Rother District Council

Strandliners
Cleaner Rivers, Cleaner Seas

Bio-beads in Rother District

Foreword

"Bio-beads may have been in use for around 30 years as part of the infrastructure used by water companies to provide clean water for large populations in the U.K, but it is only relatively recently that their presence has been increasingly recorded as lost into the environment. Back in 2012 I took photographs at Camber Sands of what I thought were nurdles (pre-production pellets that have a history of being lost to the environment for 40/50 years), not knowing that these were in fact some of the first record of bio-beads in the south east English coastline.

It took research by the Cornish Plastic Pollution Coalition and FIDRA to confirm major losses of bio-beads along the south coast of England, but still there has not been much research into the specific sources, and it seems that major organisations have not been able to shed much light either.

The presence of bio-beads in quantities at Camber Sands and Cuckmere Haven was one reason why Strandliners was founded, to engage the public to identify and record plastic pollution found in our communities, and I am really grateful that Garazi Monzo-Contreras has been able to fill in a lot of gaps around the presence of bio-beads at Camber Sands, with the support of Kristina Sodomkova and colleagues at Rother District Council. We should all praise the foresight of the Rother District Council being proactive in the publication of this report, where other organisations will be able to follow."

Andy Dinsdale, Executive Director, Strandliners - Increasing public awareness of our environment through citizen science & community engagement

"I should like to thank Garazi for allowing me to participate in this project albeit in a very small way. Firstly, it highlights the benefits of working across different local authority departments, with educational establishments and voluntary public interest groups such as Strandliners. Secondly it has raised our awareness of the presence of bio-beads in the aquatic environment. Both I and my environmental health colleagues were unaware of the existence and use of bio-beads in the sewage treatment process before our involvement in the project. While Rother Environmental Health function does not have regulatory responsibility for the use of bio-beads or their subsequent release into the environment, Garazi's project has highlighted deficiencies in the current UK environmental permitting regime and its application in relation to the release of plastics materials into our controlled waters."

Steve Biggs, Senior Environmental Health Officer, Rother District Council

"This report is a testament to the value of a local authority engaging with a higher education institution. Involving students as part of their MSc placements generates new knowledge and insights a local authority would otherwise be unlikely be able to produce. An MSc placement set up as a collaborative activity benefits the student and offers a unique opportunity for partners engagement, bringing together a diverse group of experts and enthusiasts. Such partnership approach is at the heart of the Rother's Environment Strategy and its delivery. Students are our future and any support we can lend them on their professional journey in these testing times is a worthwhile offering."

Dr Kristina Sodomkova, Environment and Policy Manager, Rother District Council

Acknowledgements

I want to firstly thank the opportunity to be a part of such an amazing project to Dr Kristina Sodomkova, the Environment Strategy's lead at Rother District Council, and my direct supervisor that spent so much time organising this project.

Secondly, I would like to thank Andy Dinsdale, Director and Founder of Strandliners CIC, who taught me everything I know on bio-beads and nurdles, showed me surveying techniques, gave me a few lifts to surveying locations and shared his passion for a plastic free environment.

I would also like to thank Steve Biggs, Senior Environmental Health Officer from the Community Protection Team department in Rother District Council, who collaborated on the project. Steve was always willing to join our data collection trips and used his contacts to acquire key documents to support this study.

The Coastal Officers of Rother District Council also played a key role in this project. Sam Stone, Stuart Lawson, and Skye Curtis have provided me with key information on the pollution incidents at Camber Sands. I am grateful for their input.

Last but not least, I would like to give a big thank you to the Green Growth platform and the University of Brighton for making this placement possible, specially to Dr Helen Walker, the module leader, and Dr Ryan Woodard, the program leader, for linking me to Rother District Council and for giving me moral support.

May 2021

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Abstract

The (2018) Cornish report by the Cornish Plastic Pollution Coalition suggested that Cornwall and the English Channel coast are major hotspots for bio-bead pollution within the UK. This Rother District report, commissioned by the local authority under the auspices of its Environment Strategy's delivery and produced as part of an MSc placement at University Brighton, confirms that a key coastal area around Camber Sands in the eastern part of the district is indeed a bio-beads hotspot, with two major bio-beads pollution incidents reported to the environmental regulator, the Environment Agency, (in years 2010 and 2017).

Moreover, the project has uncovered a low-level leakage of bio-beads into the natural environment inland at Beckley Water Treatment Works in the eastern part of the Rother District where bio-beads (also called BAFF media or Brightwater), small plastic pellets, are used as part of the wastewater treatment process.

With bio-beads, prevention is better than cure. In fact, there is no cure so far as such. Bio-beads are still present at Camber Sands to this day, after the 2010 and 2017 reported pollution incidents. Bio-beads pose a risk to the natural environment due to their perceived toxicity as well as size and light weight which means they travel large distances and the source is difficult to track down.

This inability to pinpoint who the polluter is means there is a lack of incentive for water companies to improve their management practice when it comes to handling and storing bio-beads and when it comes to introducing adequate containment measures and new technologies in replacement of the BAFF systems. Southern Water, as the Chair of the Sussex Local Nature Partnership and sitting on the East Sussex Environment Board, should be an exemplar environmental leader when it comes to its principles and practices. Within its operational area, the Water Treatment Works at Eastbourne require scrutiny, due to inconsistencies of data provided about past pollution incidents and the poor accessibility of the site for staff.

Worryingly, the Environment Agency seems to have lacked expertise and was ill-equipped dealing with bio-beads pollution incidents in the Rother District. The environmental regulator must grasp the magnitude of the threat bio-beads pose to the natural environment if future major incidents were to occur again. It is hoped this report will serve as a useful wake up call for the regulator to take this issue very seriously.

Overall, there is a need to raise awareness of the bio-bead problematic amongst various audiences and this is what the report hopes to achieve. It contains several recommendations. The bio-beads research is in early stages and there are many unanswered questions. This report aims to contribute to evidence-based approach out there, building on the work of the Cornish Plastic Pollution Coalition.

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Introduction

This report contains information about the presence of bio-beads in the Rother District – the first time such information has been collated. The report is the output of an MSc student placement, hosted by Rother District Council as part of its Environment Strategy's[1] programme. The placement investigated presence of bio-beads within the Rother District. As well as collating evidence from various sources, the purpose of the report is to raise awareness of bio-beads amongst the public and the local communities to effect positive environmental change.

The following sections of the report introduces bio-beads: what they are, where they come from and why should we be concerned about them. The regulatory and legislative framework for bio-beads is also outlined.

What exactly are bio-beads?

Bio-beads are microplastics smaller than 5mm. Their appearance is wrinkled and ridged on the sides as shown in the photo in Figure 1. They are manufactured this way to induce bacteria attachment during the water treatment, to stimulate bacterial and fungal growth at their surface. Therefore bio-beads are exclusively used by water companies as part of the water treatment process. They are known as a type of biological aerated flooded filter (BAFF) media [1].

Figure 1 Bio-beads and a magnified image, showing distinct ridges. Source: Strandliners (2021).

[1] Rother Environment Strategy: https://www.rother.gov.uk/strategies-policies-and-plans/environment-strategy/