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## **A further reply to Forrest and Pitcher (2006) “Misguided Claims of Overfishing in NSW: Comment on “Empty Oceans Empty Nets. An evaluation of NSW fisheries catch statistics from 1940 to 2000.””**

Forrest and Pitcher seem to have a good understanding of current fisheries management, as well as a good understanding of the state of NSW fisheries. It is curious, therefore, that they should deny some of the most obvious trends in the charts we present in *Empty Oceans Empty Nets* (the report).

They state that “...the data presented in the report are insufficient to substantiate the claims made therein,” however, they do not comment on the issue raised by the report, the sustainability of the fisheries of NSW.

Simply stating that “there is simply not enough information contained in catch data alone to support the list of claims given in the report,” does not relieve these authors of their responsibility to comment on the fisheries assessed in the report.

The following is an attempt at further unpacking the statistics we presented in the charts of the report and explore the criticism levelled at the HCEC for our audacity to question accepted fisheries science.

### **Catch per unit effort**

Forrest and Pitcher state quite rightly that we believe that Total Allowable Catches (TACs) should have been implemented in the State’s fisheries. However, these authors state that the setting of TACs involves using modelling to determine estimates of absolute stock size. We point out that Forrest and Pitcher avoid any mention of the most central tenet of natural resource management in NSW – the Precautionary Principle.

We believe that TACs must be introduced into NSW fisheries as a precautionary response to severe decline apparent in many commercially fished species. We have already stated that NSW Fisheries have refused to apply the Precautionary Principle from fear that it may force them to discontinue targeting those species for which they have insufficient information to be able to set management response.

In NSW, a Total Allowable Catch Committee (TAC Committee) has been established by the *Fisheries Management Act* for this very purpose.<sup>1</sup>

Section 30 of the *Fisheries Management Act* states that:

- (1) In determining total allowable catches under this Division, the TAC Committee is to give effect to the objects of this Act and is to have regard to all relevant scientific, industry, community, social and economic factors.
- (2) The TAC Committee is also to have regard to:
  - (a) the need to ensure that the exploitation of fisheries resources is conducted in a manner that will conserve fish stocks in the long term, and
  - (b) the impact of fishing activities on all species of fish and the aquatic environment, and
  - (c) *the precautionary principle, namely, that if there are threats of serious or irreversible damage to fish stocks, lack of full scientific certainty should not be used as a reason for postponing measures to prevent that damage.* (our italics).

However, Forrest and Pitcher claim that

“Setting TACs without reliable estimates of absolute abundance is extremely prone to risk. Estimating absolute abundance is data- and resource-intensive and has failed even in some of the world’s most data-rich fisheries (e.g., the northern cod fishery; see Hutchings and Myers 1994; Myers et al. 1997). Methods to reduce fishing effort, through reducing the number of licenses and implementation of spatial and temporal closures are a sensible approach to fisheries management where there are not enough data to support stock assessment and are within the guidelines of the precautionary approach.”

Forrest and Pitcher, therefore, support the methods being used by NSW Fisheries to regulate the fisheries by input controls.<sup>2</sup> The HCEC contend that this form of regulation has not led to sustainable catches, despite commercial fishing endorsements being halved over the past decade.

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<sup>1</sup> 28 Function of TAC Committee

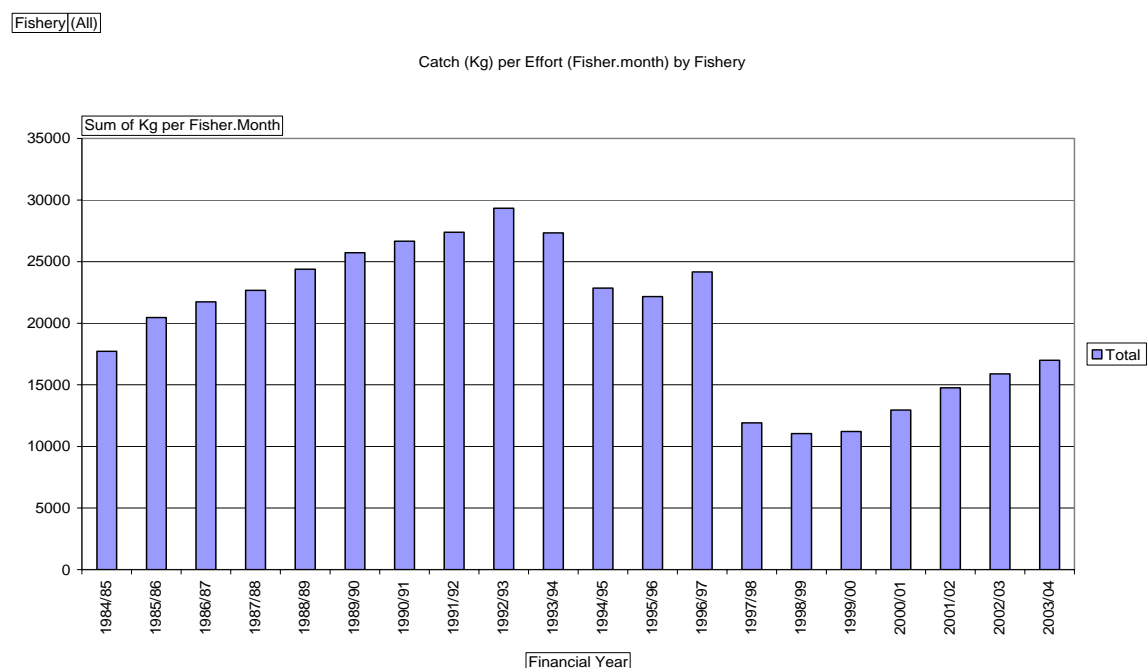
- (1) The TAC Committee may determine, in accordance with this Division, the total allowable catch of fish in any fishery for the commercial fishing sector.
- (2) The TAC Committee is required to determine a specified total allowable catch for a share management fishery if the management plan for the fishery so requires.
- (3) The TAC Committee is required to determine any other total allowable catch if (and only if) required to do so by the Minister.
- (4) The TAC Committee may also determine, in accordance with this Division, any other matter relating to fishing effort in a share management fishery if (and only if) required to do so by the Minister. This Division applies to the determination of any such matter in the same way as it applies to the determination of a total allowable catch.

<sup>2</sup> Input controls are controls on effort, like gear restrictions, closures and buy-outs. Output controls are direct limits on the amount or size of fish taken.

In the chapter *Catch per unit effort*, we presented an argument for a TAC for combined NSW fisheries, rather than relying on reducing the number of fishers. The basis for this is the Precautionary Principal.

Figure 1 of *Empty Oceans Empty Nets* (the report) graphically shows how the reduction of commercial fishers has failed to increase current catch per unit effort (CPUE) to the historical high of almost 30 tonnes per fisher month in 1992/93. While there had been a steady increase between 1999/00 and 2003/04 when it reached 17 tonnes per fisher month, CPUE has not recovered to the 1984/85 level when effort was first recorded. Forrest and Pitcher feel that the noticeable increase in CPUE after 1997 deserved mention. They may be right, but as with most of the charts presented in the Report, we let the statistics speak for themselves.

**Figure 1. Catch per unit effort (kg per fisher month) for NSW combined fisheries 1984 - 2004**



Forrest and Pitcher claim that the discontinuities in the CPUE index are *very unlikely* to be caused by a change in the underlying state of the system, but *more likely* an artefact of changes in the database, as well as changes to the size and structure of the fishing fleet. HCEC said as much in our Report. Yet Forrest and Pitcher disregard the statements by NSW Fisheries in their Assessment of the Ocean Trap and Line Fishery (OTLF) that there have been declines in CPUE across the fishery for almost all species. As the OTLF take over 200 species, this is a good indicator that CPUE is generally in decline. We presented the chart as a way of showing graphically how catch and effort are related.

While we are heartened by the slight increase in CPUE from 1999 to 2004, we note that it has not reached the peak CPUE of 1991/92.

This is the very reason why we advocate for a Total Allowable Catch. As commercial fisher numbers are reduced as part of the commercial fisher buyout process, those remaining in the industry increase their catch, negating any benefit to the fishery of the reduction in commercial fisher numbers.

## Target switching

Forrest and Pitcher disdainfully refute any assertion that more species have been landed to make up for a general decline in traditionally-caught species.

They state that:

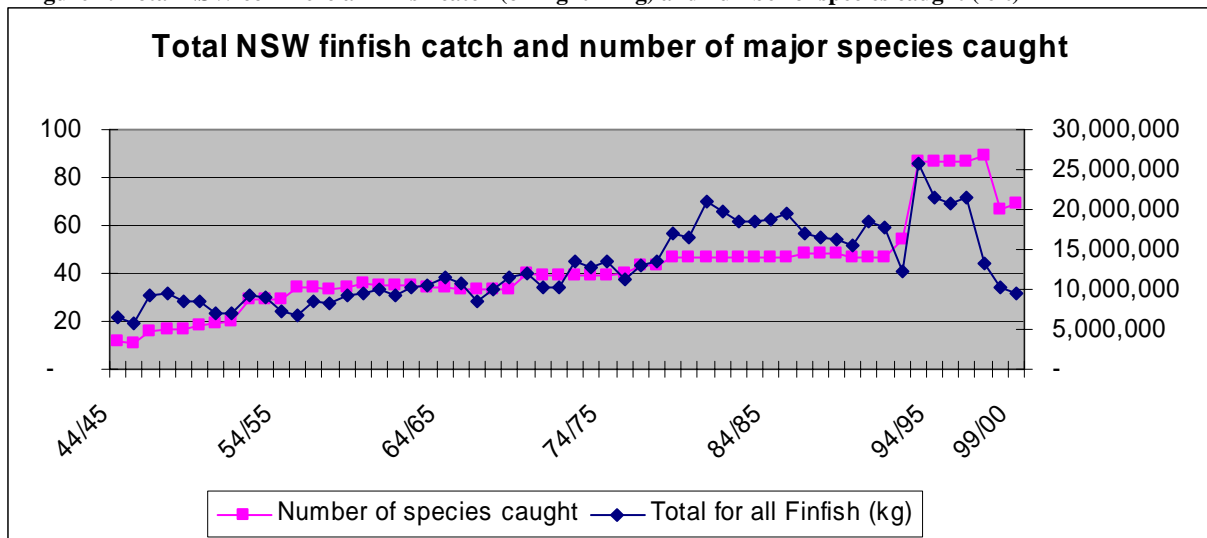
“There is no logical reason why the relationship of total landings to number of species reported should have any meaning and it is unclear why the report’s authors have raised this as an issue...”

And:

“We must also note that an increase in the number of species reported, does not, *per se*, provide any indication of sustainability or otherwise.”

Rather, they claim it is all due to new database reporting methods. This will undoubtable influence the statistics, but as can be seen in Figure 2 of the report, increases in the number of species track the increases in total finfish landings until about 1975. This can be seen as the developing of new fisheries and the targeting of new finfish species to allow for an increase in landed catch.

Figure 2. Total NSW commercial finfish catch (on right in kg) and number of species caught (left)



Forrest and Pitcher explain the increase in landed tonnage after 1975 as due to the development of new fisheries on the continental slope. This is where the catch of finfish between 1975 and 1980 doubled from about 10,000 tonnes to over 20,000 tonnes. Forrest and Pitcher, however state that this is expected to correspond with an increase in the number of species landed.

The data, however, do not support this. There is no significant observable difference to the total number of species reported in the years 1975-1994.

If the development of new fisheries leads to new deep-sea species being landed, why is this not an observable trend on the chart? We contend that it may be due to “target

switching” where declining catches of traditionally-caught species, are augmented by new species being introduced into the fishery. While new deep water species have been caught, other traditional species have been fished down to where augmentation of new species are required to maintain profitability of the fisheries.

Forrest and Pitcher are unhelpfully selective in their comments on the report, avoiding any commentary on the decline between 1980 and 1993, where the total finfish catch declined back to 1975 levels (just over 10,000 tonnes), despite 10 additional species being recorded as caught.

Forrest and Pitcher quite rightly attribute the large increase in the number of species reported as being caught between 1992 and 1993 to the changes of the Offshore Commonwealth Constitutional Settlement, where south coast NSW fisheries were traded for north coast Commonwealth fisheries. This saw an increase from about 40 species recorded in 1992 to about 85 in 1993. The same time period saw a corresponding increase in landed catch from about 12, 000 tonnes to 25,000 tonnes.

The following newly reported species from that period do not, however, substantially make up the 13,000 tonne increase in landed tonnage between 1992 and 1993.

- Albacore,
- Angel shark,
- Blue Grenadier
- Bonito,
- Broadbill swordfish,
- Bar Cod,
- Carpet Shark,
- Dolphinfish,
- Gummy Shark,
- Orange Perch,
- Pearl Perch,
- Samson fish,
- Sweep,
- Spotted Mackerel

These 14 newly-reported species accounted for only 1000 tonnes in 1993. This had declined to under 500 tonnes by 2000.

We acknowledge, however, that some of the observable increase in the number of species landed is due to reporting of species that had formerly been caught and reported as “other finfish.” For example, “other finfish” became a reporting category in NSW Fisheries in 1992/93. In that year also, new finfish that were previously accounted for in Commonwealth fisheries became the responsibility of NSW Fisheries. However, in that year, the “Other Finfish” category only accounts for about 300 tonnes of the total catch.

The “unspecified finfish” category also began to be reported in 1992. Over 4,000 tonnes were recorded in the “Fish, unspecified ocean” category in 1993, possibly as a result of these new deep-water species being accounted for by NSW Fisheries

following the offshore constitutional settlement. By 1998 this category accounted for only 87 tonnes, possibly as a result of new reporting procedures.

According to Forrest and Pitcher, catch declines following the OCS are due to new fisheries being developed. They state that:

“Catch rates (and following on from this in many cases, catches) will always be higher in the first years of a fishery’s development as the unfished standing stock biomass is initially fished down. Large catches at the beginning of time series for some species can be viewed as normal for developing fisheries.”

This position is at odds with statements made by Fisheries NSW in their Environmental Impact Statements, which admit that declines are occurring in NSW Fisheries, and that in some cases, key target species are being overfished.

Forrest and Pitcher further state that:

“By definition, when a population of fishes is in its virgin, or unharvested state, we assume that it is at carrying capacity and, all other things being equal, cannot grow any larger. If some of the virgin biomass is removed by harvesting, we expect that production will increase because there are more resources available for the remaining fish to grow and reproduce.”

And that:

“Without such density dependent effects, it would be impossible to harvest fish populations at all without driving them to extinction (Walters and Martell 2004).”

Driving them to extinction (at least commercial extinction) may well be what NSW Fisheries have done to some species, yet Forrest and Pitcher do not concern themselves with investigating whether this is the case.

Yet they conclude by citing the following:

“The main problems that have been identified with collapsed fisheries have been failure to control fishing capacity (allowing fishing fleets to become too large); too much trust placed in stock assessments; and management systems that either cannot or will not adapt to new information about the state of the fishery (Walters and Maguire 1996; Cochrane 2000).”

Nevertheless, Forrest and Pitcher go on to state that:

“The addition of new species in landings statistics does not necessarily imply that traditionally-caught species have declined as fishers are forced to seek new markets.”

Forrest and Pitcher avoid the evidence that traditionally-caught species in NSW *have* declined. For example the following species have had decreased levels of catch reported in NSW:

1. Latchet since 1973.
2. Jackass Morwong and Gemfish since 1980.

3. Snapper since 1981.
4. John Dory since 1984.
5. Silver Trevally since 1986.
6. Sand flathead since 1990.
7. Black and Yellowfin Bream and Redfish since 1993.

These species alone account for a decline of over 8,000 tonnes since 1980 in the NSW fisheries total landed catch of finfish, while newly reported species only accounted for about 4000 tonnes since 1992.

The following is a list of 22 finfish species we believe have been depleted below a level that they should not continue to be commercially targeted (those under 20% of the peak catch) and a further 14 that are being fished unsustainably.

- 8 species have been in decline for more than 20 years;
- 3 have been in decline for 20 years.
- 5 have been in decline for 15 years:
- 2 have been in decline for 10 years, and
- 18 have been so for at least the past 5 years.

**Table 1. Fished species at risk of collapse (adapted from NSW Fisheries Catch statistics 1940-2000)**

Species	Peak catch (tonnes)	Catch in 2000 (tonnes)	2000 catch as % of peak catch	>20 year decline	20 year decline	15 year decline	10 year decline	5 year decline
1. *Jackass Morwong	1160	15	1.3			yes		
2. Gemfish	4500	77	1.7		yes			
3. Red Gurnard	450	10	2.2	yes				
4. Mirror Dory	600	20	3					yes
5. Shark other	1500	50	3.3			yes		
6. Silver Dory	48	2	4					yes
7. Broadbill Swordfish	140	5	4					yes
8. Redfish	2400	100	4.2		yes			
9. Tiger Flathead	2200	100	4.5					yes
10. Ling	540	29	5.4					yes
11. Blue Grenadier	138	8	6					yes
12. John Dory	350	30	9					yes
13. Latchet	320	30	9	yes				
14. Rubber-lipped Morwong	1000	100	10		yes			
15. Mackerel Jack	205	21	10					yes
16. Leather Jacket unspecified	1050	130	12.4	yes				
17. Teraglin	210	33	16	yes				
18. Ocean Perch	300	50	17					yes
19. *Samson fish	55	10	18					yes

20. Dogfish	180	35	19					yes
21. Sweep	54	10	19					yes
22. Angel Shark	100	20	20					yes
23. Silver Trevally	1500	300	20			yes		
24. Yellow-tailed Kingfish	600	120	20			yes		
25. *Mulloway	380	80	21	yes				
26. Hapuku	70	18	26	yes				
27. * Taylor	250	66	26	yes				
28. Pilchards	620	170	27					yes
29. Garfish	290	90	31					yes
30. Snapper	900	300	33	yes				
31. Blue-Eye Cod	330	107	32				yes	
32. Shark all	1100	400	36			yes		
33. Carpet shark	129	50	39				yes	
34. Bream – Black and Yellowfin	720	300	42					yes
35. Gummy Shark	70	36	50					yes
36. Tarwhine	95	53	56					yes
<b>Total</b>	<b>25004</b>	<b>2905</b>	<b>11.6</b>					

\* Fished more heavily by recreational fishers than commercial fishers

## NSW Fisheries EIS and conclusion

NSW Fisheries are at odds to address the overfishing of the fisheries in its care. This is evident in its latest Environmental Impact Statement (EIS) for the Ocean Trap and Line Fishery (OTLF), which the HCEC did not review in its report, as it was released a month after the report's publication.

In the EIS NSW Fisheries state that:

“Overall, the Draft Fisheries Management Strategy (FMS) for Ocean Trap and Line Fishery is assessed in its EIS as potentially affording a minor reduction in the risk of overfishing to the target species of the fishery.”<sup>3</sup>

And:

“The draft FMS is unlikely to adequately address the issue of overfishing of snapper and kingfish and potentially wobbegong sharks.”<sup>4</sup>

The EIS continues in this vein on page 10 where it states that:

“The proposed recovery program to address the growth overfishing of snapper will not aid its recovery, as the issues of inappropriate harvest size, effort levels and mesh selectivity have not been directly addressed.”<sup>5</sup>

<sup>3</sup> *Environmental Impact Statement for the Ocean Trap and Line Fishery* (2006), Department of Primary Industries, Fisheries Division, Cronulla, p 9.

<sup>4</sup> *ibid*

And that:

Gemfish and Silver Trevally are assessed as remaining overfished.<sup>6</sup>

The EIS also states on page 122 that:

“Eight of the 11 primary species of the OTLF have decline over the long term.<sup>7</sup> Of these eight are fully fished, Snapper, Kingfish and Silver Trevally are assessed as overfished, Rubber lipped Morwong and Bonito have not been appraised....A cursory appraisal based solely on the presented catch and CPUE data would suggest that at best, those species are fully fished, and possibly overfished (p122).

On page 126 of the OTLF EIS NSW Fisheries state that;

“In the secondary species of the OTLF, total production has declined for 12 of the 14 key secondary species.”<sup>8</sup>

On page 130 of the OTLF EIS NSW Fisheries go on to state that;

The OTLF is either the major harvester, or harvests a significant proportion of most of the primary and key secondary species of the fishery. It is not surprising then that for most of those species, the short term trends within this fishery are consistent with the longer term downward trend across all commercial fisheries.

The HCEC does not therefore, need to justify the observations and conclusions in its report to anyone, beyond stating that we maintain that NSW fisheries are being fished unsustainably, and that many fisheries are facing collapse unless total allowable catches are established and the Precautionary Principle appropriately applied.

The current round of Zoning Plans for the Port-Stephens and Batemans Marine Parks are also a good opportunity to reduce fishing pressure in these areas by prohibiting such unsustainable fishing in areas that fish require to proliferate, and providing a buffer against stock collapse.

The “misguided claims of overfishing in NSW” are refuted beyond doubt. That NSW fisheries are overfished is substantiated by NSW Fisheries themselves. Why then, do two fisheries scientists from Canada feel the need to claim that the NSW fishery are not being overfished?

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<sup>5</sup> *Op cit* p 10

<sup>6</sup> *Environmental Impact Statement for the Ocean Trap and Line Fishery* (2006), *op cit* p 10

<sup>7</sup> Kingfish, Snapper, Silver Trevally, Bonito, Blue-Eye Cod, Rubber lipped Morwong, Yellow-fined Bream and Spanner Crab.

<sup>8</sup> Mixed shark; Wobbegong; Silver Sweep; Mulloway; Gemfish; Teraglin; Jackass Morwong; Spotted; Mackerel; Hapuku and Bass groper; Black spotted pigfish; Narrow Barred Mackerel.

