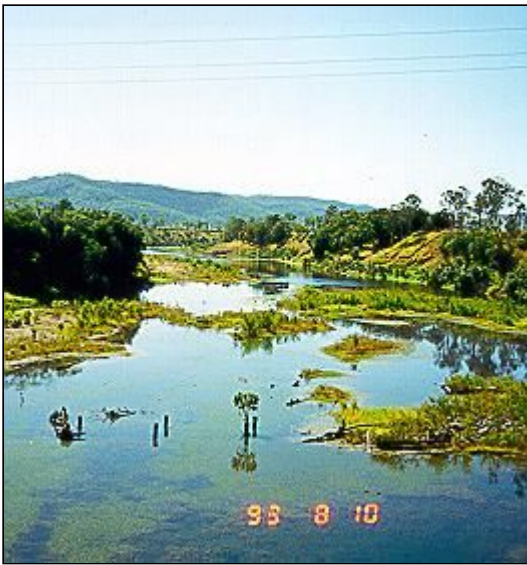


# FLOOD WARNING SYSTEM

## for the

# PIONEER RIVER

This brochure describes the flood warning system operated by the Australian Government, Bureau of Meteorology and Mackay Regional Council for the Pioneer River. It includes reference information which will be useful for understanding Flood Warnings and River Height Bulletins issued by the Bureau's Flood Warning Centre during periods of high rainfall and flooding.



*Pioneer River at Mirani*

**Contained in this document is information about:**

*(Last updated February 2021)*

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## **Flood Risk**

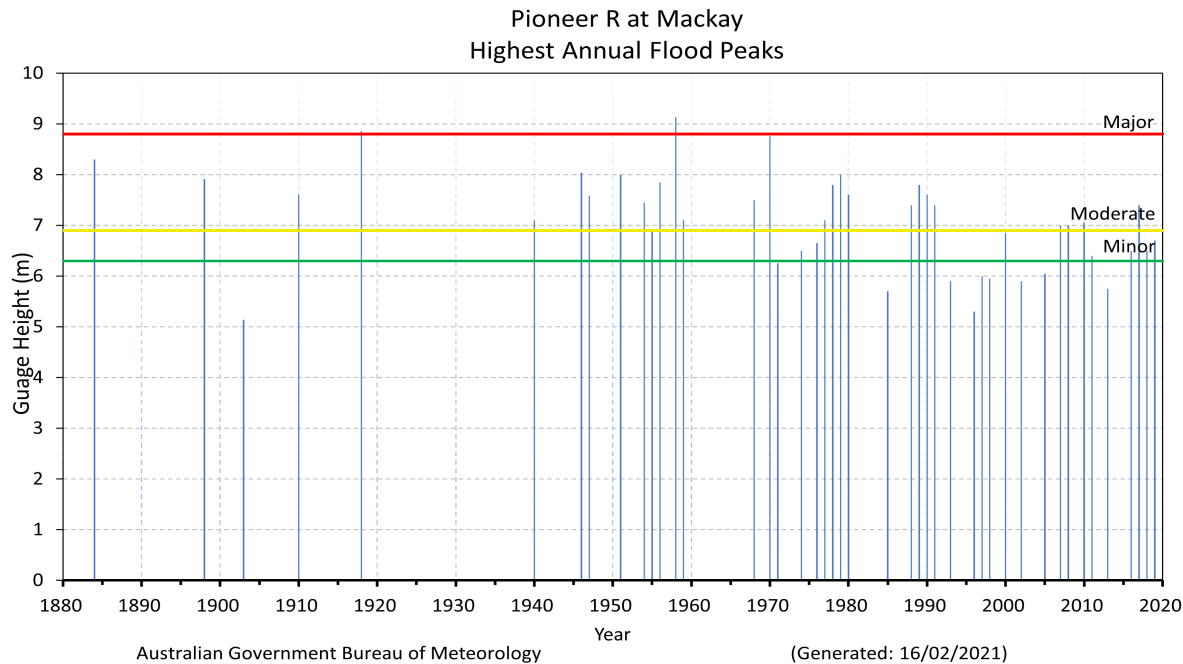
The Pioneer River basin has a catchment area of about 1500 square kilometres and lies between the headwaters of the Fitzroy and Burdekin Rivers. The river flows in an easterly direction from the Clarke Range and Connors Range to the sea. Very high rainfalls can occur along the ranges and cause very fast stream rises in Blacks and Cattle Creeks which feed into the Pioneer River. In most cases a river rise will occur at Mackay within 10 hours of heavy rainfall in the upper areas of the catchment.

The City of Mackay can be subject to major flooding with low lying areas. The introduction of an extensive levee system offers some protection for small to medium floods but large floods will still cause extensive flooding in Mackay.

## **Previous Flooding**

The Pioneer River has a quite well recorded flood history with documented evidence of flooding as far back as 1884. Since that time several serious floods have occurred, with the highest occurring in February 1958 which peaked at a height of 9.14 metres on the Mackay flood warning gauge at the

Forgan Bridge. The February 2008 flood at Mackay was caused by intense local rainfall, with the river peaking at only 7 metres.



## Flood Forecasting

The Bureau of Meteorology operates a flood warning system for the Pioneer River based on a rainfall and river height observations network shown on the map. In consultation with the Mackay Regional Council, the Bureau issues predictions of flood heights for the Pioneer River at Mackay whenever it is expected to exceed the minor flood level (excluding events where tidal heights only cause this exceedance).

The installation of the real time ALERT flood reporting network enables predictions to be made earlier and with more accuracy.

The Bureau's Flood Warning Centre issues Flood Warnings and River Height Bulletins for the Pioneer River catchment during flood events. Quantitative flood forecasts are issued when moderate flood levels are likely to be exceeded.

## Local Information

The Mackay Regional Council is able to provide further detailed local information on flooding in your area of the Pioneer River catchment. The detailed local information interprets Bureau river height forecasts into depths and areas of flooding for Mackay. This enables flood threatened residents to take appropriate action before the floodwaters reach their property.

## Pioneer ALERT System

The Pioneer ALERT system was installed in 1995 as a cooperative project between the Bureau of Meteorology and the Pioneer River Improvement Trust. The system comprises a network of rainfall and river height field stations which report via VHF radio to base station computers in Mackay. The field stations send reports for every 1 millimetre of rainfall and every 50 millimetre change in river height. The Pioneer network has over 15 field stations, some of which measure rainfall and river height, some measure rainfall only and one monitors the tide at Mackay Outer Harbour. The base

station computer collects the data and has software that displays it in graphical and tabular form. The data is on forwarded to the Bureau's Flood Warning Centre where it is used in hydrologic models to produce river height predictions.

## **Flood Warnings and Bulletins**

The Bureau of Meteorology issues Flood Warnings and River Height Bulletins for the Pioneer River catchment regularly during floods. They are sent to radio stations for broadcast, and to local Councils, emergency services and a large number of other agencies involved in managing flood response activities. Flood Warnings and River Height Bulletins are available via :

### **Radio**

Radio stations, particularly the local ABC, and local commercial stations, broadcast Flood Warnings and River Height Bulletins soon after issue.

### **Local response organisations**

These include the Councils, Police, and State Emergency Services in the local area.

### **Internet/World Wide Web**

Flood Warnings, River Height Bulletins and other weather related data is available on the Bureau's Web page at <http://www.bom.gov.au> . The Queensland Flood Warning Centre website is <http://www.bom.gov.au/qld/flood> .

### **Telephone Weather**

Flood Warnings are available through a recorded voice retrieval system, along with a wide range of other weather related and climate information.

<a href="#">Main Directory</a>	Phone	1900 955 360
Flood Warnings	Phone	1300 659 219

## **Interpreting Flood Warnings and River Height Bulletins**

Flood Warnings and River Height Bulletins contain observed river heights for a selection of the river height monitoring locations. The time at which the river reading has been taken is given together with its tendency (e.g. rising, falling, steady or at its peak). The Flood Warnings may also contain predictions in the form of minor, moderate or major flooding for a period in the future. River Height Bulletins also give the height above or below the road bridge or causeway for each river station located near a road crossing.

One of the simplest ways of understanding what the actual or predicted river height means is to compare the height given in the Warning or Bulletin with the height of previous floods at that location.

The table below summarises the flood history of the Pioneer River catchment - it contains the flood gauge heights of the more significant recent floods.

<b>River height station</b>	<b>Finch Hatton</b>	<b>Mirani Weir TW</b>	<b>Mirani</b>	<b>Dumbleton Rocks</b>	<b>Hospital Bridge</b>	<b>Mackay</b>
<b>Feb 1958</b>	-	-	16.46	-	11.64	9.14
<b>Jan 1970</b>	3.96	-	14.02	-	11.84	8.76
<b>Feb 1978</b>	3.60	11.66	10.60	-	-	7.8

<b>Feb 1979</b>	4.00	12.07	10.85	-	-	8.00
<b>Jan 1980</b>	3.50	12.74	11.00	-	-	7.60
<b>Dec 1990</b>	5.85	12.32	10.90	17.77	-	7.60
<b>Feb 2008</b>	3.63	11.27	-	17.98	9.95	7.00
<b>Jan 2010</b>	-	10.86	-	19.41	8.55	7.05
<b>Mar 2011</b>	4.7	12.11	-	19.75	9.12	6.40
<b>Mar 2012</b>	5.25	10.21	-	18.95	8.27	-
<b>Mar 2017</b>	5.27	12.49	-	20.15	10.60	7.40

All heights are in metres on flood gauges.

Historical flood heights for all river stations in the Pioneer River Floodwarning network, as shown on the map, are available from the Bureau of Meteorology upon request.

#### PIONEER RIVER CATCHMENT - ASSESSMENT OF THE FLOOD POTENTIAL

Major flooding requires a large scale rainfall situation over the Pioneer River catchment. The following can be used as a rough guide to the likelihood of flooding in the catchment:

Average catchment rainfalls of in excess of 200mm in 24 hours may cause significant moderate to major flooding and traffic disabilities to develop, particularly in the middle to lower reaches downstream of Mirani.

Average catchment rainfalls of in excess of 300mm in 24 hours may cause significant major flooding and traffic disabilities to develop, particularly in the middle to lower reaches downstream of Mirani.

#### Flood Classifications

At each flood warning river height station, the severity of flooding is described as minor, moderate or major according to the effects caused in the local area or in nearby downstream areas. Terms used in Flood Warnings are based on the following definitions.

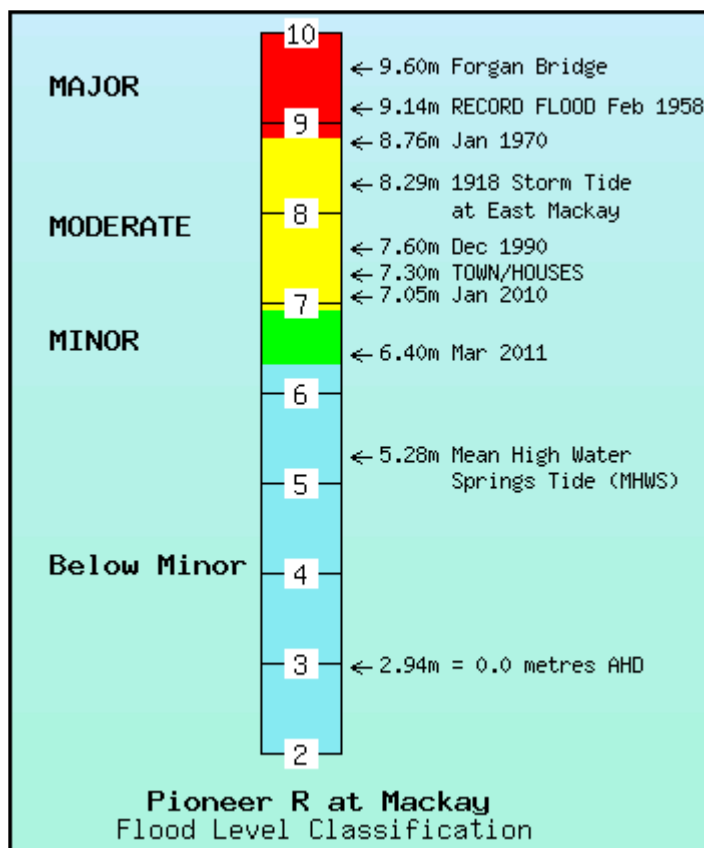
**Minor Flooding :** Causes inconvenience.

Low-lying areas next to watercourses are inundated. Minor roads may be closed and low-level bridges submerged. In urban areas inundation may affect some backyards and buildings below the floor level as well as bicycle and pedestrian paths. In rural areas removal of stock and equipment may be required.

**Moderate Flooding :** In addition to the above, the area of inundation is more substantial. Main traffic routes may be

affected. Some buildings may be affected above the floor level. Evacuation of flood affected areas may be required. In rural areas removal of stock is required.

**Major Flooding :** In addition to the above, extensive rural areas and/or urban areas are inundated. Many buildings may be affected above the floor level. Properties and towns are likely to be isolated and major rail and traffic routes closed. Evacuation of flood affected areas may be required. Utility services may be impacted.



Each river height station has a pre-determined flood classification which details heights on gauges at which minor, moderate and major flooding commences. Other flood heights may also be defined which indicate at what height the local road crossing or town becomes affected by floodwaters.

The table below shows the flood classifications for selected river height stations in the Pioneer River catchment. The flood classifications for the Pioneer River, were reviewed and updated in February 2021 to reflect the levels of impact.

River Height Station	First Report Height	Crossing Height	Minor Flood Level	Crops & Grazing	Moderate Flood Level	Towns and Houses	Major Flood Level
Teemburra Dam	-	0.0 (S)	-	-	-	-	-
Whiteford's	-	-	5.0	-	6.5	-	7.5
Sarichs	-	-	5.0	-	6.5	-	7.5
Finch Hatton	1.5	10.00 (B)	4.2	-	7.7	8.5	8.5
Gargett	-	17.90 (B)	2.6	-	8.0	-	8.5
Mirani Weir	-	-	3.1	-	8.1	-	10.9
Mirani	3.0	15.80 (B)	6.0	6.0	8.0	18.0	9.0
Dumbleton Rocks	-	14.00 (F)	17.3	-	20.0	-	21.0
Hospital Bridge	-	6.64	9.1	-	10.0	-	12.1

		(O)					
Mackay	-	9.60 (B)	6.3	-	6.9	9.7	8.8
Gooseponds	-	6.40 (B)	6.3	-	6.4	-	6.8
Bakers Creek	-	-	6.3	-	6.7	-	7.2

All heights are in metres on flood gauges.

(O) = Old Bridge (B) = Bridge (S) = Spillway (F) = Full Supply Level (W) = Weir

The above details are correct at the time of preparing this document. Up-to-date flood classifications and other details for all flood warning stations in the network are at:

[Flood gauge information](#)

For the latest rainfall and river height conditions please use the following link:

[Latest rainfall and river heights](#)

For the latest rainfall and river height network map please use the following link:

[Network maps](#)

***For further information, contact:***

***The Regional Hydrology Manager, Bureau of Meteorology, GPO Box 413, Brisbane Q 4001***

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