

# **Assessing the costs and benefits of individual transferable quota management in the Tasmanian southern rock lobster fishery, Australia**

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INSTITUTE FOR MARINE AND  
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*“Such is oft the course of deeds that move the  
wheels of the world: small hands do them because  
they must, while the eyes of the great are  
elsewhere”*

J.R.R. Tolkien – The Fellowship of the Ring

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## Statement of co-authorship

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# **ABSTRACT**

Understanding how fishers behave and make decisions is critical in determining how best to manage fisheries. If the response of fishers to management measures can be predicted, unexpected and undesirable outcomes can be avoided. Individual transferable quota (ITQ) management has been introduced in many international fisheries, with the purpose of accounting for human behaviour, as it theoretically generates behavioural incentives that are aligned with management objectives (e.g. reducing fishing costs). The ability of ITQ systems to meet continuing economic, ecological and social objectives therefore is centred on ensuring fisher behavioural incentives remain aligned with those objectives. This thesis used the Tasmanian southern rock lobster (TSRL) fishery in Australia as a case study to assess changing fishing practices and behaviour of fishers under ITQ management and how this had evolved through time. The aim was to improve general understanding of how ITQ implementation and design may affect fisher decision-making and improve certainty in fishery management outcomes.

It is critical that an ITQ system is able to manage interactions with all ecosystem components (e.g. non-target species) as required under ecosystem based fisheries management (EBFM) principles. The TSRL fishery to some extent, was more successful than other fisheries in accounting for these interactions, due to the selective and benign nature of potting. In many sustainably certified fisheries, input controls continue to be used in place of ITQ systems to manage ecosystem components, particularly in non-selective fisheries (e.g. trawl). The continued use of input controls however, can reduce the security of a fisher's ITQ right through loss



of access and potentially separate their incentives and behaviour from management objectives.

Successful ITQ management also requires the managing authority to set a binding total allowable catch (TAC). Between 2008 and 2010, the TSRL had a non-binding TAC, which reduced the price of quota on the market and caused a reactivation of latent effort, increase in fleet capacity, reduction in economic efficiency and dissipation of economic rent, as fishers engaged in a competitive race to fish during times of high revenue. Changing fishing practices such as “double night fishing” during these years also had the potential to lead to localised stock depletion through concentration of effort, however the format of the commercial logbook prevented a precise assessment of the fleet-wide extent and impact of double night fishing. Consequently, this research highlighted the importance of being able to collect fine-scale spatial and temporal data on fishing effort in order to enhance decision-making.

It is also important in an ITQ system that those actively fishing own the majority of their quota units. An implicit assumption behind the theory of ITQs is that those fishing are quota owners, however in many developed ITQ fisheries, with free transferability of quota units, the majority of the fishing is undertaken by lease quota fishers. Following analysis of the physical risk tolerance of both quota owners and lease quota fishers in the TSRL fishery, it was evident that their behavioural drivers were divergent. Lease quota fishers were more responsive to changes in expected revenue than quota owners, leading in some areas to significantly higher risk tolerance levels. In other words lease quota fishers were more prepared to take greater risks at sea than quota owners when expected

revenue was high. This result was not entirely unexpected as lease quota fishers face high costs of leasing quota and an increasing “cost price squeeze” between what that must pay to lease quota and what they are paid for their catch. Consequently, their behavioural incentives and underlying business structures are likely to be different. This was also evident in a series of economic experiments that were conducted to examine the propensity of groups with varying numbers of quota owners and lease quota fishers, to coordinate to prevent assignment problems that cause economic rent dissipation. Heterogeneous groups of lease quota fishers and quota owners were less successful in coordinating with communication than homogenous groups of quota owners. This was because lease quota fishers were less likely to adopt a socially-optimal strategy for preventing rent dissipation compared with quota owners due to having: (i) inequality in wealth; (ii) insecurity of tenure and; (iii) asymmetric information exchange. It was only through the institution of income-sharing cooperatives that lease quota fishers chose to coordinate because income-sharing offset the incentive to over-appropriate the resource, if participants doubt that others would do the same. While requiring external validation in the field, the results highlight the importance of recognising and understanding the differing behavioural incentives of lease quota fishers and quota owners. They also highlight the need for managers to consider the trade-offs associated with allowing free transferability of quota units and whether this meets overarching management objectives.

While contributing to further discussion and debate on the costs and benefits of ITQ management, this research highlighted the importance of understanding behavioural incentives of different types of fishers in order to inform management decision making. This type of research now and in the future has the potential to

inform and ultimately improve the design and implementation of ITQ management systems.

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