

13.2 Longhurst Hardy Plankton Recorder (LHPR) Tow

Sophie Fielding

The LHPR is a vehicle designed to be towed in a single V-shaped profile through the upper 400 m of the water column. It has a large aluminium frame, with a polypropylene tail fin, which houses a conical net. A nose cone at the front of the frame channels water through the 333 μm conical net to a cod-end. The cod-end contains two spools of gauze which wind round a take-up spool every two minutes (set on the instrument), sandwiching a sample of zooplankton between them, thus allowing semi-discrete samples. Attached to the frame, one each side, are two cylinders containing a rechargeable battery pack and the electronics for driving the cod-end, monitoring the sensors (in our case these were a Seabird conductivity meter, temperature probe, depth sensor and flowmeter) and communicating with the surface. To assist the sampler to dive a 45 kg depressor weight is attached to the underside front and a drogue streams from the back of the frame to assist stability and maintain a horizontal aspect.

During D285 only one LHPR tow was achieved due to weather constraints, whilst during D286 four deployments were achieved (Table 13.3). The deployment of the LHPR was from the main A frame, over the stern of *Discovery*, using the main trawl wire. As the trawl wire has no conducting core the LHPR was run in internal logging mode. The maximum duration of the LHPR tow in this mode is 180 minutes (the data holding capacity of the sensor cylinder before overwriting), including deployment and recovery: to err on the side of caution the tow was limited to a maximum of 150 minutes. This deployment was the first time I had used the LHPR on the trawl wire and the first time it has been deployed since the ship became responsible for driving the winches. As a result a 10 minute delay before the first wind-on of the gauze was added for the first haul to allow time for deployment and the wire-out was limited to 900 m to ensure the LHPR did not travel too deep in the water. The LHPR was held just below the surface for 10 minutes to allow the gauze to wind-on before the wire was payed out at ~ 15 m/minute until the frame became steady in the water, where wire-out speed was increased to 30 m/minute. The LHPR was held at the bottom of its tow (900 m wire out on the first deployment and 1200 m on subsequent deployments) for 6 minutes before hauling in at 30 m/minute. The ships speed was 4.5 knots during paying out and decreased to 3.5 knots during hauling in. The subsequent four tows were deployed with a five minute wind-on delay.

Upon retrieval, the cod-end was removed from the frame. The third spool, holding the sandwiched zooplankton, was placed in a bucket containing 4% formaldehyde and then both net and cod-end were washed and reset in preparation for the next tow.

Table 13.3 LHPR tows

Station No.	Date/Jday	Time deployed GMT	Time recovered GMT	Depth M
15505	20/11/04 325	10:18	12:22	290.8
15559	20/12/04 355	11:47	13:54	375.6
15578	26/12/04 361	08:38	10:56	379.9
15607	07/01/05 007	03:54	06:07	346.5
15625	12/01/05 012	13:30	15:38	327.4