

Improving Floodplain Connections: site selection and prioritisation

In stage 2A of the Healthy Floodplains Project we are improving connectivity and floodplain health in the northern Murray–Darling Basin through the Improving Floodplain Connections program.

Introduction

The Improving Floodplain Connections (IFC) program will improve the passage of floodwater throughout the northern Murray–Darling Basin by helping to bring priority unapproved flood works into compliance. This fact sheet explains how the unapproved flood works the program is addressing, were identified and prioritised.

Flood works include such structures as levees/embankments, above ground storages, supply channels, and access roads.

Initial site identification

More than 500 locations were initially identified as potential problem areas in the 5 northern Basin valleys: Border Rivers, Gwydir, Barwon–Darling, Macquarie and Namoi. These locations included instream as well as floodplain works and included a mixture of approved and unapproved works and were identified from:

- stakeholder engagement undertaken as part of the development of floodplain management plans
- existing floodplain models and studies
- floodplain management plans
- referrals from government agencies such as the Office of Environment and Heritage, Department of Primary Industries – Fisheries and Local Land Services (LLS)

Site prioritisation

The sites identified were prioritised to find locations containing unapproved flood works where the greatest benefit for floodplain connectivity could be achieved under the IFC program. Prioritisation included analysis of hydraulic, ecological and cultural impacts. We assessed these impacts as part of a multi-criteria analysis.

Assessment of hydraulic impacts

Eight hydraulic impact criteria were used to assess the impacts of the identified sites on flood behaviour (Table 1).

Table 1. Hydraulic impact assessment criteria and rationale

Criteria	Rationale
Height of flood structure	<ul style="list-style-type: none"> • higher structures have potentially greater impacts • height threshold relates back to <i>Water Act 1912</i> (part 8)
Instream location – part or complete	<ul style="list-style-type: none"> • impact on water flows, possibly causing water banking
% of floodway blocked	<ul style="list-style-type: none"> • larger percentage of floodway blocked creates higher potential to disturb natural flows
Number of floodways blocked	<ul style="list-style-type: none"> • the more floodways that are blocked, the higher the potential to impact water flows
Location near town levee	<ul style="list-style-type: none"> • potential to impact nearby towns during flood events • structures could redistribute flood flows putting pressure on town levees
Extent of impact – length of flow line potentially impacted	<ul style="list-style-type: none"> • extent of downstream or localised area of impact • these areas were then used to identify impacts on ecological and cultural assets
Maximum depth of flow in floodway	<ul style="list-style-type: none"> • a higher depth of flow indicates a likely higher water velocity and flood flow conveyance
Low flow path blocked	<ul style="list-style-type: none"> • blockage or hindrance of low flows have the potential to influence both high flows (overflow areas) and low flows (environmental flows)

Assessment of ecological and cultural impacts

Five assessment criteria were used to assess the impacts of the initial locations on ecological and cultural assets (Table 2).

Table 2. Criteria and rationale used to assess ecological and cultural impacts

Criteria	Rationale
Cultural asset – identify if downstream assets are affected	<p>Cultural assets are likely to be closely aligned with ecological assets, requiring water flows to be maintained, and may include:</p> <ul style="list-style-type: none"> • scarred trees • wetlands • rivers

Criteria	Rationale
	<p>The Aboriginal Heritage Information Management System (AHIMS) database was used to help identify cultural sites.</p>
<p>Ecological asset – identify if downstream assets are affected</p>	<p>Ecological assets that depend on flooding to maintain their ecological character include:</p> <ul style="list-style-type: none"> • semi-permanent wetlands • flood-dependent vegetation • floodplain ecosystems (including water courses) • areas where groundwater reserves are recharged by floodwaters.
<p>Key fish habitat – identify if downstream assets are affected</p>	<ul style="list-style-type: none"> • key fish habitats within the floodplains identified through NSW <i>Fisheries Management Act 1994</i>
<p>Management Zone D (MZD) – intercepting or located close to MZD</p>	<ul style="list-style-type: none"> • identified during the development of floodplain management plans • areas of high ecological and/or cultural significance • have more strict licensing regulations for work approvals
<p>Below ground impact – works that include below ground supply channel and works that extend below floodplain ground level</p>	<ul style="list-style-type: none"> • used to identify areas of works that are below ground and could ‘capture’ or impede low flows

Prioritisation outcome

As a result of the prioritisation process, over 100 priority sites across the five valleys have been included in the IFC program. Possible unapproved works in non-priority locations have been referred to the Natural Resources Access Regulator for further investigation.