

SEA FISH INDUSTRY AUTHORITY  
Industrial Development Unit

INTERNAL REPORT No. 1097

JUNE, 1983

PAIR TRAWLING ABOARD THE MFV BOY CARL  
AND THE MFV BOY JASON

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SUMMARY

The two vessels intended pair trawling for the first time and the SFIA were requested to provide some measurements of warp load against engine speed and water speed to enable the boats to work together despite their differing engines.

Two hauls were conducted, one each with the two nets available, and an attempt was made to acquire the desired information. Results obtained were limited because of the instability of the load meter readings. Despite this the vessels were able to fish together in a satisfactory manner and intend to continue to do so.

## 1. INTRODUCTION

The two vessels, despite being sister ships are equipped with different engines but are thought to produce roughly the same shaft horse power. The owners decided that they would like to use the vessels for pair trawling and contacted the SFIA for assistance in matching them. This to be done basically using warp tension meters to ensure that the two boats are being loaded equally.

The intention was that the loading would be increased in stages equally on both vessels, thereby maintaining the desired trawl/vessel geometry, and at each load increment the engine speed of the vessels would be noted along with the water speed. This was to be repeated for both trawls.

Overriding this requirement to make measurements was the fundamental aim of providing assistance in getting the two vessels to be able to fish together effectively. This precluded extended instrumentation of the trawls or vessels.

The instrumentation provided by the SFIA which was used, consisted of two 3 ton in-line load meters and a towed water speed log of SFIA design. It was attempted to tow the log behind the Boy Jason, however, this proved to be unsatisfactory and very little data was collected.

The report contains suggestions for any future trials of this nature.

## 2. TRIALS RECORD

Throughout the trial there was a force 5 wind and some swell. The area used for the trials, was chosen because it was considered to be relatively flat and free of "fasteners" which could damage both the net and the load meters which had a very low overload margin. It was found that the tidal currents in this area were quite strong and had significant influence upon the trawl.

## 2.1 Haul One

The Boy Jason's net was shot, it being a Cosalt Gemini Mk III fitted with rock hopper ground gear. The net was shot over an area known as Smiths knoll and was towed in a Northerly direction. The rigging was 250 fathoms of warp and 100 fathoms of sweep, see App. II & III.

The net was towed in this direction, into both the wind and the tide, for approximately four hours during which time it was attempted to make the desired measurements.

After this time a reciprocal tow was begun. It was found that the load meter readings were too unsteady to enable results to be taken which were in any way accurate, but could however give a reasonable indication for comparative purposes

Having spent about thirty minutes towing in a southerly direction, it was decided to end the tow and the net was hauled in.

The catch was three and a half kits of mixed fish.

## 2.2 Haul Two

The Boy Carl's net was shot away, it being a Boris Pair trawl equipped with rock hopper ground gear. As in haul one, 250 fathoms of warp and 100 fathoms of sweep were used.

The trawl was again towed in a Northerly direction, however, there was again such a large variation on the meter readings under supposedly constant conditions that no positive results were obtained.

After towing for three hours the net came fast, this being signalled by the load meters readings rising to maximum. and staying there. When the net was hauled in it was found that the headrope had parted causing extensive damage to the net.



### 3. RESULTS

Because of the severe problems encountered throughout the trial with fluctuations in the load meter readings, there were very few results actually obtained. Those readings that were taken relate to haul one and are given in graph 1.

The towed log was only used at the start of haul one. Two readings were made from the Boy Jason and are shown below, however, these are highly questionable.

<u>Load, Tons</u>	<u>Engine Speed, RPM</u>	<u>Water Speed, knots</u>
2.5	1100	2.3
2.7	1200	2.47

No results are available for haul two, using the Boris pair trawl.

### 4. COMMENTS

Obviously very few results were actually obtained from this trip. The original idea of providing the skippers of the two vessels with calibration charts, which would supply them with an idea of the engine speed required to tow each of the nets at a chosen speed, has not been possible.

Of course, there is a limit to the amount of information that could have been supplied anyway, since it would only have been applicable under the conditions experienced on the trial. However, had it been possible to make measurements over complete reciprocal tows, with the weather calm, it would have given the skippers enough information to form some idea of optimum engine speeds. It would also have given them information about the effect of tidal currents.



# RESULTS USING COSALT GEMINI Mk III NET

## Conditions:-

Weather force 4/5 Northerly

Swell

Tide South predominantly

BOY JASON ENGINE SPEED, r.p.m.

BOY CARL ENGINE SPEED, r.p.m.

1200  
1150  
1100  
1050  
1000  
950  
900  
850  
800  
750

420  
400  
380  
360

$1\frac{1}{4}$

$1\frac{1}{2}$

$1\frac{3}{4}$

2

$2\frac{1}{4}$

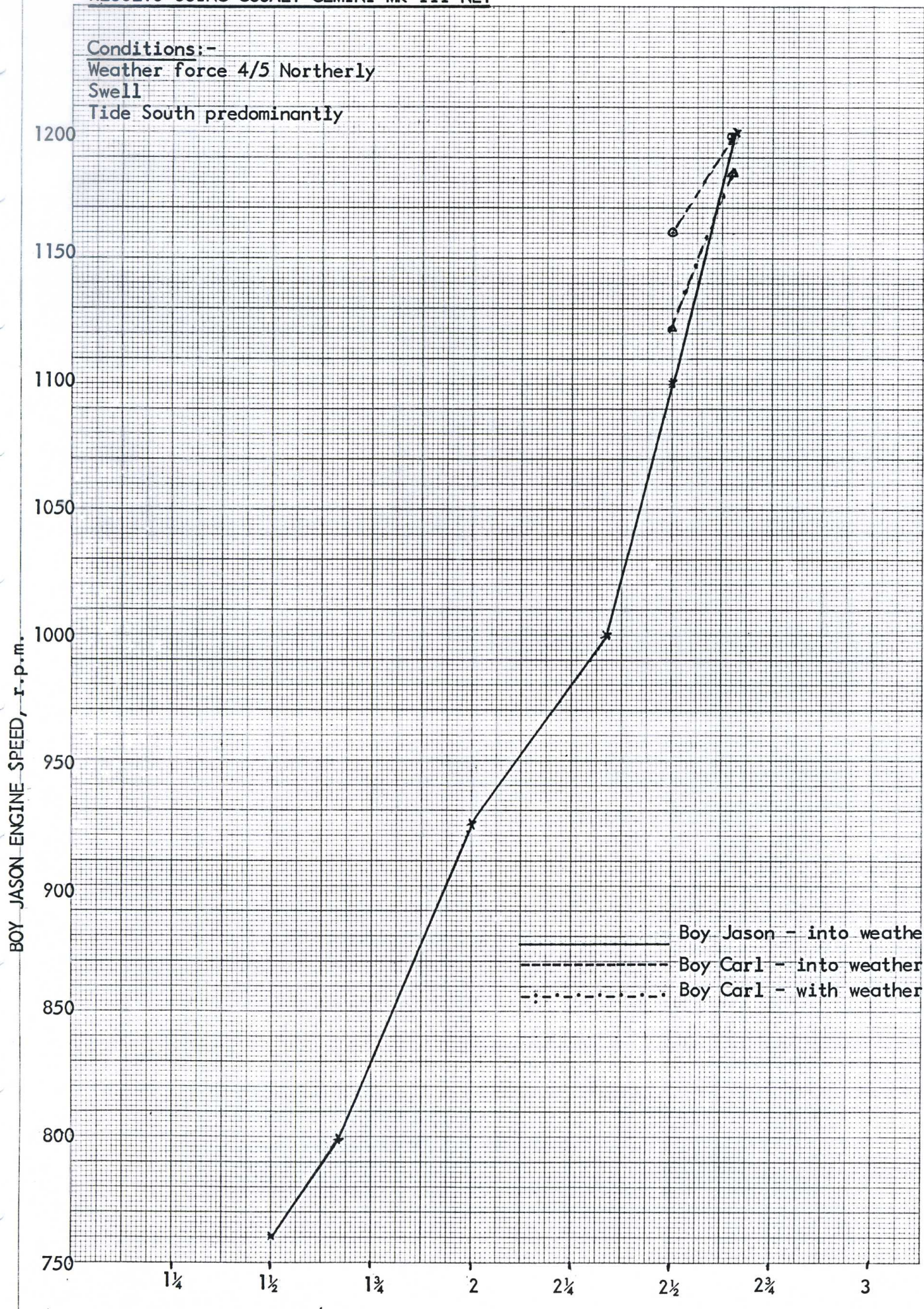
$2\frac{1}{2}$

$2\frac{3}{4}$

3

LOAD TONS

- Boy Jason - into weather
- Boy Carl - into weather
- Boy Carl - with weather





What was achieved on this trip was that the skippers managed successfully to shoot and haul the nets. Also, with the guidance of the load meters they were able to work together fairly easily.

Another point which was noted was the effect of the towing block. Both vessels were towing from the starboard aft fairleads with the warp then passing through a towing block to prevent the danger of fouling of the propeller shaft during turns. The problem with this was that frequently the tidal currents forced the gear over so that it was no longer dead astern of the vessels. Sometimes the gear was found to bear away at such an angle that the warp direction was considerably distorted as it passed through the towing block. To overcome this problem, which alters the measured load and which also affects the behaviour of the vessel, the skippers have decided to have a single towing point fitted at the stern of each vessel.

The warp load meters used on the trial were the three ton versions. It would have been preferable to have used the larger ten ton ones. This would have been beneficial in two ways. Firstly, there would have been a greater apparent stability of the reading since the observed arc of the variation of the indicator would have been less. This would have enabled some visual averaging to have been performed which was not possible with the smaller versions. Also the meters would have been less susceptible to damage from shock loads. This would have enabled the trial to have been conducted on more usual grounds.

The requirement that the observer perform a visual averaging is a direct consequence of the continued use of dial indicators. It is clear from this trial and earlier ones that this is an unsatisfactory situation. It is essential that some form of automatic integration/averaging should be performed by the instrument read out. Though in itself this is not difficult to design, is totally different to the present indicator system and would require some time and money to be invested.

It has been noted that the tidal currents in the area of the trial were quite strong. In planning future work there is a requirement that the area in which the trial is conducted should be chosen with reference to the tidal currents existing in the area. Preferably trials should be conducted in areas with moderate tidal streams although it is acknowledged that commercial considerations have to be borne in mind when the vessel is not on charter.

The other feature of this trial was the lack of time. A much larger set of results, including some from diverse grounds, could have been obtained if more time had been allowed.

Brian Scannell.



## APPENDIX I

### VESSEL SPECIFICATION

#### MFV BOY JASON

Built	:	1958, France. Length 77ft.
Main Engine	:	Deutz 505 hp @ 1350 rpm derated to 438 hp 8 cylinder
Gear Box	:	Remi Barre 4½ and 5 to 1
Radar Equipment	:	JRC Type JHA 307 display unit type NCD 461A
Echo Sounder	:	Simrad Skipper
Main Radio Receiver	:	Sailor Type R105
Transmitter	:	Sailor Type T123
VHF Radio	:	Nevalec Digital (French)
Ancillary Equipment	:	Marconi "Lifesaver" Emergency Radio 2182 Watch keeper Marconi "Warden 4C"

#### MFV BOY CARL

Built	:	1959, France
Main Engine	:	Sulzer 375 hp at 450 rpm 5 cylinder
Gear Box	:	Remi Barre, 4½ and 5 to 1

All other facilities as for Boy Jason

# GEMINI MK III.

## Pair Trawl

