POLYTECHNIC OF NAMIBIA
Namibia's university of science and technology

Re-covering the Red using local knowledge
E.M.U. Ecosystem Management Understanding
www.emuproject.org

BIOTA

Pilot restoration project in a key fertile valley of the Highland Savanna

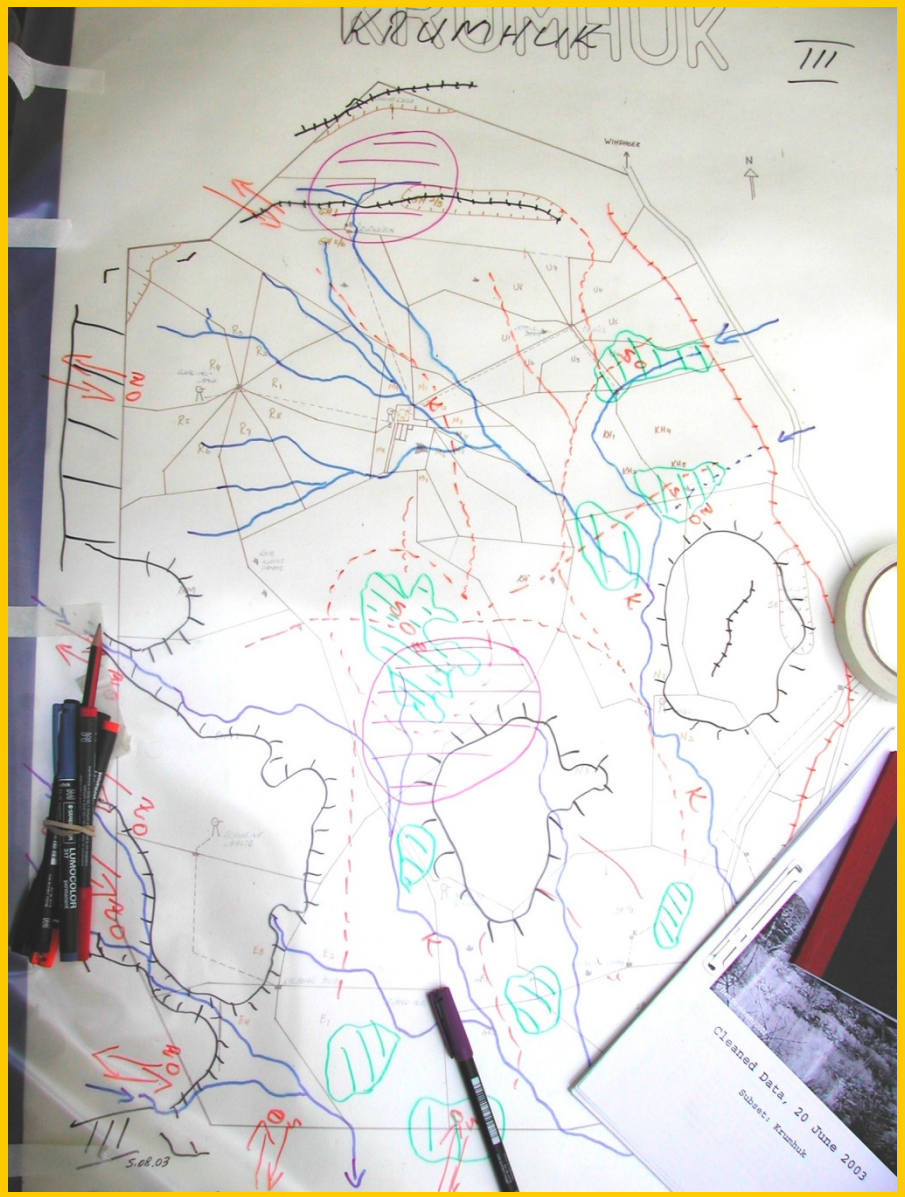
Kauatjirue, J., Shamathe, K., Pringle, H.J.R. and Zimmermann, I.

The Auas-Oanob Conservancy

- Predominantly in the highest sectors of its river catchments (an upland conservancy)
- Best production from pediments and upland valleys
- Cattle and wildlife predominate, compete
- Bush encroachment a major issue in several landscape situations

- First workshop in 2003, by EMU
- Mapping various features onto transparencies over maps and aerial photos.

- The farmers overlaid transparencies to identify key areas for priority management in their landscapes
- Increasing number of game animals over the previous few years was agreed to be the weak link
- They therefore secured a regular market for game meat



Key features in the landscape

- Farmers identified upland fertile valley systems as key features in their rangeland.
- Periodic waterlogging used to ensure that these valleys were dominated by perennial grass.
- Their fertile grasses were seasonally important for game animals.
- When cattle were introduced, they too were attracted to the fertile valleys.
- Watering points and access tracks to them also focused on the valleys compounding pressures.
- Consequently, many upland valleys are gullied and bush is encroaching.

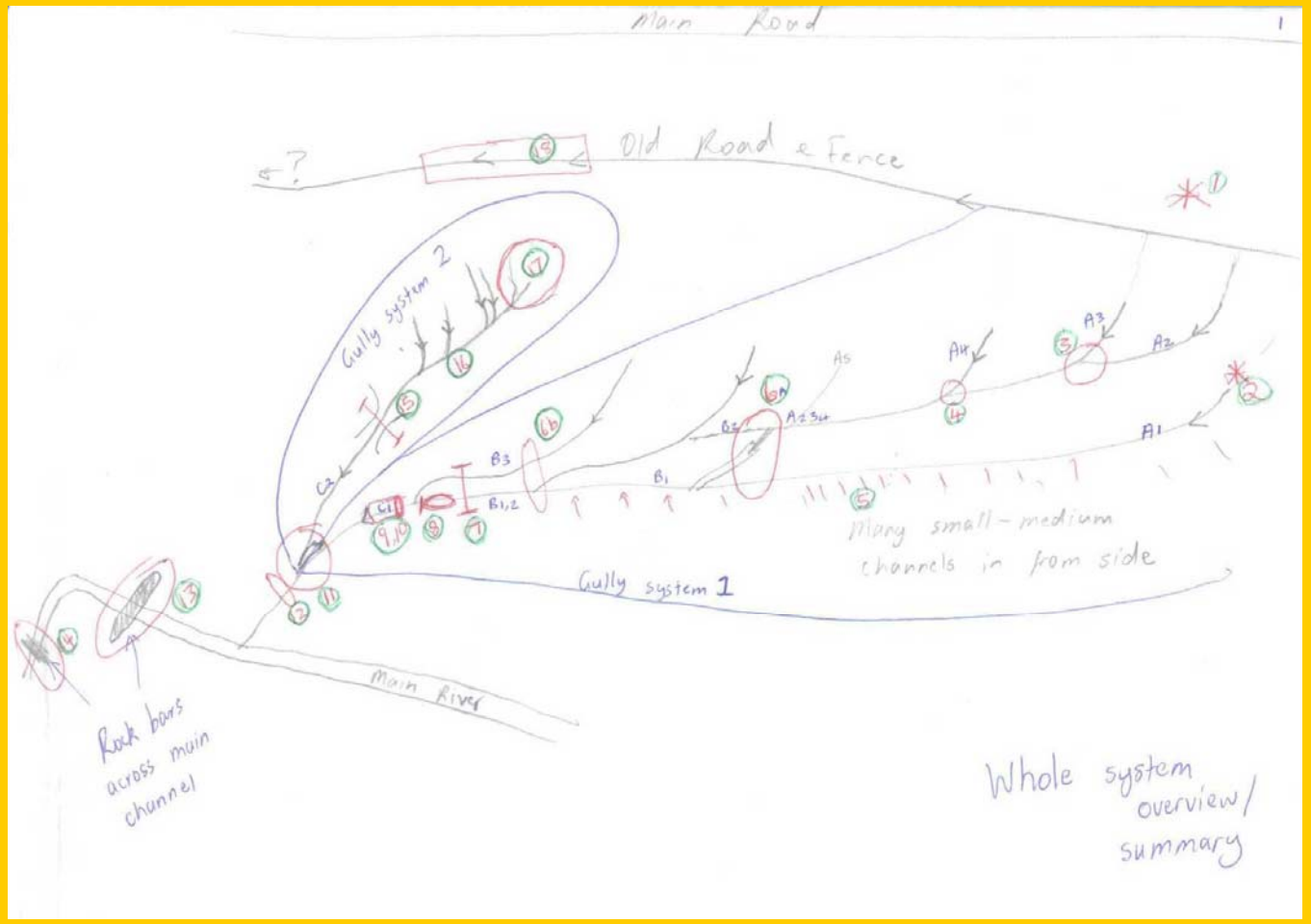
Grassy upland fertile valley acts as a benchmark, providing a vision for restoration of eroded valleys

Gully erosion drains an upland valley, allowing bushes to take over where temporary waterlogging had excluded them

Need for Restoration

- Preventative rangeland management should be a priority to avoid rangeland degradation
- But sometimes removal of causes is insufficient to bring about significant improvement ..
- .. because conditions still prevent the establishment of perennial grass cover
- In the pilot gully system, erosion removes valuable water, soil and seeds
- So this project treats symptoms too

Hugh drew up a restoration plan for a gully system on Lichtenstein-sud



The plan was implemented by Polytechnic students, helped by Hugh.

Encroachment by *Acacia mellifera* gets treated, while providing filter material

Branches of *Acacia mellifera* get placed in both

gullies **and** **rills**

Branches were stacked for water to go through, not around

Filters must be strong to calm turbulence at a confluence

Wire gets woven through a filter, to hold branches together

Filters get tied with wire to nearby trees

Where there was no tree nearby, a steel post serves as anchor

At critical locations the filter extends well beyond the gully

Half of the measured sites are fenced to exclude cattle

LFA measurements both above and below each feature at:

Untreated system & Treated system

Unfenced 2 confluences and 3 rills	**Unfenced** 2 confluences and 3 rills
Fenced 2 confluences and 3 rills	**Fenced** 2 confluences and 3 rills

Gully depth was measured at regular intervals along transects

Landscape Function Analysis across the rills and gullies

Soil Surface Assessment measurements

Slake test

Texture

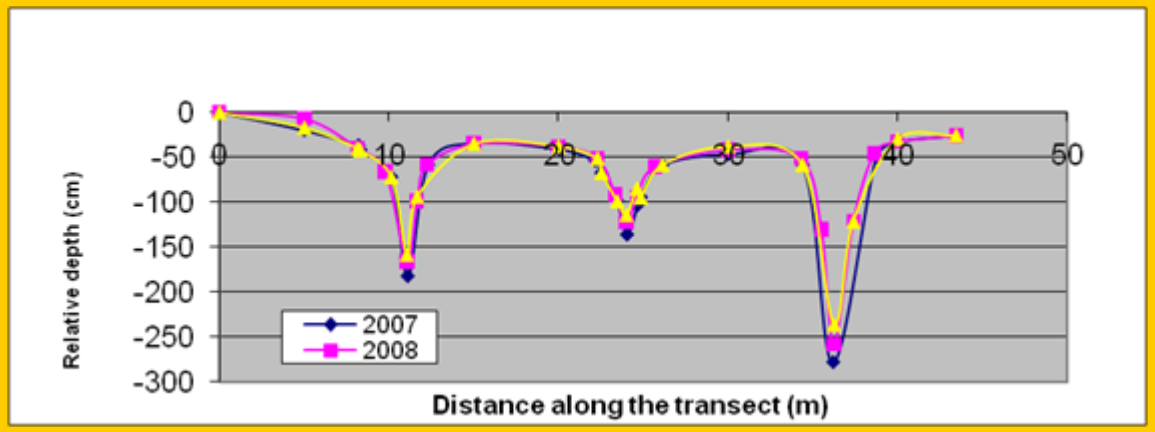
After only 20mm of rain at poor start of 2007/08 season

Then in March 2008 about 50mm of rain fell in 30 minutes

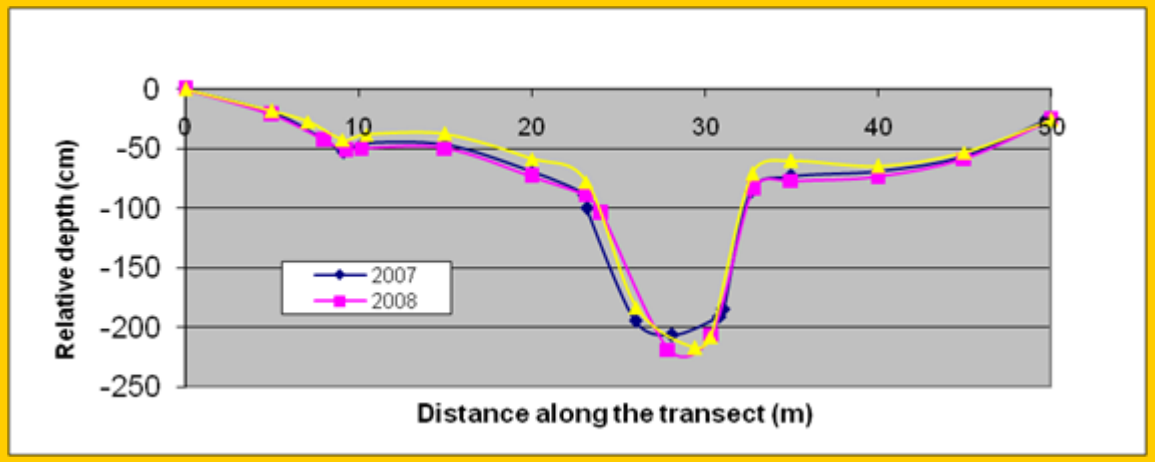
Both soil and organic matter were trapped by some filters during the rain.

Perennial grasses established in the rills

Change in cross section over a year above and below confluence



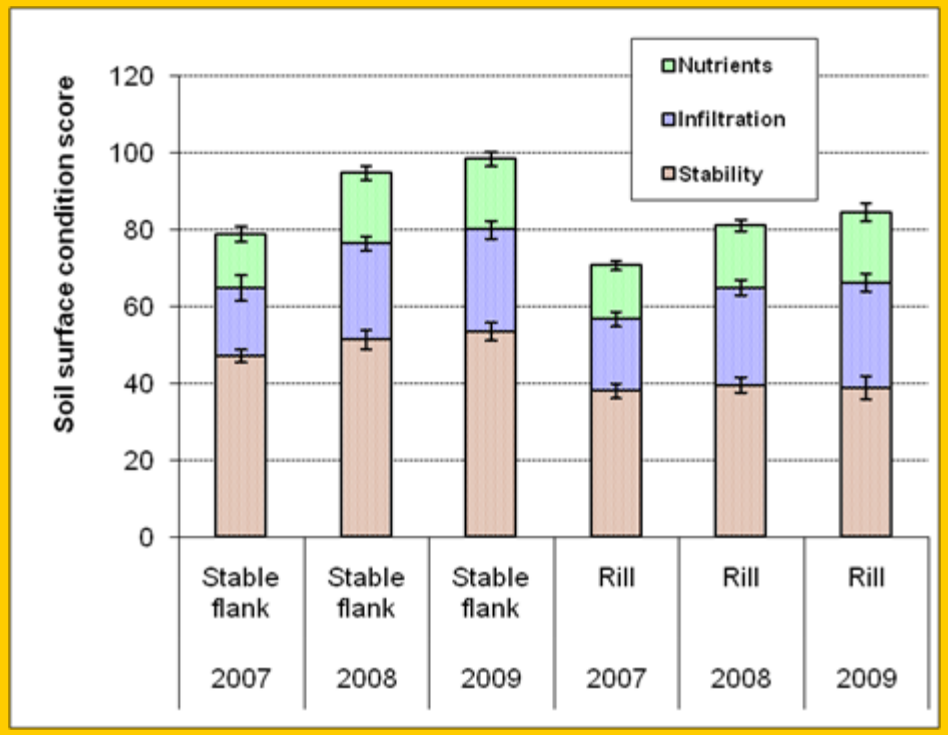
Above the filter of confluence



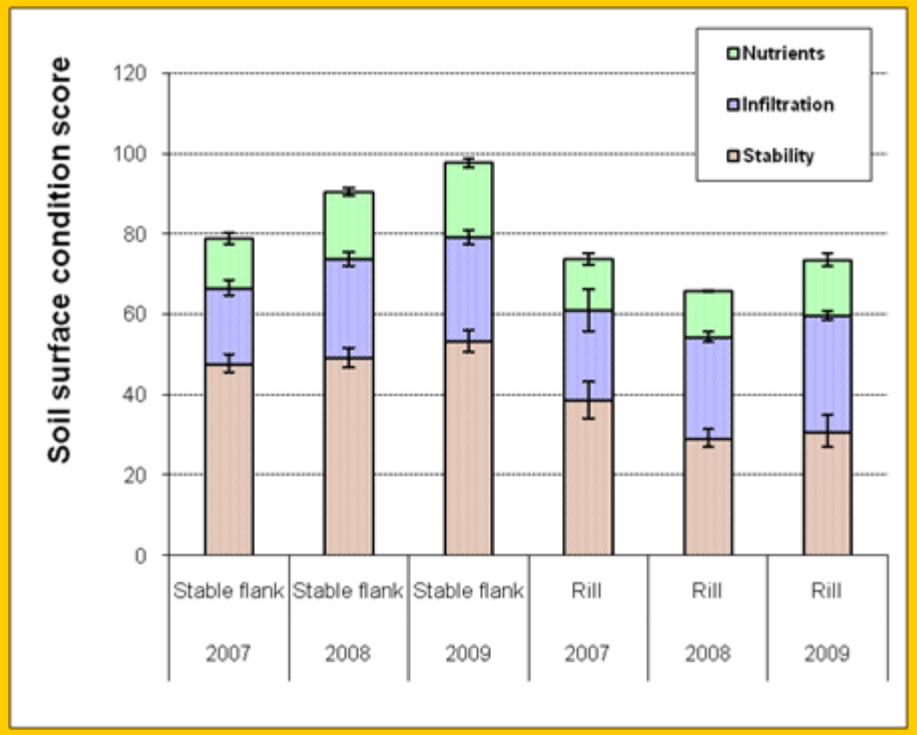
Below the filter of confluence

Soil Surfaces Assessments

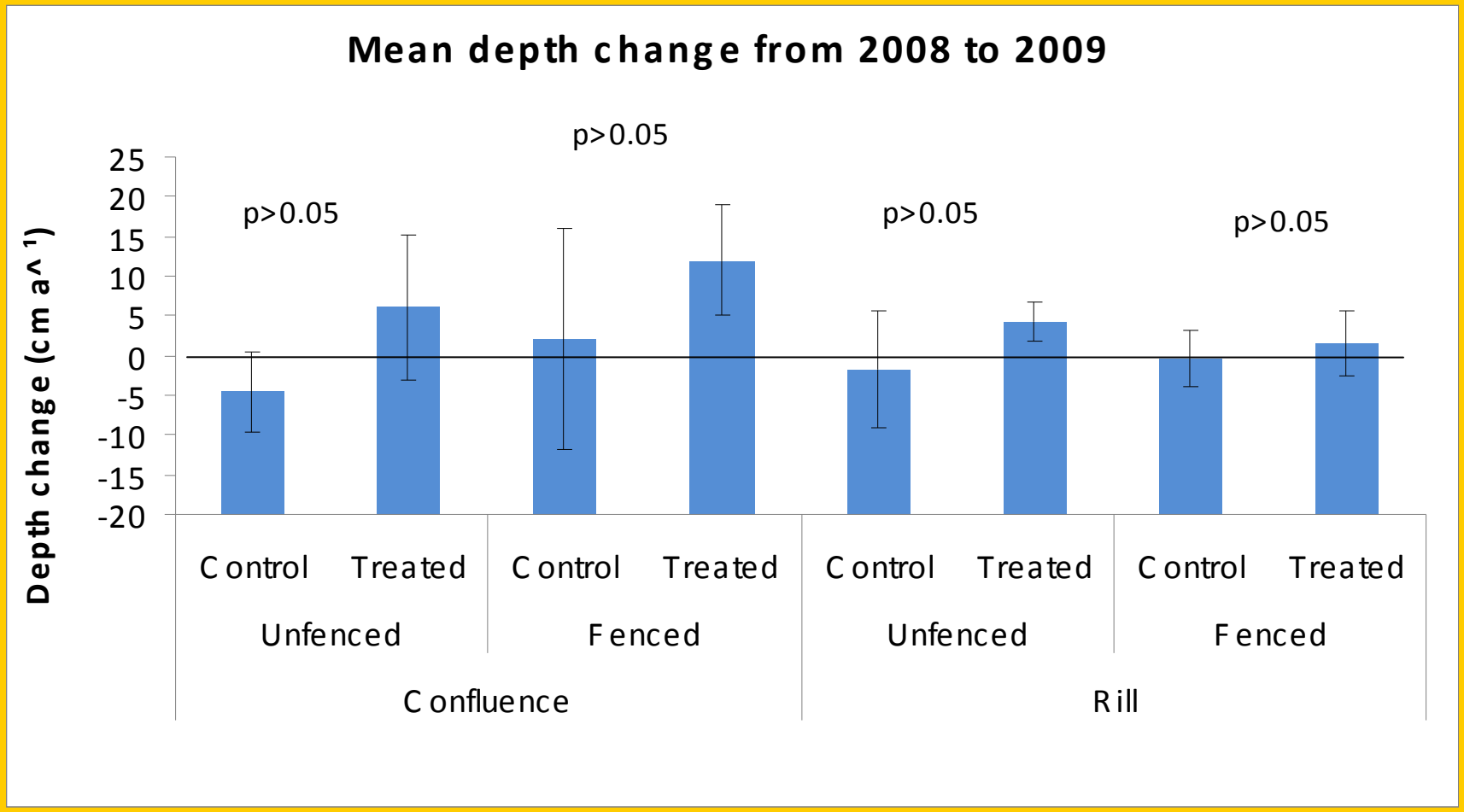
Above the confluence



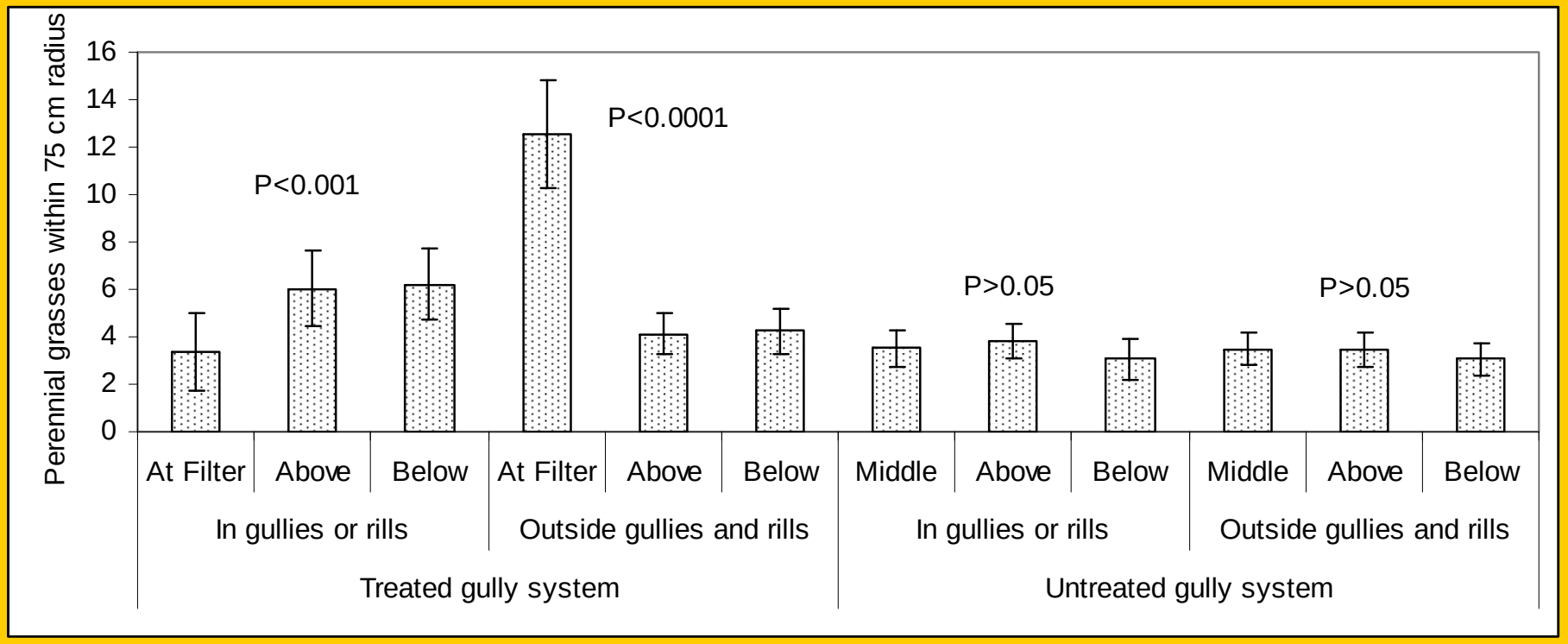
Below the confluence



Mean depth change



Densities of perennial grasses under filters and outside the filters



More grasses growing under individual filters

Higher grass biomass in fenced exclosures, but zero animal production

Lower grass biomass in surrounding camp, but higher density

Conclusions

- Perennial grasses appear to be taking over the filtering function from the rotting branches
- There was no evidence that fencing helped the restoration process, so the grazing management seems OK
- Early response is critical to prevent gullies losing rain water and soil

ACKNOWLEDGEMENTS

- Members of the Auas-Oanob Conservancy for their participation
- All Polytechnic students who assisted with the restoration work
- BIOTA for funding
- Polytechnic of Namibia for allowing it

Thank You