

MADGETT, A.S., YATES, K., WEBSTER, L., MCKENZIE, C., BROWNLOW, A. and MOFFAT, C.F. 2022. The concentration and biomagnification of PCBs and PBDEs across four trophic levels in a marine food web. [Dataset]. *Environmental pollution* [online], 309, article number 119752. Available from: <https://www.sciencedirect.com/science/article/pii/S0269749122009666?via%3Dihub#appsec1>

The concentration and biomagnification of PCBs and PBDEs across four trophic levels in a marine food web. [Dataset]

MADGETT, A.S., YATES, K., WEBSTER, L., MCKENZIE, C., BROWNLOW, A. and MOFFAT, C.F.

2022

© 2022 The Authors. Published by Elsevier Ltd. This is an open access article under the CC BY-NC license (<http://creativecommons.org/licenses/by-nc/4.0/>).

The concentration and biomagnification of PCBs and PBDEs across four trophic levels in a marine food web

**Alethea S. Madgett^{1,2*}, Kyari Yates¹, Lynda Webster², Craig McKenzie³, Andrew Brownlow⁴
Colin F. Moffat¹**

¹ School of Pharmacy and Life Sciences, Robert Gordon University, Aberdeen AB10 7JG, UK.

² Marine Scotland Science, Marine Laboratory, 375 Victoria Road, Aberdeen AB11 9DB, UK.

³ Chiron AS, Stiklestadveien 1, 7041 Trondheim, Norway

⁴ Scottish Marine Animal Stranding Scheme, Institute of Biodiversity Animal Health & Comparative Medicine,
University of Glasgow, G12 8QQ

*Corresponding Author.

Supplementary information

Table S.1: The concentration range ($\mu\text{g}/\text{kg}$ lipid weight) of thirty-two CB congeners in the muscle, liver, homogenised whole, brown meat, soft body and blubber samples analysed across eighteen of the nineteen sample categories (not including zooplankton). Sample Number = individuals for mammals and pools for all other categories. Number of individuals per pool are referred to in Madgett *et al.*, (2019). Not all the LoD values are to four significant figures to account for precision. Values <LoD were not included when calculating the sum of CBs. The shaded columns indicate the ICES-7 PCB congeners.

Category	Sample Number	CB28	CB31	CB44	CB49	CB52	CB70
Harbour Seal	10	<0.11 - 18.62	<0.13 - 4.203	<0.19 - 5.381	0.820 - 101.9	4.816 - 632.6	0.952 - 11.45
Harbour Porpoise	18	<0.13 - 16.71	<0.11 - 2.843	1.093 - 15.94	3.013 - 104.6	18.31 - 2,450	<0.17 - 16.67
Sperm Whale	5	0.754 - 9.384	2.663 - 64.62	1.997 - 59.09	8.564 - 147.9	18.94 - 387.8	1.908 - 62.25
Demersal Shark Muscle	12	<0.03 - 13.79	<0.04	<0.23	<0.05	<0.09 - 0.198	<0.09 - 16.84
Demersal Shark Liver	12	4.082 - 36.15	<0.11 - 20.63	<0.19 - 17.47	<0.13 - 29.30	<0.24 - 40.97	<0.17 - 93.84
Pelagic Roundfish Muscle	2	<0.03 - 5.660	<0.04 - 4.151	<0.23	<0.05	0.331 - 0.353	4.615 - 10.19
Pelagic Roundfish Liver	2	<0.13	<0.11 - 22.63	<0.19	<0.13	<0.24 - 0.672	30.66 - 111.1
Pelagic Roundfish Whole	3	3.846 - 7.455	2.083 - 4.214	<0.23	3.846 - 7.618	0.617 - 1.080	7.371 - 12.642
Demersal Roundfish Muscle	30	<0.03 - 68.03	<0.04 - 52.46	<0.23 - 40.98	<0.05 - 66.39	<0.09 - 1.267	<0.09 - 74.59
Demersal Roundfish Liver	30	<0.13 - 72.50	<0.11 - 72.45	<0.19 - 63.96	<0.13 - 102.4	<0.24 - 106.3	0.729 - 99.46
Demersal Roundfish Whole	6	<0.03 - 15.95	<0.04	<0.23 - 18.61	<0.05 - 23.26	<0.09 - 1.256	<0.09 - 28.24
Flatfish Muscle	12	<0.03	<0.04	<0.23	<0.05	<0.09	<0.09
Flatfish Liver	12	<0.13 - 4.416	<0.11	<0.19	<0.13 - 10.85	<0.24	<0.17 - 4.935
Demersal Invertebrates Muscle	2	<0.03	<0.04	<0.23	<0.05	<0.09	<0.09
Benthic Invertebrates Muscle	13	<0.03 - 14.29	<0.04	<0.23	<0.05	<0.09	<0.09
Benthic Invertebrates Soft Body	17	<0.04 - 27.07	<0.03 - 7.520	<0.07	<0.03 - 24.81	<0.08 - 0.87	<0.06 - 25.56
Benthic Invertebrates Whole	11	<0.04 - 15.54	<0.03	<0.07 - 10.14	<0.03 - 30.05	<0.08 - 0.937	<0.06 - 37.31
Benthic Invertebrates Brown Meat	3	<0.04 - 2.733	<0.03 - 0.227	<0.07	<0.03	<0.08 - 0.253	<0.06 - 1.708

Table S.1 (continued): The concentration range ($\mu\text{g}/\text{kg}$ lipid weight) of thirty-two CB congeners in the muscle, liver, homogenised whole, brown meat, soft body and blubber samples analysed across eighteen of the nineteen sample categories (not including zooplankton). Sample Number = individuals for mammals and pools for all other categories. Number of individuals per pool are referred to in Madgett *et al.*, (2019). Not all the LoD values are to four significant figures to account for precision. Values <LoD were not included when calculating the sum of CBs. The shaded columns indicate the ICES-7 PCB congeners.

Category	Sample Number	CB74	CB97	CB99	CB101	CB105
Harbour Seal	10	4.772 - 223.7	0.820 - 14.89	72.98 - 6,509	16.28 - 794.0	4.168 - 104.0
Harbour Porpoise	18	3.664 - 83.67	1.628 - 12.59	27.85 - 5,418	21.16 - 539.1	8.295 - 181.2
Sperm Whale	5	11.38 - 221.8	14.13 - 240.6	40.14 - 669.3	49.19 - 885.2	14.47 - 281.7
Demersal Shark Muscle	12	<0.06 - 36.36	<0.08	<0.07 - 58.18	<0.11 - 37.93	<0.15 - 22.03
Demersal Shark Liver	12	8.139 - 158.3	<0.13 - 46.21	13.69 - 287.5	11.47 - 235.3	7.192 - 231.3
Pelagic Roundfish Muscle	2	3.761 - 5.660	<0.08	9.060 - 16.23	15.04 - 28.30	<0.15
Pelagic Roundfish Liver	2	<0.16 - 19.71	<0.13	<0.40 - 19.71	44.53 - 91.11	<0.20
Pelagic Roundfish Whole	3	4.968 - 8.266	7.371 - 11.67	13.14 - 21.88	23.24 - 38.25	6.891 - 10.53
Demersal Roundfish Muscle	30	<0.06 - 64.75	<0.08 - 25.41	<0.07 - 69.23	<0.11 - 123.5	<0.15 - 50.00
Demersal Roundfish Liver	30	<0.16 - 85.28	<0.13 - 42.17	2.696 - 131.3	2.628 - 217.6	1.899 - 69.56
Demersal Roundfish Whole	6	<0.06 - 21.59	<0.08 - 28.57	<0.07 - 53.16	<0.11 - 92.69	<0.15 - 28.24
Flatfish Muscle	12	<0.06	<0.08	<0.07	<0.11	<0.15
Flatfish Liver	12	<0.16 - 5.844	<0.13 - 16.67	<0.40 - 15.19	<0.45 - 19.09	<0.20 - 8.831
Demersal Invertebrates Muscle	2	<0.06	<0.08	<0.07	<0.11	<0.15
Benthic Invertebrates Muscle	12	<0.06 - 19.78	<0.08	<0.07 - 35.16	<0.11 - 20.98	<0.15 - 23.17
Benthic Invertebrates Soft Body	19	<0.04 - 104.4	<0.07 - 38.35	<0.03 - 215.8	<0.05 - 100.6	<0.06 - 120.3
Benthic Invertebrates Whole	11	<0.04 - 79.27	<0.07 - 51.81	<0.03 - 93.78	<0.05 - 66.89	<0.06 - 45.95
Benthic Invertebrates Brown Meat	3	1.400 - 4.653	<0.07 - 0.757	6.651 - 14.00	0.795 - 3.417	5.018 - 11.39

Table S.1 (continued): The concentration range ($\mu\text{g}/\text{kg}$ lipid weight) of thirty-two CB congeners in the muscle, liver, homogenised whole, brown meat, soft body and blubber samples analysed across eighteen of the nineteen sample categories (not including zooplankton). Sample Number = individuals for mammals and pools for all other categories. Number of individuals per pool are referred to in Madgett *et al.*, (2019). Not all the LoD values are to four significant figures to account for precision. Values <LoD were not included when calculating the sum of CBs. The shaded columns indicate the ICES-7 PCB congeners.

Category	Sample Number	CB110	CB114	CB118	CB123	CB128
Harbour Seal	10	1.317 - 58.10	<0.11 - 169.3	11.78 - 242.1	<0.08	56.91 - 2,344
Harbour Porpoise	18	1.542 - 38.63	0.372 - 37.57	25.74 - 981.9	<0.08	18.68 - 1,527
Sperm Whale	5	25.09 - 489.7	1.331 - 20.51	60.66 - 1,105	0.910 - 17.19	14.62 - 211.3
Demersal Shark Muscle	12	<0.17 - 32.63	<0.05	<0.09 - 163.6	<0.06	<0.14 - 13.56
Demersal Shark Liver	12	9.389 - 246.9	<0.11 - 8.386	44.62 - 694.9	<0.08 - 12.10	17.59 - 203.9
Pelagic Roundfish Muscle	2	11.62 - 20.38	<0.05	12.99 - 24.15	<0.06	<0.14
Pelagic Roundfish Liver	2	<0.19 - 47.45	<0.11 - 10.95	<0.71 - 33.58	<0.08	<0.23
Pelagic Roundfish Whole	3	16.83 - 29.17	<0.05	21.15 - 32.58	2.885 - 4.862	8.974 - 13.13
Demersal Roundfish Muscle	30	<0.17 - 108.7	<0.05	<0.09 - 133.6	<0.06	<0.14 - 30.33
Demersal Roundfish Liver	30	<0.19 - 177.4	<0.11 - 3.041	6.00 - 197.8	<0.08 - 4.497	1.831 - 57.17
Demersal Roundfish Whole	6	<0.17 - 62.79	<0.05	12.00 - 85.56	<0.06	<0.14 - 36.67
Flatfish Muscle	12	<0.17	<0.05	<0.09	<0.06	<0.14
Flatfish Liver	12	<0.19 - 10.78	<0.11	<0.71 - 27.01	<0.08	<0.23 - 7.403
Demersal Invertebrates Muscle	2	<0.17	<0.05	<0.09	<0.06	<0.14
Benthic Invertebrates Muscle	12	<0.17 - 34.57	<0.05	<0.09 - 76.92	<0.06	<0.14 - 13.95
Benthic Invertebrates Soft Body	19	<0.11 - 73.41	<0.06	<0.07 - 338.6	<0.02 - 12.14	<0.04 - 89.47
Benthic Invertebrates Whole	11	<0.11 - 125.4	<0.06	<0.07 - 189.6	<0.02 - 41.45	<0.04 - 49.22
Benthic Invertebrates Brown Meat	3	<0.11 - 3.759	<0.06	14.24 - 35.11	<0.02 - 0.530	5.484 - 10.25

Table S.1 (continued): The concentration range ($\mu\text{g}/\text{kg}$ lipid weight) of thirty-two CB congeners in the muscle, liver, homogenised whole, brown meat, soft body and blubber samples analysed across eighteen of the nineteen sample categories (not including zooplankton). Sample Number = individuals for mammals and pools for all other categories. Number of individuals per pool are referred to in Madgett *et al.*, (2019). Not all the LoD values are to four significant figures to account for precision. Values <LoD were not included when calculating the sum of CBs. The shaded columns indicate the ICES-7 PCB congeners.

Category	Sample Number	CB132	CB137	CB138	CB149	CB153
Harbour Seal	10	<0.11 - 7,526	7.031 - 493.9	415.6 - 20,080	17.48 - 207.6	788.9 - 50,041
Harbour Porpoise	18	<0.11 - 1,725	2.687 - 447.2	93.39 - 20,670	48.79 - 8,183	183.2 - 35,440
Sperm Whale	5	31.57 - 481.9	5.902 - 96.34	83.18 - 1,417	56.60 - 991.3	160.9 - 2,636
Demersal Shark Muscle	12	<0.13 - 170.3	<0.02 - 10.91	<0.17 - 245.5	<0.07 - 74.55	<0.22 - 447.3
Demersal Shark Liver	12	<0.11 - 21.48	2.435 - 45.73	91.04 - 555.0	24.35 - 521.2	142.5 - 2,134
Pelagic Roundfish Muscle	2	<0.13	<0.02	21.71 - 40.75	24.96 - 46.42	36.58 - 68.68
Pelagic Roundfish Liver	2	<0.11	<0.09 - 5.839	94.89 - 166.7	36.50 - 186.7	81.02 - 235.6
Pelagic Roundfish Whole	3	5.128 - 14.42	1.282 - 1.538	38.78 - 59.97	32.37 - 51.38	55.93 - 86.71
Demersal Roundfish Muscle	30	<0.13 - 71.59	<0.02 - 8.197	<0.17 - 180.2	<0.07 - 182.1	<0.22 - 306.6
Demersal Roundfish Liver	30	<0.11 - 39.81	<0.09 - 11.19	11.21 - 323.4	<0.30 - 336.6	21.76 - 592.2
Demersal Roundfish Whole	6	<0.13 - 21.95	<0.02 - 5.556	28.50 - 200.0	<0.07 - 90.37	33.00 - 353.3
Flatfish Muscle	12	<0.13	<0.02	<0.17	<0.07	<0.22
Flatfish Liver	12	<0.11	<0.09 - 18.85	<0.85 - 197.5	<0.30 - 104.9	<1.34 - 303.3
Demersal Invertebrates Muscle	2	<0.13	<0.02	<0.17	<0.07	<0.22
Benthic Invertebrates Muscle	12	<0.13 - 236.3	<0.02	<0.17 - 68.02	<0.07 - 29.63	<0.22 - 178.0
Benthic Invertebrates Soft Body	19	<0.03 - 132.8	<0.03 - 18.35	<0.15 - 533.5	<0.05 - 272.2	<0.07 - 954.9
Benthic Invertebrates Whole	11	<0.03 - 22.80	<0.03 - 3.497	<0.15 - 126.8	<0.05 - 208.8	<0.07 - 223.6
Benthic Invertebrates Brown Meat	3	<0.03	<0.03 - 1.399	33.26 - 64.92	3.557 - 20.50	56.83 - 115.9

Table S.1 (continued): The concentration range ($\mu\text{g}/\text{kg}$ lipid weight) of thirty-two CB congeners in the muscle, liver, homogenised whole, brown meat, soft body and blubber samples analysed across eighteen of the nineteen sample categories (not including zooplankton). Sample Number = individuals for mammals and pools for all other categories. Number of individuals per pool are referred to in Madgett *et al.*, (2019). Not all the LoD values are to four significant figures to account for precision. Values <LoD were not included when calculating the sum of CBs. The shaded columns indicate the ICES-7 PCB congeners.

Category	Sample Number	CB156	CB157	CB158	CB167	CB170
Harbour Seal	10	9.510 - 355.10	2.323 - 52.52	7.345 - 377.3	<0.07 - 6.966	86.66 - 7,170
Harbour Porpoise	18	1.628 - 44.54	<0.05 - 7.705	3.827 - 677.6	1.797 - 47.52	33.61 - 4,668
Sperm Whale	5	9.141 - 139.8	1.487 - 26.81	6.39 - 100.9	4.238 - 79.06	28.33 - 405.6
Demersal Shark Muscle	12	<0.02 - 21.82	<0.04	<0.05 - 23.64	<0.04	<0.02 - 81.82
Demersal Shark Liver	12	8.131 - 99.56	1.808 - 20.63	6.023 - 90.48	2.179 - 54.05	19.40 - 375.9
Pelagic Roundfish Muscle	2	1.538 - 3.019	<0.04	<0.05	<0.04	6.325 - 10.94
Pelagic Roundfish Liver	2	<0.41 - 13.33	<0.05	<0.10	<0.07	39.41 - 111.1
Pelagic Roundfish Whole	3	3.357 - 5.515	<0.04	1.923 - 3.079	1.442 - 2.431	7.692 - 11.99
Demersal Roundfish Muscle	30	<0.02 - 22.13	<0.04	<0.05 - 19.67	<0.04 - 9.016	<0.02 - 63.11
Demersal Roundfish Liver	30	<0.10 - 31.80	<0.05 - 3.622	<0.10 - 31.91	0.483 - 12.38	<0.33 - 128.5
Demersal Roundfish Whole	6	<0.02 - 7.641	<0.04 - 4.319	<0.05 - 13.33	<0.04 - 11.11	<0.02 - 71.11
Flatfish Muscle	12	<0.02	<0.04	<0.05	<0.04	<0.02
Flatfish Liver	12	<0.41	<0.05	<0.10	<0.07 - 3.896	<0.33 - 15.19
Demersal Invertebrates Muscle	2	<0.02	<0.04	<0.05	<0.04	<0.02
Benthic Invertebrates Muscle	12	<0.02 - 9.890	<0.04	<0.05	<0.04	<0.02 - 29.63
Benthic Invertebrates Soft Body	19	<0.03 - 46.84	<0.04 - 7.595	<0.06 - 55.06	<0.06 - 24.06	<0.08 - 158.9
Benthic Invertebrates Whole	11	<0.03 - 11.19	<0.04	<0.06	<0.06	<0.08 - 29.55
Benthic Invertebrates Brown Meat	3	1.984 - 5.259	<0.04 - 1.892	<0.06 - 3.027	<0.06 - 4.692	8.751 - 12.49

Table S.1 (continued): The concentration range ($\mu\text{g}/\text{kg}$ lipid weight) of thirty-two CB congeners in the muscle, liver, homogenised whole, brown meat, soft body and blubber samples analysed across eighteen of the nineteen sample categories (not including zooplankton). Sample Number = individuals for mammals and pools for all other categories. Number of individuals per pool are referred to in Madgett *et al.*, (2019). Not all the LoD values are to four significant figures to account for precision. Values $<\text{LoD}$ were not included when calculating the sum of CBs. The shaded columns indicate the ICES-7 PCB congeners.

Category	Sample Number	CB209
Harbour Seal	10	4.297 - 70.99
Harbour Porpoise	18	1.091 - 180.0
Sperm Whale	5	1.243 - 7.057
Demersal Shark Muscle	12	<0.06
Demersal Shark Liver	12	<0.50 - 20.46
Pelagic Roundfish Muscle	2	<0.06
Pelagic Roundfish Liver	2	<0.50
Pelagic Roundfish Whole	3	<0.06 - 2.098
Demersal Roundfish Muscle	30	<0.06
Demersal Roundfish Liver	30	<0.50 - 6.601
Demersal Roundfish Whole	6	<0.06
Flatfish Muscle	12	<0.06
Flatfish Liver	12	<0.50
Demersal Invertebrates Muscle	2	<0.06
Benthic Invertebrates Muscle	12	<0.06
Benthic Invertebrates Soft Body	19	<0.08 - 19.08
Benthic Invertebrates Whole	11	<0.08 - 20.28
Benthic Invertebrates Brown Meat	3	<0.08

Table S.2: Concentration range ($\mu\text{g}/\text{kg}$ lipid weight) of nine BDE congeners in the muscle, liver, homogenised whole, brown meat, soft body and blubber samples analysed across eighteen of the nineteen sample categories (not including zooplankton). Number of Samples = individuals for mammals and pools for all other categories. Number of individuals per pool are referred to in Madgett *et al.*, (2019). Not all the LoD values are to four significant figures to account for precision. Values <LoD were not included when calculating the ΣPBDE_9 .

Category	Sample Number	BDE28	BDE47	BDE66	BDE100	BDE99
Harbour Seal	10	<0.18	14.54 - 302.7	<0.16	1.058 - 15.24	<0.12 - 109.3
Harbour Porpoise	18	<0.18 - 56.92	8.783 - 188.7	<0.16 - 12.32	<0.19 - 80.73	4.281 - 90.64
Sperm Whale	5	1.686 - 27.39	91.26 - 1,330	<0.16	6.488 - 75.19	18.01 - 274.8
Demersal Shark Muscle	12	<0.01	<0.06 - 32.63	<0.01	<0.04 - 5.263	<0.01
Demersal Shark Liver	12	<0.18 - 2.696	5.190 - 25.16	<0.16 - 0.144	<0.19 - 6.752	0.973 - 13.85
Pelagic Roundfish Muscle	2	<0.01	<0.06 - 2.906	<0.01	<0.04	<0.01
Pelagic Roundfish Liver	2	<0.18	<0.29 - 71.11	<0.16	8.759 - 22.22	<0.12
Pelagic Roundfish Whole	3	<0.01	3.846 - 7.293	<0.01	<0.04 - 1.399	<0.01 - 1.135
Demersal Roundfish Muscle	30	<0.01	<0.06 - 19.78	<0.01	<0.04	<0.01 - 5.495
Demersal Roundfish Liver	30	<0.18 - 0.724	1.255 - 30.75	<0.16 - 1.169	<0.19 - 6.796	<0.12 - 7.360
Demersal Roundfish Whole	6	<0.01 - 1.329	<0.06 - 22.59	<0.01 - 1.330	<0.04 - 5.980	<0.01 - 3.654
Flatfish Muscle	12	<0.01	<0.06 - 17.50	<0.01 - 3.261	<0.04 - 24.56	<0.01 - 9.783
Flatfish Liver	12	<0.18	<0.29 - 92.28	<0.16	<0.19 - 31.58	<0.12
Demersal Invertebrates Muscle	2	<0.01	<0.06 - 7.691	<0.01	<0.04	<0.01
Benthic Invertebrates Muscle	13	<0.01	<0.06	<0.01	<0.04	<0.01
Benthic Invertebrates Soft Body	17	<0.01	<0.06 - 24.62	<0.01	<0.04 - 6.329	<0.01 - 3.571
Benthic Invertebrates Whole	11	<0.01 - 10.88	<0.06 - 109.3	<0.01 - 2.073	<0.04 - 3.109	<0.01 - 2.899
Benthic Invertebrates Brown Meat	3	<0.01 - 0.303	<0.06 - 3.405	<0.01	<0.04 - 1.627	<0.01

Table S.2 (continued): Concentration range ($\mu\text{g}/\text{kg}$ lipid weight) of nine BDE congeners in the muscle, liver, homogenised whole, brown meat, soft body and blubber samples analysed across eighteen of the nineteen sample categories (not including zooplankton). Number of Samples = individuals for mammals and pools for all other categories. Number of individuals per pool are referred to in Madgett *et al.*, (2019). Not all the LoD values are to four significant figures to account for precision. Values <LoD were not included when calculating the ΣPBDE_9 .

Category	Sample Number	BDE85	BDE154	BDE153	BDE183
Harbour Seal	10	1.674 - 23.82	0.443 - 35.69	<0.15 - 149.7	<0.16 - 1.687
Harbour Porpoise	18	7.41 - 106.8	17.85 - 203.9	<0.15 - 117.3	<0.16 - 6.46
Sperm Whale	5	4.211 - 45.66	7.581 - 108.2	2.527 - 27.03	<0.16 - 0.111
Demersal Shark Muscle	12	<0.01 - 2.105	<0.02	<0.02	<0.01
Demersal Shark Liver	12	<0.12 - 4.394	<0.34 - 4.572	0.603 - 10.63	<0.16 - 1.989
Pelagic Roundfish Muscle	2	0.342 - 1.132	<0.02	<0.02	<0.01
Pelagic Roundfish Liver	2	<0.12	<0.34 - 13.33	<0.15	<0.16
Pelagic Roundfish Whole	3	<0.01 - 5.315	<0.02 - 3.077	<0.02	<0.01
Demersal Roundfish Muscle	30	<0.01 - 5.195	<0.02 - 10.77	<0.02 - 6.593	<0.01
Demersal Roundfish Liver	30	<0.12 - 3.768	<0.34 - 12.78	<0.15 - 1.221	<0.16 - 0.073
Demersal Roundfish Whole	6	<0.01 - 3.333	<0.02 - 2.326	<0.02	<0.01
Flatfish Muscle	12	<0.01	<0.02 - 15.79	<0.02	<0.01
Flatfish Liver	12	<0.12	<0.34 - 39.55	<0.15	<0.16
Demersal Invertebrates Muscle	2	<0.01	<0.02 - 3.333	<0.02	<0.01
Benthic Invertebrates Muscle	13	<0.01	<0.02	<0.02	<0.01
Benthic Invertebrates Soft Body	17	<0.01	<0.02	<0.02	<0.01
Benthic Invertebrates Whole	11	<0.01	<0.02 - 4.348	<0.02	<0.01 - 2.798
Benthic Invertebrates Brown Meat	3	<0.01	<0.02	<0.02	<0.01

Table S.3: Regression summary for the determination of TMF using both the traditional method (Borgå *et al.*, 2012; OSPAR, 2016b) and balanced method (Brisebois, 2013). For the traditional method, $y = \text{Log}_{10} [\text{CB/PBDE Concentration } \mu\text{g/kg lw}]$ and $x = \text{trophic level}$; whilst for the balanced method, $y = \text{Geometric mean } \text{Log}_{10} [\text{CB/PBDE Concentration } \mu\text{g/kg lw}]$ and $x = \text{Geometric mean trophic level}$.

Congener	Location	Regression Equation (p-value)		Sample categories
		Traditional Method	Balanced Method	
CB180	All trophic levels from the Irish Sea Biogeographic Region, Northern North Sea, Minches and Western Scotland and the Scottish Continental Shelf.	$y = 1.0082x - 2.1926$ ($p < 0.05$)	$y = 1.0255x - 2.1749$ ($p < 0.05$)	harbour seal blubber, harbour porpoise blubber, demersal shark liver, fish liver: demersal, flatfish, pelagic and benthic invertebrate whole, muscle, brown meat, soft body
	Shark, fish and invertebrates from the Irish Sea Biogeographic Region, Northern North Sea, Minches and Western Scotland and the Scottish Continental Shelf.	$y = 0.5477x - 0.4590$ ($p < 0.05$)	$y = 0.5618x - 0.4042$ ($p < 0.05$)	demersal shark liver, fish liver: demersal, flatfish, pelagic and benthic invertebrate whole, muscle, brown meat, soft body
	All trophic levels from the Irish Sea Biogeographic Region.	$y = 1.0401x - 2.2450$ ($p < 0.05$)	$y = 1.2318x - 2.9810$ ($p < 0.05$)	harbour seal blubber, harbour porpoise blubber, demersal shark liver, fish liver: demersal, flatfish, pelagic and benthic invertebrate whole, muscle, brown meat, soft body
	All trophic levels from the Northern North Sea, Minches and Western Scotland and the Scottish Continental Shelf.	$y = 1.0001x - 2.2566$ ($p < 0.05$)	$y = 0.8378x - 1.4290$ ($p < 0.05$)	harbour seal blubber, harbour porpoise blubber, demersal roundfish liver and benthic invertebrate whole, muscle, brown meat, soft body
CB153	All trophic levels from the Irish Sea Biogeographic Region, Northern North Sea, Minches and Western Scotland and the Scottish Continental Shelf.	$y = 0.9583x - 1.4724$ ($p < 0.05$)	$y = 1.0744x - 1.8962$ ($p < 0.05$)	harbour seal blubber, harbour porpoise blubber, demersal shark liver, fish liver: demersal, flatfish, pelagic and benthic invertebrate whole, muscle, brown meat, soft body
	Shark, fish and invertebrates from the Irish Sea Biogeographic Region, Northern North Sea, Minches and Western Scotland and the Scottish Continental Shelf.	$y = 0.5266x + 0.1036$ ($p < 0.05$)	$y = 0.6526x - 0.3295$ ($p < 0.05$)	demersal shark liver, fish liver: demersal, flatfish, pelagic and benthic invertebrate whole, muscle, brown meat, soft body
	All trophic levels from the Irish Sea Biogeographic Region.	$y = 0.9068x - 1.2074$ ($p < 0.05$)	$y = 1.2618x - 2.7320$ ($p < 0.05$)	harbour seal blubber, harbour porpoise blubber, demersal shark liver, fish liver: demersal, flatfish, pelagic and benthic invertebrate whole, muscle, brown meat, soft body
	All trophic levels from the Northern North Sea, Minches and Western Scotland and the Scottish Continental Shelf.	$y = 1.0172 - 1.7783$ ($p < 0.05$)	$y = 1.1627 - 2.2244$ ($p < 0.05$)	harbour seal blubber, harbour porpoise blubber, demersal roundfish liver and benthic invertebrate whole, muscle, brown meat, soft body

CB138	All trophic levels from the Irish Sea Biogeographic Region, Northern North Sea, Minches and Western Scotland and the Scottish Continental Shelf.	$y = 0.9150x - 1.5211$ ($p < 0.05$)	$y = 0.9624x - 1.6500$ ($p < 0.05$)	harbour seal blubber, harbour porpoise blubber, demersal shark liver, fish liver: demersal, flatfish, pelagic and benthic invertebrate whole, muscle, brown meat, soft body
	Shark, fish and invertebrates from the Irish Sea, Northern North Sea, Minches and Western Scotland and the Scottish Continental Shelf.	$y = 0.4886x + 0.0278$ ($p < 0.05$)	$y = 0.4943x + 0.0801$ ($p < 0.05$)	demersal shark liver, fish liver: demersal, flatfish, pelagic and benthic invertebrate whole, muscle, brown meat, soft body
	All trophic levels from the Irish Sea Biogeographic Region.	$y = 0.8625x - 1.2635$ ($p < 0.05$)	$y = 1.0936x - 2.1419$ ($p < 0.05$)	harbour seal blubber, harbour porpoise blubber, demersal shark liver, fish liver: demersal, flatfish, pelagic and benthic invertebrate whole, muscle, brown meat, soft body
	All trophic levels from the Northern North Sea, Minches and Western Scotland and the Scottish Continental Shelf.	$y = 9710x - 1.7995$ ($p < 0.05$)	$y = 0.9940x - 1.8344$ ($p < 0.05$)	harbour seal blubber, harbour porpoise blubber, demersal roundfish liver and benthic invertebrate whole, muscle, brown meat, soft body
CB118	All trophic levels from the Irish Sea Biogeographic Region, Northern North Sea, Minches and Western Scotland and the Scottish Continental Shelf.	$y = 0.4133x + 0.0545$ ($p < 0.05$)	$y = 0.2717x + 0.6019$ ($p < 0.05$)	harbour seal blubber, harbour porpoise blubber, demersal shark liver, fish liver: demersal, flatfish, pelagic and benthic invertebrate whole, muscle, brown meat, soft body
	Shark, fish and invertebrates from the Irish Sea Biogeographic Region, Northern North Sea, Minches and Western Scotland and the Scottish Continental Shelf.	$y = 0.5105x - 0.3063$ ($p < 0.05$)	$y = 6674x - 0.9199$ ($p < 0.05$)	demersal shark liver, fish liver: demersal, flatfish, pelagic and benthic invertebrate whole, muscle, brown meat, soft body
	All trophic levels from the Irish Sea Biogeographic Region.	$y = 0.5055x - 0.1705$ ($p < 0.05$)	$y = 0.4400x - 0.0045$ ($p < 0.05$)	harbour seal blubber, harbour porpoise blubber, demersal shark liver, fish liver: demersal, flatfish, pelagic and benthic invertebrate whole, muscle, brown meat, soft body
	All trophic levels from the Northern North Sea, Minches and Western Scotland and the Scottish Continental Shelf.	$y = 0.3410x + 0.1819$ ($p < 0.05$)	$y = 0.1821 + 0.8344$ ($p > 0.05$)	harbour seal blubber, harbour porpoise blubber, demersal roundfish liver and benthic invertebrate whole, muscle, brown meat, soft body
CB101	All trophic levels from the Irish Sea Biogeographic Region, Northern North Sea, Minches and Western Scotland and the Scottish Continental Shelf.	$y = 0.6799x - 1.3205$ ($p < 0.05$)	$y = 0.4018x - 0.0701$ ($p < 0.05$)	harbour seal blubber, harbour porpoise blubber, demersal shark liver, fish liver: demersal, flatfish, pelagic and benthic invertebrate whole, muscle, brown meat, soft body
	Shark, fish and invertebrates from the Irish Sea Biogeographic region, Northern North Sea, Minches and Western Scotland and the Scottish Continental Shelf.	$y = 0.7637x - 1.6527$ ($p < 0.05$)	$y = 0.4028x - 0.0877$ ($p > 0.05$)	demersal shark liver, fish liver: demersal, flatfish, pelagic and benthic invertebrate whole, muscle, brown meat, soft body

	All trophic levels from the Irish Sea Biogeographic Region.	$y = 0.6821x - 1.2050$ ($p < 0.05$)	$y = 6389x - 0.9514$ ($p < 0.05$)	harbour seal blubber, harbour porpoise blubber, demersal shark liver, fish liver: demersal, flatfish, pelagic and benthic invertebrate whole, muscle, brown meat, soft body
	All trophic levels from the Northern North Sea, Minches and Western Scotland and the Scottish Continental Shelf.	$y = 0.7040x - 1.5590$ ($p < 0.05$)	$0.5124x - 0.7445$ ($p < 0.05$)	harbour seal blubber, harbour porpoise blubber, demersal roundfish liver and benthic invertebrate whole, muscle, brown meat, soft body
CB52	All trophic levels from the Irish Sea Biogeographic Region, Northern North Sea, Minches and Western Scotland and the Scottish Continental Shelf.	$y = 1.4219x - 5.0927$ ($p < 0.05$)	$y = 1.6471x - 6.1983$ ($p < 0.05$)	harbour seal blubber, harbour porpoise blubber, demersal shark liver, fish liver: demersal, flatfish, pelagic and benthic invertebrate whole, muscle, brown meat, soft body
	Shark, fish and invertebrates from the Irish Sea Biogeographic region, Northern North Sea, Minches and Western Scotland and the Scottish Continental Shelf.	$y = 1.3010x - 4.7464$ ($p < 0.05$)	$y = 1.9678x - 7.5062$ ($p < 0.05$)	demersal shark liver, fish liver: demersal, flatfish, pelagic and benthic invertebrate whole, muscle, brown meat, soft body
	All trophic levels from the Irish Sea Biogeographic Region.	$y = 1.7901x - 6.8347$ ($p < 0.05$)	$y = 1.8395x - 7.0780$ ($p < 0.05$)	harbour seal blubber, harbour porpoise blubber, demersal shark liver, fish liver: demersal, flatfish, pelagic and benthic invertebrate whole, muscle, brown meat, soft body
	All trophic levels from the Northern North Sea, Minches and Western Scotland and the Scottish Continental Shelf.	$y = 1.1016x - 3.5735$ ($p < 0.05$)	$y = 1.2633x - 4.4003$ ($p < 0.05$)	harbour seal blubber, harbour porpoise blubber, demersal roundfish liver and benthic invertebrate whole, muscle, brown meat, soft body
CB28	All trophic levels from the Irish Sea Biogeographic Region, Northern North Sea, Minches and Western Scotland and the Scottish Continental Shelf.	$y = 0.1115x + 0.3028$ ($p > 0.05$)	$y = 0.1577x + 1.4251$ ($p > 0.05$)	harbour seal blubber, harbour porpoise blubber, demersal shark liver, fish liver: demersal, flatfish, pelagic and benthic invertebrate whole, muscle, brown meat, soft body
	Shark, fish and invertebrates from the Irish Sea Biogeographic Region, Northern North Sea, Minches and Western Scotland and the Scottish Continental Shelf.	$y = 0.3400x - 0.5242$ ($p < 0.05$)	$y = 0.0981x + 0.4585$ ($p > 0.05$)	demersal shark liver, fish liver: demersal, flatfish, pelagic and benthic invertebrate whole, muscle, brown meat, soft body
	All trophic levels from the Irish Sea Biogeographic Region.	$y = 0.0609x + 0.7238$ ($p > 0.05$)	$y = 0.0110x + 0.8776$ ($p > 0.05$)	harbour seal blubber, harbour porpoise blubber, demersal shark liver, fish liver: demersal, flatfish, pelagic and benthic invertebrate whole, muscle, brown meat, soft body
	All trophic levels from the Northern North Sea, Minches and Western Scotland and the Scottish Continental Shelf.	$0.0266x + 0.4600$ ($p > 0.05$)	$y = -0.2410x + 1.6260$ ($p > 0.05$)	harbour seal blubber, harbour porpoise blubber, demersal roundfish liver and benthic invertebrate whole, muscle, brown meat, soft body
BDE47	All trophic levels from the Irish Sea Biogeographic Region, Northern North Sea, Minches and Western Scotland and the Scottish Continental Shelf.	$y = 0.3172x - 0.1146$ ($p < 0.05$)	$y = 0.1584x - 0.6693$ ($p > 0.05$)	harbour seal blubber, harbour porpoise blubber, demersal shark liver, fish liver: demersal, flatfish, pelagic, demersal invertebrates and benthic invertebrates whole, brown meat, soft body

	Shark, fish and invertebrates from the Irish Sea Biogeographic Region, Northern North Sea, Minches and Western Scotland and the Scottish Continental Shelf.	$y = 0.0385x + 0.8804$ ($p < 0.05$)	$y = -0.3988x + 2.7169$ ($p > 0.05$)	demersal shark liver, fish liver: demersal, flatfish, pelagic, demersal invertebrates and benthic invertebrates whole, brown meat, soft body
	All trophic levels from the Irish Sea Biogeographic Region.	$y = 0.2127x + 0.3781$ ($p < 0.05$)	$y = 0.3892x - 0.1963$ ($p > 0.05$)	harbour seal blubber, harbour porpoise blubber, demersal shark liver, fish liver: demersal, flatfish, pelagic and benthic invertebrates whole, brown meat, soft body, demersal invertebrates
	All trophic levels from the Northern North Sea, Minches and Western Scotland and the Scottish Continental Shelf.	$y = 0.3976x - 0.5028$ ($p < 0.05$)	$y = 0.0948x + 0.8843$ ($p > 0.05$)	harbour seal blubber, harbour porpoise blubber, fish liver: demersal, flatfish, pelagic, demersal invertebrates and benthic invertebrates whole, brown meat, soft body

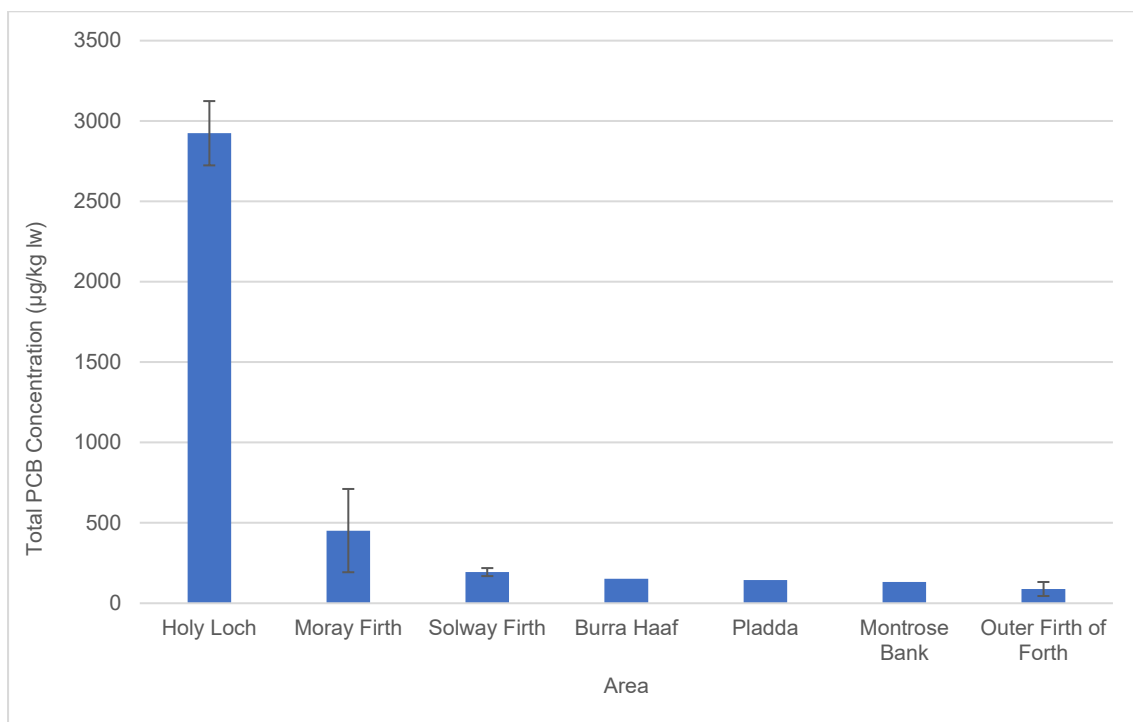
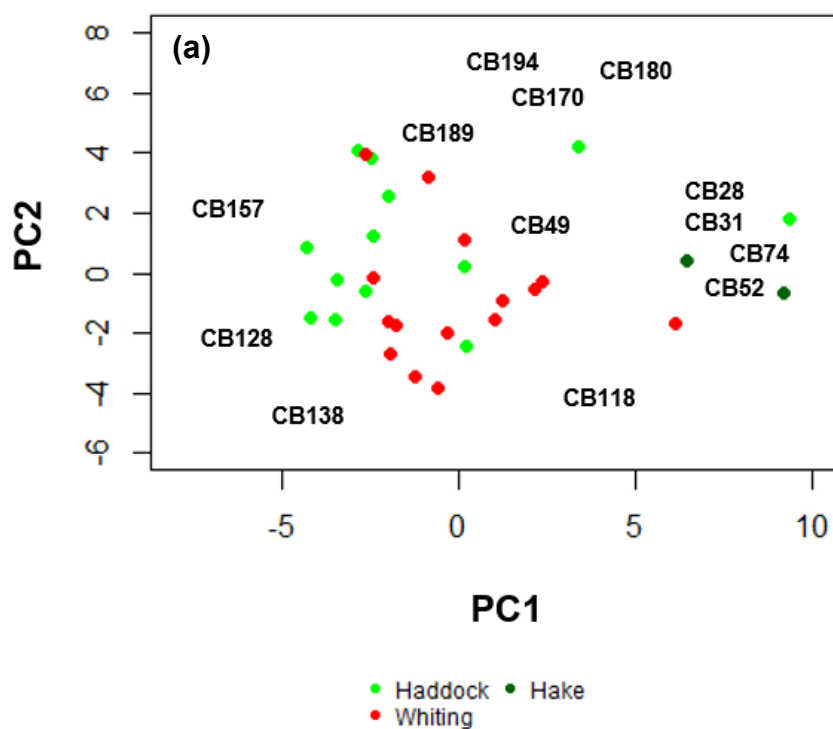


Figure S.1: ΣPCB_{32} concentration in pooled haddock from the Holy Loch (n=2), Moray Firth (n=4), Solway Firth (n=2), Burra Haaf (n=1 composed of 5 individuals), Pladda (n=1 composed of 6 individuals), Montrose Bank (n=1 composed of 5 individuals) and the Outer Firth of Forth (n=2). Error bars are to one standard deviation. There was only one sample pool analysed from Burra Haaf, Pladda and Montrose Bank because of limited sample size.



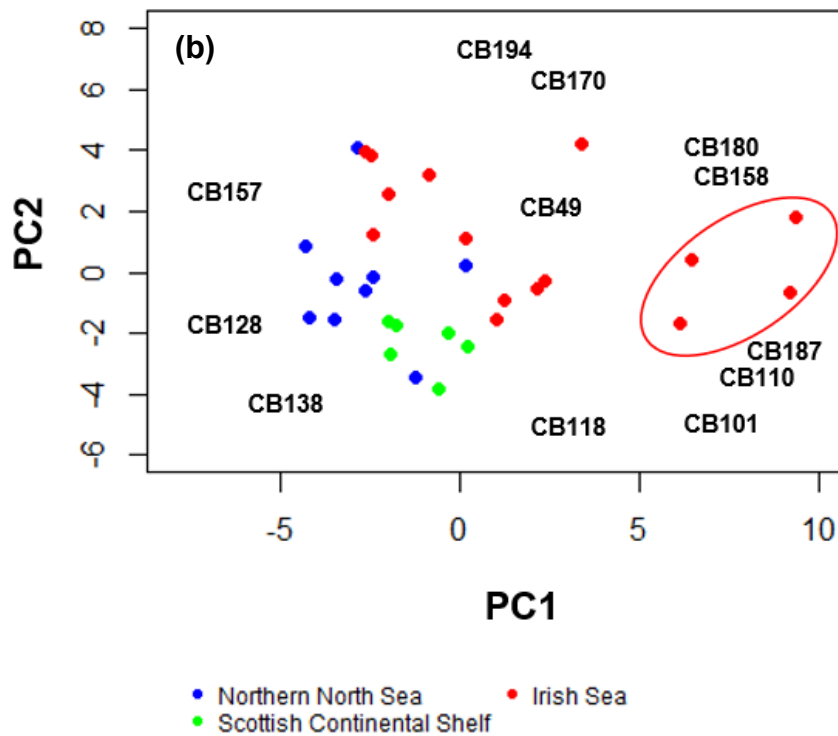


Figure S.2: PCA score plot demonstrating the variation in the PCB profiles (normalised to the concentration of CB153) across the **a)** three demersal roundfish liver species; **b)** demersal roundfish liver biogeographic sampling locations. Four sample pools (hake =2; haddock = 1, whiting = 1) are grouped together on the score plot (PC1 +5 - +10), suggesting that species is not the main influencing factor within the demersal roundfish category. The four sample pools circled in red on Figure S.2b, were collected from the Holy Loch, suggesting that localised sample collection area is a contributing factor to the variance associated within the demersal roundfish category.

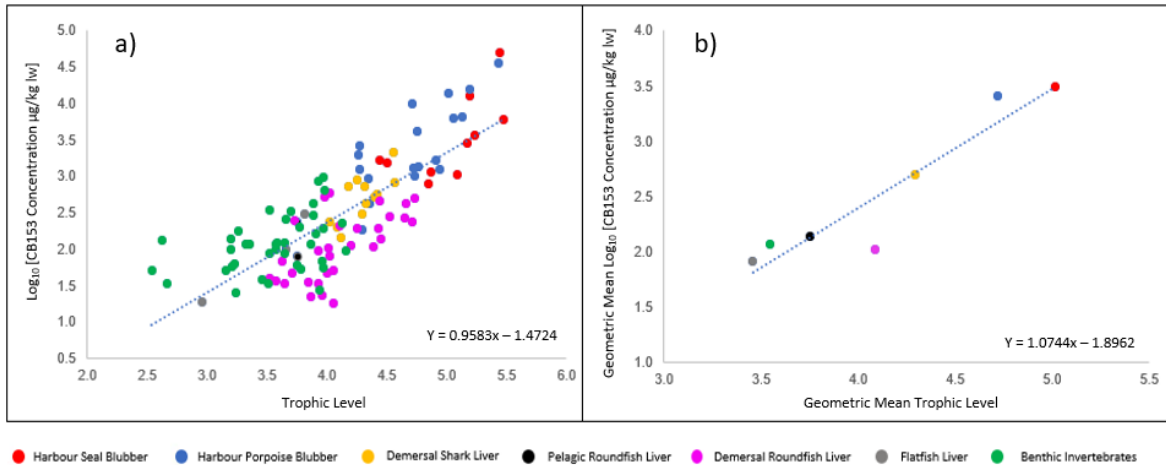


Figure S.3: (a) Relationship between trophic level and logarithmically transformed CB153 concentration ($\mu\text{g}/\text{kg lw}$) in harbour seal blubber (red), harbour porpoise blubber (blue), demersal shark liver (yellow), fish liver: demersal (pink), flatfish (grey), pelagic (black) and benthic invertebrate whole, muscle, brown meat, soft body (green) from the Irish Sea Biogeographic Region, Northern North Sea, Minches and Western Scotland and the Scottish Continental Shelf. (b) Relationship between geometric mean trophic level and logarithmically transformed geometric mean CB153 concentration ($\mu\text{g}/\text{kg lw}$) in harbour seal blubber (red), harbour porpoise blubber (blue), demersal shark liver (yellow), fish liver: demersal (pink), flatfish (grey), pelagic (black) and benthic invertebrate whole, muscle, brown meat, soft body (green) from the Irish Sea Biogeographic Region, Northern North Sea, Minches and Western Scotland and the Scottish Continental Shelf.

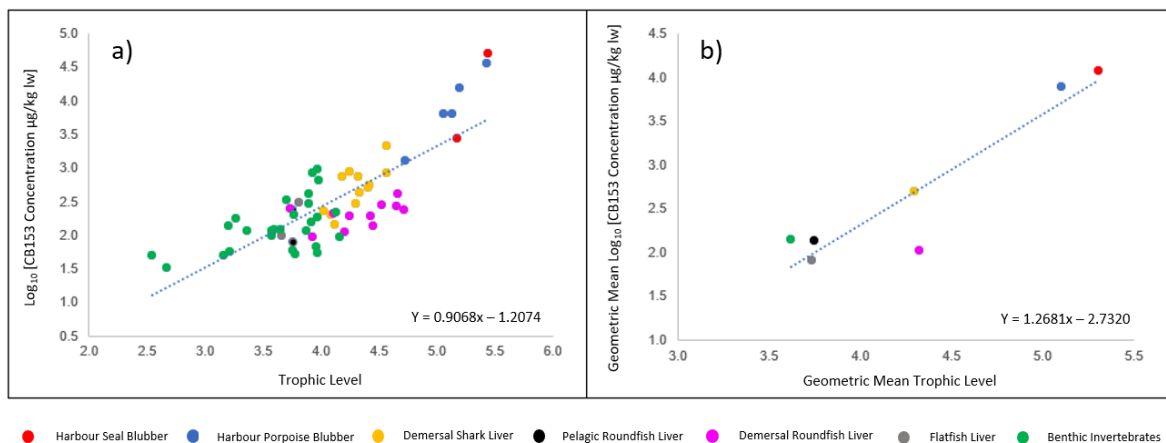


Figure S.4: (a) Relationship between trophic level and logarithmically transformed CB153 concentration ($\mu\text{g}/\text{kg lw}$) in harbour seal blubber (red), harbour porpoise blubber (blue), demersal shark liver (yellow), fish liver: demersal (pink), flatfish (grey), pelagic (black) and benthic invertebrate whole, muscle, brown meat, soft body (green) from the Irish Sea Biogeographic Region (b) Relationship between geometric mean trophic level and logarithmically transformed geometric mean CB153 concentration ($\mu\text{g}/\text{kg lw}$) in harbour seal blubber (red), harbour porpoise blubber (blue), demersal shark liver (yellow), fish liver: demersal (pink), flatfish (grey), pelagic (black) and benthic invertebrate whole, muscle, brown meat, soft body (green) from the Irish Sea Biogeographic Region.

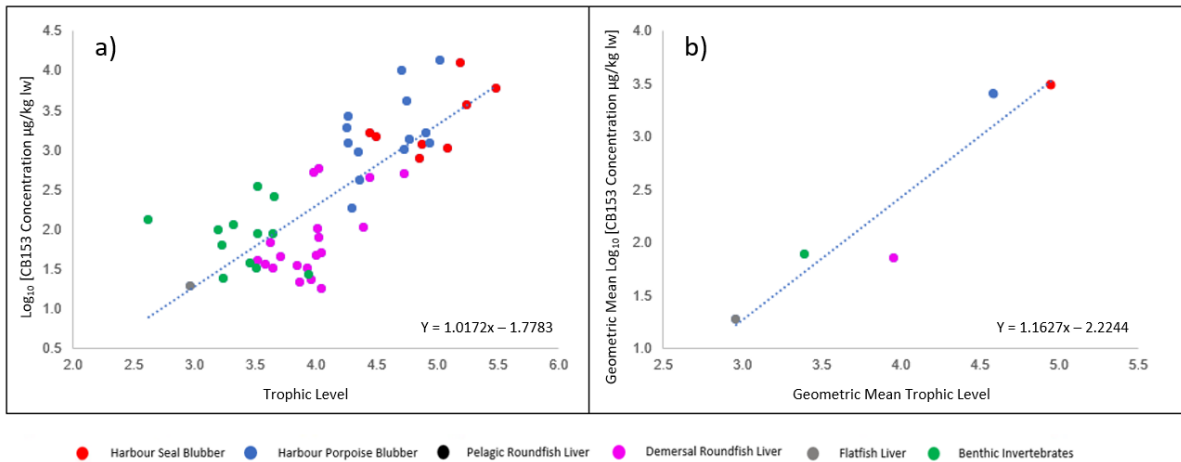


Figure S.5: (a) Relationship between trophic level and logarithmically transformed CB153 concentration ($\mu\text{g}/\text{kg lw}$) in harbour seal blubber (red), harbour porpoise blubber (blue), demersal roundfish liver (pink), flatfish liver (grey) and benthic invertebrate whole, muscle, brown meat, soft body (green) from the Northern North Sea, Minches and Western Scotland and Scottish Continental Shelf. (b) Relationship between geometric mean trophic level and logarithmically transformed geometric mean CB153 concentration ($\mu\text{g}/\text{kg lw}$) in harbour seal blubber (red), harbour porpoise blubber (blue), demersal shark liver (yellow), demersal roundfish liver (pink), flatfish liver (grey) and benthic invertebrate whole, muscle, brown meat, soft body (green) from the Northern North Sea, Minches and Western Scotland and Scottish Continental Shelf.

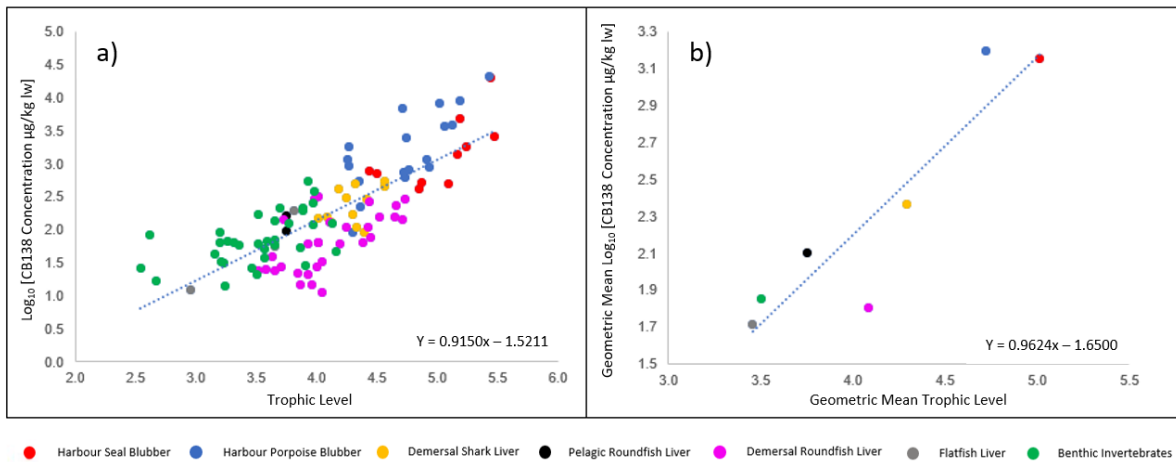


Figure S.6: (a) Relationship between trophic level and logarithmically transformed CB138 concentration ($\mu\text{g}/\text{kg lw}$) in harbour seal blubber (red), harbour porpoise blubber (blue), demersal shark liver (yellow), fish liver: demersal (pink), flatfish (grey), pelagic (black) and benthic invertebrate whole, muscle, brown meat, soft body (green) from the Irish Sea Biogeographic Region, Northern North Sea, Minches and Western Scotland and the Scottish Continental Shelf. (b) Relationship between geometric mean trophic level and logarithmically transformed geometric mean CB138 concentration ($\mu\text{g}/\text{kg lw}$) in harbour seal blubber (red), harbour porpoise blubber (blue), demersal shark liver (yellow), fish liver: demersal (pink), flatfish (grey), pelagic (black) and benthic invertebrate whole, muscle, brown meat, soft body (green) from the Irish Sea Biogeographic Region, Northern North Sea, Minches and Western Scotland and the Scottish Continental Shelf.

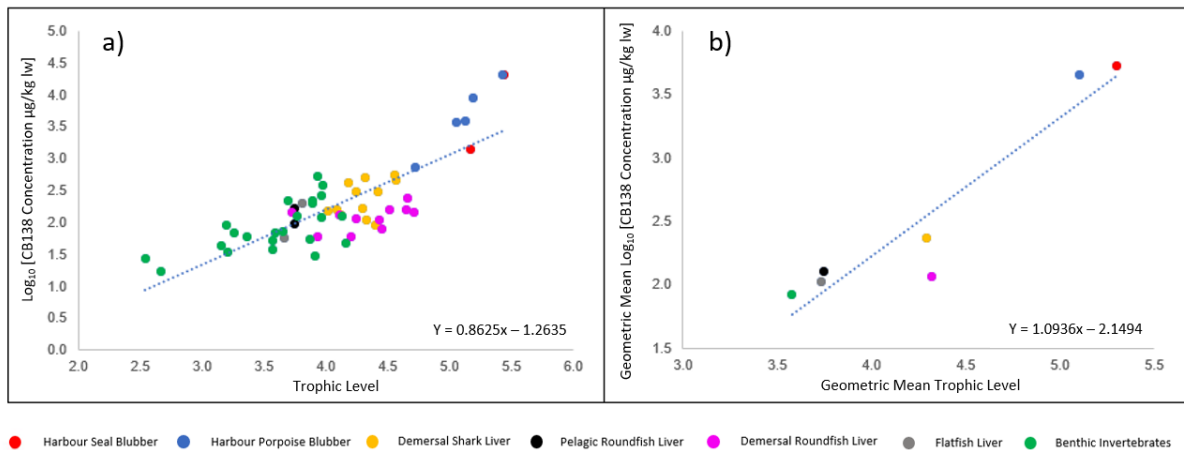


Figure S.7: (a) Relationship between trophic level and logarithmically transformed CB138 concentration ($\mu\text{g}/\text{kg lw}$) in harbour seal blubber (red), harbour porpoise blubber (blue), demersal shark liver (yellow), fish liver: demersal (pink), flatfish (grey), pelagic (black) and benthic invertebrate whole, muscle, brown meat, soft body (green) from the Irish Sea Biogeographic Region (b) Relationship between geometric mean trophic level and logarithmically transformed geometric mean CB138 concentration ($\mu\text{g}/\text{kg lw}$) in harbour seal blubber (red), harbour porpoise blubber (blue), demersal shark liver (yellow), fish liver: demersal (pink), flatfish (grey), pelagic (black) and benthic invertebrate whole, muscle, brown meat, soft body (green) from the Irish Sea Biogeographic Region.

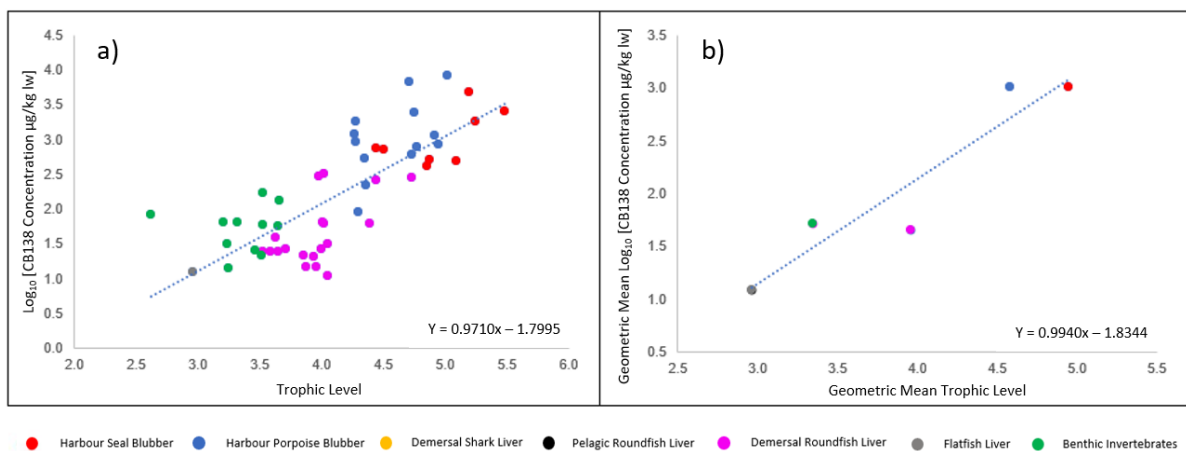


Figure S.8: (a) Relationship between trophic level and logarithmically transformed CB138 concentration ($\mu\text{g}/\text{kg lw}$) in harbour seal blubber (red), harbour porpoise blubber (blue), demersal roundfish liver (pink), flatfish liver (grey) and benthic invertebrate whole, muscle, brown meat, soft body (green) from the Northern North Sea, Minches and Western Scotland and Scottish Continental Shelf. (b) Relationship between geometric mean trophic level and logarithmically transformed geometric mean CB138 concentration ($\mu\text{g}/\text{kg lw}$) in harbour seal blubber (red), harbour porpoise blubber (blue), demersal shark liver (yellow), demersal roundfish liver (pink), flatfish liver (grey) and benthic invertebrate whole, muscle, brown meat, soft body (green) from the Northern North Sea, Minches and Western Scotland and Scottish Continental Shelf.

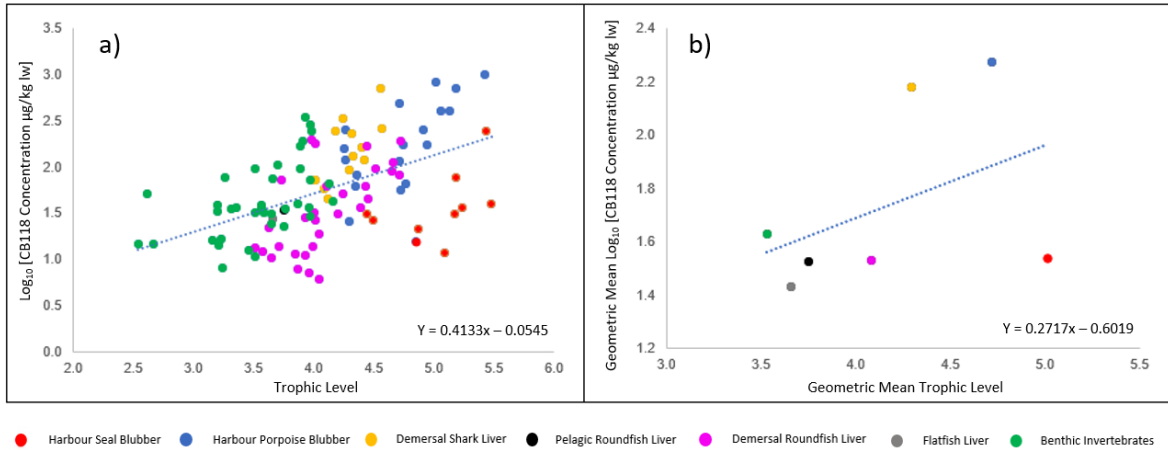


Figure S.9: (a) Relationship between trophic level and logarithmically transformed CB118 concentration ($\mu\text{g}/\text{kg lw}$) in harbour seal blubber (red), harbour porpoise blubber (blue), demersal shark liver (yellow), fish liver: demersal (pink), flatfish (grey), pelagic (black) and benthic invertebrate whole, muscle, brown meat, soft body (green) from the Irish Sea Biogeographic Region, Northern North Sea, Minches and Western Scotland and the Scottish Continental Shelf. (b) Relationship between geometric mean trophic level and logarithmically transformed geometric mean CB118 concentration ($\mu\text{g}/\text{kg lw}$) in harbour seal blubber (red), harbour porpoise blubber (blue), demersal shark liver (yellow), fish liver: demersal (pink), flatfish (grey), pelagic (black) and benthic invertebrate whole, muscle, brown meat, soft body (green) from the Irish Sea Biogeographic Region, Northern North Sea, Minches and Western Scotland and the Scottish Continental Shelf.

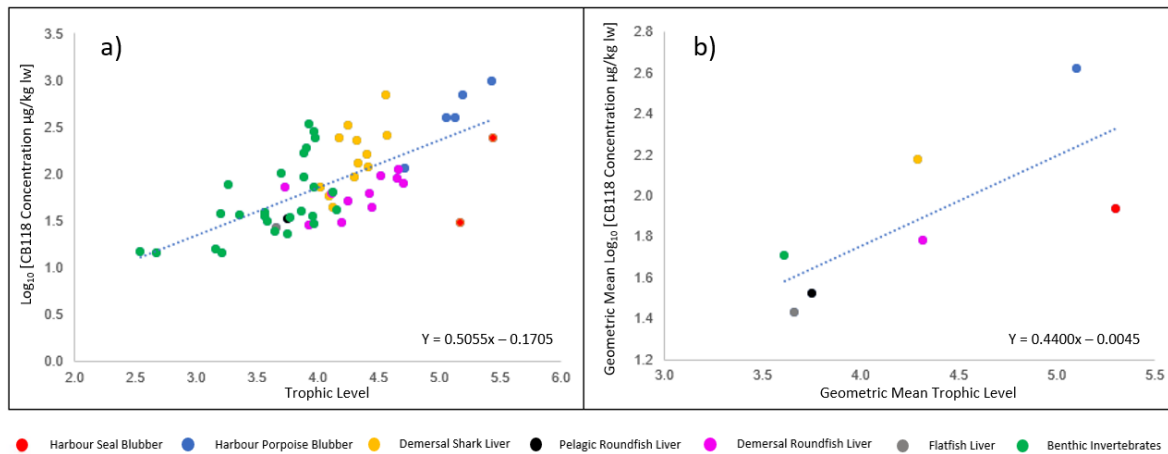


Figure S.10: (a) Relationship between trophic level and logarithmically transformed CB118 concentration ($\mu\text{g}/\text{kg lw}$) in harbour seal blubber (red), harbour porpoise blubber (blue), demersal shark liver (yellow), fish liver: demersal (pink), flatfish (grey), pelagic (black) and benthic invertebrate whole, muscle, brown meat, soft body (green) from the Irish Sea Biogeographic Region (b) Relationship between geometric mean trophic level and logarithmically transformed geometric mean CB118 concentration ($\mu\text{g}/\text{kg lw}$) in harbour seal blubber (red), harbour porpoise blubber (blue), demersal shark liver (yellow), fish liver: demersal (pink), flatfish (grey), pelagic (black) and benthic invertebrate whole, muscle, brown meat, soft body (green) from the Irish Sea Biogeographic Region.

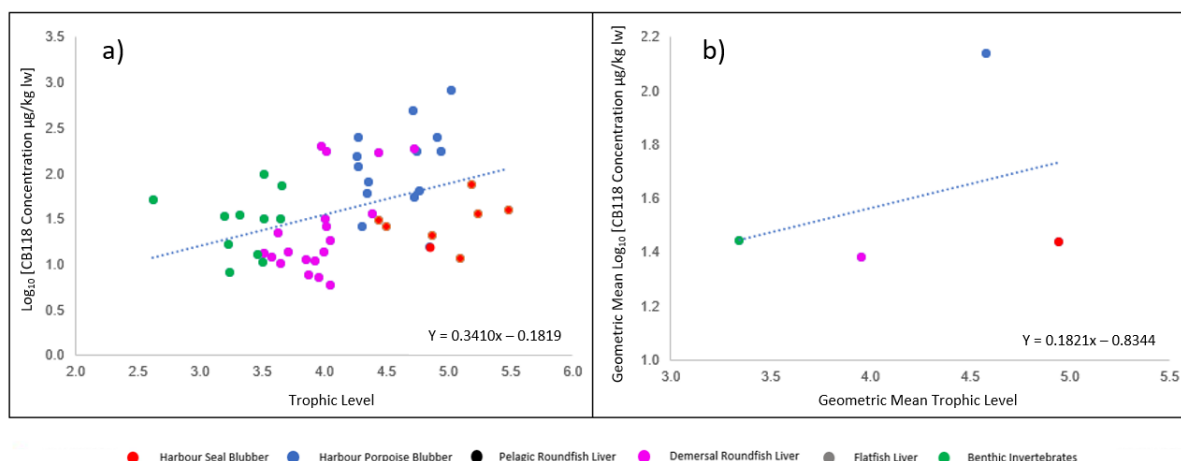


Figure S.11: (a) Relationship between trophic level and logarithmically transformed CB118 concentration ($\mu\text{g}/\text{kg lw}$) in harbour seal blubber (red), harbour porpoise blubber (blue), demersal roundfish liver (pink) and benthic invertebrate whole, muscle, brown meat, soft body (green) from the Northern North Sea, Minches and Western Scotland and Scottish Continental Shelf. (b) Relationship between geometric mean trophic level and logarithmically transformed geometric mean CB118 concentration ($\mu\text{g}/\text{kg lw}$) in harbour seal blubber (red), harbour porpoise blubber (blue), demersal shark liver (yellow), demersal roundfish liver (pink) and benthic invertebrate whole, muscle, brown meat, soft body (green) from the Northern North Sea, Minches and Western Scotland and Scottish Continental Shelf.

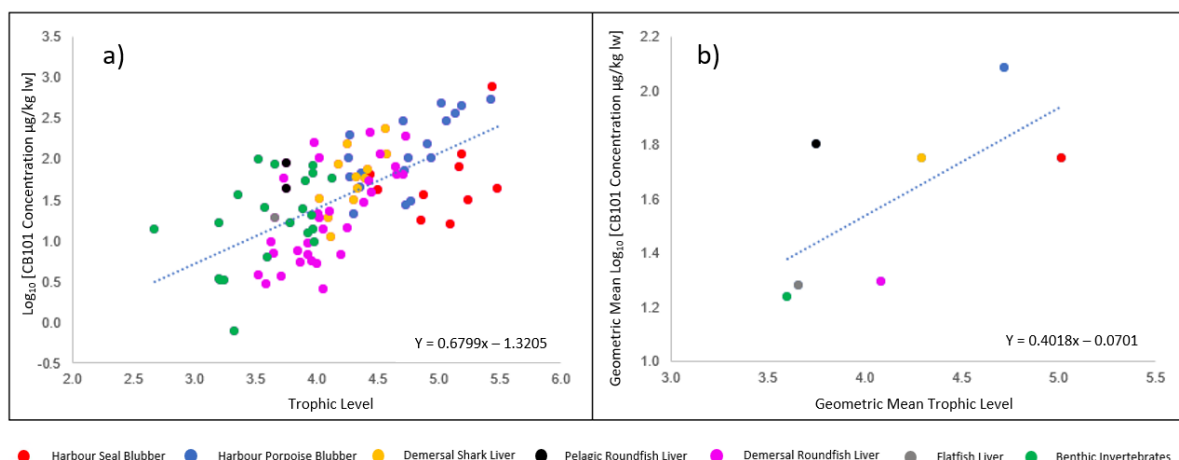


Figure S.12: (a) Relationship between trophic level and logarithmically transformed CB101 concentration ($\mu\text{g}/\text{kg lw}$) in harbour seal blubber (red), harbour porpoise blubber (blue), demersal shark liver (yellow), fish liver: demersal (pink), flatfish (grey), pelagic (black) and benthic invertebrate whole, muscle, brown meat, soft body (green) from the Irish Sea Biogeographic Region, Northern North Sea, Minches and Western Scotland and the Scottish Continental Shelf. (b) Relationship between geometric mean trophic level and logarithmically transformed geometric mean CB101 concentration ($\mu\text{g}/\text{kg lw}$) in harbour seal blubber (red), harbour porpoise blubber (blue), demersal shark liver (yellow), fish liver: demersal (pink), flatfish (grey), pelagic (black) and benthic invertebrate whole, muscle, brown meat, soft body (green) from the Irish Sea Biogeographic Region, Northern North Sea, Minches and Western Scotland and the Scottish Continental Shelf.

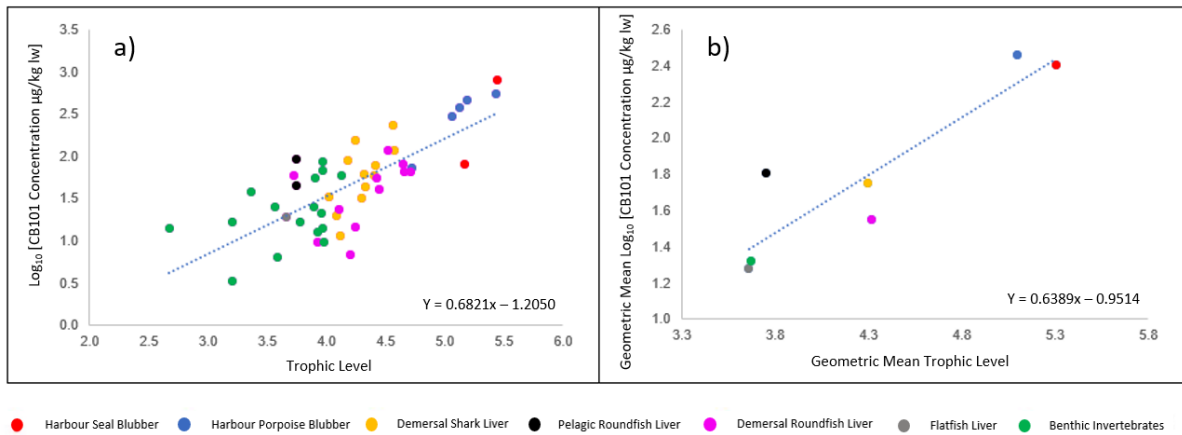


Figure S.13: (a) Relationship between trophic level and logarithmically transformed CB101 concentration ($\mu\text{g}/\text{kg}$ lw) in harbour seal blubber (red), harbour porpoise blubber (blue), demersal shark liver (yellow), fish liver: demersal (pink), flatfish (grey), pelagic (black) and benthic invertebrate whole, muscle, brown meat, soft body (green) from the Irish Sea Biogeographic Region (b) Relationship between geometric mean trophic level and logarithmically transformed geometric mean CB101 concentration ($\mu\text{g}/\text{kg}$ lw) in harbour seal blubber (red), harbour porpoise blubber (blue), demersal shark liver (yellow), fish liver: demersal (pink), flatfish (grey), pelagic (black) and benthic invertebrate whole, muscle, brown meat, soft body (green) from the Irish Sea Biogeographic Region.

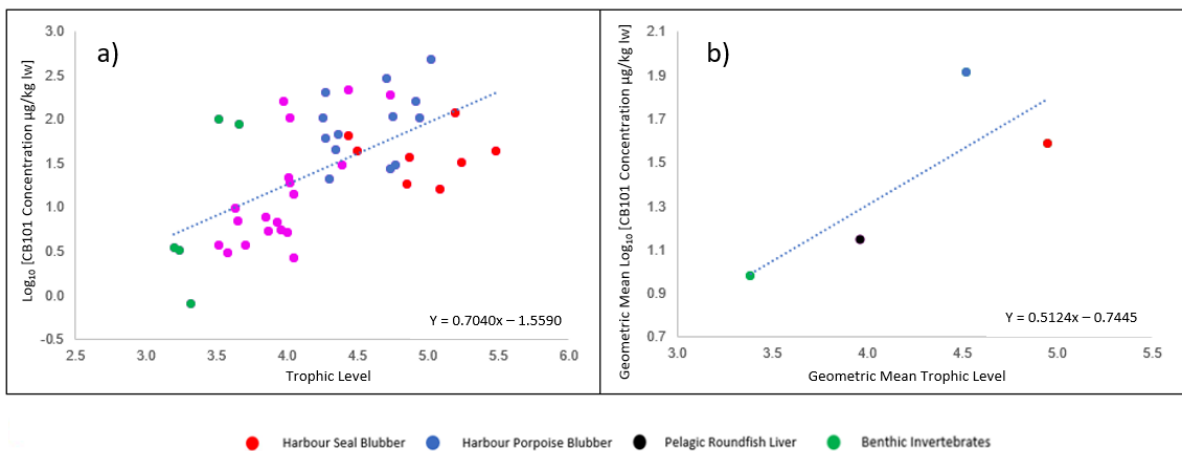


Figure S.14: (a) Relationship between trophic level and logarithmically transformed CB101 concentration ($\mu\text{g}/\text{kg}$ lw) in harbour seal blubber (red), harbour porpoise blubber (blue), demersal roundfish liver (pink), pelagic roundfish (black) and benthic invertebrate whole, muscle, brown meat, soft body (green) from the Northern North Sea, Minches and Western Scotland and Scottish Continental Shelf. (b) Relationship between geometric mean trophic level and logarithmically transformed geometric mean CB101 concentration ($\mu\text{g}/\text{kg}$ lw) in harbour seal blubber (red), harbour porpoise blubber (blue), demersal shark liver (yellow), demersal roundfish liver (pink), pelagic roundfish (black) and benthic invertebrate whole, muscle, brown meat, soft body (green) from the Northern North Sea, Minches and Western Scotland and Scottish Continental Shelf.

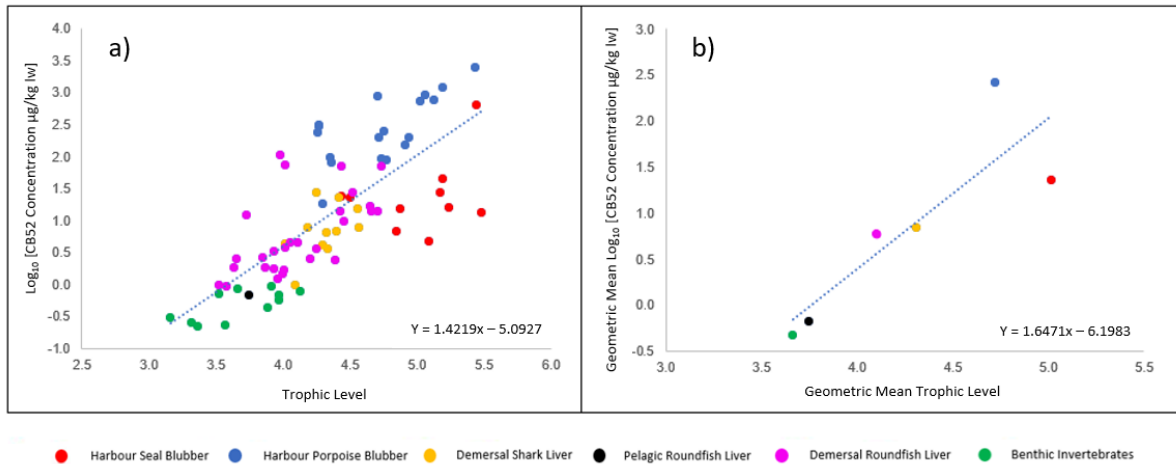


Figure S.15: (a) Relationship between trophic level and logarithmically transformed CB52 concentration ($\mu\text{g}/\text{kg lw}$) in harbour seal blubber (red), harbour porpoise blubber (blue), demersal shark liver (yellow), fish liver: demersal (pink), flatfish (grey), pelagic (black) and benthic invertebrate whole, brown meat, soft body (green) from the Irish Sea Biogeographic Region, Northern North Sea, Minches and Western Scotland and the Scottish Continental Shelf. (b) Relationship between geometric mean trophic level and logarithmically transformed geometric mean CB52 concentration ($\mu\text{g}/\text{kg lw}$) in harbour seal blubber (red), harbour porpoise blubber (blue), demersal shark liver (yellow), fish liver: demersal (pink), flatfish (grey), pelagic (black) and benthic invertebrate whole, brown meat, soft body (green) from the Irish Sea Biogeographic Region, Northern North Sea, Minches and Western Scotland and the Scottish Continental Shelf.

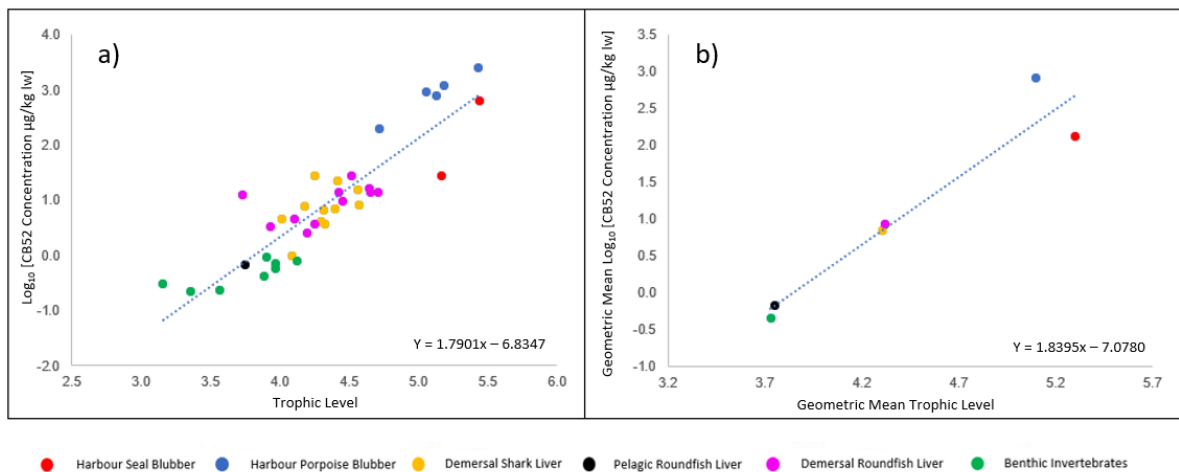


Figure S.16: (a) Relationship between trophic level and logarithmically transformed CB52 concentration ($\mu\text{g}/\text{kg lw}$) in harbour seal blubber (red), harbour porpoise blubber (blue), demersal shark liver (yellow), fish liver: demersal (pink), flatfish (grey), pelagic (black) and benthic invertebrate whole, brown meat, soft body (green) from the Irish Sea Biogeographic Region (b) Relationship between geometric mean trophic level and logarithmically transformed geometric mean CB52 concentration ($\mu\text{g}/\text{kg lw}$) in harbour seal blubber (red), harbour porpoise blubber (blue), demersal shark liver (yellow), fish liver: demersal (pink), flatfish (grey), pelagic (black) and benthic invertebrate whole, brown meat, soft body (green) from the Irish Sea Biogeographic Region.

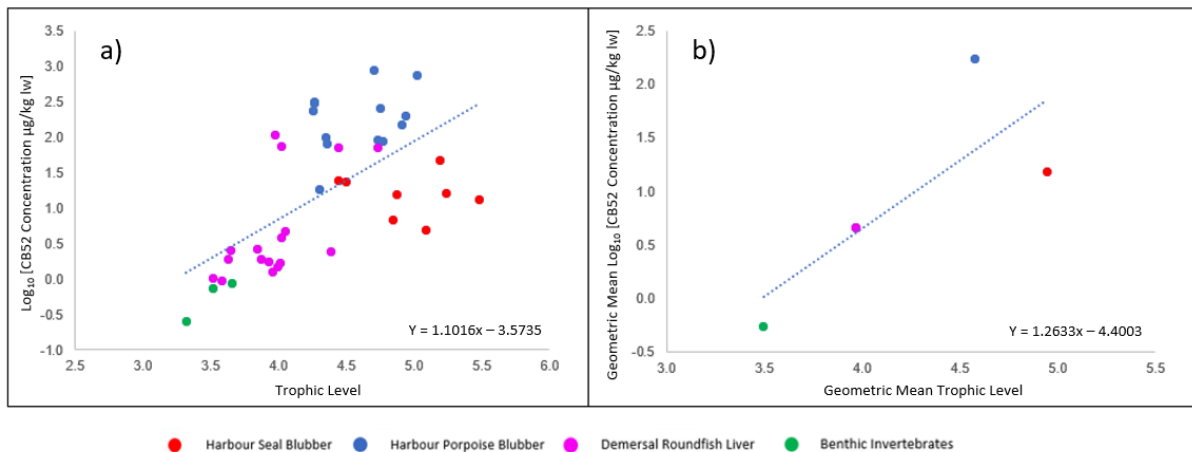


Figure S.17: (a) Relationship between trophic level and logarithmically transformed CB52 concentration ($\mu\text{g}/\text{kg lw}$) in harbour seal blubber (red), harbour porpoise blubber (blue), demersal roundfish liver (pink), and benthic invertebrate whole, brown meat, soft body (green) from the Northern North Sea, Minches and Western Scotland and Scottish Continental Shelf. (b) Relationship between geometric mean trophic level and logarithmically transformed geometric mean CB52 concentration ($\mu\text{g}/\text{kg lw}$) in harbour seal blubber (red), harbour porpoise blubber (blue), demersal roundfish liver (pink) and benthic invertebrate whole, brown meat, soft body (green) from the Northern North Sea, Minches and Western Scotland and Scottish Continental Shelf.

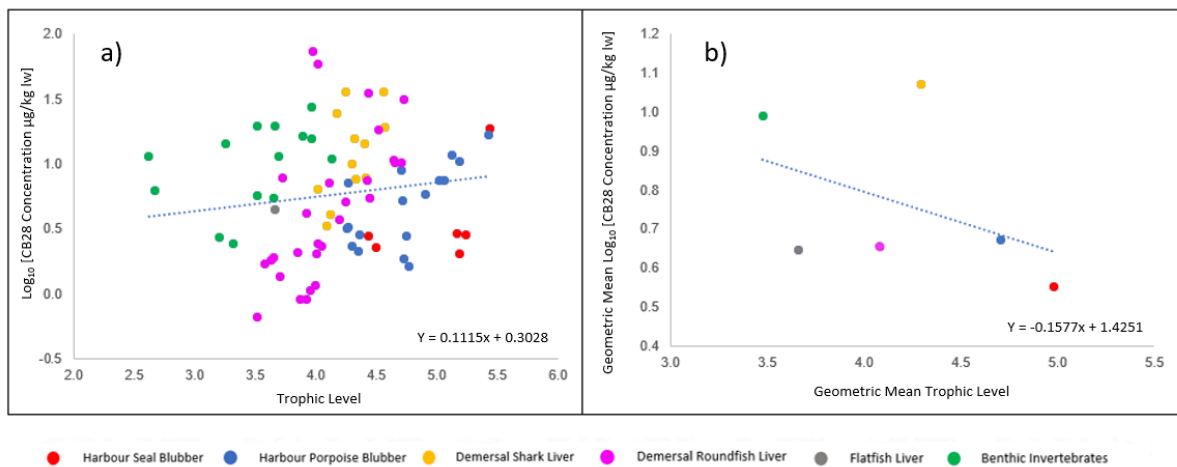


Figure S.18: (a) Relationship between trophic level and logarithmically transformed CB28 concentration ($\mu\text{g}/\text{kg lw}$) in harbour seal blubber (red), harbour porpoise blubber (blue), demersal shark liver (yellow), fish liver: demersal (pink), flatfish (grey) and benthic invertebrate whole, brown meat, soft body (green) from the Irish Sea Biogeographic Region, Northern North Sea, Minches and Western Scotland and the Scottish Continental Shelf. (b) Relationship between geometric mean trophic level and logarithmically transformed geometric mean CB28 concentration ($\mu\text{g}/\text{kg lw}$) in harbour seal blubber (red), harbour porpoise blubber (blue), demersal shark liver (yellow), fish liver: demersal (pink), flatfish (grey) and benthic invertebrate whole, brown meat, soft body (green) from the Irish Sea Biogeographic Region, Northern North Sea, Minches and Western Scotland and the Scottish Continental Shelf.

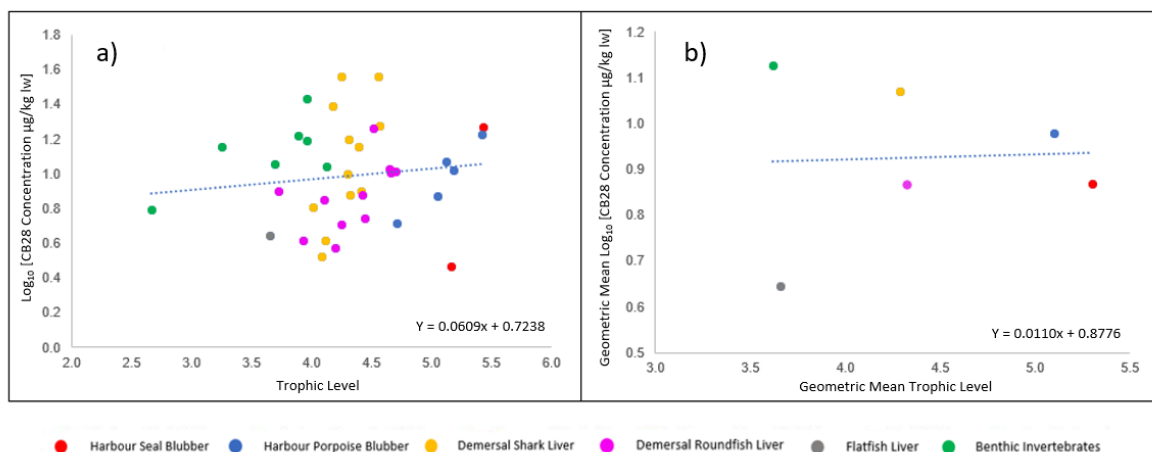


Figure S.19: (a) Relationship between trophic level and logarithmically transformed CB28 concentration ($\mu\text{g}/\text{kg lw}$) in harbour seal blubber (red), harbour porpoise blubber (blue), demersal shark liver (yellow), fish liver: demersal (pink), flatfish (grey) and benthic invertebrate whole, brown meat, soft body (green) from the Irish Sea Biogeographic Region (b) Relationship between geometric mean trophic level and logarithmically transformed geometric mean CB28 concentration ($\mu\text{g}/\text{kg lw}$) in harbour seal blubber (red), harbour porpoise blubber (blue), demersal shark liver (yellow), fish liver: demersal (pink), flatfish (grey) and benthic invertebrate whole, brown meat, soft body (green) from the Irish Sea Biogeographic Region.

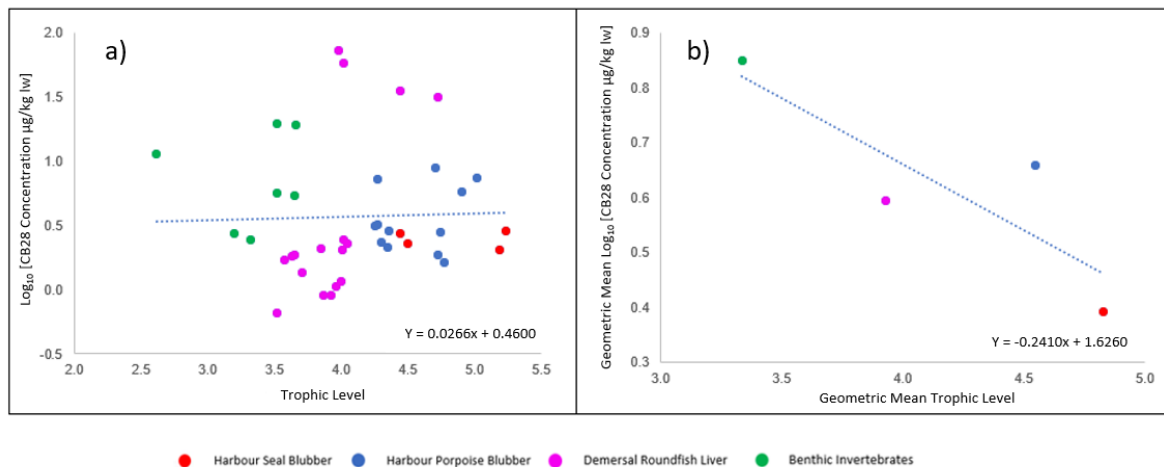


Figure S.20: (a) Relationship between trophic level and logarithmically transformed CB28 concentration ($\mu\text{g}/\text{kg lw}$) in harbour seal blubber (red), harbour porpoise blubber (blue), demersal roundfish liver (pink), and benthic invertebrate whole, brown meat, soft body (green) from the Northern North Sea, Minches and Western Scotland and Scottish Continental Shelf. (b) Relationship between geometric mean trophic level and logarithmically transformed geometric mean CB28 concentration ($\mu\text{g}/\text{kg lw}$) in harbour seal blubber (red), harbour porpoise blubber (blue), demersal roundfish liver (pink) and benthic invertebrate whole, brown meat, soft body (green) from the Northern North Sea, Minches and Western Scotland and Scottish Continental Shelf.

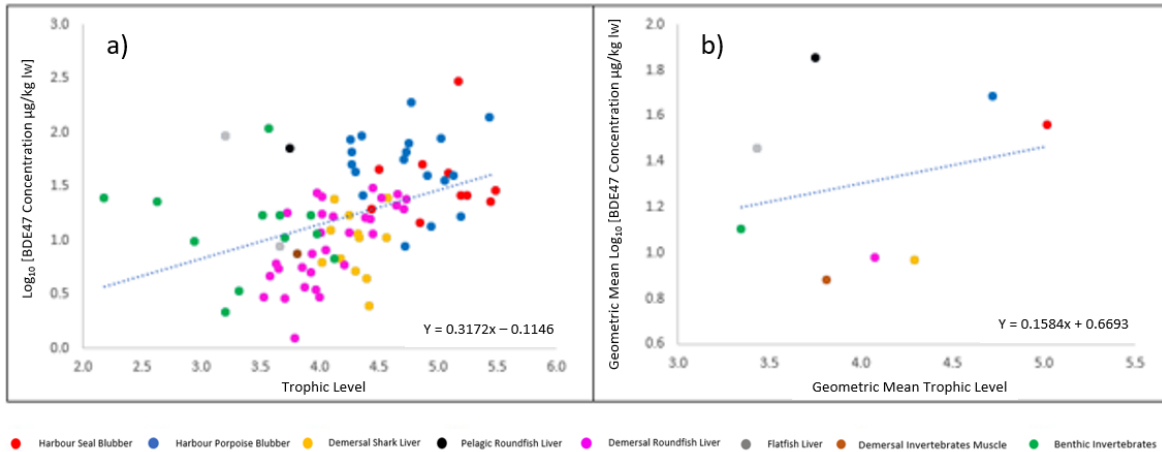


Figure S.21: (a) Relationship between trophic level and logarithmically transformed BDE47 concentration ($\mu\text{g}/\text{kg}$ lw) in harbour seal blubber (red), harbour porpoise blubber (blue), demersal shark liver (yellow), fish liver: demersal (pink), flatfish (grey), pelagic (black), demersal invertebrates (brown) and benthic invertebrate whole, brown meat, soft body (green) from the Irish Sea Biogeographic Region, Northern North Sea, Minches and Western Scotland and the Scottish Continental Shelf. **(b)** Relationship between geometric mean trophic level and logarithmically transformed geometric mean BDE47 concentration ($\mu\text{g}/\text{kg}$ lw) in harbour seal blubber (red), harbour porpoise blubber (blue), demersal shark liver (yellow), fish liver: demersal (pink), flatfish (grey), pelagic (black), demersal invertebrates (brown) and benthic invertebrate whole, brown meat, soft body (green) from the Irish Sea Biogeographic Region, Northern North Sea, Minches and Western Scotland and the Scottish Continental Shelf.

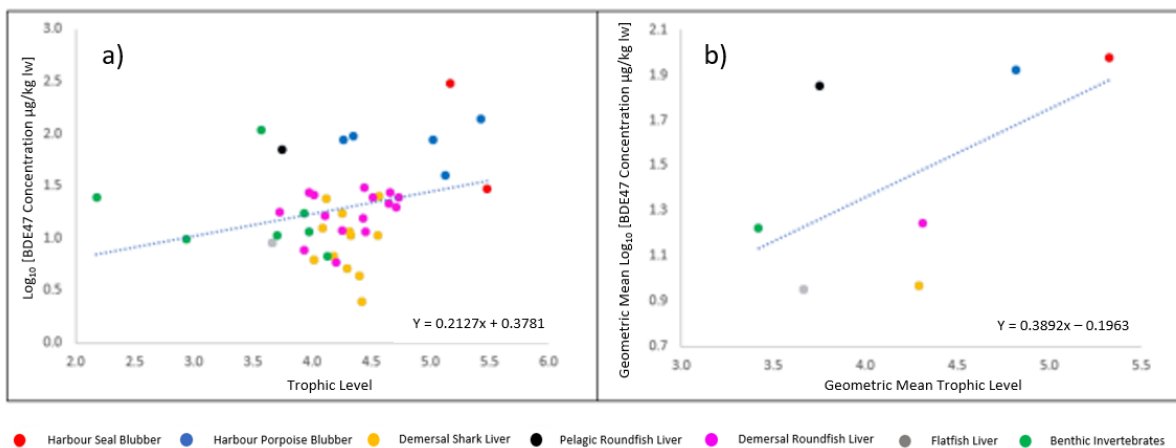


Figure S.22: (a) Relationship between trophic level and logarithmically transformed BDE47 concentration ($\mu\text{g}/\text{kg}$ lw) in harbour seal blubber (red), harbour porpoise blubber (blue), demersal shark liver (yellow), fish liver: demersal (pink), flatfish (grey), pelagic (black) and benthic invertebrate whole, brown meat, soft body (green) from the Irish Sea Biogeographic Region **(b)** Relationship between geometric mean trophic level and logarithmically transformed geometric mean BDE47 concentration ($\mu\text{g}/\text{kg}$ lw) in harbour seal blubber (red), harbour porpoise blubber (blue), demersal shark liver (yellow), fish liver: demersal (pink), flatfish (grey), pelagic (black) and benthic invertebrate whole, brown meat, soft body (green) from the Irish Sea Biogeographic Region.

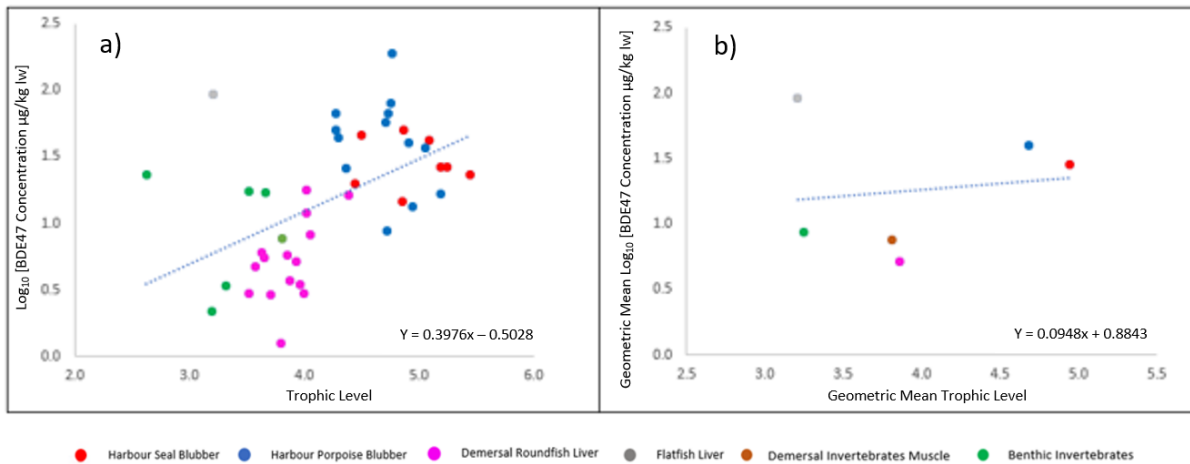


Figure S.23: (a) Relationship between trophic level and logarithmically transformed BDE47 concentration ($\mu\text{g}/\text{kg lw}$) in harbour seal blubber (red), harbour porpoise blubber (blue), fish liver: demersal (pink), flatfish (grey), demersal invertebrates and benthic invertebrate whole, brown meat, soft body (green) from the Northern North Sea, Minches and Western Scotland and Scottish Continental Shelf. **(b)** Relationship between geometric mean trophic level and logarithmically transformed geometric mean BDE47 concentration ($\mu\text{g}/\text{kg lw}$) in harbour seal blubber (red), harbour porpoise blubber (blue), fish liver: demersal (pink), flatfish (grey) and benthic invertebrate whole, brown meat, soft body (green) from the Northern North Sea, Minches and Western Scotland and Scottish Continental Shelf.