CHAPTER ONE

BACKGROUND TO THE NORTHERN PRAWN FISHERY

Introduction

1.1 The two major prawn species trawled commercially in the Northern Prawn Fishery (NPF) are tiger prawns and banana prawns. The focus of this report is the tiger prawn stock. This chapter initially provides information on the location and economic value of the NPF, trawl techniques used to catch tiger prawns, the industry consultative arrangements and effort creep. Effort creep is the term applied to the increase in the catching power of the fleet over time.

1.2 The chapter subsequently examines the historical management of the fishery. Since the 1970s, various input controls have been used in an attempt to prevent overfishing, including Class A and B statutory fishing rights (SFRs). Class A SFRs regulate the below deck volume and engine capacity of vessels operating in the NPF. Class B SFRs regulate vessel numbers. However, despite the use of these controls, the latest CSIRO research indicates that the tiger prawn stock is currently 35 per cent over-exploited. Whilst most participants in the fishery agree that there is overfishing, the extent is disputed.

1.3 Finally, the chapter examines the gear SFR management proposal, which is designed to curtail the ongoing overfishing of the tiger prawn stock. Gear SFRs regulate the length of headrope, and thereby the size of the net, that may be towed by vessels in the NPF fleet. By reducing the available headrope used in the industry, it is anticipated that fishing effort will also be reduced.

The Fishery

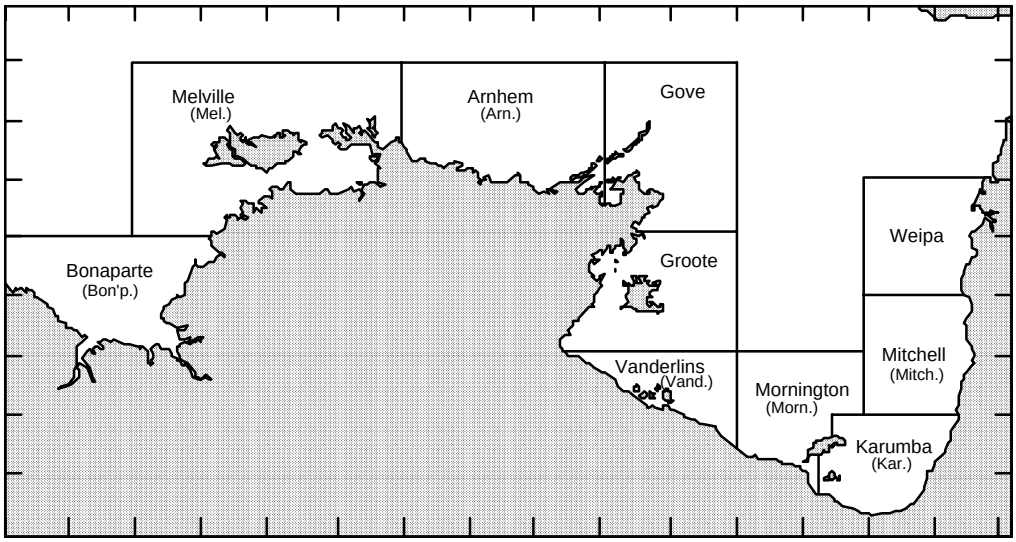
Location

1.4 The NPF is located off the north coast of Australia, and covers an area of approximately 800,000 square kilometres, bounded by Cape York to the east, Cape Londonderry to the west, and the edge of Australia's fishing zone to the north.[1] This is shown in Figure 1.1 below.

---

1 B.Taylor & D.Die (Eds) (1999), Northern Prawn Fishery Assessment Report, 1997 & 1998, AFMA, Canberra, p 4

Figure 1.1: Fishing grounds in the Northern Prawn Fishery



1.5 In total, there are at least 9 species of prawn trawled commercially in the NPF, however the white banana prawn, the brown tiger prawn and the grooved tiger prawn together account for almost 80 per cent of the total average annual catch of around 8,500 tonnes.[2]

Economic Value

1.6 Since commercial trawling began in the early 1970s, the NPF has grown to become the most valuable Commonwealth fishery in Australia, with annual production ranging between $100 and $150 million.[3] Over 90 per cent of the catch is exported, the major market being Japan.[4] Tiger prawns are the most valuable species caught in the NPF, retailing commercially in the range of $18 to $25 a kilo, compared to $10 to $15 a kilo for banana prawns.[5]

Trawl Techniques

1.7 Vessels trawling for tiger prawns in the NPF utilise twin-rigged (ie two nets per boat) otter trawl nets which sweep the bottom of the ocean behind the fishing vessel, as shown in Figure 1.2.[6]

---

2 *ibid*, p 5

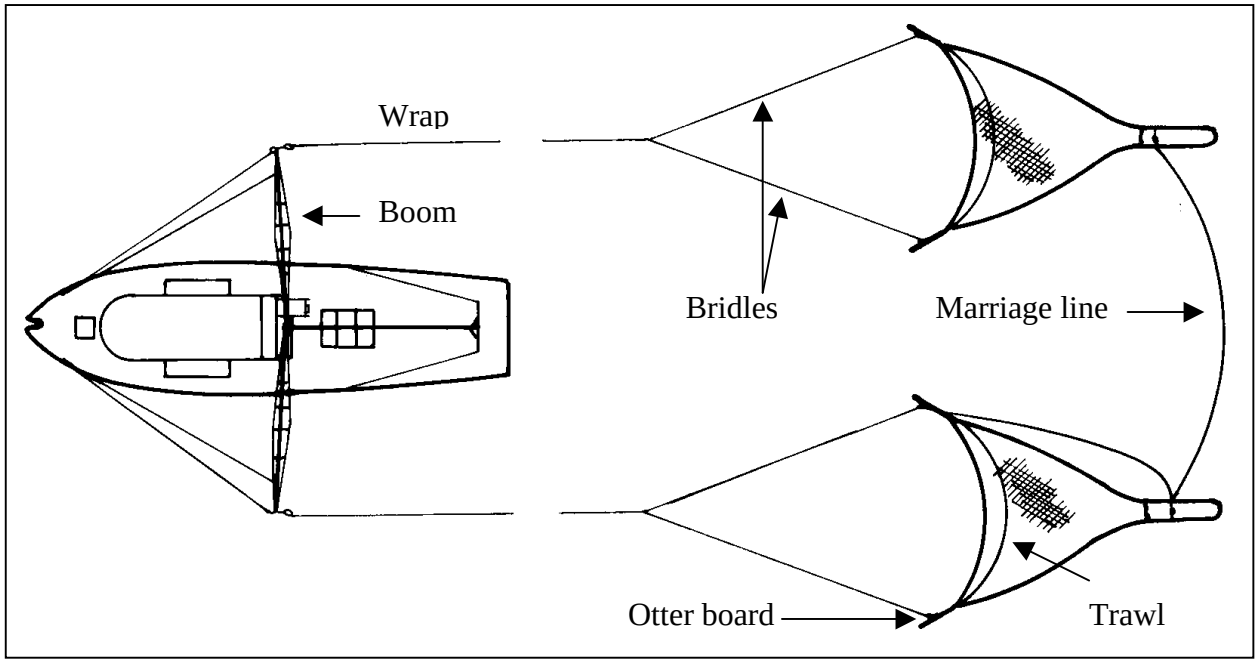
3 AFMA (April 1999), *Factual Brief* for the Independent Allocation Advisory Panel on Translation to Gear Statutory Fishing Rights, p 3

4 Northern Prawn Fishery Independent Allocation Advisory Panel (10 August 1999), Advice by the Northern Prawn Fishery Independent Allocation Advisory Panel on Changes Proposed by the Australian Fisheries Management Authority to Statutory Fishing Rights issued under the Northern Prawn Fishery Management Plan 1995, p 7

5 Evidence, RRAT, 4 February 2000, p 108

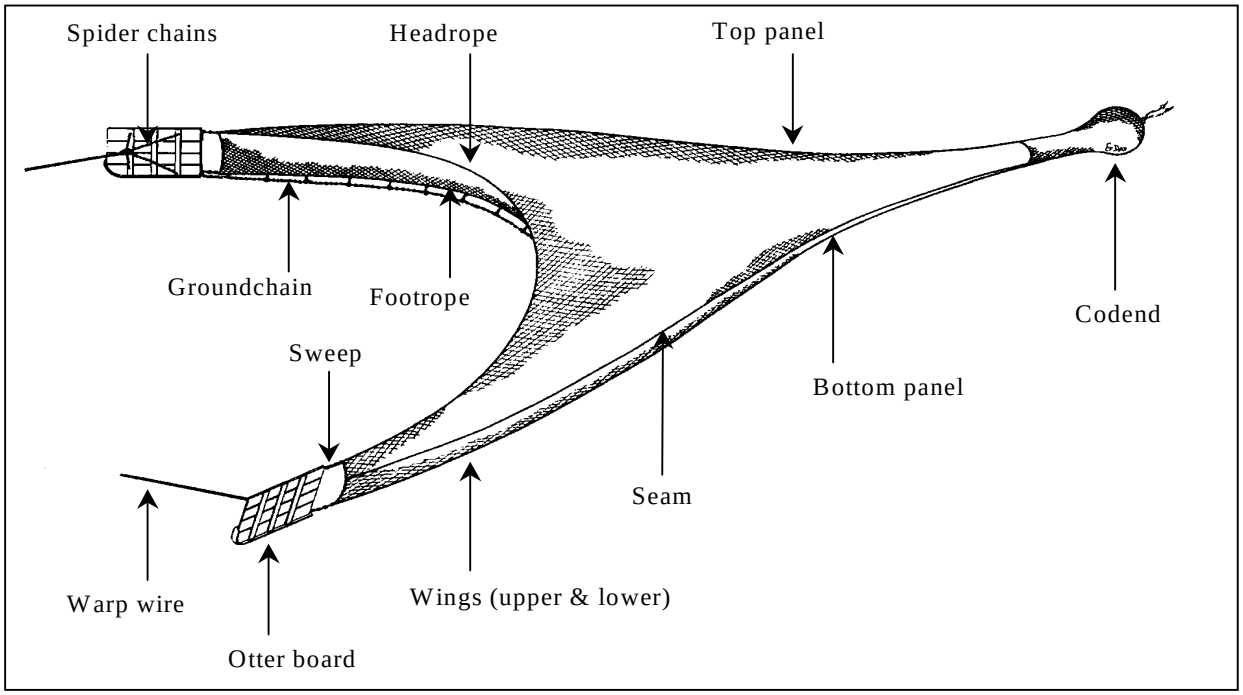
6 AFMA (April 1999), *op cit*, p 4

Figure 1.2: Main components of an Australian prawn trawl system



1.8 The netting at the mouth of the net is hung from a headrope at the top and a footrope stretched between otter boards, as shown in Figure 1.3 below. Operators can regulate the width of their net according to the angle and lateral force of the net otter boards.

Figure 1.3: Common Australian prawn trawl components



Industry Consultative Arrangements

1.9 Responsibility for the management of the NPF under the *Fisheries Management Act 1991* rests with the Australian Fisheries Management Authority (AFMA). Section 17 of the Act in turn requires AFMA to maintain a plan for the sustainable management of the NPF – currently the Northern Prawn Fisheries Management Plan 1995.[7]

1.10 AFMA's conduit for consultation with the NPF industry under section 55 of the Act is the Northern Prawn Fishery Management Advisory Committee (NORMAC). NORMAC has nine members: an AFMA member; a scientific member; an environment member; a state government member; an independent chairman; and four industry representatives. The current membership of NORMAC is listed in Appendix 2.

1.11 The four industry representatives on NORMAC have traditionally been appointed from each of the four industry associations:

i) the Northern Fishing Companies Association (NFCA);
ii) the Western Australian Trawl Owners Association (WANTOA);
iii) the Northern Territory Trawl Owners Association (NTTOA); and
iv) the Northern Prawn Fishery (Qld) Trawl Association (NPF (Qld) TA).[8]

1.12 In addition, NORMAC has appointed various sub-committees to provide advice on a range of issues. These committees include relevant scientific, environmental and economic representatives according to the committee:

a) the Northern Prawn Fisheries Assessment Group (NPFAG);
b) the NORMAC Research and Environment sub-committee;
c) the NORMAC Management Costs sub-committee; and
d) the closures sub-committee.[9]

Effort Creep

1.13 Effort creep is the term applied to the continuous increase in the catching power of the NPF fleet. Effort creep occurs because individual operators in the NPF are entitled to maximise their share of the annual prawn catch within the limitations of their vessel size and engine capacity. Accordingly, operators continually adopt new technologies and practices such as:

- more efficient vessel designs (eg. bulbous bows);
- more efficient gear designs (eg. new otter board materials);
- the global positioning system, adopted widely in the fleet in 1993;

---

7 AFMA (April 1999), *op cit*, pp 4-5

8 *ibid*

9 *ibid*, p 5

- improvements in vessel propellers and nozzles such as adjustable pitch; and
- the use of mothership services for improved catch handling.[10]

1.14 The CSIRO and the NPFAC have data quantifying the level of effort creep at 2.5 per cent per annum since 1988. However, there are many factors in effort creep for which data are not available, or which are not amenable to mathematical calculation. Accordingly, the CSIRO and NPFAC estimate the real rate of effort creep in the NPF at around 5 per cent per annum.[11]

Historical Management of the Fishery

1.15 The NPF has historically been managed through the use of input controls, which place limits on the type and amount of prawn fishing conducted by individual vessels. Input controls include gear (net) restrictions, voluntary and compulsory vessel buy-backs, annual closures, and Class A and B SFRs.

1.16 Input controls are distinct from output controls, or quotas, under which individual trawlers in the NPF would be allocated a fixed tonnage of the annual catch. Managing the NPF using output controls would be difficult due to variations in stock size from season to season. In addition, operators could 'high grade' their catch by dumping overboard prawns of lesser size or quality to maximise the value of the quota held.[12]

Early Three year Management Plans

1.17 As early as the mid-1970s, the Northern Fisheries Committee (NFC), which was then responsible to the Australian Fisheries Council (AFC) for management of the NPF, had evidence to show that the banana prawn fishery was fully exploited, although the tiger prawn fishery remained under-exploited across the fishery as a whole.[13]

1.18 In response, in January 1977 the AFC implemented an interim three-year management plan for the NPF. The plan included a moratorium on the entry of new operators into the NPF, and the formation of the Gulf of Carpentaria Prawn Advisory Committee, later the Northern Prawn Management Advisory Committee (NORPAC), to allow for more direct consultation with industry.[14]

1.19 However, the success of the moratorium was limited. This was mainly because the number of fishing licences granted at the commencement of the plan in 1977 was 292, up from 145 in 1976.

---

10 B.Taylor & D.Die (Eds) (1999), *op cit*, p. 24. See also AFMA (April 1999), *op cit*, p 10

11 AFMA (April 1999), *op cit*, p 10

12 Submission 79, p 7

13 AFMA (April 1999), *op cit*, p 6

14 P.C.Pownall (Ed) (1994), *Australia's Northern Prawn Fishery: The First 25 years*, Queensland, pp 118 - 119

1.20 A second three-year management plan was implemented in January 1980, again limiting entry under revised criteria. However, the replacement of old vessels with new curtailed the effectiveness of the plan.

1.21 In 1984, NORPAC and the NFC were amalgamated to form NORMAC, responsible to the Australian Fisheries Service for the management of the NPF. In an attempt to curtail the increase in fishing effort which had been occurring simply by the substitution of new trawlers for old, NORMAC introduced a new management plan: Class A and B units.[15]

1.22 Under the new management plan, a vessel required one Class A unit for each cubic metre of hull volume and each kilowatt of engine power. Class B units were introduced simply to regulate the number of vessels licensed to operate in the NPF. In total, 133,269 Class A and 302 Class B units were issued by NORMAC in 1984.[16]

Voluntary and Compulsory Vessel Buy-Backs

1.23 Despite the introduction of Class A and B units, data compiled by the CSIRO in 1986 showed a serious decline in brown tiger prawn stocks in the western Gulf of Carpentaria. At a series of meetings in Darwin in late 1986, the CSIRO urged an immediate 25 per cent reduction in fishing effort to protect pre-spawning tiger prawns.[17]

1.24 To address this issue, NORMAC introduced a buy-back of Class A units with an agreed target of 70,000 by the start of the 1990 season, with any shortfall to be met by a compulsory acquisition at the start of the 1990 season. However, this compulsory acquisition was actively opposed by the industry, and was disallowed by the Senate. The voluntary buy-back continued to operate, but without a specific target.[18]

1.25 Given the unspecified outcome of the voluntary buy-back, NORMAC introduced other strategies to reduce fishing effort. A six-week closure during the winter months (15 June to 1 August) was introduced to reduce capture of pre-spawning tiger prawns.[19] Operators were also restricted to towing twin gear (two nets) rather than the more widely used triple or quad gear. Finally, NORMAC implemented a more restrictive voluntary vessel replacement policy requiring the surrender of two Class B units for a new vessel of any size.[20]

---

15 P.C.Pownall (Ed), *op cit*, p 123

16 AFMA (April 1999), *op cit*, p 6

17 P.C.Pownall (Ed), *op cit*, p 125

18 B.Taylor & D.Die (Eds) (1999), *op cit*, p 11

19 *ibid*, p 13

20 AFMA (April 1999), *op cit*, p 7

1.26 However, it remained clear that the rate of reduction in effort was insufficient to sustain the profitability of the industry. Accordingly, in 1990 the Commonwealth Government appointed a task force to examine ways of restructuring the NPF. After protracted negotiations, a further reduction in Class A units to 50,000 by the beginning of the 1993 season was agreed, to be achieved by a compulsory buy-back scheme and compulsory, across the board proportional surrender of Class A units. The 50,000 limit was subsequently raised to 53,844 following agreement with industry that concessions be given to vessels under 375 Class A units.[21]

1.27 At the end of 1992, the target of 53,844 Class A units had not been met, and on 1 April 1993, 30.76 per cent of the remaining Class A units were compulsorily acquired. After the compulsory buy-back, only 132 Class B units remained, less than half the number available in the mid-1980s. At the same time, restrictions on the amount of net that vessels could tow was lifted.[22]

1.28 Class A and B units were subsequently rolled over as Class A and B SFRs under the Northern Prawn Fisheries Management Plan 1995. As part of the plan, the restrictions on the total number of Class A SFRs (54,844) and Class B SFRs (132) were maintained.[23]

Season and Area Closures

1.29 Up until recently, the fishing season in the NPF has begun on 1 April and extended through to a winter month closure on 15 June. This closure is designed to reduce fishing effort on the pre-spawning tiger prawns (tiger prawns spawn from August to October). Subsequently, the season has recommenced on 1 August, running through to 1 December, at which time small tiger prawns (and later banana prawns) begin to recruit to offshore grounds.[24]

1.30 In 1996, the NPFAG released a Fisheries Assessment Report on the status of the NPF. The report indicated that the level of fishing effort applied to the tiger prawn stock was still 10 per cent too high, and should be reduced by 25 per cent by 1999.[25] In response, in 1997 NORMAC brought forward the end of year closure to 7 November as an interim measure.

1.31 In 1998, NORMAC abandoned the 1997 season closure and trialed a partial area closure of the principal tiger prawn grounds for the entire month of November. However, because some areas remained open, the closure failed to achieve its

21 *ibid*

22 *ibid*, p 8

23 *ibid*, p 3, 8

24 B.Taylor & D.Die (Eds) (1999), *op cit*, p 13

25 AFMA (April 1999), *op cit*, pp 9-10

objective, with the result that an additional 2455 fishing days were spent targeting the tiger prawn stock.[26]

1.32 In early 1999, the NPFAG released a further report on the status of the fishery at the end of the 1998 season entitled the *Northern Prawn Fishery 1997 & 1998.* The report indicated that in 1998, fishing effort in the tiger prawn fishery was 35 per cent above maximum sustainable yield (MSY), partly due to the failure of the 1998 area closures and the lifting of the 1997 season restrictions.[27]

1.33 In the long term, NORMAC was advised that to rebuild the stocks to long term MSY levels, fishery effort would need to be reduced below MSY by about 25 - 30 per cent in 1999.[28] In response, NORMAC introduced more stringent season closures during 1999. The mid-year closure was extended to begin on 1 June and finish on 4 August, and the end of year closure began on 15 November.[29]

The Gear SFR Management Proposal

Gear SFR Options

1.34 In November 1991, NORMAC established a Future Options Working Group to examine options for managing the NPF. The Group reported in November 1992. The report recommended a move to gear SFR management as the most flexible means of controlling fishing effort, while supporting the efficient utilisation of the NPF.[30] Three basic options for translation from Class A SFRs to gear SFRs were examined: one-to-one translation, line of best fit translation and tiered translation.

One-to-One Translation

1.35 This proposal is expressed as a simple linear function where Class A SFRs would translate proportionally into gear SFRs according to the formula:

$$\mathbf{G = AX}$$

Where G = gear unit allocation (in metres)
A = Class A SFR holdings
X = the slope of the function indicating the amount of headrope to be allocated per Class A SFR.[31]

1.36 The problem with one-to-one translation is that it can potentially disadvantage smaller vessels in the NPF fleet. Currently, small vessels in the NPF under 375 Class

---

26 B.Taylor & D.Die (Eds) (1999), *op cit*, p 13. See also AFMA (April 1999), *op cit*, p 10

27 B.Taylor & D.Die (Eds) (1999), *op cit*, p 27

28 *ibid*, p 29

29 *ibid*, p 13-14

30 AFMA (April 1999), *op cit*, pp 11-12

31 Northern Prawn Fishery Independent Allocation Advisory Panel (10 August 1999), *op cit*, p 11

A SFRs tow one metre of net for every 7.5 Class A SFRs, whereas larger vessels over 375 Class A SFRs tow one metre of net for every 8.7 Class A SFRs.[32]

Line of Best Fit Translation

1.37 Under this proposal, a fixed gear SFR allocation is made not only for Class A SFRs, but also for Class B SFRs, as represented by the constant b in the following formula:

G = AX + b

Where G = gear unit allocation (in metres)
A = Class A SFR holdings
X = the slope of the function indicating the amount of headrope to be allocated per Class A SFR.
b = gear allocation for each Class B SFR

1.38 In effect, the fixed allocation of headrope to all boats by the constant b, regardless of Class A SFR allocations, results in a re-allocation of SFRs from the large operators to the small operators.[33]

Tiered Translation

1.39 This proposal envisages that vessels would be grouped into tiers based on their Class A SFRs. Gear SFRs would then be allocated to vessels on the basis of the average net size used by vessels within the tier. The problem with this approach is the difficulty of validating the length of net towed by all vessels at a particular point in time.[34]

Gear SFR Consultation

1.40 Following receipt of the Future Options Working Group report in 1992, NORMAC determined to defer discussion of the gear SFR proposal until after the 1993 restructuring of the fleet was complete. In addition, the AFMA board requested that NORMAC review its long-term strategy for management of the NPF. Accordingly, the Future Options Working Group was asked to re-examine its report. In June 1995, the working group reiterated its support for gear SFRs as the preferred management option for the NPF.[35]

1.41 In July 1996, NORMAC held a gear management workshop to provide industry representatives with a forum to debate the gear SFR proposal. It was generally agreed that gear SFRs offered an alternative management system for the fishery, although difficulties of translation were raised. At the same time, NORMAC obtained legal

32 AFMA (April 1999), *op cit*, p 17

33 Northern Prawn Fishery Independent Allocation Advisory Panel (10 August 1999), *op cit*, pp 12-13

34 *ibid*, pp 13-14

35 AFMA (April 1999), *op cit*, pp 12 – 13

advice that, in the event of a change to gear SFR, the preferable strategy would be for AFMA to amend the current Northern Prawn Fisheries Management Plan 1995, rather than revoking the plan in favour of a new one.[36]

1.42 In March 1997, in response to the 1996 NPFAG Fisheries Assessment Report indicating ongoing overfishing, NORMAC sought industry views on two alternative long-term strategies to reduce overfishing of the NPF. The first was to retain the Class A SFR system with compulsory surrender of around 20 per cent of the Class A SFR in 1999. The second was to implement gear SFRs, but with a reduction in 1999 at a level to be determined.[37]

1.43 In response, the NFCA and WANTOA supported the change to gear management. However, NPF (Qld) TA and NTTOA argued for the Class A SFRs to be retained, arguing that gear SFRs disadvantaged smaller boats and that at 5 per cent, the rate of effort creep was overestimated.[38]

1.44 Only at a meeting of NORMAC in November 1997 was a compromise position finally reached. It was agreed that the translation from Class A SFRs to gear SFRs go ahead, based on a proportional translation formula (ie Class A SFRs x 0.053). In addition, in recognition of the difficulties faced by small operators, vessels under 300 Class SFRs should be 'topped up' to total gear allocation of 16 fathoms for the 1999 and 2000 seasons.[39]

1.45 Subsequently, in a meeting of NORMAC in March 1998, this compromise was altered to measure gear SFRs in metric (10 cm) intervals rather than fathoms. The alterations specified one-to-one translation of 10 cm of headrope for each Class A SFR (53,844). By selecting 10 cm, the alterations incorporated a reduction in total gear towed by the fleet of around 15 per cent to 5384.4 metres. The provision that very small operators of less than 300 A-units would be granted top-up gear SFRs for two years was retained, allowing them to tow two nets, each 2 x 15 metres.[40]

1.46 The AFMA board approved these alterations, including the reduction in total gear to be allocated, on 1 April 1999. However, in response, the NPF (Qld) TA organised a plebiscite of the industry conducted through Coopers and Lybrand, which indicated that 87 per cent of industry members did not support the change to gear units, and did not believe the perceived rate of effort creep (5 per cent) to be correct.[41]

1.47 The AFMA board did not accept the result of the plebiscite, arguing that it was taken outside the formal AFMA consultation process. Accordingly, work on

---

36 *ibid*, p 13

37 *ibid*

38 *ibid*, pp 13-14

39 *ibid*, p 15

40 *ibid*, p 2

41 *ibid*, attachment 23

amendments to the Northern Prawn Fisheries Management Plan 1995 continued, with a draft released for public comment on 12 August 1998. Following minor adjustments to the draft, the AFMA Board approved determination of the amended Northern Prawn Fisheries Management Plan 1995 in December 1998, with the intention that the plan be implemented by 1 April 1999 for the 1999 fishing season.[42]

Allocation Advisory Panel Report

1.48 On 19 February 1998, the Minister for Agriculture, Fisheries and Forestry expressed concern whether due consideration had been given to smaller operators in the decision to switch to gear SFRs, and requested that an independent Allocation Advisory Panel (AAP) be established by AFMA to review the transition arrangements. This effectively delayed the implementation of the amended Northern Prawn Fisheries Management Plan 1995 until the 2000 fishing season.[43]

1.49 The AAP was established under Mr John Toohey *AC QC*, retired justice of the High Court, supported by Dr Julian Morison and Independent Fishing Industry Member Mr Horst Fischer. The Panel was asked to:

> a) advise the AFMA Board on the appropriate translation from Class A SFRs to gear unit SFRs; and
>
> b) advise the Board as to whether there are grounds for some transitional elements to be included in the translation arrangements, and, if so, to recommend accordingly.

1.50 In its report, the AAP noted that these terms of reference did not permit the panel to comment on whether translation from Class A SFRs to gear SFRs was advisable. Rather, the panel was asked to "advise the AFMA .Board on the appropriate translation from Class A SFRs to gear unit SFRs".[44]

1.51 The report of the AAP endorsed the transition arrangements from Class A SFRs to gear SFRs, judged against the criteria of cost effectiveness, ecological sustainability, economic efficiency, accountability and cost recovery.

Cost Effectiveness

1.52 The AAP indicated that one-to-one translation would be the most cost-effective option for translation from Class A SFRs to gear SFRs. One-to-one translation maintains the relative value of the transferred Class A SFRs, thereby minimising the likelihood of costly appeals and litigation.

---

42 *ibid*, pp 16-17

43 *ibid*

44 Northern Prawn Fishery Independent Allocation Advisory Panel (10 August 1999), *op cit*, p 5

1.53 By contrast, the AAP indicated that other methods of translation would result in a redistribution of SFR, and as such would be likely to result in a relatively high number of appeals and a high level of litigation.[45] This is shown by the submission from the NPF (Qld) TA, which proposed that line of best fit translation be used. Based on X being assigned a value of 0.0915, and b a value of 9.15, the allocation of SFRs would shift as follows:[46]

Table 1.1: Current and proposed SFR allocation using line of best fit translation

	Total Current Class A SFRs	*Total Proposed Gear Unit SFRs*
Smallest holding of Class A SFRs	124	180
Medium holding of Class A SFRs	425	422
Largest holding of Class A SFRs	706	648

Ecological Sustainability

1.54 As indicated, the prime argument for gear SFRs is that it allows greater flexibility in the sustainable management of the NPF. However, the AAP concluded that ecological sustainability would not be directly influenced by the specific means of transmission to gear SFRs.[47]

Economic Efficiency

1.55 Submissions were made to the AAP that some, generally smaller, boats in the fleet are more efficient, and therefore should be favoured in the translation to gear SFRs. However, the panel judged that bureaucratic determination of the economic efficiency of individual operators would be contrary to AFMA's economic efficiency objectives, and would greatly increase the risk of legal challenge. The management costs of actually calculating the efficiency of vessels could also be significant.[48]

Accountability

1.56 The AAP indicated that given the comprehensive consultation during formulation of the gear SFR management approach, accountability to the fishing industry had been ensured, whichever method of translation to gear unit SFR was adopted.[49]

45 *ibid*, p 14

46 *ibid*, pp 12-13

47 *ibid*, p 15

48 *ibid*

49 *ibid*, p 16

Cost Recovery

1.57 The AAP indicated that cost recovery would be equally served by any of the methods of translation to gear unit SFRs. This is because the levy paid on gear SFRs would continue to be proportionate to the number of SFRs held.[50]

The Northern Prawn Fishery Amendment Management Plan 1999

1.58 On 4 November 1999, the Minister for Agriculture, Fisheries and Forestry accepted the amendments to the Northern Prawn Fisheries Management Plan. The amendments were gazetted on 8 November, and came into effect on that day. The amendments were subsequently tabled in the House of Representatives and the Senate on 24 November 1999.

50 *ibid*