

Cost Allocation for Commercial Catcher Vessels Operating in Multiple Fisheries

Carl Lian

Northwest Fisheries Science Center

NOAA Fisheries Service

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Background --- Why Cost Allocation is Important

- Performance measures for catch shares fisheries and the PFMC Groundfish Spex process require cost data at the fishery level
- Annual catcher vessel cost data collected by the NWFSC covers either all vessel operations on the West Coast or all vessel operations in any fishery (including Alaska)
- Since most commercial catcher vessels participating in the West Coast groundfish fishery participate in multiple fisheries, a methodology for allocating joint costs to individual fisheries is needed

Components of Groundfish Fishery for Cost Allocation

Cost estimates are needed for a number of components of the West Coast groundfish fishery:

- Shoreside whiting
- At sea whiting
- DTS trawl
- Non-whiting non-DTS trawl
- Primary sablefish
- Other limited entry fixed gear groundfish
- Open access groundfish

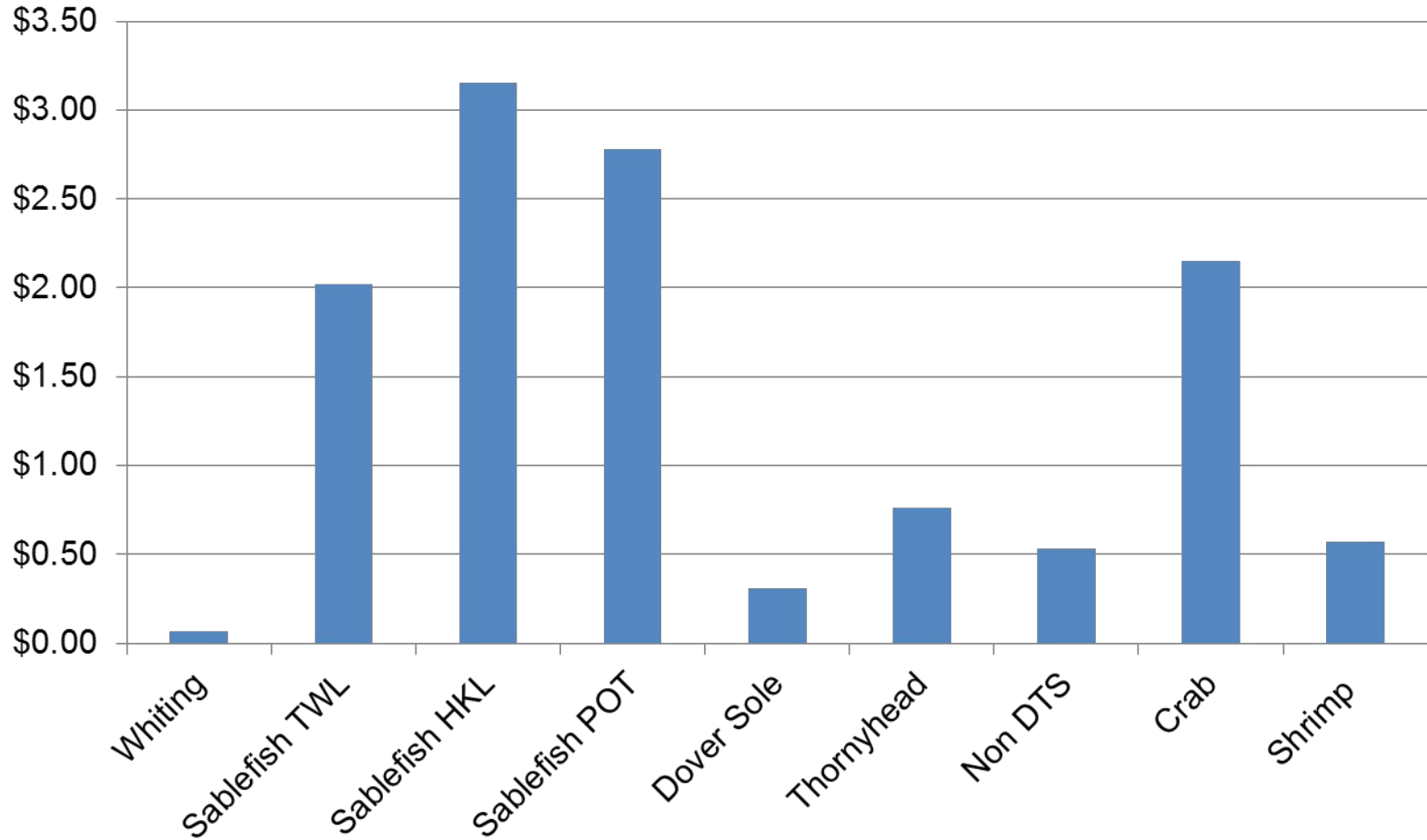
Today's Discussion

- Comparison of cost allocation methods applied to the shoreside whiting and limited entry fixed gear fisheries
- Total cost net revenue equals revenue minus monetary costs, with both variable and fixed costs included
- Net revenue is upward biased
- Total cost net revenue focuses on monetary costs associated with operating a catcher vessel, and does not consider opportunity costs such as
 - Owner-captain who is not explicitly paid for captain services
 - Opportunity cost of owning vessel, permits, and quota

Data Sources

- Comparison of cost allocation methods is based on 2010 data (most recent year for which cost data is available from all limited entry groundfish fisheries)
- PacFIN provides data on West Coast vessel landings
- The mandatory EDC program provides economic data for the shoreside whiting catcher vessels
- The voluntary cost earnings program provides data for catcher vessels operating in the limited entry groundfish fixed gear survey

Ex Vessel Prices During 2010



Cost Allocation Methodology --- Properties

The cost allocation methodology is used to allocate joint costs to individual fisheries for catcher vessels which have already made decisions about output quantities and prices.

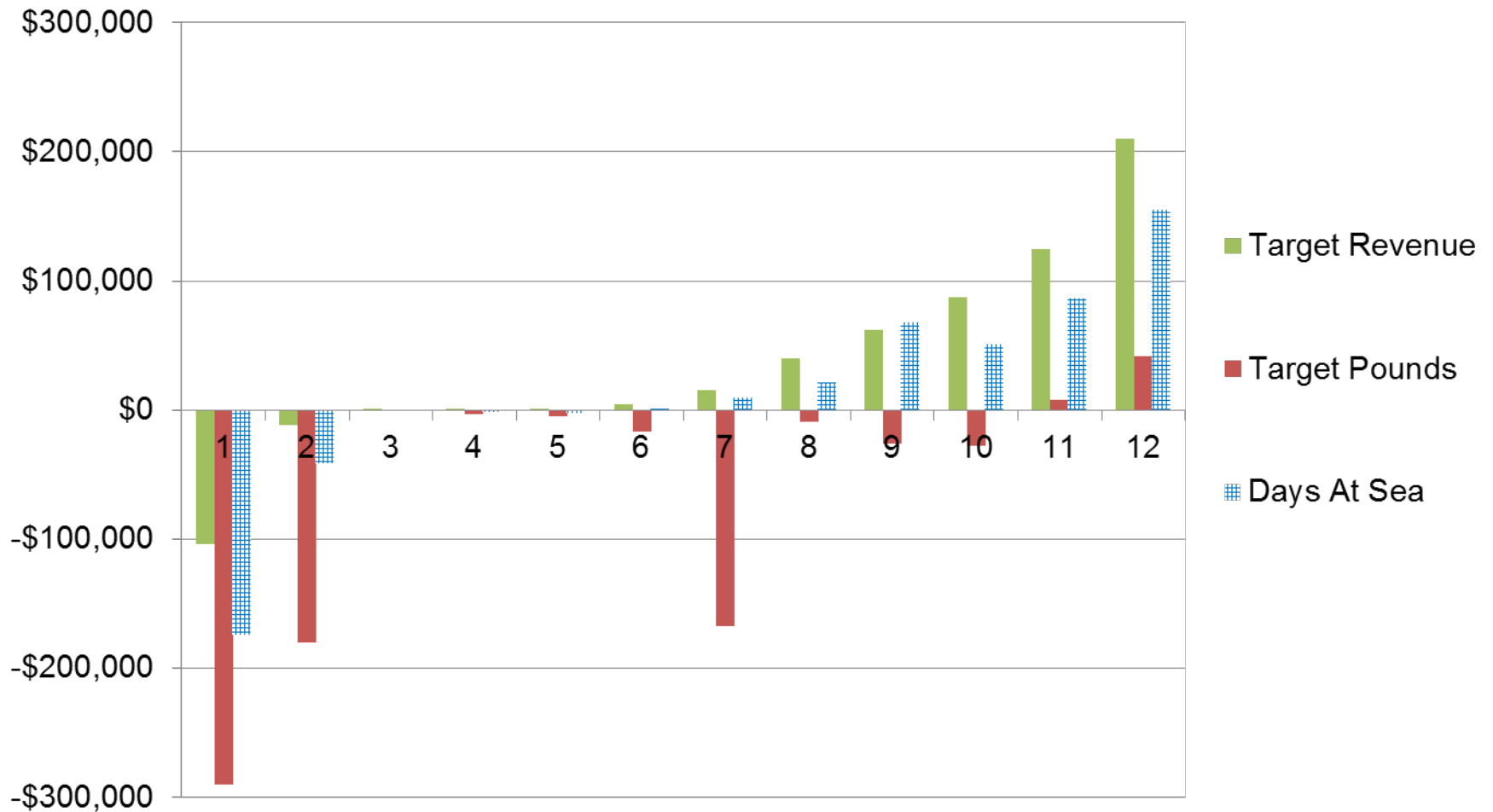
Desirable properties of a cost allocation methodology:

- The same cost allocation methodology can be applied to all vessels --- every vessel is treated in the same manner
- The allocation method is easy to understand, as a methodology which can be understood is more likely to gain acceptance
- The allocation method should be “tidy”, so that the sum of costs in all fisheries is equal to total costs for the vessel

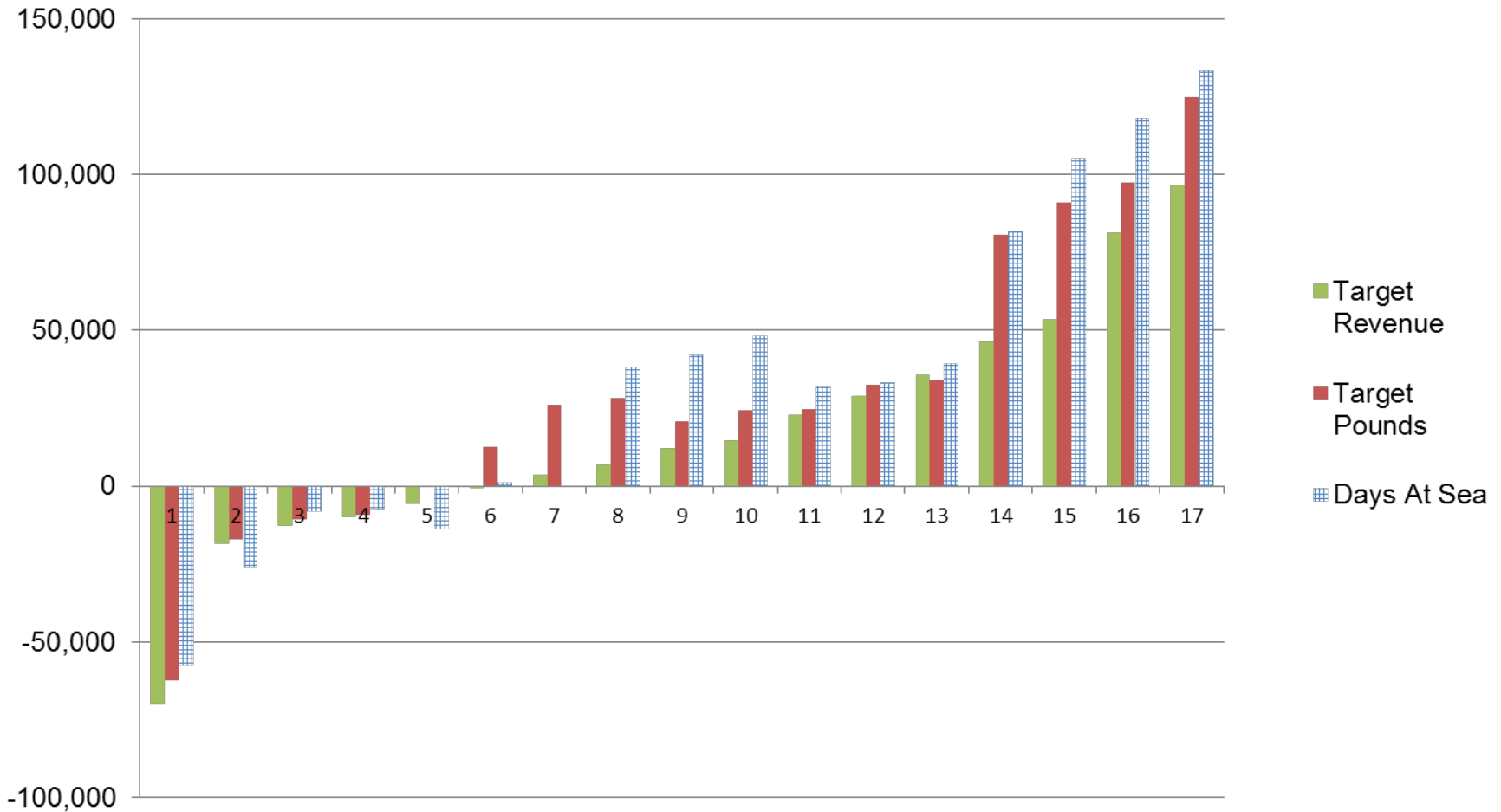
Five Methods of Allocating Costs to Individual Fisheries

- Revenue by landed species
- Revenue by target species
- Pounds by landed species
- Pounds by target species
- Days At Sea

Total Cost Net Revenue (Per Vessel, Group of 3) Shoreside Whiting



Total Cost Net Revenue (Per Vessel, Group of 3) Limited Entry Fixed Gear



Empirical Comparison of Cost Allocation Methods

--- Shoreside Whiting

For each cost category, regress reported cost on:

- WC whiting revenue
- WC non-whiting groundfish revenue
- WC crab revenue
- WC shrimp revenue
- Other WC revenue
- Alaska revenue
- Vessel length

Repeat with pounds and days at sea in place of revenue

Goodness of Fit --- Limited Entry Fixed Gear

	Revenue by Landed <u>Species</u>	Revenue by Target <u>Species</u>	Pounds by Landed <u>Species</u>	Pounds by Target <u>Species</u>	Days At <u>Sea</u>
Crew	0.86	0.89	0.81	0.81	0.84
Captain	0.84	0.85	0.79	0.80	0.71
Fuel & Lub	0.90	0.90	0.86	0.86	0.74
Bait	0.58	0.57	0.61	0.63	0.48
Food	0.72	0.73	0.64	0.66	0.77
Ice	0.29	0.31	0.32	0.33	0.36

Empirical Comparison of Cost Allocation Methods

--- Limited Entry Fixed Gear

For each cost category, regress reported cost on:

- WC groundfish revenue
- WC crab revenue
- WC halibut revenue
- Other WC revenue
- Alaska revenue
- Vessel length

Repeat with pounds and days at sea in place of revenue

Goodness of Fit --- Limited Entry Fixed Gear

	Revenue by Landed <u>Species</u>	Revenue by Target <u>Species</u>	Pounds by Landed <u>Species</u>	Pounds by Target <u>Species</u>	Days At <u>Sea</u>
Crew	0.81	0.80	0.80	0.78	0.63
Captain	0.83	0.84	0.81	0.83	0.51
Fuel & Lub	0.92	0.92	0.88	0.88	0.70
Bait	0.78	0.74	0.81	0.75	0.59
Food	0.75	0.73	0.73	0.70	0.67
Ice	0.24	0.21	0.31	0.28	0.20