

FIDO Sediment Monitoring Sites

Objective:

To establish monitoring sites to assess the volume and impacts of sediment movement resulting from road usage on Fraser Island

History:

Sediment movement resulting from vehicular traffic:

For more than a decade FIDO has raised concerns about the extent and impact of sediments being washed off the Fraser Island sand tracks. The impact sensitive sites including Yidney Lake, Lake Allom, the swale behind the lunette of the Lake McKenzie (Boorangoora) lunette and at a site where the road is adjacent to the Lake McKenzie (Boorangoora) have been specifically identified. However the extent and impact of the wash of sand off the roads generally has been raised. During a field inspection of Lake McKenzie (Boorangoora) by the Fraser Island World Heritage Joint Advisory Committees in October FIDO was given permission to monitor the movement of sediment from roads.

In July FIDO received some funding from the Burnett Mary Regional Group (BMRG) to undertake environmental monitoring on Fraser Island in conjunction with its project on weeding / bush regeneration work for 2012-13 financial year at Eurong. This provided some resources to establish monitoring sites.

Prior to establishing the first eight sediment sites FIDO consulted widely with scientists and other stakeholders to develop an effective and affordable methodology to assess the extent and the impact of sediment wash from the roads to assist management decisions and to provide some baseline data for on-going studies of environmental changes on Fraser Island. Not all of the suggestions could be incorporated in the first the round of monitoring, but since sediment movement monitoring is to be an on-going FIDO project on Fraser Island, it is possible that further refinements may be added to these sites as information gained dictates and resources permit.

The first ten datum poles were installed at the end of November, 2012 with their respective positions and GPS locations recorded. Most were established where there had been strong evidence of a buildup of sediment in recent years. This was only Stage 1 of an on-going long-term monitoring project.

The first monitoring was done during the week of 10-16 March 2013. A prolonged dry period in the latter half of 2012 up to and for two months after the poles were placed was followed by a number of heavy downfalls that contributed to a rise in the level of the lake beginning with ex-cyclone Oswald at the end of January. Registrations at the QPWS Eurong Ranger Station were:

December 2012 - 48.8mm

January 2013 - 418.8mm

February 2013 - 302.0mm

Early March 2013 - 100.4mm (prior to the monitoring readings)

No monitoring could be carried out at Yidney Lake and it was impossible to record a reading for Gunda where the whole ruler was submerged. The depositions elsewhere ranged from 90 mm at Cooloola to zero at Yirra. It was estimated that the 50 mm of sediment spread over 225 square metres at Wongul monitoring station added 17 tonnes of sand to the site in three months.

Monitoring Sites

Site 1 —Cooloola

The name was chosen because the datum post sits in the midst of a stand of Cypress pine for which the butch name is "Cooloola"

Location Description: A little over kilometre west of Eurong, the two-way road has resulted in a deep down-cutting. Although there is only a relatively small catchment there is evidence of a large volume of sediment accumulated at the site of the datum post. 60 cms down the hole was still in sediment.

GPS Reference: 25° 30.256 S 153° 06.999 E

Installed: 26th November, 2012

Photo id Markers: In addition to measuring the depth of sediment washed off the main two-way road between Eurong and Central Station. The site provides a good opportunity to visually capture any significant environmental changes through photo monitoring. Cameras can cover almost 360degrees by focussing on the three nominated target markers:

- West: The marker is a stump
- South-East: The mark is on a brush box . On 25 November a mark was painted 60 cms above the ground level
- North east: The mark 60 cms above the ground level for photos to be focussed on is in the centre of a scar observed.



Photo monitoring sighting 27 November 2012

First Monitoring 11/3/2013

90 mm of sediment had accumulated around the datum pole in the first three months after it was installed.



Photo monitoring sighting Cooloola 11-3-2013



Photo monitoring sighting Cooloola 11-3-2013



Photo monitoring sighting Cooloola 11-3-2013

Site 2 — Kunyam

Kunyam is the Kabi (Butchulla language) name for the Hoop Pine, *Auracaria cunninghamii*.

Location Description: this site is between the two one way roads near the junction of less than two kms west of Eurong in the centre of a large plume and facing the eastbound road.

GPS Reference: 25° 30.218 S 153° 06.920 E

Installed: 28th November, 2012

Photo ID Markers: Two trees have been marked to get comparative photos over a period of time from the top of the post.



Kunyam monitoring site 11 March 2013



Photo monitoring sighting 27 November 2012



Kunyam monitoring site 11 March 2013

Kunyam Monitoring 11-3-13

Following the downpours from 25 January to early March much sediment was moved. 40 mm was recorded on the post that might have been more had not an erosion gully developed adjacent to the post.



Kunyam monitoring site 11 March 2013



Kunyam monitoring site 11 March 2013

Site 3 — Dhomba

Dhomba is the Kabi (Butchulla language) name for the red gum, believed to be now *Angophora lieocapa*.

Location Description: About 2.5 km west of Eurong, the between the junction of the two one way roads and the Eastern Break. The datum has been placed in the centre of a large alluvial plume. There is a significant catchment extending about 400 metres along the road running towards the point where sediment is moved from the road there is evidence of a large volume of sediment accumulated at the site of the datum post. The hole down to 60 cms was still only in sediment.

GPS Reference: 25° 30.172 S 153° 06.432 E

Installed: 27th November, 2012

Photo ID Markers: Two photographic points focal points were identified:

- West: The marker is the fork of a *Banksia serrata* stump
- South: A mark was painted on a bloodwood tree on a brush box 60 cms above the ground



Dhomba Monitoring 13-3-13



Dhomba accumulated 50 mm of sand in the period the monitoring station was passed on Monday 17 February in the midst of a deluge that was captured on camera.

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Site 4 —Wongul

Wongul is the Kabi (Butchulla language) name for the Geebung, believed to be *Persoonia virgata*.

Location Description: About 200 metres west of the Dhomba monitoring site. The catchment extends for about 200 metres of road running towards the point where sediment is moved from the road there is evidence of a large alluvial plume accumulated at the site of the datum post.

GPS Reference: 25° 30.096 S 153° 06.363 E

Installed: 27th November, 2012

Photo ID Markers: In addition to measuring the depth of sediment washed off the main two-way road between Eurong and Central Station. The site provides a good opportunity to visually capture any significant environmental changes through photo monitoring. Cameras can capture progressive changes to the site by focussing on the identified target markers from the top of the Datum post. E.g.:



Wongul Monitoring 13-3-13



The accumulation of sediment in the 15 weeks has been 50 mm. The area of spread was at least 15 metres by 15 metres that suggests that over 17 tonnes of sand was deposited over this area in this short period adding to the depositions from previous periods of heavy rain in recent years.

Site 5 —Pibin

Pibin is the Kabi (Butchulla language) name for the Satinay, *Syncarpia hillii*.

Location Description: The site chosen is the crossroads of the Eurong Lake McKenzie (Boorangoora) Road and the Central Station Eurong Road. A vast quantity of sediment has accumulated in the vicinity as evidenced by the road signs being slowly engulfed by road sediment. However the photo monitoring is to focus on three trees that are now subject to change in the short term.

GPS Reference: 25° 28.633' S 153° 04.107' E

Installed: 28th November, 2012

Photo ID Markers: Three trees have been identified One to the north east, one to the south east and one to the south all are trees with a spot painted about 60 cms from the ground.



Pibin 28/11/12

Pibin Monitoring 11-3-13



The accumulation of sediment surrounding Pibin monitoring pole was 20 mm. However the pole is on the edge of a very large area building up from sediment.

Site 6—Gunda

Gunda is the Kabi (Butchulla language) name for the Cabbage Palm, *Livistona australis*.

Location Description: On the water's edge of Lake McKenzie (Boorangoora) immediately below the site where the road comes closest to Lake McKenzie and creates a large alluvial plume. When sited in November 2012 the lake was still high and only about 30 cms were above water level. It is expected that lake levels will fall and the lake edge retreat the datum post.

GPS Reference: 25° 26.673 S 153° 03.105 E

Installed: 28th November, 2012

Photo ID Markers: There are no photo markers.



Gunda 28/11/12



Gunda 15/3/13

The water level had risen about a metre completely submerging the ruler to measure the sediment but although it was impossible to get a reading it was clear that there had been a surprising volume of sediment accumulated because the 50 mm wide cross-bar at the base wasn't visible. Yet the slope down to this point showed no obvious evidence of erosion.

Site 7 — Billai

Billai is the Kabi (Butchulla language) name for the Geebung, believed to be *Persoonia virgata*.

Location Description: this site is in the swale behind the Lake McKenzie (Boorangoora) lunette where sediment is running past the car-park and the easternmost toilet block and there is already evidence of about 2 metres build-up of sediment to be almost a level with the top of the lunette.

GPS Reference: 25° 26.694 S 153° 03.101 E

Installed: 28th November, 2012

Photo ID Markers: Two trees have been marked



Billai 28/11/12 showing episodes of sediment deposits



Billai 15/3/13

Less than 20 mm of sediment had accumulated at the base of this monitoring station.

Site 8 — Yirra

Yirra is the Kabi (Butchulla language) name for the Blue Gum, *Eucalyptus teriticornis*.

Location Description: this is also placed in the swale behind the Lake McKenzie (Boorangoora) lunette and just to the west of the track to the main stairs on to the main beach. Here the deposition of sediment is demonstrably more than two metres in depth.

GPS Reference: 25° 26.735 S 153° 03.066 E

Installed: 27th November, 2012

Photo ID Markers: One marker was identified.



Yirra 28/11/12



Yirra 15/3/13

This was the only monitoring station where there has been no flow of sediments since the poles were installed.

Yidney Lake

There is no more demonstrable example of the adverse impacts of sedimentation through road run-off than Yidney Lake. When FIDO first started operating safaris (at least three per annum) in 1971, every safari went down the road beside the lake to get to Yidney Scrub. It was full of reeds with small open patches of water and was the only lake on the island where one could reliably see ducks and waterfowl. At that stage there was no evidence of the deep down-cutting in the roads from Happy Valley to both Yidney Scrub and Lake Garawongera. Both were severely down-cut and there is evidence of sediment moving down the steep slope to the lake.

In late November 2010 while preparing an environmental assessment on Fraser Island the growth of a significant forest in the bed of the lake was confirmed



This forest is now growing in what was Yidney Lake

The cause is demonstrated by the adjacent road cutting sluiced out over a series of heavy rainfall events in the past four decades.



This is the site from which most of the sand that now fills Yidney Lake was washed over the past four decades

It is for this reason that it was decided to try to assess the rate of sediment movement.

Site 9 — Yidney 1

Location Description: This site was approachable from the Yidney Scrub end of the lake where there is evidence of some sediment moving down the gully to the lake. It is not though the main source of sediment which appears to come from the north eastern end of the lake. The site wasn't too far from the edge of the water due to a succession of heavy rainfall years,

GPS Reference: 25° 30.219S 153° 06.920 E

Installed: 30th November, 2012. When the datum pole was installed the lake was at a high level and water was within 30 cms of the ground surface. It is close to and on the western side of a large *Eucalyptus teriticonis*.



Neither Yidney site was monitored in March 2013

Site 10 — Yidney 2

This was on a shelf further from the surface water and closer to the road. The hole was dry to 60 cms and there was little evidence of sedimentation at this site that was chosen for comparison purposes