

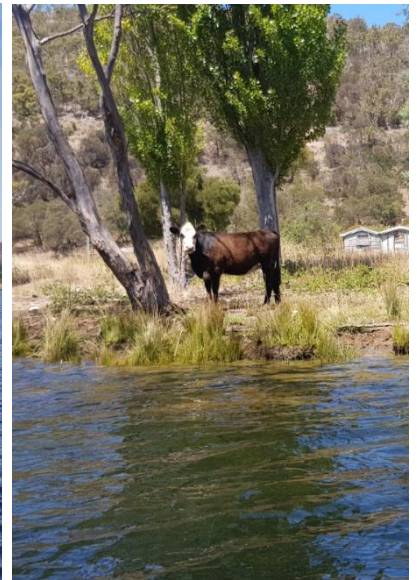
Upper estuary foreshore surveys

February 2018 + January 2019

Updated report September 2019



I. Visby



Derwent Estuary
Program

The Derwent Estuary Program (DEP) is a regional partnership between local governments, the Tasmanian State Government, businesses, scientists, and community-based groups to restore and promote our estuary. The DEP was established in 1999 and has been nationally recognised for excellence in coordinating initiatives to reduce water pollution, conserve habitats and species, monitor river health and promote greater use and enjoyment of the foreshore.

Our major sponsors include Brighton, Clarence, Derwent Valley, Glenorchy, Hobart and Kingborough councils, the Tasmanian State Government, TasWater, Tasmanian Ports Corporation, Norske Skog Boyer, Nyrstar Hobart Smelter and Hydro Tasmania.



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1 Background

Boat-based surveys were conducted by the Derwent Estuary Program (DEP) on 12 February 2018 and 22 January 2019, with the aim of updating DEP weed knowledge of the upper estuary of the River Derwent (between Bridgewater Bridge and Norske Skog (Figure 1-1).

This approx. 12.5 km stretch of river contains a mixture of public and private tenure, and importantly, encompasses freshwater wetlands of high conservation values (Derwent Estuary Program Conservation Action Plan, 2013). These wetlands include the Murphys Flat Conservation Area and the Dromedary Marshlands, which are large marsh complexes with significant areas of aquatic and terrestrial vegetation that are critical habitat for waterbirds and fish species (North Barker Ecosystem Services, 2008; Parks and Wildlife Service, 2010; Prahalad & Mount, 2011). The survey area contains three Threatened Native Vegetation Communities under the *Nature Conservation Act (2002)*: Wetlands; small patches of *Eucalyptus tenuiramis* forest and woodland on sediments; and *Eucalyptus ovata* forest and woodland.

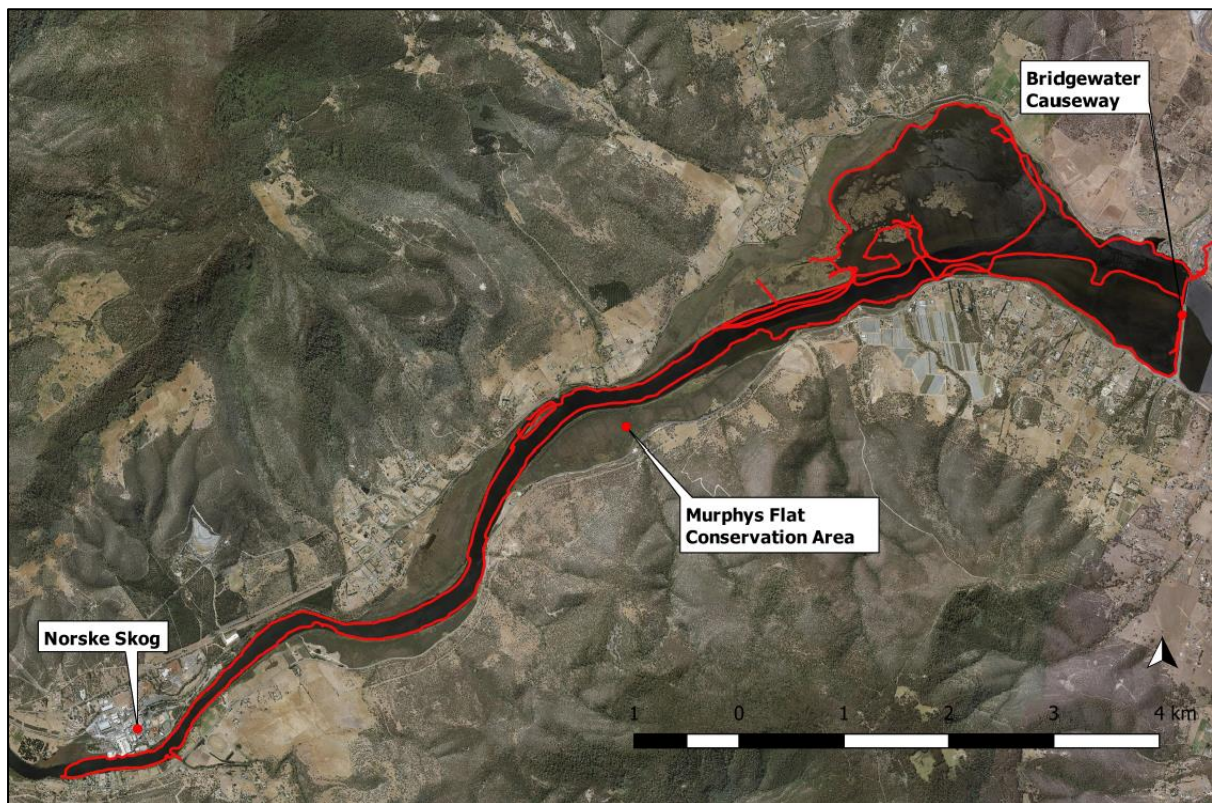


Figure 1-1. Red line shows combined track logs from boat surveys on 12 Feb 2018 and 22 Jan 2019.

The predominant aim of the survey was to obtain a comprehensive update on the weed situation in the upper estuary foreshore area, as up-to-date information was limited, and weed data on The LIST is incomplete. This aim also aligned with the recommendation from a DEP 2017 rice grass report (Visby, 2017), which suggested to conduct a yearly weed survey above Bridgewater Bridge. In addition to collecting information to inform future weed surveys and control works, it was also the intention of noting any illegal and inappropriate activities, e.g. rubbish dumps or cattle grazing in riparian areas.

The most recent, relevant surveying of this area includes: Vegetation Community and Weed Mapping in the Upper Estuary Wetlands (North Barker Ecosystem Services, 2008); a Derwent Valley Roadside Weed Management Plan (Derwent Catchment Project, 2016); and a State Growth Roadside Weed Management Action Statement for Murphys Flat (enviro-dynamics, 2018).

2 Method

The foreshore was surveyed from a small boat, manoeuvring as close to both shore banks as water levels allowed. GPS waypoints (GDA 94) were taken of individual weeds or stretches of weeds, rubbish dumps, and other points of interest. The output of this survey are GIS datasets and map layers using QGIS.

Before the survey was undertaken, the following stakeholders were informed:

Derwent Valley Council, Parks & Wildlife Services, Property Services, The Derwent Catchment Project, DPIPWE Invasive Species Section.

2.1 Survey participants

- Feb 2018: Sam Whitehead, Scientist (DEP); Akira Weller-Wong, Technical Officer (DEP); Matthew Baker, Curator of Weed Taxonomy (Tasmanian Herbarium); Inger Visby, Biodiversity Officer (DEP).
- Jan 2019: Sam Whitehead, Inger Visby.

3 Results

Forty-four species of weeds were recorded. Due to the limited vision from the boat it is possible that other species went undetected, and that there are many more individual plants present than were recorded. Overall, there were more weeds observed in the western section of the study area, towards Norske Skog and in the suburban/peri-urban areas at Bridgewater and Granton.

Four Weeds of National Significance (WoNS) were recorded (Figure 3-1, Figure 3-2):

- African Boxthorn (*Lycium ferocissimum*)
 - 50+ plants, all located in the Granton and Bridgewater area.
- Blackberry (members of the *Rubus fruticosus* aggregate)
 - 35+ infestations, mostly west of Murphys Flat and near Norske Skog.
- Gorse (*Ulex europaeus*)
 - Only observed one potential plant and was not able to confirm identification.
- Crack willow (*Salix* sp.)
 - 350+ crack willows, predominantly north and west of Murphys Flat and around Bridgewater. In addition, there were less than a dozen twisted (*Salix pendulina* var. *pendulina*) and weeping willows (*Salix matsudana* cv. 'Tortuosa'. The willows on the southern shore appeared more stressed than those on the northern shore.

Two additional declared weed species, under the *Tasmanian Weed Management Act 1999*, were recorded (Figure 3-1):

- Fennel (*Foeniculum vulgare*)
 - In 15 locations, predominantly near Granton, near the Lyell Hwy.
- Karamu (*Coprosma robusta*)
 - ~10 plants, all near Norske Skog.

All other weeds observed are also mapped (Figure 3-3). Hawthorn (*Crataegus monogyna*) was common in places. The area in front of and immediately west of Norske Skog contained numerous species of environmental weeds, including cotoneaster.

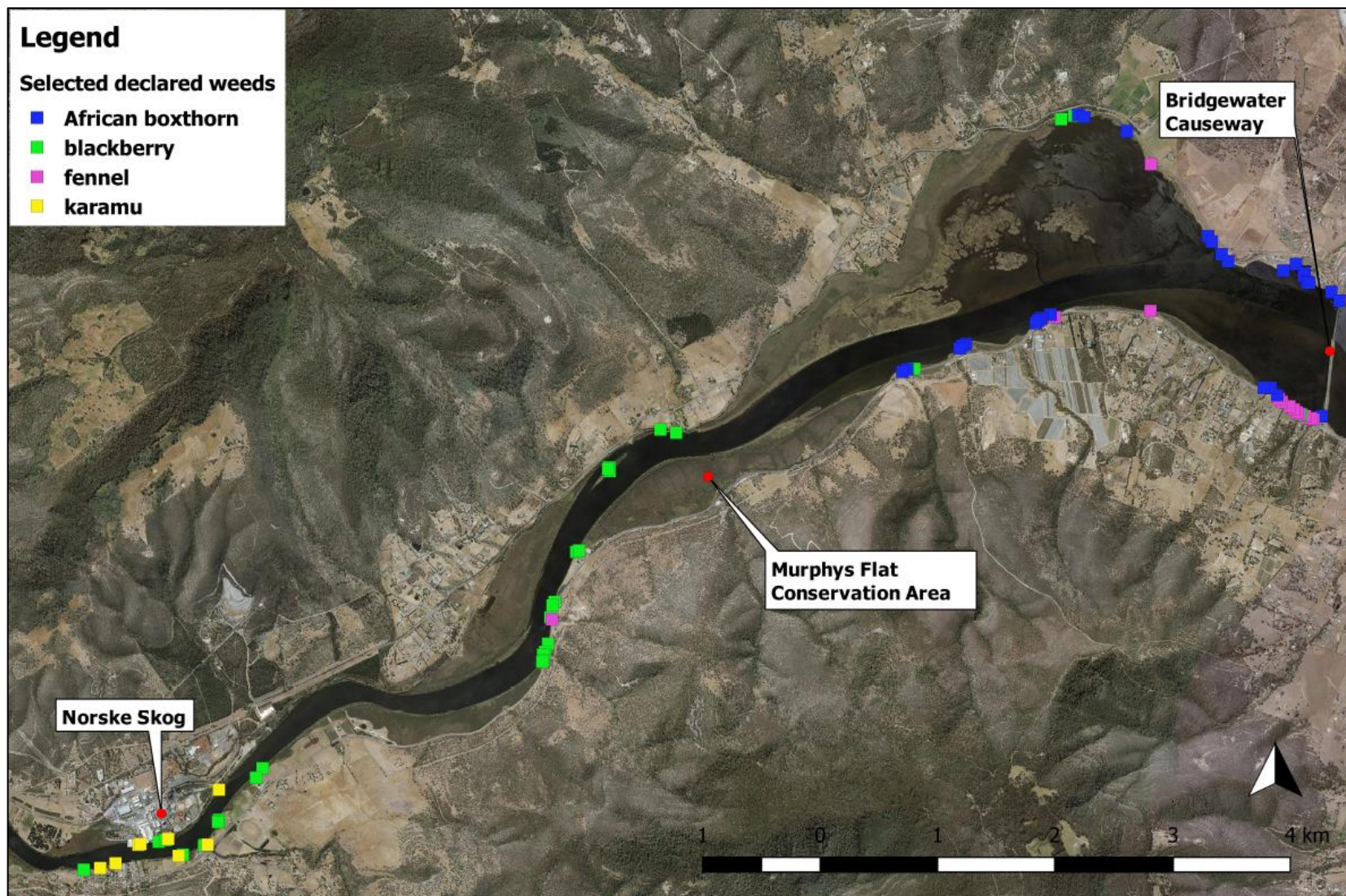


Figure 3-1. Map showing the distribution of four declared weeds: African boxthorn, blackberry, fennel and karamu, observed on 12 Feb. 2018 and 22 Jan 2019.

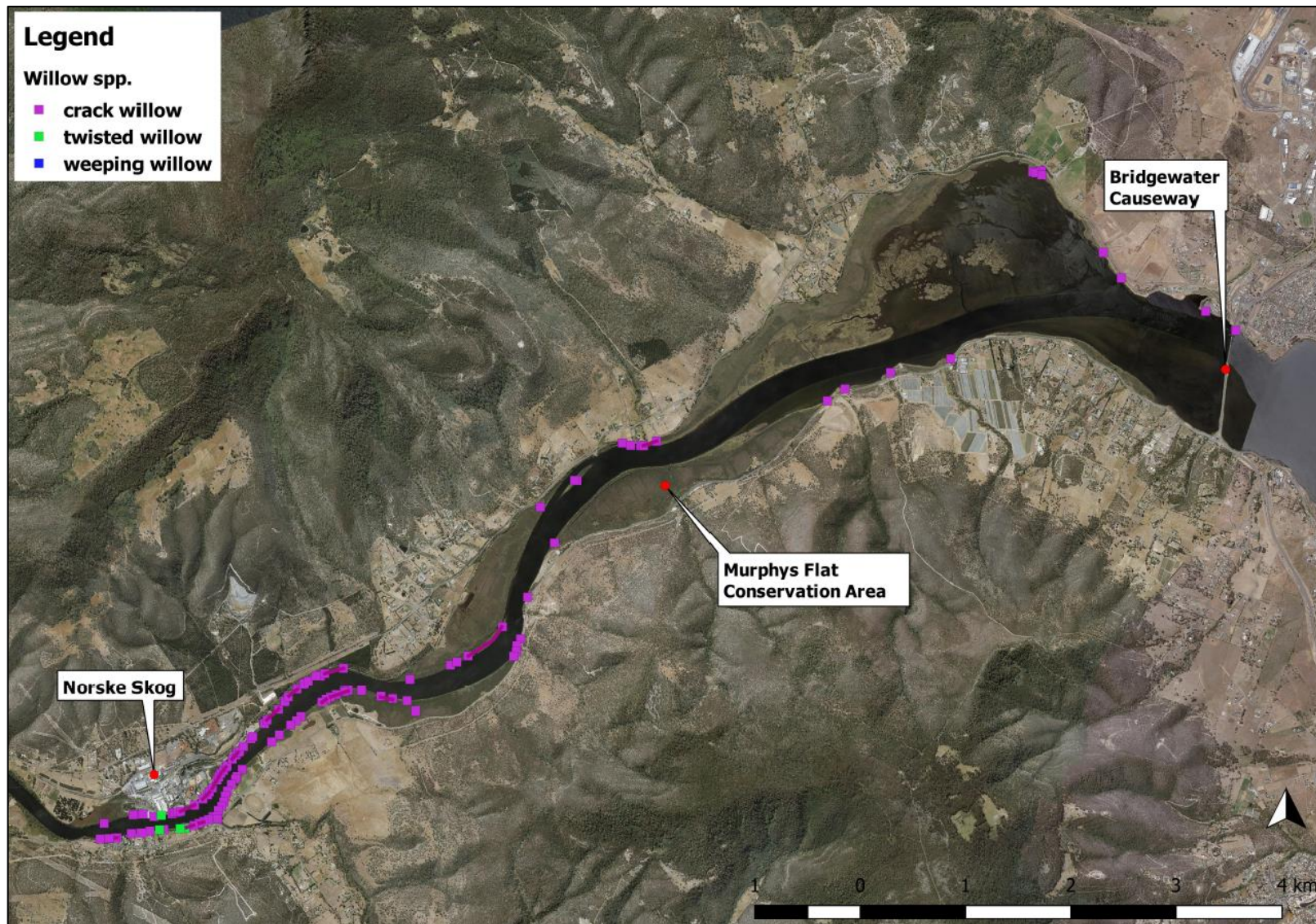


Figure 3-2. Map showing the locations where willow species were recorded. Note - weeping willows were found near the twisted willows.

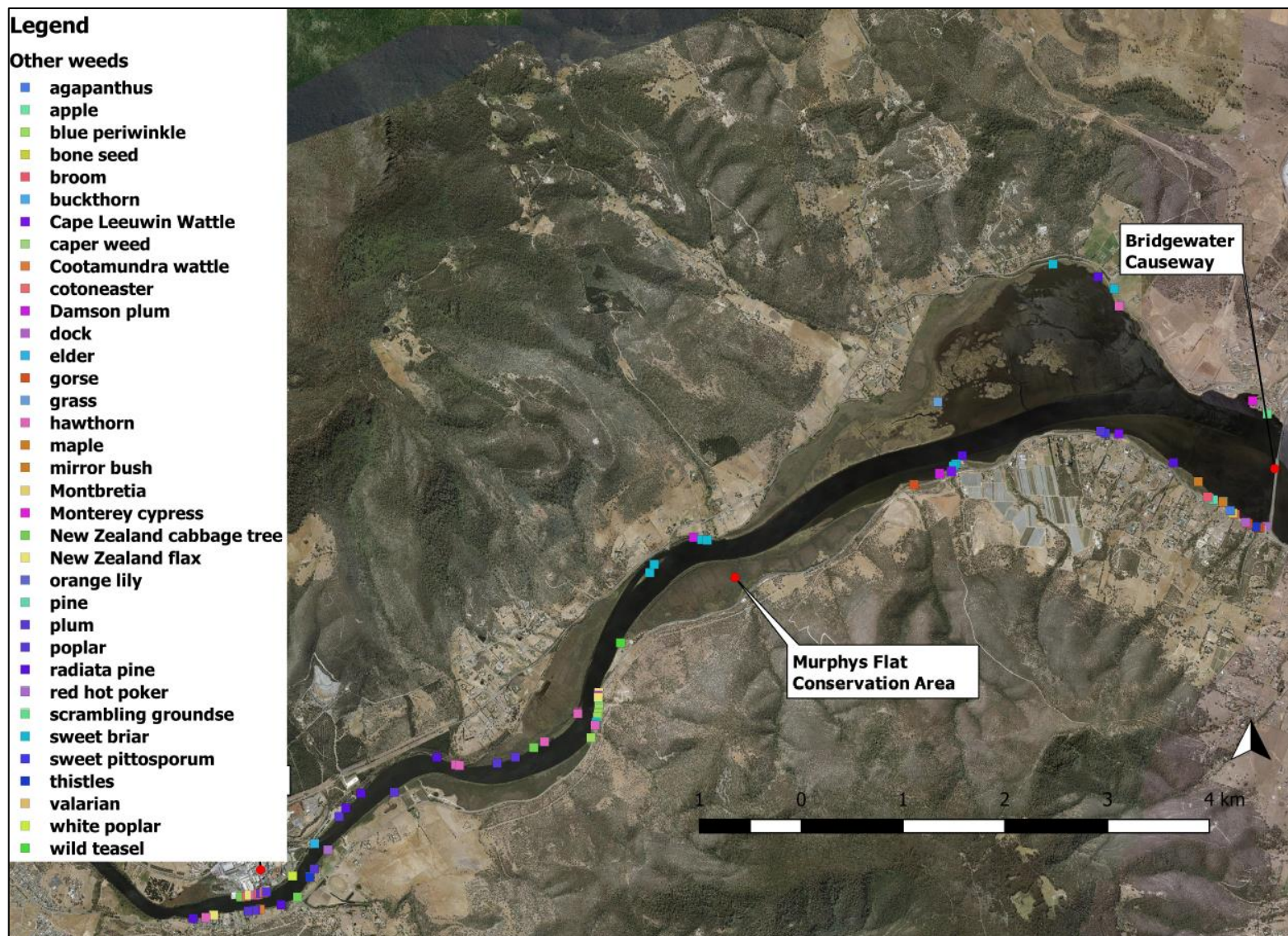


Figure 3-3. Distribution of other weed species recorded on 12 Feb 2018 and 22 Jan 2019.

4 Specific results and follow-ups

4.1 *Typha* spp.

Typha spp. occurs in large populations across the upper estuary and was sampled in nine locations (Figure 4-1). The native *Typha orientalis* and the introduced *T. latifolia* can be very difficult to distinguish (M. Baker, Tasmanian Herbarium). One specimen was sampled in Feb 2018 and subsequently confirmed (through pollen identification) to be the native *T. orientalis* (Figure 4-2).

The other locations were sampled in Jan 2019 to identify whether any of them are *T. latifolia*, which is commonly found in farm dams and along degraded waterways, including the mouth of the Lachlan River, where it can become a serious nuisance. The sample from near Norske Skog was most likely *T. latifolia*, and the other samples from around the wetlands were likely *T. orientalis*. The sampled specimens didn't contain suitable pollen, so final identification was not confirmed. Sampling specimens from the population and confirming their identity is worth pursuing in the subsequent surveys due the common occurrence of *Typha* across the valuable wetlands.

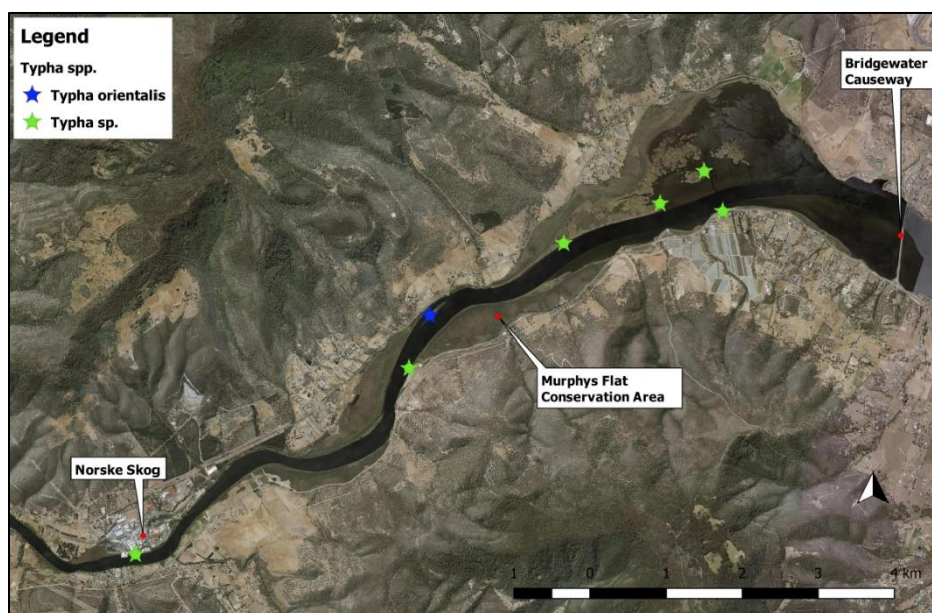


Figure 4-1. Locations where *Typha* spp. were sampled. One sample from Green Island (blue star) was confirmed as *Typha orientalis*.

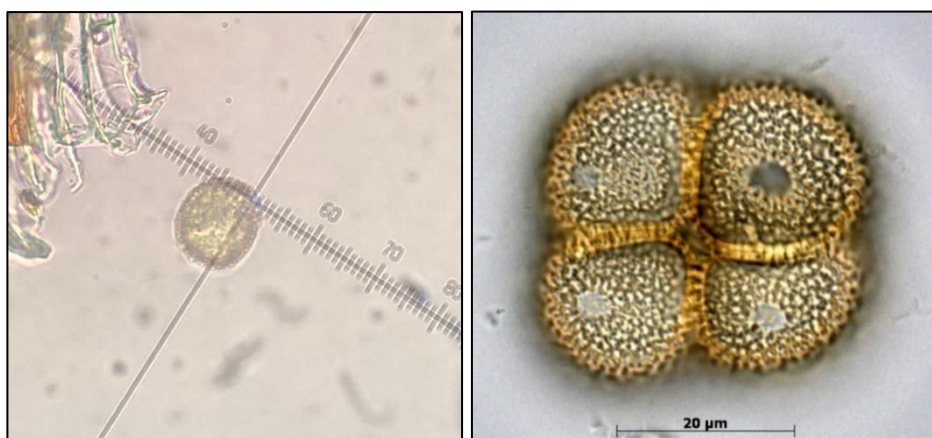


Figure 4-2. The left-hand image shows a single grained pollen, the native *Typha orientalis*. The right image shows pollen grains grouped in fours, i.e. the introduced *T. latifolia*. Images by M. Baker.

4.2 Threatened species

A small patch (1 m²) of the threatened species *Lythrum salicaria* (purple loosestrife) was discovered on the northern side of Green Island Figure 4-3). It is listed as Vulnerable in Tasmania (not federally-listed). It is predominantly found in northern Tasmania, and the closest record of this species to Green Island was from near Mt Dromedary in 1894.

See Threatened Species [Listing Statement](#).



Figure 4-3. *Lythrum salicaria* sampled on Green Island on 12 Feb 2018.

Post-survey: The identification was confirmed by Matt Baker (Tasmanian Herbarium) and has been entered into the Natural Values Atlas (NVA) through the herbarium collection.

4.3 Rubbish

Very little rubbish was observed during the survey

Figure 4-4 shows a garden waste dump at the water's edge on a private property. This has the potential for weed seeds and fragments to disperse via water movement in the estuary. It requires removing and ensuring that the site is no longer used as a dump.



Figure 4-4. Southern shore near Sorell Creek, large garden waste pile right on the water's edge, Feb 2018.

Post-survey: After arrangement with Derwent Valley Council EHO, the DEP drafted a letter to the occupant with information on introduced species and their spread, which council sent out.

4.4 Stock access to the river

At Sorell Creek three cows were observed with direct access to the river (Figure 4-5). The foreshore and surrounding vegetation were heavily trampled. The stock observed in the river at Dromedary by North Barker (North Barker Ecosystem Services, 2008) appear to have been removed.



Figure 4-5. Stock with direct access to the water, polluting the water and eroding the bank.

Post-survey: After communications with the Derwent Valley Council and the Derwent Catchment Project, the latter will be following up with the landholder, pursuing fencing or removal of stock from the river's edge.

4.5 Comparison with other surveys

4.5.1 North Barker 2008

The North Barker 2008 Vegetation Community and Weed Mapping – Upper Derwent Estuary Wetlands survey recorded declared and environmental weeds within or adjacent to the important wetlands, on foot and via car, whereas DEP recorded all observed weeds, by boat. Figure 4-6 shows North Barker weed observations in purple and DEP in blue. The different survey methods explain the differences in weed locations, and where surveys overlapped the species results were similar. Concerns mentioned by North Barker included willow, blackberry, boneseed, Montpellier broom, cape ivy, blue periwinkle (individual species maps are available upon request).

Willows are of great concern, as they are capable of spreading into the wetlands (North Barker Ecosystem Services, 2008). Figure 4-7 shows the combined willow observations of North Barker and the DEP surveys, indicating the significant presence of willows around and close to the valuable wetlands, as well as large numbers in the western end of the survey site.

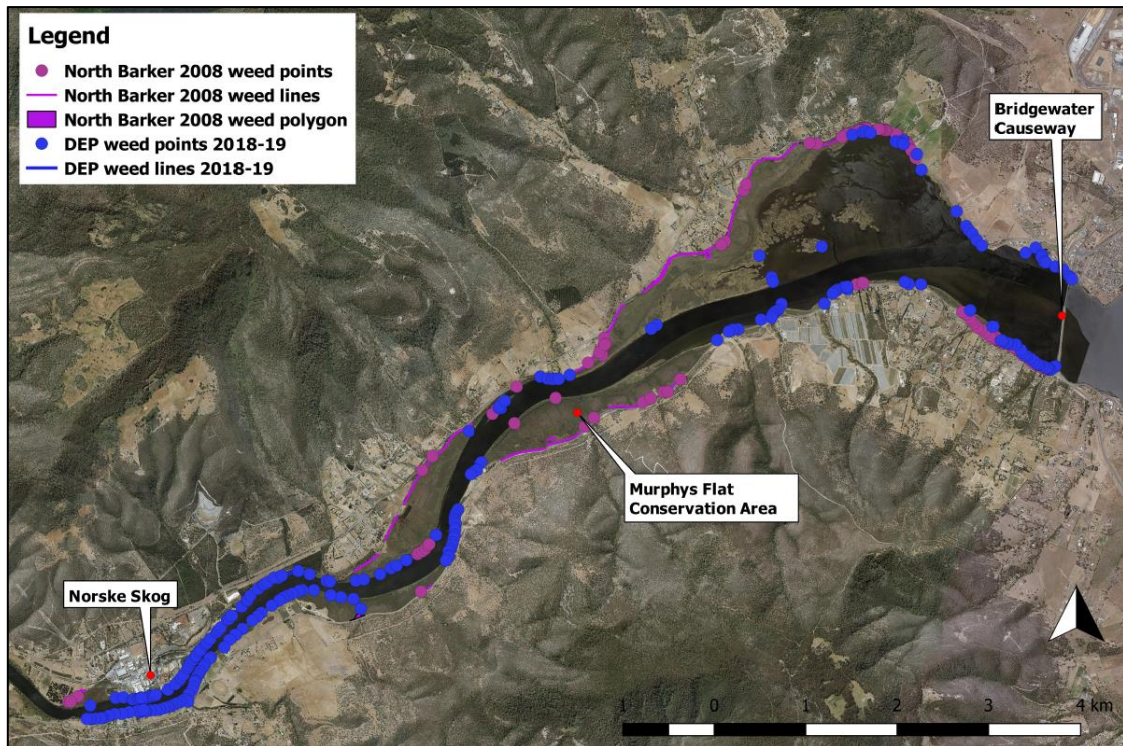


Figure 4-6. Locations where weeds were observed by North Barker 2008 and DEP 2018-19.

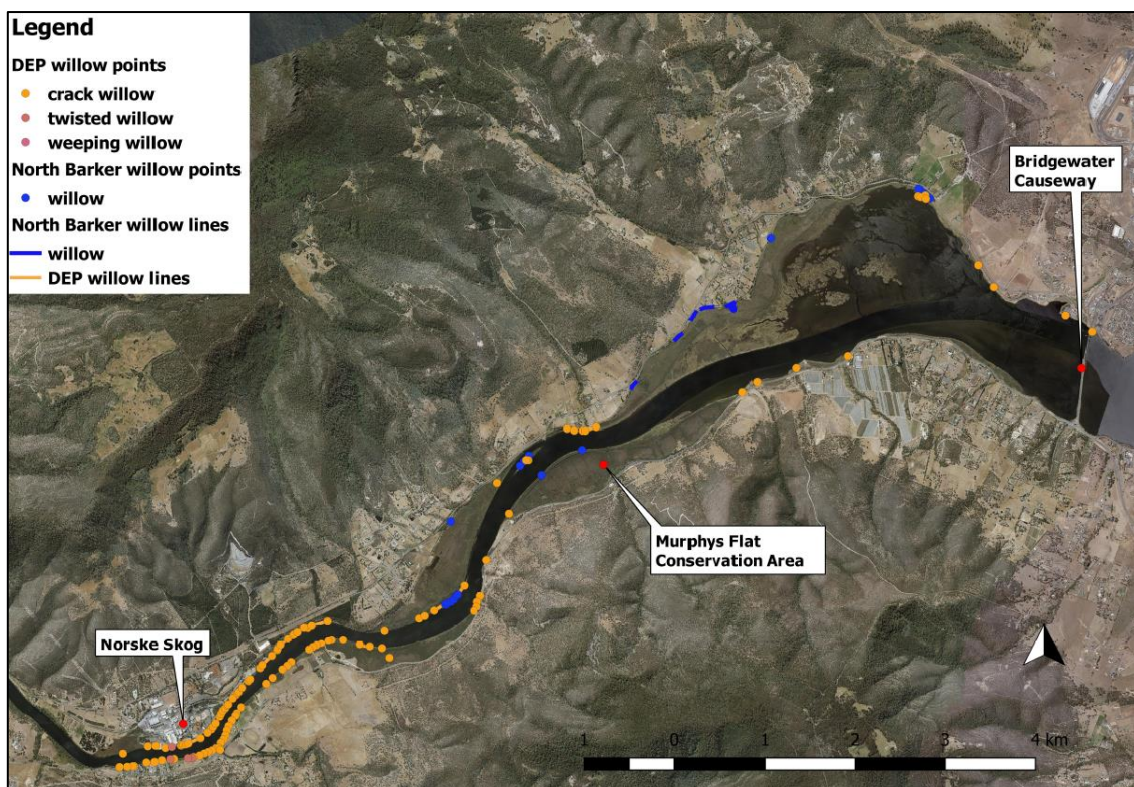


Figure 4-7. Combined willow observations by North Barker 2008 and DEP 2018-19.

4.5.2 Murphys Flat

The State Growth Roadside Weed Management Action Statement – Murphys Flat Conservation Area 2018-2022 states: “Most weeds within Murphy’s Flat are found on the margins of the reserve near

the road, on disturbed or reclaimed (overburden dump) areas. The greater extent of the reserve is substantially free of weeds although there is a threat of boneseed, blackberry, rose briar and fennel invasion spreading into the wetland especially along drainage channels and where culverts have added to disturbance” (Enviro-dynamics, 2018). The weed species recorded, near the road, were African boxthorn, blackberry, blue periwinkle, boneseed, briar rose, fennel and willow.

The encouraging lack of weeds observed by enviro-dynamics away from the roadside fits with DEP observations from the river side. Fulcrum Robotics will be conducting a weed survey with multispectral camera across Murphys Flat in October 2019, which hopefully will allow for any weed species in the middle of the site, which is difficult to access on foot, to be identified.

4.6 Weeds by the rail line

The Derwent Valley Line (Boyer operations) runs closely along the River Derwent, through stretches of wetland. Near Dromedary Marsh DEP observed the rail corridor to be heavily weedy in places (including blackberry and fennel). North Barker (North Barker Ecosystem Services, 2008) also observed significant weed infestation along the railway corridor on the north-western side of Dromedary Marsh, spreading into the marsh.

Post-surveys: Discuss with TasRail, Derwent Catchment Project and Derwent Estuary Weed Collaboration.

5 Where to from here

Introduced plants play a significant role in the upper Derwent estuary ecology. Whilst many such species provide a threat to native vegetation and are a considerable impost on both private and public finances, they also, in many locations along the river, provide important habitat for native species. Therefore, any control works need to be carefully and strategically considered, and only undertaken in collaboration with all stakeholders.

The surveys provided a snapshot of the current weed situation (within limits). Overall, there were less weeds visible across the study site than expected, and thankfully only relatively few weeds around the important wetland areas, except willows, which in part consisted of long healthy bands of *Phragmites australis* in front of a mixture of *Acacia verticillata*, *Leptospermum lanigerum*, *Juncus kraussii*, and various *Eucalyptus* species., mainly *E. viminalis*, *E. pulchella* and *E. ovata* (Figure 5-1). The wetlands vegetation communities are described in detail by North Barker (North Barker Ecosystem Services, 2008).

It was reassuring that no rice grass, pampas, or African feather grass were observed across the entire surveyed area. These are declared weed species that pose a threat to the habitats found in the Derwent Estuary.

Some introduced species have become iconic for the Derwent Valley, including the poplars, which are valued by the community. Thankfully poplars do not appear to be spreading at a fast pace.



Figure 5-1. Northern shore, west of Boyer, healthy riparian habitat.

- Karamu records have been forwarded for control through the 2018 Karamu Management Plan, managed by The Derwent Catchment Project.
- African boxthorn and fennel were recorded in high numbers, especially near Bridgewater and Granton and should be considered for future control works. This has in part already taken place recently through control works of African boxthorn and boneseed along the roadside near Granton Park by enviro-dynamics on behalf of the Department of State Growth.
- Willow removal should be considered in the long-term, in collaboration with the Willow Warriors (Derwent Valley Weed Management Program).
- Look-out for *Lythrum salicaria* and other threatened species on future boat trips.
- Sample *Typha* spp. pollen for positive identification to rule out *T. latifolia* in the wetlands.
- Consider weed control works in the rail corridor where it runs alongside the wetlands.
- Share information with previously mentioned stakeholders and include results with the Derwent Estuary Weed Collaboration for inclusion in the upcoming Derwent Estuary Strategic Weed Plan.



Figure 5-2. Southern shore, west of mouth of Sorell Creek, opposite Boyer. *Phragmites australis* in front of three willow species.

6 Acknowledgement

Many thanks to Matt Baker from the Tasmania Herbarium for sharing his extensive knowledge, not only on weeds, but also native species. Also, thanks to Josie Kelman from enviro-dynamics for handy QGIS hints.

7 References

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Figure 7-1. The cheerful survey crew in Feb 2018.