Trends in deliberate vegetation fires in Australia: Implications for recording and preventing bushfires

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The size of the problem

Landscape fires reported by Australian fire agencies

Source: Australian Productivity Commission
Data Source

- Vegetation fire data
- Provided by 18 Australian fire and land management agencies
- Analysed over five-year period (approx.)

Definition: Vegetation fires

- Vegetation fires: all fires classified as a wildfire based on AIRS codes (type of incident code = 160 to 179)
- Equivalent to landscape fire - Australian productivity commission
- The type of incidents attended vary between agencies depending on their function, responsibilities and location
- The breakdown of responsibilities are not uniform between states
Definition: Deliberate

- Deliberate fires include all fires classified as:
  - incendiary (AIRS ignition factor code = 110 or 120)
  - suspicious (AIRS ignition factor code = 210 or 220) within the ignition factor variable.
- For agencies not using the AIRS database code it include fires classified as:
  - deliberate
  - malicious
  - mischievous
  - arson
  - illegal burn
  - Suspicious

Causes of vegetation fire in Australia

Based on recorded causes*

- 41.6% Accidental
- 20.0% Incendiary
- 8.7% Suspicious
- 21.5% Natural
- 36.3% Reignition/exposure

Based on assigned causes*

- 35.2% Accidental
- 5.4% Incendiary
- 3.9% Suspicious
- 50% Natural
- 13.3% Reignition/exposure

*weighted by agency and jurisdiction
Human activity and bushfires

• People are the primary cause of bushfires
• Natural fires only 6% of all fires (larger area)
• Many bushfires occur near a capital city
  • Not just a bush problem
  • Heavy involvement of urban brigades
• Preventing deliberate bushfires can lead to a substantial reduction in overall bushfires

Data difficulties

• The complexity of the AIRS database enables extraordinary flexibility; they are upsides and downsides
• Poorly structured database variables limits usefulness
• Fire incidents duplicated across and potentially within agencies
• Changes in database structure - internal inconsistencies
• Graduated introduction of data recording
• Insufficient information - bushfires, children, firesetter/arsonist, legal outcomes etc.
Inconsistencies in fire attribution data

- Fire cause attribution is often ambiguous
- Different agencies have different thresholds:
  - Unknown
  - Suspicious
  - Incendiary
- Rates of deliberate and unknown/suspicious vary between region, agency, state
- Also natural variation due to climate and vegetation
- Certain patterns consistent across datasets

Attributions for fire agencies in one state

- Urban-based fire service
  - 25.4% Accidental
  - 1.8% Incendiary
  - 46.6% Suspicious
  - 21.4% Natural
  - 1.5% Reignition/exposure
  - 0.5% Other

- Regionally-based fire service
  - 18.9% Accidental
  - 32.4% Incendiary
  - 6.8% Suspicious
  - 32.4% Natural
  - 9.9% Reignition/exposure
  - 0.5% Other

- Land management agency
  - 6.3% Accidental
  - 31.8% Incendiary
  - 24.4% Natural
  - 5.3% Reignition/exposure
  - 1.5% Other

- State (estimate)
  - 19.7% Accidental
  - 10.7% Incendiary
  - 4.6% Natural
  - 26.7% Reignition/exposure
  - 24.4% Other
  - 3.6% Unknown
Deliberate fires by district and agency

Attributes of Australian urban fire services
Some particular problems

- Fires lit by children
  - Recorded as either deliberate or child
  - No way to measure effectiveness of intervention
- Cigarette related bushfires
  - Inconsistencies in categorisation
  - Rural and urban variations
- Vehicle fires and bushfires
  - Bushfires caused by burned abandoned/stolen vehicles
  - Difficult to tell numbers from the data

Using the data to prevent bushfires

- Relationship between total and deliberate fires
  - Higher number of fires, higher number and proportion deliberate
- Some areas are arson ‘hotspots’
  - Large number of fires in a few areas
  - Account for a high proportion of fires in the region
  - Mostly small fires
- Targeted prevention strategies
  - Requires an understanding of local causes
Relationship between deliberate and total fires

Clustering of fires

No. of postcodes with greater than 100 vegetation fires (all causes) in five years
% of all deliberate fires in the region that occurred in this area
Total no. of fires
Bushfire arson prevention strategies

- Public education campaigns
- Targeted fuel reduction
- Illegal rural burns
- Discarded cigarettes
- Juvenile arson intervention programs
- General antisocial behaviour

Conclusions

- Substantial proportion of bushfires deliberate
  - Smaller, but more frequent
- Issues with current data collection
  - Within and between agencies and jurisdictions
  - Considerable ambiguity
- Targeted prevention of deliberate bushfires
  - Requires an understanding of the local problem
  - Good quality data essential