

# Frequency vs Proportion of Beach Litter

What would you say is the most littered item? How do you decide? Is it what you see the most? What is collected the most? Or is it what keeps appearing, clean after clean, audit after audit, **even after it has been removed** for the zillionth time?

When we hear that an item is “the most littered”, it is worth asking what that actually means. Most of the time, it is the most commonly collected and recorded item. Policymakers are often influenced by the data available to them, but that data can reflect what people pick up, not what is most consistently present.

Repeated beach audits can tell us a different story: some of the most important pollutants are not in the greatest quantity or capacity, but the ones that are persistently present.

This graph compares two (of many) ways of understanding beach litter: how much of each item is found (% proportion of total litter collected) and how often it appears across repeated surveys (audits) of the same section of beach: its frequency/presence.

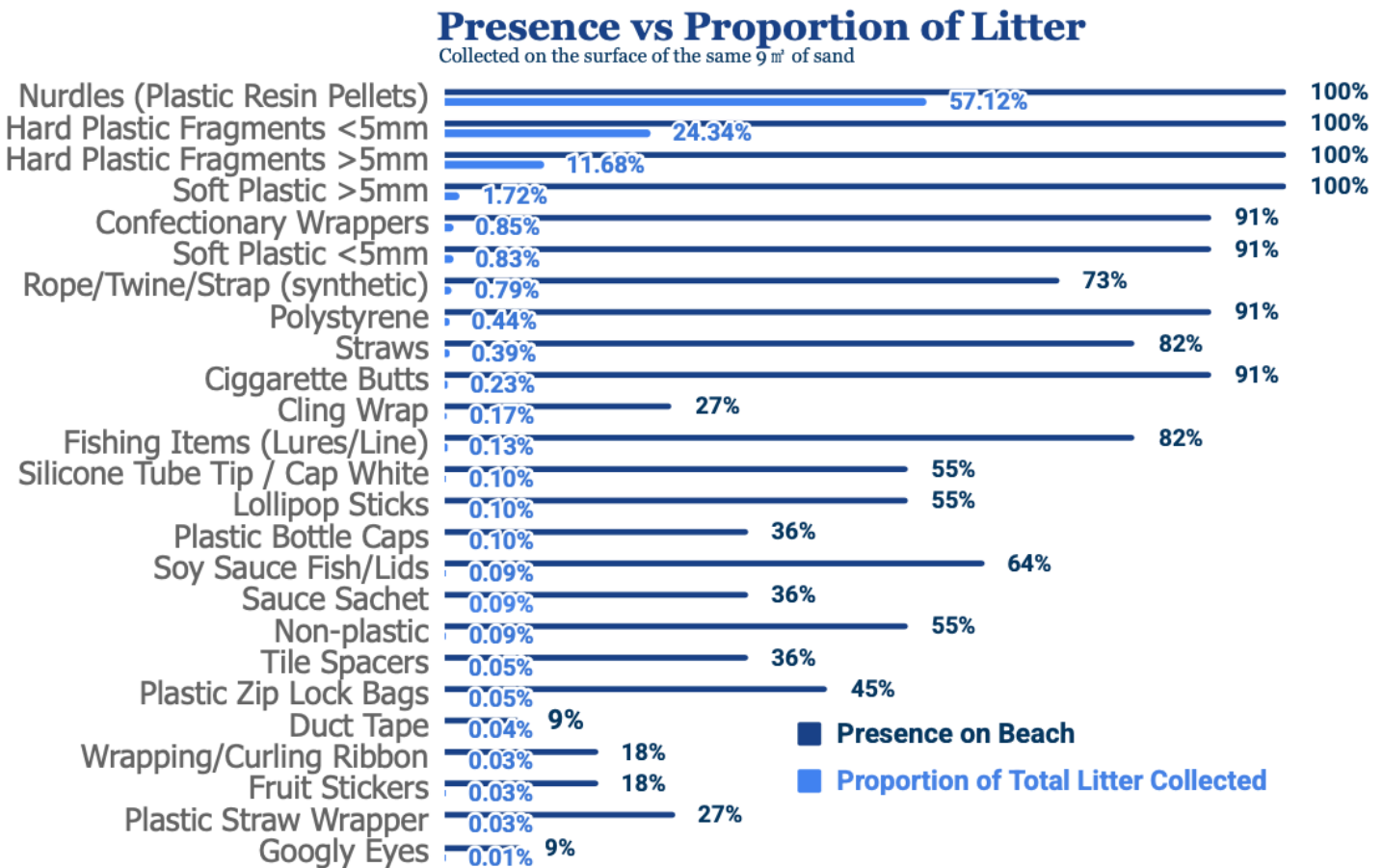


Figure 1: Results from repeated standardised beach litter audits of the same 9 m<sup>2</sup> site at Kananook Beach, Seaford, Victoria (2023–2024).

*Description: This dataset shows that litter composition alone does not capture environmental persistence. While nurdles dominate total counts, many low-volume items such as polystyrene and wrappers occur consistently across audits, indicating ongoing chronic pollution sources.*

The data comes from 11 repeated, standardised litter audits of the same 9 m<sup>2</sup> area at Kananook Beach, Seaford (99 m<sup>2</sup> total surveyed area). Because the same site was sampled multiple times, this dataset captures not just what is present, but what is consistently present.

Some items dominate in total numbers — particularly plastic fragments and resin pellets (nurdles). However, when frequency is considered, another picture emerges. Items that make up only a small proportion of total litter — such as polystyrene, confectionery wrappers, and soft plastics — are frequently found. This indicates that they are persistent features of the beach.

Total counts alone can highlight dominant materials and large pollution events, but frequency reveals which items are reliably present over time, and therefore more representative of ongoing pollution.

By combining these two measures — composition and frequency (proportion and presence), — a clearer understanding of beach litter emerges: not just what is most abundant, but what is most consistently part of the coastal environment. From there, we can move beyond counting litter and start asking targeted questions: which items are useful enough to justify their environmental cost; which are simply unnecessary, such as soy sauce fish, plastic lollipop sticks and balloons; and which need proper collection, reuse or recycling systems so they are captured before they become pollution, such as polystyrene and soft plastics.

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Debris collected from the same 9 m<sup>2</sup> audit site across three consecutive daily audits