Arctic Cleanup 2021 - 2024

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Report Title
Arctic Cleanup 2021 - 2024

Report Number
HNR-2504

Date
18.02.2025

Number of Pages
24

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Summary
This report presents the international collaboration project, Arctic Cleanup. It outlines completed activities, key results, and experiences while laying the groundwork for further efforts in the coming years.

This report has been produced with funding from Ocean Conservancy and the Norwegian Ministry of Climate and Environment.

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Photo: Max Emanuelson

Summary and Recommendations

This report provides insight into the key findings of the litter prevention and removal project, Arctic Cleanup, from 2021 to 2024. The project is funded by the Norwegian Ministry of Climate and Environment and Ocean Conservancy. Arctic Cleanup aims to mobilize and facilitate voluntary cleanup efforts and citizen science. Additionally, the project seeks to raise awareness about litter locally and regionally, strengthen local organizations, and facilitate collaboration among cleanup partners.

This report highlights some of the challenges local cleanup partners face in Arctic environments. It also presents the results achieved through citizen science, knowledge dissemination, and collaboration.

The findings of this project indicate an urgent need to prevent litter in the region, which aligns with other research in the field. There is also a need for more knowledge on the types of litter through data collection. In addition, targeted measures to address the sources of litter is needed in order to prevent future littering.

The project has demonstrated that a shared network and international collaboration across the region are beneficial to all involved parties. The results show a need for the continuation and further development of the project to gather and distribute more knowledge and build on the existing foundation to create joint solutions.

Based on the experiences and knowledge this project has generated, we offer the following recommendations:

1. **Continue and strengthen voluntary cleanup efforts in the Arctic by:**
   - Ensuring cooperation by strengthening and expanding the network of local cleanup partners.
   - Gathering data on litter through citizen science and cleanup efforts.
   - Communicating knowledge and experiences to local and regional authorities and stakeholders.

2. **Secure stable financing for local cleanup partners over time:**
   - Create sustained engagement of organizations that can adopt a long-term approach and strategy for cleanups and litter mitigation.
   - Involve as many communities, tribes, organizations and individuals as possible in the fight against littering.

3. **Prevent litter from key sources:**
   - Engage in dialogue and implement concrete initiatives, such as industry seminars for the fishing sector.
   - Implement International Organization for Standardization (ISO) standards for waste management on fishing vessels.

Introduction

The Arctic is a region with an extremely vulnerable ecosystem. Despite its sparse population, litter is a widespread problem affecting both the environment and wildlife[1,2,3]. Vast geography and limited waste management infrastructure and resources require effective measures to support cleanup and litter prevention efforts.

Littering in the Arctic originates from both local and regional sources and is carried over long distances by ocean currents[4,5]. More knowledge about these sources and causes is necessary to mitigate the influx of litter. Voluntary cleanup efforts and citizen science play a central role in addressing litter by raising awareness, encouraging behavioural changes, and gathering data.

Arctic Cleanup combines voluntary cleanup efforts, citizen science, and knowledge sharing to identify sources of litter and strengthen strategies to combat littering. The project, established in 2021 by Hold Norge Rent (HNR) and Ocean Conservancy (OC), has mobilized local volunteers for cleanup and citizen science in the USA (Alaska), Norway, Iceland, and Greenland. The project fosters collaboration and exchange of knowledge among local organizations in these countries, showcasing how volunteerism, citizen science, and cooperation can help address global environmental challenges in one of the world's most vulnerable regions.

This report provides insight into the project's results from 2021 to 2024 and proposes practical recommendations to enhance litter prevention in the region, based on the knowledge and experience gained.

[1] Bergmann et al. (2022). Plastic pollution in the Arctic.
[2] Hallager et al. (2024). Marine Litter and Microplastics in the Barents Sea Area.
[3] Mghili et al. (2023). Assessing the potential for the introduction and spread of alien species with marine litter.
[4] Bergmann et al. (2022). Plastic pollution in the Arctic.
[5] Haarr et al. (2024). Beach litter in the European Arctic: Accumulation patterns, likely sources and pathways.

About Arctic Cleanup

Arctic Cleanup is an international collaborative project between HNR, OC, and local cleanup partners throughout the Arctic. The project constitutes a network of dedicated and experienced organizations and volunteers working together to prevent and clean up litter in the Arctic. Arctic Cleanup aims to encourage and facilitate voluntary cleanup efforts and citizen science while sharing knowledge about litter locally and regionally. The project supports the efforts of local organizations and provides a central platform for exchange of information among organizations, authorities, and volunteers.

Although Arctic Cleanup was initially planned to start in 2020, the COVID-19 pandemic delayed its launch until 2021. Since its inception, the project has been part of the Arctic Council's working group "Protection of the Arctic Marine Environment" (PAME) and is embedded in the "Regional Action Plan on Marine Litter in the Arctic." The project is funded by the Norwegian Ministry of Climate and Environment and OC and has previously received support from Norrøna.

Key objectives of the project:

- Engage volunteers in cleanup efforts in the Arctic and near-Arctic region.
- Gather knowledge on litter through citizen science and data collection.
- Develop and maintain a protocol tailored to voluntary cleanup efforts in the Arctic.
- Disseminate knowledge about litter locally and regionally.
- Foster collaboration among cleanup partners in the Arctic and strengthen local partnerships through funding and coordination.

Project participants

OC and HNR are responsible for the overall leadership and coordination of the project. Additionally, the project includes a broad range of partner organizations and networks. HNR coordinates cleanup efforts in Norway, Greenland, and Iceland, while OC oversees the activities in Alaska. There is also a dialogue with partners in Finland, Canada, and the Faroe Islands for potential expansion.

Local cleanup partners are responsible for submitting plans, budgets, and annual results. They also recruit local volunteers and coordinate the logistics of cleanup efforts.

Table 1. Overview of local cleanup partners in Arctic Cleanup.

Project partner	Region
Veraldarvinir / Worldwide Friends Iceland	Iceland
Finnmark Friluftsråd	Norway
Vårt hav	Norway
Innovation South Greenland	Greenland
Prince William Sound Stewardship Foundation	Alaska
Sitka Sound Science Center	Alaska
Seacoast Indigenous Guardians Network	Alaska
Takshanuk Watershed Council	Alaska
Yakutat Tlingit Tribe	Alaska
Center for Alaskan Coastal Studies	Alaska
Dive Alaska	Alaska
Native Village of Port Heiden	Alaska
Aleut Community of St. Paul Island	Alaska
Norton Sound Economic Development Corporation	Alaska
Native Village of Afognak	Alaska
Qawalangin Tribe of Unalaska	Alaska

Challenges of volunteer cleanups in the Arctic

Despite vast geographical distances and organizational differences, local cleanup partners share many similarities, particularly in the challenges they face. These challenges highlight the necessity of projects like Arctic Cleanup, which provide a targeted, effective, and comprehensive approach to addressing litter in the region.

Here, some of the key challenges of cleanup efforts in the Arctic are described:

1. **Large distances and costly waste management**
   With significant amounts of waste spread across vast distances, collected trash often needs to be transported by boat and over long distances. In some cases, waste is stored in secured depots and retrieved with snowmobiles during winter. For especially inaccessible areas with heavy objects or large amounts of debris, helicopters are required. Waste management facilities are often far apart, and managing large volumes of waste is a challenge. Both transportation and waste management are costly and logistically difficult for the involved parties.

2. **Unpredictable funding**
   Funding is a challenge for all local, regional, and national cleanup partners. Most receive sporadic funding through grants or small sponsorships. This makes planning difficult, and causes uncertainty for organizations and their employees, leading to unstable jobs and unpredictability for local organizations and volunteers.

3. **Short cleanup season and harsh weather conditions**
   The Arctic summer is short, limiting the cleanup season. Even during summer, wind, waves, and other unpredictable weather conditions impact cleanup efforts. Ensuring the safety of volunteers is a priority, and weather often dictates whether a cleanup effort can proceed or not. Planning is challenging and requires extensive knowledge of the area among those responsible. Cleanup operations in the Arctic are often planned with multiple alternatives in case of cancellations due to sudden weather changes.

4. **Limited number of volunteers and few partners to collaborate with**
   The Arctic region is sparsely populated, making it difficult to recruit volunteers for cleanup efforts. This can make the work feel lonely and exhausting for local coordinators. These challenges emphasize the need for a strong network and discussions with other coordinators in the region facing similar situations, as well as collaboration with waste management companies, authorities, schools, and other organizations.

Photo: Max Emanuelson

Results from citizen science

The findings from the citizen science data collection provide insights into the voluntary cleanup efforts undertaken in the project and the types and sources of litter in the Arctic. Arctic Cleanup collects data using a protocol[6] specifically tailored to Arctic conditions. The protocol is based on the International Coastal Cleanup[7] and has been further adapted by OC and HNR. It has been translated into local languages and is completed by cleanup partners before being submitted for quality assurance, analysis, and results compilation.

During the project period, Arctic Cleanup has engaged 3,189 volunteers. Each participating local partner organizes their cleanups differently, affecting the number of volunteers involved in each country and community. Participating volunteers include schools, youth groups, long-term international volunteers, fishers, hunters, and the general local population.

At the project's launch in 2021, a pilot was conducted in two countries with a total of seven cleanup efforts. The number of cleanups has since increased significantly. From 2021 to 2024, a total of 149 cleanups have been conducted across the four participating countries (Figure 1).

The amount of waste collected has increased every year, with a total of 131,917 kilos and 159,986 recorded items. A total of 921 km has been cleaned. These figures are underestimates, as not all parameters were recorded for every cleanup effort. The quantity of waste removed in each region depends on local conditions, such as the number and type of volunteers, shoreline accessibility, the nature of the waste, and external factors like weather and local debris sources.

Key figures from cleanups in Arctic Cleanup 2021 – 2024.

[6] Appendix 1.
[7] Ocean Conservancy (n.d.). International Coastal Cleanup. https://oceanconservancy.org/trash-free-seas/international-coastal-cleanup/

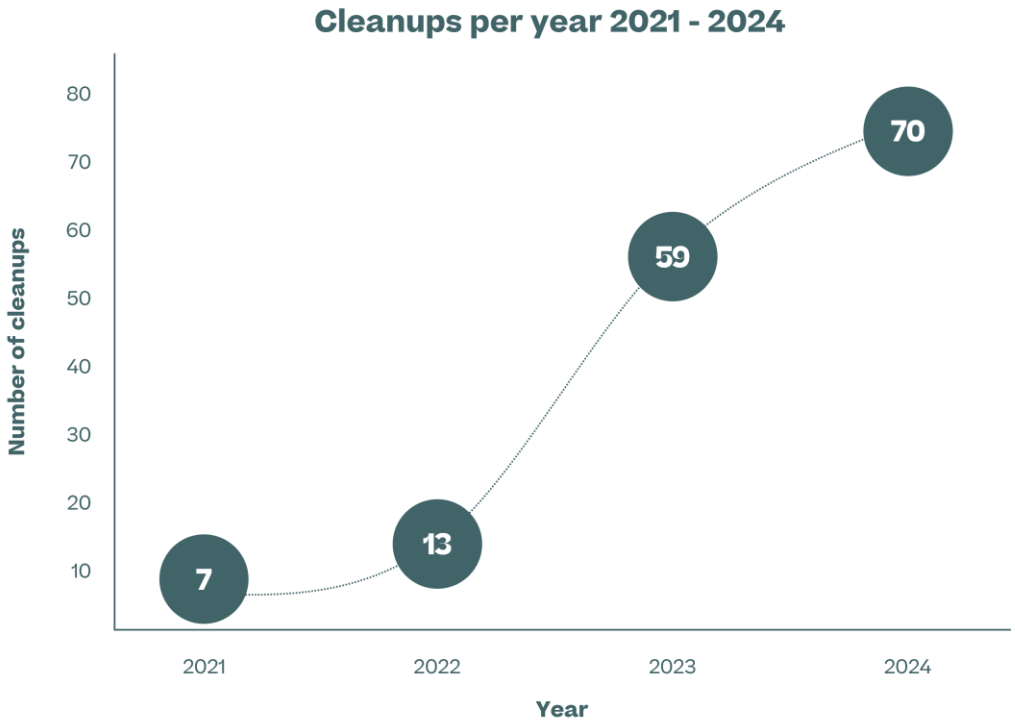

Figure 1. Number of cleanups in Arctic Cleanup from 2021 to 2024.

Tables 2 and 3 (below) show the most common litter items, based on quantity, and the most found items from the clean-up efforts in 2024. The results from 2024 to some extent represent the results from previous years but are not combined due to different locations. Results from 2023 can be found in Appendix 2.

At the top of the list of items in quantity are line and rope, plastic/foam pieces, and pieces of fishing nets (Table 2). The findings indicate that industry, especially fisheries, but also personal consumption, are main sources of litter in the Arctic. Large amounts of line and rope are also consistent with a study from 2024 that shows that local maritime activities are a key source of litter in several Arctic areas[8]. Line and rope, and unidentifiable plastic are also found at the top of the results in 2023[9].

Large amounts of line, rope, and fishing nets may indicate that littering in the Arctic is a problem for wildlife, as such types of litter often cause fish, birds, and mammals to get entangled, known as ghost fishing[10].

If we look at presence, i.e. how often the various items are found, line and rope are still at the top, followed by shopping bags and plastic beverage bottles (Table 3). They also show that plastic is the most widespread material found in the Arctic. Line, rope and plastic beverage bottles are also found at the top for 2023[11]. Plastics pose a major threat to wildlife in many areas and trend as the top marine litter items globally, with accompanying societal consequences[12].

[8] Haarr et al. (2024). Beach litter in the European Arctic: Accumulation patterns, likely sources and pathways.
[9] Appendix 2.
[10] Gall & Thompson (2015). The impact of debris on marine life.
[11] Appendix 2.
[12] MacLeod et al. (2021). The global threat from plastic pollution.

The results from Arctic Cleanup also have strong similarities with the results from the cleanup on OSPAR beaches in 2023, where plastic items are in the top three, with line and rope (thickness less than 1cm) at the top[13]. The results also have similarities with the Nordic Reference Beaches mapping programme, where plastic, personal consumption and fisheries are found in the top five[14].

Table 2. Top five litter items in quantity from cleanups in 2024.

		Number of items	Percent of items	
1	Line and rope (regardless of length)	6 691	16 %	
2	Plastic/foam pieces <2.5 cm	5 605	14 %	
3	Fishing nets (cut-offs)	3 621	9 %	
4	Cigarette butts	2 770	7 %	
5	Other plastic waste	2 012	5 %	

Tabell 3. Top five items in occurrence from cleanups in 2024.

		Number of cleanups	Percent of cleanups	
1	Line and rope (regardless of length)	52	88 %	
2	Grocery bags (plastic)	43	73 %	
3	Beverage bottles (plastic)	41	69 %	
4	Gun shells/cartridges	39	66 %	
5	Fishing nets (cut-offs)	38	64 %	

[13] Hold Norge Rent (2024). Rydderapporten 2023. https://holdnorgerent.no/content/uploads/2024/12/Rydderapporten-2023.pdf

[14] Håll Sverige Rent (n.d.). Nordic Coastal Cleanup. https://hsr.se/nordic-coastal-cleanup

Results from collaboration and knowledge sharing

Arctic Cleanup creates collaboration across cleanup partners in the Arctic and strengthens local organizations through funding and coordination. The project has evolved from a pilot with two partners to a large network of organizations working together against litter in the Arctic.

Photo: Max Emanuelson

> “Collaborative efforts to share knowledge, strategies, and solutions are essential to making progress on this issue. The Arctic Cleanup project has been an important initiative for fostering international cooperation and partnership. We look forward to expanding the network and learning from more communities across Alaska and the Arctic.”
>
> Kristina Tirman, Arctic Marine Debris Manager, Ocean Conservancy

Fieldwork and participation in cleanups in all areas during the project period have provided insight into local knowledge and the challenges the organizations face. Through meetings with authorities, waste management companies and cleanup partners, we have gained insights into this issue from different perspectives. In addition to mapping challenges, these meetings have also provided suggestions and input for solutions. Fieldwork and cleanup efforts have strengthened the network and opened doors for new collaborations across local, regional and international partners.

Virtual meetings have been used for coordination, project planning, training and network building. The meetings have resulted in a platform for shared experiences and a place to discuss common challenges and how to overcome and work around them. A separate meeting series called "Arctic Cleanup Conversations" has been developed - a larger virtual meeting place for all participants in the project to share knowledge and experiences.

> “It can sometimes feel lonely to run cleanup projects in areas with few people. This network gives us an opportunity to share experiences and be part of a network with others who share the same passion.”
>
> Arctic Cleanup Conversations

Photo: Max Emanuelson

> Doing beach cleaning in the far north of Norway is demanding. There are long distances here. Many places are uninhabited, several of the villages along the coast are sparsely populated, and a large part of the population is quite old.
>
> Several places have never been cleaned, which means that a lot of the waste is old and embedded in the terrain. Not to mention, a lot of bad weather and big waves makes it demanding and sometimes dangerous to work with beach cleaning with the ocean close by.

Hugo Tingvoll, Finnmark Friluftsråd

Photo: Max Emanuelson

Knowledge dissemination

A central part of Arctic Cleanup is knowledge dissemination related to litter in the Arctic. The project has contributed to sharing knowledge among local cleanup partners, who in turn spread the knowledge to their volunteers during the cleanups. This includes training in citizen science data collection and sharing experiences in the network through "Arctic Cleanup Conversations." The partners are also provided with resources to ensure they can share their results and stories with audiences that matter to them through social media graphics and detailed itemized reports.

Since the local cleanup partners register findings from their cleanup efforts, we have gained increased insights into the types and sources of marine litter in the Arctic (see Results from citizen science). This has resulted in us being better equipped to hold polluters accountable and work more effectively towards preventing litter in the region.

The project has also been responsible for knowledge dissemination beyond the network, at local, regional and international levels. Through fieldwork, dialogue with local authorities, presence at international conferences, and media coverage in both local and national media, Arctic Cleanup has helped raise awareness about litter in the Arctic.

During the duration of the project, Arctic Cleanup has established itself as a recognized leader in the field and has become a valuable platform for organizations across the region to collaborate.

Photo: Cleanup in Siglufjörður during an expedition to Iceland with In The Same Boat in 2023.
Photo: Hold Norge Rent.

Photo: Cleanup in Haines, Alaska 2024. Photo: Patricia Chambers, Ocean Conservancy

Photo: Ocean Conservancy and Hold Norge Rent at fieldwork in Ny Ålesund at Svalbard 2024. Photo: Max Emanuelson.

Experiences and recommendations

Arctic Cleanup was started to meet the need for a network of cleanup partners in the Arctic and near-Arctic, which mobilizes cleanup efforts and citizen science. The project aims to create a unique and novel space for collaboration to strengthen local, regional and international partnerships. Through close dialogue and coordination over several years, the project has provided insights into challenges and opportunities in the region. Despite large geographical distances, many of the challenges are similar, and the need for solutions is the same.

The work that has been put into Arctic Cleanup is very significant for the local cleanup partners. The exchange of experiences has contributed to increased knowledge, but also to a sense of unity and community. In addition, citizen science contributes to important insights into the types and sources of litter in the region, which is the first step towards a litter-free Arctic.

The results from data collection, knowledge dissemination and collaboration show that even though the project has been successful over the years, there is still a great need for more knowledge about litter, and that there is an urgent need for measures to prevent litter in the region.

The experience, expertise and knowledge the project has given us result in the following recommendations:

1. **Continue and strengthen voluntary cleanup efforts in the Arctic by:**
   - Ensuring cooperation by strengthening and expanding the network of local cleanup partners.
   - Gathering data on litter through citizen science and cleanup efforts.
   - Communicating knowledge and experiences to local and regional authorities and stakeholders.
2. **Secure stable financing for local cleanup partners over time:**
   - Create sustained engagement of organizations that can adopt a long-term approach and strategy for cleanups and litter mitigation.
   - Involve as many communities, tribes, organizations and individuals as possible in the fight against littering.
3. **Prevent litter from key sources:**
   - Engage in dialogue and implement concrete initiatives, such as industry seminars for the fishing sector.
   - Implement International Organization for Standardization (ISO) standards for waste management on fishing vessels.

Many thanks to all the local cleanup partners and to Ocean Conservancy for implementing the project. Thank you to the Norwegian Ministry of Climate and Environment, Ocean Conservancy and Norrøna for funding the project.

Photo: Max Emanuelson

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Appendix

Appendix 1: Arctic Cleanup Protocol/Data card

ARCTIC OCEAN TRASH DATA FORM

Ocean Conservancy

Thank you for tracking your cleanup with this data card customized for the Arctic Region. While cleaning up, please be mindful of the unique circumstances of your location, from sensitive habitat to cultural and/or historic items that should not be removed. This card allows you to record collected debris in a number of ways: by item count, by weight or by volume (filled bags). You do not need to report all of these measurements – choose which method works best for your group and circumstances. Thank you for making an impact and contributing to the world's largest ocean plastics database.

HERE IS HOW IT WORKS:

1 CLEAN UP TRASH & COLLECT DATA

2 ORGANIZE & ANALYZE DATA

3 PUBLISH RESULTS

4 INFORM SOLUTIONS & REDUCE OUR IMPACT

NAME: _____ **EMAIL:** _____

DATE OF CLEANUP: _____ **NUMBER OF VOLUNTEERS WORKING ON THIS CARD:** adults: _____ children (under 12): _____

CLEANUP SITE DESCRIPTION

Type of Environment (choose one):

- ○ Saltwater (ocean/bay/estuary)
- ○ Freshwater (river/stream/lake)
- ○ Inland (no water body present)

Mode of Data Collection (choose one):

- ○ Land (beach/shoreline/inland)
- ○ Underwater
- ○ Watercraft (powerboat/sailboat/kayak/canoe)

SITE INFORMATION

Cleanup Site Name:

State or Province:

Country:

Zone or County:

Nearest Crossroad or Landmark

POST-CLEANUP COMMENTS

General comments:

Fouled debris or debris with clear animal bite marks:

Notable brands or source identification:

Items not removed (hazardous material, items of cultural or historical significance):

DEAD/INJURED ANIMAL	STATUS	ENTANGLED	TYPE OF ENTANGLEMENT ITEM
	Dead or Injured	Yes or No	

Please return this form to your area coordinator.
If you are unable to do so, please email it to:
cleanup@oceanconservancy.org

Trash Free Seas: www.oceanconservancy.org/cleanup
Be a Green Boater: www.oceanconservancy.org/goodmate
Go Paperless! Download Clean Swell: www.oceanconservancy.org/cleanswell

ARCTIC CLEANUP

TRASH COLLECTED

Citizen scientist: Pick up all trash and record all items you find below. No matter how small the items, the data you collect are important for Trash Free Seas.®

THREE WAYS TO PROVIDE DATA:
1. Count individual items using tally marks
2. For a category, provide total number of bags filled and size of bag or
3. For a category, provide the total weight removed

EXAMPLE:	WEIGHT	BAGS COLLECTED	ITEM COUNT
Buoys/floats (foam) 120 Liter bags		4	

FISHING & AQUACULTURE:	WEIGHT	BAGS COLLECTED	ITEM COUNT
Aquaculture gear (trays, barrels, rope cuttings):			
Bait packaging/boxes/holders:			
Buoys/floats (foam):			
Buoys/floats (hard plastic):			
Foam blocks/dock pieces:			
Fish boxes (foam):			
Fishing hooks, lures, etc.:			
Fishing/seafood traps:			
Fishing line: *approx. length or tally space*			
Fishing nets (whole):			
Fishing nets (cut-offs):			
Line & Rope > 50 cm *(note type i.e. dolly rope, nylon, leaded, etc.)*:			
Line & Rope < 50 cm *(note type i.e. dolly rope, nylon, leaded, etc.)*:			
Packaging tube rolls:			
Plastic sheeting/tarps:			

PERSONAL HYGIENE & OTHER DEBRIS:	TOTAL #
6-pack holders:	=
Clothing:	=
Condoms:	=
Diapers:	=
E-cigarettes:	=
Electronic waste (phones, batteries):	=
Footwear:	=
Gloves (rubber/latex) & masks (PPE):	=
Paper bags:	=
Gun shells/cartridges:	=
Tobacco Products (lighters, cigar tips, wrap):	=
Toys:	=
Other plastic waste:	=

TINY TRASH LESS THAN 2.5CM (2.5cm (actual size))	TOTAL #
Plastic/foam pieces:	=

	WEIGHT	BAGS COLLECTED	ITEM COUNT
Appliances:			
Barrels & buckets (plastic):			
Barrels (metal):			
Conveyor belt pieces:			
Plastic bottles/cans (cleaners, oil):			
Metal bottles/cans (gas, oil):			
Construction materials:			
Foam Packaging/Insulation:			
Gloves (work, cloth):			
Packing/Strapping bands:			
Pallets:			
Tires:			
Other waste (metal, treated wood, etc.):			
Weather balloons:			

CONSUMER GOODS & FOODWARE:	TOTAL #
Balloons:	=
Beverage bottles (glass):	=
Beverage bottles (plastic):	=
Beverage cans:	=
Beverage sachets:	=
Bottle caps (metal):	=
Bottle caps (plastic):	=
Cigarette butts:	=
Cotton bud sticks (cotton swabs):	=
Cups, plates (foam):	=
Cups, plates (paper):	=
Cups, plates (plastic):	=
Food containers (foam):	=
Food containers (plastic):	=
Food wrappers (candy, chips, etc.):	=
Grocery bags (plastic):	=
Other bags (plastic):	=
Lids (plastic):	=
Straws/stirrers:	=
Utensils:	=

OTHER ITEMS NOT LISTED	TOTAL #
1.	=
2.	=
3.	=

CLEANUP SUMMARY (circle units)

Number of Trash Bags Filled:		Weight of Trash Collected:	lbs/kgs	Distance Cleaned:	miles/km	Area Cleaned:	miles²/km²

Appendix 2: Results from citizen science 2023

Table 1. Top five litter items in quantity from cleanups in 2023.

		Number of items	Percent of items	
1	Plastic/foam pieces <2.5 cm	77 024	69 %	
2	Packaging/strapping bands	6 526	6 %	
3	Line and rope (regardless of length)	4 053	4 %	
4	Other plastic waste	2 870	3 %	
5	Fishing line	2 663	2 %	

Table 2. Top five litter items in occurrence from cleanups in 2023.

		Number of cleanups	Percent of cleanups	
1	Beverage bottles (plastic)	44	80 %	
2	Line and rope (regardless of length)	44	80 %	
3	Buoys/floats (hard plastic)	39	71 %	
4	Food wrappers (candy, chips, etc.)	37	67 %	
5	Plastic bottles/cans (gas, oil)	35	64 %	


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