

Supplementary Material

Mesopelagic fishes are important prey for a diversity of predators

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Supplementary Figures and Tables

1.1 Supplementary Tables

Supplementary Table 1: A list of all mesopelagic prey taxa from the CCTD database with information on available depth distributions.

Fam ily	Scientific Name	Common Name	Depth category	Min Depth	Max Depth	Reference	Comments:
Anotopteridae	<i>Anotopterus nikparini</i>	North Pacific daggertooth	mesopelagic	0	2750	Miller & Lea 1972, Fishbase	usually 0-700m (Fishbase). Miller & Lea: only species in guide for Anotopteridae family, <i>Anotopterus pharao</i> listed as “mesopelagic.” Since <i>pharao</i> does not appear to be in the Pacific, likely <i>nikparini</i> ? Either way, based on the “usual” depth distribution (0-700m), considering this spp to be mesopelagic.
Bathylagidae	<i>Bathylagidae</i>	Family: Deep- sea smelt	mesopelagic , upper bathypelagic			Priede 2017	Priede: “The Bathylagidae are planktivorous fishes of the mesopelagic or upper bathypelagic.”
	<i>Bathylagoides wesethi</i>	Snubnose blacksmelt	mesopelagic	25	1130	fishbase	Miller & Lea 1972: “Mesopelagic, from approximately 130- 3281 ft.”

	<i>Bathylagus pacificus</i>	Slender blacksmelt	mesopelagic	600	7700	fishbase	usually 600-800 (Fishbase). Miller & Lea: "Mesopelagic, 490 to over 3280 ft."
	<i>Leuroglossus</i>	Genus: Smoothtongue	mesopelagic , upper bathypelagic			Priede 2017	Priede: Because the family Bathylagidae described as "mesopelagic or upper bathypelagic," we use that broad description for this genus.
	<i>Leuroglossus schmidtii</i>	Northern smoothtongue	mesopelagic , bathypelagic	394	1800	fishbase	
	<i>Leuroglossus stilbius</i>	California smoothtongue	mesopelagic	25	850	fishbase	Miller & Lea: "Mesopelagic, from near surface to 2264 ft. Abundant in offshore waters"
	<i>Lipolagus ochotensis</i>	Eared blacksmelt	mesopelagic , bathypelagic	930	6100	fishbase	
	<i>Pseudobathylagus milleri</i>	Stout blacksmelt	mesopelagic , bathypelagic	550	6600	fishbase	
Gonostomatidae	<i>Gonostomatidae</i>	Family: Bristlemouths	mesopelagic , bathypelagic			Eschmeyer 1983	Eschmeyer: "Found in deep midwaters of all temperate and tropical seas." Priede: "widespread occurrence down to an average maximum depth of over 2500m" also lists Cyclothone species depths between (300 -2700m), so they cover mesopelagic depths and deeper
Melamphaidae	<i>Melamphaes</i>	Genus: Bigscales	mesopelagic , bathypelagic			Fishbase	Eschmeyer: Family Melamphaidae: "Adults are usually bathypelagic, young shallower." Miller & Lea: the two Melamphaidae species listed were not from this family, but both mesopelagic. Because the one representative species from this genus in our database is Melamphaes lugubris with depth usually 200-500m in Fishbase, going with mesopelagic + bathypelagic
	<i>Melamphaes lugubris</i>	Highsnout melamphid	mesopelagic	50	3400	fishbase	usually 200-500m (Fishbase)
	<i>Poromitra crassiceps</i>	Crested bigscale	mesopelagic , bathypelagic	164	2730	fishbase	usually 750-2730m (Fishbase)

	<i>Scopelogadus bispinosus</i>	Twospine bigscale	mesopelagic , bathypelagic	200	4000	fishbase	
Microstomatidae	<i>Nansenia</i>	Genus: Pencil smelts	mesopelagic			Priede 2017	Priede 2017: "Family: The Microstomatidae are slender-bodies silvery mesopelagic fishes" Based on literature reference: Poulsen 2015 Zootaxa "They are all small-mouthed elongated fishes separated primarily on continuous characters and usually found in the mesopelagic realm between 200 and 1000m". While it is possible that other depths occur, because of this general genus description and the evidence that both representative spp in the database are mesopelagic, I am going to identify as mesopelagic here.
	<i>Nansenia candida</i>	Bluethroat argentine	mesopelagic , bathypelagic	83	1800	fishbase	
	<i>Nansenia crassa</i>	Stout argentine	mesopelagic	0	865	fishbase	Fishbase depth category originally listed as "benthopelagic" (which feels like a contradiction). But based on other species in this group and the general description of the family as "mesopelagic" in Priede, using category "mesopelagic" here.
Myctophidae	<i>Ceratoscopelus townsendi</i>	Dogtooth lampfish	mesopelagic	100	500	fishbase	
	<i>Diaphus theta</i>	California headlightfish	mesopelagic	10	3400	fishbase	usually 10-400m (Fishbase). Miller & Lea 1972: "Mesopelagic, surface to 2600 ft, usually below 600 ft"
	<i>Diogenichthys laternatus</i>	Diogenes lanternfish	mesopelagic , bathypelagic	0	2091	fishbase	

	<i>Lampadena urophaos</i>	Sunbeam lampfish	mesopelagic	50	1000	fishbase	Listed as "pelagic-oceanic" in fishbase but from the family Myctophidae and in mesopelagic depth range, so identifying as mesopelagic here
	<i>Lampanyctus</i>	Genus: Lanternfish	mesopelagic , bathypelagic			Miller & Lea 1972, Fishbase	The one representative species in Miller and Lea, <i>Lampanyctus ritteri</i> , described as "Mesopelagic, from 165 to 3600ft", so includes mesopelagic, and because range of <i>Lampanyctus jordani</i> from Fishbase extends to 3400m, also including bathypelagic.
	<i>Lampanyctus jordani</i>	Brokenline lanternfish	mesopelagic , bathypelagic	588	3400	Fishbase	
	<i>Lampanyctus ritteri</i>	Broadfin lampfish	mesopelagic	20	1095	Fishbase	Miller & Lea: "Mesopelagic, from 165 to 3600 ft"
	<i>Myctophidae</i>	Family: Lanternfishes	mesopelagic, and bathypelagic			Priede 2017	Priede: "They are small fishes, mean maximum length 92cm and are dominant in epipelagic, mesopelagic and bathypelagic environments." Eschemeyer 1983 Family description: "Lanternfishes occur in all oceans. Nearly all of these are oceanic, living at moderate to deep depths during the day and migrating to or near surface at night."
	<i>Myctophum nitidulum</i>	Pearly lanternfish	mesopelagic , bathypelagic	412	1537	fishbase	
	<i>Nannobranchium regale</i>	Pinpoint lampfish	mesopelagic , bathypelagic	772	3400	fishbase	usually 500-?m (Fishbase)
	<i>Notoscopelus resplendens</i>	Patchwork lampfish	mesopelagic , bathypelagic	777	2121	fishbase	
	<i>Parvilux ingens</i>	Giant lampfish	mesopelagic	100	500	fishbase	Listed as pelagic-oceanic in Fishbase .

	<i>Protomyctophum</i>	Genus: Lanternfishes	mesopelagic			Priede 2017	Priede defines the family Myctophidae as "epipelagic, mesopelagic and bathypelagic." This genus is mentioned: "...three species to the Pacific Ocean. P. thompsoni and P. crockeri in the North Pacific and P. beckeri in the East Central Pacific. P. Crockeri is a dominant species at the surface at night where it occurs in the Pacific Ocean." The one spp from Protomyctophum in Miller and Lea "Mesopelagic, to 1640 ft, rarely at surface" so choosing mesopelagic based on representative species.
	<i>Protomyctophum crockeri</i>	California flashlightfish	mesopelagic	100	500	fishbase	listed as pelagic-oceanic in fishbase, but Myctophid and depth range mesopelagic. From Miller and Lea "Mesopelagic, to 1640ft, rarely at surface"
	<i>Stenobrachius</i>	Genus: Lanternfishes	mesopelagic , bathypelagic			Priede 2017	Based on family (Myctophidae) considered to be mesopelagic. From Priede: ("epipelagic, mesopelagic and bathypelagic"). The one spp from genus Stenobrachius in Miller and Lea: "Mesopelagic, from near surface to 9500 ft"
	<i>Stenobrachius leucopsarus</i>	Northern lampfish	mesopelagic , bathypelagic	31	3400	fishbase	usually 31-1189m (Fishbase)
	<i>Symbolophorus californiensis</i>	Bigfin lanternfish	mesopelagic , bathypelagic	557	1497	fishbase	
	<i>Tarletonbeania crenularis</i>	Blue lanternfish	mesopelagic	0	710	fishbase	Miller and Lea: "Mesopelagic, from surface at night to 2730 ft"
	<i>Triphoturus mexicanus</i>	Mexican lampfish	mesopelagic	46	933	Miller & Lea 1972	Miller and Lea: "Mesopelagic, 150 to below 3060 ft." (converted to m for reference at left). Fishbase lists depth range: 25m to NA.
Nemichthyidae	<i>Nemichthyidae</i>	Family: Snipe eels	mesopelagic and bathypelagic			Priede 2017	Priede: "...highly specialized mesopelagic and bathypelagic eels (depths down to 4580m)" From Wikipedia: "Pelagic fishes found in every ocean, mostly at depths of 300-600m but sometimes as deep as 4000m." Eschemeyer: "Delicate deepsea eels...." This family defined very clearly as mesopelagic in the article: Miller et al 2014 " Vertical body orientation by a snipe eel..."

	<i>Nemichthys scolopaceus</i>	Slender snipe eel	mesopelagic , bathypelagic	100	4337	fishbase	usually 100-1000m. (Fishbase) Miller & Lea "Depth 300 to 6000 ft."
Opisthoproctidae	<i>Macropinna microstoma</i>	Barreleye	mesopelagic , bathypelagic	16	1267	fishbase	Eschemeyer: "Family: great depths in midwaters--usually deeper than 500ft (152 m)". Barreleye <i>Macropinna microstoma</i> "a deep pelagic species; Bering Sea to Baja at about 325-2925 ft (99-891m)". Miller & Lea: "Depth 324-2940 ft"
Paralepididae	<i>Arctozenus risso</i>	Spotted barracudina	mesopelagic , bathypelagic	0	2200	fishbase	Priede: "Arctozenus risso..widespread circumglobal species.. generally found at 200-1000m and associated with continental, island and seamount slopes" From lit (Devine and Guelpen 2020), caught in midwater trawl and mention they inhabit the deep pelagic waters
	<i>Lestidiops ringens</i>	Slender barracudina	mesopelagic , bathypelagic	0	3290	fishbase	Miller & Lea: "Mesopelagic." Eschemeyer: "from near surface to bathypelagic depths"
	<i>Magnisudis atlantica</i>	Duckbill barracudina	mesopelagic , bathypelagic	0	4750	fishbase	Listed as pelagic-oceanic, but depth range more consistent with mesopelagic+ bathypelagic. Based on wide depth category from fishbase a little unclear, but Il'inskiy, Balanov, Ivanov (Rare mesopelagic fishes...) consider this spp mesopealgic and so I will here. https://www.infona.pl/resource/bwmeta1.element.elsevier-7b28d715-9664-3d7f-ae12-9de3f4f5d356

	<i>Notolepis</i>	Genus: Barracudinas	mesopelagic , bathypelagic			Harry 1953	From literature, it appears this is a poorly understood taxa, but work by Harry 1953 "Studies on the bathypelagic fishes of the family Paralepididae" collected specimens (ranging from juveniles to adults) off the coast of San Diego from ~ 98m to 2743m, so going to define as mesopeaglic and bathypelagic https://www.jstor.org/stable/4064473
	<i>Paralepididae</i>	Family: Barracudinas	mesopelagic , bathypelagic			Priede 2017	Priede: Family Paralepididae "...deep pelagic habitat (mean maximum depth 1322 m)." Eschemeyer: Family: Paralepididae "Barracudinas occur in all temperate and tropical seas, in midwater, occasionally at surface."
	<i>Stemonosudis macrura</i>	Stemonosudis macrura	mesopelagic	18	330	fishbase	
Platyroctidae	<i>Sagamichthys abei</i>	Shining tubeshoulder	mesopelagic , bathypelagic	37	1500	fishbase	

Scopelarchidae	<i>Benthalbella</i>	Genus: Pearleyes	mesopelagic	500	1000	Eschmeyer 1983	Eschmeyer: <i>Benthalbella dentata</i> description: "Usually at 1640-3280 ft (500-1000m)" Since this is the one spp from this genus in our database, going to use same depth category, and since the family Scopelarchidae described as mesopelagic, consistent with description.
	<i>Benthalbella dentata</i>	Northern pearleye	mesopelagic	500	1000	Eshemeyer	usually 500-1000m (Fishbase). Miller &Lea: "Mesopelagic"
	<i>Rosenblattichthys volucris</i>	Chubby pearleye	mesopelagic			fishbase	Fishbase, Biology section: "a mesopelagic species." Consistent with family description
	<i>Scopelarchidae</i>	Family: Pearleyes	mesopelagic			Eshemeyer 1983	Eshemeyer: "Family Scopelarchidae: Adults are presumed to be mostly mesopelagic and bathypelagic- most live at about 1640-3280ft (500-1000m), but some are found shallower and at night possibly range near the surface" Fishbase: "Adults usually found in depths of 500-1000m; larvae usually occurring in 100-200m"
Sternoptychidae	<i>Argyropelecus affinis</i>	Pacific hatchet fish	mesopelagic	1	3872	fishbase	usually 1-600m (Fishbase). Oceanodromous. From Miller &Lea: "Mesopelagic, normally from 330-2000 ft"
Stomiidae	<i>Chauliodontinae</i>	Subfamily: Barbeled dragonfishes	mesopelagic , bathypelagic			Priede 2017	Priede: Family Stomiidae: "mean maximum depth 2303m...inhabit the mesopelagic and bathypelagic zones of the oceans" Based on this more general description of the family, using mesopelagic and bathypelagic as there isn't much information available for this specific Subfamily

	<i>Chauliodus macouni</i>	Pacific Viperfish	mesopelagic , bathypelagic	25	4390	fishbase	Miller & Lea: "Depth 240-5000 ft"
	<i>Idiacanthus</i>	Genus: Barbeled dragonfishes	mesopelagic, bathypelagic			Eschmeyer 1983	Eschmeyer: "Deepsea fishes-- near the surface to about 6562 ft (2000m)". Priede: "Males are bathypelagic, unable to feed and presumed to be short-lived, whereas the females are active predators making extensive vertical migrations in pursuit of prey."
	<i>Stomiidae</i>	Family: Barbeled dragonfishes	mesopelagic and bathypelagic			Priede 2017	Priede: Stomiidae "family of 287 species of specialized deep-sea predatory fishes, mean maximum length 18 cm, mean maximum depth 2303m that inhabit the mesopelagic and bathypelagic zones of the oceans"
	<i>Tactostoma</i>	Genus: Barbeled dragonfishes	mesopelagic , bathypelagic			fishbase	Miller & Lea One species listed in our area, Tactostoma Macropus "Depth 102 to 1800 ft"
	<i>Tactostoma macropus</i>	Longfin dragonfish	mesopelagic , bathypelagic	30	2000	fishbase	Miller & Lea: "Depth 102 to 1800 ft"
Tetragonuridae	<i>Tetragonurus cuvieri</i>	Smalleye squaretail	mesopelagic	1	800	Fishbase	Miller & Lea "Depth, surface to 120 ft, but usually in greater depths well offshore. " Janssen and Harbison 1981: "Young Tetragonurus live in the upper waters, whereas adults are mesopelagic or bathypelagic and migrate to the surface waters at night (Fitch, 1951, Grey 1955, Tononaka 1957, Ahlstrom 1969). Eschmeyer: "Oceanic fishes of tropical to temperate seas."

Trichiuridae	<i>Lepidopus caudatus</i>	Silver scabbardfish	mesopelagic	42	620	fishbase	Usually 100-300m. Eastern Atlantic distribution? Robertson 1979 recorded them spawning off coast of New Zealand, so apparently also in Pacific? Fishbase benthopelagic: living near the bottom as well as in midwaters or near the surface" From Demestre et al 1993: "mesopelagic species; it occurs along the shelf and slope down to 450m in the Catalan Sea"
Zoarcidae	<i>Lycodapus fierasfer</i>	Blackmouth eelpout	mesopelagic , bathypelagic	50	2212	fishbase	Miller& Lea: " Depth 162 to 6486 ft" Based on study by Sinclair and Stabeno 2002 (Dee-sea Reesearch II) <i>Mesopelagic nekton and associated physics of the southeastern Bering Sea</i> , in which they did a series of trawls at mesopelagic depths and this spp was listed as catch at 1000m.
	<i>Lycodapus mandibularis</i>	Pallid eelpout	mesopelagic	100	1370	fishbase	Eschemeyer: "Habitat: midwater, from near surface at night to about 2625 ft (800m) during the day; sometimes captured in bottom trawls but definitely a pelagic species". Love 2011: "This is a midwater, mesopelagic species found in 96-1237m. Some individuals migrate vertically into shallower waters at night. " Fishbase: "Occurs in midwater, from near surface at night to about 800m during the day" Miller & Lea "Depth 192 to 1758 ft"
	<i>Melanostigma pammelas</i>	Midwater eelpout	mesopelagic , bathypelagic	96	2195	Miller & Lea 1972	Fishbase: (450m-?) Usually 699-?m Eschemeyer: "Pelagic in deep coastal waters at 314-3937 ft (96-1200m) or deeper" Miller & Lea: "Depth 314 to 7200 ft. The only pelagic California eelpout"

Supplementary Table 2: Predator taxa that had a FO of mesopelagic fish 15% (0.15) or greater

Predator scientific name	Total # of diet samples	# samples with meso	FO meso
<i>Lissodelphis borealis</i>	56	50	0.89
<i>Delphinus delphis delphis</i>	259	222	0.86
<i>Gonatidae</i>	4	3	0.75
<i>Histioteuthidae</i>	47	26	0.55
<i>Dosidicus gigas</i>	1136	593	0.52
<i>Sebastes brevispinis</i>	25	13	0.52
<i>Alopias superciliosus</i>	45	23	0.51
<i>Xiphias gladius</i>	292	145	0.5
<i>Lagenorhynchus obliquoidens</i>	25	12	0.48
<i>Onychoteuthidae</i>	8	3	0.38
<i>Delphinus delphis bairdii</i>	49	14	0.29
<i>Sebastes pinniger</i>	69	13	0.19
<i>Thunnus alalunga</i>	750	142	0.19
<i>Bathyraxa kincaidii</i>	125	20	0.16
<i>Sebastes alutus</i>	133	21	0.16
<i>Thunnus oreintalis</i>	721	116	0.16
<i>Callorhinus ursinus</i>	351	53	0.15

Supplementary Table 3. Comparison of frequency of occurrence (FO) for mesopelagic fishes and CPS fishes, for taxa that had a greater FO of mesopelagic fish compared to CPS fish

Predator taxa	Total # diet samples	# meso samples	FO meso	# cps fish samples	FO cps fish
<i>Lissodelphis borealis</i>	56	50	0.893	2	0.036
<i>Delphinus delphis delphis</i>	259	222	0.857	47	0.181
<i>Gonatidae</i>	4	3	0.75	0	0
<i>Histioteuthidae</i>	47	26	0.553	0	0
<i>Dosidicus gigas</i>	1136	593	0.522	218	0.192
<i>Sebastes brevispinis</i>	25	13	0.52	8	0.32
<i>Alopias superciliosus</i>	45	23	0.511	13	0.289
<i>Xiphias gladius</i>	292	145	0.497	60	0.205
<i>Lagenorhynchus obliquoidens</i>	25	12	0.48	10	0.4
<i>Onychoteuthidae</i>	8	3	0.375	0	0
<i>Sebastes pinniger</i>	69	13	0.188	1	0.014
<i>Bathyraxa kincaidii</i>	125	20	0.16	0	0
<i>Sebastes alutus</i>	133	21	0.158	0	0
<i>Beringraxa rhina</i>	544	46	0.085	1	0.002

<i>Anoplopoma fimbria</i>	2619	74	0.028	60	0.023
<i>Sebastolobus altivelis</i>	1698	27	0.016	0	0
<i>Albatrossia pectoralis</i>	205	3	0.015	0	0
<i>Beringraja inornata</i>	263	3	0.011	2	0.008
<i>Sebastolobus alascanus</i>	2082	18	0.009	1	0
<i>Oncorhynchus mykiss</i>	1022	3	0.003	2	0.002
<i>Microstomus pacificus</i>	2408	1	0	0	0

Supplementary Table 4. A breakdown of the mesopelagic fish taxa consumed by predator taxa

Predator scientific name (# of mesopelagic prey taxa)	Prey scientific name	# unique predator samples per taxon
<i>Albatrossia pectoralis</i> (2)	Bathylagidae	2
	Myctophidae	1
<i>Alopias superciliosus</i> (3)	Lestidiops ringens	1
	Magnisudis atlantica	12
	Paralepididae	11
<i>Alopias vulpinus</i> (2)	Magnisudis atlantica	16
	Paralepididae	2
<i>Anoplopoma fimbria</i> (13)	Bathylagidae	11
	Bathylagus pacificus	4
	Chauliodus macouni	10
	Lampanyctus ritteri	4
	Leuroglossus	1
	Leuroglossus schmidti	1
	Myctophidae	32
	Nemichthyidae	1
	Nemichthys scolopaceus	1
	Sagamichthys abei	1
	Stenobrachius leucopsarus	3
	Tactostoma macropus	2
	Tarletonbeania crenularis	5
<i>Atheresthes stomias</i> (2)	Chauliodus macouni	1
	Myctophidae	3
<i>Bathyraja kincaidii</i> (1)	Myctophidae	20
<i>Beringraja binoculata</i> (1)	Myctophidae	1

<i>Beringraja inornate</i> (1)	Myctophidae	3
<i>Beringraja rhina</i> (1)	Myctophidae	46
<i>Callorhinus ursinus</i> (6)	Leuroglossus schmidti	26
	Myctophidae	2
	Nansenia	1
	Stenobranchius leucopsarus	20
	Symbolophorus californiensis	22
	Tarletonbeania crenularis	17
<i>Delphinus delphis bairdii</i> (11)	Bathylagidae	1
	Ceratoscopelus townsendi	7
	Diaphus theta	6
	Lampadena urophaos	2
	Lampanyctus ritteri	5
	Leuroglossus schmidti	3
	Myctophidae	1
	Stenobranchius leucopsarus	2
	Symbolophorus californiensis	8
	Tarletonbeania crenularis	2
	Triphoturus mexicanus	6
<i>Delphinus delphis delphis</i> (22)	Arctozenus risso	2
	Bathylagidae	10
	Ceratoscopelus townsendi	158
	Diaphus theta	135
	Lampadena urophaos	102
	Lampanyctus ritteri	147
	Lestidiops ringens	26
	Leuroglossus schmidti	99
	Magnisudis atlantica	6
	Melamphaes lugubris	31
	Myctophidae	37
	Myctophum nitidulum	1
	Nansenia	35
	Nansenia candida	8
	Notoscopelus resplendens	2
	Parvilux ingens	3
	Protomyctophum crockeri	26
	Scopelogadus bispinosus	21
	Stenobranchius leucopsarus	123

	Symbolophorus californiensis	172
	Tarletonbeania crenularis	43
	Triphoturus mexicanus	145
<i>Dosidicus gigas</i> (30)	Arctozenus risso	18
	Bathylagidae	32
	Bathylagoides wesethi	3
	Bathylagus pacificus	2
	Benthalbella	1
	Benthalbella dentata	1
	Ceratoscopelus townsendi	22
	Diaphus theta	137
	Diogenichthys laternatus	8
	Lampadena urophaos	2
	Lampanyctus jordani	1
	Lampanyctus ritteri	68
	Lestidiops ringens	8
	Leuroglossus schmidtii	12
	Lipolagus ochotensis	4
	Magnisudis atlantica	20
	Melamphaes	3
	Melamphaes lugubris	2
	Nannobranchium regale	1
	Nansenia	1
	Nansenia crassa	19
	Paralepididae	20
	Parvilux ingens	1
	Protomyctophum crockeri	43
	Pseudobathylagus milleri	1
	Stenobranchius leucopsarus	227
	Symbolophorus californiensis	26
	Tactostoma	14
	Tactostoma macropus	3
	Tarletonbeania crenularis	276
<i>Gonatidae</i> (2)	Myctophidae	2
	Stomiidae	1
<i>Histioteuthidae</i> (4)	Diaphus theta	3
	Myctophidae	24
	Nansenia candida	2

	Tarletonbeania crenularis	4
<i>Isurus oxyrinchus</i> (3)	Magnisudis atlantica	8
	Nansenia	1
	Paralepididae	3
<i>Lagenorhynchus obliquidens</i> (12)	Ceratoscopelus townsendi	5
	Diaphus theta	7
	Lampadena urophaos	2
	Lampanyctus ritteri	4
	Lestidiops ringens	1
	Leuroglossus schmidtii	2
	Nansenia	1
	Rosenblattichthys volucris	1
	Stenobranchius leucopsarus	4
	Symbolophorus californiensis	9
	Tarletonbeania crenularis	3
	Triphoturus mexicanus	3
<i>Lissodelphis borealis</i> (19)	Arctozenus risso	5
	Ceratoscopelus townsendi	44
	Diaphus theta	46
	Lampadena urophaos	40
	Lampanyctus ritteri	41
	Lestidiops ringens	13
	Leuroglossus schmidtii	37
	Magnisudis atlantica	13
	Melamphaes lugubris	6
	Myctophidae	10
	Nansenia	19
	Nansenia candida	3
	Notolepis	1
	Protomyctophum crockeri	5
	Scopelogadus bispinosus	11
	Stenobranchius leucopsarus	44
	Symbolophorus californiensis	43
	Tarletonbeania crenularis	27
	Triphoturus mexicanus	31
<i>Merluccius productus</i> (21)	Anotopterus nikparini	1
	Argyropelecus affinis	4
	Bathylagidae	14

	Bathylagus pacificus	1
	Chauliodontinae	1
	Diaphus theta	28
	Gonostomatidae	1
	Idiacanthus	1
	Lampanyctus	4
	Leuroglossus	1
	Leuroglossus schmidtii	6
	Lipolagus ochotensis	4
	Myctophidae	587
	Nansenia candida	2
	Paralepididae	9
	Protomyctophum	2
	Stenobranchius	2
	Stenobranchius leucopsarus	56
	Symbolophorus californiensis	3
	Tactostoma macropus	8
	Tarletonbeania crenularis	27
<i>Microstomus pacificus</i> (1)	Myctophidae	1
<i>Oncorhynchus kisutch</i> (2)	Myctophidae	3
	Stenobranchius leucopsarus	2
<i>Oncorhynchus mykiss</i> (1)	Myctophidae	3
<i>Oncorhynchus tshawytscha</i> (5)	Melanostigma pammelas	1
	Myctophidae	6
	Nemichthyidae	4
	Stenobranchius leucopsarus	1
	Tarletonbeania crenularis	1
<i>Onychoteuthidae</i> (2)	Diaphus theta	2
	Myctophidae	2
<i>Sebastes alutus</i> (5)	Chauliodus macouni	10
	Myctophidae	15
	Stenobranchius leucopsarus	4
	Tactostoma macropus	4
	Tarletonbeania crenularis	4
<i>Sebastes brevispinis</i> (1)	Myctophidae	13
<i>Sebastes flavidus</i> (2)	Myctophidae	5
	Stenobranchius leucopsarus	1
<i>Sebastes mystinus</i> (1)	Lipolagus ochotensis	1

<i>Sebastes pinniger</i> (1)	Myctophidae	13
<i>Sebastolobus alascanus</i> (7)	Bathylagus pacificus	1
	Lepidopus caudatus	1
	Lycodapus fierasfer	2
	Macropinna microstoma	1
	Myctophidae	7
	Tactostoma macropus	1
	Tarletonbeania crenularis	5
<i>Sebastolobus altivelis</i> (4)	Bathylagidae	5
	Diaphus theta	1
	Lycodapus mandibularis	2
	Myctophidae	19
<i>Thunnus alalunga</i> (13)	Ceratoscopelus townsendi	1
	Diaphus theta	4
	Lampanyctus ritteri	3
	Lestidiops ringens	68
	Magnisudis atlantica	7
	Myctophidae	16
	Nansenia	8
	Poromitra crassiceps	1
	Protomyctophum crockeri	4
	Stenobranchius leucopsarus	12
	Symbolophorus californiensis	11
	Tarletonbeania crenularis	31
	Triphoturus mexicanus	8
<i>Thunnus orientalis</i> (13)	Ceratoscopelus townsendi	41
	Diaphus theta	39
	Lampanyctus ritteri	10
	Lestidiops ringens	8
	Magnisudis atlantica	1
	Myctophidae	1
	Nansenia	6
	Protomyctophum crockeri	6
	Rosenblattichthys volucris	1
	Stenobranchius leucopsarus	43
	Symbolophorus californiensis	15
	Tarletonbeania crenularis	1
	Triphoturus mexicanus	55

<i>Trachurus symmetricus</i> (1)	Myctophidae	5
<i>Xiphias gladius</i> (17)	Arctozenus risso	8
	Ceratoscopelus townsendi	1
	Diaphus theta	1
	Lampadena urophaos	18
	Lestidiops ringens	29
	Leuroglossus schmidt	3
	Magnisudis atlantica	84
	Nansenia	32
	Paralepididae	3
	Protomyctophum crockeri	1
	Rosenblattichthys volucris	49
	Scopelarchidae	20
	Stemonosudis macrura	4
	Stenobranchius leucopsarus	2
	Symbolophorus californiensis	5
	Tetragonurus cuvieri	2
	Triphoturus mexicanus	4
<i>Zalophus californianus</i> (22)	Arctozenus risso	14
	Bathylagidae	9
	Bathylagus pacificus	1
	Ceratoscopelus townsendi	74
	Diaphus theta	53
	Lampadena urophaos	4
	Lampanyctus ritteri	22
	Lestidiops ringens	77
	Leuroglossus	1
	Leuroglossus schmidt	37
	Leuroglossus stilbius	160
	Magnisudis atlantica	75
	Melamphaes lugubris	1
	Myctophidae	53
	Nansenia	1
	Nansenia crassa	8
	Protomyctophum crockeri	4
	Stenobranchius leucopsarus	139
	Symbolophorus californiensis	226
	Tarletonbeania crenularis	75

	Tetragonurus cuvieri	13
	Triphoturus mexicanus	42

Supplementary Table 5: List of the mean standard length and standard error for mesopelagic fish taxa available in the CCTD database. Standard length values were either measured directly, back calculated or converted from total length of fork length measurements using available length conversions for available species in Fishbase).

Mesopelagic fish taxa	Mean SL (mm) \pm se	n
Anotopterus nikparini	203	1
Arctozenus risso	294.43 \pm 13.05	16
Argyropelecus affinis	55 \pm 5	2
Bathylagidae	84.49 \pm 7.72	29
Bathylagus pacificus	141.12 \pm 5.31	4
Ceratoscopelus townsendi	52.3 \pm 1.92	71
Chauliodus macouni	96 \pm 30	2
Diaphus theta	57.51 \pm 1.47	293
Diogenichthys laternatus	26.12 \pm 2.56	8
Gonostomatidae	195	1
Idiacanthus	104	1
Lampadena urophaos	180.84 \pm 34.62	6
Lampanyctus	63.04 \pm 6.88	5
Lampanyctus ritteri	45.99 \pm 1.51	128
Lestidiops ringens	183.94 \pm 3.94	124
Leuroglossus	113 \pm 47	2
Leuroglossus schmidtii	97.76 \pm 6.85	22
Leuroglossus stilbius	73.47 \pm 1.03	342
Lipolagus ochotensis	154.47 \pm 5.99	11
Magnisudis atlantica	282.18 \pm 14.46	65
Myctophidae	60.81 \pm 1.23	183
Nansenia candida	84.45	1
Nansenia crassa	144.57 \pm 8.95	21
Paralepididae	147.27 \pm 18.38	18
Protomyctophum	55.85 \pm 0.95	2
Protomyctophum crockeri	22.87 \pm 1.14	76
Stenobrachius	61.44 \pm 4.16	5
Stenobrachius leucopsarus	49.14 \pm 0.79	604
Symbolophorus californiensis	82.57 \pm 1.85	273
Tactostoma macropus	177.67 \pm 10.65	3

Tarletonbeania crenularis	58.53 \pm 0.51	642
Tetragonurus cuvieri	255.08 \pm 16.15	22
Triphoturus mexicanus	44.55 \pm 0.31	284

Coastal Pelagic Fish taxa	Mean SL (mm) \pm se	n
Atherinopsis californiensis	201.78 \pm 12.13	11
Clupea pallasii pallasii	106.96 \pm 2.25	495
Engraulis mordax	106.47 \pm 0.32	10951
Sardinops sagax	164.82 \pm 6.3	6172
Scomber japonicus	222.69 \pm 1.04	2757
Trachurus symmetricus	165.12 \pm 0.89	3813

