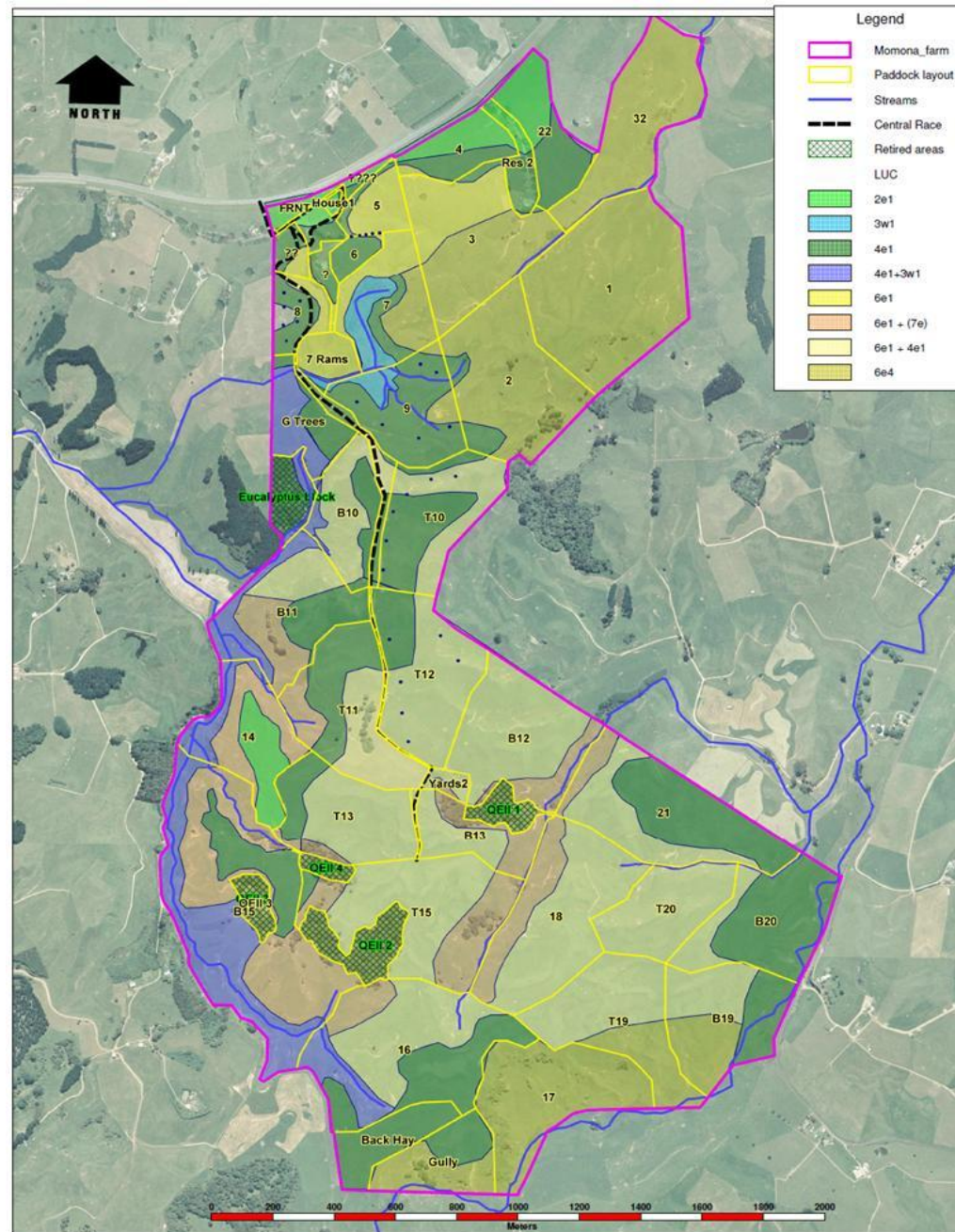
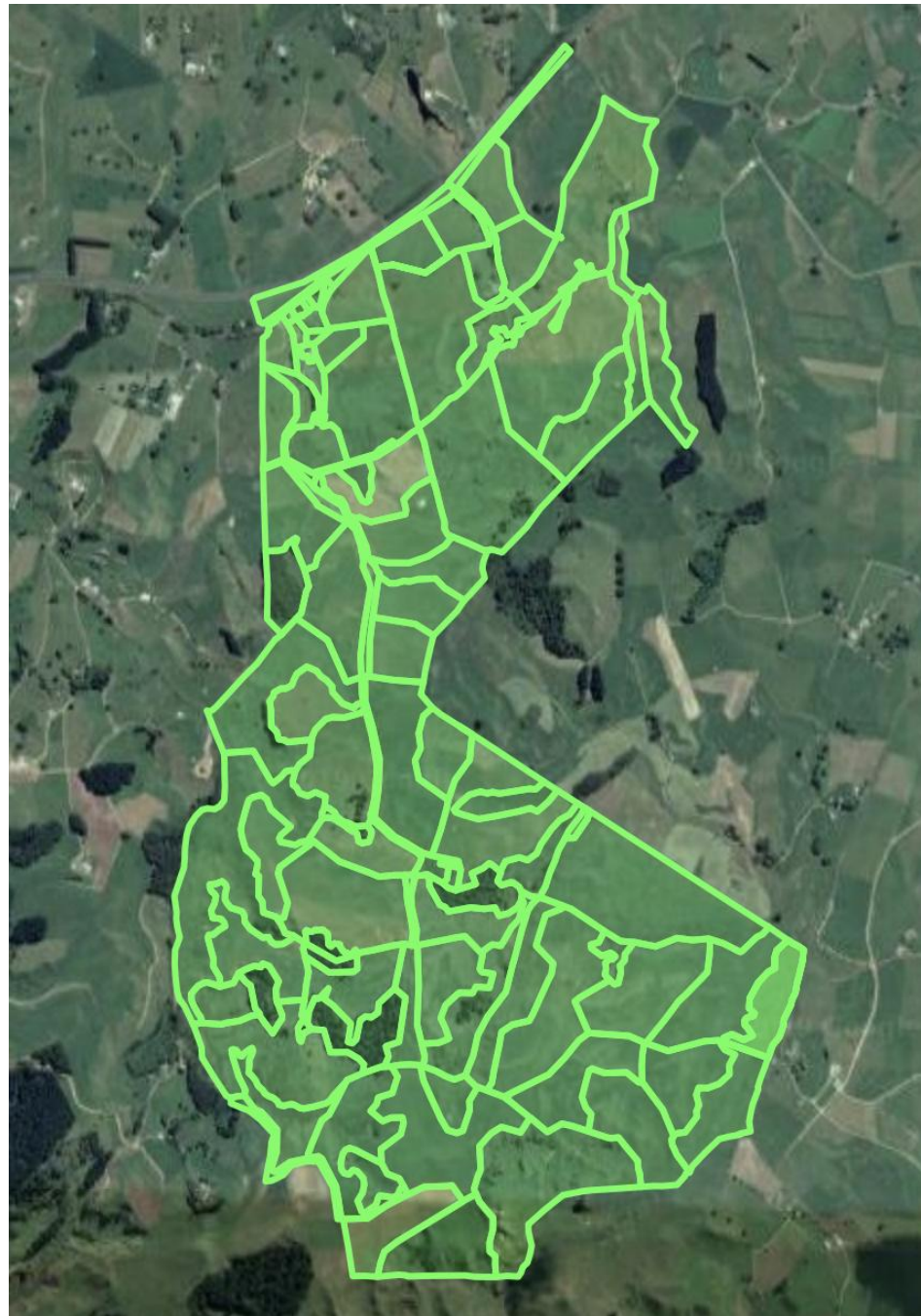


PC1 Hearings Block One  
James Bailey – Individual Submission

# 2010 LUC Mapping



# 2019 Farm Map





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Google earth

Ima2007 Date: 9/22/2014 38°00'26.46" S 175°43'35.03" E elev 177 m eye alt 893 m

PC1



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Image Date: 9/22/2014 38°00'26.47" S 175°43'35.01" E elev 177 m eye alt 887 m

On our farm we took a more considered approach to our mitigations and farm systems investment...



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Ima2007 Date: 9/22/2014 38°00'26.46" S 175°43'35.03" E elev 177 m eye alt 893 m



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Ima2007 Date: 9/22/2014 38°00'26.46" S 175°43'35.03" E elev 177 m eye alt 893 m



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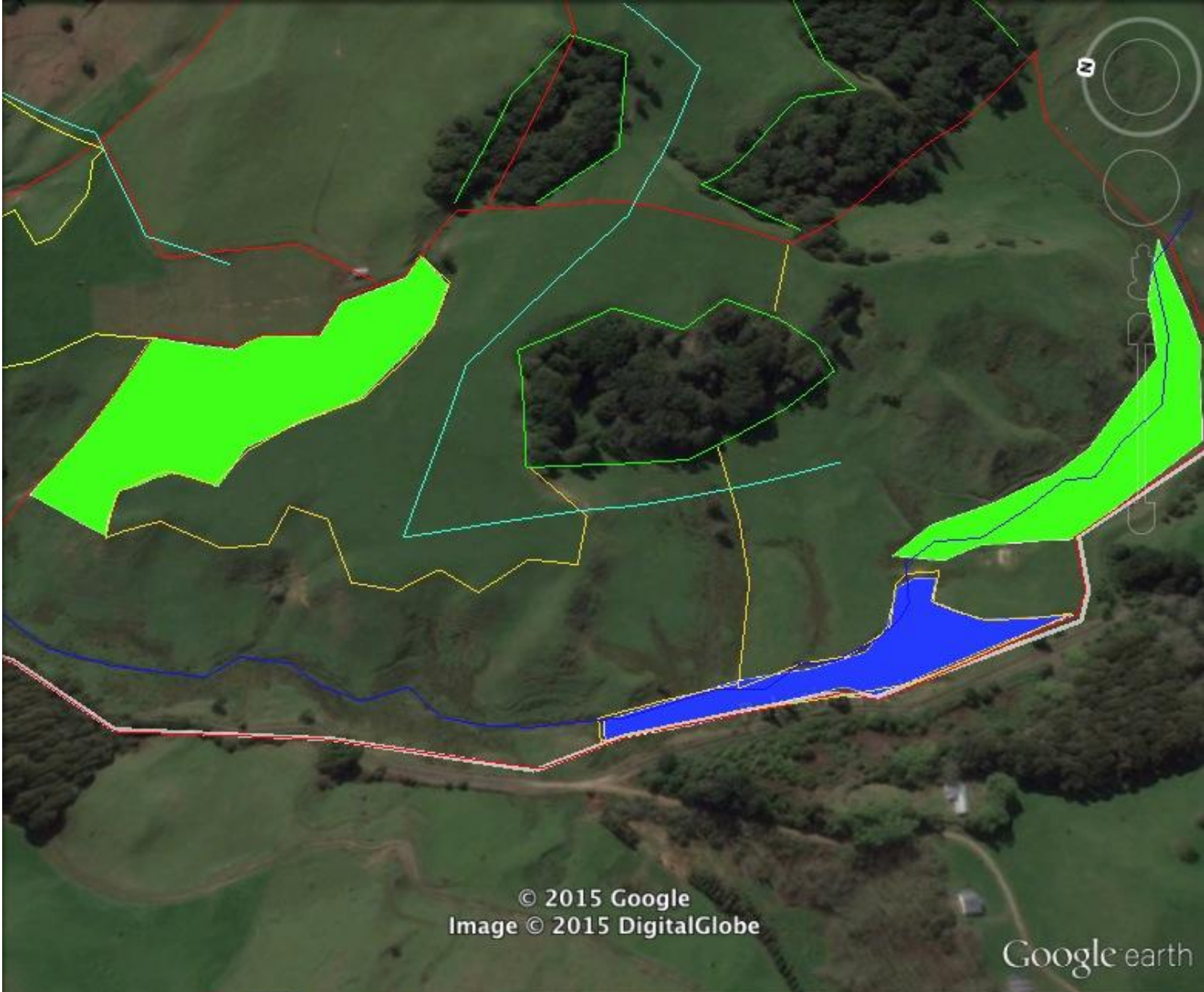


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## Farming in a changing environment: Increasing biodiversity on farm for the supply of multiple ecosystem services



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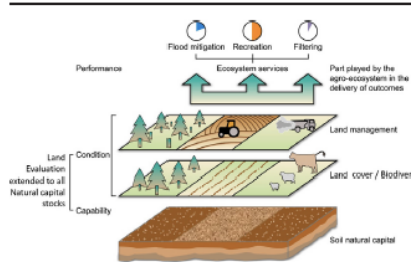
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### HIGHLIGHTS

- Use of an ecosystem approach to extend land evaluation to include biodiversity
- Ecosystem services supply from all parts of the farm
- Farm system optimisation within ecological boundaries
- Co-benefits of increased profit as well as decreased environmental impacts
- Discussion of strategy to incorporate biodiversity enhancement into farm management

### GRAPHICAL ABSTRACT



### ARTICLE INFO

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### ABSTRACT

Among natural resources, soils continue to be poorly represented in ecosystem services frameworks and decision-making processes. Similarly, the supply of multiple ecosystem services from agro-ecosystems and trade-offs between services remains under-researched. As a consequence, it is unclear how and to what extent agriculture can deliver on environmental sustainability, whilst maintaining current levels of profitability. One of the main barriers to implementation of environmental management practices is the perception by the farming industry that environmental gains come at a cost and impact negatively on profitability. Therefore, we need to demonstrate that inclusion of all the natural resources on farm in farm system design and management offers flexibility for the farm system and insures improved sustainability and greater resilience.

In this study, an ecosystem approach was paired with a new generation farm system optimisation model and the inclusion of natural resources beyond land, especially biodiversity, to explore farm system design, and report on ecosystem services beyond food and fibre from different parts of the farm. The approach was tested on a sheep and beef farm in Waikato, New Zealand to explore the added benefits of replanting fragile parts of the farm landscape for soil and biodiversity enhancement on reduced emissions to air and water, and trade-offs between different services and farm profitability. The approach showed that it is possible to define and include ecological boundaries within which resources can be managed to deliver multiple benefits ranging from increased per hectare profitability to decreased environmental footprints. This is a feature analytical farm system frameworks will require in the future. The research also highlighted the importance of developing our understanding of the relationship between the condition and function of indigenous biodiversity fragments and adjacent pastoral

- Local Indigenous Biodiversity Strategy Pilot Project (WRC, SWDC, WRA, WCEET, AG Research)
- Consultation and input from mana whenua
- AGINFORM farm system optimisation modelling through AG Research.
- Identified areas for restoration while retaining profitability
- 15% reduction in P loss
- 20% reduction in erosion and run off
- Restoration of 42 ha (10% of the farm)
- Significant increase in Biodiversity – Manuka, Totara, Wetland Species
- In reality overall reductions in N loss but not identified by Overseer
- Overseer models an increase from 17 kgN/ha/yr to 18.
- Priority 3 sub catchment
- PC1 unable to grant a consent due to the NRP

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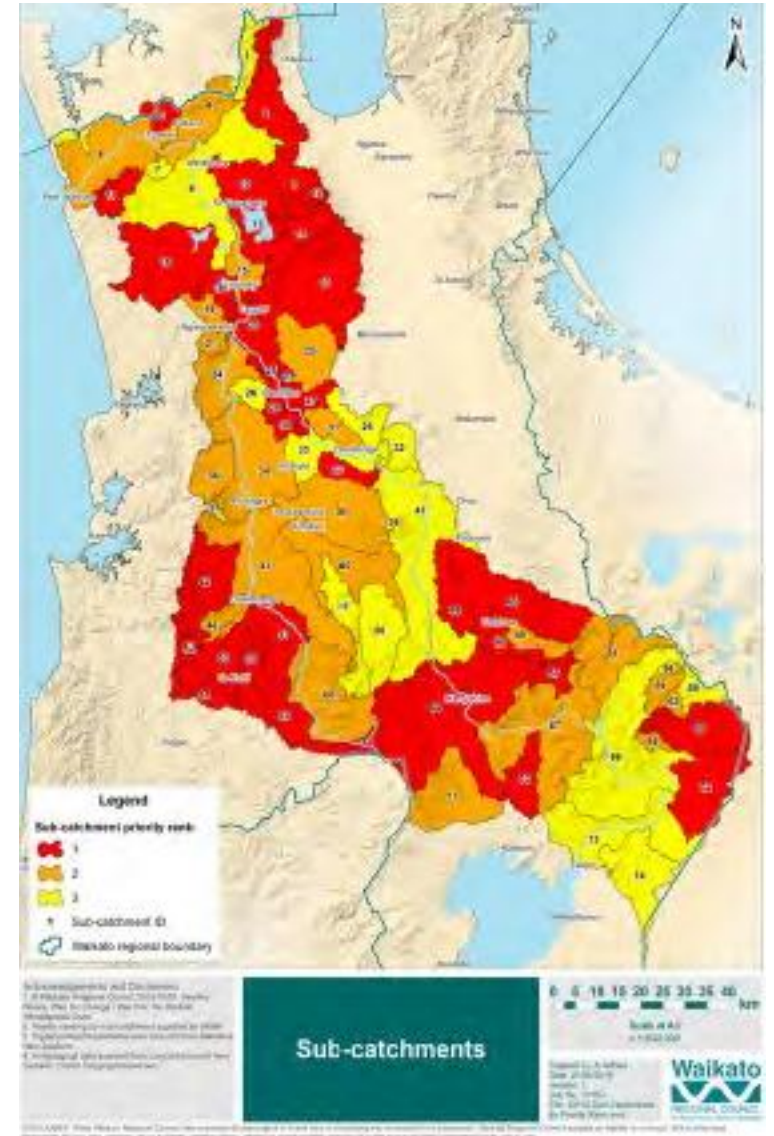
# Subcatchment Approach

“What is it acutally?”

“But how do you envisage it working?”

Too late, its already happening.....

- Whaingaroa Harbourcare
- Pomahaka Catchment
- Lake Ruawhikaaitu
- Whangape Subcatchment Group
- King Country Rivercare
- Puniu River Care
- Chesapeake Bay USA



Thank you

