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Key threatening processes in NSW

Removal of large woody debris from NSW rivers and streams

INTRODUCTION

In November 2001, the removal of large woody debris from NSW rivers and streams was listed as a key threatening process (KTP) under the *Fisheries Management Act 1994*.

A threatening process is defined under the Act as 'a process that threatens, or that may threaten, the survival or evolutionary development of a species, population or ecological community of fish or marine vegetation'.

Threatening processes that adversely affect threatened species, populations or ecological communities, or possibly cause others that are not currently threatened to become threatened, may be eligible for listing as a KTP.

Anyone can nominate the listing of a KTP. The Fisheries Scientific Committee (FSC), an independent body of scientists, assesses nominations and is responsible for determining whether any threatening processes should be listed.

The complete list of key threatening processes is contained in Schedule 6 of the *Fisheries Management Act 1994*.

WHAT IS 'LARGE WOODY DEBRIS'?

Large woody debris consists of large masses of trees or shrubs that have fallen or been washed into rivers and streams, and onto floodplains. These objects may be full trees, trunks, branches, tree heads or root masses.

Once instream, large woody debris becomes waterlogged and comes to rest in the streambed during low flow periods. However, they may become mobile during periods of high flow or floods.

Masses of large woody debris may accumulate in small areas owing to capture by existing debris. In extreme cases, 'rafts' of debris may form that can result in the realignment or diversion of rivers.

Large woody debris habitat. *Photo NSW DPI.*

Large woody debris that accumulates on floodplains may become part of the riverine habitat during floods.

WHY IS LARGE WOODY DEBRIS IMPORTANT TO AQUATIC ECOSYSTEMS AND NATIVE FISH?

Large woody debris is a significant ecological and structural component of streams and rivers, and forms essential habitat for aquatic and terrestrial organisms. Large woody debris provides:

- Habitat for benthic plants, algae, invertebrates and microorganisms;
- Hiding places (refuges) to avoid predators;
- Resting places out of the main river flow;
- Assistance in developing scour pools, which provide important shelter for fish during hot weather and droughts;

Large woody debris habitat. *Photo: NSW DPI.*

- Spawning sites essential for successful reproduction;
- Home range markers for territorial and migratory species such as Murray cod and golden perch;
- Organic enrichment by capturing fallen leaves and other detritus, and by their own decay; and
- Assistance in preventing erosion by stabilising stream banks and stream beds.

WHY IS LARGE WOODY DEBRIS BEING REMOVED?

The removal of large woody debris from NSW streams and rivers began in the mid 1800s and continues to the present time. The reasons for this removal include:

- **River stabilisation** – it has been thought that large woody debris impair river stabilisation by causing scouring of the river bed. However, recent research has shown that the strategic placement of large woody debris can actually stabilise river banks and reduce erosion;
- **River navigation** – large woody debris have been considered a hazard to river navigation;
- **Flood mitigation** – large woody debris may hinder water flow and cause flooding in some situations (for example, where large debris dams are formed). However, in most cases its removal results in only minimal improvement in channel capacity and reduction of flooding in lowland rivers;
- **Human use** – large woody debris in the riparian zone is often removed for firewood collection, agricultural purposes and other activities.

WHAT THREATENED FISH ARE AFFECTED BY THIS KTP?

The removal of large woody debris from NSW rivers and streams has been listed as a KTP because of its negative impacts on several threatened species, including:

- The endangered ecological community of the lower Murray River catchment;
- The endangered ecological community of the lowland catchment of the Darling River;
- Eastern freshwater cod (endangered);
- Trout cod (endangered);
- Macquarie perch (vulnerable); and
- Silver perch (vulnerable).

In addition, many species of invertebrates and other fishes are reliant on large woody debris at some stage of their lifecycle and are threatened by its removal.

WHAT HAPPENS AFTER A KEY THREATENING PROCESS IS LISTED?

The listing of this KTP does not automatically change existing laws regulating large woody debris management in NSW.

However, once a KTP is listed, the NSW Department of Primary Industries may prepare a 'threat abatement plan' to identify actions required to manage the KTP so as to abate, ameliorate or eliminate its adverse effects on threatened biodiversity. Threat abatement plans identify responsible persons or public authorities for each action, and set out a timetable for implementation. Public authorities are required to report their progress in implementing relevant actions in their annual reports to Parliament. This may result in some changes to the management of large woody debris in future.

When preparing threat abatement plans, the Department of Primary Industries must consider ways to minimise any social and economic consequences that may result from the listing, as well as options for community involvement. Draft threat abatement plans are publicly exhibited for a minimum of 4 weeks, during which time any interested party may comment.

Listing as a KTP establishes formal assessment requirement in development control processes established by the *Environmental Planning and Assessment Act 1979*.

HOW ARE THREAT ABATEMENT PLANS IMPLEMENTED?

The successful implementation of threat abatement plans is dependent on the assistance and cooperation of public authorities, local councils and the community.

When preparing threat abatement plans the Department of Primary Industries consults with relevant authorities and seeks their cooperation in implementing the measures included in the plan.

Threat abatement plans inform and influence other planning processes and must be considered by public authorities when making decisions. For example, local councils and other public authorities must consider threat abatement plans when assessing proposed developments or activities.

Public authorities should take any action available to them to implement measures in the plan for which they are responsible, and should not make decisions that are inconsistent with the provisions of the plan. However, there are no penalties for individuals or organisations for not complying with the plan.

Murray cod near large woody debris. *Photo: Mark Doering.*

REDUCING THE IMPACTS OF THIS KTP

In some cases, large woody debris removal may still need to be considered because of public safety or other concerns. The NSW Department of Primary Industries' Policy and Guidelines for Aquatic Habitat Management and Fish Conservation (1999) states that:

- Large woody debris should be retained to the greatest extent possible.
- Large woody debris management for purely aesthetic purposes is not supported.
- NSW Department of Primary Industries does not support large woody debris removal proposals aimed at improving boat navigation. Proposals aimed at maintaining navigability of rivers with a long history of boating use may be agreed to, provided threatened species will not be adversely affected.
- NSW Department of Primary Industries does not support large woody debris removal proposals aimed at increasing flood immunity.

The Department of Primary Industries supports large woody debris management programs that are part of an overall strategy to stabilise and rehabilitate degraded streams, providing that there are minimal levels of disturbance.

The following guidelines can be used to ensure minimal impacts on the environment from large woody debris management.

- Lopping (trimming) should be considered as a first option.
- Instream realignment should be considered as the next option.
- If realignment is unfeasible, relocation within the river channel is preferable to removal.
- Removal should be considered as a last resort.

Re-introducing large woody debris as part of river restoration programs may assist in re-establishing a diversity of aquatic habitats and reversing the decline of native fish populations.

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This publication is based on information contained in the Fisheries Scientific Committee Recommendation for listing the *'Removal of large woody debris'* (Ref. No. PR18) as a key threatening process.

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