What is LFA and what can it be used for?

Landscape Function Analysis (LFA) is a field-based monitoring procedure, using rapidly assessed, simple visual indicators, to assess **how well a landscape works as a biophysical system.** It is based on recent, cross-scale, cross disciplinary research and can be applied to a very wide range of landscape and climate types and a variety of land uses. Sometimes it is called “Reading the Landscape”.

LFA is comprised of 3 modules:

- An conceptual framework, explaining simply how landscape work as biophysical systems
- A field data collection procedure and data-reduction procedure
- An interpretational framework to facilitate management use of the emergent information

LFA provides numeric values of the status of soil stability (resistance to erosion), the infiltration of water and the cycling of nutrients, and compares the values with appropriately selected reference sites, representing respectively, the most and the least disturbed examples of the landscape type being evaluated

LFA can be used to:

(i) Evaluate the current status of a landscape subject to stress and disturbance

(ii) Use this information to design appropriate restoration procedures, if needed,

(iii) Monitor and report on the response of a landscape to time and/or a restoration treatment. The rate of progress overall and/or the response of each of 11 different indicators is followed so as to detect a time when the landscape has become self-sustaining as an ecosystem.

Additional procedures (FVA and EDA) can be deployed to more closely examine the role of emerging vegetation or physical structures in ameliorating wind and water erosion, and the “health” of ephemeral streams

The tools and instruments needed are very simple, inexpensive to implement and rapid. The procedures and spreadsheets are available at:

http://members.iinet.net.au/~lfa_procedures/

How is LFA implemented in the field?

Step 1. Fill out the **site description** sheet. This sheet records the basic nature of the site and the location of the gradsect used in step 2. These data can be used to group similar site types together in a large project, or to discriminate between sites with different basic properties. All the data here is "static", insofar as management or seasonal conditions is unlikely to change these properties. This sheet has space for a written summary of the site assessment, which would be completed after all data accession, but before leaving the site.

Step 2. Lay out a gradsect, commencing upslope and running directly downslope. The length of this line should be sufficient to characterize any pattern in the landscape: eg alternating woody vs grassy patches; grassy vs bare soil; undisturbed vs disturbed landscape elements. The line may vary from about 15 m to several hundred, depending on the scale of the pattern.

Step 3. Characterize "landscape organization" and measure different patch and inter-patch types, recording the location and size of "patches" (zones where vital resources tend to be accumulated and/or retained: see full copy of the Field Procedures for further definitions and examples of data). **Use the provided data sheet**. These data map the entire line. Some landscapes are comprised of a single patch (eg a forest) or inter-patch (eg a clay pan or scald) type. Name each type according to a functional assessment (not a botanical association). Take oblique photos of the gradsect.

Step 4. Select five randomly distributed examples of each patch and inter-patch type from the landscape organization data and assess the 11 soil surface indicators, using the set of criteria and data sheet provided. Record the location of each of these sampling sites on the gradsect: **SSA data sheet provided**. Take vertical images of each sampling site from about 1.3 m. Before leaving, check the replicate values for possible mis-assignment or mis-recording of values and other errors. Make notes about landscape function at the two sample scales in the space provided on the site description sheet.

Step 6. Using the **supplied SSA spreadsheet**, key in all the data and inspect the computed values for consistency, statistical precision and keying errors. I strongly recommend doing this on the day of collection, while memory of the site is fresh. Use the section on Interpretation on p 32-35 in the full Field Procedures manual to make objective judgments and commence the report-writing phase.

Step 7. Using both the computed index values at two scales and the notes made at the site, compile a report, using relevant questions taken from the set on p 25-28 in the full Field Procedures manual.