APPLICATION OF THE AUSTRALIAN TRAWL EFFICIENCY DEVICE IN AUSTRALIA'S NORTHERN PRAWN FISHERY

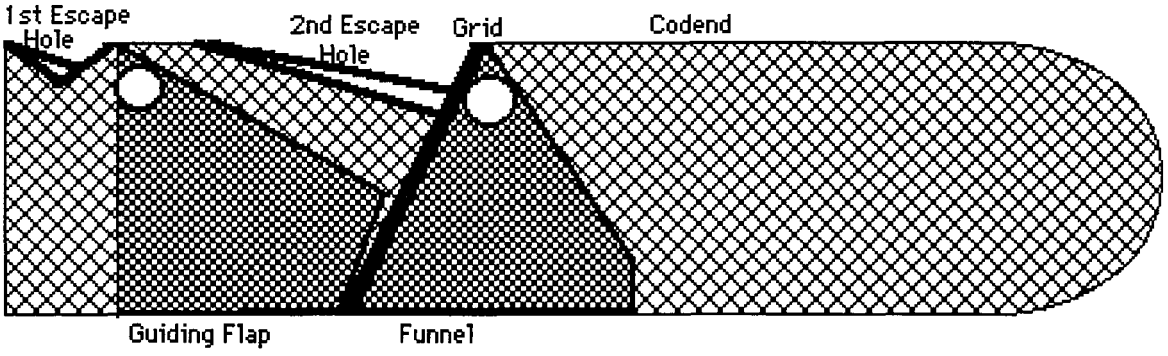
by

Richard Mounsey
Department of Primary Industry and Fisheries, Australia

Abstract

The following paper is made up of three field trip reports covering the testing and commercial use of the Australia Trawl Efficiency Device (AusTED). The work was carried out in the Northern Prawn Fishery (NPF) aboard five NPF vessels between July 95 and November 96. The study was undertaken in accordance with the program outlined in the FRDC funded project **"Development and application of AusTED in the Australia trawl industry"**. The AusTED performed exceptionally well. In fact big catches of prawns, fish and large marine creatures appear to be what the AusTED requires to fully show off it's value as a trawl efficiency device. It excluded all large creatures encountered while maintaining prawn catches. The reduction in small fish was as high as 60% but averaged around the 30% mark. Testing of the AusTED was carried out on trawlers fishing for tiger prawns and endeavour prawns in the Gulf of Carpentaria (GOC) and red leg banana prawns in the Joseph Bonaparte Gulf (JBG). The following reports cover catch comparisons between standard nets and those rigged with AusTED. Recommendations and personal opinions from NPF skippers operating in the Gulf of Carpentaria and the Joseph Bonaparte Gulf are also included.

AusTED 2



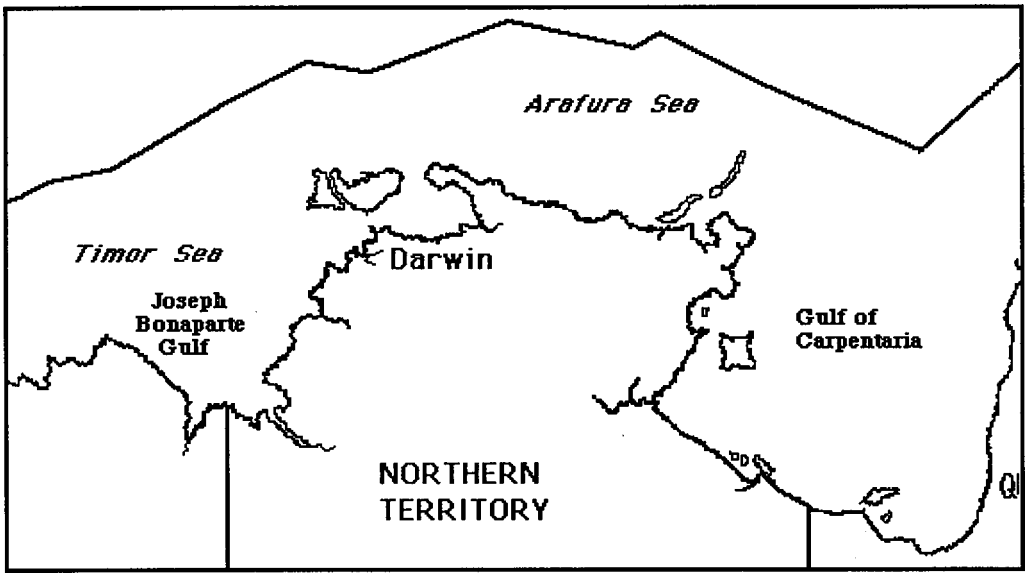
THE

AUSTRALIAN TRAWL

EFFICIENCY DEVICE
(AusTED)

in the

NORTHERN PRAWN FISHERY (NPF)



AUSTED TRIALS ABOARD F V "ROPER THERESE"
Western Gulf of Carpentaria
17 July 95 to 26 July 95

The trials were undertaken in accordance with the program outlined in the FRDC AusTED project document. These trials were the first carried out in the Northern Prawn Fishery and used a full size AusTED suited to NPF vessels.

The AusTED performed exceptionally well. In fact bigger catches of prawns, fish and large marine creatures appear to be what the TED requires to fully show off it's value as a trawl efficiency device. It excluded all large creatures encountered, including turtles, rays, sawfish and sharks while maintaining prawn catches [prawn catches were actually 7% higher] and the reduction in small fish was as high as 60% but averaged around the 30% mark.

These results were not achieved without some difficulties. We only had around $20,000 for charter and the scientists on the project recommended we undertake at least 10 days work to gain meaningful results. The cost of the charter vessel was $4,500 per day leaving a short fall of $25,000. We may every well have had to cut the charter short but good fortune was with us and we were able to sell around $30,000 worth of product which was not required for research purposes. Other than a few bumpy nights, ropes around the propeller and having to swap codends every other shot, the operation went smoothly.

The AusTED used had one major modification. A hole 20 meshes wide by 5 meshes long was placed in the top of the net just forwarded of the flap. This version was tested against a version without the hole and appeared to reduce fish meshing in the flap and funnel, reduce by-catch and retain the same amount of prawns. [See AusTED diagram above:]

The vessel chartered was the 'Roper Therese'. She is a twin rigged freezer vessel skippered by Mr. Ivor Jones. Mr. Jones has over 20 years experience in the NPF. The nets used were two standard 12 fathom head line Florida Flyers fitted with 50 mesh side panels [i.e.: Tiger Prawn Nets].

The experimental design used to quantify differences between AusTED and standard gear in terms of total reduction of by-catch, turtle and other monster reduction along with prawn retention rates was strict. Details are published in the 1997 Fisheries Research & Development Corporation report on project number 93/231.07. However basically the trials were split into four groups of two nights. At least four two hour tows were carried on the first night at each site in a region between Groote Eylandt and Cape Grey. The codend containing the TED was swapped from net to net every second shot. The second night at each site was virtually a mirror image of the first [i.e.: same track, same time] except that the TED was on the opposite side to that of the first night. Particular emphasis was placed on trawling the same tow path in paired shots.

The research crew aboard the vessel included John Wakeford a lecturer in gear technology from the Australian Maritime College, John Salini, a prominent scientist from CSIRO specialised in Gulf of Carpentaria by-catch identification, Julie Robins from Queensland Fisheries specialised, in turtle identification and by-catch reduction analysis, and myself (R. Mounsey, Fishing Gear Technologist).

John Wakeford operated two sets of SCANMAR, one on each net which enabled us to rig the nets to fish at their optimum and also to keep them fishing as close as possible to identical. The reason why the nets containing the AusTED significantly caught more prawns maybe be directly attributed to the fact the net opening width did not decrease as rapidly as that of the standard net. In general it appeared the bigger the overall catches (especially by-catch) the better the AusTED worked. In addition we had four load cells aboard. This not only allowed us to weigh the total bags of fish to within a kilogram, but when fitted to the main warp cables we were able to gauge the effects of the AusTED in the net and what effect the build up of catch was having on the trawls. Generally speaking neither the AusTED nor the catch had any significant effect on the nets. [For more details on these aspects of the operation please contact John Wakeford at the Australian Maritime College for a copy of his report].

John Salini and Julie Robins sampled the prawn catch to gauge prawn quality, species make up, size composition and the differences between the AusTED and standard gear. They concluded that AusTED produced better quality prawns i.e.: less squashed or broken prawns. They also collected data on the marketable by-catch. Sub samples of the by-catch were sorted into species, weighed and measured. Result indicated no significant differences in species of marketable by-catch composition between the AusTED and standard gear. However many unwanted fish were escaping and it was fairly obvious that the catch of dollar fish, trevally and lizard fish was drastically reduced by the TED.

Large marine creatures were identified, measured and weighed. The AusTED excluded all monsters which came in contact with it. In fact it excluded everything bigger than an average size dinner plate. Both turtle and sawfish were actually seen escaping the net through the main hole in the AusTED while it was operating near the surface.

The skipper of the vessel recorded trawling details in the wheelhouse. These included the starting time and position of each tow, a drawing of the vessels track, taken from the Global Positioning System (GPS) and a position every 12 minutes. He also recorded bottom types, depths, the vessels speed, heading and rudder position.

The vessel's crew operated the fishing gear in a standard commercial fashion. They sorted, export-graded and froze the catch and assisted in the never ending codend change overs. After a couple of nights it was only taking 10 minutes to swap codends.

Forty-four (44) paired 2 hour tows were carried out during the charter, resulting in a total catch of 25,824 kg's, including 1,709 kg's of large prawns. Six of these tows were to tune the gear and a further six were regarded as not being good enough for the comparison trials for one reason or another. From the 32 shots meeting the scientific testing criteria, a total catch of fish, prawns and monsters weighed 17,327 kg's. The total weight of

catch in the codend containing the AusTED was 7,149 kg's as compared to the standard gear's 10,178 kg's [30% difference]. The total catch of tiger prawns [NB very few other species of prawns were caught] in the AusTED gear was 570 kg's compared to 528 kg's in the standard gear.

Overall the trials went extremely well. The skipper of the vessel wanted to start the tiger prawn season using an AusTED fitted to each net. We only had two complete large versions of the TED on hand at the time so I only loaned him one and requested he keep comparison data for us.

AusTED Industry Extension on board F V " KFV CARLISLE" F V "LIBERTINE" and F V "ENDEAVOUR PEARL" 24 May to 2 June 1996 Southern Gulf of Carpentaria

The industry extension of the joint DPI (Queensland) and DPIF (Northern Territory) FRDC funded Australian Trawl Efficiency Device (AusTED) project was under taken by two technical officers from the Northern Territory's Fisheries Division.

This report outlines the AusTED's performance and acceptability on board Northern Prawn Fishing (NPF) vessels. These three to four hundred gross tonnage vessels were operating under normal conditions, targeting tiger and endeavour prawns in the southern Gulf of Carpentaria near Mornington Island. The trawlers the AusTED was demonstrated aboard belonged to Newfish Australia P/L, Austfish P/L and A. Raptis and Sons fishing companies. Apart from having to over come a few problems caused by seabed debris blocking the gear and difficulties caused by rough sea conditions the extension work was generally successful.

The work has demonstrated to NPF operators that the AusTED (i.e.: a combined turtle and by-catch trawl exclusion device) has the potential to not only reduce the amount of unwanted species landed but also increase the overall commercial viability of NPF prawn trawlers.

Along with basic data covering the weight of prawns and by-catch taken, the report includes comments and recommendations from skippers, who allowed AusTED to be demonstrated aboard their vessels.

1. THE ORIGINAL PLAN OF ATTACK

Just prior to the opening of the 1996 NPF prawn season, the NT Fisheries Division advertised in the local news paper their intent to demonstrate AusTED aboard NPF vessels in the Gulf of Carpentaria. In response to the advertisement over 20 skippers contacted the Division's Technology Section and offered to take part in the demonstrations.

The actual plan was that AusTED would be fitted to one trawl and any loss of income caused by this would be reimbursed to the company from project funds. This reimbursement needed to be included after we received disappointing AusTED results from CSIRO scientists. The results were reported to have occurred on CSIRO's research vessel, Southern Surveyor, during by-catch trials conducted in the eastern Gulf of Carpentaria. However after receiving the AusTED back in Darwin along with under water video footage of it's operation, it was obvious that it had been incorrectly installed into the trawls (i.e.: it was seriously chaffed along one side after only 15 tows, when in actual fact it should have been sitting square in the trawl and should have never come in contact with the sea bed).

2. THE ACTUAL OPERATION

As the time to conduct the work approached very few vessels were reported to be working in the Gulf of Carpentaria. In fact the fleet was spread out across the full extent of the fishery. Only one or two of the skippers who had expressed an interest in the demonstrations were actually in the Gulf.

The Newfish Australia fleet manager came to the rescue and organised for two fisheries officers from Darwin to fly to Mornington Island and meet up with the Newfish vessel ' KFV CARLISLE'. He also contacted other operation managers in the area on behalf of the project. This got the ball rolling and the project team are very thankful for Lou's assistance.

The plan was for both officers to spend one night on the 'KFV CARLISLE' then to split up and cover as many vessels as possible. Strong south easterly winds soon put a halt to this. It was then decided to at least cover vessels from a few of the larger fishing companies and show the gear to other skippers aboard the mother ships / barges.

Note: the average prawn catch per trawl from the combined vessels was around 50 kg per net, or 350 to 400 kg per boat per night . At times fishing took place during the day lights hours (no day light closure) but often it was simply not profitable to trawl during the day.

Mother Ships

The gear was stretched out aboard two mother ships anchored off Birri Beach, Mornington Island. Approximately one dozen skippers observed the gear. Generally the first comment from the skippers was **"it doesn't look as bad as I thought it would".** It appeared most had a preconceived idea that the gear was going to be some huge steel monstrosity. In fact most thought that the flexible grid was a good idea and would be OK to work around their A-frames as apposed to a rigid device. The main concern with these operators was the large turtle hole in the top of the net. They simply couldn't come to terms with the fact that very few prawns would escape through it.

KFV CARLISLE

It took approximately 1.5 hours to fit the AusTED to the 'Carlisle's' starboard trawl net. Both nets were 14 fathom Florida Flyers rigged for tiger prawn fishing. It was pointed out to the skipper and crew that the device must be set dead square just forward of the codend. Even two or three meshes off square will create a prawn loss. The lazy line also needed to be long enough so as not to roll the device inwards.

No problems were involved in setting up the gear. It was relatively simple to operate during shooting and hauling and the bad weather made no difference to it.. The flexible grid crumpled and twisted around the pipes and bars in the A-frame but always

returned to it's original shape when thrown over the side. Even if twisted or up-side down during shooting the device always managed to sort itself out. It was soft enough (i.e.: flexible) not to cause damage to the crew when on the odd occasion it hit them.

During the time the device was used on the 'KFV CARLISLE' it never come in contact with the sea bed (i.e.: no chaffing) and was not hindered by bottom debris clogging it (i.e.: clean grounds).

3. AusTED PERFORMANCE (KFV CARLISLE) north Mornington Island

The average trawl shot on the 'KFV CARLISLE' lasted four hours. The catch from the port and starboard nets was monitored during four tows to ensure the nets were operating close to identical. Following this the AusTED was fitted to the starboard net for four shots then transferred to the port net for four shots.

During the first four standardisation shots there was only a slight difference between the two nets. The starboard net caught 3 kg's more tiger prawns (approx.' 1%) while catch of white prawns (endeavour) were about the same.

Then the AusTED was fitted to the starboard net for four shots resulting in a 2.7 kg increase in the tiger prawn catch against the standard port net. The starboard net also had a 12 kg's increase in the white prawn (mainly endeavours) catch.

The AusTED was next fitted to the port net for four shots resulting in a 1.7 kg's increase in the tiger prawn catch against the standard starboard net. The port net caught the same amount of white prawns.

The reduction in by-catch for the nets fitted with the AusTED was estimated by the skipper (i.e.: while the codends were being emptied). The by-catch reduction ranged between 25% and 60% with the biggest reductions corresponding to daylight hours when more fish were normally caught. Only three large rays, two large sharks and one turtle were captured while comparing the gear. All these were caught in the standard nets (i.e.: the nets not fitted with the AusTED). Sorting times were correspondingly reduced by the percentage of by-catch not caught and the crew reported about a third reduction in the number of soft and broken prawns coming from the nets fitted with the AusTEDs.

Generally the AusTED had no effect on the overall tiger prawn catches. There was an increase in the endeavour prawn catch but this may have been due to any number of factors. The AusTED did cause a marked reduction in by-catch.

Skippers Comments: Michael Coombe

- AusTED is OK to handle on the boat (it's not dangerous).
- The TED seems to fish constant throughout the shot, where as the standard net probably slows down as the bag gets bigger.

- It should be good gear in monster / fishy country.

- Needs more research done in the Gulf sponge grounds as the grid will probably block.

- There's less soft and broken; about a third.

- Bags about a third smaller.

- Sorting time is a bit quicker.

- It's no where near as frightening as I expected.

LIBERTINE

The vessel "LIBERTINE" from the Austfish company was operating out wide on grounds north of the NT / Queensland border. The AusTED was fitted to the port net and tried for four shots.

The results were disappointing. The area trawled contained quite a lot of sponges and large starfish. 'Libertine's' trawls were picking up this debris. This was the first time the AusTED had been used on really dirty seabed. Large amounts of debris were being flicked into the codends. An attempt was made to stop this debris building up on the turtle grid by making a slit in the bottom of the trawl just in front of the grid. This was not successful and the slit probably accounted for some of the prawn losses. Although the grid probably rid the net of a few of the sponges it eventually clogged each shot and allowed the catch to escape.

The designer of the AusTED (R Mounsey) was not on board the "LIBERTINE" at the time and although this problem was later solved AusTED was removed from the net. Rather than attempting to further modify the gear it was decided that R Mounsey would work on the problem and board another vessel heading towards the "LIBERTINE'.

4. AusTED PERFORMANCE (LIBERTINE) north of the NT / Queensland border

AusTED was fitted to the port net. After four trawls the catch of tiger prawns was down 24.5 kg in comparison to the starboard net. The catch of white prawns (mainly endeavour) was also down 27 kg.

The bags with the AusTED fitted were significantly smaller and there was definitely a reduction in large animals and sponges caught, but the unacceptable reduction in prawns caused by the AusTED meant that work on the 'LIBERTINE' wound up rather quickly.

The skipper was not asked to give his comments on the gear for obvious reasons and the company was reimbursed for the loss of 51.5 kg of prawns.

ENDEAVOUR PEARL

The 'ENDEAVOUR PEARL' from the Raptis fishing company was operating in the area near 'LIBERTINE'. The first night on board the vessel was spent observing the operation and confirming that the nets were fishing evenly. The starboard net was averaging 2 kgs of prawns per shot more than the port net. The nets were rigged to dig hard on the seabed. Shells, starfish and sponges were dominate in the catches.

The next day a few modification were made to the AusTED in an attempt to prevent the grid from blocking. Six meshes were removed from the aft end of the funnel and a 30 mesh wide by 15 mesh deep debris chute was inserted in the forward lower section of AusTED.

A total of seven, four hour trawls were carried out with the AusTED fitted to the port net. These were conducted during the day and at night. No problems were encountered with bottom debris clogging the gear, although lots of bottom debris was captured by the standard net. No chaffing or other wear and tear was caused to the AusTED or the trawls during the comparison trials.

5. AusTED PERFORMANCE (ENDEAVOUR PEARL) north of the NT / QLD border

Day Light Sets

The **AusTED** was fitted to the **port net** and towed on four occasions during day light hours. The port net landed 0.9 kg less tiger prawns(less than 1% down) and 0.9 kg more white prawns.

The area was extremely fishy. The starboard side net was continually full with all types of by-catch (i.e.: capacity bags). The port net codend, on average was 55% smaller. The starboard net caught 26 large sponges and 3 large sting rays while the port net only caught one large sponge and no sting rays

Night Sets

The **AusTED** remained on the **port net** and was towed on three occasions during the night. The port net landed 0.6 kg more tiger prawns (less than 1% up) and 1.6 kg more white prawns.

The area was reasonable fishy. The starboard side codend was normally a little over half full with all types of by-catch. The port side codend, on average was 40% smaller. The starboard net caught 19 large sponges, 2

large sting rays, 1 large shovel nose shark, 1 large sawfish and one flat back turtle while the port net only caught one large sponge.

Over all the catches of prawns from both sides were close enough to being even, but the amount of by-catch reduced by the AusTED was significant (around 50%).

***Skippers Comments*:** Steve Colless

- It's got potential.
- It needs to be tested for a week on grooved tigers.
- Looks like it could be down a bit in the day time.
- It's good the way it gets rid of monsters.
- I like the flexible grid, it's better than the hard fish excluders we used in NZ.
- Bit more work needed to better perfect the sponge chute.
- Over all it could eventually be an asset to the industry.
- I'd recommend more testing on commercial vessels especially on banana and grooved tiger prawns.

AUSTED INDUSTRY EXTENSION
on board
F V "TRIDENT AURORA"
19 to 27 November 1996
Joseph Bonaparte Gulf.

The final phase of the FRDC funded Australian Trawl Efficiency Device (AusTED) project was undertaken in the Joseph Bonaparte Gulf. Monies saved during the May extension phase made it possible to carry out this final trip (i.e.: the majority of the money set aside to compensate for loss of prawns and any down time caused by the AusTED was not used).

This report describes the AusTED's performance and acceptability on Australia's largest commercial prawn trawler. The 30 metre ***Trident Aurora*** was operating under normal conditions targeting red leg banana down to 90 metres and endeavour prawns in the Joseph Bonaparte Gulf. The vessel is owned and operated by the A. Raptis and Sons fishing company which has a 20 year history in Australian's Northern Prawn Fishery (NPF).

This extension exercise supported earlier studies which showed the AusTED not only reduced the amount of unwanted species but also maintained or increased the overall commercial catch of prawn.

Along with prawn catch weights and estimates of by-catch reduction the report includes comments and recommendations from the skipper of the ***Trident Aurora***, Robert ("Brick") Aleckson.

1. A BRIEF HISTORY

Commitments to other projects delayed demonstrations until November 96. The Joseph Bonaparte Gulf (JBG) was chosen for the extension work for two reasons. Firstly, it was close to Darwin and the officers involved didn't need to undertake expensive air travel to reach the fishing grounds and secondly, there were reports of by-catch problems making operators reduce trawling times down to just twenty minutes.

On recommendations from skippers three modifications were made to the May version of the AusTED. These included;

a) Replacing all the blue 60 ply 52 mm stretched mesh codend material used to construct the AusTED with black 3 mm diameter 50 mm braided stretched mesh codend material.

b) Adding an extra kilogram of lead core rope to the guiding flap in front of the grid (total weight 2.5 kg), and,

c) Replacing the pipe and lead core rope framed debris chute with a steel triangular frame.

2. THE NOVEMBER OPERATION

Two Northern Territory Fisheries Technical Officers hitched a ride aboard the barge *Centaur II* to King George River in Western Australia. While the barge was servicing vessels from the prawn fleet the officers took the opportunity to show off the AusTED to skippers and crew.

The Raptis trawler ***Trident Aurora*** was the vessel chosen to conduct the extension work and gear trials. Both Chris Nock (the fleet master for Raptis) and "Brick" Aleckson (the skipper) were extremely helpful in arranging the trip. Neither Chris nor "Brick" requested any compensation for their involvement. "Brick" made arrangements to inform all the trawlers (not only the Raptis boats) operating in the area of exactly what was happening with the AusTED. This was done on a shot by shot basis or on request. The fact that "Brick" was letting all the other skippers know exactly what his nets were catching each shot was very much appreciated and made it unnecessary for the Fisheries Officers to jump from boat to boat with the devices.

The ***Trident Aurora*** is the largest vessels in the NPF fleet and has a 750 HP main engine. The vessel tows two 16 fathom nets and does so at better than four knots. It was thought that if the AusTED could withstand the strain and still operate efficiently on this vessel then it should work on all NPF boats.

The only disappointing aspect of the trip was that the masses of small fish reported in the area had gone. There was little in the way of by-catch. Even, during the day, fish were scarce (Note: in the JBG the vessels are allowed to operate 24 hours a day all year round). A large proportion of what was there comprised of small crabs. In the southern Gulf of Carpentaria in May the AusTED performed well when it encountered large quantities of trash fish. With the new adjustments made to the AusTED it was anticipated that it would perform even better in fishy areas but this couldn't be put to the test.

3. MV CENTAUR II

The gear was stretched out aboard the barge ***Centaur II*** anchored at the entrance to the King George River. Six skippers and a number of crew looked over the gear. Generally the first comment from the skippers was **"it doesn't look as bad as I thought it would"** (Note: this was exactly the same response received from skippers in May off Mornington Island).

A video of an earlier version of the AusTED was shown and the skippers were told how the final AusTED had evolved.

4. TRIDENT AURORA

It took approximately one hour to fit the AusTED to the ***Trident Aurora's*** starboard trawl net. Both nets were 16 fathom Florida Flyers rigged for tiger prawn fishing. The nets had recently been fine tuned and were operating as near as possible to equal.

Most of the fishing took place in the 50 to 70 metre depth range. The seabed was mud with a fair amount of weed along with a few sponges and the occasional rock.

Other than on the first shot when the rear section of the starboard net containing the AusTED was ripped clean off due to it passing through an unexpected mine field of rocks, AusTED never come in contact with the sea bed (i.e.: no chaffing) and did not appear to be effect by bottom debris clogging it.

5. GEAR MODIFICATIONS

The new heavy duty braided black codend material used in this latest version of AusTED overcame the problem of fish meshing.

The new steel framed debris exclusion chute performed reasonably well but not as good as the pipe version used on the ***Endeavour Pearl*** in May. After 50 hours towing, a weld broke on the frame and it was decided to replace it with the original prototype.

The extra kilogram of weight on the guiding flap appeared to counteract the extra flow of water forced down the net, especially when the ***Trident Aurora*** was trawling past other vessels at around 4.5 knots.

6. AUSTED's PERFORMANCE

The average trawl shot on the ***Trident Aurora*** lasted about four hours. The catch from the port and starboard nets was monitored by the skipper prior to the extension work to ensure the nets were operating close to identical. The AusTED was fitted to the starboard net for 13 shots. It was not transferred to the port net because the fishing season was coming to an end and it would have reduced trawling time. (Note: the skipper and crew had been operating these two nets all year and knew exactly what effect the AusTED was having on the gear)

After 50 hours trawling there was only a slight difference between the prawn catch of the two nets. The starboard net fitted with the AusTED caught a total of 437.4 kgs of prawns (i.e.: 134.1 kgs of red leg banana prawns and 303.3 kgs of endeavour prawns), while the port net caught a total of 414 kgs of prawns (i.e.: 131.4 kg's of red leg banana prawns and 282.6 kgs of endeavour prawns).

The overall percentage increase in the prawn catch in the net containing the AusTED was approximately four percent.

The reduction in by-catch for the net fitted with the AusTED was estimated by the skipper and/or the crew while the codends were being emptied. The by-catch reduction ranged between 10% and 50% (average 27%) with the biggest reductions occurring during daylight hours when more fish were normally caught. Only 11 large rays, two large sharks and one turtle were captured. None of these were caught in the net fitted with the AusTED. Sorting times were correspondingly reduced by the percentage of by-catch not caught and the crew reported about a third reduction in the number of soft and broken prawns coming from the net fitted with the AusTED.

The species of small fish that were noticeably reduced from the net with the AusTED included, jewfish, common grinner(lizard fish), grunter and crayfish.

The problems the AusTED caused included:

1) The occasional large starfish jammed on the grid and had to be cleared when the bag was emptied.

2) The steel framed debris chute let a few sponges and small rocks get passed it and jam on the grid.

3) The winch operator had to take care that the grid didn't catch up on the stern lazy line guiding bar during hauling.

7. RESULTS

AusTED had no negative effect on the prawn catches. There was an increase in the endeavour prawn catch but this may have been due to a number of factors. The AusTED did cause a marked reduction in by-catch. The old debris chute kept the grid clearer than the new one and should be reinstated into the AusTED design. The extra time required on the ***Trident Aurora*** to empty the codend containing the device averaged less than two minutes.

Generally, the skipper and crew seemed pleased with the AusTED and mentioned that they would be happy to conduct similar tests in the future. The skipper was quite impressed with certain aspects of the gear and may adopt them next season.

The AusTED used on this trip was given to "Brick" Aleckson (Raptis Fishing company) so that he may use it and show it to other interested people.

Skippers Comments: "Brick" Aleckson

- The AusTED is OK to handle on the boat.
- It will probably get better results in monster or fishy country.
- It works better than the composite square mesh panels I used earlier in the year.

- The debris chute is a good idea:- by allowing sponges to pass through the net quickly there should be less chance of them dying.

- There's a few more things on the net to worry about but it's not complicated and I can't see it putting anyone out of business.

- The bags were always a bit smaller and quicker to sort.

- The crew weren't complaining about it; in fact they were happy not having to get the big suckers off the tray.

- If we eventually have to use grids in our nets the flexible one used in the AusTED seems to do the job. It's also not likely to kill anyone if it hits them when the nets are being dropped out of the riggings.

8. SUMMARY

On clear trawl grounds the AusTED significantly reduced by-catch, lost no prawns and performed well on the vessel. On dirty ground it resulted in prawn reductions of up to 25%, however when operating in conjunction with the newly designed debris chute it again performed well. There were no serious problems handling the gear and it could be easily fitted to any NPF vessel. A few skippers are seriously considering using this gear when the tiger prawn season opens in August 97 and have requested plans and assistance.

The way the gear is operating at present is encouraging, but as the skippers mentioned it should be further tested aboard commercial vessels on different prawn species and different bottom types. Testing gear on clean grounds under scientifically controlled condition is often not a true reflection of how the gear will perform in the real world. The gear has the potential to improve the efficiency of the NPF vessels by reducing by-catch, and sorting times and improving prawn quality. It therefore may one day be voluntarily adopted by the industry if all the minor bugs can been sorted out.