



River Styles



Case Study

Challenge

Distribution of biodiversity resources are often not well understood due to gaps in spatial data. Tools are needed that can reliably predict species distributions to support natural resource management decision making.

Solution

NSW Fisheries have developed a rigorous predictive model that integrates biological and physical data – including River Styles data – to more accurately predict distributions and status of fish communities and threatened species in NSW.

Result

Expected distributions of fish communities and threatened species have been mapped at reach scale across the state of NSW, allowing planning and decision-making processes to better account for fish communities and their habitat.



Indicative distribution of Macquarie Perch in NSW, produced using NSW Fisheries' spatial model. Source: [Fish Communities and Threatened Species Distributions of NSW](#) – NSW Fisheries.

Predicting distributions of fish communities and threatened species across NSW

It is a requirement in many jurisdictions to consider threats to biodiversity in assessment of planning proposals. However, decision-makers are often faced with problems relating to inconsistent spatial coverage of biological data, limiting their ability to assess and mitigate potential impacts on biodiversity resources.

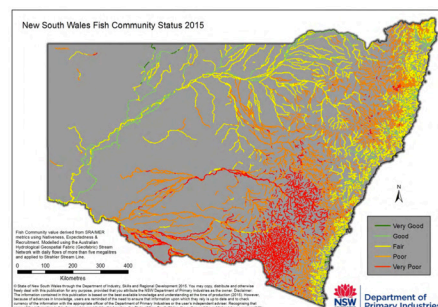
The New South Wales (NSW) Government aimed to improve the information base upon which planning decisions are made by developing maps of the distributions and status of fish communities and threatened fish species across the state, at the reach scale. Since there was not field-derived fish distribution data for all streams in the state, they developed a predictive model using physical and biological data.

The model to predict fish distribution and status integrated physical and biological data, recognising the importance of geomorphology as a 'physical template' for hydrological and ecological processes. Physical attributes of streams were sourced from the NSW River Styles database, which provided meaningful reach boundaries as well as information relevant for fish habitat.

Stage 1	Stage 2	Stage 3	Stage 4
Catchment-wide baseline survey of river character, behaviour and pattern.	Catchment-framed assessment of river evolution and geomorphic condition.	Assessment of future trajectory of change and geomorphic recovery potential.	River management applications and implications.

Data from the NSW River Styles database were from Stage 1: Catchment-wide baseline survey of river character, behaviour and pattern. The model used the attributes of 'planform' and 'bed material texture' to characterise reaches. These data were combined with available biological data to predict fish distributions based on habitat.

The NSW Government's fish community and threatened species distribution mapping is available to decision-makers in a GIS resolved to the reach scale. This means that the insights are ecologically meaningful as well as being relevant for planning decisions. The result is that planning decisions in NSW can better account for potential impacts on fish communities and threatened species.



◀ Status of fish communities in NSW, produced using the integrative model. Source: [Fish Communities and Threatened Species Distributions of NSW](#) – NSW Fisheries.

Learn more about the River Styles Framework at riverstyles.com