**Supplementary Information for:**

**Shark and odontocete depredation on the catch of the tuna longline fishery in New Caledonia (South Pacific Ocean)**

**Authors**

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**Supplementary Table 1. Fishing and depredation data summary with number of fishing trips (TT); number of sets deployed (TS); number of hooks deployed (TH); number of sets with depredation by sharks and odontocetes (DT); number of sets with depredation by sharks (DS); number of sets with depredation by odontocetes (DO); interaction rate (% of all longline sets) with sharks and odontocetes (IR); interaction rate with sharks (IRs); interaction rate with odontocetes (IRo); total number of individuals caught (TC); catch per unit effort (in number of fish per 1000 hooks) without depredation (CPUE); total number of depredated fish (DC); number of fish depredated by sharks (DCs); number of fish depredated by odontocetes (DCo); total depredation rate (% of fish depredated out of the total number of fish caught) for sets with depredation (DR); depredation rate by sharks for sets with depredation (DRs); depredation rate by odontocetes for sets with depredation (DRo); depredation per unit effort (number of fish depredated per 1000 hooks) for sets with depredation (DPUE); landing per unit effort (LPUE, in number of fish per 1000 hooks); estimated depredated weight of fish (WL, in kg) and estimated economic value of the amount of fish depredated (EL, in USD).**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Fishing events** | | | | | | | | | **Catch** | | | | | | | | | | | |
| **Years** | **TT** | **TS** | **TH** | **DT** | **DS** | **DO** | **IR** | **IRs** | **IRo** | **TC** | **CPUE** | **DC** | **DCs** | **DCo** | **DR** | **DRs** | **DRo** | **DPUE** | **LPUE** | **WL** | **EL** |
| **2002** | 8 | 56 | 104800 | 28 | 23 | 4 | 50.0 | 46.4 | 7.1 | 2716 | 20.6 | 96 | 48 | 48 | 5.7 | 3.1 | 18.5 | 1.8 | 18.8 | 1303 | 23866 |
| **2003** | 12 | 81 | 158610 | 33 | 23 | 5 | 40.7 | 34.6 | 7.4 | 3182 | 17.1 | 63 | 47 | 16 | 4.0 | 3.2 | 7.0 | 1.0 | 16.1 | 1250 | 26968 |
| **2004** | 12 | 92 | 162840 | 39 | 32 | 4 | 42.4 | 38.0 | 5.4 | 3211 | 18.0 | 81 | 57 | 24 | 5.3 | 3.9 | 17.3 | 1.2 | 16.8 | 1388 | 27585 |
| **2005** | 4 | 35 | 57495 | 6 | 3 | 1 | 17.1 | 14.3 | 2.9 | 1205 | 19.2 | 23 | 13 | 10 | 8.5 | 5.2 | 41.7 | 2.6 | 16.6 | 407 | 7301 |
| **2006** | 7 | 46 | 75900 | 12 | 7 | 2 | 26.1 | 23.9 | 6.5 | 2656 | 29.9 | 48 | 29 | 19 | 5.0 | 3.2 | 8.4 | 2.5 | 27.4 | 585 | 10630 |
| **2007** | 7 | 58 | 110760 | 10 | 9 | 1 | 17.2 | 17.2 | 1.7 | 2580 | 19.9 | 24 | 19 | 5 | 3.4 | 2.7 | 10.4 | 1.4 | 18.5 | 235 | 3325 |
| **2008** | 11 | 85 | 158520 | 20 | 15 | 5 | 23.5 | 20.0 | 5.9 | 4665 | 30.2 | 44 | 18 | 26 | 4.6 | 2.0 | 32.1 | 1.2 | 28.9 | 558 | 7398 |
| **2009** | 28 | 210 | 397534 | 127 | 92 | 26 | 60.5 | 52.9 | 15.7 | 13301 | 26.0 | 381 | 277 | 104 | 4.1 | 3.3 | 4.8 | 1.6 | 24.4 | 5965 | 107633 |
| **2010** | 30 | 236 | 419834 | 169 | 128 | 26 | 71.6 | 64.4 | 13.1 | 19489 | 36.3 | 777 | 500 | 277 | 5.1 | 3.6 | 11.4 | 2.6 | 33.7 | 12190 | 192481 |
| **2011** | 22 | 170 | 312337 | 116 | 91 | 10 | 68.2 | 64.1 | 7.6 | 12174 | 29.0 | 434 | 323 | 111 | 4.7 | 3.6 | 19.1 | 2.0 | 27.0 | 8004 | 156879 |
| **2012** | 17 | 126 | 223776 | 86 | 79 | 17 | 68.3 | 62.7 | 13.5 | 8220 | 20.6 | 323 | 240 | 83 | 4.7 | 3.6 | 7.4 | 2.1 | 18.5 | 4883 | 77479 |
| **2013** | 16 | 113 | 197538 | 70 | 64 | 12 | 61.9 | 56.6 | 10.6 | 8965 | 38.4 | 282 | 197 | 85 | 4.5 | 3.3 | 9.6 | 2.2 | 36.1 | 4807 | 78934 |
| **2014** | 19 | 145 | 253058 | 102 | 96 | 9 | 70.3 | 66.2 | 6.2 | 13458 | 44.1 | 372 | 308 | 64 | 3.6 | 3.1 | 12.2 | 2.1 | 42.0 | 5741 | 92597 |
| **2015** | 10 | 79 | 147337 | 51 | 47 | 7 | 64.6 | 59.5 | 8.9 | 5026 | 21.1 | 178 | 122 | 56 | 4.5 | 3.3 | 8.6 | 1.8 | 19.3 | 3093 | 56675 |
| **2016** | 17 | 137 | 281370 | 101 | 99 | 11 | 73.7 | 72.3 | 8.0 | 11719 | 26.0 | 521 | 398 | 123 | 5.3 | 4.1 | 11.5 | 2.5 | 23.6 | 8765 | 144710 |
| **2017** | 23 | 185 | 385470 | 145 | 139 | 18 | 78.4 | 75.1 | 9.7 | 14401 | 20.7 | 796 | 615 | 181 | 6.3 | 4.9 | 17.5 | 2.6 | 18.1 | 12046 | 198089 |
| **2018** | 30 | 254 | 535032 | 175 | 169 | 15 | 68.9 | 66.5 | 5.9 | 16411 | 24.4 | 739 | 532 | 207 | 5.9 | 4.4 | 24.5 | 2.0 | 22.5 | 12327 | 216619 |
| **2019** | 29 | 227 | 467069 | 176 | 165 | 31 | 77.5 | 72.7 | 13.7 | 14013 | 16.8 | 819 | 529 | 290 | 6.6 | 4.4 | 13.9 | 2.2 | 14.7 | 14908 | 252174 |
| **2020** | 27 | 207 | 434101 | 153 | 143 | 20 | 73.9 | 69.1 | 9.7 | 11075 | 19.4 | 552 | 380 | 172 | 6.2 | 4.4 | 18.4 | 1.7 | 17.7 | 10241 | 185049 |
| **2021** | 24 | 203 | 430278 | 126 | 119 | 13 | 62.1 | 58.6 | 6.4 | 13232 | 24.6 | 515 | 371 | 144 | 5.6 | 4.2 | 21.2 | 1.9 | 22.7 | 9593 | 172139 |
| **2022** | 13 | 109 | 226789 | 58 | 52 | 9 | 53.2 | 47.7 | 8.3 | 8594 | 26.9 | 204 | 173 | 31 | 3.6 | 3.4 | 3.4 | 1.7 | 25.2 | 3516 | 60486 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Month** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **January** | 27 | 172 | 335069 | 130 | 126 | 11 | 75.6 | 73.3 | 6.4 | 11581 | 21.3 | 564 | 421 | 143 | 5.7 | 4.3 | 26.8 | 2.2 | 19.1 | 9255 | 157395 |
| **February** | 32 | 169 | 318867 | 118 | 116 | 5 | 69.8 | 68.6 | 3.0 | 11025 | 20.8 | 451 | 431 | 20 | 4.9 | 4.8 | 10.6 | 2.0 | 18.8 | 8462 | 168037 |
| **March** | 42 | 248 | 466030 | 156 | 147 | 14 | 62.9 | 59.3 | 5.6 | 12982 | 20.5 | 460 | 427 | 33 | 4.8 | 4.6 | 4.8 | 1.5 | 19.0 | 8010 | 153017 |
| **April** | 38 | 233 | 452094 | 145 | 131 | 23 | 62.2 | 56.2 | 9.9 | 12698 | 20.8 | 437 | 332 | 105 | 4.7 | 3.8 | 10.2 | 1.5 | 19.3 | 7783 | 148798 |
| **May** | 41 | 254 | 489725 | 143 | 132 | 17 | 56.3 | 52.0 | 6.7 | 16053 | 25.9 | 412 | 313 | 99 | 3.9 | 3.2 | 9.0 | 1.5 | 24.4 | 7524 | 135773 |
| **June** | 36 | 234 | 455884 | 131 | 115 | 27 | 56.0 | 49.1 | 11.5 | 17179 | 29.5 | 520 | 299 | 221 | 4.5 | 2.8 | 12.5 | 2.0 | 27.5 | 9326 | 161427 |
| **July** | 39 | 255 | 502470 | 162 | 143 | 40 | 63.5 | 56.1 | 15.7 | 19923 | 32.5 | 836 | 372 | 464 | 5.9 | 2.9 | 14.6 | 2.6 | 29.9 | 13900 | 216936 |
| **August** | 41 | 269 | 532654 | 159 | 141 | 30 | 59.1 | 52.4 | 11.2 | 19040 | 26.5 | 698 | 361 | 337 | 5.2 | 2.9 | 16.8 | 2.1 | 24.4 | 11685 | 189922 |
| **September** | 46 | 299 | 593663 | 148 | 139 | 23 | 49.5 | 46.5 | 7.7 | 16781 | 22.0 | 463 | 346 | 117 | 4.5 | 3.4 | 8.3 | 1.5 | 20.5 | 8285 | 147332 |
| **October** | 39 | 239 | 462209 | 159 | 151 | 26 | 66.5 | 63.2 | 10.9 | 15272 | 22.8 | 628 | 493 | 135 | 5.3 | 4.3 | 6.8 | 2.0 | 20.8 | 10565 | 186682 |
| **November** | 38 | 235 | 462844 | 155 | 144 | 24 | 66.0 | 61.3 | 10.2 | 17150 | 28.8 | 756 | 515 | 241 | 5.9 | 4.1 | 16.2 | 2.4 | 26.4 | 11900 | 190426 |
| **December** | 37 | 257 | 486909 | 197 | 191 | 24 | 76.6 | 74.3 | 9.3 | 20902 | 30.0 | 1047 | 886 | 161 | 6.0 | 5.1 | 10.2 | 2.8 | 27.2 | 15110 | 243271 |

**Supplementary Table 2. Model outputs from the GLM fitted to the occurrence of sharks and/or odontocetes depredation. Month and vessel were included as categorical variables; year, effort and soaking time as continuous variables.**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Sharks | | | | Odontocetes | | | |
|  | **Estimate** | **Standard error** | **z value** | **Pr (>|z|)** | **Estimate** | **Standard error** | **z value** | **Pr (>|z|)** |
|  |  |  |  |  |  |  |  |  |
| (Intercept) | -102.8 | 10.966 | -9.375 | <0.005 | -4.259 | 0.540 | -7.891 | <0.005 |
| Year | 0.050 | 0.005 | 9.117 | <0.005 | NA | NA | NA | NA |
| February | -0.049 | 0.109 | -0.446 | 0.655 | -0.998 | 0.444 | -2.251 | 0.024 |
| March | -0.325 | 0.105 | -3.102 | 0.002 | -0.634 | 0.347 | -1.824 | 0.068 |
| April | -0.369 | 0.108 | -3.426 | 0.001 | 0.293 | 0.284 | 1.031 | 0.302 |
| May | -0.615 | 0.109 | -5.620 | <0.005 | -0.272 | 0.312 | -0.871 | 0.384 |
| June | -0.665 | 0.113 | -5.861 | <0.005 | 0.324 | 0.286 | 1.134 | 0.257 |
| July | -0.567 | 0.107 | -5.305 | <0.005 | 0.835 | 0.262 | 3.188 | 0.001 |
| August | -0.531 | 0.105 | -5.048 | <0.005 | 0.392 | 0.276 | 1.419 | 0.156 |
| September | -0.580 | 0.107 | -5.446 | <0.005 | 0.144 | 0.286 | 0.505 | 0.613 |
| October | -0.244 | 0.103 | -2.370 | 0.018 | 0.224 | 0.288 | 0.777 | 0.437 |
| November | -0.199 | 0.104 | -1.922 | 0.055 | 0.113 | 0.291 | 0.386 | 0.699 |
| December | 0.088 | 0.096 | 0.908 | 0.364 | 0.039 | 0.291 | 0.134 | 0.893 |
| Effort | 0.000 | 0.000 | 2.326 | 0.020 | 0.000 | 0.000 | 2.293 | 0.022 |
| Soaking time | 0.006 | 0.003 | 2.196 | 0.028 | 0.024 | 0.024 | -3.585 | <0.005 |
| Vessel AA | -0.407 | 0.128 | -3.183 | 0.001 | NA | NA | NA | NA |
| Vessel AB | -0.142 | 0.107 | -1.318 | 0.188 | NA | NA | NA | NA |
| Vessel AC | -0.524 | 0.167 | -3.141 | 0.002 | NA | NA | NA | NA |
| Vessel AD | -0.266 | 0.112 | -2.386 | 0.017 | NA | NA | NA | NA |
| Vessel AE | -0.334 | 0.148 | -2.249 | 0.025 | NA | NA | NA | NA |
| Vessel AF | -0.197 | 0.122 | -1.617 | 0.106 | NA | NA | NA | NA |
| Vessel AG | -0.117 | 0.221 | -0.529 | 0.597 | NA | NA | NA | NA |
| Vessel AH | -0.230 | 0.228 | -1.009 | 0.313 | NA | NA | NA | NA |
| Vessel AI | -0.229 | 0.140 | -1.631 | 0.103 | NA | NA | NA | NA |
| Vessel AJ | -0.313 | 0.183 | -1.711 | 0.087 | NA | NA | NA | NA |
| Vessel AK | -0.896 | 0.229 | -3.918 | <0.005 | NA | NA | NA | NA |
| Vessel AL | -0.361 | 0.111 | -3.263 | 0.001 | NA | NA | NA | NA |
| Vessel AM | -0.687 | 0.232 | -2.961 | 0.003 | NA | NA | NA | NA |
| Vessel AN | 0.746 | 0.485 | 1.536 | 0.124 | NA | NA | NA | NA |
| Vessel AO | -0.331 | 0.138 | -2.395 | 0.017 | NA | NA | NA | NA |
| Vessel AP | -0.062 | 0.102 | -0.603 | 0.547 | NA | NA | NA | NA |
| Vessel AQ | -0.097 | 0.102 | -0.949 | 0.342 | NA | NA | NA | NA |
| Vessel AR | -0.226 | 0.116 | -1.957 | 0.050 | NA | NA | NA | NA |
| Vessel AS | -0.388 | 0.206 | -1.880 | 0.060 | NA | NA | NA | NA |
| Vessel AT | -0.157 | 0.107 | -1.463 | 0.143 | NA | NA | NA | NA |
| Vessel AU | -0.193 | 0.211 | -0.917 | 0.359 | NA | NA | NA | NA |
| Vessel AV | 0.585 | 0.498 | 1.175 | 0.240 | NA | NA | NA | NA |
| Vessel AW | -0.112 | 114.007 | -0.098 | 0.922 | NA | NA | NA | NA |
| Vessel AX | -1.467 | 0.519 | -2.826 | 0.005 | NA | NA | NA | NA |
| Vessel AY | -1.007 | 0.273 | -3.687 | 0.000 | NA | NA | NA | NA |
| Vessel AZ | -0.394 | 0.182 | -2.168 | 0.030 | NA | NA | NA | NA |
| Vessel BA | -0.393 | 0.532 | -0.739 | 0.460 | NA | NA | NA | NA |
| Vessel BB | -0.827 | 0.337 | -2.455 | 0.014 | NA | NA | NA | NA |
| Vessel BC | -0.677 | 0.195 | -3.471 | 0.001 | NA | NA | NA | NA |
| Vessel BD | 0.019 | 0.106 | 0.179 | 0.858 | NA | NA | NA | NA |