QUEENSLAND FIELD SCIENCE PAMPHLET (A4 METRIC)

Cane Toad Tadpole Trapping & Pond Suppression

Egg identification, UQ IMB / Watergum pheromone funnel traps, and peer-reviewed mesh-container suppression research.

1. Identify Cane Toad Eggs vs Native Frog Spawn (24 to 72h after rain)

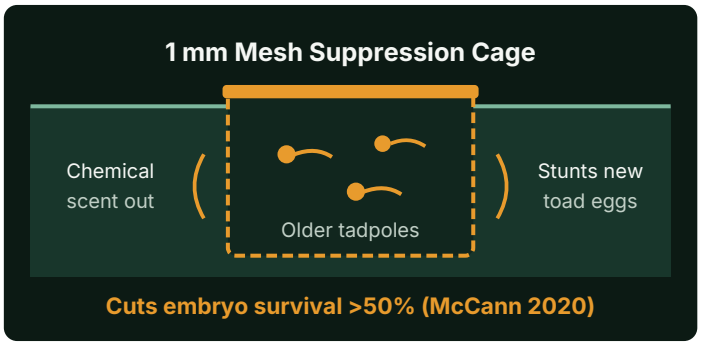
Feature	Invasive Cane Toad	Native Australian Frogs
Egg structure	Long transparent jelly ropes with double rows of jet-black beads	Floating white foam rafts, soft jelly clumps, or single scattered eggs
Tadpole appearance	Uniform jet-black body and dark belly, typically under 30 mm	Brown, olive, gold, or mottled grey; generally larger
Schooling habit	Dense swirling black schools in warm sunlit shallow edges	Swims individually or in loose scattered groups

Immediate egg action: Wearing gloves or using a fine skimmer net, lift continuous double-stranded black jelly ropes straight out of shallow pond rocks into a bucket. Wash hands thoroughly afterward, as cane toad eggs contain bufotoxins.

2. UQ Pheromone Trapping & Mesh-Container Pond Suppression



Loading a UQ pheromone lure into a Watergum tadpole funnel trap. Photo: Watergum (watergum.org)



UQ IMB / Watergum pheromone traps: Professor Rob Capon's team at the University of Queensland isolated the bufadienolide egg-scent cue that cannibalistic cane toad tadpoles track. Licensed via UniQuest to Queensland non-profit Watergum, submerged funnel traps pull thousands of cane toad tadpoles inside within hours while native Australian frog tadpoles avoid the cue.

Mesh-container suppression science: Peer-reviewed research led by Samantha McCann, Gregory Clarke, Michael Crossland, and Rick Shine found that older cane toad tadpoles continuously emit a species-specific waterborne chemical that kills or stunts newly laid cane toad embryos (>95% mortality in lab trials; less than half surviving to metamorphosis in 2020 outdoor 1 x 1 mm mesh trials) without harming native Australian frogs.

Community lure loop (South East Queensland): Watergum runs local cane toad freezer drop-off hubs where residents can donate humanely euthanised adult cane toads so their parotoid glands are recycled into fresh tadpole lures for community dams and creeks.

makespdf.com

3. Key Distinction: Egg Laying vs Egg Survival (McCann et al., 2020)

Mechanism	Free-Swimming Tadpoles	Mesh-Enclosed (1 x 1 mm)
Deters female egg laying?	Yes. Females avoid laying in ponds with free-swimming tadpoles.	No. Females still lay eggs when tadpoles are confined to cages.
Suppresses embryo survival?	Yes, via direct cannibalism and waterborne chemical cues.	Yes. Waterborne chemical cues diffuse through 1 mm mesh and kill or stunt embryos.
Dose dependence	Higher tadpole density increases suppression.	Higher tadpole density inside the mesh increases suppression.

Stopping culling rebound (McCann et al., 2019): Trapping and removing tadpoles alone lowers competition so remaining larvae grow faster and emerge larger. Pairing pheromone traps with ongoing larval chemical suppression prevents that rebound while remaining safe for native frogs (Crossland & Shine, 2017).

> **Research Status & Escape Prevention**
>
> Retaining live tadpoles in mesh containers remains an academic research finding rather than a standard local council protocol. Cane toad tadpoles metamorphose into land-dwelling toadlets in 3 to 20 weeks depending on water warmth and food. Any pond containment setup requires fine mesh (1 mm or smaller), a sealed lid extending above the waterline, and regular checks so newly transformed toadlets can never escape.

4. Humane Tadpole Euthanasia (RSPCA Two-Stage Cool-Then-Freeze)

1. Confirm every tadpole is a cane toad (tiny, uniform jet-black, dark belly) and return any native bycatch to the pond immediately.
2. Strain into a small sealed, labelled container with minimal pond water.
3. **Stage 1 (Refrigerate):** Chill at 4 C for at least 12 hours until completely motionless.
4. **Stage 2 (Freeze):** Transfer to a freezer at -18 C for at least 24 hours, then dispose of in sealed household waste.

> **Next Frontier: Peter Pan Tadpoles**
>
> Building on the same cannibalism ecology, Team Bufo researchers at Macquarie University have trialled gene-edited Peter Pan cane toad tadpoles that cannot metamorphose, allowing them to remain permanent aquatic egg-eaters in controlled ponds before trap removal.

Primary Peer-Reviewed Citations

• McCann, S., Crossland, M. R., Greenlees, M., & Shine, R. (2020). Field trials of chemical suppression of embryonic cane toads by older conspecifics. Ecology and Evolution, 10(18), 10177-10185 (PMC7520185).

• McCann, S., Crossland, M. R., & Shine, R. (2019). Pheromones can cull an invasive amphibian without releasing survivors from intraspecific competition. Ecosphere, 10(12), e02969.

• Crossland, M. R., & Shine, R. (2017). Methods for invasive species control are transferable across invaded areas. PLOS ONE, 12(11), e0187265.

• Clarke, G. S., Crossland, M. R., Shilton, C., & Shine, R. (2015). Chemical suppression of embryonic cane toads by larval conspecifics. Journal of Applied Ecology, 52(6), 1547-1557.

Watch pond egg removal footage online: toadtrap.com/au/tadpole-trapping-science/

makespdf.com