

Data required for an updated assessment of the South African kingklip resource in 2022

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Abstract

This paper lists the data that are presently available, and data that are still required, for an updated assessment of the South African kingklip resource.

Keywords: kingklip; data requirements

Data: available already and needed

This paper sets out the data that are presently available and data that are still required for an update of the assessment analyses for the South African kingklip resource (the most recent assessments for this report are provided in Brandão (2017); these assessments were based on ASPM models). Tables with the available data are given to check that any recent data updates have been taken into account.

- **Annual Catch Data** (Table 1)
Total annual catches of kingklip for the West and South coasts from hake-directed trawls over the period 1932–2019, and from hake-directed longlining for the periods 1983–2019, are available. Data for 2020 (updated to include all data) and 2021 are needed.
- **Survey abundance estimates** (Table 2)
Survey abundance data for each of the West and South coasts by season are available. For the West coast, data are available until 2020 for the Summer surveys and until 1990 for the Winter surveys. For the South coast, data are available until 2021 for the Autumn survey and until 2008 for the Spring survey. Survey abundance indices for 2021 (if any other survey took place) and for the first half of 2022 are needed.
- **Survey catch-at-length data**
Survey catch-at-length data for each coast are available for most of the years in which a survey was carried out. For the West coast data are available until 2017 (Summer). For the South coast data are available until 2016 for the Autumn and Spring surveys. Survey catch-at-length data for surveys undertaken in the period 2016/2017 and subsequent years are needed; however, to ensure that the latest version (especially of the earlier period) is used in the assessment, it is requested that survey catch-at-length for all surveys be provided.

- **Commercial/observer catch-at-length data**

Previously the following catch-at-length data had been provided:

- Observer commercial catch-at-length data disaggregated by coast and fishery, in the main from 2000 to 2010 for the longline fishery.
- Land based catch-at-length data for the trawl fishery from 2005 to 2015 for the West coast, and in 2001 and from 2008 to 2015 for the South coast.

However, recently observer CAL data was provided by Dave Japp for both the longline and the trawl fisheries. These data need to be considered together with what was previously available, and scaled in the same manner. Therefore, commercial catch-at-length data disaggregated by coast and fishery for all years for which data are available need to be provided anew. Additionally, any historical commercial catch-at-length data prior to 2000 are needed if available.

- **CPUE data** (Table 3)

Coast disaggregated CPUE abundance data for the years 1983 to 1991 for the trawl and longline fisheries are available from Punt and Japp (1994). Might these historical CPUE series be revised and/or updated? CPUE series for some years from 1991 to 2021 are desirably provided; furthermore, a decision is needed as to whether inclusion of these CPUE data in the assessment is acceptable.

Table 4 gives the biological parameters values which have been as used in previous analyses (obtained from Punt and Japp, 1994). This Table is provided here to check that the information is still applicable and has not been updated.

Reference

- Brandão, A. 2017. Updated assessment of the South African kingklip resource that includes catch-at-length data for the one-stock and two-stock hypotheses. DFFE Fisheries document: FISHERIES/2017/JUL/SWG-DEM/20.
- Punt, A.E. and Japp, D.W. 1994. Stock assessment of the kingklip *Genypterus capensis* off South Africa. *S.Afr.J.mar.Sci.* 14: 133–149.

Table 1. Annual catches (in tonness) of kingklip taken by the trawl and longline fisheries on the West and South coasts of South Africa.

| Year | West coast | | South coast | | Year | West coast | | South coast | |
|------|------------|----------|-------------|----------|--------|------------|----------|-------------|----------|
| | Trawl | Longline | Trawl | Longline | | Trawl | Longline | Trawl | Longline |
| 1932 | 436 | 0 | 164 | 0 | 1977 | 1 953 | 0 | 737 | 0 |
| 1933 | 290 | 0 | 110 | 0 | 1978 | 2 551 | 0 | 1 759 | 0 |
| 1934 | 290 | 0 | 110 | 0 | 1979 | 3 080 | 0 | 1 532 | 0 |
| 1935 | 508 | 0 | 192 | 0 | 1980 | 4 415 | 0 | 878 | 0 |
| 1936 | 508 | 0 | 192 | 0 | 1981 | 3 149 | 0 | 963 | 0 |
| 1937 | 508 | 0 | 192 | 0 | 1982 | 2 410 | 0 | 721 | 0 |
| 1938 | 508 | 0 | 192 | 0 | 1983 | 2 246 | 842 | 1 169 | 200 |
| 1939 | 508 | 0 | 192 | 0 | 1984 | 2 558 | 1881 | 1 034 | 1159 |
| 1940 | 508 | 0 | 192 | 0 | 1985 | 1 750 | 1314 | 1 650 | 5656 |
| 1941 | 436 | 0 | 164 | 0 | 1986 | 2 287 | 1231 | 399 | 7453 |
| 1942 | 436 | 0 | 164 | 0 | 1987 | 2 083 | 1948 | 392 | 4504 |
| 1943 | 436 | 0 | 164 | 0 | 1988 | 1 519 | 2091 | 408 | 3311 |
| 1944 | 436 | 0 | 164 | 0 | 1989 | 1 407 | 1607 | 223 | 2209 |
| 1945 | 944 | 0 | 356 | 0 | 1990 | 1 002 | 557 | 266 | 708 |
| 1946 | 726 | 0 | 274 | 0 | 1991 | 1 271 | 0 | 680 | 0 |
| 1947 | 798 | 0 | 302 | 0 | 1992 | 1 884 | 0 | 676 | 0 |
| 1948 | 1 089 | 0 | 411 | 0 | 1993 | 2 207 | 0 | 884 | 0 |
| 1949 | 1 307 | 0 | 493 | 0 | 1994 | 1 445 | 92 | 1 560 | 48 |
| 1950 | 1 379 | 0 | 521 | 0 | 1995 | 1 863 | 65 | 1 275 | 48 |
| 1951 | 1 742 | 0 | 658 | 0 | 1996 | 1 596 | 170 | 1 981 | 60 |
| 1952 | 2 032 | 0 | 768 | 0 | 1997 | 1 972 | 155 | 2 128 | 120 |
| 1953 | 1 960 | 0 | 740 | 0 | 1998 | 1 632 | 53 | 1 366 | 87 |
| 1954 | 1 452 | 0 | 548 | 0 | 1999 | 2 104 | 141 | 1 737 | 171 |
| 1955 | 1 669 | 0 | 631 | 0 | 2000 | 2 017 | 199 | 1 540 | 103 |
| 1956 | 1 452 | 0 | 548 | 0 | 2001 | 2 554 | 183 | 2 330 | 57 |
| 1957 | 1 089 | 0 | 411 | 0 | 2002 | 2 372 | 312 | 2 653 | 202 |
| 1958 | 1 234 | 0 | 466 | 0 | 2003 | 1 820 | 317 | 2 484 | 160 |
| 1959 | 1 452 | 0 | 548 | 0 | 2004 | 1 878 | 266 | 2 417 | 141 |
| 1960 | 1 089 | 0 | 411 | 0 | 2005 | 1 712 | 255 | 1 885 | 121 |
| 1961 | 1 524 | 0 | 576 | 0 | 2006 | 1 483 | 110 | 1 283 | 127 |
| 1962 | 1 234 | 0 | 466 | 0 | 2007 | 1 235 | 105 | 1 233 | 85 |
| 1963 | 1 307 | 0 | 493 | 0 | 2008 | 1 092 | 83 | 1 409 | 118 |
| 1964 | 1 016 | 0 | 384 | 0 | 2009 | 1 185 | 138 | 1 010 | 140 |
| 1965 | 1 815 | 0 | 685 | 0 | 2010 | 1 415 | 199 | 1 108 | 149 |
| 1966 | 2 686 | 0 | 1 014 | 0 | 2011 | 1 649 | 212 | 1 006 | 126 |
| 1967 | 2 323 | 0 | 877 | 0 | 2012 | 1 855 | 270 | 1 284 | 112 |
| 1968 | 2 105 | 0 | 795 | 0 | 2013 | 1 763 | 281 | 2 023 | 84 |
| 1969 | 2 105 | 0 | 795 | 0 | 2014 | 1 511 | 327 | 1 595 | 25 |
| 1970 | 2 105 | 0 | 795 | 0 | 2015 | 1 604 | 335 | 1 444 | 28 |
| 1971 | 3 557 | 0 | 1 343 | 0 | 2016 | 1 497 | 414 | 1 428 | 21 |
| 1972 | 3 774 | 0 | 1 426 | 0 | 2017 | 1 085 | 297 | 1 412 | 2 |
| 1973 | 4 210 | 0 | 1 590 | 0 | 2018 | 969 | 270 | 1 231 | 2 |
| 1974 | 2 532 | 0 | 956 | 0 | 2019 | 1 231 | 253 | 1 278 | 14 |
| 1975 | 2 600 | 0 | 982 | 0 | 2020†† | 1 026 | 235 | 432 | 12 |
| 1976 | 2 519 | 0 | 952 | 0 | 2021† | | | | |

†† Some catch data records for 2020 were outstanding, so these values need to be updated.

† Catches required.

Table 2. Abundance indices of kingklip (in tonnes) together with CVs obtained from surveys (separated by season) on the West and South coasts of South Africa. Values in bold denote biomass estimates obtained using the new rather than the old gear on *Africana*, while italicised values denote biomass estimates obtained from surveys carried out on an industry vessel. (Source: McGahey and Somhlaba, pers. comm.)

| Year | West coast | | | | South coast | | | |
|------|------------------|-------|------------------|-------|---------------------------------|-------|---------------------------------|-------|
| | Jan/Feb (summer) | | Jul/Aug (winter) | | Sep/Oct (spring) (0 – 200 m) | | May/Jun (autumn) (0 – 500 m) | |
| | Index | CV | Index | CV | Index | CV | Index | CV |
| 1985 | 8 176 | 0.140 | 5 803 | 0.343 | — | — | — | — |
| 1986 | 3 770 | 0.161 | 2 650 | 0.156 | 2 780 | 0.239 | — | — |
| 1987 | 2 874 | 0.192 | 5 352 | 0.244 | 3 416 | 0.182 | — | — |
| 1988 | 5 627 | 0.208 | 1 687 | 0.247 | — | — | 6 478 | 0.455 |
| 1989 | — | — | 1 089 | 0.340 | — | — | — | — |
| 1990 | 4 079 | 0.265 | 1 333 | 0.458 | 1 098 | 0.354 | — | — |
| 1991 | 3 537 | 0.300 | — | — | 2 138 | 0.274 | 7 499 | 0.146 |
| 1992 | 7 703 | 0.187 | — | — | 1 704 | 0.216 | 3 064 | 0.399 |
| 1993 | 10 366 | 0.186 | — | — | 1 135 | 0.201 | 8 759 | 0.393 |
| 1994 | 8 294 | 0.179 | — | — | 1 133 | 0.276 | 34 989 | 0.664 |
| 1995 | 7 505 | 0.257 | — | — | 1 152 | 0.427 | 20 623 | 0.409 |
| 1996 | 12 222 | 0.298 | — | — | — | — | 3 502 | 0.189 |
| 1997 | 6 100 | 0.218 | — | — | — | — | 5 130 | 0.268 |
| 1998 | — | — | — | — | — | — | — | — |
| 1999 | 14 958 | 0.299 | — | — | — | — | 11 350 | 0.611 |
| 2000 | — | — | — | — | — | — | — | — |
| 2001 | — | — | — | — | 2 033 | 0.292 | — | — |
| 2002 | 13 475 | 0.165 | — | — | — | — | — | — |
| 2003 | 14 428 | 0.312 | — | — | 4 291 | 0.586 | 8 690 | 0.745 |
| 2004 | 7 637 | 0.182 | — | — | 497 | 0.360 | 716 | 0.346 |
| 2005 | 5 714 | 0.165 | — | — | — | — | 7 472 | 0.886 |
| 2006 | 8 287 | 0.299 | — | — | 1 761 | 0.447 | 1 297 | 0.249 |
| 2007 | 5 783 | 0.258 | — | — | 939 | 0.273 | 3 297 | 0.475 |
| 2008 | 5 027 | 0.137 | — | — | 4 896 | 0.204 | 3 066 | 0.220 |
| 2009 | 11 325 | 0.185 | — | — | — | — | 6 072 | 0.302 |
| 2010 | 13 700 | 0.137 | — | — | — | — | 7 347 | 0.349 |
| 2011 | 16 067 | 0.165 | — | — | — | — | 4 879 | 0.392 |
| 2012 | 7 463 | 0.169 | — | — | — | — | — | — |
| 2013 | 7 751 | 0.275 | — | — | — | — | — | — |
| 2014 | 8 848 | 0.154 | — | — | — | — | 1 842 | 0.609 |
| 2015 | 11 705 | 0.333 | — | — | — | — | 1 353 | 0.266 |
| 2016 | 7 929 | 0.194 | — | — | 499 | 0.230 | 9 256 | 0.635 |
| 2017 | 5 124 | 0.284 | — | — | — | — | — | — |
| 2018 | — | — | — | — | — | — | — | — |
| 2019 | 16 332 | 0.340 | — | — | — | — | 4 179 | 0.239 |
| 2020 | 10 147 | 0.253 | — | — | — | — | — | — |
| 2021 | — | — | — | — | — | — | 6 220 | 0.413 |
| 2022 | | | | | | | | |

Table 3. Standardised commercial CPUE indices of relative abundance for kingklip for the trawl and longline fishery for the South and West coasts of South Africa. These data have been obtained from Punt and Japp (1994).

| Year | West coast | | South coast | |
|------|------------|----------|-------------|----------|
| | Trawl | Longline | Trawl | Longline |
| 1983 | 1.786 | | 1.294 | |
| 1984 | 2.147 | 2.253 | 1.230 | 2.276 |
| 1985 | 2.193 | 1.302 | 1.250 | 3.082 |
| 1986 | 1.829 | 1.394 | 1.190 | 3.113 |
| 1987 | 1.530 | 1.300 | 0.906 | 2.397 |
| 1988 | 1.420 | 1.294 | 0.826 | 2.202 |
| 1989 | 0.897 | 1.234 | 0.763 | 1.551 |
| 1990 | 0.720 | 1.000 | 0.520 | 1.000 |
| 1991 | 1.000 | | 1.000 | |

Table 4. Biological parameters values for kingklip for the West and South coasts of South Africa. Note that for simplicity, maturity is assumed to be knife-edge in age. These values are as used by Punt and Japp (1994).

| Parameter | West coast | South coast | Coasts combined |
|--|------------|-------------|-----------------|
| Natural mortality M (yr^{-1}) | 0.2 | 0.2 | 0.2 |
| von Bertalanffy growth | | | |
| L_{∞} (cm) | 129.2 | 136.0 | 132.6 |
| κ (yr^{-1}) | 0.141 | 0.142 | 0.142 |
| t_0 (yr) | -0.32 | 0.22 | 0.05 |
| Weight (in gm) length relationship | | | |
| e (g.cm^{-1}) | 0.00083 | 0.00162 | 0.00132 |
| f | 3.41 | 3.26 | 3.31 |
| Age of “plus group” (yr) | 30 | 30 | 30 |
| Age at maturity (yr) | 5 | 5 | 5 |
| Steepness parameter (h) | 0.5 | 0.5 | 0.5 |