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**Submission content:**

Perhaps the most ecologically significant impact of the Adelaide River Off-stream Water Storage (AROWS) project in a seasonal floodplain is the alteration of natural flow regimes, which will have cascading effects on downstream environments that rely on periodic/ seasonal flooding. Seasonal flood pulses replenish soil nutrients, sustain groundwater recharge, and maintain the ecological integrity of wetlands, riparian zones, and estuarine systems. AROWS disrupts these processes by modifying the timing, magnitude, and frequency of water releases which will lead to reduced peak flows and prolonged periods of low flow. This artificial regulation prevents the natural scouring of sediments, diminishes floodplain connectivity, and alters the distribution of aquatic and semi-aquatic vegetation. Reduced water availability downstream has serious consequences for ecosystems dependent on seasonal inundation. Wetland habitats shrink, affecting species such as waterbirds, fish, and amphibians that rely on these environments for reproduction. Additionally, decreased flow can lead to higher water temperatures and lower dissolved oxygen levels, exacerbating stress on aquatic organisms. In arid and semi-arid regions, diminished floodplain recharge can lead to desertification, reducing the resilience of entire ecological communities. Barramundi are highly dependent on seasonal flow variations for their life cycle, particularly for spawning and juvenile development. These fish migrate between freshwater and estuarine environments, relying on flood pulses to access critical nursery habitats such as mangroves and floodplain wetlands. AROWS will regulate water flow can disrupt these natural migration patterns, preventing juveniles from reaching suitable rearing habitats and reducing overall recruitment success. Reduced flow can alter the connectivity between riverine and estuarine systems further limits genetic exchange and population resilience. The interruption of flood-driven productivity cycles also affects the availability of prey species, further stressing barramundi populations. This is especially crucial for the Northern Territory, as this iconic species attracts tourism, generating significant revenue and media exposure. Proceeding with this project would put this at risk. The construction of AROWS in a seasonal floodplain has far-reaching ecological consequences, particularly for terrestrial threatened species, habitat connectivity, and downstream hydrology. The loss of critical habitats, fragmentation of ecosystems, and alteration of natural flow regimes collectively threaten biodiversity and the ecological function of flood-dependent systems. Given these impacts, it is essential to consider alternative water management strategies that minimise disruption to natural floodplain processes while addressing human water demands.