CBD NOTIFICATION N. 042/2014 "REQUEST FOR INFORMATION ON THE IMPACTS OF MARINE DEBRIS ON MARINE AND COASTAL BIODIVERSITY AND HABITATS"

ITALIAN CONTRIBUTION

IMPACTS OF MARINE DEBRIS ON MARINE AND COASTAL BIODIVERSITY AND HABITATS

Some specific topics

Overview

Negative effects of marine litter on marine organisms are fairly well known and can be determined essentially by:

1) entanglement with fragments of litter or in so-called "ghost nets"

2) ingestion, which can lead to suffocation or intake of contaminants.

These phenomena can lead to the death of the organism or its impairment and injury. At present it is unclear whether these negative effects may also have consequences at the population level and affect marine biodiversity.

Over 260 species, including invertebrates, turtles, fishes, seabirds and mammals, have been reported to ingest or become entangled in plastic debris, resulting in impaired movement and feeding, reduced reproductive output, lacerations, ulcers, and death (Derraik 2002; Laist 1997, de Lucia *et al*., 2014). Many species mistakenly ingest debris such as plastic, monofilament line, rubber, aluminium foil and tar (Bjorndal et al., 1994; Derraik, 2002). Regularly, fishes (Boerger et al., 2010), birds (van Franeker et al., 2011), cetaceans (de Stephanis et al., 2013) and marine turtles (Campani et al., 2013; Lazar and Gracan,2011; Tourinho et al., 2010) accidentally swallow micro and macroplastic debris that is often found in their digestive tracts.

In the Northern sea, Fulmarus glacialis has been chosen to evaluate marine environmental status (van Franeker et al., 2011), while the sea turtles Caretta caretta (Linnaeus, 1758) represents the main candidate to be used as bio-indicator for monitoring marine litter in the Mediterranean sea (Matiddi et al., 2011; MSFD TG Marine Litter, 2013).

Marine litter and sea turtles

Sea turtles (Caretta caretta), included in lists of endangered species, may ingest plastic bags mistaken for jellyfishes, when they feed in neritic and pelagic habitats. Plastic fragments and other anthropogenic materials may be directly responsible for the obstruction of digestive tracts (Bugoni et al., 2001; Di Bello et al., 2006) and the death of sea turtles (Bjorndal et al., 1994). Furthermore, long retention times of plastic debris in the intestine may cause the releasing of toxic chemicals (e.g. phthalates, PCBs) that may act as endocrine disruptors and therefore can compromise the fitness of individuals (Teuten *et al.*, 2009).

Few studies report data of marine litter in gastrointestinal tract of specimen of sea turtles founded dead along Mediterranean coast (Camedda *et al.*, 2013). In the Gulf of Gabes and Strait of Sicily (Casale et al., 2008) plastic debris was found with a high occurrence (Frequency of Occurrence -

FO 33.7%), in the Adriatic Sea (Lazar and Gracan, 2011) soft plastic were recorded with a high value too (FO = 68.4%) and the maximum plastic incidence (FO=75.9%) was found in the Western Mediterranean area (Tomás et al., 2002). In the Tyrrhenian Sea litter categorized as sheetlike (Campani *et al.*, 2013) showed higher values (FO = 70.4%), while the lowest percentage of interaction reported in the Mediterranean ((FO = 12.39%) is from Sardinian specimen (Camedda *et al*., 2013); where for the first time the incidence of litter was anaysed also in fecal pellets collected from alive turtles. Alive sea turtles released anthropogenic materials in the faeces for longer than a month of hospitalization, even if most of the litter was expelled within the first 2 weeks. Considering the mean distance covered in 10 days by C. caretta, the litter defecated during the hospitalization into the tanks is likely to be a sample of debris present around in a range of about 100 nautical miles from coastline.

In all cases plastic material was the main category observed, sheets and fragment were the most relevant sub-categories.The high occurrence of sheet items ingested may be due to their particular suspending pattern that make them more similar to jellyfishes than other plastic objects (fragments or foam) which positively buoy on the water surface and could be more difficult to come into contact and to be approached by sea turtles (Schuyler et al., 2012).

Lost and abandoned fishing gear

Every abandoned, deliberately discarded or lost at sea fishing gear is part of the marine litter, considering the definition of marine litter given at the international level: “any persistent, manufactured or processed solid material discarded, disposed of or abandoned in the marine and coastal environment”. The United Nations Environment Programme (UNEP) Regional Seas Programme recognises the immediate and direct interconnection between marine litter and lost/abandoned fishing gear and related debris (UNEP, 2005). The so-called “ghost nets” may determine unwanted killing of marine organisms.

The fishing gear could be lost at sea for several reasons (bad weather conditions, accidental cutting of buoys by vessels, etc.) or abandoned because leaving it in the sea is a convenient means of illegal disposal. Food and Agricultural Organization of the United Nations considered the gost fishing a big concern generating additional mortality in overexploited marine ecosystems (FAO/UNEP, 2009). Ghost nets are often considered perpetual “killing machines” that never stop fishing (Esteban, 2002). Some studies were performed to quantify the decay of efficiency of ghost net, these parameters depends on many factor as the type and dept of seabed where the net remains, the velocity of biofouling development, visibility or transparency of water etc. (Kaiser *et al*., 1996; Erzini *et al*., 1997, Saldanha *et al*., 2003).

Overall catch rates of lost/abandoned fishing gear vary so greatly that a global estimate would be meaningless (Brown *et al.*, 2005). Sancho *et al.* (2003) considered lost tangle nets to catch around 5 percent of the total commercial catch. Several studies on static fishing gear have shown it to be about 10% of the target population. Fish and crustaceans such as lobsters and crabs are frequently caught in lost or discarded fishing gear. The major damage seems to be caused by cages traps, placed on the seabottom, in which there is a self baiting phenomenon. Lost traps also continue to attract fish and crustaceans, which enter them in search of food or shelter.

Also other fishing gear as drifting net and trammel nets may act actively killing a great number of marina fauna. Drift netting is a fishing technique where nets, called drift nets, are allowed to drift drived by current at the sea surface. Drifting nets travel the seas with the currents and tides continually fishing as they progress through the waters. As they are unattended and roaming, they fish indiscriminately, not only catching threatened species but undersized and protected fish/marine mammals as well.

Trammel nets are fishing net with three layers of netting that is used to entangle fish or crustacea. A slack central layer with a small mesh is sandwiched between two taut outer layers with a much larger mesh. The net is kept vertical by the floats on the headrope and weights on the bottomrope.Trammel nets are used especially near the coasts in rocky habitats characterised by high biodiversity and continue to fishing species of high economic value.

Lost/abandoned fishing gear continue to trap passing fish 'unintentionally' (by-catch) also of particularly endangered and protected species. Floating parts and suspending parts of abandoned fishing gear entangle wildlife such as marine mammals, sea turtles, sea birds and fish, often attracted by fishes that have been caught or entangled in nets and fishing lines (Laist, 1995; Laist and Liffman, 2000).

Due to the resistance to degradation of synthetic materials (nylon, polyethylene and polypropylene), once discarded or lost, fishing gear remain in the marine environment, with negative economic and environmental impacts. Lost/abandoned fishing gear is lately becoming increasingly a world wide evident nuisance. It is assumed that hundreds of thousands tonnes of undegradable fishing nets are abandoned or lost in the world oceans every year. Worldwide, this phenomenon is having an impact on the sustainability of already stressed fisheries. Ghost fishing kills thousands of fish that might otherwise have found their way to the market. An estimated US$ 250 million in marketable lobster is lost each year from ghost fishing (UNEP, 2005).

Furthermore, derelict fishing gear in the form of nets and ropes, invisibly floating just below the water's surface, can cause significant risks to vessel operations. Nets, ropes and other derelict gear, it has been documented, have entangled vessel propellers and rudders resulting in costly repairs, significant loss of operational time, and endangering boater and crew safety (Johnson, 2000).

Moreover, lost/abandoned fishing gear, like other marine debris, has the capacity to travel for very long distances and through different habitats, transporting with them invasive species from one sea area to another.

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