

3rd March 2025

Northern Territory Environment Protection Authority

RE: Adelaide River Offstream Water Storage Project (AROWS) – Referral for Environmental Impact Assessment

About Birdlife Top End

The Top End branch of BirdLife Australia is a central forum for community activities focused on the conservation of birds and their habitats in the 'Top End' region of the Northern Territory. The BirdLife Top End branch is volunteer-run and aligns with the core values of BirdLife Australia to make a real and positive difference for Australia's birds in the Territory. Our core jurisdiction spans from the Barkly region to the northern tip of the continent, as well as the Tiwi Islands, Groote Eylandt, and all other offshore islands.

Our committed volunteers and members are involved in a range of activities, including research and monitoring programs, capacity-building initiatives, advocating for birds or their habitats under threat, and raising awareness among community members through outreach and education.

We refer to the statutory notice published on 13 January 2025 opening public comment with respect to the proponent-initiated EIS referral submitted by the NT Department of Logistics and Infrastructure (**DLI**) for the Adelaide River Off-stream Water Storage Project (**AROWS**).

The Referral comprises the following documents (collectively, the **Referral Documentation**):

- a. Referral Form;
- b. Referral Report;
- c. Appendices A-E
- d. Statement of Reasons, and
- d. Draft Terms of Reference (**Draft TOR**)

Summary

The Proposal to initiate a major floodplain harvesting project on one of the Northern Territory's most ecologically significant free-flowing rivers has the potential for widespread impact on a range of ecological communities, of which some of the Top End's most vulnerable bird species are a part.

The project proposes to harvest 70-75GL of water annually from the Adelaide river. Alteration to the flow of rivers, such as through floodplain harvesting, has been acknowledged as a major threat to ecosystem health of rivers and their associated floodplains worldwide¹.

Seasonal flooding of the Adelaide River floodplains sustains a diverse array of ecosystems and nationally and internationally significant populations of bird species, including what is likely to be the largest regularly-used egret colony in Australia², as well as several species of migratory shorebirds. Significant conservation areas are found downstream of the project area, and are likely to be impacted by the removal of significant volumes of water from the river's flow. These areas include Fogg Dam, Harrison Sam, and the Melacca Swamp Conservation Area.

We are deeply concerned that the Referral Documents fail to adequately anticipate and assess impacts of the development on the Territory's birds, and their habitats.

Part 1 – Adequacy of referral documentation

Hydrology Impact Assessment

Information on the impact of the Project on hydrological processes is contained within Appendix D - Hydrology Impact Assessment (**Hydrology Impact Assessment**).

The Hydrology Impact Assessment notes the potential for significant impacts on the hydrology of the Adelaide River, its floodplains, and associated ecological and cultural values, including potential reductions in flood level at the extraction site of up to .53m³. Despite these red flags about the serious implications of the project, the extent of modelling conducted as part of this assessment is sadly limited.

¹ See, for example, Bunn, S. E. & Arthington, A. H. 2002. Basic Principles and Ecological Consequences of Altered Flow Regimes for Aquatic Biodiversity. *Environmental Management* 30:4, 492–507

² [Territory Stories - Adelaide River coastal floodplain](#)

³ [Appendix D - AROWS Hydrology Impact Assessment](#) page 43

The modelling used in the Hydrology Impact Assessment assesses impacts over an area extending from “from the Margaret River confluence (~7 km upstream of the Project site) to approximately 15 km downstream of the Project site to assess changes in flood inundation extent and water level near to the extraction location and downstream of this location”⁴.

BirdLife TopEnd considers this modelling to be inadequate in scope. The Hydrology Impact Assessment itself recommends that the EIS should expand the hydraulic model coverage to better understand the area of impact, include an assessment of forecast climate change on the simulated system, and provide more detailed data to relevant ecological specialists to allow them to determine ecological impacts⁵. The assessment also notes that there is potential for a reduction in freshwater flow to cause an extension of tidal influences (saltwater intrusion)⁶.

Threatened Species Assessment

BirdLife Top End is alarmed at the limited scope of the Threatened Species Assessment, which is found in Appendix C of the Referral Documentation. DLI asserts in its Referral Form that the project is likely to be considered a controlled action under the EPBC Act will be referred for assessment.

The Threatened Species Assessment assessed potential impacts on threatened species within the inundation boundary and the intake corridor⁷. This approach to the Threatened Species Assessment is manifestly inadequate and profoundly inconsistent with results of other assessments conducted as part of the referral, which suggest likely impacts that extend far beyond the inundation boundary and intake corridor.

We note that the Hydrology Impact Assessment found that “(r)eductions in flood level at the extraction location range from 0.35 m to 0.53 m in all modelled flow scenarios under low tailwater conditions.”⁸ This is a significant impact on water levels, and by extension, the floodplain ecosystems and the birds that rely on them. Results of a Protect Matters Search⁹ around the intake corridor, covering an extremely conservative area of likely impact of just over 2km squared around the Adelaide river identified numerous Matters of National Environmental Significance including: Sharp-tailed Sandpiper, Curlew Sandpiper, Greater Sand Plover, and Australian Painted Snipe.

The Hydrology Impact Assessment used a limited model by which to assess impact of this project. Despite this approach, we submit that the precautionary principle should apply. The extraction of vast amounts of water from the Adelaide River undoubtedly has the potential to significantly impact birds and their habitat downstream, including those that rely on the vast

⁴ [Appendix D - AROWS Hydrology Impact Assessment](#), page i

⁵ [Appendix D - AROWS Hydrology Impact Assessment](#), p 53

⁶ [Appendix D - AROWS Hydrology Impact Assessment](#), page iv

⁷ [Appendix C - AROWS Threatened Species Assessment](#), page 3

⁸ [Appendix D - AROWS Hydrology Impact Assessment](#), p42

⁹ <https://pmst.environment.gov.au/> -

lateral floodplains. Loss of flood volume, decreased nutrient availability, and increased competition are among the risk factors.

A cursory search of a conservatively narrow area downstream of the project site using the DCCEEW Protected Matters Search tool finds a range of listed species (Appendix 1) including numerous migratory species, all of whom may be impacted by a potential loss of flooding levels and the resulting impacts on the complex foodwebs and ecological communities on which birds depend.

Part 2- Adequacy of proposed Terms of Reference

A project of this size and impact demands a robust Terms of Reference to inform the EIS. We submit that an adequate Terms of Reference has not been prepared, in part due to deficiencies in the initial assessments conducted to inform the Referral application, as outlined above.

Comments on proposed Terms of Reference for each NT EPA Factor

Terrestrial Environmental Quality

River flows and seasonal flooding facilitate nutrient delivery for a range of terrestrial environments downstream of the project, and reduced flows have the potential to impact the health, integrity and nutrient composition of these environments (not only during periods of seasonal flooding).

Recommendations:

- Water extraction from the Adelaide River should be included in the list of relevant activities.
- Downstream floodplains should be considered as relevant environmental values.
- Reduced water flow and water levels during seasonal flooding should be included as a potential impact and risks.

Terrestrial Ecosystems

As noted above, water extraction will impact the downstream floodplains of the Adelaide river, and any impacts on those terrestrial environments will also affect ecosystems.

The Adelaide River Floodplain lies within the most important habitat area for Magpie Geese in the Northern Territory¹⁰. In recent surveys, the catchment contained some of the highest density nesting sites in the Northern Territory¹¹.

As noted in the Adelaide River Floodplains Joint Management Plan¹² deteriorating and accelerating the drainage of freshwater from the floodplain has the potential to destroy magpie goose habitat, including at Melacca Swamp Conservation Area, and these impacts are likely to be accelerated further as the impacts of climate change increase.

Magpie Geese are a key species in Aboriginal cultures of the Top End, contributing to a range of cultural practices and obligations¹³. A decline in populations along the Adelaide River Floodplain could have negative impact on Traditional Owners' ability to continue these practices, as well as the long-term sustainable harvest for non-Indigenous recreational hunters.

Recommendations:

- Water extraction from the Adelaide River should be included in the list of relevant activities
- Downstream floodplains should be considered as relevant environmental values.
- Reduced water flow and water levels during seasonal flooding should be included as a potential impact and risk to terrestrial ecosystems.

Hydrological Processes

The Draft Terms of Reference require that the proponent to “describe the characteristics and current condition of hydrological processes (surface water and groundwater systems) **in the proposal area.**”

We submit that this is an inadequate scope, and that the entire downstream area, inclusive of lateral floodplains, must be included.

Recommendations:

The Draft Terms of Reference should more clearly state that the EIS must assess the cumulative impacts of the project on both the surface flow regime of Adelaide River and the

¹⁰ https://environment.nt.gov.au/_data/assets/pdf_file/0010/815689/wildlife-management-program-magpie-goose-nt.pdf

¹¹ https://environment.nt.gov.au/_data/assets/pdf_file/0010/815689/wildlife-management-program-magpie-goose-nt.pdf Page 13

¹² https://environment.nt.gov.au/_data/assets/pdf_file/0011/1447193/magpie-goose-monitoring-report-2024.pdf Page 31

¹³ https://environment.nt.gov.au/_data/assets/pdf_file/0010/815689/wildlife-management-program-magpie-goose-nt.pdf page 10

surface water inundation of entire downstream area, including lateral floodplains. Such a cumulative impact assessment should include future water extraction and climate change.

Inland Water Environmental Quality

The Terms of Reference include a requirement to “describe the characteristics and current condition of inland water environmental quality (surface and groundwater quality) in the proposal area”.

As discussed above, the “project area” represents a minute fraction of the area of impact of this project. The Adelaide River feeds vast floodplains, and as such the significant water extraction proposed here can be reasonably expected to impact the environmental quality of downstream floodplains and wetlands.

Recommendations:

- The Environmental Values should be extended to include all floodplains downstream of the project area.
- Potential Risks and Impacts should include effects of reduced river flow and reduction in floodplain levels.

Aquatic Ecosystems

The proposed list of Environmental Values only includes consideration of ‘key indicator species’ for downstream areas. This is inadequate.

Recommendations:

- The EIS must include descriptive and spatial information for aquatic habitats found within the entire downstream area
- A likelihood of occurrence assessment for all threatened and listed bird and aquatic species modelled to occur or known to occur should be developed in the same area, including within lateral floodplains fed by the Adelaide River.

Coastal process, marine environmental quality, and marine ecosystems

The absence of modelling data in the Referral Documentation should not be used as a reason to exclude coastal processes, marine environmental quality, and marine ecosystems from the Terms of Reference. Section 19(a) of the *Environment Protection Act 2019* (NT) establishes the precautionary principle, and establishes that “(i)f there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.”

The Hydrology Impact Assessment infers from its limited modelling (which did not consider coastal impacts) that impacts on coastal processes is unlikely, and asserts that “the assessed

extracted flow scenario incurs a reduction in flow volume rather than an increase. Most significant negative impacts to coastal environments occur during periods of increased water flow through flood events or storm surge, leading to erosion and other coastal hazards.”

We submit that impacts on coastal process, marine environmental quality, and marine ecosystems may also occur because of a *reduction* in flow – including, but not limited to, reduced nutrient availability and changes to tidal extent. This has the potential to impact the complex food webs that sustain the Top End’s coastal bird species.

Despite dismissing the relevance of marine and coastal impacts, the Hydrology Impact Assessment does recommend that the EIS include modelling of impacts on coastal processes for a larger than anticipated extraction scenario for AROWS. It is preferable to include coastal process, marine environmental quality, and marine ecosystems in the Terms of Reference immediately, to avoid complication and delay that may arise from finding out too late that the Project will render negative impacts on these values.

Recommendation:

- Include coastal process, marine environmental quality, and marine ecosystems as NT EPA Factors in the Draft Terms of Reference.

Comments on Referral under the EPBC Act

Matters of national environmental significance (MNES)

The Draft Terms of Reference includes a list of Guidelines, Threat Abatement Plans, Bioregional Plans or Recovery Plans against which the EIS will demonstrate its consistency. BirdLife Top End is extremely concerned that this project - with the potential to significantly impact the Adelaide River and its associated floodplains and wetlands - proposes to consider no risks or impacts on bird species, despite evidence in the Referral Documentation to the contrary.

We note that under the EPBC Act, a significant impact must be referred if it is considered ‘likely’. The Significant Impact Guidelines confirm that “it is not necessary for a significant impact to have a greater than 50% chance of happening; it is sufficient if a significant impact on the environment is a real or not remote chance or possibility. If there is scientific uncertainty about the impacts of your action and potential impacts are serious or irreversible, the precautionary principle is applicable.”¹⁴

A cursory search of a conservatively narrow area downstream of the project site using the DCCEEW Protected Matters Search tool finds a range of Matters of National Environmental Significance (MNES), all of which may be impacted by a potential loss of flooding levels and the

¹⁴ [Matters of National Environmental Significance: Significant Impact Guidelines 1.1](#)

resulting impacts on the complex foodwebs and ecological communities on which birds depend (See Appendix 1).

This includes species such as the critically endangered curlew sandpiper, which has experienced population decline of up to 81% in three generations¹⁵ and far eastern curlew, which faces rapid population decline across its international migration route because of rampant development and “a combination of restricted inflow of sediments from increasingly dammed rivers.”¹⁶

We also note that The National Directory of Important Migratory Shorebird Habitat¹⁷ identifies Harrison Dam, part of the Adelaide River floodplain wetland, is considered nationally significant for the Little Curlew.

Recommendation:

- The proponent must conduct a likelihood of occurrence assessment for all MNES modelled to occur or known to occur downstream to the river mouth, including lateral floodplains fed by the Adelaide River. This assessment should form the basis of the referral.

Appendix 1: Bird Species list for Matters of National Environmental significance, downstream of project site

Species Name	Threatened Category	Presence
Sharp-tailed Sandpiper <i>Calidris acuminata</i>	Vulnerable	Species or species habitat known to occur within area
Red Knot, Knot <i>Calidris canutus</i>	Vulnerable	Species or species habitat known to occur within area
Curlew Sandpiper <i>Calidris ferruginea</i>	Critically Endangered	Species or species habitat known to occur within area
Greater Sand Plover <i>Charadrius leschenaultii</i>	Vulnerable	Species or species habitat known to occur within area

¹⁵ [Conservation Advice for Calidris ferruginea \(curlew sandpiper\)](#)

¹⁶ [Conservation Advice for Numenius madagascariensis \(far eastern curlew\)](#)

¹⁷ [Australia published National Directory of Important Migratory Shorebird Habitat - Eeaaflyway](#)

Gouldian Finch <i>Chloebia gouldiae</i> listed as <i>Erythrura gouldiae</i>	Endangered	Species or species habitat known to occur within area
Alligator Rivers Yellow Chat, Yellow Chat <i>Epthianura crocea tunneyi</i>	Endangered	Species or species habitat known to occur within area
Red Goshawk <i>Erythrotriorchis radiatus</i>	Endangered	Species or species habitat known to occur within area
Grey Falcon <i>Falco hypoleucos</i>	Vulnerable	Species or species habitat known to occur within area
Partridge Pigeon (eastern) <i>Geophaps smithii smithii</i>	Vulnerable	Species or species habitat known to occur within area
Asian Dowitcher <i>Limnodromus semipalmatus</i>	Vulnerable	Species or species habitat known to occur within area
Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit <i>Limosa lapponica baueri</i>	Endangered	Species or species habitat known to occur within area
Eastern Curlew, Far Eastern Curlew <i>Numenius madagascariensis</i>	Critically Endangered	Species or species habitat known to occur within area
Australian Painted Snipe <i>Rostratula australis</i>	Endangered	Species or species habitat known to occur within area
Common Greenshank, Greenshank <i>Tringa nebularia</i>	Endangered	Species or species habitat known to occur within area
Masked Owl (northern) <i>Tyto novaehollandiae kimberli</i>	Vulnerable	Species or species habitat known to occur within area
Listed Migratory Species		
Common Noddy (<i>Anous stolidus</i>)		Species or species habitat may occur within area
Fork-tailed Swift (<i>Apus pacificus</i>)		Species or species habitat likely to occur within area
Streaked Shearwater (<i>Calonectris leucomelas</i>)		Species or species habitat may occur within area

Lesser Frigatebird, Least Frigatebird (<i>Fregata ariel</i>)		Species or species habitat likely to occur within area
Great Frigatebird, Greater Frigatebird (<i>Fregata minor</i>)		Species or species habitat likely to occur within area
White-tailed Tropicbird (<i>Phaethon lepturus</i>)		Species or species habitat may occur within area
Little Tern (<i>Sternula albifrons</i>)		Species or species habitat likely to occur within area
Red-rumped Swallow (<i>Cecropis daurica</i>)		Species or species habitat may occur within area
Oriental Cuckoo, Horsfield's Cuckoo (<i>Cuculus optatus</i>)		Species or species habitat known to occur within area
Barn Swallow (<i>Hirundo rustica</i>)		Species or species habitat known to occur within area
Grey Wagtail (<i>Motacilla cinerea</i>)		Species or species habitat may occur within area
Yellow Wagtail (<i>Motacilla flava</i>)		Species or species habitat likely to occur within area
Oriental Reed-Warbler (<i>Acrocephalus orientalis</i>)		Species or species habitat may occur within area
Common Sandpiper (<i>Actitis hypoleucos</i>)		Species or species habitat known to occur within area
Pectoral Sandpiper (<i>Calidris melanotos</i>)		Species or species habitat may occur within area
Oriental Plover, Oriental Dotterel (<i>Charadrius veredus</i>)		Species or species habitat may occur within area
Oriental Pratincole (<i>Glareola maldivarum</i>)		Species or species habitat may occur within area