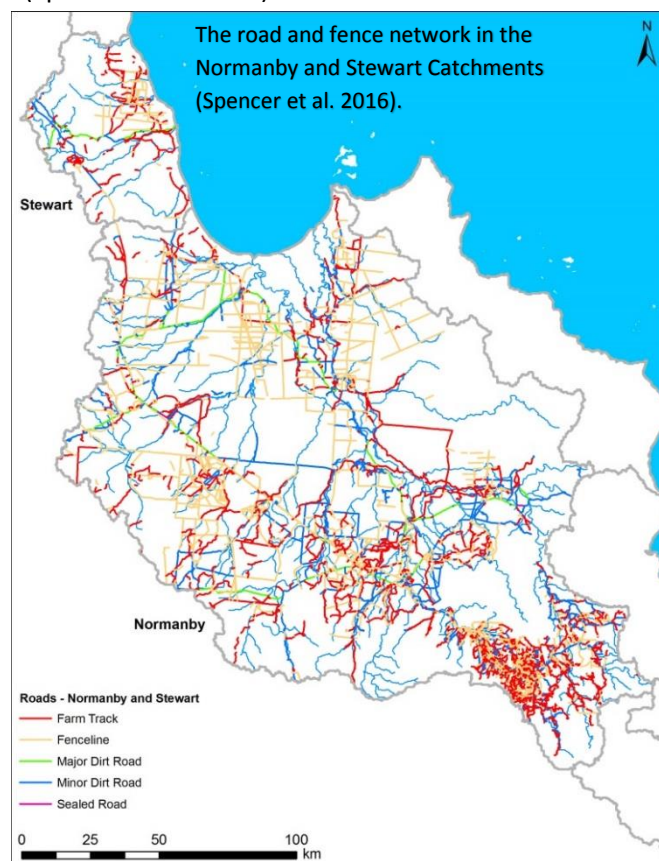




Impact of Main and Council Roads on Water Quality on Cape York Peninsula and the Great Barrier Reef

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- Roads, borrow pits, tracks, fence lines and other linear disturbances are a major sediment source draining to the Great Barrier Reef (Gleeson et al. 2012; Brooks et al. 2013; Shellberg and Brooks 2013) and have been poorly quantified in the past to prioritize sediment reduction to the GBR.
- In the Normanby-Stewart catchment of Cape York Peninsula, there are >10,800 km of linear road disturbance covering 7988 ha, which represents the largest direct human land use disturbance across Cape York compared to all other intensive land uses (Spencer et al. 2016).
- Road development represents THE major human disturbance vector for developing catchments on Cape York and the GBR, similar to other remote regions of the globe (e.g., Amazon basin; Laurance et al. 2001; 2014). Roads pollute sediment and nutrients, and carry people, animals, weeds, and development into remote intact ecosystems.
- Annual road maintenance, new road construction, and legacy road problems pollute 100s of thousands of tonnes of sediment to Cape York rivers and the GBR each year. On Cape York, road maintenance crews replace >25 mm of road surface lost to erosion each year, which represents > 500 tonnes/km/year not including associated road gully erosion.
- Both Shire Council and Queensland State road crews are publically funded many hundreds of millions of dollars each year to maintain and develop roads for public use.
- Federal and State funded '*road development programs*' that pollute sediment and nutrients are in direct conflict with funded '*reef rescue programs*' aimed at reducing this pollution.
- Addressing these program conflicts of interest represents the lowest hanging fruit for sediment pollution abatement by government programs in the northern GBR, by reducing sediment disturbance and mobilisation through improved Best Management Practices (BMPs).
- Shire Councils rely on annual and emergency State and Federal road funds to maintain their road development work forces and intricate networks of contactors and machine operators.



- Historically and recently, there has been little incentive by road engineers, Councils and contractors to 1) minimize their sediment and erosion disturbance volumes and areas along roads and borrow pits, 2) engineer and construct roads that will last with minimal ongoing maintenance, or 3) implement rigorous BMPs to reduce erosion following international standards. Many recent examples have been documented of road crews poorly addressing erosion problems year after year, and accelerating erosion to the GBR.
- Road construction and maintenance practices that would never be allowed in southeast Queensland are prevalent on Cape York Peninsula. Most road projects do not include effective sediment reduction BMPs such as minimizing disturbance, active revegetation of slopes and borrow pits, frequent effective grade control structures, or avoiding cutting drains that feed into gullies, creeks and the GBR.
- The major funding investments to pave (bitumen) the Peninsula Development Road (PDR) on Cape York will eventually reduce sediment pollution in the long-term (>20 years). However in the short-term (1-10 years), these construction works will likely contribute 10s if not 100s of thousands of tonnes of sediment through major earthwork disturbance and lack of rigorous BMPs. Many examples have been documented of major pollution from recent construction and poor road management along the PDR.
- Best Management Practices (BMPs) to reduce sediment pollution and erosion along Shire Council and Queensland State roads are in desperate need of review and improvement to bring the standards up to International best practice to reduce GBR pollution impacts.
- BMP requirements and standards must be increased for Federal and State funded road projects, with greater than >20% of project funds directly invested to avoid or reduce sediment pollution.
- Cooperation is needed between Federal, State and Council funded 'road development programs' and 'reef rescue programs' to ensure that these programs are not antagonistic and both produce outcomes for the public good and public trust (GBR).
- Cooperative education, training, and monitoring programs are needed for sediment reduction and avoidance during road projects, through the interaction of geomorphology scientists, engineers, road practitioners, and contractors. Independent monitoring and auditing of BMP implementation measures and pollution outcomes is essential for improved management and oversight.



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