

# SMALL RURAL PROPERTY BUSHFIRE MITIGATION CHECKLIST

**Note this document is not a SA CFS publication. It was written by landholders who live in the Adelaide Hills with many years of experience as volunteer fire-fighters. We have endeavoured to make this checklist both simple and comprehensive. We offer it for your own private use without any liability for omissions or mistakes. If you need assistance, contact your local CFS brigade. The responsibility for fire mitigation on your property is yours. You are ultimately responsible for the survival of you and your family.**

**Mount Lofty fire danger season 1 December to 30 April. (may vary some years).**

## Facts

1	Burning embers can travel up to 25km, especially stringy barks
2	Double the fuel load increases fire intensity 4 times.
3	Half the fuel load reduces intensity by $\frac{1}{4}$ .
4	10 degree slope uphill doubles fire speed
5	20 degree slope uphill increases fire speed 4 times.
6	Double distance away reduces fire intensity by $\frac{1}{4}$ . (Inverse square law)
7	Flame height can be 3 to 5 times tree height
8	Wind exacerbates all fires, especially sudden gusts and changes in direction
9	A person completely covered (in non synthetics such as cotton or wool) and wearing leather boots is generally OK when the fire is more than (>) 4 times the flame height away

## Access

1	Entrance gate and drive (or track) at least 4m wide
2	Drive (or track) free of all over-hanging branches and electric wires below 4m
3	Drive (or track) has slope less than 10 degrees
4	Turnaround area available with minimum inner diameter 12m, outer diameter 20m
5	Surface compacted with gravel for 15 tonne vehicles
6	Any (but preferably none) plastic pipes near the track marked by indicator posts
7	Any (but preferably none) edge drop-offs near the track marked by indicator posts
8	Any (but preferably none) sharp culverts marked by indicator posts
9	No tight curves for clear vision ahead and reversing

## Vegetation (except Heritage Agreements)

1	Cleared all fuel from within 20m "asset protection zone" all around house, especially fine fuel such as leaves, grass and twigs less than 6mm diameter. This includes mulches, weeds, bark and piles of wood. (Except significant trees 625mm diameter measured 1m above ground)
2	Cleared fine fuel such as leaves, grass and twigs from any inward facing corners (re-entrant), dormer windows, roof valleys, around chimneys, around roof lights, around vent pipes of house.
3	Removed any branches over-hanging house or sheds
4	Pruned all branches below 2m above ground in 20m zone
5	Trees and shrubs have breaks in the canopy
6	All fuel cleared within 5m around sheds and any external structures
7	All fuel cleared within 5m inside boundary fence lines, essential for properties over 100ha
8	Removed leaves and debris from gutters
9	Removed flammable mulch from garden within 20m of house
10	Planted fire resistant deciduous vegetation-high water content, low oil content, high salt content, smooth barked, no branches touching ground on the north and west sides
11	Slashed or grazed all grassed open areas on entire property
12	Visited the web sites and read the publications listed at the end of this checklist
13	Read "Landscaping for bushfire: garden design and plant selection, 5764kB pdf file and Plant Selection Key, 482kB pdf file pdf file" on the Victorian CFA website.
14	Obtained advice from the CFS to remove vegetation to reduce fuel loadings by prescribed burning
15	Obtained advice from the CFS to create a "bushfire buffer zone" to reduce fuel outside the 20m zone around a house

# SMALL RURAL PROPERTY BUSHFIRE MITIGATION CHECKLIST

## Vegetation on Heritage Agreements (HA), in addition to non Heritage Agreements in above section

1	Obtained approval from the CFS to remove vegetation to upgrade or create a new fire access track. No Ministerial consent is required.
2	Obtained approval from the CFS Regional Fire Prevention Officer (refer to "Managing Native Vegetation, Reduce the Impact of Bushfire, Sept 2009, listed at the end of this checklist) to create a "bushfire buffer zone" to reduce fuel outside the 20m zone around a house. No Ministerial consent is required.
3	Applied to the Native Vegetation Committee (NVC) ph 8303 9777 and HA Officer ph 8463 4813 to arrange Ministerial consent before creating a new access track for non fire related purposes
4	Planted fire resistant deciduous vegetation-high water content, low oil content, high salt content, smooth barked, no branches touching ground, on the north and west sides in those areas excluded from the Heritage Agreement within 20m of house exclusion zone.
5	Slashed or grazed introduced grasses only where no native grass species are present and the area had been excluded from the HA. Ministerial consent is required for such treatment on HA land.

## Water

1	Read the article on water spraying systems from the FPAA listed at the end of this checklist
2	Filled tank (or dam or pond or swimming pool) with 20,000 litres of water
3	Fitted a large diameter gate valve to the bottom of the tank, ideally with a 65NB London fire male thread for CFS fire piping to connect
4	Installed one or more hose reels with enough 20NB rubber (or flat canvas) hose to reach all around the house (usually longer than 30m) with an adjustable nozzle on the end
5	Installed a 3.5kW (or larger) pump independent from mains electricity near the house in an easy to reach spot on a concrete base inside a fire resistant masonry or steel enclosure.
6	Installed perimeter sprinkler system on northern face of house (and any sides facing bush) with brass butterfly or impact drive sprinklers on top of 20NB galvanised steel pipe 3m into air.
7	Installed sprinklers at edge of eaves above windows and doors to create wall of spray (not required above brick or stone walls)
8	Constructed all piping and fittings of steel or copper if above ground.
9	Installed any plastic piping (PVC, polyethylene, polypropylene) deeper than 400mm underground
10	Serviced pump and engine annually
11	Filled pump engine full of fresh petrol or diesel annually
12	Charged engine batteries every month in fire season
13	Checked pump starts (with inlet & outlet valves open) every month in fire season.
14	Checked piping for leaks when pressurised with pump running.
15	Checked that all fittings on hoses and pumps are compatible.
16	Checked gaskets are fitted, joints are tight and do not leak
17	Checked sprinklers for blockages by insects, geckos etc.
18	Stored fire hoses with a cork or bung in the open ends to stop ingress of insects and geckos etc.
19	Family members familiar with fire fighting equipment, especially location and operation
20	Family members know how to operate valves (straight handles are open when handles are in line with, or parallel to, the pipe and circular handles are open by turning anti-clockwise from above)
21	Family members practiced with pumps (operation of pull cords, fuel on/off, choke, throttle, stop)
22	Installed a 500 litre water tank, pump and hose on a utility or tray-top or a trailer for mopping up
23	Placed a couple of 20 litre knapsack sprayers in easy to reach places
24	Placed about ten 10 to 20 litre steel buckets filled with water around the perimeter of the house for mopping up and dousing spot fires
25	Placed two or three 200 litre steel drums, filled with water throughout the fire season, with one or two empty 10 to 20 litre steel buckets attached to the rim of the 200 litre drum, around the perimeter of the house for mopping up and spot fires. Plastic wheelie bins are an alternative but move them into position before filling them.
26	Added washing up detergent to all containers of fire fighting water to improve wetting of surfaces

# SMALL RURAL PROPERTY BUSHFIRE MITIGATION CHECKLIST

## House

1	House and contents or farm fully insured
2	Taken digital photos of all rooms, cupboards, clothes, tools, computers, electronic equipment, vehicles, tractors, sheds for insurance verification and stored on a disc that is in turn stored in a safe place away from the house or uploaded to a remote server
3	House designed to AS 3959-2009, <i>Design of Buildings in Bushfire Prone Areas</i> .
4	House built with a low profile roof.
5	Fixed street number and rapid number in an easy to read location on the front gate
6	Constructed 2m high masonry (stone or brick) walls or steel fences around house, especially on the sides facing bush, especially facing north
7	Installed shutters on all windows facing bush, especially facing north
8	Filled any gaps in walls (left from scaffolding) or window to walls or door frames to walls with fire resistant mastics such as Nullifire M701 or Epoxanweld (or silicon as last resort) or glass wool or rock wool
9	Filled any gaps under doors with wetted towels or "snakes"
10	Check all sheets on a metal roof have been properly secured, preferably with screwed fasteners
11	Backed the gaps in roof tiles with fire resistant (e.g. fibre glass) sarking
12	Sealed the roof structure by filling any gaps in the ridge or vents or chimneys with glass wool or rock wool
13	Installed bronze or stainless steel fly wire over ventilation grates in walls, windows & roof
14	Installed metal mesh over openings in roofs – whirly birds, chimney openings etc.
15	Re-inforced any sky-lights with steel wire embedded in glass.
16	Replaced any PVC downpipes with galvanised steel.
17	Maintained a well cut green lawn around the house
18	Constructed hard paving (brick, pavers, gravel or concrete) immediately around house
19	Protected fascias and barge boards with fire retardant paint or encased in fibre cement board
20	Replaced any verandah or deck support wooden posts with steel posts
21	Protected external doors with "Crimsafe" stainless steel mesh doors etc.
22	Installed window sills with sloping brick sills.
23	Installed small 1kg pressurised dry powder extinguishers in easy-to-reach places in the garage, pantry, kitchen etc.
24	Installed a fire damper in the outlet duct from the evaporative air cooler.
25	Protected solar photovoltaic panels with welding blanket
26	Protected evaporative air cooler with a welding blanket
27	Moved a ladder inside to access the roof space
28	Purchased a fire blanket (available in various sizes, e.g. 1.8m by 1.8m) for dousing fires of fats and oils on stove tops in the kitchen
29	Installed an additional tap in the laundry with quick disconnect fitting or 20NB BSP fitting to attach a common plastic garden hose to fight any fire inside the house
30	Installed smoke alarms outside main bedroom and children's bedrooms
31	Installed new batteries and checked operation of smoke alarms every 12 months
32	Enclosed any open underfloor areas, external wooden stairways, walkways, decks or terraces, with steel shuttering, stone, brick, fibre cement board or Hebel brick.
33	Removed soot from flues and chimneys annually
34	Winter heaters kept at least 2m away from curtains and bedding
35	Fire screens placed in front of open fires in winter
36	Considered installation of a certified fire safety bunker.
37	Contacted the manufacturers of certified fire safety bunkers listed at the end of this checklist
38	Read "A Guide to retrofit your home for better protection from a bushfire", 2572kB pdf file on the Victorian CFA website.

## Vehicles

1	Enclosed all vehicles in garage or shed
2	Removed any flammable material such as chaff from the exhaust system especially near the catalytic converter
3	Placed in car prior to any fire ban day, a metal "space blanket" or large woollen blanket, bow saw, rake hoe and water bottles if planning to leave
4	Placed in car a small 1kg pressurised dry powder fire extinguisher (OK for electrical fire).

# SMALL RURAL PROPERTY BUSHFIRE MITIGATION CHECKLIST

## Fuel

1	Stored all paint, lawnmower petrol, BBQ 5kg and 9kg gas bottles etc. more than 20m away from house on the southern or eastern side in a steel or masonry shed
2	Kept any 200 litre drums of fuel with bungs tightly closed more than 20m away from house on the southern or eastern side in a steel or masonry shed
3	Installed diesel and/or petrol fuel tanks underground more than 30m away from house
4	Stored fire wood more than 20m away from house on the eastern side in a steel or masonry shed
5	Removed inflammable (coir, rubber and plastic) mats from front of doorways
6	Removed inflammable (plastic, cane and wood) garden furniture from outside of house
7	Removed any paper, boxes, crates and bales from outside of house
8	Mounted 45kg liquefied petroleum gas (LPG) bottles on concrete with relief valves pointing away from walls, doors and posts
9	Turned off valves on top of 45kg LPG bottles

## Machinery (tractors, slashers, power tools, grinders and welders)

1	Parked farm machinery in a shed or on a cleared or ploughed area after use
2	Checked the exhaust system for emission of sparks
3	Checked the exhaust system for any protrusion that may pick up long grass.
4	Removed any flammable material such as chaff from the exhaust system especially near the catalytic converter
5	Checked fuel lines and tanks for leaks
6	Checked for mechanical defects that may overheat (e.g. bearings) and cause a fire
7	Kept battery terminals and all electrical wiring clean and tight
8	Kept a long handled shovel, rake hoe, 20 litre knapsack, small 1kg pressurised dry powder fire extinguisher close by or easy to reach when mounted on machinery
9	Remembered to look behind when working on tractors and slashers for sparks from hitting rocks
10	Cleared a 4m space around area when grinding or oxy cutting or welding (electric and oxy) and also kept a long handled shovel, rake hoe, 20 litre knapsack, small 1kg pressurised dry powder fire extinguisher close by

## Large animals

1	Cleared a large paddock for farm animals to roam
2	Installed large trough with automatic supply of water

## Pets

1	Thought about and written a plan for pets
2	Dogs and cats are registered with the council to assist if they get separated
3	Provided a dark cage or bag for cats, rabbits and guinea pigs
4	Remembered food, water (including bowls) and medication for pets
5	Kept collars, leads, muzzles and harnesses handy
6	Have burn cream "Silvazeen" (similar to "Burnaid" refer above) available for burnt animals

## Personal

1	Family members mentally prepared for the bushfire season
2	Family members mentally and physically prepared for a fire onslaught
3	Family members understand three bushfire messages. 1: <i>advice</i> 2: <i>watch</i> and <i>act</i> 3: <i>emergency</i>
4	Family discussed staying and defending the house or leaving early
5	Family familiar with fire danger ratings, especially severe, extreme and catastrophic
6	Survival plan thought about, written, practiced and visibly located
7	Family members aware of fire survival pack whereabouts and contents
8	Family members familiar with fire fighting equipment, especially location and operation
9	Family members know how to operate valves (circular handles are opened by turning anti-clockwise from above, straight handles opened when handles are in line or parallel with the pipe)
10	Family members practiced their pumps (operation of pull cords, fuel on/off, choke, throttle, stop)
11	Family members know the location of a refuge of last resort (shopping centre, oval, school).
12	Considered a safe route to travel to the refuge of last resort in case of evacuation
13	Surprised the household (including neighbours and visitors) to practice the survival plan.
14	Prepared a list of contact details and placed by telephone(s) in the house, including fire, police, ambulance, doctor, school, neighbours and relatives

# SMALL RURAL PROPERTY BUSHFIRE MITIGATION CHECKLIST

## Survival Pack

1	Bushfire survival plan (for more information refer to the CFS website-see below)
2	Emergency contact list as in 14 above
3	Special needs for infants, elderly, injured or disabled
4	Protective clothing for every family member stored in one easily accessible place- see below
5	Woollen blankets, at least one for every person
6	First aid kit with manual and essential medications including a tube of "Burnaid".
7	Toiletries and sanitary supplies
8	Sufficient food for at least 72 hours
9	Can opener
10	Some dry concentrated high energy food (muesli bars, biscuits, nuts etc)
11	Sufficient bottles of water for each family member, 3 litres per person per day
12	Torch for each family member
13	Change of clothes
14	Children's toys, including special favourite toys for young children
15	Battery powered radio in pack pre tuned to AM891 with spare set of batteries
16	Valuables (house title deeds, insurance papers, videos, jewellery and photos) stored in one easily accessible safe place
17	A 1.8m by 1.8m fire blanket (for wrapping someone whose clothes have caught fire)
18	Mobile phone with charger and/or spare battery
19	Tablet computer (e.g. iPad) for internet updates from CFS website.
20	Camera
21	A small 1kg pressurised dry powder extinguisher
22	Wallet with cash (\$20 to \$100), credit cards etc.

## Protective Clothing

1	Clothes made from natural fabrics: cotton, denim or woollen. (Synthetics can burn). <i>No bare flesh</i>
2	Long sleeved shirt
3	Heavy cotton pants or overalls
4	Broad brimmed woollen or cotton hat
5	Close fitting goggles protect against smoke and embers (better than wrap around sun glasses)
6	Work (e.g made from leather) gloves
7	Smoke mask (best) or tea towel etc.
8	Sturdy leather boots with woollen socks

## First Aid

1	Family members undergone first aid training
2	Know how to extinguish someone's burning clothes: Stop moving, Cover, Drop, Roll
3	Know how to hold burnt areas under cool running water for about 20 minutes
4	Know how to cover a burn with "Cling Wrap" (not on face)
5	Know <b>not</b> to prick any blisters, apply lotions (except "Burn Aid"), remove clothing, or cover burns with towels, cotton wool or blankets

## Neighbours

1	Circulated to all neighbours in street a fire contact list with names, hard line and mobile phone numbers and names of children
2	Familiarised yourself with neighbour's fire fighting equipment
3	Considered sharing fire fighting equipment with neighbours

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## ***References and further information:***

***Contact the CFS on the bushfire hotline 1300 362 361 or your local CFS station for assistance  
CFS web site [www.cfs.sa.gov.au](http://www.cfs.sa.gov.au). (Contains about 50 fact sheets, e.g. no.1.1, "Prepare. Act. Survive", 4.7, "Creating an asset protection zone" and 4.13,"Burning Off",9.1,"Campfires and BBQs")  
CFS DVD: "Prepare. Act. Survive" (a personal guide to creating your bushfire survival plan)  
CFS printed publication: "Your Guide to Bushfire Safety. Prepare. Act. Survive", 2014-15  
CFS printed publication: "Reduce the Impact of Bushfire", Sept 2009  
(32 pages of managing native vegetation, endorsed by Native Vegetation Council)***

***Victorian Country Fire web site [www.cfa.vic.gov.au](http://www.cfa.vic.gov.au) (a comprehensive site with information applicable for SA. Note the 67 recommendations from the Victorian Royal Commission's enquiry into the 7 Feb 2009 Victorian fires. Note "A Guide to retrofit your home for better protection from a bushfire", 2572kB pdf file. Note the "Landscaping for bushfire:garden design and plant selection, 5764kB pdf file and Plant Selection Key, 482kB pdf file)***

***NSW Rural Fire Service web site [www.rfs.nsw.gov.au](http://www.rfs.nsw.gov.au) (good site with information applicable for SA)  
NSW RFS publication: "Planning for Bushfire Protection-A Guide for Councils, Fire Authorities, Developers and Home Owners", 2001***

***Tasmania Fire and Emergency Services web site [www.fire.tas.gov.au](http://www.fire.tas.gov.au)***

***Western Australia Fire and Emergency Services web site [www.fesa.wa.gov.au](http://www.fesa.wa.gov.au)***

***Adelaide Hills Council web site [www.ahc.sa.gov.au](http://www.ahc.sa.gov.au)  
AHC publication "Guideline Brochure for Bushfire Mitigation on Private Holdings in the Adelaide hills Council", November 2009 (a comprehensive guide with clear colour photos for different categories of properties larger than 0.5ha: orchards, native bush, bushland residential, forestry etc.)***

***Burnside Council web site [www.burnside.sa.gov.au](http://www.burnside.sa.gov.au)***

***Native Vegetation Council web site at [www.nvc.sa.gov.au](http://www.nvc.sa.gov.au)  
NVC publication: "A Guide to the Regulations under the Native Vegetation Act", Sept 2009  
(recommendations and legislation about clearing vegetation)***

***"Overall Fuel Hazard Guide for South Australia"by SA Department of Water, Environment and Heritage, April 2006 (for assessing hazards for fire management of prescribed burns)***

***"The complete bushfire safety book" by Joan Webster, Random House, 2000 (comprehensive) and  
"Essential bushfire safety tips" by Joan Webster, CSIRO Publishing, 2008 (over 2000 tips).***

***AS 3959-2009, Design of Buildings in Bushfire Prone Areas (details required for a new building)***

***AS HB330-2009 "Living in Bushfire-prone areas" (it is a background book to AS 3959 and covers a clear concise easy-to-read handbook with photographs, diagrams and check lists in 70 pages )***

***Australian Building Codes Board (ABCB) "Performance Standard for Private bushfire Shelters 2010-part 1" can be downloaded from [www.abcb.gov.au](http://www.abcb.gov.au) (100 pages)***

***Wildfire Safety Bunkers, [www.wildfiresafetybunkers.com.au](http://www.wildfiresafetybunkers.com.au) and [www.firesheltersaustralia.com.au](http://www.firesheltersaustralia.com.au)***

***Fire Protection Association Australia (FPAA) website [www.fpaa.com.au](http://www.fpaa.com.au)  
"External Water Spray Systems to Aid Building Protection from Wildfire" by FPAA, 2000  
(50 pages of design details for sprinkler systems)***

***"Adelaide, Nature of a City" chapt. 18, 4 authors, by Bio City, 2005  
(Fire and biodiversity for conservation management in small areas)***

***"An Introduction to Fire Dynamics" by D. Drysdale, 2<sup>nd</sup> edition, by John Wiley and Sons, 1999***

***"Fire and Australian Biota" by N.P. Cheney, Australian Academy of Science, 1981***