

Project Isfjorden

Marine debris on Svalbard

Project no. 17SDF8DF



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Photo: Aktiv i friluft (AiF).



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Appendix 1

Introduction

Svalbard has an Arctic climate where tundra vegetation and flowers struggle to survive in the poor soil. Where one man's loss is another man's gain. As it should be in nature. Seven national parks and 23 nature reserves cover two thirds of the archipelago, giving a high degree of protection to the untouched and extremely fragile natural environment on Svalbard.

National parks and nature reserves play an important role, but their coasts are still exposed to the plastic, nets and other waste filling the world's oceans. That rubbish comes floating on the ocean currents that pass Svalbard and too much of it finds its final resting place here, where it takes a very long time to break down, and ends up as microplastics.

People have been harvesting the natural resources of Svalbard since the whale hunting of the 17th and 18th centuries. Then the mines opened at the start of the 20th century, and for over a century they have been the dominant force in the constantly changing landscape. Now research and tourism are becoming increasingly important. Tundra and melting glaciers; seals, polar bears, reindeer and whales: they can all be studied, observed and experienced.

Longyearbyen currently has 2,100 permanent residents. In addition there are research stations, the Ny-Ålesund research community, and the mining settlements at Barentsburg and Svea. The whole archipelago is administrated by the Governor of Svalbard, and is subject to Norwegian law.



Figures 2 and 3. The colourful, blue oyster plant (*Mertensia maritima* ssp. *tenella*) and the sea sandwort (*Honckenya peploides* ssp. *diffusa*) grow along parts of Spitsbergen's coast. They can be hard to spot, and the sea sandwort is on the red list of threatened plants on Svalbard, albeit at the lowest threat level (NT) — for the moment, at least. We did manage to find them, alongside Q-tips and a plastic bottle. Photo: AiF

Post on the Facebook page of *Aktiv i friluft* (AiF), an organisation in Svalbard that promotes sustainable outdoor pursuits:

Do you want the countryside to be littered with plastic?

Do you appreciate the joys of nature?

Then you have the chance to give something back now. Sign up to one or more of Project Isfjorden's beach clean-ups and help to reduce the amount of marine debris in the natural environment.

Project Isfjorden is a collaboration between various important entities in Longyearbyen, including the Governor of Svalbard, Svalbard's Environmental Protection Fund, Longyearbyen's municipal government, Store Norske Spitsbergen coalmining company (local mining company), Visit Svalbard, Longyearbyen School and the Longyearbyen association of field biologists (LoFF). The aims are to work together and to encourage local people to take greater responsibility for their own town, to show what is actually happening, to give people a great outdoor experience and to promote the battle against marine debris.

Sjøområdet, in the north of Longyearbyen, is home to a wonderful recreation area. Here people can have a BBQ, light a bonfire and socialise with their friends while enjoying the town's best view of Adventfjorden, Isfjorden, Hiorthfjellet and Adventdalen. The area is a favourite nesting place for the Arctic tern, and in the right season the purple sandpiper can be seen down by the shore every day. Large herds of beluga whales pass by here hunting for food, and it is also a great place to soak up the rays of the midnight sun or admire the dancing Northern Lights. Nature offers us these unique experiences completely free of charge, but they appear to come at a price.



Figures 4 and 5. When the bin was full, some “geniuses” decided that the nearest boat would do the job. The possibility of taking their rubbish with them to somewhere more suitable clearly never entered their minds. Photo: AiF

We always want to do what's good for ourselves. So why is it so hard to prevent rubbish from ending up in the natural environment? If even individuals who actually live on Svalbard and make use of the countryside don't care what happens to their rubbish, then it seems that people really are living by the saying “out of sight, out of mind”.

Marine debris owned by no-one. That's what we want to tackle. Taking ownership of rubbish is important, and it's something we've raised in Project Isfjorden. But above all we've tidied up – our own rubbish and other people's.

Tackling the marine debris on Svalbard isn't a new idea. Since 2000, the Governor has been organising annual beach clean-ups. Residents can apply to go on one of these expeditions, and 24 people are randomly selected. They sail to remote locations on the *Polarsysse*, and collect large quantities of marine debris. The tourist industry also contributes through Clean Up Svalbard. Most of the waste comes from the fishery industry, and the clean-up expeditions uncover evidence of tragedies involving animals, such as reindeer getting their antlers caught up in ropes, nets and metal wires.



Figures 6 and 7. The antlers of several reindeer are tangled up in a single wire rope. Found during Project Isfjorden's first beach clean-up at Anservika. We carried the wire rope and antlers approximately 1.2 km back to the boat. Photo: AiF

The situation along the coast of Isfjorden's many small branch fjords, particularly on the southern side, often generates surprise, shock and anger. Ironically, the worst-affected beach is the one closest to where we live. Perhaps it's too hard for people to accept the reality. Is it ignorance, or the deep-seated belief that Svalbard's nature is untouched, which is shared by many residents and visitors alike?

As users of the countryside, it's about time we woke up and started giving something back, in a big way. Perhaps the fact is that more people need to come face to face and experience the reality that exists on their doorsteps. In terms of preventive action, we should probably focus on the role of plastic manufacturers, as well as on changing people's habits and attitudes. But it's too late to just do that.

We know that for the moment the most effective way to remove marine debris is to pick it up, so we have gone out into the countryside to do precisely that.

Expedition 1 Gipshuksletta and Anservika



Figures 8 and 9. Expedition 1. Looking out over Billefjorden, the group gathers for the day's final shift. Although we also did a clean-up at Anservika in 2011, everyone in the photo returned to the boat loaded with plastic, glass and nets/strapping. Photo: AiF

Date: 30 July

Participants: 46
Coordinators: 3
Polar bear guards: 6

Length of beach: approx. 4 km
Weight: 800 kg

Weather: Sun, wind picking up over the course of the day.

Coordinates:
33X E529549 N8709079



There's always a certain amount of excitement when you embark on a new project. Transport and security are the key challenges here in the Arctic. You have to deal with long distances, treacherous waters, polar bears, the need to carry weapons and rapidly changing weather. Consequently, beach clean-ups on Svalbard require a lot of preparation. A health and safety plan, risk analyses and written instructions. Meetings, phone calls and questions. Giving information to participants, buying equipment, preparing equipment and chartering a boat. Using a helicopter requires planning and special permission.

Project Isfjorden's first clean-up expedition took place on Sunday, 30 July. We were unsure how much rubbish we would find, but once the first group of people had been landed, we were told over the VHF radio: "Bring three bulk bags – there's loads of rubbish here!" It was sad to hear, but all the more reason to get on with our job.

By the end of the day, we had collected two bulk bags of plastic and metal on the beach. We also found an old, rusty barrel containing oil that had to be lifted out by helicopter. We took the bags with us on the boat and delivered them safely to the guys at the waste disposal facility.



Figure 10. One of the polar bear guards from Longyearbyen dog club stands on a small ridge overlooking Anservika and Billefjorden. The beach is checked for polar bears before anyone is allowed onto it. There are also polar bear guards down at the shore, because the bears are just as likely to arrive by water. Photo: AiF



Figure 11. Together with Wageningen Economic Research (WECR) and NORUT, AiF wanted to map the extent of the marine debris problem on Svalbard. Ten people comb a 100 m measured section of beach at Gipshuksletta. In total, 899 items were found here in the space of just 100 metres.

Photo: AiF



Figure 12. All marine debris that is picked up within the defined 100 m section is classified and photographed for analysis. This photo shows the marine debris collected at Worsleyhamn, Liefdefjorden in northern Spitsbergen during WECR's trip in the summer of 2017.

Photo: Wouter Jan Strietman

Expedition 2 Grønfjorden



Figures 13 and 14. Project Isfjorden's camp at Kokerineset in Grønfjorden. Photo: Elin Dolmseth

Date: 11–13 August

Participants: 25
Coordinators: 3
Polar bear guards: 5

Length of beach: approx. 11 km
Weight: 1,000 kg

Weather: Sun, variable wind conditions,
rain on Sunday

Coordinates:
33X E479155 N8663824



It's good to have a plan, but always have a plan B, C and D. We discovered the importance of this over the course of the summer, and the project's second clean-up expedition was the first of several where we had to change our destination due to wind. When you're using a Zodiac (inflatable boat) to ferry people to the shore, the waves can't be too big. And it's not just a question of whether it's safe to land. We also had to think about getting the participants safely back home. The idea was to head to Farmhamna, but at the last minute we implemented our plan B, as the weather gods were not on our side. Not only that, Farmhamna had seen frequent visits from polar bears in the weeks preceding the expedition: a dead whale was stranded nearby.

Instead we spent the weekend cleaning up four beaches in Grønfjorden. We set up camp at Kokerineset opposite Barentsburg, and used that as a base for reaching the nearby beaches. As there were so many of us, we called the tourist information centre in Barentsburg, and at short notice they were able to provide us with two RIBs that ferried us between Larvikpynten, Kokerineset and Minervaodden over the course of the weekend.



Figure 15. On Arctic islands, marine ecosystems are closely intertwined with terrestrial ones. Consequently, one of our many concerns is that marine debris carried on the ocean currents is very likely to end up far inland, driven by the wind or dragged across the land by reindeer and Arctic foxes. Photo: AiF



Figures 16–21. There was a lot of plastic and metal in Grønfjorden. For example, we found many bottle tops and plastic bottles in this area, as well as typical household waste. We also collected a fair amount of rope/nets from the fishing industry.

Photos: AiF and Elin Dolmseth



Figure 22. During the project, all participants were served one hot meal a day. At our camp in Grønfjorden, we heated a pre-cooked stew and rice over the fire. Those who had forgotten to bring a plate were able to make one out of driftwood.

Photo: AiF.

Figure 23. The Zodiacs took bulk bags with all of the rubbish we had collected across to the *Polar Girl*, where it was hoisted aboard by crane. The crew of the *Polar Girl* did a fantastic job at removing everything we collected, and throughout the project they helped with the practical aspects of transporting participants and marine debris.

Thanks to their flexibility and capacity to come up with good solutions, our cooperation with them was a great success.

Photo: Helga Bårdsdatter Kristiansen



Figure 24. The guys at the waste management site collected most of the rubbish from the quay. But when time was short, it was great that a local hero from the tourist industry volunteered to help out.

Photo: Helga Bårdsdatter Kristiansen

Expedition 3 Colesbukta



Date: 18–20 August

Participants: 22

Coordinators: 3

Polar bear guards: 4

Length of beach: approx. 2 km

Weight: 440 kg

Weather: Ranging from sunny and warm to windy and cold from Saturday afternoon onwards. The wind made life tricky for the participants.

Coordinates: UTM33X: E499860, N8669940

- UTM33X: E500370, N8671520



Figures 25 and 26. Photos: Hanna Halvarsson

Colesbukta is a bay around half way between Adventfjorden (Longyearbyen) and Grønfjorden (Barentsburg). As well as being rich in plant life, the area has lots of cultural heritage from hunting and mining activity in the late 19th and early 20th centuries. The many old, abandoned buildings give the area a special character. With cultural heritage spread over a large area, it was extra important to locate the camp in the right place, and of course to think carefully before picking anything up from the beach. Once again we ended up going with plan B, as a strong westerly wind made it impossible for us to land where we had originally planned, at Kapp Linné and Isfjord Radio.

We established our camp well away from the cultural heritage sites, and with our mix of young and old participants, Colesbukta really came to life over the weekend. Having children involved helps to turn a beach clean-up into a game, and the feedback from participants was clear: “It feels so satisfying to remove rubbish from nature.”



Figure 27. Colesbukta.

Photo: Hanna Halvarsson



Figures 28–30. We had to dig up some of the plastic and nets. After that hard physical work in the Arctic air, it's extra satisfying to creep into the *lavvo* (tent) for the evening when the wind is picking up and the thermometer is on its way down. Photos: AiF



Expedition 4 Colesbukta – school trip. 7. and 8. grade



Figure 31. Class photo. Photo: Bjørn Frantzen



Figure 32. Arriving at Colesbukta. Photo: Bjørn Frantzen

The pupils from Longyearbyen School arrived at the quay in plenty of time, so they helped to load equipment onto the *Polar Girl* before we set sail. We discussed various aspects of the expedition and route to Colesbukta. This included telling the participants about safety at sea, during landing and on land. Polar bear guards and onshore coordinators were also chosen. Since ferrying people ashore is a slow process, beach zones were allocated on board, with further instructions being given to the classes when they landed, were allocated clean-up zones and started work. The people who landed first were taken back to the ship first, so everyone spent the same amount of time ashore.

Date: 22 August

Participants: 80

Coordinators: 2

Polar bear guards: 4

Length: approx. 1 km

Weight: 200 kg

Weather: Cloudy, fair. South-easterly wind.

Coordinates: UTM33X:



Figure 33. A hot lunch was prepared at the expedition base on the beach. Photo: Bjørn Frantzen



Figure 34. Polar Cress



Figure 35. One of the biology teachers gave an explanation of microplastics using a dead bird that was found to illustrate how plastic can harm animals living in the sea. The bird was taken back to the school to be dissected. The pupils and teachers were disciplined, and the flexible, friendly crew of the *Polar Girl* once again ensured that the transport leg went very smoothly.

Photo: Bjørn Frantzen

Expedition 5 Gåsøyane – school trip v



Figure 36. Ready to start the clean-up. Photo: Oddgeir Sagerup

Date: 23 August

Participants: 70

Coordinators: 2

Polar bear guards: 4

Length: approx. 0.5 km

Weight: 400 kg

Weather: Dry

Coordinates: UTM33X:



Figure 37. Collected bottle tops. Photo: AiF

For much of the summer, no-one is allowed into the bird sanctuary Gåsøyane. But after 15. August access is allowed, so we took the

opportunity to clean up the western side of the island. After our experience with the previous day's school expedition, we booked an extra RIB from Svalbard Adventure Group so we could land people more quickly. That improved things significantly, and equally importantly it would have allowed us to get people back onto the boat quickly if a polar bear appeared.

Reaching Gåsøyane by boat is a challenge, on account of the big rocks and waves. We therefore landed on the north coast and walked over to the west side of the island. When the 70 pupils and teachers had finished their work, five bulk bags of plastic, metal, trawl floats and rope, as well as four oil barrels, were ready to be removed by helicopter. All of it collected in around three hectic hours. Removing the rubbish by boat would have been time-consuming and virtually impossible.



Figure 38. Oil barrel and trawl float on Gåsøyane.

Photo: AiF



Figure 39. Spot the eight errors in the photo. Photo: AiF



Figure 40. One bulk bag completely filled with plastic. Containers, polystyrene, buckets, pipes, trays, packaging from the construction industry, bottles, bottle tops, shoes and various smaller plastic items. Photo: AiF

Expedition 6 Hiorthhamn



Figure 41. Someone's lost a shoe! Photo: AiF

Date: 27 August

Participants: 72

Coordinators: 3

Polar bear guards: 4

Length of beach: approx. 1.2 km

Weight: 3,400 kg

Weather: Still, sunny and some cloud

Coordinates: UTM33X: E515360, N8686450 -
UTM33X: E515740, N8686340 and
UTM33X: E516450, N8685510- UTM33X:
E516680, N8684800 (start–end)



Figure 42. Participants are taken by RIB to the other side of Adventfjorden. Photo: AiF



Figures 43 and 44. Driftwood is a good indicator of where you'll find marine debris on Svalbard. Lots of driftwood = lots of marine debris. Moskuslaguna by Hiorthhamn is a large, relatively flat expanse where driftwood is interspersed with plastic, metal and nets. You can see that the blue bottle in the picture has been there for quite some time: it's well on its way to being broken down into smaller pieces of plastic. Photos: AiF



Post on the Facebook page of *Aktiv i friluft* (AiF):

Svalbard has Northern Fulmars – and plastic. Lots of plastic. That's why it's so important to remove any plastic you find in the natural environment. And it's even more important to stop plastic ending up there in the first place. We all have a responsibility for that. We use the countryside, so why is it so difficult to look after it?



The marine debris collected on Svalbard can be traced back to places all over the world. The ocean currents carry the plastic north to the Arctic, and the Northern Fulmar suffers the consequences of our human failings. So if you think throwing out a cigarette butt, piece of chewing gum or chocolate wrapper isn't that important:

Think again!

Figure 45. Photo: Susanne Kuhn



Expedition 7 Cancelled

Unfortunately we had to cancel the project's 7th expedition on Sunday, 3 September. The weather forecast suggested a risk of heavy precipitation and high winds. We took all the necessary precautions, but when the Governor of Svalbard issued a severe weather warning and recommended avoiding steep terrain due to precipitation and the risk of landslides, our decision was easy. Safety first!

Threw away our samples for analysis

Before the final expedition was due, 80 kg of marine debris had been prepared for analysis. This rubbish, which came from eleven measured 100 m zones, had been sorted into small bags labelled with the beach and date. Bottle tops had been placed in a separate bag, and each expedition had cut out a 20 cm x 20cm piece from each net that was found and removed from a beach. We had done all of this work so that Wouter Jan Strietman and his team would be able to analyse the rubbish collected by Project Isfjorden. This was a good chance to get a real sense of the volume and kind of marine debris we found in different parts of Isfjorden, as well as to find out where some of it came from. The goal of their project, the "Arctic marine litter action plan", is to prevent plastic waste entering the Arctic by identifying where it comes from and preventing it from happening in the future.

Two days before Wouter Jan arrived at Svalbard to perform the analysis, the rubbish was transported down from the sports centre, where it had been stored during the project, to the waste management facility. There Wouter Jan was supposed go through all of the rubbish we had collected. Unfortunately, due to a misunderstanding at the waste management site, most of our samples were thrown away. That left us with the rubbish from just four 100 m sections of beach. (See Appendix 1)



In the summer, students from the University Centre in Svalbard (UNIS) contacted Aktiv i friluft because they wanted to collect marine debris during their field trips to the west and northwest coasts of Svalbard. After being provided with bulk bags, they were able to collect 220 kg of incinerable waste, 20 kg of glass and lots of trawl floats. On average, 6-8 people spent around 30-60 minutes each day picking rubbish from the shoreline.

The bottle tops they collected were sent on to Wageningen Economic Research and Wouter Jan for further analysis.

Photo: AiF

Expedition 8 Phantomodden



Figures 47 and 48. There were trawl floats of many colours on all of the beaches. Photos: Margrete Keyser



Date: 8–9 September

Participants: 35

Coordinators: 2

Polar bear guards: 6

Length of beach: approx. 3 km

Weight: 310 kg

Weather: Barely any wind and light clouds: perfect weather for a clean-up. Ended a day early as strong winds were forecast for Sunday.

Coordinates: UTM33X: E532468 N8718097

On 8 September the final Project Isfjorden expedition sailed to Kap Wijk on the *Polar Girl*. At Kap Wijk a polar bear and her two cubs were eating the carcass of a walrus on the beach, so we decided to implement plan B, Bohemannflya. This meant going outside Management Area 10, which requires permission from the Governor, but we already had that. But then there was the ice. Yoldiabukta was full of icebergs and the wind conditions meant that it was too dangerous to put anyone ashore there. So we fell back on plan C, which was Phantomodden.

Fortunately Phantomodden wasn't completely covered in rubbish. But there was still enough to fill four bulk bags. It's sad that we found varying amounts of plastic and marine debris on every single beach we visited in Isfjorden.

On this expedition, the coordinators and person responsible for protection against polar bears had to make some good, quick decisions in consultation with the project manager and the *Polar Girl* crew. In spite of the long boat journey, the participants, Sky News film team and Wouter Jan Strietman were all satisfied with the expedition and what they experienced. There's something special about sitting around a camp fire with people from different countries and backgrounds who share a common goal. The sense of community and of sharing an experience mean that people work together and the stories flow. Some people stay in touch after they get back home.



Figure 49. The participants in Project Isfjorden made an enthusiastic contribution to cleaning up our beaches. The expeditions exemplified cooperation and solidarity. Photo: Margrete Keyser



Figures 50–52.

Plastic, participants and nature's beauty. Photos: AiF

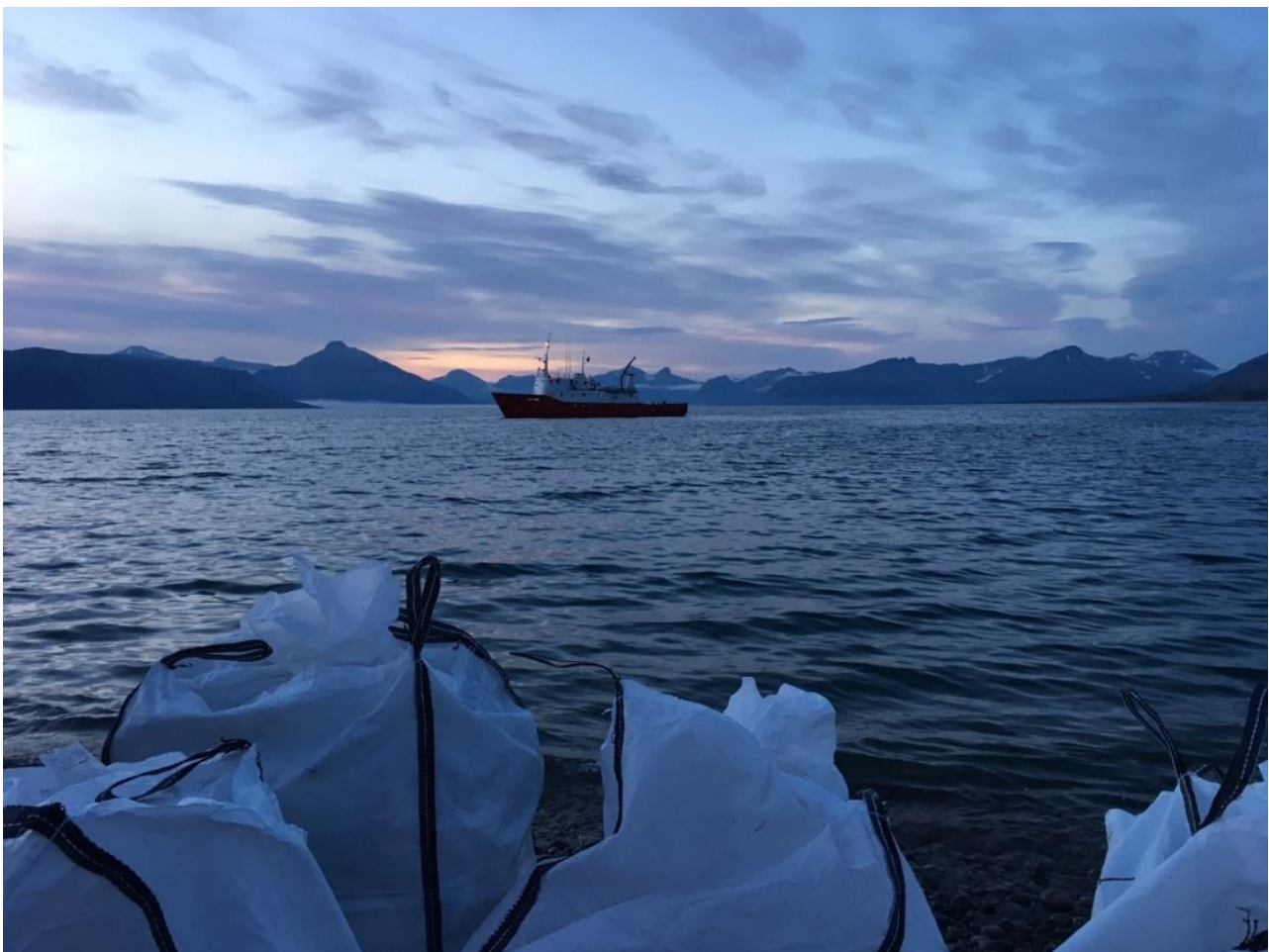


Figure 53. Bulk bags of rubbish waiting to be collected by the *Polar Girl*. Photo: Margrete Keyser

Post on the Facebook page of *Aktiv i Friluft* (AiF):

We'll have to collect a lot of marine debris over the next 50 years, as it won't disappear of its own accord.

Until new technology and systems are invented, or until we get better at prevention, our only option will be to continue with our beach clean-ups.

Summary

Participants: **350**

- Some participants went on several expeditions, so this number represents the total number of participants across all of the expeditions.
- Longyearbyen School's involvement: approx. 160 pupils and teachers from grade 7 – vgs.

Coordinators: **18**

Polar bear guards: **33**

Length of beach: approx. **22.7 km**

Weight: **6,630 kg**

Project Isfjorden – “it’s a wrap”.



In total, 6,630 kg of marine debris was collected by Project Isfjorden over the summer/autumn of 2017.

It's worth quoting what the waste management facility said:

“The waste we received from AiF contained a lot of small pieces of rubbish. We noticed this when emptying bulk bags from different sources. The 100 kg from Hiorthamn contained noticeably more small items like bottle tops, straps and plastic bottles. It's great to see things like that get noticed and picked up.”

Figure 54: Map of Isfjorden and the beaches cleaned in 2017.

After completing a project you can always find room for improvement. This is an example of learning by doing, and it means we will be even better prepared for our next project/task and clean-up expedition. Project Isfjorden was a big project, both in terms of the planning and execution. Communicating with people who signed up, safety procedures, weapon handling, organising boats, liaising with the research team and TV team, keeping track of weather forecasts and providing information to participants, polar bear guards and coordinators. The summer and



autumn have been filled with time-consuming preparations, feedback, continuous improvement and hard work. We made use of everything from our plan A through to our plan C, and chose to cancel one expedition due to a severe weather warning. We have had no shortage of challenges, but we feel that they have been dealt with appropriately and efficiently. Our first priority has always been the safety of the participants, who have repaid us with their enthusiasm and commitment. We can safely say that seven beaches in the Isfjorden area have less marine debris – at least for now.

The project is now entering its second phase, when the dark and snow make it hard to collect marine debris, but conversely give us more time to study the problem of marine debris, and to explain its importance in different ways. Art projects, museum exhibitions and a brainstorming workshop may enable us to reach different groups of people from the ones who took part in our expeditions. The Polar regions have an exciting and dramatic history. It is all about nature and animals, tranquillity and struggles. Which brings us to another thought: What kind of legacy will our modern society leave to those who come after us?

A big thank you to all of the enthusiastic participants, Polar Charter, Svalbard Catering, Longyearbyen dog club and everyone else who made the project possible.

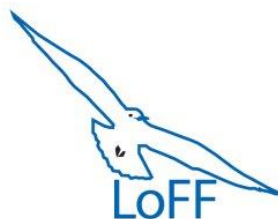
I must also thank our project partners: The Governor of Svalbard, Svalbard's Environmental Protection Fund, the mining company Store Norske Spitsbergen Kulkompani, the Longyearbyen association of field biologists (LoFF), Longyearbyen's municipal government, Longyearbyen School, Visit Svalbard and Geir W. Gabrielsen of the Norwegian Polar Institute.



SYSSELMANNEN
PÅ SVALBARD



SVALBARDS
MILJØVERN FOND



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Store Norske Spitsbergen Grubekompani
AKTIESELSKAP

30 November 2017

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