



ERNSLAW ONE LIMITED

Ernslaw One Limited North Island



Environmental Monitoring Report 2020

1. Introduction

The purpose of this report is to describe the range of environmental monitoring programmes that are undertaken in the North Island by Ernslaw One Limited (Ernslaw). Not all information/results regarding each monitoring programme will be described in this report but are available on request. This document acts to assist staff, SGS auditors and the public in understanding the range and type of environmental monitoring undertaken within the Ernslaw North Island estate.

2. Monitoring Strategy

Ernslaw is committed to monitoring a range of environmental aspects of its operations and estate across the North Island. Monitoring is a valuable tool which ensures information is collected and can be assessed in order to evaluate change and progress toward desired outcomes. All monitoring within the North Island estate contributes toward Forest Stewardship Council® (FSC®) (FSC®C010424) certification.

3. What Ernslaw Monitors

Ernslaw undertakes environmental monitoring the following areas:

1. Estate information
2. Regulatory/Voluntary compliance
3. Chemical usage and pest control
4. Storm events and response
5. Rear, threatened and endangered species
6. Ecological values
7. High Conservation Values
8. Forest health and biosecurity
9. Social-economics

4. Monitoring Programmes

4.1 Estate Information

Ernslaw regularly updates changes to the profile of the estate. These changes are reported annually in the Estate Plan and biennially in the Area Statement. Monitoring and updating these details reflect the changes in estate profile from harvesting, replanting and any other land management changes.

Ernslaw One Limited, Timbergrow Limited and Forestland Investments

Group	Region	Working Circle	Forest	Tenure	Council	Mapped Area (ha)	Stocked Area by species (ha)				AWR (ha)	Productive area (ha)		
							Prad	D.fr	Other spp.	Total				
Ernslaw One Limited	Gisborne	Mangatu	Mangatu	CFL	GI	12,630	8,384	217	238	8,840	224	9,063		
			Waipaoa	LH	GI	3,527	1,832	0		1,833	164	1,997		
		Mangatu Total				16,157	10,217	218	238	10,673	387	11,060		
		Mata	Mata	FH	GI	7,973	5,870	1	2	5,873	14	5,886		
		Ruatara	Hills	CFL	GI	453	281		5	286	8	294		
			Littleworths	CFL	GI	1,054	716			716	60	776		
			Mackeys	CFL	GI	438	302		5	307	5	312		
			Mangaoporo	CFL	GI	850	576		6	582	32	615		
			Manu	CFL	GI	1,100	783		15	798	1	799		
			Malahia	CFL	GI	264	207			207	0	207		
			Mulanys	CFL	GI	751	496			496	2	498		
			Raupunga	CFL	GI	26	23			23		23		
			Rip	CFL	GI	3,540	2,191	83	6	2,280	128	2,408		
			Stevensons	CFL	GI	149	129			129	2	131		
			Taitai	CFL	GI	1,072	753		3	756	69	825		
			Whakaangiangi	CFL	GI	1,851	1,390		8	1,399	35	1,434		
		Ruatara Total				11,547	7,848	83	48	7,979	343	8,322		
		Tokomaru												
			Carlers	CFL	GI	276	208			208	1	209		
			Hauturu	CFL	GI	1,298	863			863	167	1,031		
			Hulana	CFL	GI	965	497		5	502	238	740		
			Makomako	CFL	GI	2,069	1,618		34	1,652	35	1,686		
			Mangawhero	CFL	GI	712	361			361	40	401		
			Matanui	CFL	GI	146	41			41	51	92		
			Owhena	CFL	GI	1,256	782		10	792	128	920		
			Pouturu	CFL	GI	371	279		3	282	22	304		
			Puketara	CFL	GI	229	133		9	142	18	160		
		Tokomaru Total				7,323	4,781		61	4,843	699	5,542		
		Gisborne Total				43,000	28,716	302	349	29,367	1,443	30,810		
		Southern	Whangapoua	Whangapoua	CFL	TC	10,581	7,062		52	7,114	393	7,507	
	Karaiti		Karaiti	CFL	RU	11,068	8,061	229	92	8,383	415	8,798		
	Kumeroa		Kumeroa	FH	TR	1,079	944			944		944		
	Manuka		Aokautere	FH	PH	699	463			463	0	463		
			Himalangi	FH	MW	105	94			94		94		
			Parewanui	FH	RA	194	174			174		174		
			Pukehou	FH	RA	70	64			64	2	65		
			Shannon	FH	HH	625	282		13	295	2	297		
	Manuka Total				1,693	1,077		13	1,090	3	1,094			
	Rangitikei													
			Harakeke	CFL	WG	437	390			390	3	394		
			Harakeke	LH	WG	58	42			42	13	55		
			Santoft	CFL	RA	1,288	1,033		4	1,037	0	1,037		
			Santoft	LH	RA	2,662	1,986		8	1,994	115	2,109		
			Tangimoana	LH	MW	836	603			603	1	604		
	Rangitikei Total				5,281	4,055		12	4,066	132	4,198			
	Te Namu		Te Namu	FH	RA	3,772	2,824		1	2,825	3	2,827		
	Tilaki		Tilaki	FH	TR/CHB	8,397	6,521	1	2	6,524	378	6,902		
	Tree Farm		Tree Farm	FH	RA	461	376			376	42	418		
	Waimarino		Waimarino	FH	RU	3,918	1,972			1,972	340	2,312		
			Waimarino	LH	RU	10,203	4,246		5	4,257	403	4,660		
	Waimarino Total				14,121	6,217		5	6,229	743	6,972			
	Southern North Island Total (incl. Whangapoua)				56,452	37,138	236	177	37,551	2,110	39,661			
	North Island Total				99,452	65,854	538	526	66,918	3,553	70,471			
	South Island		Aparima											
			Avondale	FH	SO	2,946	196	2,266		2,462	1	2,463		
			Barnhill	FH	SO	1,414		1,187		1,187	0	1,188		
			Gowan Hill	FH	SO	4,302		2,739		2,744	8	2,752		
		Aparima Total			8,662	196	6,192		6,393	9	6,402			
		Blue Mountains												
			Beaumont	FH	CL	3,241	282	2,156		44	2,483	119	2,602	
			Conical Hill	FH	CL	1,804	590	827		1,428	118	1,546		
			Dusky	FH	CL	2,067	470	1,195		1,677	27	1,704		
			Pukerua	FH	CL	254	218			218	15	233		
			Ranikoburn	FH	CL	4,585	1,833	1,733		3,590	261	3,851		
			West Tapanui	FH	CL	820	21	609		636	25	661		
		Blue Mountains Total			12,770	3,415	6,521		96	10,032	565	10,597		
		Clutha												
			Bunglow	FH	CL	479		390		390		390		
			Dunkeld	FH	CL	1,287		402		924		924		
			Glenelg	FH	CL	1,065		926		927		927		
			Halwyn	FH	CL	957	108	593	148	849	2	851		
			Morven	FH	CL	1,284		991		991	3	994		
		Clutha Total			5,072	631	3,303	149	4,082	5	4,087			
		Marlborough												
			Sweet Stream	FH	MB	917	858			858	0	859		
			Wether Hill	FH	MB	514	449			449		449		
			Wallopall Downs	FH	MB	470	416			416	3	420		
		Marlborough Total			1,901	1,724			1,724	4	1,727			
		Naseby	Naseby	FH	CO	2,523	11	813	1,064	1,888	180	2,068		
		South Island Total			30,928	5,976	16,829	1,314	24,119	763	24,881			
	Ernslaw One Limited Total			130,380	71,830	17,367	1,840	91,037	4,316	95,352				
	Timbergrow Ltd	Gisborne	Hawke's Bay	Meritwa	FH	HB	724	499			499	17	517	
				Talaga										
					Moonlight	FH	GI	4,055	3,448	1	2	3,450	27	3,477
					Uawa	FH	GI	1,176	811		41	853	8	861
					Walau	FH	GI	5,326	2,746		1	2,747	53	2,800
					West Ho	FH	GI	1,838	1,080			1,080	313	1,394
				Talaga Total			12,395	8,085	1	44	8,130	402	8,532	
		Gisborne Total (incl. Hawke's Bay)			13,119	8,584	1	44	8,630	419	9,048			
		Marlborough	Marlborough	Rerwick	FH	MB	1,387	1,111	59	19	1,189	2	1,191	
					Netherwood	FH	MB	1,299	833	7		839	2	841
					Tordarroch	FH	MB	3,480	2,612	134	15	2,761	7	2,768
				Marlborough Total			6,165	4,555	200	34	4,790	11	4,801	
	Timbergrow Ltd Total			19,285	13,140	201	78	13,419	430	13,849				
	Forestland Investments	Gisborne	Waitea	Waitea	FH	GI	893	304			304	415	719	
					Parikanapa	FH	GI	242					198	198
	Forestland Investments Total						1,135	304		304	613	917		

*Area Statement as at 30 June 2020

4.2 Regulatory and Voluntary Compliance

Ernslaw monitors regulatory compliance against the applicable statutory obligations (NES-PF/resource consents). Regional audits are completed annually, one of these is always Whangapoua forest as a requirement of the resource consent and two other regions are audited on a rotational basis. These audit reports track compliance over time against regulatory requirements but also the company's Environmental Management System (EMS) and NZFOA Environmental Code of Practise (ECOP) which is the forest industry's best environmental practise guidelines.

Additionally, operational audits are regularly completed by staff to ensure contractor operations are meeting contract and operational specifications.

**See Environmental Audit Reports*

4.3 Chemical Usage

Ernslaw's chemical monitoring system records annual usage (active ingredient and area applied to) within the estate. In addition to herbicides, vertebrate pesticides and other chemicals are recorded in order to meet FSC requirements regarding the use of highly hazardous pesticides. Below is the list of pesticides used within the Ernslaw north island estate.

Type of Pesticide	Commercial Name of Pesticide	Active Ingredient	Reason for use
Fungicide	Cuprous oxide	Cuprous oxide	Control of <i>Dothistroma pini</i>
Herbicide	Gardoprim	Terbuthylazine	Post plant release from gorse
Herbicide	Glyphosate 450	Glyphosate	Pre-plant spray, roadside spray
Herbicide	Tordon Brushkiller	Triclopyr + picloram	Roadside spraying
Herbicide	Green Glyphosate 510	Glyphosate	Pre-plant spray, roadside spray, drill and poison
Herbicide	Hexol	Hexazinone	Post plant release spray
Herbicide	Meturon	Metsulfuron-methyl	Pre-plant spray
Herbicide	Terbuthylazine	Terbuthylazine	Post plant release spray, Roadside spraying
Herbicide	Valzine 500 Valzine Extra	Hexazinone + Terbuthylazine	Post plant release spray
Herbicide	Velpar 20G	Hexazinone	Post-plant release spray
Herbicide	Versatill	Clopyralid	Post-plant release spray
Animal Pesticide	1080	Sodium fluoroacetate	Possum control
Animal Pesticide	Feratox	Potassium Cyanide	Possum control
Herbicide	Tordon	Triclopyr + Picloram	Roadside spraying

**See Annual Chemical Usage Report*

Ernslaw continues to provide funding into industry cooperative research programmes in order to develop alternatives to highly hazardous chemicals. Pest control, biological control and reduction of chemical usage are the main research topics.

4.4 Chemical Alternatives – biological control

Ernslaw is in partnership with Waikato Regional Council (WRC) to trial a biological control (Lace bug) to control the plant pest Woolly Nightshade. A release site has been set up within Whangapoua



forest. Ernslaw has worked closely with WRC to develop Biological Control Agent Release Guidelines to ensure that Ernslaw is compliant with FSC-STD Indicator 6.8.2 and 6.8.3 both in terms of release approval, monitoring and reporting. WRC has committed to providing Ernslaw with an annual report to ensure compliance is achieved.

**See Biological Control reports*

4.5 Storm Events and Response

High intensity storm events have the potential to damage forest infrastructure (roads/landings) as well as environmental values and public property beyond the forest boundary. Monitoring and reporting of such events is vital toward gaining a better understanding of the events as a means to understand their occurrence and better manage their impacts in the future.



Collecting information on storm intensity, impact and remedial work provides information regarding the capability of forest infrastructure to withstand storm events. Over the last 5 years a number of high intensity rain events have affected various forests within the Ernslaw estate. Generally, forest infrastructure has responded very well to these events and the major impact has been slope failures resulting in debris flows. Ernslaw's Storm Event Plan in combination with the Assura software ensures that post-storm event

monitoring of forest infrastructure (culverts, debris traps etc) is undertaken and that damage and any required remedial work is carried out quickly and recorded.

**See storm and incident reports*

4.6 Rear, Threatened and Endangered Species

Ernslaw carries out a number of monitoring programmes aimed at protecting and enhancing North Island brown kiwi recovery.



4.6.1 Whangapoua forest - biodiversity block

Starting in 2007, Ernslaw (partnered with Project Kiwi Trust) has been engaged in managing a 1432ha biodiversity block aimed at the recovery of the North Island brown kiwi. The purpose of the programme is to quickly build the kiwi population and the current management strategy employed to achieve this includes a trapping programme, captive rearing and release of juvenile kiwi. Monitoring of the kiwi population and pest trap catch numbers benchmark progress toward the

aims of the project.

**See Annual Report Whangapoua Forest Biodiversity Block 1 July 2019- 30 June 2020 for further detail.*

4.6.2 Whangapoua forest – Waingaro Wetland

Ernslaw has partnered by Waikato Regional Council and Project Kiwi to protect and enhance this wetland which is the most significant wetland in the Colville Ecological District and hosts the endangered North Island Fern bird. Ernslaw has committed to installing and maintaining 50 ground-based traps around the perimeter of the wetland to control animal pest species. Traps are installed at 60m intervals and are serviced every month. Additionally, Te Rerenga School students have been provided the opportunity to engage in the project to learn about biodiversity management.



4.6.3 Waimarino forest – Aramahoe Ecological Reserve

Partnered with Horizons Regional Council and Ngaporo Waimarino Forest Trust, Ernslaw is working to protect and enhance indigenous forest habitat and grow the North Island kiwi population by 10% every three years. Additional aims include enhancing environmental awareness and providing a

learning platform for schools regarding conservation. The key project areas are pest control and monitoring, kiwi recovery, bird population monitoring, promotion and conservation education.

**See Kiwi population assessment Aramahoe reserve 2018 & Waimarino Forest Kiwi Population Census 2018.*

4.6.4 Mangatu Forest – Native Bat Survey

In 2018 a native bat survey was undertaken in Mangatu forest in the Gisborne region. The survey was designed assess bat colony distribution throughout the forest and review current management protocols to protect bats. Survey results showed that current forest management have enabled one or more long-tailed bat colonies to persist within the production forestry environment. This is valuable information as Mangatu forest begins second rotation. Following the review of current management protocols, several improvements were added to the existing protocol to ensure native bats are sufficiently protected during forestry operations.

**See Mangatu Forest Native Bat Survey: Forest Management Guidance 2018.*

4.6.5 Species Management Plans

Staff and contractors are encouraged to report any sightings of rear, endangered and threatened species. Specific sighting are captured in Inaturalist NZ and the Ernslaw GIS (ecological management area layer) is updated.



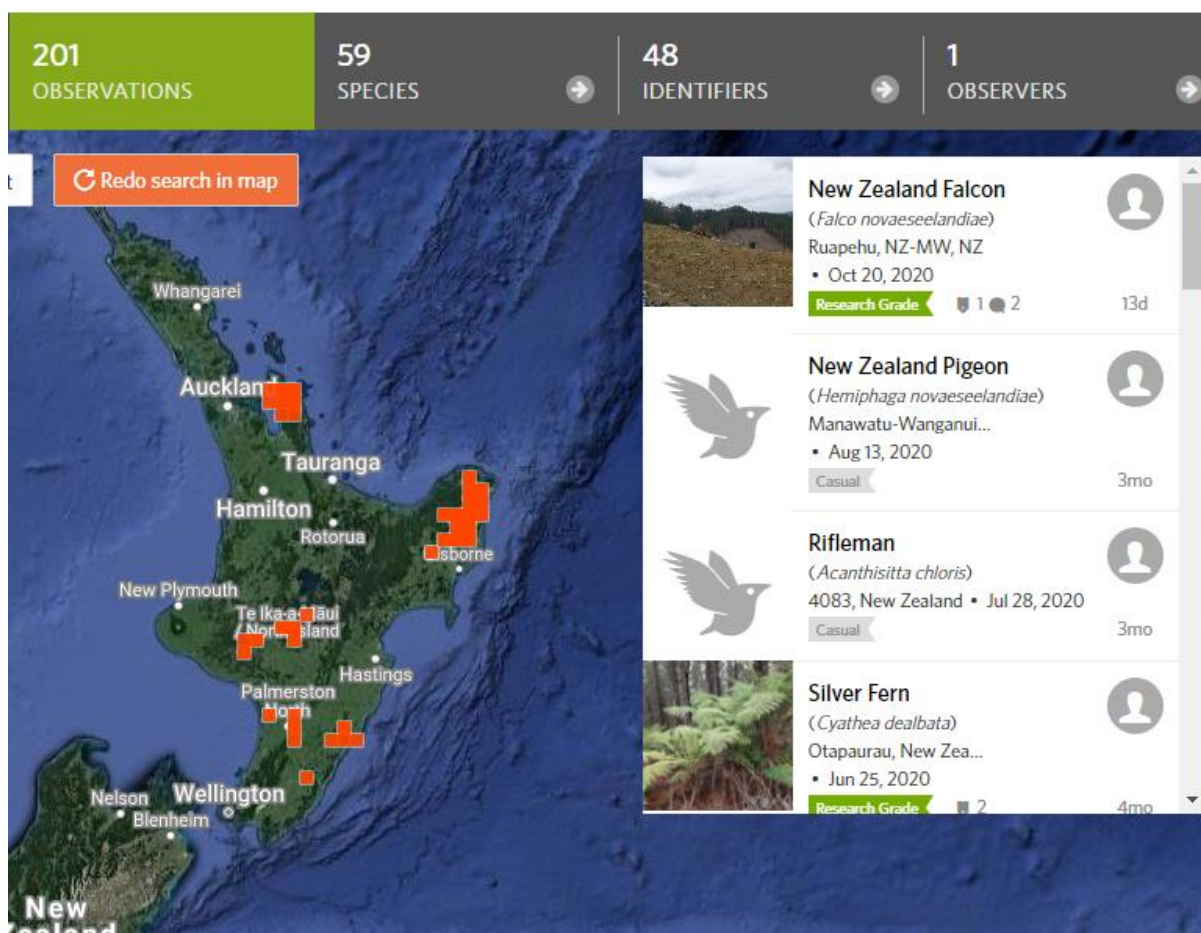
Species Management Plans are applied to the forest area where rear, endangered and threatened species are known to be present, these management plans provide staff and contractors with the necessary information required to manage operations alongside these species.

**Species Management Plans available on request*

4.6.6 Naturewatch – Biodiversity in plantation forestry



Ernslaw has adopted the Inaturalist NZ biodiversity platform which is designed to create a single platform for foresters to collate and record biodiversity observations. Using the mobile application, sightings of native flora and fauna are uploaded directly from a smart phone onto the Inaturalist NZ – biodiversity in plantation forestry portal. Ernslaw is currently working to expand this option to contractors as well. This platform acts as a key instrument for industry to showcase the range of biodiversity that exists alongside forestry operations throughout the country.



*See <https://inaturalist.nz/>

4.7 Ecological Values

As required under the National Standard for Certification of Plantation Forest Management in New Zealand, at least 5% of the total Management Unit shall be managed to retain or restore to the condition of natural forest. Additionally, a minimum of 10% of the forest area in each ecological district/region shall be managed to retain or restore to the condition of natural forest. Ernslaw currently exceeds the 5% indicator with over 16,000ha (19%) protected as formal reserve and retained as natural forest.

The table below describes the percentage per ecological district.

Ecological District	Reserve Area (ha)	Total area (ha)*	Percentage (%)
Colville	1474.4	7973.2	18.5
Eastern Hawkes Bay	772.3	6971.3	11.1
Foxton	780.9	4737.9	16.5
Heretaunga	117.3	518.3	22.6
Manawatu Gorge South	359.1	854.0	42.0
Manawatu Plains	21.2	422.8	5.0
Matemateaonga	4551.1	7752.5	58.7
Motu	907.6	7084.9	12.8
Pukeamaru	267.1	2121.7	12.6

Puketoi	82.7	943.4	8.8
Rangitikei	859.8	2878.6	29.9
Tiniroto	0.0	179.6	0.0
Tongariro	775.6	9475.5	8.2
Waiapu	5276.2	33277.1	15.9
Total	16245.2	85190.8	19.1

*Total area = planted area + AWR + infrastructure

The National Standard provides an ecological equivalence procedure where percentage shortfalls occur in specific ecological district/region. Pest control and restoration works are currently undertaken in the Manawatu Plains, Tongariro and Puketoi ecological districts where reserve shortfalls are experienced.

4.8 High Conservation Value forest (HCV)

Ernslaw has undertaken an assessment and consultation process to identify and classify HCV areas within the North Island estate. HCV areas are critical areas in a landscape which need to be appropriately managed in order to maintain or enhance the high conservation values. Following the assessment and consultation process Ernslaw has currently classified a total of 1099 hectares as HCV area. Specific management and monitoring plans have been developed to maintain the values of these areas. Local experts are consulted in the development of these plans. Ernslaw will continue to re-assess and consult on areas which have the potential to be classified as HCV.

*See Ernslaw One Ltd HCV Management Plan

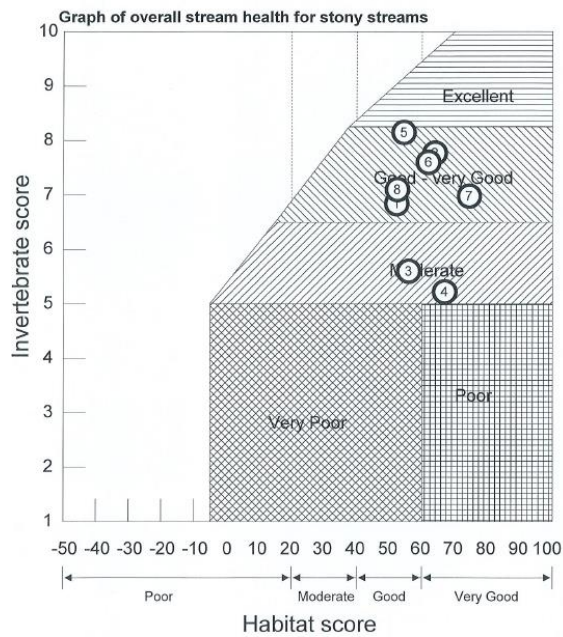
4.9 Stream Health Monitoring

Ernslaw has been monitoring the effects of harvesting operations on stream health in Whangapoua forest for more than 24 years. Ernslaw contracts NIWA to undertake this programme which includes annual monitoring with the result presented in a biennial report. This comprehensive monitoring programme is unique due its long-term nature and the data set is regarded highly internationally.

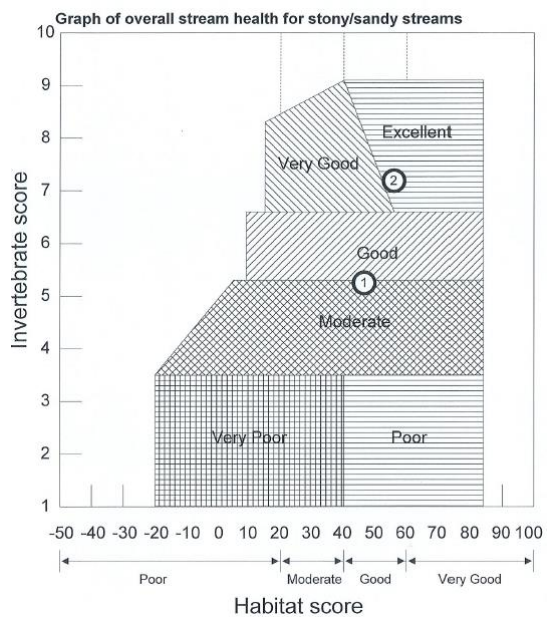
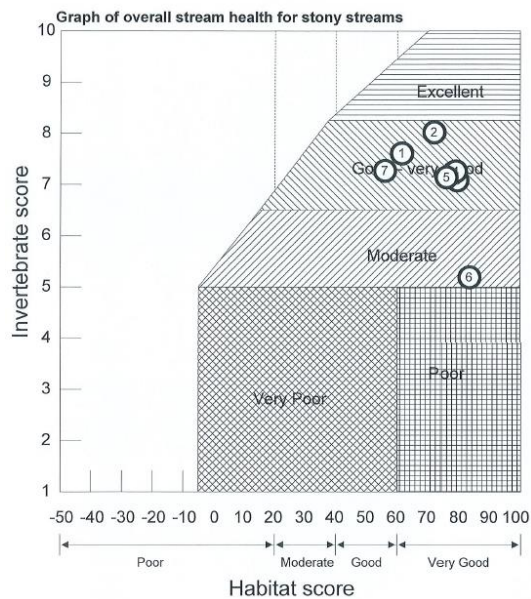
Since 2002 Ernslaw has been monitoring stream turbidity and PH at 12 sites within Waimarino forest with data supplied to Horizons Regional Council. Data has been collected on a quarterly basis and this historic data set provides solid indicators towards understanding the effects of forestry operations on some aspects of stream health.

In 2016 Ernslaw began a stream health monitoring programme within the Gisborne region. Using the NIWA designed Stream Health Monitoring and Assessments Kit (SHMAK), the programme consists of a number of long-term trend sites within the Mata forest which is designed to benchmark stream health pre-harvest, during harvest operations and then through the recovery into the next rotation. No harvest related activities have been undertaken to date.

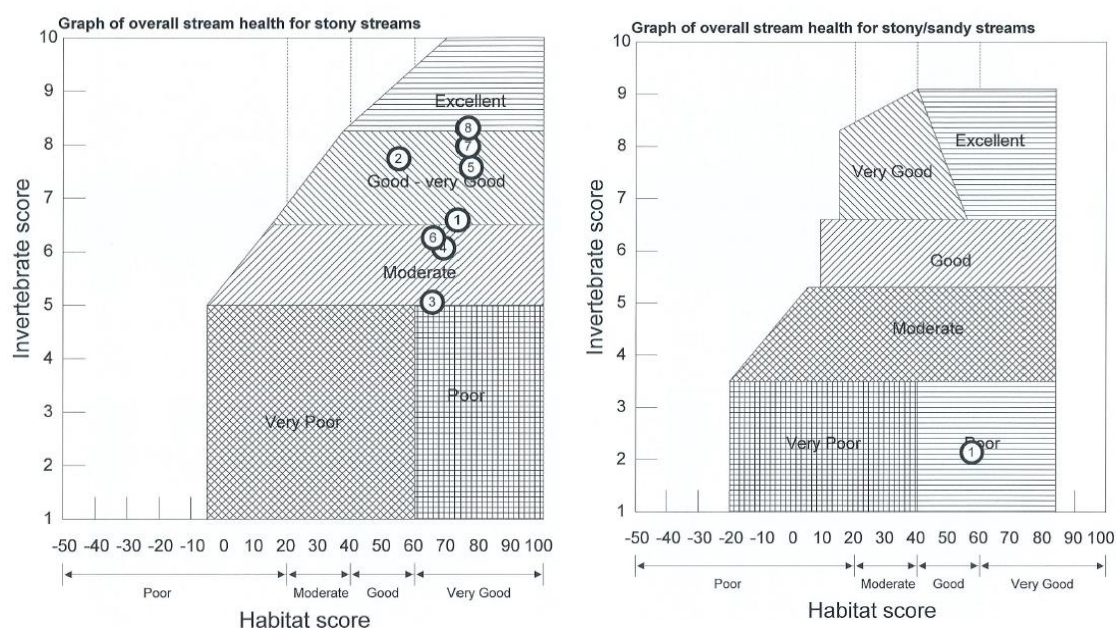
Mata Forest – Gas Road (2017-2020)



Mata Forest – Pouturu (2017-2020)



Mata Forest – Ihungia (2017-2020)



In 2019 Ernslaw extended the SHMAK programme to include Titoki and Te Namu forests and gather data regarding the state of stream health prior to earthwork and harvesting activities. Over time this biennial monitoring will provide valuable data regarding the impact of these forestry activities and the rates of recovery of the streams.

**Data available on request*

4.10 Forest Health/Pest Management

As a member of NZFOA, a sample of the Ernslaw estate is monitored annually by the Crown Research Institute Scion in order to assess any forest health risks or biosecurity incursions.



Early detection of a number of forest health diseases and/or biosecurity incursions is vital in order to minimise damage and manage the potential for risk of further spread.

**See forest health survey results.*

4.11 Socio-economic Monitoring

During 2016 Ernslaw carried out a social survey of the entire contractor workforce (north and south island). The aim of the survey is to better understand the demographic of the workforce as well provide contractors an opportunity to share their thoughts about some key areas of their daily work life (health, safety and environment). Ernslaw partnered with a local high school student who used the project as part of their final year's requirements. The report was completed in late 2016.

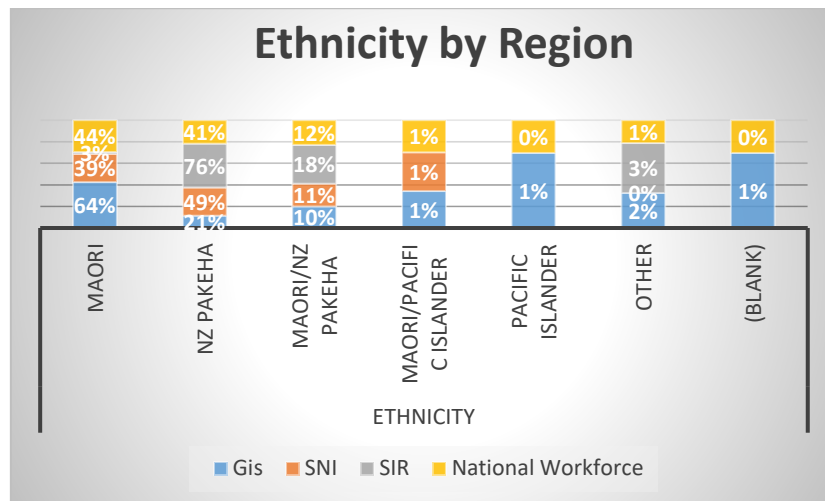


Table: Contractor ethnicity by region

**See Social Survey report for further detail*

For additional information regarding the environmental monitoring programmes described above please contact Ernslaw One Limited.

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