

A COMPARISON OF THE FEEDING HABITS OF  
MASIMASI (Coryphaena hippurus)  
BEFORE AND AFTER FAD DEPLOYMENT  
IN AMERICAN SAMOA

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## INTRODUCTION

This report is the result of several independent efforts to study the trophic biology of the masimasi (or dolphin fish, Coryphaena hippurus) in American Samoa. During the mid 1970's biologists at the Department of Marine and Wildlife Resources (DMWR) of the American Samoa Government recorded the stomach contents of pelagic species, including masimasi. The taxonomic levels of prey identification are usually very broad and are recorded only by occurrence. In 1978, the South Pacific Commission caught and recorded the stomach contents from three masimasi in Samoan waters. This data is also recorded only by occurrence. However, it is the only data taken before the Fish Aggregation Device (FAD) program began in American Samoa.

In 1985, biologists from the DMWR began collecting and preserving the stomach contents from pelagic species, including masimasi caught at FADs. James E. Norris was contracted in 1988 in part to identify and analyze the preserved stomach contents of these masimasi.

A rough comparison, based only on frequency of occurrence data, can be made between the diets of masimasi caught before and after the initiation of the FAD program in American Samoa.

## METHODS

The raw data from the 1970's was tabulated and then analyzed in the same manner as Norris for comparison. Data was recorded from 51 stomachs, of which 35 were useful for the following calculations. Norris analyzed a total of 40 stomachs, of which 22 were useful for the following calculations.

Fishes recorded as reef dwellers as adults were placed in the 'reef' category and fishes recorded as pelagic or semi-pelagic were placed in the 'pelagic' category for analysis.

The G-test was used to test for statistically significant differences between the diets of pre-FAD and FAD caught masimasi.

## RESULTS AND DISCUSSION

The data from the mid 1970's displays the high degree of piscivory of masimasi. Fishes occur in 100%, cephalopods occur in 14.3%, and crustaceans occur in 2.9% of the stomachs examined (Pre-FAD/Total, Figure 1). High piscivory is also exhibited in the FAD caught masimasi of 1985. Fishes occur in 95.5%, cephalopods occur in 18.2%, and crustaceans occur in 4.6% of the stomachs examined (Post-FAD/Feb-Aug, Figure 1). There is no

significant difference between the data sets. It appears that the introduction of FADs in the waters of American Samoa has not affected the diet of masimasi at this level.

Looking more closely at the broad ecological grouping of the fishes consumed by masimasi, the data from the 1970's shows that pre-settlement reef fishes occur in 73.5% and pelagic or semi-pelagic fishes occur in 58.8% of the stomachs examined (Pre-FAD/Total, Figure 2). Pre-settlement reef fishes occurred in 66.7% and pelagic or semi-pelagic fishes occurred in 83.3% of the FAD caught masimasi (Post-FAD/Feb-Aug, Figure 2). The difference here is significant.

The difference between the total pre-FAD sample and the post-FAD sample is probably due in part to temporal variation. The pre-FAD sample was collected over a period of about five years in the 1970's, but the post-FAD masimasi were collected at FADs in a seven month period, February through August 1985. Compared to the total pre-FAD sample it appears that the masimasi caught around FADs have a higher frequency of capturing pelagic or semi-pelagic prey. However, if the pre-FAD samples that were collected in the months February through August are analyzed in the same manner (Pre-FAD/Feb-Aug, Figure 2) the results look more similar. However, the difference remains significant.

If the sample sizes were larger and the prey categories were more numerous this comparison would have more meaning. With only two prey categories it appears that the Binomial Test could be employed, but the requirements for the test are not met because frequency of occurrence is not additive.

A comparison of Pre-FAD/Feb-Aug and Pre-FAD/Sep-Jan of Figure 2 suggests that there is seasonal variability in the types of fish prey available to masimasi in American Samoa. This is probably true, but the sample sizes are too small (16 and 19 respectively) to make specific conclusions.

Figure 1. Comparative frequency of occurrence in the diets of masimasi before and after FAD deployment in American Samoa.

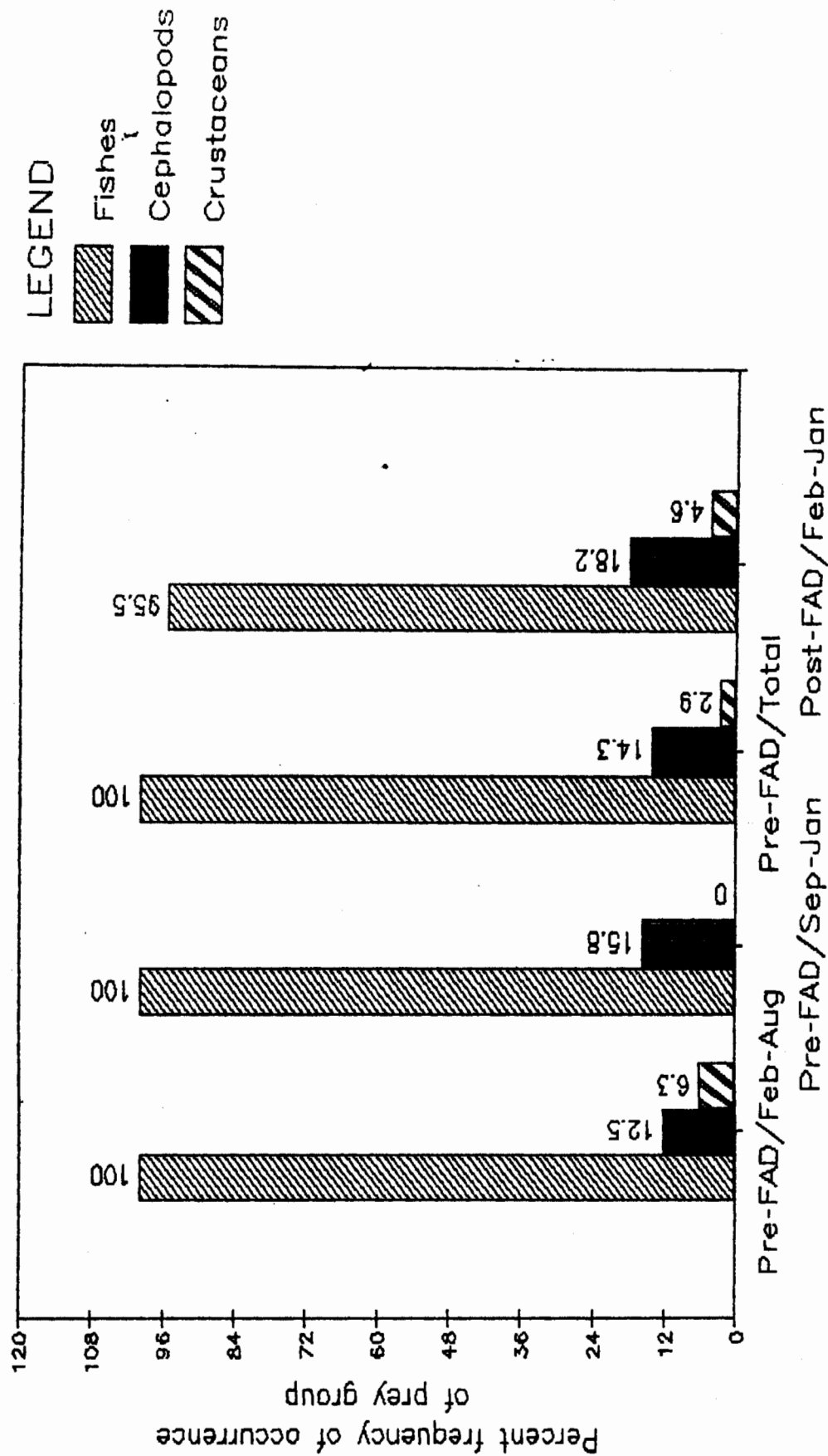


Figure 2. Comparison of two ecological groups of fish prey in masimasi before and after FAD deployment in American Samoa.

