

## FACT SHEET No 4: CATCHMENT FUNCTION ANALYSIS

# CATCHMENT FUNCTION ANALYSIS FOR THE DE GREY CATCHMENT



DE GREY LCDC  
DE GREY LAND CONSERVATION DISTRICT COMMITTEE  
— PILBARA —

During 2015 Tim Wiley was employed by Rangelands NRM to undertake property planning with De Grey LCDC stations, and decided to use a Catchment Function Analysis approach using Google Earth for the entire De Grey catchment. The catchment analysis is based on the concepts of Natural Sequence Farming of Peter Andrews and the Ecosystems Management Understanding (EMU) approach of Ken Tinley and Hugh Pringle.

To better understand, and manage a system, it can be useful to focus on the process driving the system rather than only on its components or the outcomes of the system. This can be done by mapping out the processes of a system in what is referred to as Systems Function Analysis. This approach can be applied to landscapes as 'Catchment Function Analysis'.

By analysing a catchment as a functioning system it can be determined:

- how the landscape should function,
- where key processes have been disrupted, and
- what needs to be done to restore natural catchment function.



Tim Wiley (left) and Peter Andrews discuss landscape function in the De Grey catchment.

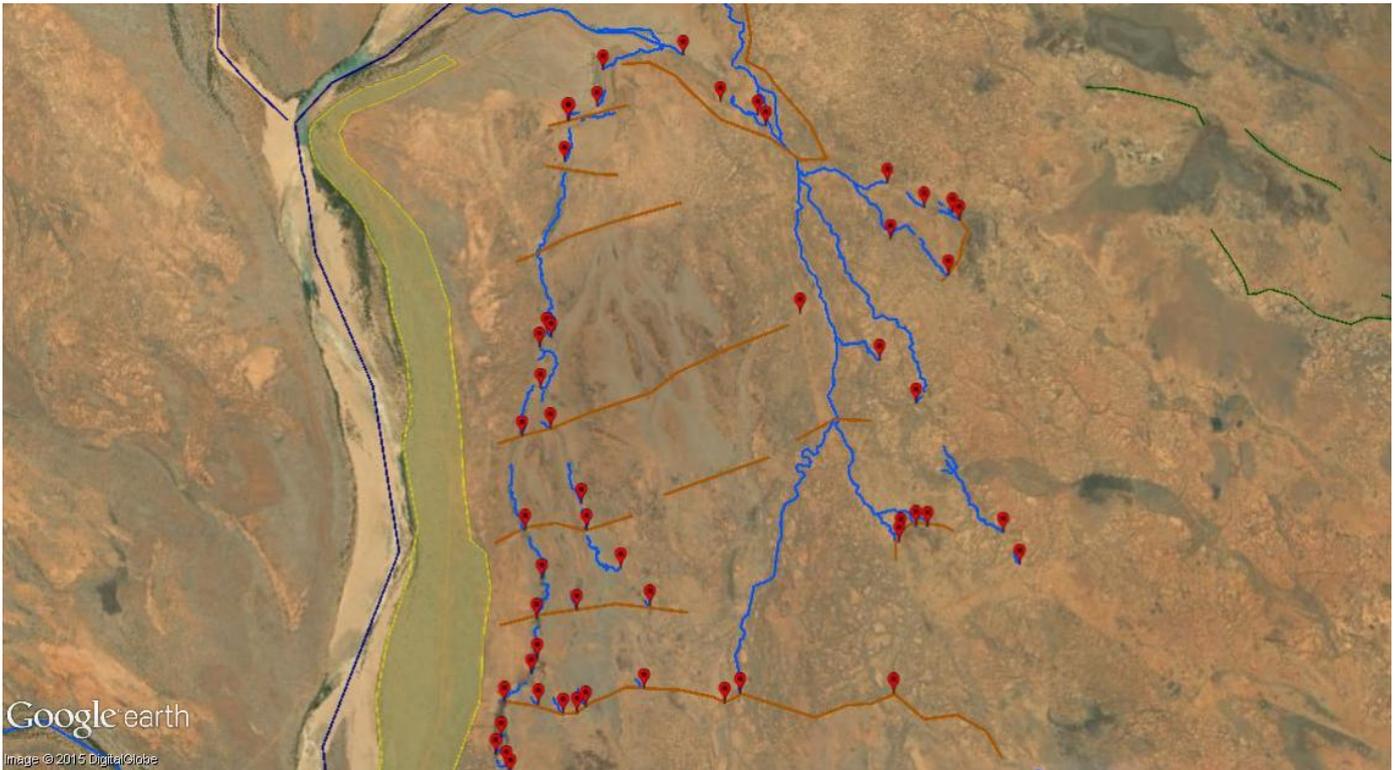
Photo: Pip Short

By analysing the landscape / catchment as a functioning system it can become evident where the critical points in the landscape are. At these critical points, relatively small interventions can have an impact over much larger areas. Addressing these areas ensures the greatest "bang for your buck".

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Peter Andrews describes Australia landscapes as functioning as a series of connected ponds. He argues that a pattern of connected 'ponds' or 'wetlands' is repeated across the landscape. One important process of these ponds is to decrease water velocity by spreading its flow evenly across a wide body of water.

The De Grey LCDC stations have been very interested in dealing with soil erosion that occurs during cyclones, high rainfall events and floods. Understanding the way the De Grey Catchment functions helps effort and very limited funding to be targeted to the critical points in the landscape that will both change water movement and address soil erosion.

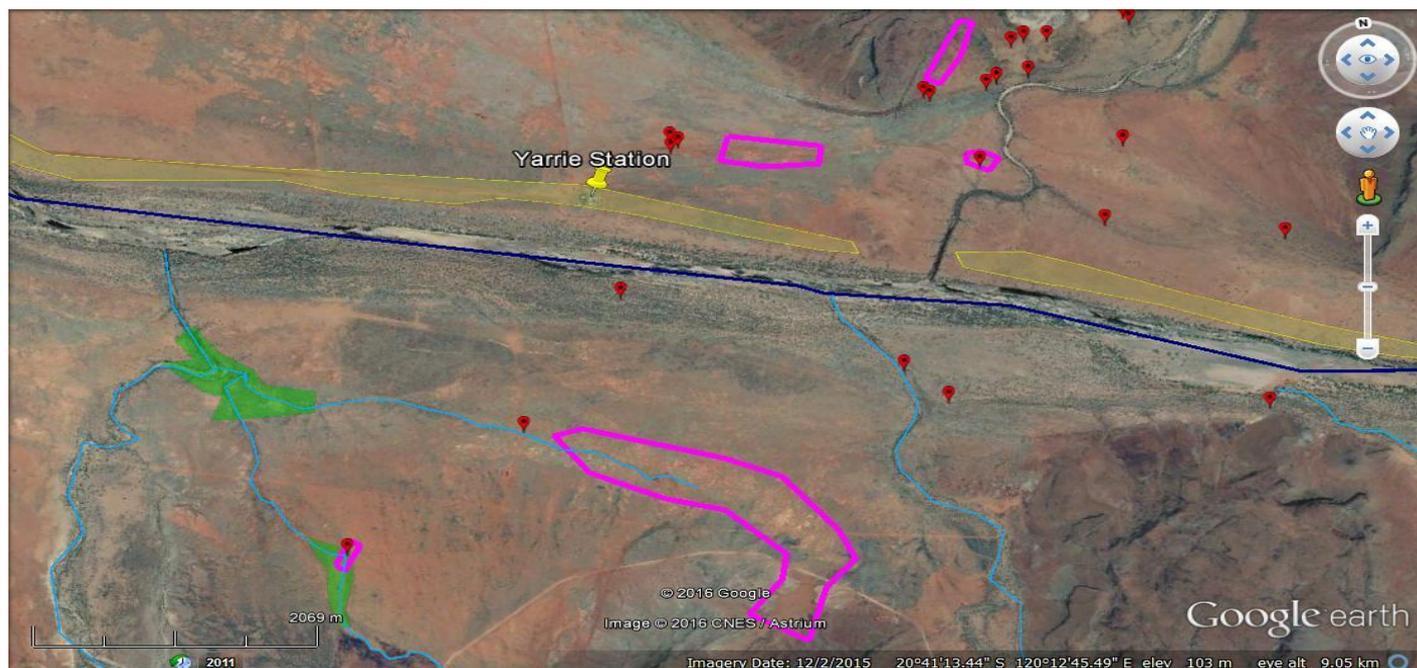


An example of Tim Wiley's catchment function analysis done using Google Earth on De Grey Station. Active erosion heads (red dots), creeks (blue lines) and landscape steps (yellow lines) to the east of the De Grey Station homestead. Earth banks have been constructed across these creeks to slow water flow and spread water across the floodplain.

This whole-of-catchment analysis is useful for:

- Catchment planning across the entire De Grey river catchment
- Preparing and implementing ESRM property plans
- Locating and constructing Rangelands Rehydration earthworks
- Linking groundcover, grazing management, and fire management.

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Yarrie Station: active erosion heads (red dots), creeks (blue lines), wetlands (green shading) and sand ridges (yellow lines) near the Yarrie Station homestead. The pink areas indicate where rangeland rehydration earth banks have been constructed to slow water flow and spread water across the floodplain. The earthworks has been located upstream of the active erosion heads (red dots) identified and mapped by Tim Wiley in the catchment function analysis.

### Tim Wiley:

*"Identifying and focussing on the critical points in the landscape is particularly important in the rangelands due to the vast scale of pastoral properties. It is easy to be overwhelmed by the scale of what is required on these stations. But by understanding how a station's landscape functions it is possible to strategically target critical areas with management intervention. An approach based on managing critical catchment processes, implies relatively small investments which can improve large areas of land and yield a high return on investment. "*

The De Grey LCDC would like to thank the support of the funders and sponsors: Rangelands NRM, National Landcare Programme, and BHP Billiton.

