**Supplementary Information**

All supplementary information as noted in the article may be found below, with supporting text to describe and clarify the results.

**Predator-Prey matrix**

Since foraging ecology studies for marine biota were rare, we assumed the predator-prey matrix for most functional groups to remain the same as Corrales et al., (2017), with modifications only on those functional groups added for this study’s questions (± 5% in order to balance the model and compute Ecotrophic Efficiency (EE), supplementary materials B). Only one group’s biomass, Goatfishes, was increased by 0.0006 t km-2, to balance the model. The species-specific fisheries data from the Ashdod trawl surveys (collated from 2008-2010) was compiled and rearranged to fit their model’s functional groups, and thus the diet composition remains the same. The reared fish diet was entirely composed of pellets. The sharks FG mainly forage caged fish discards and medium pelagic fish; their P/B and Q/B were taken from Corrales et al., 2017. In the landing input, raw data compiled from surveys along the Israeli coastline (from small, semi-industrial trawls, artisanal boats, purse-seines, trammel-net and longline fisheries) were collated and grouped according to functional group (Goren, 2013 and Edelist et al., 2013). Detritus import, classed by functional group, was taken from Coralles et al. (2017a).

1. **Diet composition entered Ecopath model. Blank cells indicate no diet composition value entered. Cells outlined are entered values less than <0.0001**



**Fisheries and Landings estimates**

1. **Landings estimates**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Group name | GiliOcean | Commercial Trawler | Total |
| 1 | Phytoplankton\* | 0 | 0 | 0.000 |
| 2 | Benthic primary producers | 0 | 0 | 0.000 |
| 3 | Micro/Mesozooplankton \* | 0 | 0 | 0.000 |
| 4 | Macrozooplankton\* | 0 | 0 | 0.000 |
| 5 | Gelatinous plankton\* | 0 | 0 | 0.000 |
| 6 | Polychaetes | 0 | 0 | 0.000 |
| 7 | Suprabenthos | 0 | 0 | 0.000 |
| 8 | Shrimps | 0 | 4.70565E-05 | 0.000 |
| 9 | Crabs | 0 | 4.81451E-06 | 0.000 |
| 10 | Benthic invertebrates | 0 | 3.8E-08 | 0.000 |
| 11 | Benthic cephalopods | 0 | 0.000163747 | 0.000 |
| 12 | Benthopelagic cephalopods\* | 0 | 0.124 | 0.124 |
| 13 | Mullets | 0 | 3E-05 | 0.000 |
| 14 | Demersal fishes | 0 | 0.000803875 | 0.001 |
| 15 | Goatfishes | 0 | 4E-05 | 0.000 |
| 16 | Herbivorous fish | 0 | 4.2903E-05 | 0.000 |
| 17 | Rocky fish | 0 | 3E-05 | 0.000 |
| 18 | Flatfishes | 0 | 2E-05 | 0.000 |
| 19 | Lizardfish | 0 | 0.000177977 | 0.000 |
| 20 | Benthopelagic fishes\* | 0 | 0.000432756 | 0.000 |
| 21 | Mesopelagic fishes\* | 0 | 0.033 | 0.033 |
| 22 | Sharks | 0 | 2.44683E-06 | 0.000 |
| 23 | Rays and skates | 0 | 7.35946E-05 | 0.000 |
| 24 | Small pelagic fishes\* | 0 | 0.001040745 | 0.001 |
| 25 | Mackerel\* | 0 | 0 | 0.000 |
| 26 | Medium pelagic fishes | 0 | 0.000199294 | 0.000 |
| 27 | Large pelagic fishes\* | 0 | 0.000475075 | 0.000 |
| 28 | Turtles | 0 | 0 | 0.000 |
| 29 | Dolphins\* | 0 | 0 | 0.000 |
| 30 | Cages | 20 | 0 | 20.000 |
| 31 | Bacteria | 0 | 0 | 0.000 |
| 32 | Detritus | 0 | 0 | 0.000 |
| 33 | Discards | 0 | 0 | 0.000 |
| 34 | Pellets | 0 | 0 | 0.000 |
| 35 | Sum | 20 | 0.1605843 | 20.161 |

**Sources of Basic Input Biomass Estimates**

The wet weight biomass estimates were derived from four main sources (detailed description of the inputs available in Appendix IV). Unlike the 2017 Israeli model which considered the entire Exclusive Economic Zone (EEZ; Corrales et al., 2017a, b), there was no distinction between native and alien fish and invertebrate groups. Phytoplankton estimates were derived *in-situ* at the cage site in 2015 (Grossowicz, 2016), with benthic primary production taken from Corrales et al. (2017). For all benthic functional groups, mesopelagic fish, demersal sharks, turtles, dolphins, detritus and discards, the biomass (t km-2 yr-1), P/B, and Q/B were taken from Corrales et al. (2017) model on the Israeli EEZ (model area: 3725 km2 from 0-200 m depth). Their vital rates (P/B and QB) were corrected from other EwE regional models using Opitz (1996), or empirically estimated using Pauly et al. (1990).For a full review of the multiple quality assurance measures undergone to develop the Israeli EEZ model, please refer to sections 2.3-2.5 of Corrales et al. (2017).

Herbivorous fish biomass was calculated from 20 m depth trawl survey data (Goren, *unpublished results*). All other fisheries biomass estimates were calculated from trawl fishery data along the 70-m depth contour offshore the Ashdod coastline to Gaza (31.4932 N, 34.28651 E to 31.40753 N, 34.2241 E) over 2.75 km2 of substrate. The P/B and Q/B estimates from Corrales et al. (2017) were deemed accurate for placement in this model, as they were calibrated to the 0-200 m depth gradient for Israel.

1. **INPUT PARAMETER SOURCES**

|  |  |
| --- | --- |
| **Functional groups**  | **Sources and References** |
|  |  |
| **1. Phytoplankton** (spp.) |
|  |  |
| B | Data taken from Grossowicz surveys in Ashdod (Grossowicz, 2016) |
| P/B | Data taken from Grossowicz surveys in Ashdod (Grossowicz, 2016). |
|  |  |
| **2. Benthic primary producer** (spp.) |
|  |  |
| B | Estimated using a EE = 0.7 (2008-2012 data; Corrales et al. 2017) |
| PB | Corrales et al. (2015). Data corrected following Opitz (1996) |
|  |  |
| **3. Micro and Mesozooplankton** (spp.) |
|  |  |
| B | [Terbiyik Kurt and Polat (2013)](file:///C%3A%5CUsers%5Cleigh%5COneDrive%5CDocuments%5CThesis%5C3%20EwE%20Ashdod%5CEcopath%20data%5CBiomass_50%20km-2.xlsx#Sheet1!_ENREF_247) |
| PB | Siokou-Frangou et al. (2002) and Zervoudaki et al. (2011) |
| QB | [Estimated using a P/Q = 0.33 (Hansen et al., 2000)](file:///C%3A%5CUsers%5Cleigh%5COneDrive%5CDocuments%5CThesis%5C3%20EwE%20Ashdod%5CEcopath%20data%5CBiomass_50%20km-2.xlsx#Sheet1!_ENREF_111) |
| Diet | Calbet et al. (2002) and Zervoudaki et al. (2007) |
|  |  |
| **4. Macrozooplankton** (euphasids, pteropods and fish larvae and eggs) |
|  |  |
| B | Estimated using a EE = 0.95 in Corrales et al., 2017 |
| PB | Labat and Cuzin-Roudy (1996). Data corrected following Opitz (1996) |
| QB | Baamstedt and Karlson (1998). Data corrected following Opitz (1996) |
| Diet | [Baamstedt and Karlson (1998)](file:///C%3A%5CUsers%5Cleigh%5COneDrive%5CDocuments%5CThesis%5C3%20EwE%20Ashdod%5CEcopath%20data%5CBiomass_50%20km-2.xlsx#Sheet1!_ENREF_14) |
|  |  |
| **5. Gelatinous plankton** (cubozoa, hydrozoa, scyphozoa, tunicata) |
|  |  |
| B | Estimated using a EE = 0.3 in Corrales et al., 2017 |
| PB | Malej (1989). Data corrected following Opitz (1996) |
| QB | Malej (1989). Data corrected following Opitz (1996) |
| Diet | Graham and Kroutil (2001) and Orek (2000) |
|  |  |
| **6. Polychaetes** (nematods and annelids) |
|  |  |
| B | [Mutlu et al. (2010)](file:///C%3A%5CUsers%5Cleigh%5COneDrive%5CDocuments%5CThesis%5C3%20EwE%20Ashdod%5CEcopath%20data%5CBiomass_50%20km-2.xlsx#Sheet1!_ENREF_177) |
| PB | Serrano (2012) and Sardá et al. (2000). Data corrected following Opitz (1996) |
| QB | [From the empirical equation of Cammen (1979)](file:///C%3A%5CUsers%5Cleigh%5COneDrive%5CDocuments%5CThesis%5C3%20EwE%20Ashdod%5CEcopath%20data%5CBiomass_50%20km-2.xlsx#Sheet1!_ENREF_40) |
| Diet | [Fauchald and Jumars (1979)](file:///C%3A%5C%5CUsers%5C%5Cleigh%5C%5COneDrive%5C%5CDocuments%5C%5CThesis%5C%5C3%20EwE%20Ashdod%5C%5CEcopath%20data%5C%5CBiomass_50%20km-2.xlsx%22%20%5Cl%20%22Sheet1%21_ENREF_87%22%20%5Co%20%22Fauchald%2C%201979%20#177) |
|  |  |
| **7. Suprabenthos** (mysids, isopods, amphipods, cumaceans and copepods) |
|  |  |
| B | Estimated using a EE = 0.8 in Corrales et al., 2017 |
| PB | Corbera et al. (2013). Data corrected following Opitz (1996) |
| QB | Cartes and Maynou (2001). Data corrected following Opitz (1996) |
| Diet | [Cartes et al. (2001)](file:///C%3A%5CUsers%5Cleigh%5COneDrive%5CDocuments%5CThesis%5C3%20EwE%20Ashdod%5CEcopath%20data%5CBiomass_50%20km-2.xlsx#Sheet1!_ENREF_44) |
|  |  |
| **8. Shrimps (***Aristeus antennatus, Aristaemorpha foliacea, Parapennaeus longirostris, Plesionika martia* and *Squilla mantis, Marsupennaeus japonicus, Metapenaeopsis aegyptia, Metapenaeus monoceros, Penaeus semisulcatus and Trachysalambria curvirostris)* |
|  |  |
| B | Combined data from Native and Alien shrimps from Corrales et al., 2017.  |
| PB | Combined data from Native and Alien shrimps from Corrales et al., 2017 with weighted average. |
| QB | Combined data from Native and Alien shrimps from Corrales et al., 2017 with weighted average. |
| Diet | Combined from Corrales et al., 2017 (simple addition) |
|  |  |
|  |  |
| **9. Crabs** (*Alpheus* spp*., Callinectes sapidus, Calappa granulata, Dardanus arrosor, Inachus dorsettensis, Latreilla elegans, Medorippe lanata* and *Scyllarides lateus, Charybdis longicollis, Erugosquilla massavensis, Ixa monody, Myra subgranulata and Portunus pelagicus)* |
|  |  |
| B | Combined data from Native and Alien shrimps from Corrales et al., 2017.  |
| PB | Combined data from Native and Alien shrimps from Corrales et al., 2017 with weighted average. |
| QB | Combined data from Native and Alien shrimps from Corrales et al., 2017 with weighted average. |
| Diet | Combined from Corrales et al., 2017 (simple addition) |
|  |  |
| **10. Benthic invertebrates** (echinoderms, bivalves, gastropods, cnidarians and sponges) |
|  |  |
| B | Estimated using a EE = 0.8  |
| PB | Moodley et al. (1998). Data corrected following Opitz (1996) |
| QB | [Brey (2001)](file:///C%3A%5CUsers%5Cleigh%5COneDrive%5CDocuments%5CThesis%5C3%20EwE%20Ashdod%5CEcopath%20data%5CBiomass_50%20km-2.xlsx#Sheet1!_ENREF_38) |
| Diet | Millar (1971), Perron and Turner (1978), Lalli and Gilmer (1989), Coulon and Jangoux (1993), Juan et al. (2007) and Baeta and Ramón (2013) |
|  |  |
| **11. Benthic cephalopods** (*Octopus vulgaris, Sepia elegans, Sepia officinalis, Sepia orbignyana* and *Sepietta oweniana*) |
|  |  |
| B | Corrales et al. 2017 estimates from bottom trawl surveys (Edelist et al., 2011; Edelist et al., 2013a) |
| PB | Corrales et al. 2017 estimates from: Corrales et al. (2015). Data corrected following Opitz (1996) |
| QB | Corrales et al. 2017 estimates from: Iglesias et al. (1996) and Quintela and Andrade (2002) |
| Diet | Corrales et al. 2017 estimates from: Quetglas et al. (1998), Alves et al. (2006) and Neves et al. (2009) |
|  |  |
| **12. Benthopelagic cephalopods** (*Illex coindetii* and *Loligo vulgaris*) |
|  |  |
| B | Bottom trawl surveys (Edelist et al., 2011; Edelist et al., 2013a) |
| PB | [Coll et al. (2013)](file:///C%3A%5CUsers%5Cleigh%5COneDrive%5CDocuments%5CThesis%5C3%20EwE%20Ashdod%5CEcopath%20data%5CBiomass_50%20km-2.xlsx#Sheet1!_ENREF_51) |
| QB | [Coll et al. (2013)](file:///C%3A%5CUsers%5Cleigh%5COneDrive%5CDocuments%5CThesis%5C3%20EwE%20Ashdod%5CEcopath%20data%5CBiomass_50%20km-2.xlsx#Sheet1!_ENREF_51) |
| Diet | Pierce et al. (1994) and Rosas-Luis et al. (2013) |
|  |  |
|  |  |
| **13. Hake** (*Merluccius merluccius*) |
|  |  |
| B | Ashdod bottom trawl surveys (unpublished data; Goren 2017) |
| PB | Z=F+M; M= empirical equation from Pauly (1980). L∞ and K from Mehanna (2009b) |
| QB | From the empirical equation of Pauly et al. (1990). W∞ from Mehanna (2009b) |
| Diet | [Philips (2012)](file:///C%3A%5CUsers%5Cleigh%5COneDrive%5CDocuments%5CThesis%5C3%20EwE%20Ashdod%5CEcopath%20data%5CBiomass_50%20km-2.xlsx#Sheet1!_ENREF_206) |
|  |  |
| **14. Mullets** (*Mullus barbatus* and *Mullus surmuletus*) |
|  |  |
| B | Ashdod bottom trawl surveys (unpublished data; Goren 2017) |
| PB | Z=F+M; M= empirical equation from Pauly (1980). L∞ and K from Mehanna (2009c) and Mehanna (2009a) |
| QB | From the empirical equation of Pauly et al. (1990). W∞ from Edelist et al. (2013c) |
| Diet | [Golani (1994)](file:///C%3A%5C%5CUsers%5C%5Cleigh%5C%5COneDrive%5C%5CDocuments%5C%5CThesis%5C%5C3%20EwE%20Ashdod%5C%5CEcopath%20data%5C%5CBiomass_50%20km-2.xlsx%22%20%5Cl%20%22Sheet1%21_ENREF_100%22%20%5Co%20%22Golani%2C%201994%20#203) |
|  |  |
| **15. Demersal fishes** *(Conger conger, Cheilodipterus novemstriatus, Jaydia smithi, Lagocephalus sceleratus, Nemipterus randalli, Ostorhinchus fasciatus, Plotosus lineatus and Apogonichthyoides pharaonis, Callionymus filamentosus, Equulites klunzingeri, Lagocephalus spadiceus, L. suezensis, Pomadasys incisus, Sargocentron rubrum, Sillago sihama, Stephanolepis diaspros, Epinephelus aeneus, Ariosoma balearicum, Balistes capriscus, Callionymus risso, Chelidonichthys lucerna, Dactylopterus volitans, Echelus myrus, Echeneis naucrates, Lepidotrigla cavillone, Lithognathus mormyrus, Liza aurata, Pagellus acarne, P. erythrinus, Pomadasys incisus, Scorpaena maderensis, Serranus cabrilla, S. hepatus, Sparus aurata, Synodus saurus, Trachinus araneus, T. draco, Uranoscopus scaber)*  |
|  |  |
| B | Ashdod bottom trawl surveys (unpublished data; Goren 2017); estimated using EE = 0.96 |
| PB | Z=F+M; M= empirical equation from Pauly (1980). L∞ and K from Ismen (2005) and Işmen (2006) |
| QB | From the empirical equation of Pauly et al. (1990). W∞ from Edelist (2014) |
| Diet | [Golani (1994)](file:///C%3A%5CUsers%5Cleigh%5COneDrive%5CDocuments%5CThesis%5C3%20EwE%20Ashdod%5CEcopath%20data%5CBiomass_50%20km-2.xlsx#Sheet1!_ENREF_100) |
|  |  |
| **16. Goatfishes** (*Upeneus moluccensis* and *Upeneus pori*) |
|  |  |
| B | Ashdod bottom trawl surveys (unpublished data; Goren 2017) |
| PB | Z=F+M; M= empirical equation from Pauly (1980). L∞ and K from Ismen (2005) and Işmen (2006) |
| QB | From the empirical equation of Pauly et al. (1990). W∞ from Edelist (2014) |
| Diet | [Golani (1994)](file:///C%3A%5CUsers%5Cleigh%5COneDrive%5CDocuments%5CThesis%5C3%20EwE%20Ashdod%5CEcopath%20data%5CBiomass_50%20km-2.xlsx#Sheet1!_ENREF_100) |
|  |  |
| **17. Rocky fish** | *Apogon imberbis,Diplodus annularis, Diplodus cervinus, Diplodus sargus, Diplodus vulgaris* |
|  |  |
| B | Ashdod bottom trawl surveys (unpublished data; Goren 2017) |
| PB | Z=F+M; M= empirical equation from Pauly (1980). L∞ and K from Garnaud (1962), Dulčić and Kraljević (1995), (Bradai et al., 1998), and (Pajuelo et al., 2003b) and Apostolidis and Stergiou (2014) |
| QB | From the empirical equation of Pauly et al. (1990). W∞ from Karakulak et al. (2006), Sangun et al. (2007), Edelist et al. (2013c) and Edelist (2014) |
| Diet | Pölzer and Patzner (1998) Labropoulou and Papadopoulou-Smith (1999), Derbal et al. (2007), Benchalel et al. (2010), Lipsky (2012) and Chaouch et al. (2013) |
|  |  |
|  |  |
| **18. Flatfishes** *(Arnoglossus spp., Bothus podas,Citharus linguatula, Cynoglossus sinusarabici, Solea solea )* |
|  |  |
| B | Ashdod bottom trawl surveys (unpublished data; Goren 2017) |
| PB | Z=F+M; M= empirical equation from Pauly (1980). L∞ and K from Mehanna (2009b) |
| QB | From the empirical equation of Pauly et al. (1990). W∞ from Mehanna (2009b) |
| Diet | [Philips (2012)](file:///C%3A%5CUsers%5Cleigh%5COneDrive%5CDocuments%5CThesis%5C3%20EwE%20Ashdod%5CEcopath%20data%5CBiomass_50%20km-2.xlsx#Sheet1!_ENREF_206) |
|  |  |
|  |  |
| **19. Herbivorous fish** (*Siganus luridus* and *S. rivulatus*) |
|  |  |
| B | Bottom trawl surveys (Edelist et al., 2011; Edelist et al., 2013a) |
| PB | Z=F+M; M= empirical equation from Pauly (1980). L∞ and K from Bariche (2005) |
| QB | From the empirical equation of Pauly et al. (1990). W∞ from Abdallah (2002) |
| Diet | [Lundberg and Golani (1995)](file:///C%3A%5CUsers%5Cleigh%5COneDrive%5CDocuments%5CThesis%5C3%20EwE%20Ashdod%5CEcopath%20data%5CBiomass_50%20km-2.xlsx#Sheet1!_ENREF_155)  |
|  |  |
| **20. Lizardfish** (*Saurida lessepsianus*) |
|  |  |
| B | Ashdod bottom trawl surveys (unpublished data; Goren 2017) |
| PB | Z=F+M; M= empirical equation from Pauly (1980). L∞ and K from Schintu et al. (1994), Ozutok and Avsar (2002) Turkmen (2003) and Türker Çakir et al. (2005) |
| QB | From the empirical equation of Pauly et al. (1990). W∞ from Abdallah (2002), Turkmen (2003), Sangun et al. (2007) and Edelist (2014) |
| Diet | Bayhan et al. (2009), Karachle and Stergiou (2011) and Abid et al. (2013) |
|  |  |
| **21. Benthopelagic fishes** *(Boops boops, Macrorhamphosus scolopax, Spicara maena and S. smaris)* |
|  |  |
| B | Ashdod bottom trawl surveys (unpublished data; Goren 2017) |
| PB | Z=F+M; M= empirical equation from Pauly (1980). L∞ and K from Garnaud (1962), Dulčić and Kraljević (1995), (Bradai et al., 1998), and (Pajuelo et al., 2003b) and Apostolidis and Stergiou (2014) |
| QB | From the empirical equation of Pauly et al. (1990). W∞ from Karakulak et al. (2006), Sangun et al. (2007), Edelist et al. (2013c) and Edelist (2014) |
| Diet | Pölzer and Patzner (1998) Labropoulou and Papadopoulou-Smith (1999), Derbal et al. (2007), Benchalel et al. (2010), Lipsky (2012) and Chaouch et al. (2013) |
|  |  |
| **22. Mesopelagic fishes (***Chlorophthalmus agassizi, Hygophum hygomii, Lampanyctus crocodilus, L. pusillus, Myctophium punctatum, Stomias boa and Vinciguerria poweridae)* |
|  |  |
| B | Bottom trawl surveys (Edelist et al., 2011; Edelist et al., 2013a) |
| PB | Z=F+M; M= empirical equation from Pauly (1980). L∞ and K from Rafail et al. (1968), Papaconstantinou (1982), Cavallaro et al. (1985), Bradai and Bouain (1988), Erzini (1991), Papaconstantinou et al. (1993), Koutrakis and Sinis (1994), Faltas and Abdallah (1997), Tosunoglu et al. (1997), Stergiou et al. (1998), Chakroun-Marzouk (1999), Chakroun-Marzouk and Ktari (2001), Kaya et al. (2001), Pajuelo et al. (2003a), Türkmen and Akyurt (2003), Ismen et al. (2004), Mesa et al. (2005), Mehanna (2007), Bilgin and Çelik (2009), El -Hawwet et al. (2009), Ilhan et al. (2010), Ismen et al. (2013) and Soykan et al. (2013) |
| QB | From the empirical equation of Pauly et al. (1990). W∞ from Papaconstantinou et al. (1993), Petrakis and Stergiou (1995), Stergiou and Moutopoulos (2001), Morato et al. (2001), Abdallah (2002), Cicek et al. (2006), Karakulak et al. (2006), Mehanna (2007), Sangun et al. (2007), El -Hawwet et al. (2009), Edelist et al. (2013c) and Edelist (2014) |
| Diet | Caragitsou and Papaconstantinou (1988), Papaconstantinou and Caragitsou (1989), Papaconstantinou et al. (1989), Bradai and Bouain (1988), Caragitsou and Papaconstantinou (1994), Labropoulou and Eleftheriou (1997), Labropoulou and Machias (1998), Terrats et al. (2000), Morte et al. (2001), Pallaoro et al. (2004), Chaoui et al. (2005), Kallianiotis et al. (2005), Boudaya et al. (2007), Derbal and Kara (2007), Fehri and Gharbi (2008), Ben Hadj Hamida et al. (2009), Bilecenoglu (2009), Fehri-Bedoui et al. (2009), Esposito et al. (2009), Montanini et al. (2010), Stagioni et al. (2012) and Ismen et al. (2013) |
|  |  |
| **23. Sharks**  *(Carchinus obscurus, C. plumbeus and Mustelus mustelus)* |
|  |  |
| B | Bottom trawl surveys (Edelist et al., 2011; Edelist et al., 2013a) |
| PB | Z=F+M; M= empirical equation from Pauly (1980). L∞ and K from Rafail and Jukic (1971), Rafail (1972), Ezzat et al. (1981), Mennes (1985), Kara and Derbal (1995) and Chemmam-Abdelkader et al. (2004) |
| QB | From the empirical equation of Pauly et al. (1990). W∞ from Rafail (1972), Ceyhan et al. (2009), Torres et al. (2012), Edelist et al. (2013c) and Edelist (2014) |
| Diet | Derbal and Kara (1996), Morales-Nin and Moranta (1997), Lamrini and Bouymajjane (2002) and Lipsky (2012) |
|  |  |
| **24. Rays and skates** *(Dasyatis chrysonota, D. pastinaca, Raja miraletus, Rhinobatos rhinobatos, R. cemiculus, Torpedo marmorata and T. torpedo)* |
|  |  |
| B | Ashdod bottom trawl surveys (unpublished data; Goren 2017) |
| PB | Z=F+M; M= empirical equation from Pauly (1980). L∞ and K from Bariche (2005) |
| QB | From the empirical equation of Pauly et al. (1990). W∞ from Abdallah (2002) |
| Diet | [Lundberg and Golani (1995)](file:///C%3A%5CUsers%5Cleigh%5COneDrive%5CDocuments%5CThesis%5C3%20EwE%20Ashdod%5CEcopath%20data%5CBiomass_50%20km-2.xlsx#Sheet1!_ENREF_155)  |
|  |  |
| **25. Small pelagic fish** *(Engraulis encrasicolus, Etrumeus teres, Sardina pilchardus and Sardinella aurita)* |
|  |  |
| B | Ashdod bottom trawl surveys (unpublished data; Goren 2017) |
| PB | Z=F+M; M= empirical equation from Pauly (1980). L∞ and K from Radhakrishnan (1957), Golani and Ben‐Tuvia (1985) and Özütok and Avşar (2004) |
| QB | From the empirical equation of Pauly et al. (1990). W∞ from Taskavak and Bilecenoglu (2001), Cicek et al. (2006), Edelist et al. (2013c) and Edelist (2014) |
| Diet | Golani et al. (1983), Golani and Diamant (1991), Golani (1993b), Lipsky (2012) and AmtyazSafi et al. (2013) |
|  |  |
| **26. Mackerel** *(Trachurus mediterraneus,* Scomberidae*)* |
|  |  |
| B | Ashdod bottom trawl surveys (unpublished data; Goren 2017) |
| PB | Z=F+M; M= empirical equation from Pauly (1980). L∞ and K from Pauly (1978), Aydin (2011) and Innal et al. (2015) |
| QB | From the empirical equation of Pauly et al. (1990). W∞ from Edelist et al. (2013c) and Edelist (2014) |
| Diet | Golani (2002), Gurlek et al. (2010), Aydin (2011) and Lee (2011) |
|  |  |
| **27. Medium pelagic fishes** *(Alepes djedaba, Caranx crysos, Sphyraena chrysotaenia and S. sphyraena; Decapterus russelli and Fistularia commersonii)* |
|  |  |
| B | Ashdod bottom trawl surveys (unpublished data; Goren 2017) |
| PB | Z=F+M; M= empirical equation from Pauly (1980). L∞ and K from Tsimenidis (1980), D’onghia et al. (2000), Nouar (2004) and Filiz et al. (2006) |
| QB | From the empirical equation of Pauly et al. (1990). W∞ from Tsimenidis and Ondrias (1980), D’onghia et al. (2000), Filiz et al. (2006) and Edelist et al. (2013c). |
| Diet | Macpherson (1981), Negzaoui-Garali et al. (2008), Sever et al. (2008), Consoli et al. (2010) and Anastasopoulou et al. (2013) |
|  |  |
| **28. Large pelagic fishes** *(Euthynnus alletteratus, Seriola dumerili, Scomberomorus commersoni)* |
|  |  |
| B | Ashdod bottom trawl surveys (unpublished data; Goren 2017) |
| PB | Z=F+M; M= empirical equation from Pauly (1980). L∞ and K from Brethes (1975), Rizkalla (1997), Mehanna (2010) and Josephides (2011) |
| QB | From the empirical equation of Pauly et al. (1990). W∞ from Gökçe et al. (2009), Mehanna (2010), Josephides (2011) and Edelist et al. (2013c) |
| Diet | Khoury (1987), Derbal and Kara (2008) and Sever et al. (2013). |
|  |  |
| **29. Turtles** *(Caretta caretta and Chelonia mydas)*  |
|  |  |
| B | [Estimated by EE = 0.5 based on Levy et al. (2015)](file:///C%3A%5CUsers%5Cleigh%5COneDrive%5CDocuments%5CThesis%5C3%20EwE%20Ashdod%5CEcopath%20data%5CBiomass_50%20km-2.xlsx#Sheet1!_ENREF_152) |
| PB | Tsagarakis et al. (2010). Data corrected following Opitz (1996) |
| QB | Polovina (1984). Data corrected following Opitz (1996) |
| Diet | [Tomas et al. (2001)](file:///C%3A%5C%5CUsers%5C%5Cleigh%5C%5COneDrive%5C%5CDocuments%5C%5CThesis%5C%5C3%20EwE%20Ashdod%5C%5CEcopath%20data%5C%5CBiomass_50%20km-2.xlsx%22%20%5Cl%20%22Sheet1%21_ENREF_249%22%20%5Co%20%22Tomas%2C%202001%20#799) |
|  |  |
| **30. Dolphins** *(Delphinus delphis, Grampus griseus, Stenella coeruleoalba, Steno bredanensis, Tursiops truncatus and Ziphius cavirostris)* |
|  |  |
| B | Bottom trawl surveys (Edelist et al., 2011; Edelist et al., 2013a) |
| PB | Z=F+M; M= empirical equation from Pauly (1980). L∞ and K from Simpfendorfer et al. (2002) and Goosen and Smale (1997) |
| QB | From the empirical equation of Pauly et al. (1990). W∞ from Filiz and Bilge (2004) and Edelist et al. (2013c) |
| Diet | Saidi et al. (2007) and Saidi et al. (2009) |
|  |  |
| **31. Cages** *(Sparus aurata)* |
|  |  |
| B | Estimated from GiliOcean production in first year (1000 tonnes harvest biomass) and scaled to 50 km-2 |
| PB | Bayle-Sempere et al., 2013 'reared gilthead seabream' |
| QB | Bayle-Sempere et al., 2013 'reared gilthead seabream' |
| Diet | Cages consume pellets and zooplankton (pers. comm. cage operators) |
|  |
| **32. Bacteria** |
|  |  |
| B | Data taken from Robarts et al. (2006) |
| PB | Berman et al. (1984)  |
| QB | Berman et al. (1984)  |
| Diet | Grossowicz 2016 |
|  |  |
| **33. Detritus**  |
|  |  |
| B | [Corrales et al., 2017](file:///C%3A%5CUsers%5Cleigh%5COneDrive%5CDocuments%5CThesis%5C3%20EwE%20Ashdod%5CEcopath%20data%5CBiomass_50%20km-2.xlsx#Sheet1!_ENREF_202)  |
|  |  |
| **34. Discards** |
|  |  |
| Amount | Cooper et al. (2003), Edelist et al. (2013b), Kerem et al. (2014) and Levy et al. (2015) |
|  |  |
| **35. Pellets** |
|  |  |
| B | Based on amount of pellets (total tonnes) inputted per year, scales to 50 km-2 |
| Diet | Pellets eaten by Fish Cages, and 10% estimated to be eaten by pelagic fishes/benthos outside of cages |
|  |  |
|  |  |

**Balancing the Ecopath Model**

1. **PREBAL statistics**

In this table, we can see that the model is balanced as (1) P/Q is between 0.1 to 0.35, (2) R/A < 1, (3) R/B remains between 1-10 for nekton, and greater values for small organisms, (4) NE > GE, and (5) P/R < 1. Notable exceptions in **bold**.



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