Title: The Complementarity of No-Take Marine Reserves and Catch Shares for Managing The Coral Reef Line Fishery of The Great Barrier Reef

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Abstract: Management changes in the coral reef fin fish fishery of the Great Barrier Reef provide a natural experiment of the efficacy of combining no-take areas and dedicated catch shares. A spatially-explicit bio-economic model of the fishery is used to analyze the tradeoffs between biomass and the net returns from fishing under different management regimes. Results for the scenarios examined show that: (1) the more the fishery is depleted, the greater are the payoffs from combining catch shares with no-take marine reserves; (2) a lower harvest while at high rates of exploitation only lowers net returns slightly for a wide range of reserve sizes; and (3) an increase in the reserve area from when it is zero or small- sized leaves net returns virtually unchanged at any catch level. Thus, catch shares and reserves are complementary and, when used jointly, promote lowering of TACs if rates of exploitation are high and increasing reserve sizes when no-take areas are small.