Cooloola Recreation Area, Teewah Beach camping area – Geotechnical summary report

Teewah Beach is a very popular natural area that has importance to generations of beach campers, fishers, surfers, nature lovers and to the local economy. We acknowledge the Traditional Owners of Teewah Beach, the Kabi Kabi First Nations people, and recognise their continuing connection to land, waters and culture.

In late 2017, there were several instances where boulders of cemented sand rolled downslope into the camping area which is situated at the base of the foredunes. To understand the slope instability risks to users of the Teewah Beach camping area, QPWS commissioned a geotechnical report.

Between November and December 2017, a landslide risk assessment of the foredunes and beach ridges of Teewah Beach was carried out by an Engineering Geologist Consultant. The main aims of the assessment were to identify hazards associated with foredune instability, and assess risk to those using the Teewah Beach camping area.

Queensland Parks and Wildlife Service (QPWS) received the consultant's report in May 2018.

What did the report show?

The report identified three main instability hazards:

1. Falls of boulders (ferricrete) or blocks of moderately cemented sand which are triggered by weathering and erosion; and/or by people digging into, or disturbing the cemented sand mass (Figure 1).

2. Composite slides through the variably cemented scarps with the debris comprising a mixture of sand and boulders having a total volume up to about 100m^3. These slides are triggered when equilibrium is lost because of erosion and/or people digging into or disturbing the cemented sand mass (Figure 1).

3. Translational landslides through the over-steepened, uncemented (or more weakly cemented) dune face which generally slide short distances prior to be being arrested. These may be triggered when vegetation support is reduced, during dry periods or after bushfires, but also after heavy rain episodes when the sand becomes saturated. Other triggers include erosion of the toe of slopes from storm surges or human activity cutting into the slopes (Figure 2).

Figure 1 - Instability Hazards 1 & 2

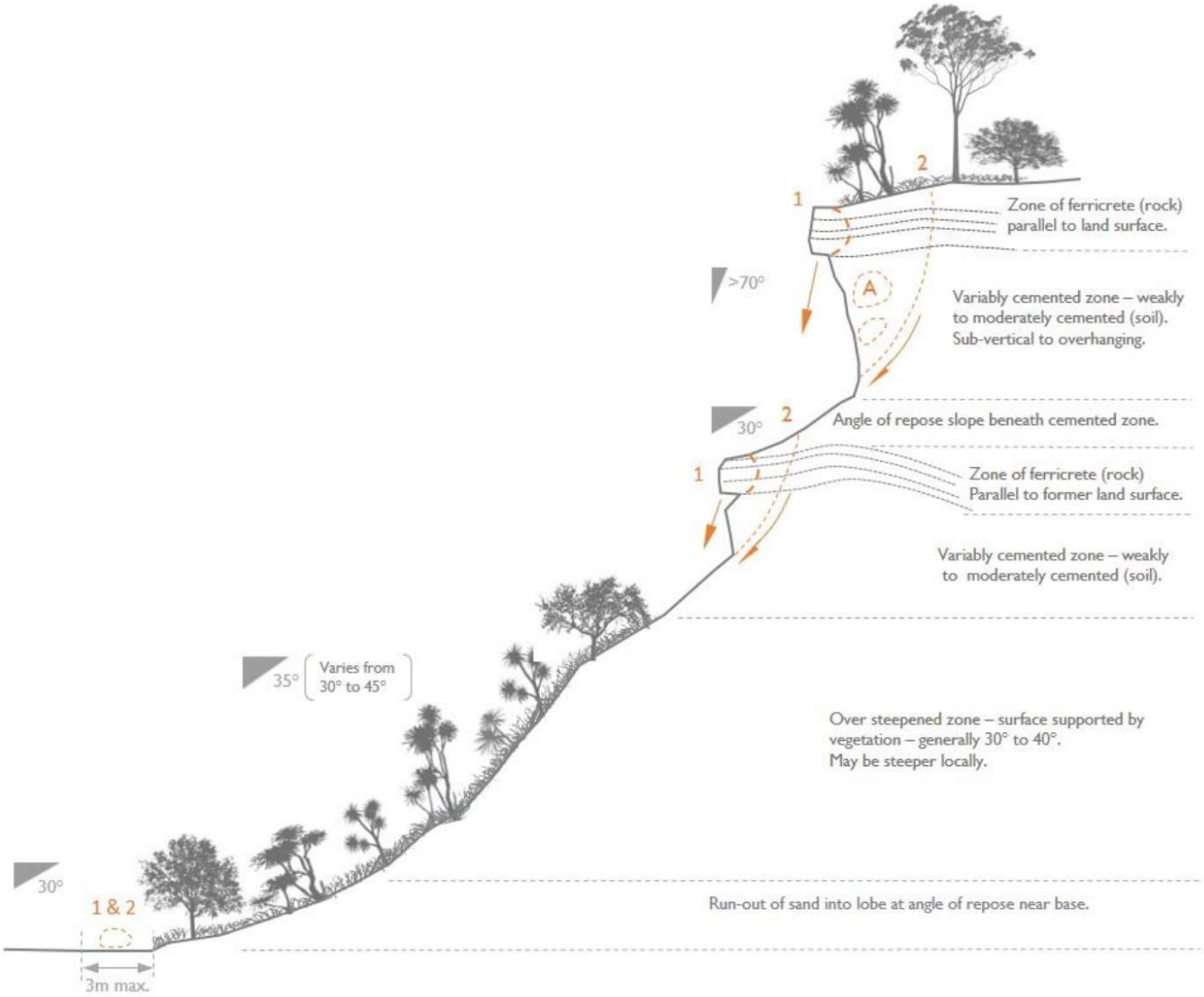
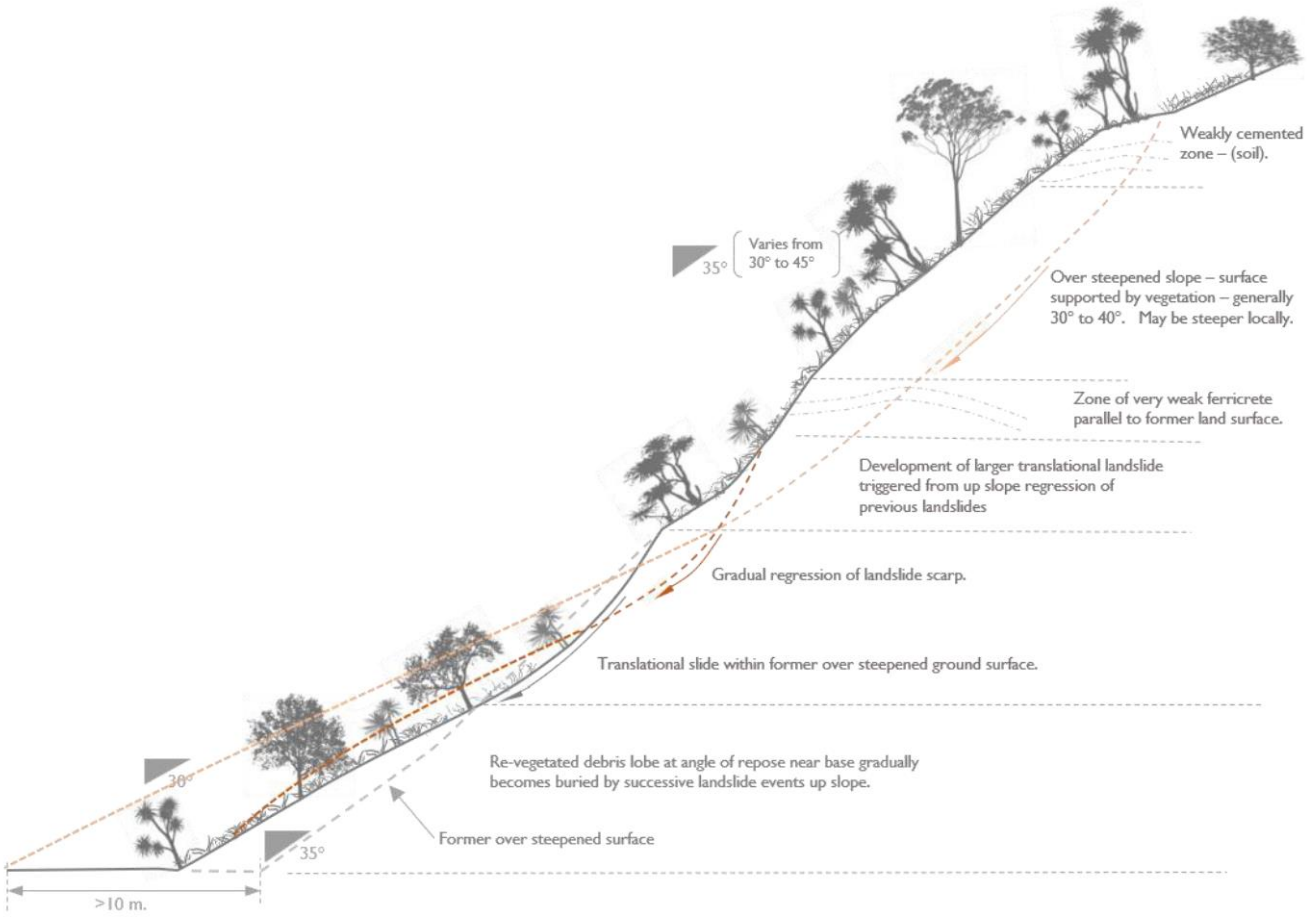


Figure 2 - Instability Hazard 3



The boulder falls and composite landslides (Hazards 1 & 2) occur only in slopes where scarps have developed in cemented sand. Scarps develop from a combination of weathering and erosion, human activities and instability events. The greater the extent of the scarps, the more potential there is for instability to develop. The higher scarps have a greater tendency to be undercut and therefore have a greater likelihood of instability.

There is considerable evidence that people dig into the steep, sand scarps which both accelerates slope failure and places those digging, many of whom are children, at immediate risk. The risk levels associated with this activity cannot be quantified, but they are considered to be very high because those potentially triggering failure are immediately within the fall zone, and failure could occur rapidly and without warning.

From the aerial photo review and field investigation translational landslides (Hazard 3) have only been identified within the large over-steepened slopes in the southern section of the camping area. Over time the scarps regress upslope and in some cases have initiated larger slides with the debris reaching the Teewah Beach camping area. It was found that approximately 4.5km of the dune face within Teewah Beach is susceptible to this hazard.

Did the report suggest how to manage risks?

The report identified risk management measures which could be implemented to limit the *consequences* of instability, by reducing the exposure of people to the hazards. Options presented:

- ***Completely close the higher risk areas of beach front to campers.***

  This would significantly reduce the available camping space, but would be relatively simple to implement and enforce.

- ***Limit camping within the higher risk zones to areas outside those affected by debris.***

  This would require erecting fencing or barricades to prevent camping in certain areas.

The report also identified specific measures for the risks associated with sand scarps. Options presented:

- ***Restricting access to the scarps.***

  In practice, this may be very difficult to achieve as the location of steep scarps in the sand slopes will varying over time and construction of barriers would probably be neither practical nor consistent with the national park environment.

- ***Informing the public of the risks***

  This would require informative signs close to the locations of the steep sand scarps to explain the nature of the hazard and the potential consequences to campers.

Did the report suggest how to reduce risks?

The report stated that there is very little that could be done practically to reduce the likelihood of continued instability in these areas for the risks triggered by natural processes. This would require earthmoving or other such activities which would have a significant impact on the natural environment.

The report suggested that monitoring and/or warning signs could also be implemented to reduce risk as follows:

- ***Regular monitoring of the dune face and camping area.***

  The foredunes above the camping area are a dynamic environment which is affected significantly by weather and human activities. Regular inspections should be conducted to assess whether large landslides are forming in the dune face, or boulders/blocks have rolled into the camping area. Camping could then be restricted in these areas as required.

- ***Informing the public of the risks.***

  Informative signs placed at key entrances explaining the instability risks including the potential consequences of instability. If this option was to be selected, we would be pleased to work with QPWS to develop informative signs and identify specific locations for signs.

What is QPWS doing?

This risk assessment process has resulted in changes to the Teewah Beach camping area, including the establishment of seven separate camping zones and closing high risk areas to camping. High risk camping areas are marked by “DANGER no camping” signage and visitors are required to camp outside these marked areas. Camping is permitted elsewhere in the Teewah Beach camping area, within one of the seven zones.

Has camping capacity been reduced?

The reduction in available camping space has resulted in a reduction to camper capacity, which has now been reduced to 1500 people per night to reduce overcrowding and improve visitor safety.

Can we drive on the beach in front of the closed areas?

You can drive on the beach in front of closed areas. The camping area beachfront speed limit is 50km/hr.

Will more landslides occur at Teewah Beach, and if so, will QPWS have to close more areas?

The foredunes and beach ridges of Teewah Beach are a part of a dynamic environment, and it is possible that further landslides will occur in the future. QPWS prioritises safety, and will implement any further required changes to campgrounds and access to manage risk appropriately.