

# Harvest Projection Assessments

## BSAI Groundfish Plan Team



November, 2023

Northern rock sole - McGilliard  
Greenland turbot - Bryan  
Kamchatka flounder - Bryan  
Arrowtooth flounder - Shotwell  
Flathead sole - Kapur  
Alaska plaice - Cronin-Fine  
Pacific ocean perch - Spencer

RE/BS rockfish - Spencer  
Atka mackerel - Sullivan  
AI pollock - Barbeaux

# Pacific ocean perch

## Not overfishing, overfished or approaching overfished

- Fishery Trends: catch decreasing slightly following peak in 2019
- Survey Trends: Persistent large biomass,
  - last survey 2022, next 2024
- Last full/update assessment 2022, next 2024
- 2024 spawning biomass 350,439, trend decreasing
- ABC: 41,096 t, OFL: 49,010 t

| Quantity                          | As estimated or specified last year for: |         | As estimated or recommended this year for: |         |
|-----------------------------------|--|---------|--|---------|
|                                   | 2023                                     | 2024    | 2024                                       | 2025    |
| <i>M</i> (natural mortality rate) | 0.056                                    | 0.056   | 0.056                                      | 0.056   |
| Tier                              | 3a                                       | 3a      | 3a   | 3a      |
| Projected total (age 3+) biomass  | 888,722                                  | 876,140 | 871,892                                    | 858,751 |
| Female spawning biomass (t)       |  |         |  |         |
| Projected                         | 359,074                                  | 352,616 | 350,439                                    | 342,980 |
| <i>B</i> <sub>100%</sub>          | 652,626                                  | 652,626 | 652,626                                    | 652,626 |
| <i>B</i> <sub>40%</sub>           | 261,050                                  | 261,050 | 261,050                                    | 261,050 |
| <i>B</i> <sub>35%</sub>           | 228,419                                  | 228,419 | 228,419                                    | 228,419 |
| <i>F</i> <sub>OFL</sub>           | 0.089                                    | 0.089   | 0.089                                      | 0.089   |
| <i>maxF</i> <sub>ABC</sub>        | 0.074                                    | 0.074   | 0.074                                      | 0.074   |
| <i>F</i> <sub>ABC</sub>           | 0.074                                    | 0.074   | 0.074                                      | 0.074   |
| OFL (t)                           | 50,133                                   | 49,279  | 49,010                                     | 48,139  |
| maxABC (t)                        | 42,038                                   | 41,322  | 41,096                                     | 40,366  |
| ABC (t)                           | 42,038                                   | 41,322  | 41,096                                     | 40,366  |
| Status                            | As determined last year                  |         | As determined this year                    |         |
|                                   | 2021                                     | 2022    | 2022                                       | 2023    |
| Overfishing                       | No                                       | n/a     | No   | n/a     |
| Overfished                        | n/a                                      |         | n/a  | No      |
| Approaching overfished            | n/a                                      |         | n/a  | No      |



# Rougheye / Blackspotted rockfish

## Not overfishing, overfished or approaching overfished

- Survey Trends: Variability in AI survey biomass estimates, 2022 estimate 65% larger than 2018 estimate (with CV of 50%)
  - last survey 2022, next 2024
- Last full/update assessment 2022, next 2024
- 2024 spawning biomass (AI portion of stock) 3,630 t, trend increasing (due to strong but uncertain recent year class)
- Recommended ABC: 569 t, OFL: 761 t

### Summary for AI portion of stock:

| Quantity                          | As estimated or specified last year for: |        | As estimated or recommended this year for: |        |
|-----------------------------------|--|--------|--|--------|
|                                   | 2023                                     | 2024   | 2024*                                      | 2025*  |
| <i>M</i> (natural mortality rate) | 0.050                                    | 0.050  | 0.049                                      | 0.049  |
| Tier                              | 3b                                       | 3a     |  |        |
| Projected total (age 3+) biomass  | 23,856                                   | 24,374 | 24,315                                     | 24,743 |
| Female spawning biomass (t)       |  |        |  |        |
| Projected                         | 3,471                                    | 3,642  | 3,630                                      | 3,821  |
| <i>B</i> <sub>100%</sub>          | 8,733                                    | 8,733  | 8,733                                      | 8,733  |
| <i>B</i> <sub>40%</sub>           | 3,493                                    | 3,493  | 3,493                                      | 3,493  |
| <i>B</i> <sub>35%</sub>           | 3,056                                    | 3,056  | 3,056                                      | 3,056  |
| <i>F</i> <sub>OFL</sub>           | 0.040                                    | 0.040  | 0.040                                      | 0.040  |
| <i>maxF</i> <sub>ABC</sub>        | 0.034                                    | 0.034  | 0.034                                      | 0.034  |
| <i>F</i> <sub>ABC</sub>           | 0.030                                    | 0.030  | 0.034                                      | 0.034  |
| OFL (t)                           | 626                                      | 686    | 684  | 736    |
| maxABC (t)                        | 533                                      | 584    | 583  | 627    |
| ABC (t)                           | 467                                      | 512    | 511  | 549    |
| Status                            | As determined last year                  |        | As determined this year                    |        |
|                                   | 2021                                     | 2022   | 2022                                       | 2023   |
| Overfishing                       | No                                       | n/a    | No   | n/a    |
| Overfished                        | n/a                                      | No     | n/a  | No     |
| Approaching overfished            | n/a                                      | No     | n/a  | No     |



Thanks to Paul Spencer

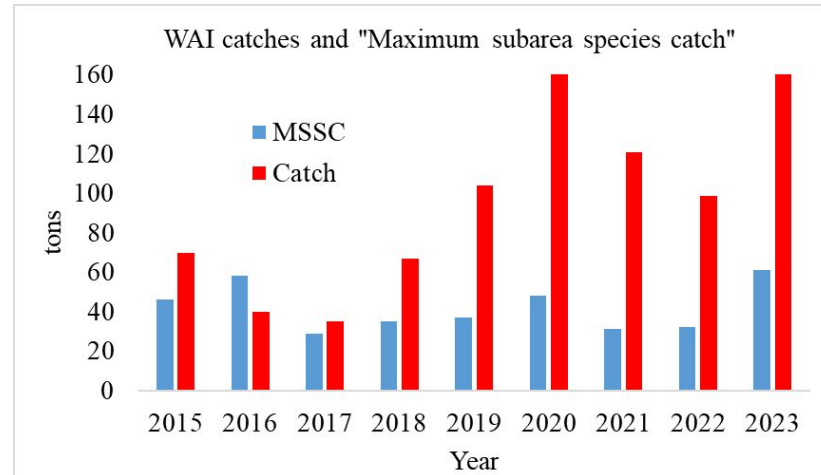
# Roughey / Blackspotted rockfish (continued)

- Fishery Trends: Continuation of strongly disproportionate harvesting
- WAI/CAI ABC exceeded every year since 2018
- WAI “Maximum Subarea Species Catch” (MSSC) was first used in 2015, and has been exceeded every year (except 2016)
- SSC comments, December 2022:

*As the BSAI GPT and the SSC have previously stated (see December SSC reports in 2018, 2020, 2021), the SSC continues to register strong concern with the disproportionate harvest in excess of the WAI/CAI subarea ABC and the WAI MSSC in recent years and reiterates that the available life history information for BS/RE rockfish suggest that this complex may be especially vulnerable to localized depletion.*

*... the MSSC appears to be an ineffective standalone tool*

*... the SSC expressed frustration at the lack of options to address the long-standing concern with this stock*



Thanks to Paul Spencer

# Atka mackerel

Not overfishing, overfished or approaching overfished

- Fishery Trends: average in western and central AI, low in the eastern AI
- Survey Trends: last survey was in 2022 (2% above 1991-2022 mean)
- Last full assessment 2022, next in 2024
- 2024 spawning biomass 625,578 t, trend increasing
- ABC: 95,358 t, OFL: 111,684 t

| Quantity                              | As estimated or specified last year for: |         | As estimated or recommended this year for: |         |
|---------------------------------------|--|---------|--|---------|
|                                       | 2023                                     | 2024    | 2024*                                      | 2025*   |
| <i>M</i> (natural mortality rate)     | 0.30                                     | 0.30    | 0.30                                       | 0.30    |
| Tier                                  | 3a                                       | 3b      | 3a   | 3b      |
| Projected total (age 1+) biomass (t)  | 615,027                                  | 606,661 | 625,578                                    | 631,261 |
| Projected female spawning biomass (t) | 122,541                                  | 111,122 | 116,618                                    | 110,694 |
| <i>B</i> <sub>100%</sub>              | 280,456                                  | 280,456 | 280,456                                    | 280,456 |
| <i>B</i> <sub>40%</sub>               | 112,182                                  | 112,182 | 112,182                                    | 112,182 |
| <i>B</i> <sub>33%</sub>               | 98,160                                   | 98,160  | 98,160                                     | 98,160  |
| <i>F</i> <sub>OFL</sub>               | 0.76                                     | 0.65    | 0.76                                       | 0.75    |
| <i>maxF</i> <sub>ABC</sub>            | 0.61                                     | 0.56    | 0.61                                       | 0.60    |
| <i>F</i> <sub>ABC</sub>               | 0.61                                     | 0.56    | 0.61                                       | 0.60    |
| OFL (t)                               | 118,787                                  | 101,188 | <b>111,684</b>                             | 99,723  |
| maxABC (t)                            | 98,588                                   | 86,464  | <b>95,358</b>                              | 84,676  |
| ABC (t)                               | 98,588                                   | 86,464  | <b>95,358</b>                              | 84,676  |
| Status                                | As determined last year for:             |         | As determined this year for:               |         |
|                                       | 2021                                     | 2022    | 2022                                       | 2023    |
| Overfishing                           | No                                       | n/a     | No   | n/a     |

Thanks to Jane Sullivan



# Aleutian Islands pollock

## Not overfishing, overfished or approaching overfished



- Fishery Trends: Continued low catch for past 25 years
  - < 4 Kt catch in 2023 with 19 Kt TAC
- Survey Trends: Increase from historic low in 2012 of 44 Kt to 110 Kt in 2022
  - last survey 2022, next 2024
- Last full/update assessment 2022, next 2024
- 2023 spawning biomass 79,747 t, trend stable
- ABC: 42,654 t, OFL: 51,516 t
- TAC cap of 19,000 t

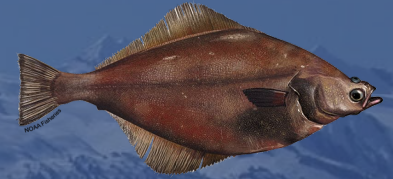
| Quantity                          | As estimated or specified last year for: |         | As estimated or recommended this year for: |         |
|-----------------------------------|--|---------|--|---------|
|                                   | 2023                                     | 2024    | 2024                                       | 2025*   |
| <i>M</i> (natural mortality rate) | 0.21                                     |         | 0.21                                       |         |
| Tier                              | 3a                                       |         | 3a   |         |
| Total (age 1+) biomass (t)        | 264,173                                  | 281,618 | 279,764                                    | 302,068 |
| Female spawning biomass (t)       |  |         |  |         |
| Projected                         | 78,628                                   | 80,432  | 79,747                                     | 81,3352 |
| <i>B</i> <sub>100%</sub>          | 174,218                                  |         | 174,218                                    |         |
| <i>B</i> <sub>40%</sub>           | 69,687                                   |         | 69,687                                     |         |
| <i>B</i> <sub>35%</sub>           | 60,976                                   |         | 60,976                                     |         |
| <i>F</i> <sub>OFL</sub> **        | 0.380                                    | 0.380   | 0.380                                      | 0.380   |
| <i>maxF</i> <sub>ABC</sub>        | 0.305                                    | 0.305   | 0.305                                      | 0.305   |
| <i>F</i> <sub>ABC</sub>           | 0.305                                    | 0.305   | 0.305                                      | 0.305   |
| OFL (t)                           | 52,383                                   | 52,043  | 51,516                                     | 53,030  |
| <i>maxABC</i> (t)                 | 43,413                                   | 43,092  | 42,654                                     | 43,863  |
| ABC (t)                           | 43,413                                   | 43,092  | 42,654                                     | 43,863  |
|                                   | As determined this year for:             |         |  |         |
| Status                            | 2021                                     | 2022    | 2022                                       | 2023    |
| Overfishing                       | no                                       | n/a     | no   | n/a     |
| Overfished                        | n/a                                      | no      | n/a  | no      |
| Approaching overfished            | n/a                                      | no      | n/a  | no      |



Thanks to Steve Barbeaux

# Arrowtooth Flounder (Tier 3a)

## Not overfishing, overfished or approaching overfished



- Fishery Trends: BSAI catch lowest in time series, AI slightly below average, majority in flatfish fisheries, ~8-9% in rockfish and Pacific cod fishery
- Survey Trends: 11% decrease in shelf bottom trawl survey, still above average
- Update Projection Catch:
  - 2023: 7,175 t, 2024: 10,701 t, 2025: 9,689 t
  - Catch/Biomass decreasing since 2012, now lowest in time series
- ABC: 87,690 t, OFL: 103,280 t

| Quantity/Status                   | As estimated or <i>specified</i><br>last year for: |                 | As estimated or<br><i>recommended this year for:</i> |                 |
|-----------------------------------|--|-----------------|--|-----------------|
|                                   | 2023   | 2024            | 2024*  | 2025*           |
| M (natural Tier)                  | 0.2, 0.35<br>3a                                    | 0.2, 0.35<br>3a | 0.2, 0.35<br>3a                                      | 0.2, 0.35<br>3a |
| Projected total (age 1+) biomass  | 929,274  | 919,797         | 921,062  | 907,809         |
| Projected female spawning biomass | 514,577  | 537,999         | 539,030  | 559,145         |
| B <sub>100%</sub>                 | 561,219  | 561,219         | 561,219  | 561,219         |
| B <sub>40%</sub>                  | 224,487  | 224,487         | 224,487  | 224,487         |
| B <sub>35%</sub>                  | 196,427  | 196,427         | 196,427  | 196,427         |
| F <sub>OFL</sub>                  | 0.174  | 0.174           | 0.174  | 0.174           |
| <del>max</del> F <sub>ABC</sub>   | 0.146  | 0.146           | 0.146  | 0.146           |
| F <sub>ABC</sub>                  | 0.146  | 0.146           | 0.146  | 0.146           |
| OFL (t)                           | 98,787   | 103,070         | <b>103,280</b>                                       | 104,270         |
| <del>max</del> ABC (t)            | 83,852   | 87,511          | 87,690   | 88,548          |
| ABC (t)                           | 83,852   | 87,511          | <b>87,690</b>  | 88,548          |
| Status                            | As determined <i>last year for:</i>                |                 | As determined <i>this year for:</i>                  |                 |
|                                   | 2022   | 2023            | 2023   | 2024            |
| Overfishing                       | No   | n/a             | No   | n/a             |
| Overfished                        | n/a  | No              | n/a  | No              |
| Approaching overfished            | n/a  | No              | n/a  | No              |

Thanks to Kalei Shotwell



# Greenland turbot

## Not overfishing, overfished or approaching overfished

- Fishery Trends: Catch has been generally declining
- Survey Trends:
  - 2023: EBS shelf BTS continues to decline, lowest since 1991
- Last full assessment 2022, next in 2024
  - Updated fleet-specific fishing mortality ratios in this year's projections
    - 86% trawl, 14% longline
- 2024 spawning biomass 31,653 t
- ABC: 3,188 t, OFL: 3,705 t

| Quantity                          | As estimated or specified last year for: |        | As estimated or recommended this year* for: |        |
|-----------------------------------|--|--------|---|--------|
|                                   | 2023                                     | 2024   | 2024  | 2025   |
| <i>M</i> (natural mortality rate) | 0.112                                    | 0.112  | 0.112                                       | 0.112  |
| Tier                              | 3a                                       | 3a     | 3a  | 3a     |
| Projected total (age 1+)          | 53,907                                   | 48,850 | 50,278                                      | 47,854 |
| Female spawning biomass           | 33,554                                   | 30,484 | 31,653                                      | 29,439 |
| Projected                         |  |        |   |        |
| <i>B</i> <sub>100%</sub>          | 67,647                                   | 67,647 | 67,647                                      | 67,647 |
| <i>B</i> <sub>40%</sub>           | 27,058                                   | 27,058 | 27,058                                      | 27,058 |
| <i>B</i> <sub>35%</sub>           | 23,676                                   | 23,676 | 23,676                                      | 23,676 |
| <i>F</i> <sub>OFL</sub>           | 0.2                                      | 0.2    | 0.18  | 0.18   |
| <i>maxF</i> <sub>ABC</sub>        | 0.17                                     | 0.17   | 0.15  | 0.15   |
| <i>F</i> <sub>ABC</sub>           | 0.17                                     | 0.17   | 0.15  | 0.15   |
| OFL (t)                           | 4,645                                    | 3,947  | 3,705                                       | 3,185  |
| maxABC (t)                        | 3,960                                    | 3,364  | 3,188                                       | 2,740  |
| ABC (t)                           | 3,960                                    | 3,364  | 3,188                                       | 2,740  |
|                                   | As determined last year for:             |        | As determined this year for:                |        |
| <b>Status</b>                     | 2021                                     | 2022   | 2022  | 2023   |
| Overfishing                       | No                                       | n/a    | No  | n/a    |
| Overfished                        | n/a                                      | No     | n/a   | No     |
| Approaching overfished            | n/a                                      | No     | n/a   | No     |



Thanks to Meaghan Bryan

# Kamchatka flounder

Not overfishing, overfished or approaching overfished

- Fishery Trends: catches have been close to ABC in recent years
- Survey Trends:
  - 2023: EBS shelf BTS continues to decline, 16% lower than 2022
- Last full assessment 2020, update in 2024
- 2024 spawning biomass 47,849 t
- ABC: 7,498 t, OFL: 8,850 t

|                                      | Tier 3 assessment model             |         |                                     |         |
|--------------------------------------|-------------------------------------|---------|-------------------------------------|---------|
|                                      | As estimated last year for          |         | As estimated this year for          |         |
| Quantity                             | 2023                                | 2024    | 2024                                | 2025    |
| $M$ (natural mortality rate)         | 0.11                                | 0.11    | 0.11                                | 0.11    |
| Tier                                 | 3a                                  | 3a      | 3a                                  | 3a      |
| Projected total (age 2+) biomass (t) | 121,977                             | 118,713 | 119,565                             | 116,651 |
| Projected female spawning biomass    | 47,877                              | 47,387  | 47,849                              | 47,330  |
| Projected                            |                                     |         |                                     |         |
| $B_{100\%}$                          | 94,370                              | 94,370  | 94,370                              | 94,370  |
| $B_{40\%}$                           | 37,748                              | 37,748  | 37,748                              | 37,748  |
| $B_{35\%}$                           | 33,029                              | 33,029  | 33,029                              | 33,029  |
| $F_{OFL}$                            | 0.103                               | 0.103   | 0.103                               | 0.103   |
| $maxF_{ABC}$                         | 0.086                               | 0.086   | 0.086                               | 0.086   |
| $F_{ABC}$                            | 0.086                               | 0.086   | 0.086                               | 0.086   |
| OFL (t)                              | 8,946                               | 8,776   | 8,850                               | 8,687   |
| maxABC (t)                           | 7,579                               | 7,435   | 7,498                               | 7,360   |
| ABC (t)                              | 7,579                               | 7,435   | 7,498                               | 7,360   |
|                                      | As determined <i>last</i> year for: |         | As determined <i>this</i> year for: |         |
|                                      | 2021                                | 2022    | 2022                                | 2023    |
| <b>Status</b>                        |                                     |         |                                     |         |
| Overfishing                          | no                                  | n/a     | no                                  | n/a     |
| Overfished                           | n/a                                 | no      | n/a                                 | no      |
| Approaching overfished               | n/a                                 | no      | n/a                                 | no      |



Thanks to Meaghan Bryan

# Northern rock sole

## Not overfishing, overfished or approaching overfished

### Fishery Trends:

- Higher catches in 2023 than previous 2 years, lower catches than in early to mid 2000s

### Survey Trends:

- 2023: EBS shelf BTS increased over most recent four years

### Last full assessment 2022, next in 2024

### 2024 spawning biomass 296,808 t

### ABC: 122,091 t, OFL: 197,828 t

### ABC reduced to equal OFL from alternative model run as in 2022

| Quantity                              | As estimated or specified last year for: |                   | As estimated or recommended this year for: |                   |
|---------------------------------------|--|-------------------|--|-------------------|
|                                       | 2023                                     | 2024              | 2024                                       | 2025              |
| <i>M</i> (natural mortality rate)     | 0.15 (f),0.17 (m)                        | 0.15 (f),0.17 (m) | 0.15 (f),0.17 (m)                          | 0.15 (f),0.17 (m) |
| Tier                                  | 1a                                       | 1a                | 1a   | 1a                |
| Projected total (age 6+) biomass (t)  | 941,359                                  | 1,111,320         | 1,121,670                                  | 1,501,330         |
| Projected Female spawning biomass (t) | 260,887                                  | 291,774           | 296,808                                    | 347,811           |
| <i>B<sub>0</sub></i>                  | 447,795                                  | 447,795           | 447,795                                    | 447,795           |
| <i>B<sub>MSY</sub></i>                | 155,293                                  | 155,293           | 155,293                                    | 155,293           |
| <i>F<sub>OFL</sub></i>                | 0.176                                    | 0.176             | 0.176                                      | 0.176             |
| <i>maxF<sub>ABC</sub></i>             | 0.169                                    | 0.169             | 0.169                                      | 0.169             |
| <i>F<sub>ABC</sub></i>                | 0.129                                    | 0.108             | 0.129                                      | 0.108             |
| OFL (t)                               | 166,034                                  | 196,011           | 197,828                                    | 264,789           |
| maxABC (t)                            | 158,935                                  | 187,631           | 189,360                                    | 253,455           |
| ABC (t)**                             | 121,719                                  | 119,969           | 122,091                                    | 122,535           |
| Status                                | As determined last year for:             |                   | As determined this year for:               |                   |
|                                       | 2020                                     | 2021              | 2022                                       | 2023              |
| Overfishing                           | no                                       | n/a               | no   | n/a               |
| Overfished                            | n/a                                      | no                | n/a  | no                |
| Approaching overfished                | n/a                                      | no                | n/a  | no                |

Thanks to Carey McGilliard

# Flathead sole

Not overfishing, overfished or approaching overfished

- Fishery Trends: catches low & stable
- Survey Trends:
  - 2022: 22% higher than the 10-year average
  - next survey in 2024
- Last full assessment 2020, update in 2024
- 2024 spawning biomass 165,629, trend stable
- ABC: 67,289 t, OFL: 81,605 t

| Quantity/Status                       | As estimated or specified <i>last</i> year for: |         | As estimated or recommended <i>this</i> year for: |         |
|---------------------------------------|---|---------|---|---------|
|                                       | 2023  | 2024    | 2024*   | 2025*   |
| M                                     | 0.2   | 0.2     | 0.2   | 0.2     |
| Tier                                  | 3a  | 3a      | 3a  | 3a      |
| Projected total (3+) biomass (t)      | 606,522   | 606,080 | 609,488   | 608,230 |
| Projected Female spawning biomass (t) | 158,962   | 164,594 | 165,629   | 169,452 |
| <u>maxF<sub>ABC</sub></u>             | 0.37  | 0.37    | 0.37  | 0.37    |
| F <sub>ABC</sub>                      | 0.37  | 0.37    | 0.37  | 0.37    |
| OFL (t)                               | 79,256  | 81,167  | <b>81,605</b>                                     | 82,699  |
| <u>maxABC</u> (t)                     | 65,344  | 66,927  | 67,289  | 68,203  |
| ABC (t)                               | 65,344  | 66,927  | <b>67,289</b>                                     | 68,203  |
| Status                                | As determined <i>last</i> year for:             |         | As determined <i>this</i> year for:               |         |
| Overfishing                           | 2022  | 2023    | 2023  | 2024    |
|                                       | No  | n/a     | No  | n/a     |



# Alaska plaice

## Not overfishing, overfished or approaching overfished

- Fishery Trends: if the projected catch (18,054 t) is accurate, it will be an increase in catch that is slightly greater than the TAC (17,500 t) but below the ABC (33,946 t)
- Survey Trends: 5% decrease in biomass from 2022 and it is 30% lower than the longer term average.
  - last survey 2023, next 2024
- Last update assessment 2023, next full 2024
- 2023 spawning biomass 158,087 t, trend increasing
- ABC: 35,494 t, OFL: 42,695 t

| Quantity  | As estimated or specified last year for: |         | As estimated or recommended this year for: |         |
|---|--|---------|--|---------|
|   | 2023                                     | 2024    | 2024                                       | 2025    |
| <i>M</i> (natural mortality rate)                       | 0.13                                     | 0.13    | 0.13                                       | 0.13    |
| Tier  | 3a                                       | 3a      | 3a   | 3a      |
| Projected total (3+) biomass (t)                        | 461,992                                  | 477,701 | 473,125                                    | 481,959 |
| Female spawning biomass (t)                             | 149,987                                  | 158,149 | 158,087                                    | 166,827 |
| <i>B</i> <sub>100%</sub>                                | 286,587                                  | 286,587 | 286,587                                    | 286,587 |
| <i>B</i> <sub>40%</sub>                                 | 114,635                                  | 114,635 | 114,635                                    | 114,635 |
| <i>B</i> <sub>35%</sub>                                 | 100,306                                  | 100,306 | 100,306                                    | 100,306 |
| <i>F</i> <sub>OFL</sub>                                 | 0.17                                     | 0.17    | 0.17                                       | 0.17    |
| <del><i>M</i><sub>max</sub><i>F</i><sub>ABC</sub></del> | 0.14                                     | 0.14    | 0.17                                       | 0.17    |
| <i>F</i> <sub>ABC</sub>                                 | 0.14                                     | 0.14    | 0.14                                       | 0.14    |
| OFL (t)   | 40,823                                   | 43,328  | <b>42,695</b>                              | 45,182  |
| <del>maxABC (t)</del>                                   | 33,946                                   | 36,021  | 35,494                                     | 37,560  |
| ABC (t)   | 33,946                                   | 36,021  | <b>35,494</b>                              | 37,560  |
| Status  | As determined last year for:             |         | As determined this year for:               |         |
|   | 2021                                     | 2022    | 2022                                       | 2023    |
| Overfishing   | No                                       | n/a     | No   | n/a     |
| Overfished  | n/a                                      | No      | n/a  | No      |
| Approaching overfished                                  | n/a                                      | No      | n/a  | No      |

Thanks to Lee Cronin-Fine



# EXAMPLE Tiers 1 and 3 - Pacific Ocean Perch (Tier 3a)

## Not overfishing, overfished or approaching overfished

- Fishery Trends: catch increasing following increases in ABC
  - Unusual trends/observations?
- Survey Trends: Persistent large biomass,
  - last survey 2021, next 2023
- Last full/update assessment 2020, next 2022
- 2023 spawning biomass 210,795, trend decreasing
- ABC: 37,193 t, OFL: 44,302 t

| Quantity                              | As estimated or specified <i>last</i> year for: |         | As estimated or recommended <i>this</i> year for: |         |
|---------------------------------------|---|---------|---|---------|
|                                       | 2022  | 2023    | 2023*   | 2024*   |
| <i>M</i> (natural mortality)          | 0.075   | 0.075   | 0.075   | 0.075   |
| Tier                                  | 3a  | 3a      | 3a  | 3a      |
| Projected total (age 2+ ) biomass (t) | 650,832   | 634,907 | 636,129   | 621,249 |
| Projected Female spawning biomass     | 216,635   | 210,257 | 210,795   | 205,713 |
| <i>B</i> <sub>100%</sub>              | 331,917   | 331,917 | 331,917   | 331,917 |
| <i>B</i> <sub>40%</sub>               | 132,767   | 132,767 | 132,767   | 132,767 |
| <i>B</i> <sub>35%</sub>               | 116,171   | 116,171 | 116,171   | 116,171 |
| <i>F</i> <sub>OFL</sub>               | 0.120   | 0.120   | 0.120   | 0.120   |
| <i>maxF</i> <sub>ABC</sub>            | 0.100   | 0.100   | 0.100   | 0.100   |
| <i>F</i> <sub>ABC</sub>               | 0.100   | 0.100   | 0.100   | 0.100   |
| OFL (t)                               | 45,580  | 44,196  | 44,302  | 43,117  |
| maxABC (t)                            | 38,268  | 37,104  | 37,193  | 36,196  |
| ABC (t)                               | 38,268  | 37,104  | 37,193  | 36,196  |
| Status                                | As determined <i>last</i> year for:             |         | As determined <i>this</i> year for:               |         |
|                                       | 2020  | 2021    | 2021  | 2022    |
| Overfishing                           | No  | n/a     | No  | n/a     |
| Overfished                            | n/a   | No      | n/a   | No      |
| Approaching overfished                | n/a   | No      | n/a   | No      |



# EXAMPLE Mixed Tiers - Skates (Tier 3a/5)

## Not overfishing, overfished or approaching overfished

- Fishery Trends: catch of AK skate up in 2022, others stable
  - Unusual trends/observations?
- Survey Trends: Slight decrease in AK skate, others up slightly
  - last survey 2021, next 2022
- Last full/update assessment 2021, next 2023
- ABC: 38,605 t, OFL: 46,220 t
  - Tier 3a ABC: 30, 567 t, OFL: 35,503 t
  - Tier 5 ABC: 8,038 t, OFL: 10,717 t

| aggregate harvest recommendations for the BSAI complex |            |   |        |  |        |
|--|------------|---|--------|--|--------|
| Quantity   |            | As estimated or specified <i>last</i> year for: |        | As estimated or recommended this year for: |        |
|  |            | 2022  | 2023   | 2023                                       | 2024   |
|  | OFL (t)    | 47,790  | 46,475 | 46,220                                     | 44,168 |
|  | maxABC (t) | 39,958  | 38,824 | 38,605                                     | 36,837 |
|  | ABC (t)    | 39,958  | 38,824 | 38,605                                     | 36,837 |





# EXAMPLE Tier 4 or 5 - roundfish (Tier 4 or 5)

## Not overfishing

- Fishery Trends: Overall catch has been declining
  - Increased use of pots in sablefish fishery
- Survey Trends: slow decline
  - Survey in 2021, next 2023
- Last full/update assessment 2021, next 2023
- ABC: 1,628 t, OFL: 2,170 t

| Quantity                     | As estimated or specified last year for: |                | As estimated or recommended this year for: |                |
|------------------------------|--|----------------|--|----------------|
|                              | 2022                                     | 2023           | 2023                                       | 2024           |
| $M$ (natural mortality rate) | 0.03                                     | 0.03           | 0.03                                       | 0.03           |
| Tier                         | 5  | 5              | 5  | 5              |
| Biomass (t)                  | 86,802                                   | 86,802         | 72,349                                     | 72,349         |
| $F_{OFL}$                    | $F=M=0.03$                               | $F=M=0.03$     | $F=M=0.03$                                 | $F=M=0.03$     |
| $\max F_{ABC}$               | $0.75M=0.0225$                           | $0.75M=0.0225$ | $0.75M=0.0225$                             | $0.75M=0.0225$ |
| $F_{ABC}$                    | 0.0225                                   | 0.0225         | 0.0225                                     | 0.0225         |
| OFL (t)                      | 2,604                                    | 2,604          | <b>2,170</b>                               | 2,170          |
| $\max ABC$ (t)               | 1,953                                    | 1,953          | 1,628                                      | 1,628          |
| ABC (t)                      | 1,953                                    | 1,953          | <b>1,628</b>                               | 1,628          |
| Status                       | As determined <i>last</i> year for:      |                | As determined <i>this</i> year for:        |                |
|                              | 2020                                     | 2021           | 2021                                       | 2022           |
| Overfishing                  | No                                       | n/a            | No   | n/a            |



# EXAMPLE Tier 6 - Octopus (Tier 6)

- Fishery Trends: Increasing
  - Unusual fishery observations?
- Last full/update assessment 2021, next 2025
- Alt. Tier 6 - conservative est. of total mortality = octopus consumed by P. cod (AFSC food habits data)
- ABC: 3,576 t, OFL: 4,769 t

| <b>Quantity</b>               | As estimated or specified last year for: |       | As estimated or recommended this year for: |       |
|-------------------------------|--|-------|--|-------|
|                               | 2022                                     | 2023  | 2023                                       | 2024  |
| Tier 6 (consumption estimate) |  |       |  |       |
| OFL (t)                       | 4,769                                    | 4,769 | 4,769                                      | 4,769 |
| ABC (t)                       | 3,576                                    | 3,576 | 3,576                                      | 3,576 |
| <b>Status</b>                 | As determined in last year               |       | As determined this year for:               |       |
| Overfishing                   | 2019                                     | 2020  | 2021                                       | 2022  |
|                               | n/a                                      | n/a   | n/a  | n/a   |

