

NZIF Report FOA/FFA Fire Committee Matakana Island Plantation Fire Field Trip - 30th June 2024	Author	Murray Dudfield
	Meeting Date	8 August 2024
	Agenda No.	
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1) PURPOSE AND CONTEXT:

Fire, Forest, and Land Management Specialists from the Forest Owners Association (FOA), NZ Institute of Forestry (NZIF), and the Farm Forestry Association (FFA) made a 30th June 2024 field visit to Matakana Island to view the geographic, environmental, and operational settings of the plantation forest fires ignited 13 December 2020 and 23 December 2023. This visit aimed to identify critical issues and lessons learned and recommend actions to reduce fire risk and adopt more effective and efficient strategic, operational, and financial performance.

2) DISCUSSION:

The December 2023 forest fire incident occurred under highly favourable climatic conditions that should have enabled early suppression, containment & control with minimal cost & impact on the commercial forest owner. The fire weather environment for December 2023 wildfire involved a Drought Code of 185, a Build Up Index of 31, and an Initial Spread Index of less than 2 for the first four days. The hourly Relative Humidity did not drop below 65% for the first four days. The Forest Fire Danger Class was between Low and Moderate from the 25th to the 30th of December. Very high or extreme fire behaviour conditions were unlikely throughout this wildfire.

The attached Report outlines a table synthesizes the specific issues, problems, causes, lessons learned, and actions recommended by this Matakana Island Forest Fire Review to improve the effectiveness and efficiency of collaboration and performance between FENZ and their forestry partners.

3) FOA/FFA Fire Committee Recommendations

The FOA/FFA Forest Fire Committee have endorsed the Findings and Recommendations in the attached NZ Institute of Forestry Plantation Fire Field Visit to Matakana Island 30th June 2024 Report prepared by Murray Dudfield, Jim Carle & Bruce Easton.

Forest Fire Management Review

Matakana Island Plantation Fires - 13 December 2020 & 23 December 2023¹



Background Context

Fire, Forest, and Land Management Specialists from the Forest Owners Association (FOA), NZ Institute of Forestry (NZIF), and the Farm Forestry Association (FFA) made a 30th June 2024 field visit to Matakana Island to view the geographic, environmental, and operational settings of the plantation forest fires ignited 13 December 2020 and 23 December 2023. This visit aimed to identify critical issues and lessons learned and recommend actions to reduce fire risk and adopt more effective and efficient strategic, operational, and financial performance.



Matakana Island borders the seaward margins of Tauranga harbour; length 20 km, width 3 km; resident population 183 (2018), mostly descendants of Ngai Te Rangi; inhabited dwellings 90; land-uses, 2,020 ha farm, and horticultural crops in the inner harbour and 4,050 ha of commercial pine plantation forest owned by Port

Blakely on the exposed outer seaward coastal strip of the island. The company operates a barge servicing the plantation forestry inputs/outputs from Sulphur Point, Tauranga. A public ferry operates from Omokoroa, and the island has a central arterial gravel road with 4x4 forest tracks that provide access to plantation forests. Port Blakely and FENZ support the island Volunteer Fire Brigade. The brigade has two 4 x 4 fire tankers and ancillary equipment. The plantation forest resource is commercially worth tens of millions of dollars. It also provides sand-dune stabilization protection to farm and horticulture lands and ecosystem protection for native & endemic flora and fauna.

Matakana Island Forest Fires

The two forest fire incidents occurred under highly favourable climatic conditions that should have enabled early suppression, containment & control with minimal cost & impact on the commercial forest owner. The fire weather environment for the second fire on 23rd December 2023 involved a Drought Code of 185, a Build Up Index of 31, and an Initial Spread Index of less than 2 for the first four days. The hourly Relative Humidity did not drop below 65% for the first four days. The Forest Fire Danger Class was between Low and Moderate from the 25th to the 30th of December. Very high or extreme fire behaviour conditions were unlikely throughout this wildfire.



¹ Authors, Murray Dudfield, Bruce Easton, Jim Carle,

Despite critical issues and the functional FENZ IMT lacking integration, the goodwill of the Matakana Island Volunteer Brigade and the local community contributed significantly to the logistical & support services and, combined with the forest owners' support, is a good example of local investment in both resources and people.

Key issues identified

- The FENZ deployment of the Incident Management Team's (IMT) lacked a significant & practical understanding of rural fire practices applicable to almost identical forest fire incidents.
- The failure to integrate senior rural fire capability at the inception phase resulted in many planning, resource deployment & suppression issues, which were eventually mitigated by highly favourable climatic conditions.
- The fundamental breakdown of best practice IMT processes contributed significantly to a lack of continuity, incorrect allocation of trained resources, and the reliance on helicopters & machinery in favour of experienced rural ground crews. The helicopter deployment lacked an understanding of effective and efficient attack & suppression techniques.
- The failed deployment of underutilised volunteer brigades had limited rural fire experience combined with no effective IMT handover processes, resulting in a resource misallocation that caused significant cost escalation & unnecessary disruption to this incident.
- The late deployment of experienced rural fire capability contributed to the practical suppression efforts; however, the IMT process still lacked significant integration to allow effective best practices.
- The failure of the communication systems to have either an integrated or a common incident channel is a severe system failure. As a PCBU, FENZ should recognise that this specific matter could have resulted in a WorkSafe & highly public prosecution should a serious incident have identified the root cause as a lack of communication capability. There is no technical reason for this matter to remain unresolved.
- FENZ & Forest Industry / Rural Fire personnel at a regional level have significant system & process failures in areas of management & leadership.
- The daily deployment of new replacement fire ground crews should be avoided. Once on-site, additional unproductive time is required to adjust to an unfamiliar environment. To mitigate this concern fire crews should be assigned to a vegetation fire for at least three to five days.
- From a review of the \$1 million FENZ cost of the 23rd December 2023 Matakana Island plantation wildfire, a small group of forestry subject matter experts have agreed that had the management of this wildfire been under the governance and management of the Pumicelands Rural Fire Authority (the Rural Fire Authority under the Forest and Rural Fires Act 1977 before July 2017) the expenditure involved in the containment of this forty-hectare wildfire would be less than \$200,000 (2024 CPI Adjusted \$340,000) Appendix A..

Key Recommended Actions

- Core sector players need to integrate strategic communication protocols between key stakeholders.
- The immediate deficiencies in training need to be addressed through a joint sector plan that has both organisation & personnel KPIs for accountability. Pan-sector moderation could be one way of testing this training effectiveness, which also has the benefit of creating inter-agency cooperation and human resource connections, which are critical in developing overall capability.
- For forestry lands greater than 1,000 Ha, the relevant forest owners should develop a Forest Fire Risk Management Plan using the FOA/FFA Forest Fire Risk Management Guidelines. This would confirm the forest owners' actions to be taken for an unwanted fire that is threatening or originates within the forest boundaries. This Plan is to be shared with FENZ and updated annually.

The following table synthesizes the specific issues, problems, causes, lessons learned, and actions recommended by this Matakana Island Forest Fire Review to improve the effectiveness and efficiency of collaboration and performance between FENZ and their forestry partners.

Matakana Island Plantation Fires - 13 December 2020 and 23 December 2023 Forest Fire Management Review

Issues	Problem	Causes	Lessons Learned	Recommended Actions
Incident Management				
<ul style="list-style-type: none"> • No Senior Forestry Specialist in the IMT • Insufficient IMT coordination in the deployment of equipment and personnel • Late deployment of equipment and personnel at the beginning of a fire event • Heavy aerial deployment throughout both fires: (13-Dec-20 \$406,256. 23-Dec-23 \$385,907) • Insufficient effective ground attack early • A hand-back Wildfire Incident Notice was issued before the fire was extinguished. • Excessive suppression costs were incurred given benign fire conditions of high RH and low fuel availability for burning. • One forestry crew deployed each day from 26th Dec, mainly on the night shift- (Appendix C) 	<ul style="list-style-type: none"> • Lack of continuity of experienced forest fire capacity and capability on fire ground. • Lack of clear strategy, operations plan • IMT had unclear directions, so units and equipment were not used efficiently or effectively. • Lack of understanding that helicopters and monsoon buckets do not extinguish forest plantation fires without the support of trained fire crews with hand tools. • Ground crews did not fully engage in extinguishing hotspots early in the fire event. • The Forest Manager was not familiar with the Hand-back Wildfire Incident Notice. • The imbalance between the aerial and ground crew deployment in forest plantation fires. 	<ul style="list-style-type: none"> • FENZ IMT rotation (training), no Forestry support person • Lack of coordination and comms between FENZ IMT & Forestry Specialists • Aerial deployment does not extinguish vegetation fires without support from productive ground crew backup • No orientation between FENZ and the Forest Manager on the Hand-back Wildfire Incident Notice • Heavy dependence on aerial attack and heavy reliance on volunteers unfamiliar with forest plantation fires • New crews deployed to the fire ground each day involved lost time in gaining awareness to allow productive gains to be fully realised. 18 Brigades involved. 	<ul style="list-style-type: none"> • FENZ & Forestry Specialists jointly can improve strategy and operations plans, comms and be more effective and efficient in the deployment of personnel, equipment, etc • Rotation of FENZ Incident Managers without a joint Forestry Manager for continuity is not sound fire management practice. • Aerial deployment needs ground support for fire breaks and extinguishing breakaways and hotspots. • Hand-back Wildfire Incident Notices must be discussed and agreed upon when the fire event is under control. • Run-away costs of forest plantation fires highlight inefficient and ineffective strategies, operations plans, and deployment of personnel and equipment. 	<ul style="list-style-type: none"> • Conduct an IMT desktop training exercise on Matakana Island using joint FENZ & Forestry Manager leadership coordination pre-summer to discuss strategy, operational plans, resources available, logistics, etc. • Proactively prepare FENZ & BP collaboration in future fires, clearly identifying a joint IMT and designating Volunteer and Forestry roles in a cohesive strategy and operational approach. • Use examples of Hand-back Wildfire Incident Notices in IMT and Forestry Manager Training to familiarize and discuss • Conduct an independent review of forest plantation fires in recent years to assess whether lessons learned and recommended actions have been incorporated into IMT, strategy, operational plans, roles, deployment, etc.
Communications				
<ul style="list-style-type: none"> • Limited Radio Cover <ul style="list-style-type: none"> ○ Geographic ○ Personnel • Health and Safety compromised • There is no radio communication connectivity between FENZ and partner agencies. 	<ul style="list-style-type: none"> • FENZ VHF radio comms covered limited geography (fire station and fire area only) • FENZ VHF radio comms to FENZ equipment and personnel only • Forestry Managers, Contractors, and Iwi and their equipment/vehicles not in the comms loop 	<ul style="list-style-type: none"> • Temporary Repeater on Mt Mauao to FENZ equipment and personnel in limited geographic cover • Forestry VHF system with cover to the whole Island and Forestry Specialists ignored by FENZ • No Senior Forest Manager in the IMT to communicate with Forestry personnel 	<ul style="list-style-type: none"> • FENZ IMT Comms need to include all key fire respondents, including Forestry Owners, Managers, Contractors, Iwi, DOC, not only FENZ • All responder units require access to radio comms for their Health and Safety 	<ul style="list-style-type: none"> • FENZ install a permanent VHF Repeater site in the Western Bay of Plenty to service the needs of Matakana Island • Proactively test and demo FENZ VHF and Forestry VHF compatibility • FENZ to establish line managers, equipment, and supervisors with radio comms capacity • Conduct joint FENZ/BP training, including radio comms exercises

Personnel Deployment

- Heavy reliance on FENZ volunteer firefighters from 18 brigades across the Bay of Plenty (Appendix B)
- Insufficient forestry specialist expertise and experience for many FF involved.
- There is inadequate awareness of the risks involved in deploying new ground crews daily who will be unfamiliar with ground terrain, land cover, water points, safety awareness, etc.
- One FENZ Fire Crew spent more time traveling to Matakana Island than the time involved on the fire ground.
- Volunteers (many traveled for hours) were reluctant to work within the forest stand (18 brigades from throughout the Bay of Plenty were present but not deployed effectively or efficiently)
- Too many volunteers, vehicles & equipment were present but not used efficiently or effectively.
- Some off-island FENZ trucks required to be rescued as unsuitable and drivers not experienced in off-road operations.
- Many volunteers were not fit for working with hand tools, in a tall forest environment, and off-road driving.
- Forestry firefighter crews with expertise and experience in a forestry environment were not utilised by FENZ until day three.
- FENZ's preference to use Volunteers with limited expertise and experience in forest plantation fires involves a high level of risk
- Off-island volunteers are not trained in forest plantation conditions or techniques.
- Forestry specialists and forest plantation owners and managers with 4x4 vehicles, chainsaws, forest experience & safety equipment) on-site but insufficiently used by FENZ
- Without adequate rural fire training, volunteers and equipment are ineffective, inefficient, and involves health and safety liability in a forest fire.
- Forestry specialists who own and manage forest plantations can provide hands-on expertise, experience, and equipment because they are familiar with operations to manage and protect them.
- In a dangerous forest fire, all crews and crew members need to know their roles, line of command, comms, and safety procedures.
- To ensure continuity and following the initial attack, ie., 2-4 hours, resources deployed must remain involved in a shift routine for the incident for up to five days.
- FENZ and IMT learn from the lessons of prior plantation forest fires
- Conduct volunteer training together with forestry specialists and contractors in the Matakana Island fire sites to highlight essential tasks, comms, health, and safety in the event of a forest plantation fire pre-summer
- FENZ to work with their forestry and DOC partners to develop a plan for resourcing extended rural fire incidents to ensure fire crews can be deployed in a shift routine for up to five days.
- Better understanding is required when deploying aircraft at wildfires to ensure maximum suppression impact of water delivered from aircraft in support of on-ground firefighting resources.

Equipment Deployment

- Over-reliance on helicopters and monsoon buckets throughout the fire event
- Insufficient use of on-ground Forestry equipment and heavy machinery by FENZ
- Forty-two FENZ vehicles, including 13 fire trucks, were involved in this 40 ha wildfire.
- Many fire ground activities lacked supervision and coordination
- Aerial attack can only achieve dousing of the fire, but insufficient mopping up and putting out hotspots by ground crews will only extend the aircraft's time on the fire ground.
- FENZ IMT did not have expertise or current experience in managing heavy equipment for fire breaks & access tracks.
- Some personnel deployed were noncontributors to the fire ground activities/management.
- FENZ IMT deployed aerial support without productive on-the-ground crews
- Forestry specialists were forced to deploy their heavy equipment, vehicles, materials & personnel despite FENZ IMT.
- Lack of FENZ driver skill sets on sand dune-related terrain.
- Inability to understand effective forest fire suppression techniques.
- A strategy and operational plan to simultaneously combine the right aerial and ground equipment is critical to effectively suppress forest fires.
- IMTs must understand aerial and ground equipment's roles, capacity, capability, and functions.
- Clearly defining fire ground supervisor roles and responsibilities within the IMT structure is needed.
- FENZ Volunteers and Forest Managers conduct aerial and heavy equipment training in a simulated forest plantation fire to highlight critical tasks, comms, health, and safety in the event of a forest plantation fire pre-summer.
- FENZ and forest owners develop an integrated forest fire management strategic partnership to suppress plantation forest fires.

Historical Fires Costs in Similar Forest/Wilding Pine Landscapes

FIRE AUTHORITY	CLAIM DETAILS	FIRE DATE	HA BURNT	FA PERSONNEL COST	FA RETARDANT COST	FA OTHER COSTS	NZFS COSTS	AIRCRAFT COSTS	OTHER RETARDANT COSTS	OTHER CONTRACT COSTS	APPROVED COSTS	2024 CPI Ajusted
MARLBOROUGH NORTH RFD	SHAKESPEARE BAY	07-Feb-01	56	\$19,574	\$0	\$7,895	\$1,678	\$82,035	\$0	\$39,054	\$150,236	80% \$270,425
MARLBOROUGH NORTH RFD	PARA	13-Mar-01	102	\$20,594	\$3,360	\$18,507	\$2,798	\$108,039	\$0	\$86,363	\$239,661	80% \$431,390
LAKE TAUPO RFD	HINEMAIAIA	06-Feb-03	25	\$25,734	\$4,352	\$40,928	\$2,858	\$72,036	\$0	\$74,643	\$220,551	71% \$377,143
SOUTHERN RFD	POURAKINO	18-Jan-04	30	\$0	\$2,756	\$10,147	\$1,701	\$52,190	\$0	\$95,151	\$161,945	68% \$272,067
WAIROA DC	MCLEANS ROAD	12-Nov-06	38	\$6,795	\$0	\$5,380	\$4,478	\$111,514	\$16,028	\$73,563	\$217,758	58% \$344,057
Five Year average											\$198,030	\$339,016

FENZ Fire Trucks and Smoke Chaser Units Deployed to Matakana Island December 2023 Wildfire

Station	Discription	Date	Time deployed	Time arrived	Travel time	Date	Time departed	Travel time back to Station	Total Time away from Station	Time on Fire Ground	Max Charge 12 hrs/day	
MATA7071	4 x 4 Tanker	23-Dec	19:39	20:13	0:34	30-Dec	19:42	0:34			84	7 days 0 hrs
GREE7511	Large Water tanker	23-Dec	20:20	22:17	1:57	30-Dec	13:24	1:57			84	6 days 17 hrs
MATA7072	4 x 4 Tanker	24-Dec	6:49	6:49	0:00	30-Dec	20:27	0:00			84	6 days 14 hr
LAKE6571	4 x 4 Tanker	24-Dec	5:27	6:57	1:30	28-Dec	16:48	1:30			56	4 days 11 hrs
EAST6071	4 x 4 Tanker	24-Dec	5:22	7:22	2:00	27-Dec	17:48	2:00			48	3 days 12 hrs
GREE7518	Command Truck	24-Dec	6:59	8:10	1:11	30-Dec	15:04	1:11			84	6 days 8 hrs
ONEM7976	4 x 4 Tanker	24-Dec	9:52	12:02	2:10	25-Dec	15:36	2:10			24	1 day 6 hrs
OKER6971	4 x 2 Fire Appliance	24-Dec	17:12	18:50	1:38	25-Dec	9:40	1:38			12	17 hrs
WHIR8672	4 x 4 Truck	25-Dec	5:03	7:30	2:27	25-Dec	19:22	2:27	16:46	11:52	12	14 hrs
LAKE2971	Rural Pump	25-Dec	15:56	18:27	2:31	28-Dec	16:51	2:31			24	3 days 1 hr
NGON8211	Water Tanker	26-Dec	5:07	7:22	2:15	28-Dec	17:38	2:15			24	2 days 11 hrs
TEPU7911	Water Tanker	27-Dec	6:16	7:40	1:24	29-Dec	18:23	1:24			72	5 days 3 hrs
CHAR4271	4 x 4 Pump	28-Dec	5:03	7:35	2:32	28-Dec	16:51	2:32	14:20	9:16	12	11 hrs
LAKE 2925	Smoke Chaser	28-Dec	4:31	8:53	4:22	28-Dec	16:16	4:22	16:07	7:23		
LAKE6625	Ute	28-Dec	5:14	7:20	2:06	28-Dec	16:50	2:06	13:42	9:30		
The 12 fire trucks above were part of the 42 FENZ vehicles deployed to the Matakana Island fire												
The hourly rate (\$477/hr) used is the rate which is included in the FMO agreement with FENZ												

FENZ Vehicles Deployed to the Matakana Island 23 Dec 2023 Plantation Fire

Responses

Alarm Level	Call Sign	Dispatched		Response	Arrival	Departed	
		Day	Time	Time	Time	Day	Time
2	MATA7071	23	19:39:47	20:13:20	20:13:27	30	19:42:11
2	GREE7511	23	20:20:25	20:29:35	22:17:31	30	13:24:13
2	MATA7026	23	19:39:49	06:49:52	06:49:53	03	16:50:20
2	MATA7072	23	19:39:49	06:49:53	06:49:54	30	20:27:50
2	LAKE6526	24	05:24:44	05:24:49	06:55:03	26	17:43:43
2	LAKE6571	24	05:24:56	05:27:42	06:57:57	28	16:48:26
2	EAST6071	24	05:21:55	05:22:39	07:22:27	27	17:48:57
2	GREE7518	24	06:58:42	06:59:44	08:10:23	30	15:04:06
2	GREE7529	23	20:29:34	20:34:06	08:32:17	30	15:04:13
2	FICOUMA05	24	08:45:38	08:47:37	08:47:38	25	10:14:19
2	GMBAYOP03	23	20:57:12	05:29:45	09:18:44	30	17:08:04
2	EAST6026	24	05:21:55	05:22:47	09:18:57	27	16:59:37
2	VSOBAYOP01	24	10:23:23	10:24:16	11:04:24	25	11:59:44
2	ONEM7971	24	09:52:50	09:52:51	12:02:36	25	15:36:01
2	ONEM7976	24	09:13:45	09:37:24	12:21:51	30	17:10:35
2	ONEM7972	24	09:13:45	09:38:27	12:21:52	30	17:10:19
2	EQUIPBOP1	24	12:19:47	12:19:48	13:47:20	25	14:36:40
2	GMBAYOP05	24	08:27:42	08:28:23	16:21:52	24	18:50:20
2	TAUR7126	24	15:54:18	15:54:31	16:57:20	30	16:13:14
2	OKER6971	24	16:57:38	17:12:44	18:50:14	25	09:40:52
2	WHIR8672	25	05:03:55	05:03:56	07:30:19	25	19:22:26
2	SOBAYOP08	25	05:35:58	05:38:37	09:15:18	28	18:28:04
2	EQUIPBOP3	25	06:53:48	09:34:43	09:35:10	28	17:44:35
2	OPOT9625	25	07:04:18	07:07:02	09:42:46	25	19:08:35
2	USARN02	25	14:35:57	14:51:44	17:12:01	07	10:09:57
2	LAKE2971	25	15:55:46	15:56:13	18:27:36	28	16:51:33
2	TAUR7122	24	15:54:18	20:20:25	20:20:26	30	17:13:52
2	NGON8211	26	05:03:38	05:07:35	07:22:32	28	17:38:29
2	SOBAYOP10	26	04:44:04	04:46:43	07:23:01	26	17:10:36
2	WAIM9829	26	05:33:54	05:33:55	07:23:11	27	18:27:41
2	GMWAIKA06	24	14:09:07	14:51:10	19:09:50	31	12:05:29
2	EQUIPBOP4	27	05:53:55	05:55:44	07:26:38	27	18:20:22
2	SOBAYOP09	27	04:59:50	05:00:15	07:26:45	28	18:15:14
2	TEPU7911	24	15:16:16	06:16:20	07:32:37	29	18:23:47
2	TURA2371	27	05:28:21	05:28:22	08:11:55	27	20:15:45
2	TRNTKTP12	28	06:06:14	06:06:15	06:26:24	30	17:14:02
2	LAKE6626	28	05:14:21	05:15:26	07:20:29	28	16:50:18
2	CHAR4271	28	05:03:28	05:03:29	07:35:14	28	16:51:15
2	LAKE2925	28	04:31:27	04:31:28	08:53:11	28	16:16:30
2	GMWAIKA01	28	10:22:17	10:22:18	10:22:19	31	11:36:50
2	ONEM7926	29	03:44:13	03:44:14	06:55:07	30	17:10:53

Forest Owner Resources Available/Deployed to Matakana Island Wildfire - 23 Dec 2023

Resources Available	Forest Company A	Forest Company B	Forest Company C	Total
How many trained forest firefighters were available,	2 crews available (10)	30 trained firefighters	14 trained firefighters	46
How many IMT staff from Sector Supervisor and above were available,		13 staff	6 staff	19
How many forest fire tankers were available	4 x 4 tanker available	4 X 4X4 tankers available	1 x 4x4	9
How many forest smoke chasers were available?		5 smoke chaser	Nil	5
Resources deployed				
How many trained forest firefighters were deployed, and how many days they were away from home base?	1 x 4 crew deployed Night shift 26 th & 27 th Dec	None requested	24 th 1x8 crew night shift 25 th 1x5 crew day shift 25 th 1x8 night shift 29 th 1x11 crew day shift 30 th 1x11 day shift	4 night crews shifts & 3 days shift crews
How many IMT staff from Sector Supervisor and above were deployed and the number of days they were away from home base,	No request for IMT staff	None requested	2 staff	2 staff
How many forest fire tankers were deployed, and the number of days away from home base,	None requested	1 tanker for four days	Nil	1 tanker
How many forest smoke chasers were deployed, and how many days were they away from the home base?	None requested	None requested	Nil	Nil