

SCCWRP #0310

## **A method for estimating marine habitat values based on fish guilds, with comparisons between sites in the southern California bight**

Alan B. Bond, John S. Stephens Jr., Daniel J. Pondella, II, M. James Allen and Mark Helvey

<sup>1</sup>*Southern California Coastal Water Research Project, Costa Mesa, CA*

### **ABSTRACT**

Habitat valuation is an essential tool for tracking changes in habitat quality and in adjudicating environmental mitigation. All current methods for estimating habitat values of coastal marine sites rely heavily on the opinion of experts or on data variables that can be readily be manipulated to influence the outcome. As a result, unbiased, quantitative comparisons between the values of different marine habitats are generally unavailable. We report here on a robust, objective technique for the valuation of marine habitats that makes use of data that are commonly gathered in surveys of marine fish populations: density, fidelity, and mean size. To insure comparability across habitats, these variables are assessed for guilds of fishes, rather than for single species. The product of the three guild-based parameters is transformed to its square root and then summed across all guilds in the habitat, yielding a single measure of habitat value for each site surveyed. To demonstrate the usefulness of this approach, we have analyzed data from existing surveys of 13 marine sites in the Southern California Bight, encompassing 98 fish species from 23 guilds. For seven of the sites, it was possible to develop estimates of the confidence interval of the habitat valuation, using a resampling technique. Variance estimates from resampling in one habitat mirrored those derived from analysis of annual variation. The resultant ranking of habitat types was: kelp beds > shallow artificial reefs > wetlands > protected shallow waters (soft bottom) > shallow open coastal sand (depth <30 m) > soft bottom habitat on the continental shelf (depth > 200 m). Although our data sets were restricted to Southern California, similar data could be obtained from any reasonably well-studied marine environment. The guild-based valuation technique may, therefore, be broadly applicable to the analysis of other marine ecosystems.

**Due to distribution restrictions, the full-text version of this article is available by request only.**

Please contact [pubrequest@sccwrp.org](mailto:pubrequest@sccwrp.org) to request a copy.