Missed Opportunity for a Golden Handshake? Why Did So Many Fishers Stay After the Introduction of ITQs?

Katell Hamon, Stewart Frusher, Rich Little, Olivier Thebaud
Outline

• The Tasmanian rock lobster fishery
• Modelling the fleet
• Modelled vs real response
• Why the difference?
• Conclusion
The Tasmanian rock lobster fishery

Coastal fishery targeting single species *Jasus edwardsii*

215 vessels fishing with baited traps

AUD $60 million return per year

75% landings exported

ITQs introduced in 1998

- Cap on quota ownership (<2%)
- Restrictive TAC
- Initial allocation based on trap ownership
Heterogeneity of the fishery

Spatial
- Size
- Colour
- Fishers

Seasonal
- Price
- Catch rates

Outline – Tas rock lobster fishery – Model – Results – Discussion – Conclusion
Outline

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Expected vs Observed impacts of ITQ

Sustainability of the resource

- If the TAC is set at a sustainable level, the stock should rebuild.

Rationalisation of the fishing fleet

- Transferability leads to more efficient fishers buying out least efficient fishers.

Strategies maximizing return

- Fishers develop fishing strategies maximizing the return on individual catch allocation.

Concentration of quota ownership

- Socially, concentration of quota ownership is not desirable.

Expected vs Observed impacts of ITQ

- Exploitable Biomass (t) vs ITQ over time:
  - Observations align with expectations.

- Number of vessels over time:
  - ITQ implementation results in a reduction of vessels.

- Proportion of effort before and after ITQ:
  - Observations align with expectations.

- Quota concentration over time:
  - Socially, concentration of quota ownership is not desirable.
Modelling the fleet

**Inputs**
- catch & effort data
- biological parameters
- tagging data

- economic data
- quota info
- vessel descriptors

**Fleet → individual based**
- quota allocation
- effort distribution (spatial & seasonnal)

**Management scenarios**
- TAC
- Aggregation limits
- ...

**Lobster Price**

**Outputs**
- economic statistics
- catch
- stock state

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Fishing plan

Expected marginal profit $/kg

Selection métier/month

Probability to be chosen

Begining of year

Next year

Next month

Fish

Allocate quota to months

Trade quota

Outline – Tas rock lobster fishery – Model – Results – Discussion – Conclusion
Quota allocation

- Begin of year
  - Compute fishing plan
- Next month
  - Allocate quota to months
- Next year
  - Fish

Fish

Trade quota

Total max catch: 14
Quota owned: 5

\[ \pi_4 > \pi_3 > \pi_2 > \pi_6 > \pi_5 > \pi_1 \]
Quota trading

- Begining of year
  - Compute fishing plan

Next year

Next month

Fish

Trade quota

- Allocate quota to months
- Trade quota
- Trade quota

- Quota price $Q$

- Demand = Fill profitable months
- Supply = quota in non profitable months

- Demand > Supply → Increase $Q$
- Supply > Demand → decrease $Q$

ID profitable months

Profitable

Demand/Supply

Comparison of Demand/Supply

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Graph showing maximum expected catch over months 1 to 6.
Fishing

- Allocate effort to areas for the month based on métier
- Simultaneous catch of quota allocated to the month
Modelled vs real response

Spatial distribution of catch:
- predictions close to reality
- anomalies in the western areas
Modelled vs real response

- Spatial distribution of catch:
  - predictions close to reality
  - anomalies in the western areas

- Vessel exit
  - Stronger decrease predicted than observed
Why the difference?

• Interviews with members of the industry
• Overestimation of fishing opportunities in some regions with high catch rates
  – Bad weather
• Market is less dynamic in reality
  • temporary transfers only ➔ very flexible
  • only profit driven ➔ higher demand
• Perfect knowledge vs 1st hand information
Summary and Conclusion

- Fishery reacted as predicted in trend but not in intensity
- More inertia in the system than profit maximisation
- Non-economic factors influence decisions
  - Personal factors
  - Weather constraints
- Target “optimal” rather than “maximum” profit
Thank you!