

Dixie Nott: Submission to Senate Inquiry into the regulation of farm practices that impact water quality outcomes in the Great Barrier Reef.'

I aim to address some or all of the following points:

The identification of leading practices in ensuring evidence-based regulation of farm practices that impact water quality outcomes in the Great Barrier Reef, with particular reference to:

- a. the existing evidence-base on the impact of farm water runoff on the health of the Great Barrier Reef and catchment areas;
- b. the connectivity of farm practices throughout the Great Barrier Reef catchment areas to water quality outcomes in the Great Barrier Reef Marine Park;
- c. relevant legislation and regulation, including in relation to impacts of water quality, farm management and soil runoff;
- d. proposed changes to regulations that would impact on farm productivity and the potential benefits and costs of such proposed regulation;
- e. the wider economic and social impact of proposed regulations to restrict farm practices; and
- f. any related matters.

In order:

- a. the existing evidence-base on the impact of farm water runoff on the health of the Great Barrier Reef and catchment areas;

A lot of the purported origin of sediments from farm water runoff is based on “estimates” and when actual measurements are made there is no evidence of increased pollution due to land management over time. Yu *et al* (2013) pointed out that at present 90% of the Fitzroy basin had been cleared for agriculture and cattle grazing since the 1960s. Their measurements were of long term flow and sedimentation data but as they state “The paper shows that in spite of the large-scale, rapid land clearing, and an increase in sediment concentration at a given discharge, there are no significant trends in mean annual sediment concentration nor in the sediment discharge into the GBR lagoon”.

Well researched and documented measurements on water quality and the Great Barrier Reef are summarised by Starck (2016) as follows:

“The effect of runoff on GBR water quality has also been grossly exaggerated. Significant runoff in the GBR catchment is limited to occasional brief flood events. These affect only relatively restricted inshore areas well removed from the main body of the reef, which is much further offshore. The nutrient flux on the outer reefs is dominated by naturally occurring internal waves which are much more frequent and orders of magnitude greater in effect than anything coming from the land. Contrary to the highly misleading claims of the reef’s self-proclaimed and self-promoting saviours,

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there is no evidence of decreasing water quality on the GBR. If anything, the quality of runoff has almost certainly improved over recent decades from advances in land-management practices. In particular this has included a substantial reduction in fertiliser and pesticide usage. There is simply no evidence for any decline in water quality on the reef, and agrichemical usage in the catchment area has declined in recent decades. In short, no evidence exists for anything other than natural perturbations in the condition of the GBR."

Support for these observations can be found in peer reviewed science publications from the team including Dr Peter Ridd eg. Andutta *et al* (2013), Marchant *et al* (2015). The bigger issue uncovered by this research and the fact that a lot of funding supports the notion of "threats" to the Great Barrier Reef (GBR) is that there needs to be a formal, independent review of GBR publications and reports which guide the Queensland Government and more broadly published science generally, Larcombe *et al* (2018).

(b) The connectivity of farm practices throughout the Great Barrier Reef catchment areas to water quality outcomes in the Great Barrier Reef Marine Park

(c) relevant legislation and regulation, including in relation to impacts of water quality, farm management and soil runoff;

Farm practices throughout the GBR catchment areas were vastly improved due to the 40 years of research by the Queensland Department of Primary Industries (QDPI) Woodland Research team. A summary of grazing land management in the woodlands of GBR catchments was published by this team in 1984, in the publication *Native Pastures in Queensland: the Resources and their Management*. The research, over all those years, has been completely ignored by the Queensland Government who prefer to quote reports commissioned and authored by the environmental movement.

A glaring example of the anti-farming purpose of the GBR legislation and the Vegetation Management Acts under various labour governments is the disregard for the basic fact that grass holds soil not trees. Woodland density in Government legislation is always based on tree number not the metric that actually characterises the health of a woodland ecosystem, basal area. Tree/grass competition in 'thickened' grazing systems, Burrows *et al* (2002), need continual management. As a general rule tree basal area in coastal central Queensland of 15 m² will depress the grass ground layer by 60% due to competition for soil moisture. Thus more soil is potentially able to be transported off site exacerbated by restrictions imposed by Vegetation Management legislation.

Soil movement is also a risk after hot, dry summer wild fire potentially followed by heavy rain due to summer storms. The fires in central Queensland in 2018 were hotter and less susceptible to control due to thickening of un-managed woody vegetation. A negative, perverse outcome of poor Vegetation Management legislation.

A positive outcome for property run off, of grazing management is the establishment of non-native grasses in continually grazed woodlands. Stoloniferous grasses provide complete

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ground cover even under heavy grazing and drought conditions compared to tussocky native species. This is recognised in farming areas where the stoloniferous species, Indian couch was used to stabilise waterways. The interesting thing is, this species is seen as a disaster by government and catchment groups, the same groups leading sedimentation reduction workshops.

Interestingly in the search for a villain to promote the flow of funding for a GBR disaster, there has been no mention of the gravel road system in GBR catchments. There would be thousands of kilometres of this connected source of sediment top-dressed at very regular intervals when the fines blow away or wash away. For an appreciation of the sort of quantities see Figure 1 below.



Figure 1. Gravel top dressing on road in the Fitzroy catchment of central Queensland. This was a continuous line of dumped material for 2km of a 4km stretch of road.

The huge, overnight rain event that was Cyclone Debbie in the Connors Range resulted in massive stream bank and stream bed erosion in uncleared woodland. Thousands of cubic meters of soil were moved dwarfing any movement due to grazing activities but this legislation aimed at protecting the GBR, takes no account of these natural soil movements (see Figure 2). Landslips were common on un-grazed, remnant hillsides after Debbie also.

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Figure 2. Up-ended large gum trees and eroded banks after cyclone Debbie in 2016.

(d) proposed changes to regulations that would impact on farm productivity and the potential benefits and costs of such proposed regulation;

(e) the wider economic and social impact of proposed regulations to restrict farm practices; and

Having farm management administrated by a bureaucrat in Brisbane and perceived mis-management subject to large fines, both have the potential to ruin individual farms. The legislation will not improve the lack of accurate historical benchmarks of reef condition and behaviour so landholders will continue to be harassed for dubious effect. There is no plan to conduct independent monitoring reported truthfully and based on replicable science so there will be no expectation of improved GBR condition in the future.

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