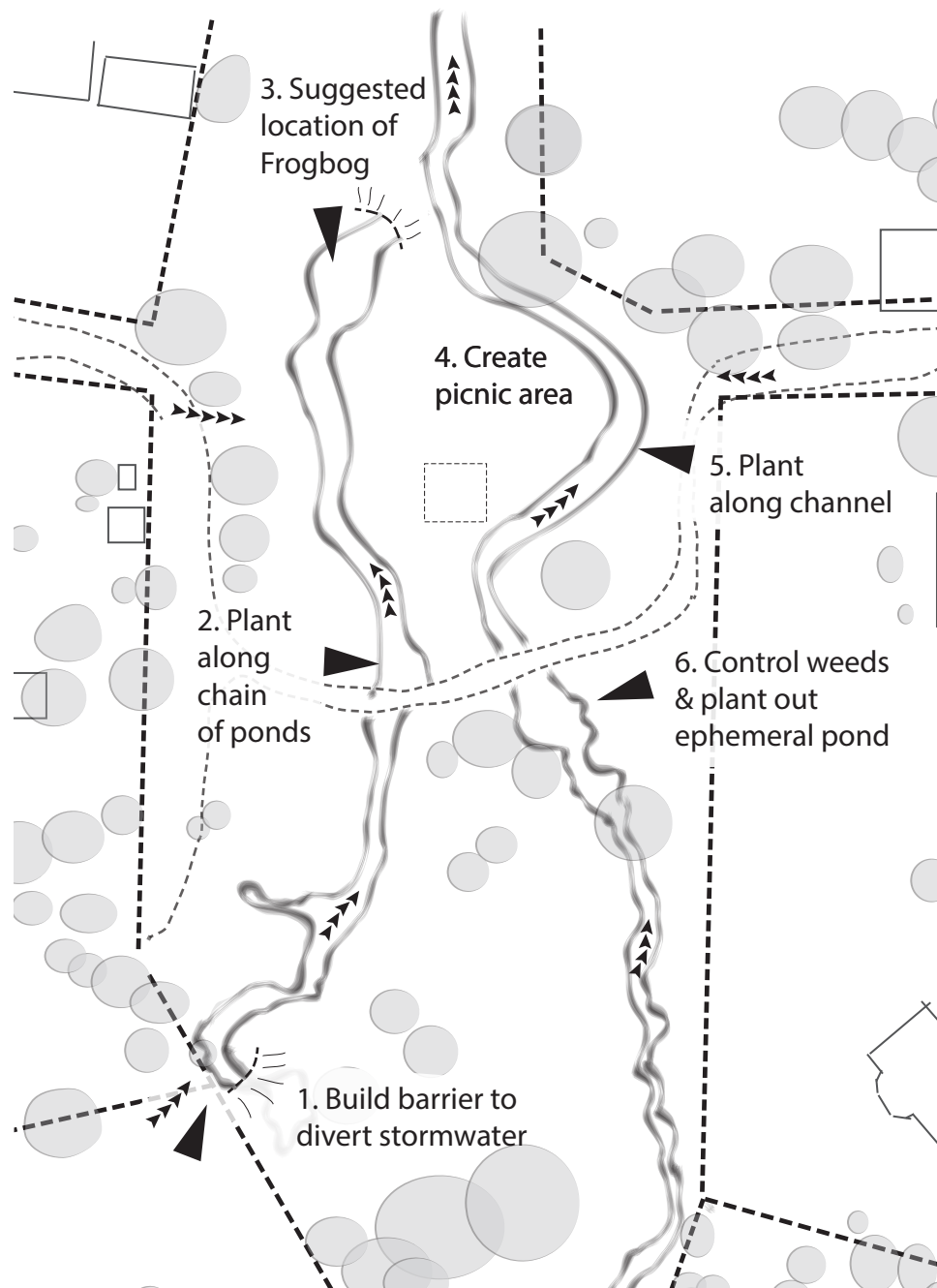
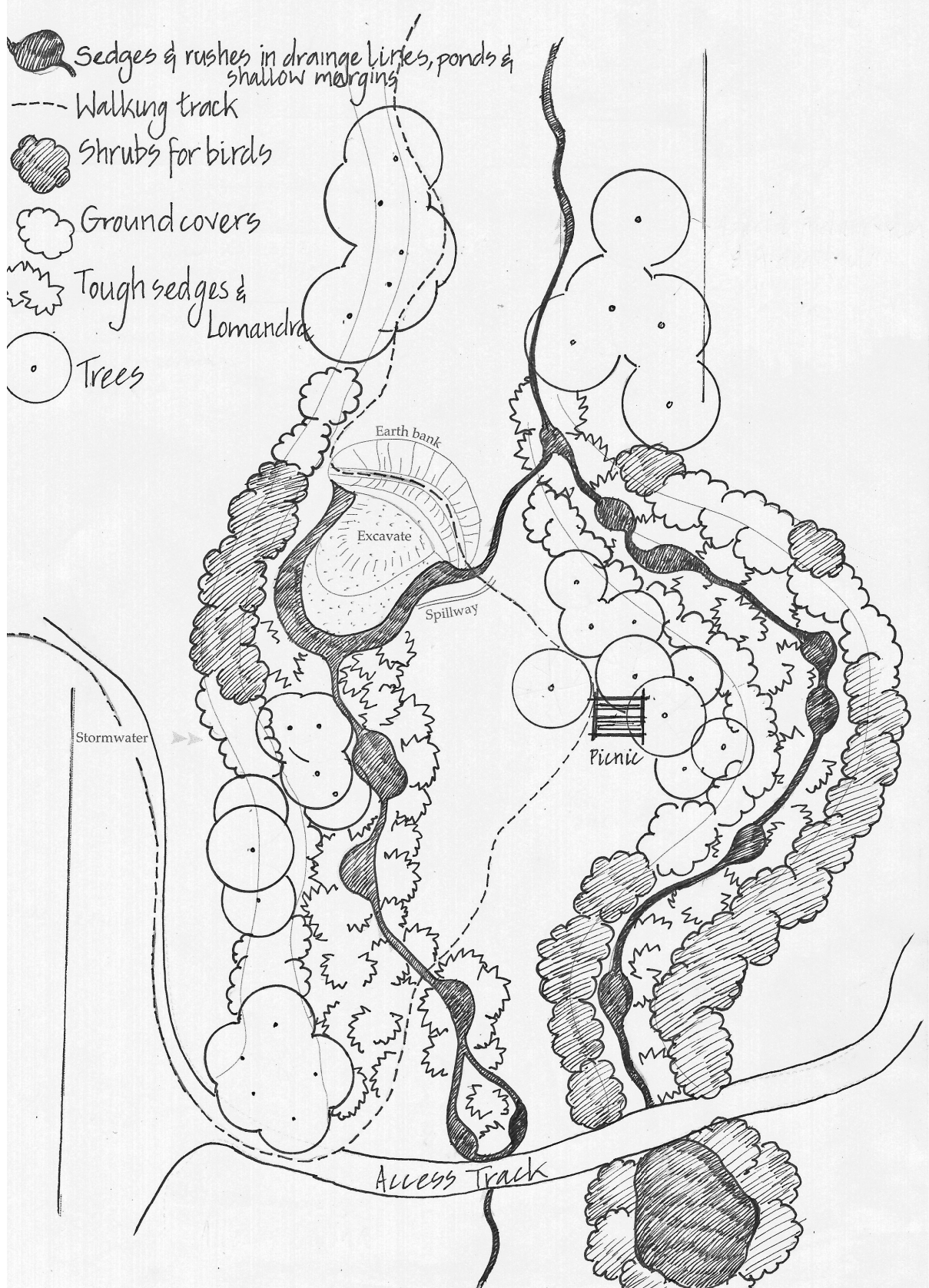


Victoria Gully ~ suggested restoration actions

1. Build earth wall to divert all stormwater runoff into eastern drainage line
2. Enhance existing chain of ponds by expanding 3-5 ponding zones (small excavations), laying jute mat to kill weeds and planting with sedges and rushes
3. Build dam wall and excavate south of wall to create a frogbog, maximum 1 m depth.
4. Create a picnic area with shady trees for amenity and habitat
5. Plant prickly shrubs along edges of drainage line for bird habitat
6. Restore weedy ephemeral pond – control weeds and plant indigenous sedges and rushes



Victoria Gully ~ restoration concept plan



Frog bog ~ design considerations

Habitat creation

Create plenty of habitat variation by constructing a range of water depths and varying the shape of the perimeter (ie by increasing bank length); add logs and rocks.

Maximise shallow zones (0 - 500 mm deep) as these are where most aquatic plants grow and they provide important frog habitat. Because the shallow zones evaporate fast, also create deep zones (500-1,000 mm) where large volume of the dam is. The deep zone extends the inundation period, providing an important refuge for tadpole while the pond dries and increasing chance of tadpoles surviving to the frog stage. Create damp zones for terrestrial edge plants that can cope with inundation for >2 weeks such as sedges and rushes.

Green infrastructure

Reduce evaporation of the frog bog through strategic planting of sedges, rushes and shrubs to create shade and to protect the water body from drying winds. Shady areas neighbouring the pond, especially around the picnic area will encourage the local community to use the gully in summer. Don't create deep shade from trees over the pond as frogs need sun to control chytrid fungus.

Management

Maximise chance of plantings thriving through weed control, prevention of kangaroo browsing, locating plantings in zones that are sinks for water rather than run-off zones; minimise fire risk by reducing continuous cover of different vegetation strata, both vertically and horizontally.

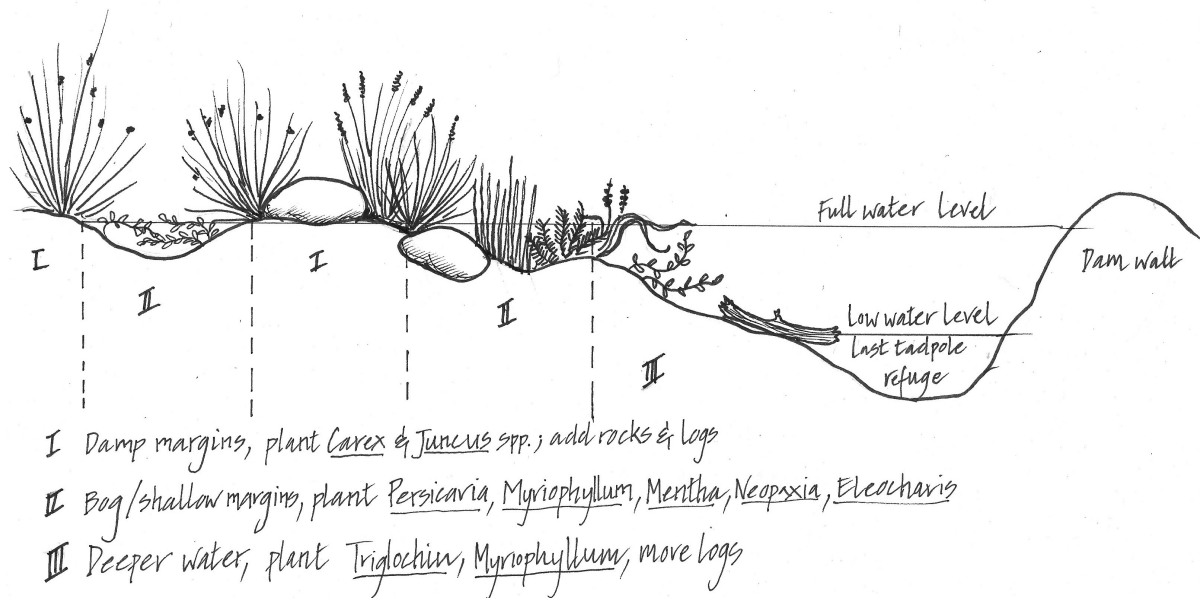
Size

A frog bog can be any size if it has plenty of shallow and boggy areas for habitat plantings and a deep zone for extending inundation period (to increase tadpoles chance of reaching the frog stage). The size of the Victoria Gully frog bog is constrained by the surrounding landscape and the desire to minimise earth works. It also must be small enough that we can use a pond liner if the soil is too permeable and small enough to fill in a flash rainfall event (~20 mm rain). Final size and shape of the frogbog will be decided with the contractor during construction, but it won't exceed 1 m in depth and I visualise will be ~5 wide and ~10 m long.

Dam build

Employ a qualified contractor to ensure dam wall and spillway are built to a high standard and will remain stable, even in big rains. Ensure dam edges are flatter than a gradient of 1:5 to prevent edge erosion. Check for stability of clays used in construction and check permeability – may need to use plastic if soils are not impermeable.

Frog bog planting profile



Suggested plantings*

- In **drainage lines and margins of ponds** plant sedges, rushes and grasses that can cope with >2 weeks inundation as well as prolonged dry periods. Species include *Carex tereticaulis*, *C. appressa*, *Juncus amabilis*, *J. remotiflorus*, *J. flavidus*, *Poa labillardierii* and *Amphibromus* sp. Plant these species in Spring.
- In **boggy areas and shallow margins** plant with *Neopaxia* sp. for a carpet of white flowers in spring, *Persicaria prostrata* (Creeping Knotweed) and *Mentha satureioides* (Native Pennyroyal) and *Eleocharis* spp. (Spike-rush)
- Plant *Myriophyllum* (Milfoil) and *Triglochin* spp. (Water Ribbons) in **deeper areas**. *Triglochin* tubers survive being dried out for years.
- **Surrounding the drainage lines** plant *Lomandra longifolia* (Spiny-head Mat-rush) and *Dianella admixta* (Black Anther Flax-lily) for ground cover
- Plant prickly shrubs for birds **along gully banks**, such as *Bursaria spinosa*, *Acacia paradoxa* and *A. genistifolia*, underplanted with *Enchylaena tomentosa* (Ruby Saltbush, mat form) to suppress weeds and reduce fire hazard
- Trees to plant include *Eucalyptus nortonii* (Silver Bundy), *Eucalyptus melliodora* (Yellow Box), *Allocasuarina verticillata* (Drooping She-oak), *Acacia melanoxylon* (Black Wattle) and *A. dealbata* (Silver Wattle).

*A preliminary list, includes suggestions for aquatic and boggy zone species from Damian Cook and Karl Just

Frogs of Victoria Gully

Victoria Gully may not be able to hold standing water for long enough for many tadpole species to metamorphose into frogs, but a frogbog will provide frogs with food, shelter and damp ground to survive the dry periods.

Species	Common name	Tadpole time to metamorphosis
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Known/ likely

<i>Limnodynastes tasmaniensis</i>	Spotted Marsh Frog	3-5 months
<i>Limnodynastes dumerilii</i>	Pobblebonk	12-15 months
<i>Limnodynastes peroni</i>	Striped Marsh Frog	11-12 months
<i>Crinia signifera</i>	Common Froglet	49 days
<i>Litoria ewingii</i>	Southern Brown Tree Frog	6-7 months

Possible (in the Castlemaine area)

<i>Litoria raniformis</i>	Growling Grass Frog	3-12 months
<i>Neobatrachus sudelli</i>	Common Spadefoot Toad	4.5-7 months
<i>Pseudophryne bibroni</i>	Bibron's Toadlet	4-7 months
<i>Crinia parinsignifera</i>	Plains Froglet	79 days
<i>Litoria vereauxi</i>	Whistling Tree Frog	29 days
<i>Litoria peroni</i>	Peron's Tree Frog	?