Designing cost-effective approaches to remediate large-scale gully erosion on grazing lands – Great Barrier Reef catchments

Major Integrated Project (Burdekin)
Landholders driving change
The current challenge

- Design and implement cost effective treatments for sediment abatement that are effective in short time frames
Background and build up

• Many NRM investment streams – not previously aimed at large scale erosion features
• Reef water quality targets – cost and timing
• Major Integrated Project – Landholders Driving Change
• Large scale gully features recognized as major generator and exporter of suspended sediment
Scale of Investment to meet targets – fine sediment

$/tonne highly important
Burdekin gullies

- Substantial gully presence
- High concentration areas close to coast
- Exporting large volumes of fine sediment to GBR lagoon
Gully types - hillslope gullies

- Likely to achieve <$50/t and immediate abatement with appropriate design and management
Alluvial gullies

- Currently >$300/t sediment abated
- Large scale design approaches to move to <$100/t
Burdekin gullies

- Significant alluvial gully clusters adjacent major streams
- Clusters of hillslope gullies
- Exporting large volumes of fine sediment to GBR lagoon
Burdekin MIP – Landholders Driving Change

- *Landscape remediation* program aims to:
  
  - Develop guidance for strategic investment in landscape remediation in the BBB that provide the greatest sediment and particulate nutrient reduction benefits for the least cost, in the shortest timeframes.

  - In partnership with BBB landholders, investigate and demonstrate the most cost effective remediation treatments for large scale erosion features and establish the basis for transferability of solutions to other areas.
Characterising gullies and treatments

- **Alluvial gully erosion:**
  - Smaller scale — <5ha, incision <3m. Management may require (technically designed) earthworks, soil amelioration, fencing and assisted revegetation. Limited requirement for structures (most relevant to on-ground action in *BBB Grazier support*).
  - Larger scale - >5ha, incision >3m. Management likely to require structures such as rock chutes and gully plug dams (at least temporarily) and earthworks, soil amelioration, fencing and assisted revegetation (suitable for this Program Area).

- **Hillslope gully erosion:**
  - Early phase incision – single erosion head with length of incision under 1km. Management likely to require (technically designed) single rock chute, fencing and assisted revegetation upstream and downstream of erosion head and multiple minor bed control and minor overland flow entry tools (most relevant to on-ground action in *BBB Grazier support* program unless further development is required).
  - Developed incision – potentially multiple erosion heads, active incision and widening and potentially meander development and bench deposition. Management likely to require assisted revegetation and associated measures as for early phase incision (suitable for this Program Area).
How do we tackle big gullies?
Mining has given us plenty to learn from
Early large scale investment

• State and federal government programs
Civil/mining earthworks design
2 orders magnitude suspended sediment reduction
Next large scale gully remediation site