

INTERNATIONAL PACIFIC



HALIBUT COMMISSION

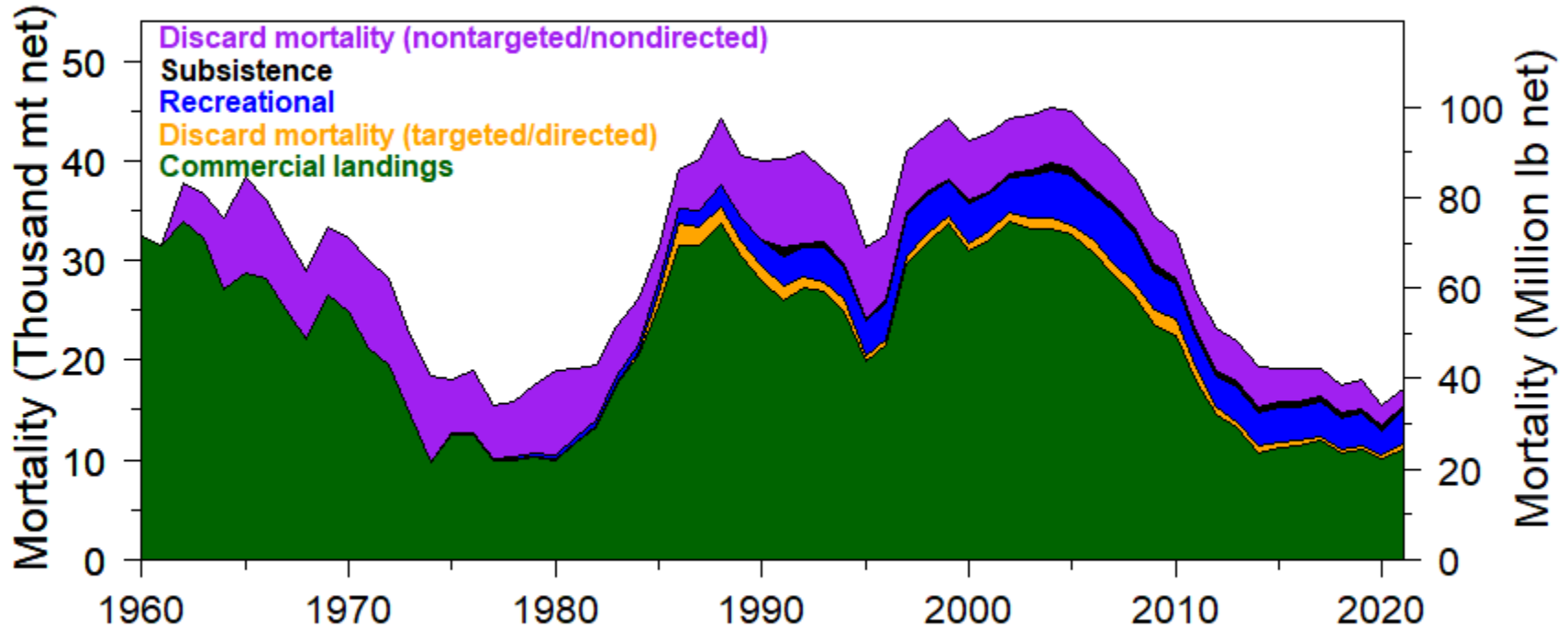
Discard mortality in the directed Pacific halibut fisheries

Alaska Bycatch Review Task Force
GOA Salmon and Halibut Subcommittee
28 July 2022

Ian Stewart and Allan Hicks



Pacific halibut mortality from all sources



Time-series data available at: <https://www.iphc.int/data/time-series-datasets>



Directed commercial halibut fisheries

- ‘Discard’ mortality from three sources

- 1) Lost gear:

Estimated from logbook-reported gear loss rates and total IPHC Regulatory Area landings.

- 2) Quota attainment:

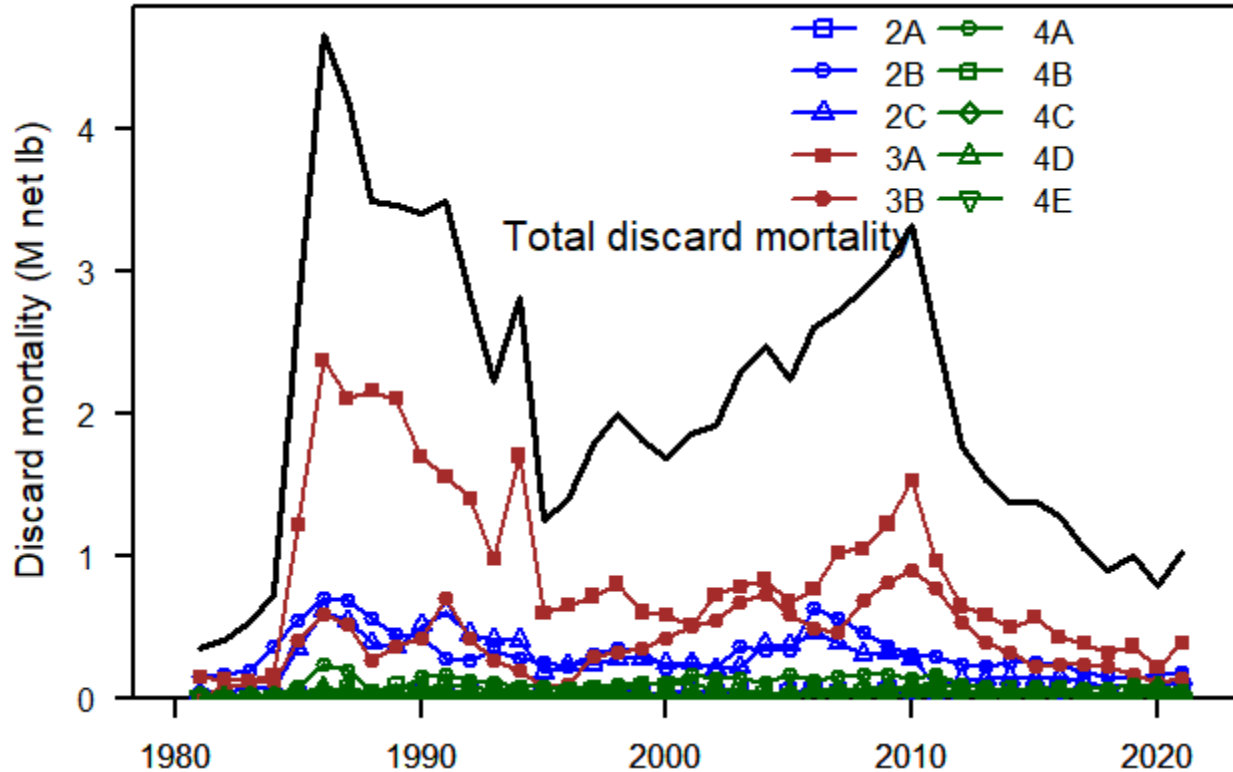
Estimated from logbook reported legal-size discards.

- 3) 32-inch minimum size limit:

Estimated from IPHC survey catch rates of sublegal fish and total IPHC Regulatory Area landings.

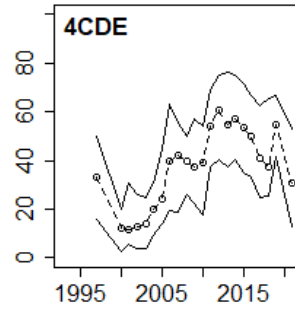
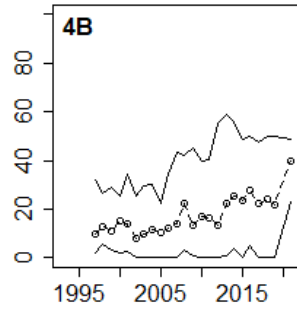
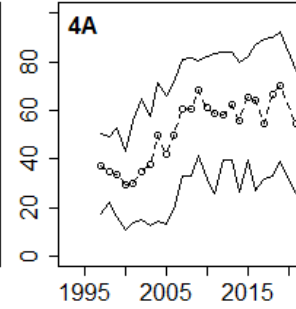
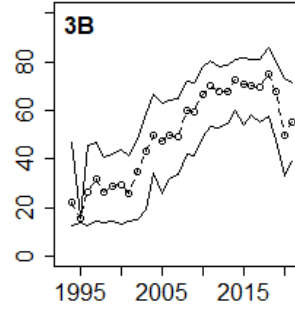
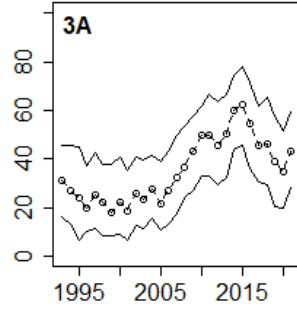
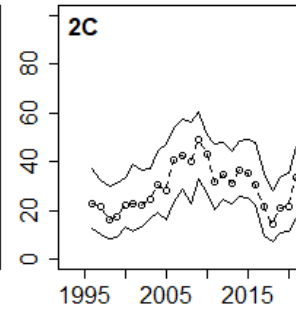
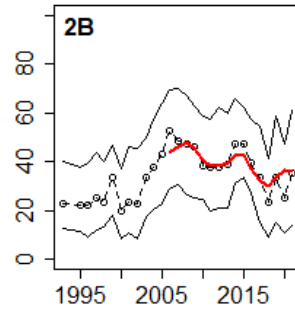
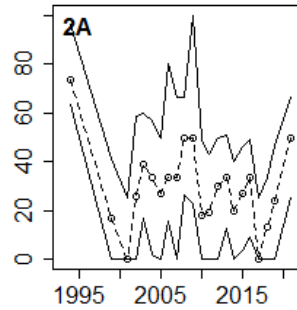


Directed commercial halibut fisheries



Commercial discards (U32)

Percent sublegal (in #s)



Directed commercial halibut fisheries (millions of net pounds)

| Year | Total Commercial mortality | Total discard mortality | U32 discard mortality | % discard mortality (U32) |
|------|----------------------------|-------------------------|-----------------------|---------------------------|
| 2017 | 27.23 | 1.05 | 0.97 | 3.6% |
| 2018 | 24.41 | 0.91 | 0.78 | 3.2% |
| 2019 | 25.24 | 1.00 | 0.90 | 3.6% |
| 2020 | 23.21 | 0.78 | 0.70 | 3.0% |
| 2021 | 25.51 | 1.02 | 0.91 | 3.6% |



Recreational fisheries (millions of net pounds)

| Year | Total recreational mortality | Recreational discard mortality | % discard mortality |
|------|------------------------------|--------------------------------|---------------------|
| 2017 | 7.60 | 0.16 | 2.1% |
| 2018 | 6.92 | 0.20 | 2.9% |
| 2019 | 7.04 | 0.14 | 2.0% |
| 2020 | 5.36 | 0.10 | 1.9% |
| 2021 | 7.65 | 0.13 | 1.7% |



2021 Tactical evaluation of size limits

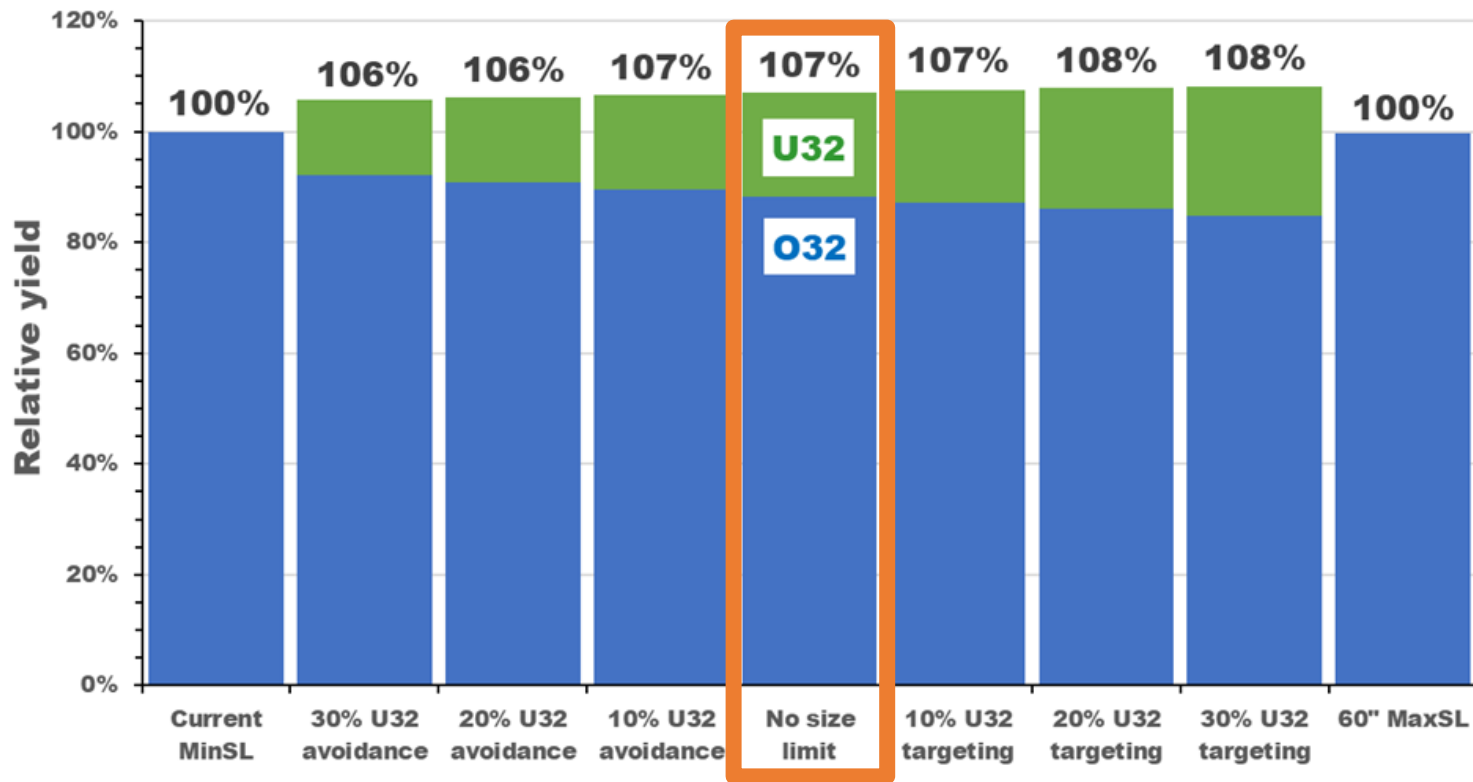
- Removing the 32-inch minimum
- Adding a 60-inch maximum

What are the affects on current fishery yield?

More information from IPHC's 97th Annual Meeting: [IPHC-2021-AM097-09](#)



Potential change in retained yield



Size limit analysis summary

| Response | Management action | |
|---|--|--|
| | Remove MinSL | Add MaxSL = 60" |
| Fishery yield | 7% increase | No change |
| Fishery value | Increased if U32 price \geq 63% of O32 price | No change |
| Discard mortality | Decreased by 0.80 million pounds | Increased by 0.12 million pounds, may increase further over time |
| Fishery efficiency (landings/catch) | 18% increase | 3% decrease |
| Data on total fishery catch and biology | Improved | Degraded |
| Recreational encounters with large fish | No change | Increased |
| Abundance/biomass of old females | No change | Increased |
| Average projected recruitment | No change | No change |



Discard mortality rates (DMRs)

- $DMR =$

Proportion of fish in each condition

X

Probability of mortality for that condition



Commercial fishery mortality probabilities

| Gear | Condition | | | |
|----------|------------------|-----------------|---------------|-------------|
| | <u>Excellent</u> | <u>Poor</u> | <u>'Dead'</u> | |
| Trawl | 20% | 55% | 90% | |
| Pot | 0% | 100% | 100% | |
| Longline | <u>Minor</u> | <u>Moderate</u> | <u>Severe</u> | <u>Dead</u> |
| | 3.5% | 36.3% | 66.2% | 100% |

Careful release is both required by regulation and important.



Recreational fishery DMRs (ADFG 2007)

| IPHC Area | Sector | DMR |
|-----------|---------|-----|
| Area 2C | Charter | 6% |
| | Private | 7% |
| Area 3A | Charter | 5% |
| | Private | 6% |



Discard mortality rates - basis

- Historical:

Based on relative recaptures of tagged fish, holding experiments.

- Recent trawl:

Satellite tagging in Bering Sea consistent with historical DMRs:

*Rose, C.S., Nielsen, J.K., Gauvin, J.R., Loher, T., Sethi, S.A., Seitz, A.C., Courtney, M.B., and Drobny, P. 2019. Survival outcome patterns revealed by deploying advanced tags in quantity: Pacific halibut (*Hippoglossus stenolepis*) survivals after release from trawl catches through expedited sorting. Canadian Journal of Fisheries and Aquatic Sciences 76: 2215-2224.*

- Recent directed commercial:

Satellite tagging estimates for minor injuries equate to 0-8.7% mortality:

Loher, T., Dykstra, C.L., Hicks, A.C., Stewart, I.J., Wolf, N., Harris, B.P., and Planas, J.V. 2021. Estimation of Postrelease Longline Mortality in Pacific Halibut Using Acceleration-Logging Tags. North American Journal of Fisheries Management. doi:10.1002/nafm.10711.

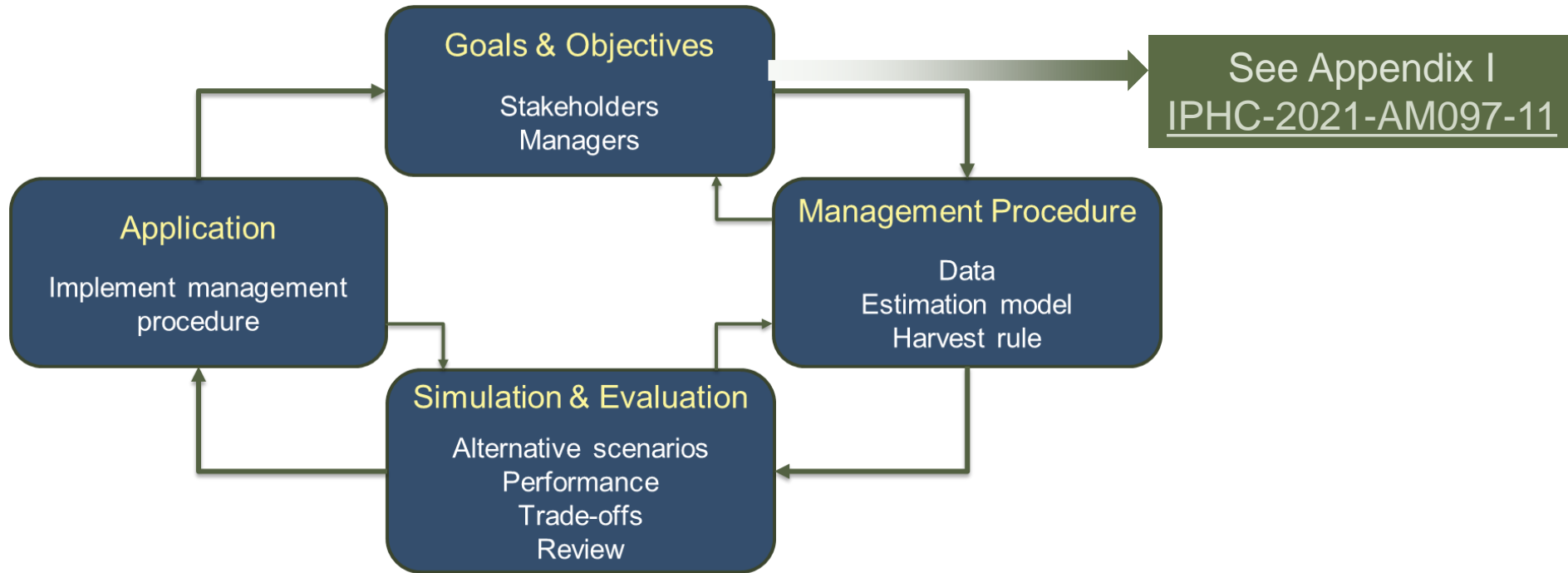
- Recreational:

Satellite tagging in 2021 (analysis ongoing) suggests very low mortality rates for fish released carefully.



Management Strategy Evaluation

a process to evaluate harvest strategies and develop a management procedure that is robust to uncertainty and meets defined objectives



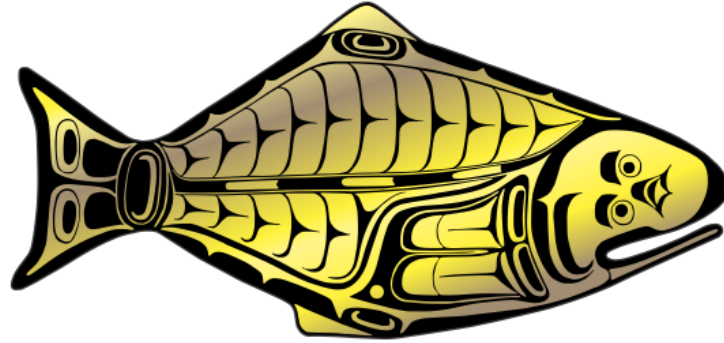
Evaluation of long-term size limit performance

- As part of the ongoing Management Strategy Evaluation (MSE):
 - How do size limits (status quo, 26-inch, no size limit) affect future coastwide stock, yield and fishery distribution across a broad range of conditions?

Results will be presented at the IPHC's [99th Annual Meeting](#), 23-27 January 2023



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