



LAND MANAGEMENT ACTIVITY – 1 NOVEMBER 2020 TO 28 FEBRUARY 2021

1. OVERVIEW

- 1.1.1 The purpose of this report is to update Council on the Land Management activity within the **Sustainable Land Use Initiative** (SLUI), Regional and Coast, and Nursery activities carried out under the Annual Plan, and the **Te Uru Rākau** (TUR) (formerly Forestry NZ) contract. The report is presented in five sections:
1. Activity during the last reporting period and upcoming activity;
 2. Report on progress against the Annual Plan, and contract outputs;
 3. SLUI activity by Whole Farm Plan production, work completed life-to-date and year-to-date, and against targets;
 4. Regional and Coast work completed against year-to-date targets; and
 5. Nursery activity.
- 1.1.2 The Land Management programme's primary activity is to reduce hill country erosion in order to increase the resilience of the region to storm events and improve water quality. SLUI, the main component of the programme, has more than 575,000 ha of farm plans across 800 farms and aims to complete approximately 3,100 ha of erosion control works and 22,500 ha of new farm plans in the 2020-21 year.
- 1.1.3 Beyond hill country erosion control, the Land programme also supports industry partnerships including the Ballance Farm Environment Awards and events that enable discussion among industry professionals and farmers about land management activity. The Land Management team also provides support to Horizons' regulatory teams about the implementation of the **National Environmental Standard for Plantation Forestry** (NES-PF) and the implementation of One Plan policies and rules about land disturbance and vegetation clearance. More recently, we have been working on implementation of the new national policy direction for freshwater.
- 1.1.4 Management of poplar and willow nurseries in order to provide the necessary materials for the hill country erosion work is the final component of the Land activity. Upgrades to Horizons' Woodville nursery will continue this year. The programme aims to produce more than 30,000 poplar poles to be planted annually for erosion control in our region.

- 1.1.5 The Annual Plan and contract targets are agreed, with the latest **Ministry of Primary Industries** (MPI) contract signed in August 2019. This commits MPI funding of more than \$6.4 million over four years until 30 June 2023. The overall budget for this programme exceeds \$30 million of funding from Horizons, MPI and landowners.
- 1.1.6 The MPI funding is not evenly spread over each of the four contract years and this year has the lowest funding with MPI contributing \$1.388 million.
- 1.1.7 The Land Management activities of this year's work programme link to the Council's Long-term Plan 2018-28 and to the non-regulatory methods of the One Plan (Chapter 5, Policies 5-1 & 5-5).

2 ACTIVITY

2.1 ACTIVITY DURING LAST REPORTING PERIOD

- 2.1.1 This activity report relates to the period 1 November 2020 – 28 February 2021. Spring conditions were better than usual with mild conditions and consistent rainfall through until Christmas. Since then, rainfall has been patchy and temperatures have fluctuated. January and early February provided good rainfall but late February has been hot and dry. By early March most areas were reporting they would like some rain, with stream levels low and pastures drying out. Rain in early March was a start but more is needed.
- 2.1.2 Tree survival and growth has been very good. Poplar and willow poles have had high (90%) establishment and very good growth rates. Pine blocks have established well. Riparian plantings have done well as long as weed control has been diligent. Riparian plantings can be difficult to establish through good growth conditions for grasses and weeds.



Photo 1 - Excellent first year growth - Shinsei poplar pole, Ongarue, Ruapehu District. Photo: Weston Brown

- 2.1.3 Staff visits to landowners at this time of year concentrate on fencing and space planting claims. Staff will also update progress on fencing jobs to be completed by the end of the financial year. This is a good time to focus on claims as staff get a good idea of tree survival, access is good and farmers are starting to think about next year's work programme.
- 2.1.4 Along with visits, staff have been making phone contact with landowners to assess progress on fencing programmes.
- 2.1.5 Staff have assisted four landowners to make applications to the Jobs for Nature programme, including offering letters of support.
- 2.1.6 Staff have been involved in mapping a small number of farms. These farms have been mostly new blocks and extensions to existing farm plans. and for new staff members this has doubled as training in land mapping.
- 2.1.7 Grant McLaren retired in early March after more than 34 years as a Land Management Advisor in the Taranaki District. Grant was well respected by his farmer clients in the southern part of the region is a major loss to the team, especially with his experience in poplar and willow poles. Grant was our representative on the Poplar and Willow Trust Technical Advisory Group.

2.2 ACTIVITY OVER THE NEXT THREE MONTHS

2.2.1 During March to May, staff will:

- Continue to keep in touch with landowners regarding grant work. All programmes are over-allocated but historically they come in closer to budget. Staff maintain funding spreadsheets with various levels of certainty of works being completed (proposed, confirmed/on track, rolled over, cancelled). See Section 4.5 of this report for details;
- Continue to work through claims processing, visiting farms and inspecting works;
- Complete Milestone reporting to TUR for the SLUI programme (March and May);
- Deliver completed farm plans and discuss work programmes for winter 2021, including on-farm inspections;
- Complete an electronic SLUI Newsletter;
- Set a date for a SLUI Advisory Group meeting – proposed for 14 April;
- Carry out form-pruning of poplar poles in trial sites throughout the region, and include new staff as a training opportunity on how to form-prune and give advice to landowners;
- Host a Nursery Managers meeting for Horizons and commercial pole growers;
- Continue to liaise with **Ministry for the Environment** (MfE) over Central Government's Freshwater proposals, specifically on the development of a Freshwater Farm Plan;
- Liaise with other land management staff from regional and unitary authorities through a Special Interest Group meeting in late March;
- Continue monitoring/audit programme for SLUI plans, with the aim of making a report available to TUR;
- Continue the silviculture programme in joint venture forests, with the aim to get as much work completed as possible. This includes work carried over from the Covid-19 interrupted programme last year;
- Complete the Soil Quality monitoring report, presenting the 2015-20 results from the first sampling round of 81 sites. This report will utilise the standard Regional Council technique for State of the Environment (SOE) reporting. The sites are strategically located to be representative of a range of soil types, land uses and physiographic zones across our region, enabling a comprehensive overview of the region's natural resources.

3 REPORT ON PROGRESS

3.1 ANNUAL PLAN AND CONTRACT TARGETS (2020-21)

3.1.1 The Annual Plan and **Hill Country Erosion Fund** (HCEF) contract targets for 2020-21 are shown in the table below.

Table 1: Annual Plan and HCEF contract targets 2020-21

MEASURE	ANNUAL PLAN	HCEF CONTRACT	TARGET	YTD	PREDICTED RESULT
Sustainable Land Use Initiative					
Erosion reduction works programmes in targeted SLUI catchments (ha)	3,100	3,065	3,100	1,216	On track, 3,350 ha work proposed
Whole Farm Plan properties mapped per year (ha)	20,000	22,500	22,500	4,210	On track more than 24,000 ha allocated
Farm or paddock assessments mapped per year (ha)		1,000	1,000	39	1 mapped and 3 awaiting mapping
Case study completed (number)		1	1	0	One proposed
Feasibility reports (number)		6	6	0	On track
Regional and Coast					
Manage grant programmes to deliver erosion reduction works (ha)	175		175	146	On track, 262 ha work proposed
Support industry initiatives that promote sustainable land use (number)	5		5	started	On track
Operate council nurseries and source additional commercial pole material to deliver poplar and willow poles to control erosion (number of poles)	30,000		30,000	32,600	2.5 – 3.0 m poles from all suppliers

4 SLUI ACTIVITY

4.1 WHOLE FARM PLAN (WFP) PRODUCTION

4.1.1 WFPs are a tool for bringing new land into the programme and for allocating grants to farms on various land types (priority land). An important part of maintaining the momentum of SLUI is the ability to bring new farms, new land and new work into the programme. This table shows the plans completed in SLUI's **life-to-date** (LTD) and progress with bringing new plans into the programme.

Table 2: WFP production (life-to-date)

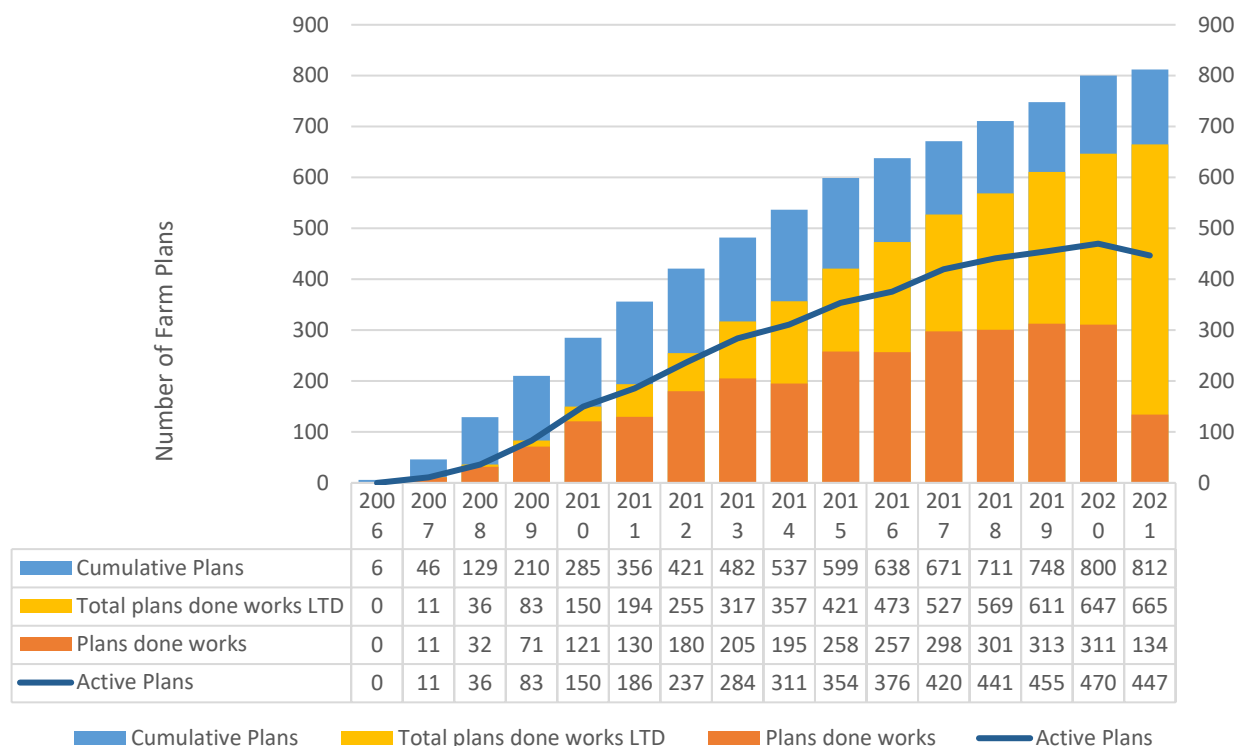
No. of Plans	Hectares	Comments
800	575,000	WFPs completed in SLUI to 30 June 2020 – 51 plans
16	4,210	Plans/ha mapped in SLUI in 2020-21 to date
41	20,343	Plus plans/ha on list to be mapped in 2020-21
57	24,553	Equals (16 + 41) plans on list to be mapped in 2020-21 financial year
71	41,072	Information with landowners who are still to finally commit to a plan

- 4.1.2 Of the 51 plans mapped last year, 43 have been delivered to farmers, 28 of whom have agreed to start a works programme.
- 4.1.3 Fifty plans are allocated to the contractor in 2020-21 and seven to Horizons staff. This is more plans than normally would be allocated to staff but new staff need to learn how to prepare a plan in order to explain the process to landowners.
- 4.1.4 The 57 (24,553 ha) plans allocated exceed the Annual Plan target but provide some leeway for plans not to be completed by the end of the financial year.
- 4.1.5 We are awaiting the return of information/documents from a further 71 farms, accounting for 41,072 ha. Those with paperwork outstanding have been prioritised by:
1. Having existing plans;
 2. Being on top priority and high priority land;
 3. Being in the Ōroua Catchment; and
 4. The likelihood of doing works.

4.2 WHOLE FARM PLAN ACTIVITY

- 4.2.1 The contract targets focus on the number of plans completed; the activity of individual plans over the life of the programme and on an annual basis provide another measure of SLUI activity. The number of plans active in any one year can and does change.

Farm Plan Activity For SLUI at March 2021



Graph 1: Farm Plan Activity at November 2020. Note the results for 2021 (2020-21) reflect the timing of this report early in the year.

- 4.2.2** Graph 1 looks at the farm plan activity as a whole and in any particular year. It is a “stacked column graph” where the orange, yellow and blue components of the column add up to the total number of plans in SLUI at the end of any given year. For example, in 2019-20 there were 800 plans completed over the life of SLUI, 647 plans had completed some works (81% active), and 311 plans had completed some work in that year (i.e. 39% of plans active in 2019-20).
- 4.2.3** The solid blue line tracks “currently active” farm plans where active is taken to be “has completed works in the last three years”. The number of plans “currently active” plans at the end of 2019-20 was 470 (59%).
- 4.2.4** As expected, the data in Graph 1 shows a trend of more active plans (yellow stacked column) as we bring on 40 - 50 new plans per year. The number of plans active in any given three-year period (blue line) has also grown but the rate of growth has slowed, this reflects more older plans dropping off and becoming less active. Reasons for this include: older plans will have completed priority works and landowners may be less motivated, landowners with more than one plan may be concentrating on one farm at a time, and if ownership changes or circumstances change plan works may be a lower priority. The blue line shows a decrease for 2021. At this stage of the year staff have

completed claims on 137 farms, while we had work programmes agreed on 398 farms. The number of active plans will continue to grow until the end of the year.

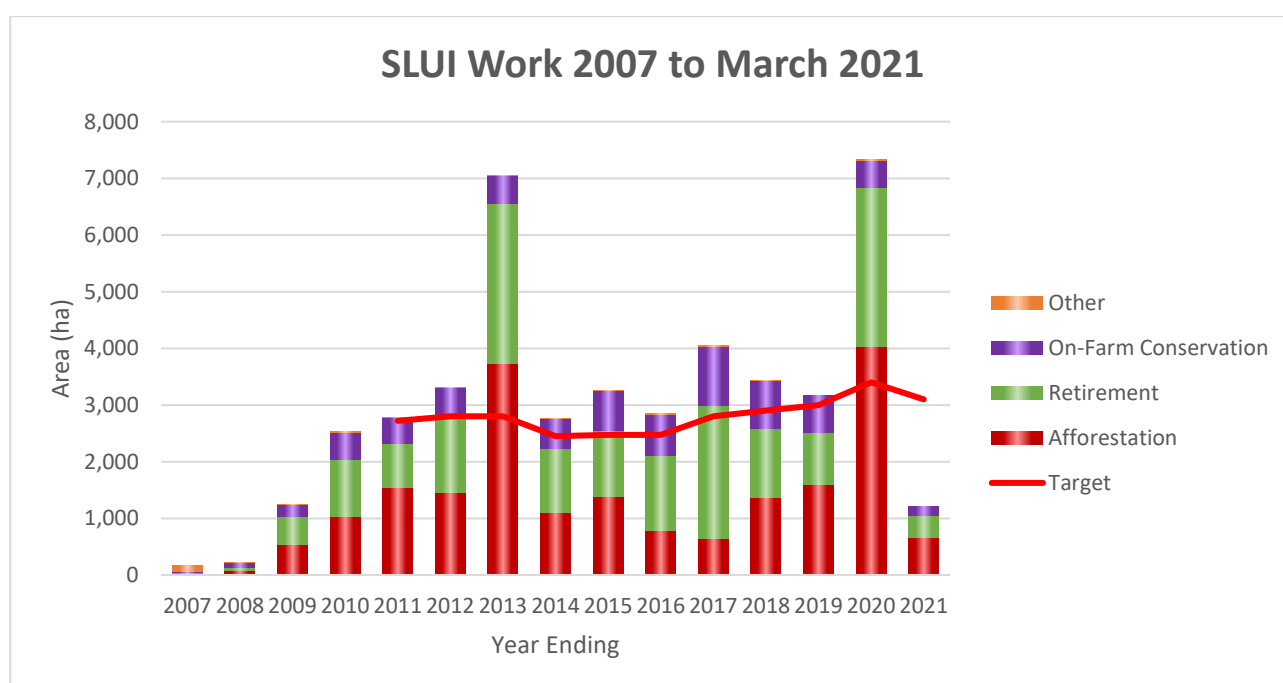
4.2.5 We have undertaken further analysis of the “inactive” plans with the aim of introducing a “maintenance” category. These are plans that:

- haven’t been active over the last three or more years, and
- have completed works on at least 70% of their Top and High priority pasture land.

4.2.6 These plans are considered to have carried out the bulk of their work programme but are not considered completed, rather in a “maintenance” category. Eleven plans have been assessed as being in this category.

4.3 SLUI LIFE TO DATE AND OUTCOMES

4.3.1 SLUI Life-to-date annual works completed are shown in Graph 2.



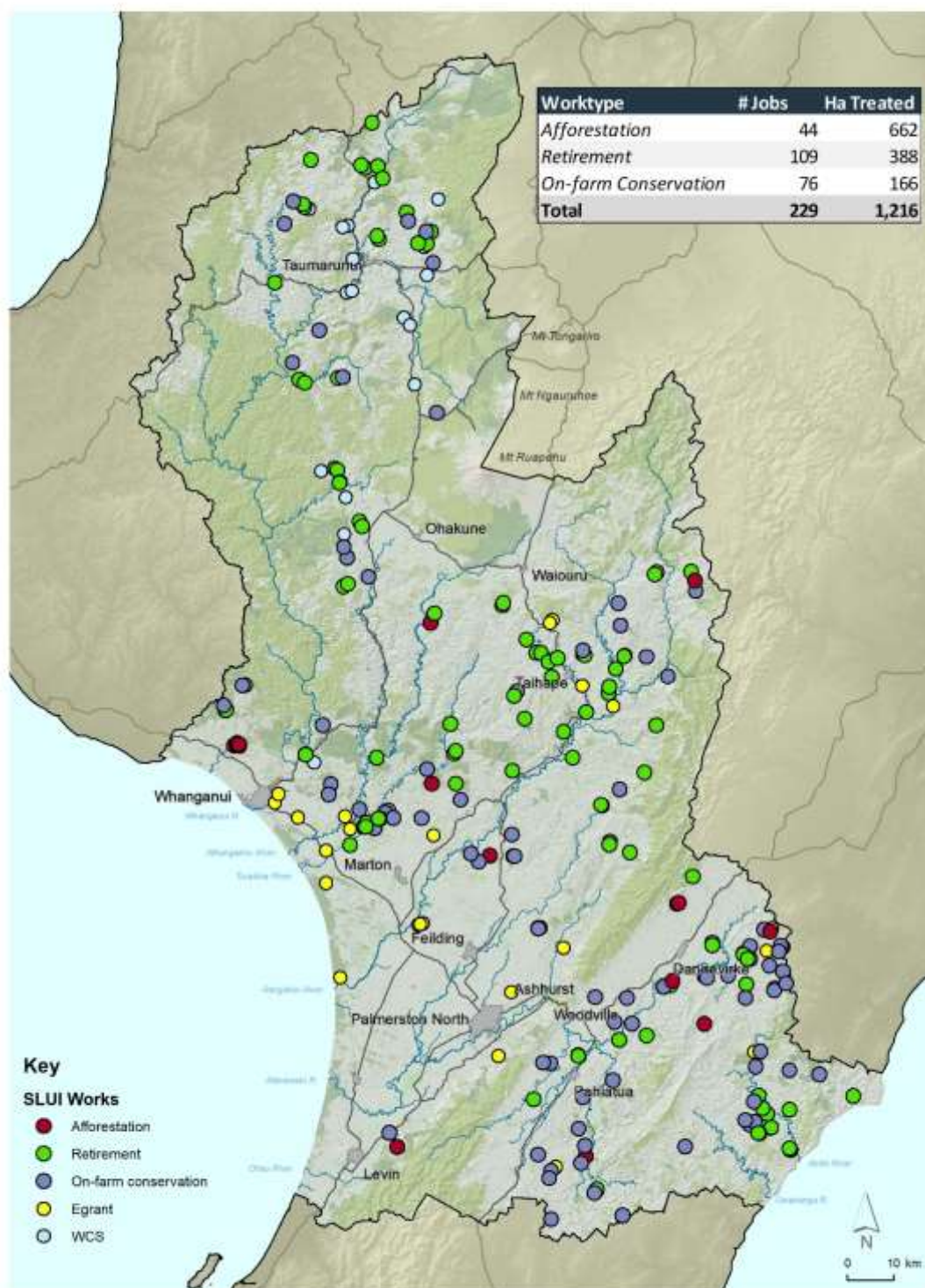
Graph2: SLUI works completed by work type during the life of the programme against annual contract targets (red line). NB 2020 is a partial year at this stage. See Graph 3 for the change in job status through the year.

4.3.2 Each year since 2010 the contract target for hectares of works completed has been exceeded.

4.3.3 The most work was completed last year with just over 7,000 ha of work. Afforestation and retirement made up the bulk of the work.

4.3.4 The notable years for afforestation were 2013, when there was a high level of uptake for the Afforestation Grant Scheme, and 2020, when there was a large amount of carbon and carbon/timber forestry established.

- 4.3.5 Retirement programmes also peaked in 2013 and 2020. In 2013 this was due to a large amount of jointly funded Ngā Whenua Rāhui work completed in the Whanganui and Whangaehu catchments. In 2020 a large contribution was due to one major retirement project in the upper Rangitikei Catchment with 1,315 ha completed, which was 50% of the total retirement work.
- 4.3.6 On-farm conservation (purple) is predominantly space planting and gully planting with poplar and willow poles but also includes structures and earthworks. It is consistently about 500-1,000 ha per year and the limitation is largely pole supply.
- 4.3.7 At the current rate of progress, analysis suggests it will take 112 years to carry out works on all the top priority land that is currently in pasture. This calculation is based on completing approximately 3,000 ha of work per year with 1,000 ha on top priority land, about 500 ha of which is in pasture. The other 500 ha is retirement of existing tree-covered land. All the high priority land that is currently in pasture is estimated to take 252 years of works.
- 4.3.8 Outcomes for SLUI have been modelled by **Manaaki Whenua Landcare Research** (MWLCR) and this work was reported for Horizons in the 2019 **State of Environment** Report (SOE) at page 19.
<https://www.horizons.govt.nz/CMSPages/GetFile.aspx?guid=a77bc2a4-381f-4660-8ef9-4e2486ac7165>
- 4.3.9 The MWLCR modelling reports:
- SLUI works to June 2018 are estimated to have reduced sediment load in rivers by 835,000 tonnes (6%) with the greatest reductions (up to 19%) in the Kai Iwi, East Coast and Lower Rangitikei areas.
 - With ongoing implementation of SLUI works at approximately the current pace, the average annual sediment load could be decreased by 27 percent and water clarity improved by 29 percent by 2043.
 - However, climate change is likely to alter annual rainfall patterns and increase hill slope erosion and river sedimentation, particularly in the northern and western areas of the region. Modelling suggests that this could result in a potential change to the predicted reduction in sediment load from 27% by 2043 to just 19%, 12% or 5% under minor, moderate and major climate change scenarios, with the amounts varying across the region.
 - Modelling also shows that SLUI, New Zealand's largest hill country erosion programme, may not offset the increases in sediment load from climate change in the longer term, as sediment loads in rivers could increase by between 40% and 180% by 2090. This suggests the long-term effectiveness of work already undertaken through SLUI is expected to reduce under climate change, as heavier rainfall events increase sediment loading in the region's rivers.



2021 Worktype Locations

Map prepared by W McKay, NRP Group on 01/03/2021

Map 1: Location of all grant works completed this financial year (SLUI and Regional and Coast).

4.4 YEAR-TO-DATE ACHIEVEMENTS

4.4.1 The table below shows the types of works completed and claimed this financial year.

Table 3: Works year-to-date (completed and claimed, by grant amount and land priority)

Worktype	Claims	Farms	Grant \$	Hectares By Land Type				
				Not Erodible (ha)	Erodible (ha)	High Priority (ha)	Top Priority (ha)	Total Ha
Afforestation	44	27	510,762	52.7	280.1	147.0	182.7	662.5
Retirement	44	39	222,466	12.0	75.0	35.2	43.0	165.2
Riparian Retirement	51	41	259,084	25.9	60.8	20.3	96.4	203.4
Wetland Retirement	13	13	58,243	7.8	10.5	-	0.8	19.1
Managed Retirement	1	1	3,168	0.0	0.4	-	-	0.4
Pole Planting	76	76	126,229	3.7	101.0	31.2	29.8	165.7
Total	229	137	1,179,952	102.1	527.8	233.7	352.7	1,216.2

4.4.2 The 1,216 ha of works completed and claimed is 39% of the Annual Plan full-year target of 3,100 ha. At the March report last year 862 ha (25%) of work had been completed.

4.4.3 Hectares completed by land type shows 586.4 ha (48%) of work claimed to date this financial year is on High priority and Top priority land. The bulk of this work has been completed on afforestation projects.

4.4.4 There have been 229 claims completed on 137 farms with 260–470 still to be completed (260 refers to the remaining on-track jobs and 470 claims would be completed if all the proposed jobs were also completed).

4.5 FORECAST VS ACTUAL (TARGETS VS ACTUAL BY WORK TYPE)

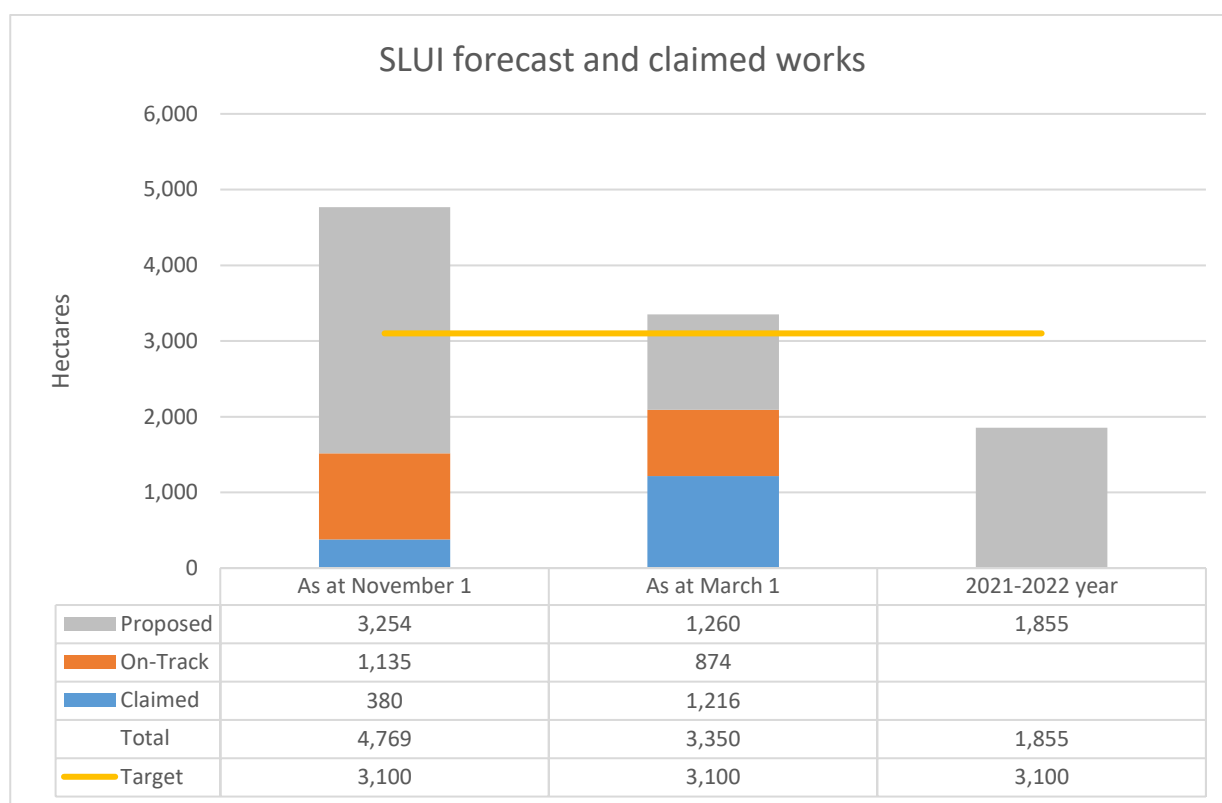
4.5.1 Table 4 shows the forecast figures against target for 2020-21. The work programme is fluid and changes throughout the year. Some changes are due to postponements or cancellations and some are due to new plans coming on-stream and bringing in new work programmes. The dollars shown in the table are the grant cost. It is unclear yet how Central Government's Freshwater rules governing river fencing will affect the work programme but it is likely more riparian fencing will be completed and requests for funding will increase, although this is already over-allocated. Further ahead, farmers may choose to redirect funding from afforestation or other works to riparian protection, and as a result the programme may struggle to meet some targets.

Table 4: Work this financial year (contract vs forecast vs actual by hectares and dollars).

Work Type	Hectares				Dollars \$ x 1000			
	Contract Target	Forecast	Actual	Actual vs Contract	Contract Target	Forecast	Actual	Actual vs Contract
Afforestation	1,250	1,475	663	-587	939	1,056	511	-428
Retirement	600	714	165	-435	261	819	222	-39
Riparian Retirement ^{*A}	220	573	222	+2	357	1,672	317	-40
Managed Retirement	85	17	0.4	-84	25	27	3	-22
Space Planting & Gully Planting	900	665	166	-734	398	315	126	-272
Structures/Earthworks	10	1	0	-10	60	7	0	-60
Other (inc. blank)	-	35	0	-	63	25	0	-63
Total ^{*B}	3,065	3,480	1216.4	-1,848	2,102	3,921	1,179	-923

^{*A} – includes wetland retirement

^{*B} – Annual Plan Target is 3,100 ha, SLUI Contract Target is 3,065 ha.



Graph 3: Changes to SLUI job status through the year and the works allocated for the next financial year. "On-track" means the Land Management Advisor has re-confirmed the work with the landowner or is confident the work will proceed. Graph 3 updates Table 4 with more recent forecasts.

- 4.5.2 Table 4 compares contract target (ha and \$) to forecast and actual. Individual work targets can vary widely, i.e. in reality the contract is to deliver 3,065 ha and the mix of work types will change from year to year. Graph 3 tracks the changes in amount of work and the certainty of that work being completed over the course of the year and into next financial year, as understood through conversations with landowners.
- 4.5.3 Graph 3 shows that the jobs allocated at this stage of the year are reasonably evenly split between proposed 38%, on-track 26% and claimed 36%. In November last year the split was proposed 68%, on track 24% and claimed 8%.
- 4.5.4 The November report forecast 4,769 ha of work to be completed, which has dropped to approximately 3,350 ha in this report. Since November, 34 jobs (333 ha) of work have been cancelled, and 40 jobs (913 ha) of work rolled over to 2021-22. The bulk of the rolled-over work is afforestation, much of which was postponed because landowners were concerned about dry conditions last winter.
- 4.5.5 In past years at this time of the year we have analysed works still to be claimed (proposed and on-track) and estimate that approximately 70% of these outstanding jobs will be completed. As staff contact landowners, we believe there is more certainty around the on track jobs this year and suggest that 60-70% of the proposed jobs may be completed. If that is the case we can expect to complete approximately 3,000-3,350 ha of work at a grant cost of about \$3.0m. The priority for staff will be to encourage landowners to complete works, giving us the most hectares to go toward the end of year targets.

4.6 JOINT VENTURE FORESTRY OPERATIONS

- 4.6.1 Horizons has interests in 10 **joint venture** (JV) forests (under a registered Forestry Right) with a net stocked area of 1,387 hectares. A report on these forests was provided to Council in April 2017 and another report is planned for later this financial year. Work and expenditure in the forests includes rates and insurance payments, maintenance of tracks and fences, pest control, audits and inspections, monitoring and measurements, arranging silviculture, valuations for external audit, maintaining Emission Trading Scheme registration and reporting, and liaising with landowners.
- 4.6.2 Work is underway on this year's silviculture programme. The contractor has completed carry-over work from last year's fire season and Covid-19 interruptions. This year's programme is on schedule and will be about 50% complete by the time the contractor has to move into the planting season.
- 4.6.3 A project to review the value of the forests for the timber harvest and carbon has been progressed to the draft report phase. The project has explored current and projected future value, options to sell some or all of the assets and has also completed a review of accountancy practices for the forests. The reports are on track to be completed in the next reporting period and to be reported to Council in a public excluded item as a part of the next Catchment Operations meeting.

5 REGIONAL AND COAST ACTIVITY

5.1 PROGRESS ON ENVIRONMENTAL GRANT AND ADVICE

- 5.1.1 Environmental Grant funding is in place to support landowners to undertake works that will reduce erosion and protect the environment. This funding is targeted slightly differently between the **Regional Land and Coast** (RL&C) environment grant and the **Whanganui Catchment Strategy** (WCS) grant. Under the WCS, support from **Whanganui River Environmental Trust** (WRET) enables a greater variety of work to be funded and at higher grant rates in some areas.

Table 5: Work area and budget expenditure for the year to date

Grant Type	AP Target	WORK AREA (ha)			AP Budget	BUDGET (\$)		
		Allocated	Complete	AP % Complete		Allocated	Complete	AP % Complete
WCS	75	121	87	116	113,000* ¹	136,815	41,631	37
RL&C	100	141	59	59	80,000	134,419	55,266	69
Total	175	262	146	84	193,000	271,234	96,897	50

Note *1 - this is \$50,000 Horizons and \$63,000 WRET

- 5.1.2 WRET allocation of \$63,000 toward grant costs is confirmed.
- 5.1.3 A total of 150 projects have been allocated to date with an estimated work area of 262 ha.
- 5.1.4 Space planting accounts for 66 of the 150 projects and riparian retirement 39.
- 5.1.5 The bulk of the work completed to date is space planting (46 ha) followed by retirement (37 ha) and riparian retirement (36 ha).
- 5.1.6 Both areas are over-allocated and some jobs may have to be transferred to the 2021-22 year, SLUI and/or additional WRET funding. Thirty-one jobs are already approved for 2021-22.

5.2 INDUSTRY PARTNERSHIPS

BALLANCE FARM ENVIRONMENT AWARDS (BFEA)

- 5.2.1 The Ballance Farm Environment Awards National Showcase event is being held at Te Papa on 25 March.

POPLAR AND WILLOW RESEARCH TRUST (PWRT)

- 5.2.2 The PWRT held its AGM on 26 November. Bruce Wills stepped down as Chair of the Trust and Iain Maxwell, a group manager from Hawkes Bay Regional Council, has been appointed as the new Chair.

- 5.2.3 PWRT has been successful in its funding bid under the One Billion Trees programme. This funding will enable the Trust to run wider extension and support to Regional Councils and landowners.
- 5.2.4 Regional Councils and the PWRT have continued to fund a project investigating the establishment of poplar sawfly near Dunedin. This project was cut short due to Covid-19 last autumn and an extension of funding has been approved from the Sustainable Food and Fibre Fund. The extension has allowed collection of more life-cycle observations of the poplar sawfly during the 2020-21 summer. The project will be wound up this winter.

BEEF AND LAMB NEW ZEALAND (BLNZ)

- 5.2.5 Staff continue to attend BLNZ workshops covering farming and the **Emissions Trading Scheme** (ETS). BLNZ has engaged Forest 360 to present to farmers about how the ETS may affect them and Horizons staff have been present to clarify funding available through our grant programmes. The other priority for BLNZ has been to run workshops outlining Central Government's Freshwater rules. Staff have been present and have answered farmers' questions.

OTHER

- 5.2.6 Staff have attended and presented at a number of events including: Various farm discussion groups and farmer visits. Central Government's Freshwater rules have dominated the discussion, especially intensive winter grazing and the low-slope map for river fencing. Staff have encouraged farmers to submit questions to the **Ministry for the Environment** (MfE) website about the low-slope areas;

Staff are involved in Horizons' response to the Freshwater rules, helping a proposed consenting process for intensive winter grazing in this report and with cross-council input into Freshwater Farm Plan design;

We have a number of new staff and informal training and mentoring is ongoing. This ranges from support on-farm to carry out claims, formal land inventory and land-use capability mapping, and an internal training session on form-pruning of poplar poles through the Horizons pole trial sites. This training has included support from Trevor Jones of PWRT helping staff measure tree growth rates. Form-pruning is a practice that provides benefits of much more leader dominant and compact trees on hillsides, as can be seen in the photograph below.



Photo 2 - Pruned/thinned rising nine-year-old Kawa and Toa poplar poles – Ngapuke, Ruapehu District. Photo: Weston Brown

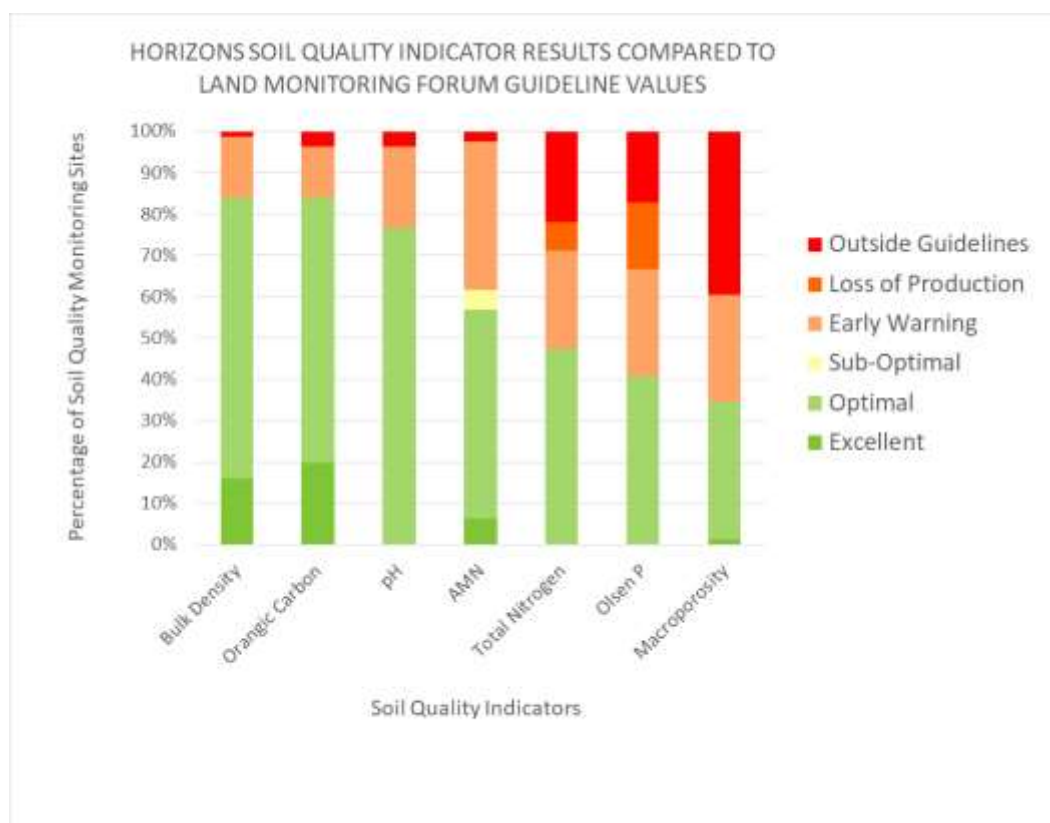
5.3 SOIL HEALTH

- 5.3.1 **Soil Quality Monitoring** (SQM) continued during spring and summer with 81 sites established since 2015. The aim is to settle at about 100 sites, which will adequately represent all the main soil and land-use types. Sixteen of the sites have SLUI Whole Farm Plans and five have a Soil Health Plans.
- 5.3.2 Sites within the following physiographic zones:
- 6 in sand country (7%)
 - 30 on low-lying plains (37%)
 - 29 on high terraces (36%)
 - 7 in hill country (9%)
 - 9 in pumice country (11%)
- 5.3.3 This is the sixth year of SQM and for the first time six earlier sites have been re-measured. Detailed soil chemistry and physics results will be reported for comparison once they are available. In the meantime, a Visual Soil Assessment comparison can be done for the re-measured sites. On average, the results indicate the Kairanga and Tokomaru silt loam sites had improved their soil structure, colour and worm count in spring 2021 compared with spring 2015. This appears to relate to a more favorable preceding winter-spring, as well as a longer interval since the sites had been cropped.

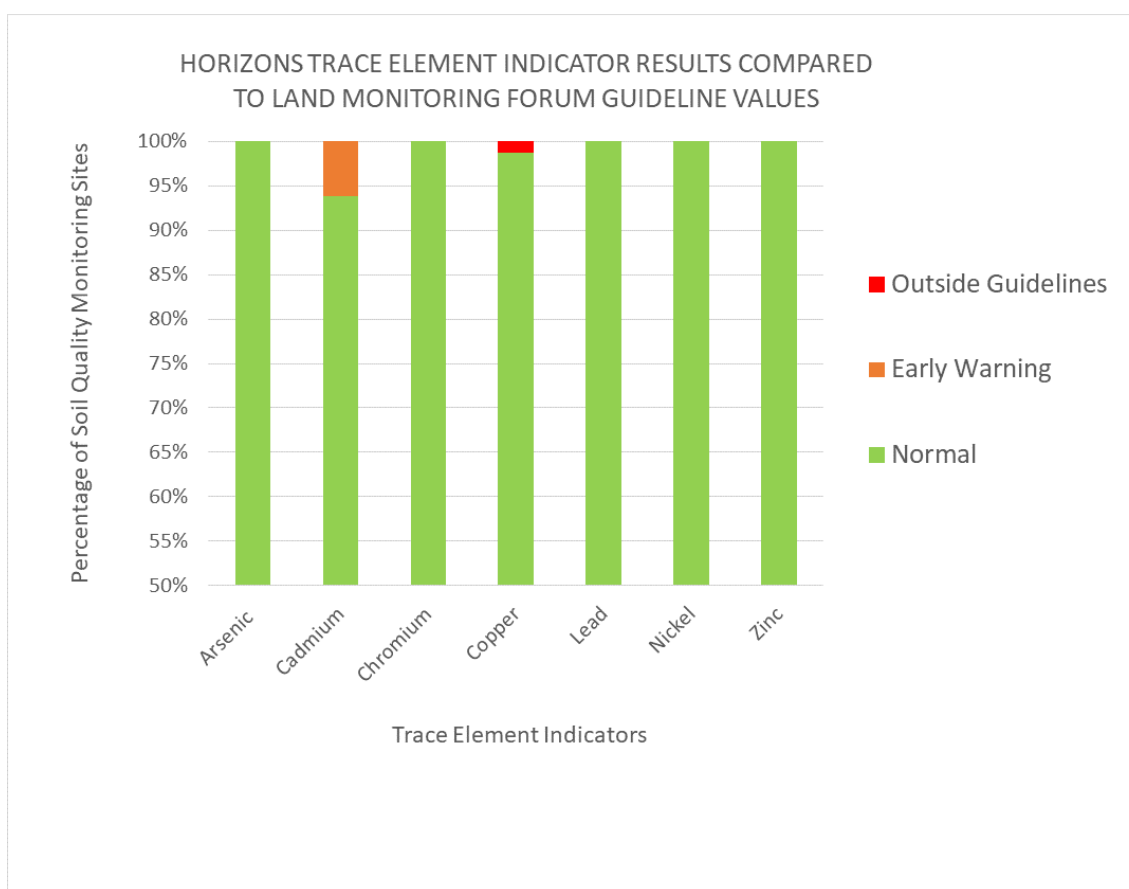
5.3.4 The overall results from the soil quality programme show:

- 35 of the 81 sites are outside guidelines for 1 indicator (43%);
- 13 are outside guidelines for 2 indicators (16%);
- 1 is outside guidelines for 3 indicators (1%);
- 1 is outside guidelines for 4 indicators (1%) (see graph 4);
- In total, 50 of 81 sites (62%) are outside guidelines for at least one indicator; and
- 1 is outside soil quality guidelines for trace elements (kiwifruit for copper);
- Five sites (6%) have been picked up as early warning (Level 1) for cadmium (see graph 5). The Level 1 relates to the NZ Cadmium Management Strategy (2019).

Macroporosity is the indicator most commonly outside guidelines (low 39%), followed by excess total nitrogen (22%) and excess available phosphate (Olsen P) (17%).



Graph 4: Percentage of SQM sites showing the range of good (green) to non-compliant (red) results as measured against agreed land monitoring guidelines for New Zealand.



Graph 5: Trace element results from SQM sites showing the range of good (green) to non-compliant (red) results. One site was non-compliant for copper and five returned early warnings for cadmium.

5.3.5 Soil Quality Monitoring result letters for sites 67-81, which were visited between November 2019 and June 2020, have been compiled, reviewed and issued to landowners. Long waiting times for the soil chemistry and physics results have delayed this process. The letters outline the results from the soil chemistry and physics laboratory results and VSA analysis whilst also interpreting the results and placing them within the regional context to inform landowners of their soil resources.

5.4 WHANGANUI CATCHMENT STRATEGY (WCS) AND WHANGANUI RIVER ENVIRONMENTAL TRUST (WRET)

5.4.1 Work programmes in the upper Whanganui-Ruapehu area are ahead of target as grant works have already exceeded the Annual Plan target for hectares of work. There are a further 46 claims to be completed for a variety of work types.

5.4.2 Staff have continued to liaise with WRET regarding funding of the works programme. WRET have not held an AGM but have indicated our funding is approved.

5.5 SUPPORT FOR CONSENTS AND COMPLIANCE

5.5.1 Advice to landowners regarding the need for consents or compliance for a number of activities which may be permitted or require consent, including:

- 2 on vegetation clearance, including one where the landowner wanted to clear native trees;
- 2 on tracking and cultivation;
- 1 proposed wetland enhancement (no consent required);
- 1 drain maintenance (no consent required); and
- 1 third party concern regarding land stability through forest harvesting.

6 NURSERY

6.1 WORK PROGRAMME TO DATE

6.1.1 WRET-supported nurseries in the Ruapehu District:

- All five northern nurseries were pruned and thinned by contractors in mid-January;
- The Ohura nursery was decommissioned. Old stools have been removed and the site re-leveled. It will be re-grassed, fences repaired and returned to Ruapehu District Council by next financial year. This site required considerable work to upgrade, needed a full replant and being a hill site it was difficult to manage. The decision was made to consolidate to sites closer to town and with better access.

6.1.2 Woodville:

- Contractors have been working at Woodville since November, thinning last year's harvested poles. The main part of the tending works are complete and the crew is not due to return until winter harvest.
- Three spray programmes have been completed for rust and aphids. Low levels of aphids have been present.
- Rows of all varieties in areas of clay soils have been showing signs of stress due to dry conditions since February.
- Provision of additional facilities for native plant storage for the freshwater programme has been scoped.
- Capex – irrigation. An irrigation company has made a site visit to provide estimates and updated pricing for proposed irrigation system. Contractors have also visited the site to ground-truth and estimate costs for constructing water storage.



Photo 3 – Members of the SLUI Advisory Group visited the Woodville nursery in November 2020. Photo: Sara Mathieson.

6.1.3 Bulls:

- Contractors have completed pruning and spraying programmes.
- With more willows being established at Bulls, more spraying for aphids is required and we now complete two sprays rather than one.
- Burning of slash piles has not been completed due to a restricted fire season. If this continues, we may have to apply for a permit and burn as it is in the area earmarked for this year's planting. Slash and waste needs to be dealt with otherwise we run the risk of building up sites harbouring diseases such as silverleaf.
- An area next to a large eucalyptus-poplar shelterbelt has the potential to be replanted next year, but this is on hold until we are able to get a contractor to fell the shelterbelt.
- Thorn apple weed has appeared in cultivated areas, including some newly planted stool beds. The biodiversity team have provided spray recommendations.