



Sound environmental management is good business

CAWTHRON MARLBOROUGH ENVIRONMENT AWARDS 2017



JUDGES' REPORT FARMING

STEVE AND MARY SATTERTHWAITE FAMILY, MULLER STATION

INTERVIEWED	Steve and Mary Satterthwaite
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JUDGES	Pete Anderson, Paul Newton, Penny Wardle

INTRODUCTION

"If we hadn't controlled broom and hieracium we'd be subsistence farming. This landscape would be good for nothing but pigs and rabbits. Creeks would be wall-to-wall broom."
Steve Satterthwaite

The Satterthwaites are dedicated, innovative and efficient farmers. They farm sustainably in a very difficult and stunningly beautiful high country environment.



“Between rabbits and scabweed, you could see a mouse run across the property,” says Steve of the start of his 37-year tenure.

He set a trend towards rotational grazing rather than set-stocking which had been the norm in the high country. Alternating grazing on summer and winter country allows land to rest and recover while enhancing performance.

Development of more productive country is enabling stock pressure to be reduced on more marginal high altitude country, provides resilience to drought and enables the raising of stud sheep.

Steve says intensification at Muller Station is possibly not economic, in terms of carrying capacity alone. However, it increases farming options while tackling weeds which left uncontrolled would quickly dominate this back-country landscape.

STAND-OUT FEATURES ON THIS PROPERTY INCLUDE:

- Around \$250,000/year is spent controlling weeds including broom and wilding pines and \$180,000 on fertiliser.
- Improved ground cover has curbed rabbit numbers and reduced environmental damage.
- Mouse-ear hawkweed (*hieracium pilosella*), once a serious problem particularly on sunny aspects in the Upper Awatere, is virtually gone from developed areas.
- Production is focused on developed front country, reducing pressure on fragile backcountry where few or no stock are run.
- Seasonal rotation rests land, ensures stock are well fed year-round and keeps them off snow-prone country in winter.
- Wethers are being phased out, taking pressure off 20,000ha of leasehold summer country which between *hieracium* and grazing is deteriorating.
- The wethers which spent from November until May on this country are being replaced with ewes which will be grazed here for about 10 weeks in autumn only.
- The Muller community is close to self-sufficient with well stocked gardens and freezers.

PROPERTY DESCRIPTION

Farm type: High country station at the head of the Awatere Valley taking in the head of the Saxton and Acheron rivers to the north of Molesworth Station and the head of the Awatere Valley.

Area: 38,870 ha (28,000 in 33-year lease from 1993 in perpetuity, 10,700 freehold).

Terrain: River valleys rising to steep to moderately steep mountaintops. Altitude ranges from 750-2100 metres. Awatere country is divided by the significant Awatere Fault, with more productive soils below the fault-line.

Climate: 550mm average rainfall at the house, up to 1000mm in the Acheron headwaters. Storms, heavy snowfalls, floods, historically 220 frosts/year (less recently) and high summer temperatures make this a climate of extremes. Thunderstorms from January to March can cause massive erosion.

Soils: Soil fertility is the biggest limiting factor to farming with sulphur being deficient and low pH.

Country being developed is high country yellow brown earths, silt loams on alluvial outwash. North-facing has a pH of 5.6-6, south-facing 5-5.4. At higher altitudes are alpine steepland soils.

Ownership: The Satterthwaite family bought Muller Station in 1965. Steve became a fulltime employee in 1971 for 2 and a half years, came back as head shepherd in 1978 and took over managing in 1980.

Stock run: 13,600 sheep comprising 4900 ewes, 4500 hoggets, 4200 wethers. 1319 cattle comprising 650 cows, 145 rising two-year-old (R2) heifers, 175 R1 heifers, 326 R1 steers, 23 bulls. (9845 stock units in 1971, 20,000 s.u. under current management in 2016)

NOTE

Judges' visit focused on improved country on the north side of the Awatere River, between Ward Stream and the Muller Station boundary. The Satterthwaites also own a 300ha property at Greta Valley in North Canterbury, not covered in this entry.

SOIL IMPACTS

- Changed from set stocking to rotational grazing. Seasonal migration of stock reduces pressure on fragile, north-facing country previously grazed for 11 months and lets land recover.
- Drop stock when conditions are dry, feed is short and soils are vulnerable.
- Conservative stocking rate to match country's potential.
- Concentrate production on lower altitude improved pastures, reducing pressure on fragile high altitude country.
- Fallow blocks once every six years so clover can set seed.
- Destock dry sunny aspect country before Christmas to avoid ripgut brome seed in wool and pelts - also good for soil conservation.
- Metsulfuron used to kill briar and matagouri takes out legumes but not grasses, so groundcover remains. Herbicide residue stays in the soil for about a year then a seedbank of nitrogen-fixing clovers sowed since the 1980s re-germinates.



"Satellite unit" where permanent pasture has replaced matagouri/briar



"Satellite units" planted with lucerne, in background

- Creating islands of productivity on naturally fertile, drillable soils with good water-holding capacity. These "satellite units" carry 7 stock units/ha vs Muller's 2.5-3.5su/ha average. They enable spelling of more marginal country, especially in dry years, and support stud

and commercial young sheep production. Since 2014, 250ha have been developed on sunny and shady aspects of the Awatere with 200-300ha to go.

- Satellite units developed by sowing two rotations of ryecorn plus lime, replaced with permanent pasture (timothy, cocksfoot, plaintain and clovers direct-drilled or oversown to avoid cultivation). Lucerne is drilled in high pH soils with good water retention, with a dressing of lime.
- Control of hawkweed/hieracium reduces damage to soil by frost-lift and rain runoff, with pasture better at capturing moisture than this flatweed.
- Maintenance fertiliser is flown on every three years, at rates calculated to replace nutrients lost by stock uptake.
- Lime is applied where necessary to lift pH to areas being intensified by truck and no nitrogen is used.
- Seed is flown on or direct-drilled, with no cultivation.
- Minimal vehicle tracks with mustering done mostly on foot and horseback.
- Lotus corniculatus spread has reduced movement of “pure running shingle” on screes which is good for stability. However there is a risk that lotus could oust native scree species including a number of endemic plants. Lotus is also known to out-compete native species in short tussock-land and to invade wetlands and immediate margins.
- While burning of sprayed matagouri/ briar and ryecorn is not ideal, this is done in August when fires don't get too hot, minimising damage to soil and fire risk.
- Closing a deer unit ended erosion caused by deer running fencelines.

WATER IMPACTS

- A Conservation Resources Report prepared for possible Tenure Review found macro-invertebrate levels in main water bodies on lease-land pointed to very good water quality.
- New Zealand Merino Company monitored Awatere water quality on Muller Station, finding it was pristine. (Steve Satterthwaite, pers. com referencing Argos Study).
- The chemical spray unit is washed on-site at the end of each job.

WASTE MANAGEMENT

- Kitchen waste fed to pigs.
- Little household plastic used. A house cow eliminates plastic milk bottles. Supermarket deliveries come in boxes, not bags.
- Everything bought in bulk with little packaging.
- Containers reused if possible, e.g. drench containers to hold dog drinking water.
- Farm rubbish pit is distant from aquifers.
- Waste oil is stored in 200 litre drums with a little used for cooking guts (dog feed) but not on the road for settling dust.

EFFICIENCY

- Merinos produce both valuable wool and quality carcasses, making do when there's little feed and making up in times of plenty.
- High fertility sheep with high lamb survival rates and longevity.
- Lambs rapidly grow to good weights, with November 1 the mean lambing date and January 15 the start of weaning.
- 121% lambing (including two toothers) compared with 153% scanning demonstrates minimal losses for high country.
- Farm to strengths of country, concentrating development on fertile areas and destocking less productive/more sensitive back country.
- High cattle to sheep ratio (40-45% of s.u.) gives ability to control spring growth, improves pasture for sheep which boosts production and reduces parasite challenge.
- Conservative stocking ensures resilience with half cattle units tradeable.
- "Satellite units" provide capacity to finish young cattle and merino hoggets, compensating for loss of wool income as the merino wether flock is dropped.
- Greta Valley finishing unit expands seasonal shoulders, is a safety valve when the Muller gets dry.
- Three way crossing (Angus-Gelbvieh-Charolais) builds hybrid vigour into trading cattle, offering fast growth via genetics.
- Spraying of magagouri-briar increases space for stock and, says Steve, improves grazeability by about 30% as with less scrub more water is available to pasture.
- Water gravity-fed to the house and flows continually to avoid winter freezing..
- Tunnel-house extends vegetable growing season.

WATER, ENERGY, FUEL AND OTHER INPUTS

- Minimal trips to town - none to Blenheim during the 9 weeks the Awatere Valley Road was closed by a slip caused by the November quake.
- Gardens and freezers stocked with fruit, vegetables and meat meant there was no need for a chopper-drop while the road was blocked.
- Muster on foot and horseback rather than by vehicle, including an eight-day autumn muster.
- Reticulated water to a few dry paddocks is gravity-fed.
- Coordinate freight and aerial work with neighbouring Middlehurst and Molesworth.
- Trucks deliver wool to town then back-load fertiliser, carrying full loads whenever possible.



Ryecorn

- Steve's confident spraying of matagouri-briar will not need to be repeated for about 50 years, spreading cost.
- Staggered sowing of ryecorn extends grazing.
- Ryecorn as a feed for weaned lambs and break-fed to cattle through winter, reduces energy-intensive making of lucerne baleage.

BIODIVERSITY

Indigenous biodiversity

- Steep terrain naturally protects native plant communities from grazing.
- Reducing stock units run on back-country and grazing days, as wethers are dropped.
- Fenced along the Awatere Fault, separating more fertile lower areas where development is focused from less fertile higher altitude country left in a more natural state.
- Land above the faultline is now not grazed with sheep and only occasionally grazed by cattle.
- Seasonal "migratory" stock rotation between Awatere winter country and Acheron summer country enables fragile country to rest and recover.
- Highly threatened black-fronted terns benefit from control of broom which provides cover for predators.
- Rate of metsulfuron used to control briar doesn't kill mānuka.
- Ask helicopter operators to avoid spraying tree matagouri as provides shelter for stock and grass grows underneath.
- Mānuka is regenerating on sunny aspects and black beech where there are seed sources, at top of some catchments plus there are tōtara remnants.

Non-indigenous biodiversity-historic sites

- Mary has developed attractive gardens around staff quarters and the homestead. With up to 200 frosts a year and searing winds, this is a difficult environment to plant trees.
- Historic cob buildings have been maintained, but disappointingly were seriously damaged and must be demolished after the November 14 2016 earthquake.



Cob homestead damaged in quake

WEED AND PEST CONTROL, ANIMAL HEALTH

Weeds

- Co-developed formula for controlling scabweed/hawkweed with Ministry of Agriculture. Aerial oversowing and topdressing (AOSTD) with clovers and sulphur-based fertiliser plus fencing over 8075ha (1982-90) dramatically reduced area.
- AOSTD about 7000ha of wether winter country (1995-2000) where hawkweed now co-habits with native grasses.
- There are few wilding pines at Muller Station but with the Marlborough District Council, spent about \$20,000/year on *Pinus contorta* and Scotch pine control in Saxton catchment. Have boom-sprayed 2-3ha where one adult tree resulted in a mass “like hair on a cat’s back”.
- Sheep eat young pine seedlings, preventing establishment.
- A cooperative approach is now being taken to controlling wildings catchment by catchment, through the South Marlborough Landscape Restoration Trust. With Ministry for Primary Industries funding, programmes will cover 16 catchment zones initially focusing on take-off sites.
- Crack willows are aerial sprayed with herbicide. They choke waterways, capturing gravel which causes flooding.
- Since 1971 control broom using helicopter spraying and ground crews, now spending about \$30,000/yr which is well down on previous spending as control. Steve rates broom as the station’s biggest environmental threat (may be overtaken by wilding pines in the future).
- Have sprayed 10,000ha of briar-matagouri since 2000. This scrub was blocking stock access to high-fertility areas and impeding mustering.
 - An experienced operator applies low rates of metsulfuron by helicopter in early December when targeted plants are actively growing for effective control.
 - Scrub remnants are burned and mulched.
 - Helicopter pilots instructed to leave strategic clumps of tree matagouri for stock shelter but Steve has not been happy with what’s left.
 - While inputs are high, Steve is confident land will remain clear for about 50 years.
 - To avoid Chilean needlegrass spreading to the Muller, use no contractors from Seddon, motorbikes must be steam-cleaned and Steve checks where vehicles have been.



Matagouri and briar sprayed in the last 12 months

Pests

- Control possums, rabbits, feral cats, goats, pigs, deer.
- When deer at the station developed TB a massive effort was devoted to killing ferrets which carry the disease.
- The introduction of Rabbit Hemorrhagic Disease (RHD) in 1997 dramatically reduced rabbit numbers. Populations exploded again in 2008 when rabbits were again intensively poisoned with pindone.
- Muller will be part of a RHD new release in autumn 2018.

Animal health/welfare

- Sheep/cattle appeared in excellent condition.
- Iodine deficiency was identified in stud sheep leading to lambs dying at birth or soon afterwards. Immediate action was taken to reduce losses and a longer-term policy of iodine supplementation to ewes is being introduced.
- DNA test and breed for foot-rot resilience.
- Use of chemicals to treat flystrike has been halved by breeding resilient sheep with fleeces that aerate with minimal suint (odour-carrying grease). 11,000 went through the yards in 2016-17, none with flystrike.
- No chemical use for lice control since 1975 as the property has remained lice-free since that time.
- A dedicated set of yards was built to deal with widespread footrot. Excellent control has been achieved by a planned programme involving careful inspection of all sheep and regular bathing of feet with zinc sulphate.
- Saltblocks are strategically used, improving lamb survival.
- Some saltpan areas have been fenced to stop stock getting stuck.
- Rate of metsulfuron used to spray out briar does not kill manuka (or elderberry) which create shade for stock.
- TB forced an end to deer-farming. Muller Station is now TB-free.



INNOVATIVE APPROACHES

The Satterthwaites have developed farming systems which reap productivity from the best country while taking pressure off fragile higher altitude land.

COMMUNITY VALUES, RESPONSIBILITY, SUSTAINABILITY

- Steve is a trustee on the South Marlborough Landscape Restoration Trust, aimed at controlling the spread of wilding pines in South Marlborough and the Clarence.
- The Satterthwaites have been active members of the Marlborough Merino Association and Steve represents Marlborough on NZ Merino Stud Breeders.
- Beekeeper Bush and Sons locates hives on the property for no charge, as pollination services are valued.
- Share seed-drill with neighbouring Molesworth.



STRATEGIES FOR MINIMISING/CONTAINING ACTIVITIES IMPINGING ON COMMUNITIES, WORKERS AND FAMILY

- Muller Station employs a married couple, two shepherds and a handyman, fulltime. At shearing numbers at the lunch table peak at 25. As not all people working on the farm are experienced, good information and training are prioritised.
- Mary is the farm's health and safety officer.
- A sign on the gate alerts visitors to farm dangers.
- Accidents are recorded along with action taken and how repetition will be avoided.
- A routine of monthly staff meetings is being established.
- Staff must wear helmets on motorbikes and riding hats when breaking in horses.
- Radios are taken on musters allowing communication through the Molesworth channel.
- After the November '16 quake, an assembly point was agreed on and a First Aid kit placed in the garage along with tents.
- Steve has talked to staff about areas which could slip badly in a quake and requires that they check country before driving it.
- An extra cook is employed at shearing to avoid children getting underfoot. Shearing gangs must notify the station if they plan to bring children and ensure they are supervised.

EDUCATION

- Steve enjoys teaching young staff new skills such as breaking in horses.



LANDSCAPE

- The homestead, buildings and surrounding gardens are low key and compatible with Muller Station's high country setting and history.
- The entrance to the property is tidy and attractive.
- Mature trees beautify farm buildings and yards and provide shelter and shade.

RESOURCE MANAGEMENT/COMPLIANCE

- No issues were noted.

SUGGESTIONS/OPPORTUNITIES FOR THE FARM

Productivity is understandably prioritised ahead of protecting indigenous vegetation at Muller Station. However, it could be satisfying for Steve and Mary to learn more about and protect native flora and fauna on the station, perhaps as they eventually step back from day-to-day farm management.

Native matagouri is controlled for farming purposes yet from an ecological perspective, even very small sites are nationally significant. Grey scrubland remnants on outwash alluvial fans (including matagouri) are classified as "chronically threatened" while plant communities growing on mounds in these areas are "at risk".

Four Recommended Areas for Protection on pastoral lease country have been identified but continue to be farmed.

Muller Station exited tenure review when it was suggested that 24,000 of 28,000ha of lease-land be retired for conservation, which Steve walked away from because this would eliminate the "relief valve" of being able to take stock off summer-dry Awatere Country into the south-facing Acheron.

Judges suggest:

- In a highly modified high country farming environment, identifying, protecting and restoring original vegetation could be complex. An ecologist's visit could probably be arranged through the Department of Conservation or Marlborough District Council, to talk through what remains and options compatible with farming.
- It is desirable to maintain and create connections between rugged high country and rivers below. You are encouraged to continue working to leaving clusters, corridors and strips of matagouri as a habitat for native birds, geckos and skinks as well as shelter for stock.
- Persevere with leaving tree matagouri when spraying.
- Perhaps plant communities on undeveloped mounds, below, could be protected.



- There are opportunities for fencing and planting wetlands, such as the lake the judges drove past, below. While this may not always contain water, soil may remain wet.



Pond at Muller Station, above

- Consider excluding stock from at least a portion of areas Recommended for Protection.
- We understand LINZ has signalled future possible requirements fencing of waterways and riparian in the future. Steve commented that this is unrealistic and unnecessary. Where possible, perhaps limit cattle access and only allow sheep access to areas that can't be practically fenced.
- Plastics should not be burned, e.g. chemical containers and baleage wrap.
- Waste oil should also not be burned.
- Introduce portable radios to improve communication between staff working the back-country.
- Note that the new Marlborough Environment Plan rule for disposal of farm rubbish into a pit (3.3.31) states that only biodegradable material must be disposed of to a farm rubbish pit.

Sources

Land Information Conservation Resources Report for Muller Station tenure review, Department of Conservation, September 2009