

Discussion of Parameters for Standardization of U.S. Purse Seine Catch-Per-Unit Effort

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INTRODUCTION

This paper briefly looks at some vessel specifications collected from U.S. purse seiners fishing in the central-western Pacific and their usefulness in the standardization of the U.S. fleet's catch-per-unit effort (CPUE).

DATA

The current vessel specification data were obtained from the Secretariat of the Pacific Community (P. Williams pers. comm.¹). The data include a Forum Fisheries Agency (FFA) vessel Identification number, vessel gross registered tons, vessel length, helicopter make and model, net depth, net length, block pull, and line pull information. Units for vessel length, net length and net depth is meters, gross registered tons, 100 cubic feet, block pull, kilograms and line pull in meters/min. CPUE, in catch tons, yellowfin (*Thunnus albacares*), skipjack (*Katsuwonus pelamis*) and bigeye tuna (*T. obesus*), per set and catch tons per day fished, for vessels in the vessels specification data set were obtained from logbook data for 1998.

RESULTS

Fifty-eight U.S. vessels were included in the data set (one vessel did not report any information). Of the 58, forty-six reported using a helicopter. Vessel gross registered tons ranged from 606 t to 1960 t, and averaged 1170 t (Figure 1A). Vessel lengths ranged between 51 m to 74 m and averaged 64 m (Figure 1B). Net lengths ranged from 290 to 3,100 m and averaged 1,470 m (Figure 2A). Five vessels did not report net length data. Net depths ranged from 55 m to 1700 m and averaged 280 m (Figure 2B). Five vessels did not report net depth data. Block pull ranged between 6,600 kg and 35,000 kg and averaged 15,290 kg (Figure 3A). Thirty-nine did not report block pull information. Line pull ranged between 19 m/min and 80 m/min and averaged 38 m/min (Figure 3B). Thirty-eight vessels did not report line pull information and one vessel reported 8,000 m/min that was changed to 80 m/min.

Of the 58 vessels, CPUE was available for 39 in 1998 logs. One of the vessels sank midway through the

¹ Peter Williams, Secretariat of the Pacific Community.

year and its CPUE was not used. CPUE in t/day fished ranged between 17 t/day fished and 42 t/day fished and averaged 29 t/day fished (Figure 4A). CPUE in t per set ranged between 26 t/set and 54 t/set and averaged 38 t/set (Figure 4B).

A loess fit was applied for CPUE in t/day fished and t/set versus the 6 parameters vessel gross registered tons and length, net length and depth, and block and line pull (Figures 5-7).

DISCUSSION

The vessel register data needs to be edited. Errors in the data may be effecting the results. At the present, with very limited editing, there seems to be no significant trends in any of the parameters. Slight trends can be seen in block pull and line pull. The analysis should be redone with the edited data.

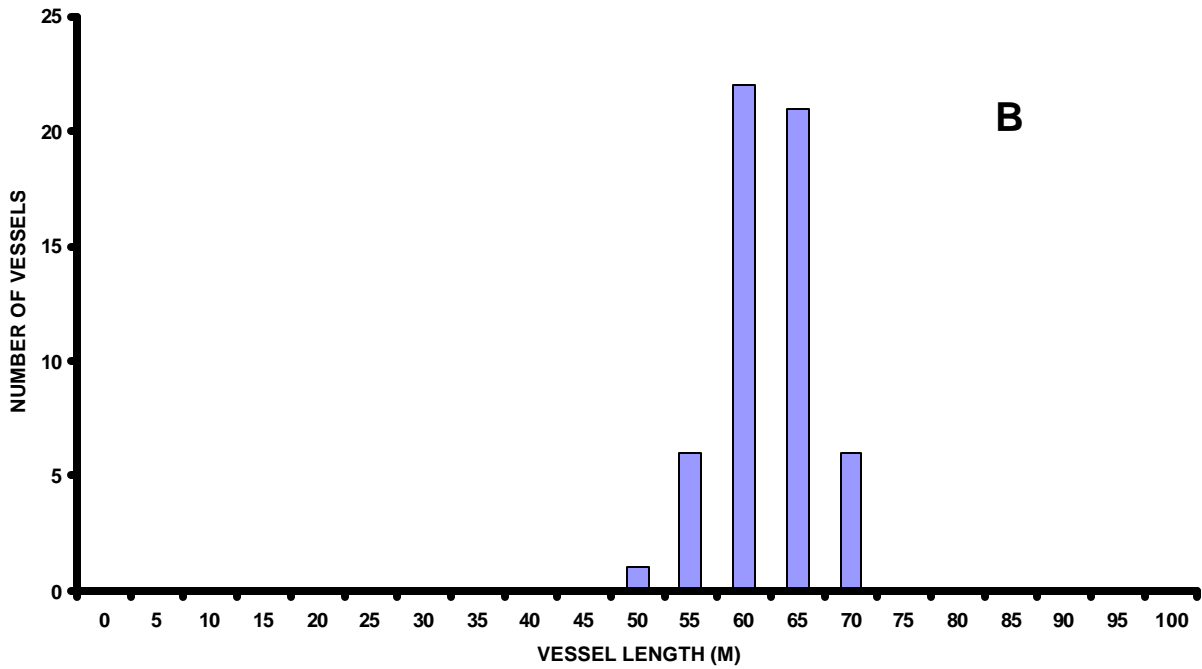
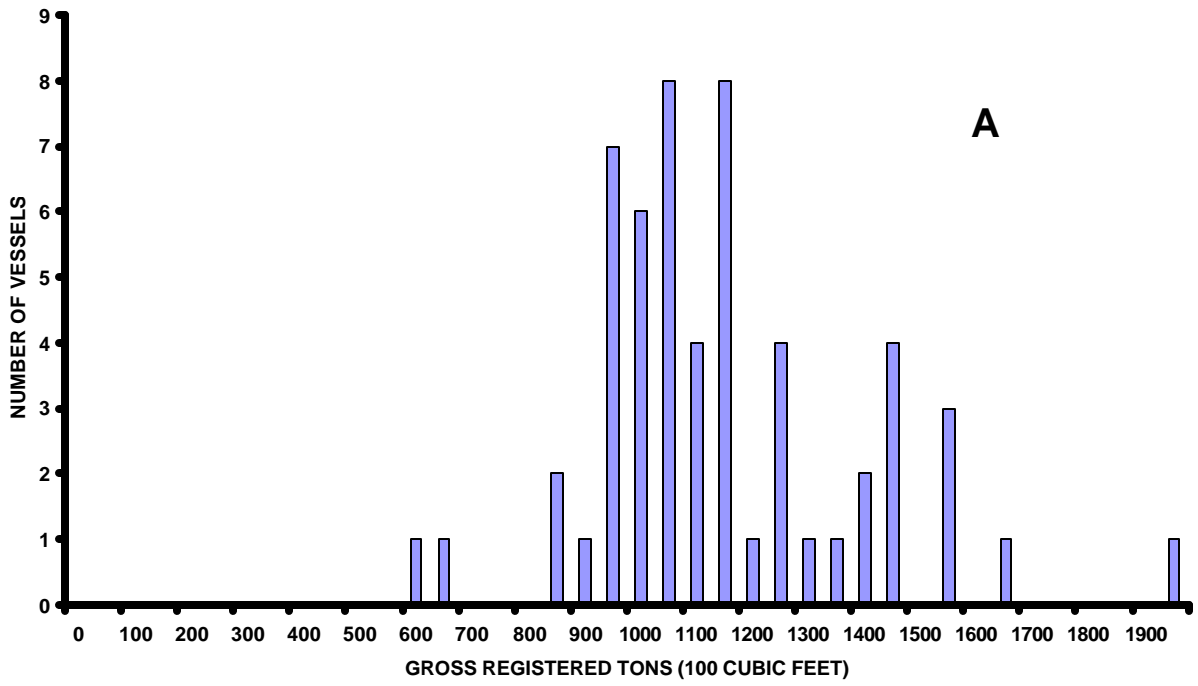


Figure 1. Vessel gross registered tons (A) and length (B) for U.S. purse seiners fishing in the central-western Pacific.

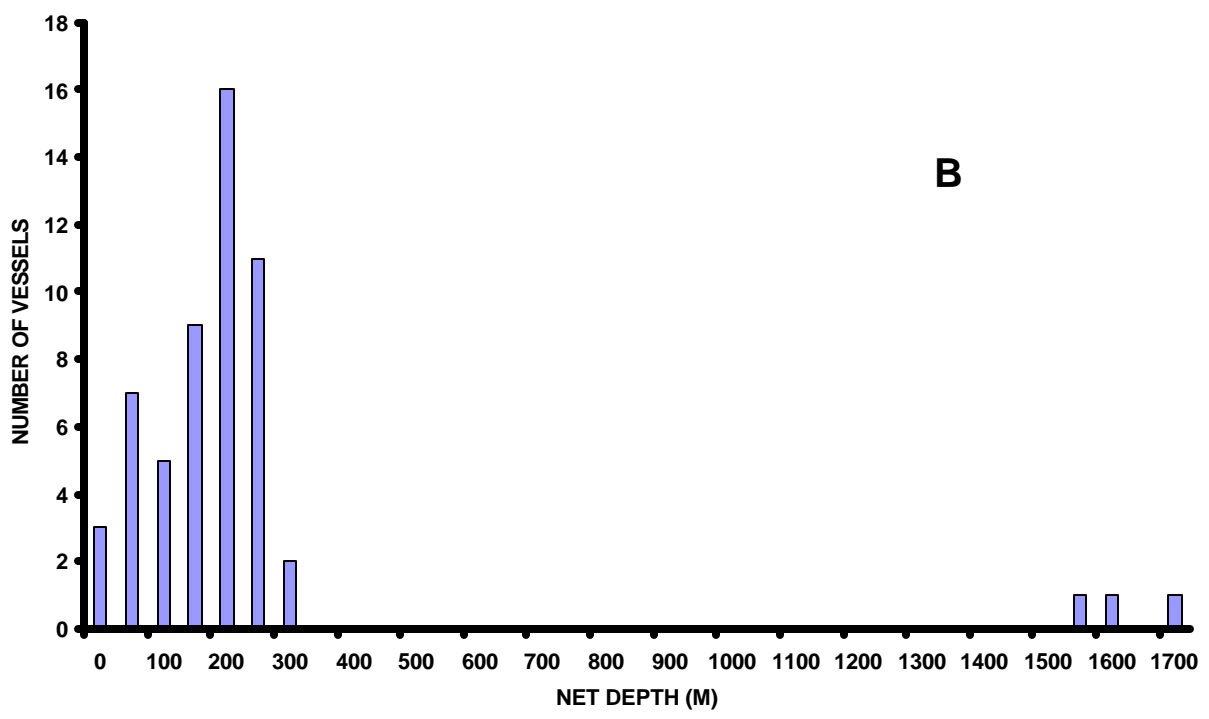
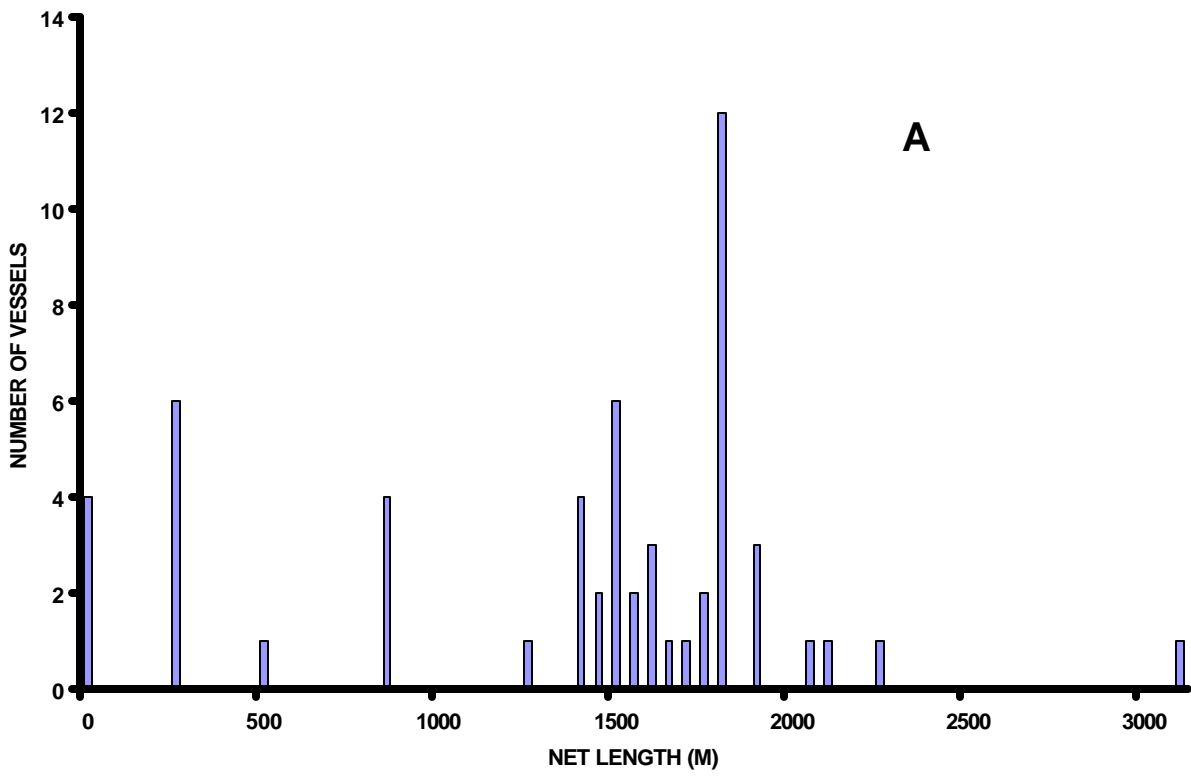


Figure 2. Net length (A) and net depth (B) for U.S. purse seiners fishing in the central-western Pacific.

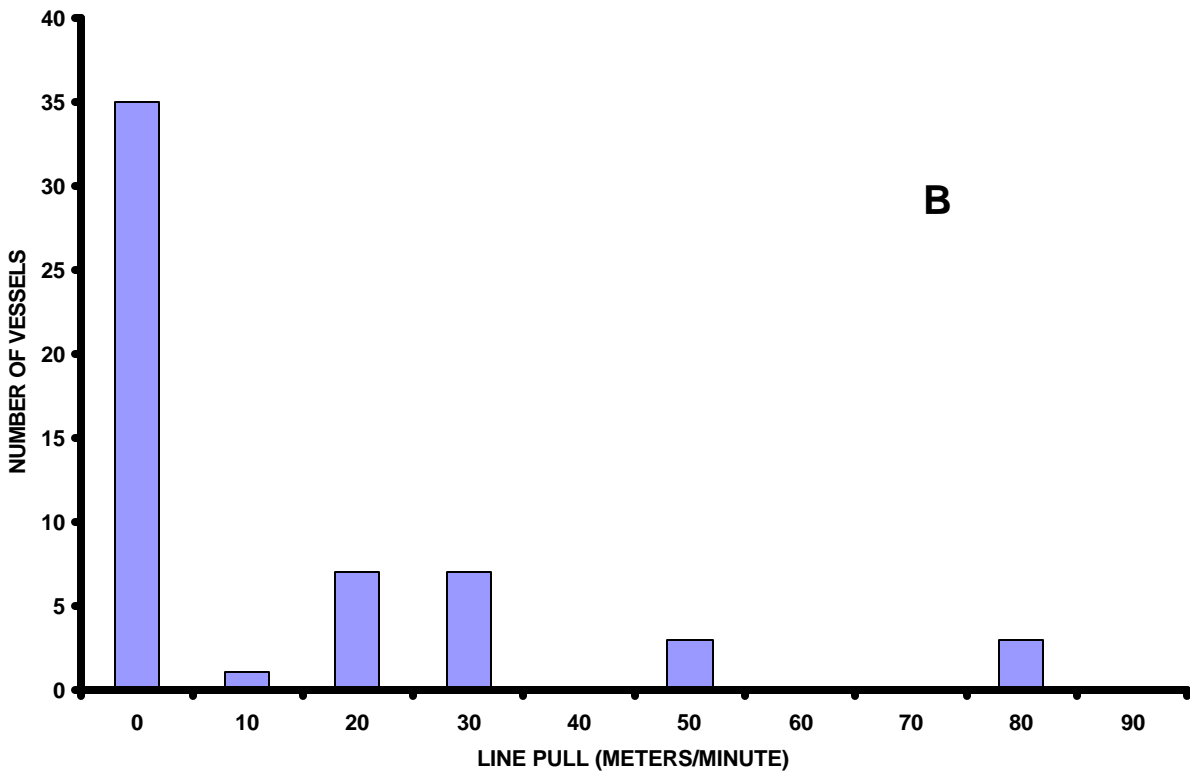
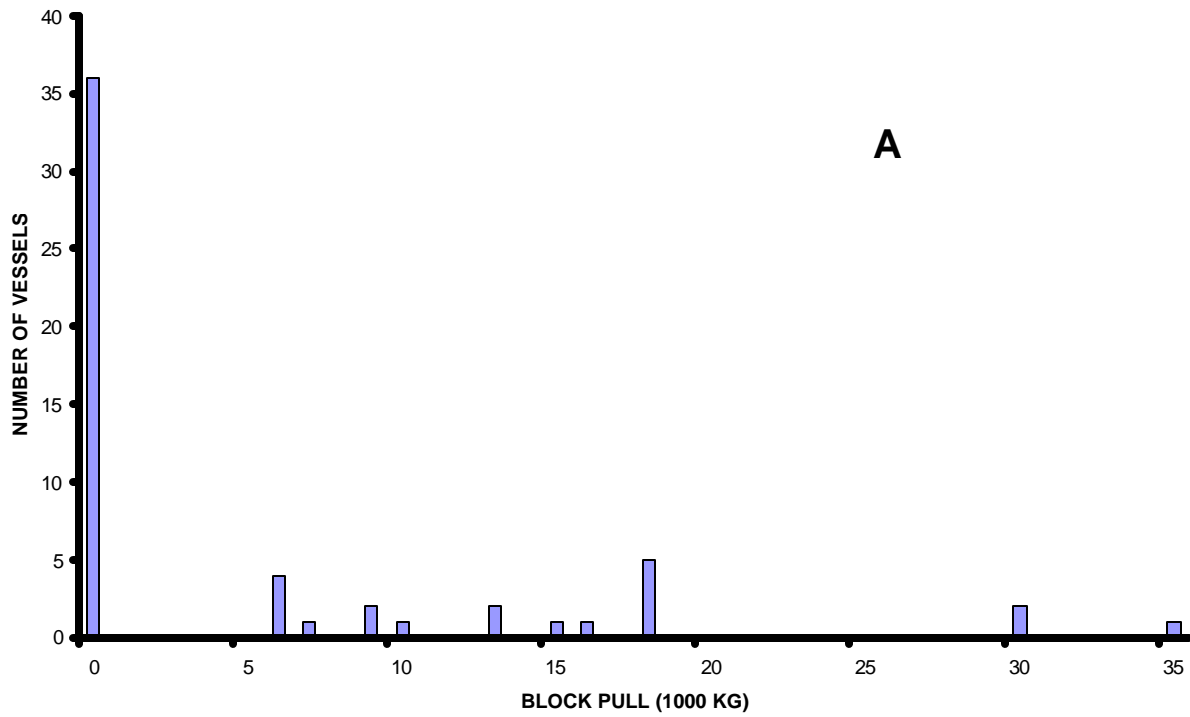


Figure 3. Block pull (A) and line pull (B) for U.S. purse seiners fishing in the central-western Pacific.

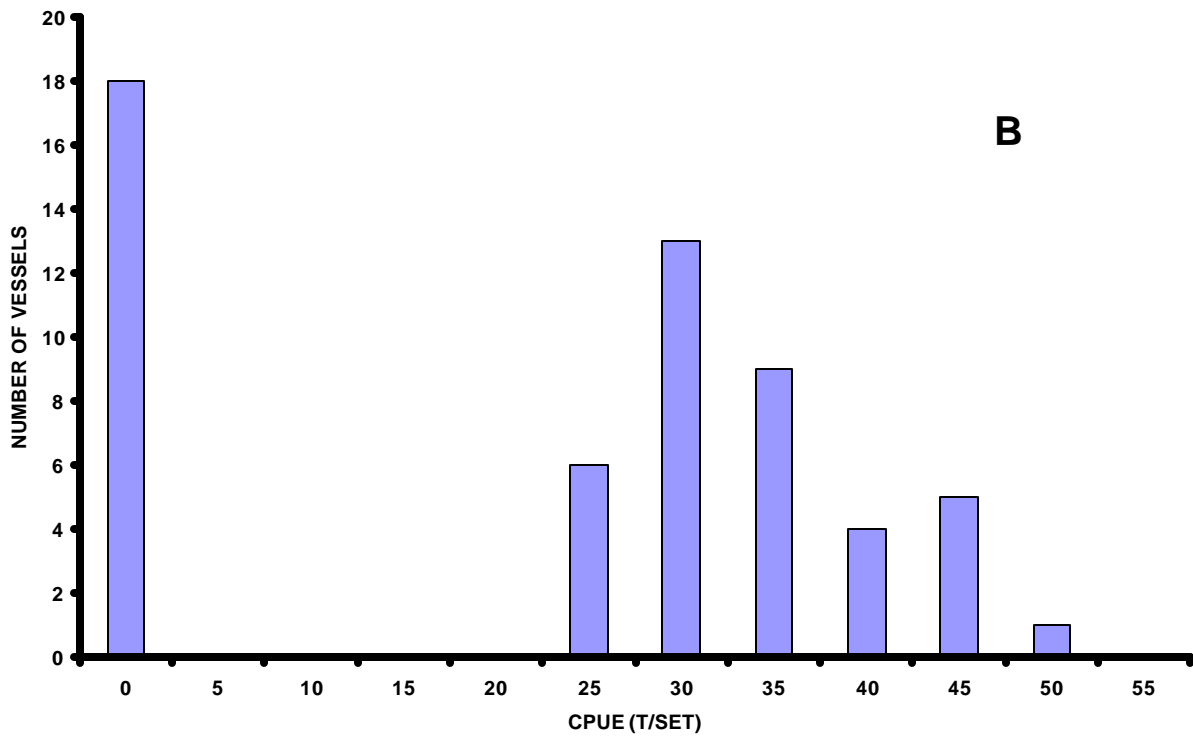
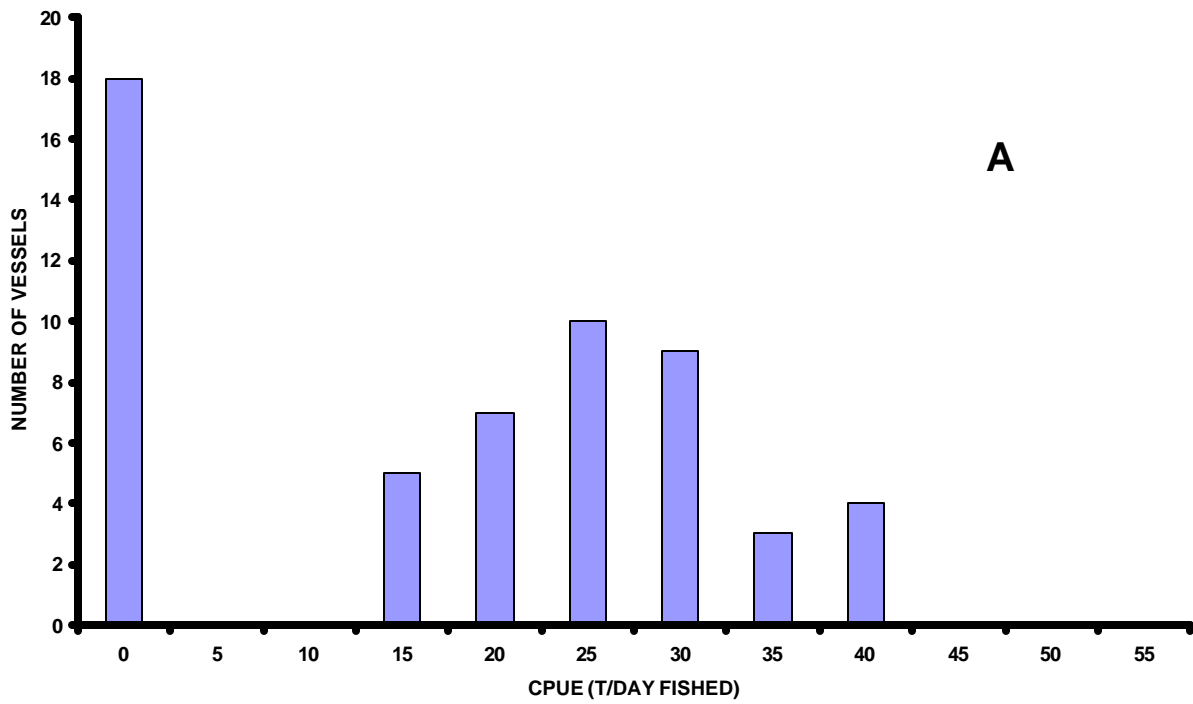


Figure 4. Catch-per-unit effort (CPUE) in metric tons per day fished (T/DAY FISHED, A) and metric tons per set (T/SET, B) for U.S. purse seiners fishing in the central-western Pacific in 1998.

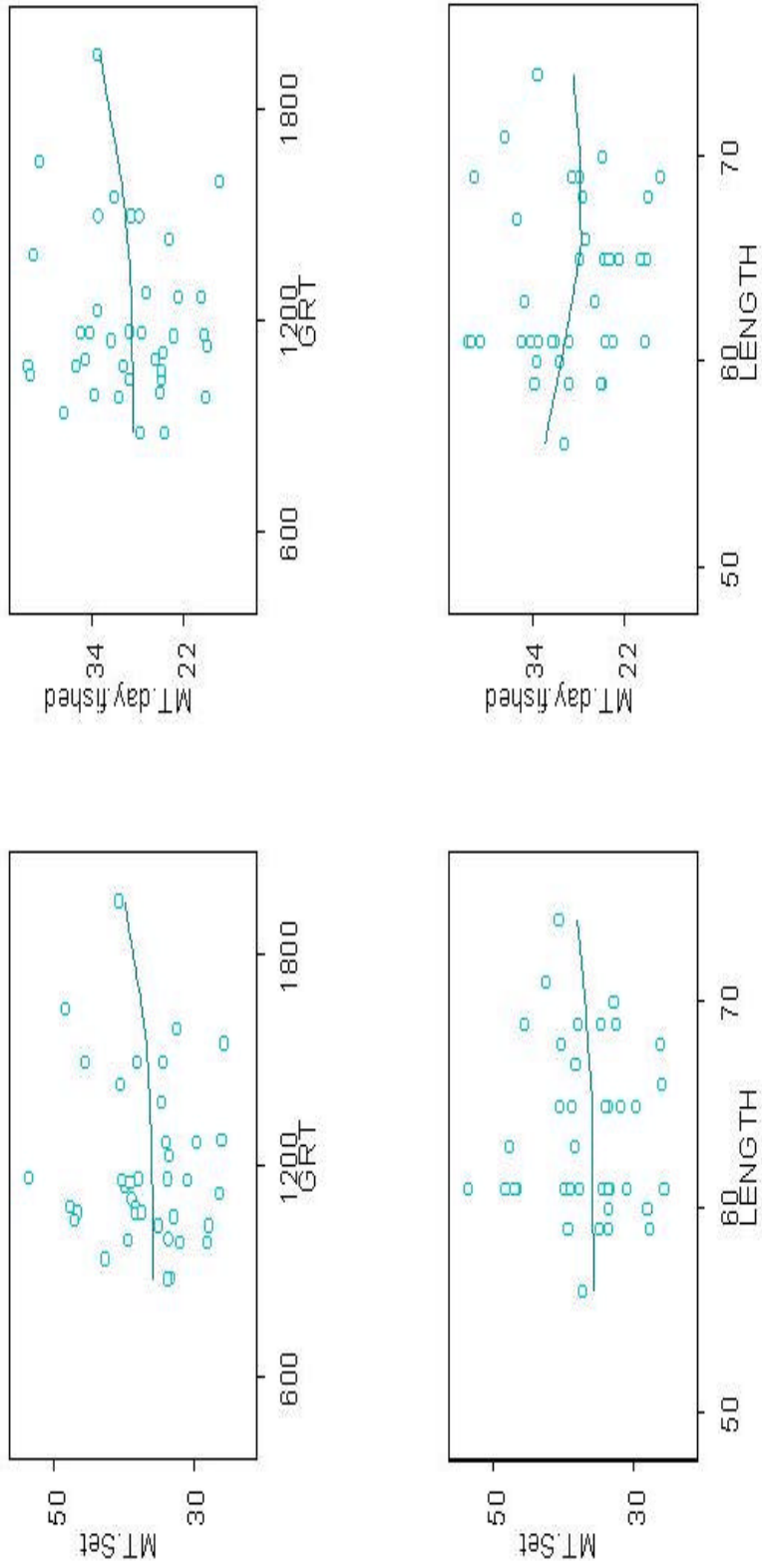


Figure 5. Relationship between CPUE in tons per set or tons per day fished and vessel gross registered tons (GRT, 100 cubic feet) or vessel length (LENGTH, meters) for U.S. purse seiners fishing in the central-western Pacific in 1998. The line indicates a loess smoother.

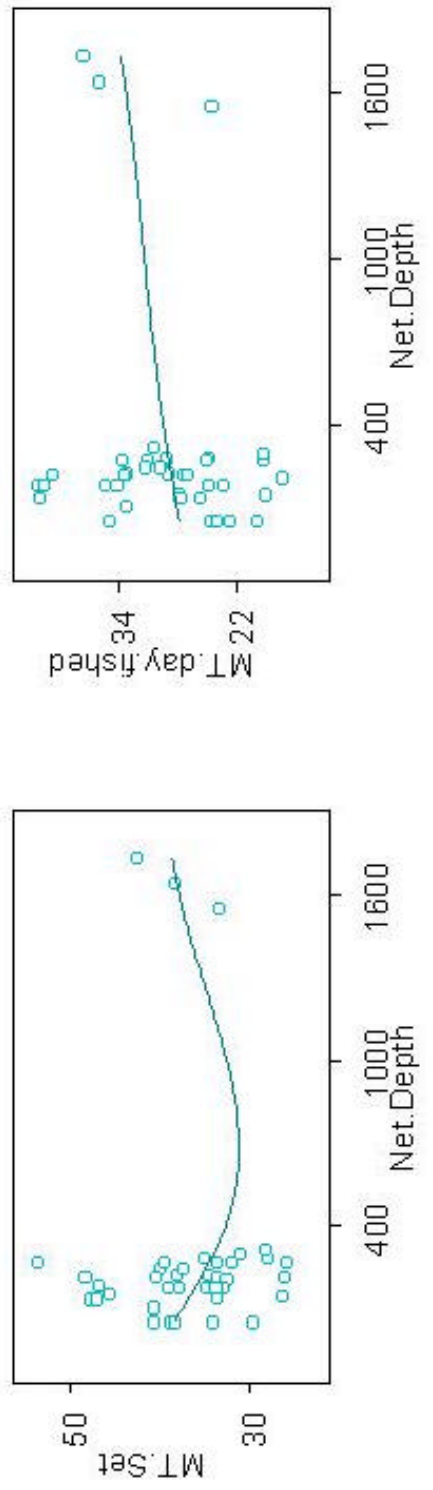
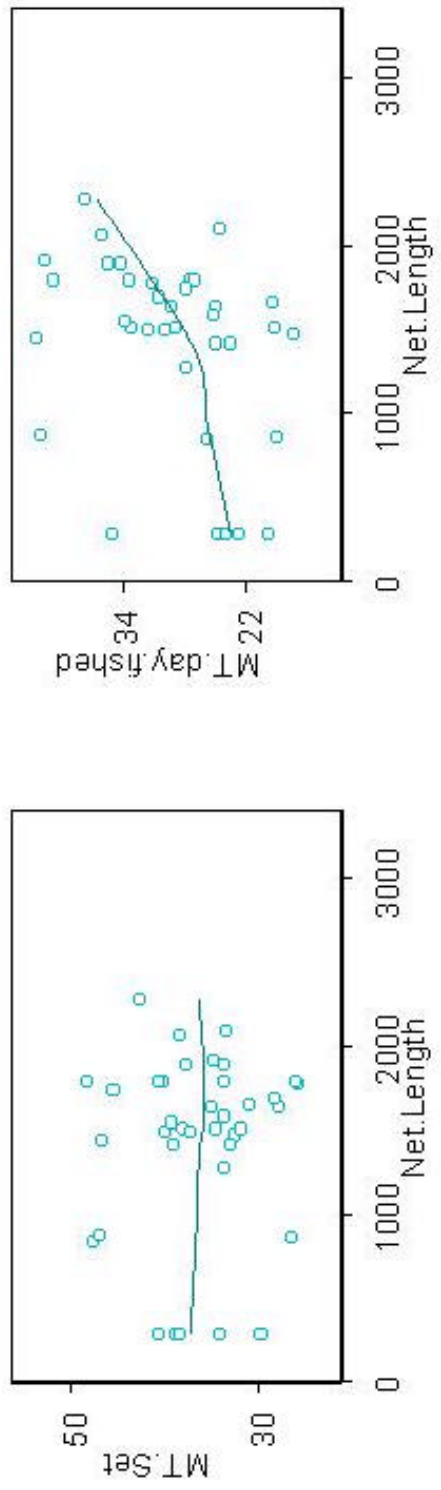


Figure 6. Relationship between CPUE in tons per set or tons per day fished and net length (meters) or net depth (meters) for U.S. purse seiners fishing in the central-western Pacific in 1998. The line indicates a loess smoother.

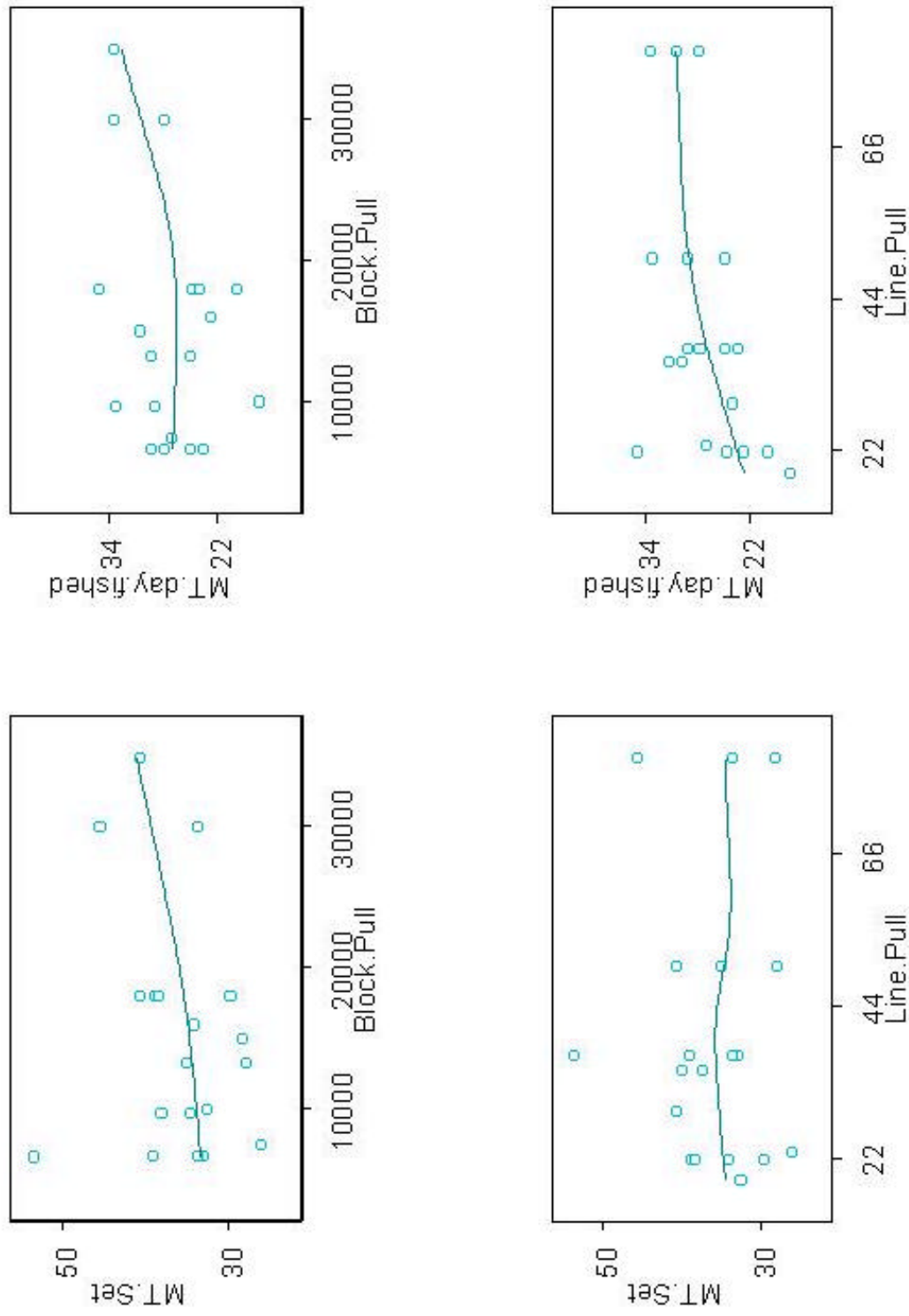


Figure 7. Relationship between CPUE in tons per set or tons per day fished and block pull (kilograms) or line pull (meters/minute) for U.S. purse seiners fishing in the central-western Pacific in 1998. The line indicates a loess smoother.