

How much plastic is washed up on our shores?

Introduction

We are well aware of the problems of plastic in the oceans. We were interested in doing a project on this topic. There were a number of projects on microplastics from our school in the past so we needed to look at another area regarding plastic in the oceans. We have seen a lot of plastic on the beaches around where we live and we are aware that there were beach clean-ups in the area. This gave us the idea for a project.

We looked at what research was done already with regard to plastic on beaches and in the sea. We noticed that there was little research done in Ireland regarding this.

As a result we decided to carry out our research on the occurrence of plastic at a number of coastal locations in Clare.

How much Plastic is Collected on Irish Shores?

There are many beach clean-ups carried out in Ireland during each year. There is also a Big Beach Clean organised by Clean Coasts which are part of An Taisce. This year's Big Beach Clean took place between 16th to the 18th of September 2022, and over 10,000 volunteers registered to carry out over 500 events, removing more than 63 tonnes of litter all across the country.

Volunteers can log onto a website and record what has been collected on the shore. The table below is a summary of the clean ups logged on the www.coastalcleanupdata.org website from the Island of Ireland over the past 12 months. It includes the total Km covered and total items collected.

Clean Up Summary	Land	Total
People	389	390
Kilograms	1540.47	1541.38
Kilometers	52.25	52.25
Total Items Collected	6936	6936

Aims

The aims of our project are:

1. To see how much plastic is accumulating on the shore at 6 locations in North Clare.
2. To see how much plastic accumulates at these locations over a two month period
3. To calculate how much plastic would wash up on a particular shore over a three month period.
4. To classify the types of plastic found on our shores

Methods

To carry out our research we chose 6 locations in North Clare. The six locations were Bishop's Quarter beach, Beside Gleninagh Pier, Fanore Beach, Whitestrand Beach near Miltown Malbay and two beaches near Quilty.



For each location we marked out a 100m length of coastline. On our first visit to each location we thoroughly collected all visible plastic on each shore from the low water mark to the top of the upper shore. We placed all plastic collected in tubs and brought them back to the lab where we weighed the total amount of plastic collected from each shore. We visited each location every two weeks and collected all plastic that we found in the same 100 m stretch of shoreline.

On one visit to Fanore beach after a storm in November, there was so much plastic deposited on the shore we were unable to collect all the plastic in the 100m section we had marked out. Instead we were only able to collect plastic from an eight meter section of the shore. We collected 3 large tubs of plastic in this section alone. We did not go back to Fanore again as we were unable to clear plastic from the shore and we would not be able to calculate how much plastic had been deposited in the meantime.

When we brought the plastic collected to the school lab, we divided it into the different types of plastic found. We used a sheet provided by Clean Coast to record the number and type of plastic found. We recorded the number and weight of each type of plastic found on each shore.

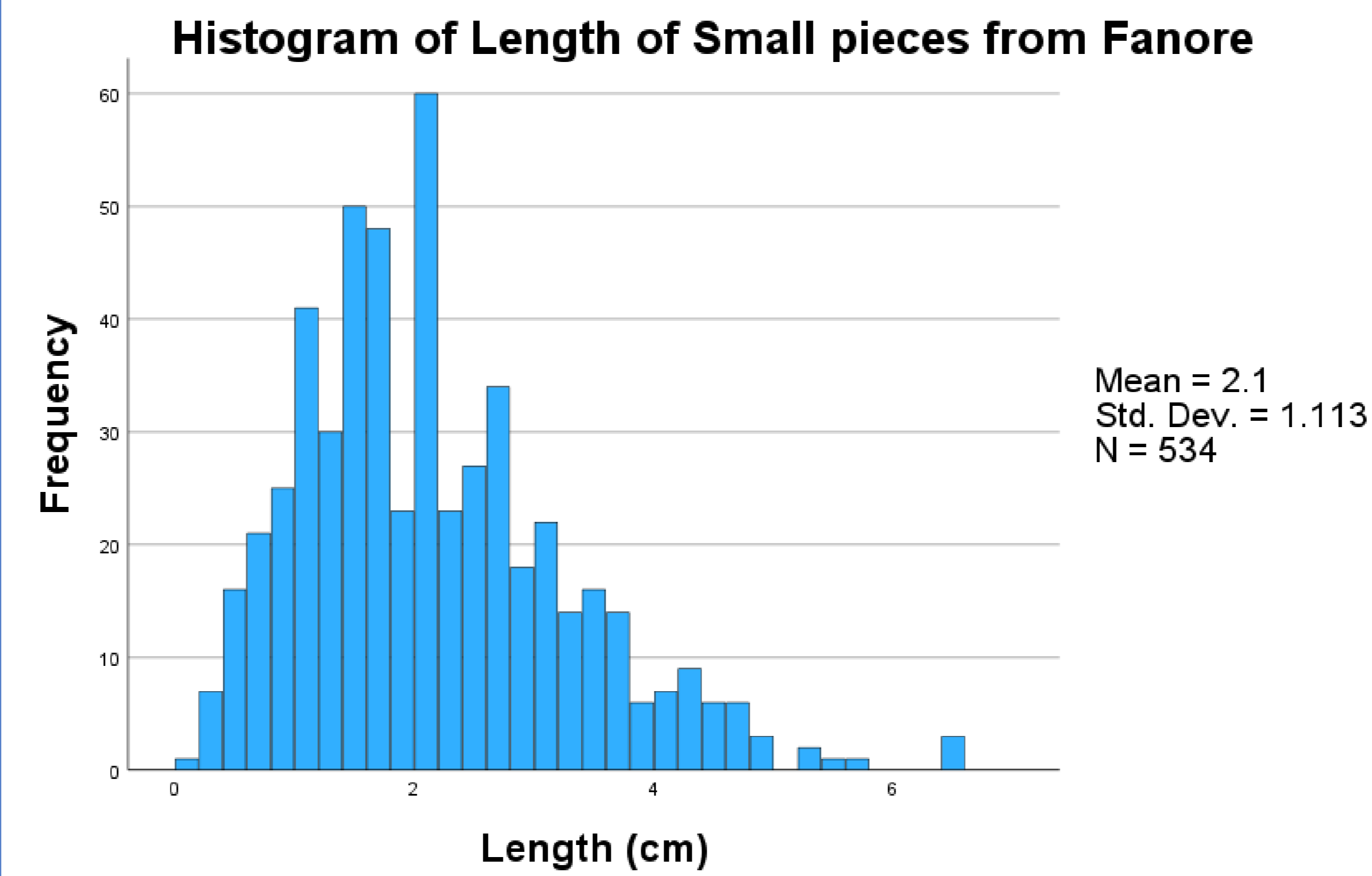
After each shore visit, we recorded the weight and number of each type of plastic found at each location.

After the visit to Fanore after the storm among the plastic collected from the 8 meter stretch of shore was 534 small pieces of plastic. We measured the length of each of these small pieces of plastic and recorded our results.

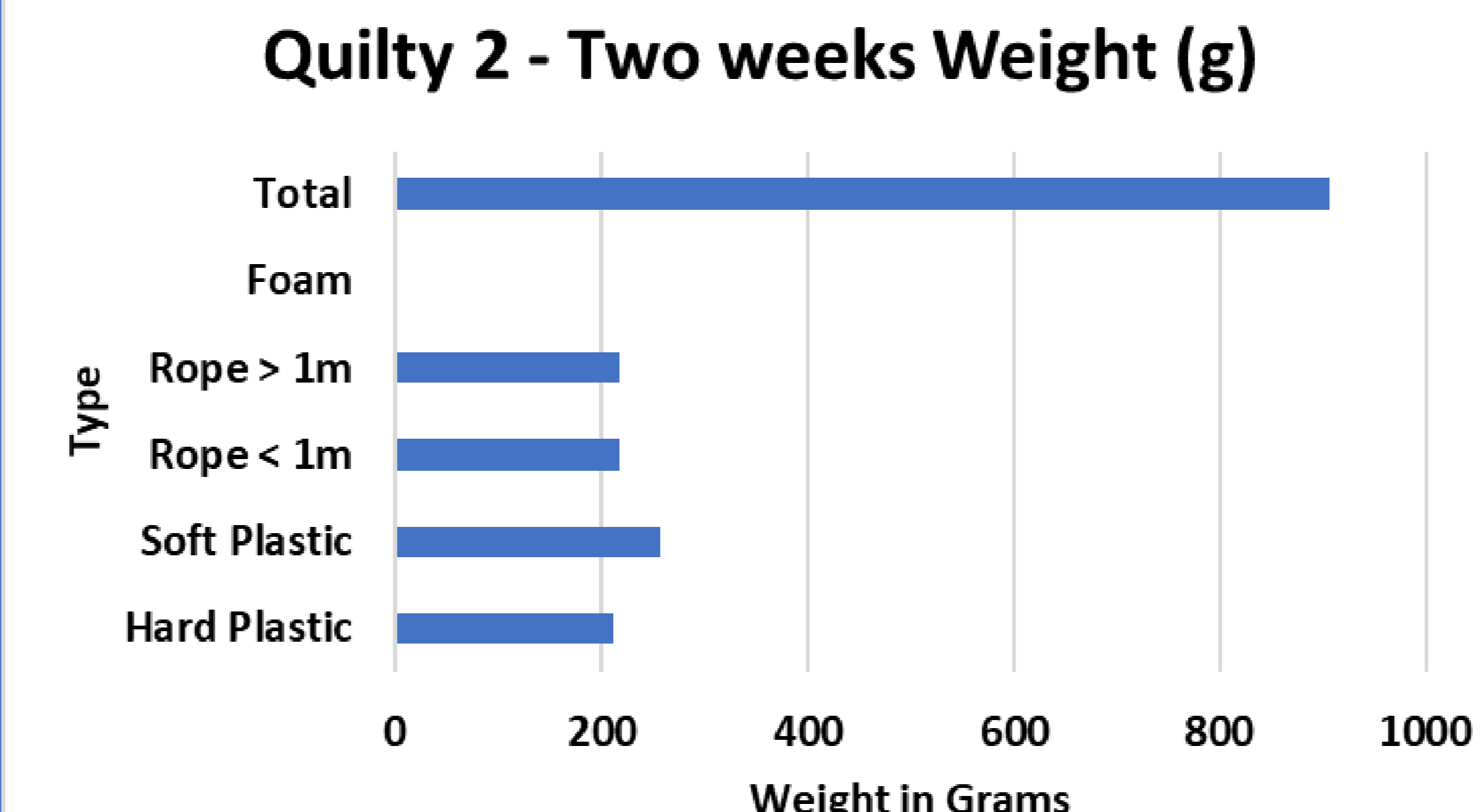
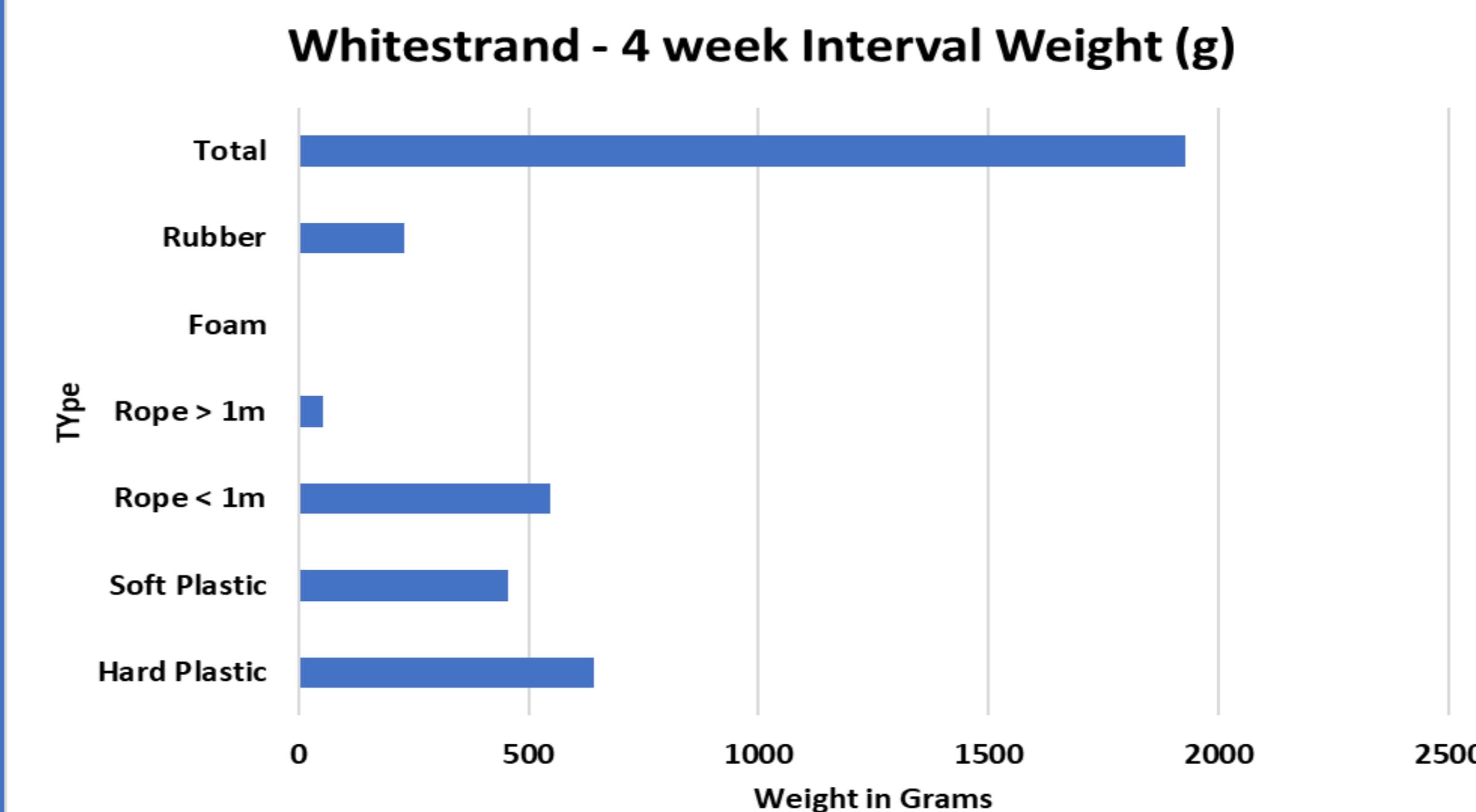
Results

The first thing we noticed from our research is that there was plastic found on all the shores. Some shores had more plastic accumulating on them than others. The shore with the least plastic was Gleninagh, while the shore with the most plastic was Fanore.

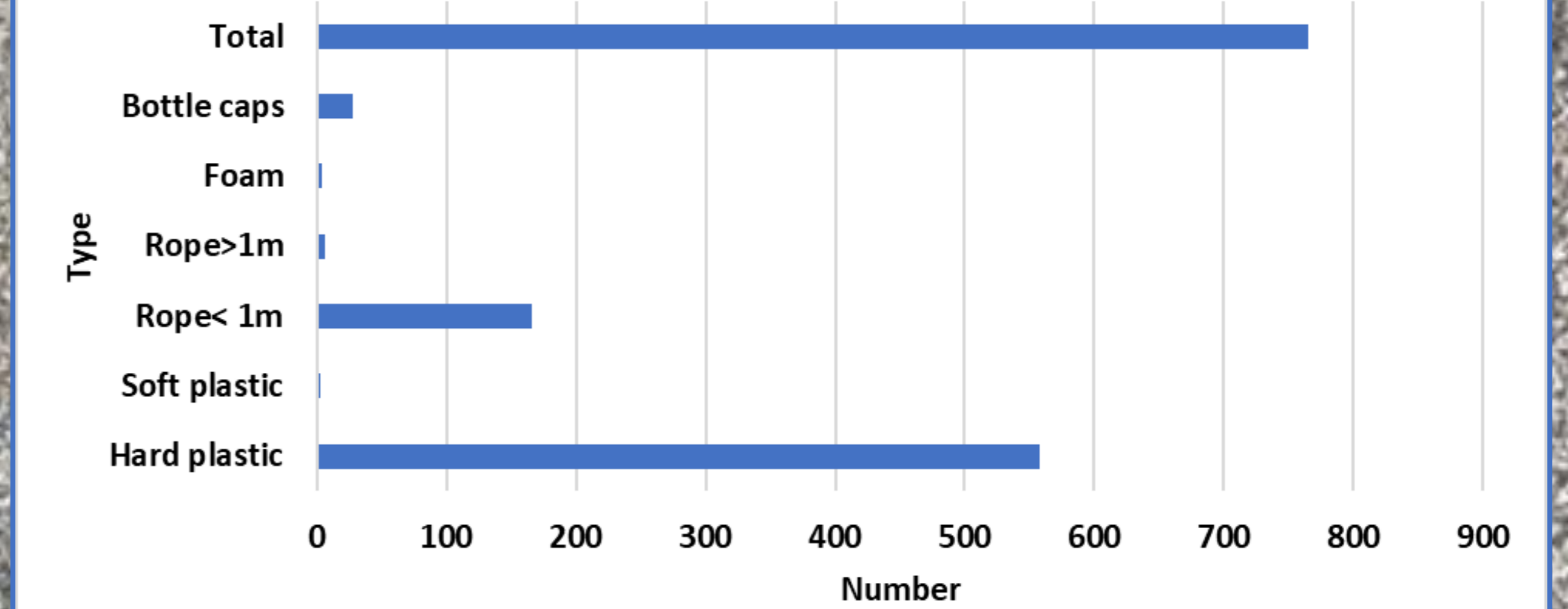
After the storm in Fanore we found 534 small pieces of hard plastic in an 8m section of the shore. We created a histogram with this data. This is shown below.



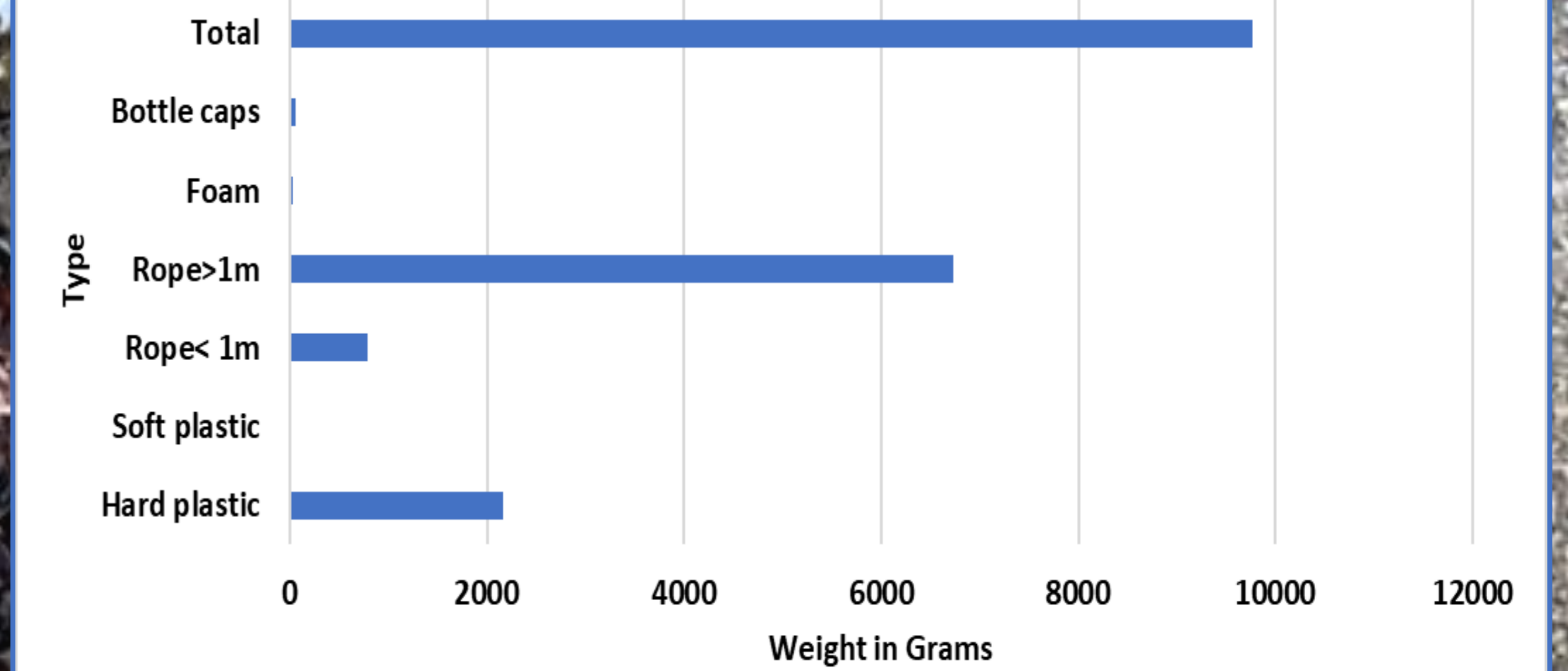
The results for the plastic collected on each of the shores at the different was graphed. A sample of these are shown below.



Fanore (8 m) - Number of Different Types of Plastic



Fanore (8m) After Storm Weight (g)



Conclusions

We found that some shores accumulated more plastic than other. Fanore collected the most plastic in the research area we marked on the shore. Gleninagh collected the least plastic with almost no plastic except on our first visit there.

We then looked at how much plastic accumulates at these locations over a two month period. For Gleninagh this was very little. On one of the two Quilty beaches it was also very little. For Fanore it would be approximately 125 kg had washed up in a 100 meter stretch of shore in a two month period.

We then looked at how much plastic would wash up on a particular shore over a two month period. For Fanore, based on what washed up in the section we recorded data from it would be approximately one tonne of plastic that would have washed up on the shore in a two month period. A storm contributed to this large amount. But remember we have a lot of storms in this area in a year. As a result the amount could be even greater in another two month period.

For the other shores it would be much smaller amounts. For Whitestrand which is about 400m long it would only be 16 kg of plastic that washed up in two months.

Finally, we classified the types of plastic that we found on our shores. The following table shows this.

	Number	Weight (g)	% Number	% weight
Hard Plastic	1049	7165.6	59.27	35.20
Soft Plastic	92	1248.2	5.20	6.13
Rope < 1m	441	3403.25	24.92	16.72
Rope > 1m	137	8149.5	7.74	40.03
Foam	15	60.9	0.85	0.30
Rubber	8	275.4	0.45	1.35
Bottle caps	28	56.4	1.58	0.28
Total	1770	20359.25	100	100

There is a problem with plastic in the oceans. If we multiplied the almost tonne of plastic that washed up on Fanore shore over two months by all the shores on the west coast of Ireland then we would have a lot of plastic to dispose of. We must remember that this plastic keeps breaking down into microplastics.

Something needs to be done about the use of plastic before the situation get any worse.