Northern Midlands Irrigation Scheme

Green And Gold Frog

HABITAT MANAGEMENT & IMPACT MITIGATION PROTOCOL

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For Tasmanian Irrigation
IDB023

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1.1.1 Key actions for green and gold frog and striped marsh frog habitat management and impact mitigation

Pre-works planning

☐ Apply for a permit to take from the Department of Natural Resources and Environment Tasmania (NRE)

Pre-clearance survey

☐ Implement site hygiene measures including cleaning of vehicles, machinery, materials, equipment, and footwear using appropriate disinfectant.

☐ Conduct a pre-clearance survey by a suitably qualified animal handler within the activity areas and relocate any frogs to the 'relocation area' prior construction activities.

☐ When handing amphibians, ensure the duration of handling is limited to minimise stress. Amphibians should be released quickly where possible and within the same site from which they were captured.

☐ When handling frogs and tadpoles, a new set of well-rinsed single use, non-powdered vinyl gloves must be used for each animal. New gloves must be used for each frog handled.

☐ Frogs are to be transported in a single use clean and dry individual container (i.e., one frog per container). A new container should be used for each animal. No containers are to be reused.

☐ Tadpoles from the same pond or stream section can be housed in a single container for a short time, but ensure tadpoles are not overcrowded.

☐ Report any sick or injured frogs to Wildlife Services. Dead amphibians or live animals showing clinical signs of chytrid disease should be collected using gloves and preserved in 70% ethanol for later investigation and disease diagnosis.

☐ Injured or sick animals may need to be euthanised by a veterinarian or experience individual under humane stipulations outlined from the permit to take.

☐ Maintain a register of up-to-date searches, including videos or photos of each capture and relocation, for inclusion on a register for permit submission.

During works

☐ Undertake inspections searches, captures and relocations as necessary prior to commencement of work each day.

☐ Ensure any roading over drainage lines must include large culverts suitable for the movement of frogs. Any pipes required for works must have their ends capped to prevent frogs becoming trapped inside.

Post-works

☐ Complete any data submission requirements to NRE associated with the permit to take.

2 BACKGROUND

Northern Midlands Irrigation Scheme (NMIS) is part of the Pipeline to Prosperity (Tranche 3) suite of schemes proposed by Tasmanian Irrigation Pty Ltd (TI). The scheme covers the regions of Cressy, Powranna, Barton, Conara, Epping Forest, the Lower Macquarie and Isis Rivers, Campbell Town, and Ross.

The pipeline alignment broadly follows the Macquarie River, with the main lines following Valleyfield and Macquarie Roads, with several additional branches distributing water along Barton Road, Mount Joy Road, Mona Vale Road, and the Isis River (Figure 1). The proposed construction corridor consists of 25.33 ha of native vegetation, and 422.46 ha of modified land (including 0.70 ha of permanent water). The construction corridor has been narrowed in places to avoid conservation significant values. The corridor is typically 30 m wide, with a 17 km section between Poatina and Quarry Rd at 40 m wide to accommodate dual pipelines.

The works proposed will require excavation along the route, as well as several aquatic crossing points. The work will occur largely through private land. Excavation in the form of trenching will occur only within the proposed construction corridor. Trenching width varies depending on the diameter of pipe required, ranging from 1 m to 5 m depending on whether it is a single trench or dual trench. The depth of the trench varies in depth, ranging from 1 m to 3.5 m, with an average depth of 1.5 m.

Where conditions permit, pipe crossings of permanent water courses will be installed using trenchless processes. This will be determined by the pipe size, type and size of rock present if any, shape and length of the crossing and other geotechnical considerations. Transient water course crossings will be conducted using a combination of trenched and trenchless processes to be selected by the construction contractor based on the time of year, presence of water, size of pipe and geotechnical considerations.

The natural values assessments undertaken for the NMIS identified that the proposed works impact habitat with the potential to support, the green and gold frog (*Litoria raniformis*), which is listed as vulnerable under both the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBCA) and the Tasmanian *Threatened Species Protection Act 1995* (TSPA).

Minor parts of the project area are within area of core range for this species (as defined on the Tasmanian Natural Values Atlas [informed by the FPA] as being all areas within 2 km of a known record from any time or place, not taking into account the accuracy of the record nor any internal habitat characteristics within the radius[1]), notably around Campbell Town and Ross (Figure 1). There have been only five observations of this species within 5 km of the alignment, the most recent occurring in 2008 on the Macquarie River near Cressy – the recent records within 5 km are essentially outliers from the northern Tasmania population (Figure 1), with the records indicating isolated individuals rather than breeding populations. All other occurrences within 5 km were recorded prior to 1975[2], consistent with the reported decline in

[1] Forest Practices Authority (2022)
[2] Tasmanian Natural Values Atlas data – as of 5 November 2022

the region[3]. The potential range is considered unlikely by NRE to extend far outside the currently known range as the species is highly conspicuous and readily detectable where present [4], which is consistent with numerous and regular incidental informal reports within online nature forums, but always within the known population range as it stands (in our experience monitoring reports in such groups – G. Daniels *pers. obs.*).

Baseline NVA surveys undertaken for the assessment of this project included dozens of hours for potential observations of the species, with the natural values assessment noting other species of frogs were recorded and that no meaningful amount of high-quality habitat for the green and gold frog was recorded as present.

Due to the requirements of the project, complete avoidance of all habitat and habitat elements is not expected to be achievable within the development footprints. Furthermore, individual frogs are mobile within their range, such that absence within habitat at a particular time doesn't preclude it from supporting individuals at another.

Subsequently, the recommendations in relation to the green and gold were:

- Due to the presence of potential habitat within the project area for the threatened green and gold frog (*Litoria raniformis*), a frog habitat management plan and impact mitigation protocol is recommended to be considered prior to the commencement of any construction works.

The requirements of the mitigation protocol (herein referred to as 'the Protocol') are outlined below. The Protocol has been prepared in accordance with the relevant management guidelines[5].

2.1 Species ecology

The green and gold frog can be found in a range of habitats, including degraded dams or ponds, however, this species is found in higher abundances in natural water bodies with vegetation structure in/around the water body[6]. Green and gold frogs are highly mobile and can move considerable distances between habitat patches. Green and gold frogs are active during the day and at night during warmer periods[7].

Green and gold frogs breed between September to January[8], and are known to breed within a wide variety of habitats, with optimal breeding habitat encompassing the shallow part of water bodies (up to approximately 1.5 m deep) where there is generally a complex vegetation structure[9].

[3] Threatened Species Section (2023c)
[4] Threatened Species Section (2023c)
[5] Department of State Growth (2015); Forest Practices Authority (2014); Threatened Species Section (2023)
[6] Forest Practices Authority (2014)
[7] Threatened Species Section (2023)
[8] Threatened Species Section (2023)
[9] Department of State Growth (2015); Forest Practices Authority (2014); Threatened Species Section (2023)

Amphibian chytrid fungus (*Batrachochytrium dendrobatidis*), is a serious and potentially lethal threat to this species. Chytrid fungus invades the surface layer of a frogs skin, causing damage to the outer keratin layer that restricts respiration and leads to significant physiological imbalances[10]. Chytrid fungus affects the green and gold frog, with the fungus considered of medium risk to this species[11]. Management considerations are therefore a crucial part of the Protocol and have been designed in accordance with the Tasmanian Government guidelines - "*Keeping it Clean – A Tasmanian Field Hygiene Manual to Prevent the Spread of Freshwater Pests and Pathogens*"[12].

2.2 Site specifics

Refuge habitat is present throughout much of the project area, particularly around log piles in paddocks, and thick vegetation along stream banks. Connectivity habitat is present throughout much of the project area, particularly in damp paddocks, drainage lines, and swales. These localised habitat traits are important within the context of broader patches of potential habitat but not recognised as being sufficient to support individuals in isolation[13].

A definition of optimal or important habitat for green and gold frogs can be derived from the broad habitat descriptions given in various guidelines, management plans, and species management profiles. As such, we have developed a habitat stratification method based on these sources to demonstrate the distribution and quality of habitat within the project area.

Potential (sub-optimal) habitat is present around the margins of the Macquarie River and smaller streams where sedges and rushes are present, as well as around wetlands even though they are seasonal and ephemeral in most cases. All wetland areas have been avoided to the maximum extent possible, with only 0.32 ha of seasonally wet lacustrine herbland (TASVEG - AHL) proposed to be impacted – this herbland occurs in a series of lentic wetlands to the west of the Campbell Town Golf Course and appears to be dry almost all of the time and constitutes very marginal habitat for the green and gold frog (Plate 1). The works can be completed in a manner than does not impact the long-term ability of the site to collect water nor support aquatic vegetation when the conditions are suitable.

Fast-flowing rivers such as the Macquarie River are largely unsuitable habitat as per the general definitions provided, but conservatively are classified as sub-optimal in our treatment due to the niche habitats that may occur at points along the river and function as potential habitat when conditions are suitable.

[10] Department of Sustainability, Environment, Water, Population and Communities (2021)
[11] Department of State Growth (2015); Forest Practices Authority (2014); Threatened Species Section (2023)
[12] Allan & Gartenstein (2010)
[13] Threatened Species Section (2023c)

Plate 1: Potential (sub-optimal - seasonal/ephemeral) wetland habitat (within an agricultural matrix) east of the Campbell Town golf course

3 PRE-WORKS PLANNING

- During the pre-construction phase, the contractor must incorporate all biodiversity objectives, including any fauna sensitive design requirements, into their Construction Environmental Management Plan (CEMP), for TI approval. The contractor shall ensure adequate training of staff on the CEMP requirements.
- Any areas identified as high-quality habitat (i.e. permanent wetlands, ponds, dams) that are in the vicinity of the proposed construction area must be buffered by a minimum of 30 m and designated as works exclusion zones. These areas must be clearly marked on the CEMP and on the ground.
- The implementation of the recommended management measures during works will require a permit applied for in advance to take threatened fauna listed under the Tasmanian *Threatened Species Protection Act 1995*. A permit can be applied for from the Conservation Assessments branch of NRE, with the standard application processing time being 28 days. If the permit is granted all of its conditions must be adhered to.
- Designate a frog 'safe zone' within existing habitat on site that will not be impacted or modified during works (e.g. the centre of the wetland where water won't be drained); the safe zone will be an area where captured frogs can be safely relocated when necessary to avoid impacts elsewhere. An ecologist should be consulted for assistance with selecting an area of appropriate size and habitat, and advice on appropriate levels of cover in and on the edges (e.g. logs, brush, relocated wetland plants) to assist frogs avoid predation.

4 HABITAT MANAGEMENT AND DIRECT IMPACT MITIGATION PROTOCOL

The protocol will be managed by TI's Ecologist with oversight from the General Manager Environment Health and Safety and project teams. The person(s) who hold these positions

must have a working knowledge of the EPBCA, TSPA, and the Tasmanian *Nature Conservation Act 2002* (NCA) and hold current permits for the capture and relocation of the green and gold frog. All personnel involved in the implementation of the Protocol will be suitably qualified and have experience in animal handling.

A. Protocol Objectives

The objectives of the Protocol are:

1. To minimise harm to the green and gold frog (*Litoria raniformis*), during clearance and construction activities; and
2. To ensure that there is no significant negative impact on the species as a result of the operational impacts associated from the developmental activity.

B. Application of the Protocol.

(i) The Protocol must be applied in its entirety to any development activity (*i.e.* the process of open ground excavation and/or the presence of heavy machinery within the habitat) within the area of potential habitat at risk.
(ii) Should any works be required in the Protocol Application Area prior to development activities, such as site mapping and exclusion fencing, a suitably qualified ecologist should be consulted over the required action and the relevant clauses of the Protocol applied to the degree necessary.
(iii) Applying the Protocol will require any frogs within the impact areas to be relocated to a new area[15], with the suggested locations being equivalent wetland habitats beyond the impact footprint, referred to as the relocation area.
(iv) Application of the Protocol involves the capture and relocation of threatened frog species, therefore, a permit to take from the Department of Natural Resources and Environment Tasmania is required.
(v) The requirements of the Protocol assumes the proponent has authority for works and to relocate fauna into the nominated relocation area, but it is the responsibility of the proponent to confirm this is the case.

C. Timing of works

The green and gold frog and its tadpoles are likely to be present in suitable waterbodies at any time of the year, but it is typically the terrestrial form is active from mid-September to March.

Given that peak frog activity coincides with the optimal season for construction activity, it is accepted that works outside of this period is not feasible, and as such, further mitigation measures must be implemented to reduce impacts to potential habitats and individuals. The following measures are proposed:

[15] Frogs will be relocated to similar habitat locally (i.e., within 200 m) as opposed to translocation to an existing known colony elsewhere, as this is not proven to be an effective strategy to date.

(i) Where possible, works should be completed between April and August in any "known" habitat locations. Known locations are defined as any area that contains records on the Tasmanian Natural Values Atlas (or other threatened fauna databases).
(ii) If heavy rain is falling, forecast to fall or has recently fallen during the previous 24 hours, measures should be taken to restrict construction works within waterways until water levels have returned to 'normal' background levels.

D. Amphibian Chytrid fungus (Batrachochytrium dendrobatidis) protocols

(iii) Prior to any personnel, equipment, materials, or machinery entering the site, actions must be taken to reduce the risk of introducing or spreading Amphibian Chytrid fungus in accordance with relevant best practice guidelines[16].
(iv) Application of hygiene protocols should occur where run off will not enter the water bodies that are at risk of contamination, with waste being appropriately disposed of.
(v) Personnel entering the development site must check and clean gear and equipment, such as footwear and hand tools, for foreign particulates, such as mud and debris, and remove them. Gear and equipment are then to be disinfected (recommended disinfectant include Phytoclean or F10 Super Concentrate[17]).
(vi) Vehicles and machinery entering the development site must be checked and cleaned for foreign particulates, such as mud and debris, and they must be removed. Vehicles and machinery are then to be disinfected (recommended disinfectant include Phytoclean or F10 Super Concentrate[18]).
(vii) Any materials entering the development site must be checked and cleaned, removing any foreign particulates, such as mud and debris. Materials are then to be disinfected (recommended disinfectant includes Phytoclean or F10 Super Concentrate[19]).
(viii) Handling and transportation of amphibians needs to be minimised as much as practicable to minimise stress and should be released where possible within the same site from which they were captured. A new set of well-rinsed single-use vinyl gloves should be worn for each animal including for both frogs and tadpoles. Cleaning of hands and handling equipment should be carried out with a disinfectant to minimise the risk of spread of Chytrid fungus.

E. Transportation of frogs prior to construction activities

The following clauses must be appropriately applied to green and gold frogs at all life stages (i.e., adults and tadpoles). NRE Tasmania needs to be engaged as a clearance survey may trigger the need for additional threatened species permits.

(i) A clearance survey is to be conducted by a suitable qualified animal handler in the activity areas, to relocate any frogs to the 'relocation area'.

[16] Allan & Gartenstein (2010); Department of Primary Industries, Parks, Water, and Environment (2015)
[17] Allan & Gartenstein (2010)
[18] Allan & Gartenstein (2010)
[19] Allan & Gartenstein (2010)

(ii) If construction is to occur through a waterbody during the breeding season for either frog species, and the environmental conditions at the time are conducive to increased frog activity (i.e., warm, and wet nights), then nocturnal searches for the species should also be made prior to construction, to maximise the chances of detecting and clearing frogs from the construction zone.

(iii) Pre-clearance surveys should occur within 7 days prior to any construction activity in a given works area.

(iv) When handling frogs and tadpoles, a new set of well-rinsed single use, non-powdered vinyl gloves must be used for each animal.

(v) Frogs are to be transported in a single use clean and dry individual container (i.e., one frog per container). A new container should be used for each animal and no containers are to be reused. The transport container must be cleaned and dried with an amphibian friendly chemical between frogs.

(vi) Tadpoles from the same pond or stream section can be housed in a single container for a short time, but ensure tadpoles are not overcrowded.

(vii) If a sick frog is found (e.g., abnormal posture or behaviour, such as hind legs stretched behind body, wobble or lack of fleeing, or skin changes such as skin discolouration, peeling or ulceration), then do not release the frog. Sightings of sick or dead frogs need to be reported to Wildlife Services on (03) 6165 4305 or email wildlife.services@nre.tas.gov.au. Dead amphibians or live animals showing clinical signs of chytrid disease should be collected using gloves and are to be preserved in a container with 70% ethanol for later investigation and disease diagnosis. Injured or sick animals may need to be euthanised under stipulations of the permit to take and should be followed using NRE's *Best Practice Guidelines for Wildlife Rehabilitation*. Euthanasia should be performed when death is imminent or highly likely and the individual is suffering chronic, unrelievable pain or distress. Ideally euthanasia should be performed by a veterinarian who can sedate the animal and then administer an intravenous overdose of barbiturate. However, in the absence of veterinarian the recommended euthanasia techniques for amphibians include blunt force trauma to the head or spinal severance[20].

(viii) A register of searches must be kept up to date, as well as videos or photos of each capture and relocation, which will also need to be recorded on a register for permit submission. The register must include the species, time/date, location, relocation area, and any additional information collected at the time of capture.

F. Relocation of frogs during construction activities

The following clauses must be completed in association with Section B, and D to ensure the appropriate relocation of frogs during the construction phase to the safe zone.

[20] Department of Primary Industries, Parks, Water and Environment (2021)

(i) Any pipes required for works must have their ends capped to prevent frogs becoming trapped inside.
(ii) Excavations should be inspected before work commences each day for frogs. If frogs are present, they are to be relocated in accordance with the procedure outlined above. Ramps must be provided within trenched areas to allow for frogs to escape without assistance.
(iii) Any roading over drainage lines must include culverts that are suitable for the movement of frogs.

G. Post construction activities protocols

(i) Complete any data submission requirements associated with the permit to take.

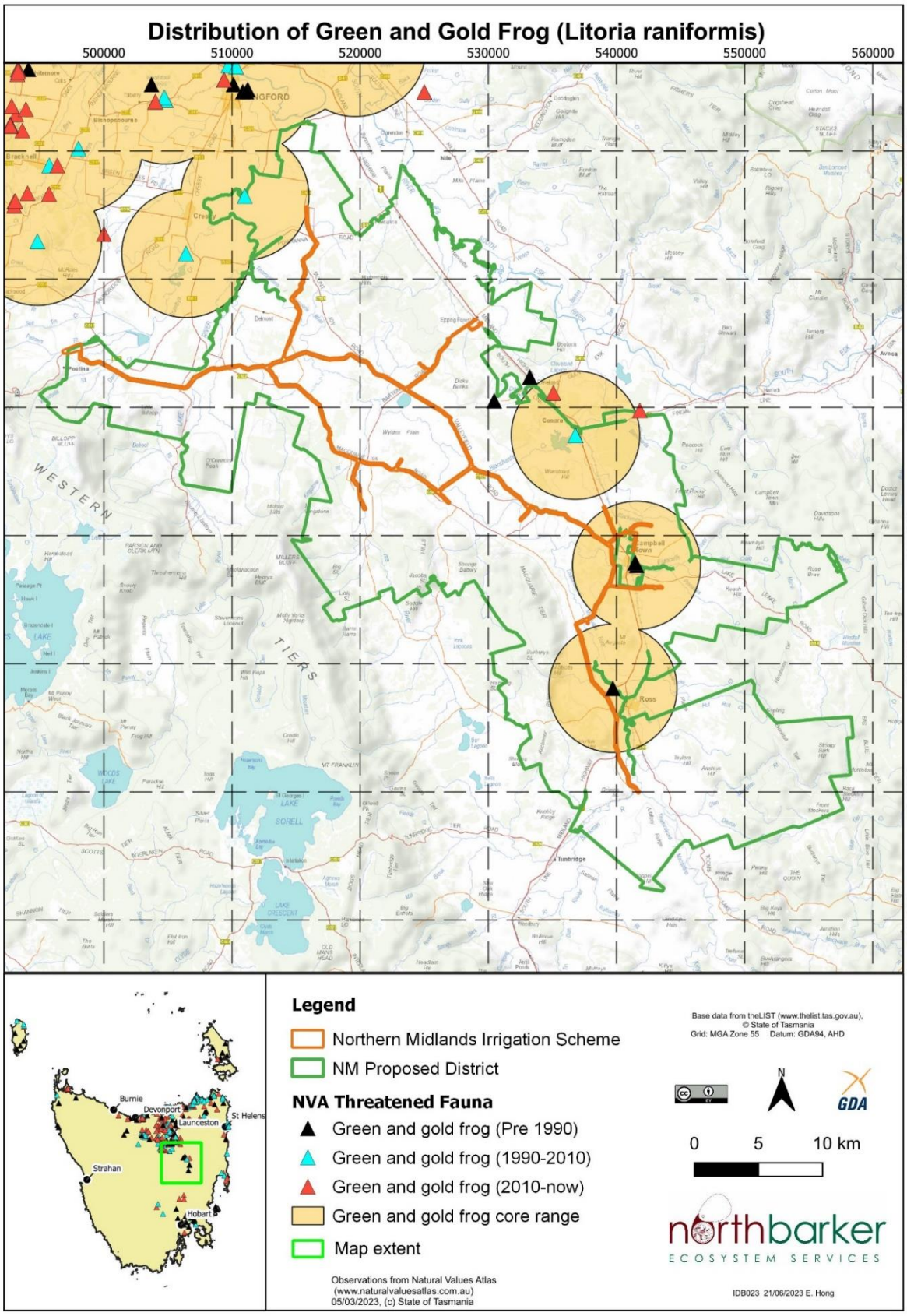

Figure 1: Distribution and core range of the green and gold frog (as defined within the Tasmanian Natural Values Atlas)

REFERENCES

Allan, K. & Gartenstein, S. (2010). Keeping it Clean - A Tasmanian field hygiene manual to prevent the spread of freshwater pests and pathogens. NRM South. ISBN: 978-1-921082-09-2.

Department of Primary Industries, Parks, Water, and Environment (2015). *Weed and Disease Planning and Hygiene Guidelines - Preventing the spread of weeds and diseases in Tasmania.* (Eds.) Karen Stewart and Michael Askey-Doran. Department of Primary Industries, Parks, Water and Environment, Hobart, Tasmania.

Department of Primary Industries, Parks, Water, and Environment (2021). Best practice guidelines for wildlife rehabilitation: Guidelines for the rehabilitation and release of injured and orphaned wildlife in Tasmania (Version 2 – July 2010). Natural and Cultural Division, Hobart, Tasmania.

Department of State Growth (2015). Green and Golden Frog (*Litoria raniformis*) Management Guidelines, report prepared by GHD.

Department of Sustainability, Environment, Water, Population and Communities (2023). CHYTRIDIOMYCOSIS (Amphibian Chytrid Fungus Disease), Australian Government, Canberra, ACT.

DPIPWE (2010). Tasmanian Chytrid Management Plan. Department of Primary Industries, Parks, Water and Environment, Hobart.

DPIPWE (2021). Best Practice Guidelines for Wildlife Rehabilitation- Guidelines for the rehabilitation and release of injured and orphaned wildlife in Tasmania, Department of Primary Industries, parks, Water and Environment, Hobart.

Forest Practices Authority (2014). Threatened frogs, Fauna Technical Note No. 18, Forest Practices Authority, Hobart, Tasmania.

Threatened Species Section (2023). Green and Gold Frog (*Litoria raniformis*): Species Management Profile for Tasmania's Threatened Species Link. https://www.threatenedspecieslink.tas.gov.au/Pages/Green-and-Gold-Frog.aspx Department of Natural Resources and Environment Tasmania. Accessed on 8/6/2023.

APPENDIX A – SIMPLIFIED PROTOCOL WITH SEARCH AND RELOCATION COMPONENTS

1. •Define extent of Protocol Application Area for all contractors (Figure 2).
2. •Outline Amphibian Chytrid Fugus mitigation strategies and procedures for all contractors and personnel entering the Protocol Application Area.
3. •Conduct pre-clearance surveys to capture and relocate green and gold frogs to designated safe zones.
4. •Construction should begin within a week 7 days of the pre-clearance survey and relocation in a given works area.
5. • Excavations must be inspected before work commences each day, and if present, they must be relocated as per the Protocol. Trenches must contain ramps to allow frogs to escape without assistance.
6. • Maintain a register of searches, including time/date, species, location data, and photos/videos for any captured frogs and their relocation area.