Healthy Coorong, Healthy Basin
On-Ground Works
Regional Bird Refugia project

Lake Hawdon North Restoration

Sarah Murphy (DEW),
Mark de Jong (Limestone Coast Landscape Board)

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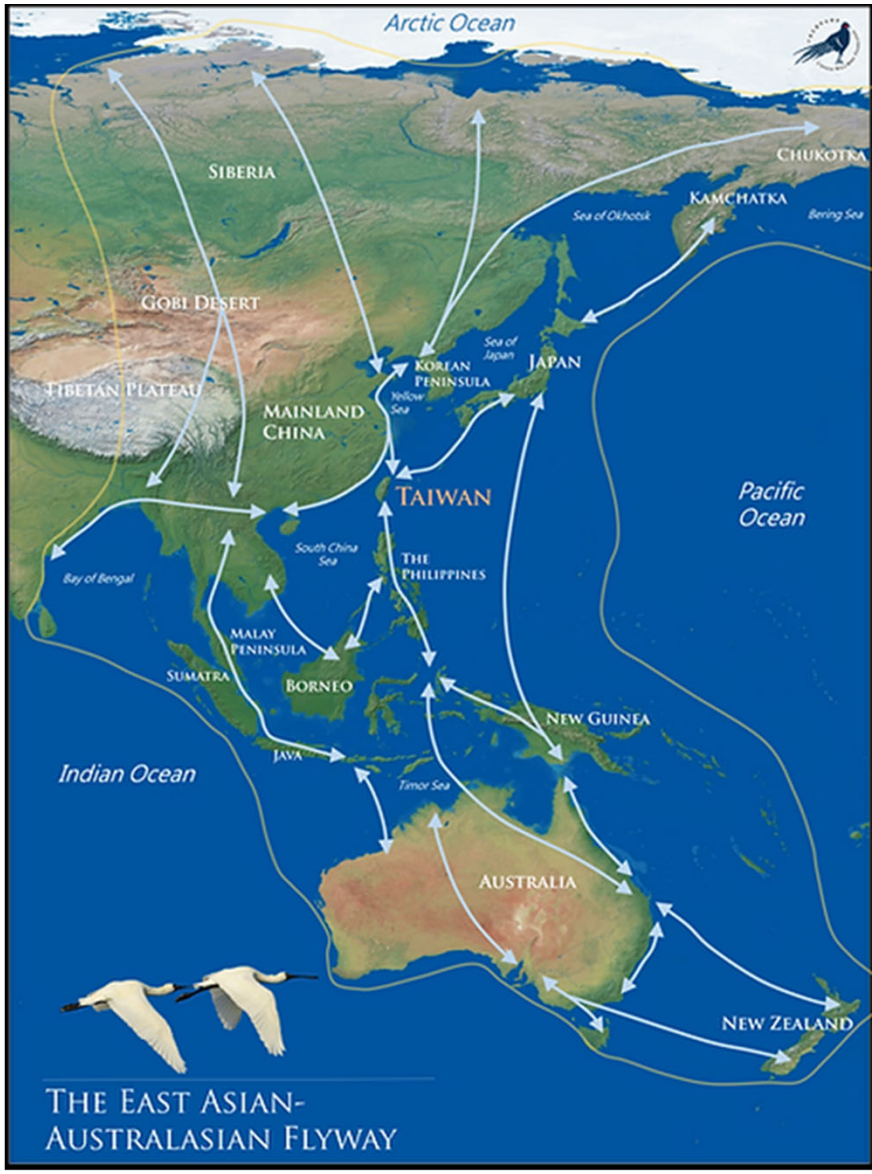
LHN Project Update

- Introductions
- Life history of migratory shorebirds
- Healthy Coorong Healthy Basin Program
- Lake Hawdon North restoration project
- E-Water management and outcomes
- progress to date
- Implementation activities and timeframes

About migratory shorebirds…

- Breed in arctic tundra in the northern summer
- Migrate to Australia every summer via the *East Asian-Australasian Flyway*
    - Arrive in Australia August to October
    - Leave February to April

Coorong and LHN are part of the migratory flyway



About migratory shorebirds…

- Individuals can fly ~5,000km non-stop
- Requires significant food consumption for energy reserves
- *50% of their body weight can be gained in the last few weeks before their return migration*

Shorebird example

Sharp-tailed Sandpiper

- Our most common and abundant migratory wader.
  - 17-22cm long and 36-43cm wingspan
  - 65g in weight
- Flexible in habitat choice within *0-10cm water depth*
- Forages and roosts in a variety of coastal and inland wetlands from fresh to hypersaline
- Tolerant of grassy vegetation and samphire than most other waders

Sharp-tailed Sandpipers using typical habitat in LHN

Habitat is critical to survival

- STSP Listed vulnerable under the *EPBC Act* in January 2024, due to population decline (80,000-140,000 pop^{n})
- 91% of the global population occurs in Australia during migration
- LHN supports>1% of the population under current conditions, meeting the criteria as a nationally important wetland for the species

Increased use of LHN, at the critical time of year is motivation for restoration

Healthy Coorong, Healthy Basin

Up to $70 million from 2019 to 2026

To support the long-term health of the Coorong, with a focus on the South Lagoon

Support the site to be a healthy, productive and resilient wetland system that maintains its international significance.

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Issue

The Coorong

- One of the most important refuges for shorebirds in the Murray-Darling Basin
- Habitat condition and availability decline
- Losing migratory shorebirds faster than 79 other shorebird wetland locations across the country.

Opportunity

- Improve availability and quality of habitat for migratory and non-migratory shorebirds in the Lower Lakes and South East of South Australia
- Extend the duration of the **migratory shorebird season**
- Improve the area of **preferred habitat** and food resource availability
- Goyder Institute investigated and prioritised sites in 2019


An initial assessment of the potential for wetlands in the South East and Lower Lakes regions of South Australia to support key species of Coorong waterbirds

Thomas J Hunt, Fiona L Paton, David C Paton

Goyder Institute for Water Research
Technical Report Series No. 19/20

GOYDER INSTITUTE FOR WATER RESEARCH

www.goyderinstitute.org

Regional Bird Refugia Project

HCHB On-Ground Works 2020-2026

- Undertake feasibility assessments and implement on-ground works to support key Coorong species
- Develop detailed designs in consultation with stakeholders at three priority wetlands.

RBR Priority Sites

- Focus on seven target waterbird species, including four *EPBC Act* listed migratory species.
- Lake Hawdon North will provide 2,475 ha additional habitat*
- Provide shallow foraging habitat at critical times.

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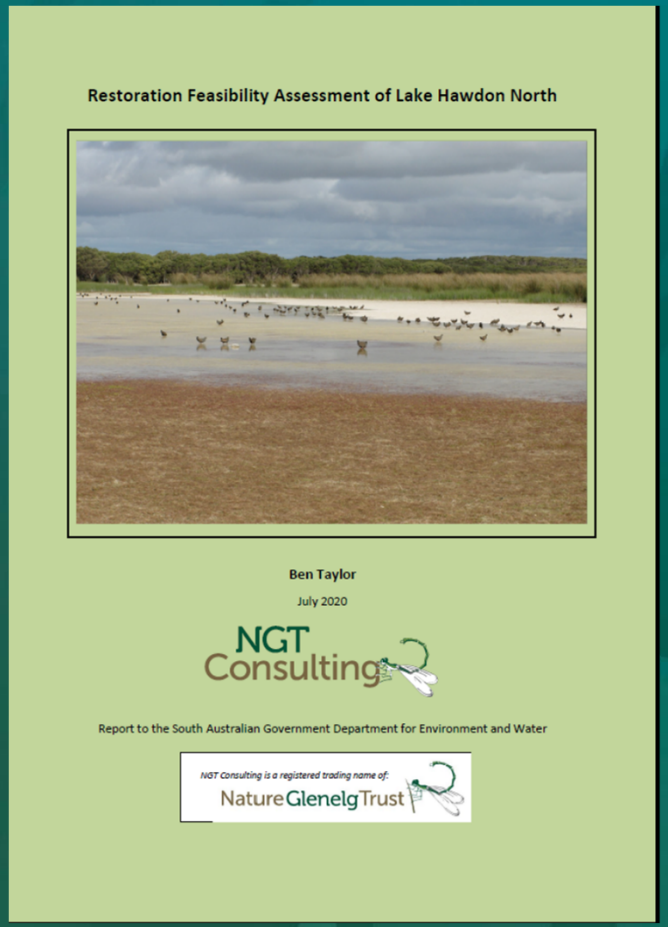
Lake Hawdon North Restoration Feasibility Assessment

Recommendations…



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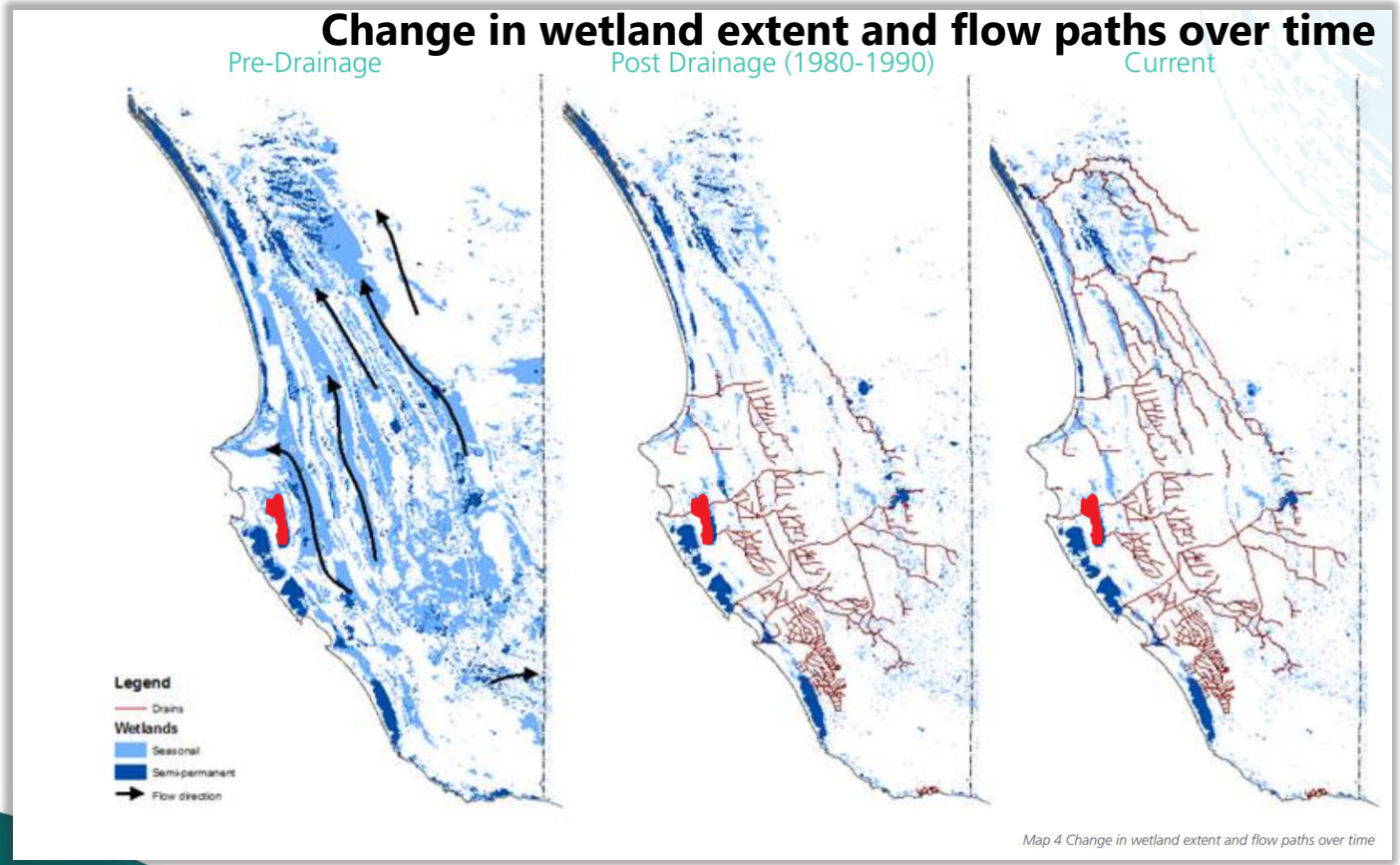
Regional surface water change

- Pre-agriculture, wetlands covered over half of the region
- Availability, quality and natural movement of surface water changed
- Wetland basin remnants still exist.

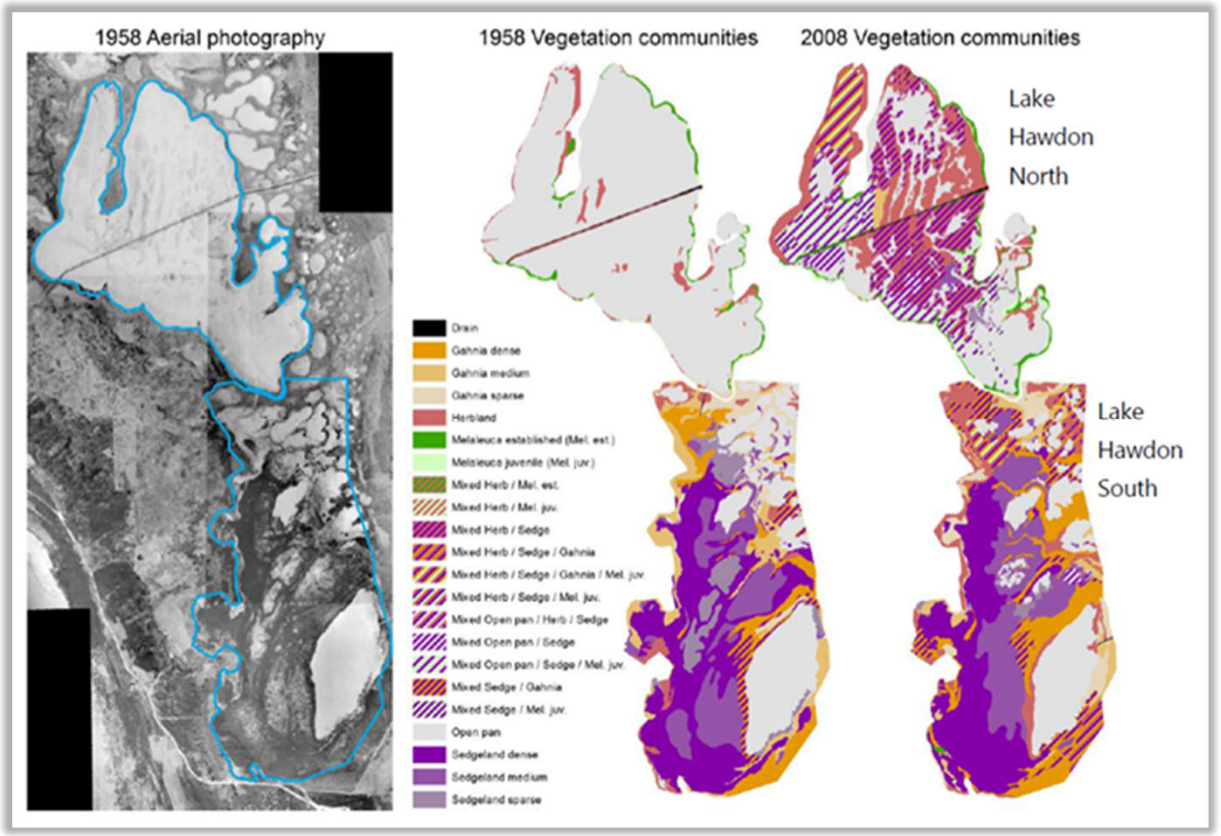


Map 4 Change in wetland extent and flow paths over time

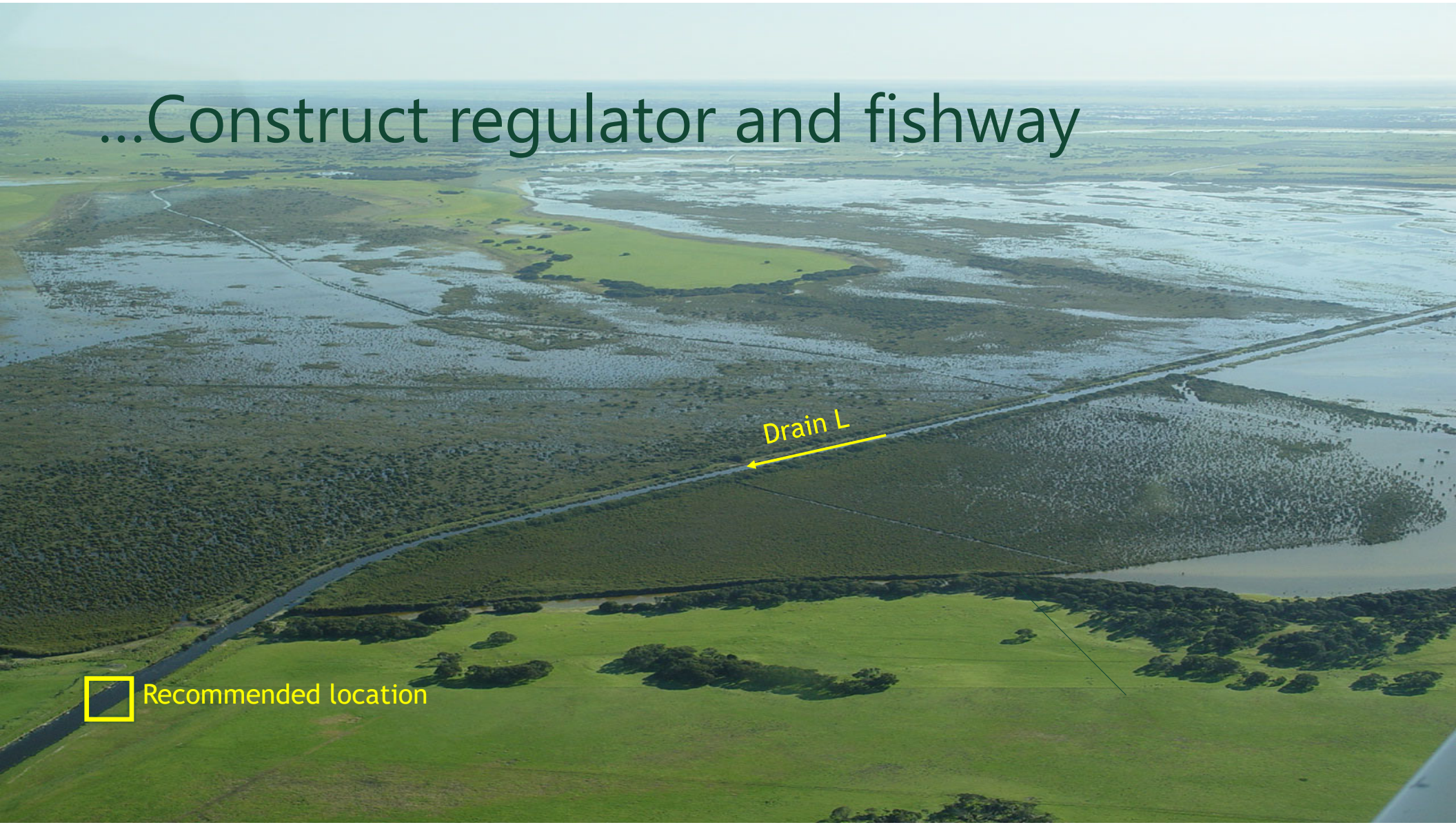
Source: https://www.landscape.sa.gov.au/files/sharedassets/limestone_cost/water/2019_se_drainage_wetlands_strategy.pdf

Lake Hawdon

- Before drainage, Hawdon North probably held water for longer than Hawdon South
- Shorter inundation duration and freshening has changed the vegetation of Lake Hawdon North.



...Construct regulator and fishway



…Restore open mudflat habitat

…Maintain grazing

Grazing exclosure (left of fence) and adjoining control (grazed) site (right), Lake Hawdon North, 27th Feb 2002 (photographer unknown).

…Develop fire regime

Lake Hawdon South, 28 May 2021 prescribed burn, Ross Anderson.

…Re-examine water management impacts on salinity and water level within Robe Lakes

Utilisation of Drain L flows to augment wetland habitat in Lake Hawdon North is considered to have **little to no potential impact** on the ecological, recreational and aesthetic character of the Robe Lakes – in fact it offers an **insurance policy against loss of viable habitat** under a future climate scenario

Image: Mark De Jong, 2012

Investigations 2021-2022

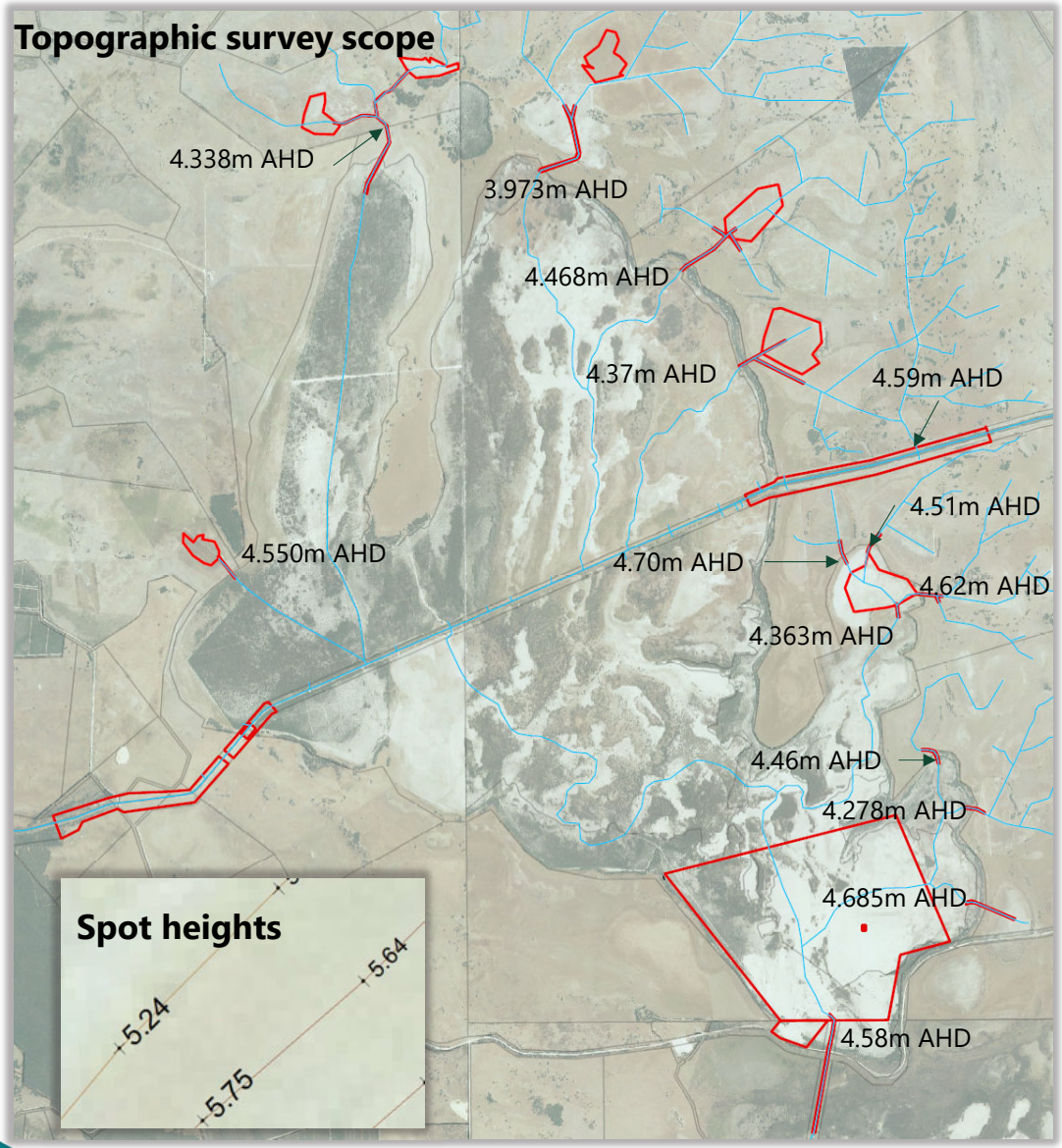
- Cultural heritage surveys
- Topographic surveys
- Hydrological monitoring
- Hydrodynamic modelling
- Groundwater review/modelling
- Vegetation removal options
- Vegetation and EPBC assessment
- Geotechnical survey
- Baseline ecological monitoring

In progress On hold Cancelled Complete

Complete

Topographic survey

- Collected surface levels in:
  - Drain L
  - Tributaries
  - Mining tenement
- Informed engineering (detailed) design and likely operational thresholds
- Confirmed operational water levels are contained within the lake



Complete

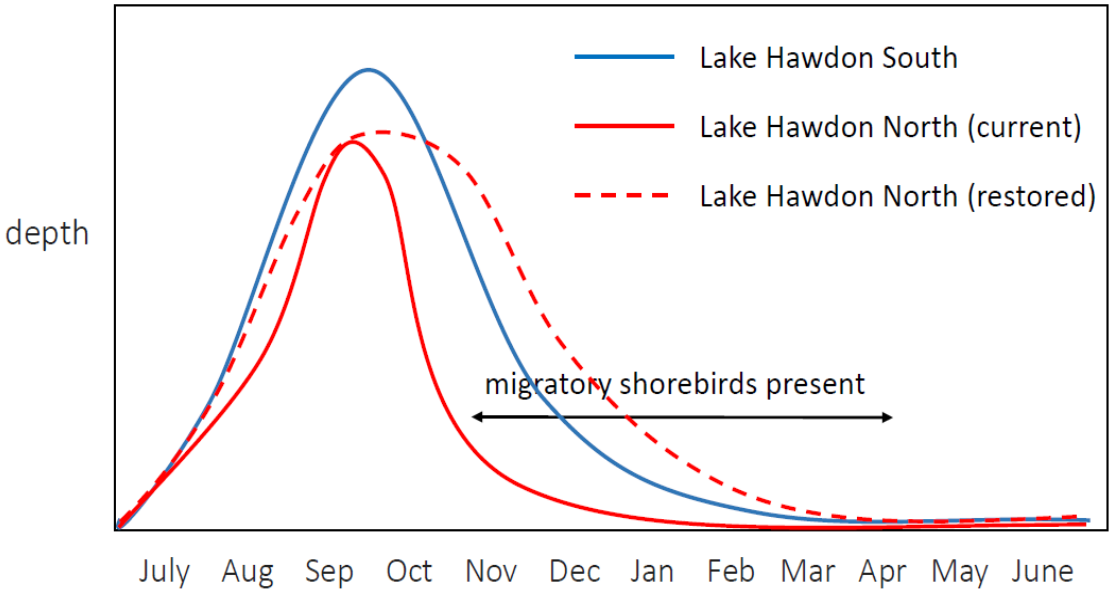
Hydrological monitoring

- 4 x monitoring stations
- Informs real time operations and evaluation
- Public sites on Water Data SA show:
  - water levels
  - electrical conductivity, and
  - flow.
- https://water.data.sa.gov.au/

Environmental benefits

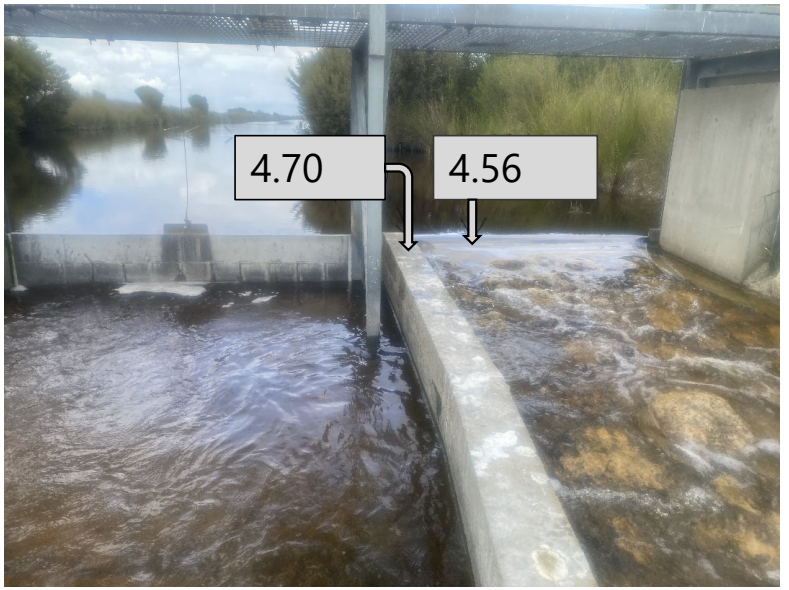
LHN restoration seeks to provide foraging habitat at the critical time Feb-March

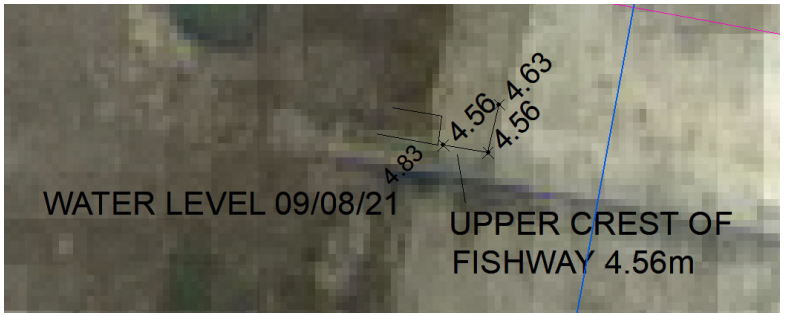
- Increase shorebird habitat extent, quality, and availability by 531% (*hectare.days*)
- Increase shorebird abundance
- Support ecological health for the water course, Robe Lakes and marine areas.



LHN water management objectives

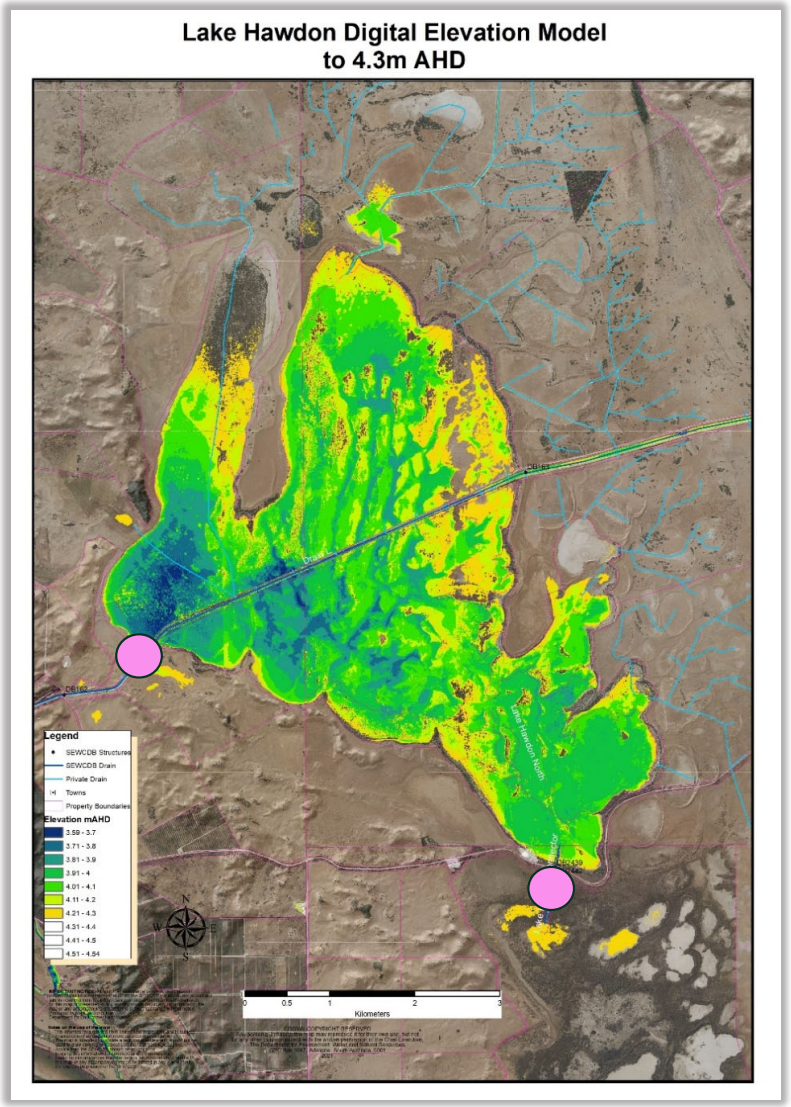
- Enable controlled water level management to achieve ecological objectives at both Robe Lakes and Lake Hawdon North
- Minimise the impact of inundation to upstream and adjacent landholders, during the winter months
- Coordinate Lake Hawdon North regulator operations with the Lake Hawdon South regulator

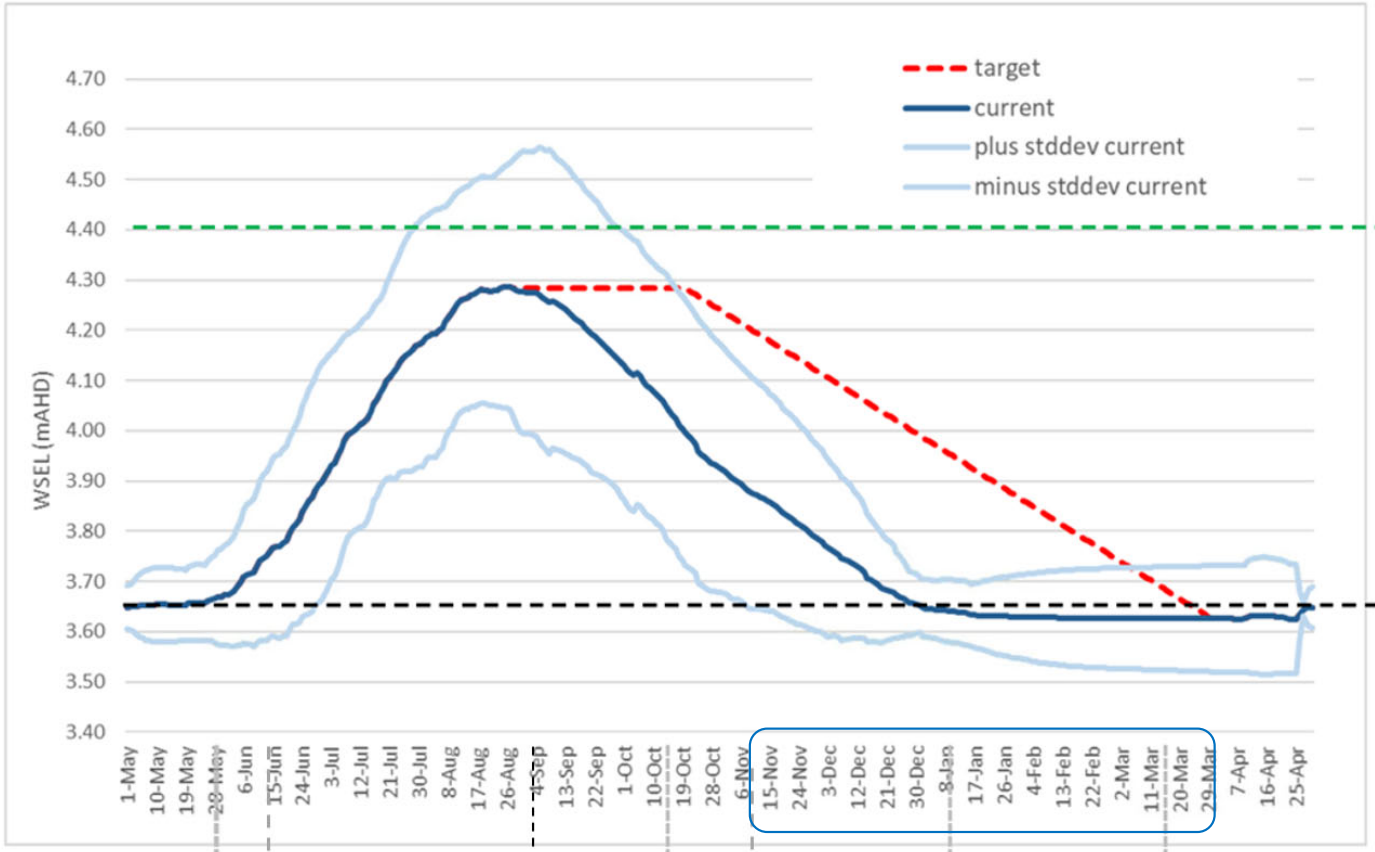




Target water levels

- Regulator operations at:
  - Lake Hawdon South
  - Drain L
- Proposed regulator operations aim to achieve a water level of 4.3 metres m AHD from late August in an average year.





Lowest elevation of most surrounding paddocks (TBC)

Lowest elevation of bed of Lake Hawdon North

LHS regulator close

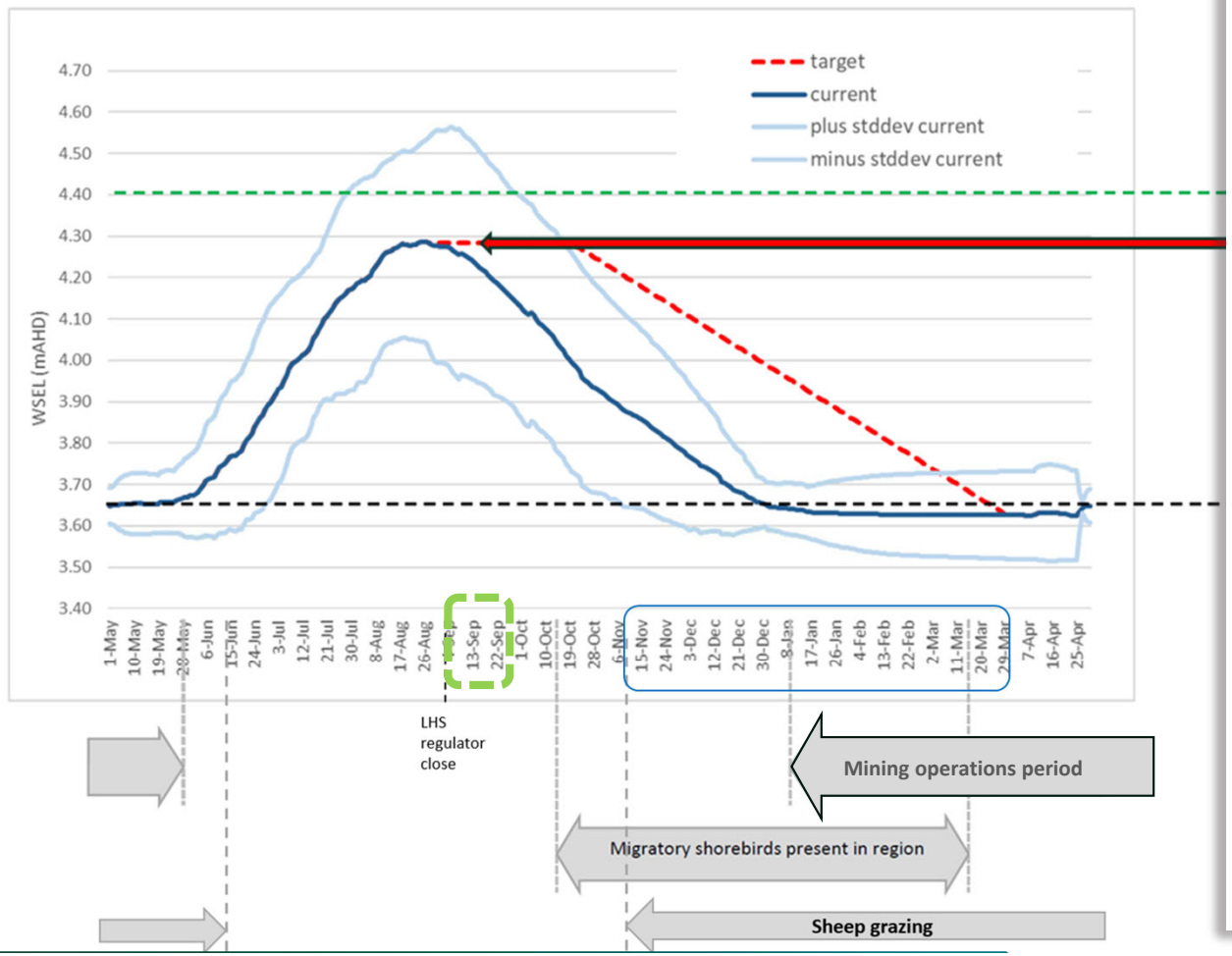
Mining operations period

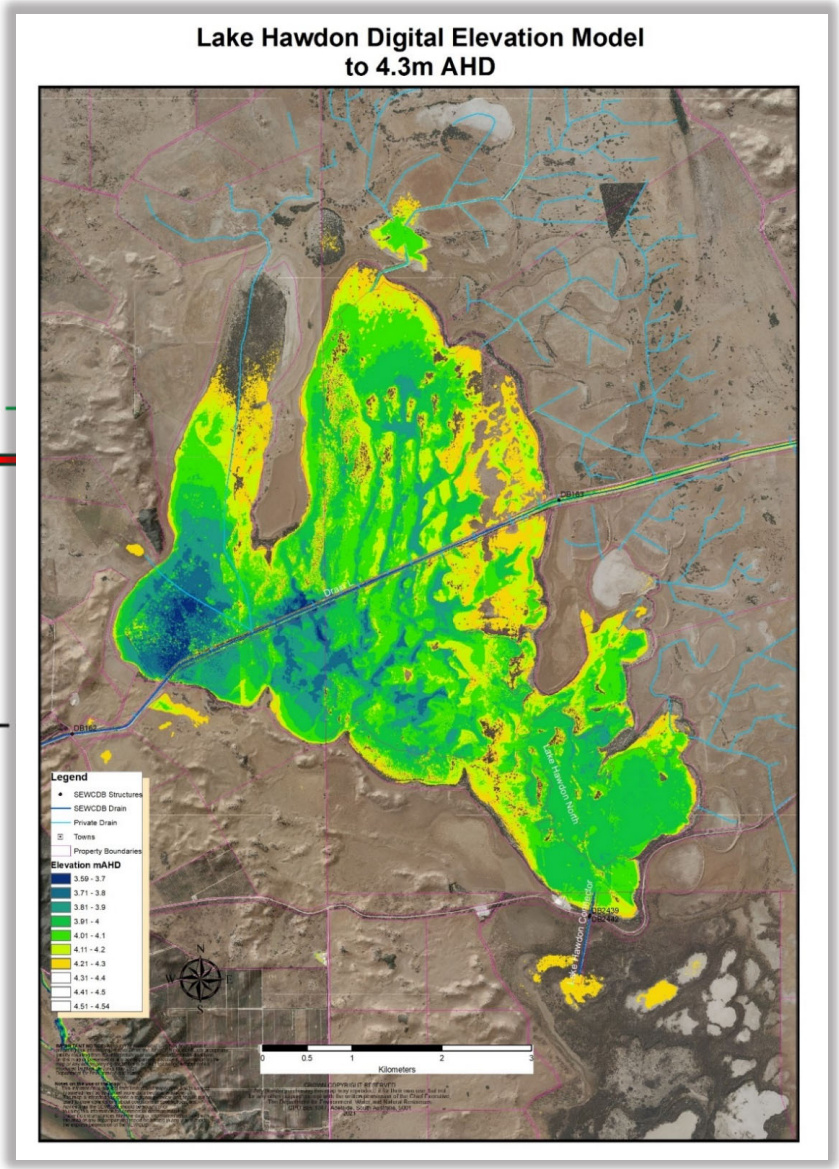
Migratory shorebirds present in region

Sheep grazing

- Overlapping land use interests from mid-Nov to Late March.

Target Hydrograph and Land Use





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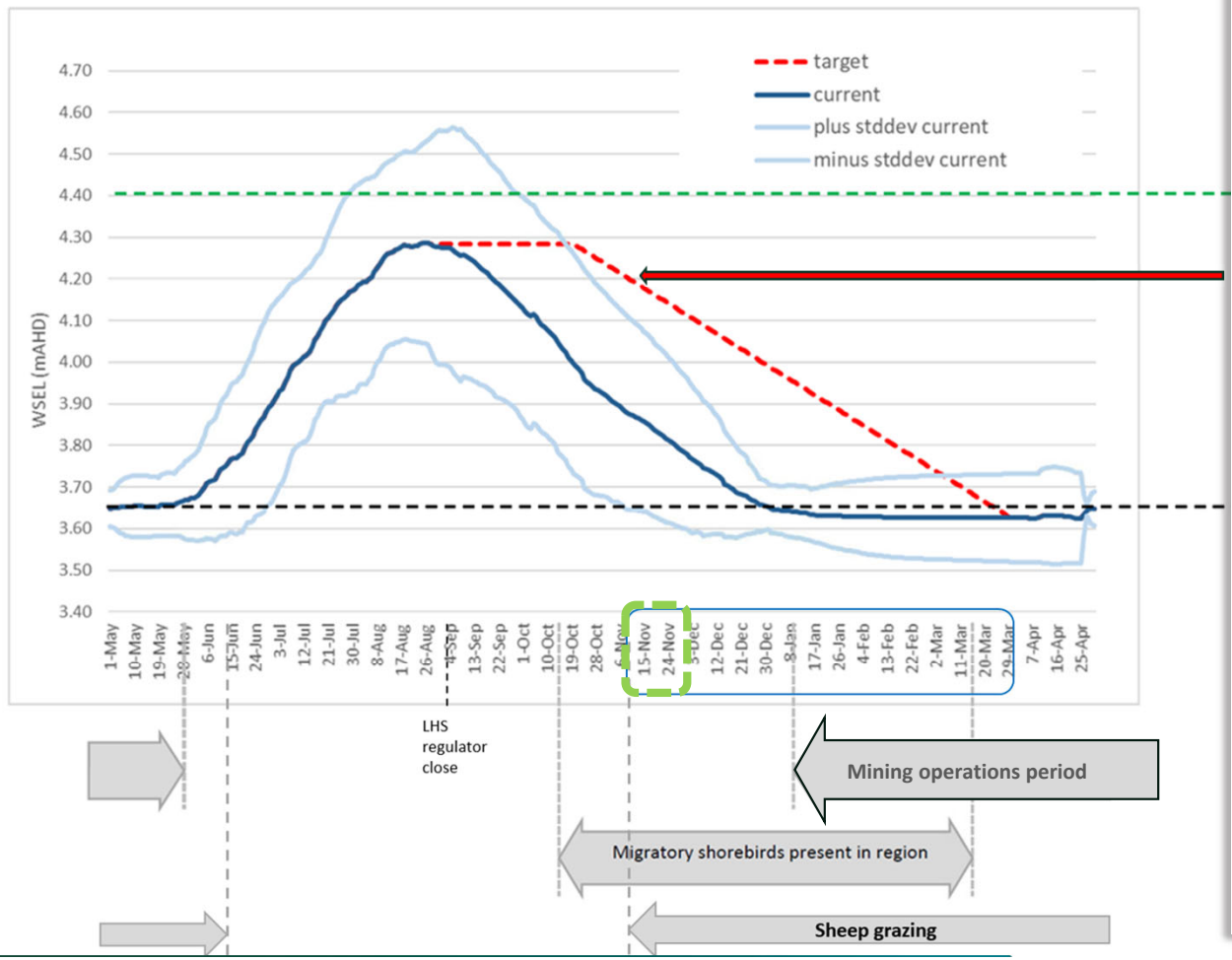

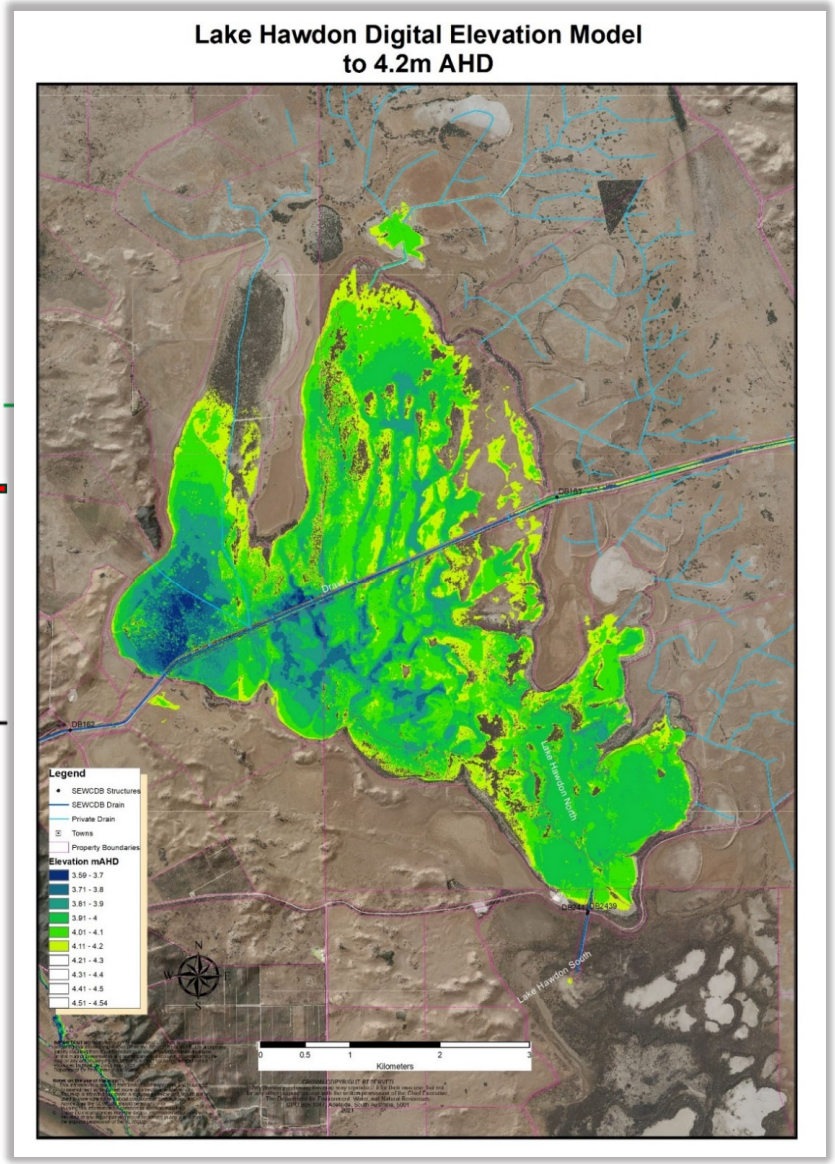

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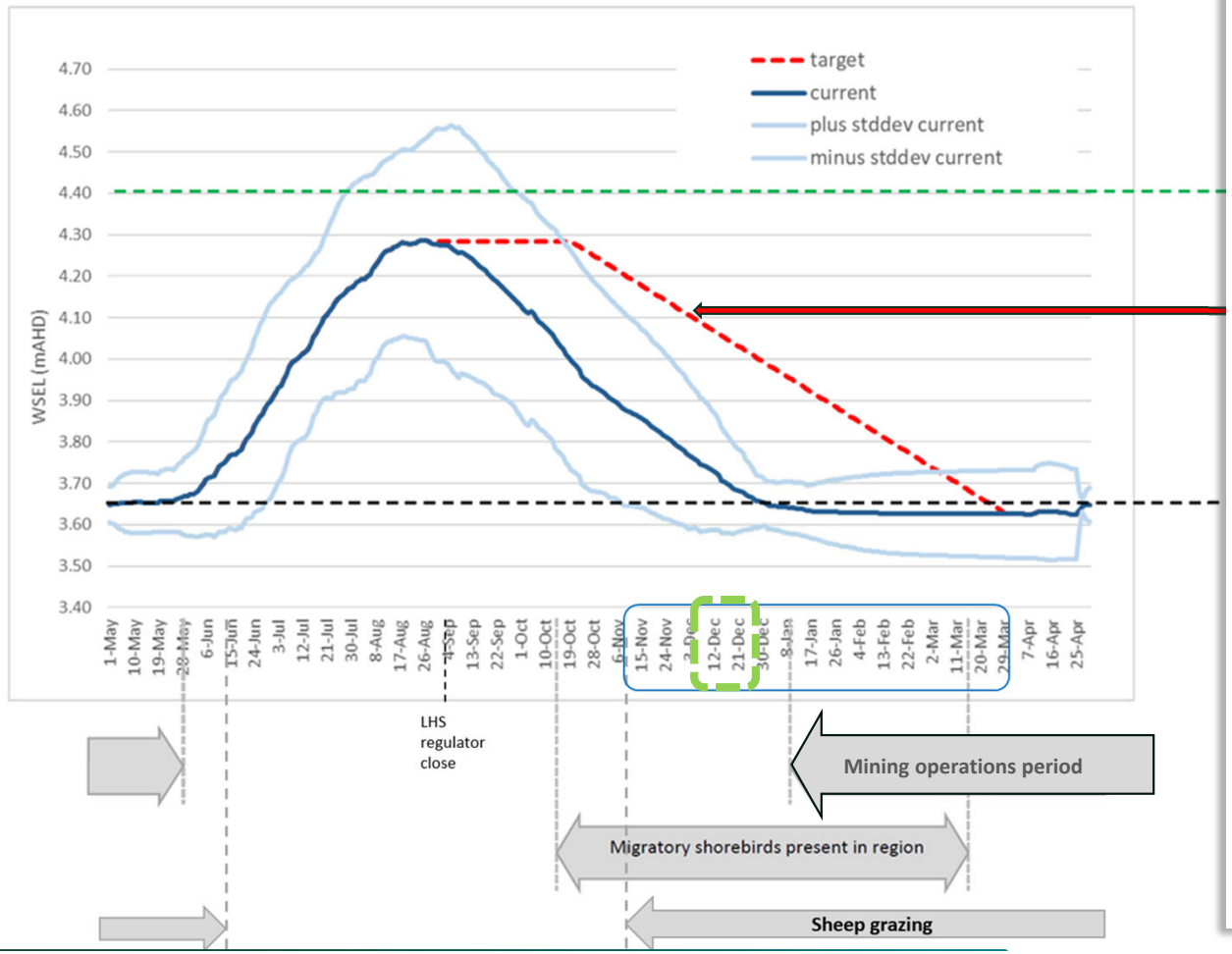

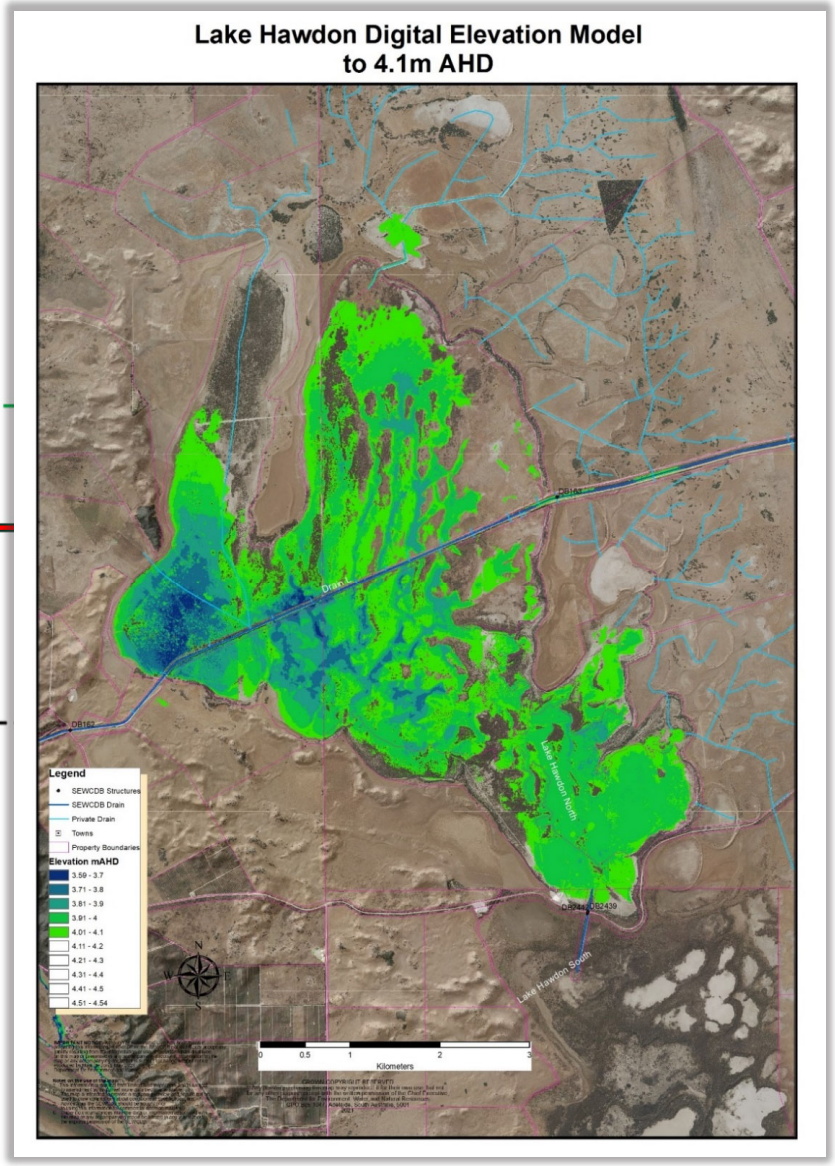

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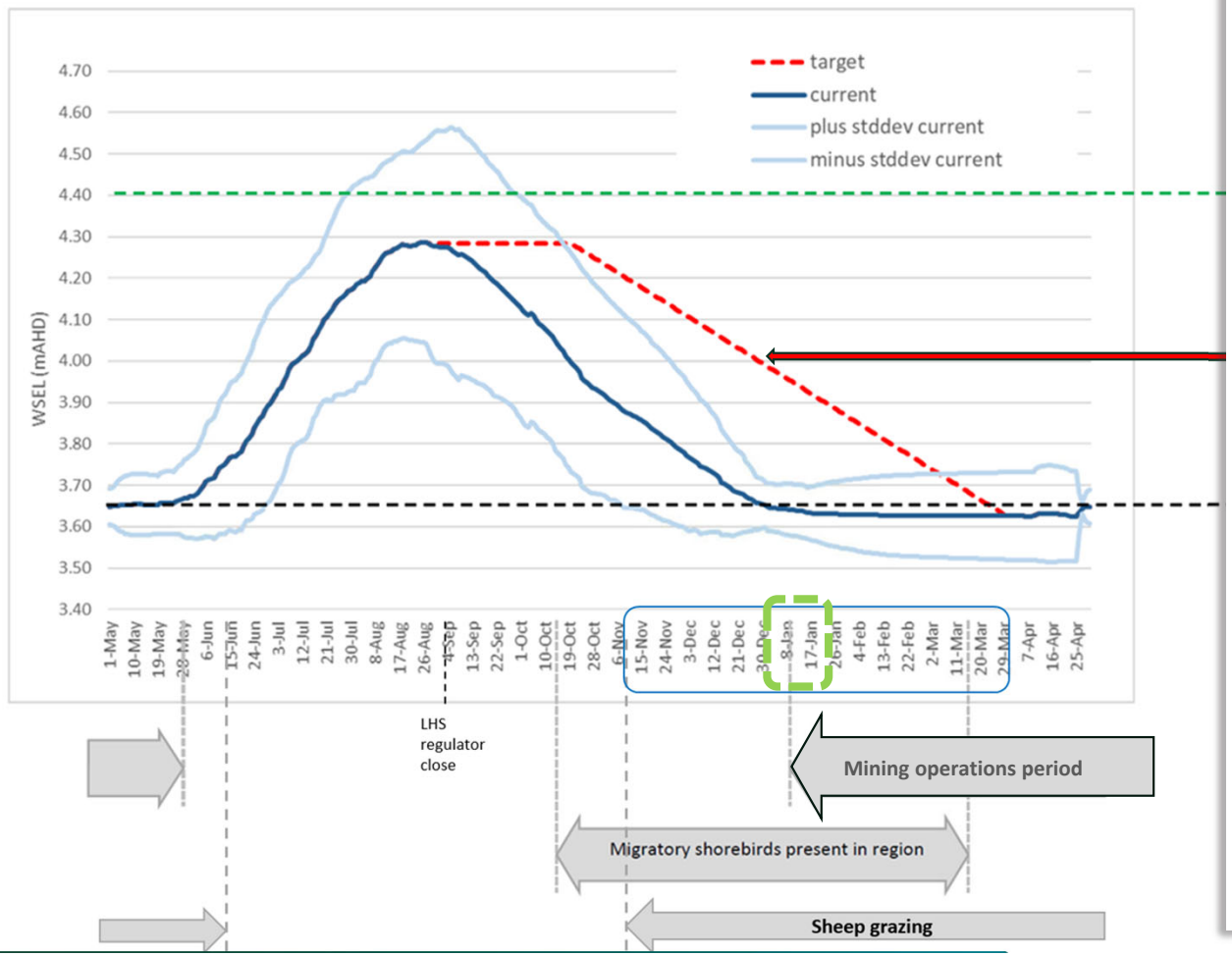

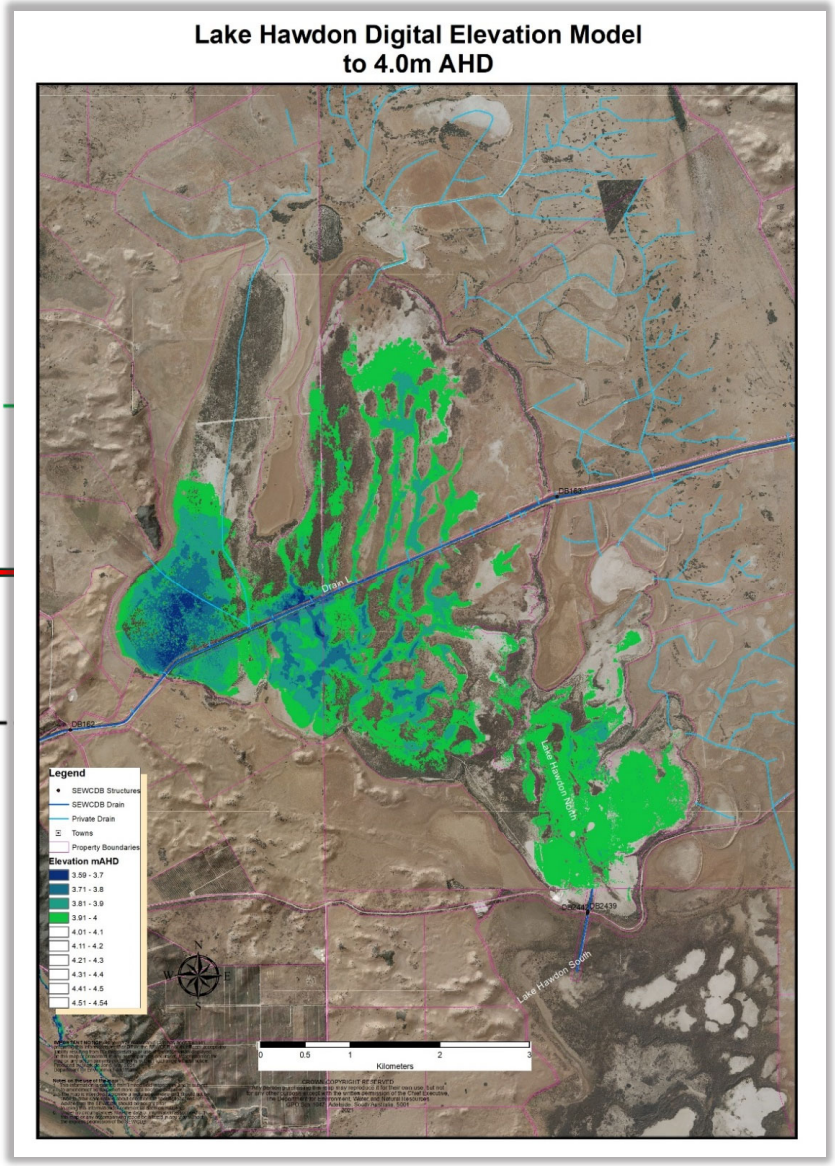

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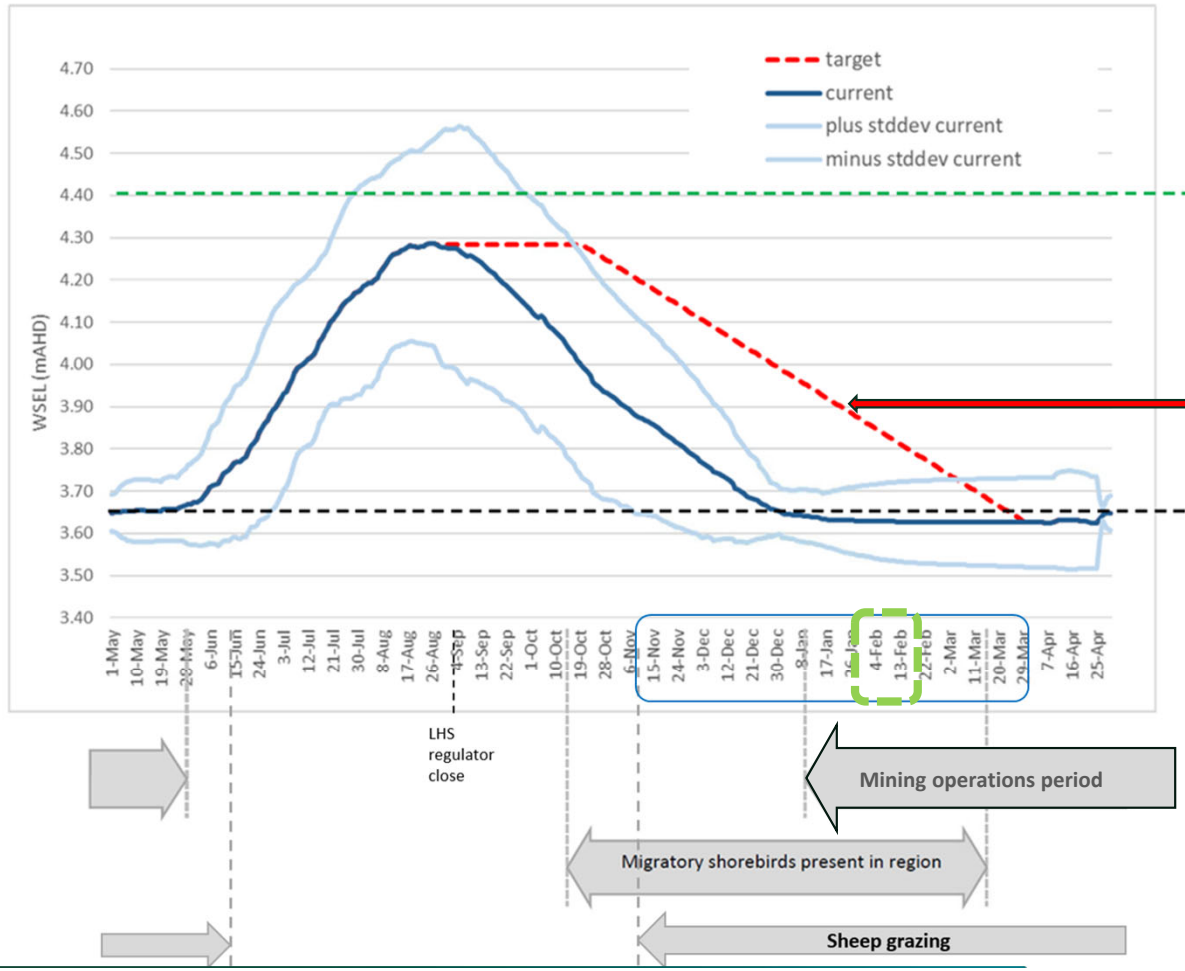

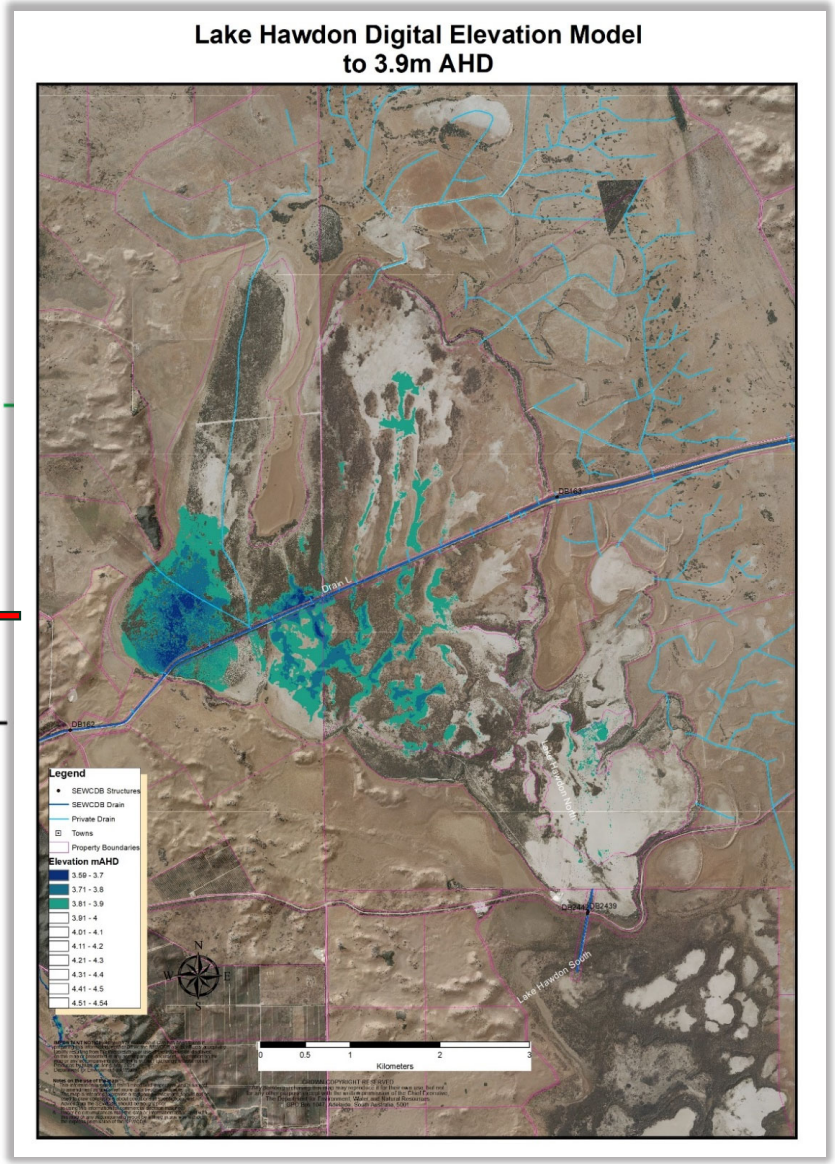

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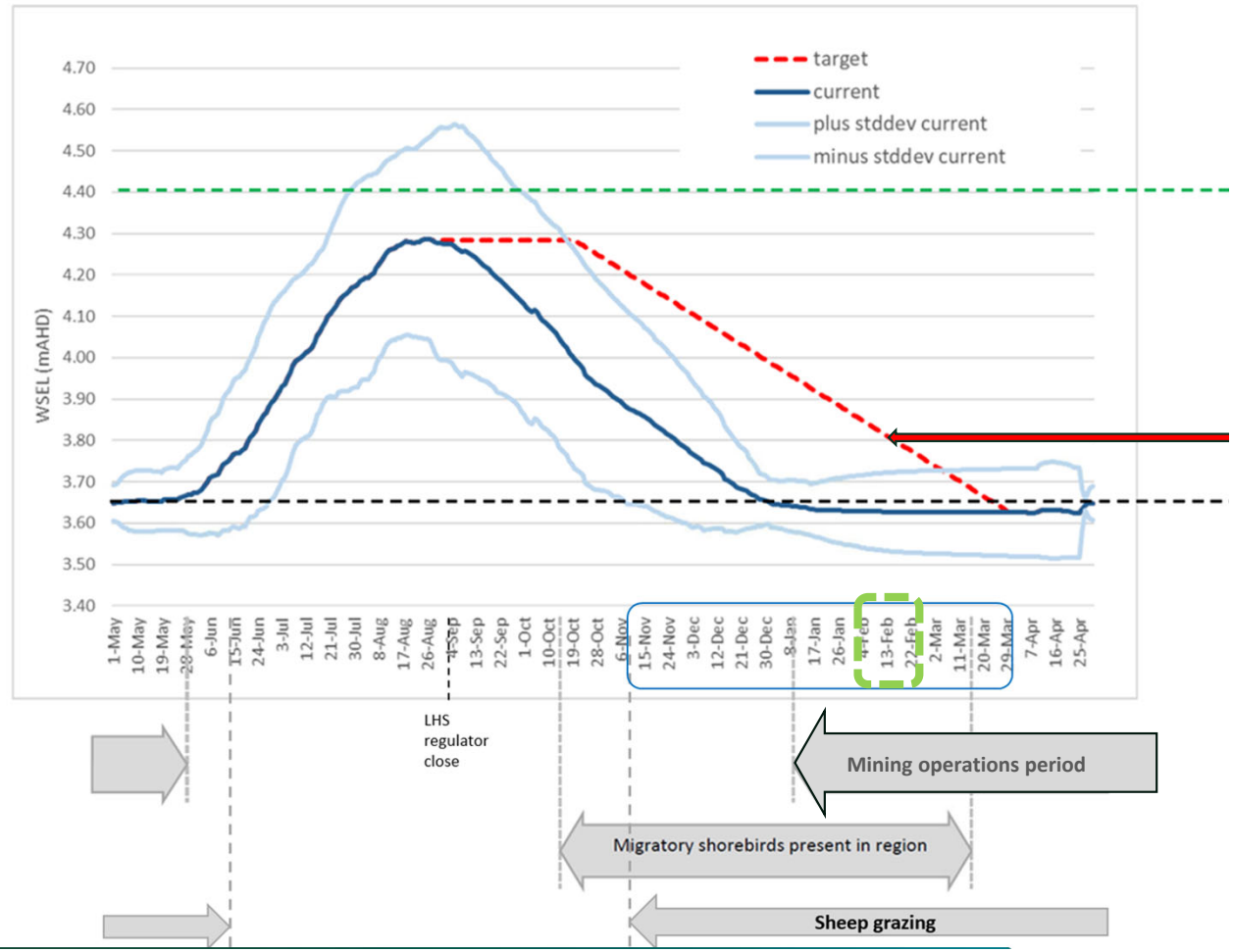
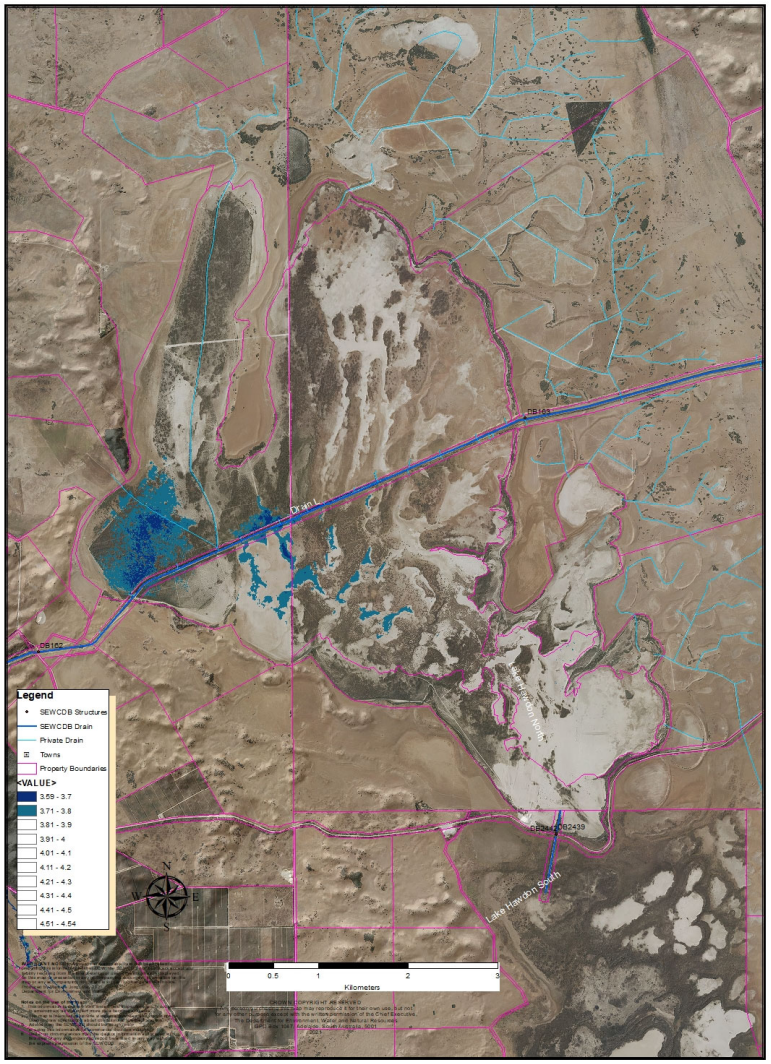
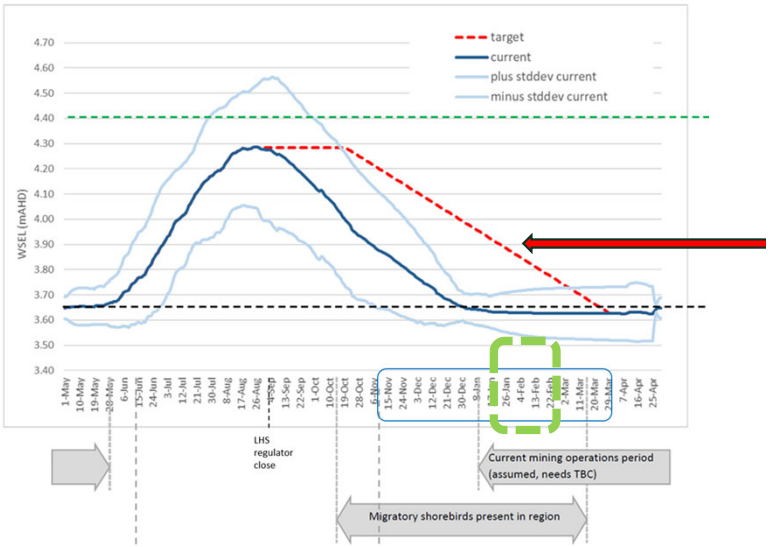
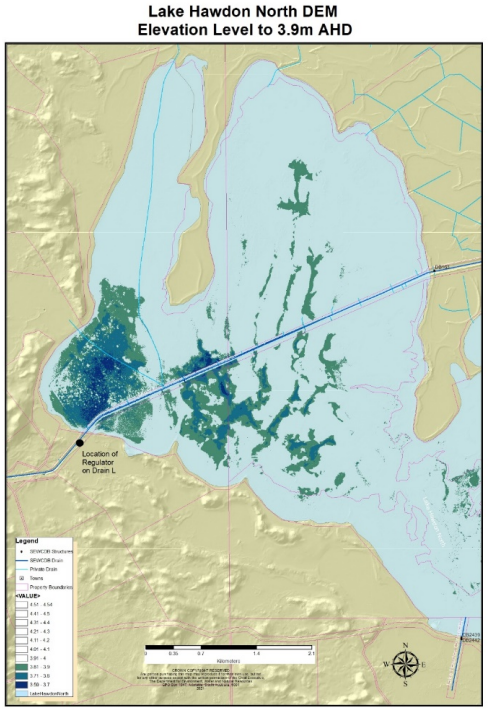


Lake Hawdon Digital Elevation Model to 3.8m AHD

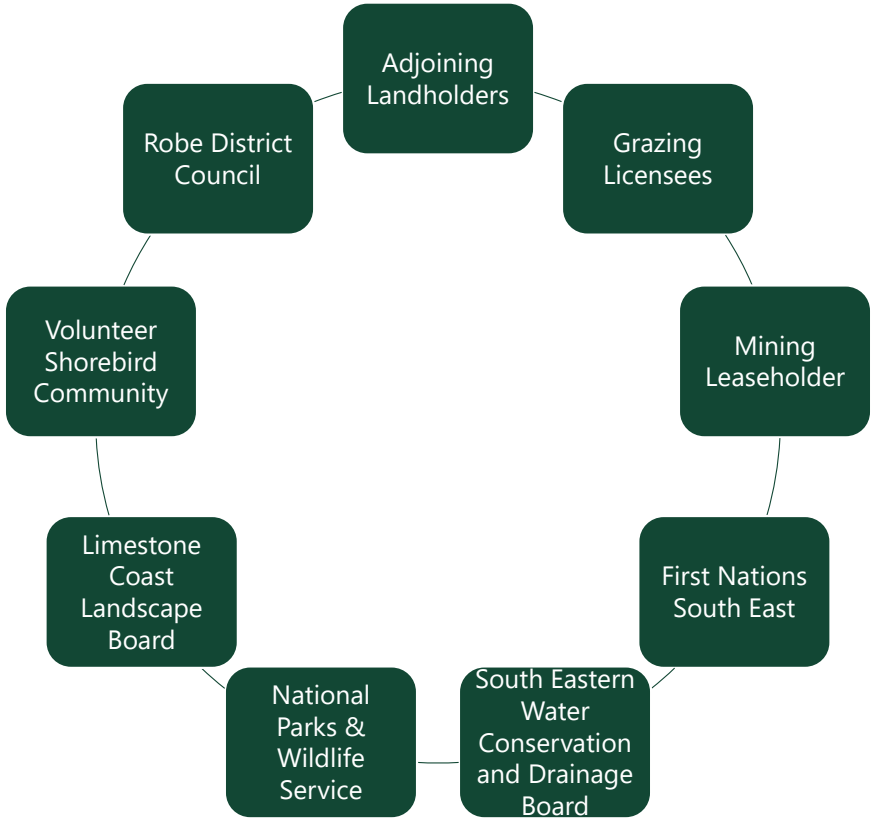


Project outcomes



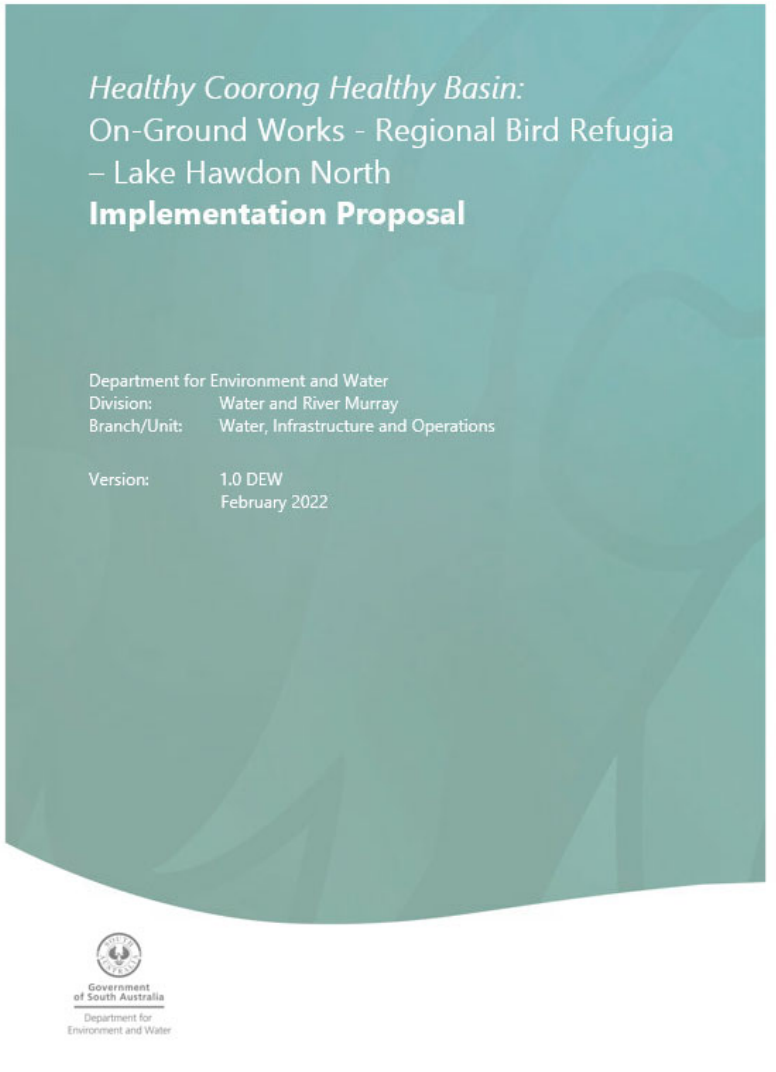


Stakeholders



Implementation Proposal

- Submitted to Commonwealth May 2022
- Funding approval for implementation was finalised in May 2024



On-Ground Works
Lake Hawdon North design, construction and Implementation

Sarah Murphy

Manager, Program Delivery

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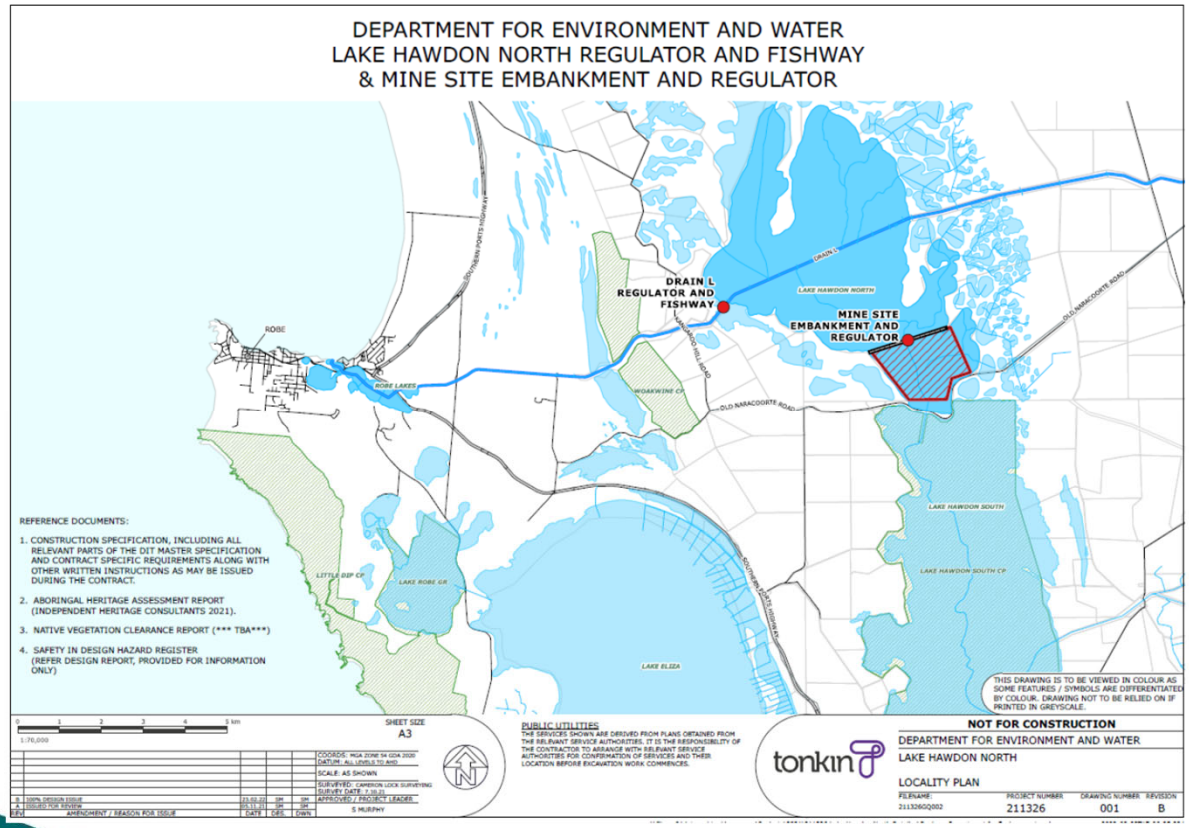
LHN Infrastructure

- Regulator to manage waterlevels
- Fishway to provide fish passage
- Mining tenement bund is no longer required

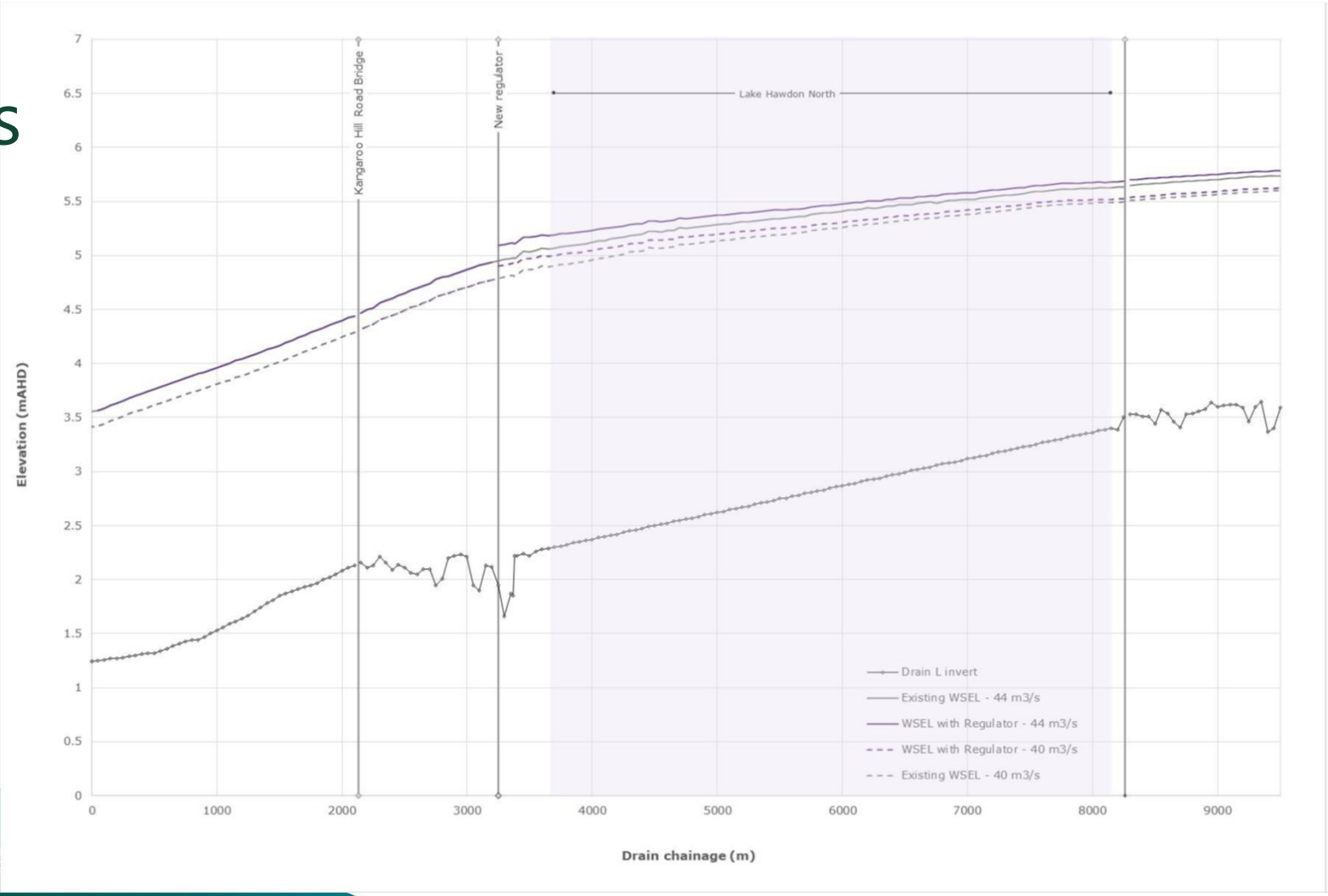


Basis of design

- Maintains flows
- Continued fish passage
- Safe operation for SEDO staff
- Continued access to LHN
- Consistent with existing designs
- Automation for responsive water level control

Design Hydraulics

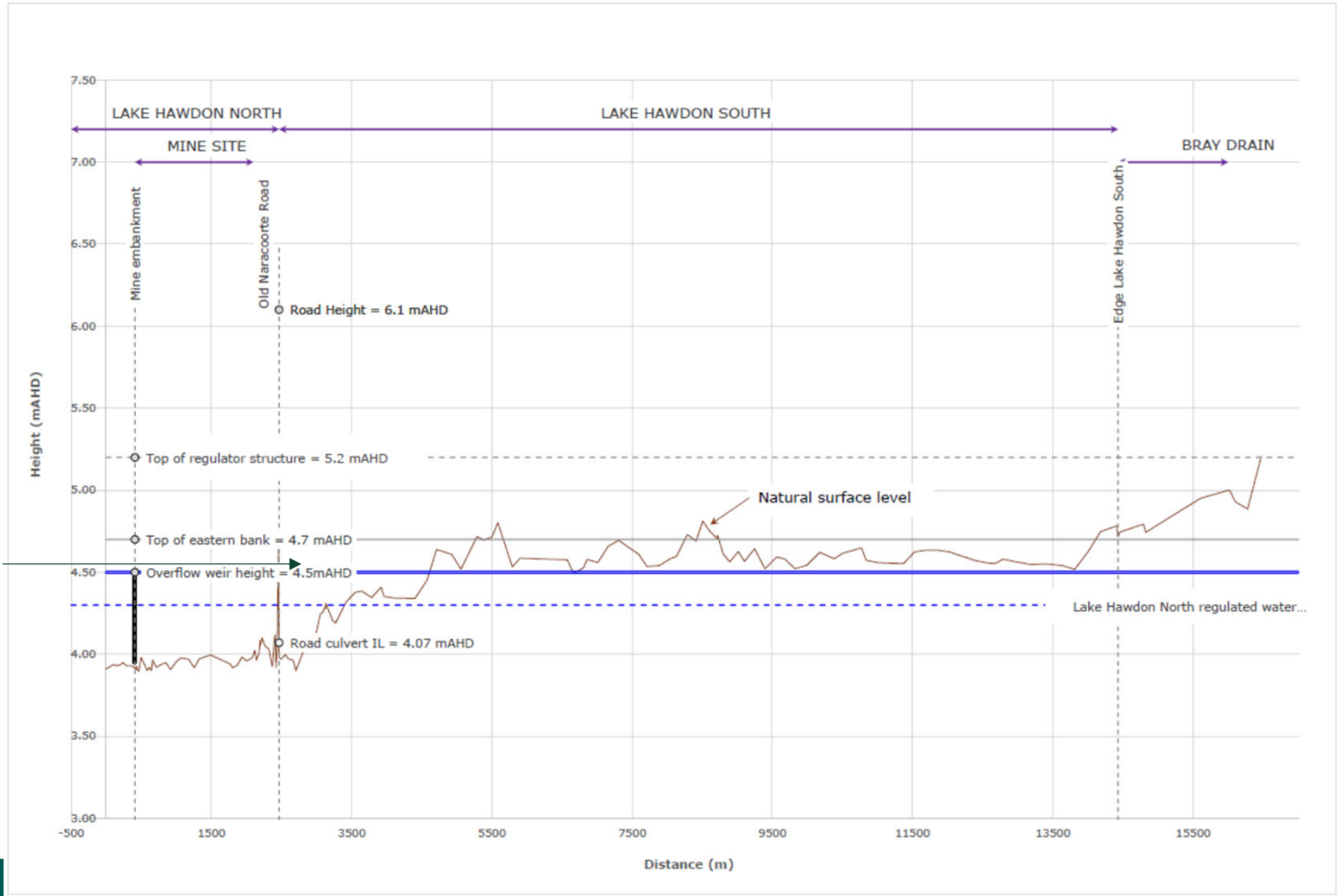
- No effect on drain hydraulics during peak winter flows
- Head water increase of ~8cm at regulator



Design Hydraulics

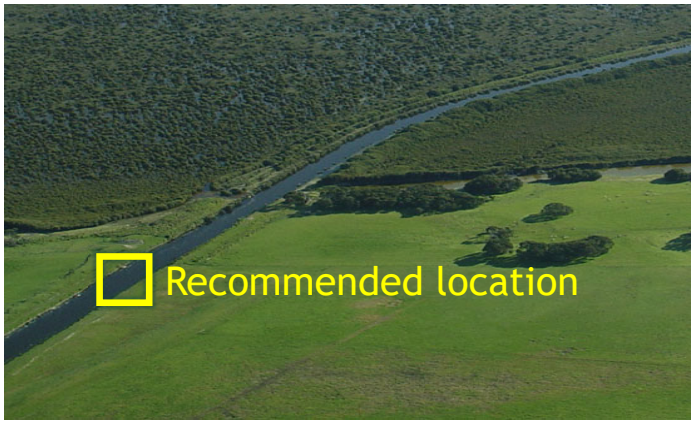
- No effect on LHS or Bray Drain

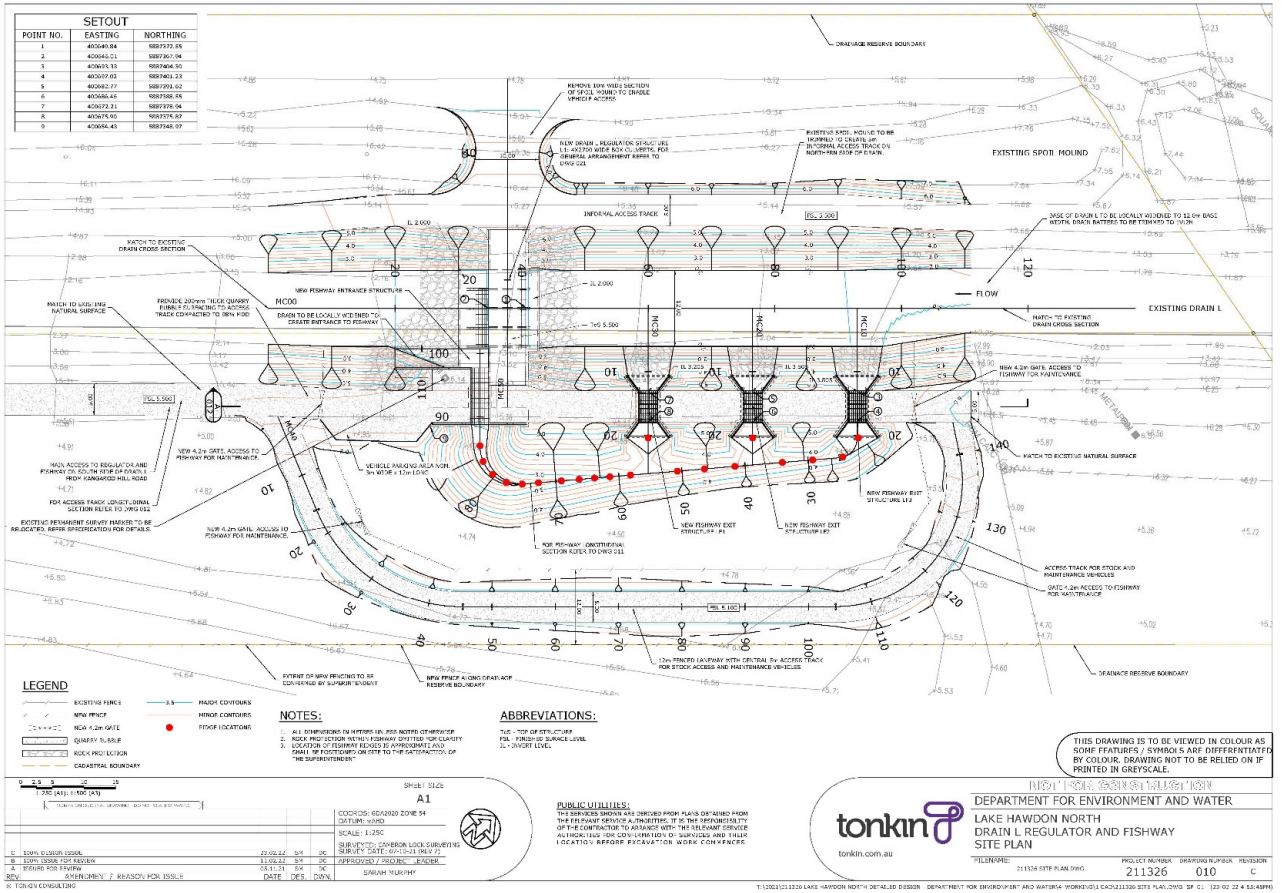
Lake Hawdon South Weir Fishway crest height 4.56m AHD



LHN Infrastructure

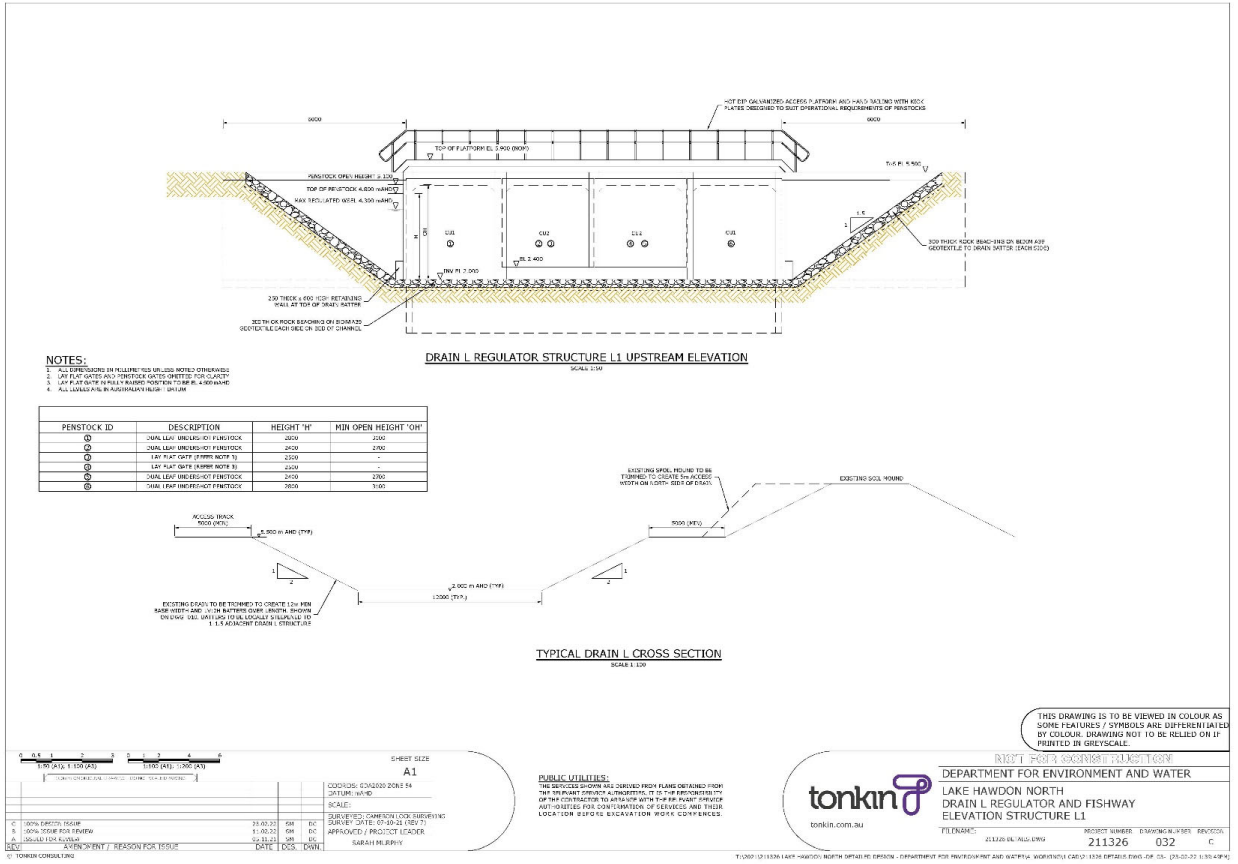
- Regulator and fishway placement





Regulator Design

- Four-cell precast concrete superstructure
- 2 automated lay-flat gates
- 2 penstock gates



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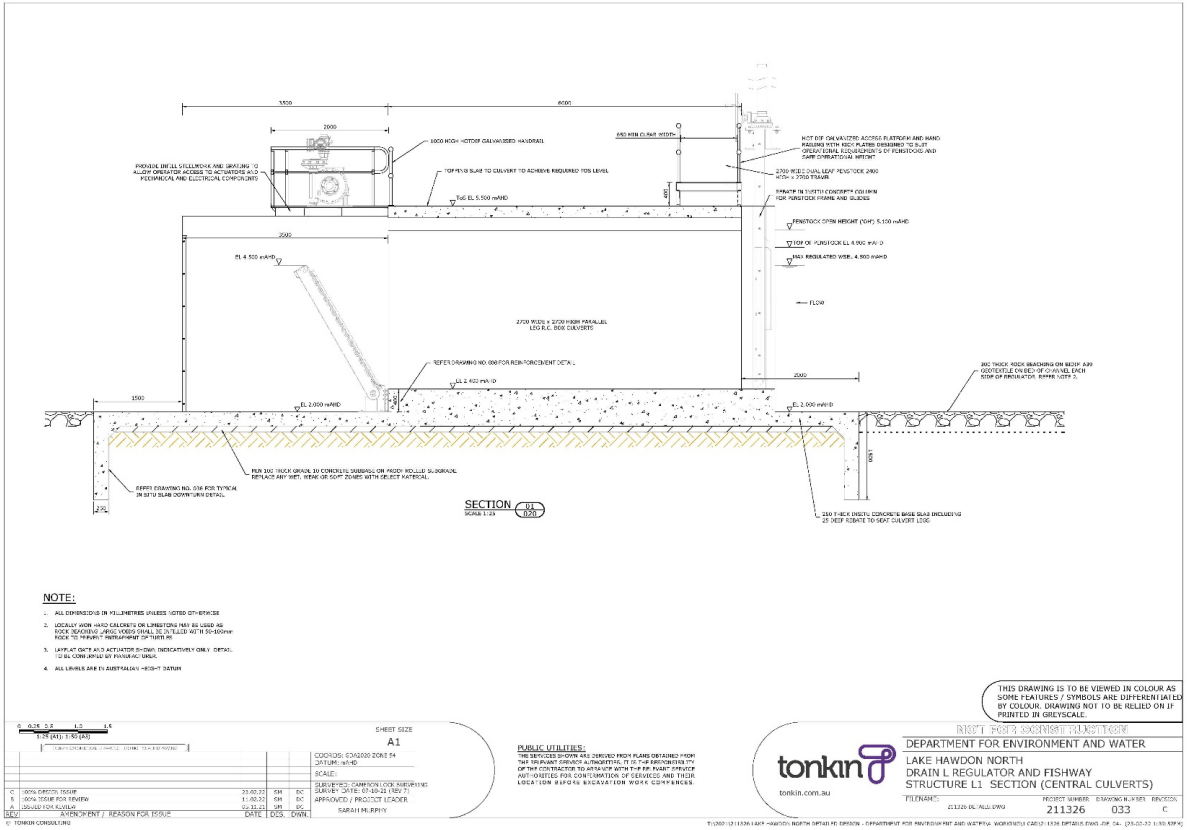
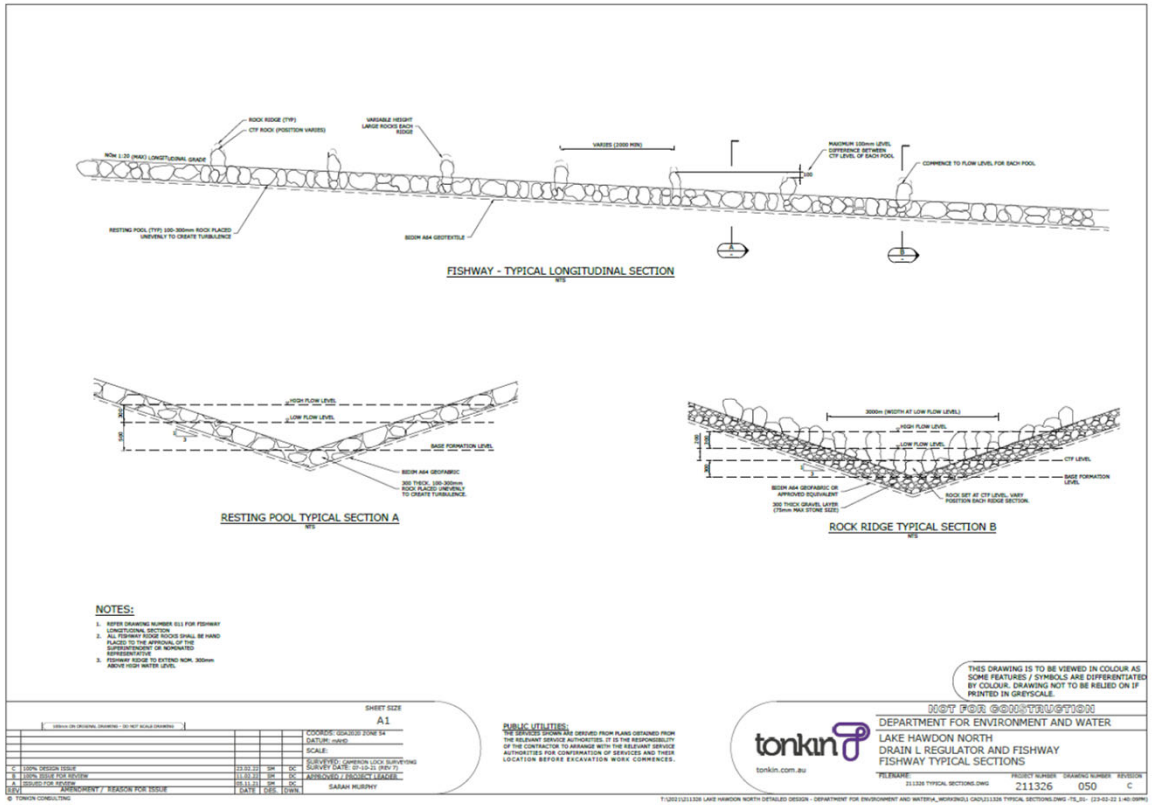


Regulator Design

- Matches existing regulators in the region
- Morella and Blackford

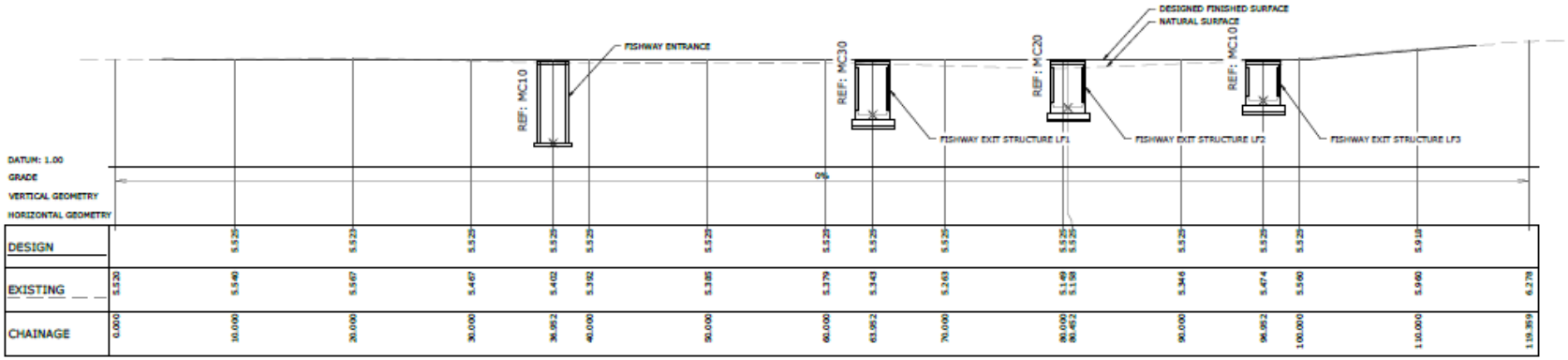
Fishway Design

- Rock-ramp fish bypass structure



Fishway Design

- 3 exits provides fish movement in a broad range of upstream water levels



LONGITUDINAL PROFILE - AA DRAIN L ACCESS TRACK

HORIZONTAL SCALE 1 : 200

VERTICAL SCALE 1 : 100

Morella Regulator and Fishway

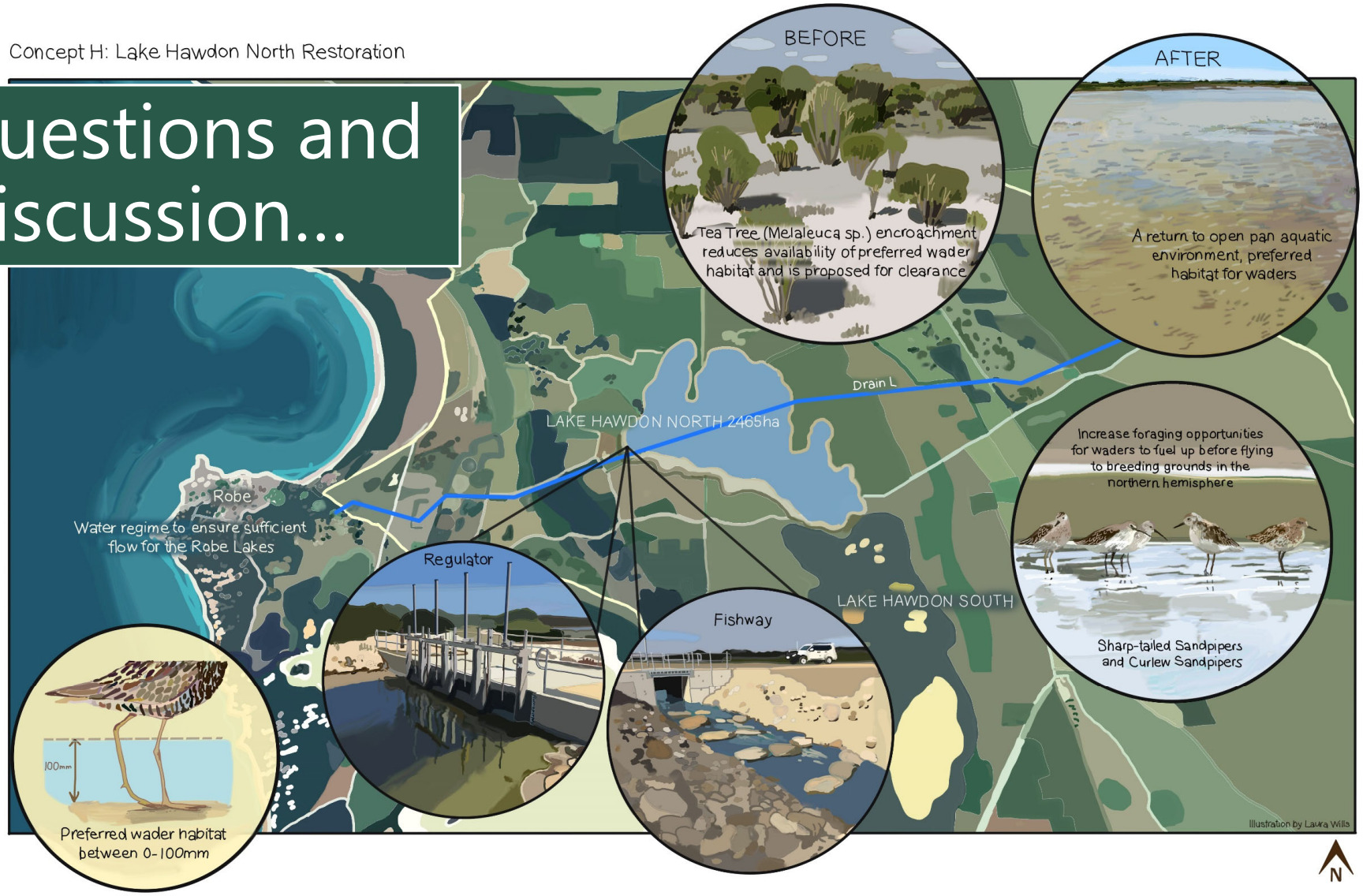
Construction timing

- construction summer – autumn 2024/25
- 6-8 month construction duration
- may span two seasons

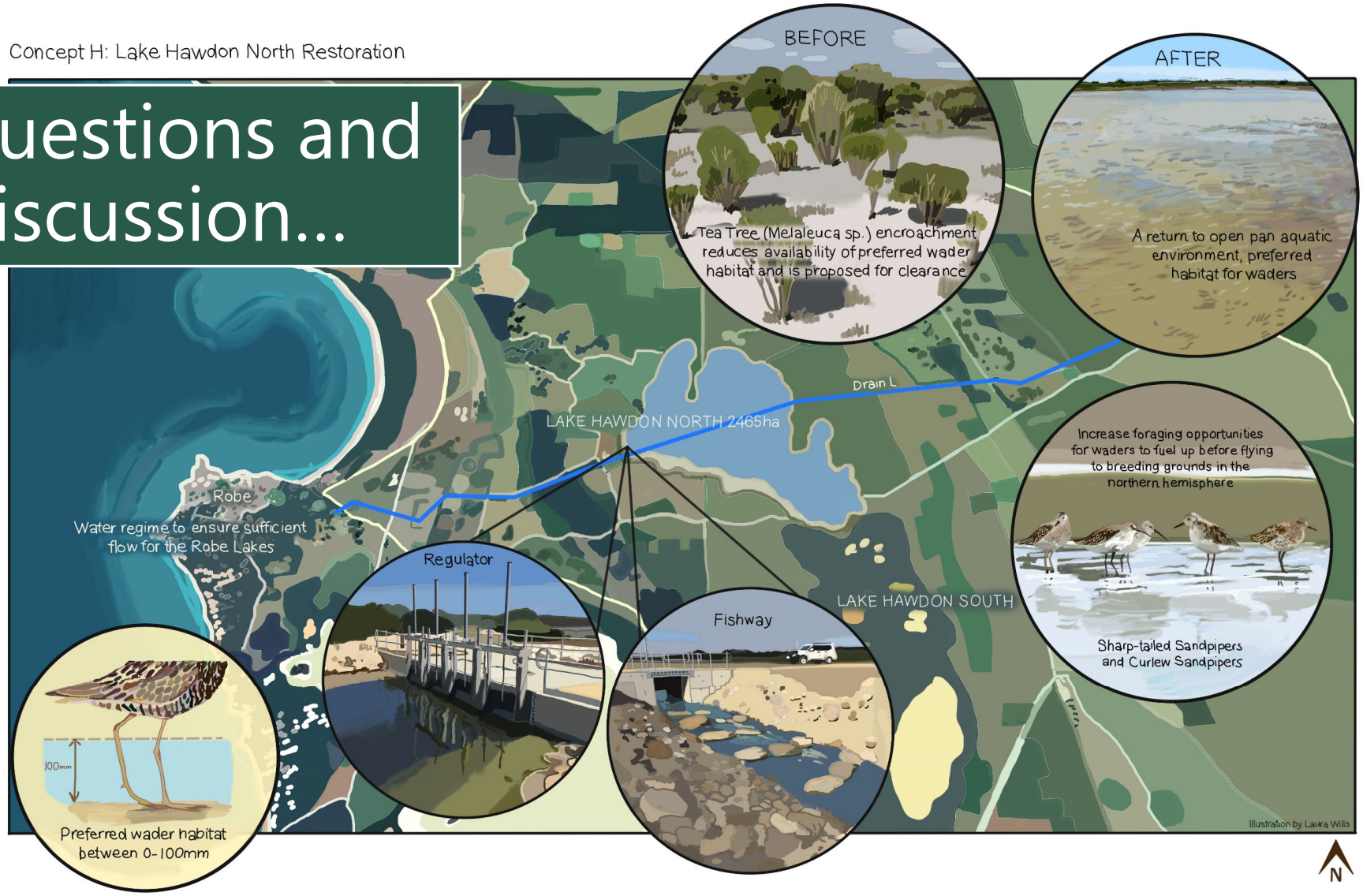
Key dates

Deliverable	By when
Implementation Proposal	Approved February 2024
Detailed design	Complete
Construction Tender	• Tender release 6 June • Tenderers site meeting 18 June • Tender Award - September
Approvals • Public Works Committee (17 June)	Mid to late 2024
Implementation (construction)	Late 2024 through to mid 2025
Implementation (habitat restoration)	Late 2024 through to mid 2026

Questions and Discussion...



Questions and Discussion...



www.environment.sa.gov.au/topics/coorong/

Healthy Coorong, Healthy Basin

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