Performance metric tables

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2022-09-10

**Supplementary Table 4.PM-1.** Summary of performance metric 1 (average annual catch) across OMs for **Pollock**.

| **System** | **EM** | **HCR** | **1. SS fix M** | **2. w Ricker** | **3. SS est M** | **4. w Ricker** | **5. MS** | **6. w Ricker** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *EBS* | *Fix M* | HCR 1a (NPFMC) | 2,120,901 | 2,586,253 | 2,443,274 | 2,828,462 | 2,738,045 | 2,880,765 |
|  |  | HCR 1b (Dynamic NPFMC) | 2,165,820 | 2,650,436 | 2,489,488 | 2,886,958 | 2,777,165 | 2,949,060 |
|  |  | HCR 2a (PFMC) | 2,033,074 | 2,400,621 | 2,278,359 | 2,570,968 | 2,553,709 | 2,625,739 |
|  |  | HCR 2b (Dynamic PFMC) | 2,041,456 | 2,405,059 | 2,284,962 | 2,571,863 | 2,555,224 | 2,628,658 |
|  |  | HCR 3a (SESSF) | 1,871,847 | 2,108,184 | 2,036,643 | 2,225,091 | 2,241,101 | 2,240,268 |
|  |  | HCR 3b (Dynamic SESSF) | 1,890,734 | 2,125,759 | 2,051,594 | 2,235,654 | 2,250,594 | 2,261,324 |
|  |  | HCR 4 (NEFMC) | 1,742,909 | 1,897,098 | 1,843,961 | 1,968,760 | 1,975,364 | 1,987,557 |
|  |  | HCR 5 (Avg F) | 1,348,182 | 1,335,734 | 1,358,809 | 1,371,885 | 1,577,509 | 1,387,251 |
|  | *Est M* | HCR 1a (NPFMC) | 2,308,577 | 2,985,136 | 3,358,081 | 4,422,975 | 3,472,592 | 5,859,546 |
|  |  | HCR 1b (Dynamic NPFMC) | 2,348,868 | 3,046,690 | 3,435,795 | 4,506,152 | 3,531,924 | 5,999,124 |
|  |  | HCR 2a (PFMC) | 2,247,980 | 2,837,890 | 3,225,580 | 4,156,443 | 3,356,052 | 5,620,329 |
|  |  | HCR 2b (Dynamic PFMC) | 2,260,091 | 2,844,328 | 3,244,434 | 4,156,013 | 3,357,307 | 5,642,380 |
|  |  | HCR 3a (SESSF) | 2,103,019 | 2,530,139 | 2,922,714 | 3,595,955 | 2,987,074 | 4,778,742 |
|  |  | HCR 3b (Dynamic SESSF) | 2,126,946 | 2,560,438 | 2,959,650 | 3,611,066 | 3,010,548 | 4,859,244 |
|  |  | HCR 4 (NEFMC) | 2,028,322 | 2,389,017 | 2,818,020 | 3,408,685 | 2,808,428 | 4,696,888 |
|  |  | HCR 5 (Avg F) | 1,333,729 | 1,315,854 | 1,345,674 | 1,353,295 | 1,527,411 | 1,272,606 |
| *GOA* | *Fix M* | HCR 1a (NPFMC) | 150,642 | 354,943 | 136,197 | 292,876 | 297,196 | 562,904 |
|  |  | HCR 1b (Dynamic NPFMC) | 155,879 | 354,435 | 140,757 | 292,031 | 299,956 | 564,752 |
|  |  | HCR 2a (PFMC) | 141,129 | 362,713 | 130,734 | 292,358 | 263,402 | 485,154 |
|  |  | HCR 2b (Dynamic PFMC) | 142,740 | 362,660 | 131,631 | 291,977 | 264,175 | 487,289 |
|  |  | HCR 3a (SESSF) | 131,329 | 362,053 | 123,415 | 288,218 | 222,368 | 402,451 |
|  |  | HCR 3b (Dynamic SESSF) | 135,878 | 360,409 | 127,091 | 287,552 | 223,078 | 405,306 |
|  |  | HCR 4 (NEFMC) | 110,982 | 326,997 | 107,716 | 252,912 | 160,112 | 284,102 |
|  |  | HCR 5 (Avg F) | 127,484 | 355,915 | 123,582 | 283,686 | 138,335 | 259,938 |
|  | *Est M* | HCR 1a (NPFMC) | 181,206 | 271,898 | 119,489 | 287,756 | 508,897 | 1,000,645 |
|  |  | HCR 1b (Dynamic NPFMC) | 186,242 | 266,715 | 122,514 | 284,325 | 510,672 | 989,044 |
|  |  | HCR 2a (PFMC) | 177,116 | 291,128 | 112,739 | 271,554 | 510,310 | 1,066,469 |
|  |  | HCR 2b (Dynamic PFMC) | 178,324 | 285,102 | 113,643 | 272,367 | 498,850 | 1,081,805 |
|  |  | HCR 3a (SESSF) | 168,529 | 313,342 | 107,748 | 264,406 | 431,957 | 803,415 |
|  |  | HCR 3b (Dynamic SESSF) | 174,284 | 306,896 | 109,916 | 264,325 | 435,098 | 778,924 |
|  |  | HCR 4 (NEFMC) | 159,421 | 340,800 | 91,170 | 218,791 | 369,144 | 670,816 |
|  |  | HCR 5 (Avg F) | 136,674 | 365,770 | 121,647 | 279,924 | 159,621 | 274,830 |

**Supplementary Table 4.PM-2.** Summary of performance metric 2 (average interannual variation in catch (IAV)) across OMs for **Pollock**.

| **System** | **EM** | **HCR** | **1. SS fix M** | **2. w Ricker** | **3. SS est M** | **4. w Ricker** | **5. MS** | **6. w Ricker** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *EBS* | *Fix M* | HCR 1a (NPFMC) | 83,976 | 153,375 | 69,932 | 139,278 | 101,156 | 172,472 |
|  |  | HCR 1b (Dynamic NPFMC) | 54,847 | 116,544 | 51,053 | 109,167 | 77,390 | 131,632 |
|  |  | HCR 2a (PFMC) | 46,229 | 92,336 | 42,091 | 88,731 | 63,212 | 107,571 |
|  |  | HCR 2b (Dynamic PFMC) | 42,333 | 89,450 | 40,161 | 87,872 | 61,415 | 104,647 |
|  |  | HCR 3a (SESSF) | 46,454 | 91,849 | 38,490 | 81,339 | 56,152 | 113,741 |
|  |  | HCR 3b (Dynamic SESSF) | 29,338 | 73,424 | 28,444 | 70,085 | 46,902 | 92,502 |
|  |  | HCR 4 (NEFMC) | 21,132 | 45,456 | 21,253 | 45,523 | 33,523 | 56,559 |
|  |  | HCR 5 (Avg F) | 10,503 | 21,310 | 11,051 | 22,966 | 17,371 | 29,575 |
|  | *Est M* | HCR 1a (NPFMC) | 161,379 | 262,127 | 284,331 | 448,773 | 462,662 | 1,522,709 |
|  |  | HCR 1b (Dynamic NPFMC) | 107,385 | 198,689 | 200,105 | 371,397 | 338,537 | 1,160,201 |
|  |  | HCR 2a (PFMC) | 88,415 | 157,078 | 166,164 | 284,605 | 260,382 | 902,058 |
|  |  | HCR 2b (Dynamic PFMC) | 79,982 | 150,003 | 155,255 | 280,409 | 247,318 | 868,182 |
|  |  | HCR 3a (SESSF) | 91,486 | 169,840 | 152,687 | 278,694 | 233,409 | 948,478 |
|  |  | HCR 3b (Dynamic SESSF) | 53,308 | 130,951 | 101,176 | 239,849 | 175,755 | 733,875 |
|  |  | HCR 4 (NEFMC) | 37,638 | 80,298 | 75,676 | 152,877 | 119,439 | 475,643 |
|  |  | HCR 5 (Avg F) | 10,112 | 21,035 | 11,075 | 24,389 | 16,884 | 31,249 |
| *GOA* | *Fix M* | HCR 1a (NPFMC) | 18,501 | 46,593 | 15,025 | 34,317 | 26,374 | 72,161 |
|  |  | HCR 1b (Dynamic NPFMC) | 18,738 | 46,436 | 15,334 | 34,849 | 26,871 | 71,132 |
|  |  | HCR 2a (PFMC) | 14,520 | 43,186 | 12,173 | 31,043 | 20,632 | 56,383 |
|  |  | HCR 2b (Dynamic PFMC) | 15,162 | 42,411 | 12,648 | 30,722 | 20,604 | 56,682 |
|  |  | HCR 3a (SESSF) | 15,145 | 41,942 | 12,832 | 29,158 | 17,234 | 46,211 |
|  |  | HCR 3b (Dynamic SESSF) | 13,570 | 40,543 | 11,692 | 28,872 | 16,659 | 46,564 |
|  |  | HCR 4 (NEFMC) | 9,390 | 31,250 | 8,071 | 21,828 | 10,509 | 29,308 |
|  |  | HCR 5 (Avg F) | 12,566 | 39,128 | 11,202 | 27,953 | 10,464 | 30,630 |
|  | *Est M* | HCR 1a (NPFMC) | 33,524 | 49,164 | 10,783 | 27,817 | 86,930 | 212,179 |
|  |  | HCR 1b (Dynamic NPFMC) | 28,005 | 44,103 | 10,066 | 26,884 | 84,584 | 225,840 |
|  |  | HCR 2a (PFMC) | 24,198 | 42,091 | 8,443 | 23,672 | 78,216 | 204,288 |
|  |  | HCR 2b (Dynamic PFMC) | 24,534 | 43,951 | 8,523 | 23,570 | 68,522 | 214,465 |
|  |  | HCR 3a (SESSF) | 30,956 | 47,434 | 9,462 | 22,237 | 66,726 | 156,685 |
|  |  | HCR 3b (Dynamic SESSF) | 24,450 | 44,156 | 8,044 | 22,673 | 61,458 | 157,190 |
|  |  | HCR 4 (NEFMC) | 18,241 | 42,888 | 5,637 | 16,050 | 42,822 | 109,409 |
|  |  | HCR 5 (Avg F) | 13,426 | 39,922 | 10,094 | 25,855 | 12,639 | 30,858 |

**Supplementary Table 4.PM-3.** Summary of performance metric 3 (probability of the fishery being closed) across OMs for **Pollock**.

| **System** | **EM** | **HCR** | **1. SS fix M** | **2. w Ricker** | **3. SS est M** | **4. w Ricker** | **5. MS** | **6. w Ricker** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *EBS* | *Fix M* | HCR 1a (NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 1b (Dynamic NPFMC) | 0 | 0.01 | 0 | 0 | 0 | 0.01 |
|  |  | HCR 2a (PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2b (Dynamic PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3a (SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3b (Dynamic SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 4 (NEFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 5 (Avg F) | 0 | 0 | 0 | 0 | 0 | 0 |
|  | *Est M* | HCR 1a (NPFMC) | 0 | 0.01 | 0 | 0.01 | 0.02 | 0.06 |
|  |  | HCR 1b (Dynamic NPFMC) | 0 | 0.01 | 0 | 0.02 | 0.01 | 0.03 |
|  |  | HCR 2a (PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2b (Dynamic PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3a (SESSF) | 0 | 0 | 0 | 0 | 0 | 0.02 |
|  |  | HCR 3b (Dynamic SESSF) | 0 | 0 | 0 | 0 | 0 | 0.01 |
|  |  | HCR 4 (NEFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 5 (Avg F) | 0 | 0 | 0 | 0 | 0 | 0 |
| *GOA* | *Fix M* | HCR 1a (NPFMC) | 0 | 0 | 0.01 | 0 | 0 | 0 |
|  |  | HCR 1b (Dynamic NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2a (PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2b (Dynamic PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3a (SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3b (Dynamic SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 4 (NEFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 5 (Avg F) | 0 | 0 | 0 | 0 | 0 | 0 |
|  | *Est M* | HCR 1a (NPFMC) | 0.03 | 0.01 | 0 | 0 | 0.01 | 0.01 |
|  |  | HCR 1b (Dynamic NPFMC) | 0 | 0 | 0 | 0 | 0 | 0.02 |
|  |  | HCR 2a (PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2b (Dynamic PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3a (SESSF) | 0.01 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3b (Dynamic SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 4 (NEFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 5 (Avg F) | 0 | 0 | 0 | 0 | 0 | 0 |

**Supplementary Table 4.PM-4.** Summary of performance metric 4 (average relative mean squared error in estimate of spawning biomass in 2060) across OMs for **Pollock**.

| **System** | **EM** | **HCR** | **1. SS fix M** | **2. w Ricker** | **3. SS est M** | **4. w Ricker** | **5. MS** | **6. w Ricker** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *EBS* | *Fix M* | HCR 1a (NPFMC) | 0 | 0 | 0.05 | 0.05 | 0 | 0.07 |
|  |  | HCR 1b (Dynamic NPFMC) | 0 | 0 | 0.05 | 0.05 | 0 | 0.07 |
|  |  | HCR 2a (PFMC) | 0 | 0 | 0.06 | 0.06 | 0 | 0.08 |
|  |  | HCR 2b (Dynamic PFMC) | 0 | 0 | 0.06 | 0.06 | 0 | 0.08 |
|  |  | HCR 3a (SESSF) | 0 | 0 | 0.07 | 0.06 | 0 | 0.09 |
|  |  | HCR 3b (Dynamic SESSF) | 0 | 0 | 0.07 | 0.06 | 0 | 0.09 |
|  |  | HCR 4 (NEFMC) | 0 | 0 | 0.07 | 0.07 | 0.01 | 0.1 |
|  |  | HCR 5 (Avg F) | 0 | 0 | 0.09 | 0.09 | 0 | 0.11 |
|  | *Est M* | HCR 1a (NPFMC) | 0.01 | 0.01 | 0 | 0 | 0.01 | 0.01 |
|  |  | HCR 1b (Dynamic NPFMC) | 0.01 | 0.01 | 0 | 0 | 0.01 | 0 |
|  |  | HCR 2a (PFMC) | 0.01 | 0.01 | 0 | 0 | 0.01 | 0.01 |
|  |  | HCR 2b (Dynamic PFMC) | 0.01 | 0.01 | 0 | 0 | 0.01 | 0.01 |
|  |  | HCR 3a (SESSF) | 0.02 | 0.01 | 0 | 0 | 0.02 | 0.01 |
|  |  | HCR 3b (Dynamic SESSF) | 0.01 | 0.01 | 0 | 0 | 0.02 | 0.01 |
|  |  | HCR 4 (NEFMC) | 0.02 | 0.02 | 0 | 0 | 0.02 | 0.01 |
|  |  | HCR 5 (Avg F) | 0.03 | 0.02 | 0 | 0 | 0.08 | 0.09 |
| *GOA* | *Fix M* | HCR 1a (NPFMC) | 0.01 | 0.01 | 0.11 | 0.1 | 0.01 | 0.01 |
|  |  | HCR 1b (Dynamic NPFMC) | 0.01 | 0.01 | 0.1 | 0.1 | 0.01 | 0.01 |
|  |  | HCR 2a (PFMC) | 0.01 | 0.01 | 0.14 | 0.13 | 0.01 | 0.01 |
|  |  | HCR 2b (Dynamic PFMC) | 0.01 | 0.01 | 0.13 | 0.12 | 0.01 | 0.01 |
|  |  | HCR 3a (SESSF) | 0.01 | 0.01 | 0.15 | 0.15 | 0.02 | 0.01 |
|  |  | HCR 3b (Dynamic SESSF) | 0.01 | 0.01 | 0.15 | 0.14 | 0.02 | 0.01 |
|  |  | HCR 4 (NEFMC) | 0.01 | 0.01 | 0.19 | 0.17 | 0.05 | 0.03 |
|  |  | HCR 5 (Avg F) | 0.01 | 0.01 | 0.16 | 0.14 | 0.07 | 0.06 |
|  | *Est M* | HCR 1a (NPFMC) | 0.03 | 0.03 | 0.01 | 0.01 | 0.11 | 0.12 |
|  |  | HCR 1b (Dynamic NPFMC) | 0.03 | 0.04 | 0.01 | 0.01 | 0.12 | 0.14 |
|  |  | HCR 2a (PFMC) | 0.04 | 0.05 | 0.01 | 0.02 | 0.14 | 0.17 |
|  |  | HCR 2b (Dynamic PFMC) | 0.04 | 0.05 | 0.01 | 0.02 | 0.13 | 0.18 |
|  |  | HCR 3a (SESSF) | 0.06 | 0.07 | 0.02 | 0.02 | 0.14 | 0.14 |
|  |  | HCR 3b (Dynamic SESSF) | 0.06 | 0.07 | 0.01 | 0.02 | 0.14 | 0.15 |
|  |  | HCR 4 (NEFMC) | 0.11 | 0.16 | 0.02 | 0.02 | 0.16 | 0.17 |
|  |  | HCR 5 (Avg F) | 0.37 | 0.51 | 0.01 | 0.01 | 0.23 | 0.16 |

**Supplementary Table 4.PM-5.** Summary of performance metric 5 (probability that the population is perceived as undergoing overfishing in the terminal year of the EM) across OMs for **Pollock**.

| **System** | **EM** | **HCR** | **1. SS fix M** | **2. w Ricker** | **3. SS est M** | **4. w Ricker** | **5. MS** | **6. w Ricker** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *EBS* | *Fix M* | HCR 1a (NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 1b (Dynamic NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2a (PFMC) | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
|  |  | HCR 2b (Dynamic PFMC) | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
|  |  | HCR 3a (SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3b (Dynamic SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 4 (NEFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 5 (Avg F) | 0 | 0 | 0 | 0 | 0 | 0 |
|  | *Est M* | HCR 1a (NPFMC) | 0 | 0 | 0 | 0 | 0.02 | 0.04 |
|  |  | HCR 1b (Dynamic NPFMC) | 0 | 0 | 0 | 0 | 0.02 | 0.04 |
|  |  | HCR 2a (PFMC) | 0.03 | 0.04 | 0.03 | 0.03 | 0.14 | 0.28 |
|  |  | HCR 2b (Dynamic PFMC) | 0.04 | 0.04 | 0.03 | 0.03 | 0.13 | 0.25 |
|  |  | HCR 3a (SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3b (Dynamic SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 4 (NEFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 5 (Avg F) | 0 | 0 | 0 | 0 | 0 | 0 |
| *GOA* | *Fix M* | HCR 1a (NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 1b (Dynamic NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2a (PFMC) | 0.01 | 0.01 | 0 | 0 | 0 | 0 |
|  |  | HCR 2b (Dynamic PFMC) | 0.01 | 0.01 | 0.01 | 0 | 0 | 0 |
|  |  | HCR 3a (SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3b (Dynamic SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 4 (NEFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 5 (Avg F) | 0 | 0 | 0 | 0 | 0 | 0 |
|  | *Est M* | HCR 1a (NPFMC) | 0.04 | 0.04 | 0.01 | 0 | 0.01 | 0.02 |
|  |  | HCR 1b (Dynamic NPFMC) | 0.03 | 0.03 | 0 | 0 | 0.01 | 0.02 |
|  |  | HCR 2a (PFMC) | 0.03 | 0.04 | 0.01 | 0.01 | 0.02 | 0.03 |
|  |  | HCR 2b (Dynamic PFMC) | 0.04 | 0.04 | 0.01 | 0.01 | 0.01 | 0.02 |
|  |  | HCR 3a (SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3b (Dynamic SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 4 (NEFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 5 (Avg F) | 0 | 0 | 0 | 0 | 0 | 0 |

**Supplementary Table 4.PM-6.** Summary of performance metric 6 (probability that the population is perceived to be overfished in the terminal year of the EM) across OMs for **Pollock**.

| **System** | **EM** | **HCR** | **1. SS fix M** | **2. w Ricker** | **3. SS est M** | **4. w Ricker** | **5. MS** | **6. w Ricker** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *EBS* | *Fix M* | HCR 1a (NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 1b (Dynamic NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2a (PFMC) | 0.01 | 0.01 | 0 | 0.01 | 0 | 0.02 |
|  |  | HCR 2b (Dynamic PFMC) | 0 | 0.01 | 0 | 0.01 | 0 | 0.01 |
|  |  | HCR 3a (SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3b (Dynamic SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 4 (NEFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 5 (Avg F) | 0 | 0 | 0 | 0 | 0 | 0 |
|  | *Est M* | HCR 1a (NPFMC) | 0 | 0.01 | 0 | 0.01 | 0.01 | 0.03 |
|  |  | HCR 1b (Dynamic NPFMC) | 0 | 0 | 0 | 0.01 | 0 | 0.02 |
|  |  | HCR 2a (PFMC) | 0.03 | 0.04 | 0.03 | 0.03 | 0.03 | 0.09 |
|  |  | HCR 2b (Dynamic PFMC) | 0 | 0.02 | 0 | 0.03 | 0.01 | 0.06 |
|  |  | HCR 3a (SESSF) | 0 | 0 | 0 | 0 | 0 | 0.02 |
|  |  | HCR 3b (Dynamic SESSF) | 0 | 0 | 0 | 0 | 0 | 0.01 |
|  |  | HCR 4 (NEFMC) | 0 | 0 | 0 | 0 | 0 | 0.02 |
|  |  | HCR 5 (Avg F) | 0 | 0 | 0 | 0 | 0 | 0 |
| *GOA* | *Fix M* | HCR 1a (NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 1b (Dynamic NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2a (PFMC) | 0.03 | 0 | 0.03 | 0 | 0 | 0 |
|  |  | HCR 2b (Dynamic PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3a (SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3b (Dynamic SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 4 (NEFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 5 (Avg F) | 0 | 0 | 0 | 0 | 0 | 0 |
|  | *Est M* | HCR 1a (NPFMC) | 0.01 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 1b (Dynamic NPFMC) | 0 | 0 | 0 | 0 | 0 | 0.01 |
|  |  | HCR 2a (PFMC) | 0.09 | 0.05 | 0.02 | 0 | 0.03 | 0.01 |
|  |  | HCR 2b (Dynamic PFMC) | 0.01 | 0.01 | 0 | 0 | 0.01 | 0.03 |
|  |  | HCR 3a (SESSF) | 0.01 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3b (Dynamic SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 4 (NEFMC) | 0.01 | 0 | 0 | 0 | 0 | 0.01 |
|  |  | HCR 5 (Avg F) | 0 | 0 | 0 | 0 | 0 | 0 |

**Supplementary Table 4.PM-7.** Summary of performance metric 7 (probability that the population is undergoing overfishing as determined from the OM) across OMs for **Pollock**.

| **System** | **EM** | **HCR** | **1. SS fix M** | **2. w Ricker** | **3. SS est M** | **4. w Ricker** | **5. MS** | **6. w Ricker** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *EBS* | *Fix M* | HCR 1a (NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 1b (Dynamic NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2a (PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2b (Dynamic PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3a (SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3b (Dynamic SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 4 (NEFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 5 (Avg F) | 0 | 0 | 0 | 0 | 0 | 0 |
|  | *Est M* | HCR 1a (NPFMC) | 0.39 | 0.47 | 0 | 0 | 0 | 0 |
|  |  | HCR 1b (Dynamic NPFMC) | 0.52 | 0.57 | 0 | 0 | 0 | 0 |
|  |  | HCR 2a (PFMC) | 0.93 | 0.93 | 0.02 | 0.03 | 0 | 0 |
|  |  | HCR 2b (Dynamic PFMC) | 0.99 | 0.95 | 0.03 | 0.03 | 0 | 0 |
|  |  | HCR 3a (SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3b (Dynamic SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 4 (NEFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 5 (Avg F) | 0 | 0 | 0 | 0 | 0 | 0 |
| *GOA* | *Fix M* | HCR 1a (NPFMC) | 0.08 | 0.09 | 0.7 | 0.9 | 0 | 0 |
|  |  | HCR 1b (Dynamic NPFMC) | 0.09 | 0.06 | 0.97 | 0.96 | 0 | 0 |
|  |  | HCR 2a (PFMC) | 0.01 | 0.01 | 0.82 | 0.82 | 0 | 0 |
|  |  | HCR 2b (Dynamic PFMC) | 0.01 | 0.01 | 0.9 | 0.84 | 0 | 0 |
|  |  | HCR 3a (SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3b (Dynamic SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 4 (NEFMC) | 0 | 0 | 0.03 | 0.01 | 0 | 0 |
|  |  | HCR 5 (Avg F) | 0 | 0 | 0 | 0 | 0 | 0 |
|  | *Est M* | HCR 1a (NPFMC) | 0.67 | 0.76 | 0.22 | 0.31 | 0 | 0 |
|  |  | HCR 1b (Dynamic NPFMC) | 0.9 | 0.91 | 0.25 | 0.26 | 0 | 0 |
|  |  | HCR 2a (PFMC) | 0.84 | 0.88 | 0.08 | 0.12 | 0 | 0 |
|  |  | HCR 2b (Dynamic PFMC) | 0.9 | 0.92 | 0.1 | 0.12 | 0 | 0 |
|  |  | HCR 3a (SESSF) | 0.03 | 0.03 | 0 | 0 | 0 | 0 |
|  |  | HCR 3b (Dynamic SESSF) | 0.03 | 0.03 | 0 | 0 | 0 | 0 |
|  |  | HCR 4 (NEFMC) | 0.67 | 0.69 | 0 | 0 | 0 | 0 |
|  |  | HCR 5 (Avg F) | 0 | 0 | 0 | 0 | 0 | 0 |

**Supplementary Table 4.PM-8.** Summary of performance metric 8 (probability that the population is overfished as determined from the OM) across OMs for **Pollock**.

| **System** | **EM** | **HCR** | **1. SS fix M** | **2. w Ricker** | **3. SS est M** | **4. w Ricker** | **5. MS** | **6. w Ricker** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *EBS* | *Fix M* | HCR 1a (NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 1b (Dynamic NPFMC) | 0.01 | 0.01 | 0 | 0.01 | 0 | 0 |
|  |  | HCR 2a (PFMC) | 0.02 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2b (Dynamic PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3a (SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3b (Dynamic SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 4 (NEFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 5 (Avg F) | 0 | 0 | 0 | 0 | 0 | 0 |
|  | *Est M* | HCR 1a (NPFMC) | 0.02 | 0.02 | 0.01 | 0.01 | 0 | 0.01 |
|  |  | HCR 1b (Dynamic NPFMC) | 0.03 | 0.03 | 0.03 | 0.05 | 0 | 0.01 |
|  |  | HCR 2a (PFMC) | 0.1 | 0 | 0.04 | 0 | 0 | 0.01 |
|  |  | HCR 2b (Dynamic PFMC) | 0.01 | 0 | 0 | 0 | 0 | 0.01 |
|  |  | HCR 3a (SESSF) | 0 | 0 | 0 | 0 | 0 | 0.01 |
|  |  | HCR 3b (Dynamic SESSF) | 0 | 0 | 0 | 0 | 0 | 0.01 |
|  |  | HCR 4 (NEFMC) | 0 | 0 | 0 | 0 | 0 | 0.01 |
|  |  | HCR 5 (Avg F) | 0 | 0 | 0 | 0 | 0 | 0 |
| *GOA* | *Fix M* | HCR 1a (NPFMC) | 0.04 | 0 | 0.15 | 0 | 0 | 0 |
|  |  | HCR 1b (Dynamic NPFMC) | 0.31 | 0.71 | 0.54 | 0.78 | 0 | 0 |
|  |  | HCR 2a (PFMC) | 0.08 | 0 | 0.25 | 0 | 0 | 0 |
|  |  | HCR 2b (Dynamic PFMC) | 0 | 0.49 | 0.07 | 0.25 | 0 | 0 |
|  |  | HCR 3a (SESSF) | 0 | 0 | 0.04 | 0 | 0 | 0 |
|  |  | HCR 3b (Dynamic SESSF) | 0 | 0.25 | 0 | 0.12 | 0 | 0 |
|  |  | HCR 4 (NEFMC) | 0.01 | 0 | 0.02 | 0 | 0 | 0 |
|  |  | HCR 5 (Avg F) | 0.62 | 0 | 0.84 | 0.01 | 0 | 0 |
|  | *Est M* | HCR 1a (NPFMC) | 0.23 | 0 | 0.03 | 0 | 0.05 | 0 |
|  |  | HCR 1b (Dynamic NPFMC) | 0.61 | 0.95 | 0.28 | 0.56 | 0.07 | 0 |
|  |  | HCR 2a (PFMC) | 0.35 | 0.02 | 0.08 | 0 | 0.04 | 0 |
|  |  | HCR 2b (Dynamic PFMC) | 0.21 | 0.92 | 0 | 0.14 | 0.03 | 0 |
|  |  | HCR 3a (SESSF) | 0.1 | 0 | 0 | 0 | 0.03 | 0 |
|  |  | HCR 3b (Dynamic SESSF) | 0.05 | 0.79 | 0 | 0.09 | 0.04 | 0 |
|  |  | HCR 4 (NEFMC) | 0.11 | 0 | 0.01 | 0 | 0.02 | 0 |
|  |  | HCR 5 (Avg F) | 0.67 | 0 | 0.82 | 0.01 | 0 | 0 |

**Supplementary Table 4.PM-9.** Summary of performance metric 9 (terminal spawning stock biomass depletion) across OMs for **Pollock**.

| **System** | **EM** | **HCR** | **1. SS fix M** | **2. w Ricker** | **3. SS est M** | **4. w Ricker** | **5. MS** | **6. w Ricker** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *EBS* | *Fix M* | HCR 1a (NPFMC) | 0.41 | 0.82 | 0.57 | 0.95 | 1.07 | 1.05 |
|  |  | HCR 1b (Dynamic NPFMC) | 0.41 | 0.69 | 0.57 | 0.79 | 1.06 | 1.04 |
|  |  | HCR 2a (PFMC) | 0.44 | 0.84 | 0.6 | 0.97 | 1.12 | 1.07 |
|  |  | HCR 2b (Dynamic PFMC) | 0.44 | 0.72 | 0.61 | 0.81 | 1.12 | 1.07 |
|  |  | HCR 3a (SESSF) | 0.48 | 0.89 | 0.64 | 1 | 1.16 | 1.09 |
|  |  | HCR 3b (Dynamic SESSF) | 0.48 | 0.75 | 0.65 | 0.84 | 1.16 | 1.09 |
|  |  | HCR 4 (NEFMC) | 0.52 | 0.92 | 0.67 | 1.03 | 1.18 | 1.11 |
|  |  | HCR 5 (Avg F) | 0.62 | 0.99 | 0.75 | 1.08 | 1.46 | 1.18 |
|  | *Est M* | HCR 1a (NPFMC) | 0.36 | 0.75 | 0.42 | 0.79 | 0.87 | 0.81 |
|  |  | HCR 1b (Dynamic NPFMC) | 0.35 | 0.63 | 0.41 | 0.65 | 0.85 | 0.8 |
|  |  | HCR 2a (PFMC) | 0.38 | 0.78 | 0.44 | 0.82 | 0.9 | 0.83 |
|  |  | HCR 2b (Dynamic PFMC) | 0.38 | 0.66 | 0.44 | 0.68 | 0.9 | 0.83 |
|  |  | HCR 3a (SESSF) | 0.42 | 0.82 | 0.49 | 0.88 | 0.95 | 0.88 |
|  |  | HCR 3b (Dynamic SESSF) | 0.42 | 0.7 | 0.49 | 0.73 | 0.95 | 0.88 |
|  |  | HCR 4 (NEFMC) | 0.44 | 0.85 | 0.51 | 0.89 | 0.95 | 0.87 |
|  |  | HCR 5 (Avg F) | 0.62 | 1 | 0.75 | 1.08 | 1.48 | 1.18 |
| *GOA* | *Fix M* | HCR 1a (NPFMC) | 0.41 | 1.85 | 0.32 | 1.11 | 1.11 | 5.99 |
|  |  | HCR 1b (Dynamic NPFMC) | 0.39 | 0.23 | 0.3 | 0.28 | 1.1 | 5.98 |
|  |  | HCR 2a (PFMC) | 0.44 | 2.34 | 0.35 | 1.34 | 1.24 | 6.61 |
|  |  | HCR 2b (Dynamic PFMC) | 0.43 | 0.28 | 0.34 | 0.34 | 1.24 | 6.61 |
|  |  | HCR 3a (SESSF) | 0.48 | 2.58 | 0.38 | 1.47 | 1.16 | 6.03 |
|  |  | HCR 3b (Dynamic SESSF) | 0.45 | 0.31 | 0.36 | 0.37 | 1.16 | 6.02 |
|  |  | HCR 4 (NEFMC) | 0.55 | 3.44 | 0.45 | 1.9 | 1.23 | 6.22 |
|  |  | HCR 5 (Avg F) | 0.49 | 2.84 | 0.38 | 1.54 | 0.91 | 4.72 |
|  | *Est M* | HCR 1a (NPFMC) | 0.31 | 0.93 | 0.39 | 1.45 | 0.59 | 3.38 |
|  |  | HCR 1b (Dynamic NPFMC) | 0.29 | 0.11 | 0.37 | 0.38 | 0.59 | 3.48 |
|  |  | HCR 2a (PFMC) | 0.33 | 1.12 | 0.42 | 1.68 | 0.65 | 3.82 |
|  |  | HCR 2b (Dynamic PFMC) | 0.32 | 0.13 | 0.41 | 0.43 | 0.68 | 3.71 |
|  |  | HCR 3a (SESSF) | 0.35 | 1.3 | 0.45 | 1.77 | 0.64 | 3.43 |
|  |  | HCR 3b (Dynamic SESSF) | 0.33 | 0.15 | 0.43 | 0.45 | 0.63 | 3.64 |
|  |  | HCR 4 (NEFMC) | 0.39 | 1.71 | 0.52 | 2.15 | 0.72 | 3.81 |
|  |  | HCR 5 (Avg F) | 0.46 | 2.44 | 0.38 | 1.56 | 0.87 | 4.64 |

**Supplementary Table 5.PM-1.** Summary of performance metric 1 (average annual catch) across OMs for **Cod**.

| **System** | **EM** | **HCR** | **1. SS fix M** | **2. w Ricker** | **3. SS est M** | **4. w Ricker** | **5. MS** | **6. w Ricker** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *EBS* | *Fix M* | HCR 1a (NPFMC) | 147,134 | 172,527 | 148,073 | 173,793 | 156,920 | 185,940 |
|  |  | HCR 1b (Dynamic NPFMC) | 149,397 | 174,713 | 150,279 | 175,555 | 159,130 | 187,570 |
|  |  | HCR 2a (PFMC) | 140,617 | 160,410 | 141,730 | 161,637 | 148,000 | 172,086 |
|  |  | HCR 2b (Dynamic PFMC) | 140,936 | 160,550 | 141,952 | 161,777 | 148,078 | 172,054 |
|  |  | HCR 3a (SESSF) | 131,152 | 145,953 | 132,563 | 147,179 | 135,639 | 156,124 |
|  |  | HCR 3b (Dynamic SESSF) | 131,533 | 146,127 | 132,790 | 147,633 | 135,771 | 156,216 |
|  |  | HCR 4 (NEFMC) | 117,866 | 125,737 | 119,385 | 126,580 | 119,316 | 134,045 |
|  |  | HCR 5 (Avg F) | 172,095 | 211,538 | 171,535 | 212,408 | 178,785 | 227,581 |
|  | *Est M* | HCR 1a (NPFMC) | 147,414 | 172,903 | 144,995 | 195,627 | 157,360 | 196,377 |
|  |  | HCR 1b (Dynamic NPFMC) | 149,726 | 175,021 | 147,107 | 197,116 | 159,448 | 198,350 |
|  |  | HCR 2a (PFMC) | 140,984 | 160,915 | 138,329 | 184,719 | 148,263 | 182,906 |
|  |  | HCR 2b (Dynamic PFMC) | 141,102 | 160,838 | 138,416 | 184,867 | 148,325 | 182,649 |
|  |  | HCR 3a (SESSF) | 131,344 | 146,210 | 129,472 | 167,157 | 136,372 | 164,707 |
|  |  | HCR 3b (Dynamic SESSF) | 131,851 | 146,407 | 129,587 | 168,008 | 136,327 | 165,192 |
|  |  | HCR 4 (NEFMC) | 118,097 | 126,026 | 115,528 | 149,671 | 119,509 | 143,311 |
|  |  | HCR 5 (Avg F) | 170,661 | 209,354 | 171,413 | 204,517 | 178,326 | 221,760 |
| *GOA* | *Fix M* | HCR 1a (NPFMC) | 27,151 | 57,916 | 19,915 | 43,532 | 28,592 | 62,001 |
|  |  | HCR 1b (Dynamic NPFMC) | 27,831 | 57,467 | 20,207 | 42,597 | 29,128 | 61,301 |
|  |  | HCR 2a (PFMC) | 26,051 | 54,581 | 19,624 | 42,239 | 27,700 | 59,217 |
|  |  | HCR 2b (Dynamic PFMC) | 26,252 | 54,352 | 19,754 | 41,762 | 27,878 | 58,886 |
|  |  | HCR 3a (SESSF) | 22,647 | 48,072 | 18,344 | 40,294 | 23,985 | 50,934 |
|  |  | HCR 3b (Dynamic SESSF) | 23,340 | 47,991 | 18,750 | 39,270 | 24,537 | 50,565 |
|  |  | HCR 4 (NEFMC) | 23,003 | 47,048 | 18,593 | 38,725 | 23,876 | 48,552 |
|  |  | HCR 5 (Avg F) | 23,264 | 47,680 | 18,880 | 39,515 | 23,002 | 46,969 |
|  | *Est M* | HCR 1a (NPFMC) | 22,835 | 51,287 | 14,497 | 27,818 | 22,598 | 50,057 |
|  |  | HCR 1b (Dynamic NPFMC) | 23,147 | 50,375 | 14,768 | 27,434 | 22,581 | 48,747 |
|  |  | HCR 2a (PFMC) | 21,410 | 46,881 | 13,312 | 23,557 | 21,172 | 45,796 |
|  |  | HCR 2b (Dynamic PFMC) | 21,473 | 46,562 | 13,487 | 23,549 | 21,159 | 45,291 |
|  |  | HCR 3a (SESSF) | 20,081 | 43,925 | 12,436 | 21,302 | 19,531 | 41,218 |
|  |  | HCR 3b (Dynamic SESSF) | 19,252 | 40,805 | 12,580 | 21,360 | 18,855 | 38,527 |
|  |  | HCR 4 (NEFMC) | 17,795 | 37,217 | 10,800 | 17,167 | 16,748 | 32,902 |
|  |  | HCR 5 (Avg F) | 22,929 | 47,627 | 18,543 | 38,813 | 22,571 | 46,654 |

**Supplementary Table 5.PM-2.** Summary of performance metric 2 (average interannual variation in catch (IAV)) across OMs for **Cod**.

| **System** | **EM** | **HCR** | **1. SS fix M** | **2. w Ricker** | **3. SS est M** | **4. w Ricker** | **5. MS** | **6. w Ricker** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *EBS* | *Fix M* | HCR 1a (NPFMC) | 3,249 | 3,612 | 3,083 | 4,047 | 3,577 | 4,632 |
|  |  | HCR 1b (Dynamic NPFMC) | 1,663 | 2,167 | 1,568 | 2,492 | 1,903 | 2,948 |
|  |  | HCR 2a (PFMC) | 1,823 | 2,227 | 1,715 | 2,534 | 2,027 | 2,958 |
|  |  | HCR 2b (Dynamic PFMC) | 1,594 | 2,061 | 1,510 | 2,340 | 1,802 | 2,785 |
|  |  | HCR 3a (SESSF) | 2,612 | 2,911 | 2,431 | 3,253 | 2,720 | 3,618 |
|  |  | HCR 3b (Dynamic SESSF) | 1,234 | 1,622 | 1,157 | 1,834 | 1,341 | 2,212 |
|  |  | HCR 4 (NEFMC) | 916 | 1,265 | 863 | 1,437 | 1,011 | 1,736 |
|  |  | HCR 5 (Avg F) | 4,137 | 4,518 | 3,928 | 4,801 | 4,586 | 5,700 |
|  | *Est M* | HCR 1a (NPFMC) | 3,307 | 3,630 | 2,815 | 5,234 | 3,267 | 4,806 |
|  |  | HCR 1b (Dynamic NPFMC) | 1,673 | 2,172 | 1,481 | 3,528 | 1,814 | 3,143 |
|  |  | HCR 2a (PFMC) | 1,861 | 2,260 | 1,591 | 3,336 | 1,905 | 3,148 |
|  |  | HCR 2b (Dynamic PFMC) | 1,630 | 2,079 | 1,394 | 3,219 | 1,707 | 3,001 |
|  |  | HCR 3a (SESSF) | 2,630 | 2,929 | 2,328 | 3,740 | 2,552 | 3,631 |
|  |  | HCR 3b (Dynamic SESSF) | 1,262 | 1,640 | 1,184 | 3,008 | 1,370 | 2,773 |
|  |  | HCR 4 (NEFMC) | 930 | 1,283 | 830 | 1,849 | 989 | 1,853 |
|  |  | HCR 5 (Avg F) | 4,052 | 4,391 | 4,026 | 4,250 | 4,667 | 5,240 |
| *GOA* | *Fix M* | HCR 1a (NPFMC) | 11,019 | 16,496 | 14,065 | 15,459 | 10,728 | 16,361 |
|  |  | HCR 1b (Dynamic NPFMC) | 7,491 | 15,224 | 7,979 | 13,727 | 7,140 | 14,701 |
|  |  | HCR 2a (PFMC) | 6,829 | 13,067 | 7,091 | 10,520 | 6,609 | 12,713 |
|  |  | HCR 2b (Dynamic PFMC) | 6,284 | 13,264 | 5,340 | 10,588 | 6,041 | 12,589 |
|  |  | HCR 3a (SESSF) | 6,512 | 10,243 | 7,226 | 8,288 | 6,031 | 9,622 |
|  |  | HCR 3b (Dynamic SESSF) | 4,949 | 10,337 | 3,864 | 7,841 | 4,522 | 9,406 |
|  |  | HCR 4 (NEFMC) | 4,203 | 9,241 | 3,011 | 6,545 | 3,769 | 8,081 |
|  |  | HCR 5 (Avg F) | 4,307 | 9,404 | 3,409 | 7,015 | 3,748 | 7,957 |
|  | *Est M* | HCR 1a (NPFMC) | 6,635 | 12,347 | 2,404 | 3,866 | 5,112 | 9,537 |
|  |  | HCR 1b (Dynamic NPFMC) | 4,489 | 11,365 | 1,701 | 3,563 | 3,397 | 8,500 |
|  |  | HCR 2a (PFMC) | 4,245 | 9,741 | 1,408 | 2,835 | 3,286 | 7,649 |
|  |  | HCR 2b (Dynamic PFMC) | 3,964 | 9,790 | 1,240 | 2,762 | 3,038 | 7,560 |
|  |  | HCR 3a (SESSF) | 4,897 | 8,749 | 1,859 | 2,768 | 3,640 | 6,553 |
|  |  | HCR 3b (Dynamic SESSF) | 3,069 | 7,575 | 1,208 | 2,539 | 2,364 | 5,646 |
|  |  | HCR 4 (NEFMC) | 2,501 | 6,232 | 789 | 1,735 | 1,850 | 4,312 |
|  |  | HCR 5 (Avg F) | 4,272 | 9,803 | 3,233 | 7,370 | 3,704 | 8,269 |

**Supplementary Table 5.PM-3.** Summary of performance metric 3 (probability of the fishery being closed) across OMs for **Cod**.

| **System** | **EM** | **HCR** | **1. SS fix M** | **2. w Ricker** | **3. SS est M** | **4. w Ricker** | **5. MS** | **6. w Ricker** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *EBS* | *Fix M* | HCR 1a (NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 1b (Dynamic NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2a (PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2b (Dynamic PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3a (SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3b (Dynamic SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 4 (NEFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 5 (Avg F) | 0 | 0 | 0 | 0 | 0 | 0 |
|  | *Est M* | HCR 1a (NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 1b (Dynamic NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2a (PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2b (Dynamic PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3a (SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3b (Dynamic SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 4 (NEFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 5 (Avg F) | 0 | 0 | 0 | 0 | 0 | 0 |
| *GOA* | *Fix M* | HCR 1a (NPFMC) | 0.06 | 0.05 | 0.09 | 0.05 | 0.06 | 0.05 |
|  |  | HCR 1b (Dynamic NPFMC) | 0 | 0 | 0.05 | 0.03 | 0 | 0 |
|  |  | HCR 2a (PFMC) | 0 | 0 | 0.02 | 0 | 0 | 0 |
|  |  | HCR 2b (Dynamic PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3a (SESSF) | 0.03 | 0.01 | 0.03 | 0 | 0.03 | 0.01 |
|  |  | HCR 3b (Dynamic SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 4 (NEFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 5 (Avg F) | 0 | 0 | 0 | 0 | 0 | 0 |
|  | *Est M* | HCR 1a (NPFMC) | 0.05 | 0.04 | 0.08 | 0.07 | 0.05 | 0.04 |
|  |  | HCR 1b (Dynamic NPFMC) | 0 | 0 | 0.05 | 0.05 | 0 | 0 |
|  |  | HCR 2a (PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2b (Dynamic PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3a (SESSF) | 0.02 | 0 | 0.08 | 0.07 | 0.02 | 0.01 |
|  |  | HCR 3b (Dynamic SESSF) | 0 | 0 | 0.05 | 0.05 | 0 | 0 |
|  |  | HCR 4 (NEFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 5 (Avg F) | 0 | 0 | 0 | 0 | 0 | 0 |

**Supplementary Table 5.PM-4.** Summary of performance metric 4 (average relative mean squared error in estimate of spawning biomass in 2060) across OMs for **Cod**.

| **System** | **EM** | **HCR** | **1. SS fix M** | **2. w Ricker** | **3. SS est M** | **4. w Ricker** | **5. MS** | **6. w Ricker** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *EBS* | *Fix M* | HCR 1a (NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 1b (Dynamic NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2a (PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2b (Dynamic PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3a (SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3b (Dynamic SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 4 (NEFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 5 (Avg F) | 0 | 0 | 0 | 0 | 0 | 0 |
|  | *Est M* | HCR 1a (NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 1b (Dynamic NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2a (PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2b (Dynamic PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3a (SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3b (Dynamic SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 4 (NEFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 5 (Avg F) | 0 | 0 | 0 | 0 | 0 | 0 |
| *GOA* | *Fix M* | HCR 1a (NPFMC) | 0 | 0 | 0.12 | 0.13 | 0.01 | 0.02 |
|  |  | HCR 1b (Dynamic NPFMC) | 0 | 0 | 0.11 | 0.12 | 0.01 | 0.02 |
|  |  | HCR 2a (PFMC) | 0 | 0 | 0.12 | 0.13 | 0.01 | 0.02 |
|  |  | HCR 2b (Dynamic PFMC) | 0 | 0 | 0.12 | 0.13 | 0.01 | 0.02 |
|  |  | HCR 3a (SESSF) | 0 | 0 | 0.15 | 0.15 | 0.01 | 0.02 |
|  |  | HCR 3b (Dynamic SESSF) | 0 | 0 | 0.15 | 0.17 | 0.01 | 0.02 |
|  |  | HCR 4 (NEFMC) | 0 | 0 | 0.15 | 0.17 | 0.01 | 0.02 |
|  |  | HCR 5 (Avg F) | 0 | 0 | 0.14 | 0.16 | 0.01 | 0.02 |
|  | *Est M* | HCR 1a (NPFMC) | 0.01 | 0 | 0 | 0 | 0.01 | 0 |
|  |  | HCR 1b (Dynamic NPFMC) | 0.01 | 0.01 | 0 | 0 | 0.01 | 0.01 |
|  |  | HCR 2a (PFMC) | 0.02 | 0.01 | 0.01 | 0.01 | 0.02 | 0.01 |
|  |  | HCR 2b (Dynamic PFMC) | 0.02 | 0.01 | 0.01 | 0.01 | 0.02 | 0.01 |
|  |  | HCR 3a (SESSF) | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
|  |  | HCR 3b (Dynamic SESSF) | 0.02 | 0.01 | 0.01 | 0.01 | 0.02 | 0.01 |
|  |  | HCR 4 (NEFMC) | 0.03 | 0.02 | 0.02 | 0.03 | 0.03 | 0.03 |
|  |  | HCR 5 (Avg F) | 0.01 | 0.01 | 0 | 0 | 0.01 | 0 |

**Supplementary Table 5.PM-5.** Summary of performance metric 5 (probability that the population is perceived as undergoing overfishing in the terminal year of the EM) across OMs for **Cod**.

| **System** | **EM** | **HCR** | **1. SS fix M** | **2. w Ricker** | **3. SS est M** | **4. w Ricker** | **5. MS** | **6. w Ricker** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *EBS* | *Fix M* | HCR 1a (NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 1b (Dynamic NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2a (PFMC) | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
|  |  | HCR 2b (Dynamic PFMC) | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
|  |  | HCR 3a (SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3b (Dynamic SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 4 (NEFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 5 (Avg F) | 0 | 0 | 0 | 0 | 0 | 0 |
|  | *Est M* | HCR 1a (NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 1b (Dynamic NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2a (PFMC) | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
|  |  | HCR 2b (Dynamic PFMC) | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
|  |  | HCR 3a (SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3b (Dynamic SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 4 (NEFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 5 (Avg F) | 0 | 0 | 0 | 0 | 0 | 0 |
| *GOA* | *Fix M* | HCR 1a (NPFMC) | 0.01 | 0.01 | 0.09 | 0.09 | 0.03 | 0.02 |
|  |  | HCR 1b (Dynamic NPFMC) | 0.03 | 0.01 | 0.11 | 0.1 | 0.04 | 0.03 |
|  |  | HCR 2a (PFMC) | 0.21 | 0.19 | 0.35 | 0.41 | 0.25 | 0.24 |
|  |  | HCR 2b (Dynamic PFMC) | 0.24 | 0.2 | 0.42 | 0.39 | 0.26 | 0.23 |
|  |  | HCR 3a (SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3b (Dynamic SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 4 (NEFMC) | 0 | 0 | 0.01 | 0 | 0 | 0 |
|  |  | HCR 5 (Avg F) | 0.07 | 0.04 | 0.29 | 0.23 | 0.08 | 0.05 |
|  | *Est M* | HCR 1a (NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 1b (Dynamic NPFMC) | 0.01 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2a (PFMC) | 0.1 | 0.1 | 0.02 | 0.02 | 0.07 | 0.06 |
|  |  | HCR 2b (Dynamic PFMC) | 0.13 | 0.11 | 0.02 | 0.01 | 0.07 | 0.06 |
|  |  | HCR 3a (SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3b (Dynamic SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 4 (NEFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 5 (Avg F) | 0.25 | 0.2 | 0.95 | 0.91 | 0.41 | 0.41 |

**Supplementary Table 5.PM-6.** Summary of performance metric 6 (probability that the population is perceived to be overfished in the terminal year of the EM) across OMs for **Cod**.

| **System** | **EM** | **HCR** | **1. SS fix M** | **2. w Ricker** | **3. SS est M** | **4. w Ricker** | **5. MS** | **6. w Ricker** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *EBS* | *Fix M* | HCR 1a (NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 1b (Dynamic NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2a (PFMC) | 0.01 | 0 | 0.01 | 0 | 0 | 0 |
|  |  | HCR 2b (Dynamic PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3a (SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3b (Dynamic SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 4 (NEFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 5 (Avg F) | 0.04 | 0.01 | 0.04 | 0.01 | 0.03 | 0.01 |
|  | *Est M* | HCR 1a (NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 1b (Dynamic NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2a (PFMC) | 0.01 | 0 | 0.01 | 0 | 0 | 0 |
|  |  | HCR 2b (Dynamic PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3a (SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3b (Dynamic SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 4 (NEFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 5 (Avg F) | 0.04 | 0.01 | 0.06 | 0 | 0.04 | 0 |
| *GOA* | *Fix M* | HCR 1a (NPFMC) | 0.05 | 0.03 | 0.07 | 0.05 | 0.05 | 0.04 |
|  |  | HCR 1b (Dynamic NPFMC) | 0 | 0 | 0.04 | 0.02 | 0 | 0 |
|  |  | HCR 2a (PFMC) | 0.09 | 0.05 | 0.17 | 0.06 | 0.08 | 0.05 |
|  |  | HCR 2b (Dynamic PFMC) | 0.01 | 0 | 0.06 | 0.03 | 0.01 | 0 |
|  |  | HCR 3a (SESSF) | 0.03 | 0.01 | 0.03 | 0 | 0.03 | 0.01 |
|  |  | HCR 3b (Dynamic SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 4 (NEFMC) | 0.05 | 0.04 | 0.07 | 0.05 | 0.05 | 0.04 |
|  |  | HCR 5 (Avg F) | 0.05 | 0.02 | 0.06 | 0.04 | 0.05 | 0.02 |
|  | *Est M* | HCR 1a (NPFMC) | 0.05 | 0.02 | 0.04 | 0.02 | 0.04 | 0.02 |
|  |  | HCR 1b (Dynamic NPFMC) | 0 | 0 | 0.02 | 0 | 0 | 0 |
|  |  | HCR 2a (PFMC) | 0.1 | 0.06 | 0.11 | 0.09 | 0.09 | 0.07 |
|  |  | HCR 2b (Dynamic PFMC) | 0.01 | 0 | 0.07 | 0.05 | 0.02 | 0 |
|  |  | HCR 3a (SESSF) | 0.02 | 0 | 0.05 | 0.05 | 0.02 | 0.01 |
|  |  | HCR 3b (Dynamic SESSF) | 0 | 0 | 0.02 | 0.02 | 0 | 0 |
|  |  | HCR 4 (NEFMC) | 0.05 | 0.04 | 0.09 | 0.07 | 0.05 | 0.04 |
|  |  | HCR 5 (Avg F) | 0.05 | 0.04 | 0.18 | 0.09 | 0.06 | 0.05 |

**Supplementary Table 5.PM-7.** Summary of performance metric 7 (probability that the population is undergoing overfishing as determined from the OM) across OMs for **Cod**.

| **System** | **EM** | **HCR** | **1. SS fix M** | **2. w Ricker** | **3. SS est M** | **4. w Ricker** | **5. MS** | **6. w Ricker** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *EBS* | *Fix M* | HCR 1a (NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 1b (Dynamic NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2a (PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2b (Dynamic PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3a (SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3b (Dynamic SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 4 (NEFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 5 (Avg F) | 0 | 0 | 0 | 0 | 0 | 0 |
|  | *Est M* | HCR 1a (NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 1b (Dynamic NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2a (PFMC) | 0 | 0 | 0 | 0.01 | 0 | 0 |
|  |  | HCR 2b (Dynamic PFMC) | 0 | 0 | 0 | 0.01 | 0 | 0 |
|  |  | HCR 3a (SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3b (Dynamic SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 4 (NEFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 5 (Avg F) | 0 | 0 | 0 | 0 | 0 | 0 |
| *GOA* | *Fix M* | HCR 1a (NPFMC) | 0.03 | 0.02 | 0.91 | 0.95 | 0 | 0 |
|  |  | HCR 1b (Dynamic NPFMC) | 0.06 | 0.03 | 0.95 | 0.97 | 0 | 0 |
|  |  | HCR 2a (PFMC) | 0.42 | 0.35 | 0.95 | 0.97 | 0 | 0 |
|  |  | HCR 2b (Dynamic PFMC) | 0.48 | 0.38 | 1 | 1 | 0 | 0 |
|  |  | HCR 3a (SESSF) | 0 | 0 | 0.01 | 0.02 | 0 | 0 |
|  |  | HCR 3b (Dynamic SESSF) | 0 | 0 | 0.01 | 0.02 | 0 | 0 |
|  |  | HCR 4 (NEFMC) | 0 | 0 | 1 | 1 | 0 | 0 |
|  |  | HCR 5 (Avg F) | 0.19 | 0.12 | 0.99 | 0.98 | 0 | 0 |
|  | *Est M* | HCR 1a (NPFMC) | 0 | 0 | 0.01 | 0.01 | 0 | 0 |
|  |  | HCR 1b (Dynamic NPFMC) | 0 | 0 | 0 | 0.01 | 0 | 0 |
|  |  | HCR 2a (PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2b (Dynamic PFMC) | 0 | 0 | 0.01 | 0 | 0 | 0 |
|  |  | HCR 3a (SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3b (Dynamic SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 4 (NEFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 5 (Avg F) | 0.12 | 0.1 | 0.95 | 0.93 | 0 | 0 |

**Supplementary Table 5.PM-8.** Summary of performance metric 8 (probability that the population is overfished as determined from the OM) across OMs for **Cod**.

| **System** | **EM** | **HCR** | **1. SS fix M** | **2. w Ricker** | **3. SS est M** | **4. w Ricker** | **5. MS** | **6. w Ricker** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *EBS* | *Fix M* | HCR 1a (NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 1b (Dynamic NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2a (PFMC) | 0.01 | 0 | 0.02 | 0 | 0 | 0 |
|  |  | HCR 2b (Dynamic PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3a (SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3b (Dynamic SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 4 (NEFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 5 (Avg F) | 0.01 | 0 | 0.01 | 0 | 0.03 | 0.01 |
|  | *Est M* | HCR 1a (NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 1b (Dynamic NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2a (PFMC) | 0.01 | 0 | 0.01 | 0 | 0 | 0 |
|  |  | HCR 2b (Dynamic PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3a (SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3b (Dynamic SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 4 (NEFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 5 (Avg F) | 0.01 | 0 | 0.01 | 0 | 0.03 | 0 |
| *GOA* | *Fix M* | HCR 1a (NPFMC) | 0.07 | 0 | 0.45 | 0.11 | 0.14 | 0.07 |
|  |  | HCR 1b (Dynamic NPFMC) | 0 | 0.05 | 0.26 | 0.18 | 0.17 | 0.08 |
|  |  | HCR 2a (PFMC) | 0.13 | 0.08 | 0.68 | 0.1 | 0.13 | 0.07 |
|  |  | HCR 2b (Dynamic PFMC) | 0.01 | 0.09 | 0.67 | 0.21 | 0.13 | 0.08 |
|  |  | HCR 3a (SESSF) | 0.04 | 0.02 | 0.2 | 0.05 | 0.09 | 0.07 |
|  |  | HCR 3b (Dynamic SESSF) | 0 | 0.02 | 0.17 | 0.08 | 0.1 | 0.07 |
|  |  | HCR 4 (NEFMC) | 0.06 | 0 | 0.25 | 0.1 | 0.11 | 0.07 |
|  |  | HCR 5 (Avg F) | 0.64 | 0.14 | 1 | 0.27 | 0.12 | 0.08 |
|  | *Est M* | HCR 1a (NPFMC) | 0.05 | 0 | 0.07 | 0.05 | 0.08 | 0.07 |
|  |  | HCR 1b (Dynamic NPFMC) | 0 | 0.05 | 0.02 | 0.08 | 0.09 | 0.07 |
|  |  | HCR 2a (PFMC) | 0.09 | 0.07 | 0.1 | 0.07 | 0.08 | 0.07 |
|  |  | HCR 2b (Dynamic PFMC) | 0 | 0.07 | 0.07 | 0.05 | 0.08 | 0.07 |
|  |  | HCR 3a (SESSF) | 0 | 0 | 0.07 | 0.02 | 0.06 | 0.05 |
|  |  | HCR 3b (Dynamic SESSF) | 0 | 0 | 0.02 | 0.02 | 0.07 | 0.05 |
|  |  | HCR 4 (NEFMC) | 0.05 | 0 | 0.09 | 0.07 | 0.08 | 0.07 |
|  |  | HCR 5 (Avg F) | 0.62 | 0.14 | 1 | 0.23 | 0.11 | 0.07 |

**Supplementary Table 5.PM-9.** Summary of performance metric 9 (terminal spawning stock biomass depletion) across OMs for **Cod**.

| **System** | **EM** | **HCR** | **1. SS fix M** | **2. w Ricker** | **3. SS est M** | **4. w Ricker** | **5. MS** | **6. w Ricker** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *EBS* | *Fix M* | HCR 1a (NPFMC) | 0.4 | 0.69 | 0.38 | 0.72 | 0.62 | 0.7 |
|  |  | HCR 1b (Dynamic NPFMC) | 0.39 | 0.6 | 0.37 | 0.63 | 0.61 | 0.69 |
|  |  | HCR 2a (PFMC) | 0.42 | 0.73 | 0.41 | 0.76 | 0.66 | 0.73 |
|  |  | HCR 2b (Dynamic PFMC) | 0.43 | 0.64 | 0.41 | 0.67 | 0.66 | 0.74 |
|  |  | HCR 3a (SESSF) | 0.46 | 0.77 | 0.45 | 0.8 | 0.7 | 0.78 |
|  |  | HCR 3b (Dynamic SESSF) | 0.46 | 0.68 | 0.45 | 0.7 | 0.7 | 0.78 |
|  |  | HCR 4 (NEFMC) | 0.51 | 0.83 | 0.5 | 0.85 | 0.77 | 0.83 |
|  |  | HCR 5 (Avg F) | 0.28 | 0.53 | 0.27 | 0.58 | 0.43 | 0.54 |
|  | *Est M* | HCR 1a (NPFMC) | 0.4 | 0.69 | 0.4 | 0.65 | 0.65 | 0.68 |
|  |  | HCR 1b (Dynamic NPFMC) | 0.39 | 0.6 | 0.39 | 0.57 | 0.65 | 0.68 |
|  |  | HCR 2a (PFMC) | 0.42 | 0.73 | 0.42 | 0.69 | 0.7 | 0.72 |
|  |  | HCR 2b (Dynamic PFMC) | 0.43 | 0.64 | 0.43 | 0.6 | 0.7 | 0.72 |
|  |  | HCR 3a (SESSF) | 0.46 | 0.77 | 0.46 | 0.74 | 0.74 | 0.77 |
|  |  | HCR 3b (Dynamic SESSF) | 0.46 | 0.68 | 0.46 | 0.65 | 0.75 | 0.77 |
|  |  | HCR 4 (NEFMC) | 0.51 | 0.82 | 0.51 | 0.79 | 0.82 | 0.82 |
|  |  | HCR 5 (Avg F) | 0.29 | 0.54 | 0.27 | 0.62 | 0.43 | 0.56 |
| *GOA* | *Fix M* | HCR 1a (NPFMC) | 0.38 | 0.78 | 0.21 | 0.52 | 0.38 | 0.79 |
|  |  | HCR 1b (Dynamic NPFMC) | 0.4 | 0.46 | 0.21 | 0.36 | 0.37 | 0.77 |
|  |  | HCR 2a (PFMC) | 0.4 | 0.82 | 0.22 | 0.56 | 0.4 | 0.84 |
|  |  | HCR 2b (Dynamic PFMC) | 0.43 | 0.5 | 0.22 | 0.39 | 0.4 | 0.84 |
|  |  | HCR 3a (SESSF) | 0.46 | 0.94 | 0.26 | 0.66 | 0.46 | 0.93 |
|  |  | HCR 3b (Dynamic SESSF) | 0.49 | 0.56 | 0.26 | 0.45 | 0.44 | 0.91 |
|  |  | HCR 4 (NEFMC) | 0.46 | 0.94 | 0.25 | 0.65 | 0.45 | 0.9 |
|  |  | HCR 5 (Avg F) | 0.45 | 0.93 | 0.24 | 0.63 | 0.42 | 0.85 |
|  | *Est M* | HCR 1a (NPFMC) | 0.46 | 0.9 | 0.4 | 0.91 | 0.51 | 1.03 |
|  |  | HCR 1b (Dynamic NPFMC) | 0.49 | 0.54 | 0.41 | 0.63 | 0.51 | 1.03 |
|  |  | HCR 2a (PFMC) | 0.49 | 0.95 | 0.44 | 0.98 | 0.55 | 1.11 |
|  |  | HCR 2b (Dynamic PFMC) | 0.52 | 0.58 | 0.46 | 0.67 | 0.55 | 1.12 |
|  |  | HCR 3a (SESSF) | 0.51 | 1.01 | 0.47 | 1.02 | 0.55 | 1.1 |
|  |  | HCR 3b (Dynamic SESSF) | 0.57 | 0.62 | 0.49 | 0.71 | 0.57 | 1.13 |
|  |  | HCR 4 (NEFMC) | 0.55 | 1.07 | 0.52 | 1.08 | 0.6 | 1.17 |
|  |  | HCR 5 (Avg F) | 0.46 | 0.93 | 0.25 | 0.66 | 0.43 | 0.86 |

**Supplementary Table 6.PM-1.** Summary of performance metric 1 (average annual catch) across OMs for **Arrowtooth flounder**.

| **System** | **EM** | **HCR** | **1. SS fix M** | **2. w Ricker** | **3. SS est M** | **4. w Ricker** | **5. MS** | **6. w Ricker** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *EBS* | *Fix M* | HCR 1a (NPFMC) | 33,497 | 47,487 | 38,422 | 57,213 | 40,019 | 59,552 |
|  |  | HCR 1b (Dynamic NPFMC) | 33,707 | 47,464 | 38,293 | 56,875 | 39,867 | 59,184 |
|  |  | HCR 2a (PFMC) | 34,428 | 48,241 | 39,757 | 58,884 | 41,251 | 61,275 |
|  |  | HCR 2b (Dynamic PFMC) | 34,423 | 48,246 | 39,769 | 58,902 | 41,258 | 61,274 |
|  |  | HCR 3a (SESSF) | 29,671 | 42,222 | 32,996 | 49,067 | 33,973 | 50,381 |
|  |  | HCR 3b (Dynamic SESSF) | 29,676 | 42,209 | 32,998 | 49,056 | 33,986 | 50,375 |
|  |  | HCR 4 (NEFMC) | 25,279 | 35,693 | 27,396 | 40,437 | 28,043 | 41,261 |
|  |  | HCR 5 (Avg F) | 11,592 | 15,372 | 11,583 | 16,515 | 11,806 | 16,611 |
|  | *Est M* | HCR 1a (NPFMC) | 34,051 | 48,146 | 47,189 | 67,060 | 50,239 | 73,762 |
|  |  | HCR 1b (Dynamic NPFMC) | 34,284 | 48,112 | 47,673 | 67,062 | 50,662 | 73,838 |
|  |  | HCR 2a (PFMC) | 34,994 | 48,822 | 49,644 | 67,816 | 52,746 | 75,281 |
|  |  | HCR 2b (Dynamic PFMC) | 35,004 | 48,832 | 49,645 | 67,812 | 52,723 | 75,289 |
|  |  | HCR 3a (SESSF) | 30,324 | 43,197 | 41,957 | 61,791 | 44,197 | 66,248 |
|  |  | HCR 3b (Dynamic SESSF) | 30,295 | 43,188 | 42,011 | 61,797 | 44,267 | 66,305 |
|  |  | HCR 4 (NEFMC) | 25,879 | 36,655 | 37,367 | 55,534 | 39,330 | 59,132 |
|  |  | HCR 5 (Avg F) | 11,568 | 15,390 | 11,943 | 16,947 | 12,160 | 17,012 |
| *GOA* | *Fix M* | HCR 1a (NPFMC) | 86,367 | 122,884 | 99,426 | 135,837 | 101,707 | 135,268 |
|  |  | HCR 1b (Dynamic NPFMC) | 86,934 | 122,921 | 99,582 | 135,831 | 101,794 | 135,289 |
|  |  | HCR 2a (PFMC) | 89,361 | 125,658 | 102,965 | 139,618 | 105,333 | 138,400 |
|  |  | HCR 2b (Dynamic PFMC) | 89,347 | 125,673 | 102,959 | 139,599 | 105,366 | 138,415 |
|  |  | HCR 3a (SESSF) | 75,379 | 106,862 | 84,578 | 116,428 | 85,639 | 116,276 |
|  |  | HCR 3b (Dynamic SESSF) | 75,386 | 106,866 | 84,593 | 116,420 | 85,650 | 116,292 |
|  |  | HCR 4 (NEFMC) | 65,849 | 92,362 | 72,358 | 99,162 | 72,764 | 99,331 |
|  |  | HCR 5 (Avg F) | 19,019 | 24,379 | 20,278 | 26,208 | 20,509 | 27,186 |
|  | *Est M* | HCR 1a (NPFMC) | 84,947 | 120,932 | 109,836 | 147,861 | 110,070 | 144,977 |
|  |  | HCR 1b (Dynamic NPFMC) | 85,447 | 120,930 | 110,593 | 147,821 | 110,563 | 144,943 |
|  |  | HCR 2a (PFMC) | 87,367 | 123,224 | 116,652 | 151,591 | 116,835 | 148,973 |
|  |  | HCR 2b (Dynamic PFMC) | 87,356 | 123,215 | 116,731 | 151,609 | 116,796 | 149,104 |
|  |  | HCR 3a (SESSF) | 74,433 | 105,509 | 95,463 | 131,234 | 94,098 | 128,110 |
|  |  | HCR 3b (Dynamic SESSF) | 74,442 | 105,564 | 95,386 | 131,305 | 94,115 | 127,922 |
|  |  | HCR 4 (NEFMC) | 65,221 | 91,510 | 85,984 | 118,745 | 84,065 | 115,630 |
|  |  | HCR 5 (Avg F) | 21,705 | 27,976 | 21,906 | 28,271 | 22,313 | 29,552 |

**Supplementary Table 6.PM-2.** Summary of performance metric 2 (average interannual variation in catch (IAV)) across OMs for **Arrowtooth flounder**.

| **System** | **EM** | **HCR** | **1. SS fix M** | **2. w Ricker** | **3. SS est M** | **4. w Ricker** | **5. MS** | **6. w Ricker** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *EBS* | *Fix M* | HCR 1a (NPFMC) | 221 | 206 | 324 | 414 | 326 | 444 |
|  |  | HCR 1b (Dynamic NPFMC) | 182 | 204 | 303 | 426 | 312 | 460 |
|  |  | HCR 2a (PFMC) | 200 | 219 | 323 | 440 | 330 | 478 |
|  |  | HCR 2b (Dynamic PFMC) | 201 | 219 | 323 | 441 | 329 | 474 |
|  |  | HCR 3a (SESSF) | 108 | 137 | 194 | 292 | 197 | 317 |
|  |  | HCR 3b (Dynamic SESSF) | 106 | 136 | 192 | 292 | 196 | 316 |
|  |  | HCR 4 (NEFMC) | 65 | 95 | 130 | 209 | 131 | 225 |
|  |  | HCR 5 (Avg F) | 17 | 28 | 37 | 65 | 37 | 69 |
|  | *Est M* | HCR 1a (NPFMC) | 247 | 221 | 792 | 642 | 788 | 699 |
|  |  | HCR 1b (Dynamic NPFMC) | 204 | 220 | 583 | 602 | 609 | 671 |
|  |  | HCR 2a (PFMC) | 224 | 237 | 763 | 748 | 797 | 830 |
|  |  | HCR 2b (Dynamic PFMC) | 225 | 237 | 762 | 746 | 795 | 830 |
|  |  | HCR 3a (SESSF) | 119 | 148 | 346 | 368 | 352 | 420 |
|  |  | HCR 3b (Dynamic SESSF) | 118 | 147 | 305 | 368 | 319 | 419 |
|  |  | HCR 4 (NEFMC) | 70 | 100 | 196 | 268 | 207 | 306 |
|  |  | HCR 5 (Avg F) | 17 | 29 | 23 | 47 | 24 | 52 |
| *GOA* | *Fix M* | HCR 1a (NPFMC) | 612 | 427 | 506 | 411 | 493 | 417 |
|  |  | HCR 1b (Dynamic NPFMC) | 572 | 426 | 493 | 411 | 488 | 417 |
|  |  | HCR 2a (PFMC) | 707 | 521 | 597 | 486 | 589 | 498 |
|  |  | HCR 2b (Dynamic PFMC) | 707 | 521 | 596 | 485 | 589 | 498 |
|  |  | HCR 3a (SESSF) | 254 | 211 | 238 | 228 | 238 | 227 |
|  |  | HCR 3b (Dynamic SESSF) | 254 | 210 | 238 | 229 | 237 | 228 |
|  |  | HCR 4 (NEFMC) | 137 | 129 | 138 | 153 | 139 | 151 |
|  |  | HCR 5 (Avg F) | 7 | 17 | 12 | 25 | 12 | 25 |
|  | *Est M* | HCR 1a (NPFMC) | 614 | 433 | 2,177 | 1,636 | 1,746 | 1,457 |
|  |  | HCR 1b (Dynamic NPFMC) | 578 | 433 | 2,077 | 1,629 | 1,687 | 1,455 |
|  |  | HCR 2a (PFMC) | 755 | 558 | 3,279 | 2,616 | 2,657 | 2,334 |
|  |  | HCR 2b (Dynamic PFMC) | 755 | 557 | 3,277 | 2,620 | 2,658 | 2,332 |
|  |  | HCR 3a (SESSF) | 249 | 208 | 900 | 719 | 739 | 644 |
|  |  | HCR 3b (Dynamic SESSF) | 249 | 207 | 901 | 720 | 739 | 644 |
|  |  | HCR 4 (NEFMC) | 136 | 127 | 574 | 476 | 470 | 428 |
|  |  | HCR 5 (Avg F) | 7 | 19 | 12 | 25 | 12 | 26 |

**Supplementary Table 6.PM-3.** Summary of performance metric 3 (probability of the fishery being closed) across OMs for **Arrowtooth flounder**.

| **System** | **EM** | **HCR** | **1. SS fix M** | **2. w Ricker** | **3. SS est M** | **4. w Ricker** | **5. MS** | **6. w Ricker** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *EBS* | *Fix M* | HCR 1a (NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 1b (Dynamic NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2a (PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2b (Dynamic PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3a (SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3b (Dynamic SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 4 (NEFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 5 (Avg F) | 0 | 0 | 0 | 0 | 0 | 0 |
|  | *Est M* | HCR 1a (NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 1b (Dynamic NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2a (PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2b (Dynamic PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3a (SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3b (Dynamic SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 4 (NEFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 5 (Avg F) | 0 | 0 | 0 | 0 | 0 | 0 |
| *GOA* | *Fix M* | HCR 1a (NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 1b (Dynamic NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2a (PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2b (Dynamic PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3a (SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3b (Dynamic SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 4 (NEFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 5 (Avg F) | 0 | 0 | 0 | 0 | 0 | 0 |
|  | *Est M* | HCR 1a (NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 1b (Dynamic NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2a (PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2b (Dynamic PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3a (SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3b (Dynamic SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 4 (NEFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 5 (Avg F) | 0 | 0 | 0 | 0 | 0 | 0 |

**Supplementary Table 6.PM-4.** Summary of performance metric 4 (average relative mean squared error in estimate of spawning biomass in 2060) across OMs for **Arrowtooth flounder**.

| **System** | **EM** | **HCR** | **1. SS fix M** | **2. w Ricker** | **3. SS est M** | **4. w Ricker** | **5. MS** | **6. w Ricker** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *EBS* | *Fix M* | HCR 1a (NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 1b (Dynamic NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2a (PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2b (Dynamic PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3a (SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3b (Dynamic SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 4 (NEFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 5 (Avg F) | 0 | 0 | 0.01 | 0.01 | 0.01 | 0.01 |
|  | *Est M* | HCR 1a (NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 1b (Dynamic NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2a (PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2b (Dynamic PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3a (SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3b (Dynamic SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 4 (NEFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 5 (Avg F) | 0 | 0 | 0 | 0 | 0 | 0 |
| *GOA* | *Fix M* | HCR 1a (NPFMC) | 0 | 0 | 0.14 | 0.13 | 0.17 | 0.17 |
|  |  | HCR 1b (Dynamic NPFMC) | 0 | 0 | 0.14 | 0.13 | 0.17 | 0.17 |
|  |  | HCR 2a (PFMC) | 0 | 0 | 0.14 | 0.14 | 0.18 | 0.17 |
|  |  | HCR 2b (Dynamic PFMC) | 0 | 0 | 0.14 | 0.14 | 0.18 | 0.17 |
|  |  | HCR 3a (SESSF) | 0 | 0 | 0.13 | 0.12 | 0.16 | 0.15 |
|  |  | HCR 3b (Dynamic SESSF) | 0 | 0 | 0.13 | 0.12 | 0.16 | 0.15 |
|  |  | HCR 4 (NEFMC) | 0 | 0 | 0.12 | 0.12 | 0.15 | 0.14 |
|  |  | HCR 5 (Avg F) | 0 | 0 | 0.1 | 0.09 | 0.11 | 0.1 |
|  | *Est M* | HCR 1a (NPFMC) | 0 | 0 | 0.01 | 0.01 | 0.02 | 0.02 |
|  |  | HCR 1b (Dynamic NPFMC) | 0 | 0 | 0.02 | 0.02 | 0.02 | 0.02 |
|  |  | HCR 2a (PFMC) | 0 | 0 | 0.02 | 0.02 | 0.02 | 0.02 |
|  |  | HCR 2b (Dynamic PFMC) | 0 | 0 | 0.02 | 0.02 | 0.02 | 0.02 |
|  |  | HCR 3a (SESSF) | 0 | 0 | 0.01 | 0.01 | 0.01 | 0.01 |
|  |  | HCR 3b (Dynamic SESSF) | 0 | 0 | 0.01 | 0.01 | 0.01 | 0.01 |
|  |  | HCR 4 (NEFMC) | 0 | 0 | 0.01 | 0.01 | 0.01 | 0.01 |
|  |  | HCR 5 (Avg F) | 0 | 0 | 0 | 0 | 0 | 0 |

**Supplementary Table 6.PM-5.** Summary of performance metric 5 (probability that the population is perceived as undergoing overfishing in the terminal year of the EM) across OMs for **Arrowtooth flounder**.

| **System** | **EM** | **HCR** | **1. SS fix M** | **2. w Ricker** | **3. SS est M** | **4. w Ricker** | **5. MS** | **6. w Ricker** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *EBS* | *Fix M* | HCR 1a (NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 1b (Dynamic NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2a (PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2b (Dynamic PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3a (SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3b (Dynamic SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 4 (NEFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 5 (Avg F) | 0 | 0 | 0 | 0 | 0 | 0 |
|  | *Est M* | HCR 1a (NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 1b (Dynamic NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2a (PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2b (Dynamic PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3a (SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3b (Dynamic SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 4 (NEFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 5 (Avg F) | 0 | 0 | 0 | 0 | 0 | 0 |
| *GOA* | *Fix M* | HCR 1a (NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 1b (Dynamic NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2a (PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2b (Dynamic PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3a (SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3b (Dynamic SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 4 (NEFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 5 (Avg F) | 0 | 0 | 0 | 0 | 0 | 0 |
|  | *Est M* | HCR 1a (NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 1b (Dynamic NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2a (PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2b (Dynamic PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3a (SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3b (Dynamic SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 4 (NEFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 5 (Avg F) | 0 | 0 | 0 | 0 | 0 | 0 |

**Supplementary Table 6.PM-6.** Summary of performance metric 6 (probability that the population is perceived to be overfished in the terminal year of the EM) across OMs for **Arrowtooth flounder**.

| **System** | **EM** | **HCR** | **1. SS fix M** | **2. w Ricker** | **3. SS est M** | **4. w Ricker** | **5. MS** | **6. w Ricker** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *EBS* | *Fix M* | HCR 1a (NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 1b (Dynamic NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2a (PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2b (Dynamic PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3a (SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3b (Dynamic SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 4 (NEFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 5 (Avg F) | 0 | 0 | 0 | 0 | 0 | 0 |
|  | *Est M* | HCR 1a (NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 1b (Dynamic NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2a (PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2b (Dynamic PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3a (SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3b (Dynamic SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 4 (NEFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 5 (Avg F) | 0 | 0 | 0 | 0 | 0 | 0 |
| *GOA* | *Fix M* | HCR 1a (NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 1b (Dynamic NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2a (PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2b (Dynamic PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3a (SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3b (Dynamic SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 4 (NEFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 5 (Avg F) | 0 | 0 | 0 | 0 | 0 | 0 |
|  | *Est M* | HCR 1a (NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 1b (Dynamic NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2a (PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2b (Dynamic PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3a (SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3b (Dynamic SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 4 (NEFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 5 (Avg F) | 0 | 0 | 0 | 0 | 0 | 0 |

**Supplementary Table 6.PM-7.** Summary of performance metric 7 (probability that the population is undergoing overfishing as determined from the OM) across OMs for **Arrowtooth flounder**.

| **System** | **EM** | **HCR** | **1. SS fix M** | **2. w Ricker** | **3. SS est M** | **4. w Ricker** | **5. MS** | **6. w Ricker** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *EBS* | *Fix M* | HCR 1a (NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 1b (Dynamic NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2a (PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2b (Dynamic PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3a (SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3b (Dynamic SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 4 (NEFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 5 (Avg F) | 0 | 0 | 0 | 0 | 0 | 0 |
|  | *Est M* | HCR 1a (NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 1b (Dynamic NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2a (PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2b (Dynamic PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3a (SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3b (Dynamic SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 4 (NEFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 5 (Avg F) | 0 | 0 | 0 | 0 | 0 | 0 |
| *GOA* | *Fix M* | HCR 1a (NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 1b (Dynamic NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2a (PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2b (Dynamic PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3a (SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3b (Dynamic SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 4 (NEFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 5 (Avg F) | 0 | 0 | 0 | 0 | 0 | 0 |
|  | *Est M* | HCR 1a (NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 1b (Dynamic NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2a (PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2b (Dynamic PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3a (SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3b (Dynamic SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 4 (NEFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 5 (Avg F) | 0 | 0 | 0 | 0 | 0 | 0 |

**Supplementary Table 6.PM-8.** Summary of performance metric 8 (probability that the population is overfished as determined from the OM) across OMs for **Arrowtooth flounder**.

| **System** | **EM** | **HCR** | **1. SS fix M** | **2. w Ricker** | **3. SS est M** | **4. w Ricker** | **5. MS** | **6. w Ricker** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *EBS* | *Fix M* | HCR 1a (NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 1b (Dynamic NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2a (PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2b (Dynamic PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3a (SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3b (Dynamic SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 4 (NEFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 5 (Avg F) | 0 | 0 | 0 | 0 | 0 | 0 |
|  | *Est M* | HCR 1a (NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 1b (Dynamic NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2a (PFMC) | 0 | 0 | 0 | 0 | 0.01 | 0 |
|  |  | HCR 2b (Dynamic PFMC) | 0 | 0 | 0 | 0 | 0.01 | 0 |
|  |  | HCR 3a (SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3b (Dynamic SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 4 (NEFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 5 (Avg F) | 0 | 0 | 0 | 0 | 0 | 0 |
| *GOA* | *Fix M* | HCR 1a (NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 1b (Dynamic NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2a (PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2b (Dynamic PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3a (SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3b (Dynamic SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 4 (NEFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 5 (Avg F) | 0 | 0 | 0 | 0 | 0 | 0 |
|  | *Est M* | HCR 1a (NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 1b (Dynamic NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2a (PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2b (Dynamic PFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3a (SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3b (Dynamic SESSF) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 4 (NEFMC) | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 5 (Avg F) | 0 | 0 | 0 | 0 | 0 | 0 |

**Supplementary Table 6.PM-9.** Summary of performance metric 9 (terminal spawning stock biomass depletion) across OMs for **Arrowtooth flounder**.

| **System** | **EM** | **HCR** | **1. SS fix M** | **2. w Ricker** | **3. SS est M** | **4. w Ricker** | **5. MS** | **6. w Ricker** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *EBS* | *Fix M* | HCR 1a (NPFMC) | 0.44 | 0.61 | 0.54 | 0.78 | 0.58 | 0.8 |
|  |  | HCR 1b (Dynamic NPFMC) | 0.43 | 0.49 | 0.55 | 0.58 | 0.59 | 0.8 |
|  |  | HCR 2a (PFMC) | 0.42 | 0.59 | 0.52 | 0.76 | 0.56 | 0.77 |
|  |  | HCR 2b (Dynamic PFMC) | 0.42 | 0.47 | 0.53 | 0.56 | 0.56 | 0.77 |
|  |  | HCR 3a (SESSF) | 0.51 | 0.73 | 0.6 | 0.88 | 0.65 | 0.89 |
|  |  | HCR 3b (Dynamic SESSF) | 0.51 | 0.58 | 0.62 | 0.65 | 0.65 | 0.88 |
|  |  | HCR 4 (NEFMC) | 0.58 | 0.83 | 0.67 | 0.97 | 0.71 | 0.97 |
|  |  | HCR 5 (Avg F) | 0.79 | 1.06 | 0.84 | 1.17 | 0.89 | 1.15 |
|  | *Est M* | HCR 1a (NPFMC) | 0.43 | 0.59 | 0.42 | 0.58 | 0.46 | 0.61 |
|  |  | HCR 1b (Dynamic NPFMC) | 0.42 | 0.47 | 0.42 | 0.42 | 0.45 | 0.61 |
|  |  | HCR 2a (PFMC) | 0.41 | 0.57 | 0.39 | 0.52 | 0.42 | 0.55 |
|  |  | HCR 2b (Dynamic PFMC) | 0.41 | 0.45 | 0.4 | 0.38 | 0.42 | 0.55 |
|  |  | HCR 3a (SESSF) | 0.49 | 0.71 | 0.49 | 0.71 | 0.53 | 0.74 |
|  |  | HCR 3b (Dynamic SESSF) | 0.5 | 0.56 | 0.5 | 0.52 | 0.53 | 0.74 |
|  |  | HCR 4 (NEFMC) | 0.57 | 0.81 | 0.55 | 0.81 | 0.59 | 0.82 |
|  |  | HCR 5 (Avg F) | 0.79 | 1.06 | 0.84 | 1.17 | 0.89 | 1.15 |
| *GOA* | *Fix M* | HCR 1a (NPFMC) | 0.42 | 0.63 | 0.48 | 0.67 | 0.5 | 0.68 |
|  |  | HCR 1b (Dynamic NPFMC) | 0.44 | 0.5 | 0.5 | 0.53 | 0.5 | 0.68 |
|  |  | HCR 2a (PFMC) | 0.4 | 0.6 | 0.46 | 0.65 | 0.48 | 0.64 |
|  |  | HCR 2b (Dynamic PFMC) | 0.42 | 0.48 | 0.48 | 0.51 | 0.48 | 0.64 |
|  |  | HCR 3a (SESSF) | 0.49 | 0.74 | 0.55 | 0.78 | 0.57 | 0.79 |
|  |  | HCR 3b (Dynamic SESSF) | 0.52 | 0.59 | 0.57 | 0.61 | 0.57 | 0.79 |
|  |  | HCR 4 (NEFMC) | 0.55 | 0.82 | 0.61 | 0.86 | 0.63 | 0.88 |
|  |  | HCR 5 (Avg F) | 0.83 | 1.12 | 0.85 | 1.14 | 0.86 | 1.18 |
|  | *Est M* | HCR 1a (NPFMC) | 0.43 | 0.64 | 0.42 | 0.57 | 0.46 | 0.61 |
|  |  | HCR 1b (Dynamic NPFMC) | 0.45 | 0.51 | 0.44 | 0.45 | 0.46 | 0.61 |
|  |  | HCR 2a (PFMC) | 0.41 | 0.62 | 0.39 | 0.51 | 0.43 | 0.55 |
|  |  | HCR 2b (Dynamic PFMC) | 0.43 | 0.49 | 0.41 | 0.4 | 0.43 | 0.55 |
|  |  | HCR 3a (SESSF) | 0.5 | 0.75 | 0.49 | 0.7 | 0.53 | 0.73 |
|  |  | HCR 3b (Dynamic SESSF) | 0.52 | 0.59 | 0.51 | 0.55 | 0.53 | 0.73 |
|  |  | HCR 4 (NEFMC) | 0.56 | 0.83 | 0.54 | 0.77 | 0.58 | 0.8 |
|  |  | HCR 5 (Avg F) | 0.81 | 1.11 | 0.85 | 1.13 | 0.86 | 1.17 |

# Count of dominated systems

**Supplementary Table 7.** Number of times a management strategy performed the best for performance metrics across OMs for **Pollock**. Note, the maximum across experiments for each OM is 9 and across experiments and OMs is 54.

| **System** | **EM** | **HCR** | **1. SS fix M** | **2. w Ricker** | **3. SS est M** | **4. w Ricker** | **5. MS** | **6. w Ricker** | **All OMs** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *EBS* | *Fix M* | HCR 1a (NPFMC) | 3 | 2 | 5 | 3 | 4 | 3 | 20 |
|  |  | HCR 1b (Dynamic NPFMC) | 4 | 2 | 4 | 2 | 4 | 3 | 19 |
|  |  | HCR 2a (PFMC) | 2 | 2 | 2 | 3 | 3 | 3 | 15 |
|  |  | HCR 2b (Dynamic PFMC) | 3 | 3 | 4 | 3 | 3 | 3 | 19 |
|  |  | HCR 3a (SESSF) | 5 | 3 | 5 | 5 | 5 | 3 | 26 |
|  |  | HCR 3b (Dynamic SESSF) | 5 | 5 | 5 | 5 | 5 | 5 | 30 |
|  |  | HCR 4 (NEFMC) | 5 | 5 | 5 | 5 | 5 | 4 | 29 |
|  |  | HCR 5 (Avg F) | 4 | 5 | 6 | 6 | 5 | 7 | 33 |
|  | *Est M* | HCR 1a (NPFMC) | 1 | 1 | 2 | 2 | 1 | 1 | 8 |
|  |  | HCR 1b (Dynamic NPFMC) | 4 | 2 | 4 | 3 | 2 | 2 | 17 |
|  |  | HCR 2a (PFMC) | 1 | 1 | 1 | 1 | 2 | 1 | 7 |
|  |  | HCR 2b (Dynamic PFMC) | 1 | 1 | 1 | 1 | 2 | 1 | 7 |
|  |  | HCR 3a (SESSF) | 2 | 3 | 2 | 3 | 3 | 2 | 15 |
|  |  | HCR 3b (Dynamic SESSF) | 5 | 3 | 5 | 3 | 5 | 2 | 23 |
|  |  | HCR 4 (NEFMC) | 3 | 2 | 3 | 3 | 4 | 2 | 17 |
|  |  | HCR 5 (Avg F) | 7 | 8 | 5 | 6 | 8 | 6 | **40** |
| *GOA* | *Fix M* | HCR 1a (NPFMC) | 0 | 1 | 0 | 3 | 4 | 3 | 11 |
|  |  | HCR 1b (Dynamic NPFMC) | 2 | 2 | 2 | 2 | 3 | 4 | 15 |
|  |  | HCR 2a (PFMC) | 1 | 2 | 1 | 1 | 4 | 4 | 13 |
|  |  | HCR 2b (Dynamic PFMC) | 2 | 2 | 2 | 2 | 4 | 4 | 16 |
|  |  | HCR 3a (SESSF) | 2 | 5 | 2 | 5 | 5 | 5 | 24 |
|  |  | HCR 3b (Dynamic SESSF) | 5 | 4 | 4 | 4 | 5 | 5 | 27 |
|  |  | HCR 4 (NEFMC) | 5 | 7 | 3 | 5 | 5 | 6 | 31 |
|  |  | HCR 5 (Avg F) | 3 | 5 | 3 | 4 | 4 | 4 | 23 |
|  | *Est M* | HCR 1a (NPFMC) | 0 | 1 | 0 | 2 | 1 | 0 | 4 |
|  |  | HCR 1b (Dynamic NPFMC) | 1 | 0 | 2 | 2 | 2 | 0 | 7 |
|  |  | HCR 2a (PFMC) | 0 | 1 | 1 | 2 | 2 | 1 | 7 |
|  |  | HCR 2b (Dynamic PFMC) | 1 | 0 | 2 | 2 | 2 | 3 | 10 |
|  |  | HCR 3a (SESSF) | 1 | 1 | 2 | 5 | 2 | 3 | 14 |
|  |  | HCR 3b (Dynamic SESSF) | 1 | 1 | 5 | 4 | 2 | 2 | 15 |
|  |  | HCR 4 (NEFMC) | 1 | 2 | 4 | 6 | 3 | 2 | 18 |
|  |  | HCR 5 (Avg F) | 4 | 6 | 3 | 4 | 5 | 4 | 26 |

**Supplementary Table 8.** Number of times a management strategy performed the best for performance metrics across OMs for **Cod**. Note, the maximum across experiments for each OM is 9 and across experiments and OMs is 54.

| **System** | **EM** | **HCR** | **1. SS fix M** | **2. w Ricker** | **3. SS est M** | **4. w Ricker** | **5. MS** | **6. w Ricker** | **All OMs** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *EBS* | *Fix M* | HCR 1a (NPFMC) | 3 | 5 | 4 | 5 | 5 | 5 | 27 |
|  |  | HCR 1b (Dynamic NPFMC) | 5 | 5 | 5 | 5 | 5 | 5 | 30 |
|  |  | HCR 2a (PFMC) | 2 | 3 | 2 | 3 | 3 | 3 | 16 |
|  |  | HCR 2b (Dynamic PFMC) | 4 | 4 | 4 | 4 | 4 | 4 | 24 |
|  |  | HCR 3a (SESSF) | 5 | 5 | 5 | 5 | 5 | 5 | 30 |
|  |  | HCR 3b (Dynamic SESSF) | 5 | 5 | 5 | 5 | 5 | 5 | 30 |
|  |  | HCR 4 (NEFMC) | 7 | 7 | 5 | 7 | 5 | 7 | **38** |
|  |  | HCR 5 (Avg F) | 5 | 4 | 5 | 5 | 5 | 4 | 28 |
|  | *Est M* | HCR 1a (NPFMC) | 3 | 5 | 4 | 5 | 5 | 5 | 27 |
|  |  | HCR 1b (Dynamic NPFMC) | 5 | 5 | 5 | 5 | 5 | 5 | 30 |
|  |  | HCR 2a (PFMC) | 2 | 3 | 2 | 2 | 3 | 3 | 15 |
|  |  | HCR 2b (Dynamic PFMC) | 4 | 4 | 4 | 3 | 4 | 4 | 23 |
|  |  | HCR 3a (SESSF) | 5 | 5 | 5 | 5 | 5 | 5 | 30 |
|  |  | HCR 3b (Dynamic SESSF) | 5 | 5 | 5 | 5 | 5 | 5 | 30 |
|  |  | HCR 4 (NEFMC) | 5 | 5 | 7 | 5 | 7 | 5 | 34 |
|  |  | HCR 5 (Avg F) | 3 | 4 | 3 | 4 | 3 | 4 | 21 |
| *GOA* | *Fix M* | HCR 1a (NPFMC) | 0 | 2 | 0 | 1 | 1 | 2 | 6 |
|  |  | HCR 1b (Dynamic NPFMC) | 2 | 0 | 1 | 0 | 1 | 1 | 5 |
|  |  | HCR 2a (PFMC) | 1 | 1 | 0 | 0 | 2 | 2 | 6 |
|  |  | HCR 2b (Dynamic PFMC) | 1 | 1 | 1 | 1 | 2 | 2 | 8 |
|  |  | HCR 3a (SESSF) | 2 | 2 | 1 | 1 | 2 | 2 | 10 |
|  |  | HCR 3b (Dynamic SESSF) | 5 | 4 | 2 | 3 | 4 | 4 | 22 |
|  |  | HCR 4 (NEFMC) | 1 | 4 | 2 | 2 | 2 | 2 | 13 |
|  |  | HCR 5 (Avg F) | 1 | 1 | 1 | 1 | 2 | 2 | 8 |
|  | *Est M* | HCR 1a (NPFMC) | 1 | 2 | 0 | 0 | 1 | 1 | 5 |
|  |  | HCR 1b (Dynamic NPFMC) | 2 | 1 | 0 | 1 | 1 | 2 | 7 |
|  |  | HCR 2a (PFMC) | 1 | 1 | 1 | 1 | 2 | 2 | 8 |
|  |  | HCR 2b (Dynamic PFMC) | 2 | 1 | 1 | 1 | 2 | 2 | 9 |
|  |  | HCR 3a (SESSF) | 2 | 3 | 2 | 3 | 3 | 3 | 16 |
|  |  | HCR 3b (Dynamic SESSF) | 6 | 5 | 3 | 3 | 4 | 4 | 25 |
|  |  | HCR 4 (NEFMC) | 5 | 7 | 5 | 5 | 6 | 6 | 34 |
|  |  | HCR 5 (Avg F) | 1 | 1 | 1 | 1 | 2 | 2 | 8 |

**Supplementary Table 9.** Number of times a management strategy performed the best for performance metrics across OMs for **Arrowtooth flounder**. Note, the maximum across experiments for each OM is 9 and across experiments and OMs is 54.

| **System** | **EM** | **HCR** | **1. SS fix M** | **2. w Ricker** | **3. SS est M** | **4. w Ricker** | **5. MS** | **6. w Ricker** | **All OMs** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *EBS* | *Fix M* | HCR 1a (NPFMC) | 5 | 5 | 5 | 5 | 5 | 5 | 30 |
|  |  | HCR 1b (Dynamic NPFMC) | 5 | 5 | 5 | 5 | 5 | 5 | 30 |
|  |  | HCR 2a (PFMC) | 5 | 5 | 5 | 5 | 5 | 5 | 30 |
|  |  | HCR 2b (Dynamic PFMC) | 5 | 5 | 5 | 5 | 5 | 5 | 30 |
|  |  | HCR 3a (SESSF) | 5 | 5 | 5 | 5 | 5 | 5 | 30 |
|  |  | HCR 3b (Dynamic SESSF) | 5 | 5 | 5 | 5 | 5 | 5 | 30 |
|  |  | HCR 4 (NEFMC) | 5 | 5 | 5 | 5 | 5 | 5 | 30 |
|  |  | HCR 5 (Avg F) | 6 | 7 | 7 | 7 | 7 | 7 | **41** |
|  | *Est M* | HCR 1a (NPFMC) | 5 | 5 | 5 | 5 | 4 | 5 | 29 |
|  |  | HCR 1b (Dynamic NPFMC) | 5 | 5 | 5 | 4 | 4 | 5 | 28 |
|  |  | HCR 2a (PFMC) | 6 | 6 | 5 | 6 | 5 | 5 | 33 |
|  |  | HCR 2b (Dynamic PFMC) | 6 | 6 | 6 | 5 | 4 | 5 | 32 |
|  |  | HCR 3a (SESSF) | 5 | 5 | 5 | 5 | 5 | 5 | 30 |
|  |  | HCR 3b (Dynamic SESSF) | 5 | 5 | 5 | 5 | 5 | 5 | 30 |
|  |  | HCR 4 (NEFMC) | 5 | 5 | 5 | 5 | 5 | 5 | 30 |
|  |  | HCR 5 (Avg F) | 6 | 5 | 6 | 6 | 6 | 6 | 35 |
| *GOA* | *Fix M* | HCR 1a (NPFMC) | 5 | 5 | 5 | 5 | 5 | 5 | 30 |
|  |  | HCR 1b (Dynamic NPFMC) | 5 | 5 | 5 | 5 | 5 | 5 | 30 |
|  |  | HCR 2a (PFMC) | 6 | 5 | 6 | 6 | 5 | 5 | 33 |
|  |  | HCR 2b (Dynamic PFMC) | 5 | 6 | 5 | 5 | 6 | 6 | 33 |
|  |  | HCR 3a (SESSF) | 5 | 5 | 5 | 5 | 5 | 5 | 30 |
|  |  | HCR 3b (Dynamic SESSF) | 5 | 5 | 5 | 5 | 5 | 5 | 30 |
|  |  | HCR 4 (NEFMC) | 5 | 5 | 5 | 5 | 5 | 5 | 30 |
|  |  | HCR 5 (Avg F) | 7 | 7 | 6 | 6 | 7 | 7 | 40 |
|  | *Est M* | HCR 1a (NPFMC) | 5 | 5 | 5 | 5 | 5 | 5 | 30 |
|  |  | HCR 1b (Dynamic NPFMC) | 5 | 5 | 5 | 5 | 5 | 5 | 30 |
|  |  | HCR 2a (PFMC) | 5 | 5 | 4 | 5 | 6 | 5 | 30 |
|  |  | HCR 2b (Dynamic PFMC) | 6 | 6 | 5 | 6 | 5 | 6 | 34 |
|  |  | HCR 3a (SESSF) | 5 | 5 | 5 | 5 | 5 | 5 | 30 |
|  |  | HCR 3b (Dynamic SESSF) | 5 | 5 | 5 | 5 | 5 | 5 | 30 |
|  |  | HCR 4 (NEFMC) | 5 | 5 | 5 | 5 | 5 | 5 | 30 |
|  |  | HCR 5 (Avg F) | 5 | 5 | 6 | 6 | 5 | 5 | 32 |

# Count of dominated systems for economic PMs

**Supplementary Table 10.** Number of times a management strategy performed the best for economic performance metrics (1-3) across OMs for **Pollock**. Note, the maximum across experiments for each OM is 3 and across experiments and OMs is 18.

| **System** | **EM** | **HCR** | **1. SS fix M** | **2. w Ricker** | **3. SS est M** | **4. w Ricker** | **5. MS** | **6. w Ricker** | **All OMs** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *EBS* | *Fix M* | HCR 1a (NPFMC) | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
|  |  | HCR 1b (Dynamic NPFMC) | 1 | 0 | 1 | 0 | 0 | 0 | 2 |
|  |  | HCR 2a (PFMC) | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
|  |  | HCR 2b (Dynamic PFMC) | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
|  |  | HCR 3a (SESSF) | 1 | 0 | 1 | 1 | 1 | 0 | 4 |
|  |  | HCR 3b (Dynamic SESSF) | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
|  |  | HCR 4 (NEFMC) | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
|  |  | HCR 5 (Avg F) | 1 | 1 | 2 | 2 | 1 | 2 | **9** |
|  | *Est M* | HCR 1a (NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 1b (Dynamic NPFMC) | 2 | 1 | 1 | 1 | 1 | 1 | 7 |
|  |  | HCR 2a (PFMC) | 1 | 1 | 1 | 1 | 1 | 0 | 5 |
|  |  | HCR 2b (Dynamic PFMC) | 1 | 1 | 1 | 1 | 1 | 0 | 5 |
|  |  | HCR 3a (SESSF) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3b (Dynamic SESSF) | 1 | 0 | 1 | 0 | 1 | 0 | 3 |
|  |  | HCR 4 (NEFMC) | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
|  |  | HCR 5 (Avg F) | 2 | 2 | 1 | 1 | 2 | 1 | **9** |
| *GOA* | *Fix M* | HCR 1a (NPFMC) | 0 | 0 | 0 | 1 | 1 | 0 | 2 |
|  |  | HCR 1b (Dynamic NPFMC) | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
|  |  | HCR 2a (PFMC) | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
|  |  | HCR 2b (Dynamic PFMC) | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
|  |  | HCR 3a (SESSF) | 0 | 1 | 0 | 1 | 1 | 1 | 4 |
|  |  | HCR 3b (Dynamic SESSF) | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
|  |  | HCR 4 (NEFMC) | 2 | 2 | 1 | 1 | 1 | 2 | **9** |
|  |  | HCR 5 (Avg F) | 1 | 1 | 1 | 1 | 2 | 1 | 7 |
|  | *Est M* | HCR 1a (NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 1b (Dynamic NPFMC) | 1 | 0 | 1 | 1 | 1 | 0 | 4 |
|  |  | HCR 2a (PFMC) | 0 | 1 | 1 | 1 | 1 | 0 | 4 |
|  |  | HCR 2b (Dynamic PFMC) | 1 | 0 | 1 | 1 | 1 | 1 | 5 |
|  |  | HCR 3a (SESSF) | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
|  |  | HCR 3b (Dynamic SESSF) | 0 | 0 | 1 | 1 | 0 | 0 | 2 |
|  |  | HCR 4 (NEFMC) | 1 | 1 | 2 | 2 | 1 | 1 | 8 |
|  |  | HCR 5 (Avg F) | 1 | 2 | 1 | 1 | 1 | 1 | 7 |

**Supplementary Table 11.** Number of times a management strategy performed the best for economic performance metrics (1-3) across OMs for **Cod**. Note, the maximum across experiments for each OM is 3 and across experiments and OMs is 18.

| **System** | **EM** | **HCR** | **1. SS fix M** | **2. w Ricker** | **3. SS est M** | **4. w Ricker** | **5. MS** | **6. w Ricker** | **All OMs** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *EBS* | *Fix M* | HCR 1a (NPFMC) | 0 | 1 | 1 | 1 | 1 | 1 | 5 |
|  |  | HCR 1b (Dynamic NPFMC) | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
|  |  | HCR 2a (PFMC) | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
|  |  | HCR 2b (Dynamic PFMC) | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
|  |  | HCR 3a (SESSF) | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
|  |  | HCR 3b (Dynamic SESSF) | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
|  |  | HCR 4 (NEFMC) | 2 | 2 | 1 | 2 | 1 | 2 | 10 |
|  |  | HCR 5 (Avg F) | 2 | 2 | 2 | 2 | 2 | 2 | **12** |
|  | *Est M* | HCR 1a (NPFMC) | 0 | 1 | 1 | 1 | 1 | 1 | 5 |
|  |  | HCR 1b (Dynamic NPFMC) | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
|  |  | HCR 2a (PFMC) | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
|  |  | HCR 2b (Dynamic PFMC) | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
|  |  | HCR 3a (SESSF) | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
|  |  | HCR 3b (Dynamic SESSF) | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
|  |  | HCR 4 (NEFMC) | 1 | 1 | 2 | 1 | 2 | 1 | 8 |
|  |  | HCR 5 (Avg F) | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
| *GOA* | *Fix M* | HCR 1a (NPFMC) | 0 | 1 | 0 | 1 | 0 | 1 | 3 |
|  |  | HCR 1b (Dynamic NPFMC) | 1 | 0 | 1 | 0 | 1 | 0 | 3 |
|  |  | HCR 2a (PFMC) | 1 | 1 | 0 | 0 | 1 | 1 | 4 |
|  |  | HCR 2b (Dynamic PFMC) | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
|  |  | HCR 3a (SESSF) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3b (Dynamic SESSF) | 1 | 1 | 0 | 1 | 1 | 1 | 5 |
|  |  | HCR 4 (NEFMC) | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
|  |  | HCR 5 (Avg F) | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
|  | *Est M* | HCR 1a (NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 1b (Dynamic NPFMC) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 2a (PFMC) | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
|  |  | HCR 2b (Dynamic PFMC) | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
|  |  | HCR 3a (SESSF) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  | HCR 3b (Dynamic SESSF) | 1 | 1 | 0 | 0 | 1 | 1 | 4 |
|  |  | HCR 4 (NEFMC) | 2 | 2 | 2 | 2 | 2 | 2 | **12** |
|  |  | HCR 5 (Avg F) | 1 | 1 | 1 | 1 | 1 | 1 | 6 |

**Supplementary Table 12.** Number of times a management strategy performed the best for economic performance metrics (1-3) across OMs for **Arrowtooth flounder**. Note, the maximum across experiments for each OM is 3 and across experiments and OMs is 18.

| **System** | **EM** | **HCR** | **1. SS fix M** | **2. w Ricker** | **3. SS est M** | **4. w Ricker** | **5. MS** | **6. w Ricker** | **All OMs** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *EBS* | *Fix M* | HCR 1a (NPFMC) | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
|  |  | HCR 1b (Dynamic NPFMC) | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
|  |  | HCR 2a (PFMC) | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
|  |  | HCR 2b (Dynamic PFMC) | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
|  |  | HCR 3a (SESSF) | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
|  |  | HCR 3b (Dynamic SESSF) | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
|  |  | HCR 4 (NEFMC) | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
|  |  | HCR 5 (Avg F) | 2 | 2 | 1 | 1 | 1 | 1 | 8 |
|  | *Est M* | HCR 1a (NPFMC) | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
|  |  | HCR 1b (Dynamic NPFMC) | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
|  |  | HCR 2a (PFMC) | 1 | 1 | 1 | 2 | 2 | 1 | 8 |
|  |  | HCR 2b (Dynamic PFMC) | 2 | 2 | 2 | 1 | 1 | 2 | **10** |
|  |  | HCR 3a (SESSF) | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
|  |  | HCR 3b (Dynamic SESSF) | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
|  |  | HCR 4 (NEFMC) | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
|  |  | HCR 5 (Avg F) | 1 | 1 | 2 | 2 | 2 | 2 | **10** |
| *GOA* | *Fix M* | HCR 1a (NPFMC) | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
|  |  | HCR 1b (Dynamic NPFMC) | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
|  |  | HCR 2a (PFMC) | 2 | 1 | 1 | 1 | 1 | 1 | 7 |
|  |  | HCR 2b (Dynamic PFMC) | 1 | 2 | 1 | 1 | 1 | 1 | 7 |
|  |  | HCR 3a (SESSF) | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
|  |  | HCR 3b (Dynamic SESSF) | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
|  |  | HCR 4 (NEFMC) | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
|  |  | HCR 5 (Avg F) | 2 | 2 | 1 | 1 | 2 | 2 | **10** |
|  | *Est M* | HCR 1a (NPFMC) | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
|  |  | HCR 1b (Dynamic NPFMC) | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
|  |  | HCR 2a (PFMC) | 1 | 1 | 1 | 1 | 2 | 1 | 7 |
|  |  | HCR 2b (Dynamic PFMC) | 1 | 1 | 2 | 2 | 1 | 2 | 9 |
|  |  | HCR 3a (SESSF) | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
|  |  | HCR 3b (Dynamic SESSF) | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
|  |  | HCR 4 (NEFMC) | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
|  |  | HCR 5 (Avg F) | 1 | 1 | 2 | 2 | 1 | 1 | 8 |

# Count of dominated systems for conservation PMs

**Supplementary Table 13.** Number of times a management strategy performed the best for conservation performance metrics (5-9) across OMs for **Pollock**. Note, the maximum across experiments for each OM is 5 and across experiments and OMs is 30.

| **System** | **EM** | **HCR** | **1. SS fix M** | **2. w Ricker** | **3. SS est M** | **4. w Ricker** | **5. MS** | **6. w Ricker** | **All OMs** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *EBS* | *Fix M* | HCR 1a (NPFMC) | 3 | 2 | 4 | 3 | 4 | 3 | 19 |
|  |  | HCR 1b (Dynamic NPFMC) | 3 | 2 | 3 | 2 | 4 | 3 | 17 |
|  |  | HCR 2a (PFMC) | 1 | 1 | 1 | 2 | 2 | 2 | 9 |
|  |  | HCR 2b (Dynamic PFMC) | 2 | 2 | 3 | 2 | 2 | 2 | 13 |
|  |  | HCR 3a (SESSF) | 4 | 3 | 4 | 4 | 4 | 3 | 22 |
|  |  | HCR 3b (Dynamic SESSF) | 4 | 4 | 4 | 4 | 4 | 4 | 24 |
|  |  | HCR 4 (NEFMC) | 4 | 4 | 4 | 4 | 4 | 3 | 23 |
|  |  | HCR 5 (Avg F) | 3 | 4 | 3 | 3 | 4 | 4 | 21 |
|  | *Est M* | HCR 1a (NPFMC) | 1 | 1 | 2 | 2 | 1 | 1 | 8 |
|  |  | HCR 1b (Dynamic NPFMC) | 2 | 1 | 3 | 2 | 1 | 1 | 10 |
|  |  | HCR 2a (PFMC) | 0 | 0 | 0 | 0 | 1 | 1 | 2 |
|  |  | HCR 2b (Dynamic PFMC) | 0 | 0 | 0 | 0 | 1 | 1 | 2 |
|  |  | HCR 3a (SESSF) | 2 | 3 | 2 | 3 | 3 | 2 | 15 |
|  |  | HCR 3b (Dynamic SESSF) | 4 | 3 | 4 | 3 | 4 | 2 | 20 |
|  |  | HCR 4 (NEFMC) | 2 | 1 | 2 | 2 | 3 | 1 | 11 |
|  |  | HCR 5 (Avg F) | 4 | 5 | 4 | 5 | 5 | 5 | **28** |
| *GOA* | *Fix M* | HCR 1a (NPFMC) | 0 | 1 | 0 | 2 | 3 | 3 | 9 |
|  |  | HCR 1b (Dynamic NPFMC) | 1 | 1 | 1 | 1 | 2 | 3 | 9 |
|  |  | HCR 2a (PFMC) | 0 | 1 | 0 | 0 | 3 | 3 | 7 |
|  |  | HCR 2b (Dynamic PFMC) | 1 | 1 | 1 | 1 | 3 | 3 | 10 |
|  |  | HCR 3a (SESSF) | 2 | 4 | 2 | 4 | 4 | 4 | 20 |
|  |  | HCR 3b (Dynamic SESSF) | 4 | 3 | 3 | 3 | 4 | 4 | 21 |
|  |  | HCR 4 (NEFMC) | 3 | 5 | 1 | 3 | 4 | 4 | 20 |
|  |  | HCR 5 (Avg F) | 2 | 4 | 2 | 3 | 2 | 3 | 16 |
|  | *Est M* | HCR 1a (NPFMC) | 0 | 1 | 0 | 2 | 1 | 0 | 4 |
|  |  | HCR 1b (Dynamic NPFMC) | 0 | 0 | 1 | 1 | 1 | 0 | 3 |
|  |  | HCR 2a (PFMC) | 0 | 0 | 0 | 1 | 1 | 1 | 3 |
|  |  | HCR 2b (Dynamic PFMC) | 0 | 0 | 1 | 1 | 1 | 1 | 4 |
|  |  | HCR 3a (SESSF) | 1 | 1 | 2 | 4 | 2 | 3 | 13 |
|  |  | HCR 3b (Dynamic SESSF) | 1 | 1 | 4 | 3 | 2 | 2 | 13 |
|  |  | HCR 4 (NEFMC) | 0 | 1 | 2 | 4 | 2 | 1 | 10 |
|  |  | HCR 5 (Avg F) | 2 | 3 | 2 | 3 | 3 | 3 | 16 |

**Supplementary Table 14.** Number of times a management strategy performed the best for conservation performance metrics (5-9) across OMs for **Cod**. Note, the maximum across experiments for each OM is 5 and across experiments and OMs is 30.

| **System** | **EM** | **HCR** | **1. SS fix M** | **2. w Ricker** | **3. SS est M** | **4. w Ricker** | **5. MS** | **6. w Ricker** | **All OMs** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *EBS* | *Fix M* | HCR 1a (NPFMC) | 3 | 4 | 3 | 4 | 4 | 4 | 22 |
|  |  | HCR 1b (Dynamic NPFMC) | 4 | 4 | 4 | 4 | 4 | 4 | 24 |
|  |  | HCR 2a (PFMC) | 1 | 2 | 1 | 2 | 2 | 2 | 10 |
|  |  | HCR 2b (Dynamic PFMC) | 3 | 3 | 3 | 3 | 3 | 3 | 18 |
|  |  | HCR 3a (SESSF) | 4 | 4 | 4 | 4 | 4 | 4 | 24 |
|  |  | HCR 3b (Dynamic SESSF) | 4 | 4 | 4 | 4 | 4 | 4 | 24 |
|  |  | HCR 4 (NEFMC) | 5 | 5 | 4 | 5 | 4 | 5 | **28** |
|  |  | HCR 5 (Avg F) | 2 | 2 | 2 | 2 | 2 | 2 | 12 |
|  | *Est M* | HCR 1a (NPFMC) | 3 | 4 | 3 | 4 | 4 | 4 | 22 |
|  |  | HCR 1b (Dynamic NPFMC) | 4 | 4 | 4 | 4 | 4 | 4 | 24 |
|  |  | HCR 2a (PFMC) | 1 | 2 | 1 | 1 | 2 | 2 | 9 |
|  |  | HCR 2b (Dynamic PFMC) | 3 | 3 | 3 | 2 | 3 | 3 | 17 |
|  |  | HCR 3a (SESSF) | 4 | 4 | 4 | 4 | 4 | 4 | 24 |
|  |  | HCR 3b (Dynamic SESSF) | 4 | 4 | 4 | 4 | 4 | 4 | 24 |
|  |  | HCR 4 (NEFMC) | 4 | 4 | 5 | 4 | 5 | 4 | 26 |
|  |  | HCR 5 (Avg F) | 2 | 2 | 2 | 3 | 2 | 2 | 13 |
| *GOA* | *Fix M* | HCR 1a (NPFMC) | 0 | 1 | 0 | 0 | 1 | 1 | 3 |
|  |  | HCR 1b (Dynamic NPFMC) | 1 | 0 | 0 | 0 | 0 | 1 | 2 |
|  |  | HCR 2a (PFMC) | 0 | 0 | 0 | 0 | 1 | 1 | 2 |
|  |  | HCR 2b (Dynamic PFMC) | 0 | 0 | 0 | 0 | 1 | 1 | 2 |
|  |  | HCR 3a (SESSF) | 2 | 2 | 1 | 1 | 2 | 2 | 10 |
|  |  | HCR 3b (Dynamic SESSF) | 4 | 3 | 2 | 2 | 3 | 3 | 17 |
|  |  | HCR 4 (NEFMC) | 0 | 3 | 0 | 0 | 1 | 1 | 5 |
|  |  | HCR 5 (Avg F) | 0 | 0 | 0 | 0 | 1 | 1 | 2 |
|  | *Est M* | HCR 1a (NPFMC) | 1 | 2 | 0 | 0 | 1 | 1 | 5 |
|  |  | HCR 1b (Dynamic NPFMC) | 2 | 1 | 0 | 1 | 1 | 2 | 7 |
|  |  | HCR 2a (PFMC) | 0 | 0 | 0 | 0 | 1 | 1 | 2 |
|  |  | HCR 2b (Dynamic PFMC) | 1 | 0 | 0 | 0 | 1 | 1 | 3 |
|  |  | HCR 3a (SESSF) | 2 | 3 | 2 | 3 | 3 | 3 | 16 |
|  |  | HCR 3b (Dynamic SESSF) | 5 | 4 | 3 | 3 | 3 | 3 | 21 |
|  |  | HCR 4 (NEFMC) | 2 | 4 | 3 | 3 | 3 | 3 | 18 |
|  |  | HCR 5 (Avg F) | 0 | 0 | 0 | 0 | 1 | 1 | 2 |

**Supplementary Table 15.** Number of times a management strategy performed the best for conservation performance metrics (5-9) across OMs for **Arrowtooth flounder**. Note, the maximum across experiments for each OM is 5 and across experiments and OMs is 30.

| **System** | **EM** | **HCR** | **1. SS fix M** | **2. w Ricker** | **3. SS est M** | **4. w Ricker** | **5. MS** | **6. w Ricker** | **All OMs** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *EBS* | *Fix M* | HCR 1a (NPFMC) | 4 | 4 | 4 | 4 | 4 | 4 | 24 |
|  |  | HCR 1b (Dynamic NPFMC) | 4 | 4 | 4 | 4 | 4 | 4 | 24 |
|  |  | HCR 2a (PFMC) | 4 | 4 | 4 | 4 | 4 | 4 | 24 |
|  |  | HCR 2b (Dynamic PFMC) | 4 | 4 | 4 | 4 | 4 | 4 | 24 |
|  |  | HCR 3a (SESSF) | 4 | 4 | 4 | 4 | 4 | 4 | 24 |
|  |  | HCR 3b (Dynamic SESSF) | 4 | 4 | 4 | 4 | 4 | 4 | 24 |
|  |  | HCR 4 (NEFMC) | 4 | 4 | 4 | 4 | 4 | 4 | 24 |
|  |  | HCR 5 (Avg F) | 4 | 5 | 5 | 5 | 5 | 5 | 29 |
|  | *Est M* | HCR 1a (NPFMC) | 4 | 4 | 4 | 4 | 3 | 4 | 23 |
|  |  | HCR 1b (Dynamic NPFMC) | 4 | 4 | 4 | 3 | 3 | 4 | 22 |
|  |  | HCR 2a (PFMC) | 4 | 4 | 4 | 4 | 3 | 4 | 23 |
|  |  | HCR 2b (Dynamic PFMC) | 4 | 4 | 4 | 4 | 3 | 3 | 22 |
|  |  | HCR 3a (SESSF) | 4 | 4 | 4 | 4 | 4 | 4 | 24 |
|  |  | HCR 3b (Dynamic SESSF) | 4 | 4 | 4 | 4 | 4 | 4 | 24 |
|  |  | HCR 4 (NEFMC) | 4 | 4 | 4 | 4 | 4 | 4 | 24 |
|  |  | HCR 5 (Avg F) | 5 | 4 | 4 | 4 | 4 | 4 | 25 |
| *GOA* | *Fix M* | HCR 1a (NPFMC) | 4 | 4 | 4 | 4 | 4 | 4 | 24 |
|  |  | HCR 1b (Dynamic NPFMC) | 4 | 4 | 4 | 4 | 4 | 4 | 24 |
|  |  | HCR 2a (PFMC) | 4 | 4 | 4 | 4 | 4 | 4 | 24 |
|  |  | HCR 2b (Dynamic PFMC) | 4 | 4 | 4 | 4 | 4 | 4 | 24 |
|  |  | HCR 3a (SESSF) | 4 | 4 | 4 | 4 | 4 | 4 | 24 |
|  |  | HCR 3b (Dynamic SESSF) | 4 | 4 | 4 | 4 | 4 | 4 | 24 |
|  |  | HCR 4 (NEFMC) | 4 | 4 | 4 | 4 | 4 | 4 | 24 |
|  |  | HCR 5 (Avg F) | 5 | 5 | 5 | 5 | 5 | 5 | **30** |
|  | *Est M* | HCR 1a (NPFMC) | 4 | 4 | 4 | 4 | 4 | 4 | 24 |
|  |  | HCR 1b (Dynamic NPFMC) | 4 | 4 | 4 | 4 | 4 | 4 | 24 |
|  |  | HCR 2a (PFMC) | 4 | 4 | 3 | 4 | 4 | 4 | 23 |
|  |  | HCR 2b (Dynamic PFMC) | 4 | 4 | 3 | 4 | 4 | 4 | 23 |
|  |  | HCR 3a (SESSF) | 4 | 4 | 4 | 4 | 4 | 4 | 24 |
|  |  | HCR 3b (Dynamic SESSF) | 4 | 4 | 4 | 4 | 4 | 4 | 24 |
|  |  | HCR 4 (NEFMC) | 4 | 4 | 4 | 4 | 4 | 4 | 24 |
|  |  | HCR 5 (Avg F) | 4 | 4 | 4 | 4 | 4 | 4 | 24 |