

# New Zealand Wildfire Summary

2021/22 Wildfire Season Update



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# Summary

The 2021/2022 wildfire year was not as significant in terms of both the number of fires and total area burnt compared to the previous year (2020/2021).

- Districts that experienced an increase in both number of wildfires and area burnt compared to the previous year include: Southland, Taranaki, Waikato, Waitematā (A1).
- Districts that experienced an increase in number of wildfires and a decrease in area burnt compared to the previous year include: Bay of Plenty, Manawatū-Whanganui, West Coast (A1).
- Districts that experienced a decrease in number of wildfires and an increase in area burnt compared to the previous year include: Northland, Tairāwhiti (A1).
- Districts that experienced a decrease in both number of wildfires and area burnt compared to the previous year include: Canterbury, Hawke's Bay, Mid-South Canterbury, Nelson Marlborough, Otago, Wellington (A1).
- Prevailing climatic conditions for the year were dominated by a weak La Niña with predominant east to north-easterly winds. This resulted in moister conditions along the east coasts of both islands, which usually experience the most damaging fires (Figure 1).

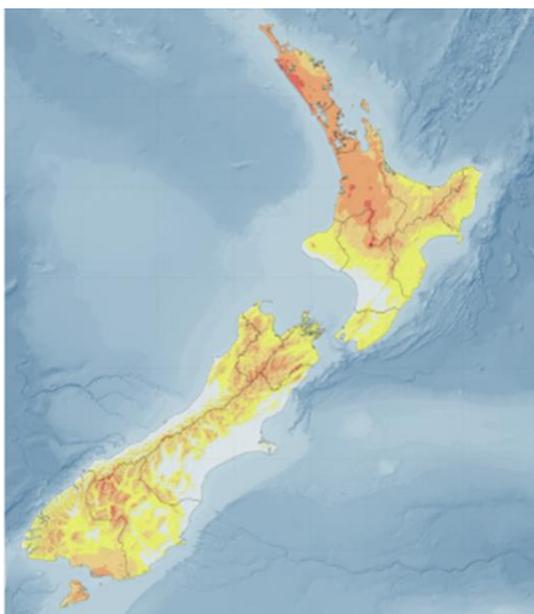
# Introduction

This report summarises wildfires in New Zealand for the 2021/2022 year. It includes an evaluation of climatic conditions and incident statistics (over an annual timeframe from 1st of July 2021 to 30th of June 2022). The purpose of this document is to provide a summary of 2021/2022, and a comparison to the previous year (2020/2021), in terms of overall conditions and incidents notified. The intent of this report is to aid in discussions in each district around operational reduction and readiness measures, and to inform opportunities for continual improvement.

# Methods

This report summarises wildfire and climatology trends which are presented nationally, by island (North versus South), and by Fire and Emergency New Zealand (FENZ) District. Updated FENZ District boundaries were brought into effect with the official stand-up of Tranche 2 of the Fire and Emergency Service Delivery structure on 27 September 2021. This resulted in several boundary and name changes for Districts around the country. At that time, 17 Districts<sup>1</sup> were created within five Regions to replace the previous 24 urban areas and 18 rural districts. Due to this update, differences in district names and values will be present for reports prior to the 2021/2022 report.

Trends in the number of wildfires, area burnt, and fire causes have been identified using data from two separate sources. Data from the former National Rural Fire Authority (NRFA) was used to cover the period from 1988 through the 2016/2017 fire season. Data from the 2017/2018 fire season through this current report have been collected from the FENZ fire incident reporting database. Occurrence data going back to 1988 does not have all of the required information for the purpose of these annual reports, therefore some district summaries may have shorter reported periods of historical data, as noted in the respective graphics. Manual adjustments were made to the 2021/2022 FENZ data following a manual validation process undertaken with all of the districts to identify 'significant fires', where a significant fire was deemed to be any fire with an area burnt of 10 hectares or more. The 2020/2021 manual adjustments were carried forward from the past report.



**Figure 1.** NIWA's New Zealand Drought Index (NZDI) map for 2022-02-22, which highlights locations experiencing drought or dry conditions during the height of the wildfire season. Red indicates severe drought conditions; orange indicates drought; light orange indicates very dry to extremely dry conditions; yellow indicates dry conditions.

The data were filtered to only include Vegetation Fires as identified in the incident type group. When duplicate records existed, these were filtered to only include the entry with the largest area. This dataset does not include vegetation fire non-responses or false alarms that required no action.

This report includes revised figures and data compared to the 2020/2021 wildfire summary report due to the completion of missing incident reports<sup>2</sup>. Therefore, there will be differences if comparing the 2020/2021 report to this 2021/2022 summary.

New Zealand's fire weather and climatology data have been summarised from the NIWA Fire Weather System as well as from general NIWA climate updates. In the case of the fire weather and climatology database, the list of stations is updated for every annual New Zealand wildfire summary. Due to this, differences in general values (e.g. summary tables in district appendices - Appendix 5 onwards) between this report and the last annual update are expected.

This summary is the most up-to-date and contains data within figures to compare both the 2020/2021 and 2021/2022 years. This comparison between the two years helps identify patterns that are emerging at the district level, as well as to help determine if risk reduction initiatives are having an impact in terms of reducing the impact of fires. The wildfire annual summary is also intended to provide additional information to support the Monthly Fire Danger Outlooks in terms of analogue seasons for comparison of prevailing conditions.

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<sup>1</sup> Chatham Islands is included in the Wellington District, Stewart Island is included in the Southland District

<sup>2</sup> New Zealand Wildfire Summary – 2020/2021 Wildfire Season Update. <https://www.fireandemergency.nz/assets/Documents/Research-and-reports/NZ-Wildfire-2020-21-Season-update-Scion.pdf>

# Wildfire statistics

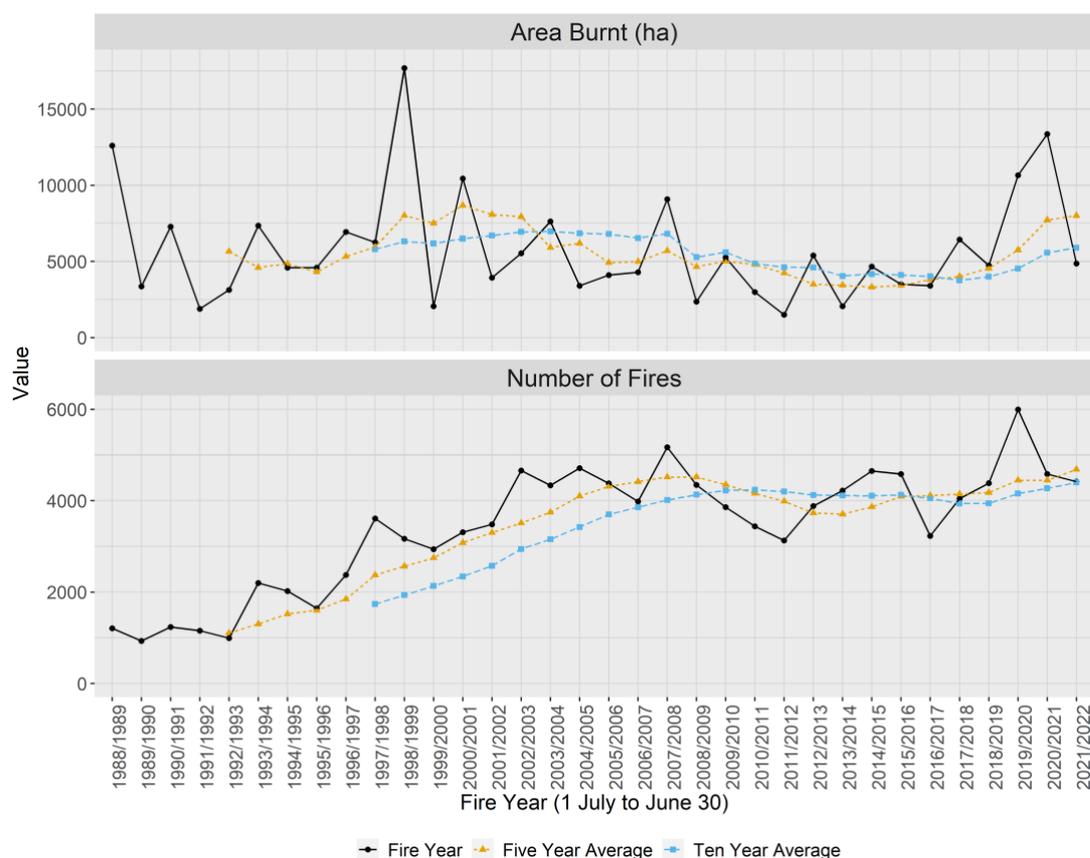
## National number of wildfires and area burnt

The 2019/2020 and 1998/1999 years remain the worst on record for number and area burnt, respectively (Figure 2).

At a national scale, the area burnt in 2021/2022 is below the 2020/2021 total, the 5-year average, the 10-year average, and the historical (1988-2022) average (Figure 2).

The total number of fires in 2021/2022 is below the 2020/2021 values and the 5-year average, but is above the 10-year average and historical (1988-2022) average.

- There were 4417 fires and 4864 ha burnt between 1st of July 2021 and 30th of June 2022. This is compared to 4580 fires and 13351 ha burnt during the 2020/2021 fire year.
- The most significant fires based on fire size during the 2021/2022 wildfire season include: Waiharara (Northland), Awarua (Southland), and Emerald Bluffs (Otago).
- The last 5-year average for total number of wildfires was 4683 and the average area burnt was 8005 ha.
- The last 10-year average for total number of wildfires was 4397 and the average area burnt was 5902 ha.
- The historical average (1988-2022) for total number of wildfires was 3419 and the average area burnt was 5802 ha.



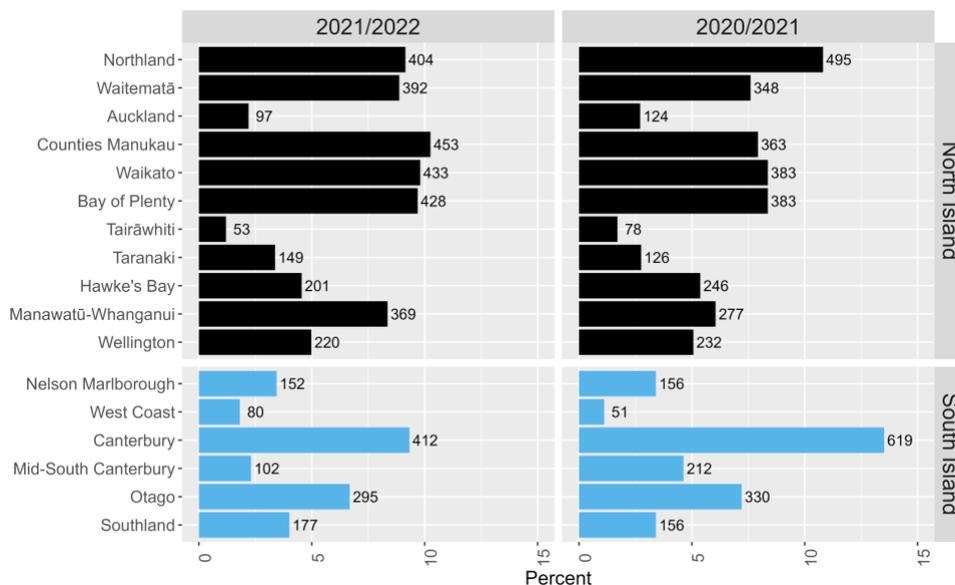
**Figure 2.** Area burnt (top) and total number of wildfires (bottom) for the last 34 years of wildfire records. Note: this dataset does not include vegetation fire non-responses or false alarms that required no action.

## Number of wildfires and area burnt by District and Island

District breakdowns for the total number of wildfires and area burnt are detailed in the Appendices<sup>3</sup>.

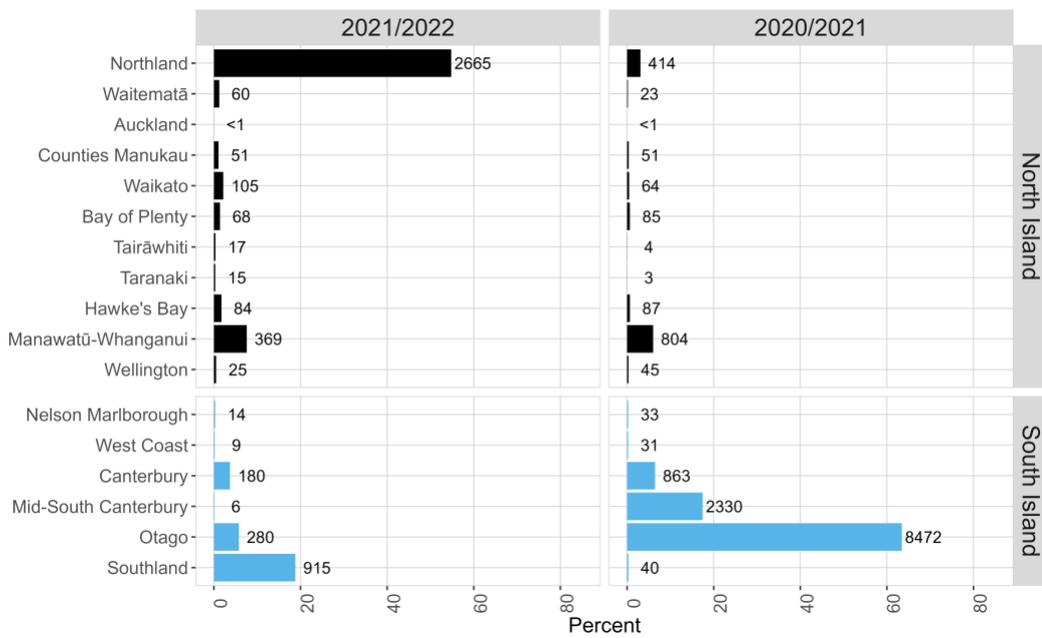
For the 2021/2022 year:

- The North Island accounted for most of the country's wildfires (72%) (Figure 3) and area burnt by wildfires (71%) (Figure 4). The number of wildfires is consistent and the area burnt is inconsistent with the patterns seen across the 29-year historical record (Figure 5).
- Counties Manukau had the highest number of wildfires in the North Island (453) and Canterbury had the highest number in the South Island (412) (Figure 3).
- Northland (2665 ha) and Southland (915 ha) districts experienced the greatest area burnt on the North and South Island, respectively (Figure 4).
- Districts that experienced an increase in both number of wildfires and area burnt compared to the previous year include: Southland, Taranaki, Waikato, Waitematā.
- Districts that experienced an increase in number of wildfires and a decrease in area burnt compared to the previous year include: Bay of Plenty, Manawatū-Whanganui, West Coast.
- Districts that experienced a decrease in number of wildfires and an increase in area burnt compared to the previous year include: Northland, Tairāwhiti.
- Districts that experienced a decrease in both number of wildfires and area burnt compared to the previous year include: Canterbury, Hawke's Bay, Mid-South Canterbury, Nelson Marlborough, Otago, Wellington.
- Districts that experienced a decrease in number of wildfires with no change in the area burnt compared to the previous year include: Auckland (A1).
- Districts that experienced an increase in number of wildfires with no change in the area burnt compared to the previous year include: Counties Manukau (A1).
- Eight experienced an increase and nine experienced a decrease in the total number of wildfires compared to the previous year (A1).
- Two districts experienced no change, six experienced an increase and nine experienced a decrease in area burnt compared to the previous year (A1).

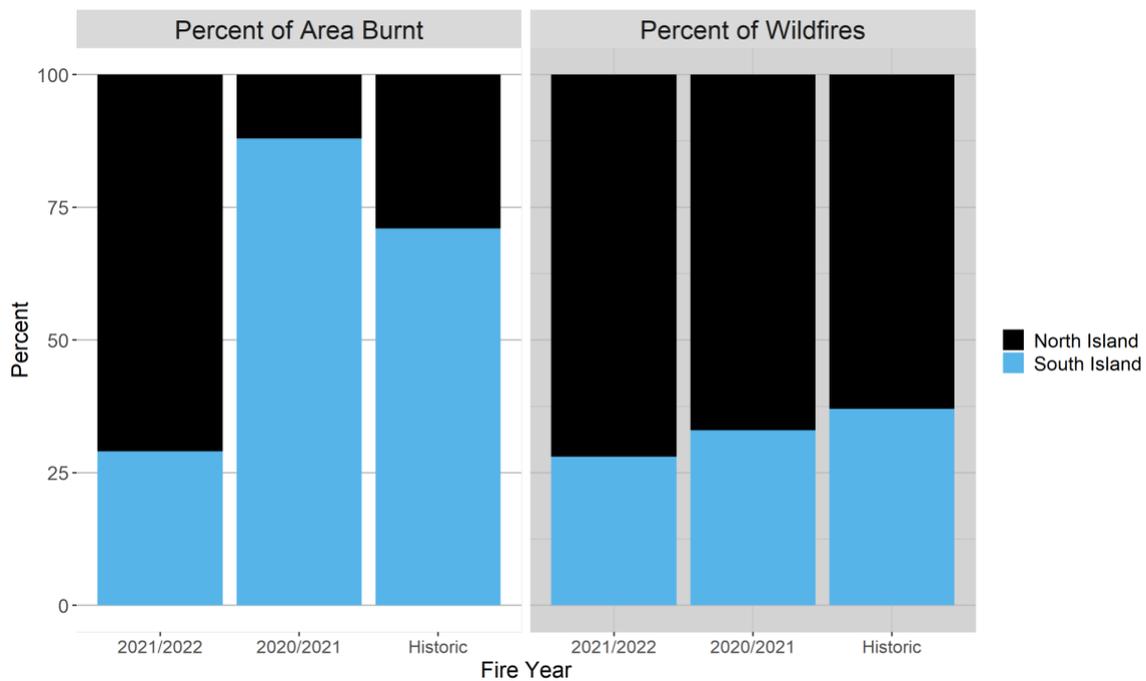


**Figure 3.** Percent of the number of wildfires by district for North Island (black bars) and South Island (blue bars). Data is presented for 2021/2022 (left) and 2020/2021 (right). The number of wildfires is noted to the right of the bar.

<sup>3</sup> Area burnt is considered to have increased/decreased when the change is +/- 1 ha. This buffer was added due to the quality of data.



**Figure 4.** Percent area burnt by district for North Island (black bars) and South Island (blue bars). Data is presented for 2021/2022(left) and 2020/2021 (right). The total area burnt (ha) is noted to the right of the bar.

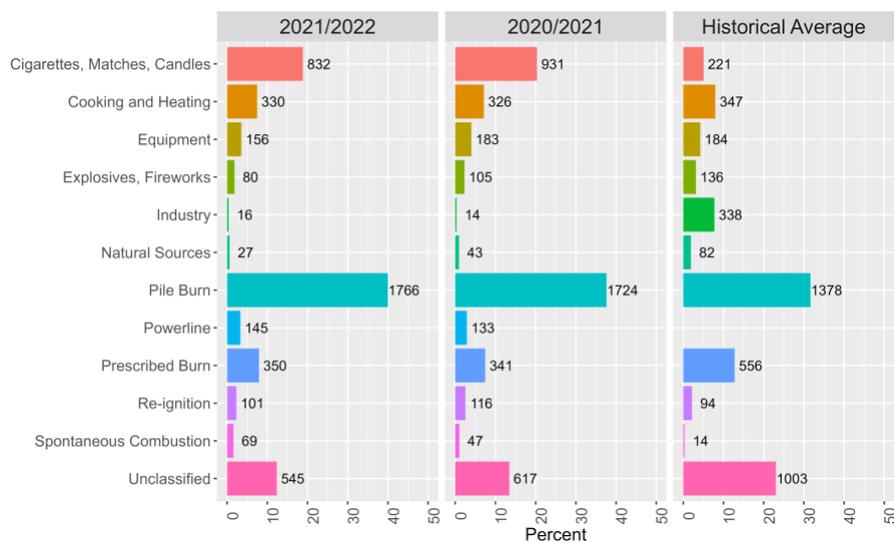


**Figure 5.** Overall percent of area burnt and percent of wildfires for North Island and South Island. Data is presented for the 2021/2022, 2020/2021, and 29-year historic record.

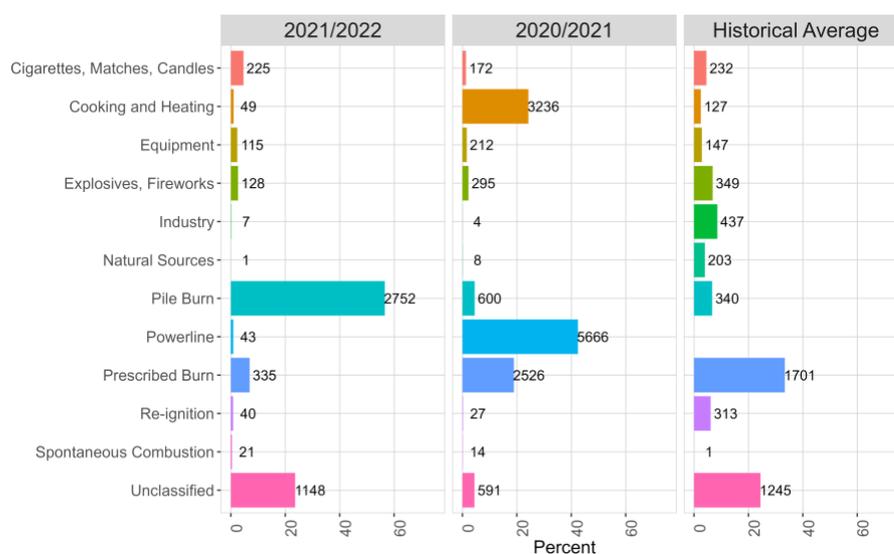
## Cause categories

There are 50 individual heat source categories used in the fire incident reporting database for the 2021/2022 annual wildfire analysis. These were merged and grouped into 12 broad cause categories to simplify illustration of the data (Appendix 2). Cause statistics by District are summarised in the Appendices.

- Pile Burn and Cigarettes, Matches, Candles were the top two causes of total wildfires in both 2021/2022 and 2020/2021 (Figure 6).
- For 2021/2022, the top two broad causes contributing to the total area burnt were Pile Burn and Unclassified, compared to Powerline and Cooking and Heating in 2020/2021 (Figure 7).



**Figure 6.** Percent of wildfires by cause for the 2021/2022(left), 2020/2021 (middle), and 34-year historical average (right). The total number of wildfires is noted to the right of the bar. Note that powerlines were included as a new category in 2020/2021.



**Figure 7.** Percent of area burnt by cause for the for the 2021/2022(left), 2020/2021 (middle), and 34-year historical average (right). The total area burnt (ha) is noted to the right of the bar. Note that powerlines were included as a new category in 2020/2021.

# Review of climate and weather for 2021/2022

Summaries for July 2021 through June 2022 are presented therefore two winter summaries are included in this report. The weather during the 2021/2022 season was largely driven by the prevailing weak La Niña conditions which saw moist east to north-easterly conditions prevail, bringing periodic wide-spread rain to large parts of the country but drought to parts of both Northland and Southland.

## Winter 2021

Winter 2021 was the warmest winter on record in Aotearoa New Zealand, surpassing winter 2020. Temperatures were above average (+0.51°C to +1.20°C of average) across most of New Zealand. Above normal rainfall (120-149% of normal) was observed in parts of Northland, southern Manawatū-Whanganui, Kāpiti Coast, Wellington City, and large swaths of the upper and western South Island. At the end of winter, soil moisture levels were near normal across most of New Zealand.

## Spring 2021

Extended periods of settled weather were interrupted by active weather and extreme events. Developing La Niña conditions resulted in a transition from a westerly air flow, near average temperatures and widespread wet weather during September to more northerly and north-easterly winds during October and November, bringing frequent warm and humid weather and contributing to what was the country's 5th-warmest October and warmest November on record. For spring as a whole, the nationwide average temperature was 13.1°C. Above normal rainfall (120-149% of normal) was observed in much of Northland, northern Auckland, Gisborne and northern Hawke's Bay, northern Tasman and interior Otago.

## Summer 2021/2022

Summer 2021/2022 was characterised by lower than normal mean sea level pressure to the north of the country, with above normal pressure over and to the south. Warm and humid winds from the sub-tropics resulted in widespread above average temperatures for all three summer months. Overall, the nationwide average temperature for summer 2021-22 was 17.8°C, making it the 5th-warmest summer on record. Summer rainfall was highly variable and featured extended dry spells alongside extreme rainfall events. Sixteen locations experienced their driest January on record. At the end of February, soil moisture levels for the time of year were above average in coastal Gisborne, parts of Hawke's Bay, the lower North Island, most of the upper South Island, and much of Canterbury.

## Autumn 2022

Autumn 2022 was the equal-2nd warmest autumn on record in Aotearoa New Zealand. The nationwide average temperature for autumn 2022 was 14.7°C. Coastal waters around New Zealand were also exceptionally warm, continuing a prolonged marine heatwave (MHW) event. Rainfall was more patchy across the season, with bursts of heavy rain events interspaced by long dry spells. In March, heavy rain hit parts of Northland, Auckland and Gisborne in a series of thunderstorms. At the end of May, drier than normal soils were prominent for Otago, eastern and inland Canterbury about and south of Christchurch, southern Wairarapa, northern Waikato, Auckland, and eastern and northern parts of Northland.

## Winter 2022

This was the warmest winter on record in Aotearoa New Zealand. The nationwide average temperature was 9.8°C which surpassed the previous winter record set just last year. Winter 2020 held the record prior to 2021 which means that New Zealand has now experienced three consecutive record-warm winters, each warmer than the year prior. Winter 2022 was also our wettest on record. Additionally, 18 locations experienced their wettest winter on record and a further 24 locations had a near-record wet winter. The overall wet season was the culmination of numerous extreme rainfall events affecting almost every part of the country. One of the most damaging events occurred from 16-20 August when an atmospheric river of moisture extending from the tropics led to State of Emergency declarations in Nelson, Tasman, the West Coast, and Marlborough. Nelson was affected by severe flooding as the Maitai River burst its banks at the end of winter, soil moisture levels were near normal for a majority of the country.

# Fuel moisture status and Fire Danger

Weather is the most powerful factor driving vegetation fire behaviour. Weather factors (temperature, relative humidity, windspeed and rainfall) directly affect vegetation fuel conditions and whether a fire will start and spread. Areas that experience below normal soil and fuel moisture dryness are at an increased risk of having a higher number of fires and larger area burnt. The Drought Code (DC) and Buildup Index (BUI) are useful indicators of seasonal drought effects and the amount of fuel available for combustion.

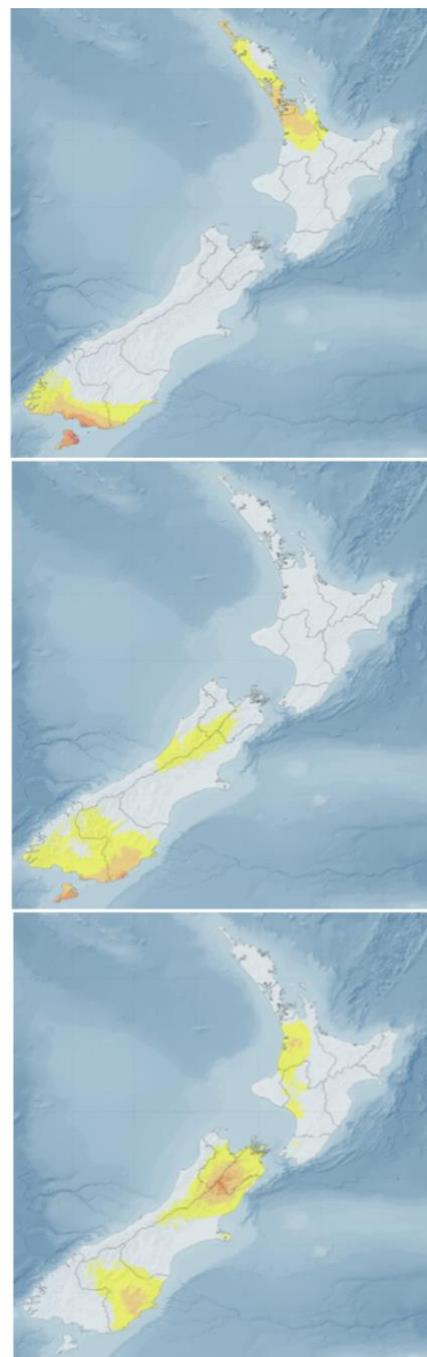
The higher the rating, the drier the subsurface, medium, and heavy fuels are, and therefore, the more difficult and extended fire control will be. District summaries on how dry conditions were during this fire season are highlighted in the Appendices.

Graphs are also available on the Scion website for those who are interested in comparing how individual weather stations are tracking for BUI and DC, as well as Cumulative Daily Severity Ratings (CDSR), over the current and previous fire season and against historical averages: <https://www.scionresearch.com/rural-fire-research/tools/trends>

## North Island

Across the North Island, average fuel moisture (BUI and DC) values were below or on trend with previous years. Peak drought (NZDI) conditions ranged from dry to extremely dry with the exception of Northland which experienced drought during 2021/2022.

- Compared to historic, 2021/2022 mean DC values tended to follow or be lower than historic mean values, with February being a consistent month with lower values (Appendices 6-16). When averaged over the year and compared to the 2020/2021 wildfire year, five districts were on trend, one district was marginally below trend ('below and on trend'), and four districts were below trend (Manawatū-Whanganui and Wellington) (Appendix 1).
- DC trends seen at individual weather stations on the North Island were similar. Compared to the historical data, some North Island stations tended to be below historical trend lines for DC, with minimum values departing in the beginning of February. Weather station DC values for Northland (Waitangi Forest Raws) and Bay of Plenty (Athol Raws) more closely tracked historic values (Figure 9).
- Mean BUI values tended to follow historic mean values except for higher values in January (and some stations in March) in most districts (Appendices 6-16). Three districts (Tairāwhiti, Hawke's Bay, Wellington) that did not have elevated summer values had slightly lower values in February and March compared to historic trends (Appendices 6-16). When averaged over the year and compared to 2020/2021 wildfire year, eight districts had BUI values on trend, Counties Manukau was slightly below trend and Wellington was marginally below trend ('below and on trend') (Appendix 1).
- Based on the NZDI, the highest category reached during 2021/2022 was drought in one district (Northland), extremely dry in four districts (Waitematā, Auckland, Counties Manukau and Waikato), very dry in two districts (Bay of Plenty and Tairāwhiti), and dry in four districts (Taranaki, Hawke's Bay, Manawatū-Whanganui and Wellington) (Figure 8, Appendix 1).

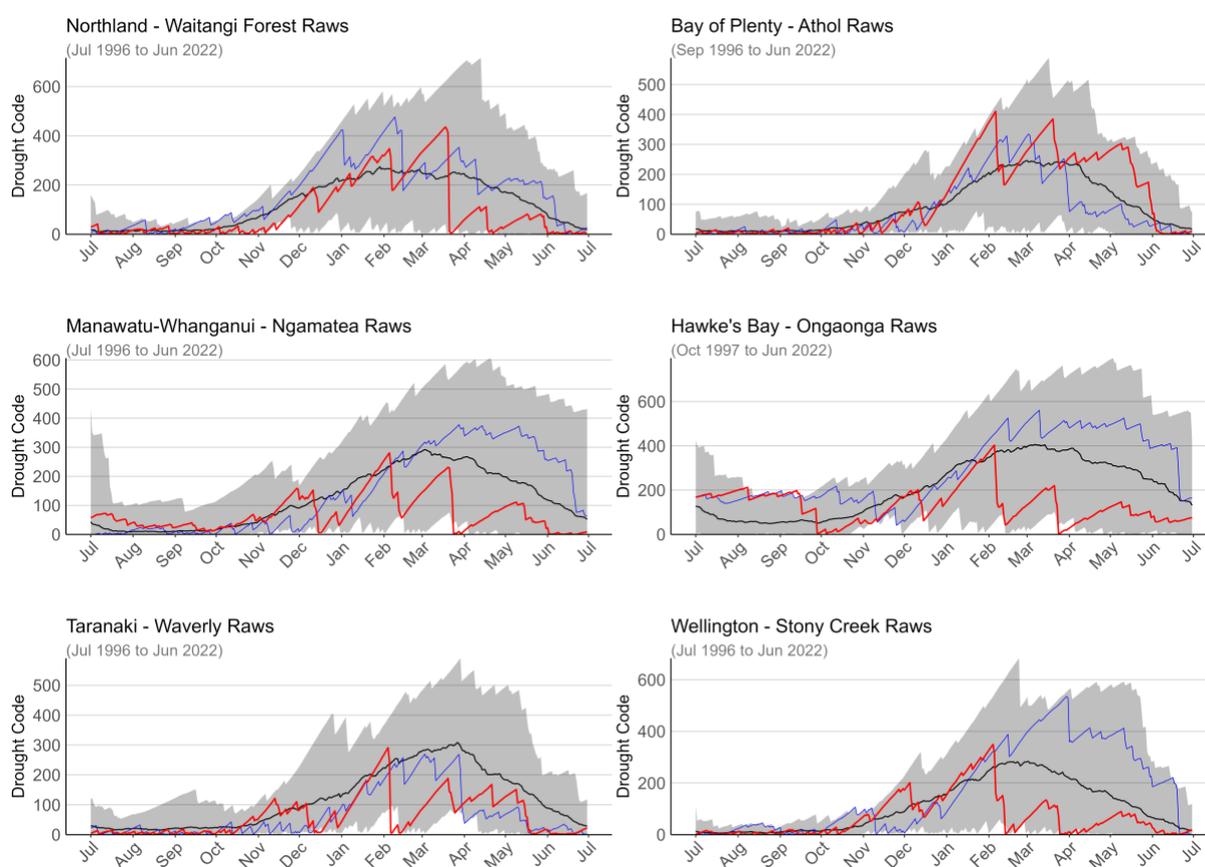


**Figure 8.** NIWA's New Zealand Drought Index (NZDI) maps, which highlights locations experiencing drought or dry conditions throughout the wildfire season (top image: 2022-03-22, middle: 2022-04-26, bottom: 2022-05-10). Red indicates severe drought conditions; orange indicates drought; light orange indicates very dry to extremely dry conditions; yellow indicates dry conditions.

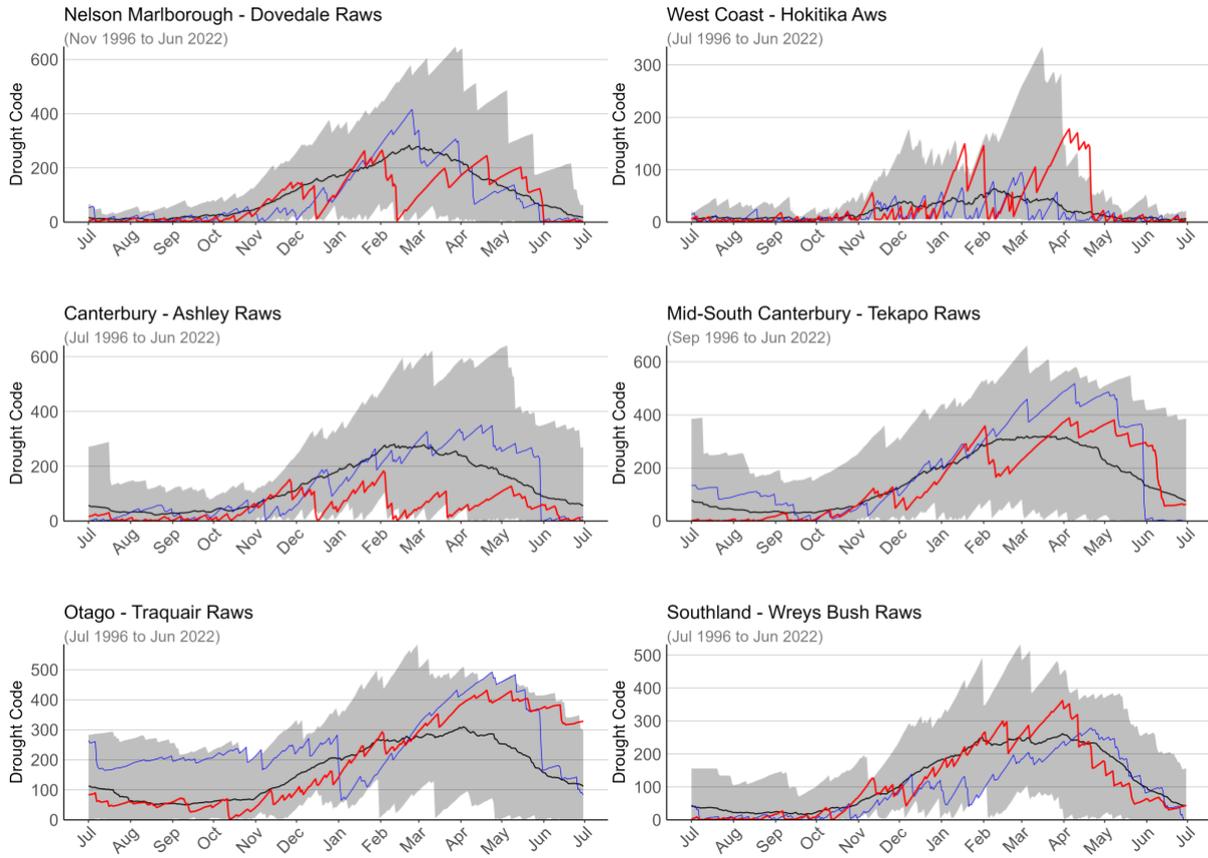
## South Island

Across the South Island, average fuel moisture (BUI and DC) values were usually below or on trend with previous years. Peak drought (NZDI) conditions ranged from dry to very dry with the exception of Southland which experienced drought to extreme drought during 2021/2022.

- Compared to historic, 2021/2022 mean DC values tended to be variable both with higher (West Coast, Otago, Southland) and lower (Nelson/Marlborough, Canterbury, Mid-South Canterbury) values tending to appear in January, February, and March (Appendices 17-22). When averaged over the year and compared to the 2020/2021 wildfire year, two districts were on trend (West Coast and Southland) and four districts were below trend (Nelson Marlborough, Canterbury, Mid-South Canterbury and Otago) (Appendix 1).
- DC trends seen at individual weather stations on the South Island during 2021/2022 were highly variable. Northern (Nelson Marlborough – Dovedale Raws) and West Coast (West Coast – Hokitika Aws) stations were highly variable with values on the West Coast exceeding previous DC values seen during the historic record (Figure 10).
- Mean BUI values tended to follow or be lower compared to historic mean values, especially in January and February (Appendices 17-22). When averaged over the year and compared to 2020/2021 wildfire year, one district had BUI values on trend (Southland), with one district slightly below (Otago) and four districts below trend (Nelson Marlborough, West Coast, Canterbury and Mid-South Canterbury) (Appendix 1).
- Based on the NZDI, the highest category reached during 2021/2022 was drought to extreme drought in Southland, with dry to very dry in one district (Otago), very dry in one district (Nelson Marlborough), dry in two districts (West Coast and Canterbury), while Mid-South Canterbury recorded no seasonal dryness (Figure 8, Appendix 1).



**Figure 9.** Daily Drought Code (DC) trends for a selection of stations across the North Island. 2021/2022 is represented by the red line, 2020/2021 is represented by the blue line, the historical average is represented by the black line and the grey shaded area represents the historical minimum/maximum values over the length of the entire weather station record as noted below the station name. Note the y-axis varies between stations.



**Figure 10.** Daily Drought Code (DC) trends for a selection of stations across the South Island. 2021/2022 is represented by the red line, 2020/2021 is represented by the blue line, the historical average is represented by the black line and the grey shaded area represents the historical minimum/maximum values over the length of the entire weather station record as noted below the station name. Note the y-axis varies between stations.

# Appendices

## Appendix 1 2021/2022 and 2020/2021 incident wildfire statistics and fire weather indices/codes.

District	Number	% (#)	Trend (#)	Top causes (#)	Ha	% (Ha)	Trend (Ha)	Top causes (Ha)	BUI	DC	CDSR	Drought (NZDI)
Northland	404	9	Decrease	Pile Burn	2,665	55	Increase	Pile Burn	On Trend	On Trend	Slightly Below	Drought
Waitematā	392	9	Increase	Pile Burn	60	1	Increase	Cooking and Heating	On Trend	On Trend	Slightly Above	Extremely Dry
Auckland	97	2	Decrease	Cigarettes, Matches, Candles	1	< 1	No change	Cigarettes, Matches, Candles	-	-	-	Extremely Dry
Counties Manukau	453	10	Increase	Pile Burn	51	1	No change	Pile Burn	Slightly Below	On Trend	Below	Extremely Dry
Waikato	433	10	Increase	Pile Burn	105	2	Increase	Equipment	On Trend	On Trend	On Trend	Extremely Dry
Bay of Plenty	428	10	Increase	Pile Burn	68	1	Decrease	Pile Burn	On Trend	Below	On Trend	Very Dry
Tairāwhiti	53	1	Decrease	Pile Burn	17	< 1	Increase	Cigarettes, Matches, Candles	On Trend	Below	Below and On Trend	Dry to Very Dry
Taranaki	149	3	Increase	Pile Burn	15	< 1	Increase	Cigarettes, Matches, Candles	On Trend	On Trend and Slightly Below	On Trend	Dry
Hawke's Bay	201	5	Decrease	Pile Burn	84	2	Decrease	Pile Burn	On Trend	On Trend	On Trend	Dry
Manawatū-Whanganui	369	8	Increase	Pile Burn	369	8	Decrease	Explosives, Fireworks	On Trend	Below	On Trend	Dry
Wellington	220	5	Decrease	Pile Burn	25	1	Decrease	Spontaneous Combustion	Below and On Trend	Below	Below	Dry

District	Number	% (#)	Trend (#)	Top causes (#)	Ha	% (Ha)	Trend (Ha)	Top causes (Ha)	BUI	DC	CDSR	Drought (NZDI)
Nelson Marlborough	152	3	Decrease	Pile Burn	14	< 1	Decrease	Equipment	Below	Below	Below	Very Dry
West Coast	80	2	Increase	Cigarettes, Matches, Candles	9	< 1	Decrease	Prescribed Burn	Below	On Trend	On Trend	Dry
Canterbury	412	9	Decrease	Pile Burn	180	4	Decrease	Pile Burn	Below	Below	Below	Dry
Mid-South Canterbury	102	2	Decrease	Pile Burn	6	< 1	Decrease	Prescribed Burn	Below	Below	Below	-
Otago	295	7	Decrease	Pile Burn	280	6	Decrease	Unclassified	Below and Slightly Below	Below	Below	Dry to Very Dry
Southland	177	4	Increase	Pile Burn	915	19	Increase	Unclassified	On Trend	On Trend	On Trend	Drought to Extreme Drought

BUI, DC and CDSR comparisons are based on current year percentage of deviation compared to the deviation of the previous year average. 'Well above'  $\geq 95\%$ , 'above' is between 35% and 95%, 'slightly above' between 15% and 35%, 'on trend' between 15% and -15%, 'slightly below' between -15% and -35%, 'below' between -35% and -95%, 'well below'  $< -95\%$ . Comparisons were done per day and month, to identify the most frequent result per month and subsequently the most common result among the 12 months. More than one result is displayed in the table when more than one result had the same frequency.

The change in FENZ districts has resulted in only one station representing the Auckland district (Auckland MOTAT Ews) from NIWA data. This station was setup in February 2022, therefore there is only data from Feb to June 2023).

**Appendix 2 Broad wildfire cause categories and the underlying individual heat source categories used for analysis of the 2021/2022 and 2020/2021 incident statistics.**

<b>Cause Group</b>	<b>HeatSource</b>
Cigarettes, Matches, Candles	Cigarette, Cigar or Smoking materials
	Cigarettes, matches and candles – Other
	Lighters
	Matchers or Lighters(Suspicious)
Cooking and Heating	BBQ
	Embers, Ashes
	Outside fire for cooking
	Outside fire for warmth / Campfire
	Umu / Hangi
Equipment	Chainsaws
	Exhaust heat / Spark
	Farm machinery
	Malfunction
	Motorbike, Truck or Car
	Mowers and slashers
	Welding, grinding, cutting
Explosives, Fireworks	Fireworks / Pyrotechnics
	Flare: Warning, Safety, Boat
	Incendiary devices, Molotov cocktail
	Sky / Chinese lanterns
	Tracer ammunition
Industry	Bee-Keeping smoking tool
	Earthwork or forestry machinery
	Electrical Fence
	Maintenance crews
	Oil and gas exploration
Natural Sources	Animals
	Geothermal Activity
	Lightning discharge
	Solar heat: Sun (magnified through glass etc)
Pile Burn	Debris burning
	Outside bonfire
	Refuse burning
	Windrow / slash pile
Powerline	Clashing / Arching power lines
	Static electrical discharge
Prescribed Burn	Trees
	Agricultural fire or burn off
	Broadcast slash burn
	Crop burn
	Deliberate – scrub and tussock
Re-ignition	Scrub and tussock burn
	Re-ignition, Rekindle from previous fire
Spontaneous Combustion	Bark or sawdust spontaneous ignition

Cause Group	HeatSource
Unclassified	Hay/silage spontaneous ignition
	Skid site spontaneous ignition
	Spontaneous ignition
	Exposure Fire – unable to classify
	Information not recorded/Unknown
	Outside fire – unable to classify

### Appendix 3 Average Monthly Fire Season Severity Ratings (MSR) for the 2021/2022 and 2020/2021 wildfire season (October through April).

Monthly Severity Rating (MSR) is the monthly average of the Daily Severity Rating (DSR) values from the Fire Weather Index System. DSR is a function of the FWI value, developed for use in comparing different years and weather stations. DSR and MSR capture the effects of both wind and fuel dryness on potential fire intensity, and therefore control difficulty and the amount of work required to suppress a fire. It allows the comparison of fire weather severity between years.

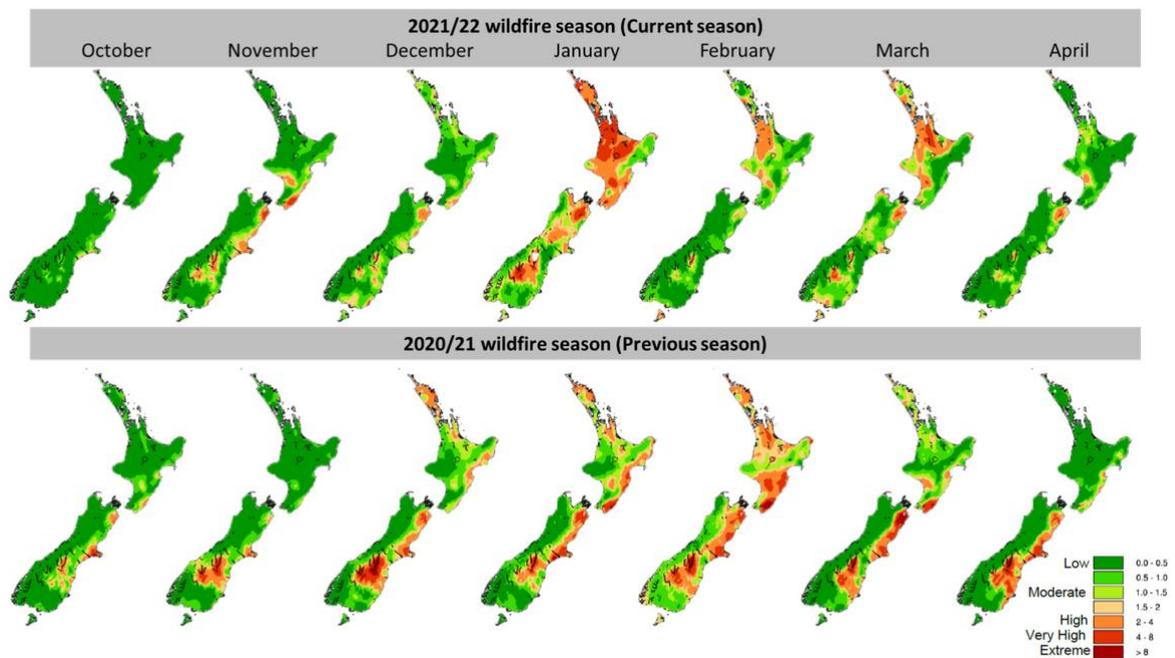


Figure A3. Monthly Severity Rating (MSR) across the country for 2021/2022 (top) and 2020/2021 (bottom).

## Appendix 4 Average Monthly Drought Code (DC) values for the 2021/2022 and 2020/2021 wildfire seasons (October through April).

The DC is a rating of the average moisture content of deep, compact, organic soil layers. It is a useful indicator of the dryness of large woody material, seasonal drought effects on forest fuels and the amount of smouldering in deep duff layers and large logs. Little mop-up needs to happen with low values (white), whereas mop-up will be difficult and extensive with values over 300 points (dark brown colouration).

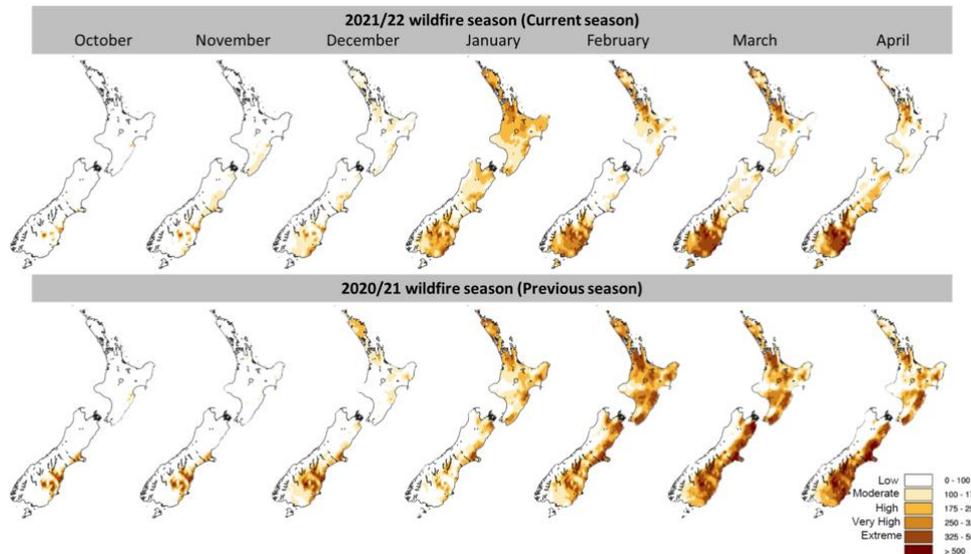


Figure A4. Monthly Drought Code (DC) across the country for 2021/2022 (top) and 2020/2021 (bottom).

## Appendix 5 District Appendices

The following appendices contain district specific summaries. For each district, information is provided on:

1. Number of wildfires and area burnt (ha) by district and by broad cause categories,
2. Drought Code (DC) values (maximum and mean),
3. Buildup Index (BUI) values (maximum and mean), and
4. New Zealand Drought Index (NZDI).

To view individual fuel moisture station trends, visit: <https://www.scionresearch.com/rural-fire-research/tools/trends>

- The Drought Code (DC) is presented as a rating of the average moisture content of deep, compact, organic soil layers. A colour scale is used as a visual indicator of high (red, orange, and yellow) and low (blue) DC values (A5.1).
- The Buildup Index (BUI) combines the Duff Moisture Code (DMC) and Drought Code (DC) to represent the total amount of fuel available for combustion. A colour scale is used as a visual indicator of high (red, orange, and yellow) and low (blue) BUI values (A5.1).
- The number of weather stations and years of station record for Buildup Index and Drought Code data varies by district. A true comparison between historic and current cannot be made because information presented is based on all available data at the time of the report. Over the length of the record stations are both added and discontinued.

Table A5.1 Colour scale used as a visual indicator of high and low DC and BUI values.

DC	Mop-up Needs	BUI	Level of difficulty for controlling a fire	Fire Danger
0-100	Little mop-up needs	0-15	Easy Control	Low
101-175	Moderate	16-30	Not Difficult	Moderate
176-250	Difficult	31-45	Difficult	High
251-300	Difficult & Extended	46-59	Very Difficult	Very High
301+	Extreme & Extensive	60+	Extremely Difficult	Extreme

## Appendix 6 Northland.

### Wildfire Statistics

- During the 2021/2022 wildfire season, Northland accounted for 9% of the total number of wildfires in the country and 55% of the area burnt (Figure 3 & 4, Appendix 1, Table A6.1).
- There has been a Decrease in the number of wildfires and a Increase in the total area burnt during 2021/2022 compared to 2020/2021.
- The dominant cause of wildfires was Pile Burn.
- The primary cause that contributed to the total area burnt was Pile Burn.

### Fuel Moisture Status

- In general, in 2021/2022 Drought Code (DC) mean values typically followed the historical trend, except that they peaked early in January 2022, dropping by April (Table A6.2). No new maximum values were observed.
- Mean Buildup Index (BUI) values typically followed the historical trend but were above the historical average in January 2022 when values peaked, with a quick drop in February 2022 before climbing above average again in March (Table A6.3). No new maximum values were observed.

**Table A6.1** Number of wildfires and area burnt (ha) in Northland by broad cause categories.

Value	Fire Year	Cigarettes, Matches, Candles	Cooking and Heating	Equipment	Explosives, Fireworks	Industry	Natural Sources	Pile Burn	Powerline	Prescribed Burn	Re-ignition	Spontaneous Combustion	Unclassified	Total
Number of Wildfires	2021/2022	56	12	11	6	2	6	197	17	45	6	1	45	404
	2020/2021	73	29	18	7	0	1	239	14	41	12	2	59	495
Area Burnt (ha)	2021/2022	143	0	5	0	0	0	2,402	1	108	2	0	3	2,664
	2020/2021	75	13	10	0	0	0	286	3	7	5	10	4	413

**Table A6.2** Drought Code (DC) values (maximum and mean) for 2021/2022, 2020/2021 and the historical average, based on values averaged across all Northland District weather stations. The colour scale is a visual indicator of high (red, orange, and yellow) and low (blue) DC values. The historical trend has a length of coverage of 25 years.

Statistic	Period	Stations	July	August	September	October	November	December	January	February	March	April	May	June
Max	2021/2022	19	102	43	36	44	139	264	477	514	567	496	347	246
	2020/2021	16	74	58	74	130	192	416	504	549	566	580	367	243
	Historic	16	320	335	355	400	511	617	630	718	798	791	708	484
Mean	2021/2022	19	14	10	7	13	47	135	292	240	255	136	103	35
	2020/2021	16	10	10	31	59	74	221	291	327	282	192	149	40
	Historic	16	17	14	20	43	95	170	241	284	272	227	150	55

**Table A6.3** Buildup Index (BUI) values (maximum and mean) for 2021/2022, 2020/2021 and the historical average, based on values averaged across all Northland District weather stations. The colour scale is a visual indicator of high (red, orange, and yellow) and low (blue) BUI values. The historical trend has a length of coverage of 25 years.

Statistic	Period	Stations	July	August	September	October	November	December	January	February	March	April	May	June
Max	2021/2022	19	30	22	11	15	44	73	133	100	107	48	25	13
	2020/2021	16	8	16	30	42	43	119	122	124	101	54	34	22
	Historic	16	24	32	59	75	95	140	167	213	223	147	132	38
Mean	2021/2022	19	3	3	2	4	11	25	58	28	40	17	8	2
	2020/2021	16	2	2	9	14	15	45	42	47	33	11	8	2
	Historic	16	2	3	6	11	20	30	42	45	32	19	8	3

## Appendix 7 Waitematā

### Wildfire Statistics

- During the 2021/2022 wildfire season, Waitematā accounted for 9% of the total number of wildfires in the country and 1% of the area burnt (Figure 3 & 4, Appendix 1, Table A7.1).
- There has been a Increase in the number of wildfires and a Increase in the total area burnt during 2021/2022 compared to 2020/2021.
- The dominant cause of wildfires was Pile Burn.
- The primary cause that contributed to the total area burnt was Cooking and Heating.

### Fuel Moisture Status

- In general, 2021/2022 Drought Code (DC) mean values typically followed the historical trend, except that they peaked early in January 2022, dropping by April (Table A7.2). No new maximum values were observed.
- Mean Buildup Index (BUI) values typically followed the historical trend except for in January when they were high (Table A7.3). No new maximum values were observed.

**Table A7.1** Number of wildfires and area burnt (ha) in Waitematā by broad cause categories.

Value	Fire Year	Cigarettes, Matches, Candles	Cooking and Heating	Equipment	Explosives, Fireworks	Industry	Natural Sources	Pile Burn	Powerline	Prescribed Burn	Re-ignition	Spontaneous Combustion	Unclassified	Total
Number of Wildfires	2021/2022	77	23	12	15	2	1	156	25	24	2	3	52	392
	2020/2021	66	19	14	11	1	2	139	9	28	5	1	53	348
Area Burnt (ha)	2021/2022	1	29	4	0	0	0	15	1	9	0	0	2	61
	2020/2021	0	1	9	0	0	0	6	0	1	0	0	6	23

**Table A7.2** Drought Code (DC) values (maximum and mean) for 2021/2022, 2020/2021 and the historical average, based on values averaged across all Waitematā District weather stations. The colour scale is a visual indicator of high (red, orange, and yellow) and low (blue) DC values. The historical trend has a length of coverage of 25 years.

Statistic	Period	Stations	July	August	September	October	November	December	January	February	March	April	May	June
Max	2021/2022	6	198	49	20	44	127	219	420	458	464	275	252	199
	2020/2021	4	21	32	48	146	167	341	414	478	436	340	311	297
	Historic	4	555	601	550	307	310	410	599	648	720	688	655	707
Mean	2021/2022	6	41	15	7	12	51	111	266	222	239	143	153	40
	2020/2021	4	6	8	15	52	70	168	268	330	276	251	165	91
	Historic	4	23	22	21	35	79	135	204	261	256	214	116	41

**Table A7.3** Buildup Index (BUI) values (maximum and mean) for 2021/2022, 2020/2021 and the historical average, based on values averaged across all Waitematā District weather stations. The colour scale is a visual indicator of high (red, orange, and yellow) and low (blue) BUI values. The historical trend has a length of coverage of 25 years.

Statistic	Period	Stations	July	August	September	October	November	December	January	February	March	April	May	June
Max	2021/2022	6	12	15	11	9	37	56	108	121	94	43	35	5
	2020/2021	4	6	9	12	32	31	56	62	79	59	43	18	7
	Historic	4	44	62	61	51	92	112	114	155	137	157	180	154
Mean	2021/2022	6	2	3	3	3	13	23	72	41	43	16	14	1
	2020/2021	4	1	2	5	14	14	29	32	42	26	10	7	2
	Historic	4	3	3	5	9	15	22	31	37	30	16	7	4

## Appendix 8 Auckland.

### Wildfire Statistics

- During the 2021/2022 wildfire season, Auckland accounted for 2% of the total number of wildfires in the country and < 1% of the area burnt (Figure 3 & 4, Appendix 1, Table A8.1)
- There has been a Decrease in the number of wildfires and a No change in the total area burnt during 2021/2022 compared to 2020/2021.
- The dominant cause of wildfires was Cigarettes, Matches, Candles.
- The primary cause that contributed to the total area burnt was Cigarettes, Matches, Candles.

### Fuel Moisture Status

- There is only one weather station included in NIWA's Fire Weather System representing the current Auckland District. This station was setup in February 2022; therefore, we currently have limited data available. Drought Code (DC) mean values were generally low between February to June (Table A8.2).
- Mean Buildup Index (BUI) mean values were high February through May, with June having moderate BUI values.

**Table A8.1** Number of wildfires and area burnt (ha) in Auckland by broad cause categories.

Value	Fire Year	Cigarettes, Matches, Candles	Cooking and Heating	Equipment	Explosives, Fireworks	Industry	Natural Sources	Pile Burn	Powerline	Prescribed Burn	Re-ignition	Spontaneous Combustion	Unclassified	Total
Number of Wildfires	2021/2022	63	1	3	3	1	0	7	1	2	0	7	9	97
	2020/2021	69	7	3	8	0	2	13	2	2	0	1	17	124
Area Burnt (ha)	2021/2022	0	0	0	0	0	0	0	0	0	0	0	0	0
	2020/2021	0	0	0	0	0	0	0	0	0	0	0	0	0

**Table A8.2** Drought Code (DC) values (maximum and mean) for 2021/2022, 2020/2021 and the historical average, based on values averaged across all Auckland District weather stations. The colour scale is a visual indicator of high (red, orange, and yellow) and low (blue) DC values. It was not possible to identify the historical trend due to the very short period of available data.

Metric	Statistic	Period	Stations	February	March	April	May	June
DC	Max	2021/2022	1	139	247	156	208	138
	Mean	2021/2022	1	96	144	123	187	36

**Table A8.3** Buildup Index (BUI) values (maximum and mean) for 2021/2022, 2020/2021 and the historical average, based on values averaged across all Auckland District weather stations. The colour scale is a visual indicator of high (red, orange, and yellow) and low (blue) BUI values. The historical trend has a length of coverage of NA years.

Metric	Statistic	Period	Stations	February	March	April	May	June
BUI	Max	2021/2022	1	41	81	41	33	4
	Mean	2021/2022	1	30	44	26	21	2

## Appendix 9 Counties Manukau

### Wildfire Statistics

- During the 2021/2022 wildfire season, Counties Manukau accounted for 10% of the total number of wildfires in the country and 1% of the area burnt (Figure 3 & 4, Appendix 1, Table A9.1).
- There has been a Increase in the number of wildfires and a No change in the total area burnt during 2021/2022 compared to 2020/2021.
- The dominant cause of wildfires was Pile Burn.
- The primary cause that contributed to the total area burnt was Pile Burn.

### Fuel Moisture Status

- In general, in 2021/2022 Drought Code (DC) mean values typically followed the historical trend, except that they were a bit higher in January (Table A9.2). No new maximum values were observed.
- Mean Buildup Index (BUI) values typically followed the historical trend but were above the historical average in January 2022 when values peaked, with a drop in February 2022 before climbing above average again in March (Table A9.3). No new maximum values were observed.

**Table A9.1** Number of wildfires and area burnt (ha) in Counties Manukau by broad cause categories.

Value	Fire Year	Cigarettes, Matches, Candles	Cooking and Heating	Equipment	Explosives, Fireworks	Industry	Natural Sources	Pile Burn	Powerline	Prescribed Burn	Re-ignition	Spontaneous Combustion	Unclassified	Total
Number of Wildfires	2021/2022	136	23	10	7	0	0	175	18	24	11	6	43	453
	2020/2021	116	19	7	17	0	1	115	10	25	3	3	47	363
Area Burnt (ha)	2021/2022	0	0	1	0	0	0	34	0	12	1	2	1	51
	2020/2021	0	9	1	0	0	0	37	1	2	0	0	1	51

**Table A9.2** Drought Code (DC) values (maximum and mean) for 2021/2022, 2020/2021 and the historical average, based on values averaged across all Counties Manukau District weather stations. The colour scale is a visual indicator of high (red, orange, and yellow) and low (blue) DC values. The historical trend has a length of coverage of 25 years.

Statistic	Period	Stations	July	August	September	October	November	December	January	February	March	April	May	June
Max	2021/2022	5	26	25	22	30	110	200	402	440	496	397	406	168
	2020/2021	4	23	36	62	113	162	288	386	458	438	377	275	149
	Historic	4	524	540	181	179	257	367	565	752	796	812	773	523
Mean	2021/2022	5	8	10	8	12	42	121	285	234	278	229	239	34
	2020/2021	4	8	11	29	51	77	178	271	345	304	225	138	42
	Historic	4	29	18	19	35	84	142	221	288	276	234	142	65

**Table A9.3** Buildup Index (BUI) values (maximum and mean) for 2021/2022, 2020/2021 and the historical average, based on values averaged across all Counties Manukau District weather stations. The colour scale is a visual indicator of high (red, orange, and yellow) and low (blue) BUI values. The historical trend has a length of coverage of 25 years.

Statistic	Period	Stations	July	August	September	October	November	December	January	February	March	April	May	June
Max	2021/2022	5	7	8	9	11	29	51	118	120	100	51	45	5
	2020/2021	4	7	10	18	31	39	65	69	93	61	32	19	6
	Historic	4	40	32	33	41	61	90	137	198	168	146	72	80
Mean	2021/2022	5	2	3	3	5	11	26	73	40	53	28	19	1
	2020/2021	4	2	3	8	15	16	34	37	47	29	11	8	2
	Historic	4	3	3	6	10	18	24	36	44	35	21	9	4

## Appendix 10 Waikato.

### Wildfire Statistics

- During the 2021/2022 wildfire season, Waikato accounted for 10% of the total number of wildfires in the country and 2% of the area burnt (Figure 3 & 4, Appendix 1, Table A10.1).
- There has been a Increase in the number of wildfires and a Increase in the total area burnt during 2021/2022 compared to 2020/2021.
- The dominant cause of wildfires was Pile Burn.
- The primary cause that contributed to the total area burnt was Equipment.

### Fuel Moisture Status

- In general, in 2021/2022 Drought Code (DC) mean values typically followed the historical trend, except that they peaked early in January 2022, and then were lower in February and March compared to historic trends (Table A10.2). No new maximum values were observed.
- Mean Buildup Index (BUI) values typically followed the historical trend but were above the historical average in January 2022 when values peaked, with a drop in February 2022 before climbing above average again in March (Table A10.3). No new maximum values were observed.

**Table A10.1** Number of wildfires and area burnt (ha) in Waikato by broad cause categories.

Value	Fire Year	Cigarettes, Matches, Candles	Cooking and Heating	Equipment	Explosives, Fireworks	Industry	Natural Sources	Pile Burn	Powerline	Prescribed Burn	Re-ignition	Spontaneous Combustion	Unclassified	Total
Number of Wildfires	2021/2022	57	21	15	6	2	3	195	15	41	8	10	60	433
	2020/2021	68	18	12	9	2	8	154	11	33	10	2	56	383
Area Burnt (ha)	2021/2022	2	0	41	0	6	0	35	0	3	12	1	4	104
	2020/2021	5	0	2	1	0	5	23	2	11	1	0	14	64

**Table A10.2** Drought Code (DC) values (maximum and mean) for 2021/2022, 2020/2021 and the historical average, based on values averaged across all Waikato District weather stations. The colour scale is a visual indicator of high (red, orange, and yellow) and low (blue) DC values. The historical trend has a length of coverage of 25 years.

Statistic	Period	Stations	July	August	September	October	November	December	January	February	March	April	May	June
Max	2021/2022	20	123	45	27	103	281	283	482	527	604	543	518	227
	2020/2021	15	142	61	85	209	228	343	437	516	491	474	488	374
	Historic	16	347	141	151	259	319	359	579	747	809	812	667	421
Mean	2021/2022	20	18	9	7	17	62	121	282	197	241	223	185	24
	2020/2021	15	12	10	23	52	67	128	216	296	254	192	148	63
	Historic	16	14	10	15	33	66	113	186	268	264	199	126	45

**Table A10.3** Buildup Index (BUI) values (maximum and mean) for 2021/2022, 2020/2021 and the historical average, based on values averaged across all Waikato District weather stations. The colour scale is a visual indicator of high (red, orange, and yellow) and low (blue) BUI values. The historical trend has a length of coverage of 25 years.

Statistic	Period	Stations	July	August	September	October	November	December	January	February	March	April	May	June
Max	2021/2022	20	10	9	10	26	76	56	133	128	120	92	70	5
	2020/2021	15	12	13	27	65	63	65	68	87	75	31	27	8
	Historic	16	26	43	48	67	87	91	139	203	169	153	155	58
Mean	2021/2022	20	2	2	3	5	14	19	65	34	49	28	16	1
	2020/2021	15	2	3	7	13	12	24	28	42	25	9	7	2
	Historic	16	2	2	5	9	14	20	31	47	32	15	8	2

## Appendix 11 Bay of Plenty.

### Wildfire Statistics

- During the 2021/2022 wildfire season, Bay of Plenty accounted for 10% of the total number of wildfires in the country and 1% of the area burnt (Figure 3 & 4, A1, Table A11.1).
- There has been a Increase in the number of wildfires and a Decrease in the total area burnt during 2021/2022 compared to 2020/2021.
- The dominant cause of wildfires was Pile Burn.
- The primary cause that contributed to the total area burnt was Pile Burn.

### Fuel Moisture Status

- In 2021/2022 Drought Code (DC) mean values typically followed the historical trend, except that after January values were lower than historic mean values (Table A11.2). A new maximum DC value of 299 was observed in November 2022 compared to the historic maximum of 259.
- Mean Buildup Index (BUI) values typically followed the historical trend but were above the historical average in January 2022 when values peaked (Table A11.3). January also had a new maximum BUI value of 142 compared to the historic maximum of 133. May and June also observed new maximum BUI values, with 83 and 88 respectively compared to historic maximums of 81 and 70.

**Table A11.1** Number of wildfires and area burnt (ha) in Bay of Plenty by broad cause categories.

Value	Fire Year	Cigarettes, Matches, Candles	Cooking and Heating	Equipment	Explosives, Fireworks	Industry	Natural Sources	Pile Burn	Powerline	Prescribed Burn	Re-ignition	Spontaneous Combustion	Unclassified	Total
Number of Wildfires	2021/2022	85	28	21	6	1	6	143	10	38	2	9	79	428
	2020/2021	70	23	8	12	1	4	143	4	38	5	8	67	383
Area Burnt (ha)	2021/2022	23	0	7	0	0	0	30	1	4	1	0	3	69
	2020/2021	7	38	0	1	0	0	23	0	5	1	2	8	85

**Table A11.2** Drought Code (DC) values (maximum and mean) for 2021/2022, 2020/2021 and the historical average, based on values averaged across all Bay of Plenty District weather stations. The colour scale is a visual indicator of high (red, orange, and yellow) and low (blue) DC values. The historical trend has a length of coverage of 25 years.

Statistic	Period	Stations	July	August	September	October	November	December	January	February	March	April	May	June
Max	2021/2022	29	113	65	54	131	299	373	486	510	495	278	303	327
	2020/2021	28	131	42	74	155	248	476	523	532	470	458	532	538
	Historic	29	412	168	165	207	259	476	573	734	758	762	644	538
Mean	2021/2022	29	15	11	8	19	77	116	245	184	171	102	103	26
	2020/2021	28	9	10	25	52	56	120	205	290	282	216	157	61
	Historic	29	13	11	16	35	74	127	190	254	240	194	117	44

**Table A11.3** Buildup Index (BUI) values (maximum and mean) for 2021/2022, 2020/2021 and the historical average, based on values averaged across all Bay of Plenty District weather stations. The colour scale is a visual indicator of high (red, orange, and yellow) and low (blue) BUI values. The historical trend has a length of coverage of 25 years.

Statistic	Period	Stations	July	August	September	October	November	December	January	February	March	April	May	June
Max	2021/2022	29	10	19	18	42	74	84	142	130	93	56	83	88
	2020/2021	28	8	12	24	31	45	108	120	96	83	55	67	70
	Historic	29	23	26	45	60	77	108	133	162	157	189	81	70
Mean	2021/2022	29	2	3	3	6	16	19	60	29	34	16	14	5
	2020/2021	28	2	3	8	11	10	27	30	45	26	11	10	3
	Historic	29	2	3	5	9	16	22	33	44	30	17	8	3

## Appendix 12 Tairāwhiti.

### Wildfire Statistics

- During the 2021/2022 wildfire season, Tairāwhiti accounted for 1% of the total number of wildfires in the country and < 1% of the area burnt (Figure 3 & 4, A1, Table A12.1).
- There has been a Decrease in the number of wildfires and a Increase in the total area burnt during 2021/2022 compared to 2020/2021.
- The dominant cause of wildfires was Pile Burn.
- The primary cause that contributed to the total area burnt was Cigarettes, Matches, Candles.

### Fuel Moisture Status

- In general, in 2021/2022 Drought Code (DC) mean values typically were slightly lower than the historical trend (Table A12.2). No new maximum values were observed.
- Mean Buildup Index (BUI) values typically followed the historical trend or were slightly lower (Table A12.3). No new maximum values were observed.

**Table A12.1** Number of wildfires and area burnt (ha) in Tairāwhiti by broad cause categories.

Value	Fire Year	Cigarettes, Matches, Candles	Cooking and Heating	Equipment	Explosives, Fireworks	Industry	Natural Sources	Pile Burn	Powerline	Prescribed Burn	Re-ignition	Spontaneous Combustion	Unclassified	Total
Number of Wildfires	2021/2022	9	6	1	2	0	1	17	0	4	1	0	12	53
	2020/2021	9	8	2	0	0	2	17	3	6	1	4	26	78
Area Burnt (ha)	2021/2022	12	0	0	0	0	0	5	0	0	0	0	0	17
	2020/2021	1	1	0	0	0	0	0	0	0	0	0	1	3

**Table A12.2** Drought Code (DC) values (maximum and mean) for 2021/2022, 2020/2021 and the historical average, based on values averaged across all Tairāwhiti District weather stations. The colour scale is a visual indicator of high (red, orange, and yellow) and low (blue) DC values. The historical trend has a length of coverage of 25 years.

Statistic	Period	Stations	July	August	September	October	November	December	January	February	March	April	May	June
Max	2021/2022	10	40	55	50	91	190	314	485	527	419	139	163	130
	2020/2021	10	42	43	80	133	182	343	534	565	470	494	330	142
	Historic	10	357	363	407	213	385	610	866	910	769	831	695	614
Mean	2021/2022	10	10	15	11	30	56	113	225	131	137	35	60	20
	2020/2021	10	7	13	25	64	70	141	280	328	249	250	139	28
	Historic	10	23	18	23	48	83	143	226	288	218	165	108	46

**Table A12.3** Buildup Index (BUI) values (maximum and mean) for 2021/2022, 2020/2021 and the historical average, based on values averaged across all Tairāwhiti District weather stations. The colour scale is a visual indicator of high (red, orange, and yellow) and low (blue) BUI values. The historical trend has a length of coverage of 25 years.

Statistic	Period	Stations	July	August	September	October	November	December	January	February	March	April	May	June
Max	2021/2022	10	9	19	16	27	43	53	81	66	62	20	27	18
	2020/2021	10	8	11	29	48	38	80	104	118	73	52	39	8
	Historic	10	52	42	66	75	134	197	278	291	144	160	70	79
Mean	2021/2022	10	2	5	4	8	13	23	40	20	23	7	9	3
	2020/2021	10	2	3	10	17	15	31	45	49	23	21	12	2
	Historic	10	3	4	7	14	20	28	40	45	23	15	11	5

## Appendix 13 Taranaki.

### Wildfire Statistics

- During the 2021/2022 wildfire season, Taranaki accounted for 3% of the total number of wildfires in the country and < 1% of the area burnt (Figure 3 & 4, A1, Table A13.1).
- There has been a Increase in the number of wildfires and a Increase in the total area burnt during 2021/2022 compared to 2020/2021.
- The dominant cause of wildfires was Pile Burn.
- The primary cause that contributed to the total area burnt was Cigarettes, Matches, Candles.

### Fuel Moisture Status

- In general, in 2021/2022 Drought Code (DC) mean values followed the historical trend or were lower, most noticeably in February (Table A13.2). No new maximum values were observed.
- Mean Buildup Index (BUI) values typically followed the historical trend, except for in January, March, and April where mean values were slightly higher than historically (Table A13.3). May had a new maximum BUI value of 94 compared to the historic maximum of 66.

**Table A13.1** Number of wildfires and area burnt (ha) in Taranaki by broad cause categories.

Value	Fire Year	Cigarettes, Matches, Candles	Cooking and Heating	Equipment	Explosives, Fireworks	Industry	Natural Sources	Pile Burn	Powerline	Prescribed Burn	Re-ignition	Spontaneous Combustion	Unclassified	Total
Number of Wildfires	2021/2022	19	13	2	5	2	1	60	2	28	5	2	10	149
	2020/2021	26	6	2	1	1	0	59	3	16	3	0	9	126
Area Burnt (ha)	2021/2022	8	0	1	0	0	0	3	0	1	2	0	0	15
	2020/2021	0	0	0	0	0	0	1	0	2	0	0	0	3

**Table A13.2** Drought Code (DC) values (maximum and mean) for 2021/2022, 2020/2021 and the historical average, based on values averaged across all Taranaki District weather stations. The colour scale is a visual indicator of high (red, orange, and yellow) and low (blue) DC values. The historical trend has a length of coverage of 25 years.

Statistic	Period	Stations	July	August	September	October	November	December	January	February	March	April	May	June
Max	2021/2022	11	18	22	31	62	187	183	319	356	285	398	423	25
	2020/2021	10	71	33	22	51	64	96	211	302	320	286	309	183
	Historic	10	125	134	152	107	222	425	536	589	689	692	527	269
Mean	2021/2022	11	6	7	7	17	70	48	174	83	128	131	76	6
	2020/2021	10	8	9	6	20	21	38	102	178	158	63	52	22
	Historic	10	11	11	12	22	56	102	164	244	231	155	88	29

**Table A13.3** Buildup Index (BUI) values (maximum and mean) for 2021/2022, 2020/2021 and the historical average, based on values averaged across all Taranaki District weather stations. The colour scale is a visual indicator of high (red, orange, and yellow) and low (blue) BUI values. The historical trend has a length of coverage of 25 years.

Statistic	Period	Stations	July	August	September	October	November	December	January	February	March	April	May	June
Max	2021/2022	11	7	7	10	18	39	28	78	79	73	87	94	6
	2020/2021	10	7	11	7	18	14	29	38	62	65	22	19	10
	Historic	10	22	35	45	33	54	108	112	101	123	118	66	23
Mean	2021/2022	11	2	2	3	5	13	8	40	19	32	23	13	1
	2020/2021	10	1	3	3	6	5	10	16	29	22	5	5	2
	Historic	10	2	3	4	6	11	16	23	32	23	12	7	2

## Appendix 14 Hawke's Bay.

### Wildfire Statistics

- During the 2021/2022 wildfire season, Hawke's Bay accounted for 5% of the total number of wildfires in the country and 2% of the area burnt (Figure 3 & 4, A1, Table A14.1).
- There has been a Decrease in the number of wildfires and a Decrease in the total area burnt during 2021/2022 compared to 2020/2021.
- The dominant cause of wildfires was Pile Burn.
- The primary cause that contributed to the total area burnt was Pile Burn.

### Fuel Moisture Status

- In general, in 2021/2022 Drought Code (DC) mean values were typically above average for the period July to October, then trended lower for the remainder of the year, most noticeably in February and March (Table A14.2). No new maximum values were observed.
- Mean Buildup Index (BUI) values typically followed the historical trend except for lower values in February and March (Table A14.3). No new maximum values were observed.

**Table A14.1** Number of wildfires and area burnt (ha) in Hawke’s Bay by broad cause categories.

Value	Fire Year	Cigarettes, Matches, Candles	Cooking and Heating	Equipment	Explosives, Fireworks	Industry	Natural Sources	Pile Burn	Powerline	Prescribed Burn	Re-ignition	Spontaneous Combustion	Unclassified	Total
Number of Wildfires	2021/2022	14	22	12	1	0	0	102	2	16	10	4	18	201
	2020/2021	46	30	8	1	1	3	99	7	17	8	2	24	246
Area Burnt (ha)	2021/2022	0	10	5	0	0	0	51	11	5	1	0	1	84
	2020/2021	4	12	35	0	0	0	19	2	9	1	0	5	87

**Table A14.2** Drought Code (DC) values (maximum and mean) for 2021/2022, 2020/2021 and the historical average, based on values averaged across all Hawke’s Bay District weather stations. The colour scale is a visual indicator of high (red, orange, and yellow) and low (blue) DC values. The historical trend has a length of coverage of 25 years.

Statistic	Period	Stations	July	August	September	October	November	December	January	February	March	April	May	June
Max	2021/2022	31	259	295	295	304	337	394	526	635	407	321	404	410
	2020/2021	25	364	386	391	379	277	335	514	622	586	613	647	561
	Historic	28	668	422	429	379	424	559	760	896	1,005	892	900	813
Mean	2021/2022	31	82	83	62	58	91	124	225	119	104	69	97	46
	2020/2021	25	58	65	55	75	57	116	231	316	309	341	318	182
	Historic	28	36	30	31	50	102	162	235	295	278	218	178	100

**Table A14.3** Buildup Index (BUI) values (maximum and mean) for 2021/2022, 2020/2021 and the historical average, based on values averaged across all Hawke’s Bay District weather stations. The colour scale is a visual indicator of high (red, orange, and yellow) and low (blue) BUI values. The historical trend has a length of coverage of 25 years.

Statistic	Period	Stations	July	August	September	October	November	December	January	February	March	April	May	June
Max	2021/2022	31	24	40	49	48	62	76	120	134	66	59	72	69
	2020/2021	25	13	21	32	59	42	85	123	168	120	78	82	33
	Historic	28	45	50	68	92	101	181	190	224	236	152	122	100
Mean	2021/2022	31	6	10	8	10	17	21	44	22	18	12	14	4
	2020/2021	25	2	7	8	16	11	30	41	64	43	30	21	5
	Historic	28	4	5	8	13	23	28	38	44	35	20	14	6

## Appendix 15 Manawatū-Whanganui.

### Wildfire Statistics

- During the 2021/2022 wildfire season, Manawatū-Whanganui accounted for 8% of the total number of wildfires in the country and 8% of the area burnt (Figure 3 & 4, A1, Table A15.1).
- There has been a Increase in the number of wildfires and a Decrease in the total area burnt during 2021/2022 compared to 2020/2021.
- The dominant cause of wildfires was Pile Burn.
- The primary cause that contributed to the total area burnt was Explosives, Fireworks.

### Fuel Moisture Status

- In general, in 2021/2022 Drought Code (DC) mean values followed the historical trend up until November and were then slightly lower than historically for the remainder of the fire year with the exception of January (Table A13.2). No new maximum values were observed.
- Mean Buildup Index (BUI) values typically followed the historical trend, except for in January when it was higher than historically (Table A15.3). No new maximum values were observed.

**Table A15.1** Number of wildfires and area burnt (ha) in Manawatū-Whanganui by broad cause categories.

Value	Fire Year	Cigarettes, Matches, Candles	Cooking and Heating	Equipment	Explosives, Fireworks	Industry	Natural Sources	Pile Burn	Powerline	Prescribed Burn	Re-ignition	Spontaneous Combustion	Unclassified	Total
Number of Wildfires	2021/2022	76	18	12	5	2	0	144	12	34	7	2	57	369
	2020/2021	40	19	7	6	0	2	117	8	23	6	3	46	277
Area Burnt (ha)	2021/2022	18	0	23	126	1	0	51	0	124	0	0	26	369
	2020/2021	55	0	0	257	0	0	15	1	14	7	0	453	802

**Table A15.2** Drought Code (DC) values (maximum and mean) for 2021/2022, 2020/2021 and the historical average, based on values averaged across all Manawatū-Whanganui District weather stations. The colour scale is a visual indicator of high (red, orange, and yellow) and low (blue) DC values. The historical trend has a length of coverage of 25 years.

Statistic	Period	Stations	July	August	September	October	November	December	January	February	March	April	May	June
Max	2021/2022	26	220	99	52	94	168	182	372	406	348	405	433	282
	2020/2021	25	301	300	217	100	182	191	390	518	548	447	475	298
	Historic	26	433	300	315	390	502	620	765	951	1,077	915	757	484
Mean	2021/2022	26	43	13	9	21	78	71	192	126	155	132	103	13
	2020/2021	25	55	52	25	27	45	58	136	261	281	200	183	128
	Historic	26	30	25	25	36	72	121	185	265	277	214	140	69

**Table A15.3** Buildup Index (BUI) values (maximum and mean) for 2021/2022, 2020/2021 and the historical average, based on values averaged across all Manawatū-Whanganui District weather stations. The colour scale is a visual indicator of high (red, orange, and yellow) and low (blue) BUI values. The historical trend has a length of coverage of 25 years.

Statistic	Period	Stations	July	August	September	October	November	December	January	February	March	April	May	June
Max	2021/2022	26	12	8	15	21	41	34	110	118	97	81	63	18
	2020/2021	25	20	25	13	23	28	37	74	100	92	27	34	22
	Historic	26	50	64	122	88	105	144	148	203	237	127	64	59
Mean	2021/2022	26	2	2	3	5	14	10	47	24	35	19	13	2
	2020/2021	25	2	5	3	8	7	12	21	45	30	8	8	5
	Historic	26	2	3	6	9	14	19	27	38	29	14	7	3

## Appendix 16 Wellington.

The Wellington district includes the Chatham Islands. In future iterations we are considering creating a sub-district specifically for the Chatham Islands because both fire occurrence and climate are different compared to the larger district.

### Wildfire Statistics

- During the 2021/2022 wildfire season, Wellington accounted for 5% of the total number of wildfires in the country and 1% of the area burnt (Figure 3 & 4, A1, Table A16.1).
- There has been a Decrease in the number of wildfires and a Decrease in the total area burnt during 2021/2022 compared to 2020/2021.
- The dominant cause of wildfires was Pile Burn.
- The primary cause that contributed to the total area burnt was Spontaneous Combustion.

### Fuel Moisture Status

- In general, in 2021/2022 Drought Code (DC) values typically followed the historical trend through January and were then lower than historic mean values from February through June (Table A16.2). No new maximum values were observed.
- Mean Buildup Index (BUI) values typically followed the historical trend but were lower in February and March (Table A16.3). No new maximum values were observed. November had a new maximum BUI value of 80 compared to the historic maximum of 76.

**Table A16.1** Number of wildfires and area burnt (ha) in Wellington by broad cause categories.

Value	Fire Year	Cigarettes, Matches, Candles	Cooking and Heating	Equipment	Explosives, Fireworks	Industry	Natural Sources	Pile Burn	Powerline	Prescribed Burn	Re-ignition	Spontaneous Combustion	Unclassified	Total
Number of Wildfires	2021/2022	40	39	9	4	0	2	82	6	8	5	4	21	220
	2020/2021	52	23	14	4	1	0	78	11	10	7	5	27	232
Area Burnt (ha)	2021/2022	1	0	3	0	0	0	3	0	0	0	17	0	24
	2020/2021	3	35	1	2	0	0	1	0	0	0	0	2	44

**Table A16.2** Drought Code (DC) values (maximum and mean) for 2021/2022, 2020/2021 and the historical average, based on values averaged across all Wellington District weather stations. The colour scale is a visual indicator of high (red, orange, and yellow) and low (blue) DC values. The historical trend has a length of coverage of 25 years.

Statistic	Period	Stations	July	August	September	October	November	December	January	February	March	April	May	June
Max	2021/2022	24	141	90	63	113	268	299	416	451	394	396	275	238
	2020/2021	23	212	183	153	186	269	260	429	514	582	453	467	362
	Historic	25	554	592	622	434	475	636	657	766	805	862	867	648
Mean	2021/2022	24	25	10	14	29	110	102	224	115	127	123	123	49
	2020/2021	23	25	51	25	53	54	86	217	321	349	269	262	130
	Historic	25	45	32	29	43	89	159	242	317	311	225	166	85

**Table A16.3** Buildup Index (BUI) values (maximum and mean) for 2021/2022, 2020/2021 and the historical average, based on values averaged across all Wellington District weather stations. The colour scale is a visual indicator of high (red, orange, and yellow) and low (blue) BUI values. The historical trend has a length of coverage of 25 years.

Statistic	Period	Stations	July	August	September	October	November	December	January	February	March	April	May	June
Max	2021/2022	24	11	9	21	34	80	82	88	95	63	47	56	19
	2020/2021	23	10	35	20	37	42	49	98	131	125	50	63	15
	Historic	25	74	97	111	82	76	117	138	176	170	141	139	63
Mean	2021/2022	24	2	2	4	7	21	14	39	16	23	14	14	2
	2020/2021	23	2	9	5	13	9	14	35	52	50	18	15	3
	Historic	25	3	4	6	9	17	25	33	43	34	16	10	4

## Appendix 17 Nelson/Marlborough.

### Wildfire Statistics

- During the 2021/2022 wildfire season, Nelson/Marlborough accounted for 3% of the total number of wildfires in the country and < 1% of the area burnt (Figure 3 & 4, A1, Table A17.1).
- There has been a Decrease in the number of wildfires and a Decrease in the total area burnt during 2021/2022 compared to 2020/2021.
- The dominant cause of wildfires was Pile Burn.
- The primary cause that contributed to the total area burnt was Equipment.

### Fuel Moisture Status

- In general, in 2021/2022 Drought Code (DC) values were typically below the historical trend, with February and March well below, the exceptions being January and May which were slightly lower than historic mean values (Table A17.2). No new maximum values were observed.
- Mean Buildup Index (BUI) values typically followed the historical trend but were higher in January and lower in February (Table A17.3). No new maximum values were observed.

**Table A17.1** Number of wildfires and area burnt (ha) in Nelson/Marlborough by broad cause categories.

Value	Fire Year	Cigarettes, Matches, Candles	Cooking and Heating	Equipment	Explosives, Fireworks	Industry	Natural Sources	Pile Burn	Powerline	Prescribed Burn	Re-ignition	Spontaneous Combustion	Unclassified	Total
Number of Wildfires	2021/2022	17	26	7	2	0	2	68	1	12	2	3	12	152
	2020/2021	12	20	11	1	0	2	63	4	13	6	1	23	156
Area Burnt (ha)	2021/2022	0	3	5	0	0	0	5	0	0	0	0	0	13
	2020/2021	0	0	3	0	0	1	1	0	7	1	0	20	33

**Table A17.2** Drought Code (DC) values (maximum and mean) for 2021/2022, 2020/2021 and the historical average, based on values averaged across all Nelson/Marlborough District weather stations. The colour scale is a visual indicator of high (red, orange, and yellow) and low (blue) DC values. The historical trend has a length of coverage of 25 years.

Statistic	Period	Stations	July	August	September	October	November	December	January	February	March	April	May	June
Max	2021/2022	25	196	79	31	82	236	271	451	481	271	359	385	294
	2020/2021	24	235	245	239	212	241	350	525	653	777	621	629	372
	Historic	26	628	541	562	590	521	708	922	1,120	1,186	1,167	1,089	933
Mean	2021/2022	25	25	7	8	20	93	93	228	110	138	195	171	48
	2020/2021	24	72	69	47	55	63	112	224	339	352	215	192	71
	Historic	26	51	39	39	52	98	160	218	299	301	225	156	81

**Table A17.3** Buildup Index (BUI) values (maximum and mean) for 2021/2022, 2020/2021 and the historical average, based on values averaged across all Nelson/Marlborough District weather stations. The colour scale is a visual indicator of high (red, orange, and yellow) and low (blue) BUI values. The historical trend has a length of coverage of 25 years.

Statistic	Period	Stations	July	August	September	October	November	December	January	February	March	April	May	June
Max	2021/2022	25	15	9	17	23	78	87	124	134	76	82	75	13
	2020/2021	24	17	35	35	56	49	85	103	132	160	65	80	14
	Historic	26	37	47	65	97	150	168	213	264	268	191	161	73
Mean	2021/2022	25	2	2	4	6	21	16	52	18	31	33	17	2
	2020/2021	24	4	8	7	13	10	20	37	56	43	17	15	2
	Historic	26	4	5	8	13	22	29	39	54	41	21	12	5

## Appendix 18 West Coast.

### Wildfire Statistics

- During the 2021/2022 wildfire season, West Coast accounted for 2% of the total number of wildfires in the country and < 1% of the area burnt (Figure 3 & 4, A1, Table A18.1).
- There has been a Increase in the number of wildfires and a Decrease in the total area burnt during 2021/2022 compared to 2020/2021.
- The dominant cause of wildfires was Cigarettes, Matches, Candles.
- The primary cause that contributed to the total area burnt was Prescribed Burn.

### Fuel Moisture Status

- In general, in 2021/2022 Drought Code (DC) values typically followed the historical trend, except for in January, March and April when values were higher than historic mean values (Table A18.2). No new maximum values were observed.
- Mean Buildup Index (BUI) values typically followed the historical trend (Table A18.3). No new maximum values were observed.

**Table A18.1** Number of wildfires and area burnt (ha) in West Coast by broad cause categories.

Value	Fire Year	Cigarettes, Matches, Candles	Cooking and Heating	Equipment	Explosives, Fireworks	Industry	Natural Sources	Pile Burn	Powerline	Prescribed Burn	Re-ignition	Spontaneous Combustion	Unclassified	Total
Number of Wildfires	2021/2022	30	11	1	0	0	0	24	0	8	1	0	5	80
	2020/2021	12	7	3	0	0	0	21	0	3	1	0	4	51
Area Burnt (ha)	2021/2022	3	0	0	0	0	0	0	0	6	0	0	0	9
	2020/2021	13	15	0	0	0	0	2	0	0	0	0	0	30

**Table A18.2** Drought Code (DC) values (maximum and mean) for 2021/2022, 2020/2021 and the historical average, based on values averaged across all West Coast District weather stations. The colour scale is a visual indicator of high (red, orange, and yellow) and low (blue) DC values. The historical trend has a length of coverage of 25 years.

Statistic	Period	Stations	July	August	September	October	November	December	January	February	March	April	May	June
Max	2021/2022	13	15	13	23	41	82	88	265	273	204	224	95	18
	2020/2021	11	30	27	17	34	96	90	150	157	163	81	33	22
	Historic	11	87	64	120	193	204	316	371	427	422	310	214	57
Mean	2021/2022	13	4	3	5	10	24	22	117	35	84	75	8	3
	2020/2021	11	5	7	4	8	28	24	43	70	35	12	8	5
	Historic	11	7	6	9	14	33	57	69	84	61	25	10	7

**Table A18.3** Buildup Index (BUI) values (maximum and mean) for 2021/2022, 2020/2021 and the historical average, based on values averaged across all West Coast District weather stations. The colour scale is a visual indicator of high (red, orange, and yellow) and low (blue) BUI values. The historical trend has a length of coverage of 25 years.

Statistic	Period	Stations	July	August	September	October	November	December	January	February	March	April	May	June
Max	2021/2022	13	5	3	7	14	27	21	70	65	60	51	6	5
	2020/2021	11	9	10	7	12	30	23	49	40	31	12	10	6
	Historic	11	24	25	33	53	63	90	85	84	101	53	23	18
Mean	2021/2022	13	1	1	2	3	7	5	24	9	21	12	1	1
	2020/2021	11	1	2	1	3	8	6	9	18	7	2	2	1
	Historic	11	2	2	3	4	8	12	12	14	10	4	2	2

## Appendix 19 Canterbury.

### Wildfire Statistics

- During the 2021/2022 wildfire season, Canterbury accounted for 9% of the total number of wildfires in the country and 4% of the area burnt (Figure 3 & 4, A1, Table A19.1).
- There has been a Decrease in the number of wildfires and a Decrease in the total area burnt during 2021/2022 compared to 2020/2021.
- The dominant cause of wildfires was Pile Burn.
- The primary cause that contributed to the total area burnt was Pile Burn.

### Fuel Moisture Status

- In general, in 2021/2022 mean Drought Code (DC) values followed the historical trend from July 2021 through November 2021 and then DC values were lower than the historical mean values from December 2021 through May 2022. (Table A19.2). No new maximum values were observed.
- Mean Buildup Index (BUI) values followed the historical trend except from December 2021 through March 2022 March when mean values were lower (Table A19.3). No new maximum values were observed.

**Table A19.1** Number of wildfires and area burnt (ha) in Canterbury by broad cause categories.

Value	Fire Year	Cigarettes, Matches, Candles	Cooking and Heating	Equipment	Explosives, Fireworks	Industry	Natural Sources	Pile Burn	Powerline	Prescribed Burn	Re-ignition	Spontaneous Combustion	Unclassified	Total
Number of Wildfires	2021/2022	105	35	14	12	0	0	155	14	18	13	4	42	412
	2020/2021	178	41	34	21	0	6	183	17	30	19	8	82	619
Area Burnt (ha)	2021/2022	3	4	18	0	0	0	103	27	1	20	0	3	179
	2020/2021	3	612	24	9	0	1	141	0	19	1	0	54	864

**Table A19.2** Drought Code (DC) values (maximum and mean) for 2021/2022, 2020/2021 and the historical average, based on values averaged across all Canterbury District weather stations. The colour scale is a visual indicator of high (red, orange, and yellow) and low (blue) DC values. The historical trend has a length of coverage of 25 years.

Statistic	Period	Stations	July	August	September	October	November	December	January	February	March	April	May	June
Max	2021/2022	36	221	225	208	252	347	408	417	448	454	554	591	618
	2020/2021	28	358	354	366	462	432	568	639	675	767	833	747	299
	Historic	29	622	485	453	479	536	640	781	862	891	853	826	704
Mean	2021/2022	36	60	34	46	59	147	132	196	115	160	222	241	193
	2020/2021	28	106	135	127	163	168	239	300	398	491	530	458	76
	Historic	29	86	67	66	82	123	204	277	364	368	323	260	132

**Table A19.3** Buildup Index (BUI) values (maximum and mean) for 2021/2022, 2020/2021 and the historical average, based on values averaged across all Canterbury District weather stations. The colour scale is a visual indicator of high (red, orange, and yellow) and low (blue) BUI values. The historical trend has a length of coverage of 25 years.

Statistic	Period	Stations	July	August	September	October	November	December	January	February	March	April	May	June
Max	2021/2022	36	19	21	35	35	67	65	117	129	72	93	106	65
	2020/2021	28	15	38	49	95	73	109	113	156	175	138	133	13
	Historic	29	47	52	64	95	120	169	237	239	203	178	191	85
Mean	2021/2022	36	5	4	10	12	28	18	35	17	32	32	24	10
	2020/2021	28	3	16	15	34	28	35	35	54	64	59	36	3
	Historic	29	6	9	12	18	27	37	45	57	46	30	21	7

## Appendix 20 Mid-South Canterbury.

### Wildfire Statistics

- During the 2021/2022 wildfire season, Mid-South Canterbury accounted for 2% of the total number of wildfires in the country and < 1% of the area burnt (Figure 3 & 4, A1, Table A20.1).
- There has been a Decrease in the number of wildfires and a Decrease in the total area burnt during 2021/2022 compared to 2020/2021.
- The dominant cause of wildfires was Pile Burn.
- The primary cause that contributed to the total area burnt was Prescribed Burn.

### Fuel Moisture Status

- In general, in 2021/2022 Drought Code (DC) values for all typically followed but were below the historical trend, with November 2021 and June 2022 being the only months slightly above the historic mean values (Table A20.2). No new maximum values were observed.
- Mean Buildup Index (BUI) values were low across the 2021/2022 fire year, with notably lower values than the historical mean values in December 2021, and February and March 2022 (Table A20.3). No new maximum values were observed.

**Table A20.1** Number of wildfires and area burnt (ha) in Mid-South Canterbury by broad cause categories.

Value	Fire Year	Cigarettes, Matches, Candles	Cooking and Heating	Equipment	Explosives, Fireworks	Industry	Natural Sources	Pile Burn	Powerline	Prescribed Burn	Re-ignition	Spontaneous Combustion	Unclassified	Total
Number of Wildfires	2021/2022	12	11	3	1	2	1	37	7	9	9	1	9	102
	2020/2021	26	18	13	3	6	6	74	11	16	11	2	26	212
Area Burnt (ha)	2021/2022	0	0	1	0	0	0	1	0	2	0	0	1	5
	2020/2021	3	2,228	15	25	3	0	16	9	9	8	0	14	2,330

**Table A20.2** Drought Code (DC) values (maximum and mean) for 2021/2022, 2020/2021 and the historical average, based on values averaged across all Mid-South Canterbury District weather stations. The colour scale is a visual indicator of high (red, orange, and yellow) and low (blue) DC values. The historical trend has a length of coverage of 25 years.

Statistic	Period	Stations	July	August	September	October	November	December	January	February	March	April	May	June
Max	2021/2022	28	265	245	251	247	293	268	343	358	370	389	406	424
	2020/2021	19	485	521	443	477	463	498	454	531	560	629	643	278
	Historic	20	617	521	430	423	464	598	771	890	958	778	731	670
Mean	2021/2022	28	72	64	69	84	128	102	177	109	162	204	209	172
	2020/2021	19	175	192	152	167	175	212	186	269	322	359	334	80
	Historic	20	110	87	84	98	124	181	230	279	290	267	218	148

**Table A20.3** Buildup Index (BUI) values (maximum and mean) for 2021/2022, 2020/2021 and the historical average, based on values averaged across all Mid-South Canterbury District weather stations. The colour scale is a visual indicator of high (red and yellow) and low (blue) BUI values. The historical trend has a length of coverage of 25 years.

Statistic	Period	Stations	July	August	September	October	November	December	January	February	March	April	May	June
Max	2021/2022	28	19	22	34	44	54	40	84	84	82	89	59	55
	2020/2021	19	25	50	93	107	67	96	87	88	95	104	90	12
	Historic	20	54	65	93	107	122	134	163	171	163	157	95	73
Mean	2021/2022	28	4	5	10	13	17	11	29	15	23	20	17	12
	2020/2021	19	7	17	15	21	20	27	19	34	35	34	27	3
	Historic	20	8	9	14	17	22	27	33	39	31	23	17	10

## Appendix 21 Otago.

### Wildfire Statistics

- During the 2021/2022 wildfire season, Otago accounted for 7% of the total number of wildfires in the country and 6% of the area burnt (Figure 3 & 4, A1, Table A21.1).
- There has been a Decrease in the number of wildfires and a Decrease in the total area burnt during 2021/2022 compared to 2020/2021.
- The dominant cause of wildfires was Pile Burn.
- The primary cause that contributed to the total area burnt was Unclassified.

### Fuel Moisture Status

- In 2021/2022 Drought Code (DC) mean values were higher than the historic mean values in January and for the period April through June, but otherwise tended to follow historical patterns (A21.2). No new maximum values were observed.
- Mean Buildup Index (BUI) values followed historical patterns, except were slightly lower in December 2021 and February 2022, and slightly above for April through June 2022 (Table A21.3). June had a new maximum BUI value of 92 compared to the historic maximum of 79.

**Table A21.1** Number of wildfires and area burnt (ha) in Otago by broad cause categories.

Value	Fire Year	Cigarettes, Matches, Candles	Cooking and Heating	Equipment	Explosives, Fireworks	Industry	Natural Sources	Pile Burn	Powerline	Prescribed Burn	Re-ignition	Spontaneous Combustion	Unclassified	Total
Number of Wildfires	2021/2022	25	30	16	3	1	4	109	10	23	14	12	48	295
	2020/2021	42	27	21	2	0	3	136	10	26	16	4	43	330
Area Burnt (ha)	2021/2022	4	0	2	2	0	0	9	0	26	0	1	236	280
	2020/2021	1	270	101	0	0	0	21	5,647	2,424	1	2	4	8,471

**Table A21.2** Drought Code (DC) values (maximum and mean) for 2021/2022, 2020/2021 and the historical average, based on values averaged across all Otago District weather stations. The colour scale is a visual indicator of high (red, orange, and yellow) and low (blue) DC values. The historical trend has a length of coverage of 25 years.

Statistic	Period	Stations	July	August	September	October	November	December	January	February	March	April	May	June
Max	2021/2022	32	489	395	377	330	390	413	612	619	600	640	660	648
	2020/2021	24	520	576	541	621	662	642	540	535	654	715	730	569
	Historic	31	573	576	591	621	665	810	1,017	922	891	865	855	692
Mean	2021/2022	32	161	136	128	121	169	194	308	253	320	374	365	314
	2020/2021	24	240	255	212	222	254	304	158	265	377	430	382	242
	Historic	31	159	132	132	145	180	248	295	329	355	355	284	203

**Table A21.3** Buildup Index (BUI) values (maximum and mean) for 2021/2022, 2020/2021 and the historical average, based on values averaged across all Otago District weather stations. The colour scale is a visual indicator of high (red, orange, and yellow) and low (blue) BUI values. The historical trend has a length of coverage of 25 years.

Statistic	Period	Stations	July	August	September	October	November	December	January	February	March	April	May	June
Max	2021/2022	32	15	33	51	56	94	54	133	116	108	115	94	92
	2020/2021	24	44	73	59	91	114	112	67	106	124	141	118	17
	Historic	31	71	73	80	133	139	171	205	217	202	178	137	79
Mean	2021/2022	32	3	7	14	17	23	20	45	21	38	38	27	18
	2020/2021	24	5	18	15	21	32	34	17	44	55	50	27	4
	Historic	31	7	9	16	21	28	36	40	42	40	31	16	8

## Appendix 22 Southland.

The Southland district includes Stewart Island.

### Wildfire Statistics

- During the 2021/2022 wildfire season, Southland accounted for 4% of the total number of wildfires in the country and 19% of the area burnt (Figure 3 & 4, A1, Table A22.1).
- There has been a Increase in the number of wildfires and a Increase in the total area burnt during 2021/2022 compared to 2020/2021.
- The dominant cause of wildfires was Pile Burn.
- The primary cause that contributed to the total area burnt was Unclassified.

### Fuel Moisture Status

- In general, in 2021/2022 Drought Code (DC) mean values typically followed the historical trend, except in January, March, and April when values were elevated (Table A22.2). No new maximum values were observed.
- Mean Buildup Index (BUI) mean values for all stations typically followed the historical trend, remaining low throughout the 2021/2022 fire year, with the exception of March which was slightly elevated. No new maximum values were observed.

**Table A22.1** Number of wildfires and area burnt (ha) in Southland by broad cause categories.

Value	Fire Year	Cigarettes, Matches, Candles	Cooking and Heating	Equipment	Explosives, Fireworks	Industry	Natural Sources	Pile Burn	Powerline	Prescribed Burn	Re-ignition	Spontaneous Combustion	Unclassified	Total
Number of Wildfires	2021/2022	11	11	7	2	1	0	95	5	16	5	1	23	177
	2020/2021	26	12	6	2	1	1	74	9	13	3	1	8	156
Area Burnt (ha)	2021/2022	7	0	0	0	0	0	3	1	35	0	0	869	915
	2020/2021	0	0	12	0	0	0	7	1	16	0	0	4	40

**Table A22.2** Drought Code (DC) values (maximum and mean) for 2021/2022, 2020/2021 and the historical average, based on values averaged across all Southland District weather stations. The colour scale is a visual indicator of high (red, orange, and yellow) and low (blue) DC values. The historical trend has a length of coverage of 25 years.

Statistic	Period	Stations	July	August	September	October	November	December	January	February	March	April	May	June
Max	2021/2022	23	32	25	33	66	131	210	324	395	458	469	255	181
	2020/2021	15	74	36	17	52	113	169	200	284	334	340	300	160
	Historic	18	261	195	179	191	251	334	502	533	514	488	444	310
Mean	2021/2022	23	5	4	7	18	61	97	189	162	197	160	53	18
	2020/2021	15	8	12	4	13	46	82	64	114	170	190	107	31
	Historic	18	13	11	14	22	51	102	145	164	171	153	85	33

**Table A22.3** Buildup Index (BUI) values (maximum and mean) for 2021/2022, 2020/2021 and the historical average, based on values averaged across all Southland District weather stations. The colour scale is a visual indicator of high (red, orange, and yellow) and low (blue) BUI values. The historical trend has a length of coverage of 25 years.

Statistic	Period	Stations	July	August	September	October	November	December	January	February	March	April	May	June
Max	2021/2022	23	4	7	12	22	39	37	62	49	55	61	32	11
	2020/2021	15	4	10	9	14	23	26	28	42	46	33	22	6
	Historic	18	22	24	38	49	78	89	114	123	95	92	56	21
Mean	2021/2022	23	1	1	2	5	11	14	22	15	26	14	3	1
	2020/2021	15	1	3	2	4	9	10	8	18	13	8	2	1
	Historic	18	1	2	4	6	11	16	19	19	15	9	3	1

