SEAFISH
TECHNOLOGY

MIDWATER PAIR TRAWLING

Controlling the Net

Net depth is generally adjusted by increasing or decreasing the warp lengths by amounts usually determined by a 'rule of thumb' and/or experience. However, use of net sounder equipment can simplify this task.

Net depth can also be altered by altering vessel speed, if the vessel is not already operating at maximum speed.

Normally, vessels tow at a distance apart approximately equal to half the warp length, with a ratio of warp length to trawl depth of 7:1.

The net can be made to 'jump' over obstacles by heaving back warp or by slacking back the top wires only. After the obstruction is cleared the gear is squared-up by re-adjusting the wires.

Vertical mouth opening is achieved by a combination of the upward pull of the top warp, the downward pull of the lower warp and the use of floatation on the headline and weighting on the footrope of the net.

The weights can be attached to the wingends of the net or the junction between bridles and warps.

Lower Warp Adjustment

The lower bridles are usually longer than the upper pair to compensate for the distortion of the lower warp due to the additional weights. Sometimes equal bridle lengths are used and the compensation made by a greater adjustment in the length of the lower warp.

The amount of extra warp paid out will depend on the depth at which the net is set, the deeper the set, the longer the lower warp must be relative to the upper warp.

The lower warp length can be calculated using the following formula and knowing some of the gears other parameters.

$$\textit{Lower warp length} = \sqrt{DL^2 + W^2 - Du^2}$$

where:
- DL = *depth of lower bridle (from surface)*
- Du = *depth of upper bridle*
- W = *length of upper warp*

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The depth of the bridles can be calculated by the warp length and angle of the warps at the vessel.

In practice, lower warp lengths are estimated for new gears using previous experience. In any case, the adjustments need not be precise.

A number of tables/charts are included to give guidance for warp length adjustments.

The lower warp adjustments must be reckoned bearing in mind the difference in length (if any) between upper and lower bridles. When adopting a set of adjustments it must be checked to see whether they apply to bridles of equal or unequal length, and corrections made appropriately.

Warp Length Ratio

Warp length is usually the means used to set initial net depth. Here again there are no general rules that apply to vessels of all horsepowers. However, a ratio of 7:1 is commonly accepted starting from about 10 fathoms depth. Factors such as vessel power, gear type and species sought affect this parameter.

Net depth can be increased by towing more closely together (i.e. ¼ or ⅓ warp length apart).

It is advisable when midwater towing to leave some power in reserve, i.e. tow at approximately 75% of maximum engine power to allow for emergency manoeuvres.

It is not possible to give fixed values for lower warp adjustments because of differences in gear types, net designs and rigging. The supplier of a midwater net should be able to give advice on such matters for their particular model of trawl.

Similarly, warp end weights will vary according to gear type and vessel power.

The following is a guide to weight relative to net size:-

Vessel H.P. (each)	Net Size (fathoms)	Warp End Weights (each)
120-250	20 x 20	165-220lbs (75-100kg)
250-350	25 x 25	220-275lbs (100-125kg)
350-450	30 x 30	275-330lbs (125-150kg)
450-550	35 x 35	330-385lbs (150-175kg)

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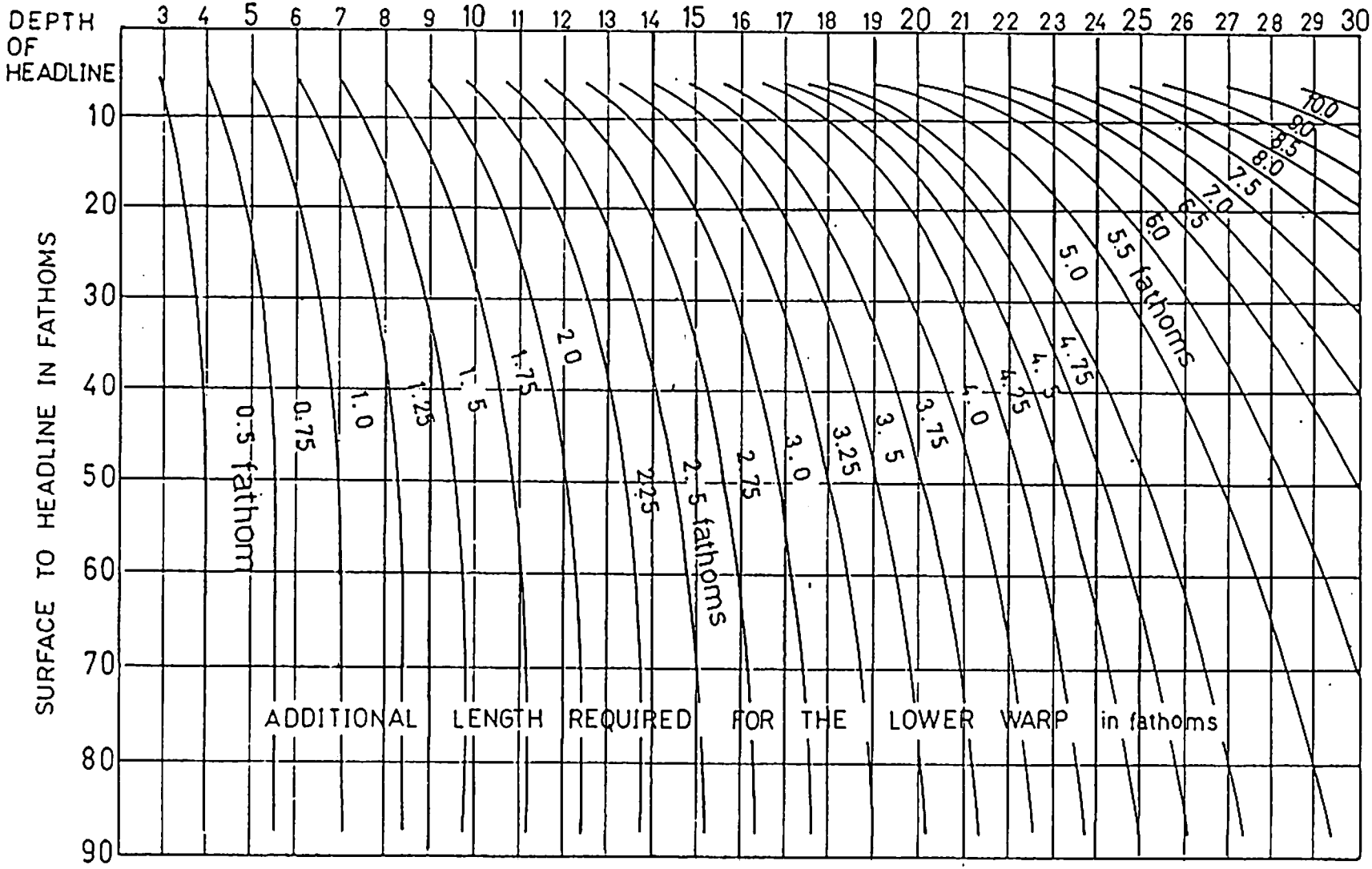
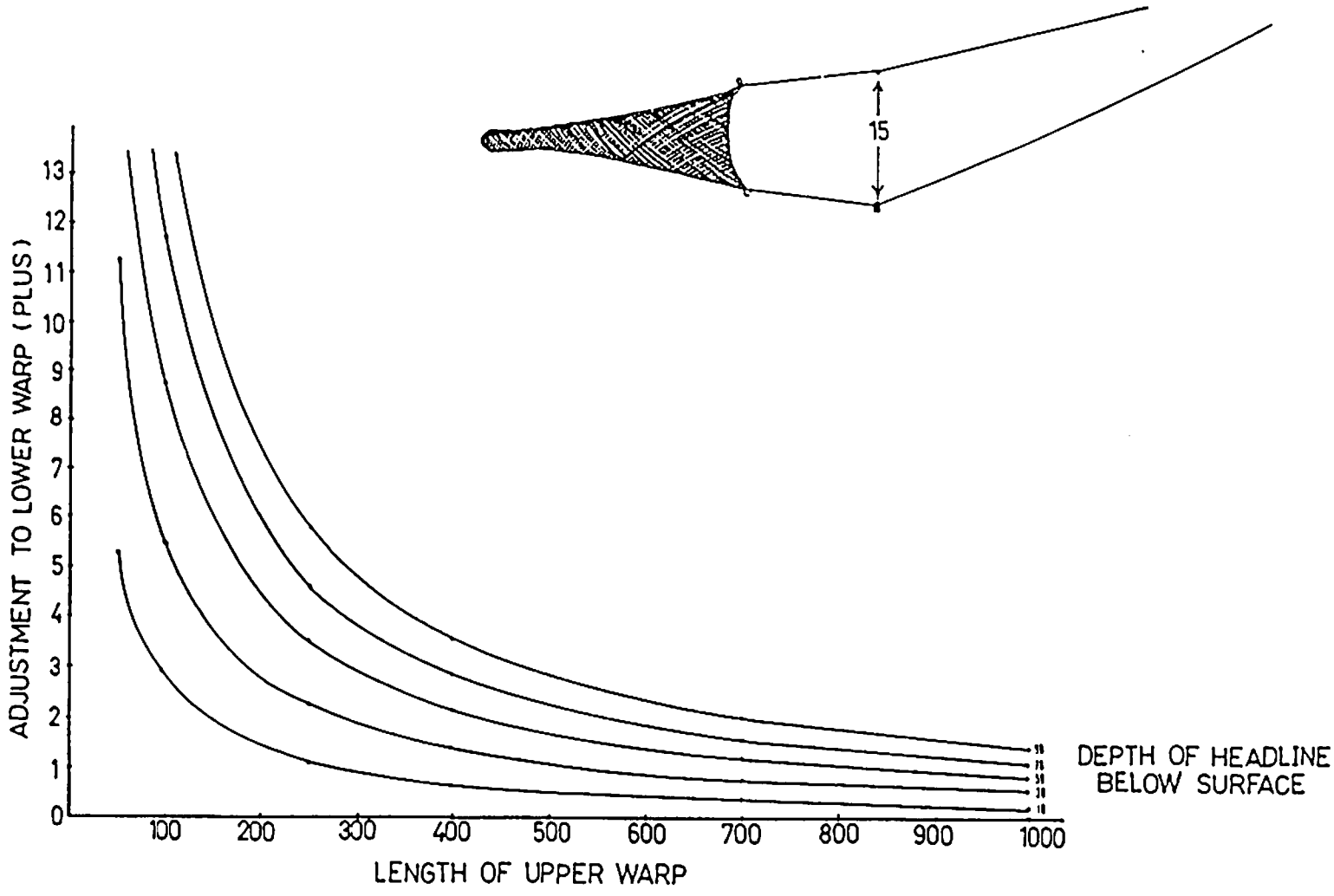
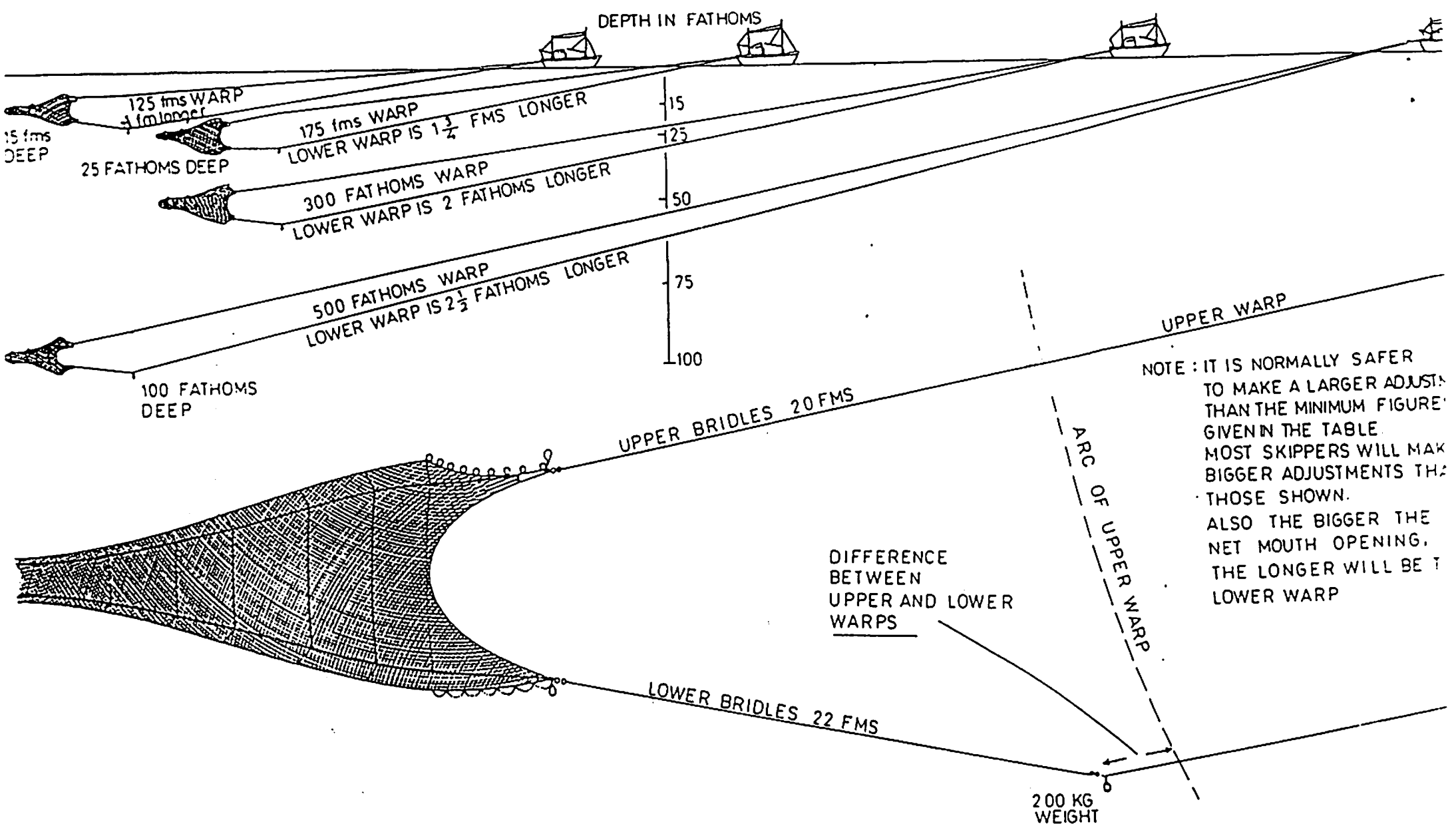


CAUTION : THESE ARE MINIMUM ADJUSTMENTS TO FISH THE NET DEEPER IT IS NORMAL PRATICE TO INCREASE THE ADJUSTMENT WITH THE DEPTH.

Warp length adjustment graph

Warp adjustment for 15-fathom trawl




DEPTH IN FATHOMS
125 fms WARP
+ fm longer
15 fms
DEEP
175 fms WARP
LOWER WARP IS 1 3/4 FMS LONGER
25 FATHOMS DEEP
300 FATHOMS WARP
LOWER WARP IS 2 FATHOMS LONGER
500 FATHOMS WARP
LOWER WARP IS 2 1/2 FATHOMS LONGER
15
25
50
75
100
100 FATHOMS
DEEP
UPPER WARP
UPPER BRIDLES 20 FMS
ARC OF UPPER WARP
DIFFERENCE
BETWEEN
UPPER AND LOWER
WARPS
LOWER BRIDLES 22 FMS
200 KG
WEIGHT
NOTE : IT IS NORMALLY SAFER
TO MAKE A LARGER ADJUST
THAN THE MINIMUM FIGURE
GIVEN IN THE TABLE
MOST SKIPPERS WILL MAK
BIGGER ADJUSTMENTS TH
THOSE SHOWN.
ALSO THE BIGGER THE
NET MOUTH OPENING,
THE LONGER WILL BE T
LOWER WARP