Appendix 1 | Table 1 | Tabulated findings from peer-reviewed literature assessing anthropogenic litter in the Mediterranean Sea.

Citation	1) Study period/data collection 2) Aim 3) Protocol	Litter location (floating, seafloor, beach, water column, biota)	Number of particles	Debris type (plastic, metal, wood, wire, glass)	Debris breakdown	Debris abundance and weight	Study area	Summary of findings
Van der Hal *et al.,* 2017	1) July 2013 to May 2015. 2) To evaluate the accumulation of debris in the eastern Mediterranean Sea on the Israeli coast. 3) 108 sea surface samples of top 10cm of water taken from the Mediterranean Sea near the shore at the Israeli coast. 15-minute trawls using a manta net (333 µm mesh size) at 2 knots. 17 sites in 5 geographical areas were sampled. Environmental data, including air temperature, weather state, wind direction and speed and wave height were recorded for all sampling.	Sea surface, top 10cm.	Total of 94,417 microplastic particles (0.3–5 mm) from all 108 samples.	Plastic debris, which was identified using magnifying glass and stereo microscope. Plastics were sorted into micro- and mesoplastics: < 0.3 mm, 0.3–5 mm (this class was also subdivided into type and colour) & 5 mm–2.5 cm	Microplastics (0.3-5mm) categorized into: Plastic fragments = 93.6–97.7% (mean value 96.2) from all samples; Plastic fishing line mean value 1.9%; Plastic pellets mean 0.2%. Colour: light coloured particles were dominant in all 108 samples (mean 76%). Other colours, blue, green, yellow, red, each present mean 4%. Dark colours mean 8%.	Mean value of 7.68 ± 2.38 particles/m^3 in the Israeli Mediterranean coast. The region of coast with highest abundance of microplastic particles was the Carmel coast.	Israeli coast, eastern Mediterranean	A total of 94,417 microplastic particles (0.3–5 mm) were recorded from all 108 samples. A mean value of 7.68 ± 2.38 particles/m^3 in the Israeli Mediterranean coast. The team noted high fluctuations in plastic particle abundance at all but two sites in the survey. They also noted temporal variation. The authors say coastal morphology and sea conditions in the region may lead to fluctuations in microplastic abundance. They did not find a significant connection between microplastic abundance and season. There was no significant relationship between wind data and microplastic abundance or distribution. However, the authors note that Carmel coast may have a higher abundance of microplastic particles because the region has rocky beaches and lagoons in which particles could become trapped. The authors suggest that the accumulation of plastic debris on the Israeli coast could be by the northward current from the Nile and the Shikmona anti-cyclonic eddy. With reference to the high abundance of light-coloured particles, the authors suggest research is conducted to assess whether marine biota have a colour preference that might attract them to ingest microplastics of a particular colour. Suggest that primary use of plastic is reduced to reduce marine plastic litter.
Blašković *et al.,* 2017	1) December 2015 2) To define baseline levels of litter in different areas of the Croatian MPA of the Natural Park of Telaščica bay.	Sediment.	Not analysed.	Plastic particles.	Of all the plastic: Filaments: 90.07% Film: 7.45% Others, including fragments, pellet, foams, granules and	Microplastic was found in 88.71% of all samples.	The Natural Park of Telaščica bay, Croatia, Adriatic Sea.	The study found microplastic in 88.71% of all sediment samples and mesoplastic in 11.29% of all sediment samples. No macroplastic was found in the sediment. The analysed plastic samples comprised

	3) Samples taken of sediment from ten sites located in the Natural Park of Telaščica bay. Three replicate samples of superficial sediment were collected by scientific scuba divers using wide mouth glass jars 1500 mL each. Sediment was dried and filtered at sieved with 4 mm, 2 mm, 1 mm and 63 µm.				unrecognized plastic pieces: 2.48%. Clear (25.13%), white (22.25%) & black (15.30%).	Mesoplastic was found in 11.29% of samples. No macroplastic was found.		90.07% filaments, 7.45% film, and 2.48% others. There was no link found between the sediment grain size and the size of plastic particles.
Güven *et al.*, 2017	1) July & August 2016 2) To evaluate amount, distribution and composition of microplastic in water and in fish from Turkish territorial waters of the Mediterranean Sea. 3) Samples obtained from 18 locations on the Mediterranean coast of Turkey. Surface water samples collected using a manta net with a mesh size of 333 µm. Fish were collected by a trawl net from 10 locations. In the lab, the smallest filtration was using a 26 µm mesh.	Water surface, water column, sediment, biota (fish)	Surface water, water column & sediment: 1517 microplastic particles were found in all the samples. Fish: 1337 fish from 28 species were analysed. 1,822 microplastic particles were extracted from stomach and intestines of fish.	Microplastics. Only plastic smaller than 5mm was included in the analysis.	Surface water, water column & sediment: particle diameter range was from 0.034 mm to 4.98 mm – but 94% of all plastic was within the size range 0.1 to 2.5 mm. Fish: 458 fish (34%) had microplastic in the stomach. 41% of all fishes had microplastic in the intestines. Types of plastic in fish gut: fibers (70%), hard plastic (20.8%), nylon (2.7%), rubber (0.8%), miscellaneous plastic (5.5%).	Surface water: microplastic particles in surface water samples ranged from 16 339 per km^2 to 520 213 per km^2 Fish: number of particles present in both stomach and intestines ranged from 1 to 35. Number of fish with microplastic in stomach or intestines = 771 (58%). Average no. microplastics in fish stomach = 1.8. Average no. microplastics in fish intestine = 1.81. Average number of plastic particles per positive samples = 2.36.	Turkish territorial waters of the Mediterranean Sea.	The study found that the size distribution of microplastic in the water and sediment was mostly uniform. Study found 58% of sampled fish had ingested at least one microplastic particle. On average, fish had ingested 2.36 microplastic particles. The authors note that this study uses the smallest mesh filtration size to date. The authors found no correlation between the length of the fish, mass of the fish or position in the trophic chain with number of ingested microplastics. Pelagic fish had ingested more microplastics than had demersal fish.
Alomar & Deudero, 2017	1) 21 December 2006 2) To quantify and identify trends of microplastic ingestion by *Galeus melastomus* (blackmouth catshark) 3) 125 *G. melastromus* individuals caught as a bycatch of commercial fishing. 81 were caught in Palma; 44 were caught in Soller over the continental shelf at approximately 600 m depth. Stomach contents were analysed using a stereomicroscope.	Biota: *Galeus melastomus* (blackmouth catshark)	Microplastics (<5mm) were found in the stomachs of 21 *G. melastromus.* Soller: 18.18% of the sampled G. melastomus had ingested microplastic.	Microplastic.	Filament = 86.36% Fragment = 12.12% Film = 1.51% Polymer type: Cellophane: 33.33% Polyacrylonitrile: 4.55% Polyethylene: 4.55% Polyethylene terephthalate (PET): 27.27% Poly(Ethyl Acrylate): 1.52% Polyacrylate: 12.12% Polyamide: 3.03% Polypropylene: 12.12%	Microplastic ingestion per individual fish: Soller: 0.32 ± 0.11 Palma: 0.35 ± 0.10 Fish with fuller stomachs also contained a higher proportion of microplastics.	Mallorca island (Palma & Soller), Balearic Islands, western Mediterranean Sea	Microplastics were found in 21 of 125 individual blackmouth catshark (Galeus melastomus) fish that were caught off the coast of Mallorca, Balearic islands, Spain. The species is a demersal species and lives near the bottom close to the seabed, indicating that microplastic litter is abundant in that region of the water column. One reason why immature fish had ingested more microplastic could be

			A significantly higher proportion of immature fish has ingested microplastic. Palma: 16.05% of individual fish had ingested microplastic.		Aklyd: 1.52% Colours: Transparent: 42.42% Blue: 31.82% Black: 12.12% Red: 10.61% White: 3.03%			because this age group uses more energy and consumes more food than adult stages. The authors express caution when considering the transfer of microplastics in the food chain because this area has not been well studied. Cellophane, used in packaging, and polyethylene terephthalate were the predominant polymer types. Plastic particles with a density higher than water will sink to the sediment and can be available for ingestion by demersal species.
Melli *et al.*, 2017	1) May–June 2014 & July 2015 2) To assess and quantify the occurrence, abundance and composition of marine litter on the rocky outcrop and sandy seabed by the coast of the Tegnùe of Chioggia in the EU Site of Community Interest in the north-west Adriatic. 3) To survey the rocky bottom, an ROV with video survey equipment moved at approximately 1.5 m above the seabed and at a constant speed (approximately 0.5 knots). Four sub-areas were surveyed. 17 transects, each of which was between 264 and 2683 m long totaling approx 19.5km.	Rocky seafloor bottom	1209 debris items. Each item was georeferenced.	Debris categorised into: fishing gear; general waste, aquaculture.	Debris categorised into: fishing gear (69.4%); general waste (11.7%); aquaculture (18.9%). Fishing-related: ropes and wires (62.2%), trawl nets (18.0%); trawl liners (13.9%) rest of data? General waste: plastic (35.5%); metal (17.7%) rest of data for this subsection and aquaculture? Mean density of litter from all sections 3.3 items 100m^2 Aquaculture debris was localized in one sample area.	1.23–8.29 items per 100m^2	A Site of Community Interest in the north-west Adriatic	The study concludes that the SCI studied, which is a 'sanctuary of marine biodiversity', is heavily polluted by marine litter. Particular reference was made to discarded fishing gear. The western Adriatic current helps to make the area favourable to benthic communities but also leads to accumulation of marine litter. In all four sampling areas, fishing gear was the most abundant type of debris. Saw no evidence of ghost fishing or of damage to biota, but adds that the study was limited temporally and to visual observations.
Pasternak *et al.*, 2017	1) June 2012 to March 2015 2) To assess the abundance, composition and spatial distribution of marine debris on the Mediterranean coast of Israel 3) 19 surveys on 8 beaches. Information on large-sized (2.5cm x 2.5cm) beach debris. Surveys were taken an average 55 days apart. Surveys took place at least 4 days after beached were cleaned.	Beach.	69,122 items. Minimum size 2.5cm x 2.5cm.	Plastic, cloth, glass/ceramic, metal, paper/cardboard, wood, rubber.	Average for the entire Israeli coast sites: Food wrappers and disposables (23.7); Plastic bags (23.1%); Other (12.9); Cigarette butts (11.6%); Bottle caps (11.1%); Cutlery (8.2%); Drinking bottles and cans (4.9%); Sanitary (2.1%); Fishing (1.5%); Construction (0.9%).	Average density of marine debris on the Israeli coast was 12.1 items/100 m^2 Debris comprises: 90% plastic (including foamed plastic) with the rest of the material categories not exceeding 3% each (cloth – 1%, glass/ceramic – 1%, metal – 2%, paper/cardboard – 3%, rubber and wood – 0.01%). NB from Kathryn Miller	South-eastern Mediterranean / the Levantine sub-basin. Israeli coast. Eight sandy beaches at intervals along the coast between the border with Lebanon and the Gaza Strip.	Beach surveys found that 90% of the beach debris was plastic. 60% of the beach litter originated from land, and comprised of disposable items most likely left by people on holiday. The authors suggest education is the best way to try to solve this problem. 5% of litter was from the sea; 35% of litter could have been from either sea or land sources. There was a higher proportion of plastic bags than elsewhere – 2x that in the rest of the Med and 3 x that globally. The authors suggest that this is possibly due to the lack of legislation concerning plastic bag usage or plastic bag tax in Israel. Legislation on this is due to change Jan 2017.

						– these figures do not add up to 100%.		The density of debris on Israeli beaches surveyed was lower than the global average, which the authors suggest is because of regular cleaning. The study did not look at the availability of rubbish bins on the beaches.
Bellas *et al.,* 2016	1) Not specified. 2) To investigate microplastic ingestion in demersal fish species from Mediterranean Spanish marine regions. 3) Fish caught by bottom trawling, 2.5–3 knots.	Biota: 128 individuals of the commercially important red mullet (*Mullus barbatus*) sampled from five subareas within the Mediterranean waters: Barcelona (36 individuals), Cartagena (36), Málaga (36), Mahón (10) and Ciutadella (10).	24 individual red mullet fish had microplastic in their gut. Of the 36 fish caught off the coast of Barcelona, 33.3% had ingested microplastic.	Microplastic.	Not possible to discern the information from the Atlantic results, so not included here.	Red mullet from Barcelona had ingested 1.75 ± 1.14 microplastics/individual. On average, red mullet caught in the Mediterranean had ingested 1.9 ± 1.29 microplastic particles. High variability in microplastic abundance was seen in red mullets from the Mediterranean (Barcelona: 33.3%, Cartagena: 11.1%, Málaga: 13.9%, Mahón: 10%, Ciutadella: 20%),	Western Mediterranean. Off the coasts of: Barcelona, Cartagena, Málaga, Mahón & Ciutadella	The team also studied the Spanish Atlantic waters, results of which are not included here because of the report focus. The high abundance of microplastic in fish from the Barcelona region may be because the area is a busy urban and tourist region with a busy port. Red mullet is a demersal species that lives close to the seafloor. This species may ingest sediment with its prey, accidentally ingesting microplastic that has settled there. The authors suggest that further investigation is needed to determine the impact of microplastic ingestion on fish health, trophic transfer of microplastics and toxicology of microplastic ingestion..
Fastelli *et al.,* 2016	1) Not stated. 2) To study the type and patterns of litter in sediments from the Aeolian Archipelago. 3) Triplicate samples from the top 5cm of undisturbed sediment at a depth of 30m were collected by scientific scuba divers. From 8 sample sites in the Aeolian archipelago including islands of Lipari, Vulcano, Salina, Stromboli, Panarea, Filicudi, Alicudi and other smaller islets. Samples were sieved at 4 mm, 2 mm, 1 mm and 63 µm.	Deep sediment.		Plastics. Microplastics (5000–1.0 µm) Mesoplastics (25.0–5.0 mm) Macroplastics (diameter > 25.0 mm)	Of all sediment analysed: microplastics = 94.3% > 2.5 cm (Macroplastics) = More than 85% of the total in the samples of plastic particles were filaments. Colours of plastic: black (28%), green (20%), white, clear, red, blue, pink (each approx 10%).	Microplastics (& mesoplastics in brackets) – mean no. particles per kg dry weight of sediment: Alicudi = 347.9 (23.9) Filicudi = 186.2 (25.1) Vulcano = 534.8 (20.4) Lipari = 678.7 (46.4) Panarea = 482.2 (22.3) Stromboli = 151.0 (11.9) Salina = 219.1 (14.7) Macroplastics, only found in sediment at Salina = mean of 1.8 particles per kg dry weight	Aeolian Archipelago, central Mediterranean Sea, south Tyrrhenian Sea	The authors found that 94.3% of all samples were microplastics. Aeolian Archipelago has been designated for the establishment of a marine protected area. They suggest that the finding that there was no significant difference between plastics found in sediment samples from different islands may be due to the currents mixing the sediment. The authors note that it is difficult to assess the meaning of the results because the topic of marine plastic litter is new and the methodology of sample collection and analysis differs between research groups. Suggest that further analysis of sediment is needed to assess presence of trace elements and organic pollutants.

Munari *et al.*, 2016 ***Useful reference paper for planning a beach study***	1) May & June 2015 2) To assess the quantity, quality and distribution of marine litter on beaches in the northwest Adriatic. 3) Five free-to-access beaches, included in the Po River Delta Parks and in the Natura 2000 Italian network were sampled. The beaches had not been cleaned for at least 6 months. At each site, two 50-m transects were used. All litter larger than 2cm was collected. Survey area ranged between 2,000m^2 and 3,000m^2. Beach names: Volano, Bellocchio, Rosolina, Bevano & Casalborsetti. These five beaches attract 700,000 visitors annually.	Beach.	Volano (1143 items, 0.57 items m^{-2}), Bellocchio (391 items, 0.13 items m^{-2}), Rosolina (371 items, 0.12 items m^{-2}), Bevano (315 items, 0.16 items m^{-2}), Casalborsetti (282 items, 0.14 items m^{-2}).	Total 2,502 marine litter items. Classified into 35 categories and 8 groups. Groups of litter: Plastics: 81.1%; Paper & card: 7%; Glass & ceramics: 3.9%; Foamed plastic 3.3%; Rubber: 1.4%; Wood 1.2%.	Litter organized into plastic, foamed plastic, cloth, glass and ceramic, metal, paper and cardboard, rubber, wood, other. The beach with the most litter was Volano with 0.57 items m^{-2}; the other four were in the range: 0.12–0.16 items m^{-2}.	Of the 35 litter categories, the highest abundance across all 5 beaches was cigarette butts at 22.9% of all litter, plastic pieces (13.5%), bottle caps (9.2%), mesh bags (7.2%), plastic bottles (6.5%), cutlery (6.4%).	North-west Adriatic, eastern Italian coastal region	Only one beach, Volano, was classified as 'dirty' according to the Clean Coast Index. The other four beaches were classified as 'clean'. The authors suggest that Volano had more litter because this free-to-access beach is close to the car park and easily accessible. On all five beaches, the majority of the litter fell into the following: cigarette butts, bottles, bottle caps, and unrecognizable pieces of plastic. Results suggest that the sources of the litter are from local sources and have been left by beach users. The authors conclude that campaigns, more regular beach cleans in the busy summer period and education can help to reduce beach, and therefore marine, litter. The authors suggest that the presence on beaches of items including small fragments, bottles and bottle caps, cutlery, and mesh bags is an indicator of pollution from beach users. Researchers also investigated the sources of litter: shoreline and recreational activities, e.g. bottles, caps, toys (948 items, 37.9%); smoking-related activities, e.g. lighters, cigarette butts (638 items, 25.5%); boat/fishing/farming activities, e.g. buoys, nets, fishing lines (421 items, 16.8%); dumping activities, e.g. building materials, tyres (474 items, 18.9%); and (v) medical/personal hygiene, e.g. syringes, tampons (0.8%). The authors say that understanding the sources of marine litter can help in eliminating the source of the problem.
Citation	**1) Study period/data collection** **2) Aim** **3) Protocol**	**Litter location (floating, seafloor, beach, water column, biota)**	**Number of particles**	**Debris type (plastic, metal, wood, wire, glass)**	**Debris breakdown**	**Debris abundance and weight**	**Study area**	**Summary of findings**
Pasquini *et al.*, 2016	1) Autumn 2014. 2) To quantify litter abundance, composition and spatial distribution on the seafloor of the Northern and Central Adriatic Sea. To identify the main sources and to estimate the contribution of	Sea floor.	1,013 items (83 kg) of litter, were collected. 1.9 km^2 of seafloor was surveyed.	Litter categorized into: plastic, metal, glass, rubber, natural and other.	Of the plastic litter, plastic bags were the most abundant item collected, comprising 25% at 0-30m, 24% at 31-50m and 44% at 51-100m.	Average densities of litter collected: plastic 706 ± 72 items/km^2 (49 ± 25 kg/km^2);	Adriatic Sea.	Plastic was the dominant litter collected (80% in terms of numbers and 62% in terms of weight), followed by glass and other material. All except two hauls contained plastic items.

	different human activities. To look at future litter management strategies. 3) Samples collected by rapido trawl (modified beam trawl). Items collected were classified. 67 stations in total were trawled: (0–30 m depth: 39 stations; 31–50 m depth: 17 stations; 51–100 m depth: 11 stations). Only items visible to the naked eye were assessed.			Source and activity of litter was evaluated. Classifications as follows: land, vessels or fisheries. Activity: recreation, domestic, sanitary, industrial, fishing, aquaculture). Or 'mix' if an object could have originated from both land and sea.	The second most abundant item was plastic sheeting from packaging: 23% at 0-30m, 36% at 31-50m and 19% at 51-100m. The third most abundant item was synthetic mussel-farming nets: 24% at 0-30m, 9% at 31-50m and 4% at 51-100m. Combined plastic litter breakdown from all depths: Bags = 27% Sheets = 24% Mussel nets = 20% Caps/lids = 7% Bottles = 3% Fishing = 3% Personal hygiene/medical = 1% Other (clothes, shoes and miscellaneous items) = 15%	glass 71 ± 18 items/km^2 (4 ± 1 kg/km^2); other 56 ± 18 items/km^2 (14 ± 8 kg/km^2); metal 29 ± 7 items/km^2 (9 ± 6 kg/km^2); natural 25 ± 7 items/km^2 (4 ± 2 kg/km^2); rubber 25 ± 5 items/km^2 (3 ± 1 kg/m^2).		At all depth stations, plastic bags were the most abundant item collected, followed by plastic sheeting and synthetic mussel-farming nets. Higher quantities of all litter (not only plastic) were found close to the shore than out to sea. The researchers found areas in which plastic litter was more prevalent: the Po estuary and near tourist cities (including Rimini, Ravenna, Pescara and Vasto). High densities of glass were found in northern Italian harbors, Venezia and Trieste. Suggest that litter originating from estuary or coast accumulates in shallow areas of the sea. Some plastic items had packaging and labels in different languages, which the authors say may indicate dumping from vessels. However, litter can travel long distances in the ocean before ending up on the seabed. Conclude that reasons for the high incidence of litter on the sea floor is for a number of reasons, including that the coastline is highly populated, has intensive shipping, popular with tourists, fishing and aquaculture. Also, the Adriatic is a semi-enclosed basin with limited water exchange. Suggest public education campaigns to reduce litter at the source, as well as regulations for mariners, fishermen and shellfish farmers. Legislation to ban or limit the use of plastic bags in non-EU countries
Nadal *et al.*, 2016	1) Between March and May 2014 2) To study feeding habits of *Boops boops*, particularly microplastics, and quantify ingestion of microplastics in the fishes' gastrointestinal tracts 3) 337 bogues fish (*Boops boops*) were collected using bottom trawl nets and purse seine. Gastrointestinal tracts were analysed using a stereomicroscope.	Biota: bogues (*Boops boops*)	731 microplastic items were observed in 195 fish with full gastrointestinal tracts. Microplastics were seen in 57.8% of all sampled *B. boops*.	Microplastic filaments.	On average, fish ingested 3.75 (±0.25) microplastic items per fish.	Only microplastic filaments were found in the fish. The range of ingested microplastics was 2.47 (±0.23) to 4.89 (±0.45) items per fish.	Balearic Sea, western Mediterranean. Two sites in Mallorca (Cala Ratjada & Cap Blanc); two in Eivissa (Espardell & Cala Tarida).	The sampling locations were located less than 2.5 miles from land therefore were near to anthropogenic activities (sewage, maritime traffic and fishing activities). Bogues live in the demersal to semipelagic zone. The authors suggest that microfibers present on the seabed and could have been ingested by the fish.

			Of all the fish caught, 85.46% had food in their stomachs and the remaining 14.54% were empty. Of the fish with full stomachs, 67.7% had ingested microplastics.					
Casale *et al.*, 2016	1) Data collection over an 11-year period in seven years: 2005, 2008, 2009, 2011, 2012, 2014, 2015. 2) Investigate ingestion of marine debris by sea turtles in the central Mediterranean 3) Turtles (n = 567) taken to a rescue centre in Lampedusa island, Italy. 29 specimens were dead before or on the day of arrival. Dead animals were dissected. Live animals were kept in tanks and their fecal pellets were analysed.	Biota: Loggerhead sea turtles. 201 of 567 turtles had ingested anthropogenic litter. Analysis of ingested particles was carried out on 172 turtles (not those that had died before/on day of arrival).	1,820 items were observed in 172 turtles. 1-170 items per turtle.	Plastics, oil/tar, paper	Size range of all debris ingested: 0.26cm-53cm. Analysis of 1,820 items ingested by 172 turtles were categorised (NB, the following add up to 100.1%): oil & tar (0.4%); rubbish, including paper (2.2%); industrial plastic (0.2%); plastic threads (4.9%); plastic sheets (57.2%); plastic foam (1.4%); plastic fragments (32%); other plastic (1.8%). 1775 items of debris in 171 turtles was assigned a colour. The majority was white (44.2%) or transparent (33.5%). Other colours included black (8.7%), light blue (3.9%) and green (3.1%).	Total weight of debris per turtle 0.1g-9.6g. Median = 0.7g.	Central Mediterranean	Sea turtles are an indicator species to monitor ingestion of marine litter. Survey of 567 loggerhead turtles (*Caretta caretta*) User plastics accounted for 97.3% of the debris ingested by the turtles. Of all the debris types ingested, 44.2% was white and 33.5% was transparent. The authors note a low rate of death or blockage in loggerheards and suggest that this species is less vulnerable to ingesting litter than other species reported in the literature. At different stages of life, turtles prefer pelagic or benthic species. In this study, approximately 80% turtles caught accidentally in pelagic longlines had ingested debris; yet only 13% of turtles caught in trawl nets had ingested debris – indicating that the epipelagic zone is where most anthropogenic debris or the debris that looks like genuine prey is found. The authors note that anthropogenic litter is found on the seabed as well as in the epipelagic zone and suggest that the turtles that ingest debris do so by selecting plastic that resembles their prey.
Citation	**1) Study period/data collection** **2) Aim** **3) Protocol**	**Litter location (floating, seafloor, beach, water column, biota)**	**Number of particles**	**Debris type (plastic, metal, wood, wire, glass)**	**Debris breakdown**	**Debris abundance and weight**	**Study area**	**Summary of findings**
Suaria *et al.*, 2016	1) May 9 to June 24 2013 2) To survey and characterize floating synthetic polymers in the Central Mediterranean Basin	Floating in the water.	14,106	This study isolated plastics and classified them into micro	26% particles were smaller than 300 µm, 51% were smaller than 500 µm. 1.4% of particles were >5mm.	Mean total abundance of plastic particles 1.25 ± 1.62 particles/m^{-2}.	Central Mediterranean Sea	Concludes that the Mediterranean Sea is severely polluted with a complex mixture of polymers. The authors note that the problem of plastic pollution is social and

	3) 74 samples collected by Neuston net trawl. 200 µm mesh size. Net towed on side of ship for ~5 minutes at a speed of 1.5–2 knots. Trawl length (mean: 175.7 ± 85.5 m) calculated using a flowmeter.			(<5mm) or meso (5mm-20mm). 16 different types of synthetic materials found.	4,050 particles >700 µm were analysed using ATR FT-IR. 16 different types of synthetic materials found: Polyethylene (52%), polypropylene (16%), synthetic paint (7.7%), polyamides (4.7%), polyvinyl chloride (2.6%), polystyrene (2.8%), nylon (1.9%), polyvinyl alcohol (1.2%). Less abundant polymers (<1%): poly(ethylene terephthalate), polyisoprene (synthetic rubber), poly(vinyl stearate), ethylene-vinyl acetate and cellulose acetate. Polycaprolactone, a 'biodegradable' polymer = 10 fragments. Epoxy resin (polyepoxide) = 201 fragments. Paraffin wax = several residues. Non-polymers: cotton, chitin, cellulose and other non-synthetic materials (4.4%).	Mean total density of plastic particles 671.91 ± 1544.16 g/ km^{-2}. The maximum concentration of plastic litter >700 µm (10.43 kg/km^2) was in the Corsica Channel, between Cap Corse and Capraia island. The lowest concentration of plastic litter >700 µm was in the southern Adriatic Sea.		behavioural and must be addressed at the source and consumption end. Particles <700 µm and fibres and filaments were not included in analysis. 4,050 particles with a width >700 µm were analysed using FTIR. 68% of all analysed plastic litter was polyethylene and polypropylene, which are low-density polymers that float on the surface and are commonly used in packaging. The presence of paint and paraffin wax in the Adriatic suggests ship-based pollution in this area. Total estimated load ranging from 873.55 to 2576.03 tonnes of plastic. Mean total estimate of plastic particles in the Mediterranean Sea = 3.1×10^{12} particles The authors note that the presence of polycaprolactone, a polymer considered to be biodegradable, might not be readily biodegradable in the marine environment. Regarding the methods, the authors note using the flowmeter to measure the effective volume of water passing through the net not the GPS to enable more accurate comparison between datasets.
Citation	**1) Study period/data collection** **2) Aim** **3) Protocol**	**Litter location (floating, seafloor, beach, water column, biota)**	**Number of particles**	**Debris type (plastic, metal, wood, wire, glass)**	**Debris breakdown**	**Debris abundance and weight**	**Study area**	**Summary of findings**
Alomar *et al.,* 2016	1) Autumn 2013 2) To quantify microplastics in shallow sediment from areas that experience different anthropological pressure, from populated urban areas to marine protected areas. 3) Sediment samples collected from three different locations: Andratx (off Mallorca island), Santa Maria & Es Port (both off Cabrera island). Two replicate samples of superficial sediments (0–3.5 cm) were collected at each site by scientific scuba divers using core tubes (length: 30 cm; diameter: 3.5 cm).	Coastal sediment. Andratx: urban development, recreational boating, sewage input. Es Port: in the marine protected area of the Cabrera Archipelago National Maritime-Terrestrial Park. Boat use and activities are controlled. Santa Maria: is in the no-take area of the marine protected area of the Cabrera Archipelago National Maritime-Terrestrial Park. No sewage input, no boat traffic, no activity allowed.	Data not supplied.	Microplastics, classified into filament or fragment type (rounded, subrounded, angular and subangular)	Percentage of plastic filaments or plastic fragments at the two sampled areas at each location: Andratx: plastic filaments 80% & 90%. Remaining % was plastic fragments. Es Port: plastic fragments 80% & 78%. Remaining % was plastic filaments. Santa Maria: plastic fragments 62% & 64%. Remaining % was plastic filaments.	Mean values of microplastics /g dry sediment at the two sampled areas at each location: Andratx: 0.16 & 0.12 Es Port: 0.1 & 0.1 Santa Maria: 0.9 & 0.24 Found microplastics in all sediment with grain sizes of 2 mm > × > 1 mm and 1 mm > × 0.5 mm	Mallorca Island and Cabrera Island, Balearic Islands, western Mediterranean	Microplastics were found in marine shallow coastal sediments – including urbanized coastal areas and Marine Protected Areas with a no-take policy. The three locations were all enclosed bays but each sample area had different anthropogenic pressure: an urbanized coastal area, a marine protected area and a Marine Protected Area with no-take regulations. The Santa Maria no-take location had the highest mass of microplastics per gram in the sediment samples. Es Port and Santa Maria, in the marine protected area, had higher % of plastic fragments in the sediment, and Andratx

	Sediment sieved into grain sizes ranging 2mm to 0.063 mm.							had majority of filaments. The authors say the filament issue in Andtrax could be because of the sewage inlet to the water bringing laundry water with fibres from synthetic clothing. The authors comment that strong currents or wind may transport plastic litter from its source – this would apply particularly to litter that floats on the surface water. Currents including the Algerian current may carry litter from the Atlantic towards the Baleric islands. Microplastics in the sediment mean that those particles are available for ingestion by organisms that feed in that area.
Battaglia *et al.,* 2016	1) May – Nov 2012 2) To investigate the diet and food composition of the commercial fish species *Trachinotus ovatus* 3) Fish were caught using trolling lines and artificial bait.	Biota: fish.	115 fish stomachs were analysed. 42 stomachs were empty. Stomach contents included prey, insects, plant seeds and plastic particles.	Plastic particles.	The stomachs of 28 individual specimens contained plastic particles, which were categorized as follows: Microplastics (83.3%) and mesoplastics (24.3%) Two fish contained more than one item of plastic.		Strait of Messina, Central Mediterranean	Stomach contents of each of the 115 fish were examined using a stereomicroscope. Plastics were categorised into macro, meso and microparticles. The fish eat a broad spectrum of prey: pelagic crustaceans and fish, also some molluscs and plant seeds. The authors suggest that the ingestion of plastic could be accidental when they consume prey. Further studies on the impact of plastic ingestion by this species are needed. The authors suggest that the occurrence of plastic debris in fish stomachs could be a risk to this species. The authors suggest that floating plastic litter may accumulate in areas of the Mediterranean where currents converge. Suggest further investigation is needed to assess the impact of plastic ingestion, including toxicology, by this species of fish.
Ruiz-Orejón *et al.*, 2016	1) 25 May – 2 July 2011 & 30 April – 14 June 2013 2) To obtain current information about the distribution, abundance and size composition of floating plastics. 3) 71 trawls, each yielding a sample, collected using Manta net trawl, mesh size 333 µm. Net towed average speed of 3.13 knots for periods of 15–30 min.	Floating	17,495 plastic particles. Plastic particle breakdown: a total of 16,719 microplastics, 691 mesoplastics and 85 macroplastics were found in	Classified into six types of plastic and non-plastic debris. Dry weight. Plastics 39.31%; vegetable (mainly algal fragments and pieces of wood) 31.71%; animal (mainly	Plastics classified: microplastics (<5 mm), mesoplastics (5 mm–25 mm) and macroplastics (25 mm–1000 mm). Hard plastic fragments (87.29%); foamed plastics (5.48%); film fragments (3.93%); fishing lines (1.69%); cigar tips (0.01%); bottle caps (0.01%); plastic ropes (0.01%);	Plastic particle concentration (excludes fibres): average, 147,500 ± 25,051 *s. e.* items km^{-2}; median, 59,415.05 items km^{-2} Floating plastic weight: average value, 579.35 ± 155.92 *s. e.* g dw km^{-}	Central and western Mediterranean Sea. Sub-divided into regions: Sea of Sardinia, Tyrrhenian Sea, Ionian Sea and Adriatic Sea. Study found a heterogeneous distribution of plastic particles across sub-	All 71 samples contained plastics. The manta net tended to exclude large sized items, and excluded items smaller than 333 µm. Therefore items outwith these sizes may be underestimated. Rough estimate of 1455 tons dw and 3.7×10^{11} particles of floating plastics in the sea. In this study, particles of 1 mm^2 were the most frequent, which opens up the

			both expeditions.	fish and larvae), 25.43%; unclassified 2.28%; Tar ball-pellets 1.24%; paper 0.03%.	fibers, which were excluded from concentration calculations, (1.58%)	^{2}; median value, 140.99 g dw km^{-2}	regions. Significant homogeneity was found in Tyrrhenian Sea – Ionian Sea & Ionian Sea – Adriatic Sea sub-regions. No significant differences were found between Sea of Sardinia and Tyrrhenian Sea. Found a significant difference in concentration of plastic particles between coastal areas (less than 25km from land) and out to sea.	opportunity for transfer of these microplastics through the food web if they are ingested by organisms occupying the lower levels of trophic chain. From this study, plastics were responsible for 96.87% of all floating debris in the Mediterranean Sea. The authors note that this percentage is higher than previous estimates and suggest that the abundance of microplastic in the Mediterranean Sea is increasing. Suggest that input from rivers, tourism and high coastal development may contribute to higher concentration of plastic particles in some regions.
Citation	**1) Study period** **2) Aim** **3) Protocol**	**Litter location (floating, seafloor, beach, water column, biota)**	**Number of particles**	**Debris type (plastic, metal, wood, wire, glass)**	**Debris characterisation**	**Debris abundance and weight**	**Study area**	**Summary of findings**
Fossi *et al.,* 2016	1) Zooplankton collected over three summers in 2011, 2012, 2013. Whale biopsies (n = 30) collected summer 2012 & 2013. 2) To count microplastics, and mapping and detecting phthalates by using zooplankton/microplastic sampling in two areas of the Pelagos Sanctuary. And to analyse for the presence of phthalates, PBT chemicals and biomarker responses via biopsies of skin samples collected from fin whales in the Pelagos Sanctuary. 3) Zooplankton/microplastic samples collected with a Neuston net (200-µm mesh size) at 1.5 knots for 20 min.	Biota: fin whales (*Balaenoptera physalus*) and zooplankton	Zooplankton/ microplastics: 36 samples collected from Gulf of Asinara: 2011 (n = 9), 2012 (n = 13) and 2013 (n = 14) 34 samples collected from the Ligurian Sea: 2011 (n = 14), 2012 (n = 4) and 2013 (n = 16) Fin whale biopsy: 30 samples.	Microplastics (considered to be <5mm). Grouped into 5 size ranges: 0.2–0.5 mm, 0.51–1 mm, 1.01–2.5 mm, and 2.51–5 mm	Microplastics in water/zooplankton samples ranged from 0 to 9.67 items/m^{3} (mean: 0.31 items/m^{3}, Average concentration of MEHP – used in this study as a tracer of plastic additives – ranged from 29.17 ng/g to 93.37 ng/g. Average MEHP concentration in the 30 whale biopsies 54.8 ± 27.7 ng/g. 70 microplastic/zooplankton samples from the Pelagos Sanctuary show that 49.7% and 37% of the items measured 1–2.5 mm and 2.5–5 mm, respectively.		Pelagos Sanctuary for Mediterranean Marine Mammals, in the northwest Mediterranean Sea	The study also collected data from the Sea of Cortez, Mexico, but those results are not presented here. The fin whale is the second-largest filter-feeder in the Mediterranean Sea. It is listed as Vulnerable on the IUCN Red List of Threatened Species. Fin whales ingest an average of 71 m^{3} of water per mouthful. The study found that fin whales are exposed to high concentrations in their summer feeding grounds in the Pelagos sanctuary. The microplastics are a similar size to the zooplankton, therefore fin whales as filter feeders are at risk of ingesting the microplastics. The authors note that: the average filtration rate of a fin whale is approximately 5800 m^{3} of seawater daily, it is likely that thousands of pieces of microplastic debris, along with their associated toxic chemicals, may be ingested on a daily basis by an actively feeding fin whale in the Pelagos Sanctuary. The authors note that it is not possible to say whether the levels of plastic additives in the fin whale biopsies were from direct

								ingestion of microplastic or from ingestion of contaminated prey.
Romeo *et al.,* 2015a	1) 2012-2013 2) To find out whether large pelagic fish ingest plastic debris, categorised as microplastics (<5 mm), mesoplastics (5–25 mm) and macroplastics (>25 mm). 3) Fish caught using harpoon, hook and lines and drifting longline. Stomach contents were examined for plastics. Identification of plastic debris using stereomicroscope Zeiss Discovery V.8 with Axiovision digital image processing software	Biota: *Xiphias gladius (*swordfish*); Thunnus thynnus* (Atlantic bluefin tuna); and *Thunnus alalunga (*albacore tuna). Fish caught for human consumption.	29 pieces of plastic were identified in 22 fish (total 121 fish examined).	Plastic.	Types of plastic were not assessed. Colours: transparent, white, blue, yellow, red, grey. Size of identified fragments: length ranging from 0.63-164.5mm; width 0.69-17.95mm; thickness 0.02-9.58mm.	Plastic debris was found in 18.2% of fish sampled: 7 swordfish (fish length range, 63-206cm) 11 bluefin tuna fish (length range 123-201cm) and 4 albacore tuna (fish length range 64-110cm). Range of weight of plastics: Swordfish: 0.0001–0.0158g Bluefin tuna: 0.0001–5.5124g Albacore: 0.0001–0.4285g	Central Mediterranean Sea (Eolian Islands, Strait of Messina)	The study found that the presence of plastic is ubiquitous in stomachs Mediterranean top predators. A total of 56 swordfish, 36 bluefin tuna and 31 albacore were caught; 121 stomachs were examined. The three species are top predators and also caught for human consumption. Plastic debris was found in 18.2% of fish sampled: 7 swordfish, 11 bluefin tuna fish and 4 albacore tuna. Swordfish and bluefin tuna ingested micro- meso- and macroplastics. Albacore ingested macro- and microplastics. The researchers suggest ingestion of plastics is by primary consumption and possibly secondary consumption (ie as part of prey that are contaminated with plastic). Albacore is a specialist feeder, and the authors suggest that ingestion of plastics may be accidental when it hunts small prey in schools. The authors note that further work is needed to investigate toxicology on fish that consume plastics.
Romeo *et al.,* 2015b	1) Not stated. 2) To evaluate the abundance of plastic debris, chemical and ecotoxicological parameters, trend of the biodiversity indices and the presence of non-indigenous species in a harbour subject to high level of anthropogenic stress. 3) Analysis of the contamination degree by trace elements (As, Cd, Cr, Cu, Hg, Ni, Pb, Zn), persistent organic pollutants (organotin compounds, polychlorinated biphenyls and hydrocarbons) and plastic debris. Sediment collection: top 30cm sediment from 4-22m depth. Three replicates from each of the 8 sampling stations. Plastics: sediment sieved using a 500-µm-mesh sieve.	Sediment.	59 fragments of plastic obtained from the totaled samples. Microplastics (n = 35 particles/kg dry sediment), macroplastics (n = 11 particles/kg dry sediment), megaplastics (n = 8 particles/kg dry sediment), plastics (n = 5 particles/kg dry sediment).	Microplastics (<5 mm), macroplastics (5–10 mm), megaplastics (10–20 mm) and plastics (>20 mm)	Types of plastic not analysed. Shape: irregular (93%) and filaments (7%).	Mean 2 ± 2.725 particles/kg dry sediment.	Valletta, Maltese Islands, central Mediterranean Sea	The study analysed sediment from different locations in a busy Maltese harbour. Microplastics were found in all the sediments collected within the harbour, and significant concentration differences were recorded with respect to the control stations. The team suggest that the sampling station with the highest abundance of debris could be because of the proximity of a sewage pipe. The team noted that there was a correlation between microplastic abundance and benzo(b)-fluoranthene, benzo(a)pyrene, fluoranthene benzo(g,h,i)perylene and Ni. They suggest that the debris is liable to concentrate environmental contaminants, which have a greater affinity for the hydrophobic surface of plastic compared to seawater.

Citation	1) Study period 2) Aim 3) Protocol	Litter location (floating, seafloor, beach, water column, biota)	Number of particles	Debris type (plastic, metal, wood, wire, glass)	Debris characterisation	Debris abundance and weight	Study area	Summary of findings
Strafella *et al.*, 2015	1) Autumn 2011 & autumn 2012 2) To determine the composition, weight and spatial distribution of benthic anthropogenic debris in the Adriatic Sea. 3) Two surveys were conducted. Litter was collected by trawler. 67 stations were sampled each year.	Seafloor.	Litter was weighed not quantified. A total of 515 kg of litter was collected from 4.3 km^2 of seafloor in the two-year period. The mean weight of litter recorded was to 85 ± 26 kg/km^2	Litter categorized into: plastic, metal & glass (aluminum, cans, jars, bottles), rubber (car tyres, rubber strings and parts of winches), wood, and other (clothes made from wool and cotton), cotton wastes, shoes, boots, gloves). Plastics were subdivided into: fishing material, aquaculture material and other plastic (bin bags, shopping bags, cups, bottles, food packaging, and industrial packaging).	Over the two-year collection period, the litter collected was weighed: plastic (34%), metal (28%), glass (5%), rubber (1%), wood (4%) and other (28%). Of the plastic: fishing material (36%); aquaculture material (17%) and other plastic (47%).	Mean weight density of all litter types at three different depths: 0-30m: 171 ± 36 kg/km^2 30-50m: 65.37 ± 21.58 kg/km^2 50-100m: 47.87 ± 23.38 kg/km^2 Mean weight density of plastic litter at three different depths: 0-30m: 71.31 ± 10.51 kg/km^2 30-50m: 40.54 ± 12.33 kg/km^2 50-100m: 11.58 ± 2.87 kg/km^2	The central and northern Adriatic Sea	There is a higher mass of all types of litter on the seabed at locations closer to the shore than at greater depths out to sea. To a depth of 50m, plastic was the most abundant category of litter found on the sea bed. The authors note that litter on the seabed can be moved to another location by trawling or currents. The authors note that there is no historical monitoring data available for the north and central Adriatic Sea, and suggest that this study is used as a comparison for future studies to help assess trends. Different methodologies in data collection, reporting and classification present difficulties in comparing the results of monitoring studies carried out by different research groups.
Angiolilli *et al.*, 2015	1) June-July 2010 in Campania & September–October 2011 in Sicily and Sardinia. 2) To provide data on marine debris in three Italian regions (Tyrrhenian Sea, NW Mediterranean). 3) Used an ROV to survey 6 areas of Campania, 11 in Sardinia and 8 in Sardinia. 69 video transects 1.5m above sea level, at 0.5 knots. Total 6.03km^2 of rocky bottom was filmed.	Sea floor, rocky bottom.	368 benthic marine debris items. Almost all images studied showed evidence of anthropogenic debris. Campania = 167 items Sicily = 99 items Sardinia = 102 items	Fishing lines, nets, pots, plastic & other (glass, tyres, cans, sacks)	Fishing gear = 89% Fishing lines = 62.5% Nets = 24.4% Pots = 2.1% Plastic = 5% Other = 6% The impact of debris was assessed: (i) covering organisms; (ii) abrasion, when the tissues of the organisms were injured; (iii) hanging debris (iv) debris on the sea floor and did not impact the organisms. At one site in Campania and three in Sicily, debris caused a high negative impact on organisms: Gorgonians (53%), red coral (23.5%), antipatharians (14.3%), sponges (6%) & other invertebrates (3.2%).	Campania (median abundance of debris items 0.12 m^{-2}, range was 0.02 to 0.16 debris m^{-2}). Sicily (median abundance of debris items 0.09 m^{-2} , range 0–0.3 debris m^{-2}). Sardinia (median abundance of debris items 0.03 m^{-2}, 0.01–0.09 debris m^{-2}).	Tyrrhenian Sea around Campania, Sicily & Sardinia	Found a high incidence of anthropogenic debris on the rocky sea bottom of the Tyrrhenian Sea. Sicily had the highest range of debris abundance, with a median abundance of 0.12 items m^{-2}. Sardinia had the smallest litter abundance. The findings reflect the population size in these coastal urban areas, supporting the idea that areas closer to heavily populated coasts are more heavily polluted with anthropogenic litter. The authors note a positive relationship between abundance of litter and population density in the areas studied. Population densities as follows: Campania 429; Sicily 196; Sardinia: 68 inhabitants km^{-2}. The majority of debris was fishing gear, which had a major impact on benthic communities, particularly corals. More than half of the recorded debris items negatively affected benthic organisms by covering or abrading their tissues.

					The number of different species growing on debris was counted. 80% of debris had been colonized by invertebrates.			Assessment of the impact of debris showed that 17.2% of the debris was covered with sessile invertebrate organisms, 37.3% caused abrasion to organisms, 26.2% of debris lay on the sea floor & 19.3% hung from rocks but did not appear to cause an impact. 80% of debris was colonized by marine organisms. But the authors note that such colonisation can hamper efforts to maintain and conserve biodiversity and habitats if it alters community structure and spatial heterogeneity or enables the settlement of non-indigenous species. Lines and nets were most abrasive. Bags and nets covered/enveloped organisms. Hanging debris was solely nets and lines. Debris on the sea floor was bottles, cans, tires or rigid sacks and were generally used as a substrate/refuge by organisms. Found an increasing abundance of plastic debris with increasing depth, which the authors suggest could be because of hydrographical and geomorphological factors.
Citation	**1) Study period** **2) Aim** **3) Protocol**	**Litter location (floating, seafloor, beach, water column, biota)**	**Number of particles**	**Debris type (plastic, metal, wood, wire, glass)**	**Debris characterisation**	**Debris abundance and weight**	**Study area**	**Summary of findings**
Tubau *et al.*, 2015	1) June & July 2011 2) To investigate the sources, distribution, fate and impact of marine litter on the seabed in submarine canyons in an area of the ocean that is subject to anthropogenic and oceanographic pressures. 3) 26 remotely operated vehicle (ROV) dives (8 in Cap de Creus canyon, 14 in La Fonera canyon and 4 in Blanes canyon). ROV stayed 50cm above the seabed, providing a vision of 3m. Transects were planned to provide video images of all the different environments on the canyons and were not assigned randomly. Dive depth 140-1,731m. 70 hours of high-resolution video were recorded from the dives.	Sea floor, canyon flank and continental shelf. Cap de Creus depth range: 156-1570m La Fonera depth range: 140-1731m Blanes depth range: 165-1492m	A total 852 litter items were found in 24 of the 26 dives. There were 415 items in Cap de Creus, 405 in La Fonera and 32 in Blanes.	Litter was characterized into four groups: plastic, fishing gear, metal and other. Other included glass, pottery, paper, wood, tyres, clothes and objects that included a corrugated plate of asbestos cement. Litter was classified into small (less than 10 cm), mid-size (10 to 50 cm) and large (greater than 50 cm).	Position of the litter, figures from all three canyons: Canyon floor = 80.8% Canyon flank = 18.9% Continental shelf = 0.2% Size of litter, all three canyons figures amalgamated: Small: 18.4% Mid-size: 49.5% Large: 32% Depth of the litter: Less than 500m: 18.5% 500m-1,000m: 40.1% More than 1,000m: 41.3%	Litter from all three canyons: Plastic = 615 items or 72.2%; Fishing gear (some of which was plastic, but not assigned to the plastic category) = 144 items or 16.9%; Metal = 68 items or 8% Other (glass (6 items), pottery (3), paper (3), wood (10), tyre (1), cloth (1), asbestos (1)) = 25 items or 2.9%. Mean litter density: Cap de Creus: 8,090 items km^{-2}	Cap de Creus, La Fonera and Blanes canyons in the northwest Mediterranean	Plastic litter accounted for 72.2% of all litter observed in the three canyons. Most of the fishing gear was found at less than 500m depth in Cap de Creus and La Fonera canyons. Litter was also categorised by weight, the highest abundance was light items, which totalled 628 or 73.7%. Heavy items totalled 224 or 26.3%. The highest abundance of lightweight litter was found at Cap de Creus at 1000m and La Fonera at 500m. The authors suggest that storms and deep-water currents carry these light items to the canyon floor. The three canyons studied are near the shore and can trap litter. The highest litter abundance was seen on the canyon floor in all three canyons. The authors identify submarine canyons as litter hotspots, in the area studied. They suggest continued, regular

				Litter was also characterized as 'light' such as plastics and card, or 'heavy', such as metals and ceramics.		La Fonera: 15,057 items km^{-2} Blanes: 1559 items km^{-2}		monitoring of these areas to give a better idea of residence time of particular types of litter and the effect of high-energy events to allow temporal trends to be observed. Sources of litter in the studied area are from marine and land sources. The majority of lightweight litter was land-sourced. Microplastics and chemical effects were not studied. Observations show anthropogenic litter partially buried by sediment, some anthropogenic litter such as fishing gear is mixed with natural elements such as urchin graveyards. The authors suggest that oceanographic processes such as currents and storms transport litter and natural objects.
Cózar, *et al.*, 2015	1) May 2013 2) To assess plastic pollution in the surface waters across the Mediterranean basin. 3) Neuston net, 0.2mm mesh, towed at 2–3 knots for periods of ~15 min. 39 net tows at 29 sites. This study combined data from 33 additional tows published in two separate studies. Therefore the combined three-study total was 72 net tows at 39 locations.	Floating.	3,901 plastic items, measured under optical microscope. 83% of plastics in the samples were smaller than 5mm diameter, therefore classed as microplastic. Approx 243,853 items of plastic of all sizes km^{-2}.	Plastic	Plastics were divided into five categories: (i) pellets and granules (1.8%); (ii) films (5.9%); (iii) fishing thread (2.3%); (iv) foamed plastic (2.3%); and (v) rigid fragments, eg bottles and caps (87.7%). Textile-like fibres and tar particles were eliminated from the analysis.	Plastic concentrations range from 22 to 1934 g km^{-2}, with most of the sites (92%) presenting high concentrations (> 50 g km^{-2}). Average plastic contamination in the surface waters of the Mediterranean water was 423 g km^{-2}	Mediterranean basin	Plastic debris was found in all net tows. Average plastic contamination in the surface waters of the Mediterranean water was 423 g km^{-2} or 243,853 items km^{-2}. The authors compare the Mediterranean figure with the inner regions of subtropical ocean gyres, which ranged from 281 to 639 g km^{-2}. The authors write that the Mediterranean Sea can be considered as an accumulation zone of floating plastic debris. Microplastics dominate the surface litter, particularly small plastic particles (< 2 mm). But there was a lower density of sub-2mm size particles in the Mediterranean than in other ocean gyres. They also note the abundance of large objects (> 20 mm), which was higher in the Med than in other ocean gyres. They suggest that there might be a higher removal rate of microplastic in the Mediterranean surface waters than other oceans. Microplastics may be ingested by plankton, which they suggest could be greater in the Mediterranean. Suggest that the Mediterranean surface plastic load ranges from 756 to 2,969 tons.

								Suggest that to achieve more accurate estimates of plastic load in the Mediterranean more surveys with improved resolution and coverage.
Fossi *et al.* 2014	1) 2006-2013 2) To explore the toxicological effects of microplastics in filter-feeding megafauna, the Mediterranean basking shark (*Cetorhinus maximus*) and fin whale (*Balaenoptera physalus*) 3) Biopsies taken from stranded and accidentally caught basking sharks (n = 6) and fin whales (n = 5) were analysed for phthalates and organochlorine compounds as an indication of microplastics ingestion during filter feeding. The crustacean *Euphausia krohnii* was analyzed for phthalates. *E. krohnii* is prey of the fin whale and is a component of zooplankton.	Biota: Mediterranean basking shark (*Cetorhinus maximus*) and fin whale (*Balaenoptera physalus*)	Used published monitoring data relating to plastic particle concentration in the neuston in the Pelagos Sanctuary to have a mean value 0.62 of items/m^3. Estimate that basking sharks could consume approximately 13,110 microdebris items per day. Estimate that fin whales could ingest approximately 3,653 items of debris per day.	Microplastics.	Phthalate and organochlorine concentrations were higher in samples obtained from fin whales than from basking sharks. A phthalate metabolite was found in *E. krohnii.* .	n/a	Pelagos Sanctuary for Mediterranean Marine Mammals, in the northwest Mediterranean Sea (off Sardinia and the Ligurian Sea). Coastal waters of southwest Italy and southeast Italy in the Adriatic.	Fin whales, which are on average 50,000kg and 20m long, are a type of baleen whales, which are filter-feeders therefore could be susceptible to ingesting microplastic litter in the ocean. Fin whales ingest an average of 70,000 litres of water per mouthful. Fin whales consume about 913kg plankton per day. Basking sharks, which are on average 4,000kg and 7m long, are one of only three species of shark that filter-feed planktonic species. A 5–7 m long basking shark might consume 30.7 kg of zooplankton in a day. The fin whale is the second-largest filter-feeder in the Mediterranean Sea. It is listed as Vulnerable on the IUCN Red List of Threatened Species. The basking shark is listed Endangered on the same list. Plastic marine debris can be a carrier of plastic additives and of persistent organic pollutants. The theoretical calculation is that the basking shark can consume more microdebris items per day than the fin whale. However, there was a higher concentration of chemical contaminants in the fin whale biopsy samples than the basking shark samples. The bioaccumulation of contaminants in the fin whale is an indication of the difference in excretion between the cartilaginous fish and the cetacean in this study. Large filter-feeding marine animals seem to be chronically exposed to chemical contaminants through in the food chain or accidental ingestion of microplastic debris. The plastic additives found in the fin whale and basking shark biopsies could be from direct ingestion of microplastic or from ingestion of contaminated prey. The authors suggest that the presence of phthalates in fin whales and basking

								sharks can be used as a tracer to indicate presence of microplastic in the marine environment.
Suaria & Aliani, 2014	1) Visual surveys of floating debris: 18-21 May 2013, 5–25 June 2013 & 20-29 October 2013 2) To perform a large-scale survey of floating macro (2–10 cm) and mega (>10 cm) debris on the surface of the central and western Mediterranean Sea. 3) Observations were made by the same person, by eye, from the ship's bearing deck. Ship speed c. 10 knots. Debris larger than 2cm was recorded. Binoculars were used to identify objects further away.	Floating on the sea surface, visual observations from transects performed by ship.	1,402 items observed in all the transects. 90% of transects included at least one sighting of litter. 167 transits measuring in total 1538.2 km, with circa 87 hours of observations.	Litter categorized into natural marine litter and anthropogenic. Size classes: <10 cm, 10–50 cm, 50–100 cm, >100 cm	Anthropogenic debris was seen in 87% of all transects. 0 to 162.1 items/km^2 and a mean total density of 24.9 ± 2.4 items/km^2 across all sampled locations. Natural marine debris was seen in 42% of all transects. 0 to 117.5 items/km^2 and a mean abundance of 6.9 ± 1.2 items/km^2 across the whole study area. Anthropogenic debris comprised 1095 items (78%) of all debris sighted. Of the sighted anthropogenic items: Plastic = 898 (82%), Styrofoam = 149 (13.6%), other man-made objects = 48 (4.4%). Natural marine litter was 22% of all sightings. Included bamboo, logs, trunks, cuttlebones, algal fragments.	The highest abundance of anthropogenic debris was in the Adriatic (sector A mean value of 54.6 items/km^2 & sector B mean value of 52.1 items/km^2) and Algerian basin (sector M, mean value 52.9 items/km^2). Lowest abundance of anthropogenic debris was seen in Central Tyrrhenian Sea (sector I), with mean 4.9 items/km^2. The highest abundance of natural marine litter was in the Corsica channel (section J) which had 32.2 ± 12.9 items/km^2. There was a significant difference between the abundance of anthropogenic litter and natural litter.	Central and western Mediterranean Sea divided as follows: Central Adriatic (A), Southwestern Adriatic (B), Southeastern Adriatic (C), Strait of Otranto (D), Northwestern Ionian Sea (E), Sicilian Sea (F), Strait of Sicily (G), South Tyrrhenian Sea (H), Central Tyrrhenian Sea (I), Corsica Channel(M), Sea of Sardinia (K), Balearic Sea (L), Algerian Basin (M) and Sardinia Channel (N). 3 to 38 transects per section, depending on the weather.	The eastern Mediterranean basin was not surveyed. The authors found that litter was ubiquitous in the Mediterranean basin, with a high spatial variability. The authors estimate that there are in the region of 62 x10^6 macro-litter items floating on the surface of the Mediterranean basin (based on the assumption that the eastern part of the basin also has floating debris). The authors note that their figure is a 17-fold increase in marine debris when compared to an estimate published more than 25 years ago (in 1988) that estimated 3.6 x 10^6 items of floating litter in the Mediterranean basin. The increase can in part be because the number of inhabitants has increased (the Mediterranean coastal states are now home to approximately 466 million people. The region is popular with residents, tourists, shipping and fishing. Anthropogenic debris comprised 1095 items (78%) of all debris sighted. Of this, 898 items (82%) was plastic, 13.6% was Styrofoam, and 4.4% was other man-made items. Anthropogenic debris was seen in 87% of all transects, with a mean total density of 24.9 ± 2.4 items/km^2 across all sampled locations. 92.8% of the plastic items were smaller than 50 cm. The authors note that visual detection of marine litter can be affected by factors including the following: sea state, sun position, wave height, speed of ship, observer ability/experience and fatigue. The authors suggest that their simplified method of including all sightings of debris irrespective of size of debris or distance from ship can be used to help to promote large-scale data collection/monitoring. Anthropogenic litter was more abundant than natural marine litter in all but one location (Corsica channel). This may be because anthropogenic litter is more persistent. Both anthropogenic and natural debris accumulated in similar

								locations, leading to the idea that the currents and tides play a part in distributing marine debris. No pattern of debris accumulation was noted in this study, but the authors note that the highest abundance of anthropogenic litter was seen in the Adriatic Sea and the northwest African coast, both areas are densely populated and popular with tourism.. More research is needed to determine the source and fate of anthropogenic litter.
Citation	**1) Study period** **2) Aim** **3) Protocol**	**Litter location (floating, seafloor, beach, water column, biota)**	**Number of particles**	**Debris type (plastic, metal, wood, wire, glass)**	**Debris characterisation**	**Debris abundance and weight**	**Study area**	**Summary of findings**
Fabri *et al.,* 2014	1) 2009 2) To assess the distribution and threat of anthropogenic impacts on benthic ecosystems including fishing activities and waste disposal. 3) Exploration by ROV of 17 submarine canyons in the bathyal bathymetric zone, from 180 to 700 m depth. Data from 101 dives by the ROV. Because of technical constraints in measuring surface areas, in this study the researchers estimated abundances along the ROV navigation tracks.	Sea floor / benthic ecosystem.	n/a	Classified as: metal, glass, plastic, pottery, wood, concrete, others—including fabric and paper-board. Plastics were seen in every canyon surveyed. The highest abundance was in the Planier canyon (2 items/km^{-1})	Fishing gear: nets, lead weights, ropes. Lost fishing gear was observed in every canyon of the Ligurian Sea (from Planier to Var canyons) and in five canyons of the Gulf of Lion.	Higher concentrations of litter were observed in the Ligurian Sea than in the Gulf of Lion. 199 lost fishing gear items at a mean depth of 343 m. The highest abundance of litter was in Toulon canyon in the Ligurian Sea (up to 12 items/km^{-1}). The highest abundance in the Gulf of Lion was in the Grand-Rhône canyon (up to 5 items/km^{-1}).	Gulf of Lion, Ligurian Sea. The shelf break and the bathyal zone of the French continental margin of the northwest Mediterranean Sea	The study focused on the occurrences of benthic fishes, Vulnerable Marine Ecosystems, and anthropogenic impacts located deeper than 180 m. Colonies of deep-sea coral: deep-sea two scleractinian species, *Lophelia pertusa* and *Madrepora oculata*. Found at depths ranging from 246 m to 541 in the Lacaze-Duthiers canyon. Lost fishing gear had impacted upon structure-forming fauna and was observed to have broken cnidarian colonies in the Ligurian Sea and Gulf of Lion in the northwest Mediterranean Sea. Long lines had also become tangled around rocks. High densities of lost fishing gear was seen with cold water corals in Lacaze-Duthiers and Cassidaigne canyons. *Callogorgia verticillata* (an Alcyonacea) is unusual in the Mediterranean sea. It is fragile and colonies were seen tangled with fishing nets and lines. The authors suggest that this species should be protected. The higher concentration of litter in the Ligurian Sea is explained by the coastal canyons and the discharge from the Rhone River. Plastics were ubiquitous. Glass (mainly beer bottles) in the Ligurian Sea was most likely from pleasure boats.
Laglbauer *et al.,* 2014	1) July 2012 2) To assess the quantity, quality and type of macrodebris and of microplastics on	Beach.	5870 macrodebris items	Macrodebris and microplastics	Macrodebris: Plastic (64%); Paper (19%); glass and ceramics (11%); metal (2%); rubber (1%).	Macrodebris: Median macrodebris count density was 1.25 items m^{-2}. The	Beaches in Slovenia, Gulf of Trieste	This was the first study to assess microplastic litter in Slovenia.

	Slovenian beaches. To assess the cleanliness of Slovenian beaches using the Clean Coast Index. 3) Six beaches (Tourist) or Non Tourist) were sampled: Debeli Rtič (T1), Jadranska (NT1), Simonov Zaliv (T2), Bele Skale (NT2), Portorož (T3), and Seča (NT3). Slovenian beaches are cleaned monthly, with Simonov Zaliv & Portorož cleaned daily in summer. Litter sampling took place before the beach clean operations. Sampling took place along a 50-m transect, and all items large than 2cm were collected. Microplastic sampling took place in quadrants, extracting the top 5cm of sand that was filtered through a 250-µm sieve. Microplastic sampling was taken as the shore – between the high and low tide marks) and infralittoral (10 m distance perpendicular to the shoreline).		collected from all samples.		Of the plastics, cigarette filters was a median 41.9% at the beaches. Microplastics: Shore data: Fibres 75%; Fragments 21%; Film 4%. Infralittoral data: Fibres 96%; Fragments 4% Microplastic size: 0.25-1mm 27%; 1-2mm 19% 2-3mm 27% 3-4mm 19% 4-5mm 8% All microplastics found were secondary. No primary microplastics were found.	range was from 0.81 items m^{-2} in Seča (NT3) to 3.45 items m^{-2} in Simonov Zaliv (T2). Median density by weight was 4.45 g m^{-2}, ranging from 2.84 g m^{-2} in Bele Skale (NT2) to 19.12 g m^{-2} in Seča (NT3). At Seča there was a high proportion of glass and ceramics litter. Microplastics: Median density in the infralittoral (155.6 particles kg^{-1}); in the shoreline (133.3 particles kg^{-1}).		The authors found that macrodebris and microplastics are ubiquitous on Slovenian beaches. Using the Clean Coast Index, the beaches were classified as: Simonov Zaliv (T2) & Bele Skale (NT2) were extremely dirty (the most extreme category on the index); Jadranska (NT1), Debeli Rtič (T1), & Portorož (T3) were dirty; Seča (NT3) was moderate. The quantity of beach litter could deter tourists, and could impact the tourist industry. The presence of litter on the beach suggests that litter disposal is inadequate. Regarding microplastics, there was no difference between microplastic density between the tourist or non-tourist beaches, or between the shore and infralittoral samples. The high proportion of cigarette filters on beaches suggests that beachgoers leave their litter on the beach during their visit. The authors suggest another study that covers seasonal sampling, larger sample collection. The authors suggest that the Clean Coast Index is amended to include non-plastic debris. And suggest that plastics are classified as hazardous materials.
Collignon *et al.,* 2014	1) 30 August 2011 to 7 August 2012 2) To analyse the abundance of micro- and mesoplastic and neustonic zooplankton in the Bay of Calvi. 3) A total of 38 neuston samples (2-11 per month) were collected using a net with 0.2 mm mesh size. Samples were collected at an average speed of 2.5 km/h for a period of 20 min per sample. Tow depth 0.2 metres.	Neustonic (surface water)	Highest number of plastic particles recorded on September 30 2011 56.7 particles/100 m^2) and on April 10 2012 (68.8 particles/100 m^2). The lowest values were recorded in winter (0 particles/100 m^2).	Plastic.	Plastic particles were found in 74% of the 38 samples. Plastic particles classified into three sizes: 0.2–2 mm, 2–5 mm and 5–10 mm. Large microplastics (2-5 mm) was the most abundant size class, and represented 54% of the total number of plastics recorded. The annual average abundance of large microplastics (2-5 mm) was 3.4/100m^2. Small microplastics (0.2-2 mm) represented 28% of the total plastics. The annual average abundance of small microplastics was 1.7/100m^2.	Annual average of total number of plastic particles less than 10 mm was 6.2 particles per 100 m^2. The highest plastic particle abundance of all sizes was in the summer months. Lowest plastic particle abundance of all sizes was in the winter months.	Bay of Calvi, Corsica.	No significant correlation was seen between wind speed and abundance of plastic particles <10 mm. But there were no high winds or storms during the sampling period. However, the authors noted that the northeast wind caused an accumulation of plastic particles in the Bay of Calvi. The authors note that floating plastic particles last longer in the marine environment than natural materials and can become a floating reef for microbes. The authors analysed the abundance of neustonic zooplankton. They found that the annual average abundance of the total neustonic zooplankton organisms (<10 mm) was 11,206 individuals per 100 m^2. 96% of the zooplankton was in the size class 0.2-2mm. The average ratio between

					Mesoplastics (5-10mm) represented 18% of the total plastic particles. The annual average abundance of mesoplastics was 1.1/100m^2. Macroplastics (>10mm) were present in the samples analysed with 1.3 particles/100 m^2.			the small zooplankton and small microplastics (0.2-2mm) was 0.002 for the whole study, therefore it is unlikely that this class of zooplankton encounter small microplastics. But the ratio between large microplastics (2-5mm) and larger zooplankton (2-5mm) was 2.63, therefore this class of zooplankton could be affected by or encounter microplastics. Larger organisms could mistakenly ingest or ingest by filter-feeding microplastics instead of zooplankton.
Poeta *et al.,* 2014	1) April & May 2012 2) To analyse the type of litter on sandy coastal habitats and to find out if there is a relationship between beach litter and litter on sandy dunes. 3) Monitoring took place at five sites along a 21-km stretch of coast with dunes less than 10-metres high. 153 sites (2m x 2m random plots) were sampled once. All beaches sampled are tourist beaches and are cleaned at the end of May – sampling took place before the beach cleaning.	Beach and sand dunes	52.3% of the plots sampled (80/153) contained at least one item of litter.	Classified into: plastic, polystyrene, glass and other (includes clothing, fishing gear, rubber, wire, metal).	Of the 80 polluted plots, 86% contained plastic, 45% contained polystyrene, 12% contained glass, and 16% were polluted with 'other' materials. Type of plastic: fragments (in 58 plots), bottles (in 13 plots), bottle caps (in 11 plots), plastic drinking glass (in 4 plots).	Not analysed.	Lazio region, central Italy west coast.	Plastic litter was the most abundant item of litter found on the beach sample plots. The authors compared litter accumulation with habitat type and noted a spatial distribution in litter on the sites studied. The upper beach was least polluted, which may be because the action of the sea removes the litter. The fore dunes had the highest abundance of litter of all the zones in the dune system. The authors say that the waves rarely reach this dune type, and so they can become an area in which litter accumulates. Litter from the fore dunes can be distributed inland by wind action. The fixed dunes, which contain shrubs and forest vegetation, had little or no litter, which suggests that this habitat can act as a barrier against litter moving inland. Dune systems are an important habitat and accumulation of litter is an environmental concern. More research is needed to find out the sources and factors affecting the distribution of litter along Mediterranean coasts.
Pham *et al.,* 2014	1) 1999 to 2001 2) To assess the type and abundance of litter on the deep sea floor in different Mediterranean Sea locations. 3) Research cruises operated in the Mediterranean Sea, as well as other European waters (not reported here). Trawls (a net or otter trawl Mareita System) and one ROV survey in the Mediterranean Sea, at ten sites on areas covering the continental shelf, continental slope, submarine canyons, and deep basins. Depth range 85m to 3,000m.	Seafloor	Assessment by weight for practical purposes.	Classified into: fishing gear, glass, metal, plastic, clinker (residue of burnt coal, typically dumped at sea from coal-fired ships in 18th-20th centuries), other	Percentage by weight of all collected litter, except Gulf of Lion: Calabrian slope: plastic (36.2%); other (26.6); derelict fishing gear (13.2%); metal (8.4%); clinker (15.5%). Western Mediterranean slope: clinker (64.9%); fishing (21.6%); plastic (12.1%); glass (0.6%); other (0.6%); metal (0.2%) Crete–Rhodes ridge:	Number of items counted at two locations: Blanes canyon had a high quantity of litter, with mean 32.1 ± 11.9 items ha^{-1}. The Gulf of Lion had a low quantity of litter, with a mean of 0.4 ± 0.1 items ha^{-1}. Mean weight of litter: Calabrian slope: 0.6 ± 0.4 kg ha^{-1}	Ten locations: Calabrian slope (central Med); Western Mediterranean slope; Crete–Rhodes ridge (east Med); Blanes slope (NW Med); Gulf of Lion (NW Med); Blanes canyon (NW Med); Gulf of Lion canyons (NW Med); Algero-Balaeric basin (W Med); Crete–Rhodes ridge (E Med); Calabrian basin (central Med)	Plastic litter was found at all Mediterranean sites. Limitations of the study: trawl studies assessed litter by weight, which mean that the abundance of lighter litter (such as plastic) cannot be compared with other types (heavy glass). However, the trawl studies captured large quantities of plastic items (from bags to microplastics) that it was more practical to weigh than count. The EU Marine Strategy Framework Directive states that litter must be quantified. The authors note an accumulation of macrolitter on the seabed, including

					Clinker (45.5%); other (20.5%); plastic (17%); glass (9.3%); metal (6%); fishing (1.6%). Blanes slope: Clinker (57.1%); plastic (12.6%); other (11.6%); metal (8.4%); glass (7.9%); fishing (2.3%). Gulf of Lion (items counted); Plastic (88.9%); other (11.1%). Blanes canyon: ROV & trawl data presented respectively in parentheses. Plastic (78% & 76.3%); other (9% & 1.7%); metal (6% & 2.2%); fishing (3% & 0.2%); glass (3% & 4.9%); clinker (0% & 14.7%) Gulf of Lion canyons; Plastic (67.3%); other (32.7%). Algero-Balaeric basin; Clinker (37%); metal (29.6%); fishing (16.5); plastic (14%); other (2.1%); glass (0.8%). Crete–Rhodes ridge; Clinker (38.5%); metal (25%); plastic (19.5%); glass (9.7%); other (7.2%). Calabrian basin: Clinker (50.1%); other (36.1%); glass (6.7%); plastic (5.9%); metal (0.7%); fishing (0.5%).	West Med: 4 ± 1.8 kg ha^{-1} Central Rhodes ridge 1.1 ± 0.3 kg ha^{-1} Blanes slope 1.2 ± 0.4 kg ha^{-1} Blanes canyon 0.7 ± 0.2 kg ha^{-1} Algero-Balaeric basin 1.8 ± 1.5 kg ha^{-1} Crete–Rhodes ridge 1.2 ± 0.3 kg ha^{-1} Calabrian basin 1.7 ± 0.6 kg ha^{-1}		plastic litter, which is often thought to float. The surveys in this study show higher density of litter on the seafloor than floats. Litter on the coast/beaches is higher than on the seafloor because there is input from marine as well as land sources. The study noticed higher density in seafloor litter at locations closer to the shore than further out to sea. But the authors note that distribution of marine litter is affected by factors including wind and wave action, currents and weather systems such as storms. One reason why litter may not accumulate at the continental shelf (Gulf of Lion in this study) is a strong current taking litter to deeper water. Canyons had the highest litter density – this is an environmental concern because these regions are often Vulnerable Marine Ecosystems. Regarding the type of litter: plastics often float far from their origin before sinking whereas metal, glass and clinker usually sink much closer to their source. The authors note the predominance of plastics in submarine canyons, and that these canyons can be considered accumulation zones of land-based marine litter in the deep sea. Note that the Blanes canyon was surveyed with ROV and trawling. Clinker was recovered on the trawl survey but had not been identified with the ROV survey. The authors say this may be because the 100+-year-old clinker had been buried beneath layers of sediment, therefore was not identified. The authors note that there are merits for different types of survey. Video imaging is non-intrusive and good for areas with complex topography or protected ecosystems. Trawling is valuable for allowing detailed litter analysis and identification.
Bo *et al.*, 2014	1) 2010-2012. 2) To assess the impact of fishing gear on deep circa-littoral hard bottom coral biocoenoses (70–300 m depth) of the Tyrrhenian Sea using ROV surveys. 3) ROV surveys were carried out on four Tyrrhenian deep rocky banks (St. Lucia	Rocky bottom.	n/a	Fishing gear, including long lines, nets, trammels, ropes, floating devices, anchors and disposable moorings (plastic bags filled with	ROV video frames showing lost fishing gear of various types including long lines and nets: St. Lucia Bank: 19%, about 17 m of lines and 0.5 m^2 of nets per 100 m^2.	Lost long line fishing gear was the most abundant form of fishing litter, comprising: Vedove Shoal, 35% of litter in the video frame; St. Lucia Bank 86%;	Tyrrhenian Sea.	The survey identified 2300 coral colonies, belonging to 13 target species. There was an inverse relationship between the number of ROV frames in which fishing long lines were visible and the distance from the coast.

	Bank, Mantice Shoal, Vedove Shoal and Marco Bank).			stones and attached to ropes).	Mantice Shoal: 38%, 32 m of lines and about 8 m^2 of nets per 100 m^2 of explored sea floor. Vedove Shoal: 62%, 70 m of lines and ropes per 100 m^2 of explored sea floor. Marco Bank: 30%, 28 m of lines per 100 m^2 At Vedove Shoal, 50% of the impacted frames showed plastic bags filled with stones and attached to floating polyester ropes.	Mantice Shoal 87%; Marco Bank 96%. Nets (fixed & trawling) were only found at St. Lucia Bank (3% of fishing litter in the video frame) and Mantice Shoal (7%).		Mantice Shoal is dominated by shallow water corals, which also grow at Vercelli Seamount (cited in a separate paper), but total coral abundance was six times higher at Vercelli. The authors suggest that this is most likely because Mantice has been subjected to continued fishing pressure for decades. Lost fishing gear impacts the benthic communities in different ways. The study reports: nets can cover and choke the benthic flora and fauna; lines can entangle the corals and cause them to bend under the tension. Say that the number of corals tangled in fishing lines may be underestimated because some corals may have been uprooted and others be experiencing secondary impacts from physical damage. At Vedove Shoal, 50% of the impacted frames showed plastic bags filled with stones and attached to floating polyester ropes. The authors say this is a form of disposable mooring that is used by locals during purse seine fishing. The temporary moorings are deliberately dumped. 14% of frames at the Vedove Shoal site also showed other litter. Vedove Shoal is 12 nautical miles off the coast of Capri in the South Tyrrhenian Sea. The higher abundance of abandoned lines and fewer nets suggests that recreational and professional fishers use lines. This, say the authors, is in accordance with the Italian legislation. The authors note that the ability of benthic species to cope with the impact of fishing and lost fishing debris depends on its fragility and ability to recover. Conclude that lost fishing gear is a major cause of mechanical degradation to the benthic rocky ecosystem in the Tyrrhenian Sea. They note that there has been the disappearance of deep, slow-growing corals in the area, and suggest large-scale monitoring of the impact of fishing activities in the area. Also to establish protected areas.
Citation	**1) Study period** **2) Aim**	**Litter location (floating, seafloor, beach, water column, biota)**	**Number of particles**	**Debris type (plastic, metal,**	**Debris characterisation**	**Debris abundance and weight**	**Study area**	**Summary of findings**

	3) Protocol			**wood, wire, glass)**				
Vianello *et al.,* 2013	1) Not stated. 2) To examine the presence and diffusion of microplastics in the Lagoon of Venice. And to explore analytical approaches to polymer identification. 3) 10 sampling sites in shallow waters. Sites selected for following reasons: three were landward with freshwater input, three were located seaward, the others had aquaculture, urban and industrial input. Two replicate samples from each site were collected. µFT-IR analysis.	Sediment.	n/a	Microplastic.	Ten polymer types identified, % indicates proportion of samples: polyethylene (PE) = 48.4%; polypropylene (PP) = 34.1%; poly(ethylene-propylene) (PEP) = 5.2%; polyester (PEst)= 3.6%; polystyrene (PS) = 3.5%; polyacrylonitrile (PAN) = 2.6%; alkyd resin (Alkyd) = 1.4%; polyvinylchloride (PVC) = 0.5% polyvinyl alcohol (PVOH) = 0.4%; nylon (Polyamide) = 0.3%. All samples contained at least two different polymer types. Fragments = 86% Fibres = 11% Film = 2% Pellets = 1% Size: 93% were 30–500 µm.	Abundance varied from 2175 to 672 kg^{-1} d.w.	Venice lagoon. Adriatic.	Found widespread distribution of microplastics in the sediment in Venice Lagoon. Report that the highest concentrations of microplastics were in the confined areas along the lagoon border, which are also more influenced by freshwater inputs. This suggests that rivers are potential sources of microplastics to the marine environment. Polyethylene and polypropylene were the most frequently found polymer types. PE used in packaging, and can result from the breakdown of rigid plastic. PP used in furnishings, water and gas pipes, PP fibers are used in textile floor coverings, carpets, rugs, sportswear and fishing nets. Suggest that transfer in the food web in this area is investigated, because harvesting Manila clams (*Ruditapes philippinarum*) is the main fishing resource.
Anastasopoulou *et al.,* 2013	1) Summer and autumn 2010 2) To study the debris ingested by fish inhabiting the deep-waters (300-850m) of the Eastern Ionian Sea 3) Fish were caught using bottom long lines. Fish stomachs and intestinal tracts were emptied and examined using a stereomicroscope.	Biota. 1,502 specimens from 26 species of fish, categorized into 9 elasmobranchs and 17 teleosts. Debris was found in four elasmobranch species: *Pteroplatytrygon violacea* (pelagic stingray); *Etmopterus spinax* (velvet belly lanternshark); *Galeus melastomus* (blackmouth catshark); *Squalus blainville* (longnose spurdog). And one teleost species: *Pagellus bogaraveo* (blackspot seabream).	37 items of debris were found to have been ingested by 28 fish (1.9% of the total number of fish caught). Number of items of debris per fish ranged between one and six. Four elasmobranch species and one teleost species ingested debris.	Plastic (86.5%); metal (8.1%); wood (2.7%).	Of the ingested plastics: hard pieces of plastic (56%); fragments of plastic bags (22%); fishing lines and ropes (19%); textile fibers (3%). Plastic particles were blue (bags), brown (hard plastic), black (bags) and transparent green (fishing gears). Size range 5–60 mm.		Waters off Cephalonia Island, Ionian Sea (Eastern Mediterranean)	25 fish had ingested plastic. 3 fish had ingested metal, 1 fish had ingested wood. The authors conclude that ingestion of marine debris by fish inhabiting the deep water in the Ionian Sea is rare. More elasmobranch species may have consumed debris for reasons that include accidental ingestion with sediment, because their prey had consumed debris, or had mistaken debris as prey. Authors conclude by saying that relatively little is known about the extent of litter in the deep water of the eastern Mediterranean.
Ramirez-Llodra *et al.,* 2013 *** Detailed paper with	1) Not stated. 2) To analyse litter data collected in two ecological studies of bathyal and abyssal Mediterranean habitats. Aims to describe litter distribution by depth and geographic region, describe and quantify litter types	The deep seabed and water column at bathyal and abyssal levels.	At bathyal and abyssal levels, the most abundant litter types were plastic,	Eight categories: (1) hard plastic (e.g. bottles or buckets); (2) soft plastic (e.g. bags and bag pieces); (3) glass (e.g.	To detect potential distribution patterns caused by the way litter is transported in the water column, data on the most abundant litter types (plastic, glass, metal and clinker) were grouped into light litter (soft and	Mediterranean transect: litter weight was often equivalent to biomass and, in some cases (the deep Central	Blanes canyon, northwest Mediterranean. And transect west to east across the Mediterranean Sea.	Conclude that marine litter is a major problem in the Mediterranean Sea at local and at basin scale. In some trawls the mass of litter was greater than the mass of living marine organisms. Litter was collected in all samples.

thorough analysis ***	and analyse potential relationships with depth and region in relation to natural processes (seafloor geomorphology, general hydrographical settings and main rivers) and anthropogenic processes (shipping routes and coastal population density). 3) Two surveys were carried out in the Blanes canyon and adjacent open slope (Catalan margin, NW Mediterranean) from 900 to 2700 m depth. One survey was carried out on a regional scale, on a trans-Mediterranean Sea cruise, sampling from 1200 to 3000 m depth. Litter was collected by trawling using an otter-trawl Maireta system (40mm & 12mm mesh size) and an Agassiz trawl (12mm mesh size).		glass, metal and clinker	bottles, broken glass); (4) metal (e.g. conserve tins, cans and metal pieces); (5) clinker; (6) fabric (e.g. clothes); (7) lost or discarded longlines, with and without hooks; and (8) lost or discarded fishing nets. Oil drums were noted but not weighed.	hard plastic) and heavy litter (glass, metal and clinker). Unusual items included: shoes, toothbrushes, oil drums, a chair, a porcelain toilet bowl, the box of the survival raft of an F15 aircraft (first flight of this type of aircraft was 1972), two Roman amphorae from 1st century AD. Mediterranean transect: litter comprised mainly soft plastics and clinker. Blanes slope: had a high proportion of heavy clinker was found at the 1500 m and 1750 m sites, 60km from coast on the shipping line between Suez Canal and Strait of Gibraltar. Blanes slope: the deepest site, 2,700m, had a small amount of mainly plastic litter. The site was 81km away from shipping routes. The shallower sites at 900 and 1050 m had more longline fishing gear. Blanes canyon: at 900m depth, 10km from coast, mainly plastics, glass and clinker. At 1,500m mainly hard and soft plastic. At 2250 m, at a distance of 80 km from coast, mainly clinker, metal and soft plastic. The deeper site was on a shipping route.	Mediterranean and the sampled three depths in the Eastern Mediterranean), litter weight was higher than biomass collected in the same sample. Mediterranean transect: minimum total litter (14.7 kg km^{-2}) collected from the Central Mediterranean at 1200 m depth, and the maximum (1,536.6 kg km^{-2}) in a sample from the Western Mediterranean at 1200 m depth. Blanes slope: minimum total litter (0.02 kg km^{-2}) was collected in a sample from 1750 m depth, and the maximum total litter (3264.6 kg km^{-2}) was collected in a sample from 2250 m depth. This sample contained over 20 kg of clinker. Blanes slope: 93.3% of samples contained soft plastics. Clinker was in 68.3% of samples. Fabric in 45.2% and hard plastic in 39.4%, glass and metal were found in 21% of the samples.		Different litter types are transported differently in the water column. Note that the shallower sites closer to shore have higher proportion of plastics, and heavier litter is further out into the deeper basin. The full impact of deep-sea litter on habitats and fauna is not well understood. In this study, there was evidence of ghost fishing in the bathyal north-western Mediterranean – in one trawl nine dead *Geryon* crabs were found in a fishing net. Paint pots were collected in the Central and Eastern Mediterranean – these could be a long-term source of chemical contamination. The study points out that mass of litter and biomass were used in this study not abundance data, so it is difficult to say how litter affects the habitat and fauna. Add that the clinker was often colonized by the brachiopod *Grypheus vitreus*
Kordella *et al.*, 2013 ***A good example of citizen science ***	1) 2006 & 2007 2) To record beach litter on 80 Greek beaches and understand the sources of the litter. 3) All litter from 80 beaches was collected by volunteers during beach-clean activities. In 2006, 10,938 volunteers assisted. In	Beach.	110,423 items of litter recorded over the two-year period.	Litter was classified into: glass, plastic, paper, aluminum, other metals, rope, building materials, and other materials.	Materials with the highest abundances were: 2006: Plastic (43%); paper (13%); aluminium (12%) 2007:	Not analysed.	Greece.	Volunteers collected all beach litter in clean-up sessions in 2006 and 2007. A total of 110,423 items were collected. In both years, plastics were the most abundant material, followed by paper and aluminium. The authors were uncertain that very small items of litter (<1cm) were collected by the volunteers.

	2007, 15,748 assisted. Each beach was visited once over the 2-year study period. Because volunteers with different educational backgrounds were recruited, the size and weight of items, and oceanographic or geomorphological data were not recorded.				Plastic (51%); paper (18%); aluminium (7%)			Sources of litter were evaluated. Recreational activities (including shore fishing and beach sports) were the major land-based sources of litter. Shipping and recreational boating were the major sea-based sources of litter. The authors note that the study provided the opportunity for members of the public to engage with scientific study. The authors conclude that environmental awareness strategies could help to reduce litter on recreational beaches in Greece.
Citation	**1) Study period** **2) Aim** **3) Protocol**	**Litter location (floating, seafloor, beach, water column, biota)**	**Number of particles**	**Debris type (plastic, metal, wood, wire, glass)**	**Debris characterisation**	**Debris abundance and weight**	**Study area**	**Summary of findings**
Lazar & Gračan, 2011	1) June 2001 and November 2004 2) To investigate the ingestion of marine debris by loggerhead sea turtles in the Adriatic Sea. 3) Collection and necropsy of carcasses of 54 loggerhead sea turtles found dead following incidental capture by fisheries (n = 46, 85.2%) or dead stranded (n = 4, 7.4%)	Loggerhead sea turtles (*Caretta caretta*)	82 items of marine litter were found in 19 (35.2%) of the 52 turtles examined. Mean number of pieces per loggerhead turtle = 4.3 ± 6.6 (range: 1–27).	Plastics (mainly remains of plastic bags and wrapping foils), ropes, Styrofoam & monofilament lines	Plastic was the most frequent debris type. Percentage of turtles with different types of marine litter in their guts: Soft plastic: found in 68.4% turtles. Ropes: 42.1% Styrofoam: 15.8% Monofilament lines: 5.3% Colour of debris: 52.6% of loggerheads (n = 10) contained only white or translucent debris, 31.6% (n = 6) ingested debris of other colours (green, brown, red and black), three turtles (15.8%) ingested white/translucent and coloured debris.	76 pieces of debris, found in 14 loggerheads, were larger than 1 cm in length (mean length: 3.7 ± 1.8 cm). Mass of debris ranged from below the limit of detection to 0.71 g. Mean dry mass = 0.08 ± 0.18 g.	Eastern Adriatic (Slovenia & Croatia)	Plastic was the most frequent debris type, and had been ingested by 13 loggerheads (68.4%). The turtle that had ingested 27 items of debris was a female – the authors report that there was no evidence to suggest that ingestion of plastic caused the turtle's death. The majority of debris ingested by the loggerheads in this study is soft, floating plastic, which suggests that this is a common route of exposure for these animals. The ingestion of different colours of debris suggests the loggerheads have low feeding discrimination. Of all the loggerhears investigated for this study, only one had probably died directly from debris ingestion. The turtle had ingested plastic, which the authors say was the most likely cause of death of the juvenile loggerhead. It had ingested 0.71g of plastic that occupied the major part of its stomach. The authors note that debris ingestion at sub-lethal levels can cause dietary dilution and reduced energy intake. Debris ingestion (mass, number or size) by turtles was not affected by age or gender.

Karamanlidis *et al.* 2008	1) 1991-2007 (necropsies). No dates for questionnaires. 2) To assess the threat of accidental entanglement in fishing gear to Mediterranean monk seal populations, and investigate ways to mitigate entanglement. 3) Data from a literature review, questionnaires with professional fishers and necropsies of seals found in Greece and Portugal.	Biota: Mediterranean monk seal, *Monachus monachus*	n/a	Fishing gear, primarily plastic. Long lines and gill nets.	Necropsies carried out in Greece (Portuguese results not included here): 200 dead monk seals reported from 1991-2007, of which 96 cases had full necropsies. 7 had been accidentally ensnared in fishing gear, 15 had been deliberately killed, 39 died from non-human-related causes and 35 died from unknown causes. Entanglement appeared to af-fect mainly sub-adult individuals (46%). Questionnaires to Greek fishers: Alonnisos: 25 responses, 1 monk seal reported entangled and escaped alive. Kalymnos: 40 responses, 5 seals caught, only one escaped alive. Zakanthos: 20 responses, 7 seals caught, only two escaped alive.		Northeast Mediterranean.	Accidental entanglement in fishing gear is a major threat to the Mediterranean monk seal in the northeast Mediterranean Sea. The authors in the discussion say it is impossible to state the extent of the impact of entanglement on the seals because of other threats such as deliberate killing have also caused the decline in population numbers. Predict that unless conservation measures are put in place in the coastal areas, as the population of coastal areas increases and the fishing activity increases, it is likely that entanglement will continue.
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