MECHANISMS TO IMPROVE THE EFFICIENCY OF RECREATIONAL FISHING

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RECREATIONAL FISHING

- The *management* of recreational fisheries is under-researched in the fisheries economics literature compared to commercial fisheries.
  - Yet management matters for maximizing the value of recreational fishing opportunities to anglers.
- There are important differences between recreational and commercial fisheries.
  - Motivation, size, and "countability" of the set of participants.
  - However, in both cases, fishing mortality is an input to profits/utility and an externality of fisher/angler decision making.
- Economic efficiency in a mixed-use fishery requires that we maximize the net present value of total economic value (roughly consumer and producer surplus) to both recreational and commercial sectors.
- Full economic efficiency requires:
  - Dynamic efficiency (the right path of total fishing mortality through time)
  - Inter-sectoral efficiency (efficient allocations of TACs across recreational vs. commercial)
  - Within-sector efficiency (efficiency within each sector, conditional on allocations)

EFFICIENCY: THE FIRST-BEST

- Efficiency requires
  1. Equimarginal principle: the monetized marginal value of fishing mortality must be equalized across anglers.
     - Assuming no discard mortality or full retention: the marginal value of harvest is equalized across anglers.
     - Heterogeneity in preferences or constraints → *quantities* will NOT be equalized across anglers.
  2. The "right" marginal value: if "internalized", induces angler behavior that just consumes the recreational allocation.
- Theoretically, efficiency can be achieved through a single, homogenous tax on fishing mortality
  - Or a dual tax instrument on landings and discards, where discards are taxed at a discount equal to survival rate.
  - Could also be achieved through a recreational ITQ.
- This is exactly the same solution as for commercial fisheries.
- It's also infeasible in most recreational fisheries!
  - Reforms in recreational fishing are inherently second-best

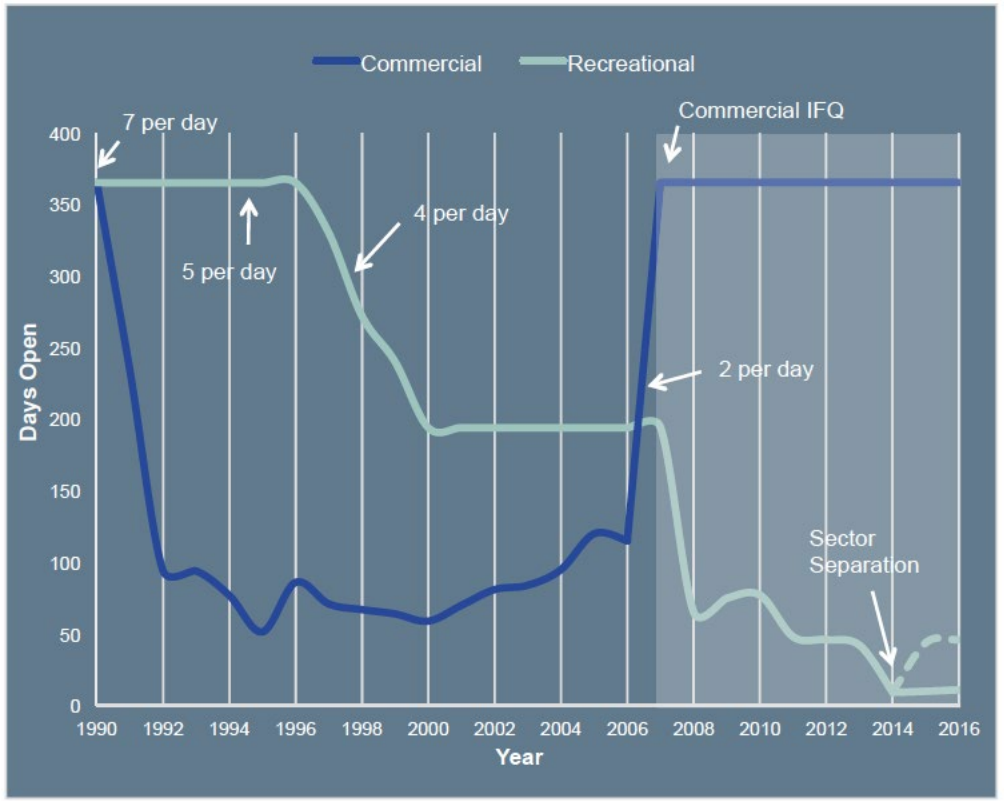
BACK TO REALITY

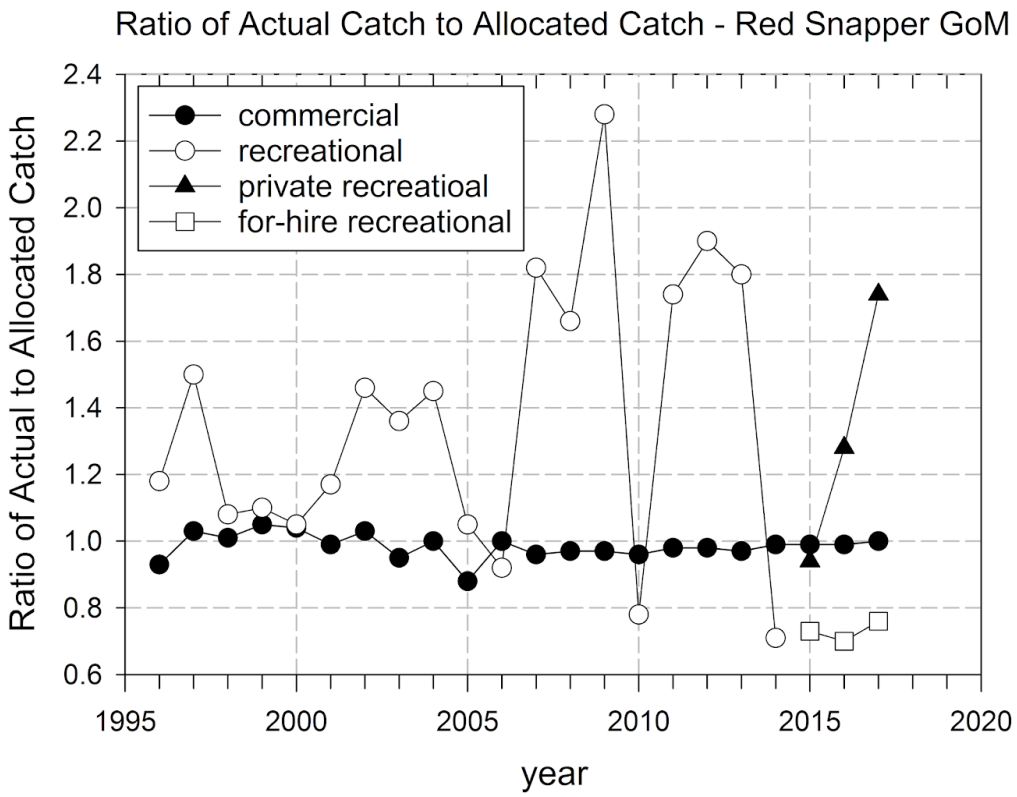
- Recreational fisheries are overwhelmingly managed under regulated open access (ROA) institutions.
  - Some for-hire fisheries impose limited entry on vessels, but not anglers.
- Fishing mortality is limited and rationed across anglers using retention (bag) limits, size limits, and seasonal retention restrictions.
  - Directly regulates angler impact per trip (in terms of harvest, but not discards)
  - Indirectly constrains trip taking through curtailing the quality of the trip
    - Most recreational "closures" are just retention restrictions → a seasonal limit on trip quality

INEFFICIENCIES OF RECREATIONAL ROA

- Seasonal closures allocate fishing *opportunities* inefficiently:
  - Blocking high-valued trips in favor of low-valued trips or forcing costly reallocation of trips to suboptimal times of year.
  - May exacerbate congestion externalities.
- Bag limits fail the equimarginal principle for allocating *harvest* efficiently → foregone "gains from trade"
  - No marginal incentive for anglers unconstrained by the bag limit (MB=0)
  - Heterogeneous marginal incentives for high-skill or high-retention anglers ($MB_1 \neq MB_2$)
  - This feeds back to distort trip-taking incentives.
- Difficult to balance control on the intensive (landings and discards per trip) vs. extensive (# trips) margins
- In general: fails to allocate fish in decreasing order of marginal value
  - Critically important for efficiency in recreational/commercial allocations (Holzer & McConnell 2014).

GULF OF MEXICO RED SNAPPER





LOOKING FORWARD: RIGHTS-BASED APPROACHES

- For-hire sector: cooperatives and ITQs are viable (Abbott and Willard 2013)
- Private sector: attenuated rights-based approaches. Allocate limited number of seasonal rights.
  - Output-based: harvest tags (Johnston et al. 2007)
  - Input-based: short-term licenses (i.e. 'day passes') (Abbott 2015)
- More durable rights could be vested in organizations (e.g., AMOs) with comanagement rights (Sutinen & Johnston 2003).
- Benefits:
  - (Relatively) direct targeting of fishery mortality outcomes.
  - Good allocative efficiency properties if paired with market-based (re)allocation policies.
  - Informationally efficient.
    - Monitoring and enforcement costs may be exaggerated.

LOOKING FORWARD: TECHNOCRATIC ROA

- Relatively modest tweaks to existing policies can markedly improve welfare
  - Lengthening seasons while reducing bag limits (Abbott et al. 2018; Melnychuk et al. 2021)
  - Enforcement challenges under ROA and allocative efficiencies remain.
- Inefficiencies can be further reduced by leveraging information about angler heterogeneity to customize policies
  - Spatially and temporally differentiated season openings with distinct bag limits (sorting equilibria)
    - Difficult to calibrate policies to allocations
  - Heterogeneous policies based on observable angler heterogeneity (Fenichel and Abbott 2014).

RESEARCH NEEDS

Upcoming REEP symposium article with Dan Lew, Rich Woodward, and John Whitehead (early 2022)

1. Empirical research on preferences and behaviors under recreational RBM
   - Angler apps and field experiments are promising!
2. Comparison of welfare and allocative outcomes for both marginal tweaks and innovative policies
   - Must move beyond single-number welfare summaries to embrace distributional analysis.
   - Critical to build bioeconomic models that adequately capture angler heterogeneity (Fenichel and Abbott 2013).
3. More research into comanagement governance approaches for the recreational sector.
   - Are there variations on the AMO concept that might be more palatable to recreational anglers?
4. Policy experiments!

The field is wide open!

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