Adaptation of fisheries management to climate change HANDBOOK

Australia's marine environment is changing faster now than it has during any other period on record. To help fisheries cope, The Fisheries Research and Development Corporation funded the Australian Fisheries Management Authority, CSIRO and the University of Tasmania to develop an adaptation planning handbook. This handbook is designed to help fisheries managers, operators – and anyone else helping to support fisheries – step through a risk assessment and identify feasible adaptation options.

Need for adaptation

Best available science indicates that all Australian fisheries contain species that are sensitive to climate change. These sensitive species have both economic value as well as cultural value. Bycatch, threatened, endangered and protected species are also likely to be highly sensitive to climate change effects. Understanding how this sensitivity interacts with any fishing effects is important in ensuring that these species are not put under unacceptable pressure.

Climate change will also directly affect some fisheries – undermining infrastructure or complicating safety at sea.

All of this means that fisheries, but especially those for short lived species and invertebrates, are likely to become far more variable, affecting when, where and how much fish is caught.

Successfully coping with this requires an understanding of what options exist, what response is feasible and if some risks are simply unavoidable.

Building this understanding begins by being clear on what pressures are already being felt (particularly those stemming from the physical environment such as temperature and pH), what additional pressure is anticipated in coming years and how these pressures may affect the fishery now and over the coming decades.

Understanding how change may come about, what response options exist for operators and managers and the costs involved makes planning more robust and effective.

The Fisheries Climate Adaptation Handbook

Researchers, managers and operators collaborated to develop the handbook. The goal was to create a structured process that could use the best available information to explore all adaptation options and determine which are most feasible and effective.

The approach provided in the handbook is designed to:

Inclusive – involve committees of industry, management and other stakeholders to come to a shared understanding of climate risks and develop more robust adaptive management options

Scalable – be applied with differing degrees of detail so that it can be adjusted for the available information and the resources available

Flexible – not be limited to the climate-driven risks to ecological components of Commonwealth fisheries, it could be applied to other sectors and/or other types of risks.

The Handbook's process

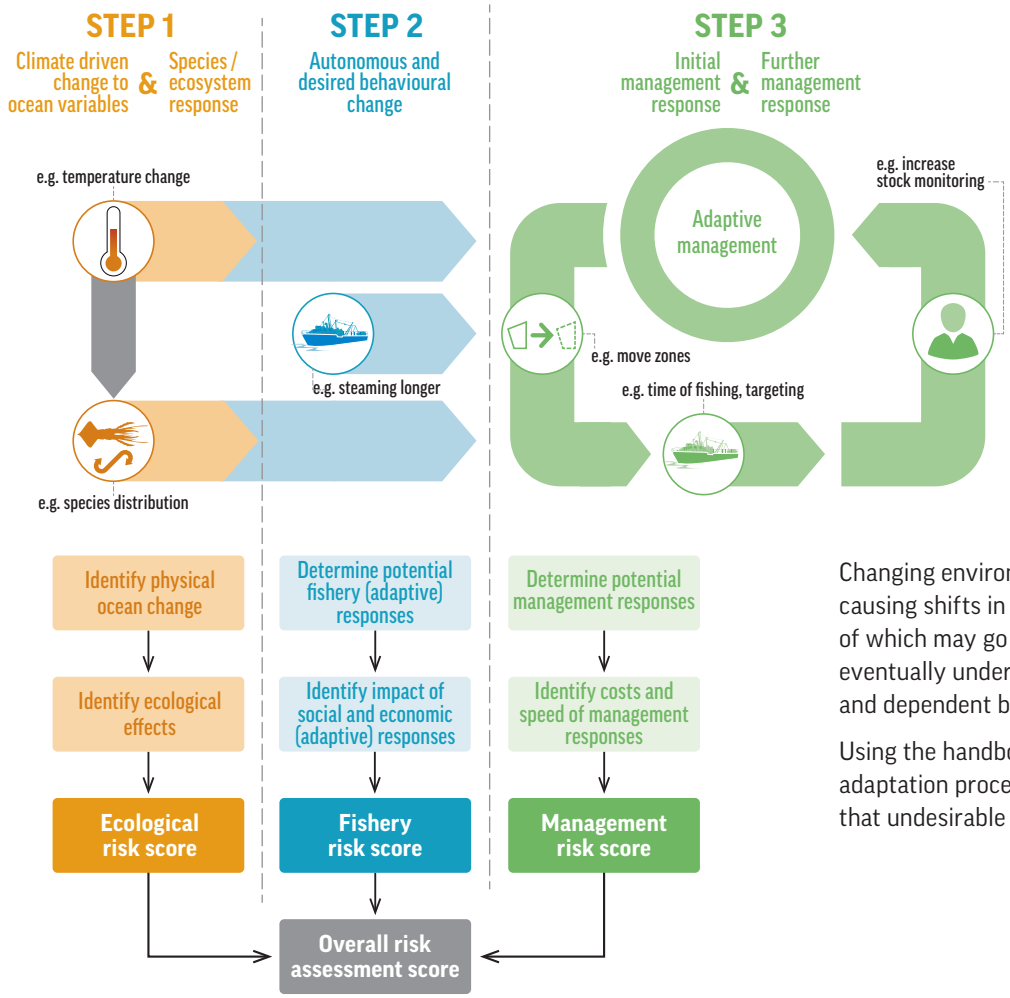
The handbook guides readers through a multi-step assessment process.

First there is a scoping step, describing the fishery and collating information on what physical changes are occurring (or are anticipated to occur) in the region.

With the information in hand the formal three-step assessment process begins:

- **STEP 1** considers the biophysical components of the system – the **physical drivers and the species and ecosystems that are affected.**
- **STEP 2** considers **how fishery operators are likely to respond** and adapt, autonomously at first, to any changes in the marine environment.
- **STEP 3** considers the **way in which management authorities** also have to **account for changes** in the behaviour of fishers/fleets and respond where adaptive behaviour by the fishery may not be possible within current regulations.

Each step provides a structured approach for deriving a risk score. **Ecological, fishery and management risk scores** are then **combined into an overall risk** assessment score to help guide decision making.



Looking ahead

It is clear that cross jurisdictional management coordination will be required to improve adaptation and minimise the risks from cumulative effects. Monitoring and forecast capacity will also be key to understanding system change, supporting evidence-based decision making, fishery sustainability and business profitability.

Changing environmental conditions are already causing shifts in ecosystem state, the magnitude of which may go unnoticed for many years, eventually undermining sustainability of fisheries and dependent businesses and livelihoods.

Using the handbook to step through the adaptation process will reduce the chance that undesirable outcomes occur.

Accessing the Handbook

The handbook and regional summaries of climate change around Australia are available for download from https://research.csiro.au/cor/home/climate-impacts-adaptation/climate-adaptation-handbook/

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