

**JOB PROGRESS REPORT  
DEVELOPMENT PROJECT SEGMENT**

**STATE:** Territory of Guam

**PROJECT NO:** F-3-D  
**SEGMENT:** 2

**PROJECT TITLE:** Maintenance and Redeployment of DAWR FADs and SWMs (2323)

**PERIOD COVERED:** October 1, 1997 to September 30, 1998

**SUMMARY**

**FADs**

The coordinates of the sixteen operational sites in the Division of Aquatic & Wildlife Resources' (DAWR) Fish Aggregating Device (FAD) program and their relative locations to the island are depicted in Figure 1. As of September 30, 1998, the Facpi 2 site was the only one missing a buoy; which was reported off-station on the 14th of September and recovered the following day. Figure 2 diagrams the design and construction of the FAD system presently being used at each of the sites.

The average time on station for the FADs lost in FY98 was approximately 11 months, roughly a 7-month decrease from the FY97 average of around 18 months. The decrease in the average lifespan is largely the result of the Fadian, Agat and Facpi 2 FAD losses after being on site for less than 3 months. Of the three, the Agat and Facpi 2 losses are believed to be the result of fish-bite given the appearance of the break on the line and the depth at which the break occurred (the line on the Fadian FAD had already been removed before it was recovered and therefore the cause of the loss could not be determined). If these three FAD losses were not included in the calculation of the average time on station (because they did not exceed the critical 6-month initial time on site), the resulting recalculation would yield a figure just over the expected lifespan of 24 months. Table 1 lists the five FADs lost in FY98, the date last deployed, when they were reported to be off-station, recovery date and length of time on station.

Table 1. FAD Losses - FY98

| <b>Site</b>     | <b>Date Deployed</b> | <b>Date Lost</b> | <b>Date Recovered</b> | <b>Time on Site</b> |
|-----------------|----------------------|------------------|-----------------------|---------------------|
| Fadian          | 09/05/97             | 12/15/97         | 01/08/98              | 3 months            |
| No. 2           | 07/15/94             | 12/16/98         | not recovered         | 3 yrs, 5 mos        |
| No. 5           | 06/23/97             | 02/20/98         | 02/20/98              | 8 months            |
| Agat            | 07/14/98             | 07/25/98         | 07/28/98              | 2 weeks             |
| Facpi 2         | 07/15/98             | 09/14/98         | 09/15/98              | 2 months            |
| <b>Average:</b> |                      |                  |                       | <b>11 months</b>    |

The average replacement period for a FAD system in FY98 was 3-1/3 months with a range from 1 day to 8-1/2 months. How quickly a FAD can be reestablished depends primarily on prevailing sea conditions because deployments are typically conducted during calm seas to ensure the safest working conditions. Therefore, the 8-1/2 months that it took to replace the Fadian FAD was greatly affected by the fact that this site is located on the windward side of the island where there are much fewer periods of calm seas to work with. Table 2

lists the location, redeployment dates and replacement time for the five FADs that were reestablished in FY98.

Table 2. Reestablished FADs - FY98

| <b>Site</b>     | <b>Date Reestablished</b> | <b>Date Recorded Lost</b> | <b>Replacement Period</b> |
|-----------------|---------------------------|---------------------------|---------------------------|
| No. 4           | 10/05/97                  | 08/08/97                  | 2 months                  |
| No. 2           | 02/26/98                  | 12/16/97                  | 2-1/2 months              |
| No. 5           | 07/01/98                  | 02/20/98                  | 3-1/2 months              |
| Agat            | 07/29/98                  | 07/28/98                  | 1 day                     |
| Fadian          | 09/04/98                  | 12/15/97                  | 8-1/2 months              |
| <b>Average:</b> |                           |                           | <b>3-1/3 months</b>       |

The average replacement costs for a 500-fathom FAD system for FY98 was \$8,992.39; up nearly \$1,200.00 from the previous year. This was the result of a majority of the replacements being located the furthest away from the port, and the additional stops made to replace lights of operational FADs in the area on the return trips. Table 3 lists the major costs for the replacement of a 500-fathom FAD system. A 1,000-fathom FAD system costs an extra \$1,770.00 due to the additional 3,000 feet of polypropylene rope necessary to complete the system. Table 4 provides a summary of recovery and buoy and light replacement activity for FY98.

Table 3. Average Replacement Cost per 500-Fathom FAD System - FY98

| <b>Item/Service</b>            | <b>Cost</b>       |
|--------------------------------|-------------------|
| Buoy                           | \$518.50          |
| Buoy Preparation*              | \$494.00          |
| Anchor Block                   | \$368.96          |
| Mooring System (500 fathoms)** | \$4,138.90        |
| Navigation Light and Batteries | \$242.93          |
| Loading and Deployment         | \$3,229.10        |
| <b>Total:</b>                  | <b>\$8,992.39</b> |

\* Includes sanding, painting, welding and moving services.

\*\* Additional \$1,770.00 for 1000-fathom system

Table 4. Operations & Maintenance Activity and Costs - FY98

| <b>Activity</b>  | <b>Date</b> | <b>Cost</b> |
|--|-------------|-------------|
| Reestablish No 4 FAD;<br>replace lights: Nos. 5-6<br>(scheduled 09/30/97; FY97 P.O.) | 10/05/97    | \$11,755.00 |
| Recovery of Fadian FAD<br>off Inarajan shoreline                                     | 01/08/98    | \$200.00    |
| Recovery of No.5 FAD<br>off Two-Lovers Point.  | 02/20/98    | \$1,684.00  |
| Reestablish No.2 FAD;<br>replace lights: Nos.1,3,4 &<br>Old NOAA                     | 02/26/98    | \$12,279.50 |
| Replace lights: Facpi, 9-mile,<br>Umatac, Cocos and Asiga                            | 03/17/98    | \$2,120.00  |
| Miscellaneous painting and<br>buoy refurbishment                                     | Feb-Mar/98  | \$572.50    |
| Reestablish No.5 FAD; replace lights:<br>Nos. 1-4, Ledge, Old NOAA                   | 07/01/98    | \$12,243.50 |
| Replaced light: Facpi<br>(after deployment of new Agat FAD)                          | 07/14/98    | --          |

|  |               |                     |
|--|---------------|---------------------|
| Replaced lights: Nine-Mile and Umatac<br>(after deployment of new Facpi 2 FAD) | 07/15/98      | --                  |
| Recovery of Agat FAD   | 07/28/98      | \$1,331.00          |
| Reestablish Agat FAD   | 07/29/98      | \$13,110.00         |
| Replaced light: No.6<br>(did not use Cabras Marine)                            | 08/27/98      | --                  |
| Reestablish Fadian FAD; replace<br>lights: Asiga, Cocos                        | 09/04/98      | \$13,185.00         |
| Recovery of Facpi 2 FAD  | 09/15/98      | \$1,331.00          |
|  | <b>Total:</b> | <b>\$69,811.50*</b> |

\* Does not include personnel cost and benefits

DAWR has further streamlined the predeployment preparation of FAD systems by ordering prespliced 500- and 1000-fathom systems according to DAWR specifications. The prespliced lines add little to the total cost of the FAD system, however save considerable manpower time and further facilitate convenient short-notice replacements of lost FADs. An example of this was the replacement of the Agat FAD only one day after it was recovered by using a prespliced 1,000-fathom system right out of the original shipping carton. Given the initial success of this approach on at least four separate occasions, future orders of FAD lines will consist primarily of prespliced systems

### **Shallow Water Moorings (SWMs)**

There was no maintenance or replacement activity recorded for the SWM project in FY98. Installation of SWMs is expected to begin sometime in early FY99.

### **OBJECTIVES**

1. To maintain, preserve and efficiently replace DAWR's fish aggregating devices.
2. To maintain, preserve and efficiently replace DAWR's shallow water moorings.

### **RECOMMENDATIONS**

The project to maintain and reinstall FADs and SWMs should be continued with the following recommendations for FY99:

1. Reestablish the open account to prepare FAD systems for deployment, conduct actual deployments, recover errant buoys, and perform on-site replacement of expired navigation lights and worn FAD buoys on an as-is-needed basis.
2. Identify and contract a private vendor to conduct SWM maintenance and reinstallation services on a short notice and as-is-needed basis similar to that of the FAD project.
3. Reorder buoys, concrete anchors, pre-spliced ropes, chains and other miscellaneous mooring hardware to establish an inventory sufficient to replace up to ten 500-fathom FAD systems and twenty 10-fathom SWM systems.
4. Purchase a new work-boat to allow for some minor maintenance routines to be conducted for both the FAD and SWM projects.

5. Establish and maintain an inventory of other miscellaneous equipment, supplies and materials, such as navigation lights and batteries, necessary for both the FAD and SWM projects.

### **PROGRAM COST**

The estimated cost for the project to continue maintenance and reinstallation of FADs and SWMs is \$69,812.

Prepared by: Andrew A. Torres

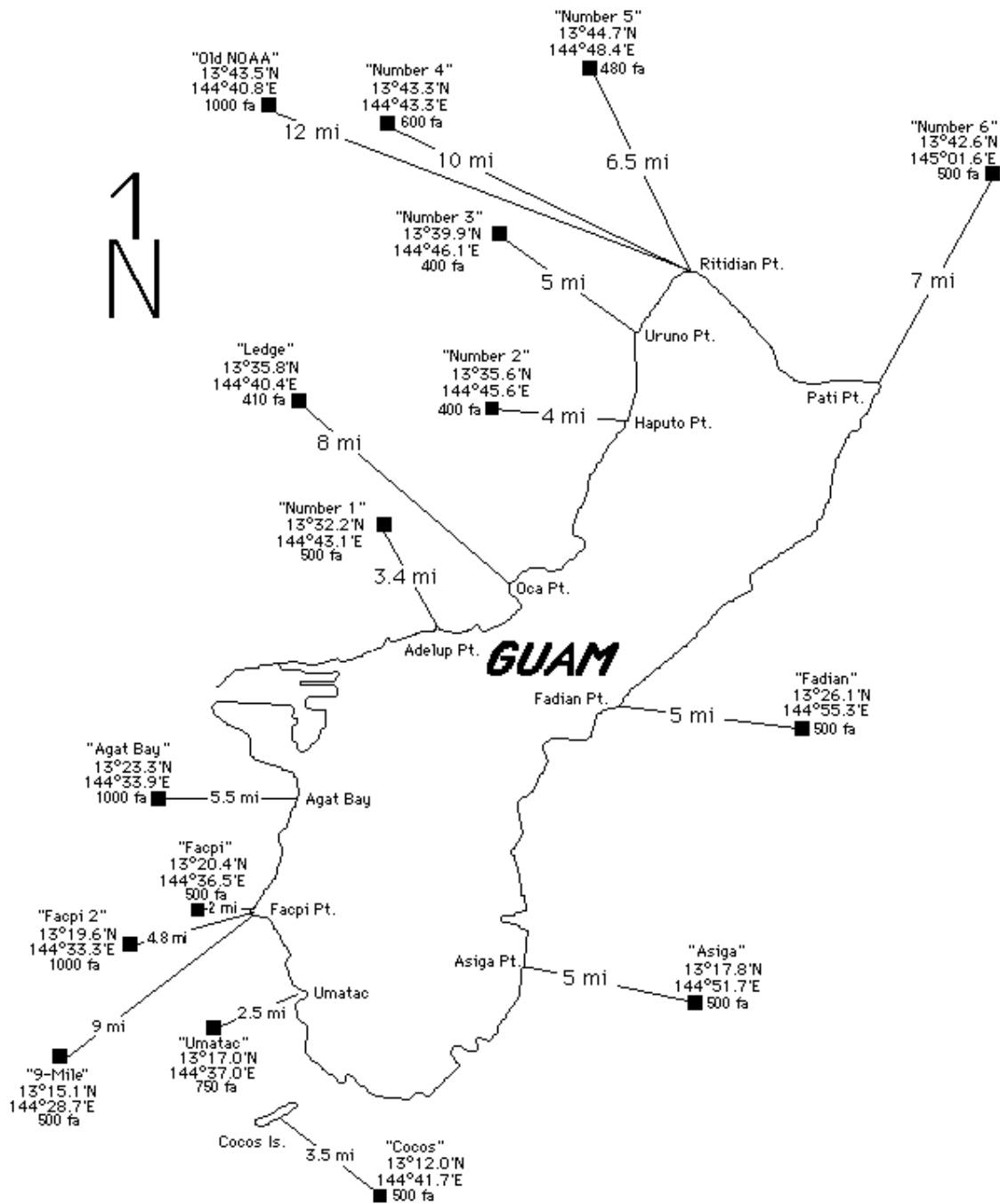


Figure 1. DAWR FAD Sites

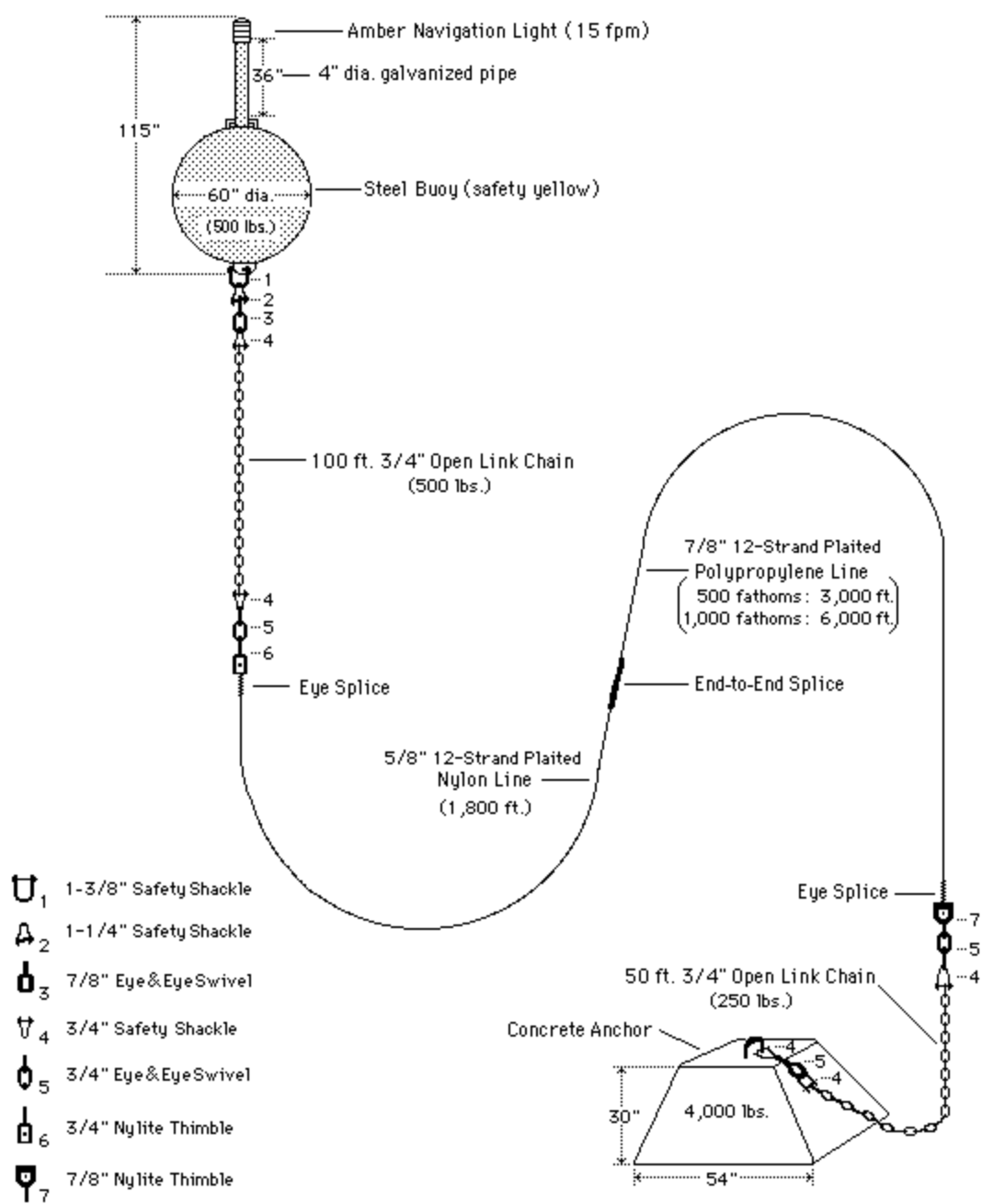


Figure 2. FAD with Spherical Steel Buoy