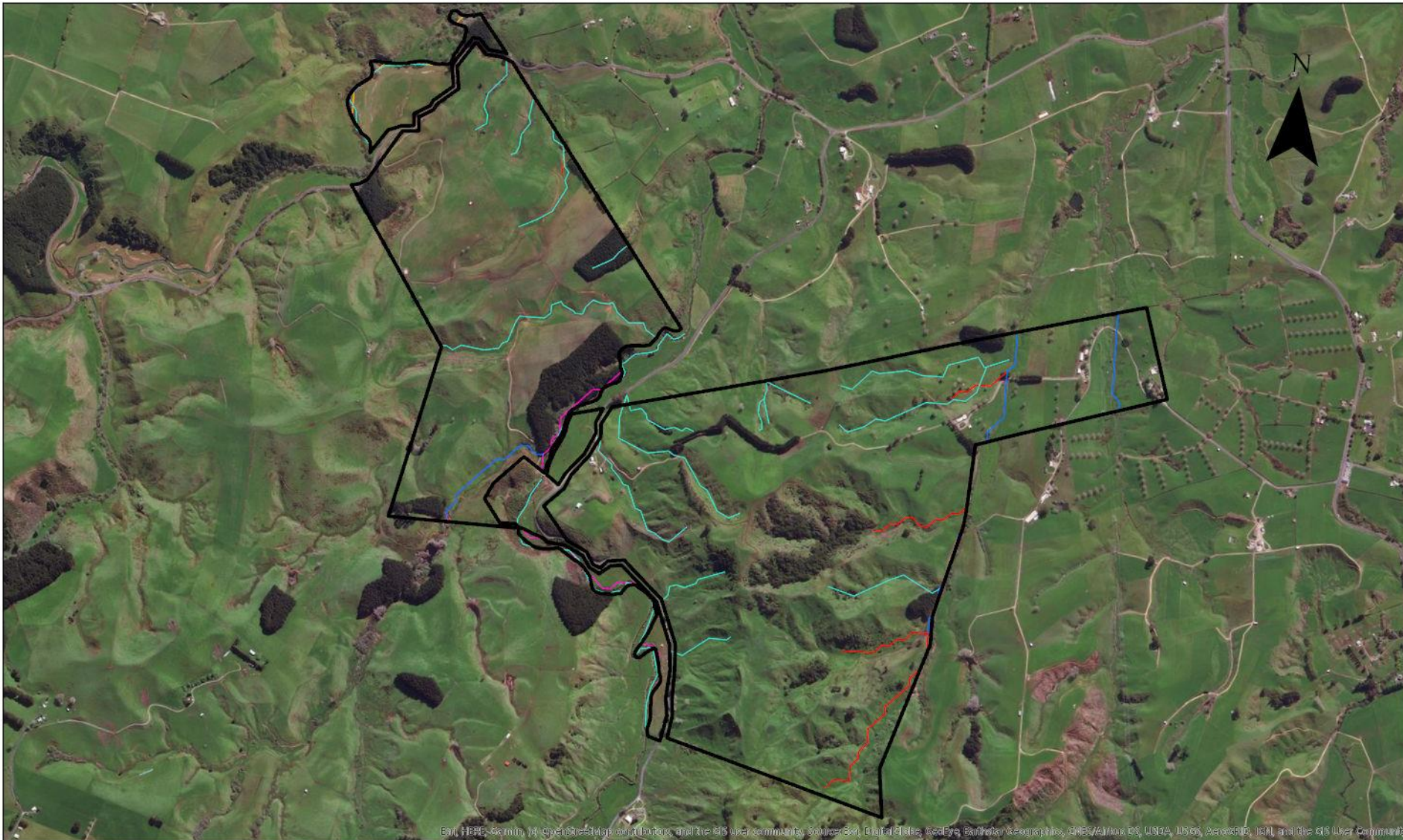


# **FFNZ analysis of fencing, setbacks and riparian planting**

**Source: Annexure PLM1 to Statement of Evidence for Paul le Miere  
dated 5 July 2019**

**Dr Paul Le Mière – Regional Policy Manager, FFNZ**



Basin, HERE, Garmin, IR, OpenStreetMap contributors, and the GIS user community, SourceSat, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



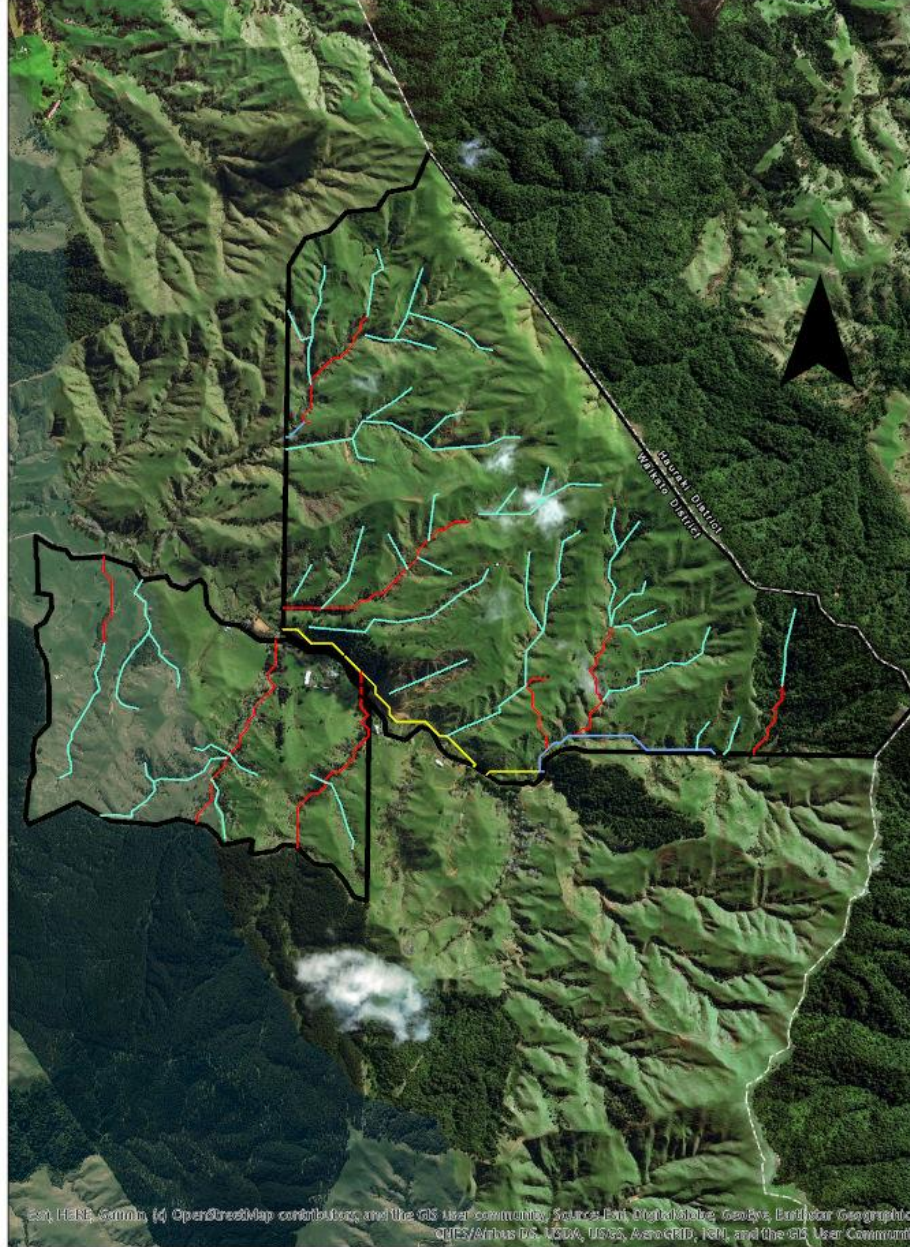
- |                                 |                               |
|---------------------------------|-------------------------------|
| Mr. Milner's Farm 2             | <b>Farm 2 - Stream Orders</b> |
| Perennial waterways - 3.2 km    | 1 - 1.9 km                    |
| Intermittent waterways - 7.2 km | 2 - 1.7 km                    |
|                                 | 4 - 1.2 km                    |
|                                 | 5 - 0.4 km                    |







**FEDERATED  
FARMERS**  
OF NEW ZEALAND



0 0.13.25 0.5 Kilometers  
|-----|-----|-----|

▭ Farm A

Farm A - Stream orders

— 1 - 5.1 km

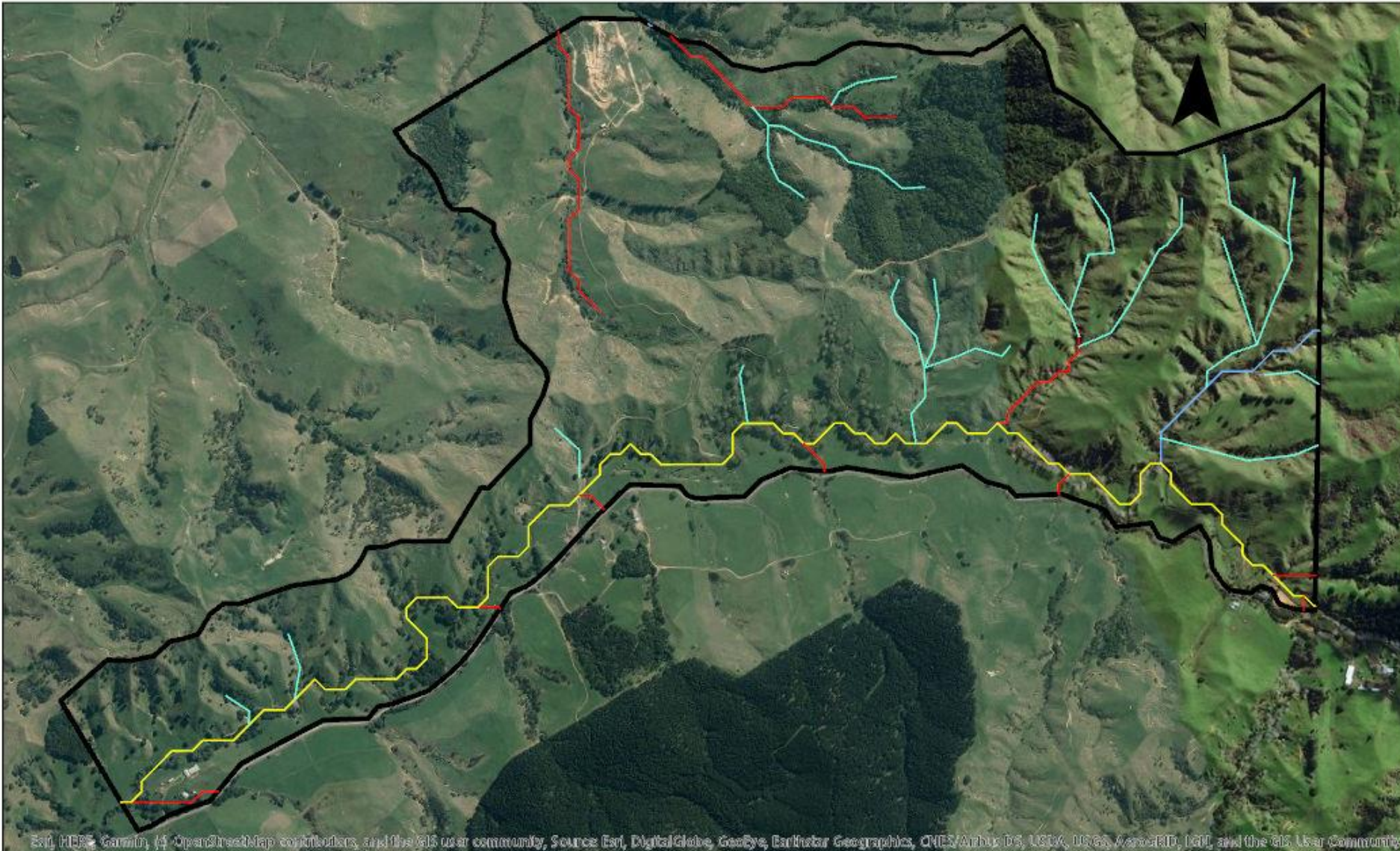
— 2 - 1.0 km

— 3 - 1.3 km

— Streams (perennial & intermittent) ID'd by H.C.F.G 14.2 km








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 Farm B

 Streams (perennial & intermittent) ID'd by H.C.F.G. 6.3 km

Farm B - Stream orders

 1 - 2.9 km

 2 - 0.7 km

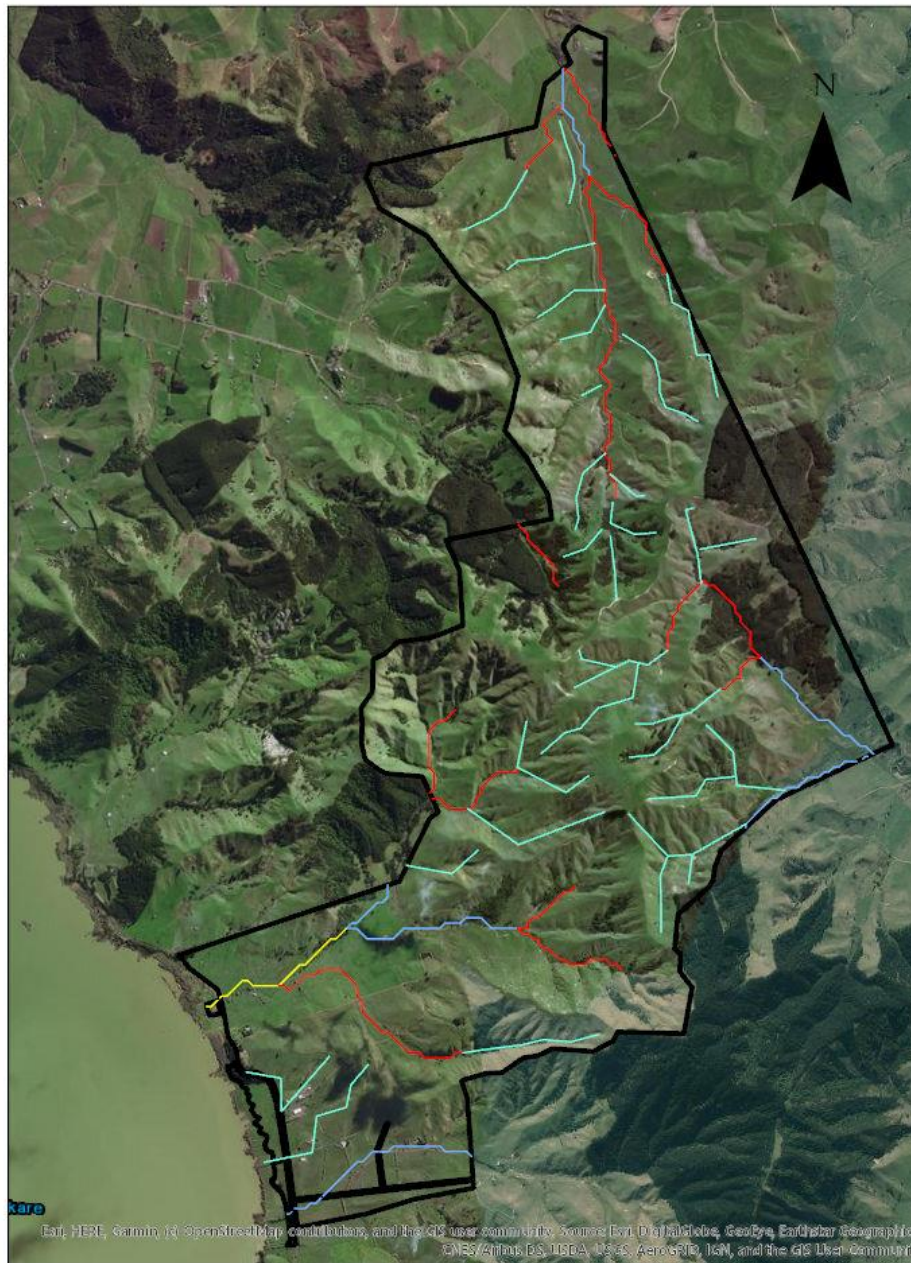
 3 - 5.0 km







**FEDERATED  
FARMERS**  
OF NEW ZEALAND



00.10.25 0.5 Kilometers

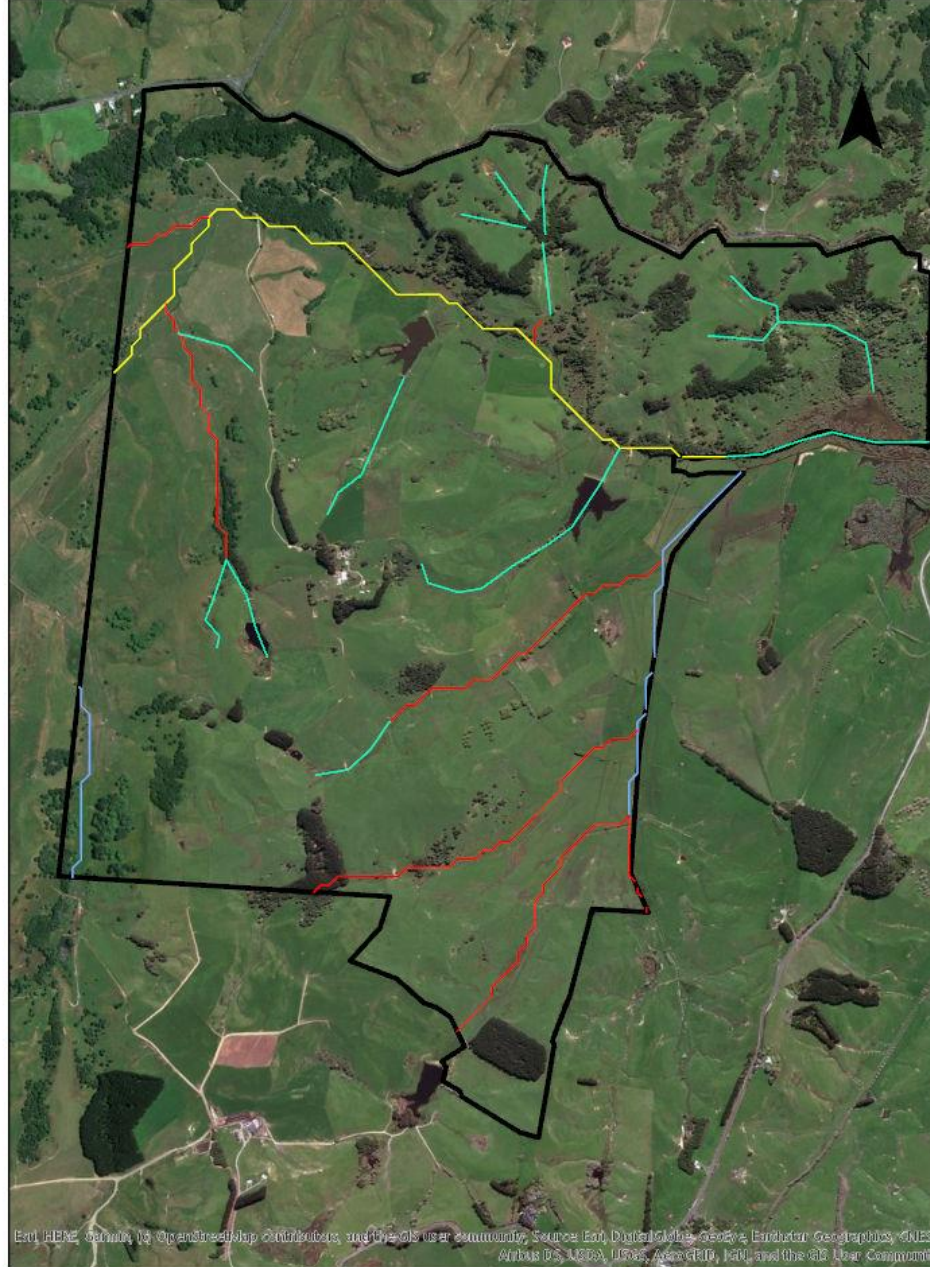
- Farm C
- Streams (perennial & intermittent) ID'd by H.C.F.G. 16.7 km.
- Farm C - Stream orders
- 1 - 9.7 km
- 2 - 5.1 km
- 3 - 1.0 km



**FEDERATED  
FARMERS**  
OF NEW ZEALAND



**FEDERATED  
FARMERS**  
OF NEW ZEALAND

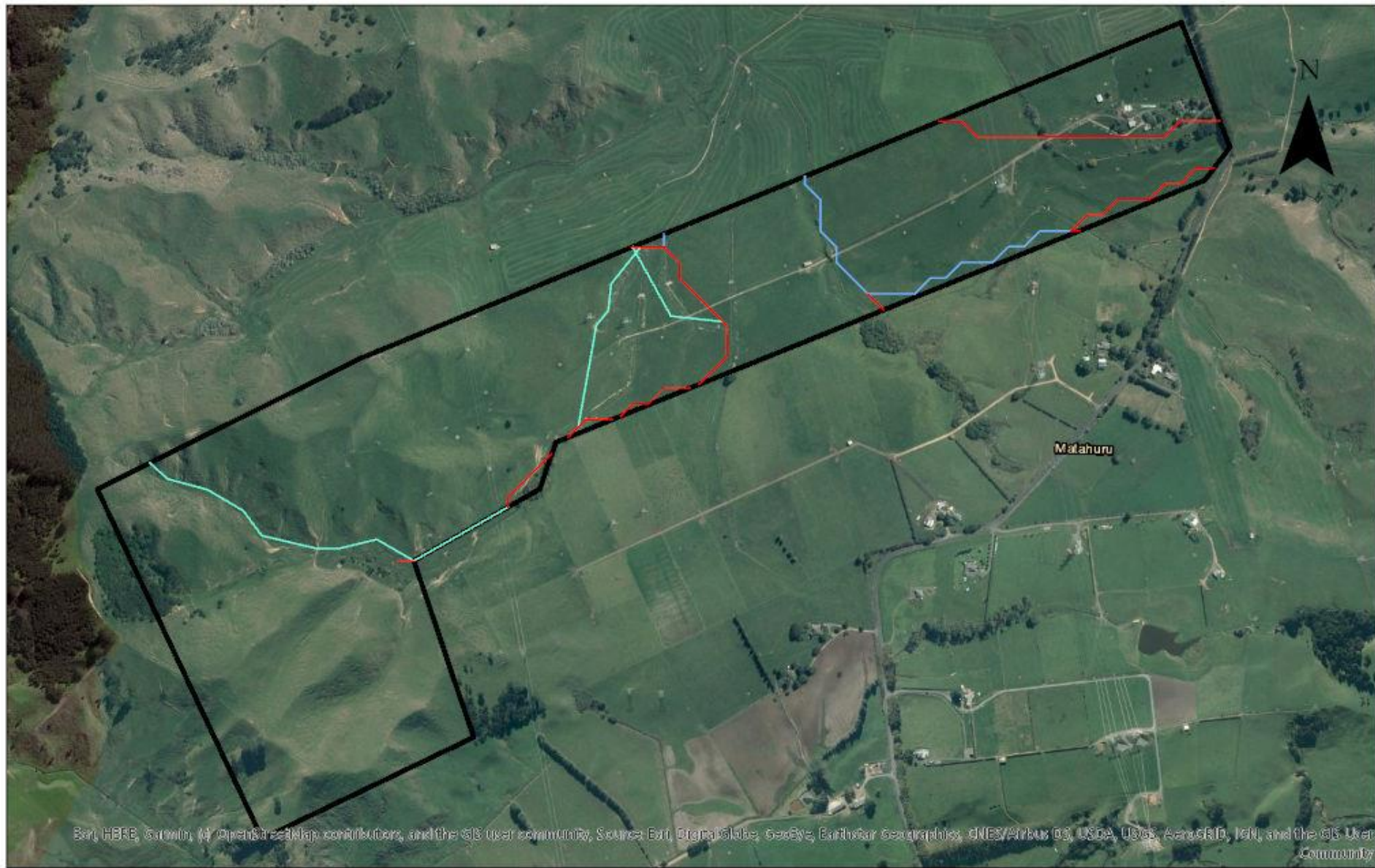


0 0.130.25 0.5 Kilometers

- Farm D
- Streams (perennial & intermittent) ID'd by H.C.F.G. 5.3 km
- Farm D - Stream orders
  - 1 - 5.3 km
  - 2 - 2.0 km
  - 3 - 2.9 km







Bas, HERE, Garmin, Mapbox, OpenStreetMap contributors, and the GIS user community, Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

0 0.13 0.25 0.5 Kilometers

Farm E

Streams (perennial & intermittent) ID'd by H.C.F.G. 1.5 km

Farm E - Stream Orders

1 - 1.8 km

2 - 0.7 km



# Analysis of costs of fencing, setbacks and riparian planting – all livestock land in PC1 Catchment



**Table 1: Length of streams, cost of fencing and areas of land in setbacks**

Stream Order	River length (km)	Fencing @ \$10 p/m	1m setback ha	3m setback ha	5m setback ha	10m setback ha	15m setback ha	20 m setback ha
1	6110.6	\$122,211,803	1222	3666	6111	12221	18332	24442
2	3021.2	\$60,423,419	604	1813	3021	6042	9064	12085
3	1644.3	\$32,885,933	329	987	1644	3289	4933	6577
4	648.5	\$12,969,694	130	389	648	1297	1945	2594
5	252.0	\$5,039,573	50	151	252	504	756	1008
6	31.4	\$627,250	6	19	31	63	94	125
7	39.7	\$794,209	8	24	40	79	119	159
<b>Total</b>	11747.6km	\$234,951,881	2,350ha	7,049ha	11,748ha	23,495ha	35,243ha	46,990ha



# Analysis of costs of fencing, setbacks and riparian planting – 1m setback



Table 2: Costs and land value at 1m setback							
Stream Order	River length (km)	Total riparian area at 1m setback (Ha)	Fencing @ \$10 per metre	Land value @\$20,000/ha	Riparian planting cost @\$45,000/ha	Maintenance cost years 1-3 @ \$22,000/ha total	Total cost and value of land
1	6110.6	1,222	\$122,211,803	\$24,442,361	\$54,995,311	\$26,886,597	\$228,536,072
2	3021.2	604	\$60,423,419	\$12,084,684	\$27,190,539	\$13,293,152	\$112,991,794
3	1644.3	329	\$32,885,933	\$6,577,187	\$14,798,670	\$7,234,905	\$61,496,695
4	648.5	130	\$12,969,694	\$2,593,939	\$5,836,362	\$2,853,333	\$24,253,328
5	252.0	50	\$5,039,573	\$1,007,915	\$2,267,808	\$1,108,706	\$9,424,001
6	31.4	6	\$627,250	\$125,450	\$282,262	\$137,995	\$1,172,957
7	39.7	8	\$794,209	\$158,842	\$357,394	\$174,726	\$1,485,170
<b>Total</b>	11747.6km	2,349.5ha	\$234,951,881	\$46,990,376	\$105,728,346	\$51,689,414	\$439,360,017

# Analysis of costs of fencing, setbacks and riparian planting – 3m setback



Table 3: Costs and land value at 3m setback							
Stream Order	River length (km)	Total riparian area at 3m setback (Ha)	Fencing @ \$10 per metre	Land value @\$20,000/ha	Riparian planting cost @\$45,000/ha	Maintenance cost years 1-3 @ \$22,000/ha total	Total cost and value of land
1	6110.6	3,666	\$122,211,803	\$73,327,082	\$164,985,934	\$80,659,790	\$441,184,609
2	3021.2	1,813	\$60,423,419	\$36,254,052	\$81,571,616	\$39,879,457	\$218,128,544
3	1644.3	987	\$32,885,933	\$19,731,560	\$44,396,009	\$21,704,716	\$118,718,218
4	648.5	389	\$12,969,694	\$7,781,816	\$17,509,087	\$8,559,998	\$46,820,595
5	252.0	151	\$5,039,573	\$3,023,744	\$6,803,423	\$3,326,118	\$18,192,858
6	31.4	19	\$627,250	\$376,350	\$846,787	\$413,985	\$2,264,372
7	39.7	24	\$794,209	\$476,525	\$1,072,182	\$524,178	\$2,867,093
<b>Total</b>	11747.6km	7,048.6ha	\$234,951,881	\$140,971,128	\$317,185,039	\$155,068,241	\$848,176,290



# Analysis of costs of fencing, setbacks and riparian planting – 5m setback



Table 4: Costs and land value at 5m setback							
Stream Order	River length (km)	Total riparian area at 5m setback (Ha)	Fencing @ \$10 per metre	Land value @\$20,000/ha	Riparian planting cost @\$45,000/ha	Maintenance cost years 1-3 @ \$22,000/ha total	Total cost and value of land
1	6110.6	6,111	\$122,211,803	\$122,211,803	\$274,976,557	\$134,432,983	\$653,833,147
2	3021.2	3,021	\$60,423,419	\$60,423,419	\$135,952,694	\$66,465,761	\$323,265,294
3	1644.3	1,644	\$32,885,933	\$32,885,933	\$73,993,349	\$36,174,526	\$175,939,741
4	648.5	648	\$12,969,694	\$12,969,694	\$29,181,811	\$14,266,663	\$69,387,863
5	252.0	252	\$5,039,573	\$5,039,573	\$11,339,039	\$5,543,530	\$26,961,715
6	31.4	31	\$627,250	\$627,250	\$1,411,312	\$689,975	\$3,355,787
7	39.7	40	\$794,209	\$794,209	\$1,786,969	\$873,629	\$4,249,016
<b>Total</b>	11747.6	11,747.6	\$234,951,881	\$234,951,881	\$528,641,732	\$258,447,069	\$1,256,992,562

# Analysis of costs of fencing, setbacks and riparian planting – 10m setback



Table 5: Costs and land value at 10m setback							
Stream Order	River length (km)	Total riparian area at 10m setback (Ha)	Fencing @ \$10 per metre	Land value @\$20,000/ha	Riparian planting cost @\$45,000/ha	Maintenance cost years 1-3 @ \$22,000/ha total	Total cost and value of land
1	6110.6	12,221	\$122,211,803	\$244,423,606	\$549,953,114	\$268,865,967	\$1,185,454,490
2	3021.2	6,042	\$60,423,419	\$120,846,839	\$271,905,387	\$132,931,523	\$586,107,168
3	1644.3	3,289	\$32,885,933	\$65,771,866	\$147,986,698	\$72,349,052	\$318,993,549
4	648.5	1,297	\$12,969,694	\$25,939,388	\$58,363,623	\$28,533,327	\$125,806,032
5	252.0	504	\$5,039,573	\$10,079,146	\$22,678,078	\$11,087,060	\$48,883,857
6	31.4	63	\$627,250	\$1,254,500	\$2,822,624	\$1,379,950	\$6,084,324
7	39.7	79	\$794,209	\$1,588,417	\$3,573,938	\$1,747,259	\$7,703,823
<b>Total</b>	11747.6	23,495.2	\$234,951,881	\$469,903,762	\$1,057,283,463	\$516,894,138	\$2,279,033,243



# Analysis of costs of fencing, setbacks and riparian planting – 15m setback



Table 6: Costs and land value at 15m setback							
Stream Order	River length (km)	Total riparian area at 15m setback (Ha)	Fencing @ \$10 per metre	Land value @\$20,000/ha	Riparian planting cost @\$45,000/ha	Maintenance cost years 1-3 @ \$22,000/ha total	Total cost and value of land
1	6110.6	18,332	\$122,211,803	\$366,635,409	\$824,929,671	\$403,298,950	\$1,717,075,834
2	3021.2	9,064	\$60,423,419	\$181,270,258	\$407,858,081	\$199,397,284	\$848,949,043
3	1644.3	4,933	\$32,885,933	\$98,657,799	\$221,980,047	\$108,523,579	\$462,047,357
4	648.5	1,945	\$12,969,694	\$38,909,082	\$87,545,434	\$42,799,990	\$182,224,201
5	252.0	756	\$5,039,573	\$15,118,719	\$34,017,117	\$16,630,591	\$70,806,000
6	31.4	94	\$627,250	\$1,881,750	\$4,233,937	\$2,069,925	\$8,812,861
7	39.7	119	\$794,209	\$2,382,626	\$5,360,908	\$2,620,888	\$11,158,630
<b>Total</b>	11747.6	35,242.8	\$234,951,881	\$704,855,642	\$1,585,925,195	\$775,341,207	\$3,301,073,925

# Analysis of costs of fencing, setbacks and riparian planting – 20m setback



Table 7: Costs and land value at 20m setback							
Stream Order	River length (km)	Total riparian area at 20m setback (Ha)	Fencing @ \$10 per metre	Land value @\$20,000/ha	Riparian planting cost @\$45,000/ha	Maintenance cost years 1-3 @ \$22,000/ha total	Total cost and value of land
1	6110.6	24,442	\$122,211,803	\$488,847,212	\$1,099,906,228	\$537,731,934	\$2,248,697,177
2	3021.2	12,085	\$60,423,419	\$241,693,678	\$543,810,775	\$265,863,045	\$1,111,790,917
3	1644.3	6,577	\$32,885,933	\$131,543,732	\$295,973,396	\$144,698,105	\$605,101,165
4	648.5	2,594	\$12,969,694	\$51,878,776	\$116,727,246	\$57,066,654	\$238,642,369
5	252.0	1,008	\$5,039,573	\$20,158,292	\$45,356,156	\$22,174,121	\$92,728,142
6	31.4	125	\$627,250	\$2,509,000	\$5,645,249	\$2,759,899	\$11,541,398
7	39.7	159	\$794,209	\$3,176,834	\$7,147,877	\$3,494,518	\$14,613,437
<b>Total</b>	11747.6	46,990.4	\$234,951,881	\$939,807,523	\$2,114,566,927	\$1,033,788,275	\$4,323,114,606



# Analysis of costs of fencing, setbacks and riparian planting – intermittent streams



**Table 8: Intermittent and permanent waterways on Mr Millner Case Study 2 farm and four Hill Country Farmers' case study farms**

Farm	Type	Size (ha)	FMU	Stream order layer (km)					Total	Additional : Intermittent & perennial streams	Total: stream order + additional	Additional streams as % of stream order
				1	2	3	4	5				
Mr Millner's farm 2	DAI + SNB	368	Waipa	1.9	1.7	0	1.2	0.4	5.2	10.4	15.6	200%
Farm A (HCFG)	SNB	514	Lower Waikato	5.1	1.0	1.3	0	0	7.4	14.2	21.6	192%
Farm B (HCFG)	SNB	370	Lower Waikato	2.9	0.7	5.0	0	0	8.6	6.3	14.9	73%
Farm C (HCFG)	SNB	1,064	Lower Waikato	9.7	5.1	1.0	0.2	0	16.0	16.7	32.7	104%
Farm D (HCFG)	SNB	622	Lower Waikato	5.3	2.0	2.9	0	0	10.2	5.5	15.7	54%
Farm E (HCFG)	SNB	89	Lower Waikato	1.8	0.7	0	0	0	2.5	1.5	4.0	60%