Comprehensive Incentives for Reducing Chinook Salmon Bycatch in the Bering Sea Pollock Fleet: Individual Tradable Encounter Credits

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Abstract:
Concern about recent bycatches of Chinook salmon (Oncorhynchus tshawytscha) in the Eastern Bering Sea pollock (Theragra chalcogramma) fishery has led to the imposition of a bycatch cap effective 2011—if the cap is exceeded, the fishery will be closed. A hard limit on Chinook salmon bycatch threatens to ignite a race-for-fish in what is currently a highly profitable share-based fishery. A hard cap also has perverse consequences for Chinook salmon by being most restrictive when salmon are relatively abundant and bycatch levels are high and least restrictive when salmon are less abundant and in greatest need of protection. Here we show that a comprehensive incentive plan involving the allocation and trading of a particular form of individual bycatch quota, the Individual Tradable Encounter Credit (ITEC), aligns economic incentives to protect Chinook salmon even when the hard cap is not binding, while concurrently minimizing the cost to industry of avoiding Chinook salmon. Under this plan, the penalties and rewards associated with bycatch and bycatch avoidance are tied directly to the cost of foregone pollock when bycatch rates exceed the hardcap. These penalties/rewards are based on true price discovery associated with the market trading of ITEC: a price for bycatch that reflects the true cost of byctach to the fishery as opposed to an artifical pricing structure. This plan is flexible, and contains multiple parameters which can be tuned to enhance bycatch reduction performance. In addition, implementation of this plan would create a transparent market for bycatch credits that is scalable and can be extended to other bycatch species within the fishery or to bycatch caught in other fisheries. Our analysis of this plan is based on actual data from the Inshore catcher-vessel sector of the fishery,