JOB PROGRESS REPORT
RESEARCH PROJECT SEGMENT

STATE: Territory of Guam

PROJECT NO.: F-1R-9
SUB-PROJECT NO.: F-2
STUDY NO.: 1
JOB NO.: 1

STUDY: Monitoring of Guam's Freshwater Fisheries

JOB TITLE: Freshwater Monitoring Program (2440)

PERIOD COVERED: October 1, 2000 to September 30, 2001

OBJECTIVE

To survey aquatic fauna in selected watersheds to assess sport fishing opportunities and to preserve freshwater and marine coastal water sport fishing habitat.

To survey 7 rivers in 3 watersheds on Guam (including one that contains a dam), over a one year period, to obtain information on fish species density and composition for analysis and comparison between watersheds.

RESULTS

Five rivers in 3 watersheds were surveyed in FY/01. Species composition, organism density, and habitat characteristics were collected in 5 of the 7 experimental and control rivers chosen in FY/97, using the methods described in the annual report of FY/97. The only experimental river (located above Fena Reservoir) surveyed was the Maulap River. The control rivers surveyed were the Maagas River, the Manenggon River, the Pago River, and the Ylig River. When possible, analysis of variance was used for data comparison of the streams. However, when the data did not conform to the assumptions of ANOVA, appropriate nonparametric tests were performed (StatView 4.51, Abacus Concepts, Inc., Berkeley, California, 94704-1014). The Almagosa and Sadog Rivers were not surveyed in FY/01. These rivers are located in the Naval Ordnance Annex and were inaccessible due to the heightened security measures following the 11 September, 2001 attacks on the World Trade Centers and Pentagon. These rivers had not been surveyed prior to 11 September, 2001 due to shortages in manpower. The rivers will be surveyed as soon as access is granted to non-essential personnel.

The number of species per square meter surveyed in FY/01 did not differ significantly from FY/97 (considered baseline) ($P = 0.53$, Mann-Whitney U). However, there were significantly fewer individuals per square meter in FY/01 than in FY/97 ($P = 0.02$, Mann-Whitney U). Neither species density nor total density differed significantly between experimental and control streams ($P = 0.08$; 1-way ANOVA, for both). Although five years of data collection is not enough time to see broad trends, total densities and species composition appear relatively consistent.

The goby *Stiphodon* sp. (formerly known as *Stiphodon elegans*) and the freshwater prawn *Macrobrachium lar* were seen in both control and experimental streams. Individually, densities of *M. lar*, and *Stiphodon* sp. did not differ significantly between experimental and control rivers ($P = 0.62$, 1-way ANOVA; $P = 0.07$, Mann-Whitney U; respectively). The eel *Anguilla marmorata*, the goby *Awaous guamensis*, the flagtail *Kuhlia rupestris*, the snapper *Lutjanus argentimaculatus*, and the tilapia *Oreochromis mossambicus* were present only in control streams. The dam probably excludes flagtails because it is not morphologically adapted for

climbing. It is also absent above natural waterfalls in most streams of Guam. The snapper *L. argentimaculatus* is a marine species that frequents the lower reaches of rivers as a juvenile. The eel *Anguilla marmorata,* the goby *Awaous guamensis*, and the tilapia *Oreochromis mossambicus* have been seen above the dam in previous surveys.

No species were present only in experimental streams. The gobies *Mugilogobius cavifrons*, *Sicyopus* sp. (formerly known as *Sicyopus leprurus*), *Sicyopterus macrostetholepis*, *Stenogobius* sp., and *Stiphodon percnopterygionus*, the tilapia *Tilapia zillii,* and the tucunare *Cichla ocellaris* were not recorded in any surveys. No single species was seen in all streams surveyed.

PROJECT COST: $52,500

Report prepared by: Trina J. Leberer

JOB PROGRESS REPORT
RESEARCH PROJECT SEGMENT

STATE: Territory of Guam

PROJECT NO.: F-1R-9
SUB-PROJECT NO.: F-2
STUDY NO.: 1
JOB NO.: 2

STUDY: Monitoring of Guam's Freshwater Fisheries

JOB TITLE: Fisheries Studies in Fena Lake (2440)

PERIOD COVERED: October 1, 2000 to September 30, 2001

OBJECTIVES

To survey aquatic fauna in selected watersheds to assess sport fishing opportunities and to preserve freshwater and marine coastal water sport fishing habitat.

To conduct a stock assessment, using electrofishing and mark-recapture methodology, over a five year period in Fena Lake, Guam, to obtain information on fish species composition and population structure.

RESULTS

A stock assessment of Fena Reservoir began in FY/01. Methods of fish capture attempted (i.e. setting a weir-like net, baited minnow traps, casting with hook and line, talaya (cast net), and trolling) have been only moderately successful up to now. Currently, no marked fish have been recaptured, so no population estimates can be made at this time. Although two types of tilapia (*Oreochromis mossambicus* and *Tilapia zillii*) are the only species that have been caught (see FY/00 annual report), several peacock bass (*Cichla ocellaris*) and native eels (*Anguilla marmorata*) have been seen. New catch methods, such as electrofishing, and improvements to existing ones continue to be explored in this ongoing project. Two staff (Leberer, Biologist III at the time, and Bass, Fish and Wildlife Technician I) were sent to the US Fish and Wildlife Service National Conservation Training Center course on the Principles and Techniques of Electrofishing in Sacramento, California from 6-9 February, 2001. The rest of the Technical staff was given a briefing on the course and are currently completing the computer-based correspondence course of the same name. Different types of electrofishing equipment were evaluated but could not be purchased in FY/01 due to a lack of capital outlay funds. Additionally, this project has been affected by the heightened security measures in the Naval Ordnance Annex (the location of Fena Reservoir), which remains inaccessible to non-essential personnel following the 11 September, 2001 attacks on the World Trade Centers and Pentagon. Electrofishing equipment will most likely be purchased at the beginning of FY/02, pending the restoration of access to the reservoir.

PROJECT COST: $15,750

Report prepared by: Trina J. Leberer