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## Research & Education

# Habitat Suitability Modelling : Identifying important fish habitat in coastal waters.

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Scientists at the Marine and Freshwater Systems Platform (MFSP, formerly MAFRI) are using computerised mapping software known as a Geographic Information System (GIS) in an innovative project to model the extent and location of important fish habitat in Victoria's bays and inlets.

The Habitat Suitability Index (HSI) modelling project aims to determine the habitat requirements at a bay-wide scale of selected fish species and incorporate this information into a GIS. The process of HSI modelling involves deriving suitability indices (SI's) for each species that indicate a preference or affinity level for selected environmental variables (eg. salinity, depth, sediment, habitat etc). By combining the spatial distribution of preferred habitats in a GIS, a predictive map of the location of important fishery habitat can be produced.

To date MFSP scientists have developed habitat suitability indices, for different life history stages, for five species in Port Phillip Bay using existing fisheries independent data sets. These species include some of the most important commercial and recreational demersal species in Port Phillip Bay (ie. sand flathead, King George whiting, snapper and greenback flounder) and a pelagic invertebrate species (southern calamari). Where the information was available, suitability indices have been developed for both juveniles and adults which allows the model indices to reflect changes in habitat use with age.

The environmental parameters that have been investigated are depth, sediment type, habitat type, distance from the mouth of the bay and, for juveniles, salinity variation.

Data collected from a range of projects that have been carried out at MFSP over the years have been used to develop the models. Ongoing MFSP projects will also provide new data that will be incorporated into the modelling process as it becomes available, including habitat use in shallow water and data on newly settled snapper in several Victorian bays and inlets.

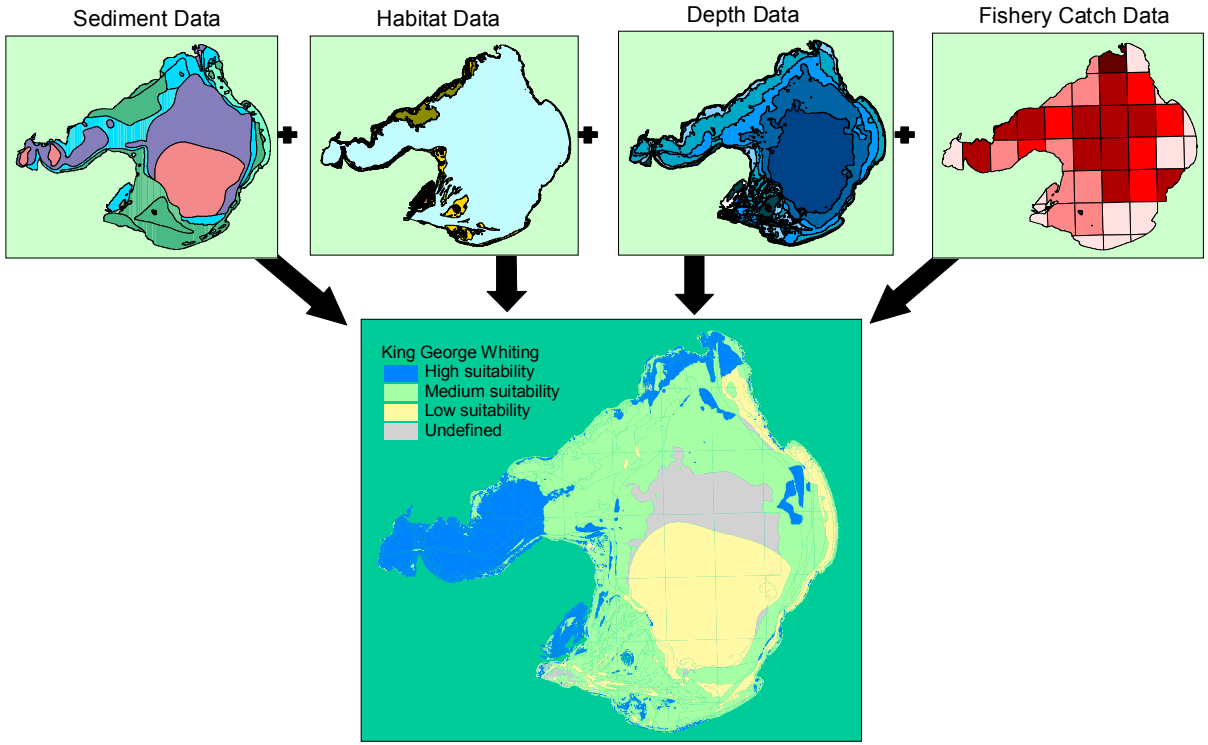
The environmental data were mapped, and overlaid with catch and effort data to identify links between fish catch and habitat. This analysis has produced some promising results and is helping to confirm the habitat affinities of species determined from the fishery independent data.

The environmental data has been incorporated in a GIS and preliminary habitat suitability distribution maps are currently being produced (see map below).

The results of this project will be used by Fisheries Victoria in its advocacy role for the sustainable management of marine habitats. The provision of this interactive mapping tool will allow Fisheries Victoria and other agencies to readily identify the spatial distribution of important fish habitats and identify implications of changes to these habitats.

This project is funded by Fisheries Victoria and the Fisheries Research and Development Corporation.

For more information about this project please contact Mr David Ball at MFSP on (03) 5258 0210.




Habitat layers are reclassified with Habitat Suitability Indices derived from analysis of commercial catch and effort statistics and fishery independent monitoring data and then combined to provide a predictive map of habitat suitability classes (low to high). This example presents the results of preliminary HSI modelling for King George whiting in Port Phillip Bay from commercial catch and effort statistics.