

Moulting Lagoon Wetland Restoration Field Day – 31st May 2022

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We wish to acknowledge the traditional custodians of the land that includes Moulting Lagoon, people of the Paredarerme (Oyster Bay) nation, and pay our respects to elders past and present.

Background

In 2021, NGT was engaged by NRM South to undertake an independent eco-hydrological assessment of Moulting Lagoon and adjacent saltmarsh, and commence restoration works at Long Point and The Grange. These two properties had been extensively modified by drainage works and are involved in the broader Regional Land Partnerships project being delivered by NRM South.

A Hydrological Restoration Plan was developed for these properties in February 2022 in consultation with the Tasmanian Land Conservancy, the Department of Natural Resource and Environment Tasmania and NRM South. The plan is now being used to guide the physical restoration works on both properties. The first phase of on-ground works commenced in March 2022 and the remainder will take place February-March 2023 (subject to site conditions).

The goal of the remedial works is to reinstate the natural landform (i.e. to reinstate physical conditions more closely resembling the natural surface profile and elevation gradient where it has been artificially modified) which will allow for the recovery of (a) the natural hydrological regime across the site, and (b) the re-establishment and recovery of saltmarsh and fringing wetland communities on the remediated ground.

This handout is a guide to accompany the field day and contains information on each of the stops we anticipate making on our journey across the site.



Looking northeast across Long Point.



Site map – Long Point and The Grange. Greater Moulting Lagoon (inset).

THE GRANGE

The Grange is a working farm used primarily for primary production (sheep grazing) with some areas set aside for conservation. Yards Hole, adjacent Moulting Lagoon, has undergone changes to its water regime and physical form as a result of an aquaculture development which occurred in the 1990s.

Zootech Research used sites on both properties in an attempt to develop techniques for the commercial production of zooplankton to culture whitebait, as a replacement for wild harvested fish meal. As part of this venture, a moat was effectively constructed around Yards Hole, creating a zone of deeper permanent water around the wetland margin and increasing the capacity of the wetland. Several small, deep ponds were also constructed to the north of the wetland and a deeper channel to Moulting Lagoon was cut to increase connectivity between Yards Hole and Little Bay.

Site 1. Yards Hole Outlet Restoration

The natural outlet from Yards Hole to Moulting Lagoon and surrounding area was significantly modified in the 1990s during the development phase of the unrealised aquaculture project. As shown below, restoration works were undertaken at this site in March 2022. The aerial image from 1948 was used as a template for restoration which aimed to restore the natural geomorphology and therefore hydrology of the site.

RIGHT: The modified Yards Hole outlet, showing pre and post works in March 2022, and restoration template from 1948 aerial image.

Site 2. Yards Hole Perimeter Restoration

The historic aquaculture works resulted in the entire perimeter of Yards Hole being modified with the construction of a deep channel which, in turn, left a steep artificial bank and a large spoil heap the whole way around the margin.

Bulk earthworks created this major change in the 1990s and were now also required to reverse that impact. The works redistributed the large spoil bank back into its former location within the drain around the wetland edge, a zone where this material will slowly compact and settle to form a reinstated bank with a gentler slope. This will provide fresh opportunities for fringing saltmarsh and sedgeland vegetation to re-establish.

The dark colour of the original surface level which has been re-exposed through the removal of the spoil heap provided a clear visual guide for the contractors to determine the natural contours and elevation of the surface during works.









Modified perimeter of Yards Hole showing the eastern bank before (left) and after (right) remediation.

As shown right, a close inspection of this layer, because it was suddenly buried 30 years ago, shows evidence of the compacted plants and roots of the former surface (in this case *Gahnia filum*), as well as the sudden change in texture and colour caused by the deeper soil and sediment, excavated from nearby, being deposited on top at the time of those works.

RIGHT: Evidence of Gahnia filum compressed beneath spoil at the level of the former surface

Whilst we were unable to manually compact the remediated margin of redistributed spoil material effectively this year due to the water level, we expect this bank zone to naturally settle and compact over time in response to rain and inundation events. We will re-evaluate the progress of this process and change in condition ahead of continued works next year.

There is also a small section of bank on the northern margin of Yards Hole that was not remediated this year, to give us time to more closely assess a rare species of saltmarsh growing in that area, *Wilsonia rotundifolia*, before determining the best approach for continuing works in this area next year (i.e. once we have an agreed plan in place with our project partners).

RIGHT: Wilsonia rotundifolia.





Completed restoration works around the margins of Yards Hole (pre and post works). See 50m section of northern bank still intact due to the interim protection of a rare saltmarsh species, which germinated and now grows on the excavated sediment in this section of spoil.

LONG POINT RESERVE

Long Point Reserve is a 386 ha low-lying peninsula located east of The Grange, adjacent to the southwestern portion of Moulting Lagoon. Long Point has been owned and managed as a protected area for nature conservation by the Tasmanian Land Conservancy (TLC) since 2005. Prior to that date, Long Point was part of the neighbouring pastoral property The Grange.

Wetlands on Long Point have also been impacted by the aquaculture works which were undertaken in the 1990s (see Site 3 information). However, Long Point had a legacy of extensive drainage works prior to this. The significant (> 2 km) network of levees was most likely built by convict labour in the mid-1800s.

Site 3. Barkstand Channel and Wetlands

Barkstand gets its name from an extensive phase when black wattle bark was harvested for the Swansea bark mill in the late 1800s, through until the 1930s. This elevated area of Dolerite is now completely cut-off from the rest of the property by a channel which was constructed as part of the aquaculture works undertaken in the 1990s.

This channel has extended and deepened a natural drainage feature and several other smaller features have been connected to it as part of aquaculture works. The water regime of all of these features has now been artificially altered. It is likely that the channel is also intercepting shallow groundwater flow or seepage from the higher Barkstand Point onto the lower saltmarsh areas.

The water regime of Opening Hole may now align more closely with the tidal regime within the greater Moulting Lagoon than previously. Preliminary hydrological analysis also suggests that this wetland is now regulated at 0.4 m AHD until it dries internally from seepage and/or evaporation.



Overview of the Barkstand channel, associated drainage areas and Opening Hole in the background.

Bulk earthworks, similar to those undertaken at Yards Hole, will be undertaken at this site early in 2023 and will aim to restore the channel and associated drainage areas to their original condition. The 1948 aerial image will guide on-ground works and be used as a remediation template. Remediation of this site will involve disconnecting the channel from Moulting Lagoon and remediating the adjacent saltmarsh surface.



Barkstand channel, 1948 image prior to aquaculture works, and present day.

Site 4. South-eastern Levee Restoration Commencement

The main L-shaped levee and adjacent drain have not only compromised the saltmarsh habitat along its length by creating a disturbance footprint with an altered elevation profile, but the levee system appears to be having an ongoing impact on contemporary hydrology and saltmarsh condition, including flood flows, attenuation and natural drainage across the saltmarsh.

There is evidence that the levees are impeding the movement of water (northern levee) and altering the mixing of fresh and saline water (eastern levee) across the eastern area of Long Point, despite them being breached in many places. This is due to the substantial impact that any barriers to flow can have in tidal saltmarsh communities, where the extremely flat terrain, combined with the lowenergy and temporary nature of tides prevents the efficient equalisation of water levels either side of such barriers, even if they are breached in some locations.

Due to wet conditions experienced in summer/autumn 2022, restoration works have so far only been completed at the southern end of the eastern levee, south of the floodway.



Convict-era levee banks constructed at Long Point, shown (left) and marked up (right) in the earliest aerial imagery from 1948. Area of restoration works able to be achieved at Long Point in March 2022 shown in red.

The work required along this levee bank is more sensitive in nature than the bulk earthworks at Yards Hole and was undertaken with a much smaller and lighter excavator, with rubber tracks, to minimise the degree of disturbance associated with the remediation works footprint. Note the present-day disturbance, as part of the remediation process, is limited to the narrow, original disturbance footprint.



Sensitive levee bank remediation in progress, left, and completed, right, March 2022.

The existing levee bank was used to infill the associated drains and the topography of the typically flat natural (undisturbed) ground either side of the levee was used as an accurate visual guide for works (see right).

Once complete in 2023, approximately 5 ha of levee and/or drainage footprints will be directly restored and another 80 ha of indirectly affected land rehabilitated.



RIGHT: Long Point drainage/levee footprints. Hatched area represents an additional 80 ha zone which is set to benefit from restoration works.

Our recent experience at the site, given the trial with a smaller machine at the southern end of the Long Point levee, combined with the bulk earth works completed with two larger machines at Yards Hole, will put us in good stead for



the completion of all remaining works in 2023. Works on Long Point will continue next summer/autumn when site conditions permit.

Priority works at Long Point for 2022/23 include:

- Continuing to address the main L-shaped eastern levee.
- Tackling the short, minor western levee
- Bulk earth works at Barkstand channel and associated wetland areas.

Thank you for your ongoing interest in this project and attendance at the field day. If you have any questions or further information to share, please send us an email, or give one of us a call.

Likewise, if you would like to be added to our monthly newsletter or future Moulting Lagoon project updates just drop us an email.

Cheers,

Bec and Mark.

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The shorter, breached western levee, Long Point.