Supplement 1. Simulation model details

Life-cycle Model used for simulations

Subscript y denotes the years in the time series, i denotes the nursery sector (i =1,…,5, with 1= UK West, 2=Rye, 3=Somme, 4=Seine, 5=Veys), and r denotes the component of the metapopulation (r=1,2,3 with 1=West FR, associated with nursery grounds Seine and Veys; 2=UK, associated with nursery grounds UK West and Rye; 3=East FR, associated with nursery ground Somme).

All parameter values are defined in Table S1.

Eggs and larval drift

The number of settling larvae (i.e., post-larvae) in nursery sector i at year y, $L_{y,i}$ result from the survival and drift of eggs spawned by adult females:

$$L_{y,i} = \sum_{r=1}^{r=3} \omega_{y,r} \cdot D_{r,i}^{larvae} \quad \text{(S1)}$$

where $\omega_{y,r}$ is the egg pool for the subpopulation r at year y and $D_{y,r,i}^{larvae}$ is the probability of success for an egg from the egg pool r to reach the nursery sector i at year y. The egg pool for each year and each subpopulation is calculated from the spawning stock biomass (all fish between age 3 and 15 take part in reproduction, ICES 2010):

$$\omega_{y,r} = \sum_{a \geq 3} N_{a,y,r} \cdot pf_a \cdot fec_a \quad \text{(S2)}$$

where pf_a is the proportion of females for age class a (known, considered constant over the time series and homogeneous across areas, Rochette et al. 2012), and $fec_{a,y}$ is the number of eggs per female of age a, calculated from the weight at age $w_{a,y}$ as (ICES 2010, Rochette et al. 2012):

$$fec_{a,y} = e^{5.6 + 1.17 * \log\left(w_{a,y}\right)} \quad \text{(S3)}$$

Post-larvae to juvenile on nursery grounds, from settlement to summer's end

The number of age-0 fish at year y in nursery *i*, $N_{0_{y,i}}$, is defined from a density dependent Beverton-Holt equation parameterized with α_i, the nursery-specific maximum survival rate; K_i, the nursery-specific carrying capacity per unit of surface (1000 fish km^{-2}); and S_i, the surface of nursery sector *i* (km^2):

Unexplained random variations (environmental stochasticity) are captured by independent lognormal random noise with the same variance σ_{BH}^2 for all nursery sectors:

$$N_{0_{y,i}} = \frac{\alpha_i \cdot L_{y,i}}{1 + \dfrac{\alpha_i}{K_i \cdot S_i} \cdot L_{y,i}} \cdot e^{\varepsilon_{L,y,i} - 0.5 \cdot \sigma_{BH}^2} \quad \text{(S4)}$$

Natural mortality of age 0 from summer's end to December

The number of age-1 fish in nursery i, $N_{1,y+1,i}$, is defined as

$$N_{1,y+1,i} = N_{0,y,i} \cdot e^{-1/3 \cdot M_0} \cdot e^{\varepsilon_{0,y,i} - 0.5 \cdot \sigma_0^2} \quad \text{(S5)}$$

where $N_{0,y,i}$ is the number of age-0 fish in the nursery i, M_0 is the annual natural mortality rate at age 0 and $\varepsilon_{0,y,i}$ is normal environmental noise with variance σ_0^2.

Natural and fishing mortality at age 1 and emigration from nursery to adult population

The number of age-2 fish in nursery i at the very beginning of year $y + 1$, $N_{2,y+1,i}$ is defined as

$$N_{2,y+1,i} = N_{1,y,i} . e^{-Z_{1,i}} \cdot e^{\varepsilon_{1,y,i} - 0.5 \cdot \sigma_p^2} \quad \text{(S6)}$$

where $Z_{1,i} = M_1 + F_{1,r}$ is the total mortality, M_1 is the annual natural mortality rate at age 1, $F_{1,r}$ is the fishing mortality in subpopulation r associated with nursery i, and $\varepsilon_{1,y,i}$ is normal environmental noise with variance σ_p^2.

Age-2 fish leave nurseries at the very beginning of the year and are supposed to contribute directly to the subpopulation r adjacent to the nursery. Fish from the Seine and Veys nurseries contribute to subpopulation r =1=West FR; UK West and Rye nurseries contribute to subpopulation r =2=UK; and the Somme nursery contributes to subpopulation r=3=East FR. Starting from $N_{2,y+1,i}$ as defined in Eq. (S6), the number of age-2 fish in each subpopulation r, $N_{2,y+1,r}$ (note the subscript r and not i), is defined as follows:

$$\begin{cases} N_{2,y+1,r=1} = \sum_{i=4}^{i=5} N_{2,y+1,i} \\ N_{2,y+1,r=2} = \sum_{i=1}^{i=2} N_{2,y+1,i} \\ N_{2,y+1,r=3} = N_{2,y+1,i=3} \end{cases} \quad \text{(S7)}$$

Natural and fishing mortality at the adult stage

Prior to any mortality fishes are assumed to move from a region to another according to a connectivity matrix estimated from capture-mark-recapture data (Lecomte et al. 2020), then the number of fish from age 2 to 15 then follows the classical dynamics:

$$N_{a+1,y+1,r} = \left(\sum_{j=1}^{j=3} N_{a,y,r} \cdot D_{r,j}^{adult} \right) \cdot e^{-Z_{a,r}} \cdot e^{\varepsilon_{a,y,r} - 0.5 \cdot \sigma_p^2} \quad \text{(S8)}$$

where $N_{a,y,r}$ is the number of fish of age a in component r at year y, $Z_{a,y,r}$ is the total mortality rate ($Z_{a,r} = F_{a,r} + M_a$) and $\varepsilon_{a,y,r}$ is a normal environmental noise with variance σ_p^2. $D_{r,r}^{adult}$ is the connectivity matrix of size 3*3 (region*region).

All remaining fish are assumed to die at age 15.

Bayesian fitting of the population dynamic model

A Bayesian hierarchical framework using Monte Carlo Markov Chain methods is used to estimate all model parameters by assimilating an extensive data set. The details of the Bayesian methods used to fit the model are given in Archambault et al. (2016). The data assimilated in the model are summarized in the Table S1. This includes:

(i) the outputs of a biophysical model which provide larval survival and dispersal from spawning areas to the five nursery sectors (Savina et al. 2016);

(ii) annual juvenile (ages 0 and 1) abundance indices over the five nursery sectors. Those data were updated from Archambault et al. (2016) by adding 7 years of data in the Somme and Seine sectors, and two years in the Veys sector;

(iii) annual catch-at age and abundance indices (ages 2 to 15) directly derived from the stock assessment working groups (ICES 2020), available at the scale of the EEC and also spatially desegregated for the three subpopulations of adult fish. Those data were updated from Archambault et al. (2016) with 8 and 7 years of recent data, respectively;

(iv) a connectivity matrix to disperse age 2 to 15 individuals between the three subpopulations but parameterized so that only low connectivity between the three sub-populations occurs in the model. Extreme a priori hypotheses on meta-population structure on adult-mediated connectivity (i.e., no inter-regional connectivity after larval drift / full mixture) previously made by Archambault et al., (2016) were replaced by a connectivity matrix estimated from mark-recapture data (Lecomte et al. 2020) to disperse age 2 to 15 individuals between the three subpopulations with a low, but non null, mixing rate.

Bayesian posterior distributions were approximated via Monte Carlo Markov Chain (MCMC) methods using the Nimble package (https://r-nimble.org; release 0.9.0). The same procedure than the one detailed in Archambault et al. (2016) was used for model fitting. Convergence of the MCMC chains was assessed using the Gelman-Rubin (Brooks & Gelman 1998) and the Heidelberg and Welch tests as implemented in the R Coda package (gelman.diag() and heidel.diag() function, respectively).

Bayesian uncertainties around estimated parameters were not considered in simulations. Values of all parameters were fixed to the mode of their posterior distributions (see Table S2).

Table S1. Synthesis of data and results of previous models used as inputs for the Bayesian integrated life cycle model (updated from Archambault et al. 2016).

Stage	Details	Nature of the information	Source	Time series
Eggs & larvae	Survival and allocation from spawning areas to the five nursery sectors	Outputs of biophysical IBM model	Updated run of Rochette et al. (2012): Savina et al. (2016)	1982-2007
Juveniles	Abundance indices available for each nursery sector			
	West UK	Outputs of a habitat suitability model	Updated from Rochette et al. (2010)	1982-1999
	Rye			1982-2006
	Somme			1982-1983; 1987-2018
	Seine			1995-2002; 2006; 2008-2018
	Veys			2006. 2010-2011. 2016-2017
Adults	*Available at EEC scale*			
	Catches at age	Data	ICES	1982-2019
	UK commercial CPUE (UKCBT)			1986-2017
	Belgium commercial CPUE (BECBT)			2004-2017
	French commercial CPUE (FRCOT)			2002-2017
	Available for the three subpopulations			
	Spatial repartition of catches (total weights, no age structure) among the three areas (East FR, UK, West FR)	Data	ICES (2003–2019) Vermard, Pers. comm. (1982–2002)	1982-2019
	Spatial Scientific Abundance Index (UKSBT)	Data	Vermard, Pers. comm.	1990-2018
	Movement of adult between the three populations	Output of a mark-recapture model	Lecomte et al. (2020)	X

Table S2. Fixed values for the parameters of the spatially and age-structured life-cycle simulation model.

Parameters	Value	Description
M_a	**Age 0**: 1.5; **Age 1**: 2.6; **Age 3-11**: 0.1; **Age 12**: 0.2; **Age 13**: 0.3; **Age 14**: 0.4; **Age 15**: 0.5	Natural mortality at age a (y^{-1})
σ_p^2	0.001	Variance of process errors on the dynamics of adult stages
W_a	**Age 1**: 0.094; **Age 2**: 0.122; **Age 3**: 0.169; **Age 4**: 0.208; **Age 5**: 0.236; **Age 6**: 0.287; **Age 7**: 0.288; **Age 8**: 0.335; **Age 9**: 0.381; **Age 10**: 0.416; **Age 11-15**: 0.566.	Weight at age a (kg)

$\mathbf{F}_{\mathbf{a,r}}$	**In region 1 (West FR)** **Age 1**: 0.00248; **Age 2**: 0.107; **Age 3**: 0.181; **Age 4-10**: 0.183; **Age 11-15**: 0.182. **In region 2 (UK)** **Age 1**: 0.00357; **Age 2**: 0.154; **Age 3**: 0.261; **Age 4-15**: 0.262 **In region 3 (East FR)** **Age 1**: 0.00431; **Age 2**: 0.186; **Age 3**: 0.315; **Age 4-10**: 0.317; **Age 11-15**: 0.316	Fishing mortality at age a (y^{-1})
α_i	**West UK:** 0.885; **Rye**: 0.961; **Somme**: 0.861; **Seine**: 0.882; **Veys**: 0.893.	Nursery-specific maximum survival rates.
K_i	**West UK**: 61.2; **Rye**: 229.4; **Somme**: 127.7; **Seine**: 78.9; **Veys**:122	Nursery-specific carrying capacity per unit of surface (1000 fish × km^{-2}).
S_i	**West UK**: 2407.8; **Rye**: 661.6; **Somme**: 2185.8; **Seine**: 1424.1; **Veys**:312.7.	Nursery-specific surface (km^2).
σ^2_{BH}	0.323	Variance of process errors on the post-larvae to juvenile BH relationship
σ^2_0	0.137	Variance of process errors from age-0 to age-1 fish
fec_a	**Age 0-2**: 0; **Age 3**: 1.1 × 10^5; **Age 4**: 1.4 × 10^5; **Age 5**: 1.6×10^5; **Age 6-7**: 2.1 × 10^5; **Age 8**: 2.5× 10^5; **Age 9**: 2.9 × 10^5; **Age 10**: 3.1 × 10^5; **Age 11-15**: 4.5 × 10^5	The number of eggs per female of age a
$D^{larvae}_{r,i}$	**From region West FR to** **West UK**: 6.295 × 10^{-8}; **Rye**: 1.519 × 10^{-8}; **Somme**: 3.113 × 10^{-6}; **Seine**: 2.621× 10^{-3}; **Veys**: 2.788 × 10^{-3}. **From region UK to** **West UK**: 9.299 × 10^{-4}; **Rye**: 2.511 × 10^{-4}; **Somme**: 2.062 × 10^{-5}; **Seine**: 1.510 × 10^{-6}; **Veys**: 8.942 × 10^{-9}. **From region East FR to** **West UK**: 2.921 × 10^{-5}; **Rye**: 2.236 × 10^{-5}; **Somme**: 5.577 × 10^{-3}; **Seine**: 2.115 × 10^{-5}; **Veys**: 7.199 × 10^{-9}.	Larval drift matrix
$D^{adult}_{r,r}$	**From region West FR to** **West FR**: 0.96; **UK**: 0.01; **East FR**: 0.03 **From region UK to** **West FR**: 0.02; **UK**: 0.97; **East FR**: 0.01 **From region East FR to** **West FR**: 0.01; **UK**: 0.01; **East FR**: 0.98	Adult movement matrix
pf_a	**Age 1**: 0.436715, **Age 2**: 0.473897, **Age 3**: 0.509978, **Age 4**: 0.544574, **Age 5**: 0.577386, **Age 6**: 0.608202, **Age 7**: 0.636891, **Age 8**: 0.663395, **Age 9**: 0.687714, **Age 10**: 0.709895, **Age 11**: 0.73002, **Age 12**: 0.748194, **Age 13**: 0.764535, **Age 14**: 0.779171, **Age 15**: 0.792227	Proportion of female in the class of age a.

Supplement 2. Systematic literature review

Methods

We searched the available literature to assess the effect of pollutant exposure on vital rates of marine juvenile fish in nearshore nursery ground. The analysis of retained papers aimed at pooling these data to estimate a range of values of the effects of pollutants on juvenile on two demographic traits (survival and future fecundity). We also tried to assess the potential drivers of the range of these effects (experiment/observation, species, pollutant level, and time of exposure).

First, a request to the Web of Science database was conducted in November 2018, using a search string designed to link four items: the target of study (fish species), one or several pollutants, the vital rates, and the life stage (juvenile):

Request: fish AND **(**pollu* OR OHC OR PBDE OR PCB OR DDT OR PFAS OR PAH OR hydrocarbon OR metal* OR xenob* OR organic***)** AND **(**mortality OR growth OR fecundity OR recruitment OR metabol* OR survival OR vulnerability OR reproduction**)** AND **(**nursery OR recruitment OR juvenile OR youn***)**

The references returned by this search were evaluated for inclusion in our study. To be retained, a publication had to include at least one study (i.e., experimental or *in situ*) that met 4 criteria: (i) focus on marine fish, (ii) reports on pollutant(s) effects, (iii) links between the pollutant(s) and demographic traits, (iv) focus on juveniles. We assessed the publications in a three-stage screening process, according to the set of predefined inclusion criteria: the titles to remove any publications dealing with unrelated topics, then abstracts of the remaining publications, and finally, the full text of the articles.

Second, this collection was increased from searches of the same format using Google Scholar (November 2018) with the same selection procedure, references cited in selected papers, and authors' own literature databases.

Results summary

From the 1638 studies returned by the search on Web of Science, 106 relevant references that provided a range of values on the effects of pollutants on demographic traits of juvenile fish were finally retained (Table S3). Among these references, a large part focused on growth, metabolism, or behavior. A total of 32 references provided information on survival rate and mortality, while only one addressed the future fecundity of juvenile marine fish.

Regarding survival and mortality, 6 references were added based on the complementary search performed with Google Scholar. After screening references cited in the 38 selected papers and authors' own literature databases, 12 more references were added. As some of these 50 references account for several experiments and/or species, they provide data on 195 individual case study (1 experiment × 1 species; Supp. Mat 1).

These references contained various data types: survival or mortality rates, or lethal concentration LC50 or LC20. They used a large diversity of approaches (i.e., field studies or laboratory-controlled experiments), species (30), pollutants (i.e., metals, organic pollutants or mixtures, cocktail in sediment, microplastics), levels of exposure (from realistic levels of contamination to several orders of magnitude higher to estimate LC50) and durations of exposure (two days to one year). Both the low sample size and its huge heterogeneity did not allow for reliable aggregation nor statistical treatment of these data to estimate a range of change in survival or mortality related to realistic *in situ* exposure to pollutants.

Retained references

Table S3. Literature review results: experiments details from selected studies.1 line = 1 experiment × 1 species. Realism column characterizes the study protocol compared to environmentally relevant condition: from low (0) to high (1) realism

Species	Concentration/Control	Mortality Δ%	Control	Contaminant	Realism	Duration	Study
Areolate grouper *(Epinephelus areolatus)*	0.25 µg Benzo[a]Pyrene/g body wt/d	No mortality	NA	PAH	1	28d	Wu et al. (2003)
	12.5 µg/g body wt/d	No mortality	NA	PAH	1	28d	Wu et al. (2003)
Atlantic cod *(Gadus morhua)*	produced water till 200ppm	Not significant	Control (0ppm)	PAH	1	154d	Pérez-Casanova et al. (2010)
	0.5µmol/L	Not significant	No 4 n-heptyphenol	4 n-heptylphenol	1	8d	Tollefsen et al. (1998)
	1µmol/L	No mortality	No 4 n-heptyphenol	4 n-heptylphenol	1	3d	Tollefsen et al. (1998)
	2.1µmol/L	No mortality	No 4 n-heptyphenol	4 n-heptylphenol	1	2d	Tollefsen et al. (1998)
	4.2µmol/L	No mortality	No 4 n-heptyphenol	4 n-heptylphenol	1	3d	Tollefsen et al. (1998)
	2.1µmol/L	0-25	No 4 n-heptyphenol	4 n-heptylphenol	1	6d	Tollefsen et al. (1998)
	2.1µmol/L	0-25	No 4 n-heptyphenol	4 n-heptylphenol	1	7d	Tollefsen et al. (1998)
	4.2µmol/L	50-75	No 4 n-heptyphenol	4 n-heptylphenol	1	3d	Tollefsen et al. (1998)
	4.2µmol/L	75-100	No 4 n-heptyphenol	4 n-heptylphenol	1	4d	Tollefsen et al. (1998)
Barred knifejaw *(Oplegnathus fasciatus)*	0.30mg/kg	Not significant	0.30mg Cd/kg	Cadmium	1	112d	Okorie et al. (2014)
	21.0mg/kg	Not significant	0.30mg Cd/kg	Cadmium	1	112d	Okorie et al. (2014)
	40.7mg/kg	Not significant	0.30mg Cd/kg	Cadmium	0	112d	Okorie et al. (2014)
	83.5mg/kg	Not significant	0.30mg Cd/kg	Cadmium	0	112d	Okorie et al. (2014)
	162mg/kg	Not significant	0.30mg Cd/kg	Cadmium	0	112d	Okorie et al. (2014)
	1387mg/kg	Not significant	0.30mg Cd/kg	Cadmium	0	112d	Okorie et al. (2014)
	2743mg/kg	25-50	0.30mg Cd/kg	Cadmium	0	112d	Okorie et al. (2014)
Blackhead seabream *(Acanthopagrus schlegelii)*	50µg/g	0-25	0.6±0.2±gCd/g and nanopure water	Copper	1	14d	Dang et al. (2012)
	50µg/g	0-25	0.6±0.2±gCd/g and nanopure water	Copper	1	28d	Dang et al. (2012)

	250µg/g	0-25	0.6±0.2±gCd/g and nanopure water	Copper	1	14d	Dang et al. (2012)
	250µg/g	0-25	0.6±0.2±gCd/g and nanopure water	Copper	1	28d	Dang et al. (2012)
	1000µg/g	0-25	0.6±0.2±gCd/g and nanopure water	Copper	1	14d	Dang et al. (2012)
	1000µg/g	0-25	0.6±0.2±gCd/g and nanopure water	Copper	1	28d	Dang et al. (2012)
	100µg/L	0-25	0.6±0.2±gCd/g and nanopure water	Copper	1	14d	Dang et al. (2012)
	100µg/L	0-25	0.6±0.2±gCd/g and nanopure water	Copper	1	28d	Dang et al. (2012)
	500µg/L	0-25	0.6±0.2±gCd/g and nanopure water	Copper	1	14d	Dang et al. (2012)
	500µg/L	25-50	0.6±0.2±gCd/g and nanopure water	Copper	1	28d	Dang et al. (2012)
Cobia (*Rachycentron canadum*)	0.31mg Cd/kg	Not significant	No Cadmium added (0.31mg Cd/kg)	Cadmium	1	112d	Liu et al. (2015)
	3.14mg/kg	Not significant	No Cadmium added (0.31mg Cd/kg)	Cadmium	1	112d	Liu et al. (2015)
	3.32mg/kg	Not significant	No Cadmium added (0.31mg Cd/kg)	Cadmium	1	112d	Liu et al. (2015)
	5.576mg/kg	Not significant	No Cadmium added (0.31mg Cd/kg)	Cadmium	1	112d	Liu et al. (2015)
	5.425mg/kg	Not significant	No Cadmium added (0.31mg Cd/kg)	Cadmium	1	112d	Liu et al. (2015)
	10.90 mg/kg	0-25	No Cadmium	Cadmium	1	112d	Liu et al. (2015)
Common goby (*Pomatoschistus microps*)	20µg/L	No mortality	20µg/L pyrene	Pyrene	1	4d	Oliveira et al. (2013)
	20µg/L + 18.4µg/L	No mortality	20µg/L pyrene	Pyrene + Micro particule	1	4d	Oliveira et al. (2013)
	20µg/L + 184µg/L	No mortality	20µg/L pyrene	Pyrene + Micro particule	1	4d	Oliveira et al. (2013)
	18.4µg/L	No mortality	20µg/L pyrene	Micro particule	1	4d	Oliveira et al. (2013)

184µg/L	No mortality	20µg/L pyrene	Micro particule	1	4d	Oliveira et al. (2013)
200µg/L	75-100	20µg/L pyrene	Pyrene	1	2d	Oliveira et al. (2013)
200µg/L + 18.4 µg/L	75-100	20µg/L pyrene	Pyrene + Micro particule	1	3d	Oliveira et al. (2013)
200µg/L + 184µg/L	75-100	20µg/L pyrene	Pyrene + Micro particule	1	3d	Oliveira et al. (2013)
12.6mg/L	No mortality	No Cr(VI). No Microplastic	Cr(VI) sediment M-est	1	4d	de Sá et al. (2015)
18.9mg/L	25-50	No Cr(VI). No Microplastic	Cr(VI) sediment M-est	1	4d	de Sá et al. (2015)
28.4mg/L	25-20	No Cr(VI). No Microplastic	Cr(VI) sediment M-est	1	4d	de Sá et al. (2015)
12.6mg/L	25-50	No Cr(VI). No Microplastic	Cr(VI) sediment L-est	1	4d	de Sá et al. (2015)
18.9mg/L	25-50	No Cr(VI). No Microplastic	Cr(VI) sediment L-est	1	4d	de Sá et al. (2015)
28.4mg/L	75-100	No Cr(VI). No Microplastic	Cr(VI) sediment L-est	1	4d	de Sá et al. (2015)
1.8mg/L + 0.216mg/L	No mortality	No Cr(VI). No Microplastic	Cr(VI) + Microplastic sediment M-est	1	4d	de Sá et al. (2015)
3.9mg/L + 0.216mg/L	No mortality	No Cr(VI). No Microplastic	Cr(VI) + Microplastic sediment M-est	1	4d	de Sá et al. (2015)
8.0mg/L + 0.216mg/L	0-25	No Cr(VI). No Microplastic	Cr(VI) + Microplastic sediment M-est	1	4d	de Sá et al. (2015)
18.9mg/L + 0.216mg/L	0-25	No Cr(VI). No Microplastic	Cr(VI) + Microplastic sediment M-est	1	4d	de Sá et al. (2015)
28.4mg/L + 0.216mg/L	50-75	No Cr(VI). No Microplastic	Cr(VI) + Microplastic sediment M-est	1	4d	de Sá et al. (2015)
1.8mg/L + 0.216mg/L	No mortality	No Cr(VI). No Microplastic	Cr(VI) + Microplastic sediment L-est	1	4d	de Sá et al. (2015)
3.9mg/L + 0.216mg/L	0-25	No Cr(VI). No Microplastic	Cr(VI) + Microplastic sediment L-est	1	4d	de Sá et al. (2015)
8.0mg/L + 0.216mg/L	0-25	No Cr(VI). No Microplastic	Cr(VI) + Microplastic sediment L-est	1	4d	de Sá et al. (2015)

	18.9mg/L + 0.216mg/L	0-25	No Cr(VI). No Microplastic	Cr(VI) + Microplastic sediment L-est	1	4d	de Sá et al. (2015)
	28.4mg/L + 0.216mg/L	75-100	No Cr(VI). No Microplastic	Cr(VI) + Microplastic sediment L-est	1	4d	de Sá et al. (2015)
	0.216mg/L	25-50	No Cr(VI). No Microplastic	Microplastic sediment M-est	1	4d	de Sá et al. (2015)
	0.216mg/L	25-50	No Cr(VI). No Microplastic	Microplastic sediment L-est	1	4d	de Sá et al. (2015)
	1.3mg/L	No mortality	No Cefalexin	Cefalexin (25°C)	0	4d	Fonte et al. (2016)
	2.5mg/L	No mortality	No Cefalexin	Cefalexin (25°C)	0	4d	Fonte et al. (2016)
	5mg/L	0-25	No Cefalexin	Cefalexin (25°C)	0	4d	Fonte et al. (2016)
	10mg/L	0-25	No Cefalexin	Cefalexin (25°C)	0	4d	Fonte et al. (2016)
	1.3mg/L	No mortality	No Cefalexin	Cefalexin (20°C)	0	4d	Fonte et al. (2016)
	2.5mg/L	No mortality	No Cefalexin	Cefalexin (20°C)	0	4d	Fonte et al. (2016)
	5mg/L	0-25	No Cefalexin	Cefalexin (20°C)	0	4d	Fonte et al. (2016)
	10mg/L	0-25	No Cefalexin	Cefalexin (20°C)	0	4d	Fonte et al. (2016)
	0.184mg/L	0-25	No Microplastic	Microplastic (25°C)	0	4d	Fonte et al. (2016)
	0.184mg/L	0-25	No Microplastic	Microplastic (20°C)	0	4d	Fonte et al. (2016)
	8mg/L + 0.184mg/L	0-25	No Cefalexin no Microplastic	Cefalexin + MP	0	4d	Fonte et al. (2016)
	10mg/L + 0.184mg/L	0-25	No Cefalexin no Microplastic	Cefalexin + MP	0	4d	Fonte et al. (2016)
Common sole (*Solea solea*)	fuel-exposed 39ng/L PAH	25-50	4ng/L PAH	PAH	1	90d	Claireaux et al. (2004)
	50 ng/L	0-25	Control no fuel added	PAH	1	90d	Gilliers et al. (2012)
	BDE-209 = 184.2 ng/g ww. BDE-153 = 181.1. BDE-100 = 93.1. BDE-99 = 85.7. BDE-47 = 82.2. BDE-28 = 84.8ng/g ww	Not significant	Solvent-control fish.Control fish	PBDE congeners (BDE-28. -47. -99. -100. -153. -209)	1	84d	Munschy et al. (2010)

European seabass (*Dicentrarchus labrax*)	Contaminated sediments: Chrome = 50.60±4.56, Nickel = 21.65±3.62, Copper = 14.99±2.35, Zinc = 57.05±4.38, Arsenic = 5.75±0.88, Cadmium = 0.12±0.02, Lead = 11.21±0.5, Mercury = 17.63±1.7µg/g	No mortality	Control (7.73µg/g ww or µg/L)	Contaminated sediments, especially Mercury	1	30d	De Domenico et al. (2013)
	47+/-4 ppb Zinc, 68+/-7ppb benzene	No mortality	Control undosed sea water	PAH	1	42d	Sakanari et al. (1983)
	75.6mg/L	Mortality	Not Contaminated	PAH	0	4d	Dussauze et al. (2015)
	9.60 ± 2.86 mg/L	Not significant	No PAH	PAH	1	4d	Kerambrun et al. (2012)
	18.6 ± 3.6 mg/L	Not significant	No PAH	PAH	1	4d	Kerambrun et al. (2012)
Flathead grey mullet *(Mugil cephalus)*	0.007mg/L	No mortality	No Pb	Pb	1	30d	Hariharan et al. (2016)
	0.017mg/L	No mortality	No Pb	Pb	1	30d	Hariharan et al. (2016)
	0.030mg/L	0-25	No Pb	Pb	1	30d	Hariharan et al. (2016)
	0.070mg/L	25-50	No Pb	Pb	0	30d	Hariharan et al. (2016)
	0.118mg/L	50-75	No Pb	Pb	0	30d	Hariharan et al. (2016)
Florida pompano *(Trachinotus carolinus)*	2.83ppm	0-25	Control no Naphtalene	PAH	0	12d	Dos Santos et al. (2006)
Freckled blenny (*Hypsoblennius ionthas*)	30mg/kg	Not significant	Control no TNT	TNT	0	7d	Lotufo et al. (2010)
	100mg/kg	Not significant	Control no TNT	TNT	0	7d	Lotufo et al. (2010)
	300mg/kg	Not significant	Control no TNT	TNT	0	7d	Lotufo et al. (2010)
Gilthead seabream (*Sparus aurata*)	Spill oil sediment = up to 5.10mg/kg dw, Cr = 2mg/kg dw, Zn = 6.45mg/kg dw, Pb = 1.26mg/kg dw, Cu = 1.19mg/kg dw, Cd = 0.92mg/kg dw, Ni = 1.71mg/kg dw	No mortality	Clean sediment	Contaminated Sediments	1	60d	Morales-Caselles et al. (2006)
	23ng	Not significant	No PCDD/FS (fed with dry feed coated with an olive oil)	PCDD/FS	1	390d	Ábalos et al. (2008)

	0.02mg/L	No mortality	Control no PAH	PAH	1	4d	Correia et al. (2007)
	0.1mg/L	No mortality	Control no PAH	PAH	1	4d	Correia et al. (2007)
Jarbua terapon (*Terapon jarbua*)	up to 64.8µg/g dw	Not significant	Control fish diet	Cadmium	1	28d	Dang and Wang (2009)
	As(III) 50µg/L	Not significant	Control 1.4±0.04µg/L	Arsenic	1	10d	Zhang et al. (2012)
	As(III) 150µg/L	Not significant	Control 1.4±0.04µg/L	Arsenic	1	10d	Zhang et al. (2012)
	As(III) 500µg/L	Not significant	Control 1.4±0.04µg/L	Arsenic	1	10d	Zhang et al. (2012)
	As(V) 50µg/L	Not significant	Control 1.4±0.04µg/L	Arsenic	1	10d	Zhang et al. (2012)
	As(V) 150µg/L	Not significant	Control 1.4±0.04µg/L	Arsenic	1	10d	Zhang et al. (2012)
	As(V) 500µg/L	Not significant	Control 1.4±0.04µg/L	Arsenic	1	10d	Zhang et al. (2012)
	Waterborne As(III) 100µg/L	Not significant	Control 1.4±0.04µg/L	Arsenic	1	10d	Zhang et al. (2012)
	0.008mg/L	Not significant	No Pb	Pb	1	30d	Hariharan et al. (2016)
	0.017mg/L	0-25	No Pb	Pb	1	30d	Hariharan et al. (2016)
	0.035mg/L	25-50	No Pb	Pb	1	30d	Hariharan et al. (2016)
	0.070mg/L	50-75	No Pb	Pb	0	30d	Hariharan et al. (2016)
	0.140mg/L	50-75	No Pb	Pb	0	30d	Hariharan et al. (2016)
Korean rockfish *(Sebastes schlegelii)*	10^6 microplatic	No mortality	No Microplastic	Microplastic	1	21d	Yin et al. (2018)
	120mg/L	No mortality	No Pb	Pb	1	28d	Kim et Kang (2017)
	240mg/L	No mortality	No Pb	Pb	1	28d	Kim et Kang (2017)
Large yellow croacker *(Larimichthys crocea)*	0.21mg/kg diet	Not significant	Control 0.21mg Cd/kg (No SVM)	Cadmium	1	56d	Li et al. (2009)
	7.26mg/kg diet	Not significant	Control 0.21mg Cd/kg (No SVM)	Cadmium	1	56d	Li et al. (2009)
	12.08 mg/kg diet	Not significant	Control 0.21mg Cd/kg (No SVM)	Cadmium	1	56d	Li et al. (2009)
Longjaw mudsucker *(Gillichthys mirabilis)*	PCBs = 80-240ppb, DDTs = 10-34ppb, Chlordanes = 5.89-20.9	0-25	Reference marsh (TB)	Contaminated Sediments	1	NA	McGourty et al. (2009)
Meagre *(Argyrosomus regius)*	20µg/L, 160µg/kg	No mortality	Control non-contaminated feed	Venlafaxine	0	28d	Maulvault et al. (2018)
Mummichog *(Fundulus heteroclitus)*	1mg/L	Mortality	Control Pristine estuary	Mercury	1	4d	Khan and Weis (1987)

Northern wolfish *(Anarhichas denticulatus)*	14µg/L	0-25	Seawater	TPH	0	35d	Sandrini-Neto et al. (2016)
	23µg/L	0-25	Seawater with dispersant	TPH	0	35d	Sandrini-Neto et al. (2016)
Pacific halibut (*Hippoglossus stenolepis*)	1636µg/g	Not significant	0µg/g	TPH	0	90d	Moles and Norcross (1998)
	4700µg/g	75-100	0µg/g	TPH	0	90d	Moles and Norcross (1998)
Pacific herring (*Clupea pallasii*)	9.6±2.5µg/L	Not significant	No PAH (0.2 ±0.1µg/L)	PAH	1	56d	Kennedy and Farrell (2006)
	96h/1344h 40.7±6.9g/L	0-25	No PAH (0.2 ±0.1µg/L)	PAH	1	56d	Kennedy and Farrell (2006)
	1344h 120.2 ±11.4g/L	25-50	No PAH (0.2 ±0.1µg/L)	PAH	1	56d	Kennedy and Farrell (2006)
	9.7 ± 6.5µg/L	No mortality	Beads not soaked in oil	PAH	1	58d	Kennedy and Farrell (2005)
	37.9 ± 8.6µg/L	No mortality	Beads not soaked in oil	PAH	1	58d	Kennedy and Farrell (2005)
	99.3 ± 5.6 µg/L	No mortality	Beads not soaked in oil	PAH	1	58d	Kennedy and Farrell (2005)
Rock sole (*Lepidopsetta bilineata*)	1840µg/g	Not significant	0µg/g	TPH	0	90d	Moles and Norcross (1998)
	4711µg/g	Not significant	0µg/g	TPH	0	90d	Moles and Norcross (1998)
Senegalese sole (*Solea senegalensis)*	Polluted site 882.37 +/- 150.0 ng/g sediment dw	0-25	Sediment reference	PAH	1	28d	Costa et al. (2009)
	High polluted site 1100.48 +/- 187.08 ng/g sediment dw	25-50	Sediment reference	PAH	1	28d	Costa et al. (2009)
	0.01mg/L	No mortality	Control no Copper	Copper	1	4d	Oliva et al. (2009)
	0.1mg/L	No mortality	Control no Copper	Copper	1	4d	Oliva et al. (2009)
	1mg/L	25-50	Control no Copper	Copper	0	1d	Oliva et al. (2009)
	1mg/L	75-100	Control no Copper	Copper	0	2d	Oliva et al. (2009)
	1mg/L	75-100	Control no Copper	Copper	0	3d	Oliva et al. (2009)
	1mg/L	75-100	Control no Copper	Copper	0	4d	Oliva et al. (2009)

Sheepshead minnow (*Cyprinodon variegatus*)	Ba = 26.42ppm, Cd = 0.105, U = 0.050, V = 7.92	Not significant	Uncontaminated sediment	Solid coal combustion residue (CCR): As, Cd, Cr, Cu, Hg, Se, V…	1	365d	Rowe (2003)
	<1 (sediment control). 52.109. 199. 358. and 751 mg tPAH/kg sediment	No mortality	Control sediment	PAH	1	133d	Raimondo et al. (2016)
	52mg tPAH/kg sediment	No mortality	Control sediment	PAH	1	133d	Raimondo et al. (2016)
	109mg tPAH/kg sediment	No mortality	Control sediment	PAH	1	133d	Raimondo et al. (2016)
	199mg tPAH/kg sediment	No mortality	Control sediment	PAH	1	133d	Raimondo et al. (2016)
	358mg tPAH/kg sediment	No mortality	Control sediment	PAH	1	133d	Raimondo et al. (2016)
	751mg tPAH/kg sediment	No mortality	Control sediment	PAH	1	133d	Raimondo et al. (2016)
	7mg/kg	0-25	Control no TNT	TNT	0	4d	Lotufo et al. (2010)
	340mg/kg	75-100	Control no TNT	TNT	0	4d	Lotufo et al. (2010)
Southern flounder (*Paralichthys lethostigma*)	0.247mg/kg	0-25	No PAH	PAH	1	28d	Brown-Peterson et al. (2017)
	0.431mg/kg	0-25	No PAH	PAH	1	28d	Brown-Peterson et al. (2017)
	33.33mg/kg	0-25	No PAH	PAH	1	28d	Brown-Peterson et al. (2017)
	691.85mg/kg	25-50	No PAH	PAH	1	28d	Brown-Peterson et al. (2017)
	3.940mg/kg	75-100	No PAH	PAH	0	28d	Brown-Peterson et al. (2017)
	0.8mg/kg	No mortality	No PAH	PAH	1	28d	Brown-Peterson et al. (2017)
	9.7mg/kg	No mortality	No PAH	PAH	1	28d	Brown-Peterson et al. (2017)
	80mg/kg	25-50	No PAH	PAH	1	28d	Brown-Peterson et al. (2017)
	395mg/kg	75-100	No PAH	PAH	1	28d	Brown-Peterson et al. (2017)
Spot croaker *(Leiostomus xanthurus)*	Control	No mortality	Control sediment (no PAH)	PAH	1	28d	Hargis et al. (1984)

2500ppm	25-50	Control sediment (no PAH)	PAH	1	18d	Hargis et al. (1984)
2500ppm	50-75	Control sediment (no PAH)	PAH	1	28d	Hargis et al. (1984)
0.0044	Not significant	Control unhalogenated clarifier effluent	Cl2 Effluent + Cl2	1	9d	Roberts (1980)
0.005mg/L	Not significant	Control unhalogenated clarifier effluent	Cl2 Effluent + Cl2	1	9d	Roberts (1980)
0.0011mg/L	Not significant	Control unhalogenated clarifier effluent	BrCl Effleunt + BrCl	1	9d	Roberts (1980)
0.023mg/L	Not significant	Control unhalogenated clarifier effluent	BrCl Effleunt + BrCl	1	9d	Roberts (1980)
0.06	Not significant	Control unhalogenated clarifier effluent	Cl2 Effluent + Cl2	1	9d	Roberts (1980)
0.18	Not significant	Control unhalogenated clarifier effluent	Cl2 Effluent + Cl2	1	9d	Roberts (1980)
0.05	Not significant	Control unhalogenated clarifier effluent	BrCl Effleunt + BrCl	1	9d	Roberts (1980)
0.13mg/L	Not significant	Control unhalogenated clarifier effluent	BrCl Effleunt + BrCl	1	9d	Roberts (1980)
0.208mg/L	Not significant	Control unhalogenated clarifier effluent	Cl2 Effluent + Cl2	1	9d	Roberts (1980)
0.183mg/L	Not significant	Control unhalogenated clarifier effluent	Cl2 Effluent + Cl2	1	9d	Roberts (1980)
0.21mg/L	0-25	Control unhalogenated clarifier effluent	BrCl Effleunt + BrCl	1	6d	Roberts (1980)

	0.32mg/L	75-100	Control unhalogenated clarifier effluent	Cl2 Effluent + Cl2	0	6d	Roberts (1980)
	0.41mg/L	75-100	Control unhalogenated clarifier effluent	BrCl Effleunt + BrCl	0	6d	Roberts (1980)
	16µg/L	No mortality	No PAH	PAH	1	14d	Sved et al. (1992)
	35µg/L	No mortality	No PAH	PAH	1	14d	Sved et al. (1992)
	76µg/L	Mortality	No PAH	PAH	1	14d	Sved et al. (1992)
	150µg/L	Mortality	No PAH	PAH	1	14d	Sved et al. (1992)
	320µg/L	Mortality	No PAH	PAH	1	14d	Sved et al. (1992)
Starry flounder (*Platicthys stellatus)*	6.91mg/L	Mortality	No Control	PAH	0	4d	Rice and al. (1979)
	1.42mg/L	Mortality	No Control	PAH	0	4d	Rice and al. (1979)
Thinlip grey mullet (*Chelon ramada*)	0.17mg/L	0-25	No Atrazine	Atrazine	0	20d	Biagianti-Risbourg et al. (1995)
	0.17mg/L	25-50	No Atrazine	Atrazine	0	29d	Biagianti-Risbourg et al. (1995)
Turbot (*Scophtalmus maximus*)	2.44 +/-0.95 mg/kg	No mortality	No PAH	Contaminated sediment PAH	1	21d	Kerambrun et al. (2012)
	0.001±1% produced water (PW)	Not significant	0% produced water	PAH	1	42d	Stephens et al. (2000)
	0.5µg/g	Not significant	Uncontaminated feed. no fuel added	PAH	1	42d	Saborido-Rey et al. (2007)
	2.5µg/g	Not significant	Uncontaminated feed. no fuel added	PAH	1	42d	Saborido-Rey et al. (2007)
	49µg/g	Not significant	Uncontaminated feed. no fuel added	PAH	1	42d	Saborido-Rey et al. (2007)
	114µg/g	Not significant	Uncontaminated feed. no fuel added	PAH	0	42d	Saborido-Rey et al. (2007)
	162µg/g	Not significant	Uncontaminated feed. no fuel added	PAH	0	42d	Saborido-Rey et al. (2007)
	260µg/g	Not significant	Uncontaminated feed. no fuel added	PAH	0	42d	Saborido-Rey et al. (2007)

	2.24mg/kg	0-25	Reference sediment	Contaminated sediment PAH	1	26d	Kerambrun et al. (2014)
	10.2mg/kg	50-75	Reference sediment	Contaminated sediment PAH	1	26d	Kerambrun et al. (2014)
	1.27mg/kg	No mortality	No PAH	Contaminated sediment PAH	1	21d	Kerambrun et al. (2012)
	Recirculating aquaculture systems: Zn = 12mg/L, Fe = 15, Cu = 9 Cu, NO2-N = 10, NO3-N = 9, PO4-P = 9, CO = Mn = 9 µg/L	No mortality	Disinfected sea water	Fe. Zn. Cu. Co. Mn	1	63d	van Bussel (2014)
Yellowfin sole (*Limanda aspera*)	1840µg/g	Not significant	0µg/g	TPH	0	90d	Moles and Norcross (1998)
	4711µg/g	Not significant	0µg/g	TPH	0	90d	Moles and Norcross (1998)

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