Water Conservation Order: Te Waikoropupū Springs and Associated Waterbodies

Submission Reference no: 643

Soraya, **Soraya Bradley (Soraya Joy Bradley)**
[redacted]

Submitter Type: Individual
Source: Email

Overall Notes:

Clause
The specific parts of the application that my/our submission relates to are:
Notes
Spiritual, Scientific and Environmental significance.

Clause
What is/are your view/s on the application?
Position
Support
Notes
Please see the email submission on farmer interests. As the partner of a farmer and granddaughter of a Langford - (Langford extended family have been farming in Takaka district since 1870s) I can say Farmers themselves are not looking after their own interests. One of the biggest questions of our time is whether water is a right or a commodity (like oil). Farming and water in NZ is suffering the “tragedy of the commons” - an economic theory of a situation within a shared-resource system where individual users acting independently according to their own self-interest behave contrary to the common good of all users by depleting or spoiling that resource through their collective action.

Clause
I/we seek the following recommendation from the Special Tribunal to the Minister for the Environment
Position
Grant the order
Notes

Clause
Would you like to present your views on this submission to the Special Tribunal at a public hearing?
Notes
Unable to attend

Water Conservation Order: Te Waikoropupū Springs & Associated Waterbodies

Farmers Interests -
As the partner of a farmer and granddaughter of a Langford - (Langford extended family have been farming in Takaka district since 1870s) I can say Farmers themselves are not looking after their own interests.

One of the biggest questions of our time is whether water is a **right** or a **commodity** (like oil). Farming and water in NZ is suffering the "tragedy of the commons" - an economic theory of a situation within a shared-resource system where individual users acting independently according to their own self-interest behave contrary to the common good of all users by depleting or spoiling that resource through their collective action.

The average annual rainfall in Takaka is 2019mm. My partner, a second generation farmer, suggested that the farmer unable to farm with this rainfall, displays a competence level is so low, they shouldn't be allowed to farm. To qualify - Michaels family have farmed in Manakau, Levin since 1980s. Their annual rainfall is 1141mm, Nitrogen/Urea fertiliser free and no irrigation farming at 1.4 stocking units. Cambridge/Waikato - dairy farm country annual rainfall average 1214mm per annum.

Flawed Farming Methods -
In 2007 Richard Mulvaney, Saeed Khan, and Tim Ellsworth of the University of Illinois announced the disaster of Synthetic Nitrogen fertiliser. The Marrow Plots, the oldest experimental fields studying soil fertility est. in 1876. Synthetic Nitrogen fertiliser, used on the plot since 1967, had significantly reduced the organic soil matter and nitrogen - the opposite of what its thought to do. (This is a rediscovery of pre- war research 1920s and 1930s and featured in "The Soil and Health" (1947) by British agronomist Sir Albert Howard. b

There is the same amount of carbon in the earth and atmosphere as there has always been.
But we are ripping carbon in the form of oil from deep within the ground. The past 100 years we have practiced farming techniques that have lost carbon in our topsoil. Estimates 1/3 of carbon in atmosphere is from topsoil loss.

In Australia 2007, the Soil Carbon Accreditation Scheme was begun. The scheme was based on financially rewarding farming practices that restored carbon to the soil. In the USA the AMP Grazing research project was begun, Dr Richard Teague found AMP grazing stored 3tons more carbon per hectare than traditional grazing. (Shell Oil is one of the financial supporters of this research aka carbon credits)

A German grassland study (begun 2002) found as species diversity increases so does annual biomass - more than using fertiliser. Even when nitrogen rates increased to 200kg/ha, plant diversity trumped biomass production. Biomass production kept doubling with pasture plots up to 60 species. As species increased so did soil carbon whereas soil carbon declined with monocultures. c

Meanwhile since the Clark government agricultural research funding was cut - independent/neutral research facilities such as Ruakura were scaled back and smaller areas closed. Interested parties such as Fonterra and fertiliser companies now fund this research. While international research is looking incredibly positive, NZ universities are negative about the success of carbon sequestion and impact of cows - recommending poorly sighted local research. NZ used to lead the world in innovation in hydroponics, increasing the milk yield in cows by breeding stock. This means that despite NZ grassfeed, rotational grazing, we are significantly behind other countries in best practices.

Current farming practices include a problematic monoculture of rye and clover, this has transitioned to further problematic annuals that require yearly tilling and replanting - further increasing loss of carbon. There is an insistence of farmers (agricultural and horticultural) to grab surface water, then aquifers and now we are two minutes to midnight to destroying these springs that have a cultural, scientific and heritage significance. The clearest springs outside of Greenland and may provide the scientific breakthrough to clean all our waterways.

Nestle produces in three days what Fonterra produces in a year. China has built the worlds biggest dairy farm on the Russian border and since this time NZ milk prices have dropped. Fonterra has been satisfied to push farmers to

intensification, increasing yield and reducing payouts for short term and unsustainable gain. Whether Fonterra will still exist in ten years time is questionable if milk powder to china is aim. Instead of innovation, A2/allergenic and grassfeed, grass finished, hormone and antibiotic free, permaculture, regenerative products into higher end markets is not pursued and lowering processing cost and increasing farmer payouts.

NZ Farmers today have been satisfied to haemorrhage their profits to fertiliser, irrigation companies and other associated chemicals & gadgets … they have lost touch with the health of the land and with the desire of the consumer for low pollution organic produce. (The regenerative farming model mixes organic style land practices based on ancient prairie grazing with modern treatment of the cow.)

The most successful models seem to be a no till, rotational grazing with 20 species diverse crop.

A Laymans understanding of Ecosystem
In order to sequester carbon, we must sequester nitrogen and the co-sequestion results in greater water infiltration, less evaporation and greater water holding capacity of the land. When we interrupt the cycle we lose function in the soil. Carbon is needed for life and all living things require nitrogen - nitrogen compounds like amino acids are required to form proteins. In atmosphere, nitrogen is a very stable gas and not available to plants. Nitrogen needs to "be fixed" in bacteria/microbes in the soil or root nodules or in plant and animal waste. Keeping enough nitrogen in a system is ongoing challenge for farmers, relying on manure, composting, crop rotation and cover crops traditionally. Transfer of nitrogen by plants takes place via fungi and microbes in the soil. The fungi does not fix the nitrogen, rather the nitrogen compound are part of the trading network for which mychorrhizal fungi act as a broker. In thriving systems, plants send carbon exudates out through there roots. These sugars are "bartered" with microbes and fungi for minerals the plant needs including nitrogen often through a mycorrhizal intermediary.
So nitrogen and carbon are inextricably linked. Chlorophyll, where photosynthesis takes place, is part of a protein complex, which means it must contain nitrogen. Photosynthesis cannot be achieved without nitrogen and plant cannot procure nitrogen with carbon compounds to exchange for it. Minerals are not just floating round in the soil, they are bound up. They need fungal and bacterial enzymes to release them. The plant provides the biochemical energy, the fuel in so doing, the plant helps to build the soil.

"Fertiliser is good for the father and bad for the sons."– Dutch saying
Synthetic nitrogen offers apparent results while disrupting the system. Farms become increasingly reliant on synthetic/ inorganic nitrogen to compensate for impaired soil - which has to be weaned off it like a drug.
Less than half of the Synthetic Nitrogen fertiliser applied is taken up by the plant. The remainder is leached into water, volatilised into the air or immobilised in soil. (Excess use and poor management of nitrogen & phosphorus fertiliser are responsible for algae blooms and the 6000 mile deadzone in the gulf of mexico.)
But Synthetic nitrogen alters the biological system of the plant and soil that requires an increase of water.
"In pursuit of yield we've uncoupled the linkages between carbon, nitrogen and water."
In supplying nitrogen upon plants without asking them to pay for it with carbon, we have disturbed the arrangement, short-circuiting the pathway. The plant does not need to provide the carbon to the microbes in exchange for nitrogen and therefor the plant is not getting other nutrients the microbes are also providing. With no need to deal in carbon the plants get lazy. And because they are not getting the trace elements, plant immunity is down - this leaves plants susceptible to disease and pests and now farmers need expensive pesticides. Due to the synthetic nitrogen, their is a loss of carbon in soil. Therefore the soil no longer has any structure and the soil water holding capacity is significantly reduced.

* Precious topsoil is washed away in rain and the soil soaked with inorganic nitrogen provides plant and algae structure in the water the same "growth burst" as the do the plant on land - explaining the massive algae blooms. The plants may look fine but the edifice that supports them is crumbling.

In the wet weather root systems are shallow, as the weather warms and lower summer rainfall the root systems plunge deeper into the ground, older grasses self seed. By irrigating year round the roots of the grass stay shallow meaning that plants and grasses are weak and susceptible to any change in water supply.
Hence irrigation in combination with synthetic nitrogen fertiliser is terminal.
….
Examples
Browns Ranch in Bismark, North Dakota - Regenerative Agriculture example …
265% increase in organic soil matter in 13 years
16 fold increase in water infiltration 1/2" per hour to 8" per hour
13.6" of rain in 22 hours: zero erosion, little runoff
zero fertiliser and herbicide use
127 bushel corn yield compared to 100 bushel county average

Central Otago grape growers found planting flowers between vines reduced pesticide use because they attract predators and pollinators. Furthermore, irrigation use dropped 40 per cent because these species were building carbon, whereas bare soil loses carbon and water-holding capacity.

Thank you
Soraya Bradley
[redacted]

References

Climate Change Information : https://en.climate-data.org/location/37182/

b. Richard Mulvaney

* The dark side of synthetic nitrogen fertiliser https://www.youtube.com/watch?v=Kgy6g44pEIo&list=PL4tNPdK4jtOxHIm1Hy5eQqHbbEBNqWxDW&index=14
* https://grist.org/article/2010-02-23-new-research-synthetic-nitrogen-destroys-soil-carbon-undermines/

c. German Grassland study http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0075599
Numerous studies have reported positive effects of species richness on plant community productivity. Such biodiversity effects are usually quantified by comparing the performance of plant mixtures with reference monocultures. However, several mechanisms, such as the lack of resource complementarity and facilitation or the accumulation of detrimental agents, suggest that monocultures are more likely than mixtures to deteriorate over time. Increasing biodiversity effects over time could therefore result from declining monocultures instead of reflecting increases in the functioning of mixtures. Commonly, the latter is assumed when positive trends in biodiversity effects occur. Here, we analysed the performance of 60 grassland species growing in monocultures and mixtures over 9 years in a biodiversity experiment to clarify whether their temporal biomass dynamics differed and whether a potential decline of monocultures contributed significantly to the positive net biodiversity effect observed. Surprisingly, individual species' populations produced, on average, significantly more biomass per unit area when growing in monoculture than when growing in mixture. Over time, productivity of species decreased at a rate that was, on average, slightly more negative in monocultures than in mixtures. The mean net biodiversity effect across all mixtures was continuously positive and ranged between 64–217 g per m^2. Short-term increases in the mean net biodiversity effect were only partly due to deteriorating monocultures and were strongly affected by particular species gaining dominance in mixtures in the respective years. We conclude that our species performed, on average, comparably in monocultures and mixtures; monoculture populations being slightly more productive than mixture populations but this trend decreased over time. This suggested that negative feedbacks had not yet affected monocultures strongly but could potentially become more evident in the future. Positive biodiversity effects on aboveground productivity were heavily driven by a small, but changing, set of species that behaved differently from the average species

https://www.biogeosciences-discuss.net/bgd-2007-0140/bgd-4-3829-2007.pdf

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Other Sources

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Grassfeed Beef http://abcnews.go.com/Travel/video/food-forecast-ginger-zee-season-now-streaming-abcnews-52216428

Dr Christine Jones : https://www.youtube.com/watch?v=S3rhjqzVrRc&index=5&t=13s&list=PL4tNPdK4jtOxHIm1Hy5eQqHbbEBNqWxDW

Soil Carbon Cowboys/Coalition
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https://soilcarboncoalition.org/
https://soilcarboncoalition.org/html/changemap.htm
Soil Carbon Cowboys Movie : https://vimeo.com/80518559

The role of soil in watersheds : http://harvardforest.fas.harvard.edu/sites/harvardforest.fas.harvard.edu/files/grazing/Collins_Harvard%20Forest%202.pdf

BOOKS
***Water in Plain Sight by Judith Schwartz
***Cows Save the Planet by Judith Schwartz (intro and first chapter frame larger issues well)

The Last Ranch by Sam Bingham (a beautifully written narrative)
Grass, Soil, and Hope by Courtney White
The Soil will Save Us by Kristin Ohlson (nice chapter at end about urban soil carbon)

The Ecology of Care by Didi Pershouse
The Vegetarian Myth by Lierre Keith
The Third Plate by Dan Barber
Grass Productivity by Andre Voisin
For the Love of Land, Global Case Studies of Grazing in Nature's Image by Jim Howell
Teaming with Microbes: The Organic Gardener's Guide to the Soil Food Web by Lowenfels and Lewis
Farmacology: Total Health from the Ground Up by Daphne Miller

UN: Wake up before it is too late: http://unctad.org/en/PublicationsLibrary/ditcted2012d3_en.pdf

Corporate Influence over University Agricultural Research : https://www.foodandwaterwatch.org/sites/default/files/Public%20Research%20Private%20Gain%20Report%20April%202012.pdf