## Bed I-1.90
| Bed I Lavas | Unnamed: 1 | Unnamed: 2 | Olduvai | Modern | bio1 | bio2 | bio3 | bio4 | bio5 | bio6 | bio7 | bio8 | bio9 | bio10 | bio11 | bio12 | bio13 | bio14 | bio15 | bio16 | bio17 | bio18 | bio19 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Age 1.9 | Family | Tribe | Genus/Species | Genus/Species | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN |
| NaN | Bovidae | Alcelaphini | Megalotragus kattwinkeli | Connochaetes taurinus | 19.966665 | 16.439411 | 58.896310 | 348.250005 | 32.063608 | 4.232238 | 28.703418 | 23.820237 | 14.955475 | 24.221991 | 14.286723 | 432.525976 | 88.765092 | 2.635078 | 95.462885 | 336.617280 | 8.606823 | 195.067123 | 12.050679 |
| NaN | Bovidae | Alcelaphini | Parmularius altidens | Alcelaphus buselaphus | 25.481329 | 13.378858 | 66.997561 | 231.683309 | 34.370162 | 14.365018 | 20.108347 | 25.005950 | 23.606931 | 25.093848 | 23.291517 | 552.076984 | 214.988861 | 0.362622 | 113.822309 | 573.729694 | 1.634491 | 174.417276 | 4.796381 |
| NaN | NaN | NaN | NaN | Damaliscus pygargus | 17.286569 | 15.937626 | 54.049465 | 401.369155 | 30.175847 | 1.315943 | 26.257844 | 21.904322 | 12.475427 | 21.644095 | 12.899821 | 646.656128 | 120.016047 | 6.204795 | 73.474827 | 329.215451 | 35.453589 | 270.044666 | 36.337503 |
| NaN | Bovidae | Alcelaphini | Connochaetes sp. | Connochaetes taurinus | 19.966665 | 16.439411 | 58.896310 | 348.250005 | 32.063608 | 4.232238 | 28.703418 | 23.820237 | 14.955475 | 24.221991 | 14.286723 | 432.525976 | 88.765092 | 2.635078 | 95.462885 | 336.617280 | 8.606823 | 195.067123 | 12.050679 |
| NaN | Bovidae | Antilopini | Antidorcas recki | Antidorcas marsupialis | 22.043898 | 16.153461 | 58.708929 | 359.059652 | 33.527861 | 6.966230 | 27.763654 | 25.193668 | 19.880238 | 27.255372 | 19.102755 | 320.735235 | 66.949044 | 0.019442 | 95.072745 | 178.178762 | 2.605072 | 117.318054 | 7.429270 |
| NaN | Bovidae | Hippotragini | Hippotragus gigas | Hippotragus niger | 21.486386 | 14.262978 | 62.635149 | 251.562476 | 31.809770 | 13.318876 | 17.142415 | 25.729208 | 20.383827 | 24.948534 | 16.965479 | 866.366945 | 193.260809 | 0.915199 | 108.195597 | 503.948213 | 3.192534 | 260.168780 | 6.104475 |
| NaN | Bovidae | NaN | NaN | Hippotragus leucophaeus | 23.627719 | 12.756005 | 62.958285 | 279.453594 | 33.606990 | 10.876905 | 19.487678 | 22.464818 | 24.845974 | 27.199540 | 20.823805 | 802.373033 | 154.112705 | 7.424810 | 77.869107 | 435.303134 | 25.667373 | 102.820007 | 50.455788 |
| NaN | Bovidae | NaN | NaN | Hippotragus equinus | 20.861599 | 12.556645 | 59.444565 | 324.633554 | 31.513710 | 8.982985 | 20.833358 | 19.499338 | 20.556345 | 25.071372 | 17.359925 | 650.859433 | 114.340385 | 12.907210 | 59.727347 | 320.372094 | 44.606573 | 130.134642 | 86.365508 |
| NaN | Bovidae | Reduncini | Kobus sigmoidalis | Kobus ellipsiprymnus | 26.024752 | 12.983104 | 66.101463 | 183.094816 | 33.075546 | 14.954934 | 17.602803 | 25.423754 | 23.441101 | 25.897912 | 24.400545 | 943.582740 | 212.072256 | 0.153898 | 108.266866 | 629.673466 | 0.179259 | 134.014587 | 44.448292 |
| NaN | NaN | NaN | NaN | Kobus lechwe | 25.378000 | 14.264600 | 69.744700 | 181.323000 | 34.363500 | 14.396500 | 19.875700 | 25.371800 | 23.500700 | 25.794200 | 23.236900 | 879.797000 | 197.102000 | 0.099749 | 108.321000 | 559.790000 | 0.000000 | 144.117000 | 219.310000 |
| NaN | NaN | NaN | Redunca redunca | Redunca redunca | 25.599968 | 13.037740 | 65.700721 | 186.423365 | 33.116610 | 13.146641 | 17.330261 | 25.352459 | 22.274657 | 25.822995 | 22.575435 | 896.560316 | 209.748668 | 0.839761 | 105.207645 | 565.254752 | 1.200734 | 178.380616 | 4.930131 |
| NaN | Bovidae | NaN | Tragelaphus strepsiceros | Tragelaphus strepsiceros | 18.841589 | 15.030232 | 70.088072 | 188.728196 | 28.931274 | 8.611170 | 15.480241 | 19.845506 | 16.032297 | 21.387693 | 15.771338 | 710.638549 | 138.304479 | 4.991785 | 93.126307 | 322.099697 | 25.900917 | 202.557490 | 148.424728 |
| NaN | Giraffidae | NaN | Giraffa stillei | Giraffa camelopardalis | 23.695993 | 12.977025 | 70.119855 | 204.903831 | 32.688038 | 13.534543 | 19.153481 | 24.639950 | 21.442862 | 25.990060 | 21.020713 | 644.958824 | 138.841534 | 4.148727 | 97.925692 | 332.012844 | 17.975500 | 172.783833 | 69.477094 |
| NaN | NaN | NaN | NaN | Giraffa reticulata | 23.695993 | 12.977025 | 70.119855 | 204.903831 | 32.688038 | 13.534543 | 19.153481 | 24.639950 | 21.442862 | 25.990060 | 21.020713 | 644.958824 | 138.841534 | 4.148727 | 97.925692 | 332.012844 | 17.975500 | 172.783833 | 69.477094 |
| NaN | NaN | NaN | NaN | Giraffa tippelskirchi | 23.656570 | 12.974443 | 70.119355 | 204.862460 | 32.646063 | 13.495162 | 19.150888 | 24.609544 | 21.395841 | 25.946984 | 20.979661 | 646.876804 | 139.080701 | 4.143028 | 97.800423 | 339.050050 | 17.941024 | 173.746043 | 68.720029 |
| NaN | NaN | NaN | NaN | Giraffa giraffa | 23.406322 | 13.320552 | 69.127181 | 222.796437 | 32.763759 | 12.762735 | 20.001009 | 24.596903 | 20.859376 | 25.856397 | 209.114858 | 625.111602 | 134.397840 | 4.043926 | 97.817542 | 329.949281 | 17.407919 | 175.413193 | 63.843440 |
| NaN | NaN | NaN | NaN | Okapia johnstoni | 23.825286 | 9.817287 | 86.616466 | 55.536348 | 29.425109 | 17.959634 | 11.464616 | 23.616037 | 23.780878 | 24.504164 | 23.158333 | 1647.147194 | 204.705393 | 55.707053 | 37.514507 | 456.117024 | 125.709721 | 419.906977 | 442.655385 |
| NaN | Giraffidae | NaN | Sivatherium maurusium | Giraffa camelopardalis | 23.695993 | 12.977025 | 70.119855 | 204.903831 | 32.688038 | 13.534543 | 19.153481 | 24.639950 | 21.442862 | 25.990060 | 21.020713 | 644.958824 | 138.841534 | 4.148727 | 97.925692 | 332.012844 | 17.975500 | 172.783833 | 69.477094 |
| NaN | NaN | NaN | NaN | Giraffa reticulata | 23.695993 | 12.977025 | 70.119855 | 204.903831 | 32.688038 | 13.534543 | 19.153481 | 24.639950 | 21.442862 | 25.990060 | 21.020713 | 644.958824 | 138.841534 | 4.148727 | 97.925692 | 332.012844 | 17.975500 | 172.783833 | 69.477094 |
| NaN | NaN | NaN | NaN | Giraffa tippelskirchi | 23.656570 | 12.974443 | 70.119355 | 204.862460 | 32.646063 | 13.495162 | 19.150888 | 24.609544 | 21.395841 | 25.946984 | 20.979661 | 646.876804 | 139.080701 | 4.143028 | 97.800423 | 339.050050 | 17.941024 | 173.746043 | 68.720029 |
| NaN | NaN | NaN | NaN | Giraffa giraffa | 23.406322 | 13.320552 | 69.127181 | 222.796437 | 32.763759 | 12.762735 | 20.001009 | 24.596903 | 20.859376 | 25.856397 | 209.114858 | 625.111602 | 134.397840 | 4.043926 | 97.817542 | 329.949281 | 17.407919 | 175.413193 | 63.843440 |
| NaN | NaN | NaN | NaN | Okapia johnstoni | 23.825286 | 9.817287 | 86.616466 | 55.536348 | 29.425109 | 17.959634 | 11.464616 | 23.616037 | 23.780878 | 24.504164 | 23.158333 | 1647.147194 | 204.705393 | 55.707053 | 37.514507 | 456.117024 | 125.709721 | 419.906977 | 442.655385 |
| NaN | NaN | NaN | Kolpochoerus heseloni | Hylochoerus meinertzhageni | 24.788869 | 10.071092 | 81.865988 | 97.187209 | 30.595146 | 17.449920 | 11.693593 | 24.464871 | 24.090858 | 25.935352 | 24.486332 | 1486.627579 | 214.834120 | 5.884419 | 64.919351 | 604.534038 | 62.343801 | 418.457775 | 469.487991 |
| NaN | Suidae | NaN | NaN | Potamochoerus larvatus | 22.652810 | 12.379215 | 71.665767 | 168.940015 | 31.220370 | 14.531589 | 14.859810 | 25.820003 | 21.212107 | 24.991380 | 22.197335 | 1082.279434 | 220.861739 | 0.105441 | 106.472651 | 555.802967 | 0.901633 | 307.477710 | 7.375354 |
| NaN | NaN | NaN | NaN | Potamochoerus porcus | 24.813231 | 9.920804 | 77.178566 | 105.915314 | 30.624392 | 18.628940 | 11.581929 | 24.702543 | 23.745014 | 25.810851 | 24.134265 | 1533.136988 | 221.606712 | 0.105441 | 69.596496 | 635.515060 | 0.901633 | 419.223634 | 10.355245 |
| NaN | NaN | NaN | Metridiochoerus andrewsi | Phacochoerus aethiopicus | 26.890100 | 11.021225 | 73.579874 | 147.054449 | 32.949643 | 17.737246 | 14.876377 | 26.707097 | 24.798622 | 28.838545 | 25.376231 | 565.480757 | 117.429848 | 2.522473 | 98.666355 | 257.498823 | 6.888880 | 162.221986 | 63.130983 |
| NaN | NaN | NaN | NaN | Phacochoerus africanus | 27.091999 | 12.703717 | 66.984508 | 193.423909 | 31.536350 | 17.333448 | 15.616673 | 25.966801 | 25.808117 | 26.348458 | 25.780029 | 954.809241 | 207.611381 | 0.705383 | 106.136617 | 540.830356 | 4.869890 | 229.925436 | 39.778004 |
| NaN | NaN | NaN | Metridiochoerus compactus | Phacochoerus aethiopicus | 26.890100 | 11.021225 | 73.579874 | 147.054449 | 32.949643 | 17.737246 | 14.876377 | 26.707097 | 24.798622 | 28.838545 | 25.376231 | 565.480757 | 117.429848 | 2.522473 | 98.666355 | 257.498823 | 6.888880 | 162.221986 | 63.130983 |
| NaN | NaN | NaN | NaN | Phacochoerus africanus | 27.091999 | 12.703717 | 66.984508 | 193.423909 | 31.536350 | 17.333448 | 15.616673 | 25.966801 | 25.808117 | 26.348458 | 25.780029 | 954.809241 | 207.611381 | 0.705383 | 106.136617 | 540.830356 | 4.869890 | 229.925436 | 39.778004 |
| NaN | NaN | NaN | Metridiochoerus modestus | Phacochoerus aethiopicus | 26.890100 | 11.021225 | 73.579874 | 147.054449 | 32.949643 | 17.737246 | 14.876377 | 26.707097 | 24.798622 | 28.838545 | 25.376231 | 565.480757 | 117.429848 | 2.522473 | 98.666355 | 257.498823 | 6.888880 | 162.221986 | 63.130983 |
| NaN | NaN | NaN | NaN | Phacochoerus africanus | 27.091999 | 12.703717 | 66.984508 | 193.423909 | 31.536350 | 17.333448 | 15.616673 | 25.966801 | 25.808117 | 26.348458 | 25.780029 | 954.809241 | 207.611381 | 0.705383 | 106.136617 | 540.830356 | 4.869890 | 229.925436 | 39.778004 |
| NaN | Equidae | NaN | Equus oldowayensis | Equus grevi | 23.804982 | 12.088427 | 65.858324 | 247.009279 | 33.779481 | 12.046117 | 21.784256 | 25.742950 | 21.484805 | 26.316063 | 18.223094 | 444.037196 | 84.929033 | 0.730717 | 96.074735 | 226.729258 | 4.679347 | 153.793300 | 11.321824 |
| NaN | Rhinocerotidae | NaN | Ceratotherium simum | Ceratotherium simum | 23.126900 | 14.462800 | 60.898400 | 295.294000 | 34.479300 | 10.347400 | 24.131900 | 24.931800 | 19.913300 | 26.434800 | 18.995600 | 622.168000 | 136.563000 | 4.096440 | 101.686000 | 354.858000 | 17.291400 | 172.342000 | 76.982400 |
| NaN | Canidae | NaN | Canis mesomelas | Canis mesomelas | 23.045982 | 12.579792 | 63.044805 | 156.955584 | 33.147559 | 11.076110 | 16.094778 | 25.478614 | 18.441946 | 25.462259 | 18.454561 | 481.703175 | 123.119444 | 0.352027 | 84.289978 | 266.365945 | 3.604913 | 178.077663 | 6.955702 |
| NaN | Hyaenidae | NaN | Crocuta ultra | Crocuta crocuta | 25.839273 | 13.569623 | 62.286300 | 266.097435 | 32.972842 | 12.420725 | 22.449634 | 26.575084 | 24.389938 | 26.966515 | 21.437049 | 753.652799 | 155.487898 | 0.000000 | 91.801626 | 344.415589 | 0.482479 | 81.447620 | 0.482479 |
| NaN | Cercopithecidae | NaN | Theropithecus oswaldi | Theropithecus gelada | 19.961800 | 14.847300 | 71.340100 | 174.376000 | 30.017600 | 8.548800 | 19.855700 | 20.837200 | 17.984100 | 21.997600 | 17.747400 | 855.110000 | 217.137000 | 6.574290 | 100.547000 | 527.539000 | 20.474100 | 212.556000 | 150.745000 |
| NaN | Pythonidae | NaN | Python aff. sebae | Python sebae | 24.967124 | 9.954748 | 70.539479 | 64.777483 | 31.722424 | 18.539006 | 12.195423 | 24.488289 | 24.005676 | 25.888289 | 23.995975 | 1546.288274 | 216.637923 | 0.000000 | 80.804620 | 566.835750 | 0.117109 | 187.760877 | 2.000000 |
| NaN | Viperidae | NaN | Bitis olduvaiensis | Bitis arietans | 27.321004 | 13.448571 | 67.499720 | 222.741722 | 31.651356 | 12.780289 | 15.474586 | 25.892961 | 26.638710 | 26.100848 | 25.773048 | 355.025962 | 177.962185 | 0.136915 | 110.459895 | 473.523622 | 0.504994 | 91.953790 | 2.792759 |
| NaN | NaN | NaN | NaN | Bitis nasicornis | 25.098699 | 9.635287 | 83.111242 | 55.176175 | 30.691916 | 18.922779 | 11.547510 | 24.467052 | 24.159722 | 25.015286 | 24.250168 | 1583.094480 | 225.558700 | 0.733382 | 51.947052 | 615.129021 | 10.615592 | 341.420074 | 30.854965 |
| NaN | NaN | NaN | NaN | Bitis gabonica | 25.292802 | 9.385915 | 80.907901 | 68.486339 | 31.165795 | 18.438332 | 11.735989 | 24.563600 | 24.648669 | 26.201611 | 24.367278 | 1714.716025 | 270.331553 | 4.578697 | 62.757250 | 560.417952 | 32.951273 | 366.529885 | 304.991544 |
| NaN | NaN | NaN | NaN | Mean | 23.894631 | 12.772278 | 69.107917 | 200.355714 | 32.114166 | 13.422875 | 18.050509 | 24.590568 | 21.932179 | 25.695418 | 30.828010 | 839.287868 | 163.757811 | 5.413842 | 90.693570 | 419.893441 | 18.545452 | 211.021443 | 86.103043 |
| NaN | NaN | NaN | NaN | Minimum | 17.286569 | 9.385915 | 54.049465 | 55.176175 | 28.931274 | 1.315943 | 11.464616 | 19.499338 | 12.475427 | 21.387693 | 12.899821 | 320.735235 | 66.949044 | 0.000000 | 37.514507 | 178.178762 | 0.000000 | 81.447620 | 0.482479 |
| NaN | NaN | NaN | NaN | Maximum | 27.321004 | 16.439411 | 86.616466 | 401.369155 | 34.479300 | 18.922779 | 28.703418 | 26.707097 | 26.638710 | 28.838545 | 209.114858 | 1714.716025 | 270.331553 | 55.707053 | 113.822309 | 635.515060 | 125.709721 | 419.906977 | 469.487991 |
| NaN | NaN | NaN | NaN | sd | 2.423756 | 1.891559 | 7.470326 | 85.236558 | 1.378589 | 4.305028 | 4.686900 | 1.676598 | 3.250123 | 1.580550 | 41.569443 | 393.170336 | 49.269938 | 11.991659 | 19.317554 | 130.601152 | 28.279929 | 91.595918 | 121.549401 |
| NaN | NaN | NaN | NaN | standard error range (min) | 14.862813 | 7.494356 | 46.579140 | -30.060383 | 27.552685 | -2.989085 | 6.777716 | 17.822740 | 9.225304 | 19.807143 | -28.669621 | -72.435101 | 17.679106 | -11.991659 | 18.196953 | 47.577610 | -28.279929 | -10.148298 | -121.066922 |
| NaN | NaN | NaN | NaN | standard error range (max) | 29.744761 | 18.330970 | 94.086792 | 486.605713 | 35.857889 | 23.227806 | 33.390318 | 28.383695 | 29.888833 | 30.419095 | 250.684301 | 2107.886361 | 319.601491 | 67.698712 | 133.139863 | 766.116212 | 153.989650 | 511.502896 | 591.037392 |

## Bed I-1.848
| Tuff IB | Unnamed: 1 | Unnamed: 2 | Olduvai | Modern | bio1 | bio2 | bio3 | bio4 | bio5 | bio6 | bio7 | bio8 | bio9 | bio10 | bio11 | bio12 | bio13 | bio14 | bio15 | bio16 | bio17 | bio18 | bio19 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Age 1.848 | Family | Tribe | Genus/Species | Genus/Species | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN |
| NaN | Bovidae | Alcelaphini | Megalotragus kattwinkeli | Connochaetes taurinus | 19.999626 | 16.443437 | 58.941173 | 347.101284 | 32.078076 | 4.267275 | 28.684825 | 23.844645 | 14.991699 | 24.244826 | 14.317829 | 431.096432 | 88.845972 | 2.594366 | 95.716841 | 337.145409 | 8.504746 | 194.633481 | 11.895394 |
| NaN | Bovidae | Alcelaphini | Parmularius altidens | Alcelaphus buselaphus | 25.512518 | 13.360644 | 67.003779 | 231.577855 | 34.393799 | 14.401094 | 20.066503 | 25.021309 | 23.656265 | 25.107848 | 23.328728 | 548.800355 | 215.112635 | 0.357020 | 113.865225 | 574.305527 | 1.609237 | 173.808272 | 4.753177 |
| NaN | NaN | NaN | NaN | Damaliscus pygargus | 17.260512 | 15.949405 | 54.005440 | 402.091156 | 30.166950 | 1.278616 | 26.280125 | 28.908160 | 12.423276 | 21.631053 | 12.856564 | 646.420418 | 119.807222 | 6.217081 | 73.374789 | 328.663641 | 35.539283 | 270.203112 | 36.377094 |
| NaN | Bovidae | Alcelaphini | Connochaetes sp. | Connochaetes taurinus | 19.999626 | 16.443437 | 58.941173 | 347.101284 | 32.078076 | 4.267275 | 28.684825 | 23.844645 | 14.991699 | 24.244826 | 14.317829 | 431.096432 | 88.845972 | 2.594366 | 95.716841 | 337.145409 | 8.504746 | 194.633481 | 11.895394 |
| NaN | Bovidae | Antilopini | Antidorcas recki | Antidorcas marsupialis | 22.018500 | 16.174265 | 58.629996 | 360.194320 | 33.519705 | 6.909586 | 27.822927 | 25.181406 | 19.840373 | 27.248336 | 19.074903 | 321.032880 | 66.983822 | 0.019142 | 94.954200 | 178.361403 | 2.595723 | 117.266789 | 7.345386 |
| NaN | Bovidae | Hippotragini | Hippotragus gigas | Hippotragus niger | 21.480417 | 14.265095 | 62.642331 | 251.315852 | 31.801894 | 13.326309 | 17.127855 | 25.733392 | 20.376352 | 24.941604 | 16.958288 | 867.288286 | 193.503982 | 0.901059 | 108.272916 | 504.551570 | 3.143209 | 260.645128 | 6.010160 |
| NaN | NaN | NaN | NaN | Hippotragus leucophaeus | 20.795756 | 12.549590 | 59.363536 | 325.666653 | 31.462512 | 8.935352 | 20.863743 | 19.422098 | 24.876164 | 25.020829 | 17.280204 | 647.508914 | 113.412750 | 13.047696 | 59.258784 | 317.736723 | 45.091608 | 102.884589 | 87.288417 |
| NaN | NaN | NaN | NaN | Hippotragus equinus | 23.690636 | 12.758230 | 63.040816 | 278.383613 | 33.653232 | 10.917432 | 19.455423 | 22.525618 | 24.876164 | 27.248061 | 20.905324 | 806.075314 | 155.036430 | 7.310096 | 78.245024 | 438.017683 | 25.270808 | 102.884589 | 49.707137 |
| NaN | Bovidae | NaN | Oryx sp.\* | Oryx gazella | 24.174830 | 15.157635 | 61.900778 | 372.520677 | 36.889784 | 9.868601 | 25.109604 | 26.407877 | 20.810731 | 27.576186 | 20.350661 | 309.144556 | 70.363208 | 0.369990 | 71.409350 | 175.735362 | 2.351035 | 87.640019 | 1.987673 |
| NaN | Bovidae | Reduncini | Kobus sigmoidalis | Kobus ellipsiprymnus | 26.042909 | 12.971005 | 66.072085 | 183.047000 | 33.066654 | 14.981896 | 17.568769 | 25.432657 | 23.455916 | 25.899490 | 24.426802 | 943.403784 | 212.159206 | 0.151521 | 108.343084 | 630.296518 | 0.176489 | 133.597206 | 43.761557 |
| NaN | NaN | NaN | NaN | Kobus lechwe | 25.324500 | 14.288900 | 69.665500 | 182.668000 | 34.340300 | 14.300600 | 19.949800 | 25.341600 | 23.418600 | 25.773000 | 23.157900 | 879.410000 | 196.892000 | 0.098208 | 108.293000 | 559.050000 | 0.000000 | 145.582000 | 215.976000 |
| NaN | Bovidae | Reduncini | Redunca redunca | Redunca redunca | 22.583532 | 13.156174 | 58.002379 | 2114.016789 | 32.710939 | 8.621994 | 24.772560 | 22.943320 | 19.150050 | 26.841598 | 18.927438 | 1250.679273 | 218.766849 | 1.803896 | 103.746344 | 564.711313 | 7.490632 | 244.927171 | 14.817446 |
| NaN | Bovidae | Tragelaphini | Tragelaphus strepsiceros | Tragelaphus strepsiceros | 18.891932 | 15.056030 | 69.960020 | 189.801548 | 29.012677 | 8.644988 | 15.479001 | 19.911239 | 16.051883 | 21.460499 | 15.801136 | 704.912114 | 137.619967 | 4.914661 | 93.436450 | 319.811529 | 25.500743 | 202.745094 | 146.162439 |
| NaN | Giraffidae | NaN | Giraffa stillei | Giraffa camelopardalis | 23.670364 | 12.984961 | 70.119721 | 205.360488 | 32.670935 | 13.496153 | 19.174767 | 24.625011 | 21.405992 | 25.966903 | 20.987447 | 645.374903 | 138.833761 | 4.148323 | 97.848060 | 337.877229 | 17.963311 | 173.312196 | 69.019123 |
| NaN | NaN | NaN | NaN | Giraffa reticulata | 23.670364 | 12.984961 | 70.119721 | 205.360488 | 32.670935 | 13.496153 | 19.174767 | 24.625011 | 21.405992 | 25.966903 | 20.987447 | 645.374903 | 138.833761 | 4.148323 | 97.848060 | 337.877229 | 17.963311 | 173.312196 | 69.019123 |
| NaN | NaN | NaN | NaN | Giraffa tippelskirchi | 23.630365 | 12.949566 | 70.119373 | 203.670088 | 32.593630 | 13.499792 | 19.093824 | 24.577703 | 21.379768 | 25.906677 | 20.968221 | 650.153043 | 139.632952 | 4.131287 | 97.703732 | 340.621182 | 17.893478 | 174.619692 | 68.134438 |
| NaN | NaN | NaN | NaN | Giraffa giraffa | 23.370532 | 13.367581 | 68.984991 | 225.233068 | 32.777992 | 12.661237 | 20.116740 | 24.593664 | 20.784227 | 25.842207 | 206.129386 | 621.915064 | 133.764865 | 4.007611 | 97.839807 | 328.712688 | 17.249542 | 175.588304 | 62.982661 |
| NaN | Giraffidae | NaN | Giraffa jumae | Giraffa camelopardalis | 23.670364 | 12.984961 | 70.119721 | 205.360488 | 32.670935 | 13.496153 | 19.174767 | 24.625011 | 21.405992 | 25.966903 | 20.987447 | 645.374903 | 138.833761 | 4.148323 | 97.848060 | 337.877229 | 17.963311 | 173.312196 | 69.019123 |
| NaN | NaN | NaN | NaN | Giraffa reticulata | 23.670364 | 12.984961 | 70.119721 | 205.360488 | 32.670935 | 13.496153 | 19.174767 | 24.625011 | 21.405992 | 25.966903 | 20.987447 | 645.374903 | 138.833761 | 4.148323 | 97.848060 | 337.877229 | 17.963311 | 173.312196 | 69.019123 |
| NaN | NaN | NaN | NaN | Giraffa tippelskirchi | 23.630365 | 12.949566 | 70.119373 | 203.670088 | 32.593630 | 13.499792 | 19.093824 | 24.577703 | 21.379768 | 25.906677 | 20.968221 | 650.153043 | 139.632952 | 4.131287 | 97.703732 | 340.621182 | 17.893478 | 174.619692 | 68.134438 |
| NaN | NaN | NaN | NaN | Giraffa giraffa | 23.370532 | 13.367581 | 68.984991 | 225.233068 | 32.777992 | 12.661237 | 20.116740 | 24.593664 | 20.784227 | 25.842207 | 206.129386 | 621.915064 | 133.764865 | 4.007611 | 97.839807 | 328.712688 | 17.249542 | 175.588304 | 62.982661 |
| NaN | Giraffidae | NaN | Okapia sp. | Okapia johnstoni | 23.825541 | 9.814253 | 86.631943 | 55.392170 | 29.422109 | 17.964022 | 11.457227 | 23.615129 | 23.783280 | 24.502878 | 23.160536 | 1648.069824 | 204.767392 | 55.754137 | 37.459477 | 455.918057 | 125.533159 | 420.131038 | 442.998507 |
| NaN | Suidae | NaN | Kolpochoerus heseloni\* | Hylochoerus meinertzhageni | 24.784405 | 10.065359 | 81.903594 | 96.957198 | 30.590586 | 17.450694 | 11.682877 | 24.459234 | 24.089454 | 25.931716 | 24.484998 | 1488.672757 | 214.960284 | 5.901654 | 64.800085 | 605.066543 | 62.554792 | 419.084160 | 471.056370 |
| NaN | NaN | NaN | NaN | Potamochoerus larvatus | 22.645814 | 12.385716 | 71.650846 | 169.104714 | 31.221600 | 14.520286 | 14.868156 | 25.822784 | 21.204194 | 24.988424 | 22.191197 | 1081.221414 | 220.879326 | 0.103812 | 106.576590 | 555.651510 | 0.887702 | 307.223127 | 7.261403 |
| NaN | NaN | NaN | NaN | Potamochoerus porcus | 24.813231 | 9.920804 | 77.178566 | 105.915314 | 30.624392 | 18.628940 | 11.581929 | 24.702543 | 23.745014 | 25.810851 | 24.134265 | 1533.136988 | 221.606712 | 0.105441 | 69.596496 | 635.515060 | 0.901633 | 419.223634 | 10.355245 |
| NaN | Suidae | NaN | Metridiochoerus andrewsi | Phacochoerus aethiopicus | 26.894888 | 11.017807 | 73.586365 | 147.001077 | 32.958146 | 17.739760 | 14.879832 | 26.713167 | 24.798643 | 28.851854 | 25.378143 | 562.632040 | 116.975152 | 2.525216 | 98.699321 | 256.007898 | 6.828796 | 161.543383 | 62.722619 |
| NaN | NaN | NaN | NaN | Phacochoerus africanus | 27.098302 | 12.712929 | 66.941486 | 193.718638 | 31.534243 | 17.332931 | 15.625685 | 25.967314 | 25.815716 | 26.343074 | 25.784972 | 954.883259 | 207.833688 | 0.694484 | 106.225662 | 541.466435 | 4.794649 | 229.755091 | 39.194326 |
| NaN | Suidae | NaN | Metridiochoerus modestus | Phacochoerus aethiopicus | 26.894888 | 11.017807 | 73.586365 | 147.001077 | 32.958146 | 17.739760 | 14.879832 | 26.713167 | 24.798643 | 28.851854 | 25.378143 | 562.632040 | 116.975152 | 2.525216 | 98.699321 | 256.007898 | 6.828796 | 161.543383 | 62.722619 |
| NaN | NaN | NaN | NaN | Phacochoerus africanus | 27.098302 | 12.712929 | 66.941486 | 193.718638 | 31.534243 | 17.332931 | 15.625685 | 25.967314 | 25.815716 | 26.343074 | 25.784972 | 954.883259 | 207.833688 | 0.694484 | 106.225662 | 541.466435 | 4.794649 | 229.755091 | 39.194326 |
| NaN | Equidae | NaN | Equus oldowayensis | Equus grevi | 23.770858 | 12.103323 | 65.962469 | 246.282951 | 33.742164 | 12.003122 | 21.791625 | 25.701367 | 21.436175 | 26.276899 | 18.175688 | 446.479567 | 85.415279 | 0.707583 | 96.329625 | 227.885564 | 4.543444 | 154.738796 | 11.012353 |
| NaN | Hyaenidae | NaN | Crocuta ultra | Crocuta crocuta | 25.864931 | 13.551552 | 62.365308 | 265.100938 | 32.948541 | 12.489930 | 22.404062 | 26.566199 | 24.427174 | 26.951582 | 21.493642 | 326.761178 | 156.515522 | 0.000000 | 92.112149 | 346.541294 | 0.475025 | 81.548856 | 0.475025 |
| NaN | Canidae | NaN | Canis mesomelas | Canis mesomelas | 23.039092 | 12.572379 | 63.025572 | 156.709067 | 33.163819 | 11.067209 | 16.080953 | 25.488215 | 18.424302 | 25.469022 | 18.442903 | 479.513835 | 122.669543 | 0.346588 | 84.231422 | 264.938874 | 3.580117 | 177.909601 | 6.879135 |
| NaN | Canidae | NaN | Protocyon recki | Otocyon megalotis | 20.427783 | 15.707186 | 56.090945 | 1057.838796 | 32.048152 | 6.527097 | 18.225420 | 23.767391 | 16.774051 | 25.726325 | 13.589006 | 375.544487 | 83.984010 | 0.190773 | 100.303159 | 220.805154 | 0.863021 | 85.669632 | 2.264294 |
| NaN | Herpestidae | NaN | cf Myonax sanguineus | Herpestes sanguineus | 26.599117 | 12.125559 | 66.833971 | 134.477000 | 31.362225 | 15.602682 | 16.573672 | 26.158355 | 23.504596 | 26.017807 | 23.192053 | 1430.236688 | 195.977127 | 0.856300 | 106.598900 | 506.991630 | 4.123025 | 97.518824 | 7.888910 |
| NaN | Herpestidae | NaN | Galerella primitivus | Herpestes ichneumon | 26.574240 | 13.012330 | 67.421324 | 228.903608 | 31.466665 | 15.923293 | 19.838973 | 25.737157 | 25.658216 | 25.870797 | 23.783477 | 904.379029 | 28.751522 | 0.697032 | 90.654959 | 70.549506 | 3.601311 | 29.226995 | 7.474148 |
| NaN | NaN | NaN | NaN | Herpestes pulverulenta | 19.983450 | 16.511226 | 56.352971 | 419.322333 | 30.618892 | 4.527016 | 30.251005 | 21.847021 | 13.766929 | 22.970140 | 13.454387 | 411.126688 | 76.895127 | 7.546300 | 64.600567 | 153.908297 | 30.808692 | 133.198824 | 45.650244 |
| NaN | Herpestidae | NaN | Mungos minutus | Mungos mungo | 23.874041 | 11.574958 | 70.987435 | 172.040142 | 32.049425 | 17.230958 | 15.049193 | 25.601766 | 25.848262 | 26.483258 | 25.092318 | 1146.635427 | 228.631368 | 3.041387 | 90.505138 | 675.803419 | 15.050635 | 172.143086 | 49.768507 |
| NaN | Cercopithecidae | NaN | Theropithecus oswaldi | Theropithecus gelada | 19.961800 | 14.847300 | 71.340100 | 174.376000 | 30.017600 | 8.548800 | 19.855700 | 20.837200 | 17.984100 | 21.997600 | 17.747400 | 855.110000 | 217.137000 | 6.574290 | 100.547000 | 527.539000 | 20.474100 | 212.556000 | 150.745000 |
| NaN | Cercopithecidae | NaN | Papio sp. | Papio anubis | 22.209600 | 15.046500 | 63.996900 | 176.874000 | 33.645600 | 5.567530 | 26.629400 | 22.685200 | 17.880100 | 23.763700 | 20.878400 | 1290.680000 | 258.584000 | 0.000000 | 94.128800 | 804.860000 | 0.000000 | 189.971000 | 0.000000 |
| NaN | Pythonidae | NaN | Python sebae | Python sebae | 24.969177 | 9.947722 | 70.549684 | 64.470372 | 31.720533 | 18.550763 | 12.180043 | 24.488470 | 24.011768 | 25.888470 | 24.002218 | 1547.411684 | 216.736218 | 0.000000 | 80.775193 | 567.070041 | 0.115299 | 187.780022 | 2.000000 |
| NaN | Viperidae | NaN | Bitis olduvaiensis | Bitis arietans | 27.323770 | 13.449366 | 67.498179 | 222.758073 | 31.650562 | 12.779048 | 15.473434 | 25.894614 | 26.641202 | 26.100835 | 25.776554 | 354.793808 | 177.985944 | 0.134799 | 110.482145 | 473.654583 | 0.497191 | 91.892703 | 2.749610 |
| NaN | NaN | NaN | NaN | Bitis nasicornis | 25.098720 | 9.633197 | 83.128064 | 55.017406 | 30.688950 | 18.928607 | 11.542141 | 24.467561 | 24.158800 | 25.011959 | 24.252483 | 1583.649227 | 225.519167 | 0.722051 | 51.899975 | 615.513283 | 10.467029 | 341.552635 | 30.393700 |
| NaN | NaN | NaN | NaN | Bitis gabonica | 25.289823 | 9.387678 | 80.958764 | 68.121925 | 31.155508 | 18.451645 | 11.727708 | 24.562617 | 24.640192 | 26.196951 | 24.367784 | 1713.237195 | 269.553921 | 4.507955 | 62.700745 | 561.168554 | 32.442170 | 367.176786 | 305.051931 |
| NaN | NaN | NaN | NaN | Mean | 23.616286 | 13.075950 | 67.716022 | 274.786877 | 32.179621 | 12.649645 | 18.958389 | 24.630803 | 21.583201 | 25.603549 | 29.544050 | 827.074302 | 158.969019 | 3.880923 | 90.727083 | 414.419483 | 15.071693 | 192.936241 | 68.235959 |
| NaN | NaN | NaN | NaN | Minimum | 17.260512 | 9.387678 | 54.005440 | 55.017406 | 29.012677 | 1.278616 | 11.457227 | 19.422098 | 12.423276 | 21.460499 | 12.856564 | 309.144556 | 28.751522 | 0.000000 | 37.459477 | 70.549506 | 0.000000 | 29.226995 | 0.000000 |
| NaN | NaN | NaN | NaN | Maximum | 27.323770 | 16.511226 | 86.631943 | 2114.016789 | 36.889784 | 18.928607 | 30.251005 | 28.908160 | 26.641202 | 28.851854 | 206.129386 | 1713.237195 | 269.553921 | 55.754137 | 113.865225 | 804.860000 | 125.533159 | 420.131038 | 471.056370 |
| NaN | NaN | NaN | NaN | sd | 2.438746 | 1.933224 | 7.289456 | 327.103154 | 1.441884 | 4.586564 | 5.019615 | 1.795377 | 3.566119 | 1.551102 | 39.635923 | 408.226891 | 58.407699 | 8.564883 | 17.413245 | 163.975179 | 21.932426 | 92.017758 | 105.652909 |
| NaN | NaN | NaN | NaN | standard error range (min) | 14.821766 | 7.454454 | 46.715985 | -272.085748 | 27.570793 | -3.307948 | 6.437612 | 17.626720 | 8.857157 | 19.909397 | -26.779359 | -99.082335 | -29.656176 | -8.564883 | 20.046231 | -93.425672 | -21.932426 | -62.790763 | -105.652909 |
| NaN | NaN | NaN | NaN | standard error range (max) | 29.762516 | 18.444450 | 93.921399 | 2441.119943 | 38.331668 | 23.515171 | 35.270620 | 30.703537 | 30.207321 | 30.402956 | 245.765308 | 2121.464086 | 327.961620 | 64.319020 | 131.278470 | 968.835179 | 147.465585 | 512.148795 | 576.709279 |

## Bed I-1.84
| Unnamed: 0 | Unnamed: 1 | Olduvai | Modern | bio1 | bio2 | bio3 | bio4 | bio5 | bio6 | bio7 | bio8 | bio9 | bio10 | bio11 | bio12 | bio13 | bio14 | bio15 | bio16 | bio17 | bio18 | bio19 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Tuff IC | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN |
| 1.84 | Bovidae | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN |
| NaN | Alcelaphini | Megalotragus kattwinkeli | Connochaetes taurinus | 20.008718 | 16.444548 | 58.953549 | 346.784395 | 32.082067 | 4.276941 | 28.679696 | 23.851378 | 15.001691 | 24.251126 | 14.326410 | 430.702075 | 88.868284 | 2.583135 | 95.786898 | 337.291100 | 8.476587 | 194.513855 | 11.852557 |
| NaN | NaN | Parmularius altidens | Alcelaphus buselaphus | 25.521122 | 13.355620 | 67.005494 | 231.581415 | 34.400319 | 14.411046 | 20.054960 | 25.025545 | 23.669874 | 25.111710 | 23.338994 | 547.896458 | 215.146779 | 0.355474 | 113.877063 | 574.464378 | 1.602271 | 173.640270 | 4.741258 |
| NaN | NaN | NaN | Damaliscus pygargus | 17.253323 | 15.952654 | 53.993296 | 402.290328 | 30.164496 | 1.268319 | 26.286272 | 28.916782 | 12.408889 | 21.627456 | 12.844630 | 646.355395 | 119.749615 | 6.220470 | 73.347193 | 328.511417 | 35.562922 | 270.246822 | 36.388016 |
| NaN | NaN | Connochaetes sp. | Connochaetes taurinus | 20.008718 | 16.444548 | 58.953549 | 346.784395 | 32.082067 | 4.276941 | 28.679696 | 23.851378 | 15.001691 | 24.251126 | 14.326410 | 430.702075 | 88.868284 | 2.583135 | 95.786898 | 337.291100 | 8.476587 | 194.513855 | 11.852557 |
| NaN | Antilopini | Antidorcas recki | Antidorcas marsupialis | 22.011493 | 16.180004 | 58.608221 | 360.507331 | 33.517455 | 6.893960 | 27.839278 | 25.178023 | 19.829376 | 27.246396 | 19.067219 | 321.114988 | 66.993415 | 0.019059 | 94.921498 | 178.411786 | 2.593144 | 117.252647 | 7.322246 |
| NaN | Hippotragini | Hippotragini gigas | Hippotragus niger | 21.478770 | 14.265679 | 62.644312 | 251.247818 | 31.799722 | 13.328360 | 17.123838 | 25.734546 | 20.374290 | 24.939692 | 16.956304 | 867.542450 | 193.571064 | 0.897159 | 108.294245 | 504.718014 | 3.129602 | 260.776534 | 5.984142 |
| NaN | NaN | NaN | Hippotragus leucophaeus | 20.777593 | 12.547644 | 59.341183 | 325.951646 | 31.448389 | 8.922212 | 20.872125 | 19.400790 | 24.884492 | 25.006886 | 17.258211 | 646.584633 | 113.156850 | 13.086450 | 59.129525 | 317.009725 | 45.225410 | 102.902404 | 87.543013 |
| NaN | NaN | NaN | Hippotragus equinus | 23.707993 | 12.758844 | 63.063583 | 278.088446 | 33.665989 | 10.928612 | 19.446525 | 22.542390 | 24.884492 | 27.261446 | 20.927811 | 807.096633 | 155.291250 | 7.278450 | 78.348725 | 438.766525 | 25.161410 | 102.902404 | 49.500613 |
| NaN | NaN | Oryx sp. | Oryx gaxella | 24.158489 | 15.167775 | 61.900342 | 372.772968 | 36.886798 | 9.840166 | 25.122983 | 26.399185 | 20.795533 | 27.564168 | 20.337455 | 309.278130 | 70.360337 | 0.368388 | 71.497188 | 175.769408 | 2.349516 | 87.754131 | 1.987726 |
| NaN | Equidae | Equus oldowayensis | Equus grevi | 23.761444 | 12.107432 | 65.991199 | 246.082585 | 33.731802 | 11.991261 | 21.793658 | 25.689896 | 21.422760 | 26.266096 | 18.162611 | 447.153325 | 85.549416 | 0.701201 | 96.399940 | 228.204545 | 4.505953 | 154.999622 | 10.926982 |
| NaN | NaN | Crocuta crocuta | NaN | 25.872010 | 13.546567 | 62.387103 | 264.826042 | 32.941838 | 12.509022 | 22.391490 | 26.563748 | 24.437446 | 26.947463 | 21.509254 | 326.775199 | 156.799005 | 0.000000 | 92.197811 | 347.127695 | 0.472968 | 81.576783 | 0.472968 |
| NaN | NaN | Python aff. sebae | NaN | 24.969743 | 9.945784 | 70.552499 | 64.385652 | 31.720011 | 18.554007 | 12.175801 | 24.488520 | 24.013449 | 25.888520 | 24.003940 | 1547.721590 | 216.763334 | 0.000000 | 80.767075 | 567.134673 | 0.114800 | 187.785303 | 2.000000 |
| NaN | NaN | Bitis olduvaiensis | Bitis arietans | 27.324533 | 13.449585 | 67.497754 | 222.762583 | 31.650343 | 12.778706 | 15.473116 | 25.895071 | 26.641890 | 26.100831 | 25.777522 | 354.729766 | 177.992499 | 0.134216 | 110.488283 | 473.690711 | 0.495039 | 91.875851 | 2.737707 |
| NaN | NaN | NaN | Bitis nasicornis | 25.098725 | 9.632620 | 83.132704 | 54.973608 | 30.688132 | 18.930215 | 11.540660 | 24.467701 | 24.158545 | 25.011042 | 24.253121 | 1583.802261 | 225.508262 | 0.718926 | 51.886988 | 615.619286 | 10.426047 | 341.589204 | 30.266455 |
| NaN | NaN | NaN | Bitis gabonica | 25.289001 | 9.388164 | 80.972796 | 68.021398 | 31.152671 | 18.455317 | 11.725424 | 24.562346 | 24.637854 | 26.195666 | 24.367923 | 1712.829241 | 269.339402 | 4.488440 | 62.685157 | 561.375616 | 32.301728 | 367.355241 | 305.068589 |
| NaN | NaN | NaN | Mean | 23.149445 | 13.412498 | 64.999839 | 255.804041 | 32.528807 | 11.157672 | 20.613701 | 24.837820 | 21.477485 | 25.577975 | 19.830521 | 732.018948 | 149.597186 | 2.628967 | 85.694299 | 399.025732 | 12.059599 | 181.978995 | 37.909655 |
| NaN | NaN | NaN | Minimum | 17.253323 | 9.388164 | 53.993296 | 54.973608 | 30.164496 | 1.268319 | 11.540660 | 19.400790 | 12.408889 | 21.627456 | 12.844630 | 309.278130 | 66.993415 | 0.000000 | 51.886988 | 175.769408 | 0.114800 | 81.576783 | 0.472968 |
| NaN | NaN | NaN | Maximum | 27.324533 | 16.444548 | 83.132704 | 402.290328 | 36.886798 | 18.930215 | 28.679696 | 28.916782 | 26.641890 | 27.564168 | 25.777522 | 1712.829241 | 269.339402 | 13.086450 | 113.877063 | 615.619286 | 45.225410 | 367.355241 | 305.068589 |
| NaN | NaN | NaN | sd | 2.778341 | 2.415854 | 8.101484 | 114.075849 | 1.706683 | 5.386968 | 6.048965 | 2.103820 | 4.289307 | 1.536765 | 4.115787 | 488.605136 | 64.659419 | 3.730553 | 19.227626 | 146.468681 | 14.887310 | 92.101897 | 77.640145 |
| NaN | NaN | NaN | standard error range (min) | 14.474982 | 6.972310 | 45.891812 | -59.102241 | 28.457813 | -4.118649 | 5.491695 | 17.296970 | 8.119583 | 20.090691 | 8.728844 | -179.327006 | 2.333996 | -3.730553 | 32.659362 | 29.300727 | -14.772509 | -10.525115 | -77.167177 |
| NaN | NaN | NaN | standard error range (max) | 30.102874 | 18.860402 | 91.234188 | 516.366177 | 38.593481 | 24.317183 | 34.728661 | 31.020603 | 30.931196 | 29.100933 | 29.893308 | 2201.434377 | 333.998821 | 16.817004 | 133.104689 | 762.087966 | 60.112720 | 459.457139 | 382.708734 |

## Bed-1.831
| Unnamed: 0 | Unnamed: 1 | Olduvai | Modern | bio1 | bio2 | bio3 | bio4 | bio5 | bio6 | bio7 | bio8 | bio9 | bio10 | bio11 | bio12 | bio13 | bio14 | bio15 | bio16 | bio17 | bio18 | bio19 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Tuff IE | Mammals | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN |
| 1.831 | Bovidae | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN |
| NaN | Alcelaphini | Parmularius altidens | Alcelaphus buselaphus | 23.849300 | 13.888600 | 67.173300 | 231.591000 | 33.165500 | 12.638600 | 21.320300 | 24.167900 | 21.385700 | 25.154800 | 21.227000 | 787.613000 | 202.829000 | 2.026430 | 104.154000 | 534.717000 | 9.163630 | 196.110000 | 75.382600 |
| NaN | NaN | NaN | Damaliscus pygargus | 17.616000 | 15.030400 | 55.865700 | 402.500000 | 30.185100 | 2.194710 | 26.996500 | 21.459600 | 13.355000 | 21.739200 | 12.846900 | 646.288000 | 119.692000 | 8.042080 | 73.286500 | 328.324000 | 31.765400 | 270.276000 | 36.394500 |
| NaN | NaN | Connchaetes sp. | Connchaetes gnou | 18.279547 | 16.419037 | 56.532311 | 406.611135 | 31.364036 | 2.254054 | 29.985166 | 22.654753 | 12.898893 | 23.161052 | 12.462863 | 483.805184 | 80.330185 | 4.443700 | 83.877232 | 306.038762 | 12.726508 | 213.566197 | 18.226765 |
| NaN | NaN | Beatragus sp. | Beatragus hunteri | 26.002800 | 10.782000 | 69.639200 | 163.758000 | 33.336500 | 17.391700 | 15.694400 | 26.731500 | 26.283800 | 27.688200 | 24.185200 | 553.993000 | 110.938000 | 6.475880 | 71.099800 | 263.639000 | 46.593000 | 156.084000 | 74.394000 |
| NaN | Antilopini | Antidorcas recki | Antidorcas marsupialis | 22.003611 | 16.186461 | 58.583724 | 360.859469 | 33.514924 | 6.876381 | 27.857673 | 25.174218 | 19.817004 | 27.244212 | 19.058575 | 321.207361 | 67.004208 | 0.018966 | 94.884708 | 178.468468 | 2.590243 | 117.236737 | 7.296214 |
| NaN | Reduncini | Redunca redunca | NaN | 24.865500 | 13.121600 | 68.877400 | 180.029000 | 33.431600 | 12.933900 | 18.068500 | 24.760700 | 22.300600 | 26.381800 | 20.600500 | 934.145000 | 210.229000 | 3.122840 | 98.450300 | 526.642000 | 11.264100 | 200.613000 | 107.136000 |
| NaN | Tragelaphini | Tragelaphini sp. | Tragelaphus strepsiceros | 19.039500 | 14.308400 | 71.177300 | 190.433000 | 28.595700 | 8.661550 | 17.383300 | 19.963100 | 16.700300 | 21.239100 | 16.213400 | 806.540000 | 155.928000 | 5.970150 | 89.741100 | 388.168000 | 29.993700 | 202.855000 | 159.888000 |
| NaN | Giraffidae | Giraffa jumae | Giraffa camelopardalis | 23.793925 | 12.946701 | 70.119767 | 203.158875 | 32.753392 | 13.681235 | 19.072144 | 24.697033 | 21.583748 | 26.078544 | 21.147826 | 643.368920 | 138.871236 | 4.150267 | 98.107142 | 309.604106 | 18.022073 | 170.764876 | 71.227073 |
| NaN | NaN | NaN | Giraffa reticulata | 23.793925 | 12.946701 | 70.119767 | 203.158875 | 32.753392 | 13.681235 | 19.072144 | 24.697033 | 21.583748 | 26.078544 | 21.147826 | 643.368920 | 138.871236 | 4.150267 | 98.107142 | 309.604106 | 18.022073 | 170.764876 | 71.227073 |
| NaN | NaN | NaN | Giraffa tippelskirchi | 23.615004 | 12.934983 | 70.119384 | 202.971112 | 32.562893 | 13.502506 | 19.060373 | 24.559038 | 21.370346 | 25.883048 | 20.961515 | 652.073597 | 139.956685 | 4.124405 | 97.647051 | 341.542191 | 17.865606 | 175.131831 | 67.791161 |
| NaN | NaN | NaN | Giraffa giraffa | 23.349551 | 13.395149 | 68.901638 | 226.661438 | 32.786336 | 12.601739 | 20.184582 | 24.591766 | 20.740175 | 25.833889 | 204.379281 | 620.041231 | 133.393811 | 3.986323 | 97.852860 | 327.987789 | 17.156700 | 175.690955 | 62.478067 |
| NaN | Suidae | Kolpochoerus heseloni | Hylochoerus meinertzhageni | 24.426600 | 10.651600 | 79.334800 | 96.829700 | 30.537200 | 17.220500 | 13.211300 | 24.086000 | 24.113200 | 25.477500 | 23.514800 | 1523.410000 | 248.226000 | 22.372700 | 64.732600 | 647.629000 | 98.001600 | 334.468000 | 405.527000 |
| NaN | NaN | NaN | Potamochoerus larvatus | 23.409900 | 11.684600 | 73.269600 | 151.349000 | 30.963200 | 12.030500 | 16.002300 | 24.588400 | 21.933800 | 25.085800 | 22.208900 | 1195.220000 | 210.057000 | 2.972540 | 86.557000 | 563.276000 | 14.362300 | 330.046000 | 53.642800 |
| NaN | NaN | NaN | Potamochoerus porcus | 24.260100 | 10.899700 | 75.671600 | 123.904000 | 31.058300 | 17.035800 | 13.322600 | 24.999600 | 23.302200 | 25.719700 | 23.494600 | 1396.920000 | 233.905000 | 8.199620 | 79.308400 | 622.857000 | 36.634000 | 357.270000 | 147.815000 |
| NaN | NaN | Metridiochoerus sp. | Phacochoerus aethiopicus | 25.971400 | 11.207800 | 71.865600 | 147.001000 | 32.968800 | 17.710000 | 15.261800 | 26.425400 | 24.831900 | 27.343000 | 24.372600 | 560.976000 | 123.980000 | 2.495590 | 98.696100 | 276.491000 | 15.180800 | 161.151000 | 62.457100 |
| NaN | NaN | NaN | Phacochoerus africanus | 24.463900 | 12.712800 | 69.702900 | 193.874000 | 32.511900 | 14.362800 | 18.152700 | 24.678400 | 22.628100 | 26.375700 | 22.282800 | 954.918000 | 194.188000 | 3.641630 | 94.942000 | 505.537000 | 18.610600 | 229.680000 | 141.246000 |
| NaN | Equidae | Equus oldowayensis | Equus grevi | 23.750854 | 12.112055 | 66.023519 | 245.857173 | 33.720146 | 11.977918 | 21.795944 | 25.676991 | 21.407668 | 26.253941 | 18.147899 | 447.911302 | 85.700320 | 0.694021 | 96.479043 | 228.563399 | 4.463776 | 155.293052 | 10.830940 |
| NaN | Rhinocerotidae | Ceratotherium simum | NaN | 23.133400 | 14.466000 | 60.892800 | 295.430000 | 34.490000 | 10.350900 | 24.139000 | 24.938300 | 19.919600 | 26.443300 | 19.000500 | 621.519000 | 136.457000 | 4.093840 | 101.733000 | 354.561000 | 17.280000 | 172.042000 | 77.044300 |
| NaN | NaN | Panthera pardus | NaN | 24.546577 | 11.828743 | 67.899856 | 184.856757 | 33.004093 | 17.045025 | 17.624550 | 24.977954 | 22.651992 | 25.812722 | 24.379635 | 1338.151100 | 192.251860 | 0.008101 | 93.135847 | 531.895346 | 0.015240 | 197.231693 | 0.194512 |
| NaN | NaN | Panthera leo | NaN | 25.777448 | 12.045955 | 64.858880 | 167.117733 | 33.691933 | 17.117429 | 18.855421 | 25.738198 | 19.864431 | 25.921328 | 25.031272 | 1071.269288 | 205.900048 | 0.008101 | 102.512189 | 495.693255 | 0.015240 | 148.938104 | 4.302960 |
| NaN | Hyaenidae | Crocuta sp. | NaN | 25.879973 | 13.540959 | 62.411622 | 264.516784 | 32.934296 | 12.530499 | 22.377347 | 26.560990 | 24.449002 | 26.942828 | 21.526817 | 326.790973 | 157.117923 | 0.000000 | 92.294180 | 347.787396 | 0.470655 | 81.608201 | 0.470655 |
| NaN | Canidae | Canis mesomelas | Canis mesomelas | 23.035053 | 12.568034 | 63.014298 | 156.564557 | 33.173351 | 11.061991 | 16.072849 | 25.493842 | 18.413960 | 25.472986 | 18.436069 | 478.230428 | 122.405808 | 0.343400 | 84.197096 | 264.102315 | 3.565581 | 177.811082 | 6.834251 |
| NaN | NaN | Prototocyon recki | Otocyon megalotis | 20.425687 | 15.708040 | 56.090108 | 1055.779673 | 32.046790 | 6.526848 | 18.218747 | 23.766311 | 16.772450 | 25.726083 | 13.586348 | 375.475084 | 83.956560 | 0.189018 | 100.327968 | 220.770150 | 0.855082 | 85.626675 | 2.243465 |
| NaN | Cercopithecidae | Theropithecus sp. | Theropithecus gelada | 20.449464 | 14.067708 | 77.387419 | 137.819450 | 29.393605 | 12.891437 | 18.263661 | 19.928188 | 19.623935 | 22.494666 | 19.035378 | 1075.959289 | 250.965443 | 12.098112 | 96.922238 | 592.619494 | 44.273222 | 225.591744 | 228.288094 |
| NaN | NaN | Python sebae | NaN | 24.970381 | 9.943604 | 70.555667 | 64.290342 | 31.719424 | 18.557656 | 12.171028 | 24.488576 | 24.015339 | 25.888576 | 24.005877 | 1548.070234 | 216.793839 | 0.000000 | 80.757943 | 567.207384 | 0.114239 | 187.791244 | 2.000000 |
| NaN | NaN | Bitis olduvaiensis | Bitis arietans | 27.325391 | 13.449832 | 67.497276 | 222.767658 | 31.650097 | 12.778321 | 15.472758 | 25.895584 | 26.642663 | 26.100827 | 25.778610 | 354.657718 | 177.999872 | 0.133559 | 110.495188 | 473.731354 | 0.492618 | 91.856893 | 2.724316 |
| NaN | NaN | NaN | Bitis nasicornis | 25.098731 | 9.631971 | 83.137925 | 54.924335 | 30.687212 | 18.932023 | 11.538994 | 24.467859 | 24.158259 | 25.010009 | 24.253840 | 1583.974424 | 225.495993 | 0.715409 | 51.872377 | 615.738539 | 10.379941 | 341.630344 | 30.123304 |
| NaN | NaN | NaN | Bitis gabonica | 25.288077 | 9.388711 | 80.988581 | 67.908304 | 31.149478 | 18.459449 | 11.722854 | 24.562041 | 24.635223 | 26.194219 | 24.368080 | 1712.370294 | 269.098068 | 4.466486 | 62.667621 | 561.608561 | 32.143730 | 367.556004 | 305.087329 |
| NaN | NaN | NaN | Mean | 23.515057 | 12.781005 | 68.489712 | 228.661513 | 32.148186 | 12.964525 | 18.532105 | 24.454617 | 21.335108 | 25.526628 | 27.416247 | 844.938119 | 165.447932 | 3.890837 | 89.458522 | 417.314415 | 18.286488 | 203.381625 | 79.724053 |
| NaN | NaN | NaN | Minimum | 17.616000 | 9.388711 | 55.865700 | 54.924335 | 28.595700 | 2.194710 | 11.538994 | 19.928188 | 12.898893 | 21.239100 | 12.462863 | 321.207361 | 67.004208 | 0.000000 | 51.872377 | 178.468468 | 0.015240 | 81.608201 | 0.194512 |
| NaN | NaN | NaN | Maximum | 27.325391 | 16.419037 | 83.137925 | 1055.779673 | 34.490000 | 18.932023 | 29.985166 | 26.731500 | 26.642663 | 27.688200 | 204.379281 | 1712.370294 | 269.098068 | 22.372700 | 110.495188 | 647.629000 | 98.001600 | 367.556004 | 405.527000 |
| NaN | NaN | NaN | sd | 2.392968 | 1.878506 | 7.141859 | 184.990838 | 1.417579 | 4.519738 | 4.684657 | 1.666793 | 3.401972 | 1.562543 | 34.874377 | 426.143033 | 56.840468 | 4.712730 | 14.041671 | 142.859182 | 20.657809 | 79.874810 | 97.356860 |
| NaN | NaN | NaN | standard error range (min) | 15.223032 | 7.510205 | 48.723841 | -130.066503 | 27.178121 | -2.325028 | 6.854337 | 18.261395 | 9.496921 | 19.676557 | -22.411514 | -104.935673 | 10.163740 | -4.712730 | 37.830707 | 35.609286 | -20.642569 | 1.733391 | -97.162349 |
| NaN | NaN | NaN | standard error range (max) | 29.718359 | 18.297543 | 90.279784 | 1240.770511 | 35.907579 | 23.451762 | 34.669823 | 28.398293 | 30.044635 | 29.250743 | 239.253658 | 2138.513327 | 325.938536 | 27.085430 | 124.536858 | 790.488182 | 118.659409 | 447.430813 | 502.883860 |

## Bed I-1.8
| Unnamed: 0 | Unnamed: 1 | Olduvai | Modern | bio1 | bio2 | bio3 | bio4 | bio5 | bio6 | bio7 | bio8 | bio9 | bio10 | bio11 | bio12 | bio13 | bio14 | bio15 | bio16 | bio17 | bio18 | bio19 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Tuff IF | Mammals | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN |
| 1.8 | Bovidae | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN |
| NaN | Alcelaphini | Connochaetes sp. | Connochaetes taurinus | 20.054181 | 16.450101 | 59.015428 | 345.199952 | 32.102022 | 4.325268 | 28.654050 | 23.885044 | 15.051655 | 24.282623 | 14.369314 | 428.730291 | 88.979843 | 2.526980 | 96.137183 | 338.019555 | 8.335792 | 193.915728 | 11.638371 |
| NaN | NaN | Parmularius altidens | Damaliscus pygargus | 17.217381 | 15.968901 | 53.932572 | 403.286190 | 30.152224 | 1.216834 | 26.317005 | 21.863122 | 12.336957 | 21.609468 | 12.784965 | 646.030278 | 119.461580 | 6.237416 | 73.209210 | 327.750300 | 35.681119 | 270.465369 | 36.442624 |
| NaN | NaN | NaN | Alcelaphus buselaphus | 25.564141 | 13.330498 | 67.014070 | 231.599210 | 34.432921 | 14.460806 | 20.018211 | 25.046729 | 23.737920 | 25.131021 | 23.390320 | 543.376969 | 215.317501 | 0.347747 | 113.936258 | 575.258631 | 1.567439 | 172.800265 | 4.681666 |
| NaN | Antilopini | Antidorcas recki | Antidorcas marsupialis | 21.976461 | 16.208700 | 58.499346 | 362.072389 | 33.506206 | 6.815831 | 27.921033 | 25.161110 | 19.774389 | 27.236691 | 19.028801 | 321.525532 | 67.041385 | 0.018645 | 94.757987 | 178.663704 | 2.580250 | 117.181937 | 7.206545 |
| NaN | Reduncini | Kobus cf. sigmoidalis | Kobus ellipsiprymnus | 23.137800 | 13.147500 | 69.158100 | 182.967000 | 33.069300 | 13.891400 | 18.859200 | 24.520400 | 22.637100 | 26.024900 | 22.439700 | 997.599000 | 212.280000 | 2.783190 | 99.079300 | 584.605000 | 12.248200 | 185.088000 | 145.365000 |
| NaN | NaN | NaN | Kobus lechwe | 25.235900 | 14.329300 | 69.534400 | 184.895000 | 34.301900 | 14.141900 | 20.072500 | 25.291700 | 23.282700 | 25.737900 | 23.027200 | 878.770000 | 196.545000 | 0.095657 | 108.245000 | 557.825000 | 0.000000 | 148.008000 | 210.458000 |
| NaN | Tragelaphini | Tragelaphus cf. strepsiceros | NaN | 19.098100 | 14.305200 | 71.092500 | 191.581000 | 28.664000 | 8.697560 | 17.458800 | 20.033900 | 16.746900 | 21.306300 | 16.261100 | 804.651000 | 155.951000 | 5.932080 | 89.918700 | 388.531000 | 29.756600 | 203.056000 | 158.076000 |
| NaN | Giraffidae | Giraffa stillei | Giraffa camelopardalis | 23.859923 | 12.926264 | 70.270092 | 201.982927 | 32.797434 | 13.780092 | 19.017329 | 24.735502 | 21.678693 | 26.138175 | 21.233490 | 642.297463 | 138.891252 | 4.151305 | 98.245526 | 294.502565 | 18.053459 | 169.404275 | 72.406407 |
| NaN | NaN | NaN | Giraffa reticulata | 23.859923 | 12.926264 | 70.270092 | 201.982927 | 32.797434 | 13.780092 | 19.017329 | 24.735502 | 21.678693 | 26.138175 | 21.233490 | 642.297463 | 138.891252 | 4.151305 | 98.245526 | 294.502565 | 18.053459 | 169.404275 | 72.406407 |
| NaN | NaN | NaN | Giraffa tippelskirchi | 23.586992 | 12.908390 | 70.237434 | 201.696508 | 32.506843 | 13.507455 | 18.999374 | 24.525001 | 21.353164 | 25.839960 | 20.949285 | 655.575784 | 140.547023 | 4.111854 | 97.543692 | 343.221678 | 17.814780 | 176.065731 | 67.165185 |
| NaN | NaN | NaN | Giraffa giraffa | 23.311292 | 13.445422 | 68.749642 | 229.266112 | 32.801550 | 12.493242 | 20.308294 | 24.588305 | 20.659843 | 25.818720 | 201.187915 | 616.624241 | 132.717183 | 3.947504 | 97.876660 | 326.665914 | 16.987400 | 175.878144 | 61.557924 |
| NaN | NaN | Giraffa jumae | Giraffa camelopardalis | 23.859923 | 12.926264 | 70.270092 | 201.982927 | 32.797434 | 13.780092 | 19.017329 | 24.735502 | 21.678693 | 26.138175 | 21.233490 | 642.297463 | 138.891252 | 4.151305 | 98.245526 | 294.502565 | 18.053459 | 169.404275 | 72.406407 |
| NaN | NaN | NaN | Giraffa reticulata | 23.859923 | 12.926264 | 70.270092 | 201.982927 | 32.797434 | 13.780092 | 19.017329 | 24.735502 | 21.678693 | 26.138175 | 21.233490 | 642.297463 | 138.891252 | 4.151305 | 98.245526 | 294.502565 | 18.053459 | 169.404275 | 72.406407 |
| NaN | NaN | NaN | Giraffa tippelskirchi | 23.586992 | 12.908390 | 70.237434 | 201.696508 | 32.506843 | 13.507455 | 18.999374 | 24.525001 | 21.353164 | 25.839960 | 20.949285 | 655.575784 | 140.547023 | 4.111854 | 97.543692 | 343.221678 | 17.814780 | 176.065731 | 67.165185 |
| NaN | NaN | NaN | Giraffa giraffa | 23.311292 | 13.445422 | 68.749642 | 229.266112 | 32.801550 | 12.493242 | 20.308294 | 24.588305 | 20.659843 | 25.818720 | 201.187915 | 616.624241 | 132.717183 | 3.947504 | 97.876660 | 326.665914 | 16.987400 | 175.878144 | 61.557924 |
| NaN | Equidae | Equus oldowayensis | Equus grevi | 23.714377 | 12.127979 | 66.134847 | 245.080753 | 33.679996 | 11.931957 | 21.803821 | 25.632540 | 21.355683 | 26.212077 | 18.097224 | 450.522112 | 86.220100 | 0.669291 | 96.751512 | 229.799450 | 4.318500 | 156.303754 | 10.500127 |
| NaN | Rhinocerotidae | Ceratotherium simum | NaN | 23.137800 | 14.468200 | 60.889000 | 295.521000 | 34.497200 | 10.353300 | 24.143900 | 24.942600 | 19.923900 | 26.449100 | 19.003900 | 621.082000 | 136.385000 | 4.092090 | 101.765000 | 354.361000 | 17.272300 | 171.840000 | 77.086000 |
| NaN | Suidae | Kolpochoerus limnetes | Hylochoerus meinertzhageni | 24.852900 | 10.648800 | 79.360500 | 96.583900 | 30.532000 | 17.220000 | 13.208500 | 24.077900 | 24.111800 | 25.471000 | 23.508000 | 1525.780000 | 248.547000 | 22.483500 | 64.605100 | 648.435000 | 98.425200 | 334.661000 | 406.831000 |
| NaN | NaN | NaN | Potamochoerus larvatus | 23.415700 | 11.703500 | 73.226700 | 151.827000 | 30.962400 | 15.224900 | 15.050100 | 24.563500 | 21.906500 | 25.069400 | 22.168400 | 1525.780000 | 212.300000 | 3.062800 | 86.547700 | 562.530000 | 14.744200 | 329.144000 | 54.514700 |
| NaN | NaN | NaN | Potamochoerus porcus | 24.270100 | 10.890900 | 75.713400 | 123.414000 | 31.060700 | 17.048700 | 13.324000 | 24.989200 | 23.323200 | 25.725700 | 23.499400 | 1400.960000 | 234.482000 | 8.474220 | 79.043500 | 624.212000 | 37.801300 | 357.328000 | 152.008000 |
| NaN | Felidae | Panthera cf. pardus | NaN | 24.533700 | 12.257700 | 67.962200 | 184.930000 | 33.004500 | 15.705600 | 18.544700 | 24.949900 | 21.526000 | 25.814500 | 23.243100 | 1108.130000 | 192.168000 | 3.754590 | 93.059600 | 497.599000 | 16.321900 | 198.036000 | 66.647700 |
| NaN | NaN | Bitis olduvaiensis | Bitis arietans | 27.328347 | 13.450681 | 67.495629 | 222.785136 | 31.649249 | 12.776995 | 15.471527 | 25.897352 | 26.645327 | 26.100813 | 25.782358 | 354.409554 | 178.025270 | 0.131298 | 110.518972 | 473.871347 | 0.484277 | 91.791594 | 2.678192 |
| NaN | NaN | NaN | Bitis nasicornis | 25.098753 | 9.629737 | 83.155906 | 54.754617 | 30.684043 | 18.938254 | 11.533255 | 24.468403 | 24.157272 | 25.006454 | 24.256314 | 1584.567429 | 225.453735 | 0.703297 | 51.822053 | 616.149301 | 10.221133 | 341.772047 | 29.630228 |
| NaN | NaN | NaN | Bitis gabonica | 25.284892 | 9.390595 | 81.042952 | 67.518759 | 31.138482 | 18.473680 | 11.714001 | 24.560991 | 24.626161 | 26.189238 | 24.368620 | 1710.789475 | 268.266806 | 4.390865 | 62.607219 | 562.410929 | 31.599516 | 368.247519 | 305.151880 |
| NaN | NaN | NaN | Mean | 23.464866 | 13.030041 | 69.261753 | 208.911369 | 32.301819 | 12.847698 | 19.115802 | 24.460542 | 21.328511 | 25.468219 | 36.018211 | 834.012231 | 164.146568 | 4.101150 | 91.909463 | 418.241944 | 19.298997 | 209.214336 | 92.749495 |
| NaN | NaN | NaN | Minimum | 17.217381 | 9.390595 | 53.932572 | 54.754617 | 28.664000 | 1.216834 | 11.533255 | 20.033900 | 12.336957 | 21.306300 | 12.784965 | 321.525532 | 67.041385 | 0.018645 | 51.822053 | 178.663704 | 0.000000 | 91.791594 | 2.678192 |
| NaN | NaN | NaN | Maximum | 27.328347 | 16.450101 | 83.155906 | 403.286190 | 34.497200 | 18.938254 | 28.654050 | 25.897352 | 26.645327 | 27.236691 | 201.187915 | 1710.789475 | 268.266806 | 22.483500 | 113.936258 | 648.435000 | 98.425200 | 368.247519 | 406.831000 |
| NaN | NaN | NaN | sd | 2.137626 | 1.802686 | 6.745841 | 83.281418 | 1.446403 | 4.159211 | 4.526183 | 1.196038 | 3.075803 | 1.360186 | 50.968161 | 416.491049 | 53.397216 | 4.454538 | 15.254391 | 141.292238 | 19.764310 | 78.557015 | 97.612473 |
| NaN | NaN | NaN | standard error range (min) | 15.079755 | 7.587910 | 47.186731 | -28.526802 | 27.217597 | -2.942377 | 7.007072 | 18.837862 | 9.261154 | 19.946114 | -38.183197 | -94.965517 | 13.644168 | -4.435893 | 36.567662 | 37.371465 | -19.764310 | 13.234579 | -94.934281 |
| NaN | NaN | NaN | standard error range (max) | 29.465974 | 18.252787 | 89.901747 | 486.567609 | 35.943603 | 23.097465 | 33.180233 | 27.093389 | 29.721130 | 28.596877 | 252.156076 | 2127.280525 | 321.664022 | 26.938038 | 129.190649 | 789.727238 | 118.189510 | 446.804534 | 504.443473 |

## Bed II-1.76
| Unnamed: 0 | Unnamed: 1 | Olduvai | Modern | bio1 | bio2 | bio3 | bio4 | bio5 | bio6 | bio7 | bio8 | bio9 | bio10 | bio11 | bio12 | bio13 | bio14 | bio15 | bio16 | bio17 | bio18 | bio19 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Tuff IIA | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN |
| 1.76 | Bovidae | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN |
| NaN | Alcelaphini | Damaliscus niro | Damaliscus pygargus | 17.181440 | 15.985148 | 53.871848 | 404.282053 | 30.139952 | 1.165348 | 26.347738 | 21.841719 | 12.265025 | 21.591479 | 12.725299 | 645.705160 | 119.173544 | 6.254363 | 73.071228 | 326.989182 | 35.799317 | 270.683917 | 36.497232 |
| NaN | NaN | Megalotragus isaaci | Connochaetes taurinus | 25.607160 | 13.305375 | 67.022647 | 231.617005 | 34.465523 | 14.510566 | 19.961139 | 25.067913 | 23.805966 | 25.150332 | 23.441646 | 538.857481 | 215.488223 | 0.340019 | 113.995452 | 576.052883 | 1.532607 | 171.960259 | 4.622073 |
| NaN | NaN | NaN | Alcelaphus buselaphus | 25.607160 | 13.305375 | 67.022647 | 231.617005 | 34.465523 | 14.510566 | 19.961139 | 25.067913 | 23.805966 | 25.150332 | 23.441646 | 538.857481 | 215.488223 | 0.340019 | 113.995452 | 576.052883 | 1.532607 | 171.960259 | 4.622073 |
| NaN | NaN | Parmularius angusticornis | Alcelaphus buselaphus | 25.607160 | 13.305375 | 67.022647 | 231.617005 | 34.465523 | 14.510566 | 19.961139 | 25.067913 | 23.805966 | 25.150332 | 23.441646 | 538.857481 | 215.488223 | 0.340019 | 113.995452 | 576.052883 | 1.532607 | 171.960259 | 4.622073 |
| NaN | NaN | NaN | Connchaetes taurinus | 25.607160 | 13.305375 | 67.022647 | 231.617005 | 34.465523 | 14.510566 | 19.961139 | 25.067913 | 23.805966 | 25.150332 | 23.441646 | 538.857481 | 215.488223 | 0.340019 | 113.995452 | 576.052883 | 1.532607 | 171.960259 | 4.622073 |
| NaN | NaN | Parmularius maasaicus | Alcelaphus buselaphus | 25.607160 | 13.305375 | 67.022647 | 231.617005 | 34.465523 | 14.510566 | 19.961139 | 25.067913 | 23.805966 | 25.150332 | 23.441646 | 538.857481 | 215.488223 | 0.340019 | 113.995452 | 576.052883 | 1.532607 | 171.960259 | 4.622073 |
| NaN | NaN | NaN | Connchaetes taurinus | 25.607160 | 13.305375 | 67.022647 | 231.617005 | 34.465523 | 14.510566 | 19.961139 | 25.067913 | 23.805966 | 25.150332 | 23.441646 | 538.857481 | 215.488223 | 0.340019 | 113.995452 | 576.052883 | 1.532607 | 171.960259 | 4.622073 |
| NaN | NaN | Numidocapra arambourgi | Alcelaphus buselaphus | 25.607160 | 13.305375 | 67.022647 | 231.617005 | 34.465523 | 14.510566 | 19.961139 | 25.067913 | 23.805966 | 25.150332 | 23.441646 | 538.857481 | 215.488223 | 0.340019 | 113.995452 | 576.052883 | 1.532607 | 171.960259 | 4.622073 |
| NaN | Antilopini | Antidorcas recki | Antidorcas marsupialis | 21.941428 | 16.237395 | 58.390455 | 363.637447 | 33.494957 | 6.737701 | 28.002787 | 25.144196 | 19.719403 | 27.226987 | 18.990383 | 321.936076 | 67.089354 | 0.018230 | 94.594476 | 178.915622 | 2.567356 | 117.111228 | 7.090844 |
| NaN | NaN | Gazella aff. rufifrons | Eudorcas rufifrons | 24.625100 | 13.800900 | 64.296700 | 224.200000 | 34.110400 | 14.398700 | 20.407600 | 25.529300 | 22.582700 | 27.293000 | 21.179100 | 453.833000 | 141.899000 | 0.436851 | 109.598000 | 283.023000 | 1.840590 | 131.343000 | 7.515530 |
| NaN | Hippotragini | Hippotragus gigas | Hippotragus niger | 21.462301 | 14.271519 | 62.664125 | 250.567479 | 31.777995 | 13.348866 | 17.083671 | 25.746088 | 20.353668 | 24.920575 | 16.936464 | 870.084082 | 194.241888 | 0.858152 | 108.507539 | 506.382448 | 2.993532 | 262.090598 | 5.723962 |
| NaN | NaN | NaN | Hippotragus equinus | 23.881558 | 12.764981 | 63.291253 | 275.136775 | 33.793554 | 11.040412 | 19.357546 | 22.710112 | 24.967775 | 27.395296 | 21.152689 | 817.309823 | 157.839457 | 6.961996 | 79.385737 | 446.254937 | 24.067436 | 103.080561 | 47.435369 |
| NaN | NaN | NaN | Hippotragus leucophaeus | 20.595958 | 12.528181 | 59.117653 | 328.801575 | 31.307154 | 8.790812 | 20.955946 | 19.187712 | 24.967775 | 24.867456 | 17.038289 | 637.341823 | 110.597857 | 13.473996 | 57.836937 | 309.739737 | 46.563436 | 103.080561 | 90.088969 |
| NaN | Reduncini | Kobus sigmoidalis | Kobus ellipsiprymnus | 26.098009 | 12.934291 | 65.982938 | 182.901905 | 33.039670 | 15.063710 | 17.465495 | 25.459673 | 23.500873 | 25.904276 | 24.506478 | 942.860747 | 212.423053 | 0.144305 | 108.574366 | 632.187160 | 0.168085 | 132.330673 | 41.677674 |
| NaN | Tragelaphini | Tragelaphus strepsiceros | NaN | 19.044697 | 15.134314 | 69.571448 | 193.058617 | 29.259692 | 8.747608 | 15.475239 | 20.110703 | 16.111317 | 21.681428 | 15.891558 | 687.535347 | 135.542826 | 4.680629 | 94.377571 | 312.868123 | 24.286422 | 203.314375 | 139.297561 |
| NaN | Equidae | Equus oldowayensis | Equus grevi | 23.667309 | 12.148525 | 66.278495 | 244.078921 | 33.628189 | 11.872653 | 21.813985 | 25.575185 | 21.288607 | 26.158059 | 18.031837 | 453.890900 | 86.890784 | 0.637381 | 97.103084 | 231.394355 | 4.131047 | 157.607886 | 10.073271 |
| NaN | Giraffidae | Giraffa gracilis | Giraffa camelopardalis | 23.945081 | 12.899895 | 70.136133 | 200.465573 | 32.854264 | 13.907650 | 18.946601 | 24.785139 | 21.801203 | 26.215118 | 21.344023 | 640.914937 | 138.917079 | 4.152645 | 98.424086 | 275.016706 | 18.093957 | 167.648660 | 73.928129 |
| NaN | NaN | NaN | Giraffa reticulata | 23.945081 | 12.899895 | 70.136133 | 200.465573 | 32.854264 | 13.907650 | 18.946601 | 24.785139 | 21.801203 | 26.215118 | 21.344023 | 640.914937 | 138.917079 | 4.152645 | 98.424086 | 275.016706 | 18.093957 | 167.648660 | 73.928129 |
| NaN | NaN | NaN | Giraffa tippelskirchi | 23.550848 | 12.874077 | 70.130734 | 200.051857 | 32.434521 | 13.513841 | 18.920666 | 24.481082 | 21.330995 | 25.784364 | 20.933506 | 660.094735 | 141.308748 | 4.095660 | 97.410325 | 345.388757 | 17.749199 | 177.270764 | 66.357473 |
| NaN | NaN | NaN | Giraffa giraffa | 23.261926 | 13.510289 | 68.553518 | 232.626982 | 32.821181 | 12.353245 | 20.467922 | 24.583838 | 20.556190 | 25.799148 | 197.070022 | 612.215222 | 131.844115 | 3.897414 | 97.907371 | 324.960268 | 16.768949 | 176.119676 | 60.370642 |
| NaN | NaN | Sivertherium maurusium | Giraffa camelopardalis | 23.945081 | 12.899895 | 70.136133 | 200.465573 | 32.854264 | 13.907650 | 18.946601 | 24.785139 | 21.801203 | 26.215118 | 21.344023 | 640.914937 | 138.917079 | 4.152645 | 98.424086 | 275.016706 | 18.093957 | 167.648660 | 73.928129 |
| NaN | NaN | NaN | Giraffa reticulata | 23.945081 | 12.899895 | 70.136133 | 200.465573 | 32.854264 | 13.907650 | 18.946601 | 24.785139 | 21.801203 | 26.215118 | 21.344023 | 640.914937 | 138.917079 | 4.152645 | 98.424086 | 275.016706 | 18.093957 | 167.648660 | 73.928129 |
| NaN | NaN | NaN | Giraffa tippelskirchi | 23.550848 | 12.874077 | 70.130734 | 200.051857 | 32.434521 | 13.513841 | 18.920666 | 24.481082 | 21.330995 | 25.784364 | 20.933506 | 660.094735 | 141.308748 | 4.095660 | 97.410325 | 345.388757 | 17.749199 | 177.270764 | 66.357473 |
| NaN | NaN | NaN | Giraffa giraffa | 23.261926 | 13.510289 | 68.553518 | 232.626982 | 32.821181 | 12.353245 | 20.467922 | 24.583838 | 20.556190 | 25.799148 | 197.070022 | 612.215222 | 131.844115 | 3.897414 | 97.907371 | 324.960268 | 16.768949 | 176.119676 | 60.370642 |
| NaN | NaN | NaN | Okapia johnstoni | 23.826316 | 9.805046 | 86.678907 | 54.954664 | 29.413004 | 17.977337 | 11.434805 | 23.612374 | 23.790570 | 24.498974 | 23.167220 | 1650.869529 | 204.955525 | 55.897014 | 37.292489 | 455.314295 | 124.997384 | 420.810945 | 444.039704 |
| NaN | Rhinocerotidae | Ceratotherium simum | NaN | 23.143500 | 14.471000 | 60.884200 | 295.639000 | 34.506400 | 10.356300 | 24.150100 | 24.948300 | 19.929300 | 26.456500 | 19.008100 | 620.517000 | 136.292000 | 4.089840 | 101.806000 | 354.104000 | 17.262300 | 171.580000 | 77.139800 |
| NaN | NaN | Diceros bicornis | NaN | 21.581500 | 13.706800 | 62.222500 | 263.215000 | 31.959500 | 9.524180 | 22.435400 | 23.397900 | 18.429700 | 24.418200 | 17.831500 | 775.483000 | 161.751000 | 4.708930 | 90.549400 | 424.860000 | 19.985800 | 243.089000 | 62.364800 |
| NaN | Suidae | Kolpochoerus heseloni | Hylochoerus meinertzhagen | 24.770862 | 10.047961 | 82.017708 | 96.259237 | 30.576749 | 17.453042 | 11.650359 | 24.442127 | 24.085195 | 25.920682 | 24.480951 | 1494.878817 | 215.343128 | 5.953957 | 64.438176 | 606.682422 | 63.195040 | 420.984914 | 475.815591 |
| NaN | NaN | NaN | Potamochoerus larvatus | 23.353116 | 11.728437 | 73.159402 | 152.453521 | 31.097216 | 15.663049 | 14.024364 | 25.541623 | 22.004119 | 25.287365 | 22.811846 | 1188.188193 | 219.101331 | 0.268514 | 96.068284 | 570.964018 | 2.296078 | 332.961768 | 18.781911 |
| NaN | NaN | NaN | Potamochoerus porcus | 24.369721 | 10.571611 | 75.753497 | 122.796694 | 30.816773 | 17.591093 | 12.481928 | 25.015792 | 23.196001 | 25.672974 | 23.723285 | 1400.343175 | 219.451885 | 0.268514 | 78.715885 | 608.473243 | 2.296078 | 385.544794 | 20.184125 |
| NaN | NaN | Kolpochoerus paiceae | Phacochoerus aethiopicus | 26.909417 | 11.007436 | 73.606061 | 146.839121 | 32.958146 | 17.747391 | 14.890316 | 26.731588 | 24.798708 | 28.892242 | 25.383946 | 553.987657 | 115.595382 | 2.533539 | 98.799353 | 251.483713 | 6.646472 | 159.484175 | 61.483447 |
| NaN | NaN | NaN | Phacochoerus africanus | 27.117431 | 12.740885 | 66.810940 | 194.612989 | 31.527851 | 17.331363 | 15.653034 | 25.968870 | 25.838777 | 26.326737 | 25.799973 | 955.107866 | 208.508274 | 0.661414 | 106.495869 | 543.396605 | 4.566333 | 229.238182 | 37.423168 |
| NaN | NaN | Kolpochoerus majus | Phacochoerus aethiopicus | 26.909417 | 11.007436 | 73.606061 | 146.839121 | 32.958146 | 17.747391 | 14.890316 | 26.731588 | 24.798708 | 28.892242 | 25.383946 | 553.987657 | 115.595382 | 2.533539 | 98.799353 | 251.483713 | 6.646472 | 159.484175 | 61.483447 |
| NaN | NaN | NaN | Phacochoerus africanus | 27.117431 | 12.740885 | 66.810940 | 194.612989 | 31.527851 | 17.331363 | 15.653034 | 25.968870 | 25.838777 | 26.326737 | 25.799973 | 955.107866 | 208.508274 | 0.661414 | 106.495869 | 543.396605 | 4.566333 | 229.238182 | 37.423168 |
| NaN | NaN | Metridiochoerus compactus | Phacochoerus aethiopicus | 26.909417 | 11.007436 | 73.606061 | 146.839121 | 32.958146 | 17.747391 | 14.890316 | 26.731588 | 24.798708 | 28.892242 | 25.383946 | 553.987657 | 115.595382 | 2.533539 | 98.799353 | 251.483713 | 6.646472 | 159.484175 | 61.483447 |
| NaN | NaN | NaN | Phacochoerus africanus | 27.117431 | 12.740885 | 66.810940 | 194.612989 | 31.527851 | 17.331363 | 15.653034 | 25.968870 | 25.838777 | 26.326737 | 25.799973 | 955.107866 | 208.508274 | 0.661414 | 106.495869 | 543.396605 | 4.566333 | 229.238182 | 37.423168 |
| NaN | Hyaenidae | Crocuta ultra | Crocuta crocuta | 25.942792 | 13.496716 | 62.605055 | 262.077083 | 32.874801 | 12.699934 | 22.265773 | 26.539237 | 24.540166 | 26.906269 | 21.665373 | 326.915408 | 159.633831 | 0.000000 | 93.054428 | 352.991708 | 0.452405 | 81.856053 | 0.452405 |
| NaN | Primates | Theropithecus oswaldi | Theropithecus gelada | 22.683468 | 13.184626 | 56.105336 | 1087.049313 | 33.636766 | 14.860752 | 20.119624 | 24.605276 | 19.199598 | 25.283675 | 18.990000 | 903.439961 | 216.229942 | 0.000000 | 97.492555 | 601.136675 | 0.000000 | 224.217933 | 0.067307 |
| NaN | NaN | NaN | Mean | 24.181727 | 12.936009 | 67.663529 | 239.842227 | 32.686260 | 13.722802 | 18.720894 | 24.743539 | 22.380663 | 25.821578 | 30.977811 | 726.281596 | 166.872605 | 3.926694 | 96.859256 | 422.633077 | 14.702134 | 197.604016 | 62.170767 |
| NaN | NaN | NaN | Minimum | 17.181440 | 9.805046 | 53.871848 | 54.954664 | 29.259692 | 1.165348 | 11.434805 | 19.187712 | 12.265025 | 21.591479 | 12.725299 | 321.936076 | 67.089354 | 0.000000 | 37.292489 | 178.915622 | 0.000000 | 81.856053 | 0.067307 |
| NaN | NaN | NaN | Maximum | 27.117431 | 16.237395 | 86.678907 | 1087.049313 | 34.506400 | 17.977337 | 28.002787 | 26.731588 | 25.838777 | 28.892242 | 197.070022 | 1650.869529 | 219.451885 | 55.897014 | 113.995452 | 632.187160 | 124.997384 | 420.984914 | 475.815591 |
| NaN | NaN | NaN | sd | 2.232318 | 1.373446 | 6.282312 | 155.738485 | 1.456771 | 3.474209 | 3.632417 | 1.579810 | 2.793038 | 1.490769 | 39.791727 | 297.624419 | 45.192895 | 9.093707 | 16.609025 | 142.216979 | 22.945720 | 79.125455 | 100.542216 |
| NaN | NaN | NaN | standard error range (min) | 14.949121 | 8.431601 | 47.589536 | -100.783821 | 27.802921 | -2.308861 | 7.802388 | 17.607902 | 9.471987 | 20.100711 | -27.066428 | 24.311657 | 21.896459 | -9.093707 | 20.683464 | 36.698643 | -22.945720 | 2.730598 | -100.474908 |
| NaN | NaN | NaN | standard error range (max) | 29.349749 | 17.610841 | 92.961218 | 1242.787798 | 35.963171 | 21.451546 | 31.635204 | 28.311398 | 28.631815 | 30.383011 | 236.861749 | 1948.493948 | 264.644779 | 64.990721 | 130.604477 | 774.404139 | 147.943104 | 500.110369 | 576.357807 |

## 1.68
| Unnamed: 0 | Unnamed: 1 | Unnamed: 2 | Olduvai | Modern | bio1 | bio2 | bio3 | bio4 | bio5 | bio6 | bio7 | bio8 | bio9 | bio10 | bio11 | bio12 | bio13 | bio14 | bio15 | bio16 | bio17 | bio18 | bio19 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1.68 | 1.68 | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN |
| NaN | NaN | NaN | Damaliscus niro | Damaliscus pygargus | 17.109556 | 16.017641 | 53.750400 | 406.273778 | 30.115409 | 1.062378 | 26.409205 | 21.798914 | 12.121160 | 21.555503 | 12.605967 | 645.054926 | 118.597474 | 6.288255 | 72.795263 | 325.466946 | 36.035711 | 271.121011 | 36.606449 |
| NaN | NaN | NaN | Megalotragus isaaci | Connochaetes taurinus | 20.190569 | 16.466761 | 59.161706 | 340.446622 | 32.161887 | 4.470250 | 28.577114 | 23.986041 | 15.201544 | 24.377115 | 14.498026 | 422.814938 | 89.314520 | 2.358514 | 97.188038 | 340.204918 | 7.913406 | 192.121346 | 10.995813 |
| NaN | NaN | NaN | NaN | Alcelaphus buselaphus | 25.693198 | 13.255131 | 67.039799 | 231.652596 | 34.530726 | 14.610086 | 19.846997 | 25.110281 | 23.942059 | 25.188953 | 23.544298 | 529.818505 | 215.829668 | 0.324564 | 114.113840 | 577.641389 | 1.462943 | 170.280247 | 4.502888 |
| NaN | NaN | NaN | Parmularius angusticornis | Alcelaphus buselaphus | 25.693198 | 13.255131 | 67.039799 | 231.652596 | 34.530726 | 14.610086 | 19.846997 | 25.110281 | 23.942059 | 25.188953 | 23.544298 | 529.818505 | 215.829668 | 0.324564 | 114.113840 | 577.641389 | 1.462943 | 170.280247 | 4.502888 |
| NaN | NaN | NaN | NaN | Damaliscus pygargus | 17.109556 | 16.017641 | 53.750400 | 406.273778 | 30.115409 | 1.062378 | 26.409205 | 21.798914 | 12.121160 | 21.555503 | 12.605967 | 645.054926 | 118.597474 | 6.288255 | 72.795263 | 325.466946 | 36.035711 | 271.121011 | 36.606449 |
| NaN | NaN | NaN | Parmularius maasaicus | Alcelaphus buselaphus | 25.693198 | 13.255131 | 67.039799 | 231.652596 | 34.530726 | 14.610086 | 19.846997 | 25.110281 | 23.942059 | 25.188953 | 23.544298 | 529.818505 | 215.829668 | 0.324564 | 114.113840 | 577.641389 | 1.462943 | 170.280247 | 4.502888 |
| NaN | NaN | NaN | NaN | Damaliscus pygargus | 17.109556 | 16.017641 | 53.750400 | 406.273778 | 30.115409 | 1.062378 | 26.409205 | 21.798914 | 12.121160 | 21.555503 | 12.605967 | 645.054926 | 118.597474 | 6.288255 | 72.795263 | 325.466946 | 36.035711 | 271.121011 | 36.606449 |
| NaN | NaN | NaN | Numidocapra arambourgi | Alcelaphus buselaphus | 25.693198 | 13.255131 | 67.039799 | 231.652596 | 34.530726 | 14.610086 | 19.846997 | 25.110281 | 23.942059 | 25.188953 | 23.544298 | 529.818505 | 215.829668 | 0.324564 | 114.113840 | 577.641389 | 1.462943 | 170.280247 | 4.502888 |
| NaN | NaN | Antilopini | Antidorcas recki | Antidorcas marsupialis | 21.871363 | 16.294786 | 58.172675 | 366.767563 | 33.472459 | 6.581442 | 28.166297 | 25.110369 | 19.609430 | 27.207579 | 18.913548 | 322.757163 | 67.185292 | 0.017402 | 94.267454 | 179.419457 | 2.541567 | 116.969808 | 6.859442 |
| NaN | NaN | Hippotragini | Hippotragus gigas | Hippotragus niger | 21.445833 | 14.277359 | 62.683937 | 249.887139 | 31.756268 | 13.369372 | 17.043504 | 25.757629 | 20.333047 | 24.901458 | 16.916625 | 872.625715 | 194.912711 | 0.819145 | 108.720833 | 508.046882 | 2.857462 | 263.404662 | 5.463782 |
| NaN | NaN | NaN | NaN | Hippotragus equinus | 24.055124 | 12.771118 | 63.518923 | 272.185103 | 33.921120 | 11.152211 | 19.268567 | 22.877834 | 25.051058 | 27.529146 | 21.377567 | 827.523013 | 160.387663 | 6.645541 | 80.422749 | 453.743349 | 22.973462 | 103.258717 | 45.370125 |
| NaN | NaN | NaN | NaN | Hippotragus leucophaeus | 20.414324 | 12.508718 | 58.894123 | 331.651503 | 31.165920 | 8.659411 | 21.039767 | 18.974634 | 25.051058 | 24.728026 | 16.818367 | 628.099013 | 108.038863 | 13.861541 | 56.544349 | 302.469749 | 47.901462 | 103.258717 | 92.634925 |
| NaN | NaN | Reduncini | Kobus sigmoidalis | Kobus ellipsiprymnus | 26.148099 | 12.900914 | 65.901895 | 182.770000 | 33.015140 | 15.138087 | 17.371608 | 25.484234 | 23.541742 | 25.908627 | 24.578911 | 942.367077 | 212.662914 | 0.137746 | 108.784622 | 633.905926 | 0.160445 | 131.179279 | 39.783234 |
| NaN | NaN | Tragelaphini | Tragelaphus strepsiceros | NaN | 19.183575 | 15.205482 | 69.218200 | 196.019589 | 29.484252 | 8.840898 | 15.471819 | 20.292035 | 16.165348 | 21.882272 | 15.973760 | 671.738286 | 133.654515 | 4.467874 | 95.233136 | 306.555936 | 23.182493 | 203.831903 | 133.056762 |
| NaN | NaN | Equidae | Equus oldowayensis | Equus grevi | 23.573174 | 12.189618 | 66.565792 | 242.075258 | 33.524576 | 11.754044 | 21.834311 | 25.460474 | 21.154455 | 26.050022 | 17.901063 | 460.628476 | 88.232153 | 0.573562 | 97.806229 | 234.584165 | 3.756141 | 160.216150 | 9.219560 |
| NaN | NaN | Giraffidae | Giraffa gracilis | Giraffa camelopardalis | 24.115398 | 12.847157 | 70.139428 | 197.430867 | 32.967923 | 14.162767 | 18.805144 | 24.884414 | 22.046222 | 26.369004 | 21.565090 | 638.149887 | 138.968735 | 4.155324 | 98.781205 | 236.044987 | 18.174954 | 164.137431 | 76.971571 |
| NaN | NaN | NaN | NaN | Giraffa reticulata | 24.115398 | 12.847157 | 70.139428 | 197.430867 | 32.967923 | 14.162767 | 18.805144 | 24.884414 | 22.046222 | 26.369004 | 21.565090 | 638.149887 | 138.968735 | 4.155324 | 98.781205 | 236.044987 | 18.174954 | 164.137431 | 76.971571 |
| NaN | NaN | NaN | NaN | Giraffa tippelskirchi | 23.478559 | 12.805450 | 70.131330 | 196.762557 | 32.289876 | 13.526613 | 18.763250 | 24.393245 | 21.286655 | 25.673170 | 20.901947 | 669.132636 | 142.832199 | 4.063272 | 97.143591 | 349.722917 | 17.618038 | 179.680830 | 64.742051 |
| NaN | NaN | NaN | NaN | Giraffa giraffa | 23.163193 | 13.640024 | 68.161270 | 239.348721 | 32.860444 | 12.073252 | 20.787179 | 24.574905 | 20.348883 | 25.760004 | 188.834237 | 603.397184 | 130.097979 | 3.797236 | 97.968793 | 321.548978 | 16.332046 | 176.602742 | 57.996080 |
| NaN | NaN | NaN | Sivertherium maurusium | Giraffa camelopardalis | 24.115398 | 12.847157 | 70.139428 | 197.430867 | 32.967923 | 14.162767 | 18.805144 | 24.884414 | 22.046222 | 26.369004 | 21.565090 | 638.149887 | 138.968735 | 4.155324 | 98.781205 | 236.044987 | 18.174954 | 164.137431 | 76.971571 |
| NaN | NaN | NaN | NaN | Giraffa reticulata | 24.115398 | 12.847157 | 70.139428 | 197.430867 | 32.967923 | 14.162767 | 18.805144 | 24.884414 | 22.046222 | 26.369004 | 21.565090 | 638.149887 | 138.968735 | 4.155324 | 98.781205 | 236.044987 | 18.174954 | 164.137431 | 76.971571 |
| NaN | NaN | NaN | NaN | Giraffa tippelskirchi | 23.478559 | 12.805450 | 70.131330 | 196.762557 | 32.289876 | 13.526613 | 18.763250 | 24.393245 | 21.286655 | 25.673170 | 20.901947 | 669.132636 | 142.832199 | 4.063272 | 97.143591 | 349.722917 | 17.618038 | 179.680830 | 64.742051 |
| NaN | NaN | NaN | NaN | Giraffa giraffa | 23.163193 | 13.640024 | 68.161270 | 239.348721 | 32.860444 | 12.073252 | 20.787179 | 24.574905 | 20.348883 | 25.760004 | 188.834237 | 603.397184 | 130.097979 | 3.797236 | 97.968793 | 321.548978 | 16.332046 | 176.602742 | 57.996080 |
| NaN | NaN | NaN | NaN | Okapia johnstoni | 23.827021 | 9.796676 | 86.721601 | 54.556931 | 29.404727 | 17.989441 | 11.414421 | 23.609869 | 23.797197 | 24.495426 | 23.173297 | 1653.414716 | 205.126555 | 56.026901 | 37.140681 | 454.765421 | 124.510316 | 421.429043 | 444.986246 |
| NaN | NaN | Rhinocerotidae | Ceratotherium simum | NaN | 23.154900 | 14.476500 | 60.874400 | 295.876000 | 34.525000 | 10.362400 | 24.162600 | 24.959600 | 19.940300 | 26.471400 | 19.016700 | 619.388000 | 136.106000 | 4.085330 | 101.888000 | 353.588000 | 5.348310 | 220.367000 | 67.463000 |
| NaN | NaN | Suidae | Kolpochoerus heseloni | Hylochoerus meinertzhagen | 24.758550 | 10.032144 | 82.121449 | 95.624726 | 30.564169 | 17.455176 | 11.620797 | 24.426576 | 24.081322 | 25.910651 | 24.477271 | 1500.520689 | 215.691167 | 6.001504 | 64.109168 | 608.151403 | 63.777084 | 422.712873 | 480.142155 |
| NaN | NaN | NaN | NaN | Potamochoerus larvatus | 23.300702 | 11.777145 | 73.047611 | 153.687452 | 31.106433 | 15.578365 | 14.086892 | 25.562458 | 21.944841 | 25.265212 | 22.765853 | 1180.261457 | 219.233089 | 0.256309 | 96.846998 | 569.829290 | 2.191710 | 331.054415 | 17.928188 |
| NaN | NaN | NaN | NaN | Potamochoerus porcus | 24.402916 | 10.522901 | 75.860157 | 121.533208 | 30.802374 | 17.668770 | 12.414568 | 24.992347 | 23.237092 | 25.683293 | 23.754045 | 1410.282121 | 219.613162 | 0.256309 | 78.033345 | 610.497186 | 2.191710 | 388.065485 | 19.448483 |
| NaN | NaN | NaN | Kolpochoerus paiceae | Phacochoerus aethiopicus | 26.922625 | 10.998007 | 73.623968 | 146.691888 | 32.958146 | 17.754328 | 14.899847 | 26.748334 | 24.798766 | 28.928959 | 25.389221 | 546.129127 | 114.341047 | 2.541106 | 98.890291 | 247.370817 | 6.480723 | 157.612167 | 60.356926 |
| NaN | NaN | NaN | NaN | Phacochoerus africanus | 27.134820 | 12.766299 | 66.692260 | 195.426035 | 31.522039 | 17.329937 | 15.677896 | 25.970285 | 25.859742 | 26.311885 | 25.813611 | 955.312054 | 209.121535 | 0.631349 | 106.741511 | 545.151305 | 4.358772 | 228.768264 | 35.813024 |
| NaN | NaN | NaN | Kolpochoerus majus | Phacochoerus aethiopicus | 26.922625 | 10.998007 | 73.623968 | 146.691888 | 32.958146 | 17.754328 | 14.899847 | 26.748334 | 24.798766 | 28.928959 | 25.389221 | 546.129127 | 114.341047 | 2.541106 | 98.890291 | 247.370817 | 6.480723 | 157.612167 | 60.356926 |
| NaN | NaN | NaN | NaN | Phacochoerus africanus | 27.134820 | 12.766299 | 66.692260 | 195.426035 | 31.522039 | 17.329937 | 15.677896 | 25.970285 | 25.859742 | 26.311885 | 25.813611 | 955.312054 | 209.121535 | 0.631349 | 106.741511 | 545.151305 | 4.358772 | 228.768264 | 35.813024 |
| NaN | NaN | NaN | Metridiochoerus compactus | Potamochoerus larvatus | 23.300702 | 11.777145 | 73.047611 | 153.687452 | 31.106433 | 15.578365 | 14.086892 | 25.562458 | 21.944841 | 25.265212 | 22.765853 | 1180.261457 | 219.233089 | 0.256309 | 96.846998 | 569.829290 | 2.191710 | 331.054415 | 17.928188 |
| NaN | NaN | NaN | NaN | Potamochoerus porcus | 24.402916 | 10.522901 | 75.860157 | 121.533208 | 30.802374 | 17.668770 | 12.414568 | 24.992347 | 23.237092 | 25.683293 | 23.754045 | 1410.282121 | 219.613162 | 0.256309 | 78.033345 | 610.497186 | 2.191710 | 388.065485 | 19.448483 |
| NaN | NaN | Hyaenidae | Crocuta ultra | Crocuta crocuta | 26.013574 | 13.446866 | 62.823007 | 259.328125 | 32.807765 | 12.890846 | 22.140056 | 26.514726 | 24.642886 | 26.865075 | 21.821493 | 327.055617 | 162.468657 | 0.000000 | 93.911045 | 358.855721 | 0.431841 | 82.135323 | 0.431841 |
| NaN | NaN | Primates | Theropithecus oswaldi | Theropithecus gelada | 22.638765 | 13.180779 | 56.100501 | 1092.183436 | 33.646004 | 14.817081 | 20.152823 | 24.602309 | 19.081434 | 25.279871 | 18.881363 | 903.134963 | 217.128581 | 0.000000 | 97.291984 | 602.221371 | 0.000000 | 224.066663 | 0.064248 |
| NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN |
| NaN | NaN | NaN | NaN | Mean | 23.462321 | 13.084151 | 67.159986 | 250.595192 | 32.301909 | 12.767270 | 19.037753 | 24.497639 | 21.469983 | 25.493057 | 30.208924 | 763.559310 | 162.121490 | 4.301959 | 93.181203 | 412.663878 | 16.398853 | 214.432029 | 63.465495 |
| NaN | NaN | NaN | NaN | Minimum | 17.109556 | 9.796676 | 53.750400 | 54.556931 | 29.404727 | 1.062378 | 11.414421 | 18.974634 | 12.121160 | 21.555503 | 12.605967 | 322.757163 | 67.185292 | 0.000000 | 37.140681 | 179.419457 | 0.000000 | 82.135323 | 0.064248 |
| NaN | NaN | NaN | NaN | Maximum | 27.134820 | 16.466761 | 86.721601 | 1092.183436 | 34.530726 | 17.989441 | 28.577114 | 26.748334 | 25.859742 | 28.928959 | 188.834237 | 1653.414716 | 219.613162 | 56.026901 | 114.113840 | 633.905926 | 124.510316 | 422.712873 | 480.142155 |
| NaN | NaN | NaN | NaN | sd | 2.710724 | 1.719737 | 7.443239 | 167.363958 | 1.511907 | 4.774926 | 4.540731 | 1.700709 | 3.743670 | 1.708204 | 39.200246 | 328.949179 | 47.761876 | 9.338510 | 17.098596 | 146.893308 | 23.838820 | 89.147816 | 103.159647 |
| NaN | NaN | NaN | NaN | standard error range (min) | 14.398832 | 8.076940 | 46.307161 | -112.807027 | 27.892820 | -3.712548 | 6.873690 | 17.273925 | 8.377490 | 19.847299 | -26.594279 | -6.192016 | 19.423416 | -9.338510 | 20.042085 | 32.526149 | -23.838820 | -7.012493 | -103.095399 |
| NaN | NaN | NaN | NaN | standard error range (max) | 29.845545 | 18.186497 | 94.164840 | 1259.547394 | 36.042633 | 22.764367 | 33.117845 | 28.449043 | 29.603412 | 30.637163 | 228.034482 | 1982.363895 | 267.375039 | 65.365411 | 131.212436 | 780.799234 | 148.349136 | 511.860689 | 583.301801 |

## 1.66
| Unnamed: 0 | Unnamed: 1 | Olduvai | Modern | bio1 | bio2 | bio3 | bio4 | bio5 | bio6 | bio7 | bio8 | bio9 | bio10 | bio11 | bio12 | bio13 | bio14 | bio15 | bio16 | bio17 | bio18 | bio19 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Tuff FLK-Wb | Mammals | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN |
| BPT | Bovidae | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN |
| NaN | Alcelaphini | Connochaetes sp. | Connochaetes taurinus | 20.213300 | 16.469537 | 59.184966 | 339.654400 | 32.171864 | 4.494414 | 28.564291 | 24.002873 | 15.226526 | 24.392863 | 14.519478 | 421.829046 | 89.370300 | 2.330437 | 97.363180 | 340.569145 | 7.843008 | 191.822282 | 10.888720 |
| NaN | NaN | Damaliscus niro | Damaliscus pygargus | 17.091585 | 16.025764 | 53.720039 | 406.771709 | 30.109273 | 1.036635 | 26.424571 | 21.788212 | 12.085194 | 21.546509 | 12.576134 | 644.892367 | 118.453457 | 6.296728 | 72.726272 | 325.086387 | 36.094810 | 271.230285 | 36.633753 |
| NaN | NaN | Megalotragus isaaci | Connochaetes | 20.213300 | 16.469537 | 59.184966 | 339.654400 | 32.171864 | 4.494414 | 28.564291 | 24.002873 | 15.226526 | 24.392863 | 14.519478 | 421.829046 | 89.370300 | 2.330437 | 97.363180 | 340.569145 | 7.843008 | 191.822282 | 10.888720 |
| NaN | NaN | NaN | Alcelaphus buselaphus | 25.714708 | 13.242570 | 67.044087 | 231.661494 | 34.547027 | 14.634965 | 19.818461 | 25.120872 | 23.976082 | 25.198608 | 23.569961 | 527.558761 | 215.915029 | 0.320700 | 114.143438 | 578.038515 | 1.445527 | 169.860244 | 4.473092 |
| NaN | NaN | Parmularius angusicornis | Alcelaphus buselaphus | 25.714708 | 13.242570 | 67.044087 | 231.661494 | 34.547027 | 14.634965 | 19.818461 | 25.120872 | 23.976082 | 25.198608 | 23.569961 | 527.558761 | 215.915029 | 0.320700 | 114.143438 | 578.038515 | 1.445527 | 169.860244 | 4.473092 |
| NaN | NaN | NaN | Damaliscus pygargus | 17.091585 | 16.025764 | 53.720039 | 406.771709 | 30.109273 | 1.036635 | 26.424571 | 21.788212 | 12.085194 | 21.546509 | 12.576134 | 644.892367 | 118.453457 | 6.296728 | 72.726272 | 325.086387 | 36.094810 | 271.230285 | 36.633753 |
| NaN | NaN | Parmularius maasaicus | Alcelaphus buselaphus | 25.714708 | 13.242570 | 67.044087 | 231.661494 | 34.547027 | 14.634965 | 19.818461 | 25.120872 | 23.976082 | 25.198608 | 23.569961 | 527.558761 | 215.915029 | 0.320700 | 114.143438 | 578.038515 | 1.445527 | 169.860244 | 4.473092 |
| NaN | NaN | NaN | Damaliscus pygargus | 17.091585 | 16.025764 | 53.720039 | 406.771709 | 30.109273 | 1.036635 | 26.424571 | 21.788212 | 12.085194 | 21.546509 | 12.576134 | 644.892367 | 118.453457 | 6.296728 | 72.726272 | 325.086387 | 36.094810 | 271.230285 | 36.633753 |
| NaN | Antilopini | Antidorcas recki | Antidorcas marsupialis | 21.853847 | 16.309134 | 58.118231 | 367.549302 | 33.466835 | 6.542377 | 28.207174 | 25.101912 | 19.581937 | 27.202726 | 18.894339 | 322.962435 | 67.209277 | 0.017195 | 94.185699 | 179.545416 | 2.535119 | 116.934453 | 6.801592 |
| NaN | NaN | Gazella aff. rufifrons | Eudorcas rufifrons | 24.260151 | 13.242999 | 63.792662 | 2161.654220 | 34.634996 | 13.358857 | 22.521848 | 24.864871 | 23.117287 | 27.263272 | 21.056410 | 576.284030 | 127.171651 | 0.414098 | 117.658672 | 260.047289 | 13.679385 | 143.607823 | 20.418132 |
| NaN | Hippotragini | Hippotragus gigas | Hippotragus niger | 21.441716 | 14.278820 | 62.688890 | 249.717054 | 31.750836 | 13.374499 | 17.033463 | 25.760515 | 20.327514 | 24.896679 | 16.911665 | 873.261123 | 195.080417 | 0.809393 | 108.774156 | 508.462991 | 2.823445 | 263.733178 | 5.398737 |
| NaN | NaN | NaN | Hippotragus equinus | 24.098515 | 12.772652 | 63.575841 | 271.447185 | 33.953012 | 11.180161 | 19.246322 | 22.919765 | 25.071879 | 27.562609 | 21.433786 | 830.076310 | 161.024715 | 6.566428 | 80.682002 | 455.615452 | 22.699968 | 103.303256 | 44.853814 |
| NaN | NaN | NaN | Hippotragus leucophaeus | 20.368915 | 12.503852 | 58.838241 | 332.363985 | 31.130612 | 8.626561 | 21.060722 | 18.921365 | 25.071879 | 24.693169 | 16.763386 | 625.788310 | 107.399115 | 13.958428 | 56.221202 | 300.652252 | 48.235968 | 103.303256 | 93.271414 |
| NaN | Reduncini | Kobus sigmoidalis | Kobus ellipsiprymnus | 26.160622 | 12.892570 | 65.881635 | 182.737024 | 33.009007 | 15.156681 | 17.348137 | 25.490374 | 23.551960 | 25.909715 | 24.597019 | 942.243659 | 212.722880 | 0.136106 | 108.837186 | 634.335617 | 0.158535 | 130.891430 | 39.309624 |
| NaN | Tragelaphini | Tragelaphus strepsiceros | NaN | 19.218294 | 15.223274 | 69.129888 | 196.759832 | 29.540391 | 8.864221 | 15.470964 | 20.337368 | 16.178856 | 21.932483 | 15.994311 | 667.789020 | 133.182438 | 4.414685 | 95.447027 | 304.977889 | 22.906511 | 203.961285 | 131.496563 |
| NaN | NaN | cf. Taurotragus sp. | Taurotragus oryx | 22.644842 | 12.903353 | 60.755048 | 1931.155707 | 33.065505 | 9.988669 | 23.726212 | 23.407954 | 20.414852 | 25.645694 | 20.060351 | 1036.708793 | 227.876764 | 0.758599 | 99.657576 | 499.245275 | 6.147183 | 228.703549 | 17.026844 |
| NaN | Equidae | Equus oldowayensis | Equus grevi | 23.549641 | 12.199891 | 66.637616 | 241.574342 | 33.498673 | 11.724392 | 21.839393 | 25.431796 | 21.120916 | 26.023012 | 17.868370 | 462.312870 | 88.567495 | 0.557607 | 97.982015 | 235.381617 | 3.662414 | 160.868216 | 9.006132 |
| NaN | Giraffidae | Giraffa pygmaea | Giraffa camelopardalis | 24.157977 | 12.833972 | 70.140450 | 196.672191 | 32.996337 | 14.226546 | 18.769780 | 24.909233 | 22.107477 | 26.407475 | 21.620357 | 637.458624 | 138.981648 | 4.155993 | 98.870485 | 226.302058 | 18.195203 | 163.259624 | 77.732432 |
| NaN | NaN | NaN | Giraffa reticulata | 24.157977 | 12.833972 | 70.140450 | 196.672191 | 32.996337 | 14.226546 | 18.769780 | 24.909233 | 22.107477 | 26.407475 | 21.620357 | 637.458624 | 138.981648 | 4.155993 | 98.870485 | 226.302058 | 18.195203 | 163.259624 | 77.732432 |
| NaN | NaN | NaN | Giraffa tippelskirchi | 23.460487 | 12.788293 | 70.131488 | 195.940231 | 32.253715 | 13.529807 | 18.723896 | 24.371286 | 21.275570 | 25.645372 | 20.894057 | 671.392112 | 143.213062 | 4.055175 | 97.076908 | 350.806456 | 17.585247 | 180.283346 | 64.338195 |
| NaN | NaN | NaN | Giraffa giraffa | 23.138510 | 13.672458 | 68.063208 | 241.029156 | 32.870260 | 12.003253 | 20.866993 | 24.572672 | 20.297057 | 25.750218 | 186.775290 | 601.192675 | 129.661445 | 3.772191 | 97.984148 | 320.696155 | 16.222820 | 176.723509 | 57.402439 |
| NaN | NaN | Sivertherium maurusium | Giraffa camelopardalis | 24.157977 | 12.833972 | 70.140450 | 196.672191 | 32.996337 | 14.226546 | 18.769780 | 24.909233 | 22.107477 | 26.407475 | 21.620357 | 637.458624 | 138.981648 | 4.155993 | 98.870485 | 226.302058 | 18.195203 | 163.259624 | 77.732432 |
| NaN | NaN | NaN | Giraffa reticulata | 24.157977 | 12.833972 | 70.140450 | 196.672191 | 32.996337 | 14.226546 | 18.769780 | 24.909233 | 22.107477 | 26.407475 | 21.620357 | 637.458624 | 138.981648 | 4.155993 | 98.870485 | 226.302058 | 18.195203 | 163.259624 | 77.732432 |
| NaN | NaN | NaN | Giraffa tippelskirchi | 23.460487 | 12.788293 | 70.131488 | 195.940231 | 32.253715 | 13.529807 | 18.723896 | 24.371286 | 21.275570 | 25.645372 | 20.894057 | 671.392112 | 143.213062 | 4.055175 | 97.076908 | 350.806456 | 17.585247 | 180.283346 | 64.338195 |
| NaN | NaN | NaN | Giraffa giraffa | 23.138510 | 13.672458 | 68.063208 | 241.029156 | 32.870260 | 12.003253 | 20.866993 | 24.572672 | 20.297057 | 25.750218 | 186.775290 | 601.192675 | 129.661445 | 3.772191 | 97.984148 | 320.696155 | 16.222820 | 176.723509 | 57.402439 |
| NaN | NaN | NaN | Okapia johnstoni | 23.827197 | 9.794584 | 86.732275 | 54.457498 | 29.402658 | 17.992468 | 11.409325 | 23.609243 | 23.798853 | 24.494539 | 23.174816 | 1654.051013 | 205.169312 | 56.059373 | 37.102729 | 454.628202 | 124.388549 | 421.583567 | 445.222882 |
| NaN | Rhinocerotidae | Ceratotherium simum/germanoafricum | Ceratotherium simun | 23.157800 | 14.477900 | 60.872000 | 295.935000 | 34.529600 | 10.363900 | 24.165700 | 24.962400 | 19.943000 | 26.475100 | 19.018900 | 619.106000 | 136.060000 | 4.084200 | 101.909000 | 353.459000 | 17.237500 | 170.929000 | 77.274400 |
| NaN | Suidae | Kolpochoerus heseloni | Hylochoerus meinertzhagen | 24.755472 | 10.028190 | 82.147384 | 95.466098 | 30.561024 | 17.455710 | 11.613406 | 24.422688 | 24.080354 | 25.908143 | 24.476351 | 1501.931157 | 215.778177 | 6.013391 | 64.026916 | 608.518648 | 63.922595 | 423.144862 | 481.223796 |
| NaN | NaN | NaN | Potamochoerus larvatus | 22.600461 | 12.427862 | 71.554115 | 170.172416 | 31.229576 | 14.447010 | 14.922261 | 25.840812 | 21.152902 | 24.969255 | 22.151400 | 1074.362525 | 220.993334 | 0.093251 | 107.250400 | 554.669646 | 0.797395 | 305.572722 | 6.522689 |
| NaN | NaN | NaN | Potamochoerus porcus | 24.846385 | 9.872155 | 77.285093 | 104.653394 | 30.610011 | 18.706521 | 11.514652 | 24.679127 | 23.786054 | 25.821157 | 24.164986 | 1543.063612 | 221.767790 | 0.093251 | 68.914802 | 637.536494 | 0.797395 | 421.741200 | 9.620515 |
| NaN | NaN | Kolpochoerus paiceae | Phacochoerus aethiopicus | 26.925927 | 10.995650 | 73.628444 | 146.655080 | 33.013269 | 17.756062 | 14.902230 | 26.752520 | 24.798781 | 28.938138 | 25.390540 | 544.164495 | 114.027463 | 2.542997 | 98.913026 | 246.342593 | 6.439286 | 157.144165 | 60.075296 |
| NaN | NaN | NaN | Phacochoerus africanus | 27.139168 | 12.772653 | 66.662591 | 195.629296 | 31.520587 | 17.329581 | 15.684111 | 25.970639 | 25.864983 | 26.308172 | 25.817020 | 955.363101 | 209.274850 | 0.623833 | 106.802922 | 545.589980 | 4.306882 | 228.650785 | 35.410488 |
| NaN | NaN | Kolpochoerus majus | Phacochoerus aethiopicus | 26.925927 | 10.995650 | 73.628444 | 146.655080 | 33.013269 | 17.756062 | 14.902230 | 26.752520 | 24.798781 | 28.938138 | 25.390540 | 544.164495 | 114.027463 | 2.542997 | 98.913026 | 246.342593 | 6.439286 | 157.144165 | 60.075296 |
| NaN | NaN | NaN | Phacochoerus africanus | 27.139168 | 12.772653 | 66.662591 | 195.629296 | 31.520587 | 17.329581 | 15.684111 | 25.970639 | 25.864983 | 26.308172 | 25.817020 | 955.363101 | 209.274850 | 0.623833 | 106.802922 | 545.589980 | 4.306882 | 228.650785 | 35.410488 |
| NaN | NaN | Metridiochoerus compactus | Potamochoerus larvatus | 22.600461 | 12.427862 | 71.554115 | 170.172416 | 31.229576 | 14.447010 | 14.922261 | 25.840812 | 21.152902 | 24.969255 | 22.151400 | 1074.362525 | 220.993334 | 0.093251 | 107.250400 | 554.669646 | 0.797395 | 305.572722 | 6.522689 |
| NaN | NaN | NaN | Potamochoerus porcus | 24.846385 | 9.872155 | 77.285093 | 104.653394 | 30.610011 | 18.706521 | 11.514652 | 24.679127 | 23.786054 | 25.821157 | 24.164986 | 1543.063612 | 221.767790 | 0.093251 | 68.914802 | 637.536494 | 0.797395 | 421.741200 | 9.620515 |
| NaN | NaN | Caracal/Leptailurus sp. | Leptailurus serval | 23.620091 | 11.631103 | 68.908060 | 207.630669 | 32.740965 | 16.520474 | 19.534252 | 25.783122 | 22.233725 | 25.857752 | 21.023695 | 899.618990 | 198.051245 | 0.057553 | 87.960707 | 522.922763 | 0.026702 | 120.796747 | 21.141735 |
| NaN | NaN | NaN | Caracal aurata | 23.950807 | 10.968323 | 72.055463 | 183.332861 | 32.911284 | 14.958983 | 18.183827 | 24.980295 | 24.760674 | 25.966073 | 21.655937 | 1022.870767 | 131.637734 | 0.503857 | 75.026800 | 430.174748 | 0.016050 | 232.224032 | 184.198133 |
| NaN | NaN | NaN | Caracal caracal | 23.880595 | 11.132153 | 70.218229 | 208.457329 | 33.566603 | 14.256855 | 19.494466 | 25.190933 | 24.947908 | 26.176712 | 21.258065 | 872.030342 | 106.127096 | 0.386836 | 80.948076 | 371.313046 | 0.016050 | 180.617649 | 141.473665 |
| NaN | NaN | Panthera pardus | Panthera pardus | 24.458175 | 11.807380 | 68.170705 | 185.337093 | 32.938337 | 17.068837 | 17.503250 | 24.914639 | 22.871276 | 25.802195 | 24.362858 | 1364.380025 | 191.789398 | 0.007344 | 92.590828 | 536.574699 | 0.013817 | 201.730208 | 3.244678 |
| NaN | Hyaenidae | Crocuta ultra | Crocuta crocuta | 26.031270 | 13.434403 | 62.877495 | 258.640886 | 32.791006 | 12.938574 | 22.108627 | 26.508599 | 24.668566 | 26.854776 | 21.860522 | 327.090669 | 163.177363 | 0.000000 | 94.125199 | 360.321725 | 0.426700 | 82.205141 | 0.426700 |
| NaN | NaN | Hyaena hyaena | Hyaena hyaena | 24.056013 | 15.486903 | 55.122405 | 379.610547 | 34.986275 | 7.149685 | 27.919270 | 27.773876 | 22.223288 | 28.524776 | 16.903022 | 319.703480 | 72.035697 | 0.000000 | 65.301032 | 179.410614 | 0.898922 | 66.066252 | 0.898922 |
| NaN | Primates | Theropithecus oswaldi | Theropithecus gelada | 22.627589 | 13.179817 | 56.099293 | 1093.466966 | 33.648314 | 14.806164 | 20.161123 | 24.601567 | 19.051894 | 25.278920 | 18.854204 | 903.058714 | 217.353241 | 0.000000 | 97.241842 | 602.492546 | 0.000000 | 224.028846 | 0.063483 |
| NaN | NaN | NaN | Mean | 23.387461 | 13.055940 | 66.709194 | 334.575579 | 32.451599 | 12.622845 | 19.597967 | 24.598310 | 21.498467 | 25.627534 | 28.384029 | 779.330017 | 157.513083 | 3.680084 | 92.101872 | 404.769388 | 14.492588 | 206.484159 | 61.523679 |
| NaN | NaN | NaN | Minimum | 17.091585 | 9.794584 | 53.720039 | 54.457498 | 29.402658 | 1.036635 | 11.409325 | 18.921365 | 12.085194 | 21.546509 | 12.576134 | 319.703480 | 67.209277 | 0.000000 | 37.102729 | 179.410614 | 0.000000 | 66.066252 | 0.063483 |
| NaN | NaN | NaN | Maximum | 27.139168 | 16.469537 | 86.732275 | 2161.654220 | 34.986275 | 18.706521 | 28.564291 | 27.773876 | 25.864983 | 28.938138 | 186.775290 | 1654.051013 | 227.876764 | 56.059373 | 117.658672 | 637.536494 | 124.388549 | 423.144862 | 481.223796 |
| NaN | NaN | NaN | sd | 2.538136 | 1.813985 | 7.327798 | 413.946428 | 1.472131 | 4.773483 | 4.697980 | 1.665601 | 3.654580 | 1.666318 | 35.585885 | 339.447322 | 49.381041 | 8.656169 | 17.476500 | 144.386483 | 22.400123 | 88.544595 | 98.944455 |
| NaN | NaN | NaN | standard error range (min) | 14.553449 | 7.980598 | 46.392241 | -359.488930 | 27.930526 | -3.736848 | 6.711345 | 17.255764 | 8.430614 | 19.880191 | -23.009751 | -19.743842 | 17.828236 | -8.656169 | 19.626230 | 35.024130 | -22.400123 | -22.478343 | -98.880972 |
| NaN | NaN | NaN | standard error range (max) | 29.677304 | 18.283523 | 94.060072 | 2575.600649 | 36.458407 | 23.480004 | 33.262271 | 29.439478 | 29.519563 | 30.604456 | 222.361175 | 1993.498334 | 277.257805 | 64.715543 | 135.135172 | 781.922977 | 146.788672 | 511.689458 | 580.168251 |
| NaN | NaN | NaN | NaN | 0.388761 | 0.270793 | 1.129608 | 64.647452 | 0.229807 | 0.718663 | 0.700371 | 0.259718 | 0.549879 | 0.258488 | 5.547290 | 52.291166 | 7.530907 | 1.351466 | 2.726354 | 22.494978 | 3.494552 | 13.823720 | 15.403125 |

## 1.60
| Unnamed: 0 | Unnamed: 1 | Unnamed: 2 | Olduvai | Modern | bio1 | bio2 | bio3 | bio4 | bio5 | bio6 | bio7 | bio8 | bio9 | bio10 | bio11 | bio12 | bio13 | bio14 | bio15 | bio16 | bio17 | bio18 | bio19 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Tuff IIC | NaN | Antilopini | Antidorcas recki | Antidorcas marsupialis | 21.801298 | 16.352177 | 57.954898 | 369.894632 | 33.449961 | 6.425183 | 28.329807 | 25.076542 | 19.499457 | 27.188170 | 18.836712 | 323.578251 | 67.281231 | 0.016573 | 93.940433 | 179.923292 | 2.515778 | 116.828389 | 6.628040 |
| 1.6 - 1.47 | NaN | NaN | Gazella aff. rufifrons | Eudorcas thomsonii | 23.250551 | 12.842713 | 66.158723 | 1935.029502 | 32.951296 | 13.036222 | 21.078129 | 23.925240 | 22.047658 | 25.824827 | 19.694003 | 618.328989 | 134.101173 | 0.557026 | 109.610768 | 283.112878 | 14.763897 | 170.914731 | 26.700128 |
| NaN | NaN | NaN | NaN | Eudorcas rufifrons | 24.370025 | 13.284818 | 63.547144 | 2182.227923 | 34.814454 | 13.399380 | 22.672866 | 24.967345 | 23.228710 | 27.416406 | 21.209792 | 572.558463 | 126.623278 | 0.399131 | 118.610768 | 257.949194 | 13.184949 | 140.829468 | 19.680128 |
| NaN | NaN | Alcelaphini | Megalotragus isaaci | Connochaetes taurinus | 25.779236 | 13.204887 | 67.056951 | 231.688187 | 34.595930 | 14.709605 | 19.732854 | 25.152648 | 24.078151 | 25.227574 | 23.646950 | 520.779528 | 216.171112 | 0.309108 | 114.232229 | 579.229894 | 1.393279 | 168.600235 | 4.383703 |
| NaN | NaN | NaN | NaN | Alcelaphus buselaphus | 25.779236 | 13.204887 | 67.056951 | 231.688187 | 34.595930 | 14.709605 | 19.732854 | 25.152648 | 24.078151 | 25.227574 | 23.646950 | 520.779528 | 216.171112 | 0.309108 | 114.232229 | 579.229894 | 1.393279 | 168.600235 | 4.383703 |
| NaN | NaN | Reduncini | Kobus sigmoidalis | Kobus ellipsiprymnus | 26.198190 | 12.867537 | 65.820853 | 182.638095 | 32.990609 | 15.212464 | 17.277722 | 25.508794 | 23.582612 | 25.912978 | 24.651344 | 941.873406 | 212.902775 | 0.131187 | 108.994878 | 635.624691 | 0.152804 | 130.027884 | 37.888794 |
| NaN | NaN | NaN | Kobus kob | NaN | 24.436025 | 13.430637 | 59.609893 | 1833.109832 | 34.411264 | 11.488462 | 20.180790 | 24.111460 | 21.739541 | 26.152926 | 21.339446 | 1068.038940 | 229.618533 | 1.900296 | 95.389247 | 619.020556 | 11.617217 | 219.577511 | 49.119958 |
| NaN | NaN | Tragelaphini | Tragelaphus strepsiceros | NaN | 19.322452 | 15.276650 | 68.864952 | 198.980561 | 29.708811 | 8.934189 | 15.468399 | 20.473367 | 16.219379 | 22.083116 | 16.055962 | 655.941225 | 131.766205 | 4.255118 | 96.088701 | 300.243748 | 22.078565 | 204.349432 | 126.815964 |
| NaN | NaN | NaN | cf. Taurotragus sp. | Taurotragus oryx | 22.662644 | 12.903119 | 60.667487 | 1937.085467 | 33.109772 | 9.978994 | 23.780197 | 23.428330 | 20.430144 | 25.680879 | 20.073619 | 1036.276602 | 228.513269 | 0.705673 | 99.888913 | 499.200701 | 5.718310 | 228.247364 | 15.908693 |
| NaN | NaN | Equidae | Equus oldowayensis | Equus greyvi | 23.479039 | 12.230711 | 66.853089 | 240.071594 | 33.420963 | 11.635436 | 21.854638 | 25.345167 | 21.020302 | 25.941985 | 17.770290 | 467.366052 | 89.573521 | 0.509743 | 98.509373 | 237.773974 | 3.381234 | 162.824414 | 8.365849 |
| NaN | NaN | Suidae | Kolpochoerus majus | Potamochoerus larvatus | 22.585986 | 12.441312 | 71.523243 | 170.513172 | 31.232121 | 14.423624 | 14.939529 | 25.846566 | 21.136532 | 24.963137 | 22.138698 | 1072.173518 | 221.029719 | 0.089880 | 107.465446 | 554.356286 | 0.768573 | 305.045997 | 6.286929 |
| NaN | NaN | NaN | Metridiochoerus compactus | Potamochoerus porcus | 24.855552 | 9.858704 | 77.314548 | 104.304476 | 30.606034 | 18.727972 | 11.496051 | 24.672653 | 23.797402 | 25.824007 | 24.173481 | 1545.808301 | 221.812328 | 0.089880 | 68.726315 | 638.095416 | 0.768573 | 422.437301 | 9.417364 |
| NaN | NaN | NaN | Ceratotherium cf simum | NaN | 23.166291 | 14.482117 | 60.864655 | 2961.117706 | 34.543547 | 10.368433 | 24.175113 | 24.970879 | 19.951181 | 26.486220 | 19.025289 | 618.259047 | 135.920959 | 4.080818 | 101.970141 | 353.072663 | 17.222654 | 170.537850 | 77.355124 |
| NaN | NaN | Felidae | Panthera leo | NaN | 22.594062 | 13.176932 | 56.095760 | 1097.317558 | 33.655242 | 14.773411 | 20.186022 | 24.599341 | 18.963271 | 25.276068 | 18.772727 | 902.829965 | 218.027220 | 0.000000 | 97.091414 | 603.306068 | 0.000000 | 223.915393 | 0.061189 |
| NaN | NaN | Hyaenidae | Crocuta ultra | Crocuta crocuta | 26.084356 | 13.397015 | 63.040959 | 256.579167 | 32.740728 | 13.081758 | 22.014339 | 26.490216 | 24.745605 | 26.823881 | 21.977612 | 327.195825 | 165.303483 | 0.000000 | 94.767662 | 364.719735 | 0.411277 | 82.414594 | 0.411277 |
| NaN | NaN | Primates | Theropithecus oswaldi | Theropithecus gelada | 22.594062 | 13.176932 | 56.095760 | 1097.317558 | 33.655242 | 14.773411 | 20.186022 | 24.599341 | 18.963271 | 25.276068 | 18.772727 | 902.829965 | 218.027220 | 0.000000 | 97.091414 | 603.306068 | 0.000000 | 223.915393 | 0.061189 |
| NaN | NaN | NaN | NaN | Mean | 23.684938 | 13.258197 | 64.282867 | 939.347726 | 33.155119 | 12.854884 | 20.194083 | 24.645034 | 21.467585 | 25.706614 | 20.736600 | 755.913600 | 177.052696 | 0.834596 | 101.038121 | 455.510316 | 5.960649 | 196.191637 | 24.591752 |
| NaN | NaN | NaN | NaN | Minimum | 19.322452 | 9.858704 | 56.095760 | 104.304476 | 29.708811 | 6.425183 | 11.496051 | 20.473367 | 16.219379 | 22.083116 | 16.055962 | 323.578251 | 67.281231 | 0.000000 | 68.726315 | 179.923292 | 0.000000 | 82.414594 | 0.061189 |
| NaN | NaN | NaN | NaN | Maximum | 26.198190 | 16.352177 | 77.314548 | 2961.117706 | 34.814454 | 18.727972 | 28.329807 | 26.490216 | 24.745605 | 27.416406 | 24.651344 | 1545.808301 | 229.618533 | 4.255118 | 118.610768 | 638.095416 | 22.078565 | 422.437301 | 126.815964 |
| NaN | NaN | NaN | NaN | sd | 1.884003 | 1.437689 | 5.492875 | 968.482873 | 1.538021 | 3.020510 | 4.161255 | 1.380604 | 2.371633 | 1.242536 | 2.543096 | 338.140560 | 55.570126 | 1.412560 | 12.095911 | 166.935958 | 7.368892 | 82.813944 | 35.082081 |
| NaN | NaN | NaN | NaN | standard error range (min) | 17.438449 | 8.421014 | 50.602886 | -864.178397 | 28.170790 | 3.404673 | 7.334796 | 19.092763 | 13.847746 | 20.840580 | 13.512866 | -14.562310 | 11.711105 | -1.412560 | 56.630405 | 12.987334 | -7.368892 | -0.399350 | -35.020892 |
| NaN | NaN | NaN | NaN | standard error range (max) | 28.082193 | 17.789867 | 82.807422 | 3929.600579 | 36.352475 | 21.748482 | 32.491061 | 27.870819 | 27.117238 | 28.658942 | 27.194440 | 1883.948861 | 285.188659 | 5.667678 | 130.706679 | 805.031374 | 29.447457 | 505.251246 | 161.898045 |

## 1.47
| Unnamed: 0 | Unnamed: 1 | Unnamed: 2 | Olduvai | Modern | bio1 | bio2 | bio3 | bio4 | bio5 | bio6 | bio7 | bio8 | bio9 | bio10 | bio11 | bio12 | bio13 | bio14 | bio15 | bio16 | bio17 | bio18 | bio19 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| NaN | Tuff IID dates from McHenry and Stanistreet (2018) | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN |
| Tuff IID (Bottom) | NaN | Bovidae | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN |
| 1.47 | NaN | Alcelaphini | Alcelaphini 3A | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN |
| NaN | NaN | NaN | Damaliscus niro | Damaliscus pygargus | 16.920862 | 16.102936 | 53.431600 | 411.502056 | 30.050983 | 0.792081 | 26.570554 | 21.686549 | 11.743515 | 21.461061 | 12.292721 | 643.348060 | 117.085290 | 6.377223 | 72.070855 | 321.471078 | 36.656247 | 272.268385 | 36.893143 |
| NaN | NaN | NaN | Connochaetes taurinus | Connchaetes taurinus | 20.429248 | 16.495916 | 59.389973 | 332.128294 | 32.266651 | 4.723969 | 28.442475 | 24.162786 | 15.463851 | 24.542475 | 14.723273 | 412.463071 | 89.900205 | 2.063700 | 99.027033 | 344.029303 | 7.174230 | 188.981178 | 9.871336 |
| NaN | NaN | NaN | Megalotragus sp. | Alcelaphus buselaphus | 25.910039 | 13.123240 | 67.084824 | 231.746021 | 34.701885 | 14.871325 | 19.547372 | 25.221495 | 24.299301 | 25.290334 | 23.813760 | 506.091192 | 216.725959 | 0.283993 | 114.424610 | 581.811215 | 1.280075 | 165.870216 | 4.190027 |
| NaN | NaN | Antilopini | Antidorcas recki | Antidorcas marsupialis | 21.687443 | 16.445438 | 57.601017 | 374.976768 | 33.413402 | 6.171262 | 28.595510 | 25.021573 | 19.320751 | 27.156631 | 18.711854 | 324.912518 | 67.437131 | 0.015227 | 93.409023 | 180.742025 | 2.473870 | 116.598582 | 6.252012 |
| NaN | NaN | NaN | Gazella sp. | Eudorcas thomsonii | 23.003506 | 12.741742 | 66.758452 | 1872.486543 | 32.532753 | 12.966654 | 20.714281 | 23.695689 | 21.777285 | 25.466935 | 19.369490 | 630.090821 | 136.153452 | 0.593017 | 107.773644 | 289.471270 | 14.376830 | 177.931909 | 28.143117 |
| NaN | NaN | NaN | NaN | Eudorcas rufifrons | 24.608085 | 13.375426 | 63.015189 | 2226.804280 | 35.203280 | 13.487180 | 23.000071 | 25.189374 | 23.470127 | 27.748198 | 21.542122 | 564.486400 | 125.435137 | 0.366701 | 120.673644 | 253.403322 | 12.113672 | 134.809699 | 18.081117 |
| NaN | NaN | Hippotragini | Hippotragus sp. | Hippotragus niger | 21.402604 | 14.292690 | 62.735945 | 248.101246 | 31.699234 | 13.423201 | 16.938066 | 25.787926 | 20.275408 | 24.851276 | 16.864547 | 879.297501 | 196.673622 | 0.716752 | 109.280728 | 512.416022 | 2.500280 | 266.854079 | 4.780809 |
| NaN | NaN | NaN | NaN | Hippotragus equinus | 24.510733 | 12.787228 | 64.116558 | 264.436965 | 34.255980 | 11.445685 | 19.034996 | 23.318105 | 25.269676 | 27.880503 | 21.967871 | 854.332636 | 167.076705 | 5.814849 | 83.144905 | 473.400430 | 20.101779 | 103.726377 | 39.948859 |
| NaN | NaN | NaN | NaN | Hippotragus leucophaeus | 19.937533 | 12.457628 | 58.307358 | 339.132565 | 30.795180 | 8.314485 | 21.259796 | 18.415305 | 25.269676 | 24.362023 | 16.241071 | 603.836636 | 101.321505 | 14.878849 | 53.151305 | 283.386030 | 51.413779 | 103.726377 | 99.318059 |
| NaN | NaN | Reduncini | Kobus cf. kob | NaN | 24.398842 | 13.412858 | 59.595607 | 1831.340554 | 34.425366 | 11.411962 | 20.168510 | 24.077470 | 21.675901 | 26.139546 | 21.269860 | 1072.170911 | 230.366510 | 1.963027 | 95.013645 | 621.567005 | 11.649709 | 220.098141 | 42.864363 |
| NaN | NaN | Tragelaphini | Tragelaphus sp. | NaN | 19.548128 | 15.392297 | 68.290925 | 203.792140 | 30.073720 | 9.085786 | 15.462842 | 20.768031 | 16.307180 | 22.409488 | 16.189540 | 630.271000 | 128.697701 | 3.909389 | 97.478994 | 289.986444 | 20.284682 | 205.190415 | 116.674667 |
| NaN | NaN | NaN | Taurotragus oryx | NaN | 22.701214 | 12.902612 | 60.477770 | 1949.933281 | 33.205684 | 9.958033 | 23.897165 | 23.472476 | 20.463278 | 25.757111 | 20.102367 | 1035.340189 | 229.892363 | 0.591001 | 100.390143 | 499.104124 | 4.789085 | 227.258963 | 13.486030 |
| NaN | NaN | Equidae | Equus oldowayensis. | Equus grevi | 23.326070 | 12.297486 | 67.319946 | 236.815641 | 33.252592 | 11.442697 | 21.887670 | 25.159222 | 20.802304 | 25.766425 | 17.557782 | 478.314613 | 91.753245 | 0.406036 | 99.651983 | 242.957415 | 2.772012 | 167.062842 | 6.978568 |
| NaN | NaN | Giraffidae | Giraffidae | Giraffa camelopardalis | 24.562479 | 12.708719 | 70.154134 | 189.464763 | 33.266277 | 14.832447 | 18.433820 | 25.145011 | 22.689398 | 26.772954 | 22.145390 | 630.891629 | 139.104329 | 4.162356 | 99.718643 | 133.744226 | 18.387570 | 154.920455 | 84.960607 |
| NaN | NaN | NaN | NaN | Giraffa reticulata | 24.562479 | 12.708719 | 70.154134 | 189.464763 | 33.266277 | 14.832447 | 18.433820 | 25.145011 | 22.689398 | 26.772954 | 22.145390 | 630.891629 | 139.104329 | 4.162356 | 99.718643 | 133.744226 | 18.387570 | 154.920455 | 84.960607 |
| NaN | NaN | NaN | NaN | Giraffa tippelskirchi | 23.288802 | 12.625305 | 70.133202 | 188.128142 | 31.910184 | 13.560141 | 18.350032 | 24.162672 | 21.170264 | 25.381288 | 20.819104 | 692.857128 | 146.831259 | 3.978252 | 96.443416 | 361.100084 | 17.273737 | 186.007252 | 60.501567 |
| NaN | NaN | NaN | NaN | Giraffa giraffa | 22.904020 | 13.980578 | 67.131618 | 256.993288 | 32.963509 | 11.338270 | 21.625228 | 24.551456 | 19.804703 | 25.657251 | 167.215300 | 580.249835 | 125.514372 | 3.534267 | 98.130024 | 312.594340 | 15.185176 | 177.870790 | 51.762854 |
| NaN | NaN | NaN | Sivatherium sp. | Giraffa camelopardalis | 24.562479 | 12.708719 | 70.154134 | 189.464763 | 33.266277 | 14.832447 | 18.433820 | 25.145011 | 22.689398 | 26.772954 | 22.145390 | 630.891629 | 139.104329 | 4.162356 | 99.718643 | 133.744226 | 18.387570 | 154.920455 | 84.960607 |
| NaN | NaN | NaN | NaN | Giraffa reticulata | 24.562479 | 12.708719 | 70.154134 | 189.464763 | 33.266277 | 14.832447 | 18.433820 | 25.145011 | 22.689398 | 26.772954 | 22.145390 | 630.891629 | 139.104329 | 4.162356 | 99.718643 | 133.744226 | 18.387570 | 154.920455 | 84.960607 |
| NaN | NaN | NaN | NaN | Giraffa tippelskirchi | 23.288802 | 12.625305 | 70.133202 | 188.128142 | 31.910184 | 13.560141 | 18.350032 | 24.162672 | 21.170264 | 25.381288 | 20.819104 | 692.857128 | 146.831259 | 3.978252 | 96.443416 | 361.100084 | 17.273737 | 186.007252 | 60.501567 |
| NaN | NaN | NaN | NaN | Giraffa giraffa | 22.904020 | 13.980578 | 67.131618 | 256.993288 | 32.963509 | 11.338270 | 21.625228 | 24.551456 | 19.804703 | 25.657251 | 167.215300 | 580.249835 | 125.514372 | 3.534267 | 98.130024 | 312.594340 | 15.185176 | 177.870790 | 51.762854 |
| NaN | NaN | NaN | NaN | Okapia johnstoni | 23.828870 | 9.774705 | 86.833674 | 53.512883 | 29.383000 | 18.021216 | 11.360914 | 23.603295 | 23.814593 | 24.486111 | 23.189248 | 1660.095831 | 205.575508 | 56.367857 | 36.742187 | 453.324625 | 123.231762 | 423.051549 | 447.470920 |
| NaN | NaN | Rhinocerotidae | Ceratotherium sp. | NaN | 23.184784 | 14.491165 | 60.848809 | 2964.956623 | 34.573701 | 10.378286 | 24.195415 | 24.989235 | 19.968936 | 26.510353 | 19.039220 | 616.424297 | 135.619527 | 4.073488 | 102.103417 | 352.234927 | 17.190410 | 169.691202 | 77.530055 |
| NaN | NaN | Suidae | Kolpochoerus paiceae | Hylochoerus meinertzhagen | 24.726232 | 9.990626 | 82.393768 | 93.959135 | 30.531148 | 17.460779 | 11.543197 | 24.385754 | 24.071157 | 25.884319 | 24.467612 | 1515.330602 | 216.604771 | 6.126316 | 63.245522 | 612.007477 | 65.304948 | 427.248764 | 491.499385 |
| NaN | NaN | NaN | Metridiochoerus compactus | Phacochoerus aethiopicus | 26.957297 | 10.973256 | 73.670972 | 146.305402 | 33.068980 | 17.772537 | 14.924866 | 26.792292 | 24.798921 | 29.025339 | 25.403068 | 525.500486 | 111.048416 | 2.560967 | 99.129005 | 236.574465 | 6.045633 | 152.698146 | 57.399811 |
| NaN | NaN | NaN | NaN | Phacochoerus africanus | 27.180468 | 12.833012 | 66.380728 | 197.560280 | 31.506784 | 17.326195 | 15.743159 | 25.973999 | 25.914774 | 26.272900 | 25.849410 | 955.848047 | 210.731343 | 0.552431 | 107.386322 | 549.757391 | 3.813926 | 227.534731 | 31.586396 |
| NaN | NaN | NaN | NaN | Potamochoerus larvatus | 22.554625 | 12.470456 | 71.456355 | 171.251477 | 31.237636 | 14.372955 | 14.976942 | 25.859032 | 21.101064 | 24.949882 | 22.111179 | 1067.430670 | 221.108555 | 0.082578 | 107.931378 | 553.677337 | 0.706127 | 303.904760 | 5.776116 |
| NaN | NaN | NaN | NaN | Potamochoerus porcus | 24.875413 | 9.829559 | 77.378366 | 103.548488 | 30.597419 | 18.774449 | 11.455746 | 24.658625 | 23.821988 | 25.830181 | 24.191886 | 1551.755126 | 221.908826 | 0.082578 | 68.317927 | 639.306413 | 0.706127 | 423.945521 | 8.977203 |
| NaN | NaN | Felidae | Panthera cf leo | Panthera leo | 22.521419 | 13.170682 | 56.087980 | 1105.660506 | 33.670254 | 14.702446 | 20.239970 | 24.594520 | 18.771255 | 25.269887 | 18.596193 | 902.334343 | 219.487509 | 0.000000 | 96.765486 | 605.068700 | 0.000000 | 223.669580 | 0.056217 |
| NaN | NaN | NaN | NaN | Mean | 23.270654 | 13.083021 | 66.838689 | 586.484588 | 32.526142 | 12.621717 | 19.436045 | 24.304864 | 21.417533 | 25.732065 | 30.625670 | 775.843289 | 156.610754 | 4.810360 | 93.625283 | 371.657337 | 18.725975 | 208.605494 | 72.832741 |
| NaN | NaN | NaN | NaN | Minimum | 16.920862 | 9.774705 | 53.431600 | 53.512883 | 29.383000 | 0.792081 | 11.360914 | 18.415305 | 11.743515 | 21.461061 | 12.292721 | 324.912518 | 67.437131 | 0.000000 | 36.742187 | 133.744226 | 0.000000 | 103.726377 | 0.056217 |
| NaN | NaN | NaN | NaN | Maximum | 27.180468 | 16.495916 | 86.833674 | 2964.956623 | 35.203280 | 18.774449 | 28.595510 | 26.792292 | 25.914774 | 29.025339 | 167.215300 | 1660.095831 | 230.366510 | 56.367857 | 120.673644 | 639.306413 | 123.231762 | 427.248764 | 491.499385 |
| NaN | NaN | NaN | NaN | sd | 2.181338 | 1.699508 | 7.478316 | 777.728026 | 1.530320 | 4.092701 | 4.498192 | 1.655912 | 3.138216 | 1.502828 | 37.968421 | 334.320119 | 48.809699 | 10.375243 | 18.381166 | 163.899162 | 24.948099 | 88.162874 | 114.912440 |
| NaN | NaN | NaN | NaN | standard error range (min) | 14.739523 | 8.075198 | 45.953284 | -724.215142 | 27.852680 | -3.300621 | 6.862722 | 16.759393 | 8.605299 | 19.958233 | -25.675700 | -9.407602 | 18.627432 | -10.375243 | 18.361021 | -30.154936 | -24.948099 | 15.563503 | -114.856223 |
| NaN | NaN | NaN | NaN | standard error range (max) | 29.361806 | 18.195424 | 94.311990 | 3742.684649 | 36.733600 | 22.867151 | 33.093701 | 28.448204 | 29.052991 | 30.528166 | 205.183721 | 1994.415950 | 279.176209 | 66.743099 | 139.054810 | 803.205575 | 148.179861 | 515.411638 | 606.411825 |

## 1.39
| Unnamed: 0 | Unnamed: 1 | Unnamed: 2 | Olduvai | Modern | bio1 | bio2 | bio3 | bio4 | bio5 | bio6 | bio7 | bio8 | bio9 | bio10 | bio11 | bio12 | bio13 | bio14 | bio15 | bio16 | bio17 | bio18 | bio19 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Tuff IID (Top) | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN |
| NaN | NaN | NaN | Damaliscus niro | Damaliscus pygargus | 16.804051 | 16.155737 | 53.234248 | 414.738608 | 30.011100 | 0.624754 | 26.670437 | 21.616991 | 11.509735 | 21.402597 | 12.098807 | 642.291429 | 116.149176 | 6.432299 | 71.622412 | 318.969349 | 37.040389 | 272.978664 | 37.070620 |
| NaN | NaN | NaN | Connochaetes taurinus | Connchaetes taurinus | 20.577001 | 16.513964 | 59.513601 | 326.978853 | 32.331505 | 4.881033 | 28.359126 | 24.272199 | 15.626232 | 24.644841 | 14.862711 | 406.054772 | 90.262772 | 1.881196 | 100.165458 | 346.396780 | 6.716645 | 187.037264 | 9.175231 |
| NaN | NaN | NaN | Megalotragus sp. | Alcelaphus buselaphus | 26.045028 | 13.041593 | 67.112697 | 231.803856 | 34.807841 | 15.033044 | 19.361890 | 25.290343 | 24.520452 | 25.353093 | 23.980570 | 491.402855 | 217.280806 | 0.258878 | 114.616992 | 584.392536 | 1.166871 | 163.140197 | 3.996351 |
| NaN | NaN | Antilopini | Antidorcas recki | Antidorcas marsupialis | 21.573587 | 16.538699 | 57.247144 | 380.059709 | 33.376838 | 5.917341 | 28.861213 | 24.966604 | 19.142045 | 27.125092 | 18.586996 | 326.246785 | 67.593031 | 0.013880 | 92.877612 | 181.560757 | 2.431963 | 116.368776 | 5.875984 |
| NaN | NaN | NaN | Gazella sp. | Eudorcas thomsonii | 22.756461 | 12.640772 | 67.358181 | 1809.943583 | 32.114211 | 12.897086 | 20.350433 | 23.466139 | 21.506913 | 25.109043 | 19.044977 | 641.852653 | 138.205732 | 0.629009 | 105.936519 | 295.829661 | 13.989764 | 184.949087 | 29.586107 |
| NaN | NaN | NaN | NaN | Eudorcas rufifrons | 24.846146 | 13.466035 | 62.483233 | 2271.380636 | 35.592105 | 13.574981 | 23.327275 | 25.411402 | 23.711545 | 28.079990 | 21.874451 | 556.414338 | 124.246995 | 0.334272 | 122.736519 | 248.857450 | 11.042395 | 128.789930 | 16.482107 |
| NaN | NaN | Hippotragini | Hippotragus sp. | Hippotragus niger | 21.375843 | 14.302180 | 62.768140 | 246.995694 | 31.663928 | 13.456523 | 16.872795 | 25.806681 | 20.240229 | 24.820211 | 16.832308 | 883.427654 | 197.763710 | 0.653366 | 109.627331 | 515.120728 | 2.279166 | 268.989433 | 4.358017 |
| NaN | NaN | NaN | NaN | Hippotragus equinus | 24.792777 | 12.797201 | 64.486522 | 259.640499 | 34.463274 | 11.627359 | 18.890404 | 23.590654 | 25.405010 | 28.098009 | 22.333297 | 870.929070 | 171.217541 | 5.300610 | 84.830050 | 485.569099 | 18.324070 | 104.015881 | 36.592837 |
| NaN | NaN | NaN | NaN | Hippotragus leucophaeus | 19.642377 | 12.426001 | 57.944122 | 343.763699 | 30.565674 | 8.100959 | 21.396004 | 18.069054 | 25.405010 | 24.135449 | 15.883697 | 588.817070 | 97.163141 | 15.508610 | 51.050850 | 271.572299 | 53.588070 | 104.015881 | 103.455237 |
| NaN | NaN | Reduncini | Kobus cf. kob | NaN | 24.398842 | 13.412858 | 59.595607 | 1831.340554 | 34.425366 | 11.411962 | 20.168510 | 24.077470 | 21.675901 | 26.139546 | 21.269860 | 1072.170911 | 230.366510 | 1.963027 | 95.013645 | 621.567005 | 11.649709 | 220.098141 | 42.864363 |
| NaN | NaN | Tragelaphini | Tragelaphus sp. | NaN | 19.773804 | 15.507944 | 67.716898 | 208.603720 | 30.438629 | 9.237383 | 15.457284 | 21.062695 | 16.394980 | 22.735860 | 16.323118 | 604.600776 | 125.629197 | 3.563661 | 98.869287 | 279.729139 | 18.490798 | 206.031399 | 106.533370 |
| NaN | NaN | NaN | Taurotragus oryx | NaN | 22.739785 | 12.902106 | 60.288054 | 1962.781094 | 33.301596 | 9.937071 | 24.014133 | 23.516623 | 20.496411 | 25.833343 | 20.131116 | 1034.403776 | 231.271456 | 0.476329 | 100.891373 | 499.007548 | 3.859859 | 226.270561 | 11.063367 |
| NaN | NaN | Equidae | Equus oldowayensis | NaN | 23.173101 | 12.364262 | 67.786803 | 233.559688 | 33.084221 | 11.249959 | 21.920701 | 24.975674 | 20.584306 | 25.590865 | 17.345275 | 489.263174 | 93.932969 | 0.302330 | 100.794593 | 248.140856 | 2.162789 | 171.301271 | 5.591288 |
| NaN | NaN | Giraffidae | Giraffidae | Giraffa camelopardalis | 24.732795 | 12.655981 | 70.170550 | 186.430057 | 33.379936 | 15.087564 | 18.292363 | 25.244286 | 22.934417 | 26.926840 | 22.366457 | 628.126578 | 139.155984 | 4.165035 | 100.075763 | 94.772508 | 18.468566 | 151.409226 | 88.004050 |
| NaN | NaN | NaN | NaN | Giraffa reticulata | 24.732795 | 12.655981 | 70.170550 | 186.430057 | 33.379936 | 15.087564 | 18.292363 | 25.244286 | 22.934417 | 26.926840 | 22.366457 | 628.126578 | 139.155984 | 4.165035 | 100.075763 | 94.772508 | 18.468566 | 151.409226 | 88.004050 |
| NaN | NaN | NaN | NaN | Giraffa tippelskirchi | 23.216513 | 12.556678 | 70.134063 | 184.838841 | 31.765539 | 13.572913 | 18.192616 | 24.074835 | 21.125924 | 25.270094 | 20.787544 | 701.895030 | 148.354710 | 3.945864 | 96.176682 | 365.434244 | 17.142575 | 188.417318 | 58.886145 |
| NaN | NaN | NaN | NaN | Giraffa giraffa | 22.805287 | 14.110313 | 66.739370 | 263.715028 | 33.002772 | 11.058276 | 21.944485 | 24.542523 | 19.597397 | 25.618107 | 158.979514 | 571.431797 | 123.768235 | 3.434089 | 98.191445 | 309.183050 | 14.748274 | 178.353856 | 49.388291 |
| NaN | NaN | NaN | Sivatherium sp. | Giraffa camelopardalis | 24.732795 | 12.655981 | 70.170550 | 186.430057 | 33.379936 | 15.087564 | 18.292363 | 25.244286 | 22.934417 | 26.926840 | 22.366457 | 628.126578 | 139.155984 | 4.165035 | 100.075763 | 94.772508 | 18.468566 | 151.409226 | 88.004050 |
| NaN | NaN | NaN | NaN | Giraffa reticulata | 24.732795 | 12.655981 | 70.170550 | 186.430057 | 33.379936 | 15.087564 | 18.292363 | 25.244286 | 22.934417 | 26.926840 | 22.366457 | 628.126578 | 139.155984 | 4.165035 | 100.075763 | 94.772508 | 18.468566 | 151.409226 | 88.004050 |
| NaN | NaN | NaN | NaN | Giraffa tippelskirchi | 23.216513 | 12.556678 | 70.134063 | 184.838841 | 31.765539 | 13.572913 | 18.192616 | 24.074835 | 21.125924 | 25.270094 | 20.787544 | 701.895030 | 148.354710 | 3.945864 | 96.176682 | 365.434244 | 17.142575 | 188.417318 | 58.886145 |
| NaN | NaN | NaN | NaN | Giraffa giraffa | 22.805287 | 14.110313 | 66.739370 | 263.715028 | 33.002772 | 11.058276 | 21.944485 | 24.542523 | 19.597397 | 25.618107 | 158.979514 | 571.431797 | 123.768235 | 3.434089 | 98.191445 | 309.183050 | 14.748274 | 178.353856 | 49.388291 |
| NaN | NaN | NaN | NaN | Okapia johnstoni | 23.829575 | 9.766336 | 86.876368 | 53.115150 | 29.374723 | 18.033320 | 11.340530 | 23.600790 | 23.821220 | 24.482563 | 23.195325 | 1662.641018 | 205.746538 | 56.497745 | 36.590380 | 452.775750 | 122.744694 | 423.669646 | 448.417462 |
| NaN | NaN | Rhinocerotidae | Ceratotherium sp. | NaN | 23.196165 | 14.496732 | 60.839058 | 2967.319034 | 34.592257 | 10.384348 | 24.207909 | 25.000531 | 19.979862 | 26.525204 | 19.047793 | 615.295219 | 135.434030 | 4.068977 | 102.185433 | 351.719397 | 17.170567 | 169.170188 | 77.637706 |
| NaN | NaN | Suidae | Kolpochoerus paiceae | Hylochoerus meinertzhagen | 24.706225 | 9.964925 | 82.562346 | 92.928055 | 30.510706 | 17.464248 | 11.495159 | 24.360483 | 24.064864 | 25.868019 | 24.461633 | 1524.498644 | 217.170336 | 6.203581 | 62.710884 | 614.394571 | 66.250769 | 430.056696 | 498.530052 |
| NaN | NaN | NaN | Metridiochoerus compactus | Phacochoerus aethiopicus | 26.978761 | 10.927586 | 73.700070 | 146.066149 | 33.107097 | 17.783809 | 14.940354 | 26.819504 | 24.799016 | 29.085003 | 25.411640 | 512.730375 | 109.010121 | 2.573263 | 99.276780 | 229.891009 | 5.776291 | 149.656133 | 55.569215 |
| NaN | NaN | NaN | NaN | Phacochoerus africanus | 27.208726 | 12.843962 | 66.187874 | 198.881480 | 31.497341 | 17.323879 | 15.783560 | 25.976299 | 25.948842 | 26.248766 | 25.871571 | 956.179853 | 211.727891 | 0.503576 | 107.785491 | 552.608779 | 3.476640 | 226.771116 | 28.969912 |
| NaN | NaN | NaN | NaN | Potamochoerus larvatus | 22.523264 | 12.499599 | 71.389466 | 171.989782 | 31.243152 | 14.322285 | 15.014355 | 25.871499 | 21.065595 | 24.936627 | 22.083660 | 1062.687821 | 221.187390 | 0.075275 | 108.397311 | 552.998389 | 0.643680 | 302.763523 | 5.265303 |
| NaN | NaN | NaN | NaN | Potamochoerus porcus | 24.895274 | 9.800414 | 77.442184 | 102.792499 | 30.588804 | 18.820927 | 11.415442 | 24.644597 | 23.846574 | 25.836356 | 24.210290 | 1557.701952 | 222.005325 | 0.075275 | 67.909539 | 640.517411 | 0.643680 | 425.453740 | 8.537042 |
| NaN | NaN | Felidae | Panthera cf leo | Panthera leo | 22.448777 | 13.164431 | 56.080199 | 1114.003455 | 33.685265 | 14.631481 | 20.293918 | 24.589699 | 18.579239 | 25.263707 | 18.419659 | 901.838721 | 220.947797 | 0.000000 | 96.439559 | 606.831332 | 0.000000 | 223.423767 | 0.051245 |
| NaN | NaN | Primates | Theropithecus sp. | NaN | 22.448777 | 13.164431 | 56.080199 | 1114.003455 | 33.685265 | 14.631481 | 20.293918 | 24.589699 | 18.579239 | 25.263707 | 18.419659 | 901.838721 | 220.947797 | 0.000000 | 96.439559 | 606.831332 | 0.000000 | 223.423767 | 0.051245 |
| NaN | NaN | NaN | NaN | Mean | 23.256971 | 13.088522 | 66.437403 | 604.183907 | 32.583909 | 12.698596 | 19.462634 | 24.326250 | 21.336251 | 25.735388 | 29.689612 | 778.748252 | 158.871003 | 4.624507 | 93.860229 | 374.453526 | 17.903493 | 208.918477 | 70.141304 |
| NaN | NaN | NaN | NaN | Minimum | 16.804051 | 9.766336 | 53.234248 | 53.115150 | 29.374723 | 0.624754 | 11.340530 | 18.069054 | 11.509735 | 21.402597 | 12.098807 | 326.246785 | 67.593031 | 0.000000 | 36.590380 | 94.772508 | 0.000000 | 104.015881 | 0.051245 |
| NaN | NaN | NaN | NaN | Maximum | 27.208726 | 16.538699 | 86.876368 | 2967.319034 | 35.592105 | 18.820927 | 28.861213 | 26.819504 | 25.948842 | 29.085003 | 158.979514 | 1662.641018 | 231.271456 | 56.497745 | 122.736519 | 640.517411 | 122.744694 | 430.056696 | 498.530052 |
| NaN | NaN | NaN | NaN | sd | 2.200558 | 1.701761 | 7.671028 | 771.427870 | 1.567467 | 4.095683 | 4.480387 | 1.665215 | 3.197839 | 1.520276 | 35.294402 | 332.530592 | 49.928177 | 10.285337 | 18.454067 | 176.207691 | 24.927114 | 87.531298 | 114.909482 |
| NaN | NaN | NaN | NaN | standard error range (min) | 14.603493 | 8.064574 | 45.563220 | -718.312720 | 27.807255 | -3.470930 | 6.860143 | 16.403839 | 8.311896 | 19.882320 | -23.195595 | -6.283807 | 17.664854 | -10.285337 | 18.136312 | -81.435183 | -24.927114 | 16.484584 | -114.858237 |
| NaN | NaN | NaN | NaN | standard error range (max) | 29.409283 | 18.240460 | 94.547396 | 3738.746904 | 37.159573 | 22.916610 | 33.341600 | 28.484719 | 29.146681 | 30.605279 | 194.273916 | 1995.171610 | 281.199633 | 66.783081 | 141.190586 | 816.725102 | 147.671808 | 517.587994 | 613.439534 |

## Bed III-1.15
| Unnamed: 0 | Unnamed: 1 | Olduvai | Modern | bio1 | bio2 | bio3 | bio4 | bio5 | bio6 | bio7 | bio8 | bio9 | bio10 | bio11 | bio12 | bio13 | bio14 | bio15 | bio16 | bio17 | bio18 | bio19 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Bed III | Bovidae | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN |
| Tuff IIIA | Alcelaphini | Connochaetes taurinus | NaN | 20.792949 | 16.540342 | 59.669968 | 319.452747 | 32.426292 | 5.110588 | 28.237310 | 24.432111 | 15.863557 | 24.794453 | 15.066506 | 396.688797 | 90.792678 | 1.614459 | 101.829311 | 349.856938 | 6.047867 | 184.196159 | 8.157848 |
| 1.15 | NaN | Megalotragus kattwinkeli | Connochaetes taurinus | 20.792949 | 16.540342 | 59.669968 | 319.452747 | 32.426292 | 5.110588 | 28.237310 | 24.432111 | 15.863557 | 24.794453 | 15.066506 | 396.688797 | 90.792678 | 1.614459 | 101.829311 | 349.856938 | 6.047867 | 184.196159 | 8.157848 |
| NaN | NaN | P. rugosus/M. Kattwinkeli | Alcelaphus buselaphus | 26.263201 | 12.922262 | 67.153434 | 231.888384 | 34.962699 | 15.269404 | 19.090801 | 25.390966 | 24.843671 | 25.444819 | 24.224369 | 469.935286 | 218.091737 | 0.222171 | 114.898165 | 588.165236 | 1.001419 | 159.150169 | 3.713286 |
| NaN | NaN | Parmularius rugosus | Damilscus pygargus | 16.633327 | 16.232909 | 52.945810 | 419.468955 | 29.952810 | 0.380199 | 26.816420 | 21.515328 | 11.168056 | 21.317160 | 11.815394 | 640.747122 | 114.781009 | 6.512794 | 70.966996 | 315.382136 | 37.601826 | 274.016764 | 37.330010 |
| NaN | NaN | Damaliscus agelius | Damilscus pygargus | 16.633327 | 16.232909 | 52.945810 | 419.468955 | 29.952810 | 0.380199 | 26.816420 | 21.515328 | 11.168056 | 21.317160 | 11.815394 | 640.747122 | 114.781009 | 6.512794 | 70.966996 | 315.382136 | 37.601826 | 274.016764 | 37.330010 |
| NaN | NaN | Damaliscus niro | Damilscus pygargus | 16.633327 | 16.232909 | 52.945810 | 419.468955 | 29.952810 | 0.380199 | 26.816420 | 21.515328 | 11.168056 | 21.317160 | 11.815394 | 640.747122 | 114.781009 | 6.512794 | 70.966996 | 315.382136 | 37.601826 | 274.016764 | 37.330010 |
| NaN | NaN | Numidocapra arambourgi | Alcelaphus buselaphus | 26.263201 | 12.922262 | 67.153434 | 231.888384 | 34.962699 | 15.269404 | 19.090801 | 25.390966 | 24.843671 | 25.444819 | 24.224369 | 469.935286 | 218.091737 | 0.222171 | 114.898165 | 588.165236 | 1.001419 | 159.150169 | 3.713286 |
| NaN | NaN | Alcelaphini sp. 1 | NaN | 20.792949 | 16.540342 | 59.669968 | 319.452747 | 32.426292 | 5.110588 | 28.237310 | 24.432111 | 15.863557 | 24.794453 | 15.066506 | 396.688797 | 90.792678 | 1.614459 | 101.829311 | 349.856938 | 6.047867 | 184.196159 | 8.157848 |
| NaN | NaN | Alcelaphini sp. 2 | NaN | 20.792949 | 16.540342 | 59.669968 | 319.452747 | 32.426292 | 5.110588 | 28.237310 | 24.432111 | 15.863557 | 24.794453 | 15.066506 | 396.688797 | 90.792678 | 1.614459 | 101.829311 | 349.856938 | 6.047867 | 184.196159 | 8.157848 |
| NaN | Antilopini | Antidorcas sp. | Antidorcas marsupialis | 21.407183 | 16.675003 | 56.729960 | 387.490070 | 33.323401 | 5.546225 | 29.249549 | 24.886265 | 18.880860 | 27.078997 | 18.404512 | 328.196868 | 67.820885 | 0.011912 | 92.100936 | 182.757366 | 2.370714 | 116.032904 | 5.326404 |
| NaN | NaN | Gazellini sp. | Eudorcas thomsonii | 25.194080 | 13.598463 | 61.705760 | 2336.530695 | 36.160389 | 13.703304 | 23.805497 | 25.735904 | 24.064385 | 28.564917 | 22.360163 | 544.616708 | 122.510481 | 0.286875 | 125.751490 | 242.213483 | 9.476682 | 119.991805 | 14.145092 |
| NaN | NaN | NaN | Eudorcas rufifrons | 25.194080 | 13.598463 | 61.705760 | 2336.530695 | 36.160389 | 13.703304 | 23.805497 | 25.735904 | 24.064385 | 28.564917 | 22.360163 | 544.616708 | 122.510481 | 0.286875 | 125.751490 | 242.213483 | 9.476682 | 119.991805 | 14.145092 |
| NaN | Hippotragini | Hippotragus gigas | Hippotragus niger | 21.336731 | 14.316050 | 62.815195 | 245.379887 | 31.612326 | 13.505225 | 16.777399 | 25.834091 | 20.196431 | 24.774808 | 16.785190 | 889.464031 | 199.356915 | 0.560724 | 110.133903 | 519.073759 | 1.956001 | 272.110334 | 3.740089 |
| NaN | NaN | NaN | Hippotragus leucophaeus | 19.210996 | 12.379777 | 57.413239 | 350.532279 | 30.230243 | 7.788883 | 21.595078 | 17.562994 | 25.602807 | 23.804304 | 15.361382 | 566.865396 | 91.085531 | 16.429031 | 47.980953 | 254.306078 | 56.765881 | 104.439003 | 109.501883 |
| NaN | NaN | NaN | Hippotragus equinus | 25.204996 | 12.811777 | 65.027239 | 252.630279 | 34.766243 | 11.892883 | 18.679078 | 23.988994 | 25.602807 | 28.415904 | 22.867382 | 895.185396 | 177.269531 | 4.549031 | 87.292953 | 503.354078 | 15.725881 | 104.439003 | 31.687883 |
| NaN | Reduncini | Kobus ellipsiprymnus | Kobus ellipsiprymnus | 26.479949 | 12.679792 | 65.364988 | 181.896131 | 32.852625 | 15.630833 | 16.749613 | 25.646946 | 23.812502 | 25.937453 | 25.058778 | 939.096511 | 214.251995 | 0.094290 | 110.177568 | 645.292747 | 0.109828 | 123.551292 | 27.232571 |
| NaN | NaN | Kobus kob | Kobus kob | 24.307314 | 13.369093 | 59.560441 | 1826.985407 | 34.471621 | 11.223654 | 20.138284 | 23.993803 | 21.519247 | 26.106610 | 21.092313 | 1082.341917 | 232.207683 | 2.117440 | 94.089086 | 627.835189 | 11.729692 | 221.379693 | 27.465977 |
| NaN | Tragelaphini | Tragelaphus sp. | Tragelphus strepsiceros? | 20.103638 | 15.676967 | 66.877935 | 215.636028 | 30.971958 | 9.458948 | 15.449162 | 21.493357 | 16.523304 | 23.212865 | 16.518348 | 567.082755 | 121.144460 | 3.058366 | 100.901254 | 264.737694 | 15.868969 | 207.260529 | 91.711474 |
| NaN | NaN | Taurotragus cf. arkelli | Taurotragus oryx | 22.796157 | 12.901365 | 60.010775 | 1981.558668 | 33.441775 | 9.906435 | 24.185086 | 23.581144 | 20.544837 | 25.944759 | 20.173133 | 1033.035173 | 233.287055 | 0.308732 | 101.623939 | 498.866397 | 2.501761 | 224.825974 | 7.522553 |
| NaN | NaN | NaN | Giraffa camelopardalis | 25.243745 | 12.497766 | 70.052141 | 177.325938 | 33.720912 | 15.852913 | 17.867993 | 25.542111 | 23.669475 | 27.388498 | 23.029658 | 619.831427 | 139.310950 | 4.173072 | 101.147121 | -22.142648 | 18.711556 | 140.875539 | 97.134377 |
| NaN | NaN | NaN | Giraffa reticulata | 25.243745 | 12.497766 | 70.052141 | 177.325938 | 33.720912 | 15.852913 | 17.867993 | 25.542111 | 23.669475 | 27.388498 | 23.029658 | 619.831427 | 139.310950 | 4.173072 | 101.147121 | -22.142648 | 18.711556 | 140.875539 | 97.134377 |
| NaN | NaN | NaN | Giraffa tippelskirchi | 22.999648 | 12.350797 | 70.137362 | 174.970939 | 31.331605 | 13.611230 | 17.720367 | 23.811323 | 20.992905 | 24.936514 | 20.692867 | 729.008735 | 152.925064 | 3.848699 | 95.376482 | 378.436721 | 16.749090 | 195.647515 | 54.039878 |
| NaN | Giraffidae | Sivatherium maurusium | Giraffa giraffa | 22.509090 | 14.499518 | 65.562626 | 283.880247 | 33.120561 | 10.218297 | 22.902255 | 24.515723 | 18.975477 | 25.500675 | 134.272158 | 544.977684 | 118.529827 | 3.133553 | 98.375710 | 298.949178 | 13.437565 | 179.803054 | 42.264604 |
| NaN | Hippoptamidae | Hippopotamus gorgops | Okapia johnstoni | 23.831689 | 9.741226 | 87.004451 | 51.921952 | 29.349892 | 18.069634 | 11.279379 | 23.593276 | 23.841101 | 24.471918 | 23.213555 | 1670.276578 | 206.259627 | 56.887408 | 36.134958 | 451.129127 | 121.283489 | 425.523939 | 451.257089 |
| NaN | Suidae | Kolpochoerus heseloni | Hylochoerus meinertzhageni | 24.676984 | 9.927361 | 82.808730 | 91.421092 | 30.480830 | 17.469317 | 11.424950 | 24.323549 | 24.055667 | 25.844195 | 24.452894 | 1537.898090 | 217.996930 | 6.316506 | 61.929490 | 617.883401 | 67.633123 | 434.160597 | 508.805642 |
| NaN | NaN | NaN | Potamochoerus larvatus | 22.477428 | 12.542193 | 71.291706 | 173.068842 | 31.251212 | 14.248230 | 15.069036 | 25.889719 | 21.013757 | 24.917255 | 22.043439 | 1055.755966 | 221.302611 | 0.064602 | 109.078289 | 552.006080 | 0.552412 | 301.095560 | 4.518730 |
| NaN | NaN | NaN | Potamochoerus porcus | 24.924303 | 9.757818 | 77.535456 | 101.687592 | 30.576212 | 18.888855 | 11.356536 | 24.624094 | 23.882507 | 25.845380 | 24.237189 | 1566.393466 | 222.146361 | 0.064602 | 67.312664 | 642.287330 | 0.552412 | 427.658060 | 7.893730 |
| NaN | NaN | Metridiochoerus compactus | Phacochoerus aethiopicus | 27.010130 | 10.871429 | 73.742597 | 145.716471 | 33.162807 | 17.800284 | 14.962991 | 26.859276 | 24.799156 | 29.172204 | 25.424169 | 494.066367 | 106.031074 | 2.591233 | 99.492759 | 220.122881 | 5.382638 | 145.210114 | 52.893729 |
| NaN | NaN | NaN | Phacochoerus africanus | 27.250026 | 12.870558 | 65.906012 | 200.812464 | 31.483539 | 17.320493 | 15.842607 | 25.979659 | 25.998633 | 26.213493 | 25.903960 | 956.664799 | 213.184384 | 0.432174 | 108.368891 | 556.776191 | 2.983683 | 225.655062 | 25.145820 |
| NaN | Equidae | Equus oldowayensis | Equus grevyi | 22.949530 | 12.461857 | 68.469133 | 228.800987 | 32.838140 | 10.968264 | 21.968977 | 24.711725 | 20.265694 | 25.334277 | 17.034687 | 505.264916 | 97.118719 | 0.150759 | 102.464561 | 255.716655 | 1.272387 | 177.495898 | 3.563724 |
| NaN | NaN | NaN | Mean | 22.864987 | 13.624322 | 65.053261 | 497.403241 | 32.483886 | 11.159396 | 20.675914 | 24.230278 | 20.620705 | 25.447912 | 23.615885 | 737.977935 | 151.975291 | 4.532651 | 94.221539 | 381.052572 | 17.741726 | 209.505283 | 60.972624 |
| NaN | NaN | NaN | Minimum | 16.633327 | 9.741226 | 52.945810 | 51.921952 | 29.349892 | 0.380199 | 11.279379 | 17.562994 | 11.168056 | 21.317160 | 11.815394 | 328.196868 | 67.820885 | 0.011912 | 36.134958 | -22.142648 | 0.109828 | 104.439003 | 3.563724 |
| NaN | NaN | NaN | Maximum | 27.250026 | 16.675003 | 87.004451 | 2336.530695 | 36.160389 | 18.888855 | 29.249549 | 26.859276 | 25.998633 | 29.172204 | 134.272158 | 1670.276578 | 233.287055 | 56.887408 | 125.751490 | 645.292747 | 121.283489 | 434.160597 | 508.805642 |
| NaN | NaN | NaN | sd | 3.052268 | 2.136645 | 8.167270 | 659.688981 | 1.884339 | 5.586083 | 5.554123 | 1.895715 | 4.546731 | 2.005881 | 21.364480 | 359.881874 | 55.241653 | 10.453381 | 21.388940 | 181.139728 | 25.922113 | 92.414786 | 118.316326 |
| NaN | NaN | NaN | standard error range (min) | 13.581059 | 7.604581 | 44.778540 | -607.767028 | 27.465553 | -5.205884 | 5.725256 | 15.667279 | 6.621325 | 19.311279 | -9.549086 | -31.685006 | 12.579232 | -10.441469 | 14.746017 | -203.282376 | -25.812285 | 12.024216 | -114.752603 |
| NaN | NaN | NaN | standard error range (max) | 30.302294 | 18.811648 | 95.171721 | 2996.219675 | 38.044728 | 24.474938 | 34.803671 | 28.754991 | 30.545364 | 31.178085 | 155.636638 | 2030.158452 | 288.528708 | 67.340789 | 147.140430 | 826.432475 | 147.205603 | 526.575384 | 627.121968 |

## Bed IV-0.80
| Unnamed: 0 | Unnamed: 1 | Olduvai | Modern | bio1 | bio2 | bio3 | bio4 | bio5 | bio6 | bio7 | bio8 | bio9 | bio10 | bio11 | bio12 | bio13 | bio14 | bio15 | bio16 | bio17 | bio18 | bio19 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Tuff IVA | Alcelaphini | Megalotragus kattwinkeli | Connochaetes taurinus | 21.190747 | 16.588934 | 59.882412 | 305.588867 | 32.600899 | 5.533452 | 28.012911 | 24.726686 | 16.300735 | 25.070055 | 15.441917 | 379.435685 | 91.768819 | 1.123102e+00 | 104.894304 | 356.230913 | 4.815907e+00 | 178.962546 | 6.283720 |
| Lower | NaN | Numidocapra arambourgi | Alcelaphus buselaphus | 26.639618 | 12.702443 | 67.228476 | 232.044093 | 35.247965 | 15.704803 | 18.591427 | 25.576324 | 25.439076 | 25.613787 | 24.673473 | 430.389764 | 219.585556 | 1.545541e-01 | 115.416115 | 595.114947 | 6.966396e-01 | 151.800118 | 3.191851 |
| NaN | NaN | NaN | Damilscus pygargus | 16.318836 | 16.375067 | 52.414476 | 428.182751 | 29.845433 | -0.070296 | 27.085336 | 21.328054 | 10.538648 | 21.159763 | 11.293318 | 637.902346 | 112.260702 | 6.661074e+00 | 69.759649 | 308.722355 | 3.863605e+01 | 275.929053 | 37.807833 |
| 0.8 | Antilopini | Antidorcas sp. | Antidorcas marsupialis | 21.100649 | 16.926089 | 55.777297 | 401.182078 | 33.224968 | 4.862591 | 29.964903 | 24.738271 | 18.399729 | 26.994085 | 18.068356 | 331.789125 | 68.240615 | 8.286582e-03 | 90.670216 | 184.961646 | 2.257887e+00 | 115.414194 | 4.314020 |
| NaN | NaN | Gazellini sp. | Eudorcas thomsonii | 21.730275 | 12.221356 | 69.849362 | 1550.149751 | 30.375648 | 12.608111 | 18.839065 | 22.512620 | 20.383829 | 23.622414 | 17.697001 | 690.709495 | 146.730586 | 7.785128e-01 | 98.305384 | 322.241439 | 1.238195e+01 | 214.097366 | 35.580064 |
| NaN | NaN | NaN | Eudorcas rufifrons | 25.835012 | 13.842409 | 60.273572 | 2456.543962 | 37.207227 | 13.939690 | 24.686433 | 26.333673 | 24.714355 | 29.458203 | 23.254896 | 522.884231 | 119.311639 | 1.995654e-01 | 131.305384 | 229.974597 | 6.592475e+00 | 103.784734 | 9.840064 |
| NaN | Tragelaphini | Tragelaphus sp. | Tragelphus strepsiceros? | 20.711226 | 15.988325 | 65.332476 | 228.590281 | 31.954406 | 9.867094 | 15.434200 | 22.286683 | 16.759690 | 24.091558 | 16.877981 | 497.970612 | 112.883103 | 2.127559e+00 | 104.644350 | 237.121874 | 1.103928e+01 | 209.524716 | 64.407982 |
| NaN | NaN | Taurotragus cf. arkelli | Taurotragus oryx | 22.900000 | 12.900000 | 59.500000 | 2016.148936 | 33.700000 | 9.850000 | 24.500000 | 23.700000 | 20.634043 | 26.150000 | 20.250532 | 1030.514061 | 237.000000 | 6.661338e-16 | 102.973404 | 498.606383 | 3.286260e-14 | 222.164894 | 1.000000 |
| NaN | Giraffidae | Giraffa jumae | Giraffa camelopardalis | 25.988880 | 12.267036 | 70.009147 | 164.049098 | 34.218169 | 16.969047 | 17.249120 | 25.976439 | 24.741434 | 28.061748 | 23.996825 | 607.734331 | 139.536941 | 4.184793e+00 | 102.709518 | -192.643917 | 1.906592e+01 | 125.513912 | 110.449437 |
| NaN | NaN | NaN | Giraffa reticulata | 25.988880 | 12.267036 | 70.009147 | 164.049098 | 34.218169 | 16.969047 | 17.249120 | 25.976439 | 24.741434 | 28.061748 | 23.996825 | 607.734331 | 139.536941 | 4.184793e+00 | 102.709518 | -192.643917 | 1.906592e+01 | 125.513912 | 110.449437 |
| NaN | NaN | NaN | Giraffa tippelskirchi | 22.683385 | 12.050555 | 70.376109 | 160.580248 | 30.698784 | 13.667108 | 17.031670 | 23.427035 | 20.798920 | 24.450043 | 20.554795 | 768.549555 | 159.590163 | 3.707000e+00 | 94.209523 | 397.398668 | 1.617526e+01 | 206.191552 | 46.972405 |
| NaN | NaN | NaN | Giraffa giraffa | 22.077134 | 15.067108 | 63.846540 | 313.287858 | 33.292336 | 8.993327 | 24.299003 | 24.476641 | 17.935754 | 25.329420 | 98.240597 | 506.398769 | 110.890481 | 2.695272e+00 | 98.644429 | 284.024782 | 1.152612e+01 | 181.916467 | 31.875893 |
| NaN | NaN | NaN | Okapia johnstoni | 23.825964 | 9.809231 | 86.657560 | 55.153530 | 29.417142 | 17.971285 | 11.444997 | 23.613626 | 23.787256 | 24.500748 | 23.164182 | 1649.596936 | 204.870010 | 5.583207e+01 | 37.368392 | 455.588732 | 1.252409e+02 | 420.501896 | 443.566432 |
| NaN | NaN | Sivatherium maurusium | Giraffa camelopardalis | 25.988880 | 12.267036 | 70.009147 | 164.049098 | 34.218169 | 16.969047 | 17.249120 | 25.976439 | 24.741434 | 28.061748 | 23.996825 | 607.734331 | 139.536941 | 4.184793e+00 | 102.709518 | -192.643917 | 1.906592e+01 | 125.513912 | 110.449437 |
| NaN | NaN | NaN | Giraffa reticulata | 25.988880 | 12.267036 | 70.009147 | 164.049098 | 34.218169 | 16.969047 | 17.249120 | 25.976439 | 24.741434 | 28.061748 | 23.996825 | 607.734331 | 139.536941 | 4.184793e+00 | 102.709518 | -192.643917 | 1.906592e+01 | 125.513912 | 110.449437 |
| NaN | NaN | NaN | Giraffa tippelskirchi | 22.683385 | 12.050555 | 70.376109 | 160.580248 | 30.698784 | 13.667108 | 17.031670 | 23.427035 | 20.798920 | 24.450043 | 20.554795 | 768.549555 | 159.590163 | 3.707000e+00 | 94.209523 | 397.398668 | 1.617526e+01 | 206.191552 | 46.972405 |
| NaN | NaN | NaN | Giraffa giraffa | 22.077134 | 15.067108 | 63.846540 | 313.287858 | 33.292336 | 8.993327 | 24.299003 | 24.476641 | 17.935754 | 25.329420 | 98.240597 | 506.398769 | 110.890481 | 2.695272e+00 | 98.644429 | 284.024782 | 1.152612e+01 | 181.916467 | 31.875893 |
| NaN | NaN | NaN | Okapia johnstoni | 23.825964 | 9.809231 | 86.657560 | 55.153530 | 29.417142 | 17.971285 | 11.444997 | 23.613626 | 23.787256 | 24.500748 | 23.164182 | 1649.596936 | 204.870010 | 5.583207e+01 | 37.368392 | 455.588732 | 1.252409e+02 | 420.501896 | 443.566432 |
| NaN | Suidae | Kolpochoerus heseloni | Hylochoerus meinertzhageni | 24.623119 | 9.820120 | 83.262595 | 88.645108 | 30.425795 | 17.478655 | 11.295618 | 24.255512 | 24.038725 | 25.800310 | 24.436796 | 1562.581280 | 219.519603 | 6.524526e+00 | 60.490080 | 624.310192 | 7.017956e+01 | 441.720416 | 527.734359 |
| NaN | NaN | NaN | Potamochoerus larvatus | 22.392993 | 12.582613 | 71.111622 | 175.056586 | 31.266061 | 14.111812 | 15.169764 | 25.923283 | 20.918266 | 24.881569 | 21.969349 | 1042.986759 | 221.514860 | 4.494023e-02 | 110.332723 | 550.178143 | 3.842867e-01 | 298.022618 | 3.143465 |
| NaN | NaN | NaN | Potamochoerus porcus | 24.977776 | 9.641308 | 77.707274 | 99.652238 | 30.553017 | 19.013986 | 11.248025 | 24.586326 | 23.948701 | 25.862003 | 24.286740 | 1582.404150 | 222.406164 | 4.494023e-02 | 66.213158 | 645.547708 | 3.842867e-01 | 431.718270 | 6.708682 |
| NaN | NaN | Metridiochoerus compactus | Phacochoerus aethiopicus | 27.067917 | 10.800909 | 73.820937 | 145.072328 | 33.265431 | 17.830632 | 15.004689 | 26.932540 | 24.799413 | 29.332837 | 25.447248 | 459.685299 | 100.543356 | 2.624336e+00 | 99.890615 | 202.128960 | 4.657487e+00 | 137.020079 | 47.965203 |
| NaN | NaN | Metridiochoerus modestus | Phacochoerus africanus | 27.326105 | 12.952477 | 65.386791 | 204.369540 | 31.458114 | 17.314256 | 15.951379 | 25.985850 | 26.090353 | 26.148517 | 25.963624 | 957.558121 | 215.867397 | 3.006426e-01 | 109.443577 | 564.453002 | 2.075606e+00 | 223.599173 | 18.101440 |
| NaN | Equidae | Equus oldowayensis | Equus grevyi | 22.537689 | 12.641638 | 69.726057 | 220.034959 | 32.384833 | 10.449352 | 22.057908 | 24.238906 | 19.678776 | 24.861615 | 16.462552 | 534.741810 | 102.987206 | -1.284508e-01 | 105.540818 | 269.672073 | -3.678273e-01 | 188.907052 | -0.171263 |
| NaN | NaN | NaN | Mean | 23.603352 | 12.871068 | 68.877931 | 427.729214 | 32.383292 | 13.234740 | 18.849562 | 24.586045 | 21.527247 | 25.827256 | 27.751260 | 789.232524 | 154.144528 | 6.736310e+00 | 93.381772 | 295.529705 | 2.232841e+01 | 221.330863 | 93.855610 |
| NaN | NaN | NaN | Minimum | 16.318836 | 9.641308 | 52.414476 | 55.153530 | 29.417142 | -0.070296 | 11.248025 | 21.328054 | 10.538648 | 21.159763 | 11.293318 | 331.789125 | 68.240615 | -1.284508e-01 | 37.368392 | -192.643917 | -3.678273e-01 | 103.784734 | -0.171263 |
| NaN | NaN | NaN | Maximum | 27.326105 | 16.926089 | 86.657560 | 2456.543962 | 37.207227 | 19.013986 | 29.964903 | 26.932540 | 26.090353 | 29.458203 | 98.240597 | 1649.596936 | 237.000000 | 5.583207e+01 | 131.305384 | 645.547708 | 1.252409e+02 | 441.720416 | 527.734359 |
| NaN | NaN | NaN | sd | 2.573445 | 2.177198 | 8.651414 | 631.651004 | 2.011668 | 4.982233 | 5.520079 | 1.427700 | 3.810897 | 1.944100 | 22.021042 | 418.013009 | 50.954293 | 1.526267e+01 | 22.936588 | 260.282122 | 3.516419e+01 | 106.596830 | 151.158898 |
| NaN | NaN | NaN | standard error range (min) | 13.745392 | 7.464111 | 43.763062 | -576.497474 | 27.405475 | -5.052529 | 5.727947 | 19.900354 | 6.727751 | 19.215664 | -10.727725 | -86.223884 | 17.286323 | -1.539112e+01 | 14.431805 | -452.926039 | -3.553202e+01 | -2.812096 | -151.330161 |
| NaN | NaN | NaN | standard error range (max) | 29.899550 | 19.103286 | 95.308974 | 3088.194966 | 39.218895 | 23.996219 | 35.484982 | 28.360240 | 29.901250 | 31.402303 | 120.261639 | 2067.609945 | 287.954293 | 7.109474e+01 | 154.241972 | 905.829830 | 1.604051e+02 | 548.317246 | 678.893257 |

## 0.70
| Unnamed: 0 | Unnamed: 1 | Olduvai | Modern | bio1 | bio2 | bio3 | bio4 | bio5 | bio6 | bio7 | bio8 | bio9 | bio10 | bio11 | bio12 | bio13 | bio14 | bio15 | bio16 | bio17 | bio18 | bio19 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Upper | Bovidae | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN |
| 0.7 | Alcelaphini | Numidocapra arambourgi | Connochaetes taurinus | 21.304404 | 16.602817 | 59.925111 | 301.627759 | 32.650786 | 5.654271 | 27.948797 | 24.810850 | 16.425643 | 25.148798 | 15.549178 | 374.506224 | 92.047717 | 0.982714 | 105.770016 | 358.052049 | 4.463919 | 177.467228 | 5.748255 |
| NaN | NaN | Alcelaphini sp. 1 | Alcelaphus buselaphus | 26.747166 | 12.639638 | 67.249916 | 232.088582 | 35.329469 | 15.829202 | 18.448749 | 25.629284 | 25.609191 | 25.662064 | 24.801789 | 419.091044 | 220.012362 | 0.135235 | 115.564100 | 597.100579 | 0.609560 | 149.700103 | 3.042870 |
| NaN | NaN | Alcelaphini sp. 2 | Damilscus pygargus | 16.228982 | 16.415684 | 52.262667 | 430.672407 | 29.814754 | -0.199009 | 27.162169 | 21.274547 | 10.358817 | 21.114793 | 11.144153 | 637.089552 | 111.540614 | 6.703440 | 69.414693 | 306.819561 | 38.931546 | 276.475421 | 37.944354 |
| NaN | NaN | Alcelaphini sp. 3 | NaN | 21.304404 | 16.602817 | 59.925111 | 301.627759 | 32.650786 | 5.654271 | 27.948797 | 24.810850 | 16.425643 | 25.148798 | 15.549178 | 374.506224 | 92.047717 | 0.982714 | 105.770016 | 358.052049 | 4.463919 | 177.467228 | 5.748255 |
| NaN | Antilopini | Antilopini sp. | Antidorcas marsupialis | 21.013068 | 16.997828 | 55.505118 | 405.095151 | 33.196845 | 4.667268 | 30.169290 | 24.695987 | 18.262262 | 26.969824 | 17.972312 | 332.815485 | 68.360538 | 0.007251 | 90.261439 | 185.591440 | 2.225651 | 115.237420 | 4.024768 |
| NaN | NaN | Gazellini sp. | Eudorcas thomsonii | 21.540241 | 12.143687 | 70.310691 | 1502.039782 | 30.053692 | 12.554597 | 18.559182 | 22.336043 | 20.175850 | 23.347112 | 17.447376 | 699.757058 | 148.309263 | 0.806199 | 96.892211 | 327.132509 | 12.084205 | 219.495195 | 36.690056 |
| NaN | NaN | NaN | Eudorcas rufifrons | 26.018136 | 13.912108 | 59.864376 | 2490.833466 | 37.506324 | 14.007229 | 24.938129 | 26.504464 | 24.900061 | 29.713428 | 23.510534 | 516.674952 | 118.397684 | 0.174620 | 132.892211 | 226.477772 | 5.768415 | 99.154142 | 8.610056 |
| NaN | Reduncini | Redunca indet. | Redunca redunca | 26.603291 | 12.512423 | 64.759672 | 182.395501 | 32.729956 | 15.374826 | 16.119863 | 25.758509 | 23.607384 | 25.933988 | 24.785565 | 918.783282 | 214.734666 | 0.313177 | 110.219367 | 630.936775 | 0.447797 | 133.620368 | 1.838621 |
| NaN | Tragelaphini | Tragelaphus strepsiceros grandis | Tragelphus strepsiceros | 20.884823 | 16.077284 | 64.890917 | 232.291495 | 32.235105 | 9.983708 | 15.429925 | 22.513348 | 16.827228 | 24.342613 | 16.980733 | 478.224286 | 110.522715 | 1.861614 | 105.713807 | 229.231640 | 9.659372 | 210.171626 | 56.606984 |
| NaN | NaN | Tragelaphus sp. | Tragelphus strepsiceros | 20.884823 | 16.077284 | 64.890917 | 232.291495 | 32.235105 | 9.983708 | 15.429925 | 22.513348 | 16.827228 | 24.342613 | 16.980733 | 478.224286 | 110.522715 | 1.861614 | 105.713807 | 229.231640 | 9.659372 | 210.171626 | 56.606984 |
| NaN | NaN | Taurotragus cf. arkelli | Taurotragus oryx | 22.929670 | 12.899610 | 59.354064 | 2026.031870 | 33.773778 | 9.833876 | 24.589975 | 23.733959 | 20.659530 | 26.208640 | 20.272646 | 1029.793744 | 238.060841 | -0.088209 | 103.358966 | 498.532093 | -0.714789 | 221.404585 | -0.863587 |
| NaN | NaN | Giraffa jumae | Giraffa camelopardalis | 26.201776 | 12.201113 | 70.043642 | 160.255715 | 34.360243 | 17.287943 | 17.072299 | 26.100532 | 25.047708 | 28.254106 | 24.273158 | 604.278017 | 139.601510 | 4.188142 | 103.155917 | -241.358565 | 19.167162 | 121.124875 | 114.253740 |
| NaN | NaN | NaN | Giraffa reticulata | 26.201776 | 12.201113 | 70.043642 | 160.255715 | 34.360243 | 17.287943 | 17.072299 | 26.100532 | 25.047708 | 28.254106 | 24.273158 | 604.278017 | 139.601510 | 4.188142 | 103.155917 | -241.358565 | 19.167162 | 121.124875 | 114.253740 |
| NaN | NaN | NaN | Giraffa tippelskirchi | 22.593024 | 11.964772 | 70.410048 | 156.468622 | 30.517979 | 13.683074 | 16.834900 | 23.317238 | 20.743495 | 24.311051 | 20.515346 | 779.846932 | 161.494477 | 3.666515 | 93.876106 | 402.816367 | 16.011304 | 209.204134 | 44.890164 |
| NaN | NaN | NaN | Giraffa giraffa | 21.953719 | 15.229277 | 63.356230 | 321.690033 | 33.341415 | 8.643335 | 24.698074 | 24.465475 | 17.658040 | 25.280490 | 87.945865 | 495.376221 | 108.707811 | 2.570049 | 98.721206 | 279.760669 | 10.979987 | 182.520300 | 28.907690 |
| NaN | NaN | NaN | Okapia johnstoni | 23.825964 | 9.809231 | 86.657560 | 55.153530 | 29.417142 | 17.971285 | 11.444997 | 23.613626 | 23.787256 | 24.500748 | 23.164182 | 1649.596936 | 204.870010 | 55.832070 | 37.368392 | 455.588732 | 125.240918 | 420.501896 | 443.566432 |
| NaN | NaN | Giraffa stillei | Giraffa camelopardalis | 26.201776 | 12.201113 | 70.043642 | 160.255715 | 34.360243 | 17.287943 | 17.072299 | 26.100532 | 25.047708 | 28.254106 | 24.273158 | 604.278017 | 139.601510 | 4.188142 | 103.155917 | -241.358565 | 19.167162 | 121.124875 | 114.253740 |
| NaN | NaN | NaN | Giraffa reticulata | 26.201776 | 12.201113 | 70.043642 | 160.255715 | 34.360243 | 17.287943 | 17.072299 | 26.100532 | 25.047708 | 28.254106 | 24.273158 | 604.278017 | 139.601510 | 4.188142 | 103.155917 | -241.358565 | 19.167162 | 121.124875 | 114.253740 |
| NaN | NaN | NaN | Giraffa tippelskirchi | 22.593024 | 11.964772 | 70.410048 | 156.468622 | 30.517979 | 13.683074 | 16.834900 | 23.317238 | 20.743495 | 24.311051 | 20.515346 | 779.846932 | 161.494477 | 3.666515 | 93.876106 | 402.816367 | 16.011304 | 209.204134 | 44.890164 |
| NaN | NaN | NaN | Giraffa giraffa | 21.953719 | 15.229277 | 63.356230 | 321.690033 | 33.341415 | 8.643335 | 24.698074 | 24.465475 | 17.658040 | 25.280490 | 87.945865 | 495.376221 | 108.707811 | 2.570049 | 98.721206 | 279.760669 | 10.979987 | 182.520300 | 28.907690 |
| NaN | NaN | NaN | Okapia johnstoni | 23.825964 | 9.809231 | 86.657560 | 55.153530 | 29.417142 | 17.971285 | 11.444997 | 23.613626 | 23.787256 | 24.500748 | 23.164182 | 1649.596936 | 204.870010 | 55.832070 | 37.368392 | 455.588732 | 125.240918 | 420.501896 | 443.566432 |
| NaN | NaN | Sivatherium maurusium | Giraffa camelopardalis | 26.201776 | 12.201113 | 70.043642 | 160.255715 | 34.360243 | 17.287943 | 17.072299 | 26.100532 | 25.047708 | 28.254106 | 24.273158 | 604.278017 | 139.601510 | 4.188142 | 103.155917 | -241.358565 | 19.167162 | 121.124875 | 114.253740 |
| NaN | NaN | NaN | Giraffa reticulata | 26.201776 | 12.201113 | 70.043642 | 160.255715 | 34.360243 | 17.287943 | 17.072299 | 26.100532 | 25.047708 | 28.254106 | 24.273158 | 604.278017 | 139.601510 | 4.188142 | 103.155917 | -241.358565 | 19.167162 | 121.124875 | 114.253740 |
| NaN | Giraffidae | NaN | Giraffa tippelskirchi | 22.593024 | 11.964772 | 70.410048 | 156.468622 | 30.517979 | 13.683074 | 16.834900 | 23.317238 | 20.743495 | 24.311051 | 20.515346 | 779.846932 | 161.494477 | 3.666515 | 93.876106 | 402.816367 | 16.011304 | 209.204134 | 44.890164 |
| NaN | NaN | NaN | Giraffa giraffa | 21.953719 | 15.229277 | 63.356230 | 321.690033 | 33.341415 | 8.643335 | 24.698074 | 24.465475 | 17.658040 | 25.280490 | 87.945865 | 495.376221 | 108.707811 | 2.570049 | 98.721206 | 279.760669 | 10.979987 | 182.520300 | 28.907690 |
| NaN | NaN | NaN | Okapia johnstoni | 23.825964 | 9.809231 | 86.657560 | 55.153530 | 29.417142 | 17.971285 | 11.444997 | 23.613626 | 23.787256 | 24.500748 | 23.164182 | 1649.596936 | 204.870010 | 55.832070 | 37.368392 | 455.588732 | 125.240918 | 420.501896 | 443.566432 |
| NaN | Suidae | Kolpochoerus heseloni | Hylochoerus meinertzhageni | 24.607729 | 9.795594 | 83.392270 | 87.851969 | 30.410070 | 17.481323 | 11.258665 | 24.236073 | 24.033884 | 25.787771 | 24.432196 | 1569.633620 | 219.954653 | 6.583960 | 60.078820 | 626.146418 | 70.907118 | 443.880364 | 533.142564 |
| NaN | NaN | Kolpochoerus majus | Potamochoerus larvatus | 22.368869 | 12.600275 | 71.060169 | 175.624513 | 31.270303 | 14.072836 | 15.198544 | 25.932873 | 20.890888 | 24.871373 | 21.948181 | 1039.338414 | 221.575502 | 0.039323 | 110.691133 | 549.655875 | 0.336251 | 297.144696 | 2.750532 |
| NaN | NaN | NaN | Potamochoerus porcus | 24.993054 | 9.614134 | 77.756365 | 99.070708 | 30.546390 | 19.049738 | 11.217022 | 24.575536 | 23.967518 | 25.866753 | 24.300898 | 1586.978632 | 222.480393 | 0.039323 | 65.899013 | 646.479244 | 0.336251 | 432.878391 | 6.370097 |
| NaN | NaN | Metridiochoerus compactus | Phacochoerus aethiopicus | 27.084427 | 10.788600 | 73.843320 | 144.888287 | 33.294752 | 17.839303 | 15.016603 | 26.953472 | 24.799486 | 29.378733 | 25.453842 | 449.862136 | 98.975436 | 2.633794 | 100.004288 | 196.987840 | 4.450301 | 134.680069 | 46.557053 |
| NaN | NaN | Metridiochoerus modestus | Phacochoerus africanus | 27.347842 | 12.983722 | 65.238442 | 205.385848 | 31.450850 | 17.312474 | 15.982457 | 25.987619 | 26.116559 | 26.129952 | 25.980671 | 957.813356 | 216.633973 | 0.263062 | 109.750630 | 566.646377 | 1.816155 | 223.011777 | 16.088760 |
| NaN | NaN | Phacochoerus antiquus | Phacochoerus africanus | 27.347842 | 12.983722 | 65.238442 | 205.385848 | 31.450850 | 17.312474 | 15.982457 | 25.987619 | 26.116559 | 26.129952 | 25.980671 | 957.813356 | 216.633973 | 0.263062 | 109.750630 | 566.646377 | 1.816155 | 223.011777 | 16.088760 |
| NaN | Equidae | Equus oldowayensis | Equus grevyi | 22.420021 | 12.693004 | 70.085177 | 217.530380 | 32.255317 | 10.301092 | 22.083316 | 24.107006 | 19.511085 | 24.726569 | 16.299085 | 543.163780 | 104.663916 | -0.208225 | 106.419749 | 273.659335 | -0.836460 | 192.167382 | -1.238402 |
| NaN | NaN | NaN | Mean | 23.756290 | 12.986568 | 68.699579 | 364.672838 | 32.389279 | 13.373755 | 18.631866 | 24.641018 | 21.586892 | 25.837130 | 27.572875 | 780.733267 | 154.190928 | 7.111801 | 94.333258 | 283.021984 | 22.367404 | 215.168716 | 93.132493 |
| NaN | NaN | NaN | Minimum | 16.228982 | 9.614134 | 52.262667 | 55.153530 | 29.417142 | -0.199009 | 11.217022 | 21.274547 | 10.358817 | 21.114793 | 11.144153 | 332.815485 | 68.360538 | -0.208225 | 37.368392 | -241.358565 | -0.836460 | 99.154142 | -1.238402 |
| NaN | NaN | NaN | Maximum | 27.347842 | 16.997828 | 86.657560 | 2490.833466 | 37.506324 | 19.049738 | 30.169290 | 26.953472 | 26.116559 | 29.713428 | 87.945865 | 1649.596936 | 238.060841 | 55.832070 | 132.892211 | 646.479244 | 125.240918 | 443.880364 | 533.142564 |
| NaN | NaN | NaN | sd | 2.580001 | 2.192744 | 8.369265 | 549.186832 | 1.968344 | 4.868800 | 5.395004 | 1.421653 | 3.842334 | 1.884232 | 19.732582 | 406.442912 | 49.764612 | 15.764931 | 22.775788 | 283.392309 | 35.734960 | 102.698431 | 146.547659 |
| NaN | NaN | NaN | standard error range (min) | 13.648980 | 7.421390 | 43.893402 | -494.033302 | 27.448799 | -5.067809 | 5.822018 | 19.852894 | 6.516483 | 19.230561 | -8.588429 | -73.627428 | 18.595927 | -15.973156 | 14.592604 | -524.750875 | -36.571420 | -3.544289 | -147.786061 |
| NaN | NaN | NaN | standard error range (max) | 29.927843 | 19.190571 | 95.026825 | 3040.020299 | 39.474668 | 23.918538 | 35.564295 | 28.375125 | 29.958893 | 31.597660 | 107.678447 | 2056.039848 | 287.825453 | 71.597001 | 155.668000 | 929.871554 | 160.975878 | 546.578795 | 679.690224 |

## Masek-0.60
| Unnamed: 0 | Unnamed: 1 | Olduvai | Modern | bio1 | bio2 | bio3 | bio4 | bio5 | bio6 | bio7 | bio8 | bio9 | bio10 | bio11 | bio12 | bio13 | bio14 | bio15 | bio16 | bio17 | bio18 | bio19 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Masek | Bovidae | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN |
| 0.6 | Antilopini | Gazellini sp. | Eudorcas thomsonii | 21.350207 | 12.066017 | 70.772021 | 1453.929813 | 29.731736 | 12.501083 | 18.279298 | 22.159465 | 19.967872 | 23.071810 | 17.197751 | 708.804621 | 149.887940 | 0.833885 | 95.479038 | 332.023579 | 11.786461 | 224.893024 | 37.800048 |
| NaN | NaN | NaN | Eudorcas rufifrons | 26.201259 | 13.981807 | 59.455179 | 2525.122971 | 37.805420 | 14.074767 | 25.189825 | 26.675255 | 25.085766 | 29.968652 | 23.766172 | 510.465674 | 117.483729 | 0.149674 | 134.479038 | 222.980948 | 4.944356 | 94.523551 | 7.380048 |
| NaN | Reduncini | Redunca indet. | Redunca redunca | 26.688535 | 12.467791 | 64.679719 | 182.053287 | 32.697105 | 15.564137 | 16.017026 | 25.793008 | 23.720615 | 25.943419 | 24.973341 | 920.671385 | 215.158285 | 0.268437 | 110.645172 | 636.517236 | 0.383826 | 129.817459 | 1.575961 |
| NaN | Tragelaphini | Tragelaphus strepsiceros grandis | Tragelphus strepsiceros | 21.058420 | 16.166244 | 64.449357 | 235.992710 | 32.515804 | 10.100321 | 15.425650 | 22.740013 | 16.894767 | 24.593669 | 17.083486 | 458.477959 | 108.162327 | 1.595669 | 106.783263 | 221.341406 | 8.279462 | 210.818537 | 48.805987 |
| NaN | Suidae | Kolpochoerus heseloni | Hylochoerus meinertzhageni | 24.592339 | 9.773786 | 83.521946 | 87.058831 | 30.394346 | 17.483991 | 11.221713 | 24.216634 | 24.029044 | 25.775232 | 24.427597 | 1576.685960 | 220.389703 | 6.643394 | 59.667560 | 627.982644 | 71.634673 | 446.040312 | 538.550770 |
| NaN | NaN | NaN | Potamochoerus larvatus | 22.344745 | 12.620655 | 71.008716 | 176.192440 | 31.274545 | 14.033859 | 15.227323 | 25.942462 | 20.863536 | 24.861176 | 21.927012 | 1035.690069 | 221.636145 | 0.033705 | 111.049542 | 549.133607 | 0.288215 | 296.266801 | 2.357599 |
| NaN | NaN | NaN | Potamochoerus porcus | 25.008332 | 9.589677 | 77.805455 | 98.489179 | 30.539763 | 19.085490 | 11.186019 | 24.564745 | 23.986363 | 25.871503 | 24.315055 | 1591.553113 | 222.554623 | 0.033705 | 65.584868 | 647.410781 | 0.288215 | 434.038540 | 6.031512 |
| NaN | NaN | Metridiochoerus compactus | Phacochoerus aethiopicus | 27.100938 | 10.779776 | 73.865703 | 144.704246 | 33.324073 | 17.847974 | 15.028517 | 26.974405 | 24.799559 | 29.424628 | 25.460436 | 440.038974 | 97.407517 | 2.643252 | 100.117961 | 191.846720 | 4.243116 | 132.340060 | 45.148902 |
| NaN | NaN | Phacochoerus antiquus | Phacochoerus africanus | 27.369579 | 13.018452 | 65.090093 | 206.402155 | 31.443585 | 17.310692 | 16.013534 | 25.989388 | 26.142765 | 26.111388 | 25.997718 | 958.068591 | 217.400548 | 0.225482 | 110.057682 | 568.839752 | 1.556704 | 222.424380 | 14.076080 |
| NaN | Equidae | Equus oldowayensis | Equus grevyi | 22.302352 | 12.744370 | 70.444298 | 215.025800 | 32.125801 | 10.152831 | 22.108725 | 23.976525 | 19.343394 | 24.591523 | 16.135617 | 551.586360 | 106.340627 | -0.287999 | 107.298680 | 277.646597 | -1.305093 | 195.427711 | -2.305541 |
| NaN | NaN | NaN | Mean | 24.401671 | 12.320857 | 70.109249 | 532.497143 | 32.185218 | 14.815515 | 16.569763 | 24.903190 | 22.483368 | 26.021300 | 22.128419 | 875.204271 | 167.642144 | 1.213920 | 100.116280 | 427.572327 | 10.209993 | 238.659037 | 69.942136 |
| NaN | NaN | NaN | Minimum | 21.058420 | 9.589677 | 59.455179 | 87.058831 | 29.731736 | 10.100321 | 11.186019 | 22.159465 | 16.894767 | 23.071810 | 16.135617 | 440.038974 | 97.407517 | -0.287999 | 59.667560 | 191.846720 | -1.305093 | 94.523551 | -2.305541 |
| NaN | NaN | NaN | Maximum | 27.369579 | 16.166244 | 83.521946 | 2525.122971 | 37.805420 | 19.085490 | 25.189825 | 26.974405 | 26.142765 | 29.968652 | 25.997718 | 1591.553113 | 222.554623 | 6.643394 | 134.479038 | 647.410781 | 71.634673 | 446.040312 | 538.550770 |
| NaN | NaN | NaN | sd | 2.451621 | 1.963840 | 7.108827 | 809.771038 | 2.274794 | 3.194189 | 4.366487 | 1.637539 | 3.013871 | 2.144481 | 3.838899 | 430.555580 | 56.279487 | 2.104426 | 22.251295 | 193.920809 | 21.968279 | 120.886153 | 165.754013 |
| NaN | NaN | NaN | standard error range (min) | 18.606798 | 7.625837 | 52.346352 | -722.712207 | 27.456942 | 6.906132 | 6.819532 | 20.521926 | 13.880896 | 20.927330 | 12.296719 | 9.483394 | 41.128030 | -2.392425 | 37.416265 | -2.074088 | -23.273372 | -26.362603 | -168.059554 |
| NaN | NaN | NaN | standard error range (max) | 29.821200 | 18.130084 | 90.630774 | 3334.894009 | 40.080214 | 22.279678 | 29.556312 | 28.611944 | 29.156636 | 32.113133 | 29.836617 | 2022.108692 | 278.834110 | 8.747820 | 156.730334 | 841.331590 | 93.602952 | 566.926465 | 704.304783 |