

Appendix C12 Otago Region Fire Returns 1991/92 to 2006/07

Number of Fires (Figure O1):

- From 1991/92 to 2006/07 Otago averaged 188 fires annually, or around 6% of the national average annual number of fires.
- The total annual number of fires varied considerably, from just 33 fires in 1993/94 (1.5% of that year's national total) to 382 fires in 2003/04 (about 9% of that year's national total). Otago accounted for the highest proportion of any year's national total in 1999/2000 when 268 fires (or 9% of the national total number of fires) occurred there.
- Otago's total number of fires from 1991/92 to 2006/07 showed a statistically significant increase over time (regression: $R^2 = 0.7885$; F-value = 52.2; P-value = 0.00). This increasing trend correlates with the national trend in total number of fires (correlation coefficient = 0.880; P-value = <0.001).

Area Burned (Figure O2):

- The average annual total area burned for Otago was 2,459 ha (on average proportionally about 33% of the annual national total area burned and 41.5% of the national total area burned over the entire study period).
- The total annual area burned varied from 426 ha in 2005/06 (10% of that year's national total) to 14,637 ha in 1998/99 (83% of that year's national total).
- Otago accounted for its lowest proportion of any year's national total area burned in 2000/01 with just 8%.
- The total area burned varied considerably and showed no statistically significant positive or negative trend over time (1991/92 to 2006/07) (regression: $R^2 = 5^{-06}$; F-value = 0.00; P-value 0.993).

Number of Fires by Cause (Figures O3 and O4):

- As in most other regions, miscellaneous and unknown causes accounted for a considerable proportion of Otago's number of fires. Around 30% (actual average 55 fires) of the average annual total number of fires was attributed to miscellaneous causes; unknown accounted for 10% (an average of 19 fires) of the average annual total number of fires; average annual combined 'unspecified' proportion of total number of fires for Otago was just under 40%.
- Land clearing accounted for about 30% (or annually an average of 57 fires) of the average annual total number of fires.
- Around 13% of the average annual total number of fires were due to vehicles causes (annual average of 25 fires).
- Before 1997/98 the reported number of fires occurring in Otago was less than 100 fires annually, and from 1997/98 the number of fires doubled and has fluctuated since. From 1997/98 the number of fires being attributed to vehicles and land clearing increased.

Area Burned by Fuel Type (Figures O5 and O6):

- Around 72% of the total area reported burned in Otago was grass; average annual total grass area burned was 1,781 ha; 57% of the national total grass area burned from 1991/92 to 2006/07 occurred in Otago.
- Around 26% of the total area burned in Otago was scrub; average annual total scrub area burned was 631 ha (22% of the national annual scrub area burned).
- Forest made up the remaining 2% of total area burned; average annual total forest area burned was 47 ha (12% of the national annual average).
- The area burned by fuel type showed no clear directional trend over time; large areas were burned in 1998/99 (more than twice the area burned of any other year studied) in both grass and scrub fuels.

Area Burned by Cause (Figures O7 and O8):

- Area burned by cause was significantly different to number of fires by cause.
- Land clearing accounted for 30% of the average total annual number of fires, but 64% of the average annual total area burned (an average of 1,576 ha annually burned for the study period).
- Around 21% of the average total area burned was attributed to unknown causes (512 ha annually average). Miscellaneous causes accounted for only 2% of the average total area burned (average annually of 60 ha).
- The total area burned by cause was dominated each year by land clearing, and years with a high total area burned usually had most of their area burned attributed to land clearing.
- In 1998/99 over 14,000 ha were burned; over 4,000 ha land clearing, over 6,000 ha from unknown causes, over 2,000 ha from power lines, and around 1,000ha attributed to vehicle fires.

Area Burned by Cause by Fuel type (Figures O9, O10, O11, O12, O13, and O14):

- Around 68% of the average annual total grass area burned (1,204 ha averaged annually) was attributed to land clearing.
- Around 20% of the average annual total grass area burned (362 ha averaged annually) was attributed to unknown causes.
- Around 6% of the average annual total grass area burned (average annually 114 ha) was attributed to power lines.
- Since grass area burned made up the largest fuel type reported in Otago, the annual trend for grass area burned mirrored that of the total area burned.
- Land clearing dominated the average total scrub area burned at 56% (annual average of 355 ha burned).
- Around 23% of the average annual total scrub area burned was attributed to unknown (147 ha) causes.

- Around 9% of the average annual total scrub area burned was attributed to power lines (average annually 55 ha).
- The trend for annual total scrub area burned again mirrored the total area burned trend with land clearing accounting for the greatest proportion of the area burned in most years.
- The average annual total forest area burned was greatly influenced by single causes that made up most of the forest area burned in different years; miscellaneous in 1994/95, 2004/05 and 2005/06; land clearing in 2006/07; incendiary in 1997/98; and unknown in 1998/99.
- Around 43% of the average annual total forest area burned was attributed to miscellaneous causes (average annually 20 ha) mostly in 1994/95; 35% to land clearing (average annually 16 ha); and 9% attributed to incendiary causes (4ha).

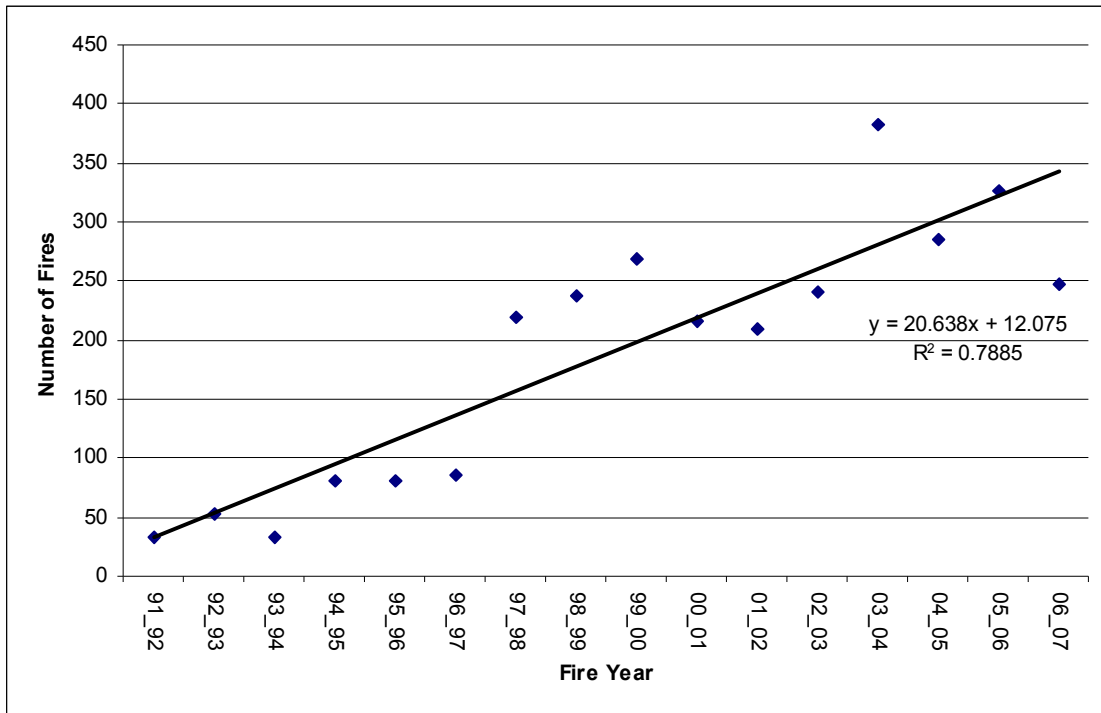


Figure O1. Otago total annual number of fires from 1991/92 to 2006/07.

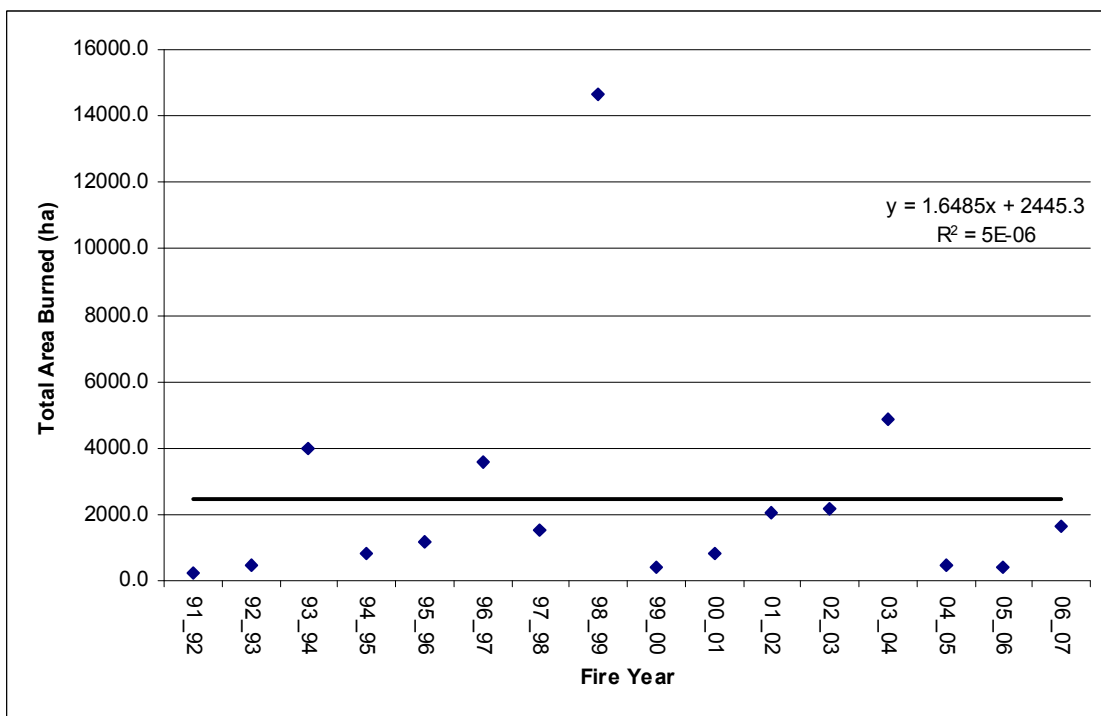


Figure O2. Otago total annual area burned from 1991/92 to 2006/07.

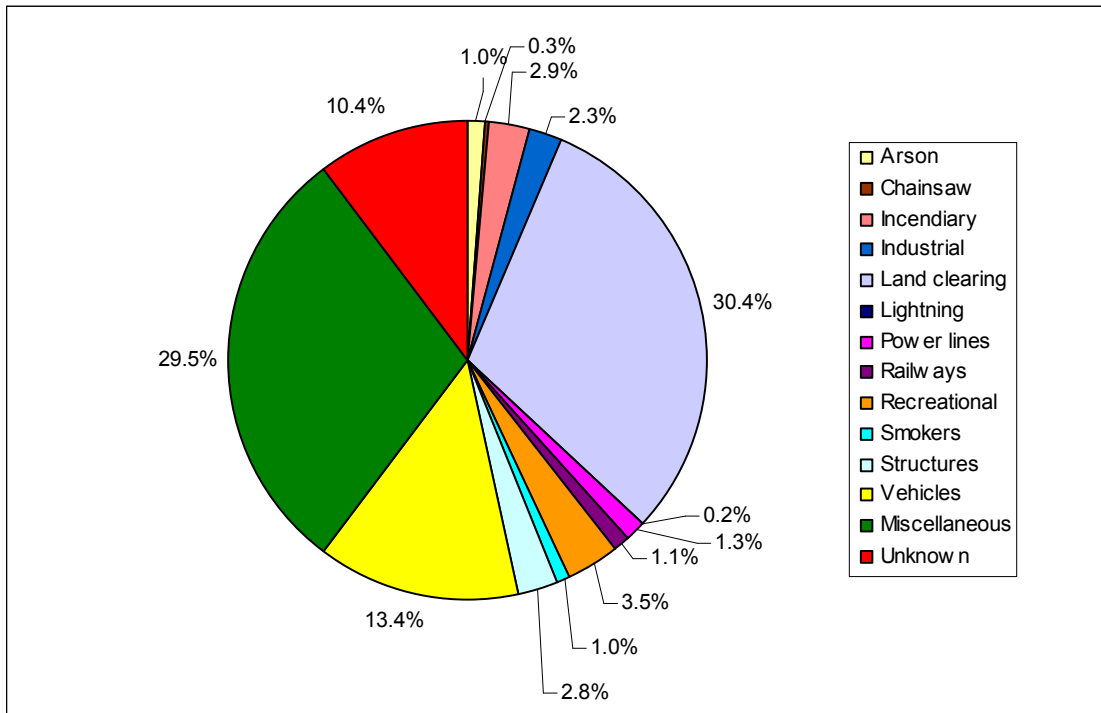


Figure O3. Otago average total number of fires by cause from 1991/92 to 2006/07.

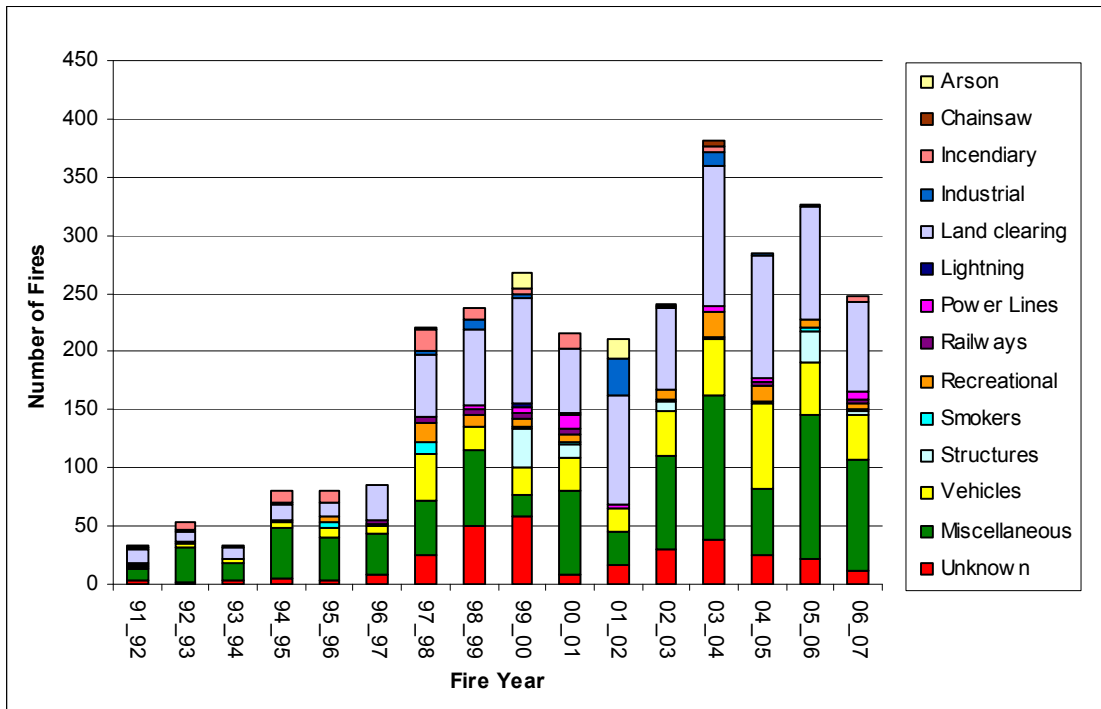


Figure O4. Otago total annual number of fires by cause from 1991/92 to 2006/07.

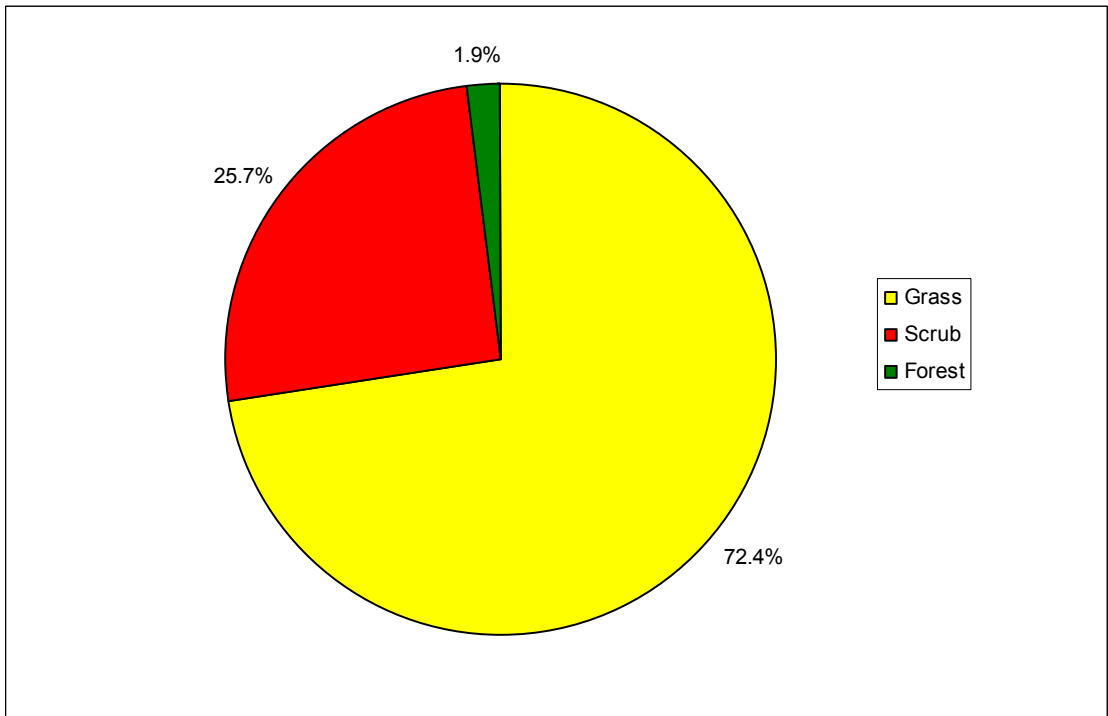


Figure O5. Otago total area burned by fuel type from 1991/92 to 2006/07.

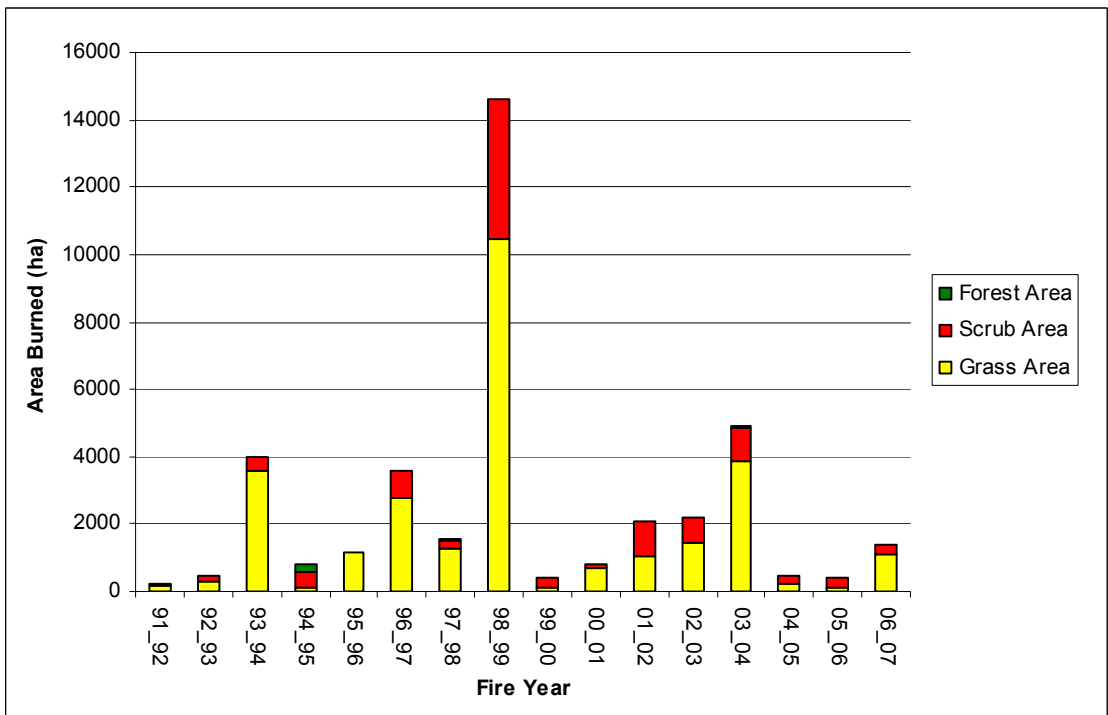


Figure O6. Otago total annual area burned by fuel type from 1991/92 to 2006/07.

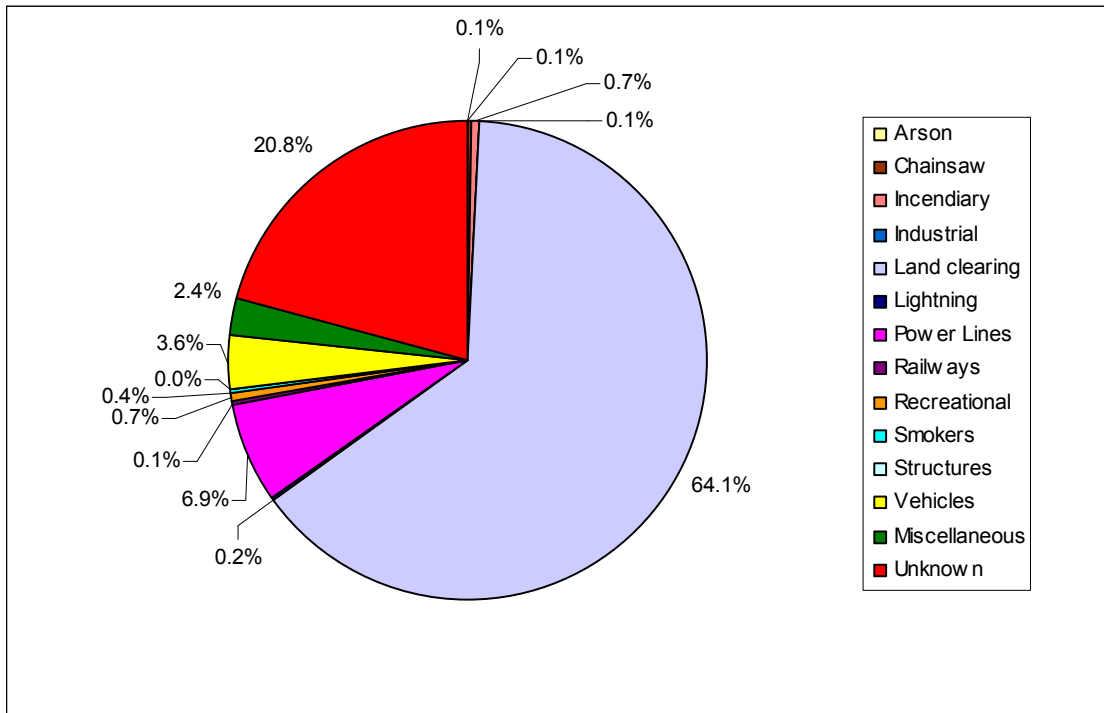


Figure O7. Otago average total area burned by cause from 1991/92 to 2006/07.

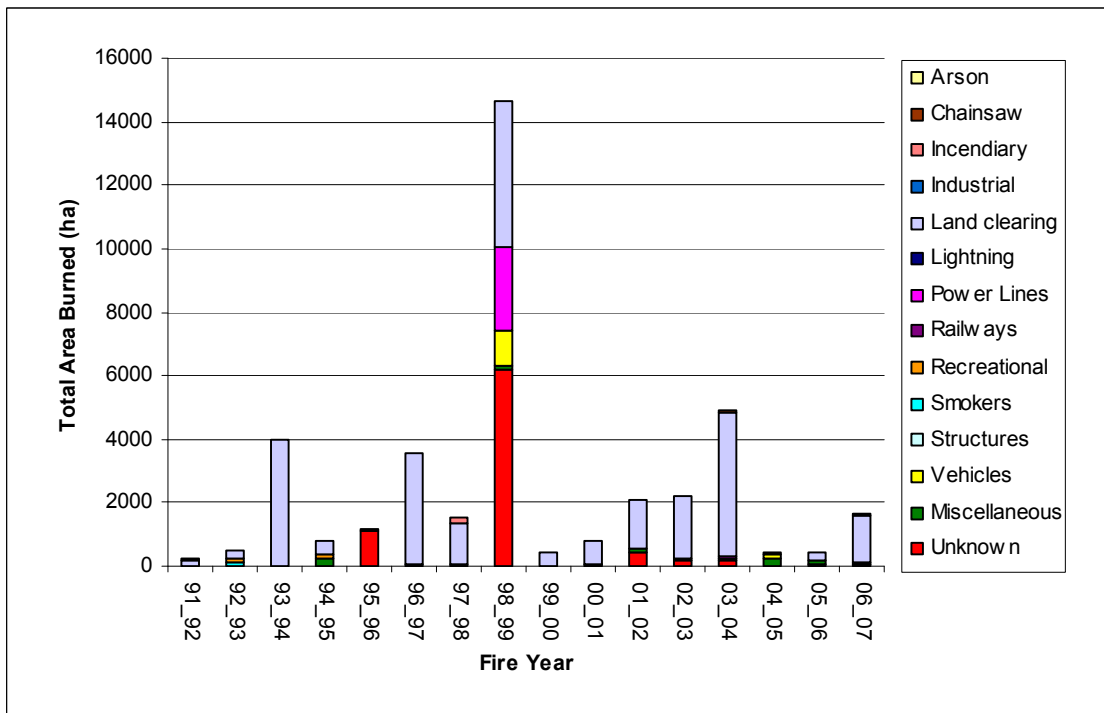


Figure O8. Otago total annual area burned by cause from 1991/92 to 2006/07.

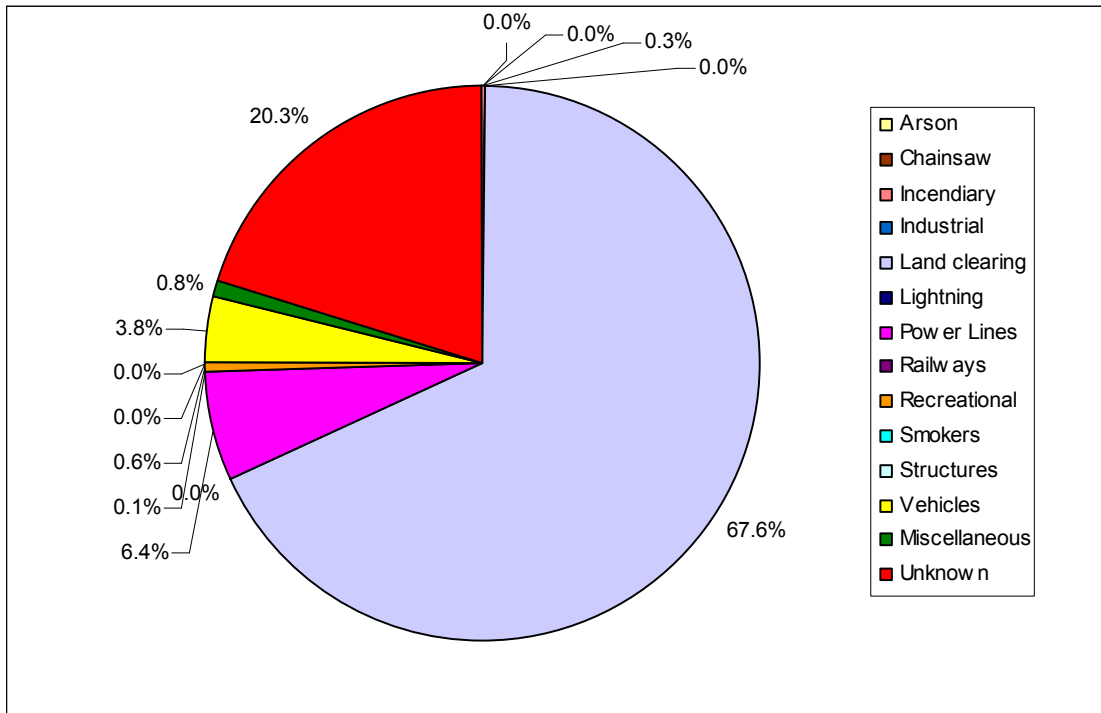


Figure O9. Otago average total grass area burned by cause from 1991/92 to 2006/07.

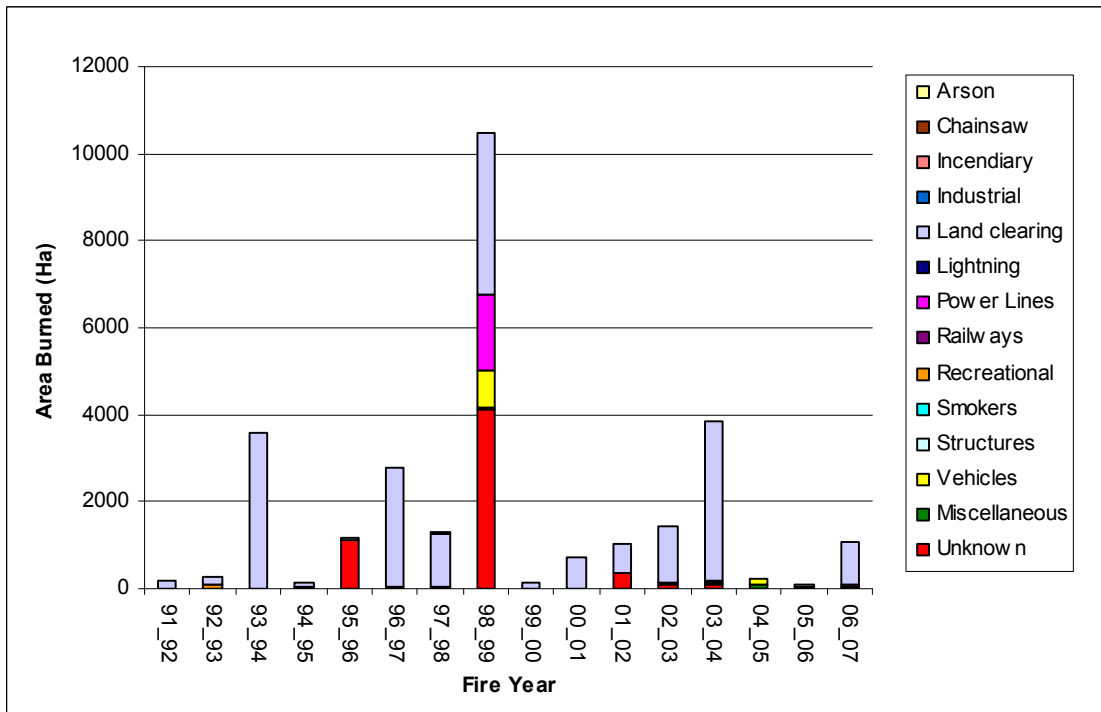


Figure O10. Otago total annual grass area burned by cause from 1991/92 to 2006/07.

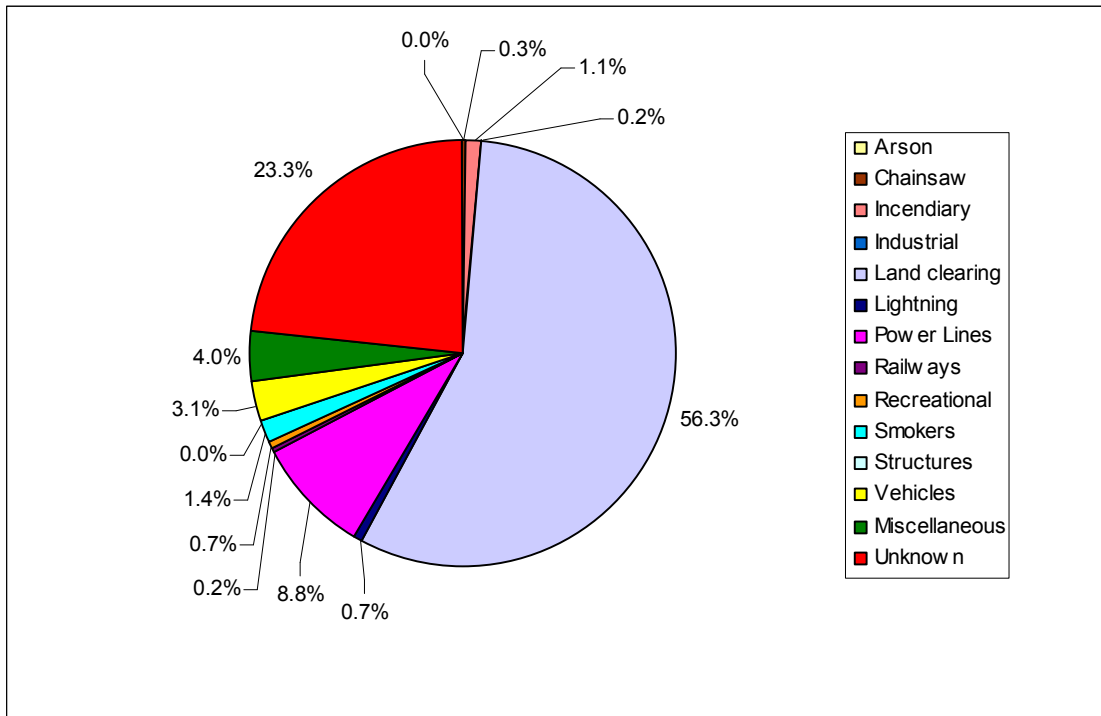


Figure O11. Otago average total scrub area burned by cause from 1991/92 to 2006/07.

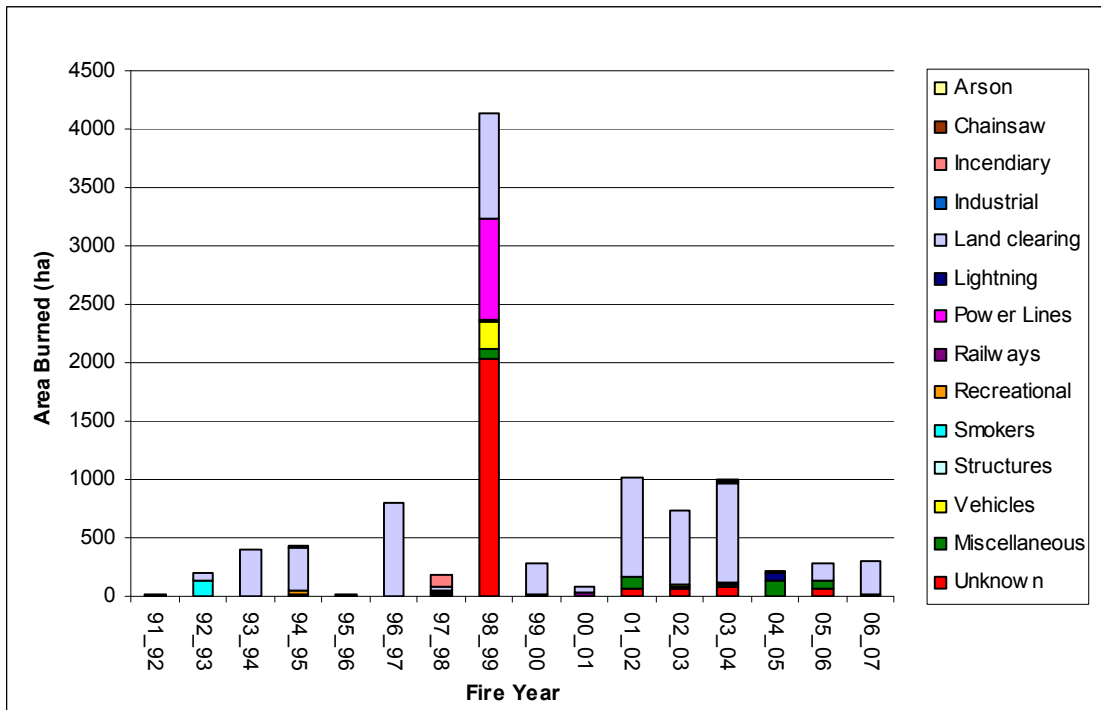


Figure O12. Otago total annual scrub area burned by cause from 1991/92 to 2006/07.

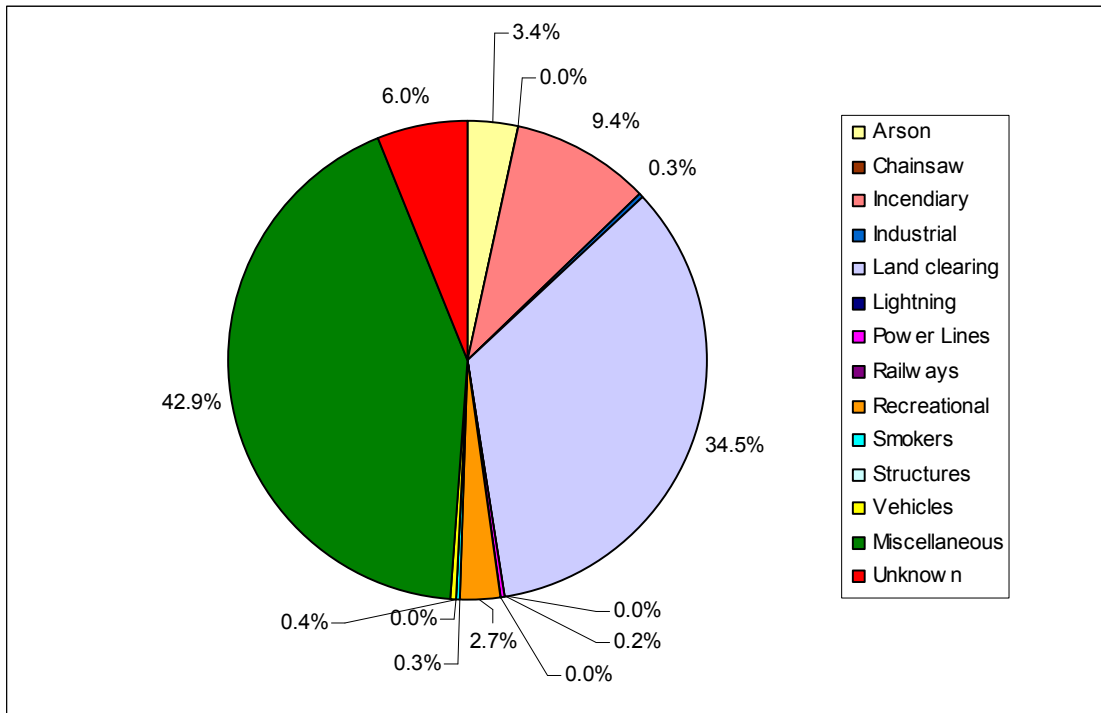


Figure O13. Otago average annual total forest area burned by cause from 1991/92 to 2006/07.

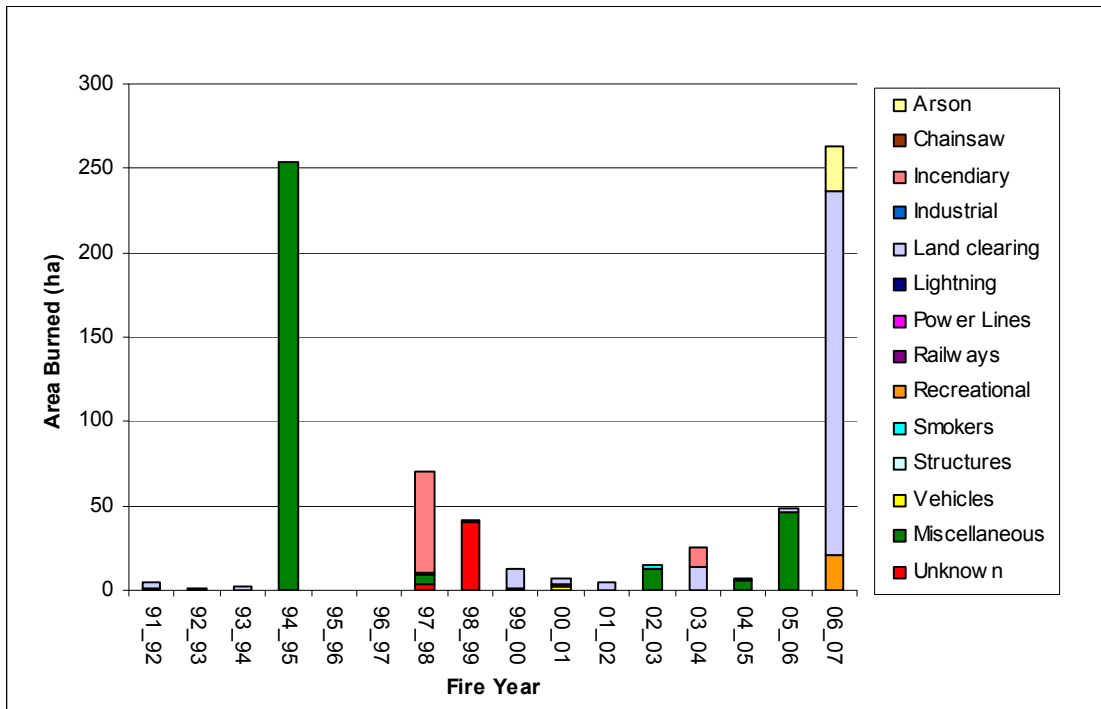


Figure O14. Otago total annual forest area burned by cause from 1991/92 to 2006/07.