

Ghost Fishing: The Silent Predator of the Seas

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SUMMARY

Ghost fishing, the phenomenon where lost, discarded, or abandoned fishing gear continues to entangle and kill marine life, represents a severe and often overlooked threat to ocean health. Each year, millions of pieces of fishing equipment—including nets, lines, pots, and Fish Aggregating Devices (FADs)—are lost due to environmental factors, operational failures, and deliberate disposal. These derelict gear items persist in the marine environment for decades, indiscriminately capturing fish, crustaceans, marine mammals, sea turtles, and seabirds. In addition to depleting fish stocks and endangering wildlife, ghost fishing contributes significantly to plastic pollution and creates hazards for navigation and fishing operations. Addressing this problem requires a multifaceted approach combining prevention, mitigation, and recovery strategies. Effective measures include marking and tracking gear, reducing soak times, adopting biodegradable materials and escape panels, and deploying advanced technologies such as ropeless retrieval systems and Remote Operated Vehicles (ROVs) for gear recovery.

INTRODUCTION

In the vast expanses of the world's oceans, a silent menace drifts unseen, ensnaring marine life and choking fragile ecosystems. Known as ghost fishing, this phenomenon occurs when fishing gear such as nets, lines, pots, and traps are lost, discarded, or abandoned, only to continue catching marine organisms long after their intended use. Unlike active fisheries, ghost fishing yields no economic benefit but inflicts severe ecological damage and contributes to the mounting crisis of plastic pollution in marine environments. As our dependence on seafood grows and the health of marine life becomes increasingly precarious, understanding and addressing ghost fishing is essential to achieving sustainable fisheries and protecting biodiversity.

How Fishing Gear Becomes Ghost Gear?

Fishing gear is designed to be highly effective at capturing target species, but this same effectiveness makes it deadly when control over it is lost. A recent survey involving over 450 fishers worldwide found that natural forces are among the leading causes of gear loss. Storms, rough seas, and unpredictable currents can drag nets and lines off course or snap them free from their moorings. Tidal surges often pull gear far beyond retrieval range, while sudden squalls make it impossible to recover equipment before it is lost to the depths. In addition to environmental factors, human actions play a major role. Gear may be carelessly stored or improperly secured on deck, leading to accidental losses. In other instances, fishers deliberately discard damaged or unwanted gear at sea to avoid the cost and inconvenience of disposal onshore. The cumulative effect is staggering: each year, up to 2.5% of all fishing gear is lost globally. This includes over 78,000 square kilometers of nets, 740,000 kilometers of longlines, and more than 25 million pots and traps—enough to encircle the Earth nearly 19 times.



Figure 1: An olive ridley turtle entangled in ghost gear and trapped underwater. Image by lex Mustard.

Ecological Impacts of Ghost Fishing

Once abandoned, lost, or discarded, fishing gear continues to fulfill its original purpose—indiscriminate capture of marine life—but without oversight or an end date. Nets drifting freely or snagged on the seabed ensnare fish, crustaceans, and mollusks in a perpetual cycle of entrapment and death. As these organisms perish, their bodies attract scavengers such as crabs, octopuses, and other fish, which also become trapped and die. This tragic chain reaction depletes fish stocks and

undermines ecosystem resilience. Large marine mammals are especially vulnerable. Whales, dolphins, and seals often become entangled in ropes or netting, which can constrict their bodies, impair their ability to swim, and eventually lead to drowning or starvation. Sea turtles, already endangered in many regions, are frequently caught in drifting nets or FADs, their flippers and necks ensnared in synthetic mesh they cannot escape. Even seabirds are not spared: washed-up nets on beaches create deadly hazards for shorebirds and chicks. Each lost net represents an unmonitored trap, silently decimating marine populations that conservation efforts struggle to protect.

Ghost Gear and Plastic Pollution

Beyond its direct toll on marine life, ghost fishing gear is a major contributor to the growing crisis of plastic pollution in the oceans. Modern fishing equipment is typically manufactured from highly durable synthetic materials, such as nylon and polyethylene, which can persist in the marine environment for decades or longer. As these materials break down into microplastics, they spread throughout the food chain, from zooplankton to top predators and ultimately to humans who consume seafood. Research indicates that lost and discarded fishing gear accounts for between 10% and 20% of all plastic debris in the ocean. In some regions, the concentration is even higher: in the infamous North Pacific “garbage patch,” abandoned fishing nets alone constitute nearly 46% of all plastic observed. The impacts are not merely aesthetic; plastics absorb and transport persistent organic pollutants and heavy metals, creating toxic hazards for marine organisms and ecosystems. Furthermore, ghost gear provides a vector for invasive species and pathogens to travel across ocean basins, threatening biodiversity far beyond its point of origin.

Economic and Navigational Consequences

Ghost fishing is not only an environmental tragedy but also an economic and operational burden. Each year, countless fish and commercially valuable species are lost to these phantom traps, reducing the available harvest and compromising the livelihoods of fishers who depend on healthy stocks. The costs of lost gear are twofold: the immediate financial loss of the equipment itself and the long-term loss of potential catches. Moreover, ghost gear poses a hazard to navigation and vessel safety. Submerged or floating nets can entangle propellers, foul rudders, and damage hulls, leading to costly repairs and dangerous situations for crews. In some cases, encounters with ghost gear have forced vessels to abandon fishing grounds entirely, further straining the economic viability of small-scale fisheries.

Strategies to Prevent Gear Loss

Addressing ghost fishing requires a comprehensive approach that combines prevention, mitigation, and recovery. Prevention begins with good fisheries management and training. Crews must be educated on proper handling, storage, and maintenance of gear to reduce accidental losses. For example, minimizing soak times—the length of time gear is left in the water—significantly lowers the risk of gear displacement or damage. Marking gear with durable identification tags establishes ownership and accountability, discouraging deliberate abandonment and facilitating retrieval when losses occur. In some fisheries, regulatory frameworks limit the number of replacement tags issued, motivating fishers to recover lost pots rather than replace them indiscriminately. Advanced technologies also play a critical role. GPS mapping can help fishers avoid high-risk areas prone to gear conflicts or environmental hazards. Digital tracking systems allow real-time monitoring of gear location, reducing the likelihood that it will be forgotten or misplaced.

Mitigating the Impact of Lost Gear

Even with the best preventative measures, some loss is inevitable, especially in challenging offshore environments. Therefore, mitigation strategies are essential to reduce the impact of ghost gear. One of the most effective interventions is gear modification. Pots and traps can be fitted with biodegradable escape hatches or panels that degrade over time, eventually releasing any trapped animals. Escape rings allow undersized species to exit while retaining legal-size catch. Ropes connecting traps and pots to surface buoys can be designed with weak links that break under strain, enabling entangled marine mammals to free themselves. In recent years, fisheries have also begun trialing ropeless technologies, such as acoustic release mechanisms or inflatable lift bags, which allow traps to be retrieved without leaving vertical lines in the water column. This innovation not only prevents entanglement of whales and turtles but also reduces the risk of gear conflicts.

Recovery and Recycling Initiatives

Removing ghost gear already in the environment is an immense undertaking, but critical to reversing its impacts. Organizations such as the Global Ghost Gear Initiative and Ghost Diving have mobilized divers, fishers, and volunteers to locate and retrieve derelict nets, lines, and traps from coastal waters and reefs. These operations are logistically complex, often requiring multiple dives and specialized equipment to lift heavy gear safely. New technologies have greatly expanded recovery capacity. Remote Operated Vehicles (ROVs), like those developed by Deep Trekker, are increasingly used to survey, document, and retrieve ghost fishing equipment from depths beyond the reach of divers. Equipped with cameras, grabber claws, and powerful lighting, ROVs can locate and recover gear in difficult or hazardous conditions. Ports around the world are also establishing disposal and recycling facilities to ensure that recovered gear does not re-enter the marine

environment. By processing synthetic materials into new products or energy, these initiatives close the loop and reduce the burden of plastic waste.

CONCLUSION

Ghost fishing is a silent predator in our seas, claiming the lives of countless marine animals and undermining the health of ocean ecosystems. It damages economies, imperils navigation, and fuels the crisis of plastic pollution. But it is not an unsolvable problem. Through innovation, cooperation, and commitment, fisheries, governments, conservation organizations, and technology companies are making strides to prevent gear loss, retrieve ghost gear, and mitigate its impacts. With scalable solutions like biodegradable gear, ropeless retrieval systems, and advanced recovery tools, we have the means to turn the tide against ghost fishing. Sustained action and global collaboration are essential to ensure that our oceans can remain healthy, productive, and resilient for generations to come.

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