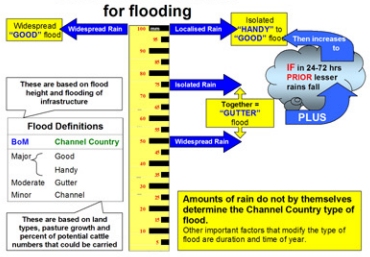
Cooper Creek Catchment Flood Rules of Thumb

How to use this guide:

This guide has used the best information available at present. It is intended to help you assess what type of flood is likely to occur in your area and maybe even indicate what amount of feed you might expect. You may wish to record your own flooding guides on the map. You can add more value to this guide by participating in an MLA EDGEnetwork Grazing Land Management (GLM) training package. GLM training helps you identify land types and flood zones and to develop a grazing management plan for your property

Amount of rain needed for flooding



Channel Country Flood descriptions

Flood type	Description	Land systems flooded	Hydrology	Pasture growth which supports:
Good	Good floods are similar to handy floods, but cover a much higher proportion of the floodplain (75% or more) and grow more feed per area than a handy flood.	C1, C3, C2	Flooded across most of floodplains 80-100% inundation	85 - 100% of potential cattle numbers
Handy (or useful)	Handy floods occur when the water escapes from the gutters, connecting up to form the large sheets of water. It can cover up to 50% of the floodplain. There is a large pasture response from these floods but yield and area is less than a good flood.	C1, C3	Pushing out of gutters across floodplain and into swamps and depressions 50-60% inundated	45 - 85% of potential cattle numbers
Gutter	Gutter floods occur when the water escapes from the main channels and spills over to the many small waterways (gutters) that flow from the main channels. These floods promote growth of a good body of herbage and grasses along the gutters.	C1	Pushing out of channels into gutters 5-15% inundated	5 - 25% of potential cattle numbers
Channel	The major channels run and water just spills over banks but does not escape to the surrounding floodplain. Limited feed grows along margins of major channels.	C1, limited to channel margins	Major channels breaking banks <5% inundated	5 - 15% of potential cattle numbers

What are the Channel Country floodplain land types?

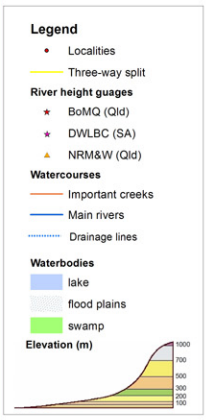
C1: Frequently flooded alluvial plains with braided channels, often with deep and fast moving water in major channels.

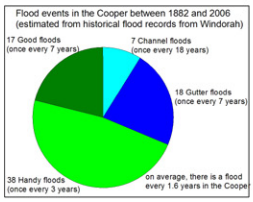
C2: Occasionally flooded, flat alluvial plains, generally with shallow and slow moving water. This land zone is usually the furthest from the major channels, but includes higher areas of floodplains.

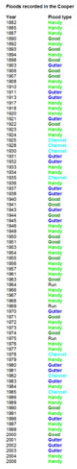
C3: Poorly drained swamps and depressions on alluvial plains of intermittent flooding frequency, with variable water speed and depth, generally associated with the outer lying channels.

Estimated Summer Flood Pasture Growth in the Channel Country Floodplains.

Flood type	Frequently flooded plains (C1) (kg DM/ha of useful feed)	Occasionally flooded plains (C2) (kg DM/ha of useful feed)	Swamps and depressions (C3) (kg DM/ha of useful feed)
Good	1200-2500	1500-3500	4500-8000
Handy	750-1500	100-250	3500-6500
Gutter	400-1200	No growth	2000-4500
Channel	250-750	No growth	1200-2500







"How Often" are FLOOD rains received?

Proportion (%) of years that rainfall is at least 100 mm in 24 hrs	Proportion (%) of years that rainfall is at least 75 mm in 24 hrs	Location
19	42	Muttaburra
16	28	Aramac
12	30	Camoola Park

"How Often" are FLOOD rains received?

Proportion (%) of years that rainfall is at least 100 mm in 24 hrs	Proportion (%) of years that rainfall is at least 75 mm in 24 hrs	Location
14	36	Longreach
5	16	Tocal
		Stonehenge

"How Often" are FLOOD rains received?

Proportion (%) of years that rainfall is at least 100 mm in 24 hrs	Proportion (%) of years that rainfall is at least 75 mm in 24 hrs	Location
6	14	Opalton
11	25	Morella
		Maneroo

"How Often" are FLOOD rains received?

Proportion (%) of years that rainfall is at least 100 mm in 24 hrs	Proportion (%) of years that rainfall is at least 75 mm in 24 hrs	Location
9	37	Prairie
15	39	Torrens Creek
7	20	Lake Galilee
		Tangorin

The Thomson River catchment has large areas of Mitchell grass clay plains, which need a lot of rain to run enough water for a flood

The top part of the catchment is the desert uplands. There is a lot of sandy spinifex and rocky outcrop country which only needs a few inches (>50 mm) of rain before to runoff water. Twenty inches of rain (500mm) up there will produce a huge flood at Stonehenge. There will still be a reasonable flood there if there are widespread smaller falls of rain

Lake Buchanan (left) and Lake Dunn (right) are ephemeral lakes which rarely contribute water to the Cooper system

A useful reference point is the old bridge at Longreach. Local radio programs often announce when the old bridge goes under. This happens when the river level reaches about 7 foot (2.2 m)

If the water is over the old bridge at Longreach, and backed up to Muttaburra, then stock movements need to be planned

The 2006 flood at Longreach was moderate in size, peaking at 16.4 feet (5 m), partly covering the 16 km wide floodplains. A handy flood resulted in the Cooper

"How Often" are FLOOD rains received?

Proportion (%) of years that rainfall is at least 100 mm in 24 hrs	Proportion (%) of years that rainfall is at least 75 mm in 24 hrs	Location
13	37	Barcaldine
12	37	Jericho

"How Often" are FLOOD rains received?

Proportion (%) of years that rainfall is at least 100 mm in 24 hrs	Proportion (%) of years that rainfall is at least 75 mm in 24 hrs	Location
3	14	Isisford
14	34	Yaraka
9	19	Retreat

"How Often" are FLOOD rains received?

Proportion (%) of years that rainfall is at least 100 mm in 24 hrs	Proportion (%) of years that rainfall is at least 75 mm in 24 hrs	Location
16	26	Yalleroi
15	38	Blackall
7	25	Tambo

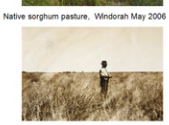
"How Often" are USEFUL rains received?

Proportion (%) of years that rainfall is at least 50 mm in 24 hrs	Proportion (%) of years that rainfall is at least 25 mm in 24 hrs	Location
42	89	Windorah
21	72	South Galway
31	80	Tanbar
52	96	Durham Downs

"How Often" are USEFUL rains received?

Proportion (%) of years that rainfall is at least 50 mm in 24 hrs	Proportion (%) of years that rainfall is at least 25 mm in 24 hrs	Location
23	68	Nappa Merrie
26	65	Innamincka
		Nocundra

Native sorghum pasture, Windorah May 2006



Native sorghum, pepper grass and bluebush pasture, Windorah circa 1947

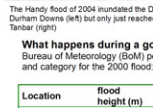
Gutters (or reticulate channels) help distribute floodwaters out from the main channels

Large and moderate sized channels distribute the water during initial flooding

Cow vine and other herbages often dominate occasionally flooded plains following summer floods in the Channel Country

Good feed, such as that pictured above, is made even better when local rains follow flooding. Rains alone grow little, if any, feed because the heavy clay soils of the Channel Country are so thirsty

Handy floods reach the beach on Mayfield

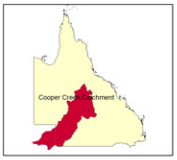


The Handy flood of 2004 inundated the DPI&F frequently flooded bluebush site on Durham Downs (left) but only just reached the occasionally flooded plains site on Tanbar (right)

All the streams that drain to the south-east away from Windorah drain steep and rocky country. They contribute a lot of flow to the Thomson River but their floods are short lived

North of Windorah looking south at the town channel

Looking west along the three-way split



What happens during a good flood?

Bureau of Meteorology (BoM) peak flood heights, durations and category for the 2000 flood:

Location	flood height (m)		flood duration
Muttaburra	8.1	Major	20 February – 9 March 2000
Camoola Park	7.4	Major	17 February – 13 March 2000
Longreach	5.6	Major	15 February – 16 March 2000
Stonehenge	6.4	Major	16 February – 24 March 2000
Jundah	7.9	Major	19 February – 26 March 2000
Blackall	1.8	Minor	17 February - 18 February 2000
Isisford	3.1	Minor	16 February – 14 May 2000
Retreat	5.2	Major	21 February – 3 March 2000
Windorah	7.4	Major	23 February – 26 March 2000
Nappa Merrie	4.9	Major	30 March – 24 May 2000

When do flood heights get reported?

BoM flood height levels for gauging stations in the Cooper Creek system.

Station	First Report Height	Crossing Height	Minor Flood Level	Moderate Flood Level	Major Flood Level
Muttaburra	3.0	4.0 (B)	3.0	5.0	7.0
Aramac	1.3	1.8 (B)	1.5	2.0	5.0
Camoola Park	1.0	0.4 (X)	2.0	4.0	6.7
Longreach	1.0	2.2 (OB)	2.0	3.0	4.0
Bogewong	0.3	3.1 (B)	2.0	4.0	6.0
Stonehenge	0.5	1.6 (A)	2.0	3.0	5.0
Jundah	1.0	3.7 (A)	2.5	4.0	5.0
Tambo	2.5	2.9 (B)	3.0	5.1	5.9
Gillespie	3.5	6.4 (B)	4.0	7.0	7.5
Duneira	1.0	1.4 (B)	2.0	3.0	3.5
Blackall	1.0	2.8 (B)	2.0	4.0	5.0
Glencoe	1.0	1.0 (X)	2.0	2.5	3.0
Jericho	1.8	2.3 (B)	2.0	2.3	3.0
Barcaldine	2.0	5.6 (B)	3.0	5.0	6.0
Isisford	2.0	4.0 (B)	4.0	5.0(d/s)	6.0(d/s)
Retreat	2.0	1.7 (C)	3.0	4.0	5.0
Windorah	3.0	4.3 (A)	3.0	4.0	5.0
Nappa Merrie	1.5	8.0 (B)	3.0	6.0	9.0

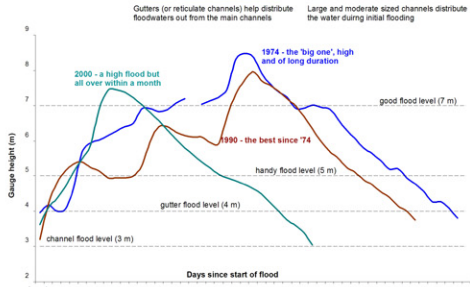
All heights are in metres on flood gauges. (B) = Bridge (OB) = Old bridge (A) = Approaches (C) = Causeway (X) = Crossing (d/s) = Downstream

Some major floods of the past

BoM peak flood heights at gauging stations in the Cooper Creek system.

	Mar 1971	Jan 1974	Apr 1990	Feb 1991	Feb 1997	Feb/Mar 2000
Muttaburra	4.19	7.80	7.15	6.65	4.50	8.10
Camoola Park	2.84	7.16	6.80	5.52		7.42
Longreach	1.97	5.47	5.04	4.38	3.60	5.62
Bogewong		8.64	7.90	6.60	5.65	8.40
Stonehenge	5.94	6.88	5.86	4.70	3.50	6.42
Jundah	7.54	8.38	7.55	6.48	4.95	7.85
Blackall			7.30		6.15	
Isisford		6.83	9.20	4.25	8.05	
Retreat			12.05	6.55	9.45	
Windorah	7.65	8.48	7.95	6.70	5.87	7.45
Durham Downs		4.40	4.16	2.15	2.80	3.65
Karmona			5.38	4.29	4.05	
Nappa Merrie	5.91	10.13	9.38	3.20	2.51	5.10

All heights are in metres on flood gauges.



The 1974 flood was the biggest on record for most of eastern Australia. In the Cooper Creek, 1990 and 2000 were other major, or good, floods. These graphs provide a useful comparison of the flood height and duration of these important floods at Windorah. Most of the major floods have resulted from monsoonal rain activity moving further south than usual and generally coincide with positive SOI years

Handy floods cover 50 - 60% of the floodplain

Below minor floods do not break the banks e.g. the Cooper Creek bridge at Windorah with a 7.2 feet (2.2 m) flood in 1996 - minor flood level is 9.8 feet (3 m)

For more information, queries or corrections, please contact Longreach DPI&F
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Data source: (Geoscience Australia) 2002. (C) Copyright Commonwealth of Australia.
Bureau of Meteorology (Qld)
Text sourced from interviews conducted by the Sustainable Grazing of the Channel Country Floodplains project team and
ARIDFLO - report to the community, DWLBC,2004
1:1,500,000 at AO size
Digital Terrain Model supplied by, Desert Channels Queensland.
Map Authors: David Phelps, Ben Lynes, Kirsten Forrest, Peter 'Pedro' Connelly & Darrell 'Dazza' Horrocks September 2006

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General Information

Flood height information

Flood speed information

Creek and river junctions like the Gin or Vergemont & the Thomson can hold up the main flow if the smaller creeks come in first. This backs up the main flood and spreads it out further

Where floods occur in succession the second flood will travel more slowly due to vegetation grown from the first flood. The second flood will often flow clearer, because of the vegetation filtering more sediment out and slowing water flow

The creek lines in the lower Cooper area have changed and there is a lot more vegetation in them than there was 40 years ago

Water in the main channel of the Cooper is fast moving. Local rain will make a flood travel faster

The Longreach river height guaging station does not record all water in the upper catchment. There is a lot of hard country that drains south-east from Winton into the Darr River, Vergemont Creek and others and then into the Thomson downstream of Longreach.
These probably contribute about 30% extra flow compared to what is measured at Longreach

Start watching for a flood with reports of 2 - 4 inches (50 - 100 mm) generalised rain around Muttaburra, Torrens Creek and Aramac

It is useful to track the flood from Muttaburra onwards

Vergemont & Maneroo Creeks & the Darr River can contribute a lot of water to the Thomson. If the flow, the Thomson can bottleneck at Stonehenge; water backs up and spreads out further

8-10 inches (100-150mm) of rain at Stonehenge will produce a small, fast flood (a 'splash flood') which covers the high country first but runs out of steam by the bottom end of Tanbar

A quick 2 inches (50 mm) of rain will run Vergemont Creek. At first it runs red but with big rains it will run clear. The Vergemont area has tighter alluvial soils and grows good grass cover with some herbage. The Thomson area nearby mainly grows herbage

If 6 - 8 inches (150 - 200 mm) fall during the afternoon and into the night, the Vergemont would be 3 miles (4.8 km) wide but would drop off unless there is more rain, then it might last 5 - 6 days

Normally floods take about 4 days to come from Longreach to Rosabel. It usually takes another couple of days for the flood to then get to Bogewong. It takes about a day for flows to get from Bogewong to Noonbah

In the Bogewong to Noonbah stretch of the river it takes about a 10 to 12 foot (3 to 3.6 m) flood for it to spill out of the channels and across the floodplains.

The Thomson has a fairly steep gradient from Longreach to Stonehenge and flows can take anywhere from only 2 days or up to 5 days to travel that distance.

Floods normally take 14 days to flow from Longreach to Windorah. A flood peak only takes about 3 days from Jundah to Windorah

The flood needs to be 9 foot (2.7 m) at Windorah to flow west over the 'hump' in the town channel

The western water will flow back into the main channel when the water drops below 9 foot (2.7 m) - localised around the 3-way split

The western side of the Cooper is very slow to move and flood out - it takes about 3 weeks for the water to get from the 3-way split (just below Windorah) to Towans waterhole (on South Galway)

The Barcoo runs faster than the Thomson

A big flood in the Barcoo is 16 foot (4.9 m) at the Isisford bridge, a major flood is 20 foot (6.1 m)

The best floods in the Cooper come when both the Thomson and the Barcoo hit at the same time

A big flood in the Barcoo can push the Thomson water to the west

Water in the Barcoo runs fast but slows down and spreads out on the eastern side of the Cooper at Windorah

If the eastern side of the Cooper gets going first, i.e. flooding in the Kyabra and Keeroongooloo Creek systems, the Thomson and Barcoo water will be held up. This will push the flood water further west and create a handy to good flood for Mayfield, South Galway and Tanbar

Water on the eastern side of the Cooper is relatively fast moving as channels are generally smaller and the plains are current swept; it grows less feed as a result

The 1963 flood was bigger than the 1974 flood for the eastern side of the Cooper

18 foot (5.5 m) at Windorah equals 9 foot (2.7 m) at Durham Downs, and will give a good flood at Baryoola

A flood of about 24 feet (7.3 m) for at least 3 weeks at Windorah will produce a 12 foot (3.6 m) flood at Durham Downs causeway, and then a 24 foot (7.3 m) flood at the Innamincka causeway

At Durham Downs causeway

8 foot (2.4 m) flood = 8 miles (12.9 km) wide, but only in channels (Channel Flood)
9 foot (2.7 m) flood = 9 miles (14.5 km) wide, spilling out of channels (Gutter Flood)
10 foot (3.0 m) flood = 12 miles (19.3 km) wide
12 foot (3.6 m) flood = 12 miles (19.3 km) wide, but deeper (Handy Flood)
15 feet 4.6 m) flood = 18 miles (29 km) wide (Good Flood)

For the Cooper to reach Lake Eyre, the flood needs to be 14 feet (4.3 m) for at least 3 months at the causeway near the Durham Downs house.

Floods take approximately 3 weeks to flow from Windorah to Innamincka

'Dry Floods' are when the river floods from rain that falls upstream only and there is no local rain. It usually takes about 5 to 7 days for a 'dry flood' to travel from Jundah to Windorah. A 'dry flood' takes about six weeks to go from Windorah to Innamincka

Creek and river junctions like the Gin or Vergemont & the Thomson can hold up the main flow if the smaller creeks come in first. This backs up the main flood and spreads it out further

Where floods occur in succession the second flood will travel more slowly due to vegetation grown from the first flood. The second flood will often flow clearer, because of the vegetation filtering more sediment out and slowing water flow

The creek lines in the lower Cooper area have changed and there is a lot more vegetation in them than there was 40 years ago

Water in the main channel of the Cooper is fast moving. Local rain will make a flood travel faster

General Catchment Area
Mostly isolated or local flooding

General Flood Plains
extensive flooding including isolated or localised flooding in some areas

You need the water to hold up at a decent (guage) height for a good flood. This helps water more country and grow more feed.

Little floods make big floods.
The little floods fill up the waterholes and wet the catchment and allow the next one to go further.

Can it flood during droughts?

Yes. There were handy floods during the droughts of the 1920s and 1960s and the river still ran during the 2001-05 drought.

The biggest floods come when a monsoonal trough moves further south than usual, like during the big wet years of the 1940s, 1950s, 1970s and early 1990s

In 1950/51 there were big flows in the Cooper. This was the first flow for 27 years past the sand hills, which blocked the channels upstream of Kopperamanna in the 1930s

Of the Floodplains immediately south of Windorah: the eastern side needs a bigger flood to get across the floodplain there because of the deeper channels, compared to the western side. The eastern side of the floodplain only stays flooded for about half as long as the western side from the same flood at Windorah

A BoM Moderate to Major flood is needed to reach Coongie Lakes

Floods usually take 3 months to flow from Innamincka to Lake Eyre

The Cooper needs to be 21 feet (6.4 m) over the causeway at Innamincka for 6 weeks to flows into Lake Eyre. If it is 19 feet (5.8 m) there will be a flow as far as the Birdsville Track

The Cooper flood waters do not reach Lake Eyre very often; they only contribute about 15% of water into the Lake