

# Warragamba Dam Raising Project

## Project Upstream Impact Area

## Fact Sheet



### Project Upstream Impact Area

The proposed Warragamba Dam Raising Project (the Project) involves raising the height and increasing the thickness of the dam creating a 'flood mitigation zone' to temporarily hold back inflows. This would reduce the frequency and extent of major floods in the Hawkesbury-Nepean Valley downstream.

Upstream inflows which are contained within this 'flood mitigation zone' above the full supply level (FSL) would be released after the flood has passed in a controlled way, providing more time to allow downstream evacuation and reduce the risk to communities on the floodplain.

Currently, the dam does not have a dedicated flood mitigation zone and spills when Lake Burragorang reaches the FSL. The lake has filled above the FSL on many occasions since the dam was built causing temporary inundation. The most recent occurrence was the March 2021 flood event.

With the Project, the temporary upstream inundation above FSL would increase, both in depth and duration when the flood mitigation zone is operating.

To assess the potential change in upstream inundation between what already occurs and what would occur with the Project, flood modelling was undertaken. The full range of flood events and lake variables were modelled to determine what the likely inundation level would be.

### *Modelling the upstream Project impact area*

In consultation with key government agencies, and building on the flood modelling for the Project, the likely inundation extents for both the existing dam and the raised dam were determined. To establish the upstream area for impact assessment and any offsetting, the modelling was used to determine the likely additional area of inundation as a result of the Project.

### Monte Carlo approach

To capture the variability of floods, 'Monte Carlo' modelling was used. This approach randomly combines the range of factors that generate and influence flooding, such as:

- how much rain falls
- where and when the rain falls
- dam storage level at the start of the event
- soil moisture levels
- the timing of inflows.

Close to 20,000 possible flood events were modelled, which represents the range of floods that could be experienced over a 200,000-year period.

### Likely inundation

The modelled results were further analysed by selecting the maximum inundation level for each 20-year period to determine the 'average' or most likely peak level of inundation over the long term.

Breaking down and averaging the modelled 200,000-year flood record in this way is considered appropriate, as, based on historical records, it is likely at least one large flood above the FSL would occur within a 20-year timeframe.

The Monte Carlo flood estimation technique which takes account of the true variability of floods, is more robust than using a modelled single flood event or flood frequency to determine the likely impact area.

### Project upstream impact area

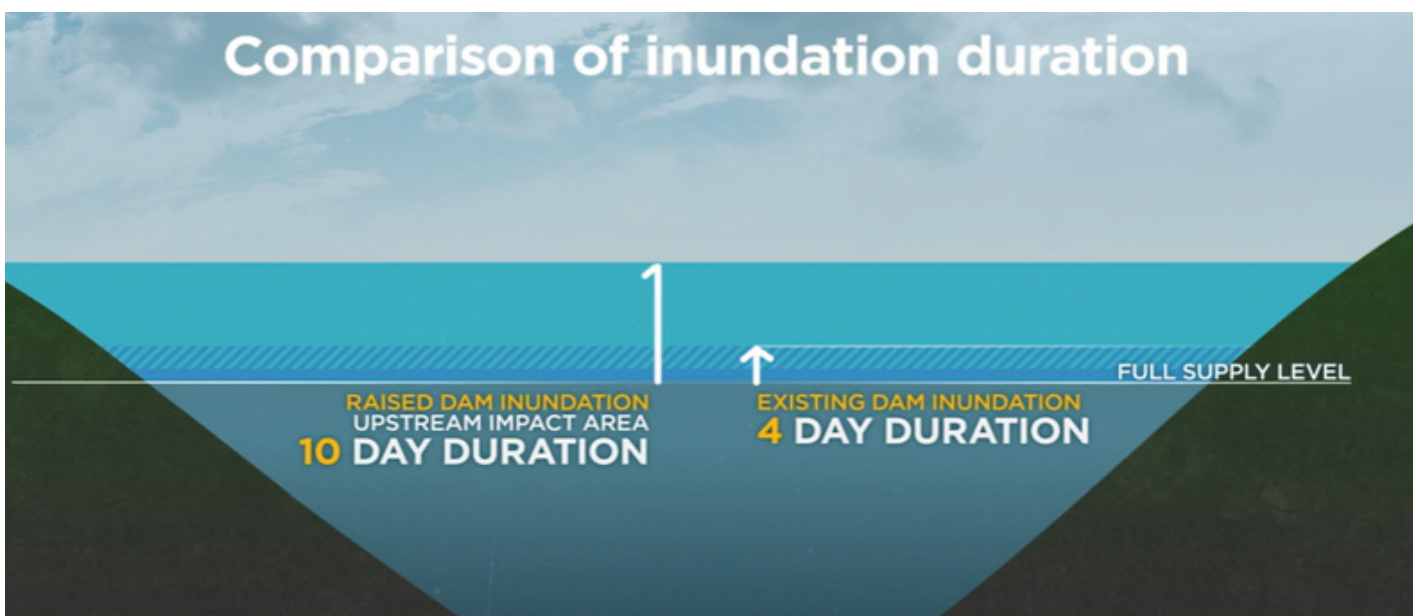
The modelling determined the likely peak inundation level with the Project is 10.3 metres above the FSL, compared to 2.8 metres with the existing dam. The existing inundation duration can be for up to around four days and as a result of the Project for up to around 10 additional days.

The likely inundation area between the existing inundation level and the Project inundation level defines the 'Project upstream impact area' of around 1,400 hectares (including 304 Ha of Greater Blue Mountains World Heritage Area).

### Modelling validation

The Monte Carlo modelling results for the existing inundation are consistent with the inundation records since the completion of Warragamba Dam in 1960.

Over the past 60 years, inundation has twice exceeded two meters above the dam's FSL: in November 1961 when it peaked at 2.8 metres; and again in June 1964 when it peaked at 2.2 metres. There have been four times when inundation exceeded the FSL by more than 1.5 metres, up to and including in March 2021. This record of previous flood events aligns with the modelling outcomes of the likely inundation for the existing dam at 2.8 metres above FSL.





## Project Impact Assessment

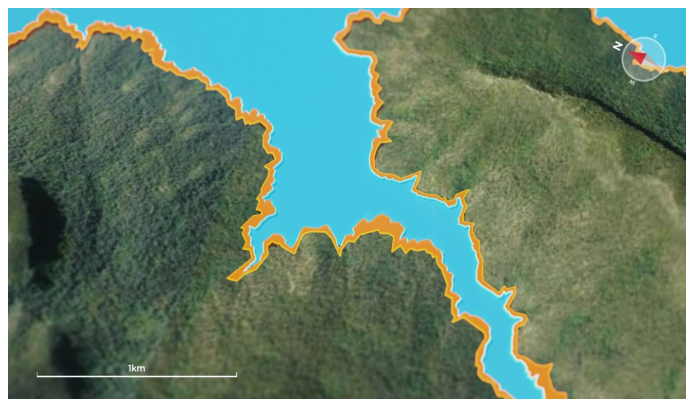
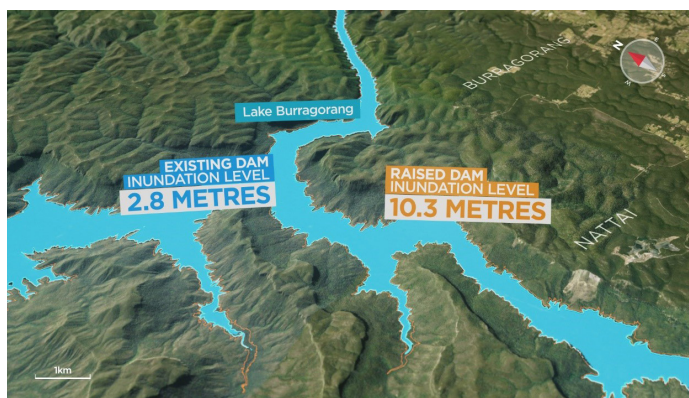
Most infrastructure projects assessments relate to impacts that can be readily assessed such as vegetation clearing for construction.

The increased extent and duration of temporary upstream inundation may result in the loss or damage of environmental values. The extent to which this may occur is substantially dependent on a large range of independent variables such as: flood tolerance of species; geology; flood frequency; depth and duration of flooding; geographic setting; and lake edge effects. The existing dam inundation area above FSL is evidence that a complete loss of environmental values does not occur with temporary inundation due to these variables.

For the purposes of offsetting the potential impacts of the Project a conservative assumption of a complete loss of environmental values within this Project upstream impact area of around 1,400 hectares has been used.

This offset approach compensates for the loss of biodiversity and potential impacts to protected and sensitive lands. This equates to replacing the land within the Project upstream impact area with land suitable for incorporation into National Parks and the World Heritage Area.

Capturing dam inflows in the flood mitigation zone would not affect the rate of inflows to Lake Burragorang or the erosion that happens in the catchment during any heavy rainfall event. The Project would influence the increase in temporary inundation above the FSL. This increase in inundation - both in depth and duration - would typically reduce as you move further away from the dam wall into the upstream tributaries.



Based on modelling and validation by historical events, the 1,400 hectare area between 2.8 metres and 10.3 metres above FSL is the Project upstream impact area.

## Ask a Question

Visit the project portal and virtual engagement room: [www.waternsw.com.au/wdr](http://www.waternsw.com.au/wdr)

**Free call:** 1800 932 066

**Email:** [wdr@waternsw.com.au](mailto:wdr@waternsw.com.au)



**Toll-free Service**

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