Landcare Tasmania

ENHANCING FARM DAMS IN TASMANIA

Improving water quality, farm productivity and biodiversity

This guide details the benefits of enhancing farm dams and provides steps on how to undertake a dam enhancement project.

Australian Government
Department of Agriculture, Fisheries and Forestry

Future Drought Fund

TAS FARM INNOVATION HUB

TIA Tasmanian Institute of Agriculture

Landcare Tasmania

This Farm Dam Enhancement extension project is being delivered by Landcare Tasmania, with support from the TAS Farm Innovation Hub through funding from the Australian Government's Future Drought Fund.

WHY SHOULD I ENHANCE MY FARM DAM?

Farm dams are essential to Tasmanian farming. They provide water for livestock, irrigation, firefighting and day-to-day farm operations.

Farm dam enhancement is a simple idea. By reducing stock impact and allowing native vegetation to return, dams become:

- cleaner
- more reliable
- healthier for livestock
- better for biodiversity
- more enjoyable places to spend time

> **I think fencing off dams and providing off-stream watering points is a real win-win. It helps reduce siltation of your dam, improves habitat for native wildlife and at the same time it increases livestock production by providing cleaner, better quality water.** — NATALIE KIMBER, PRESTON

Tasmanian farmers tell us they now visit their enhanced dams more often because they look great, attract birds and are part of family life.

Enhanced dams support almost twice as many waterbug species—a key sign of improved water quality[1].

Enhanced dams have 65 per cent lower turbidity and 60–70 per cent fewer faecal bacteria, meaning cleaner, safer drinking water for livestock[2].

Above images: Showing a comparison of unfenced (left) and enhanced (above) dams on the same property near Albury, NSW. These photos were taken on the same day in early 2019, during an extremely dry period. *Photo credit: Sustainable Farms, Australian National University.*

Front cover: An enhanced Tasmanian farm dam — clear water, vegetation, and reflections. *Photo credit: Karen Brown.*

1 Evans MJ, Beggs R, Scheele BC, Crane C, Lang E, Siegrist A, Florance D, Smith D, Malerba ME, Lindenmayer DB. (2024) Farm dam enhancement significantly improves water quality. Agriculture, Ecosystems & Environment, 373, 109134.

2 Westgate MJ, Crane C, Smith D, O'Malley C, Siegrist A, Florance D, Lang E, Crane M, Hingee K, Scheele BC, Lindenmeyer D. (2022) Improved management of farm dams increases vegetation cover, water quality, and macroinvertebrate biodiversity. Ecology and Evolution, 12(3), e8636.

WHAT IS FARM DAM ENHANCEMENT?

Farm dam enhancement improves the condition and function of a farm dam. Traditional dams often suffer from pugged edges, bare banks and poorer water quality due to constant livestock access.

An enhanced dam is one where livestock access is managed with fencing to reduce trampling and contamination, allowing the re-establishment of a grassy buffer zone around the dam. Native vegetation is established in and around the dam to stabilise banks, reduce evaporation and support wildlife.

Enhanced dams may also include:

- varied depths
- logs or snags
- shallow shelves
- small islands

Healthy, enhanced dams typically have:

- cleaner, more reliable stock water
- stronger, vegetated banks that reduce erosion
- cooler, clearer water that lasts longer in dry periods
- more native plants and animals
- improved ecosystem services across the farm

Research shows enhanced dams can have:

- a third less sediment
- twice as many native species
- healthier water for livestock

Green and Gold Frog (*Litoria raniformis*)

White-faced heron (*Egretta novaehollandiae*)

Research shows enhanced dams support significantly greater bird species richness and more breeding activity compared to unfenced dams. (ANU SUSTAINABLE FARMS RESEARCH[3])

A Southern Tasmanian dam where farm dam enhancement principles have been applied for many years, Richmond. *Photo by Landcare Tasmania.*

3 Smith DG, Evans MJ, Scheele BC, Florance D, Siegrist A, Lang E, Crane C, Malerba M, Bell K, Crane M. (2025) Grazing control and revegetation increases bird biodiversity at farm dams. Biological Conservation, 309, 111310.

BENEFITS OF FARM DAM ENHANCEMENT

Water quality

Fencing and vegetation help to filter sediment and nutrients from run-off and keep banks stable. This reduces turbidity, faecal contamination and nutrient loads. Stock drink cleaner water and dams need less maintenance.

Livestock health and productivity

Improved water quality reduces stress and disease risk and improves palatability. Current research is investigating the potential benefits in terms of livestock weight gain.

Biodiversity

Vegetation, snags and variable depths support frogs, birds, beneficial insects, platypus and microbats. These help with natural pest control across paddocks.

Drought resilience

Enhanced dams lose less water to wind and heat. Shade, reduced wind speeds and stable vegetated banks all slow evaporation. Windbreaks can reduce evaporation from small dams up to 30 percent, extending water availability during dry spells[4].

Farm aesthetics

Enhanced dams become attractive features on the property. Many landholders value them as spaces for family enjoyment and wildlife watching.

Research led by ANU Sustainable Farms shows enhanced dams function best when planned as part of a connected farm landscape. This dam can be treated as a small wetland within that landscape, and sits close to existing native vegetation where farm dam enhancement principles will be applied to strengthen connections over time.

4 Hipsey M, Sivapalan M, Clement T. (2004) A numerical and field investigation of surface heat fluxes from small wind-sheltered waterbodies in semi-arid Western Australia. Environmental Fluid Mechanics, 4(1), 79-106.

HOW TO ENHANCE A FARM DAM

These steps follow ANU Sustainable Farms guidance but are adapted for Tasmanian conditions.

1 Manage livestock access

Fence dams to restrict stock access and install alternative watering points. This reduces erosion and contamination and allows groundcover to recover, improving water quality.

2 Provide alternative stock water points

Reticulate water to troughs where possible. Alternatively, install a controlled stock access point with a hardened surface to limit erosion.

3 Allow vegetation to return

Exclude stock to enable natural regeneration. Planting native species can speed up recovery and increase habitat value.

4 Shape edges and create variable depths

Shallow edges help filter inflows, while deeper areas store cooler water for longer.

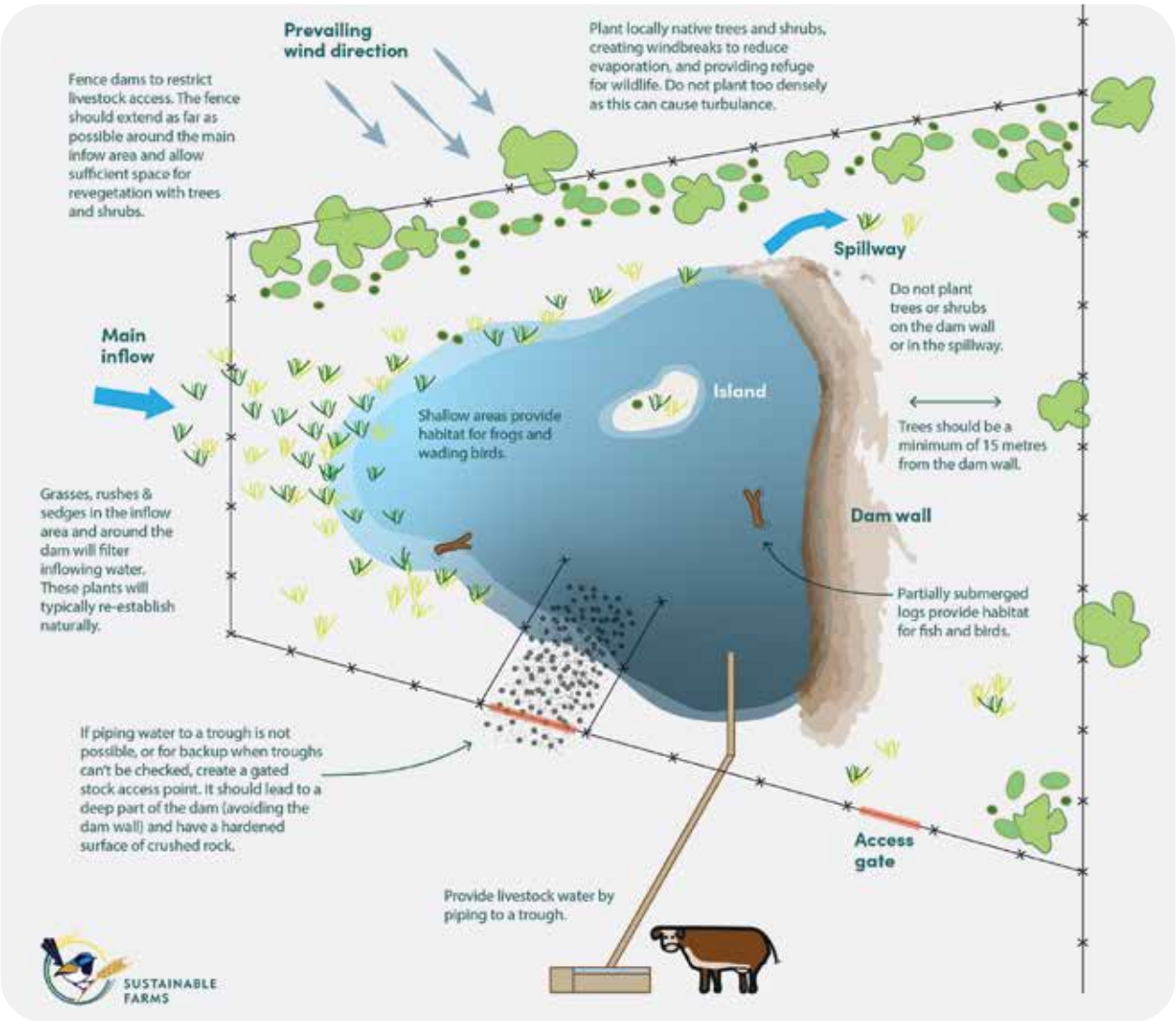
5 Add structure

Logs, branches or small islands provide habitat for frogs, fish and waterbirds.

6 Monitor and maintain

Check fences, manage weeds and observe water clarity. Water quality often improves early, with vegetation benefits increasing over time.

Below image: An enhanced farm dam with different zones and vegetation types to provide benefits to biodiversity, water quality and dam functionality.[5]



5 Image provided by Sustainable Farms, Australian National University.

TASMANIAN STORIES: FARM DAM ENHANCEMENT

Tasmanian farmers are enhancing their dams for many reasons; from improving water quality and protecting dam walls, to supporting native wildlife and reducing evaporation. Below are stories on what farmers are doing across the state, and why they chose to start their farm dam enhancement journey.

Farm dam at North Motton. *Photo credit: Landcare Tasmania.*

David Black is enhancing the dam on his North Motton property through Landcare Tasmania's Catchment Connect project. Works include livestock exclusion fencing and planting native species to improve biodiversity and reduce evaporation.[6]

> **By excluding livestock from the dam area and installing alternative water points in the adjacent paddocks, we can prevent erosion and maintain integrity of the dam wall. This prevents the need for remedial earthworks down the track and maintains water quality for our resident platypus.**
> – DAVID BLACK, NORTH MOTTON

Knowles Kerry in front of his enhanced farm dam in Richmond. *Photo credit: Karen Brown.*

Knowles Kerry inherited a 90-megalitre dam on the property he and his wife Liz bought in the Coal Valley almost 40 years ago. The couple immediately set about fencing off the dam to keep cattle out, and creating shelter belts nearby because they considered protecting the dam essential to developing the property. Knowles said enhancing the dam improved 'everything, including the quality of the water that's in it.'

> **The result, as you can see, is fantastic. It's beautiful, it's beautifully sited, and for me, as a lover of wildlife, it's fantastic to see the birds that it attracts here.**
>
> **I would certainly recommend to any farmer to look after their water - fence it off if you can, let the natural vegetation gather around it and get the wildlife coming in.**
> – KNOWLES KERRY, RICHMOND

Natalie Kimber's farm dam, Preston. *Photo credit: Landcare Tasmania.*

Natalie Kimber is undertaking farm dam enhancement works including livestock exclusion fencing, installation of off-dam water infrastructure and planting native tubestock around the dam to improve water quality and reduce evaporation on her beef farm in Preston. These works are being undertaken through the Catchment Connect project[7].

> **I think fencing off dams and providing off-stream watering points is a real win-win. It helps reduce siltation of your dam, improves habitat for native wildlife and at the same time it increases livestock production by providing cleaner, better quality water.** – NATALIE KIMBER, PRESTON

6 & 7 The Catchment Connect project is supported by the Australian Government's Future Drought Fund, in partnership with the Tasmanian Landcare Fund. This project received funding from the Australian Government's Future Drought Fund.

TASMANIA'S ROLE IN NATIONAL RESEARCH

Across Australia, new research is measuring how enhanced dams perform and why they work so well. ANU's Sustainable Farms team has developed clear farm dam enhancement principles, supported by more than ten years of research comparing enhanced and traditional dams. Their work provides the scientific foundation for the recommended practices used in this guide.

Tasmania's contribution

In Tasmania, Landcare Tasmania is working with the Grower Group Alliance through the Ripple Effect project to monitor selected enhanced dams. This work focuses on collecting local data on water quality, biodiversity and greenhouse gas emissions before and after enhancement.

Data from Tasmanian sites contributes to broader national research efforts led by multiple universities and research organisations.

Current research activities across Australia include:

- Greenhouse gas monitoring using RMIT Blue Carbon Lab Pondi sensors
- Acoustic monitoring of wildlife activity by ANU Sustainable Farms using Audiomoths
- Water quality and livestock productivity research led by the University of Adelaide
- Water storage and evaporation research by the University of Southern Queensland
- Farm dam design improvements through the WaterSmart Dams platform led by the University of Western Australia
- Ongoing ANU Sustainable Farms research into biodiversity and water quality outcomes from farm dam enhancement

Together, this collective research is building a strong evidence base to support best-practice farm dam management, informed by both national research and Tasmanian field data.

Farm dam enhancement is complemented by connecting and rehabilitating vegetation in a catchment, such as this dam in Gunns Plains, which connects to the Leven River riparian area. *Photo credit: Landcare Tasmania.*

PLANNING FARM DAM ENHANCEMENT IN TASMANIA

Good planning supports better outcomes — at any stage.

In Tasmania, considering farm dam enhancement early in the design or approval process can make it cheaper and easier to include features that improve water quality, stability and farm resilience.

Just as importantly, existing dams can still be enhanced. Many improvements — such as fencing, revegetation, reshaping edges and managing stock access — can be planned and staged over time.

Tasmanian farm dams operate in landscapes and regulatory settings that differ from much of mainland Australia. These conditions influence how and when enhancement works are best planned.

Stream-fed and connected dams

Many Tasmanian dams are built on natural watercourses. Enhancement can affect flows, aquatic species and downstream values, and may trigger higher-risk categories under the *Water Management Act 1999* (*https://nre.tas.gov.au/water/dams*), Department of Natural Resources and Environment Tasmania and Dam Works Assessment Decision Framework (*https://nre.tas.gov.au/water/dams/dam-works-assessment-decision-framework*) Department of Natural Resources and Environment Tasmania.

Permits, approvals and water use

Most new or enlarged dams require a Dam Works Permit, usually supported by a dam design report from a qualified engineer.

Where enhancement features are included early — such as gentler batters, stock exclusion or vegetation zones — designs are often more flexible.

Where dams are already in place, understanding approvals early helps identify what improvements are feasible.[8]

Local conditions matter

From the dry Midlands to high-rainfall and coastal regions, local conditions influence erosion risk, vegetation choice, turbidity and timing. Enhancement approaches should be tailored to place.

In Tasmania, thoughtful planning helps farm dam enhancement work better — whether you're starting from scratch or improving an existing dam.

If you're unsure where to begin, see our Resources and Support section for contacts and where to find more information.

Image left: Local advice and site mapping can help identify practical farm dam enhancement options.

8 https://nre.tas.gov.au/water/water-licences/water-licensing-faqs, Water Licensing - FAQs, Deparment of Natural Resources and Environment Tasmaina.

RESOURCES AND SUPPORT

Across Tasmania, Landcare Tasmania, the TAS Farm Innovation Hub and ANU's Sustainable Farms team have partnered to help landholders enhance farm dams for cleaner water, healthier stock and thriving wildlife. Through train-the-trainer workshops and field days, many people across NRM regions, Tasmanian Irrigation, Inland Fisheries, local councils and community Landcare groups are now equipped to help you get started.

Key resources

ANU Sustainable Farms – Enhance Farm Dams

A practical guide covering dam design, water planning, improving water quality, reducing water loss and supporting biodiversity.

Catchment Connect – Enhancing Farm Dams for Climate Resilience

Tasmanian examples, local context and project learnings.

Farm Dam Enhancement Revegetation Plant Species List

Tasmanian native species suited to dam edges and wetland zones.

Further information

ANU Sustainable Farms

sustainablefarms.org.au

TAS Farm Innovation Hub

Funding opportunities, events and practical support helping farmers build climate resilience.
tasfarmhub.com.au

- *Decision making for on-farm water storage*
- *Planning new on-farm water storage*

WaterSmart Dams

Water Evaluation Platform (University of Western Australia)Tools for estimating dam performance and planning dam design.
waterevaluationplatform.app/dam

Blue Carbon Lab (RMIT)

Research on how enhanced dams can reduce greenhouse gas emissions.
bluecarbonlab.org

Tasmanian Irrigation

tasmanianirrigation.com.au

Regional Water Management Officers (NRE Tasmania)

For dam permits, water licensing and guidance on what approvals apply to your dam.

1300 368 550
Water.Enquiries@nre.tas.gov.au

NRE Tas – Dam Works:
nre.tas.gov.au/water/dams

NRE Tas – Dam Works Assessment Decision Framework:
nre.tas.gov.au/water/dams/dam-works-assessment-decision-framework

NRE Tas – Water Licences FAQ:
nre.tas.gov.au/water/water-licences/water-licensing-faqs

Landcare Tasmania

Visit the Landcare Tasmania Reading Room on our website for local support, advice and connections to trained practitioners including:

- Tasmanian Irrigation
- NRM South
- NRM North
- NRM Cradle Coast

landcaretas.org.au/landcare-on-farms

Keep informed – sign up for our newsletter:
landcaretas.org.au/join

TASMANIAN NATIVE PLANT SPECIES FOR FARM DAM ENHANCEMENT

Selecting the right native plants helps stabilise banks, filter runoff, improve water quality and create habitat for wildlife. Use this list to choose species suited to each planting zone around your dam.

How to use this list

- Match species to the part of your dam: inflow, spillway, margins, shallow water, deep water, or dam wall
- Use local provenance plants whenever possible
- Combine species that occur naturally together
- For the full detailed table including provenance, plant communities and nursery options, *scan the QR code:*

Pondweed (*Potamogeton spp.*)

Shallow water or margins

(Plants that tolerate standing water or very wet soils at the dam edge)

- *Baumea arthrophylla* – Fine twig-sedge
- *Baumea juncea* – Bare twig-sedge
- *Bolboschoenus caldwellii* – Marsh club-rush
- *Carex appressa* – Tall sedge
- *Carex gaudichaudiana* – Fen sedge
- *Centella cordifolia* – Swamp pennywort
- *Chorizandra australis* – Southern bristle sedge
- *Elatine gratioloides* – Waterwort
- *Eleocharis acuta* – Common spike-sedge
- *Eleocharis pusilla* – Dwarf spike-rush
- *Eleocharis sphacelata* – Tall spike-sedge
- *Ficinia nodosa* – Knobby club-rush
- *Gahnia filum* – Chaffy saw-sedge
- *Gahnia grandis* – Cutting grass
- *Gahnia trifida* – Coast saw-sedge
- *Gunnera cordifolia* – Tasmanian mudleaf
- *Isolepis cernua* – Low bulrush
- *Isolepis fluitans* – Floating club-sedge
- *Isolepis inundata* – Swamp club-rush
- *Juncus kraussii* – Sea rush
- *Juncus procerus* – Tall rush
- *Lepidosperma longitudinale* – Pithy sword-sedge
- *Leptocarpus tenax* – Slender twine-rush
- *Lilaeopsis polyantha* – Jointed swamp-stalks
- *Melaleuca ericifolia* – Swamp paperbark
- *Mimulus (Thyridia) repens* – Creeping monkeyflower
- *Myriophyllum variifolium* – Variable water-milfoil
- *Phragmites australis* – Southern reed
- *Potamogeton spp.* – Pondweed
- *Ranunculus amphitrichus* – River buttercup
- *Schoenus fluitans* – Floating bog-sedge
- *Schoenus nitens* – Shiny bog-sedge
- *Schoenus tesquorum* – Soft bog-sedge
- *Selliera radicans* – Swampweed
- *Triglochin procera* – Water-ribbons
- *Villarsia/Ornduffia reniformis* – Running marsh-flower

Inflow, spillway or damp edges

(Species that tolerate periodic wetting, inflowing water, or damp/soft soils)

- *Carex appressa* – Tall sedge
- *Centrolepis fascicularis*
- *Eleocharis acuta* – Common spike-sedge
- *Eleocharis pusilla* – Dwarf spike-rush
- *Ficinia nodosa* – Knobby club-rush
- *Isolepis cernua* – Low bulrush
- *Isolepis fluitans* – Floating club-sedge
- *Isolepis inundata* – Swamp club-rush
- *Juncus amabilis* – Graceful rush
- *Juncus floridus* – Flooded rush
- *Juncus gregiflorus* – Clustered rush
- *Juncus kraussii* – Sea rush
- *Juncus procerus* – Tall rush
- *Leptospermum lanigerum* – Woolly teatree
- *Melaleuca ericifolia* – Swamp paperbark
- *Phragmites australis* – Southern reed
- *Ranunculus amphitrichus* – River buttercup
- *Schoenus fluitans / nitens / tesquorum* – Bog sedges
- *Triglochin procera* – Water-ribbons

Margins or dam walls

(Species good for stabilising banks, reducing erosion and providing structure)

- *Lepidosperma longitudinale* – Pithy sword-sedge
- *Lobelia pedunculata* – Matted pratia
- *Selliera radicans* – Swampweed

Shallow to deep water (submerged/floating)

(For stable water levels — use only in appropriate dams)

- *Eleocharis sphacelata* – Tall spike-sedge
- *Myriophyllum variifolium* – Water-milfoil
- *Potamogeton spp.* – Pondweed
- *Triglochin procera* – Water-ribbons
- *Villarsia/Ornduffia reniformis* – Running marsh-flower

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