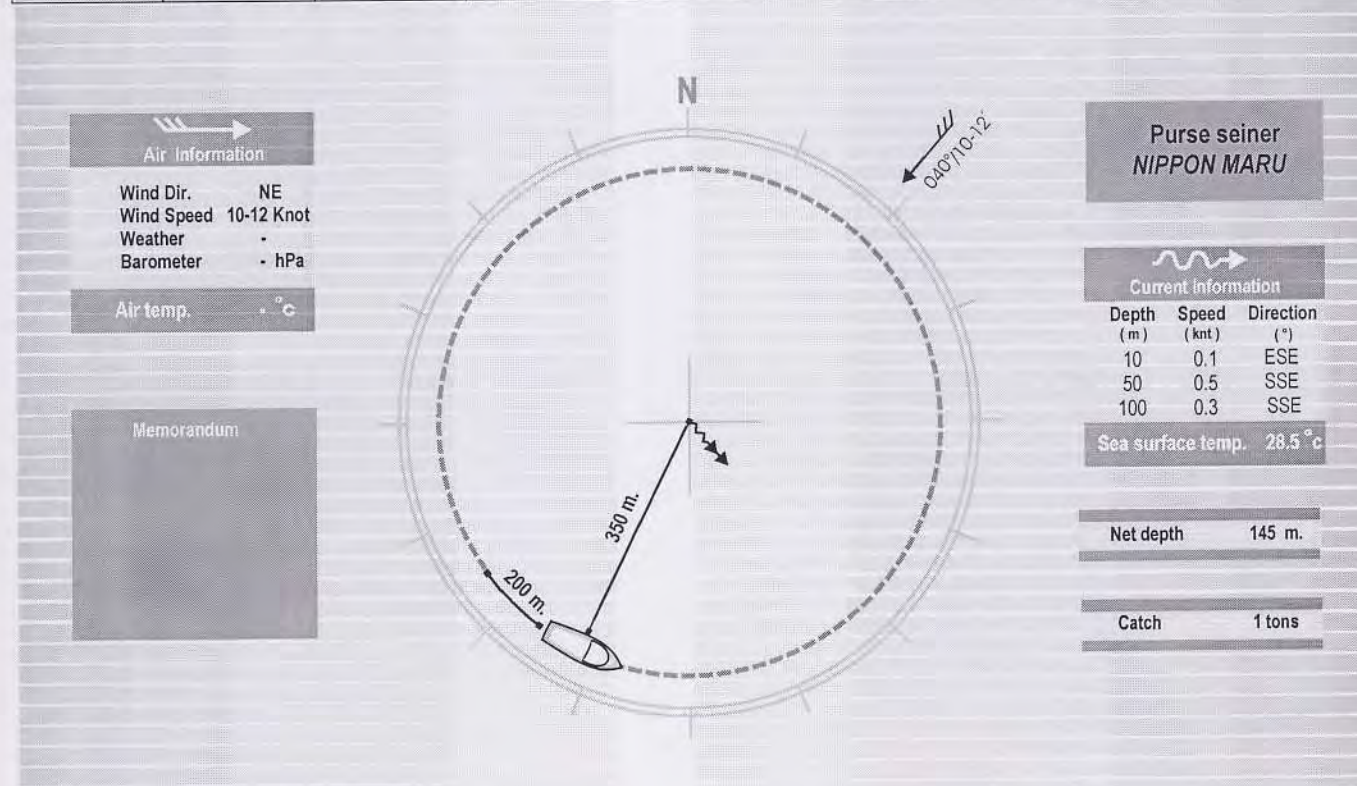


Date	Position	Target	Start St.	Finish Sh.	Purse line Haul	Fin. Purse line Haul	Net Haul	Fin. Net Haul
28/12/92	06°04'8S 044°29'5E	Drifting FAD	0552	0600	0602	0629	0635	0930

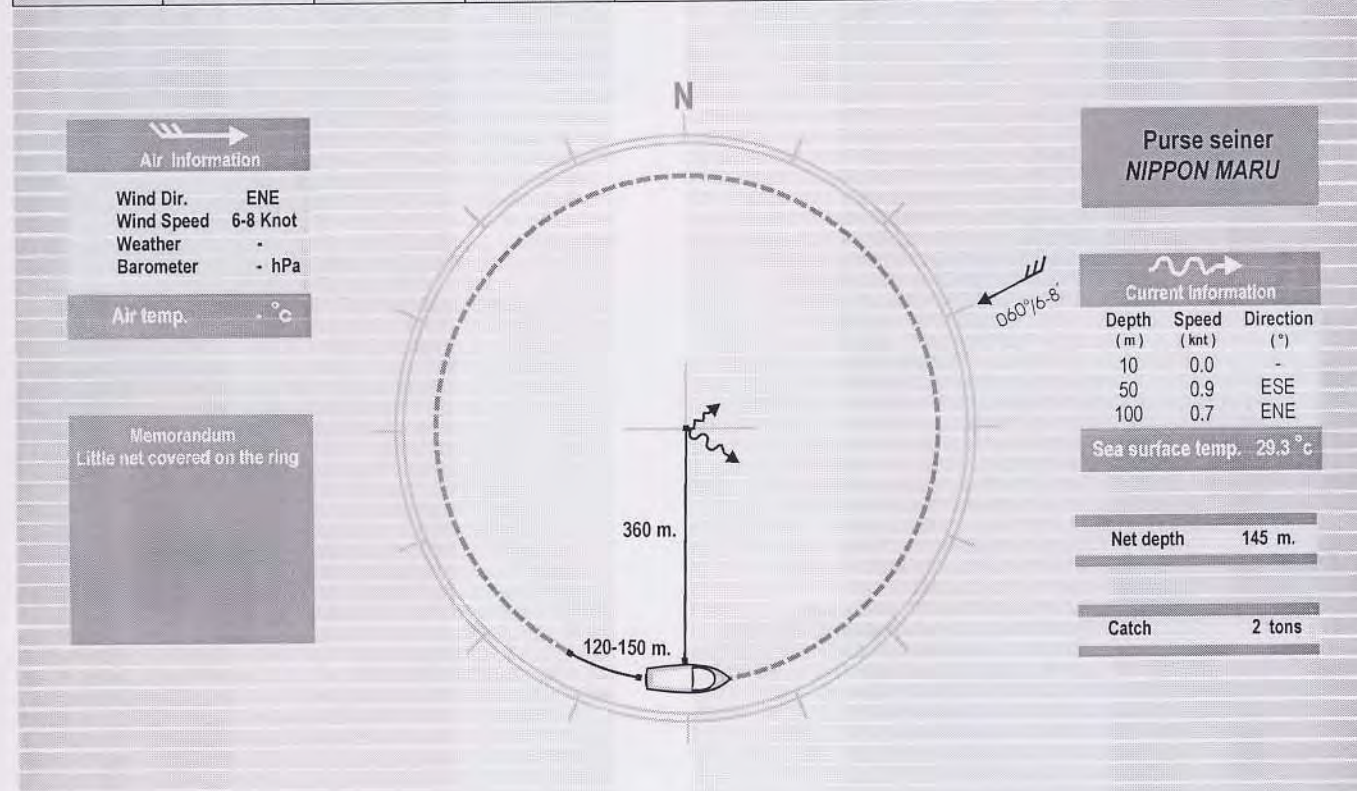


Tuna purse seine shooting operation technique

Date	Position	Target	Start St.	Finish Sh.	Purse line Haul	Fin. Purse line Haul	Net Haul	Fin. Net Haul
29/12/92	03°47'8S 044°25'9E	Drifting FAD	0555	0602	0603	0637	0640	0845

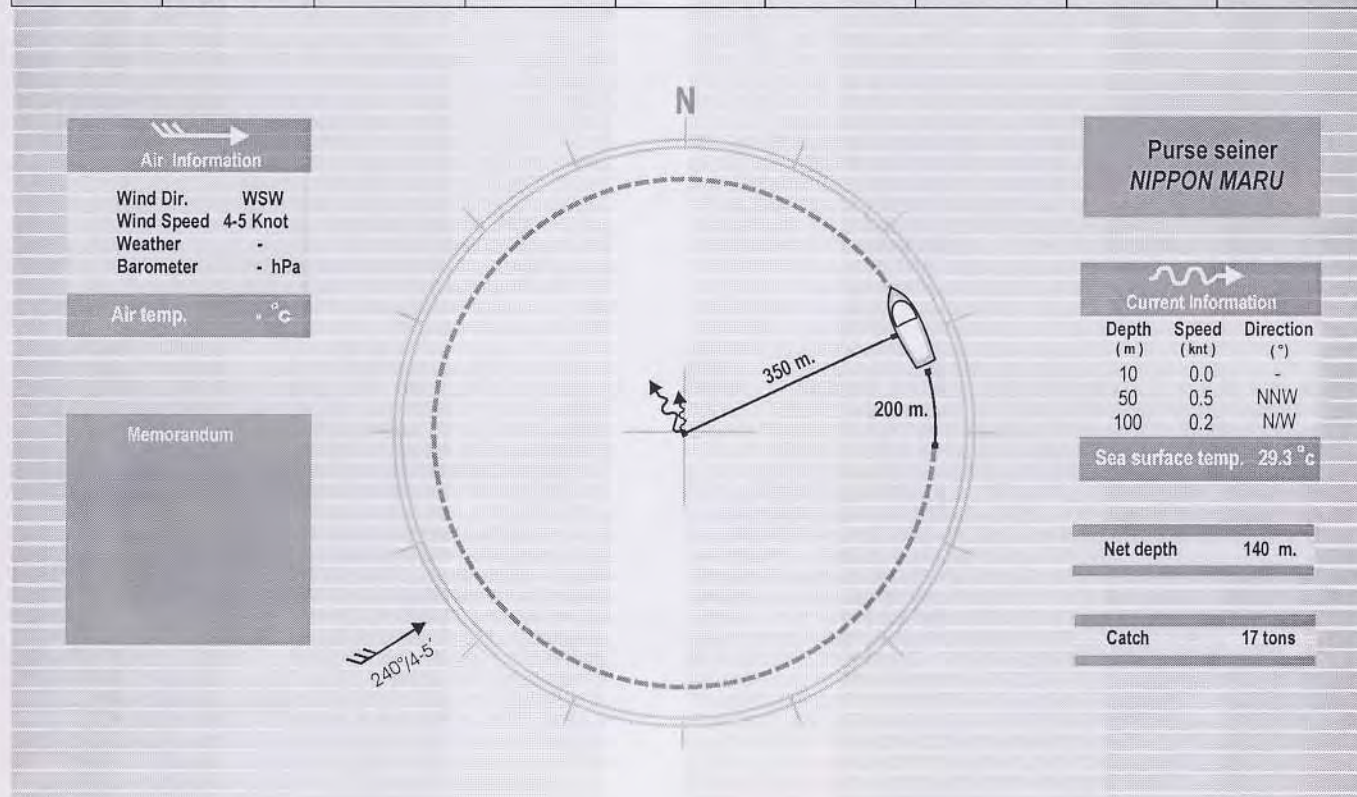


Date	Position	Target	Start St.	Finish Sh.	Purse line Haul	Fin. Purse line Haul	Net Haul	Fin. Net Haul
31/12/92	05°53'6S 049°13'9E	Drifting FAD	0538	0543	0543	0617	0620	0840

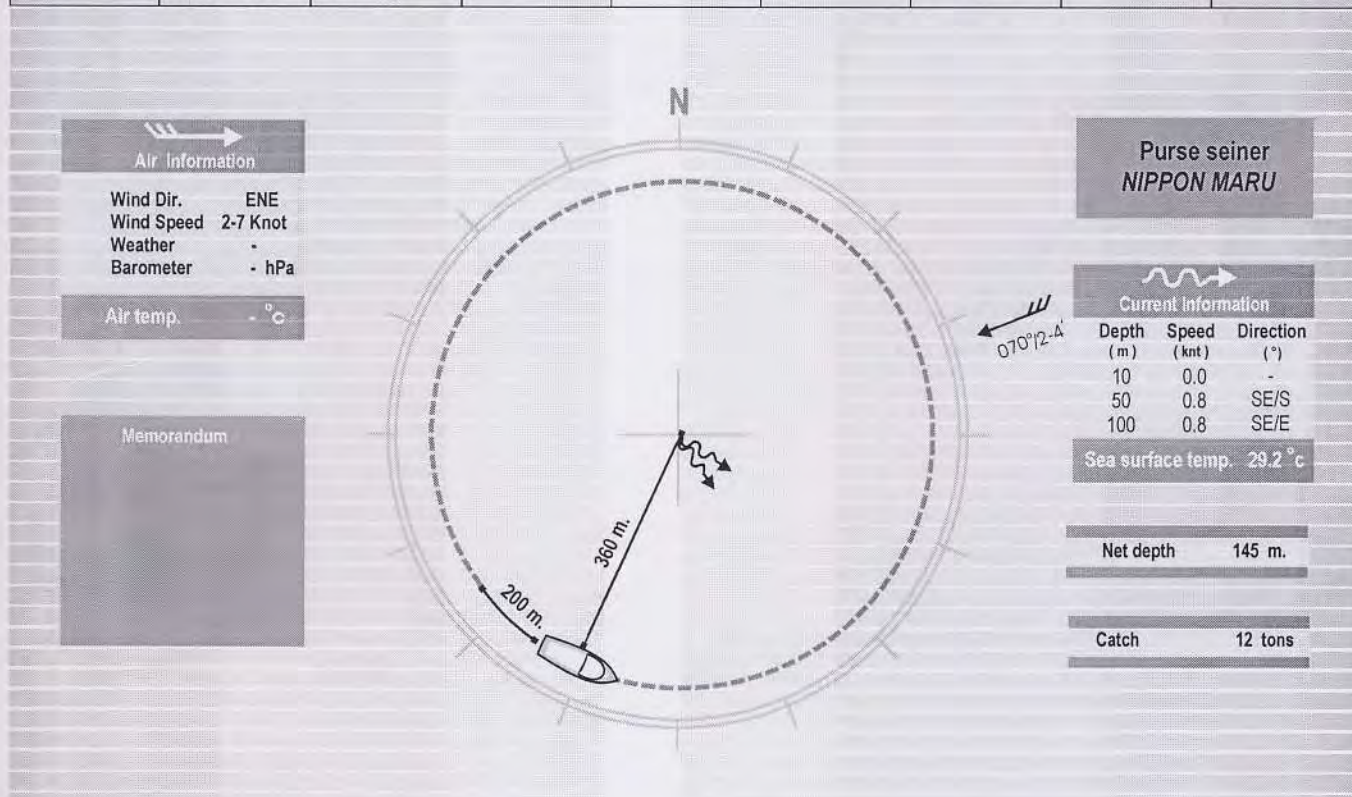


Tuna purse seine shooting operation technique

Date	Position	Target	Start St.	Finish Sh.	Purse line Haul	Fin. Purse line Haul	Net Haul	Fin. Net Haul
1/01/93	06°12.8'S 049°02.1'E	Drifting FAD	0542	0549	0550	0616	0620	0930

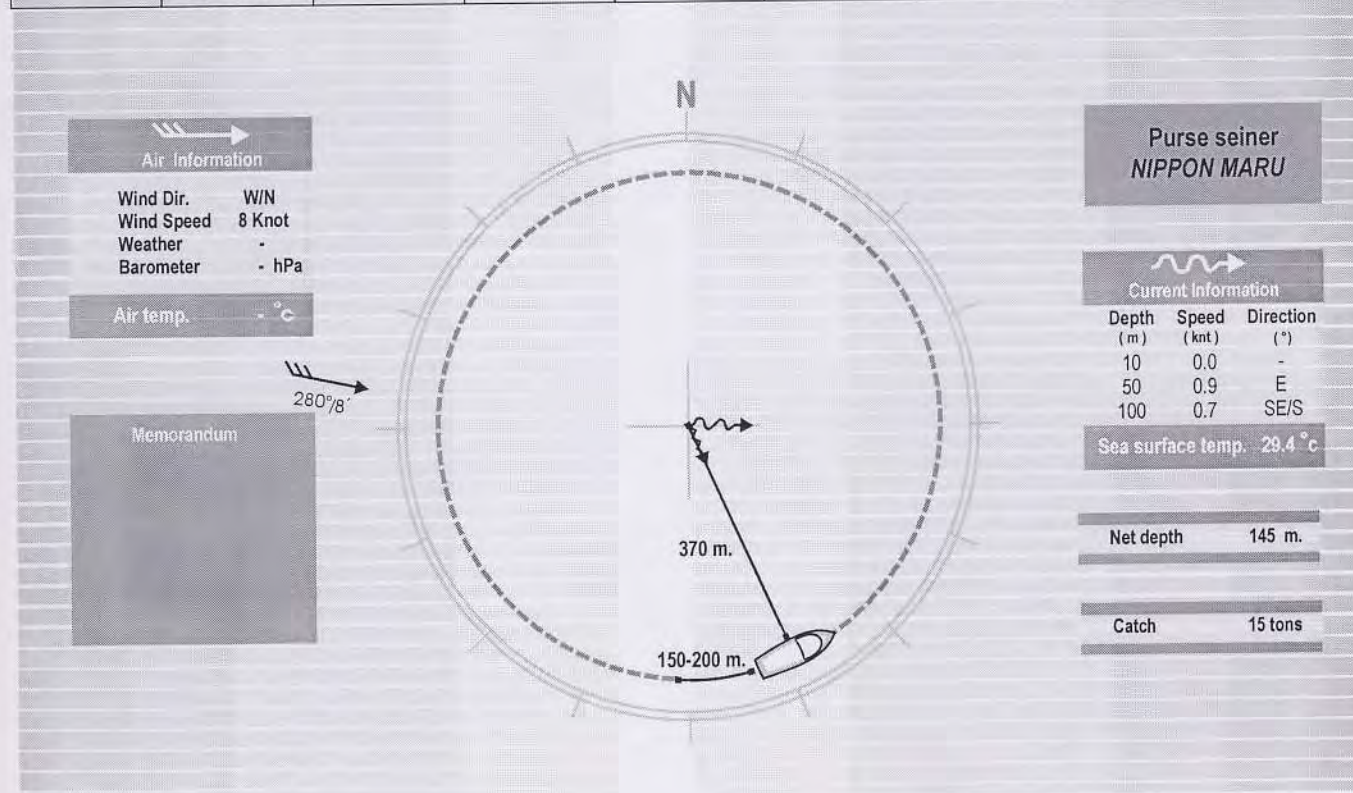


Date	Position	Target	Start St.	Finish Sh.	Purse line Haul	Fin. Purse line Haul	Net Haul	Fin. Net Haul
2/01/93	06°34.2'S 048°17.2'E	Drifting FAD and log	0538	0543	0545	0615	0620	0920

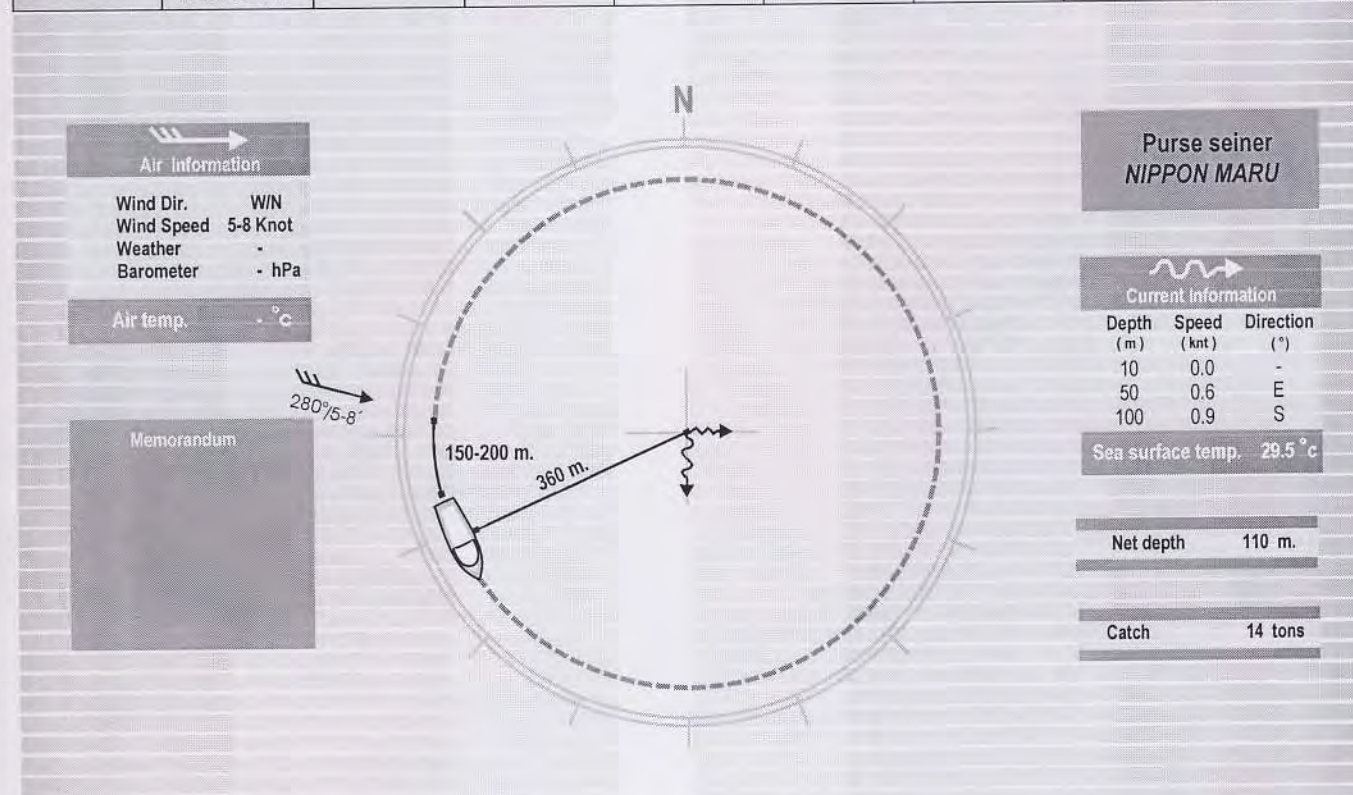


Tuna purse seine shooting operation technique

Date	Position	Target	Start St.	Finish Sh.	Purse line Haul	Fin. Purse line Haul	Net Haul	Fin. Net Haul
3/01/93	06°15'5S 047°55.7E	Drifting FAD	0531	0538	0540	0613	0617	0910

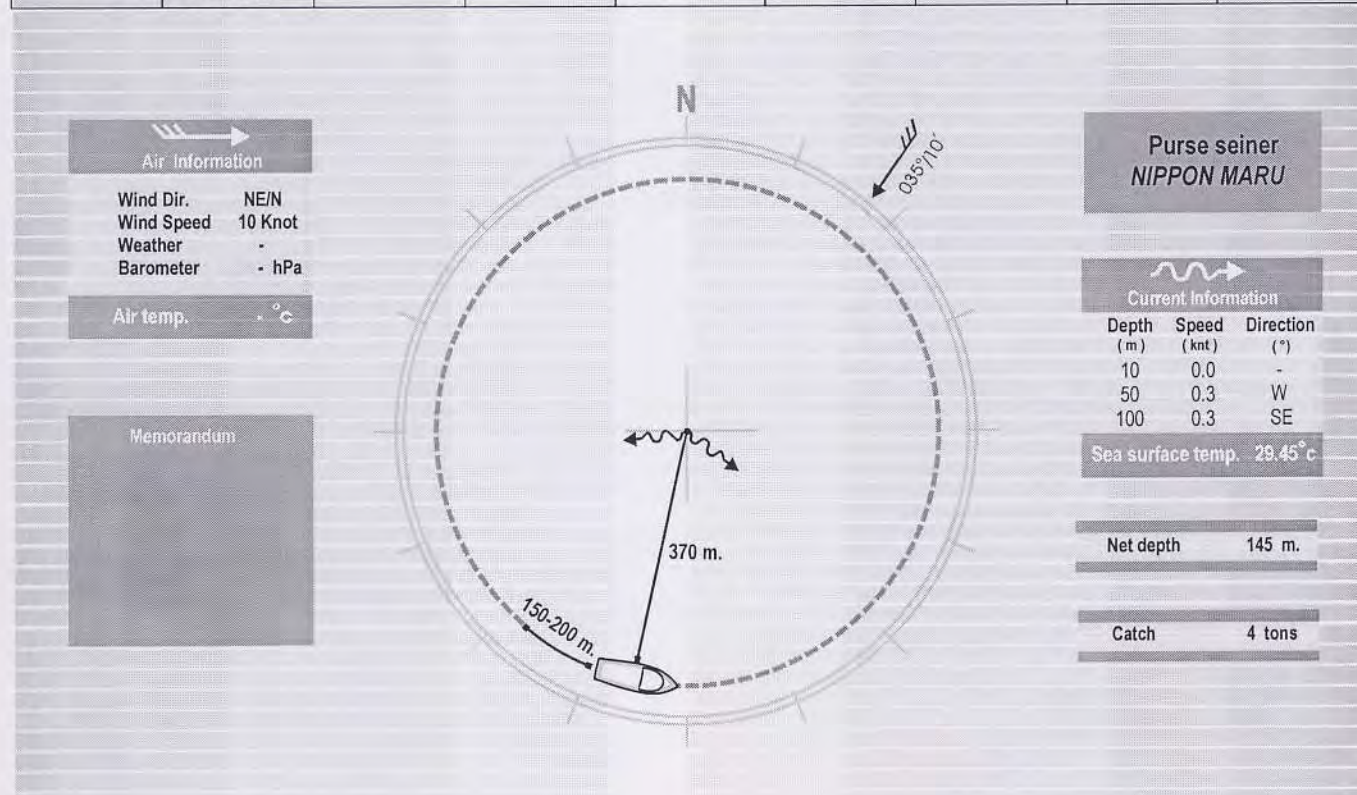


Date	Position	Target	Start St.	Finish Sh.	Purse line Haul	Fin. Purse line Haul	Net Haul	Fin. Net Haul
3/01/93	06°30.0S 047°44.4E	Drifting FAD	1037	1042	1043	1111	1120	1330

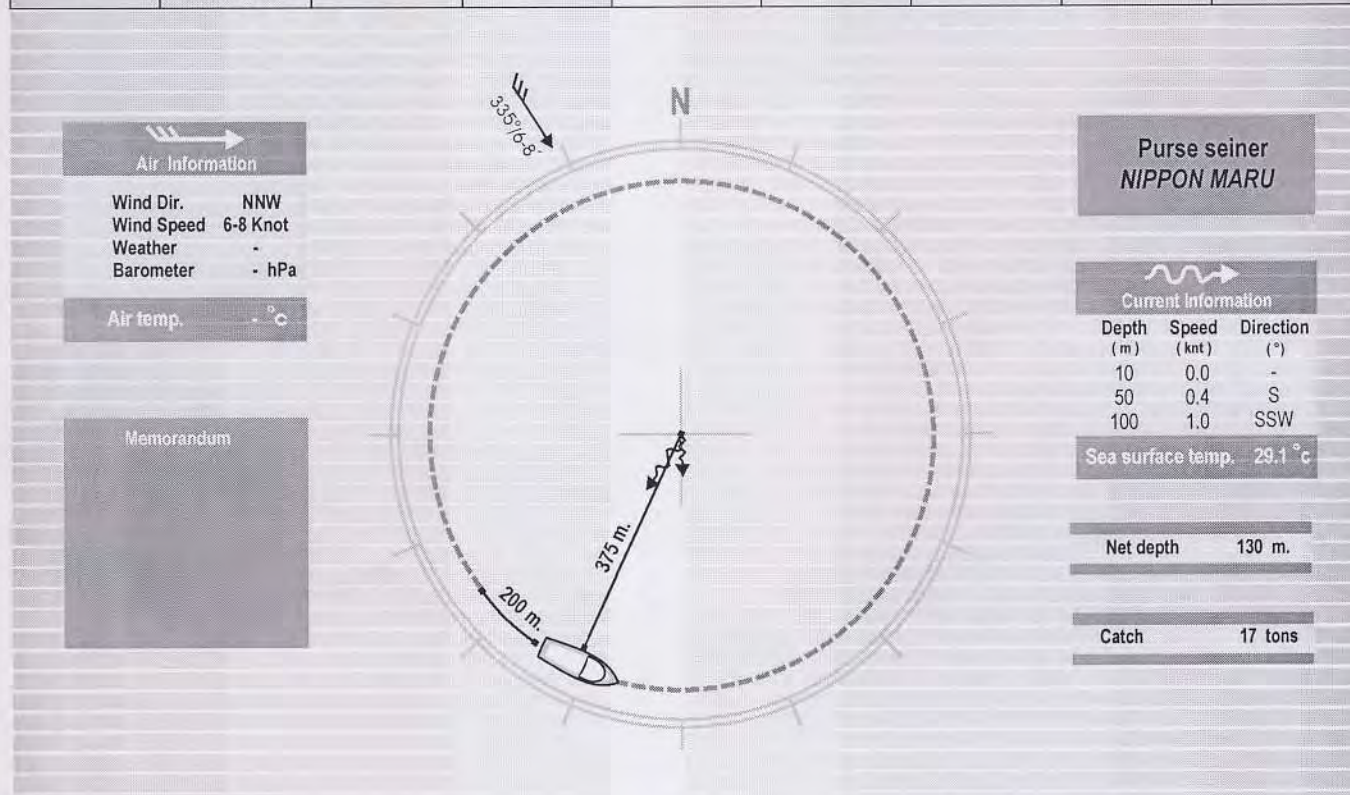


Tuna purse seine shooting operation technique

Date	Position	Target	Start St.	Finish Sh.	Purse line Haul	Fin. Purse line Haul	Net Haul	Fin. Net Haul
4/01/93	06°33.0S 047°47.1E	Drifting FAD	0547	0554	0555	0623	0628	0900

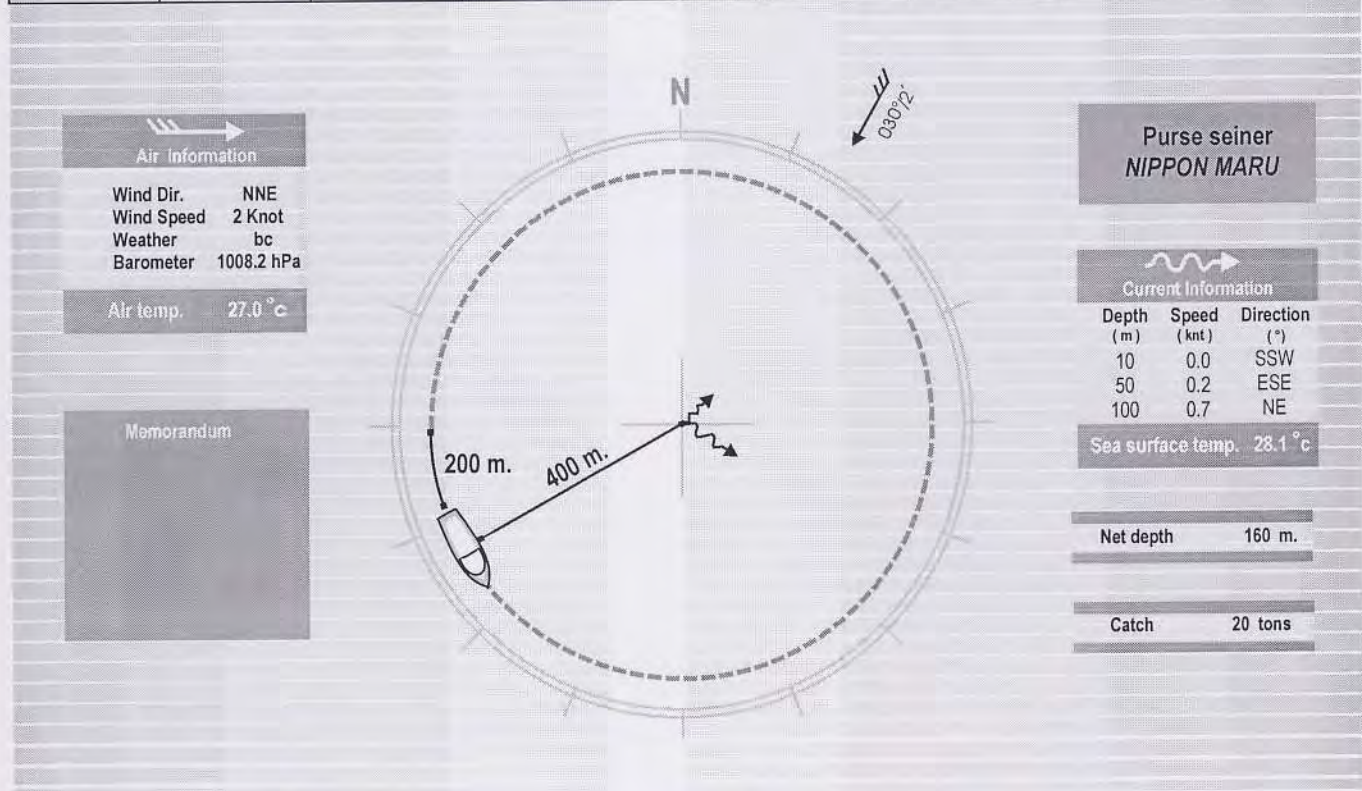


Date	Position	Target	Start St.	Finish Sh.	Purse line Haul	Fin. Purse line Haul	Net Haul	Fin. Net Haul
5/01/93	05°12.1S 048°55.0E	Drifting FAD	0534	0541	0542	0613	0618	0900

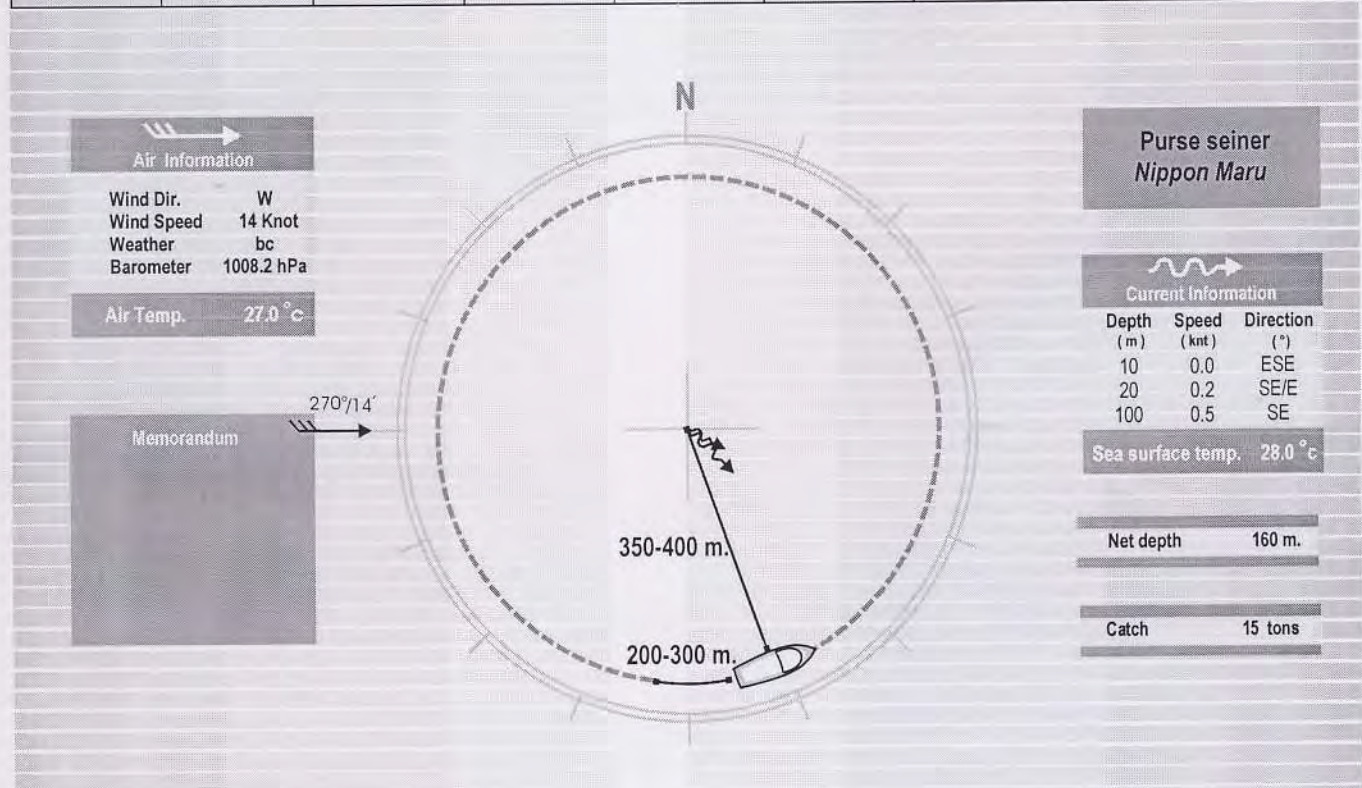


Tuna purse seine shooting operation technique

Date	Position	Target	Start St.	Finish Sh.	Purse line Haul	Fin. Purse line Haul	Net Haul	Fin. Net Haul
31/12/2000	04°23.1'N 085°30.1'E	Drifting FAD	0520	0527	0529	0600	0600	0926

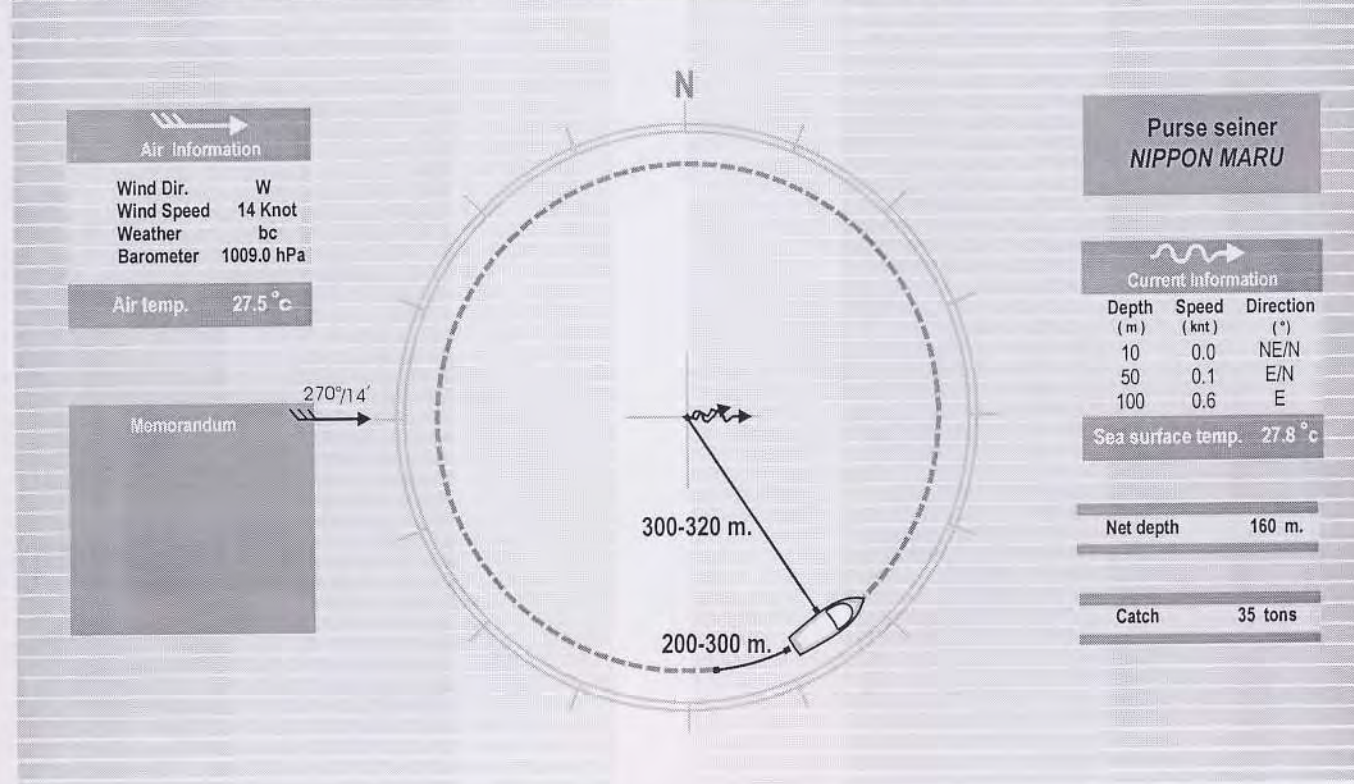


Date	Position	Target	Start St.	Finish Sh.	Purse line Haul	Fin. Purse line Haul	Net Haul	Fin. Net Haul
2/01/2001	01°01.6'S 091°00.7'E	Drifting FAD	0503	0509	0512	0538	0542	0815

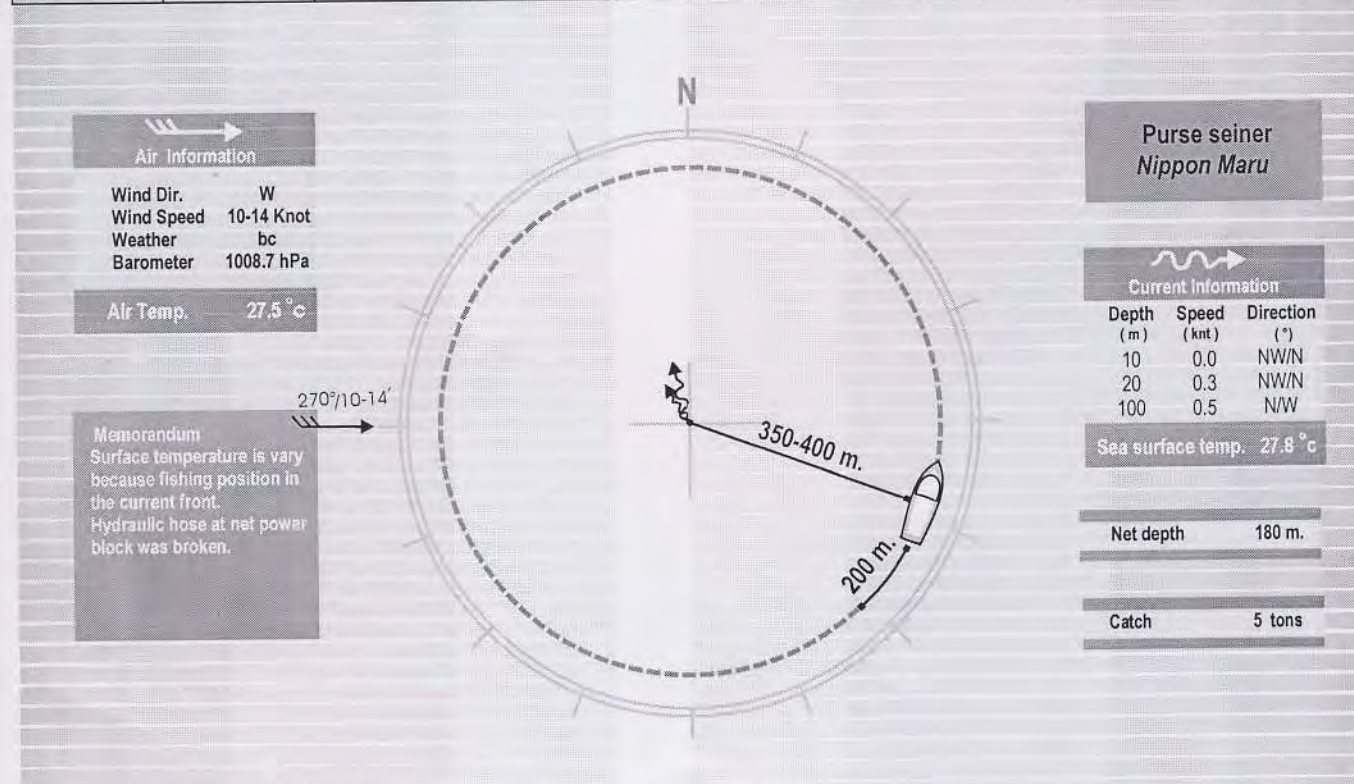


Tuna purse seine shooting operation technique

Date	Position	Target	Start St.	Finish Sh.	Purse line Haul	Fin. Purse line Haul	Net Haul	Fin. Net Haul
3/01/2001	00°25.1'S 089°01.8'E	Drifting FAD	0518	0524	0526	0552	0554	0910

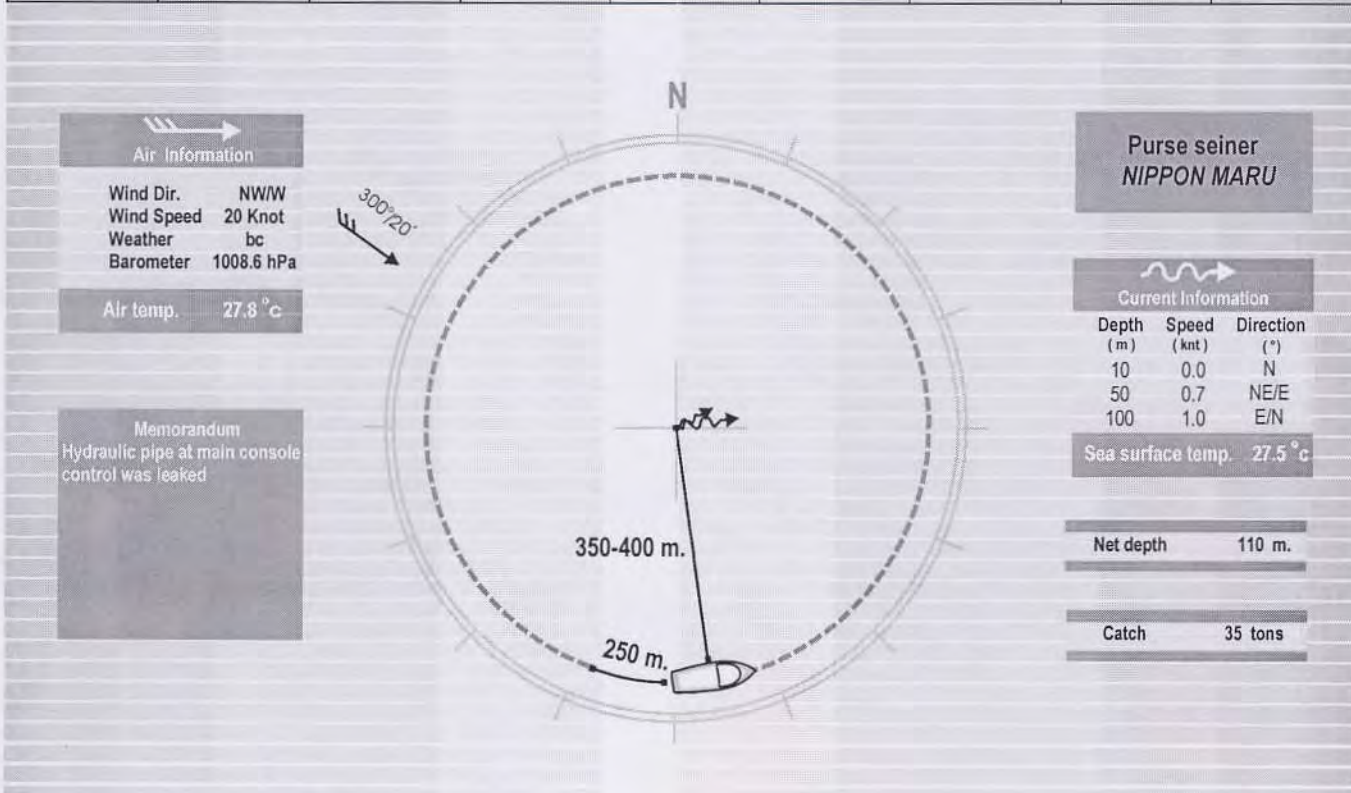


Date	Position	Target	Start St.	Finish Sh.	Purse line Haul	Fin. Purse line Haul	Net Haul	Fin. Net Haul
4/01/2001	00°30.8'S 089°30.1'E	Drifting FAD	0503	0509	0512	0538	0542	0815

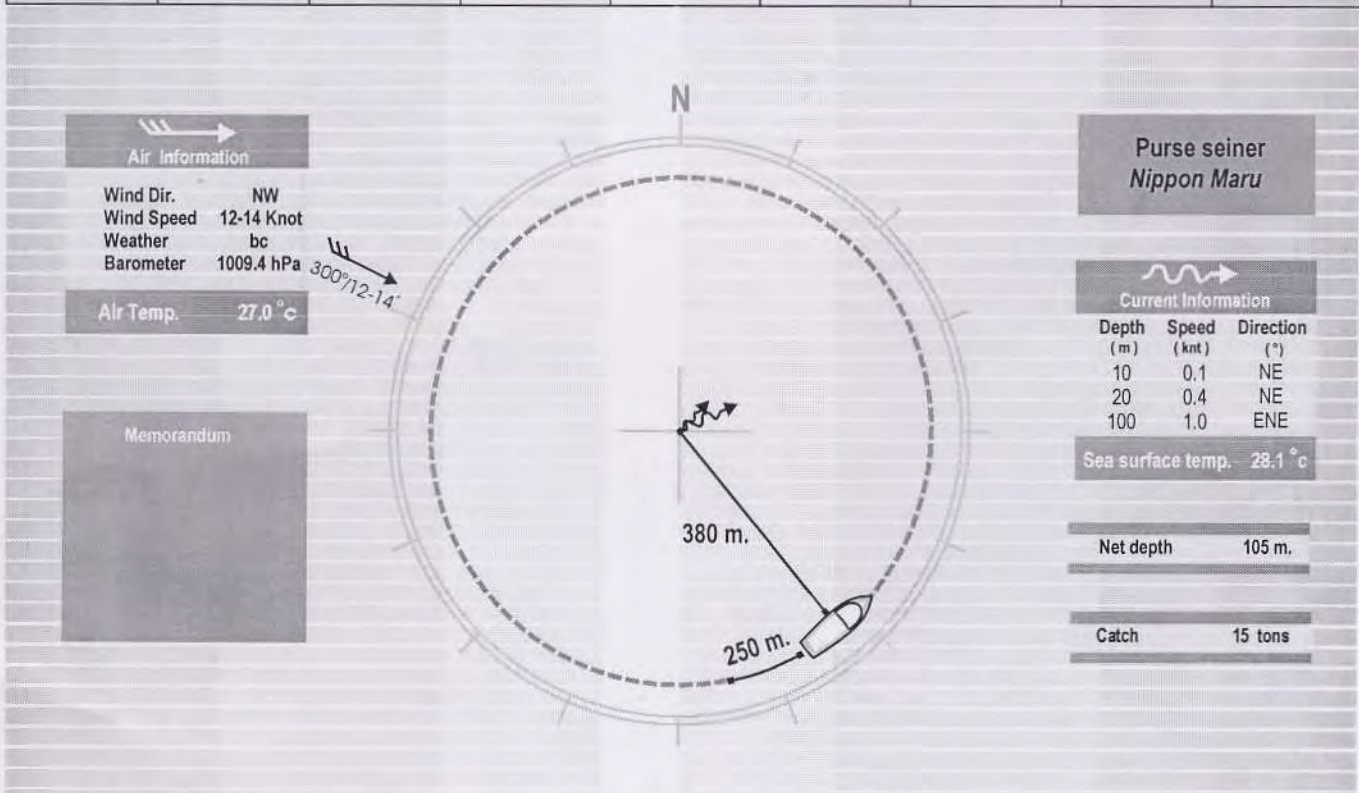


Tuna purse seine shooting operation technique

Date	Position	Target	Start St.	Finish Sh.	Purse line Haul	Fin. Purse line Haul	Net Haul	Fin. Net Haul
7/01/2001	04°38'3S 082°56'2E	Drifting FAD	0546	0552	0555	0620	0626	0957

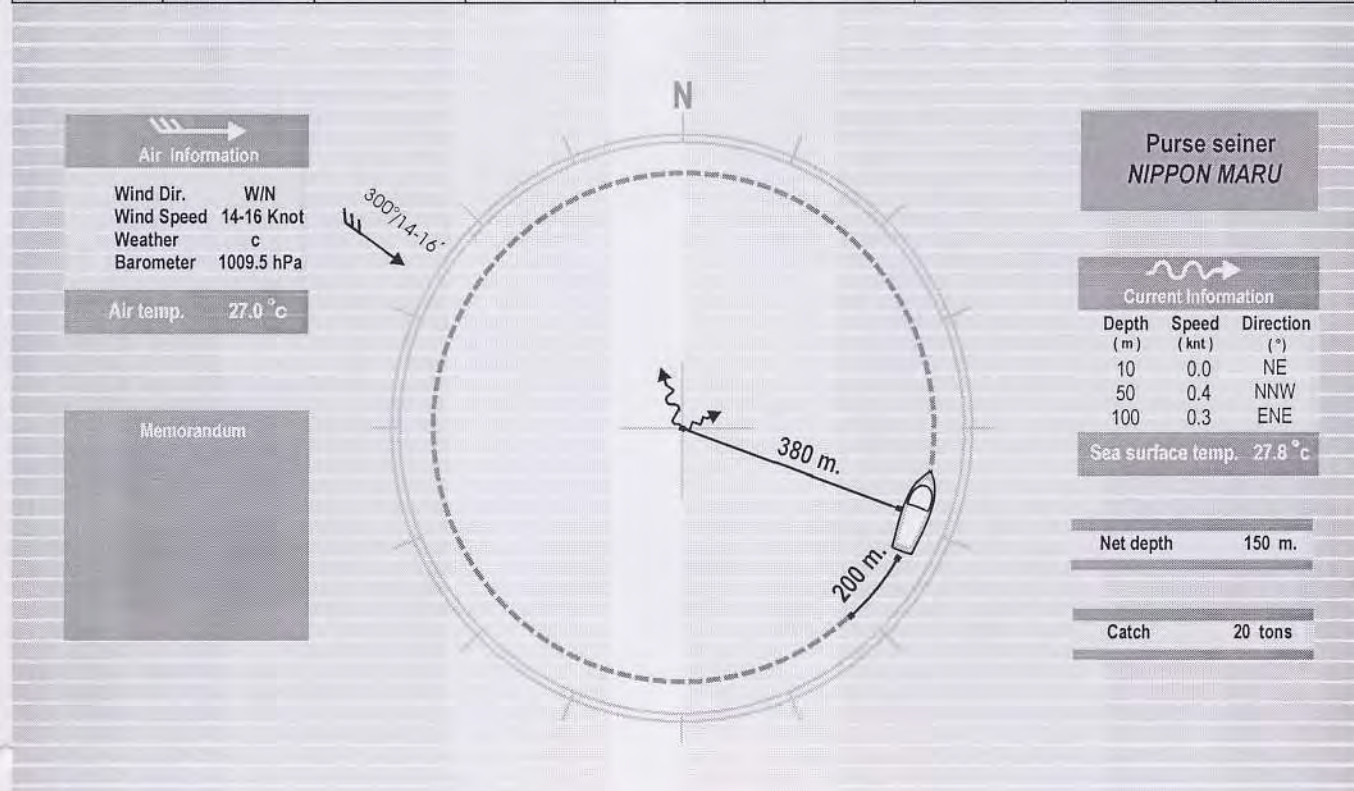


Date	Position	Target	Start St.	Finish Sh.	Purse line Haul	Fin. Purse line Haul	Net Haul	Fin. Net Haul
15/01/2001	04°09'3S 082°23'0E	Drifting FAD	0552	0557	0600	0628	0630	0900

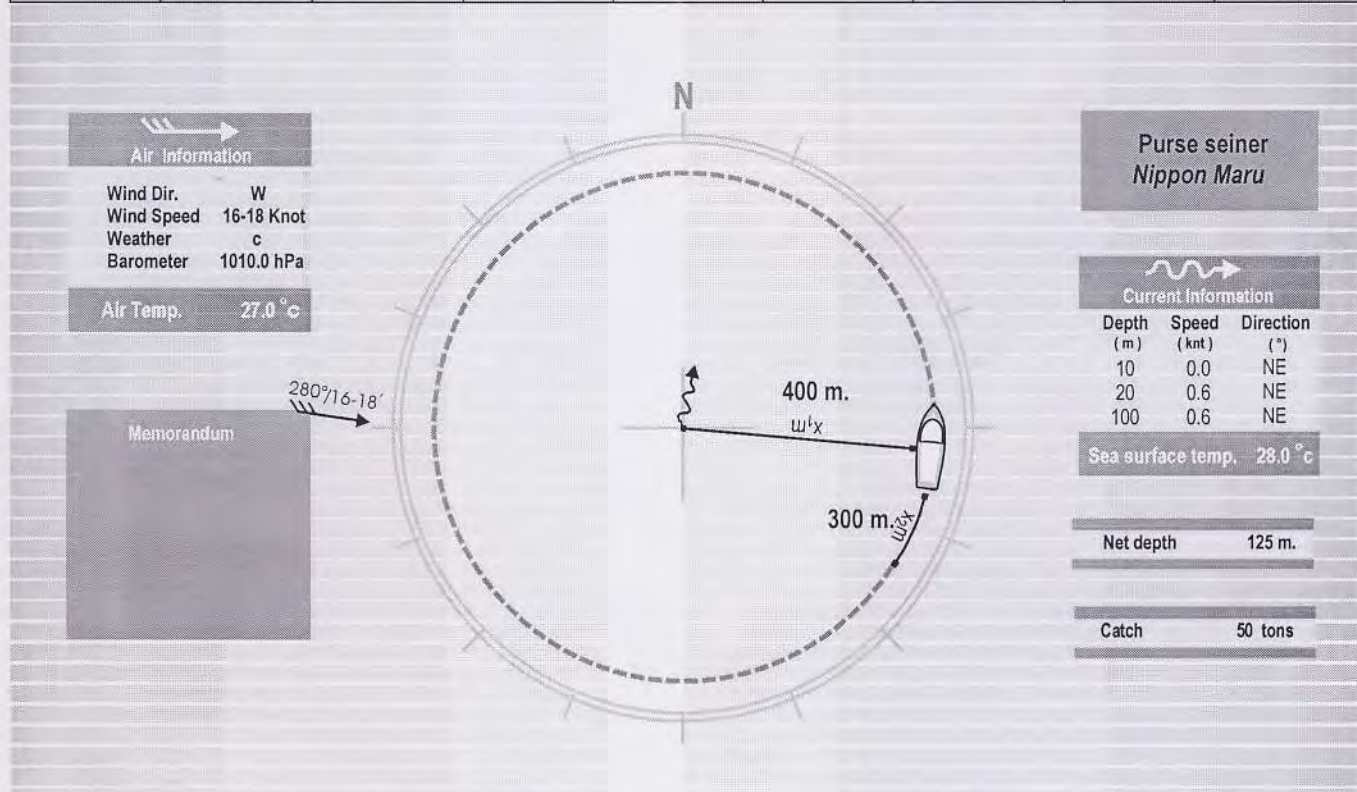


Tuna purse seine shooting operation technique

Date	Position	Target	Start St.	Finish Sh.	Purse line Haul	Fin. Purse line Haul	Net Haul	Fin. Net Haul
16/01/2001	05°07'1S 082°15'6E	Drifting FAD	0550	0556	0559	0625	0628	0945



Date	Position	Target	Start St.	Finish Sh.	Purse line Haul	Fin. Purse line Haul	Net Haul	Fin. Net Haul
17/01/2001	05°31'5S 080°27'6E	Drifting FAD	0558	0604	0607	0633	0633	1010

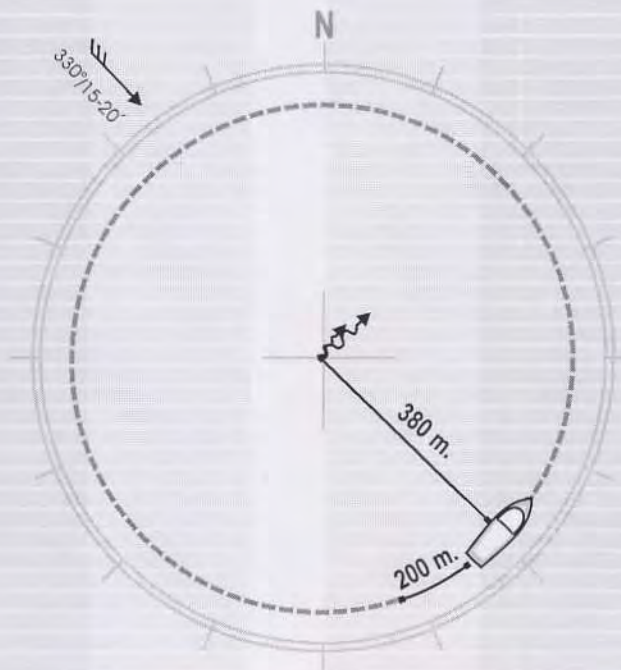


Tuna purse seine shooting operation technique

Date	Position	Target	Start St.	Finish Sh.	Purse line Haul	Fin. Purse line Haul	Net Haul	Fin. Net Haul
19/01/2001	03°10'0S 085°16'4E	Drifting FAD	0538	0544	0546	0613	0616	0942

Air Information	
Wind Dir.	NWW
Wind Speed	15-20 Knot
Weather	bc
Barometer	1008.0 hPa
Air temp. 27.5 °c	

Memorandum



Purse seiner
NIPPON MARU

Current Information		
Depth (m)	Speed (knt)	Direction (°)
10	0.0	ENE
50	0.3	NE
100	0.7	NE/N
Sea surface temp. 27.8 °c		

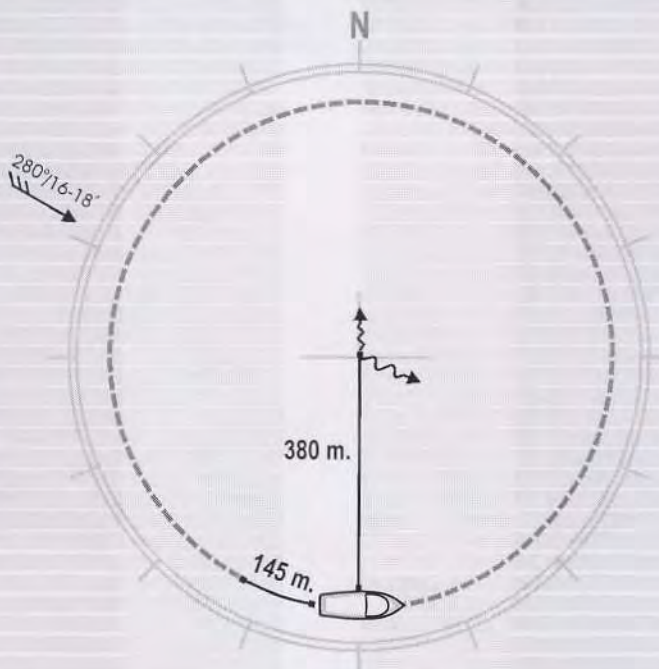
Net depth 155 m.

Catch 35 tons

Date	Position	Target	Start St.	Finish Sh.	Purse line Haul	Fin. Purse line Haul	Net Haul	Fin. Net Haul
20/01/2001	03°06'3S 085°32'8E	Drifting FAD	0537	0542	0546	0614	0617	0954

Air Information	
Wind Dir.	WNW
Wind Speed	8-10 Knot
Weather	c
Barometer	1008.7 hPa
Air Temp. 27.5 °c	

Memorandum



Purse seiner
Nippon Maru

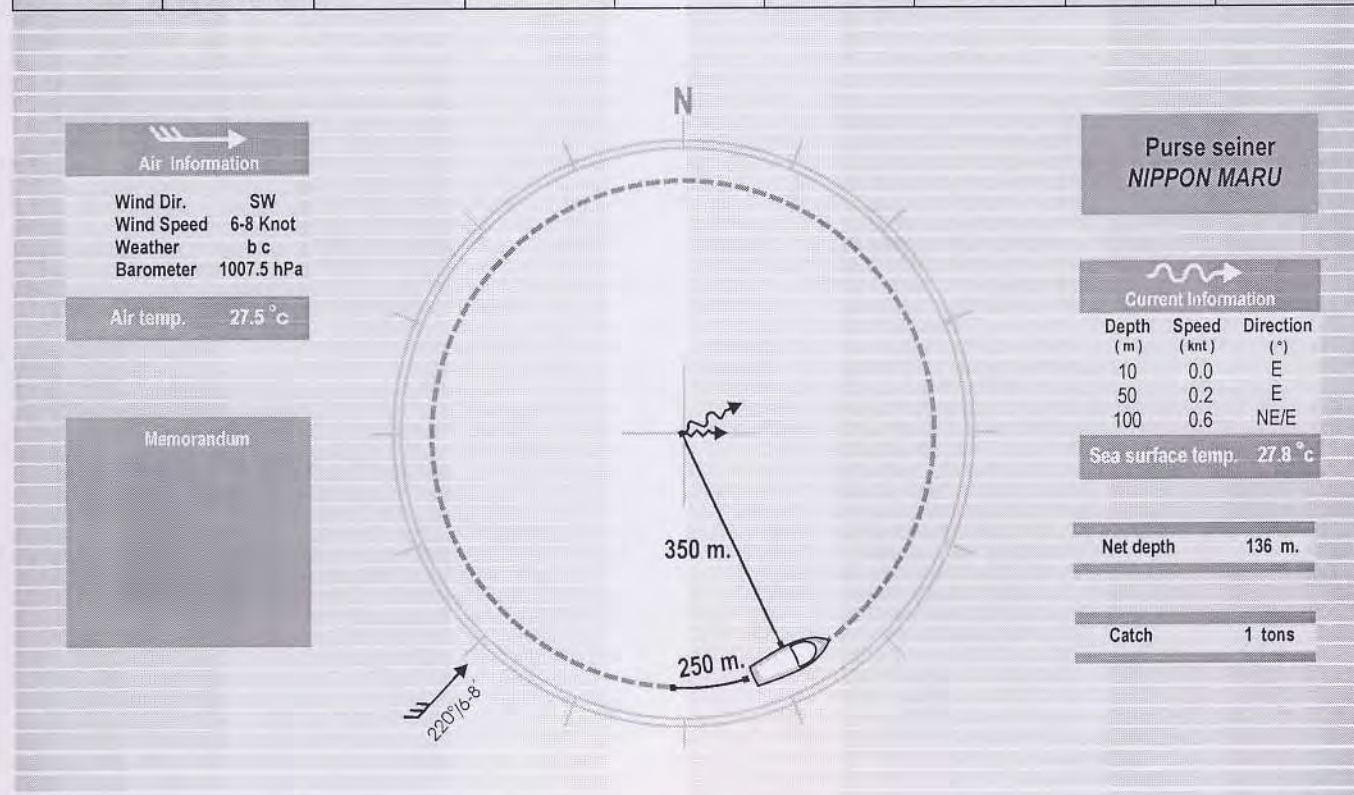
Current Information		
Depth (m)	Speed (knt)	Direction (°)
10	0.0	NNW
20	0.5	N
100	0.6	SE/E
Sea surface temp. 27.5 °c		

Net depth 135 m.

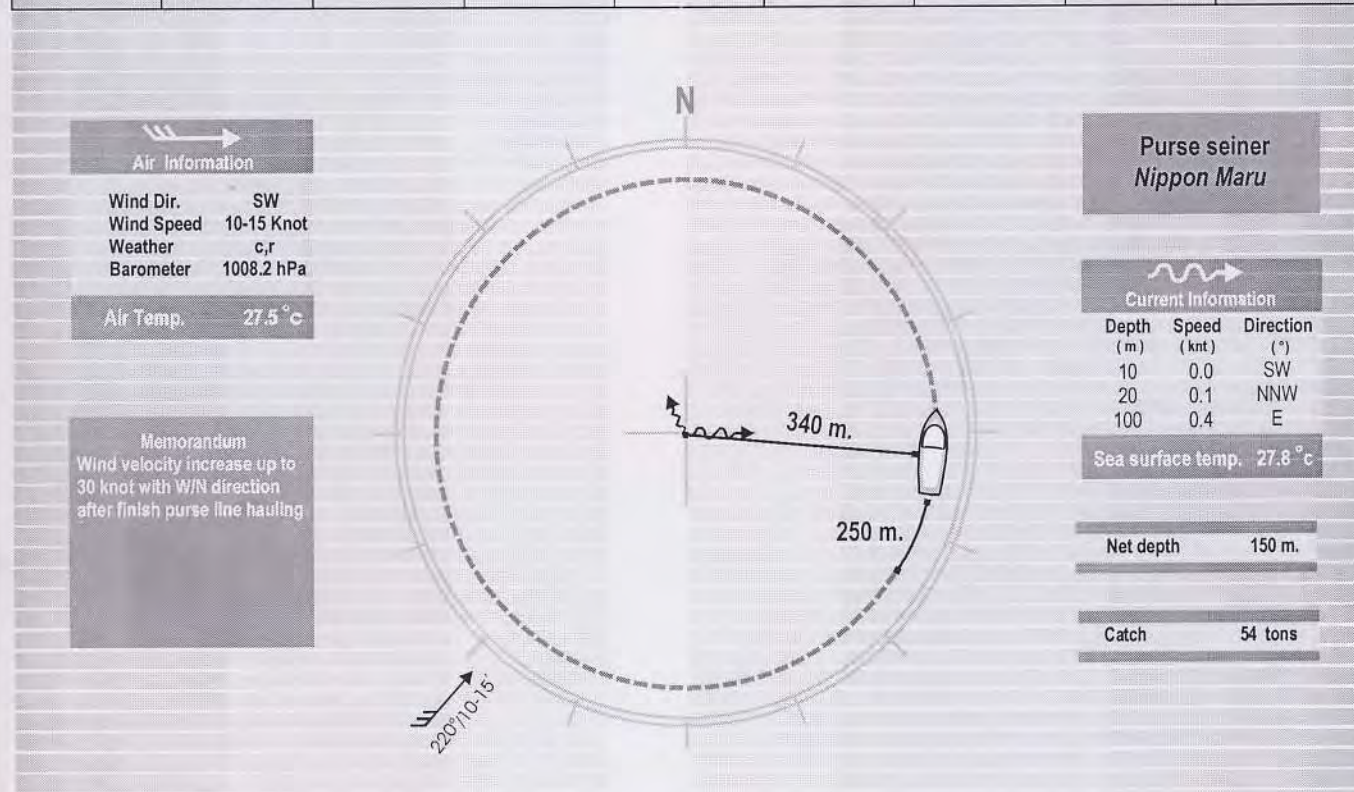
Catch 90 tons

Tuna purse seine shooting operation technique

Date	Position	Target	Start St.	Finish Sh.	Purse line Haul	Fin. Purse line Haul	Net Haul	Fin. Net Haul
21/01/2001	02°38'1S 089°05.8E	Drifting FAD	0518	0524	0526	0552	0556	0813

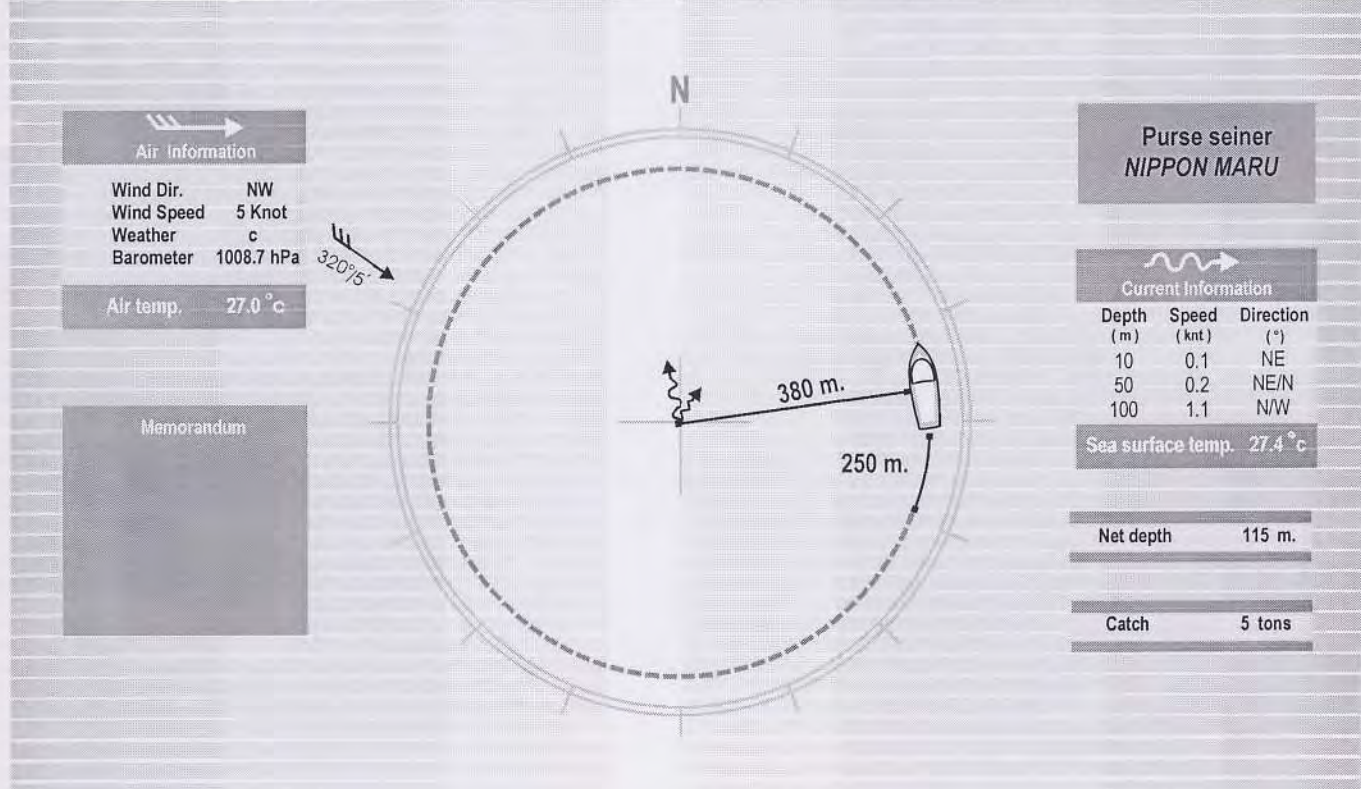


Date	Position	Target	Start St.	Finish Sh.	Purse line Haul	Fin. Purse line Haul	Net Haul	Fin. Net Haul
26/01/2001	01°09'3S 089°49.5E	Drifting FAD	0527	0532	0535	0559	0602	0958

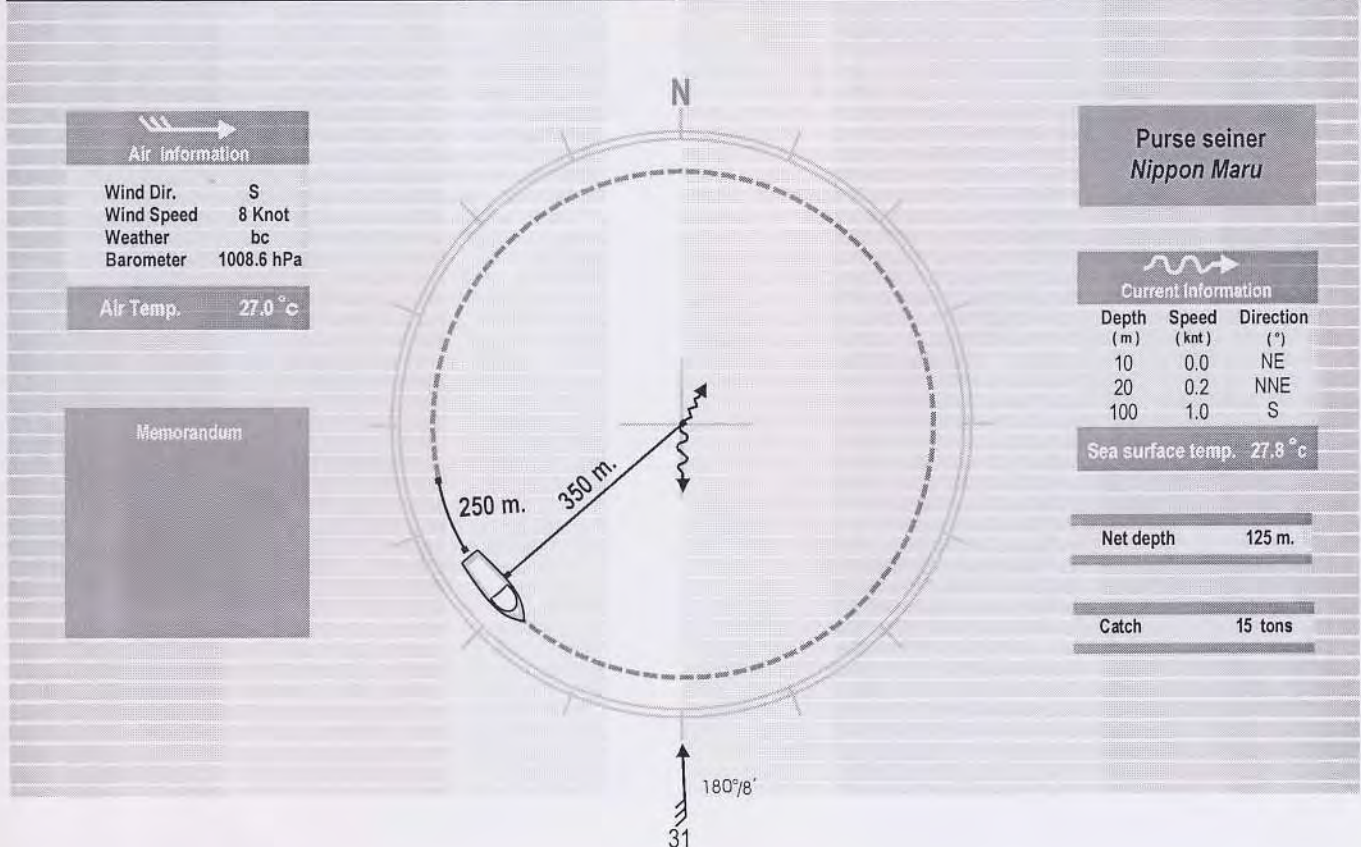


Tuna purse seine shooting operation technique

Date	Position	Target	Start St.	Finish Sh.	Purse line Haul	Fin. Purse line Haul	Net Haul	Fin. Net Haul
30/01/2001	01°09'3S 089°49'5E	Drifting FAD	0536	0542	0544	0608	0612	0853

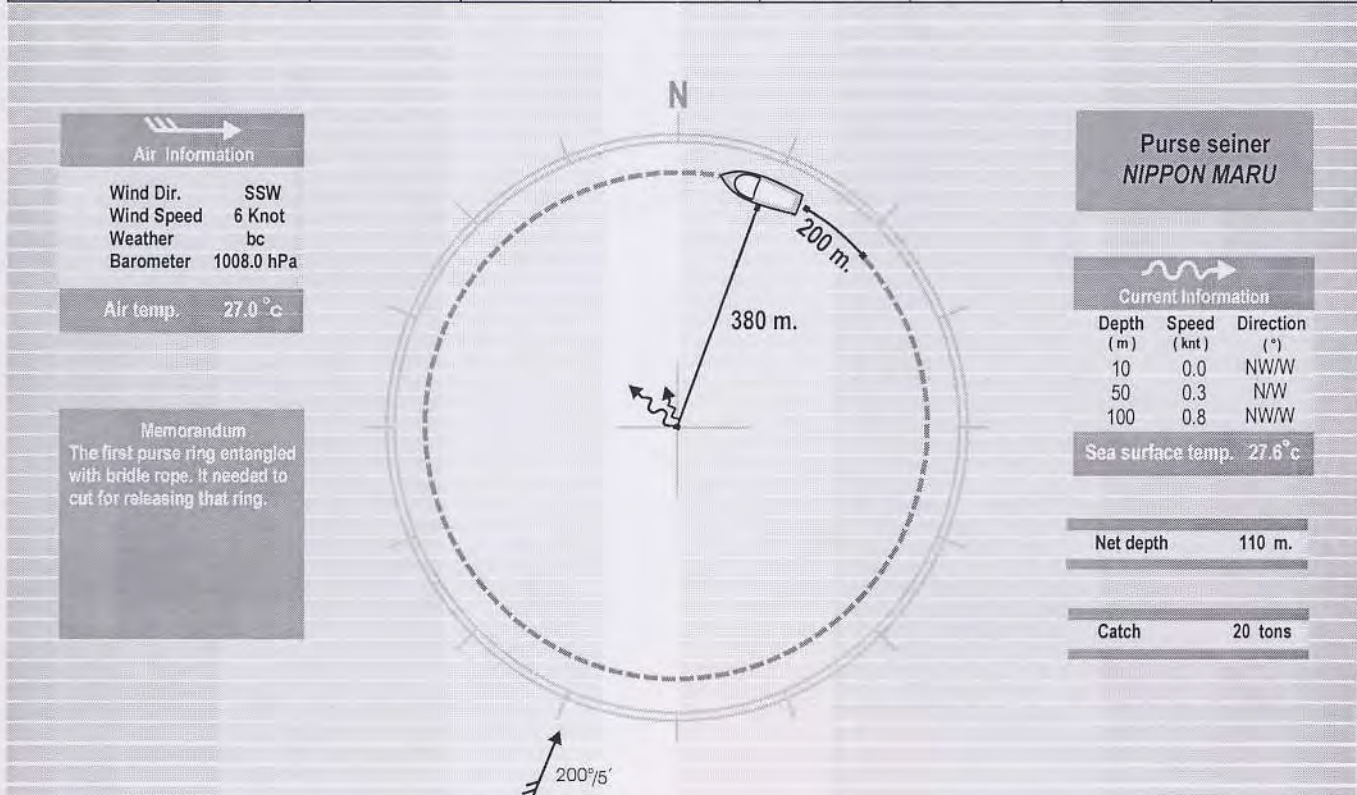


Date	Position	Target	Start St.	Finish Sh.	Purse line Haul	Fin. Purse line Haul	Net Haul	Fin. Net Haul
31/01/2001	02°31'9S 084°53'7E	Drifting FAD	0541	0547	0549	0619	0621	0816

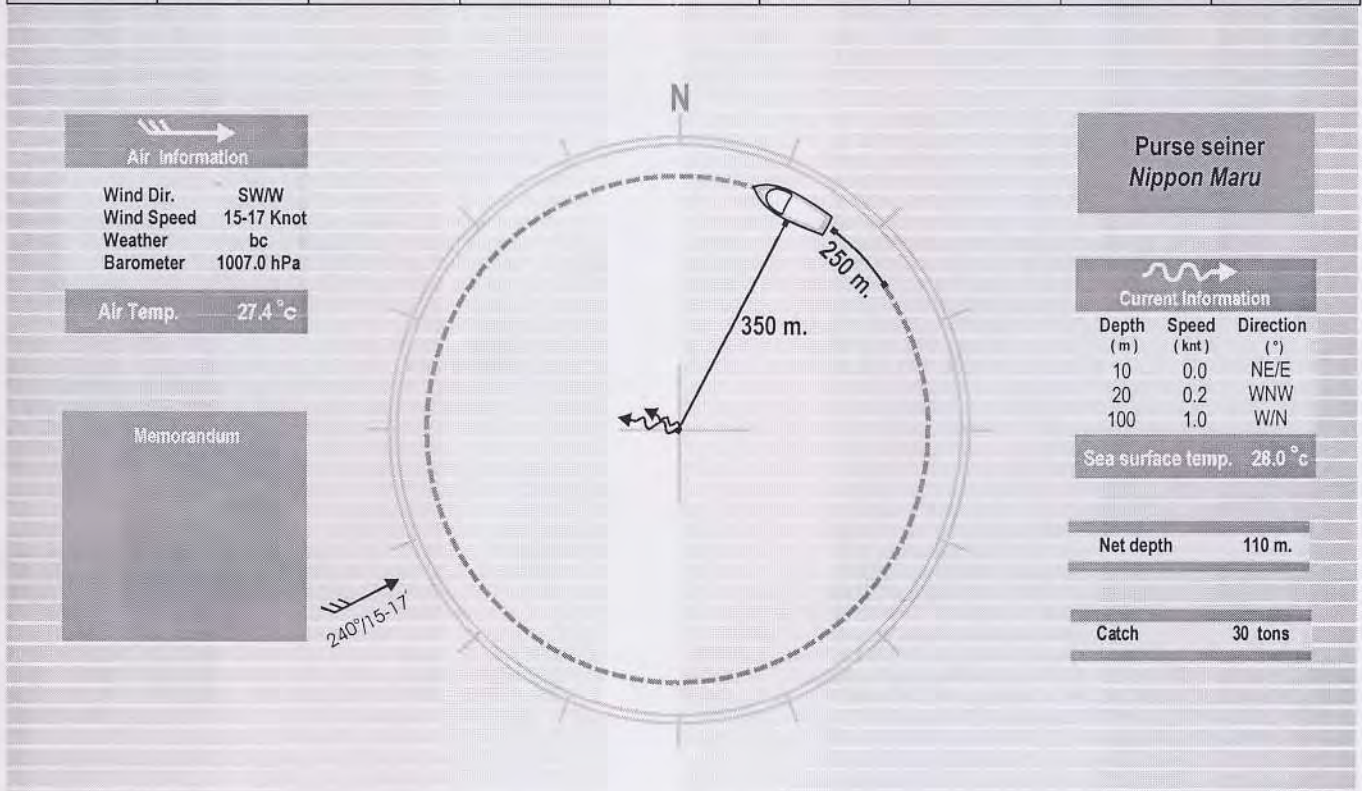


Tuna purse seine shooting operation technique

Date	Position	Target	Start St.	Finish Sh.	Purse line Haul	Fin. Purse line Haul	Net Haul	Fin. Net Haul
1/02/2001	01°35.7'S 087°47.7'E	Drifting FAD	0530	0536	0538	0605	0611	0858

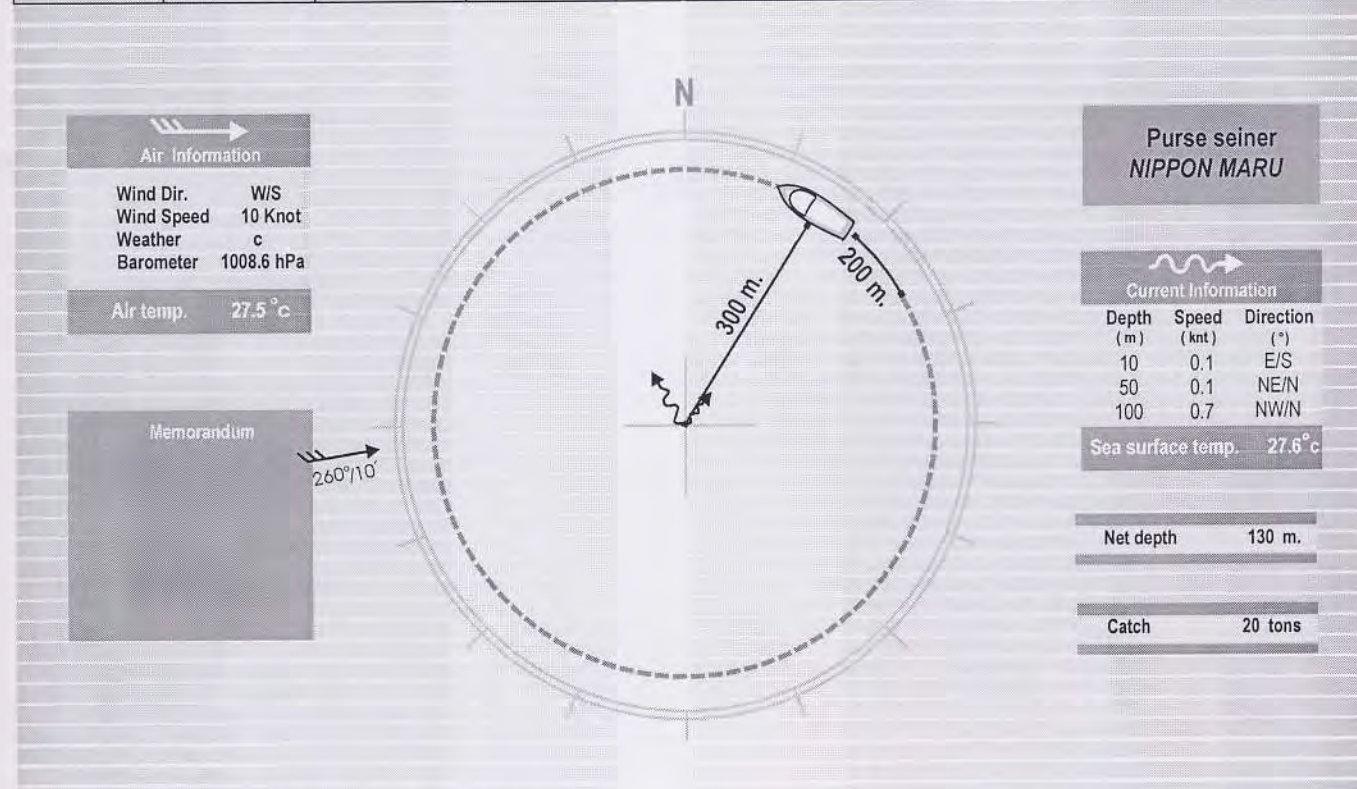


Date	Position	Target	Start St.	Finish Sh.	Purse line Haul	Fin. Purse line Haul	Net Haul	Fin. Net Haul
2/02/2001	01°12.0'S 087°47.5'E	Drifting FAD	0532	0537	0540	0606	0608	0859

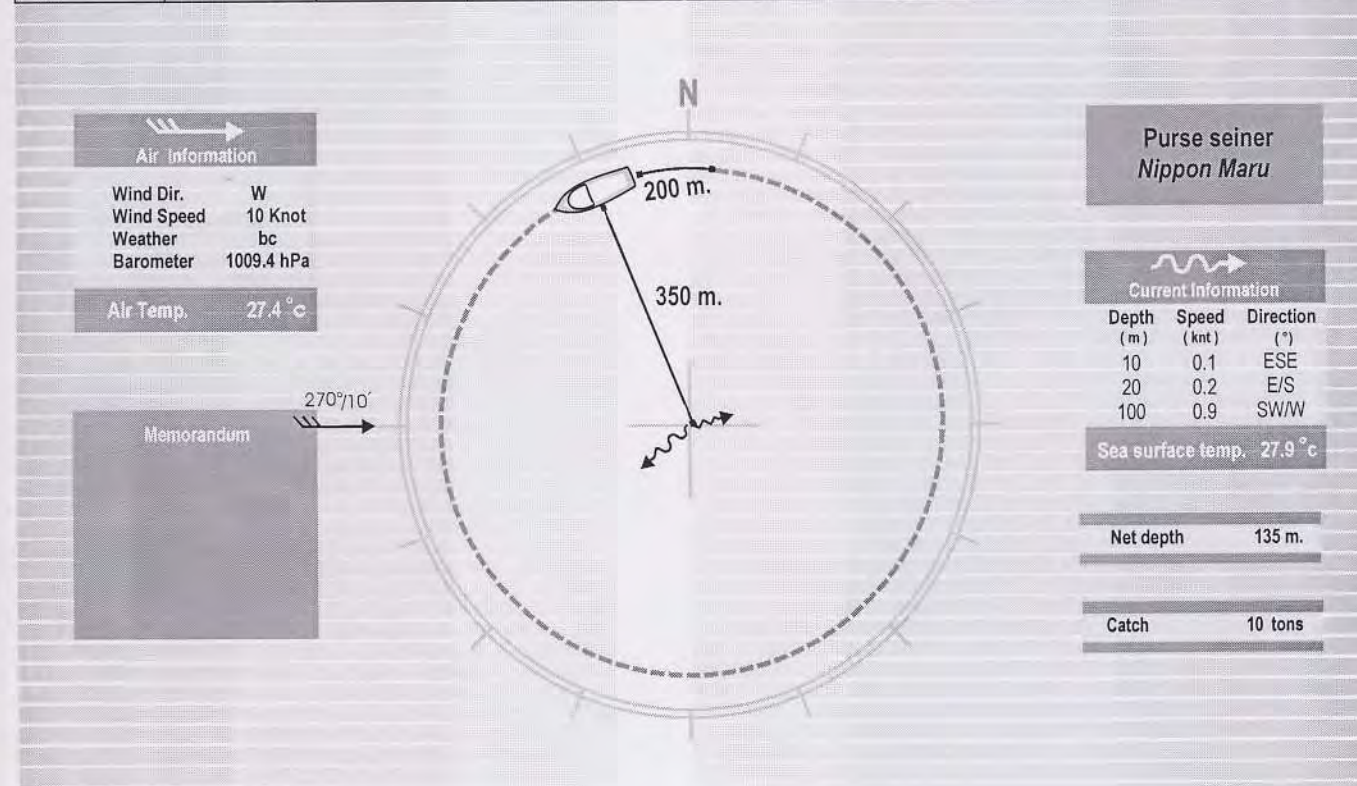


Tuna purse seine shooting operation technique

Date	Position	Target	Start St.	Finish Sh.	Purse line Haul	Fin. Purse line Haul	Net Haul	Fin. Net Haul
4/02/2001	01°02.4'S 086°24.2'E	Drifting FAD	0549	0555	0558	0624	0627	0858



Date	Position	Target	Start St.	Finish Sh.	Purse line Haul	Fin. Purse line Haul	Net Haul	Fin. Net Haul
5/02/2001	00°01.8'S 083°31.5'E	Drifting FAD	0600	0606	0608	0634	0637	0855



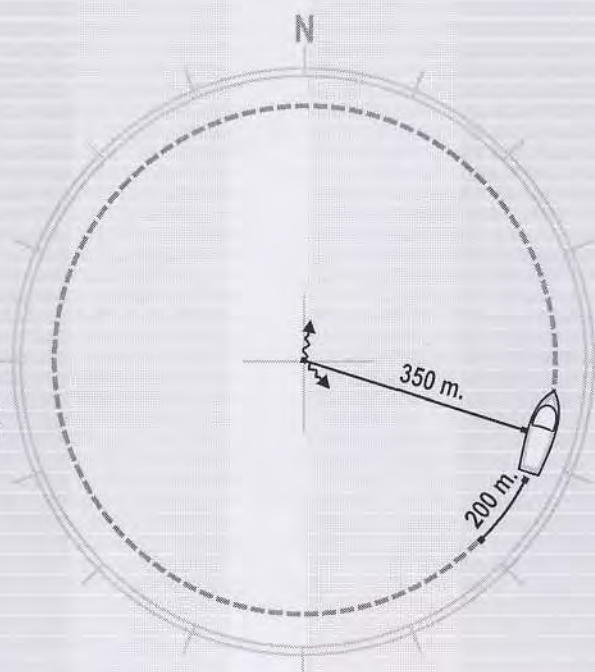
Tuna purse seine shooting operation technique

Date	Position	Target	Start St.	Finish Sh.	Purse line Haul	Fin. Purse line Haul	Net Haul	Fin. Net Haul
8/02/2001	00°38'5S 088°15.6E	Drifting FAD	0530	0536	0538	0604	0607	0907

Air Information	
Wind Dir.	WSW
Wind Speed	10 Knot
Weather	r
Barometer	1009.7 hPa
Air temp.	25.0 °C

Memorandum
Wind direction is not steady.

260°/10'



Purse seiner
NIPPON MARU

Current Information

Depth (m)	Speed (knt)	Direction (°)
10	0.0	SE
50	0.1	N/E
100	0.1	SE

Sea surface temp. 27.4 °C

Net depth 158 m.

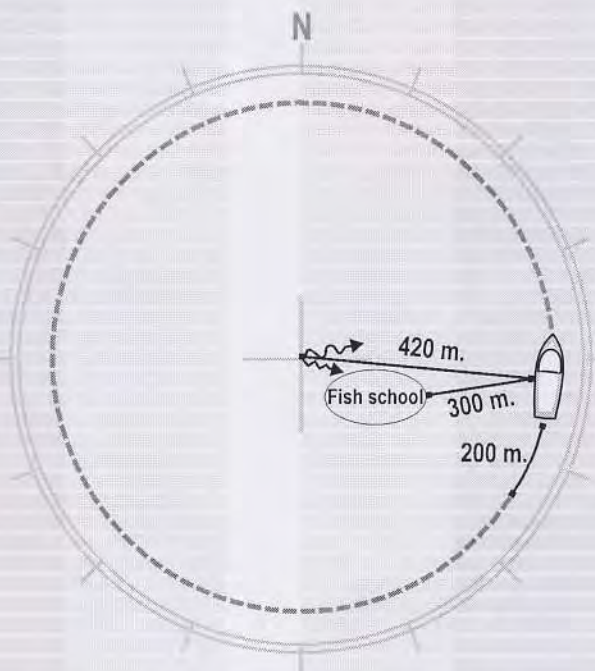
Catch 25 tons

Date	Position	Target	Start St.	Finish Sh.	Purse line Haul	Fin. Purse line Haul	Net Haul	Fin. Net Haul
9/02/2001	01°52'2S 091°36.9E	Drifting FAD	0503	0509	0511	0538	0542	0840

Air Information	
Wind Dir.	W/S
Wind Speed	18 Knot
Weather	c
Barometer	1009.2 hPa
Air Temp.	27.5 °C

Memorandum
Fish school did not stay at the drifting FAD.
Wind force was 30-40 knot, direction SW, after start net hauling.

270°/10'



Purse seiner
Nippon Maru

Current Information

Depth (m)	Speed (knt)	Direction (°)
10	0.0	NNE
20	0.1	E/S
100	1.0	E/N

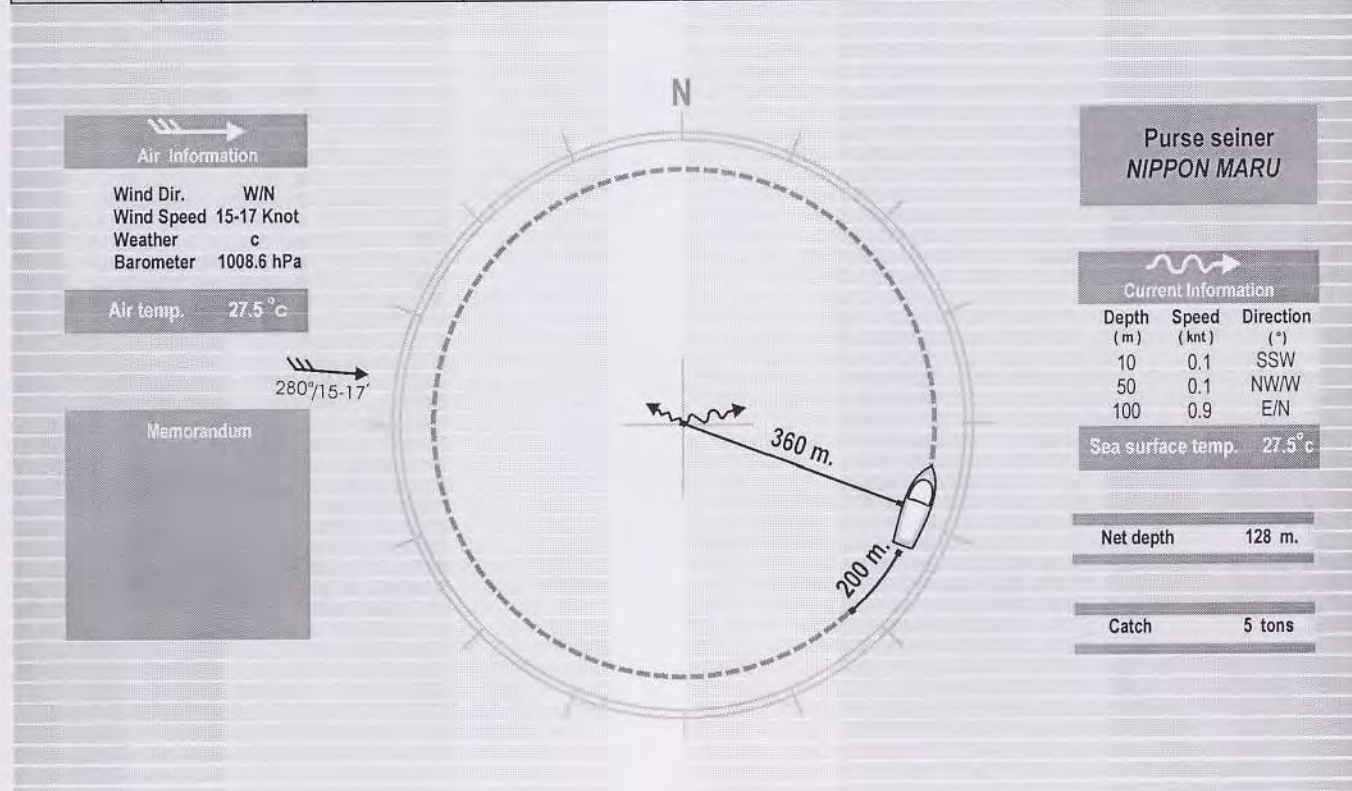
Sea surface temp. 27.5 °C

Net depth 124 m.

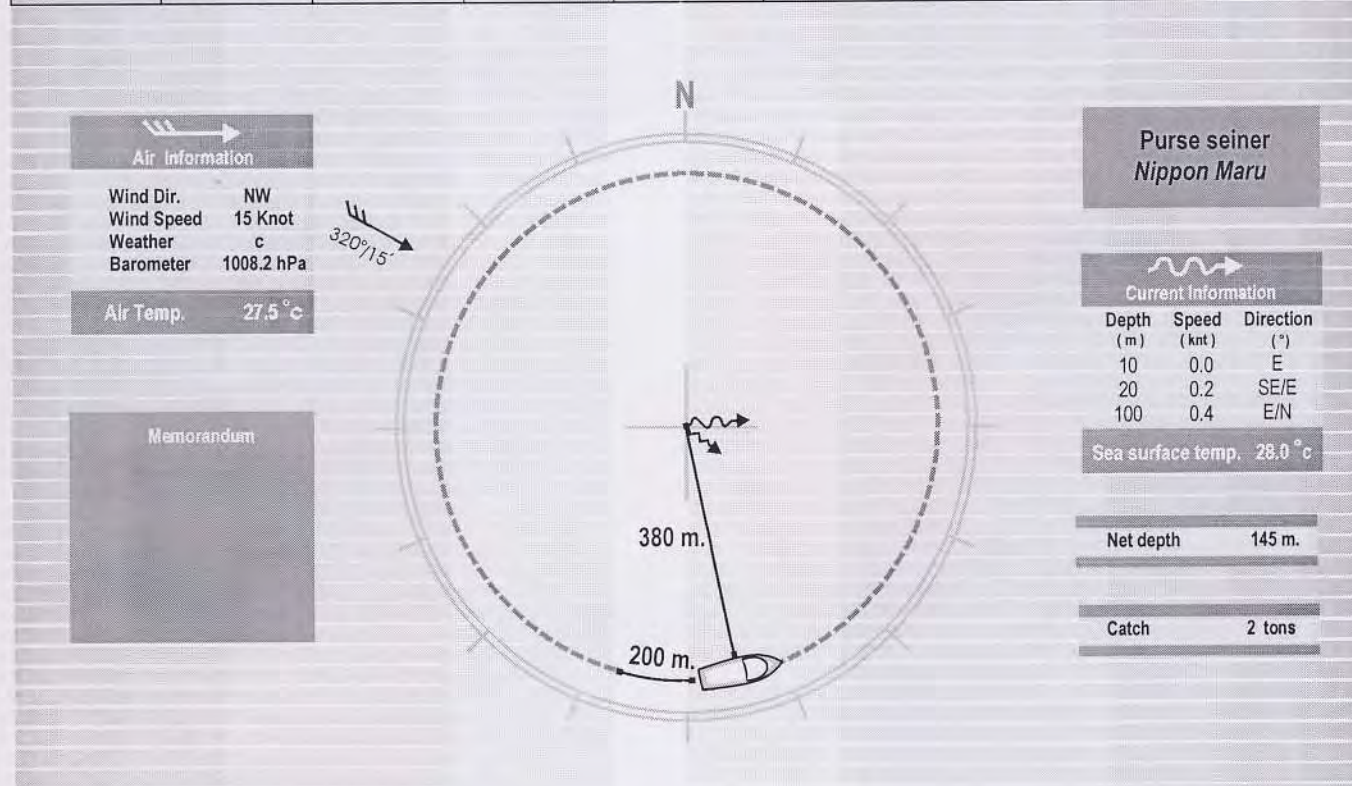
Catch 10 tons

Tuna purse seine shooting operation technique

Date	Position	Target	Start St.	Finish Sh.	Purse line Haul	Fin. Purse line Haul	Net Haul	Fin. Net Haul
10/02/2001	01°46.9S 091°48.8E	Drifting FAD	0502	0508	0511	0538	0541	0817



Date	Position	Target	Start St.	Finish Sh.	Purse line Haul	Fin. Purse line Haul	Net Haul	Fin. Net Haul
11/02/2001	01°57.8S 091°49.0E	Drifting FAD	0506	0512	0514	0539	0542	0803



Tuna purse seine shooting operation technique

Date	Position	Target	Start St.	Finish Sh.	Purse line Haul	Fin. Purse line Haul	Net Haul	Fin. Net Haul
14/02/2001	01°06'6S 084°40'3E	Drifting FAD	0544	0550	0552	0622	0624	0835

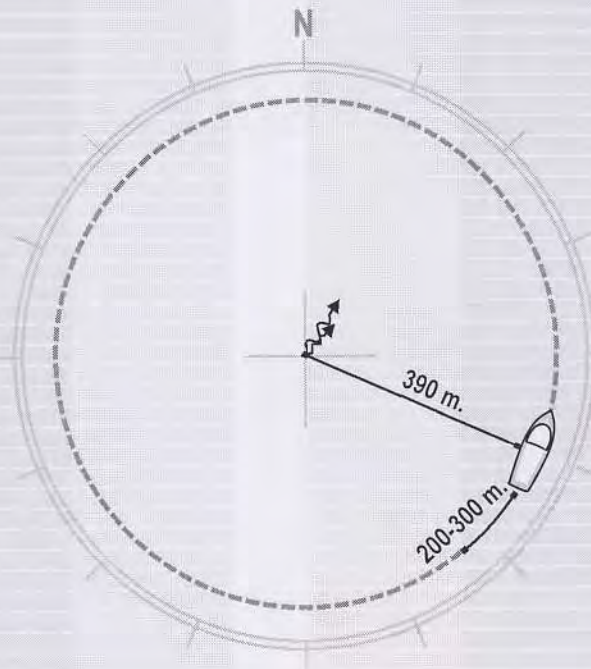
Air Information

Wind Dir. W/N
Wind Speed 10-12 Knot
Weather bc
Barometer 1009.5 hPa

Air temp. 27.5 °C

Memorandum

280°/10-12'



Purse seiner
NIPPON MARU

Current Information

Depth (m)	Speed (knt)	Direction (°)
10	0.1	NE/N
50	0.4	NE
100	0.9	NNE

Sea surface temp. 27.7 °C

Net depth 95 m.

Catch 10 tons

Date	Position	Target	Start St.	Finish Sh.	Purse line Haul	Fin. Purse line Haul	Net Haul	Fin. Net Haul
17/02/2001	01°05'1S 081°52'1E	Drifting FAD	0556	0602	0604	0630	0634	0840

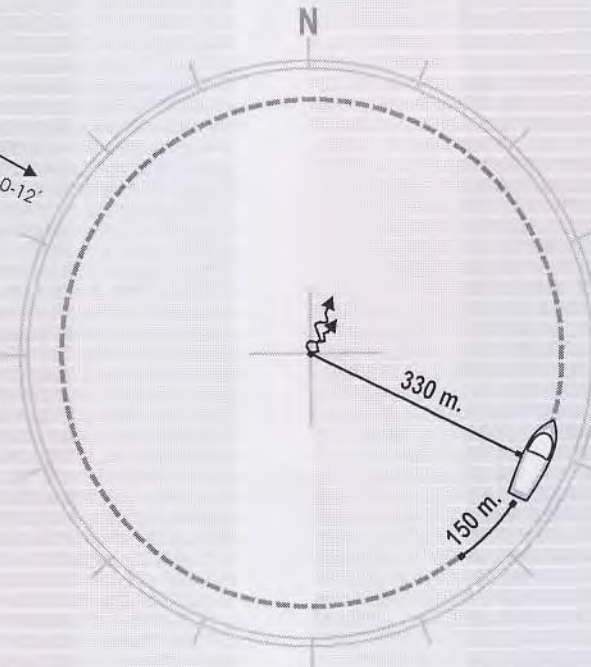
Air Information

Wind Dir. NW/N
Wind Speed 10-12 Knot
Weather bc
Barometer 1010.8 hPa

Air Temp. 27.5 °C

Memorandum

320°/10-12'



Purse seiner
Nippon Maru

Current Information

Depth (m)	Speed (knt)	Direction (°)
10	0.0	WSW
20	0.4	NNE
100	0.7	NE/N

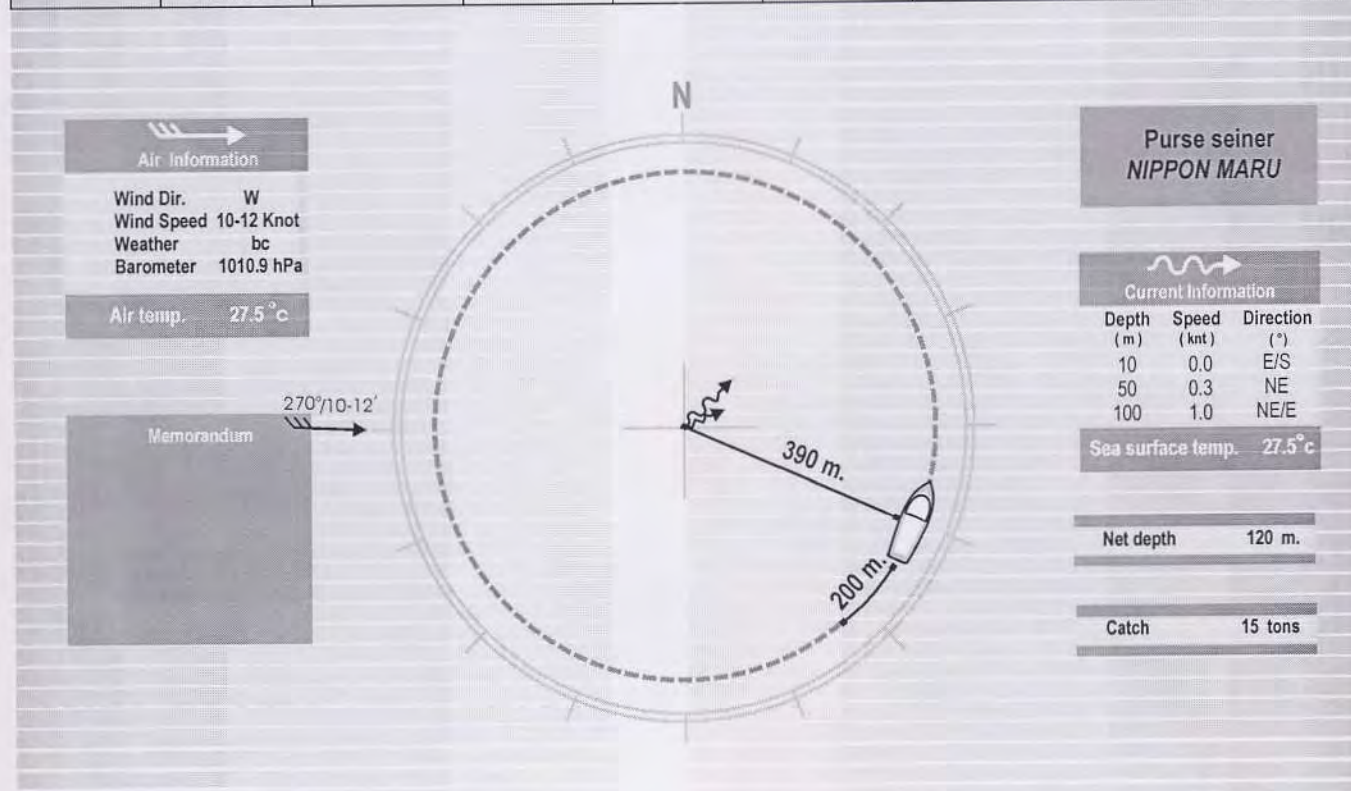
Sea surface temp. 28.2 °C

Net depth 115 m.

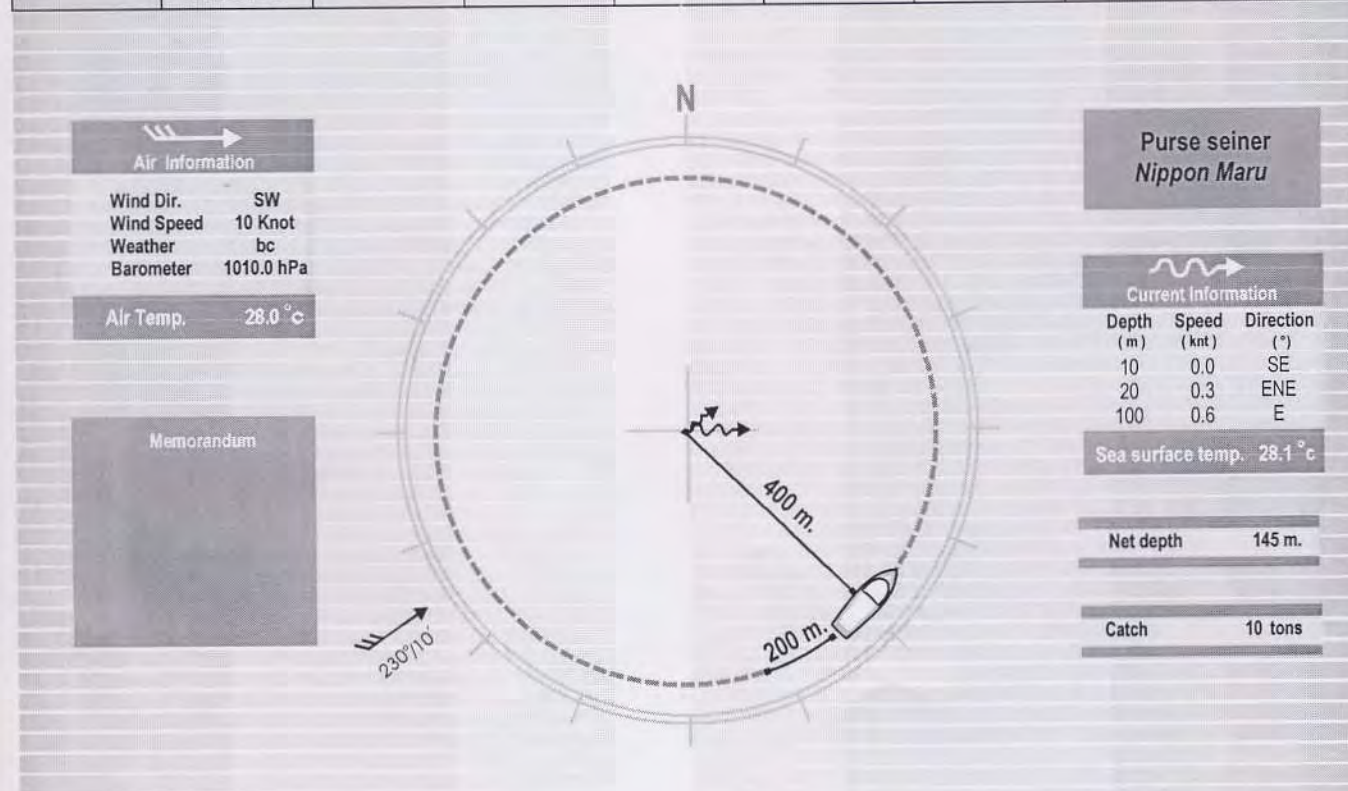
Catch 3 tons

Tuna purse seine shooting operation technique

Date	Position	Target	Start St.	Finish Sh.	Purse line Haul	Fin. Purse line Haul	Net Haul	Fin. Net Haul
20/02/2001	00°52.4S 091°44.4E	Drifting log	0515	0521	0523	0547	0549	0822

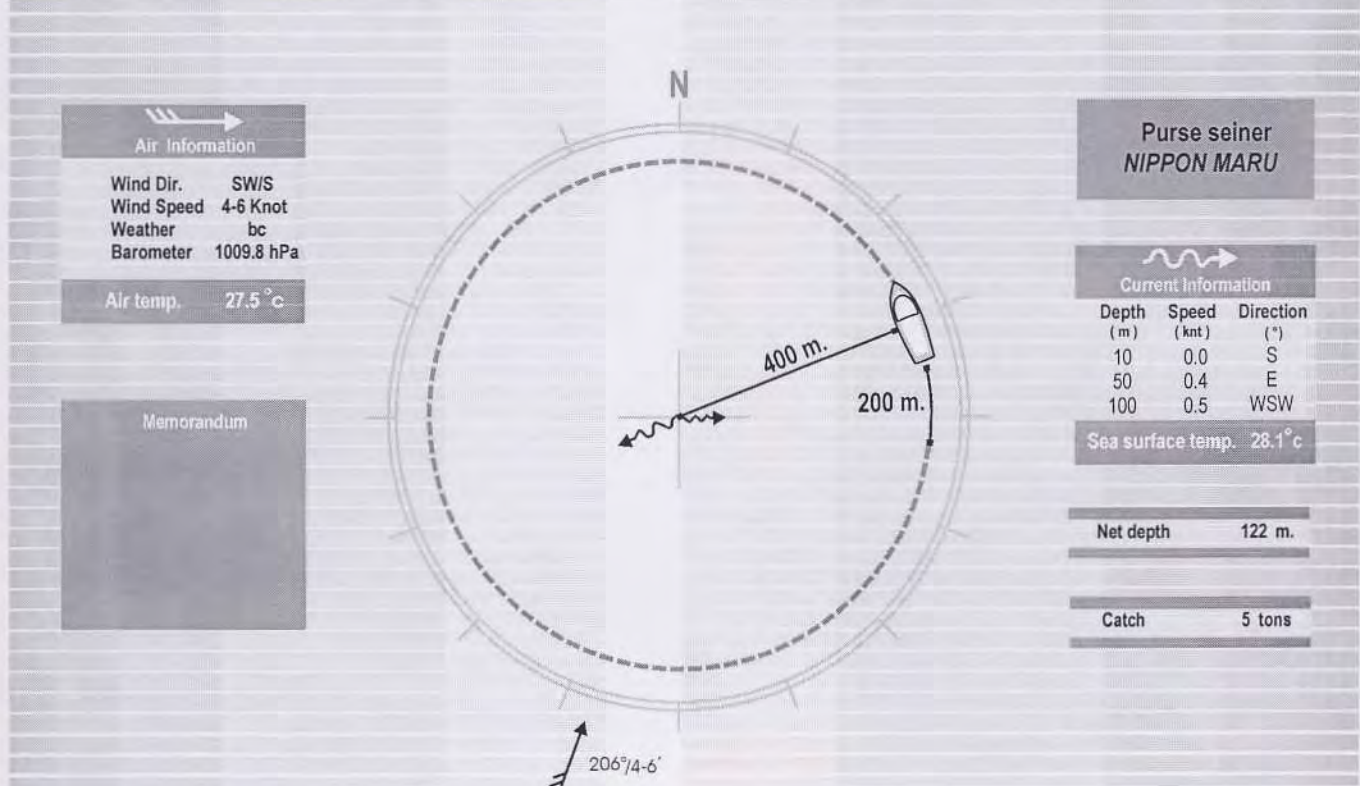


Date	Position	Target	Start St.	Finish Sh.	Purse line Haul	Fin. Purse line Haul	Net Haul	Fin. Net Haul
23/02/2001	00°29.6S 089°03.0E	Drifting FAD	0528	0534	0536	0605	0607	0821

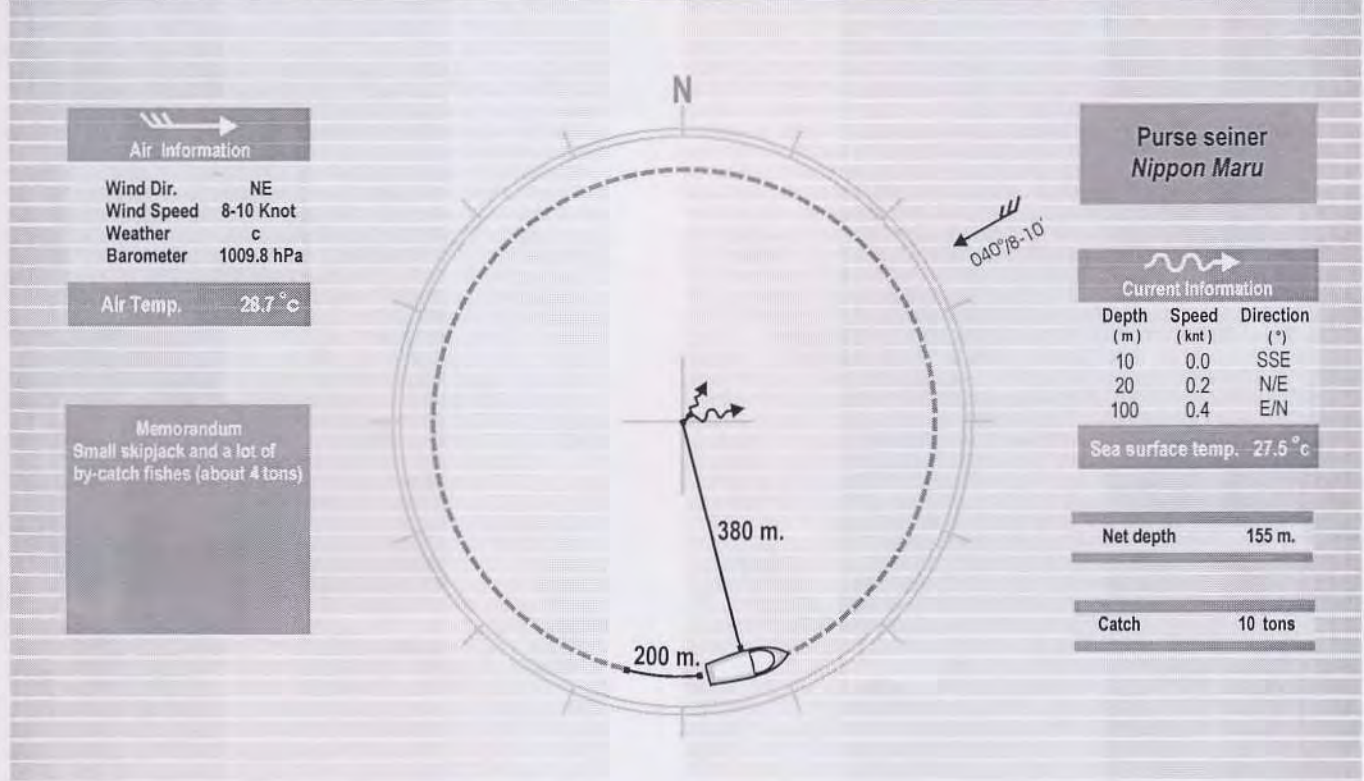


Tuna purse seine shooting operation technique

Date	Position	Target	Start St.	Finish Sh.	Purse line Haul	Fin. Purse line Haul	Net Haul	Fin. Net Haul
24/02/2001	00°19.4'N 087°38.5'E	Drifting log	0533	0539	0542	0607	0609	0708



Date	Position	Target	Start St.	Finish Sh.	Purse line Haul	Fin. Purse line Haul	Net Haul	Fin. Net Haul
25/02/2001	01°32.8'N 085°01.6'E	Drifting FAD	0557	0603	0606	0632	0634	1000



Conclusion on tuna purse seine shooting operation

1. Target is moving within the small area

(Fishing with target: drifting object, log, drifting FAD)

1. Two pieces of 2000 watt Under-water lamps are always used for concentrate the fish school at the target. But lamps may not effective for fish concentration during full moon period.

2. During fish luring by light, a working always checks the other fish school within the distance 50-200 m. around the target. Some fish schools may not stay at the light. Both of working boats transmit Tele-echo sounder to the net boat, distance about 800-1200 m.

3. Distance between starting point to target (Fish school) is 350-370 m.

4. Gap of net at the stern deck when net boat reach skiff boat should be 150-200 m.

5. Current should not over than 1.0 m. However, that is depended on the amount of fish at the target and wind condition. (Maximum of the records is 1.1 knot at the depth 100 m.) The shooting direction is followed the current direction.

The different speed between current 2 layers of the depth, i.e. 50 m. and 100 m., should not more than 1 knot and the direction should not more than 90 degree.

6. Wind condition should not more than 20 knot. However that is depended on the amount of fish at the target and current condition. If the wind speed is more than 10 knot, shooting direction should follow the wind (Maximum of the record is 20 knot)

7. Drifting speed of the target (drifting object, log or drifting FAD) should not more than 1.0 knot.

2. Target is moving at the surface

(Fishing with fish school)

1. To surrounding the fish school, shooting direction should be kept parallel along fish school direction.

2. Direction of fish school should be steady in one direction. If fish school intends to change the swimming direction or become scatter, operation should not be done.

3. Current and wind condition must be taken into consideration same as surrounding around drifting object.

Reference

Aussanee M., Isara Chanrachkij. 1992, *Observation report on tuna purse seine fishing operation around Seychelles waters onboard Nippon maru* (TD/RES32), SEAFDEC/TD, Samutprakarn, Thailand, , 39 pp.

Hilmar K. and others (FAO), 1977. *Modern fishing gear of the world 3*, Fishing news books Ltd, London, England, 537 pp.

Retallack B.J. 1970. *Compendium of lecture notes for training class IV meteorological personnel* (Unit 1 General Meteorology), World Meteorological Organization, 225 pp.

Hermansson B. 1978. *Training Fishermen at Sea*, Fishing news books Ltd, London, England, 537 pp.

Appendix 1

Wind & Current direction

Compass direction	Exact Equivalent degree
N/E	11.25
NNE	22.5
NE/N	33.75
NE	45.0
NE/E	56.25
ENE	67.5
E/N	78.75
E	90.0
E/S	101.25
ESE	112.5
SE/E	123.75
SE	135.0
SE/S	146.25
SSE	157.5
S/E	168.75
S	180.0
S/W	191.25
SSW	202.5
SW/S	213.75
SW	225.0
SW/W	236.25
WSW	247.5
W/S	258.75
W	270.0
W/N	281.25
WNW	292.5
NW/W	303.75
NW	315.0
NW/N	326.25
NNW	337.5
N/W	348.75
N	360.0

Appendix 2

Sky and Weather Notation

b	Blue sky (up to one-quarter covered)
bc	Partly cloudy (quarter to three- quarter covered)
c	Mainly cloudy (not less than three-quarter over)
d	Drizzling
e	Wet air without rain
f	Fog
g	Gale, force 8 or 9 maintained not for less than 10 minutes
h	Hail
l	Lightening
m	Misty
o	Overcast (Completely covered)
p	Passing showers
q	Squalls
Q	Heavy rain
r	Rain
s	Snow
t	Thunder
ti	Thunderstorm
u	Ugly sky
v	Abnormal visibility: objects at a distance usually
z	Hazy

Source: International Meteorological Convention 1921

Appendix 3

Safety Rules of Purse Seiner

The code of the safety for fisherman and fishing vessel part A. *Safety and Health for skippers and crews*, published on behalf of FAO, ILO and IMCO (International Organization, Geneva 1970) contains the following 16 recommendations (Page 27 to 29) which should be kept well in mind by purse seining skippers and their crews.

1. To reduce the danger of fisherman stepping inside loop of purse seine bridles during setting of the net. The bridle should be coiled in the net or else stows in a separated box or compartment next to the 'clothespin' (rack or bar) from which the ring run out.

2. When setting begin, the net should be so arranged that it is pull out by buoy or skiff without crew having expose themselves to danger by going aft or on the top of the net.

3. During setting of the net, the winch-man should take care not to allow the drum to turn faster than purse line run out, so as to avoid fouling the wire.

4. The extension rope attached to the tail end of the net should be coiled down in the separated box or compartment so that there is no danger for fisherman being caught into the loops during setting.

5. The sharp knife always be kept handy near the net bin or the platform.

6. Fisherman should be avoid standing below the power block or transfer block because of the dangerous of their being hit by heavy purse ring passing through the purse blocks, where such danger exists. Fisherman should ware protective helmet.

7. When hauling big catches it is essential to brail or pump the fish on board as quickly as possible to avoid an excessive weight of the dead fish in the net.

8. The sinker line and breast line of the bunt should be so attached to the vessel that can be quickly the fish if fish lie too heavy in the net and endanger the stability of the vessel. Preferably, the breast line and the part of sinker line which is tie up to the bunt room and/or the railing of the vessel, during brailing or pumping should be fitted with the rings through which is released a wire, fixed to vessel at either and end with an easily-released slip-hook.

9. When the netting is liberally hung in, the bunt may be still retain a heavy weight of fish even after the breast line and sinker line have been released, it is therefor, advisable to attached bridle to the bunt float-line so that it can be hoisted up to release the fish.

10. Should the vessel heel over dangerous, and if it is not possible to release the fish, the vessel should be driven ahead and turned toward the listing side. When it is not succeed to righting the vessel, the net should be slacked off immediately or cut.

11. Where the net is stacked in an expose place it is highly desirable to fit removable stanchions with guard ropes for prevent man falling over board.

12. Sea-water in the fish hold causes the fish become fluid and shift. Care should be taken to separate sea-water from the fish during brailing or pumping before catch reaches the hold, using standing gratings leading to the hatches. Similarly, the blood water seeping from the fish should be pump out frequently.

13. Fishes carry on deck should be covered by the double tarpaulins securely fixed, for instance by nailing wooden strips over the edges to outside the railing and to fix pounds board. On the steel vessel, a wooden plank should be bolt on for this purpose.

14. In the emergency, the skipper should be able to release the deck load through special ports by quick release the mechanism.

15. When fish are carried out on deck, life line should be rigged at suitable height.

16. Where the small auxiliary boat is used. It should always light and sound signal equipment in good working order and the crew should ware life jackets.

