DEPLOYING A SUBMERGED FISH AGGREGATING DEVICE AT KAVALA, FIJI

by Tekata Toaisi and Sailosi Drili, Fiji Fisheries Department

In mid-2008, a surface fish aggregating device (FAD) was deployed outside Lasemarawa reef by the Fiji Fisheries Department in order to encourage local fishermen to partake in FAD fishing activities as an alternative source of income as well as to improve food security. It was also hoped that the FAD would provide a substitute fishing area to divert fishermen away from their inshore fishing activities and to relieve pressure on inshore reef stocks. It was intended to channel catch from the FADs to the Wainikaculoa Rural Fisheries Service Centre for distribution, through sales, to the people of Kavala Bay as well as the rest of Kadavu and Fiji, if fish supplies were abundant.

Figure 1. Wainikaculoa Fisheries Service Centre in Kavala Bay, Kadavu.

Lasemarawa reef is a system of submerged patch reefs clustered outside Kavala Bay, about 2 nm southeast of the government Wainikaculoa Rural Fisheries Service Centre, which was established by the Fiji Fisheries Department in 2006 (Fig. 1). The centre has an ice plant, a marketing display and storage facility, and fisheries staff to assist local communities with setting up a fishermen's association and to use the facility to market their catch for urban areas such as Suva.

The floating FAD deployed in mid-2008 consisted of a large orange float with a bamboo raft. This FAD was lost, however, after only three weeks. Villagers reported seeing divers with the orange FAD float, indicating that the FAD was probably vandalised and cut by the divers.

In light of the FAD's short life span, it was decided to replace it with a subsurface FAD settled at 46 m (25 fathoms) below the sea surface, rather than redeploying another surface floating FAD, and so would not be exposed to strong winds and high swells that are often experienced during certain times of the year in Fiji. It would also reduce the risk of local divers vandalising it.

Survey of FAD site

A FAD site survey was carried out using a GPS (global positioning system) to determine the coordinates of the surveyed sites (Fig. 2), and an echo sounder to determine depth. While the GPS functioned well, the echo sounder did not, and manual sounding had to be undertaken at each site. This was done using a fishing line with a lead attached at the end. The lead and line was dropped, retrieved, and measured at each sounding site. A total of 0.5 nm^2 was sounded with the coordinates in latitude and longitude recorded on graph paper.

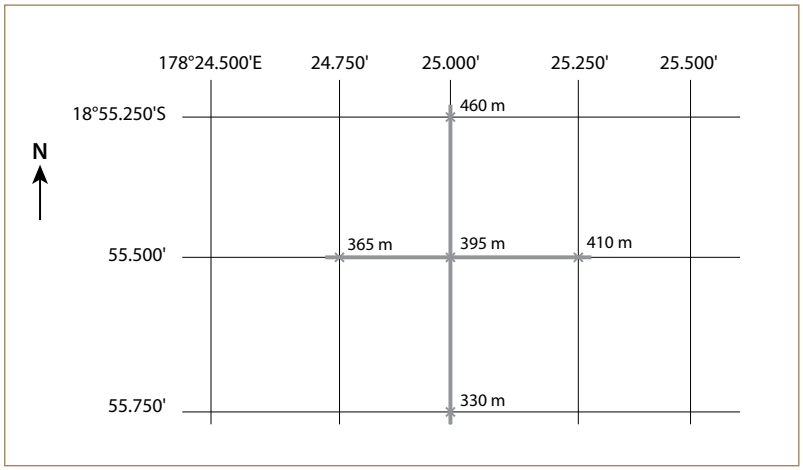

Figure 2. Area and coordinates of survey.

After the survey, a site with a depth of 395 m (216 fathoms) was selected. Mooring ropes were spliced to the appropriate length to set the float 46 m below the sea surface.

Deploying the FAD

Kavala Rural Fisheries Service Centre did not have a boat to deploy the FAD or carry out FAD surveys. Therefore, a 7-m fibreglass boat fitted with a 60 hp outboard engine, travelled from the Fisheries Department base in Lami to Kadavu to carry out the FAD survey and deployment.

FAD components were constructed in Suva and transported to Kavala on the MV *Sinu Wasa*; a local passenger/cargo vessel servicing the Suva Kadavu route on a weekly basis. These components were assembled at the Wainikaculoa Fisheries Centre (Fig. 3).

Figure 3. Assembling the FAD components at the Fisheries Centre.

Despite unfavourable weather conditions, with a strong southeasterly wind, the FAD was deployed.

When the exact FAD location was reached, the subsurface FAD flotation section was put into the water (Fig. 4), then the deployment vessel moved upwind while paying out the mooring rope.

Figure 4. Flotation section being deployed.

The vessel did a long anticlockwise turn to prevent crossing the part of the mooring line already in the water. Once all the rope was paid out, the vessel had to be in position at the exact coordinates (18°55.518′ S and 178°25.051′ E) chosen for deploying the anchor. As soon as this was confirmed the anchor was released.

Floating line marker

A floating line, with one end attached to a 2-L coke bottle and the other tied to the submerged float, was released after the flotation section was deployed. The floating line was marked with red insulation tape at 10-m intervals to determine the exact depth at which the flotation section settled below the surface. After it was determined that the FAD had reached its final settling position, the floating line was retrieved and the depth measured. The FAD flotation section was observed to settle at 46 m (25 fathoms).

Followup work

After completing the FAD deployment operation, some followup work was carried out:

- The Fiji Islands Marine and Safety Authority were informed of the location of the submerged FAD for the safety of seafarers.
- Fishermen from the area were informed of the location of the submerged FAD by the Kavala Fisheries staff, which carried out a briefing on the importance FADs for their livelihood.
- Monitoring the FAD on a weekly basis by Kavala Fisheries staff.

It was also noted that a new echo sounder with a depth range of 1,000 m or more will need to be purchased for future FAD work.

As of late August, the Fisheries Department office was receiving reports from fishermen confirming that the submerged FAD was still in place and starting to be productive. During the second phase of this Kadavu FAD development project, Fisheries Department staff will concentrate on working with FAD users to encourage them to regularly report their FAD catches.