Abstract: Statistical testing of the habitat-based method to standardize effort.

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The habitat-based standardization (HBS) of fishing effort has become the preferred method to standardize effort for estimating CPUE of tuna and billfish stocks in the Pacific Ocean. HBS is generally applicable and was developed in recognition that the distribution of a species is moderated and limited by the environment and that fishing effort is generally not placed in the environment in a manner that results in equal probability of capture of a fish by each unit of nominal fishing effort. Though widely used in the Pacific, the method has generally not been used for stocks in the other oceans of the world. For these stocks the traditional GLM approach has been used. Recently, HBS has been criticized by scientists working in the Atlantic, in particular is noted the inability to test if effort estimates obtained using HBS provide significant improvements over nominal effort.

A method is developed to test if HBS provides a significant improvement in the representation of effort. This method uses the nominal and standardized effort to predict catch, and the fit to the observed catch is measured by a log-normal likelihood function. The Bayesian Information Criterion provides test criteria. The method is applied to yellowfin and bigeye tuna in the western central Pacific Ocean and the eastern Pacific Ocean. Results show that HBS provides a significant improvement over the nominal effort for all four stocks.