**Stock: Western mackerel**

**Assessment Quality Control Diagram 1**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Average F(4-8,u) | | | | | | | | | | | | | | | |
| Date of assessment | Year | | | | | | | | | | | | | | |
|  | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | |
| 1989 | 0.34 |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |
| 1990 | 0.28 | 0.29 |  |  |  |  |  |  |  |  |  |  |  |  |  | |
| 1991 | 0.28 | 0.25 | 0.31 |  |  |  |  |  |  |  |  |  |  |  |  | |
| 1992 | assessment | - | - | - |  |  |  |  |  |  |  |  |  |  |  | |
| 1993 | 0.21 | 0.18 | 0.20 | 0.24 | 0.27 |  |  |  |  |  |  |  |  |  |  | |
| 1994 | 0.21 | 0.17 | 0.17 | 0.21 | 0.24 | 0.30 |  |  |  |  |  |  |  |  |  | |
| 1995 | 0.200 | 0.156 | 0.163 | 0.183 | 0.225 | 0.313 | 0.319 |  |  |  |  |  |  |  |  | |
| 1996 | 0.220 | 0.170 | 0.176 | 0.194 | 0.230 | 0.308 | 0.301 | 0.307 |  |  |  |  |  |  |  | |
| 1997 | 0.223 | 0.174 | 0.181 | 0.200 | 0.238 | 0.309 | 0.306 | 0.294 | 0.220 |  |  |  |  |  |  | |
| 1998 | # | # | # | # | # | # | # | # | # | # |  |  |  |  |  | |
| 1999 | 0.232 | 0.190 | 0.199 | 0.218 | 0.259 | 0.332 | 0.327 | 0.305 | 0.225 | 0.205 | 0.214 |  |  |  |  | |
| 2000 | 0.233 | 0.191 | 0.199 | 0.219 | 0.259 | 0.332 | 0.326 | 0.301 | 0.221 | 0.204 | 0.215 | 0.198 |  |  |  | |
| 2001 | 0.233 | 0.192 | 0.201 | 0.220 | 0.262 | 0.336 | 0.332 | 0.306 | 0.226 | 0.208 | 0.219 | 0.202 | 0.212 |  |  | |
| 2002 | no assessment |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |
| 2003 | no assessment |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |

Fishing mortalities not directly comparable due to increases in egg survey estimates used to tune the assessment.

# Fishing mortality the same as last year because assessment of Working Group 1997 was maintained.

**Remarks:**

**Stock: Western mackerel**

**Assessment Quality Control Diagram 2**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Recruitment (age 0) Unit: millions | | | | | | | | | | | | | | | |
| Date of assessment | Year class | | | | | | | | | | | | | | |
|  | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | |
| 1989 | 3600 |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |
| 1990 | 6300 | 3900 |  |  |  |  |  |  |  |  |  |  |  |  |  | |
| 1991 | 6900 | 5200 | 3300 |  |  |  |  |  |  |  |  |  |  |  |  | |
| 1992 | assessment | - | - | - |  |  |  |  |  |  |  |  |  |  |  | |
| 1993 | 5855 | 3192 | 6100 | 4700 | 3500 |  |  |  |  |  |  |  |  |  |  | |
| 1994 | 4641 | 2744 | 3110 | 3067 | 3517 | 3517 |  |  |  |  |  |  |  |  |  | |
| 1995 | 4480 | 2452 | 2651 | 2600 | 3909 | 1375 | 3464 |  |  |  |  |  |  |  |  | |
| 1996 | 3328 | 4662 | 2708 | 3036 | 3183 | 4598 | gm | gm |  |  |  |  |  |  |  | |
| 1997 | 4677 | 2802 | 3251 | 3688 | 4874 | 2797 | 4359 | gm | gm |  |  |  |  |  |  | |
| 1998 | # | # | # | # | # | # | # | # | # | # |  |  |  |  |  | |
| 1999 | 4460 | 3038 | 3582 | 4268 | 5696 | 3771 | 4275 | 5969 | 3886 | gm | gm |  |  |  |  | |
| 2000 | 4364 | 3078 | 3667 | 4401 | 5763 | 4002 | 4187 | 4983 | 3389 | 3634 | gm | gm |  |  |  | |
| 2001 | 4270 | 3106 | 3592 | 4380 | 5580 | 4157 | 4188 | 5023 | 3547 | 3240 | 3503 | gm | gm |  |  | |
| 2002 | no assessment |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |
| 2003 | no assessment |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |

Average recruitment. Strong recruitment. 1991 and 1992 year class abundance based on recruitment surveys as (1-2)year olds and (0-1),

respectively. Numbers at age 0 have been calculated by using F and M in 1992 (for the 1992 yearclass) and in 1991 and 1992 (for the 1991 year class).

Geometric mean (gm)

# Recruitment the same as last year because assessment of Working Group 1997 was maintained.

**Remarks:**

**Stock: Western mackerel**

**Assessment Quality Control Diagram 3**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Spawning stock biomass ('000 t) | | | | | | | | | | | | | | | | | |
| Date of assessment | Year | | | | | | | | | | | | | | | | |
|  | | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
| 1989 | | 1713 | 1672  1687 | 19122067 | 2170  2465 |  |  |  |  |  |  |  |  |  |  |  |  |
| 1990 | | 2014 | 1930 | 1970 | 2278 | 2596 |  |  |  |  |  |  |  |  |  |  |  |
| 1991 | | 2028 | 2082 | 1990 | 2214 | 2400 | 2500 |  |  |  |  |  |  |  |  |  |  |
| 1992 | | no | assessment | - | - | - |  |  |  |  |  |  |  |  |  |  |  |
| 1993 | | 2475 | 2483 | 2314 | 2662 | 2786 | 2899 | 2921 | 2776 |  |  |  |  |  |  |  |  |
| 1994 | | 2522 | 2552 | 2406 | 2742 | 2764 | 2452 | 2024 | 1763 | 1577 |  |  |  |  |  |  |  |
| 1995 | | 2821 | 2866 | 2684 | 3028 | 2927 | 2474 | 2035 | 1895 |  |  |  |  |  |  |  |  |
| 1996 | | 2614 | 2629 | 2485 | 2856 | 2852 | 2510 | 2149 | 2126 |  |  |  |  |  |  |  |  |
| 1997 | | 2564 | 2604 | 2461 | 2834 | 2841 | 2530 | 2213 | 2253 | 2130 |  |  |  |  | |  |  |
| 1998 | | # | # | # | # | # | # | # | # | # | # | # |  |  |  |  |  |
| 1999 | | 2472 | 2490 | 2336 | 2679 | 2713 | 2465 | 2219 | 2365 | 2352 | 2432 | 2505 | $ |  |  |  |  |
| 2000 | | 2473 | 2490 | 2337 | 2676 | 2710 | 2474 | 2244 | 2409 | 2413 | 2493 | 2504 | 2739 | $ |  |  |  |
| 2001 | | 2466 | 2485 | 2331 | 2664 | 2695 | 2454 | 2218 | 2370 | 2375 | 2465 | 2484 | 2733 | 2637 | $ | $ |  |
| 2002 | | no assessment |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 2003 | | no assessment |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

Forecast. Average level of recruitment of 3,600 million at age 0. High level recruitment of 6,100 million at age 0. Forecast based on the assumption that the catch in 1993

will be 750,000 tonnes and F94=F92.

**Remarks**

# Spawning stock biomass the same as last year because assessment not repeated..

$ No catch projections done for the Western mackerel component