

Beach Wrack Management | A Beach Manager's perspective

While beach wrack is often seen as just another waste item to be removed, it has an important role in the beach ecosystem. For example, having beach wrack on the beach helps alleviate the effects of beach erosion, and many species depend on beach wrack as a source of food, living space and nursery. It also has significant potential as a resource and as a remediation measure to improve coastal water quality. In fact, it has seen plentiful historical use as such, and many of these applications are now being revived. Of course, technological advances, innovative business models and a resurgent political drive for sustainability and circularity have spiked interest in this material as well. This all begs the question: how is beach wrack currently being managed, and how could these management practices be optimized? Here at EUCC, we researched into these issues from a holistic socioeconomic angle, focusing on the stakeholder perspective and the managers in particular .



Beach wrack piled up on beach before collection. Photo: EUCC-D

What is beach wrack?

Beach wrack is a common occurrence along the shores of the Baltic Sea. While we all have a rough idea what it consists of, there are multiple definitions of what beach wrack actually is. There are two distinct terms used to loosely refer to the same material. For the purpose of this article, we can first define beach cast as an umbrella term for all washed up material consisting of beach wrack as the largest component, terrestrial debris, litter and living animals that inhabit it, but excluding materials such as sand, stones or pebbles. Beach wrack is seen as purely the marine organic component of beach cast that originates from the sea, e.g. torn off seagrass, macro- and microalgae, shells, dead fish etc.

For the most part, when it lands on beaches that see little use by local human residents, beach wrack is an uncontested part of nature and poses few pressing political challenges. However, it becomes a legitimate beach management issue on beaches devoted to tourism and recreation. Among other things, it can pose health and safety issues, and raise questions about beach quality and aesthetics. This leads to pressure on the beach managers to remove it from the beach, along with other materials present there, such as litter.

An inquiry into beach wrack management practices

In 2019, as part of the CONTRA project, the EUCC-D organised a questionnaire aimed at beach managers in six Baltic Sea Region countries: Germany, Poland, Russia, Denmark, Sweden, and Estonia. The primary objectives were to identify current management practices and to gather information about the financial and logistical burden that beach wrack places on local communities. This baseline data that has been collected can be used to open up discussions on how local practices can be improved.

The respondents were individuals who have direct responsibility for beach management/cleaning and therefore the removal of beach wrack, including insight into the financial costs. The questionnaire had a total of 31 questions that were split into four sections: General, beach wrack quantities, beach wrack management, and costs. In total, we gathered 42 responses. 27 respondents agreed to make their data fully published, 3 wanted their beach wrack costs and cost factors kept confidential, and 9 allowed the data to be published but without reference to the municipality name. Most respondents manage relatively small resort beaches, where beach cleaning, and beach wrack collection, is only practiced on part of the total beach length, leaving some parts ungroomed.



Fresh beach wrack ashore in Warnemünde. Photo: J.Hofmann

Beach wrack quantities

Amounts of beach wrack landings that managers experienced were quite varied. For one site, amounts of under 1t were already extreme; on the other hand, multiple sites saw 5t as a small amount. In general, any amount up to 100t of beach wrack is considered by

the responding municipalities as being a small monthly amount and up to 500t is considered a large amount. The majority of local authorities report that between May and September, i.e. the main tourism season, small to medium amounts of beach wrack are most common.

	Municipality	Managed beach length	Small amounts (tonnes/t)	Medium amounts (tonnes/t)	Large amounts (tonnes/t)	Extreme amounts (tonnes/t)
DE	Poel	3.0 km	100	300	500	700
DK	Koege	0.9 km	10	100	500	1000
PL	Puck	0.1 km	1	10	20	50
SE	Kristianstad	2.5 km	10	50	250	400
DE	Breege - Juliusruh	1.5 km	<20	50	150	>150

Examples of divergences between definitions of small, medium, large and extreme amounts at selected sites

Large and extreme amounts of beach wrack are more common in January – March and in autumn (Oct - Dec). When asked about the trend of beach wrack quantities over the past 10 years, 40% of respondents said that the quantities had remained the same.

Country	Municipality	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
SE	Kristianstad			x	x	x	x	x	x				
SE	Gotland	x	x	x	x	x	x	x	x	x	x	x	x
SE	Öland				x	x	x	x	x	x			
SE	Karlskrona						x	x					
DE	Wustrow					x	x	x	x	x			
DE	Sellin					x	x	x	x	x			
EE	Pärnu				x	x	x	x	x	x			
EE	Saaremaa vald				x	x	x	x	x	x	x		
EE	Narva Jõesuu				x	x	x	x	x	x			
EE	Harku						x	x	x				
DE	Breege					x	x	x	x	x			
DE	Wieck a. Darß	x	x	x	x	x	x	x	x	x	x	x	x
PL	Puck					x	x	x	x				
DE	Seebad Altefähr	x	x	x	x	x	x	x	x	x	x	x	x
DE	Mönchgut					x	x	x	x	x			
DK	Ostseebad Insel Poel				x	x	x	x	x	x	x		
DK	Solrød	x	x	x	x	x	x	x	x	x	x	x	x
DK	Greve					x	x	x	x	x			
DK	Vordingborg					x	x	x	x				
DK	Dragør				x	x	x	x	x	x			
DK	Helsingør / Fredensborg												
DK	Køge					x	x	x	x	x			

Frequency and amounts of beach wrack landings at selected sites (X means beach wrack is collected in that month)

■ small amounts
 ■ medium amounts
 ■ large amounts
 ■ Extreme amounts
 No data



Collection of beach wrack using heavy machinery. Photo: J.Hofmann

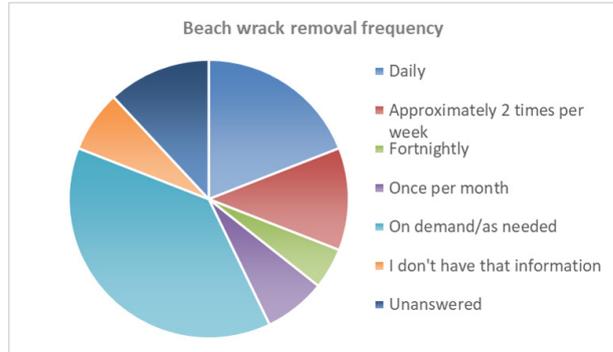
In autumn and winter, when little to no cleaning takes place, the municipalities rely on natural decomposition processes and the fact that the next storm will wash the beach wrack away again to reduce residence times. Also, in the spring, instead of removing beach wrack periodically, many municipalities do a single big clean-up right before the tourist season.

Beach operations

Zoning techniques are employed by most municipalities. Temporal zoning, i.e. adopting specific time and date intervals for beach grooming, helps reduce management costs. This includes seasonal and small timescale routines, e.g. cleaning just weekly. The main months when local authorities remove beach wrack are in the high tourist season between May – September, despite the fact that beach wrack amounts are usually at their lowest then. These practices also help to reduce the environmental stress caused by regular heavy machinery use on the beach. Spatial zoning, that is, limiting cleaning to specific sections of the beach, is used by all responding municipalities. Again, this keeps costs down and may reduce environmental impacts. Some municipalities also employ modified spatial zoning patterns, such as cleaning only near the waterline. In practice, zoning best practices are site-specific.

Sand removal has been identified as one of the most problematic impacts of beach wrack management. While many Baltic beaches are already losing sand due to beach erosion, the machines used to groom the beaches often also remove sand, which is then transported off the beach to the disposal site. Unfortunately, our data shows that sand loss is not being considered at many beaches. Some sites try to limit this at the collection stage by employing only manual tools, others try to separate the sand from the material collected by machines and deposit it back on the beach. While sand nourishment in the form of importing sand from other beaches to a beach affected by sand loss is possible, it is also quite expensive. With respect to the challenges associated with beach wrack storage, most sites report not having dedicated storage facilities. In some countries, including Germany, the requirements for storage facilities are legally defined in a manner that makes setting them up for individual managers too expensive. These legal

demands stem from the problem of contaminant leaching, as they are meant to limit the leaching of heavy metals into the environment. Beach wrack collection, storage and treatment is subject to various local, regional, national and European legal acts. 38% of respondents said that the legal framework surrounding beach wrack management is clear.



Frequency of beach wrack removal at all sites in months that removal takes place

Beach wrack management costs

Currently, even though the litter content in Baltic Sea Region beach wrack is quite low, litter and beach wrack are rarely distinguished by managers at an operational level. Due to this, most of their estimates concerning the costs of beach wrack management were only rough estimates based on the entire costs of beach cleaning. Another common problem was managers' reluctance to share costs data. Nevertheless, the average annual cost seems to range between 20€ and 40€ per meter of beach length. The most important cost factors were personnel costs, machinery hire and transportation to the disposal site. Most beaches did not charge their visitors a beach tax for visiting the beach, with the exception of German beaches. On those sites, the frequency of beach cleaning tended to be higher. A number of municipalities attempt to reduce the financial & logistical burden of beach wrack management through cooperation. When asked about the cooperation practices that they have in place, 27% of municipalities said that they cooperate with other neighbouring local authorities and 7% said that they cooperate with local companies.

Future work

To promote cooperation and the gathering/transfer of knowledge on all aspects of beach wrack management, the EUCC-D has established an international [Beach Wrack Network](#). This is a multi-disciplinary forum consisting of local authority representatives, coastal engineers, nature conservationists, scientists, and private companies. A coordinated approach will ensure that local research gaps are closed and that sensible policy reforms are considered which promote the sustainable treatment of beach wrack.

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