

Thalassorama

ITQs in the Australian South East Fishery

Introduction

The south east fishery is one of Australia's oldest commercial fisheries, with trawling occurring off New South Wales since the late 1890s (Tilzey, Zann-Schuster, Klaer and Williams 1990). The multispecies fishery now includes most of the waters off southern New South Wales, Victoria, Tasmania and south eastern South Australia (Figure 1). The fishery is the major supplier of fresh fish to the Australian domestic market. Gross value of production in 1991-92 was estimated to be \$A63.7 million (ABARE 1992). In 1992, individual transferable quotas (ITQs) were introduced into the fishery as the principal management system. The purpose in this paper is to outline the main challenges and successes that have occurred in the fishery as a result of ITQ management to date.

Background

The south east fishery fleet is composed of three boat types—danish seiners, inshore otter trawlers and offshore otter trawlers. The danish seiner boats are small (13-20 metres in length), low powered inshore vessels that fish mostly for flathead (*Neoplatycephalus richardsoni*) and whiting (*Sillago bassensis flindersi*) in relatively shallow water. The otter trawl fleet is much more diverse and includes boats of 12.5-40 metres in length targeting a large range of species. The smaller boats of the inshore sector fish on the continental shelf and upper continental slope to depths of around 500 metres. The offshore sector includes the larger boats which mainly target orange roughy (*Hoplostethus atlanticus*) on the continental slope in depths mainly between 600 and 1000 metres.

The history of the fishery is one of commercial survival being dependent on the discovery of new fish resources as exploited stocks became depleted. The early fleet was dominated originally by steam trawlers, then by danish seiners. These boats mainly targeted flathead in the inshore waters of New South Wales and Victoria. Fishermen expanded their activity to deeper waters in the late 1940s to target redfish (*Centroberyx affinis*) and morwong (*Nemadactylus macropterus*) following a decline in the flathead fishery. Steam trawlers ceased operating altogether in the early 1950s.

There was a marked downturn in danish seining in the early 1970s as fishermen switched to otter trawling (Tilzey et al. 1990). Otter trawling was better suited to the deeper waters being exploited by many fishermen. The development of the gemfish (*Rexea solandri*) fishery was a consequence of operators expanding their activity into deeper waters. Catches of gemfish increased from 83 tonnes in 1972 to over 6000 tonnes in 1980 (Menz, Geen and Collins 1986).

Boat numbers increased in response to improved profitability in the fishery due largely to the increase in gemfish catches. The fleet was limited to 150 boats



Figure 1. Australia's south east fishery

in 1985 in response to concerns about the level of fishing capacity. Fleet capacity was further constrained by the introduction of a unitisation scheme. Each boat was allocated a number of units based on size and engine power. If an operator wished to upgrade engine power or purchase a larger boat, it was necessary to acquire additional units. In an attempt to reduce overall fishing capacity, there was also a requirement that on upgrading some further units were to be forfeited.

As catches of gemfish started to decline in the mid-1980s, operators again moved further offshore to target underexploited stocks. The development of the blue grenadier (*Macruronus novaezelandiae*) and orange roughy fisheries was a consequence of operators seeking new resources as existing stocks became over-exploited. Unfounded optimism about the size and productivity of the orange roughy stock resulted in an expansion in investment in the offshore sector of the fishery. The number of trawlers operating in the offshore sector increased from 16 in 1985–86 to 59 in 1989–90. Since then, there has been a gradual decrease in boat numbers in the offshore sector of the fleet.

Catches of orange roughy expanded from 3000 tonnes in 1986 to peak at about 38000 tonnes in 1988–89. Limits on the catch of orange roughy were introduced in July 1989 to protect the stock from even higher catch levels while stock assessment research was undertaken. As a result of this research, catches of orange roughy were cut through reductions in the total allowable catch (TAC). Current estimates of the maximum annual sustainable yield in the fishery are as low as 3000 tonnes based on the known stocks (Bureau of Rural Resources 1992).

A TAC was introduced for the winter spawning run of east coast gemfish in 1988 to limit the catch. This was based on concerns that the stock was being

Table 1
Rates of Return to Capital at Full Equity in the South East Fishery

Year	Danish Seiners (%)	Inshore Boats (%)	Offshore Boats (%)	Total Fishery (%)
1989-90	23 (41)	27 (20)	34 (17)	32 (15)
1990-91	27 (26)	15 (38)	16 (35)	16 (26)
1991-92	30 (14)	15 (45)	42 (18)	33 (17)
1992-93 ^P	22 (21)	25 (25)	30 (21)	28 (17)

^P Projections. Figures in parenthesis are the relative standard errors of the estimates expressed as percentages.

overexploited. Instead of allocating quota between operators, the stock was fished competitively until the TAC was reached. The effects of the competitive TAC were increased competition, inefficient fishing operations and market gluts (Coutts 1991). The TAC was allocated amongst fishermen as individual transferable quotas (ITQs) in 1989. This was to allow fishermen to adjust their operations in response to the falling gemfish catch and reduce the competition between operators in harvesting the limited resource.

ITQs were introduced for a further fifteen species in the fishery (including orange roughy) at the beginning of 1992. While over one hundred species are landed, the sixteen quota species account for the majority of the catch.

Impact on Profitability

In early 1992 and 1993, ABARE conducted surveys of the fishery to assess the economic performance of the fleet over the period 1989-90 to 1991-92. The economic performance of the fleet in 1992-93 was also estimated based on changes in fleet structure, prices and catch between 1991-92 and 1992-93. From the data collected in the survey the average rates of return to capital at full equity were estimated for each boat group. The preliminary estimates of these rates are given in Table 1.

The expected rates of return of various boat groups in the sector which may have occurred if ITQs had not been introduced in 1992 were also estimated (Figure 2). These estimates are based on costs and returns if boat numbers had not fallen from their 1990-91 level. They also include the assumption that the total fishery catch would have been the same in the absence of ITQs. As some boats may have left the fishery even in the absence of ITQs, the estimates represent the worst case scenario.

Between 1989-90 and 1990-91, before the introduction of ITQs, the reduction in the competitive total allowable catch for orange roughy resulted in a decrease in the return to capital of the offshore fleet. With the introduction of ITQs in 1992, full equity returns to capital in this sector of the fleet increased (Table 1). This is despite a further reduction in the total allowable catch for orange roughy. Offshore operators who owned more than one vessel were able to amalgamate their quota, offsetting the reduction in their individual quotas. Some other operators removed their boats from the fishery and leased their quota to the remaining operators. As full equity returns exclude the cost of leasing quota, the profits retained by operators actively fishing may be lower than the full equity profits.

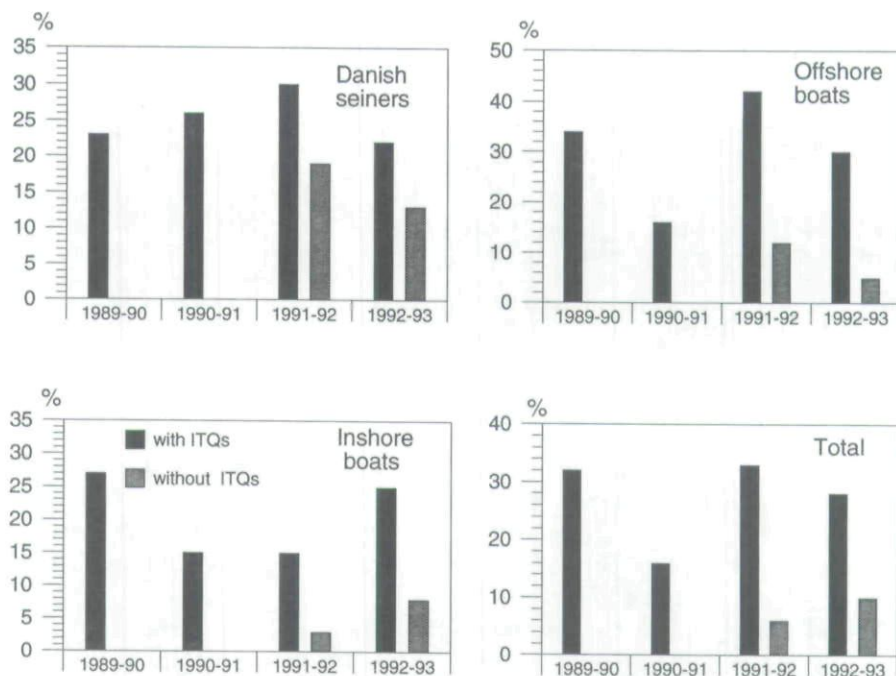


Figure 2. Estimated rates of return to capital at full equity in the south east fishery with and without ITQs

However, as can be seen in Figure 2, if the fleet had been unable to adjust, the falling TAC would have resulted in lower rates of return for inshore and offshore boats.

The rise and subsequent decline in rates of return to capital for the danish seiners (Table 1) was largely due to changes in the price for whiting rather than the effects of ITQs. However, 10 percent of the fleet (2 boats) exited the sector following the introduction of ITQs, resulting in higher catches and returns to those boats which remained.

The earlier introduction of ITQs on gemfish and a reduction in the total allowable catch resulted in a decline in profits in the inshore fleet in 1990-91. While revenue has fallen in each year since 1989-90, lower interest rates and fuel costs resulted in a higher rate of return to capital in 1992-93. The relatively lower returns to this sector mainly occurred as a result of the slowness of this part of the fleet to adjust to falling TACs. This slowness may, in part, be due to the problems experienced with ITQs in this part of the fishery. These problems are outlined below.

Difficulties Experienced by the Inshore Fleet

A major problem that was experienced by the inshore fleet arose from the allocation of quota. The initial allocation process was based on a combination of historical catch and boat size. The average share caught by each boat, rather than quantity, was used as the basis for the historical catch portion of the allocation. The purpose behind this approach was to reward operators who were involved in the development of parts of the fishery, as they would have had high individual

shares of total catch during the development phase. The period used for assessing historical catch, however, bore little relation to the more recent fleet activity. Some operators who changed their operations following the development of new stocks received relatively small shares in these stocks. This resulted in some operators ending up with unviable quota packages. As a result of partial allocation based on boat size, some operators ended up with quota for species they had never caught. In some cases, the quota mix did not match the actual catch composition, resulting in problems of overquota catch of bycatch species.

The method of quota allocation was challenged in court. This challenge was successful and the quota allocation was declared invalid. As a result, all quota trades were made void. Transfers were also prohibited (except through leasing) while the decision was appealed. This appeal was also lost by the government. Quotas have since been reallocated on the basis of actual catch (rather than share of catch) and boat size, but permanent trades are currently still prohibited while the management plan is being revised. Permanent trades are likely to be permitted again in 1994.

This lack of permanent transferability has prevented many inshore operators from exiting the fishery. While they could have conceivably leased their quota, the newness of the system and lack of a formal quota market has made quota leasing difficult. Uncertainty surrounding the whole management plan as a result of the court decisions has also prevented some operators from leaving the fishery. Operators are not prepared to sell their boat and lease their quota while the future existence of a quota system is uncertain.

With falling TACs for orange roughy, offshore species quota was generally unavailable in the offshore sector. As a result, inshore operators were prevented from expanding their activity in the offshore sector.

Employment prospects in many coastal communities also are not conducive to leaving the fishing industry. ITQs were introduced into the fishery at a time of generally high unemployment levels. Consequently, the opportunity cost of remaining in the industry in the short term is low for many inshore operators. Similarly, the opportunity cost of maintaining capital in the fishery is low. With few alternative uses of the boats and low profitability in other fisheries, fishermen may have difficulty selling their boats in the short term. Limitations on entry to other fisheries also prevent operators using their boats elsewhere.

A further problem being experienced with ITQ management in the fishery is management of incidental bycatch. Being a multispecies fishery, bycatch of quota species often occurs when targeting other quota species. This becomes a problem when insufficient quota is held for the bycatch species. As mentioned before, this problem has been compounded by a quota allocation that in some cases does not represent normal catch compositions. A number of policy options have been examined to address this problem, including a system of quota substitution, permitted limited quota overruns, a tax on landed overquota catch, and surrender (Baulch and Pascoe 1992). At this stage, the Australian Fisheries Management Authority is still considering the preferred option and the best means of implementing such an option.

The south east fishery also suffers from jurisdictional problems. In Australia, jurisdiction over waters within the Australian fishing zone is split between the state and Commonwealth governments. States have jurisdiction over the first three nautical miles, after which the seas fall under the jurisdiction of the Com-

monwealth government. In some cases, jurisdiction over waters within certain areas has been passed totally to either the Commonwealth or the state governments under an Offshore Constitutional Settlement agreement. This, however, is not the case for the waters of the south east fishery.

Under the current arrangements, the quota applies only to fish caught using trawl gear in Commonwealth controlled waters. That is, fish caught within the three mile state water boundary do not count against an operator's quota. This causes enforcement difficulties, as most south east fishery operators are licensed to fish in both state and Commonwealth waters. Since quotas have been introduced, many operators have recorded increased catches of quota species in the unregulated state waters by comparison with historical catch patterns. While this may in part be the result of increased effort being expended in state waters, the current arrangements provide an incentive to misreport catch location. As a consequence, some of the catch recorded in state waters may have been caught in Commonwealth waters and recorded as state catch to avoid quota restrictions.

Discussion and Conclusions

From the experiences of the south east fishery, some conclusions can be drawn about the preconditions necessary for the effective and efficient operation of ITQs. The major successes in the fishery have occurred in the offshore fleet. These boats essentially fish a single species (orange roughy), that is gear specific (deep water trawl), region specific and has little or no bycatch problems. Despite a falling total allowable catch for this species, operators appear to have been able to adjust their quota packages and improve their profitability.

Danish seiners also appear to have fared well under the ITQ program. While there has been no substantial increase in profitability since the introduction of ITQs in this sector of the fleet, there have been no substantial problems either. These boats fish predominantly two species in roughly equal proportion. Their quota holdings reasonably represent their catch composition. Again, there are few bycatch problems.

The major difficulties have arisen in the inshore fishery. This is a highly heterogeneous fishery, with many quota species caught as both target and bycatch. These species can be caught by a variety of methods, and can be caught in both Commonwealth and state waters. Allocation in this sector of the fishery has resulted in quota holdings that, in some cases, bear no relation to the normal catch composition of the operators. This has led to problems of bycatch discards. The current freeze on permanent transfers of quota, the ineffective quota leasing market and the lack of opportunities outside the fishery have also locked some operators into the fishery in the short term. Jurisdictional problems have caused difficulties in ensuring the integrity of the program.

Some conclusions can be drawn from this regarding important preconditions necessary for the successful implementation of ITQs. ITQs appear to work best in situations where there are a limited number of species, quota can be applied to an entire stock and the initial quota allocation is equitable. Where such conditions do not apply, effort will be required in establishing an effective and efficient quota market for both permanent transfers and leasing, establishing a bycatch management program, ensuring that quotas apply to the entire stock of fish, and ensuring that allocation is equitable and supported by the industry.

Most of these problems are currently being addressed by the Australian Fisheries Management Authority and the industry. Despite these transitional problems, ITQs have been effective in some parts of the south east fishery and are likely to lead to a return to high levels of profitability across the whole fishery in the longer term.

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