Greater Heretaunga and Ahuriri
Land and Water Management (TANK)
Project

Farmer Reference Group Meeting
10 May 2017
Meeting the Sediment Challenge

2.00pm **Welcome and introductions**

- Reason for meeting
- Why is sediment a problem
- Tangata whenua perspective
- Experiences from elsewhere
- What a TANK Plan Change needs

Breakout session

Tea break

- Feedback and discussion
- Where to from here

5pm **Finish with social at Puketapu Pub**

Meeting objectives

1. **Keeping up with the TANK project**

2. **What is happening elsewhere**

3. **Understanding what's involved with the plan change**
   - **What the objectives are**
   - **Who else is involved**

4. **Contributing to developing the solutions**


Why is sediment a problem?

Sediment pathways

River

Estuary

Flood load

Delivery during storm events

Estuary

Gravel & sand

Eelgrass, intertidal vegetation

Shellfish & other animals

Mud

Smothered!

Estuary

1. Deposited sediment


Mussel on hard substrate

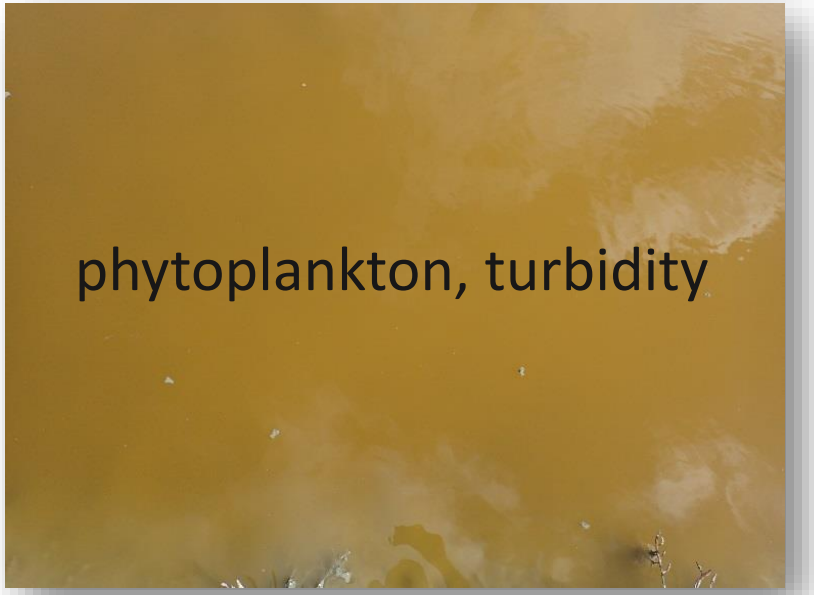

Mussel in deposited sediment


Signs of anoxic sediment

- Lost habitat: Seagrass beds, Ruppia etc. smothered
- Smothering of sand leads to decline in filter feeders (mussels)
- Mud has high contaminant retention capacity

Estuary

2. Suspended sediment



Clarity and light

→ Effects visibility for fish catching prey

Amount of particles in the water:

→ Clogs and abrades gills of filter feeders

→ Filter feeders get indigestible silt, less energy for growth, reproduction

Sediment pathways: River

Floods:

Most sediment → estuary/coastal environment

Receding flood:
'Frozen bedload'

At ¼ of flood discharge bedload motion stops

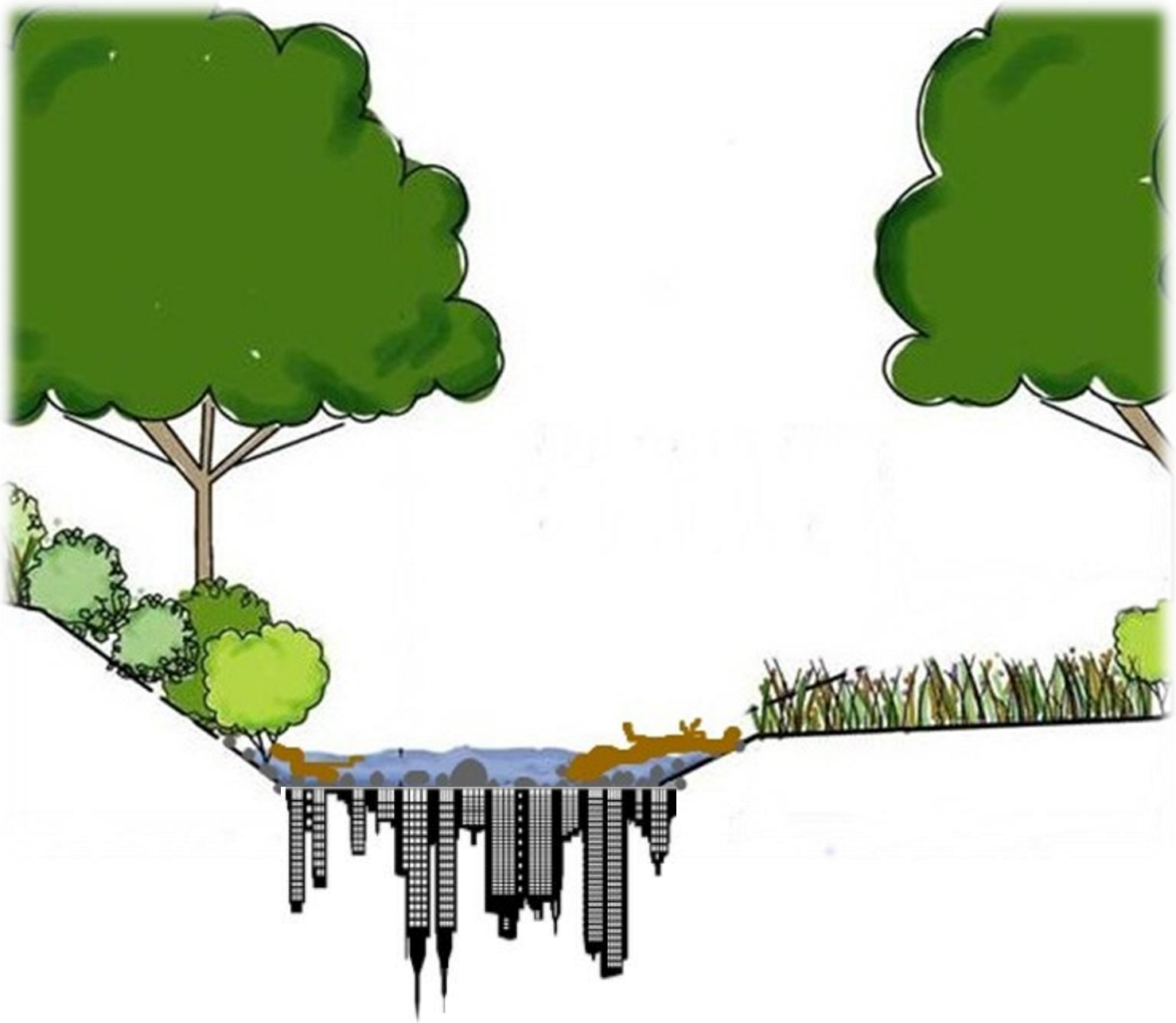
→ Sediment deposition between and on gravel

Sediment pathways: River

Chronic delivery

During stable flow, local impact

Habitat

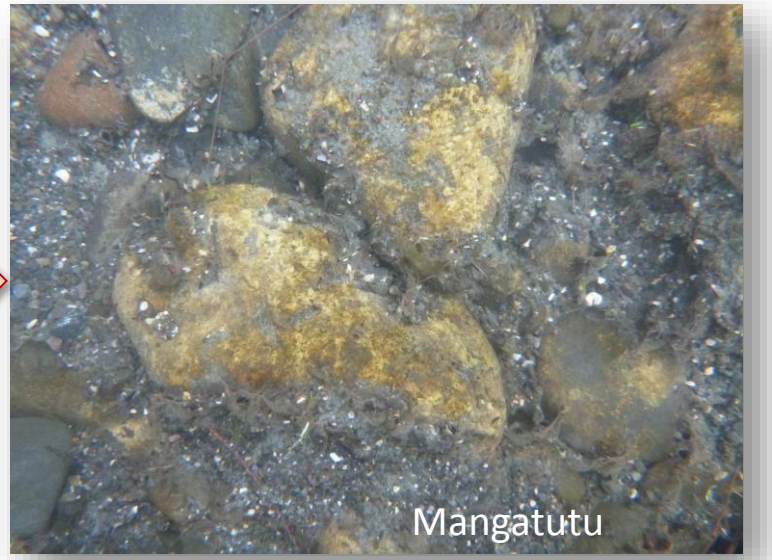


‘Shuffle test’

Sediment is clogging space between gravel

River

1. Deposited sediment



Clean gravel

- Habitat, refuge
- Exchange with groundwater
- Reaction surface to clean water

→ Loss of habitat, refuge (floods, high temperature, stress!)

→ Water warms up more without flow between gravel

→ Less exchange with groundwater (recharge)

→ Loss of reaction surface for microorganisms

River

2. Suspended sediment

Clarity/visibility

- Recreation: Safety, aesthetics;
- Fish need good visibility for catching prey

Amount of particles

- Clogging/destroying nets of filter feeders
- Abrading, damaging gills.
- Filter feeders eat indigestible silt/clay → health

Why is sediment a problem?

Flood loads (land and stream banks)

Chronic input (riparian areas)

- Mainly estuary
- Mainly river

- Fine particle size; mud

Deposited sediment

- River and estuarine life – habitat and refuge
- Keeping water cool and clean
- Exchange with groundwater

Suspended sediment

- Fish in water column: food and health
- Estuarine plant habitat → plankton!
- Swimmers, recreation

→ Abundance and biodiversity of life in rivers and coastal areas affected

TK’s presentation

TANK: Key points on FEMP and Tukituki

Brendan Powell/Nathan Heath

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Sediment management

- Handout – typical reductions
- Critical source area concept
- Site specific and targeted = cost effective
  - Issue – erosion type, severity, area
  - Location – slope, topography, connectivity
  - Mitigation selection – natural, infrastructural, density
  - Multiple objectives
- Key is connectivity to waterways
- Low hanging fruit first
- On-going maintenance
- Soil conservation = art & science

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Tukituki Catchment Plan (PC6) – FEMP's

GOOD	BAD	UGLY
Autonomy – targeted & specific	No prioritisation or targeting	Large numbers
Everyone required to act	1 plan requirement for all – intensity & complexity	Capacity and capability issues
Initiates engagement in the issue		Linking FEMP's to sub-catchments variability
		Cross scale effects – objectives vs rules
		Bottlenecks & leaving to the last minute

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FEMP – fundamentals

- Fundamentals – details, location, description
- Risk assessment and action plan
- Priorities identified spatially – mapped
- Meeting limits and permitted activity status
- Action plan developed (costed ideally)
- 3 components
  - FEMP (wetlands, riparian, soil etc)
  - Phosphorus management plan (critical source areas P & sediment)
  - Nutrient budget (nutrient management plan)

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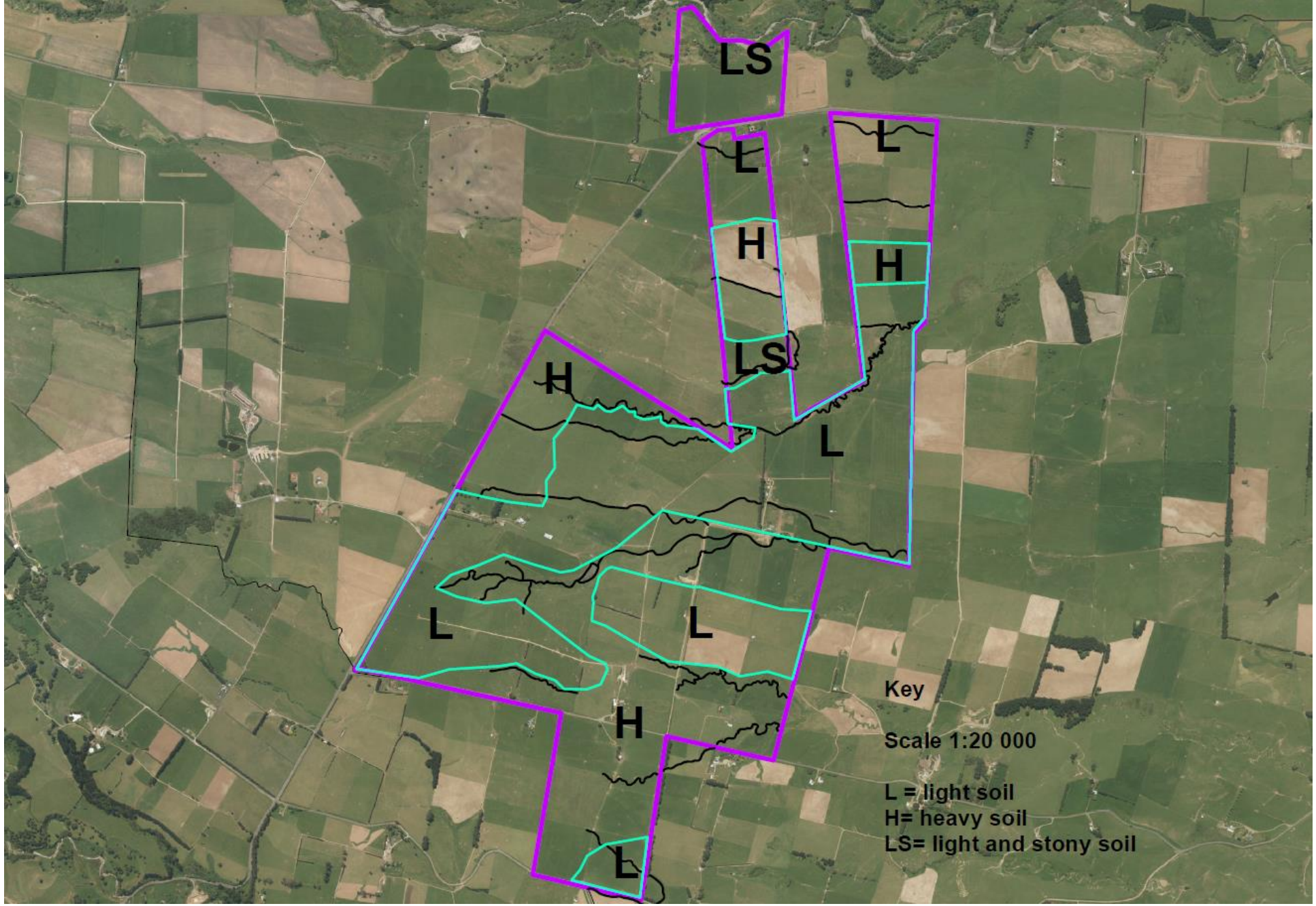
LS
L
L
H
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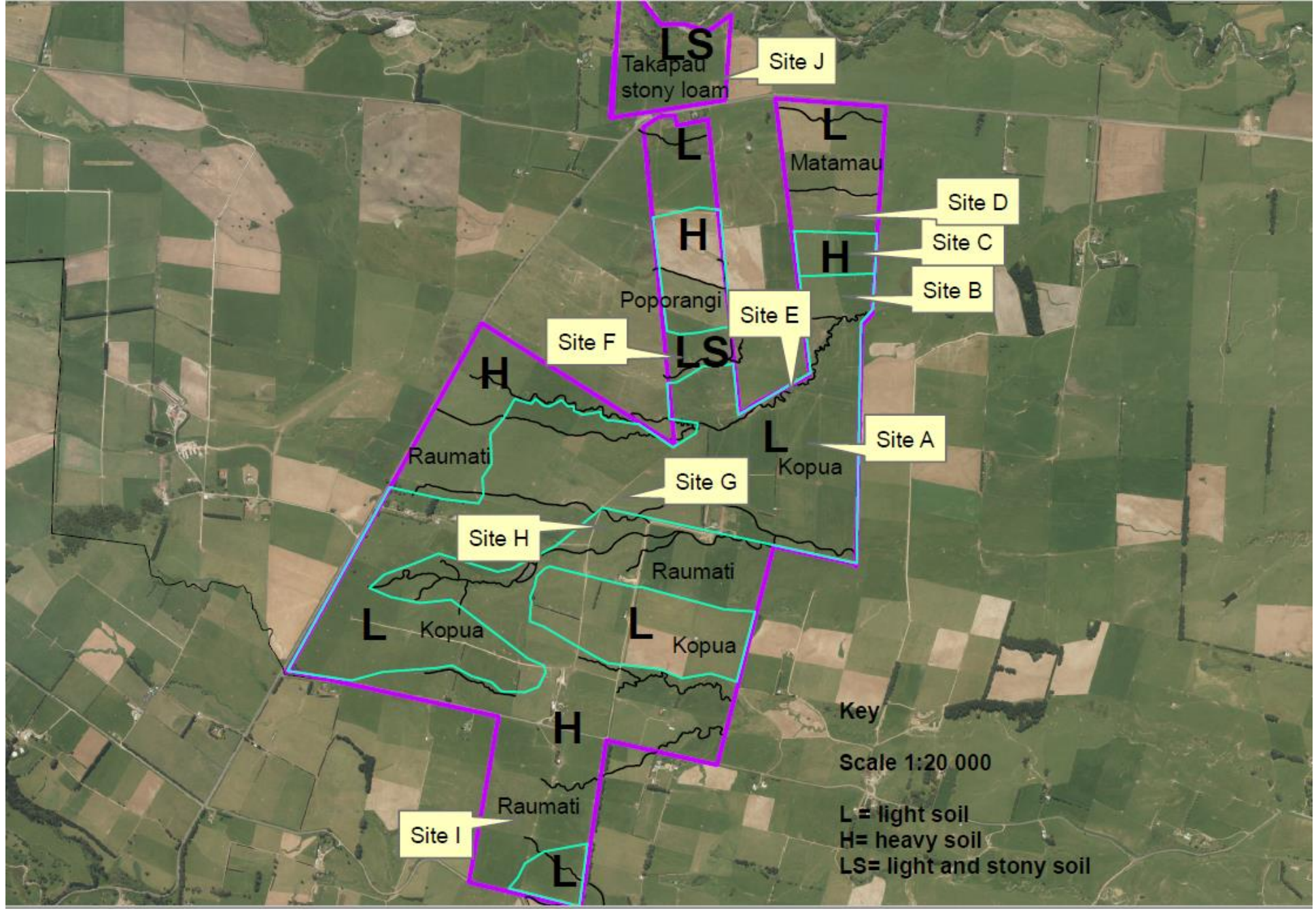
L
Key
Scale 1:20 000
L = light soil
H= heavy soil
LS= light and stony soil


LS
Takapau
stony loam
Site J
L
L
Matamau
Site D
H
Site C
H
Site B
Poporangi
Site E
Site F
LS
H
L
Site A
Kopua
Raumati
Site G
Site H
Raumati
L
Kopua
L
Kopua
H
Raumati
Site I
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Key
Scale 1:20 000
L = light soil
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Action plan - example:

- 2018 - Stop applying P fertilizer to paddocks with Olsen P levels of 65 +. Monitor until levels drop to 35. (Site G)
- 2018 – “Strategically” graze winter crops. Start grazing at end most distant from stream. (Site A)
- 2019 – Site winter crops on paddocks without waterways (Site F)
- Plant 200 willow poles to stabilize gully erosion in paddocks 3 and 8.
- 2020 - Two wire electric fencing of streams to exclude cattle from waterway A by February.

- Tick off as actions completed.

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Tukituki plan has 2 options for getting an FEMP

1. Each farmer prepares one with help from a farm plan provider
2. Complete one through an industry approved process eg Hort NZ, Dairy NZ, Beef and Lamb.
3. ?

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Mohaka plan change

Rivers:
- **Objectives**
- **N targets (15 years)**
- **Limits**

Target catchment N load (10 years)

CMP "Club" enabled
- Collective responsibility

2-tier Farming Rules:
- Permitted: **if perform**
- Consent: "whole of farm"

Native bush retained

5 year effectiveness review

Taharua Catchment Management Plan (CMP)

CMP "Club
- Terms of Participation
- Peer review meetings (biannual / annual)
- Eject poor performer

N management

- **Dairy target ≤28 kgN/ha/yr (reassess)**
- **Eco-n or other approach**
- **Agreed BMPs**

Eco-n Partnership (MOU)

Eco-N use / monitor (20% N reduction?)

Ravensdown, HBRC Lincoln, Dairy, Poronui

P, soil, riparian, E.coli management

Enhanced Monitoring

Catchment Group approach

Positives	Negatives	Considerations
Shared learning	Transactional cost trade offs	Need a purpose
Social capital and trust	Resource hungry	Resourcing
Wider range of considerations	Whether they achieve outcomes	Facilitation and administration is critical – self organising
Empowered to do more - resilience		Meetings are the tip of the iceberg
		Relationship & role of government
		Agreements and rules
		Products & mandates

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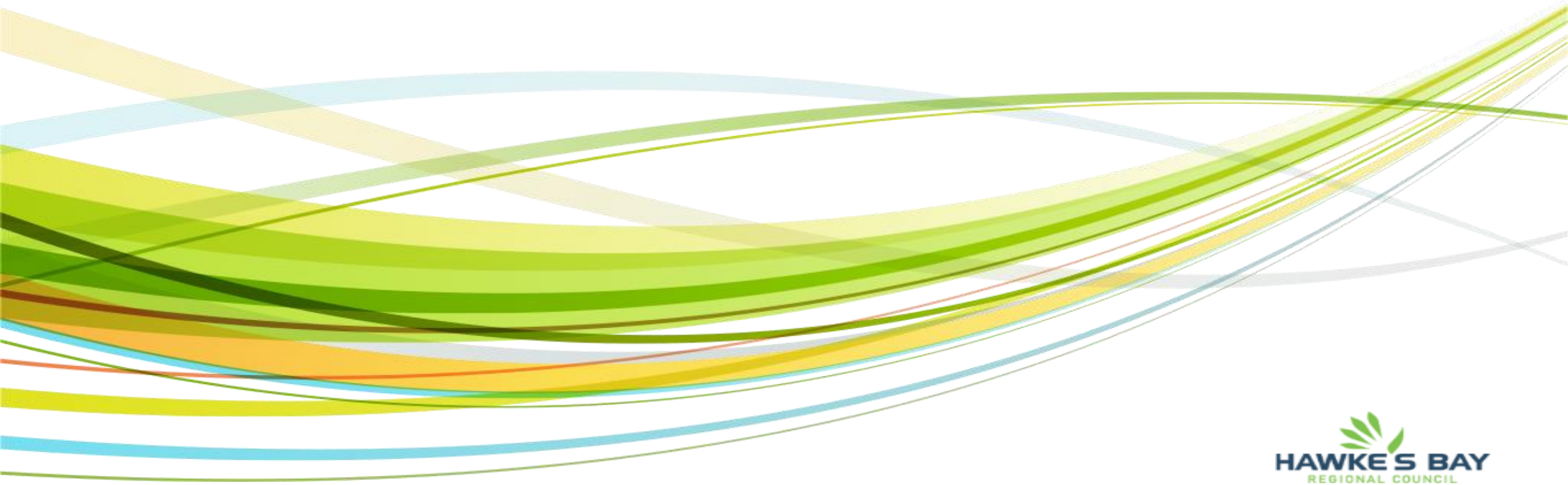
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What a Plan Change needs

1. **Agree Objectives –**
   - **TANK progress:**
     - Specified what are we managing the waterbodies for- **values**
       - *Healthier ecosystems / better mauri– freshwater, the estuary and the coast*
       - *Human health and recreation*

2. **Identify the relevant attributes – and their desired state;**
     - Water clarity (turbidity/suspended solids) – improvement sought
     - Deposited sediment – less deposited sediment
     - Algae – reduce algal growth
     - Dissolved nutrients – reduce concentrations in tributaries
   - ***Target; Reduce amount of sediment lost by 30%***

3. **Adopt limits/methods to ensure objectives are met;**

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What are the methods needed to meet the objectives?

1. **Choices between regulatory and non-regulatory approaches;**
   - They must be robust and defensible
   - Efficient and effective
   - Take into account costs and timeframes
     - *Consider priority actions and locations*
   - Identify who bears the costs

2. **The methods must have the trust and confidence of the TANK group and wider community;**
   - "Business as usual" not likely to be acceptable
   - Reporting, monitoring and recording, auditing likely tobe key components

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Opportunities

This collaborative approach to decision making provides opportunities;

- Better understanding of the issues
- Involvement in the development of the solutions
  - *Understanding roles and responsibilities*
- Developing innovative methods
- Collective responses
- Support and integration

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Farms in the TANK catchments and a focus on the Ahuriri Lagoon & the Mangaone sub-catchments.

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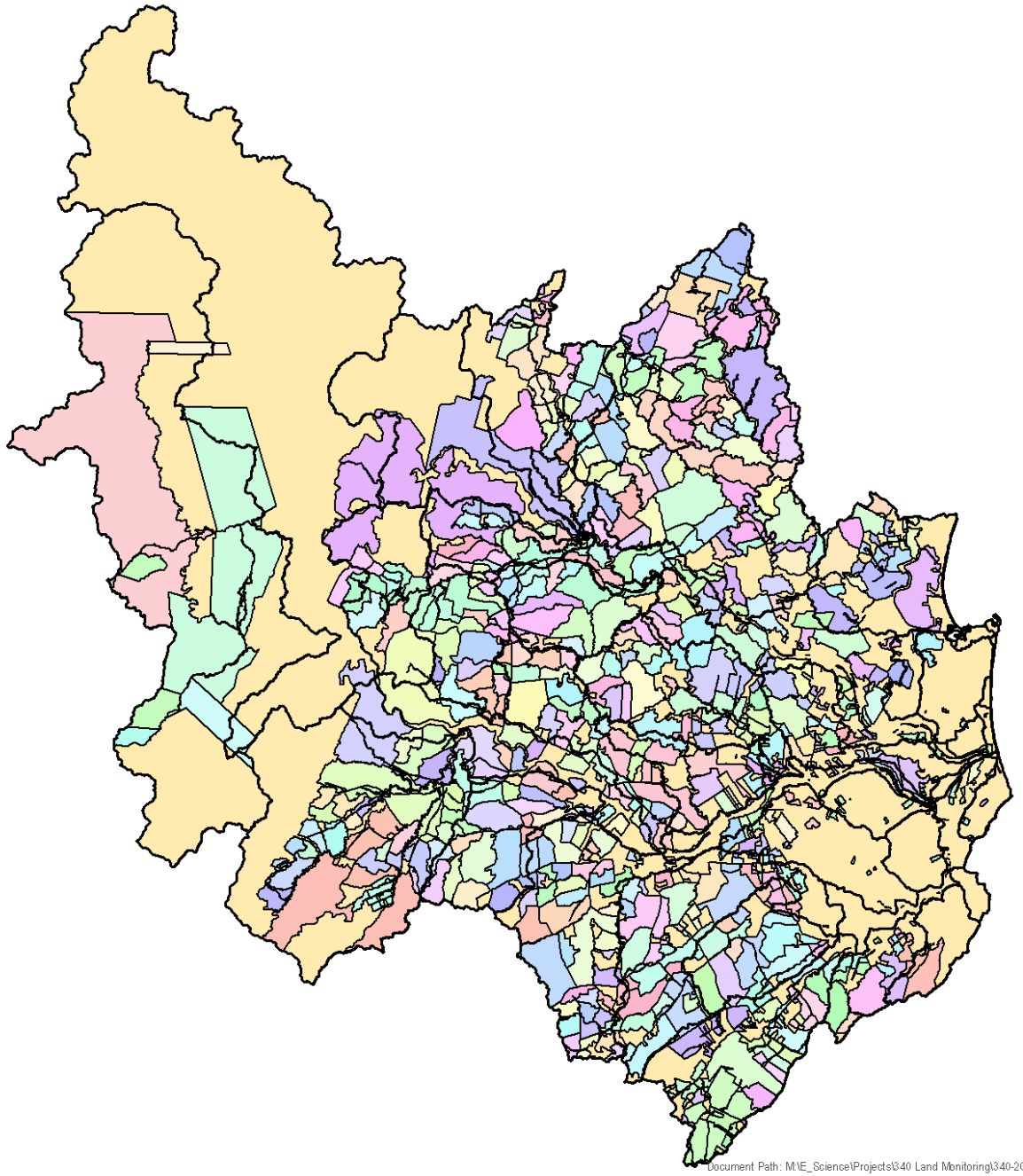
Farms over 100 Ha across the TANK area (693 recorded Farm ID's)



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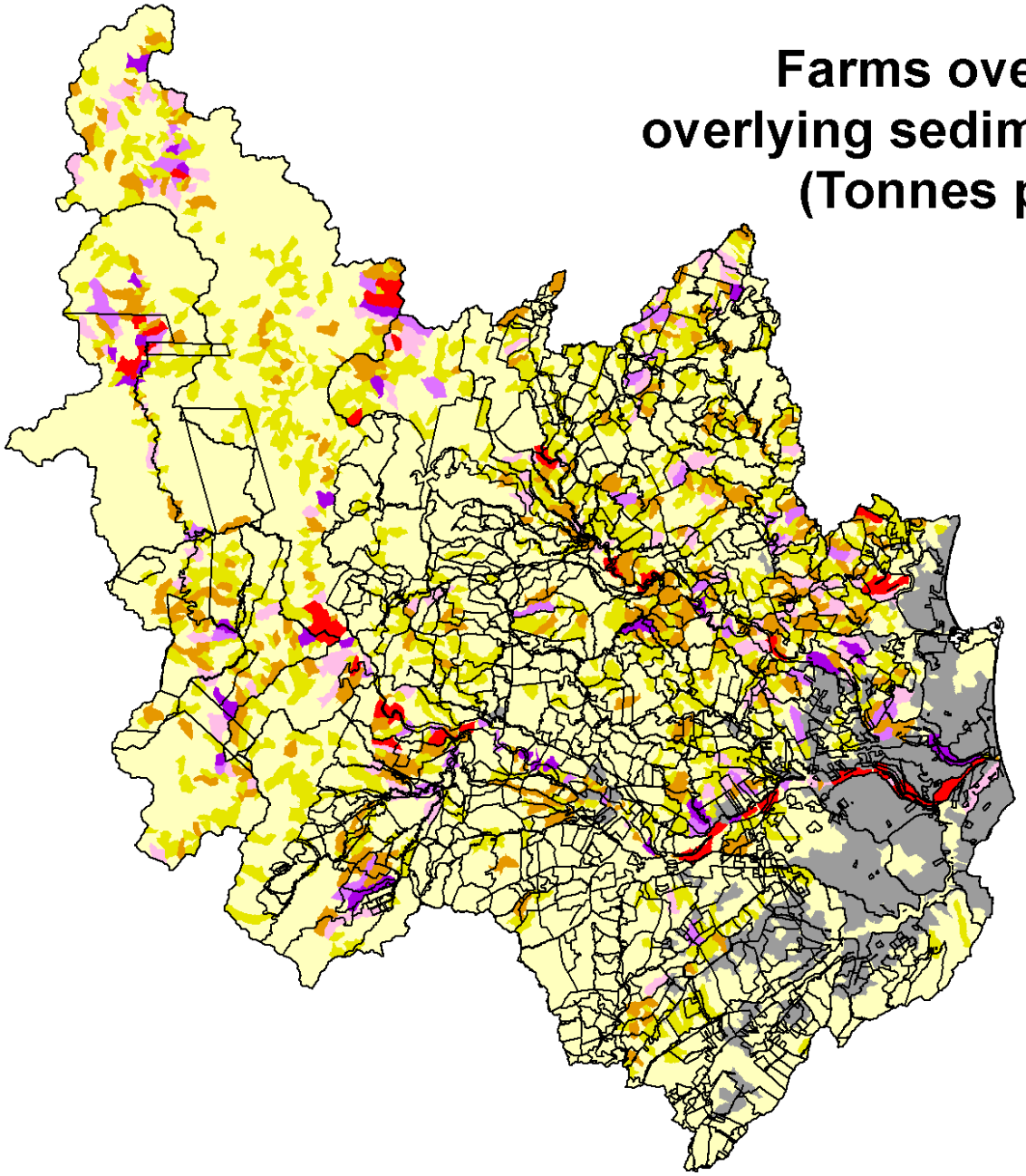
Farms over 100 Ha overlying sediment loss loads (Tonnes per year)



Sediment load (t/yr)

- < 0
- 0 - 250
- 250 - 500
- 500 - 750
- 750 - 1000
- 1000 - 1250
- 1250 - 1500
- > 1500

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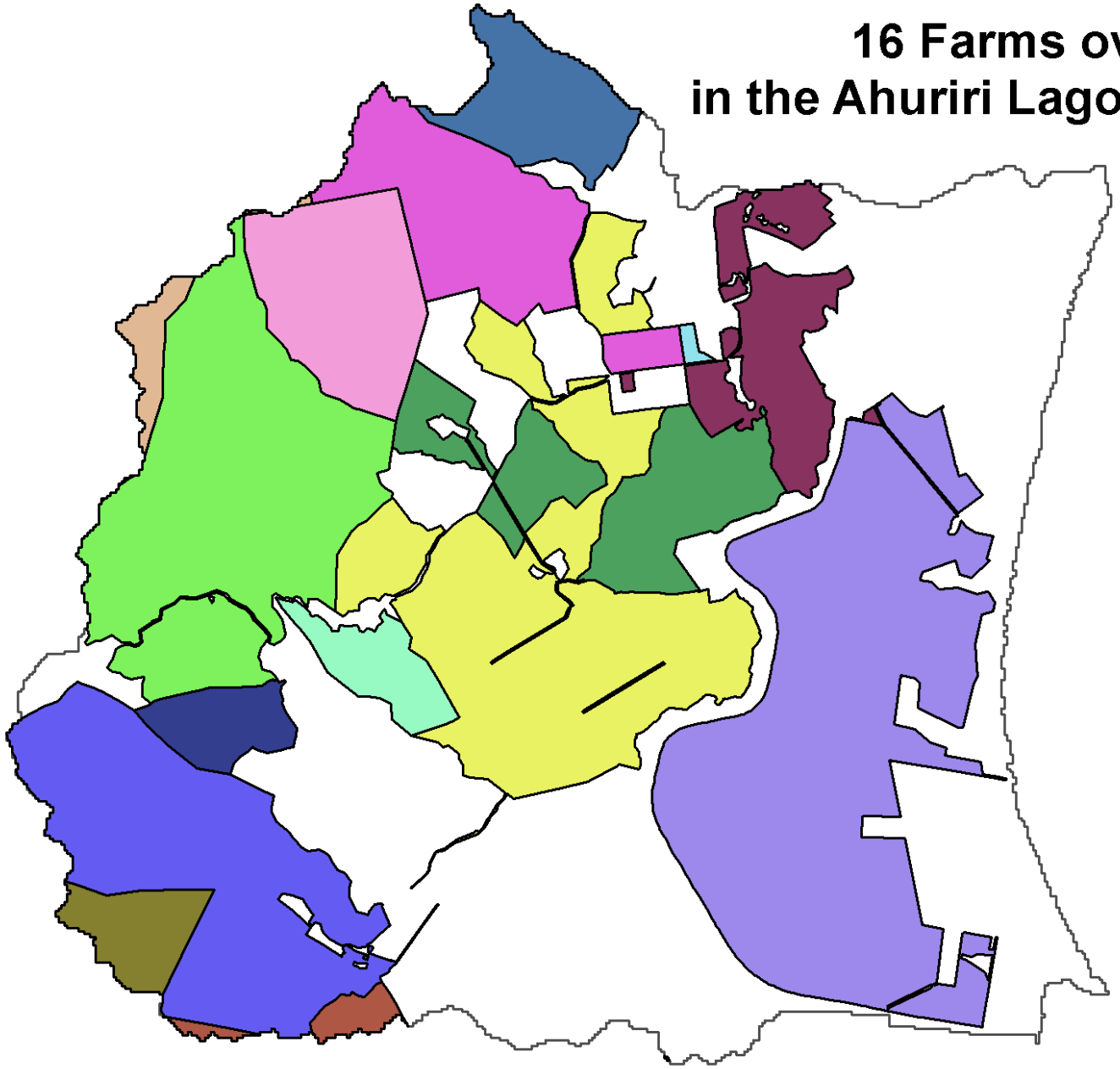
16 Farms over 100 Ha in the Ahuriri Lagoon subcatchment



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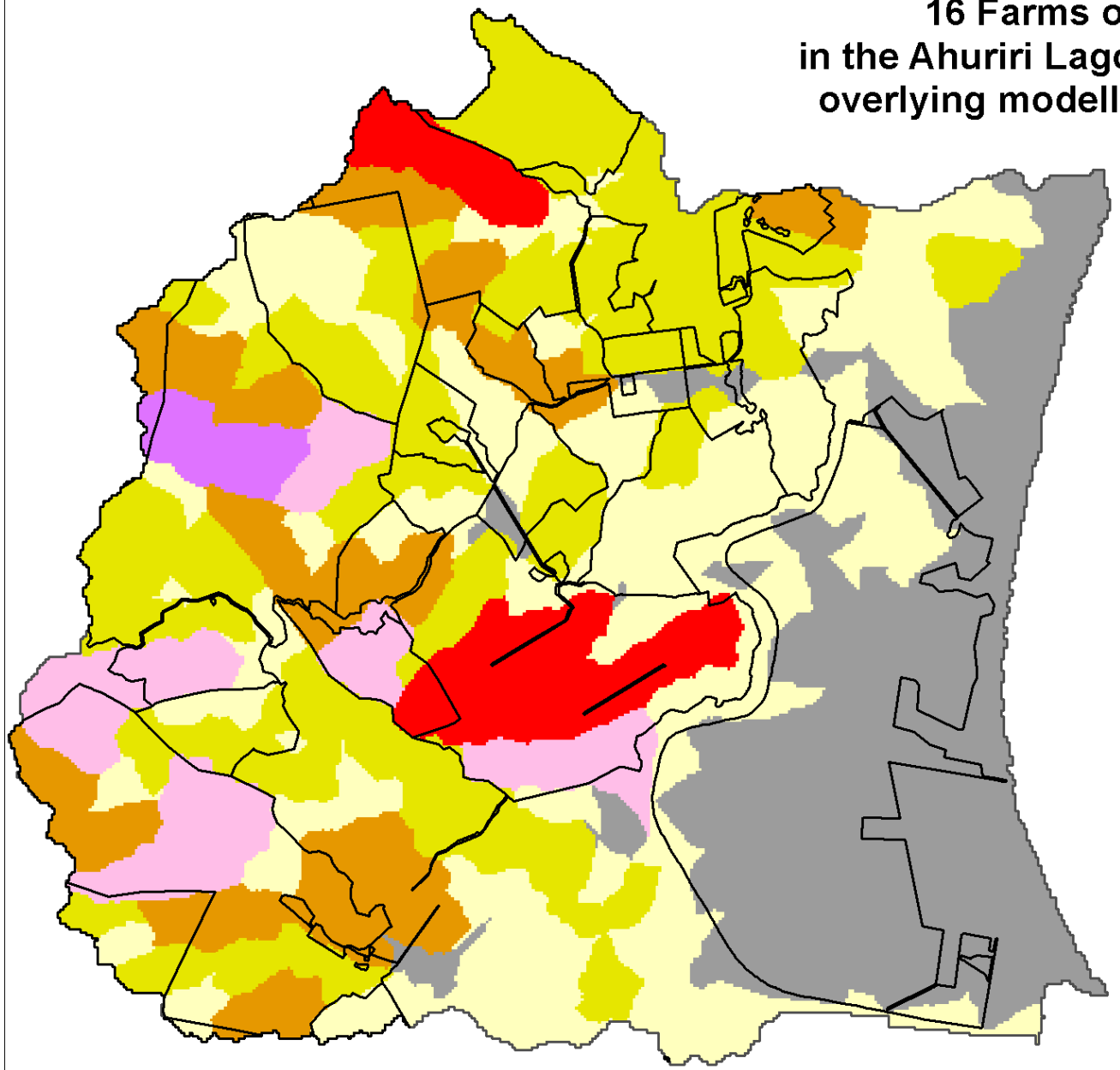
16 Farms over 100 Ha in the Ahuriri Lagoon subcatchment overlying modelled sediment load



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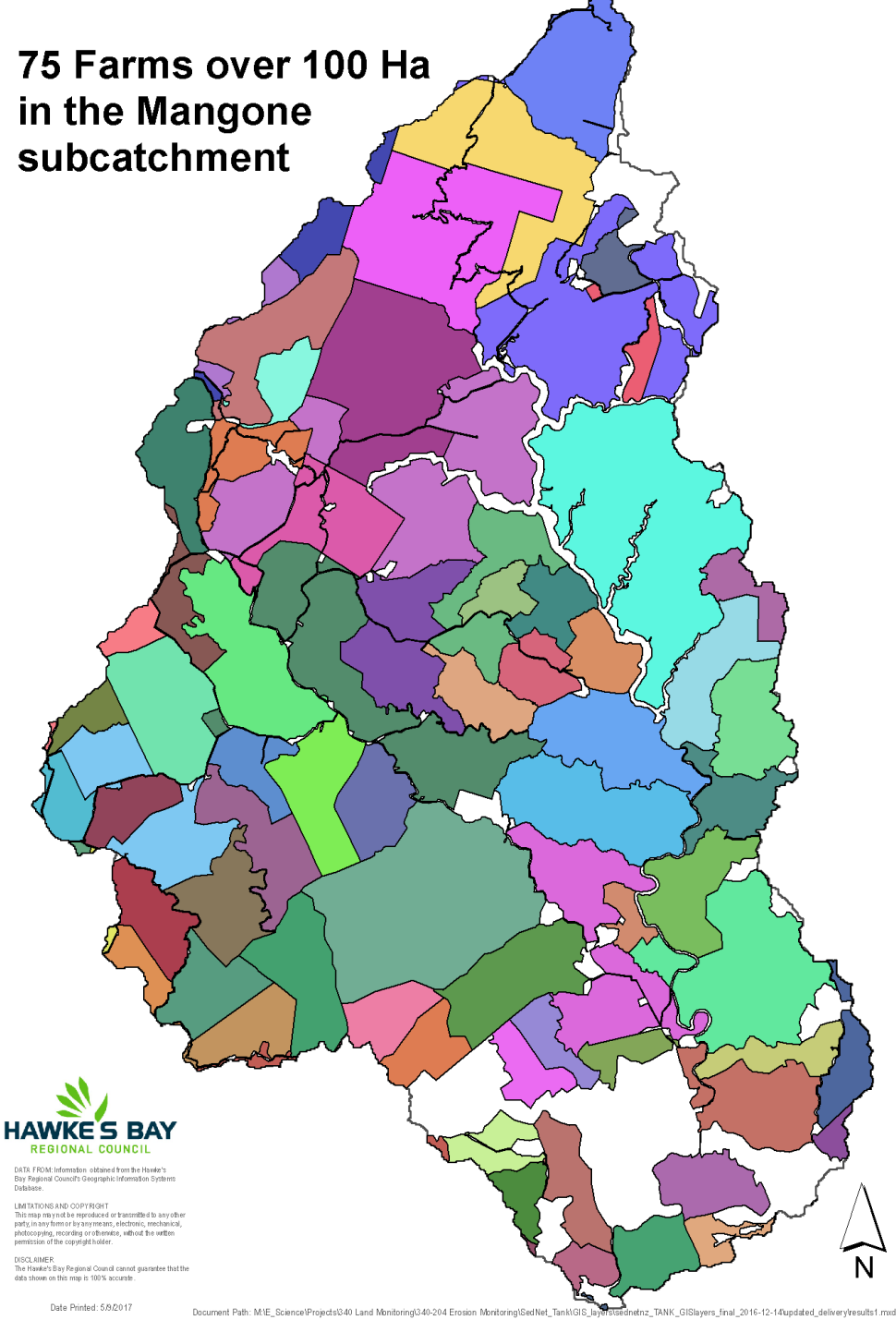
75 Farms over 100 Ha in the Mangone subcatchment



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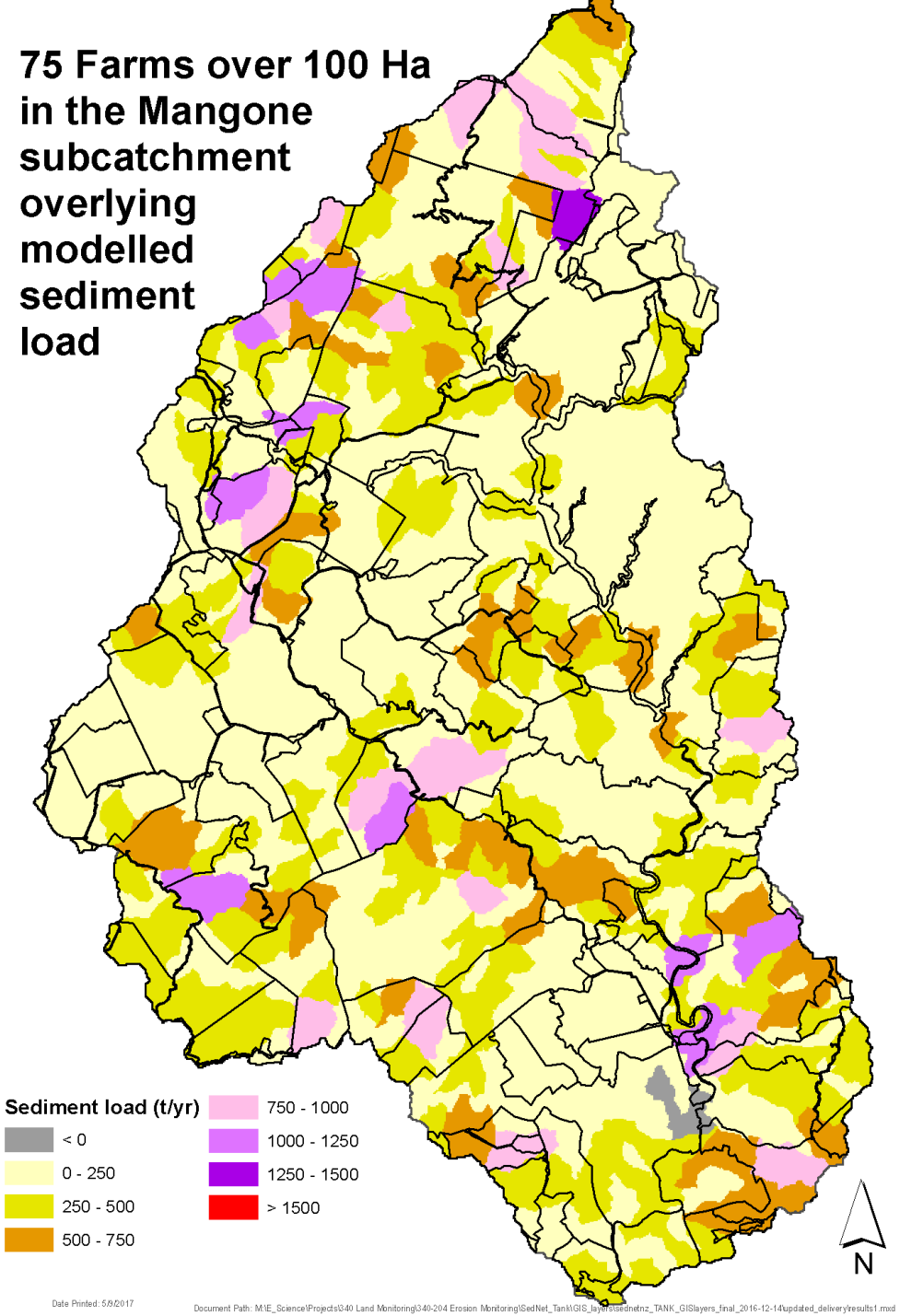
75 Farms over 100 Ha in the Mangone subcatchment overlying modelled sediment load



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Sub-catchment	Area (Ha)	Count of farm ID's	Total load (Tonnes/yr)	Reduction with sediment plan
Ahuriri Lagoon Tributaries	5,832	16	50,749	35,524
Awanui	5,216	18	13,421	9,395
Awatoto	30	2	1,771	1,240
Hastings Streams	30	3	377	264
Havelock North Streams	971	7	8,713	6,099
Irongate-Southland	1,109	14	6,742	4,720
Karamu-Clive Corridor	227	6	1,330	931
Kikowhero	6,149	31	17,572	12,300
Louisa	2,484	14	9,082	6,357
Mangaone	30,439	75	182,368	127,657
Mangatahi	7,021	29	26,100	18,270
Mangateretere	4	1	14	10
Mangatutu	8,779	26	53,387	37,371
Maraekakaho	10,183	49	24,987	17,491
Muddy Creek	57	3	410	287
Napier Drains	340	4	795	557
Napier South	38	2	427	299
Ngaruroro Corridor	7,217	43	56,442	39,510
Ohiwia	8,792	38	71,394	49,976
Omahaki	5,019	13	34,577	24,204
Otakarara	4,179	17	16,908	11,836
Otamauri	6,189	27	50,202	35,141
Paritua-Karewarewa	9,187	38	32,411	22,688
Poporangi	15,693	32	53,580	37,506
Poukawa	8,175	28	9,263	6,484
Raupare	130	7	3,365	2,355
Taipo	269	5	5,946	4,162
Taruarau	25,597	6	78,656	55,059
Tutaekuri Corridor	8,329	52	104,685	73,280
Tutaekuri-Waimate	3,115	21	25,831	18,082
Upper Ngaruroro	5,121	8	58,165	40,716
Upper Tutaekuri	5,823	7	29,551	20,686
Waikonini	5,478	30	36,159	25,311
Waitio	3,451	21	28,965	20,275
Grand Total	**200,673**	**693**	**1,094,347**	**766,043**

Summary farm data (over 100ha) for all TANK sub-catchments

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Summary farm data (over 100ha) for all TANK sub-catchments

Easy to form a Catchment Group?

Sub-catchmet	Farm ID	Sum of Ha	Total load (Tonnes/yr)	Reduction with sediment plan
Ahuriri Lagoon Tributaries	HS00027	383	2,496	1,747
	HS00051	380	3,815	2,671
	HS00052	43	5,339	3,737
	HS00124	199	1,753	1,227
	HS00144	960	7,970	5,579
	HS00279	687	6,761	4,733
	HS00337	8	2,221	1,555
	HS00504	868	8,844	6,191
	HS00572	111	4,093	2,865
	HS00711	286	1,667	1,167
	HS02052	319	639	447
	HS02465	54	2,147	1,503
	HS02814	103	1,127	789
	HS08428	108	1,448	1,014
	NA00019	1,324	219	153
	NA00052	0	209	146
Grand Total		5,832	50,749	35,524

Sub-catchmet	Farm ID	Sum of Ha	Total load (Tonnes/yr)	Reduction with sediment plan
Mangaone	HS00017	459	2,975	2,082
	HS00034	669	6,490	4,543
	HS00049	317	2,518	1,763
	HS00108	904	6,967	4,877
	HS00122	1,134	4,566	3,196
	HS00147	129	1,438	1,007
	HS00148	102	2,440	1,708
	HS00150	11	1,323	926
	HS00155	1,206	5,463	3,824
	HS00156	497	1,637	1,146
	HS00173	259	3,003	2,102
	HS00176	830	3,739	2,617
	HS00177	262	1,424	997
	HS00178	232	1,696	1,187
	HS00186	236	1,934	1,354
	HS00192	571	1,328	929
	HS00193	1,412	5,959	4,171
	HS00196	1,128	8,959	6,271
	HS00199	122	2,475	1,732
	HS00200	687	3,366	2,356
	HS00201	438	2,595	1,816
	HS00202	1,583	9,982	6,987
	HS00204	567	2,070	1,449
	HS00208	370	2,468	1,727
	HS00210	315	1,280	896
	HS00212	288	793	555
	HS00218	210	859	601
	HS00219	290	883	618
	HS00222	380	1,340	938
	HS00228	558	5,812	4,068
	HS00230	188	1,194	836
	HS00276	44	3,309	2,317
	HS00279	0	6,761	4,733
	HS00290	469	2,856	2,000
	HS00292	220	1,986	1,390
	HS00295	135	1,044	731
	HS00305	572	1,033	723
	HS00322	490	1,950	1,365
	HS00337	213	2,221	1,555
	HS00338	100	699	489
	HS00352	424	2,918	2,043
	HS00356	220	1,345	941
	HS00366	171	605	423
	HS00387	229	1,066	746
	HS00414	135	2,047	1,433
	HS00451	413	2,014	1,410
	HS00486	400	2,479	1,736
	HS00502	106	602	422
	HS00504	58	8,844	6,191
	HS00527	636	1,222	855
	HS00538	5	948	664
	HS00555	274	1,646	1,152
	HS00556	180	218	152
	HS00578	110	878	615
	HS00590	9	1,444	1,011
	HS00620	111	1,562	1,094
	HS00625	102	584	409
	HS00634	469	4,571	3,200
	HS00712	168	397	278
	HS00742	175	3,119	2,183
	HS00745	3	281	197
	HS00832	531	2,540	1,778
	HS00906	274	1,379	965
	HS00928	136	305	213
	HS00937	412	1,813	1,269
	HS01161	1,273	1,220	854
	HS01834	220	544	381
	HS02017	1,858	2,044	1,431
	HS02040	724	1,373	961
	HS02053	273	639	447
	HS02102	191	649	455
	HS02465	209	2,147	1,503
	HS02580	985	7,210	5,047
	HS03186	148	163	114
	HS08387	208	715	501
Grand Total		30,439	182,368	127,657

Not so easy to form a Catchment Group!

Breakout session

What can we do that will give the community confidence that farmers will carry out practices that reduce sediment?

What do we need in order to make this successful?

HAWKE'S BAY
REGIONAL COUNCIL