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## Phase 2 MDBA Analysis - Existing TLM works and measures: Lindsay Island

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### Forward

Under the Basin Plan a measure must meet particular criteria to be considered as a supply measure for the purposes of the SDL adjustment mechanism. Under the Basin Plan (cl.7.03 and (cl.7.15) a supply measure must:

- operate to increase the quantity of water available to be taken in a set of surface water SDL resource units compared with the quantity available under the benchmark conditions of development;
- achieve equivalent environmental outcomes with a lower volume of held environmental water than would otherwise be required; and
- have no detrimental impacts on reliability of supply of water to holders of water access rights that are not offset or negated.

The Living Murray projects have been modelled as part of the MDBA's trial implementation of its ecological elements method, and the results indicate that the projects meet the above criteria.

### Lindsay Summary:

In 2003 The Living Murray Program began developing the project Lindsay Island Watercourse Enhancement Project (Lindsay Island Works Stage 1) that described a package of works aimed to maintain existing high quality habitat for native fish, increase the extent of flowing habitat on Lindsay Island by about 28 km, improve fish passage between the Lindsay Island anabranches and the River Murray and improve the condition of riparian vegetation.

The project is part of the Living Murray Initiative and is funded by the Australian Government, New South Wales, Victoria and South Australia through the Murray–Darling Basin Authority.

MDBA supports the nominated Stage 1 of the Lindsay Island Works as meeting the Phase 2 criteria.

Lindsay Island is part of the Chowilla-Lindsay-Wallpolla Icon Site and is part of the Murray-Sunset National Park, managed by Parks Victoria. It covers 15,000 ha of floodplain to the south of the River Murray, between Lock 8 and Lock 6. The island is enclosed by the Lindsay River and extends for approximately 28 km from east to west. It incorporates a complex range of landforms including creeks, temporary anabranches, wetlands, floodplain woodlands and grasslands. The island is an area of high ecological significance and along with Lake Wallawalla is listed in the *Directory of Important Wetlands in Australia*. For the Living Murray Initiative, the ecological objectives were developed for the entire Lindsay, Mulcra and Wallpolla Islands. The works contribute to all of the icon site objectives:

- provide a diversity of structural aquatic habitats; increase the diversity and abundance of wetland aquatic vegetation;
- maintain and improve the populations of threatened flora and fauna that are flow dependent;
- restore productivity linkages between the river and floodplain habitats.
- increase abundance, diversity and extent of distribution of native fish;
- provide occasional breeding and roosting habitat for colonial waterbirds; and

- provide habitat suitable for migratory birds, especially the Japan Australia Migratory Bird Agreement, the Republic of Korea Australia Migratory Bird Agreement and the China Australia Migratory Bird Agreement listed species;

The development and implementation of the Lindsay Island project have proceeded through a number of agreed phases with several plans:

- *The Living Murray - The Chowilla Floodplain (Including Lindsay-Wallpolla) Icon Site Environmental Management Plan 2006-2007.*
- *TLM Works and Measures Program- Upper Lindsay Watercourse Enhancement – Lindsay Stage 1 works - Investment Proposal (Lindsay Island Works Stage 1)*
- *TLM Works and Measure Program- Upper Lindsay Watercourse Enhancement – Lindsay River Inlet Regulators - Construction Proposal (Lindsay Island Works Stage 1) –*
- *TLM Works and Measure Program- Upper Lindsay Watercourse Enhancement - Mullaroo Construction Proposal– May 2013.*
- *Lindsay-Wallpolla Islands Environmental Water Management Plan Feb 2012*
- *Upper Lindsay Watercourse Enhancement Project – Lindsay River Regulators - Interim Operating Plan 2013*
- *Upper Lindsay Inlet Structures - The MDBA Delegate (RM Executive Director) approved SA Water to proceed to Construction on 23 January 2013 (Water Act 2007, Clause 58)*
- *Mullaroo Regulator and Fishway – The MDBA Delegate (RM Executive Director) approved SA Water to proceed to Tender on 26 July 2013 (Water Act, Clause 58(2)) and Construction on 17 October 2013 (Water Act, 2007 Clause 58(3) and Clause 60).*

The project seeks to provide Lindsay Island with adaptive management options during times of heightened River Murray flows and altering River Murray Operations. The two inlets on Lindsay River and also the associated Mullaroo Creek will enable a variety of flow in through the icon site (including Lake Walla Walla).

Please note The Upper Lindsay Inlet structures were completed in 2012-13 but cannot be operated until the Mullaroo regulator and fishway are completed (expected completion June 2015). After this structure is tested a fuller system scale commissioning is being planned for 2015-2016 that will test all structures. As such an interim operating plan that incorporates both the Upper Lindsay and Mullaroo structures is under development.

Risks and possible ecological impacts were identified in these various plans, modelled and will be adaptably managed during the commissionings.

In order to assist evaluation of icon site structures **Table 1** describes each work, with key SDL information, variations and status.

In relation to the current SDL adjustment process, the Mullaroo and Lock 7 raising is incorporated in model. In regards to Lake Wallawalla, MDBA modelling notes a small inundation difference that has little net effect on the SDL adjustment outputs.

There are clear links between this package of works and recently submitted projects by Victoria, particularly with the Lindsay Island Management SDL Adjustment proposal.

Ongoing costs will be part of the MDBA River Management annual budget. No additional resources are required to operate and maintain the Lindsay structures: the minimal costs (additional petrol and time to travel daily to the sites) are considered 'sunk' and the activities during operation is business as usual for the Lock 7 staff. Environmental use of water remains cost effective.

Table 1: List of TLM structures for SDL adjustment

Package	Works	Key purpose	Built under TLM program, commissioned	Variations or key comments for modelling	Key Links
<b>Lindsay River inlets</b>	Southern inlet regulator	improve upstream fish passage under Lock 7 raising	Yes – Commissioned but not yet applied for a managed operation	Default is open.	Lindsay Island Management SDL Adjustment proposal – Stage 2
	improve upstream fish passage under Lock 7 raising	improve upstream fish passage under Lock 7 raising	Yes – Commissioned but not yet applied for a managed operation	Default is open	Lindsay Island Management SDL Adjustment proposal – Stage 2
<b>Mullaroo River</b>	Mullaroo regulator	Improve Murray Cod habitat by reducing flows under Lock 7 normal operations (Base flow scenario) and provide flow variation by raising Lock 7.	Under construction in 2015	This was an addition to the original proposal to assist inflows to Lindsay system (in-stream) Aim to achieve a flow rate of 500-600ML/day under a Base Flow scenario	Lindsay Island Management SDL Adjustment proposal – Stage 2
<b>Lock 7</b>	Raising of Lock 7 to 22.6 AHD (0.5m above Full Supply Level).	This enables increased flows into the Lindsay and Mullaroo River inlets, and can also generate broader inundation through smaller runners across floodplain system	The raising will be part of the next commissioning.	Lock 7 included in SDL model.	Lindsay Island Management SDL Adjustment proposal – Stage 2