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NMFS/SEFSC
Sustainable
Fisheries Division

Interim Analysis for Vermilion Snapper

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Background Documentation

- Klibansky et al. 2022. Evaluating procedures for updating catch advice of reef fishes between stock assessments, with management strategy evaluation.

- Report and presentation provided to SSC at the October 2022 SSC meeting

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Possible interim adjustment process

1. Scientific analysis: center staff compute adjusted catch

2. SSC reviews catch adjustment and makes recommendation to SAFMC

3. SAFMC implements adjusted catch

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Computing adjusted catch

- Data required:

1. SEDAR 55 vermilion snapper BAM assessment output

2. Vermilion snapper standardized chevron trap index from SCDNR 2022 Trends Report

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Computing adjusted catch[1]

- Basic calculation

$$C_{adj} = C_{ref} * a$$

C_{adj} = adjusted catch

C_{ref} = reference catch

a = adjustment

Subscript ref indicates values associated with reference stock assessment (e.g. most recent)

1 Eq. 6 of: Huynh, Q. C., A. R. Hordyk, R. E. Forrest, C. E. Porch, S. C. Anderson, and T. R. Carruthers. 2020. The interim management procedure approach for assessed stocks: Responsive management advice and lower assessment frequency. Fish and Fisheries **21**:663-679.

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Computing adjusted catch

- $a = (I_{rcn} + s_{ref}*b)/(I_{ref} + s_{ref}*b)$

  I_{rcn} = geometric mean of recent index values

  s_{ref} = standard deviation of index residuals

  b = buffering constant

  I_{ref} = reference index value

- If:

  b = 0, a is not buffered by s_{ref}

  $0 < b < 1$, buffering effect of s_{ref} is diminished

  b = 1, buffering solely dependent upon s_{ref}

  $b > 1$, buffering effect of s_{ref} enhanced

  b ~ infinity, a ~ 1

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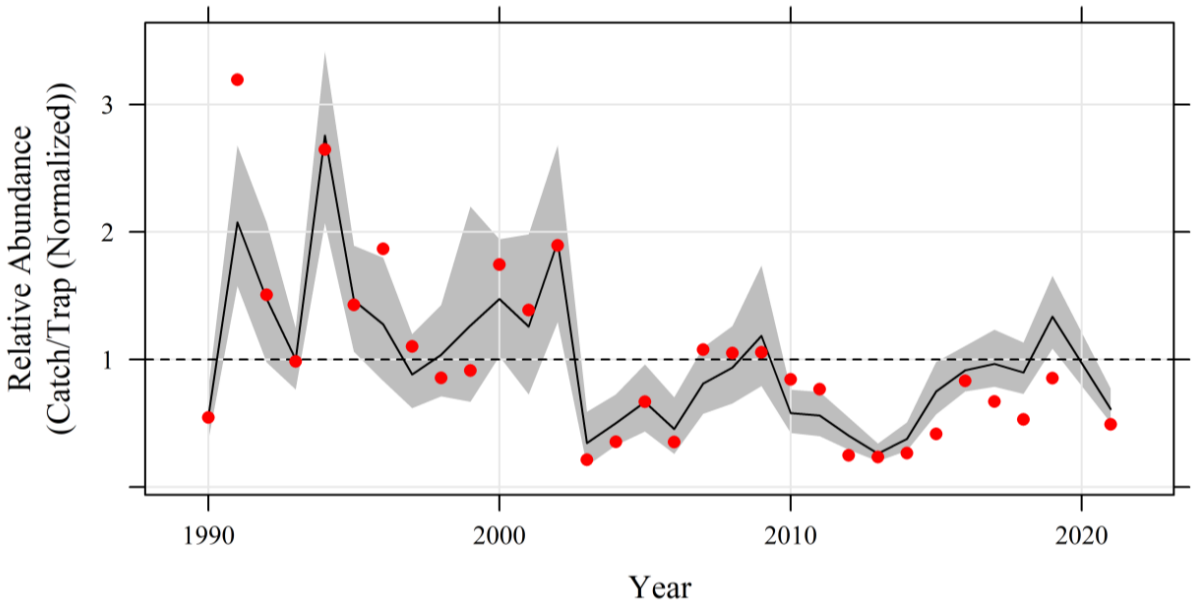
Well that sounds easy enough. Let's try it!

- Data

SEDAR 55 Benchmarks

Quantity	Units	Estimate	Median	SE
F_{MSY}	y^{-1}	0.41	0.44	0.20
$85\%F_{MSY}$	y^{-1}	0.35	0.37	0.17
$75\%F_{MSY}$	y^{-1}	0.31	0.33	0.15
$65\%F_{MSY}$	y^{-1}	0.27	0.29	0.13
B_{MSY}	mt	4249.2	4030.8	560.5
SSB_{MSY}	1E12 eggs	18.3	17.2	2.59
MSST	1E12 eggs	13.7	12.9	1.94
MSY	1000 lb	1305.8	1339.6	125.5
D_{MSY}	1000 fish	245.9	97.8	43.2
R_{MSY}	1000 age-1 fish	5591	5230	926
Y at $85\%F_{MSY}$	1000 lb	1300.3	1334.9	127.2
Y at $75\%F_{MSY}$	1000 lb	1288.2	1324.6	130.5
Y at $65\%F_{MSY}$	1000 lb	1266.0	1305.2	136.0
$F_{2014-2016}/F_{MSY}$	—	0.609	0.564	0.41
$SSB_{2016}/MSST$	—	1.51	1.54	0.34
SSB_{2016}/SSB_{MSY}	—	1.13	1.16	0.25

Chevron trap index through 2021



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Well that sounds easy enough. Let's try it!

$C_{ref} = ABC_{SEDAR55} = 1269$ klb
$I_{rcn} = geomean(I_{2018\text{-}2021}) = 0.90$
- I_{2020} got covid and is not available
$I_{ref} = I_{2016} = 0.92$ (value from updated index)
$S_{ref} = 0.61$

If:
$b = 0, a = 0.981, C_{adj} = 1245$ klb
$b = 1, a = 0.989, C_{adj} = 1255$ klb

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Next Steps

SEFSC will provide the following at the October, 2023 SSC meeting:

- Updated Vermilion Snapper Interim Analysis
  - Hopefully with 2022 index value included

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Questions?

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