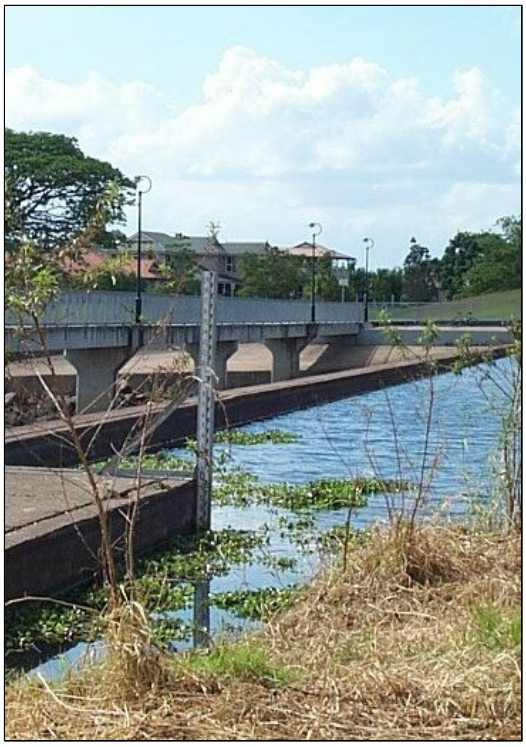
FLOOD WARNING SYSTEM for the ROSS, BOHLE & BLACK RIVERS

This brochure describes the flood warning system operated by the Australian Government, Bureau of Meteorology for the Ross, Bohle and Black Rivers. 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.



Ross River at Aplin Weir

Contained in this document is information about:
(Last updated May 2011)

Flood Risk

The Ross, Bohle and Black River catchments covers an area of 750 square kilometres. Two main tributaries drain the Ross catchment; Central Creek flows from the north and Ross River from the South. Central Creek flows into the Ross River just upstream of the Ross River Dam. The Ross River Dam was constructed by Leighton Holdings in 1971 for the purposes of flood mitigation and water storage and has a capacity of 250 000 megalitres. Downstream of the Dam, the Ross River continues on its course, flowing into the sea near Townsville Harbour.

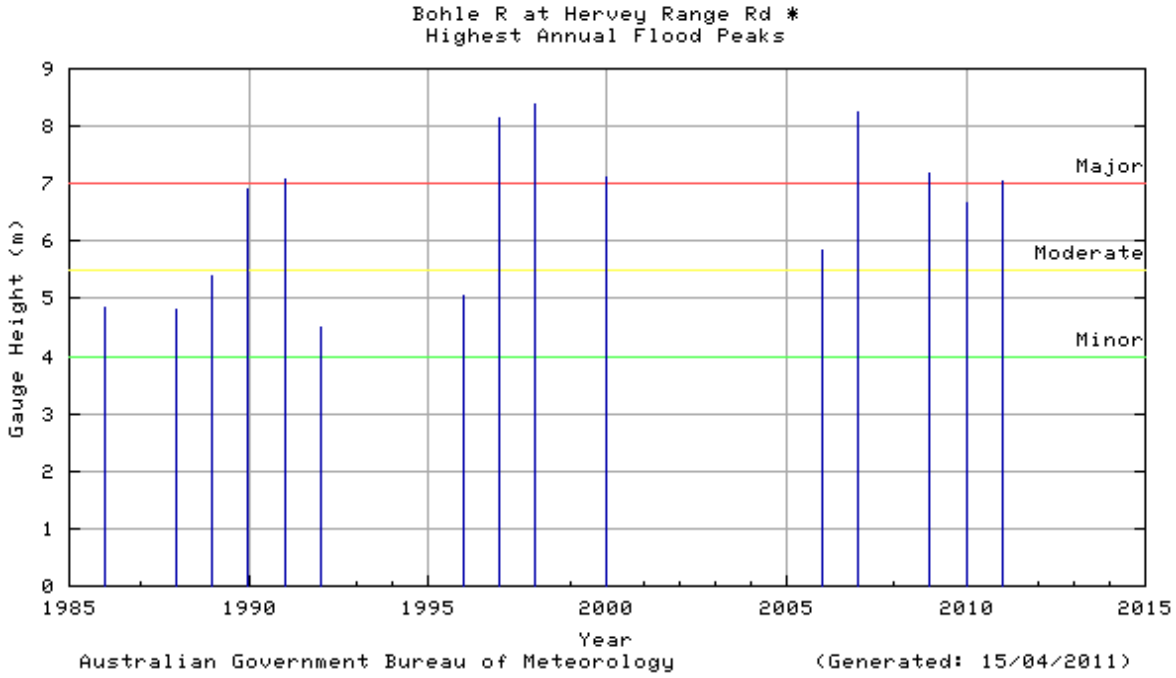
The Bohle River atchment is approximately 355 square kilometres. The Bohle River drains most of the coastal plains immediately west of the Townsville City area, extending as far as the Alice River and Black River catchments. The floodplain adjoining the Bohle River channel is subject to flooding. In the past flooding has been worsened by overland flows from the Ross River, however construction of the Ross River Dam in 1971 has greatly reduced the potential for flood overflows.

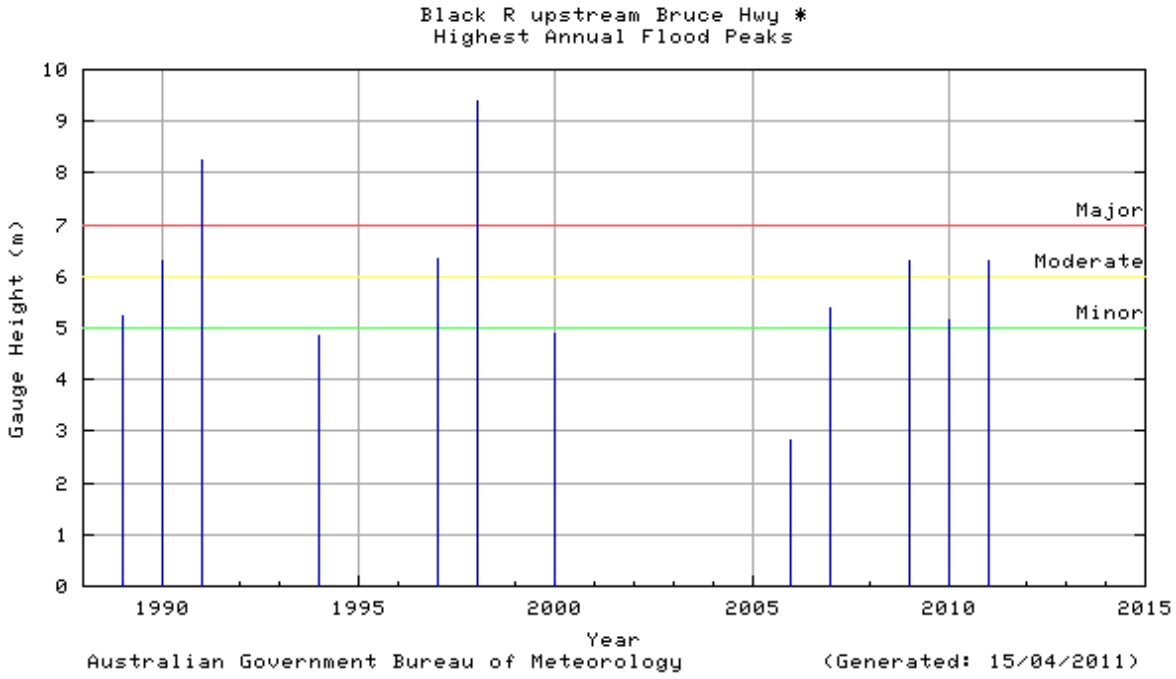
The Black River and its tributary the Alice River drain the area to the west of Thuringowa. The largest flood recorded for the Black River was in January 1998 when flood levels reached 9.38 metres, which caused widespread flooding to occur throughout the area.

Previous Flooding

The Ross River catchment only has a very short history of flood records. The oldest station in the catchment is located at Mysterton. This station has been recording water levels since 2000. Since this time floods have not exceeded the major flood level. The Bohle River has records since 1986 and has reached major flooding five times; 1991, 1997, 1998, 2000 and in 2007. The Black River has records since 1989 and has reached the major flood level twice in that time; 1991 and 1998.

The major flood that occured in 1998 caused flash flooding in Townsville and the surrounds, with levels metres higher than previously recorded. Major flooding resulted in large areas of the city. Thuringowa was inundated which caused 48 houses to become seriously flooded, 14 creek and riverside homes were totally destroyed (8 actually washed away) and a further 33 were left severely damaged. Due to the mitigating effect of the Ross River dam, flood levels in the Ross River below the Dam peaked some 48 hours after the heavy rainfall.





Flood Forecasting

The Bureau of Meteorology and Townsville City Council operates a flood warning system for the Ross River based on a rainfall and river height observations network shown on the map. The network consists of a number of automatic telephone and radio telemetry stations which are operated by the Bureau of Meteorology and Townsville Water. Downstream areas of the catchment and the Bohle and Black Rivers are monitored by stations owned by the Townsville City Council.

The Bureau's Flood Warning Centre issues Flood Warnings and River Height Bulletins for the Rossand Bohle Rivers during flood events. Quantitative flood forecasts are issued when moderate flood levels are likely to be exceeded at Ross River Dam.

Local Information

The Townsville City Coucil is able to provide further information on flooding in your area of the Ross River catchment.

Ross, Bohle & Black River ALERT System

The first Ross River catchment ALERT stations were installed in 1997 by NQWater with the assistance of the Bureau. It was funded through the Regional Flood Mitigation Program. The network was extended over the next few years by the Townsville City Council to include the urban areas. The system consists of a network of rainfall and river height field stations which report via VHF radio to base station computers in the Council offices at Townsville City Council and in the Flood Warning Centre in Brisbane.

The Ross River monitoring network has nineteen field stations - four which measure river height and rainfall, twelve which measure only rainfall, and three river height only stations; the Bohle River monitoring network has nine field stations - four which measure river height and rainfall, three which measure only rainfall, and two river height only stations. These field stations send reports for every 1 millimetre of rainfall and every 50 millimetre change in water level.

The base station computer collects the data and has software that displays it in graphical and tabular form. The data is transmitted to the Bureau's Flood Warning Centre in Brisbane where it is used in hydrologic models to produce river height predictions during times of heavy rain and flooding.

Flood Warnings and Bulletins

The Bureau of Meteorology issues Flood Warnings and River Height Bulletins 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.

Main Directory	Phone	1900 955 360
Flood Warnings	Phone	1300 659 219

Telephone Weather Services Call Charges:
1900 numbers: 77c per minute incl. GST; 1300 numbers: Low call cost - around 27.5c incl. GST.
(More from international, satellite, mobile or public phones)

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 Ross, Bohle and Black River basins - it contains the flood gauge heights of the more significant recent floods.

River Height Station	Feb 1991	Jan 1998	Apr 2000	Feb 2007	Feb 2008	Feb 2009	Jan 2010
Alligator Creek	-	-	-	4.95	5.15	5.51	4.78
Stuart Creek	-	-	-	7.00	-	-	5.05
Ross River Dam	-	-	2.76	4.00	-	-	-
Ross River Dam HW	3.38	2.72	-	-	0.46	1.20	0.95
Black Weir	-	-	0.76	1.20	-	-	-
Aplin Weir	-	1.77	0.92	1.25	-	-	-
Mysterton	-	-	-	3.37	3.07	-	3.12
Louisa Creek	-	-	-	5.53	5.73	5.13	5.23
Little Bohle River	-	-	-	6.21	3.01	-	-
Bohle River	7.07	8.38	7.11	8.25	7.54	7.24	6.74
Mt Bohle	-	-	-	7.55	-	-	6.06
Black River	8.25	9.38	4.89	5.38	6.86	6.31	5.14
Bluewater	6.75	9.70	-	6.12	7.10	6.25	6.10

All heights are in metres on flood gauges.

NOTE: In June 2007, the spillway gates at the Ross River Dam were constructed and put in place effectively controlling the release of water from the dam itself.

Historical flood heights for all river stations in the Ross, Bohle and Black Rivers floodwarning network, as shown on the map, are available from the Bureau of Meteorology upon request.

ROSS, BOHLE AND BLACK RIVER CATCHMENTS - ASSESSMENT OF THE FLOOD POTENTIAL

Major flooding requires a large scale rainfall situation over the Ross, Bohle and Black River catchments. The following can be used as a rough guide to the likelihood of flooding in the catchment:

Average catchment rainfall in excess of 200mm in 24 hours may result in stream

rises and the possibility of minor to moderate flooding developing in the Bohle River. However rainfall in excess of 300mm for the Black River and 500mm for the Ross River (over 24 hours) is needed to achieve minor to moderate flooding.

Average catchment rainfall in excess of 400mm in 24 hours is likely to result in significant stream rises with major flooding for the Bohle River however 500mm for the Black River and 700mm over 24 hours at the Ross River is needed to reach the major classification. Major flooding around the outskirts of the Townsville area can cause the closure of the Bruce Highway near Stuart Creek.

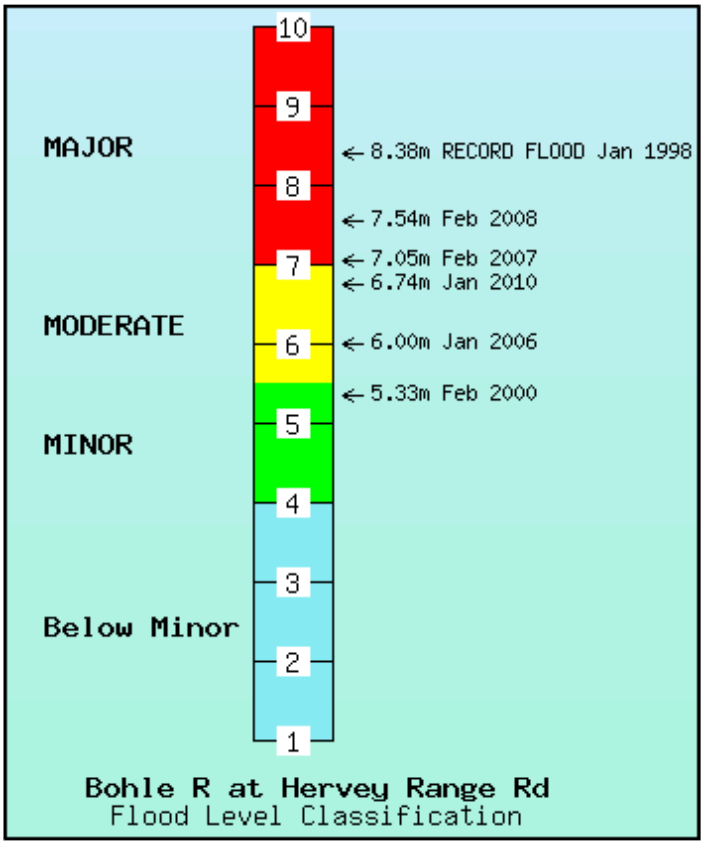
Flood Classifications

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.

Major Flooding : This causes inundation of large areas, isolating towns and cities. Major disruptions occur to road and rail links. Evacuation of many houses and business premises may be required. In rural areas widespread flooding of farmland is likely.

Moderate Flooding : This causes the inundation of low lying areas requiring the removal of stock and/or the evacuation of some houses. Main traffic bridges may be closed by floodwaters.

Minor Flooding : This causes inconvenience such as closing of minor roads and the submergence of low level bridges and makes the removal of pumps located adjacent to the river necessary.



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 Ross, Bohle and Black Rivers catchment.

River Height Station	First Report Height	Crossing Height	Minor Flood Level	Crops & Grazing	Moderate Flood Level	Towns and Houses	Major Flood Level
Alligator Creek	-	-	5.0	-	6.0	-	7.0
Stuart Creek	-	6.90 (B)	5.0	-	5.9	-	6.0
Ross River Dam	-	38.5 (F)	-	-	-	-	-
Black Weir	-	0.00 (W)	2.0	-	2.5	-	3.5
Aplin Weir	-	0.00 (W)	2.5	-	3.5	-	4.0
Mysterton	-	3.80 (B)	3.5	-	3.8	-	4.0
Louisa Creek	-	6.40 (B)	5.0	-	6.0	-	6.4
Little Bohle River	-	-	3.0	-	4.0	-	5.0
Bohle River	-	-	4.0	-	5.5	-	7.0
Mt Bohle	-	-	4.0	-	5.5	-	7.0
Black River	-	-	5.0	-	6.0	-	7.0
Bluewater	-	-	6.0	-	7.0	-	8.0

All heights are in metres on flood gauges.
(B) = Bridge (W) = Weir (F) = Full Supply Level
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:
http://www.bom.gov.au/hydro/flood/qld/networks/index.shtml

Catchment Map showing the Ross & Bohle Rivers flood warning network

Click here to view map as: PNG PDF (329K bytes)

For further information, contact:
The Regional Director, Bureau of Meteorology, GPO Box 413, Brisbane Q 4001
