



INTERNATIONAL PACIFIC



HALIBUT COMMISSION

Effects of historical discard mortality in non-directed fisheries (bycatch)

Agenda item 6.4

IPHC-2019-IM095-11

Purpose

To provide the Commission with a response to the Commission's request:

- “AM095–Rec.05 (para. 67) The Commission **RECOMMENDED** that the IPHC Secretariat expand upon the analysis completed in IPHC-2019-AM095-INF08 “Treatment and effects of Pacific halibut discard mortality (bycatch) in non-directed fisheries projected for 2019”, to be reviewed by the SRB at its next meeting. The objective of this work is to estimate lost yield from bycatch of Pacific halibut in non-directed fisheries for the years of 1991-2018.”



Previous studies

Study	Rate
Adlerstein 1993, 1994	1.0-3.3 (Gear and season specific)
Sullivan et al. 1994	1.7
Clark and Hare 1998	1.12 for 1995
Hare and Clark 2007	1.40, 1.58
Hare and Williams 2013	1.14
IPHC-2019-AM095-INF07,INF08	1.25-1.29 (projected for 2019-2021)



Methods

- Numerical evaluation using the preliminary 2019 ensemble
- Equilibrium model (results in IPHC-2019-IM095-11)



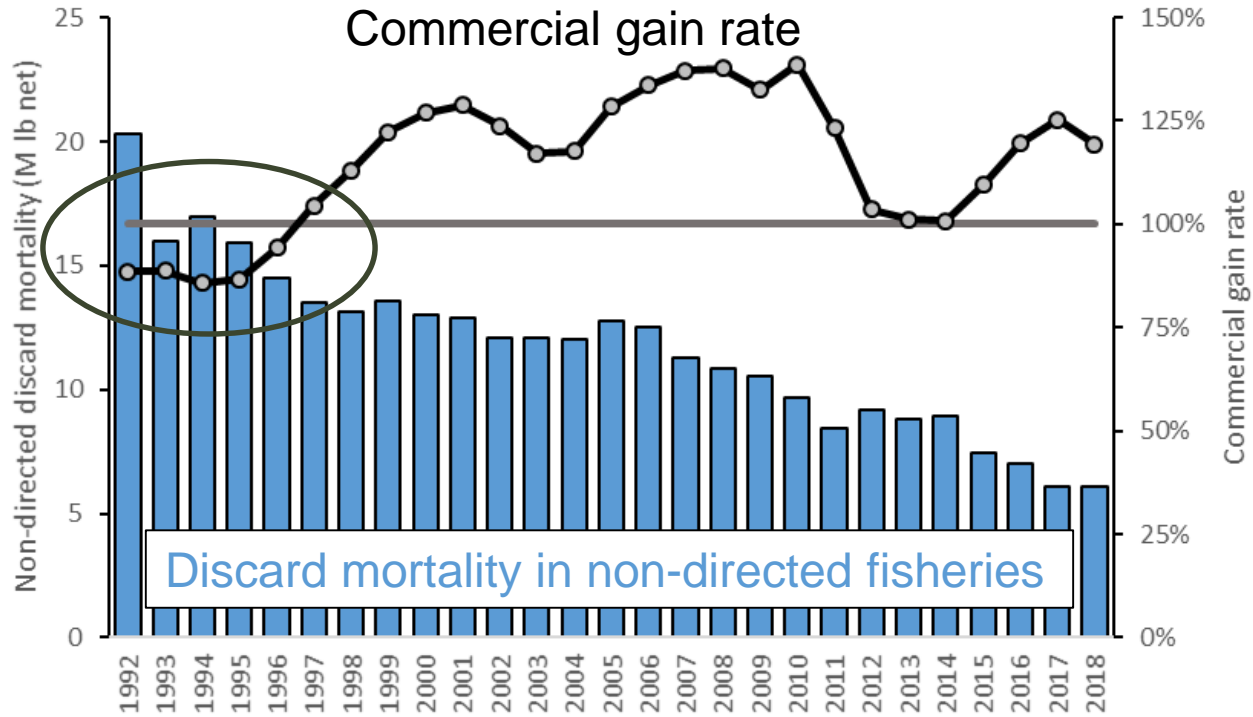
Methods

- Remove non-directed discard mortality from assessment models in a single year
- Recalculate directed commercial fishery yield (so that results are comparable over the full time-series) at the same SPR
- Calculate the ‘yield gain’ for each IPHC Regulatory Area based on the fishery yield distribution in that year



Results (ensemble)

Average: 115%
Range: 86-139%



Results

Distribution (Table 4):

	2A	2B	2C	3A	3B	4A	4B	4CDE
Non-directed discard mortality	3.7%	3.7%	1.3%	22.8%	11.1%	12.4%	5.3%	39.7%
Yield gain	3.7%	8.7%	5.4%	28.0%	13.5%	8.4%	5.7%	26.4%



Discussion

- There is no constant gain rate, results depend on: Growth, mortality, selectivity, discard mortality rates, fishing intensity, age structure of the population
- This analysis is *not* a replay of history, it is a sequential analysis of each individual year
- No distributional feedback is included, evaluation of ‘downstream effects’ caused by ontogenetic movement would require a spatial model.
- The trade-off in yield among sectors is part of a management strategy, and may be best evaluated as part of the MSE



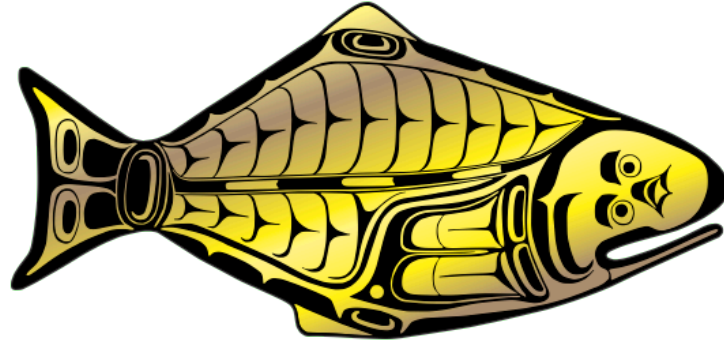
Recommendations

That the Commission:

- **NOTE** paper IPHC-2019-IM095-11 which provides an analysis of the effects of historical discard mortality in non-directed fisheries (bycatch) on yields to the directed fisheries



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