Fishery Time Series and BSAIcrabR

January 2025 CPT Modelling Workshop

Why

Catch times series standardization and R workflow started ~ 2020/21 by Ben and Tyler – left unfished

Recent data requests highlighted that the approach was clunky and inconsistent across stocks (*and the R scripts weren't being used*)

Need for more streamlined data and R workflow, that is consistent across stocks (*ie finish what we started*)

State of the Data – Observer / Dockside

Mostly good

Access to multi-year, all-fishery data dumps for every species for all ADF&G staff and confidential signers (by request)

Issues

- Minor format issues (additional columns, quick fix)
- Differentiating SM- and PIBKC fisheries (same fishery code in most years)
- Direct access through R package uncertain (not high priority)

State of the Data – Fish Ticket Data

More complicated than you'd might expect – need support from ADF&G fish ticket staff

Need fish ticket data for total effort and retained catch

Three data sources

- Doug Penguilly '90s effort timeseries – BBRKC, WBT, EBT, BSSC
- Fish Ticket report by stat area, by fishery
- Directed/Incidental report, post-rationalization – BBRKC, WBT, EBT, BSSC

Report by Stat Area

Contains retained catch, deadloss, total pot lifts by stat area

Excel worksheets (2023 – 1990) with tabs by fishery, formats differ by year going back in time

R code to parse these data are slow, and not perfect

Requesting single .csv file pull for all years / all fisheries or individual files by fisheries that include all years

Direct access

Directed/Incidental Report

Contains catch and effort as directed and incidental for WBT, EBT, BSSC, BBRKC, by trip

Excel worksheets (2023 – 2005) , one for EBT/BBRKC, WBT/BSSC

Requesting single .csv file pull for all years all fisheries – if it can't be done, okay

Direct access

R library – *BSAIcrabR*

https://commfish.github.io/BSAIcrabR/

Vision is one-stop shop for data access and summary analysis

Utility for data access is fuzzy at the moment, consistent analytical approach is *mostly* complete

Non-ADF&G users cannot access data directly

Retained Catch, R

Nothing new, sum of all retained catch (live+dead, dir+inc)

$$R = \sum R_{L,j} + R_{D,j}$$

$R_{L,j}$ = Live retained catch in stat area, j

$R_{D,j}$ = Deadloss retained catch in stat area, j

get_retained_catch()

Total Catch, T

$$T_g = \sum \left(\frac{\sum C_g}{n} N \right) P_{g,x}$$

$$T_g = \sum \left(\frac{\sum C_g}{n} N \right) w_g P_{g,x}$$

g – 'Group' stratum (i.e., female, sublegal / legal male)

x – Additional biological strata (e.g. shell condition, stat area, maturity) or stat area

C_g – Observer catch (number) from count pots in group, g

n – Number of observer count pots (may be stratified by stat area)

N – Directed fishery pot lifts (may be stratified by stat area)

w_g – Average calculated weight in group, g based on size composition

$P_{g,x}$ – Proportion of measured pot samples in biological strata x , in group, g

Total Catch – How it's different

1. Data filtering is consistent for observer CPUE and average weight calculations
2. Expand using directed pot lifts, not total
3. Biological strata are used such that $\sum T_{g,x} = T_g$. Was previously not the case when observer CPUE and average weight were stratified by biological strata

get_total_catch()

Discards, D

Nothing new, use subtraction method

$$D = T - R$$

Negative values interpreted as 0

Discard mortality = $D \times$ handling mortality

get_discards()

Size Composition – What's different

1. Data filtering consistent across stocks

2. Function easily stratifies by sex, shell condition, legal/maturity status, etc

Method is same for dockside and observer - count by strata

Progress

BSAIcrabR mostly complete – small tweaks as data improves, stocks added

BBRKC , AIGKC, PIGKC, BSSC *complete*, BSTC is close, **need data support for other stocks**

Goal is to have completed time series for May draft assessments,

publish ADF&G Fishery Data Series

I don’t plan to be the contact for data after this is done

BSAIcrabR

BBRKC Example