**Supplementary Table 1**. The abundance estimates and pup counts used when fitting the model. The year indicated by an asterisk is the reference year on which a prior on absolute abundance is placed. Source: Sielfeld et al. (1997), Oporto et al. (1999), Bartheld et al. (2008), Sepúlveda et al. (2011), Oliva et al. (2012), Contreras et al (2014) Oliva et al. (2016), Oliva et al. (2020)

1. South American sea lions

|  |  |  |
| --- | --- | --- |
| Year | 1+ abundance | Pups |
| North |  |  |
| 1996\* | 28781 | 13083 |
| 2007 | 29406 | 10616 |
| 2012 | 30016 | 19134 |
| 2019 | 30121 | 10127 |
| Central |  |  |
| 1997\* | 15163 | 1677 |
| 2007 | 16052 | 1705 |
| 2015 | 24784 | 1855 |
| 2019 | 21610 | 1085 |
| South |  |  |
| 1998\* | 41887 | 13041 |
| 2007 | 40588 | 9608 |
| 2012 | 44197 | 22486 |
| 2019 | 46520 | 18615 |

1. South American fur seals (south zone)

|  |  |  |
| --- | --- | --- |
| Year | 1+ abundance | Pups |
| North |  |  |
| 1998\* | 2565 | 263 |
| 2007 | 4116 | 1408 |
| 2012 | 6412 | 3183 |
| 2019 | 24017 | 5579 |

**References**

Bartheld, J., Pavés, H., Contreras, F., Vera, C., Manque, C., Miranda, D., Sepúlveda, D., Artacho, P., Osman, L., 2008. Cuantificación poblacional de lobos marinos en el litoral de I a IV región. Informe final proyecto FIP 2006-50, 124 p.

Contreras, F., Bartheld, J., Montecinos, M., Moreno F., Torres, J., 2014. Cuantificación poblacional de lobo marino común (*Otaria flavescens*) en el litoral de la XV, I y II Regiones. Informe Final Proyecto 2012-6-FAP-1, 86 p.

Oliva, D., Durán, L.R., Couve, P., Sepúlveda, M., Carrasco, P., Urra, A., Muñoz, L., Pavés G., Pizarro, M., 2016. Estimación poblacional de lobos marinos en la V, VI, VII y VIII Regiones. Informe Final Proyecto FIP 2014-29, 169 pp + Anexos.

Oliva, D., Durán, L.R., Sepúlveda, M., Cárcamo, D., Pizarro, M., Anguita, C., Santos, M., Canto, A., Herrera, P., Muñoz, L., Orellana, M., Vásquez, P., 2020. Estimación poblacional de lobos marinos e impacto de la captura incidental. Informe Final Proyecto FIPA 2018-54, 184 pp + Anexos.

Oliva, D., Sepúlveda, M., Durán, R., Urra, A., Sielfeld, W., Moraga, R., Pavés, G., Muñoz, L., 2012. Cuantificación poblacional de lobos marinos en las Regiones X-XI y propuesta de escenarios de manejo. Informe Final Proyecto FAP ID 4728-46-LP11, 100 p.

Oporto, J., Brieva, L., Navarro, R., Turner, A., 1999. "Cuantificación poblacional de lobos marinos en la X y XI Regiones"., Informe Final Proyecto FIP 97–44, 277 p.

Sepúlveda, M., D. Oliva, A. Urra, MJ. Pérez, R. Moraga, D. Schrader, P. Inostroza, A. Melo, H. Díaz Sielfeld, W., 2011. Abundance and status of South American sea lions (*Otaria flavescens*) off Central Chilean coast. Revista Chilena de Historia Natural 84(1): 97-106.

Sielfeld, W., Amado, N., Peredo, R., Vargas, M., Guerra, C., Malinarich, A., Acuña, E., Cerda, G., Bolvaran, A., Durán, R., Aguayo, A., Sepúlveda, M., Palma, F., Veloso, X., Guerra, Y., Grau, R., Galaz, J.L.,m 1997. Monitoreo de la pesquería y censo del lobo marino común en el litoral desde la I a IV regiones. Proyecto FIP 95-28, 105 p.

Venegas, C., Gibbons, J., Aguayo, A., Sielfeld, W., Acevedo, J., Amado, N., Capella, J., Guzmán, G., Valenzuela, C., 2002. Distribución y abundancia de lobos marinos (Pinnipedia: Otariidae) en la Región de Magallanes, Chile. Anales Instituto Patagonia, Ser. Cs. Nat. 30: 67-82.

**Supplementary Table 2.** Further details on the basis for the fisheries included in the analyses for South American sea lions and fur seals off Chile.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Target Species** | **Gear type** | **Number of vessels** | **Zone of operation** | **Zone based on administrative region numbers** |
| Anchoveta / Chilean silverside | Artisanal Purse seine | 76 | XV-II Regions: 1 Mar-31 Dec; Chilean province (0- 5 nm) XV to II Regions | North |
| Anchoveta | Artisanal Purse seine | 43 | Chilean province (0-5 nm) III to IV Regions | North |
| Anchoveta | Artisanal Purse seine | 442 | Jul and 5 Oct-30 Nov X Region: 15 Apr-15 Sep and 15 Oct-15 Mar | Central |
| Anchoveta / Chilean silverside | Industrial Purse seine | 58 | XV-II Regions: 1 Mar-31 Dec Chilean province (1-200 nm) XV to II Regions | North |
| Anchoveta | Industrial Purse seine | 14 | Chilean province (5-200 nm) III to IV Regions | North |
| Anchoveta | Industrial Purse seine | 28 | Jul and 5 Oct-30 Nov X Region: 15 Apr-15 Sep and 15 Oct-15 Mar | Central |
| Chilean jack mackerel | Artisanal Purse seine | 605 | All year; Chilean province XV to X Regions (0-5 nm (artisanal fishing)) | North / Central |
| Chilean jack mackerel | Industrial Purse seine | 87 | All year; XV to X Regions 5-200 nm and SPRFMO area (industrial fishing) | North/Central |

**Supplementary Table 3**. Data and information on bycatch of South American sea lions and fur seals off Chile. The column “observer coverage” is the proportion of the annual targeted (fish) catch obtained from observed hauls. Sources: San Martin (2016), Aranis (2017, 2018), Bernal et al. (2017, 2019), Vega et al. (2019) (see Supplementary Table 2 for more information on the basis for the fisheries).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Year** | **Zone** | **Fishery** | **Bycatch** |  | **Observer** |
|  |  |  | **Dead** | **Alive** | **Coverage** |
| South American Sea Lion | | | | | |
| 2017 | North | Artisanal purse seine (anchovy & sardine) | 0 | 89 | 1.40 |
| 2018 | North | Artisanal purse seine (anchovy & sardine) | 1 | 267 | 1.58 |
| 2017 | North | Industrial purse seine (anchovy & sardine) | 0 | 259 | 4.47 |
| 2018 | North | Industrial purse seine (anchovy & sardine) | 2 | 1339 | 14.23 |
| 2015 | Central | Industrial purse seine (jack mackerel) | 0 | 316 | 10.51 |
| 2016 | Central | Industrial purse seine (jack mackerel) | 4 | 908 | 8.77 |
| 2017 | Central | Industrial purse seine (jack mackerel) | 7 | 249 | 19.39 |
| 2018 | Central | Industrial purse seine (jack mackerel) | 3 | 264 | 18.47 |
| 2015 | Central | Artisanal purse seine (anchovy & sardine) | 0 | 214 | 0.47 |
| 2016 | Central | Artisanal purse seine (anchovy & sardine) | 0 | 1092 | 0.80 |
| 2017 | Central | Artisanal purse seine (anchovy & sardine) | 1 | 1615 | 2.24 |
| 2018 | Central | Artisanal purse seine (anchovy & sardine) | 3 | 355 | 1.34 |
| 2015 | Central | Industrial purse seine (anchovy & sardine) | 5 | 564 | 8.29 |
| 2016 | Central | Industrial purse seine (anchovy & sardine) | 19 | 572 | 5.87 |
| 2017 | Central | Industrial purse seine (anchovy & sardine) | 1 | 341 | 10.11 |
| 2018 | Central | Industrial purse seine (anchovy & sardine) | 0 | 177 | 16.67 |
| 2015 | Central | Trawl fishery | 27 | 16 | 19.36 |
| 2016 | Central | Trawl fishery | 73 | 44 | 72.05 |
| 2017 | Central | Trawl fishery | 104 | 17 | 100 |
| 2018 | Central | Trawl fishery | 123 | 6 | 100 |
| 2015 | South | Ice trawler fleet | 112 | 12 | 29.14 |
| 2016 | South | Ice trawler fleet | 91 | 32 | 57.84 |
| 2017 | South | Ice trawler fleet | 58 | 5 | 37.53 |
| 2018 | South | Ice trawler fleet | 31 | 9 | 35.19 |
| 2015 | South | Trawl factory fleet | 1 | 1 | 74.75 |
| 2016 | South | Trawl factory fleet | 17 | 14 | 88.06 |
| 2017 | South | Trawl factory fleet | 35 | 0 | 42.76 |
| 2018 | South | Trawl factory fleet | 117 | 11 | 81.04 |
| South American fur seal | | | | | |
| 2015 | South | Ice trawler fleet | 0 | 0 | 29.14 |
| 2016 | South | Ice trawler fleet | 1 | 1 | 57.84 |
| 2017 | South | Ice trawler fleet | 2 | 1 | 37.53 |
| 2018 | South | Ice trawler fleet | 2 | 0 | 35.19 |
| 2015 | South | Trawl factory fleet | 11 | 3 | 74.75 |
| 2016 | South | Trawl factory fleet | 85 | 47 | 88.06 |
| 2017 | South | Trawl factory fleet | 24 | 12 | 42.76 |
| 2018 | South | Trawl factory fleet | 33 | 1 | 81.04 |

**References**

Aranis, A., 2017. Programa de seguimiento de las principales pesquerías pelágicas de la zona centro-sur de Chile, V-XI regions, año 2016. Informe final. (available at <https://www.ifop.cl/busqueda-de-informes/>)

Aranis, A,. 2018. Programa de seguimiento de las principales pesquerías pelágicas de la zona centro-sur de Chile, V-XI regions, año 2017. Informe final. (available at https://www.ifop.cl/busqueda-de-informes/)

Bernal C., San Martín M.A., Bravo C., et al. 2019. Programa de Investigación del Descarte y Captura de Pesca Incidental, 2016-2017. Programa de Monitoreo y Evaluación de los Planes de Reducción del Descarte. Informe final. (available at https://www.ifop.cl/busqueda-de-informes/)

Bernal C., San Martín M.A., Bravo C., et al. 2018. Programa de Investigación del Descarte y Captura de Pesca Incidental, 2016-2017. Informe final. (available at <https://www.ifop.cl/busqueda-de-informes/>)

San Martín, M.A. 2016. Programa de Investigación del Descarte y Captura de Pesca Incidental 2015. Informe final (available at <https://www.ifop.cl/busqueda-de-informes/>)

Vega, R., Ossa, L., Henríquez, S. 2019. Programa de investigación del descarte y captura de pesca incidental en pesquerías pelágicas 2018-2019. Informe final. (available at <https://www.ifop.cl/busqueda-de-informes/>)

**Supplementary Table 4**. Prior distribution for catchability and the probability of dying immediately, given captured in the gear

|  |  |  |  |
| --- | --- | --- | --- |
| **Zone** | **Fishery** | **Catchability** | **Probability of dying immediately** |
| South American Sea Lion | | | |
| North | Artisanal purse seine (anchovy & sardine) | U[0.01, 0.95] | U[0, 0.01] |
| North | Industrial purse seine (anchovy & sardine) | U[0.01, 0.95] | U[0, 0.01] |
| Central | Industrial purse seine (jack mackerel) | U[0.2, 0.95] | U[0, 0.02] |
| Central | Artisanal purse seine (anchovy & sardine) | U[0.2, 0.95] | U[0, 0.04] |
| Central | Industrial purse seine (anchovy & sardine) | U[0.02, 0.60] | U[0, 0.04] |
| Central | Trawl fishery | U[0.01, 0.05] | U[0.05, 0.90] |
| South | Ice trawler fleet | U[0, 0.01] | U[0.45, 0.95] |
| South | Trawl factory fleet | U[0, 0.01] | U[0.45, 0.95] |
| South American fur seal | | | |
| South | Ice trawler fleet | U[0, 0.001] | U[0.35, 0.95] |
| South | Trawl factory fleet | U[0, 0.05] | U[0.35, 0.85] |

**Supplementary Table 5**. Posterior distributions (medians and 90% probability intervals) for the base-case model for the key parameters and model outputs.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Species / Zone | MSYR1+ | *K*1+ | Population Size in reference year | Sampling CV (1+ numbers) | Sampling CV (pups) | *N*1990/K |
| South American Sea Lion | | | | | | |
| North | 0.042 | 34,549 | 24,306 | 0.179 | 0.385 | 0.617 |
|  | [0.022; 0.094] | [28,613; 56,605] | [19,880; 29,674] | [0.106; 0.669] | [0.208; 0.798] | [0.311; 0.693] |
| Central | 0.029 | 29,604 | 14010 | 0.454 | 0.31 | 0.492 |
|  | [0.021; 0.092] | [17,765;353,701] | [10,407; 19,652] | [0.154; 0.943] | [0.149; 0.669] | [0.04; 0.662] |
| South | 0.052 | 46,823 | 35,480 | 0.138 | 0.389 | 0.574 |
|  | [0.021; 0.096] | [42,035;103,513] | [27,927; 41,070] | [0.1; 0.407] | [0.217; 0.719] | [0.272; 0.676] |
| South American fur seal | | | | | | |
| South | 0.108 | 15,130 | 1,208 | 0.704 | 0.297 | 0.024 |
|  | [0.071; 0.138] | [7,232; 47,934] | [658; 2,632] | [0.349; 0.949] | [0.132; 0.762] | [0.012; 0.121] |

**Supplementary Table 6**. Posterior distributions (medians and 90% probability intervals) for the base-case model and the 8 alternative models for 2020 depletion and the total removals by fishery over years 2010-2019.

1. South American sea lion (north zone)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Model | 2020 depletion | Fishery 1 | Fishery 2 |  |  |
| Base case | 0.925 | 723 | 361 |  |  |
|  | [0.67; 0.993] | [98; 2259] | [50; 2003] |  |  |
| Model 1 | 0.925 | 754 | 475 |  |  |
|  | [0.642; 0.991] | [90; 2387] | [71; 1829] |  |  |
| Model 2 | 0.928 | 678 | 355 |  |  |
|  | [0.606; 0.992] | [77; 2517] | [58; 1593] |  |  |
| Model 3 | 0.917 | 720 | 398 |  |  |
|  | [0.651; 0.99] | [106; 2126] | [62; 1362] |  |  |
| Model 4 | 0.973 | 666 | 304 |  |  |
|  | [0.945; 0.987] | [88; 2216] | [55; 1681] |  |  |
| Model 5 | 0.812 | 839 | 297 |  |  |
|  | [0.602; 0.912] | [127; 2297] | [44; 1215] |  |  |
| Model 6 | 0.927 | 728 | 368 |  |  |
|  | [0.729; 0.989] | [119; 2290] | [48; 1736] |  |  |
| Model 7 | 0.944 | 729 | 324 |  |  |
|  | [0.659; 0.992] | [47; 2289] | [59; 1439] |  |  |
| Model 8 | 0.915 | 587 | 457 |  |  |
|  | [0.611; 0.991] | [89; 2511] | [43; 1950] |  |  |

1. South American sea lion (central zone)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Model | 2020 depletion | Fishery 1 | Fishery 2 | Fishery 3 | Fishery 4 |
| Base case | 0.503 | 412 | 2147 | 1024 | 1258 |
|  | [0.044; 0.913] | [117; 1183] | [480; 5009] | [259; 2602] | [1204; 1358] |
| Model 1 | 0.418 | 460 | 2134 | 998 | 1294 |
|  | [0.095; 0.828] | [165; 1112] | [478; 4206] | [252; 3132] | [1240; 1368] |
| Model 2 | 0.457 | 351 | 1848 | 1066 | 1489 |
|  | [0.066; 0.85] | [104; 1168] | [528; 4469] | [297; 2345] | [1331; 1906] |
| Model 3 | 0.476 | 344 | 2435 | 1072 | 1246 |
|  | [0.096; 0.881] | [105; 1064] | [358; 5056] | [307; 2628] | [1191; 1314] |
| Model 4 | 0.767 | 368 | 2119 | 1170 | 1240 |
|  | [0.565; 0.895] | [97; 1639] | [526; 5743] | [252; 3234] | [1205; 1326] |
| Model 5 | 0.486 | 347 | 2035 | 983 | 1268 |
|  | [0.146; 0.681] | [114; 924] | [326; 5028] | [244; 2491] | [1211; 1345] |
| Model 6 | 0.534 | 381 | 2312 | 954 | 1243 |
|  | [0.037; 0.876] | [134; 1126] | [558; 5251] | [336; 2043] | [1200; 1379] |
| Model 7 | 0.537 | 383 | 2573 | 1165 | 1189 |
|  | [0.059; 0.881] | [95; 1005] | [750; 4199] | [297; 2646] | [1139; 1270] |
| Model 8 | 0.373 | 407 | 2327 | 1184 | 1318 |
|  | [0.079; 0.799] | [134; 1380] | [444; 5670] | [313; 2446] | [1263; 1436] |

(c) South American sea lion (south zone)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Model | 2020 depletion | Fishery 1 | Fishery 2 |  |  |
| Base case | 0.956 | 1179 | 1182 |  |  |
|  | [0.459;0.982] | [1122;1813] | [1116;1406] |  |  |
| Model 1 | 0.876 | 1241 | 1196 |  |  |
|  | [0.533;0.983] | [1136;1809] | [1134;1414] |  |  |
| Model 2 | 0.895 | 1411 | 1303 |  |  |
|  | [0.435;0.983] | [1212;1962] | [1193;1636] |  |  |
| Model 3 | 0.911 | 1189 | 1172 |  |  |
|  | [0.434;0.983] | [1117;1731] | [1123;1482] |  |  |
| Model 4 | 0.961 | 1161 | 1180 |  |  |
|  | [0.946;0.969] | [1126;1646] | [1161;1409] |  |  |
| Model 5 | 0.766 | 1224 | 1174 |  |  |
|  | [0.505;0.891] | [1128;1788] | [1113;1379] |  |  |
| Model 6 | 0.955 | 1164 | 1197 |  |  |
|  | [0.688;0.984] | [1123;1633] | [1138;1404] |  |  |
| Model 7 | 0.893 | 1201 | 1118 |  |  |
|  | [0.319;0.985] | [1117;1778] | [1055;1315] |  |  |
| Model 8 | 0.882 | 1166 | 1255 |  |  |
|  | [0.218;0.98] | [1125;1784] | [1171;1456] |  |  |

(d) South American fur seal (south zone)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Model | 2020 depletion | Fishery 1 | Fishery 2 |  |  |
| Base case | 0.861 | 23 | 832 |  |  |
|  | [0.31;0.961] | [18;42] | [771;1005] |  |  |
| Model 1 | 0.909 | 24 | 846 |  |  |
|  | [0.402;0.976] | [19;41] | [796;1021] |  |  |
| Model 2 | 0.877 | 31 | 1050 |  |  |
|  | [0.202;0.97] | [22;48] | [937;1197] |  |  |
| Model 3 | 0.925 | 25 | 827 |  |  |
|  | [0.347;0.975] | [18;37] | [757;1010] |  |  |
| Model 4 | 0.454 | 24 | 838 |  |  |
|  | [0.07;0.777] | [18;40] | [801;986] |  |  |
| Model 5 | 0.646 | 24 | 824 |  |  |
|  | [0.255;0.886] | [19;42] | [779;972] |  |  |
| Model 6 | 0.883 | 23 | 849 |  |  |
|  | [0.316;0.977] | [18;41] | [773;1000] |  |  |
| Model 7 | 0.894 | 23 | 812 |  |  |
|  | [0.371;0.972] | [17;42] | [761;973] |  |  |
| Model 8 | 0.897 | 26 | 851 |  |  |
|  | [0.267;0.967] | [18;49] | [778;1029] |  |  |

Diagram

Description automatically generated

Supplementary Figure 1. Time series of total population (age 1+ abundance) and age-0 (pup) numbers by species/zone, along with the data used to fit the model for the base-case model. The dark lines are posterior medians, while the dark and light shading covers the 50% and 90% probability intervals, respectively. The sampling intervals for the abundance indices account for estimated sampling variance.

Diagram, engineering drawing

Description automatically generated

Supplementary Figure 2. Time series of total population (age 1+ abundance) and age-0 (pup) numbers by species/zone, along with the data used to fit the model (left two columns). The dark lines in the left two columns are posterior medians, while the dark and light shading covers the 50% and 90% probability intervals, respectively. The sampling intervals for the abundance indices account for estimated sampling variance. The two right columns show the fit to the bycatch data (data open symbols; closed symbols posterior medians and lines posterior 90% intervals). The results are for the alternative model 1.

Diagram

Description automatically generatedSupplementary Figure 3. Time series of total population (age 1+ abundance) and age-0 (pup) numbers by species/zone, along with the data used to fit the model (left two columns). The dark lines in the left two columns are posterior medians, while the dark and light shading covers the 50% and 90% probability intervals, respectively. The sampling intervals for the abundance indices account for estimated sampling variance. The two right columns show the fit to the bycatch data (data open symbols; closed symbols posterior medians and lines posterior 90% intervals). The results are for the alternative model 2.

Diagram, engineering drawing

Description automatically generatedSupplementary Figure 4. Time series of total population (age 1+ abundance) and age-0 (pup) numbers by species/zone, along with the data used to fit the model (left two columns). The dark lines in the left two columns are posterior medians, while the dark and light shading covers the 50% and 90% probability intervals, respectively. The sampling intervals for the abundance indices account for estimated sampling variance. The two right columns show the fit to the bycatch data (data open symbols; closed symbols posterior medians and lines posterior 90% intervals). The results are for the alternative model 3.

Diagram, schematic

Description automatically generatedSupplementary Figure 5. Time series of total population (age 1+ abundance) and age-0 (pup) numbers by species/zone, along with the data used to fit the model (left two columns). The dark lines in the left two columns are posterior medians, while the dark and light shading covers the 50% and 90% probability intervals, respectively. The sampling intervals for the abundance indices account for estimated sampling variance. The two right columns show the fit to the bycatch data (data open symbols; closed symbols posterior medians and lines posterior 90% intervals). The results are for the alternative model 4.

Diagram, engineering drawing

Description automatically generatedSupplementary Figure 6. Time series of total population (age 1+ abundance) and age-0 (pup) numbers by species/zone, along with the data used to fit the model (left two columns). The dark lines in the left two columns are posterior medians, while the dark and light shading covers the 50% and 90% probability intervals, respectively. The sampling intervals for the abundance indices account for estimated sampling variance. The two right columns show the fit to the bycatch data (data open symbols; closed symbols posterior medians and lines posterior 90% intervals). The results are for the alternative model 5.

Diagram, schematic

Description automatically generatedSupplementary Figure 7. Time series of total population (age 1+ abundance) and age-0 (pup) numbers by species/zone, along with the data used to fit the model (left two columns). The dark lines in the left two columns are posterior medians, while the dark and light shading covers the 50% and 90% probability intervals, respectively. The sampling intervals for the abundance indices account for estimated sampling variance. The two right columns show the fit to the bycatch data (data open symbols; closed symbols posterior medians and lines posterior 90% intervals). The results are for the alternative model 6.

Diagram

Description automatically generatedSupplementary Figure 8. Time series of total population (age 1+ abundance) and age-0 (pup) numbers by species/zone, along with the data used to fit the model (left two columns). The dark lines in the left two columns are posterior medians, while the dark and light shading covers the 50% and 90% probability intervals, respectively. The sampling intervals for the abundance indices account for estimated sampling variance. The two right columns show the fit to the bycatch data (data open symbols; closed symbols posterior medians and lines posterior 90% intervals). The results are for the alternative model 7.

Diagram, engineering drawing

Description automatically generatedSupplementary Figure 9. Time series of total population (age 1+ abundance) and age-0 (pup) numbers by species/zone, along with the data used to fit the model (left two columns). The dark lines in the left two columns are posterior medians, while the dark and light shading covers the 50% and 90% probability intervals, respectively. The sampling intervals for the abundance indices account for estimated sampling variance. The two right columns show the fit to the bycatch data (data open symbols; closed symbols posterior medians and lines posterior 90% intervals). The results are for the alternative model 8.

Diagram, engineering drawing

Description automatically generated

Supplementary Figure 10. Time series of total population (age 1+ abundance) and age-0 (pup) numbers by species/zone, along with the data used to fit the model (left two columns). The dark lines in the left two columns are posterior medians, while the dark and light shading covers the 50% and 90% probability intervals, respectively. The sampling intervals for the abundance indices account for estimated sampling variance. The two right columns show the fit to the bycatch data (data open symbols; closed symbols posterior medians and lines posterior 90% intervals). The results are for a model in which the prior for post-release mortality is U[0,1] for all fleets.