

REPORT

Net Trawling Floating Refuse Trial

By: Christine Dobridge

Between the 27th June and the 19th July 2001, Civic Exchange, the Marine Department, a Dutch sea captain and an Aberdeen fishing crew collaborated to design and test a new refuse trawling method for cleaning up Hong Kong marine waters. The method adapted traditional fishing nets to capture floating refuse above and below the surface. A local fishing crew carried out daily trials around southern Hong Kong Island and the following report is a compilation of the daily observations recorded by Civic Exchange interns and the fishermen during the trial.

Strengths of the method

- The nets were very effective at collecting small floating refuse, like plastic bags, plastic containers and small Styrofoam pieces. The rubbish flowed directly into the nets and none of it was washed away. The method was particularly effective at trawling for refuse in areas where the refuse had collected in pockets near the shore or in lines in the open water. In those areas, the nets picked up a large amount of refuse in a short amount of time.
- Putting the plastic bags in the fishing buckets and then filling up the bags was an effective way of getting the trash into the bags.
- The boat was able to trawl close to the shore.
- The small vessel was highly maneuverable and could change directions easily to reach the refuse.
- Using the mechanized pulley to lift the full nets out of the water was effective and easier for the fishermen than manually pulling the nets out of the water.

Weaknesses of the method

- The refuse was difficult to remove from the net. The fishermen had to transfer it from the nets to the bags and bucket by dumping the refuse on deck and transferring it by hand. The process was very dirty and could be dangerous (there were often loose nails sticking out of pieces of timber, for example). There was only one shovel on the boat to transfer the refuse from the deck to the bags. Another shovel would have helped.
- It was difficult to collect heavy, bulky refuse. The fisherman used a combination of hand nets, ropes, a long hook, the mechanized pulley and manpower to hoist large pieces of refuse including tree trunks, large pieces of timber, large foam boxes and gasoline jugs onto the boat. The process was time consuming and could be dangerous.
- In choppy seas, the small vessel is hard to maneuver. Choppy seas also made the recovery process more dangerous.
- Storage space on the boat was limited. When the deck was congested it was difficult and a little dangerous for the fishermen to work around them.

- The method was not very effective at collecting in heavily congested areas like the Aberdeen Typhoon shelter because most of the floating refuse was close to the moored boats where the fishing boat could not maneuver.
- The small fishing boat was not very effective at collecting refuse in open water (unless the fisherman found streams of refuse) because the span of the nets was quite small and it took a long time to collect a substantial amount of refuse.
- Small pieces of plastic and timber stuck in the nets.

Conclusions

The very nature of rubbish collection is labor, time and energy intensive, whether at sea or on land. Four people appear to be an optimum number for a vessel of the size used for the trails. The fact that it took a team of four to clean marine refuse should not be seen as a fault of the method.

Using adapted fishing nets to collect floating refuse is potentially an excellent method for cleaning up Hong Kong waters and reducing the visible blight of marine rubbish. Much of the visible blight is due to small pieces of floating plastic and timber and using nets is an excellent method for collecting that type of refuse. The nets can collect a substantial amount of refuse in a short amount of time and very little of the catch is lost before it can be transferred to bags for disposal.

Before the technique can be utilized by the Marine Department on a large scale to clean up Hong Kong waters, however, the weaknesses in the process must be addressed and the technique should be adapted for use under different conditions. The difficulty of transferring rubbish from the nets to the trash bags is the main weakness of the system and modifications should be made and safety should be a priority at all times.

The use of nets to collect rubbish can also be expanded beyond sending out one fishing boat at a time. Mr. Gijs Lock's ideas for expanding the netting techniques include: 1) sending out two or three fishing boats to trawl side by side so that they can collect a wider span of rubbish, and 2) stringing nets between two tugboats to trawl a larger area or an area with choppier conditions than a fishing boat can handle, like Victoria Harbour.

Adapted fishing nets could be effectively integrated into the Marine Department's current program for collecting marine refuse. The netting technique is not very effective for collecting bulky pieces of rubbish but is good at collecting small pieces. Marine Department vessels that use mechanized scoops for collecting refuse are very effective at collecting and disposing of bulky pieces of rubbish, but not effective at collecting small pieces. Marine Department vessels invariably lose a portion of the refuse collected in choppy waters before being able to dispose of it. Neither the larger Marine Department vessels or the netting technique are effective at collecting floating refuse in highly congested areas like the typhoon shelter; a very small vessel and hand nets are necessary for this.

All things considered, the combination of netting techniques and current Marine Department techniques for collecting refuse has the potential to facilitate and expedite the clean up of Hong Kong waters.

20 July 2001

Summary of Observations for Net Trawling Floating Refuse Trial

Date	Location	Approximate Amounts of Refuse Collected			Remarks
		buckets of rubbish (foam box, timber, other)	m ³ of refuse (1 bucket = ~ .15 m ³)	weight of large timber pieces	
27/6/01	Pok Fu Lam, Sandy Bay, Ap Lei Pai	21 buckets other	3.15	-	most refuse is plastic bags or containers with some small timber and foam pieces
28/6/01	Deep Water Bay, Chey Hom Wan, Pok Ful Lam, Wah Fu	14 buckets other	2.35	-	most refuse is plastic bags or containers
29/6/01	S. Bay, Round Island, Ap Lei Chau, Ocean Park	13 buckets 'other'	1.95	-	several large pieces of timber found, most of the floating refuse is plastic bags and small timber pieces
3/7/01	Southern Horizon, Sandy Bay, Ocean Park	3 buckets of timber, foam, 8 buckets other	1.65	100 lbs timber	"other" = bottles, plastic bags
4/7/01	Luk Chau Wan, Picnic Bay	6 buckets timber, 12 buckets other	2.7	-	"other" = plastic bags
5/7/01	Picnic Bay	27 buckets	4.05	200 lbs timber	
9/7/01	Sandy Bay, Wah Fu Estate, Southern Horizon	42-45 buckets total	6.3-6.75	1200 lbs timber	
10/7/01	Repulse Bay and Chung Hom Kok	15 buckets timber, 30 buckets other	6.75	-	
11/7/01	Stanley, Repulse Bay and Sandy Bay	5 buckets timber, 13 buckets other	2.7	300lbs timber	
12/7/01	Tai Tam, Stanley, Repulse Bay, Deep Water Bay and Ocean Park	13 buckets other	1.98	150 lbs timber	
13/7/01	Luk Chau, Hok Kwu Wan, Repulse Bay, South Bay	6 buckets timber, 26 buckets other	4.8	600 lbs timber	
16/7/01	Sok Kwu Wan, Repulse Bay, Ocean Park	5 buckets timber, 27 buckets other	2.8	300 lbs timber	
17/7/01	Yung Shu Wan, Typhoon Shelter, Ocean Park	12 buckets timber, 23 buckets other	5.25	300 lbs timber	2 large Styrofoam blocks, plastic jugs, tires, "other" = plastic bags, containers, small timber pieces
18/7/01	Causeway Bay, Clear Water Bay, Ocean Park	1 buckets timber, 35 buckets other	5.25	500 lbs timber	
19/7/01	Yung Shu Wan, Lamma Island, Ocean Park	30 buckets total	4.5	100 lbs timber	most refuse is plastic bags and bottles, several large timber pieces, one large rope