

TROPHIC ECOLOGY AND STRUCTURE-ASSOCIATED AGGREGATION BEHAVIOR IN BIGEYE AND YELLOWFIN TUNA IN HAWAIIAN WATERS

PRIVATE FADS (“pFADs”) – CATCH COMPOSITION AND AGGREGATION DYNAMICS OF BIGEYE TUNA

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Background

Private Fish Aggregating Devices (pFADs) are clandestine fish aggregating devices deployed by individual entrepreneurs operating fishing vessels from Hawaii Island. The prevalence of these devices has steadily increased and yet the magnitude and composition of catches produced by pFADs are unknown. Unsubstantiated reports suggest large catches of juvenile bigeye are taken around pFADs. Previous work in Hawaii has shown that bigeye tuna do not feed well during their residence at FADs located far offshore and little is known about the duration of their residency around any type of anchored FAD – coastal or offshore. This work would extend previous work on feeding and catch composition to pFADs and would extend current electronic tagging from Oahu to Hawaii to answer questions concerning the duration of residency of bigeye at pFADs and the movements of these fish within clusters of pFADs.

Methods

The following scope of work is only made possible because we have secured the active collaboration of a fisherman who deploys clusters of his own pFADs.

Composition of the catch taken from pFADs will be determined through port sampling when the vessels return from fishing. Species composition and weight/length data will be collected at dockside. Stomachs will be removed from a sub-set of fish during port sampling to provide data for diet analyses. Gut contents will be analyzed to the lowest possible taxonomic level.

A range of sizes of bigeye tuna caught at pFADs will be equipped with pressure sensitive, individually coded acoustic transmitters (“pingers”). Clusters of pFADs will be equipped with Vemco data loggers to measure the residency time of the tagged fish and reveal any ‘shuttling’ of fish between the FADs in the cluster. The use of pressure sensitive pingers will allow analysis of the swimming depth of the different size. The data loggers will be attached to the pFADs in a way that will allow retrieval and re-deployment by crew members on the fishing boats.

Budget Justification

Tagging fish and port sampling of catches are labor intensive tasks. Consequently, funds are requested for a Fisheries Researcher to assist with tagging and data logger deployment, retrieval and interrogation. A Graduate Research Assistant (resident on the

Big Island) will be employed to conduct port sampling throughout the pFAD 'season'. This will allow detection of any seasonal change in catch composition. Funds are also requested for one month of a faculty level Research Assistant to specialize in gut content analysis.

Placing scientific personnel on board the fishing vessel to tag fish will result in reduced income for the vessel because of reduced fishing time and fewer fishing personnel. Consequently, funds are requested to purchase fuel and ice and other expendables to compensate for lost vessel income. Travel funds are requested to permit scientific personnel to travel to Hawaii Island from Oahu.

Budget – See attached budget sheet