Technical Memorandum

Sandmining drain/track status and impact on Belongil catchment	
To:	Bryan Green (Byron Shire Council)
From:	Damian McCann, Jesse Munro (AWC)
Date:	13 November 2018
Pg/Attach.:	5
Job ref:	1-181009_03_A_sandminetrack

Sandmining track/drain

AWC have been engaged to undertake an assessment of the disused sandmining track/drain system that runs north from the West Byron Sewage Treatment Plant (WBSTP). The aim of the assessment is to provide a report on the current status of the track/drain and its impact on the Belongil Creek catchment.

The investigation was in response to the following request:

That the WWSAC receive a report on the current status of the old sand mining drain/path and its impact on the Belongil catchment.

The assessment included:

- Site inspection;
  - Vegetation
  - Hydraulics
  - Train track
- Review of historic photographs

Findings have been compiled within the following memorandum. No further action is recommended at this stage.

Water | Ecology | Management

8 George St
Bangalow NSW 2479

p. (02) 6687 1550
e. info@awconsult.com.au
w. awconsult.com.au

Australian Wetlands Consulting Pty Ltd
ABN 81 140 533 919

Site Inspection

Site inspections were undertaken on 26th July and 10th August 2018 by Jesse Munro and Damian McCann. Weather prior had been dry and cool. There had not been any rain for >12 days prior, and below average monthly totals in the previous three months.

During the first inspection the train tracks were used to access the site from the south in a northerly direction. The second inspection came into the northern end of the track/drain via Grays Lane in Tyagarah.

Vegetation

Generally, the vegetation immediately surrounding the train tracks in the south indicates a wetter environment. There are swathes of macrophyte beds in some locations, and swales along side the tracks with dense macrophyte growth. To the north of the rail line dunal ridge systems are evident with coastal heath/forest growing. In low lying areas forested wetlands dominated by Broad Leafed Paperbark were noted.

In the north, the track and drain are overgrown with short swamp forest type vegetation, including *Melaleuca quinquenervia* and *Leptospermum laevigatum* in the canopy and *Gahnia sp.*, *Baloskion pallens* in the understory.

Photo 1 - Example drain in the north

Photo 2 – Tannin coloured drain water in the north

A water sample was analysed for pH and conductivity; it showed pH of 4.24 and conductivity of 282µS/cm. The relatively low pH value is consistent with the wallum heath type of vegetation evident in the vicinity. The water shows a tannin stained colour, as seen in Photo 2 (above), a result of peat and tea tree pigments from the surrounding areas.

The conductivity shows the area is freshwater and is not tidally influenced. This is also reflected in the vegetation.

Hydrology

The train tracks appear to be causing a substantial impediment to water movement from the north to the south and entering the Belongil catchment. The tracks have been built on a compacted mound, of which the construction below the cobble basalt covering is unknown. It would be expected the soil below ground surface, below the tracks, is also compacted and stabilised which would limit lateral movement of groundwater.

Several constructed gaps (bridges) in the rail bund were evident (refer Photo 3), allowing surface flows to move south. Also evident were pipe culverts through the bund. The hydraulic control point of the culverts and gaps were generally above the natural ground surface causing some standing water in the area.

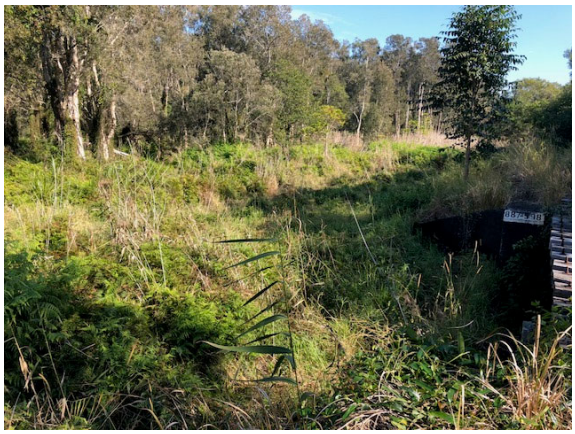

Photo 3 – Looking north, along the train line. Note bridge for water movement, and open area adjacent with tall forest vegetation

Although the sandmining drain in the north shows standing water, the hydraulic capacity would be diminished as there is dense vegetation on the edges and occasionally in the channel, as well as fallen vegetation and siltation. These are expected to reduce conveyance potential.

The track is mostly overgrown, though less dense than in the drainage channel. There appears to have been some imported fill material for track construction, rock, gravel and cobble in places. There are areas where past works may have occurred and caused disturbance to soil that is still evident; vegetation growth is low, with bare areas.

The southern section of the drain that runs in a south easterly direction from the rail line to the western boundary of the WBSTP was inspected. The edges are heavily vegetated with Broad Leaved

Paperbark and macrophytes. The drain is approximately five metres wide and had standing water during the inspection (refer photo below). A track or remnants was not visible through this area due to the dense vegetation.

Although there was no flow on the inspection day, it is assumed the flow is in a southerly direction. The drain stops at the boundary of the WBSTP with water dissipating through the site with no formalised channel. (Example images four and five).

Photo 4

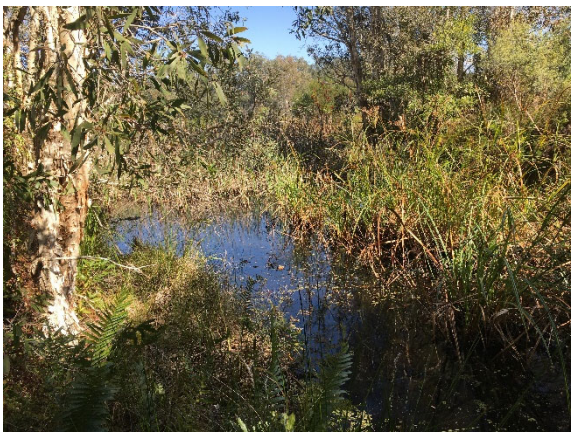

Photo 5

Train Tracks

The north coast rail line from Casino to Murwillumbah was opened in the late 1800's, thus any modification of landscape scale hydrology resulting from the rail line has been in play for >100 years.

Current status of track/drain

The drain is generally functional though the conveyance is limited due to blockage by vegetation and siltation. Based on visual indicators, the vegetation, water quality and habitat are of good quality in the drainage line. It would be expected that a variety of fauna use the drainage line, in particular some of the wallum frog species some of which are threatened.

The sandmining track is considered unpassable by vehicles with dense vegetation growth. Other than *Leptospermum laevigatum* (Coast Teatree), there were very few weeds evident. Coast Teatree is not naturally found north of Nambucca Heads, it was often used for dune stabilisation and after sand mining. Some areas adjacent the track/drain show a greatly reduced vegetation density and diversity, potentially a result of sand mining operations that left the soil devoid of nutrients, organic matter and/or compacted.

Impact on Belongil Creek catchment

The impact of the sandmining track/drain on the Belongil Creek catchment is indiscernible. The drain may have lowered the water table and expedited water flow from the site, however the railway track may have caused a dam effect restricting surface and groundwater flows to the south.

Conclusion

The catchment of Belongil Creek is highly modified; a substantial portion of the catchment has been cleared for agricultural or urban use. Drains were cut into large areas of the catchment in order to lower the water table for agricultural use. Additionally, a large volume of water is imported into the catchment for potable use which is passed through the West Byron STP and discharges to the catchment in the upper reached of the union drain. Thus the hydrology of the catchment is highly modified, the effect of the sand mining tack/drain on the hydrology in the overall catchment is indiscernible. The rail track likely has a greater influence on the catchment hydrology.

The drain/track flows through the Tyagarah Nature Reserve which is protected from development and disturbance. Sand mining operations in the Byron Shire ceased in the 1970s. The ecology upstream of the train track is likely to have adapted, or is in the process of adapting to, the altered hydrology. Although a detailed assessment of the whole area was not done, there does not appear to be any substantial impacts in terms of vegetation growth.