

**FLOOD PREVENTION AND LAND DRAINAGE
(SCOTLAND) ACT 1997
BIANNUAL REPORT**

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FLOOD PREVENTION AND LAND DRAINAGE (SCOTLAND) ACT 1997
BIANNUAL REPORT, JULY 2000

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1. Introduction

- 1.1 In March 1997 the introduction of the Flood Prevention and Land Drainage (Scotland) Act 1997 instigated changes to the responsibilities and duties of Local Authorities in Scotland.
- 1.2 This Act amended the Flood Prevention (Scotland) Act 1961 and repealed sections of the Land Drainage (Scotland) Act 1930 and the Land Drainage (Scotland) Act 1941.
- 1.3 In respect of this Act the flooding referred to is the flooding of land, not being agricultural land. Flooding of agricultural land falls outwith the requirements of the Act.
- 1.4 The implications on The Highland Council of this Act impose the following additional requirements:-
- a) **Assessment of Watercourses**, from time to time for the purpose of ascertaining whether any such watercourse is in a condition likely to flood.
 - b) **A Duty to Maintain Watercourses**, which are in a condition likely to cause flooding, or where works would substantially reduce the likelihood of such flooding.
 - c) **Notification of Local Authorities outwith the Area**. Where it appears to The Highland Council that any watercourse in the area is in a condition which is likely to cause flooding, outwith the area, the Council shall notify the local authority for the area in which that land is situated.
 - d) **Reports** shall be published, at two year intervals.
- 1.6 In recognition of these requirements the Highland Council prepared and implemented a Flood Prevention Policy, a copy of which is included in Appendix A of this report.
- 1.5 This report is published in accordance with reporting requirements of the Act identified in paragraph 1.4.d) above.
- 1.6 The previous report was published in November 1997.

2. Reporting Requirements of the Flood Prevention and Land Drainage (Scotland) Act 1997

- 2.1 The Act states that each local authority in Scotland shall prepare and publish a report specifying:-
- a) The measures which they consider that they require to take to prevent or mitigate the flooding of land in their area.
 - b) The measures which they have taken since the date of publication of their previous report to prevent or mitigate the flooding of such land.
 - c) All occurrences of flooding of such land since the publication of their previous report.
- 2.2 This report has been prepared to meet the reporting requirements of the Act, and has been subdivided into the three reporting headings specified above.

3. Measures Required to Prevent or Mitigate the Flooding of Non Agricultural Land

3.1 Implementation of the Highland Council Structure Plan

The Highland Council have recently prepared a Structure Plan for implementation over the next 10 years and beyond.

The Structure Plan sets out the strategic framework for the use of land and shows the scale and direction of development.

The Structure Plan contains a complementary strategic approach to safeguarding and enhancing the environment, and a section on Natural Hazards including Flooding is contained within this document.

The Structure Plan has been prepared and was approved by full Council in December 1999. The Plan has been submitted to the Minister for Transport and the Environment and the formal approval processes are ongoing. On approval by the Minister the Structure Plan becomes a Statutory Development Plan.

The section relating to Natural Hazards of the Structure Plan, see Appendix B, includes the following proposals:-

Proposal NH1 Flood Consultation Areas

Local Plans will identify areas with a perceptible risk of flooding with assessment of development proposals within these areas for compatibility with flood risk.

Proposal NH2 Flood Appraisal Group

The Council will establish a Flood Appraisal Group to provide a coordinated approach to flood management.

Proposal NH3 Integrated Catchment Management Plans

The Council will support integrated catchment management plans.

3.2 Major Flood Prevention Schemes at Feasibility Stage

In the previous flood prevention report dated November 1997, eight flood prevention schemes were identified at various stages of progression, each is reviewed below:

3.2.1 Aviemore Flood Prevention. (Programmed for 2001/2002)

The Dalfaber Road area of Aviemore is prone to flooding. A report in 1992 prepared by consulting engineers stated that records kept by one of the occupiers of the affected buildings identified 13 flooding events in 18 years. Three houses and the Old Bridge Public House are affected.

The proposals are that the properties be protected by the construction of an earth flood bank some 900m long at an estimated cost of £450,000.

A Draft Flood Prevention Order(FPO), required to permit construction of flood protection schemes, received objections. The scheme is yet to proceed to Notice of Intention to Develop(NID) the planning approval process of The Highland Council or final submission of the FPO due to the objections received and financial constraints.

3.2.2 Kingussie Flood Prevention. (Programmed for 2001/2002)

The areas in Kingussie which are prone to flooding from the River Gynack include the upper section of Spey Street, part of the B970 from Kingussie to Ruthven Bridge, the High School, the Railway Bridge and adjacent sections of the track and the marginal ground along both banks of the river.

The proposals are to increase the capacity of the River Gynack by enlarging the cross-section and gradient of the River. The cost, including protection works to structures is estimated at £450,000.

The scheme is currently being re-evaluated and a revised Flood Prevention Order is under consideration.

3.2.3 Drumnadrochit Flood Prevention

A flood prevention scheme was identified in Drumnadrochit, however emergency works were undertaken following a flooding incident on the 1 March 1997. Following completion of the emergency works at a cost of £120,000 it is now not proposed to undertake the previously identified scheme, but to monitor the effect of the emergency works.

3.2.4 Acharacle Flood Prevention

A flood prevention scheme has been designed to mitigate the risk of flooding at Moss Side.

With the area being part of a Site of Special Scientific Interest(SSSI) and a potential Special Protection Area consideration is being given to an environmental assessment and discussions are currently in progress with regard to developing a scoping study to determine the extent of the Environmental Assessment(EA). Following preparation of the Environmental Assessment the scheme development will move onto the formal Flood Prevention Order and Notice of Intention to Develop submissions.

3.2.5 Inverness Flood Prevention

In recent years there have been increasing problems where the burns draining the catchment area to the south west of Inverness meet developed land. The burns concerned are the Lochardil, Ault na Skiach and Mill plus their tributaries.

Consultants HR Wallingford were commissioned to undertake an audit of previous technical reports and make recommendations for immediate action.

HR Wallingford have recommended that the resistance to flow through the urban area should be reduced and arrangements are being put in hand to implement these measures as soon as finance permits. The measures will include removal of silt and other existing obstructions, clearance of vegetation and strengthening of vulnerable burn edges. Works are already in hand on a section of Lochardil Burn.

HR Wallingford further confirmed that a diversion to Holm Mains Burn would be the best long term drainage strategy. It is envisaged that sufficient flow would remain in any existing watercourses to maintain dilution of disposal from downstream developed areas, prevention of stagnant pondings and to preserve amenity value and local diversity.

Excess flows in flood conditions would be permitted to spill into an alternative artificial watercourse and taken to a discharge point on the Holm Mains Burn.

Additional work would be required to increase the safe channel capacity of Holm Mains Burn, particularly adjacent to property and at its confluence with the River Ness.

It will be necessary for the Council to promote, and have confirmed, a Flood Prevention Order prior to any works taking place

Design work is currently progressing, and preparation of the Flood Prevention Order is underway.

Preliminary estimates indicate that the project is likely to be in the region of £3m .

3.2.6 Glencoe

One cottage, garages, car park and gardens suffer from flooding.

A draft Flood Prevention Order was prepared in 1991 but not published. This scheme has not been progressed since the last flood report in 1997.

3.2.7 Fort Willaiam, Caol

A scheme was prepared to prevent flooding of Caol and Lochyside. A draft Flood Prevention Order has been prepared but not published. This scheme has not been progressed since the last flood report in 1997.

3.2.8 Inverness Ness Bank

As identified in the previous flood report, objections to the proposed scheme to protect several properties and the road were received. This scheme has not been progressed since the last flood report in 1997.

3.3 Minor Flood Prevention Measures – Programmed

3.3.1 Drainage Problems at Balvraid, Sutherland

Water is running off the carriageway onto a private drive, ditches are blocked preventing the draining of adjacent fields resulting in flooding. Standing water in ditches in proximity to the property is likely to be causing dampness in the house.

It is proposed to install a tar fillet across the drive to direct flow into adjacent ditch, clean out and regrade surrounding ditches to provide drainage to the area.

3.3.2 U329 at Portgower, Sutherland

Due to insufficient capacity of a cross carriageway culvert, water floods onto the U329, flows down this road and issues onto the A9 Trunk Road at Portgower, carrying mud and debris onto the highway.

The works proposed include re-cutting feeder ditches, clearing out of the watercourse and culvert, with culvert headwall and invert pitching works.

3.3.3 Balmoral Road – Portree, Isle of Skye

Occasional flooding of a garden on Balmoral Road is continuing. A video survey of the piped watercourse identified problems with partial blockages, broken pipes and obstructions caused by poorly made connections.

Options to rectify the problems are currently being evaluated prior to implementation.

3.3.4 Blaven Park – Portree, Isle of Skye

An open ditch has been infilled and a garden shed constructed on the line of the old watercourse by a householder. The reduced capacity has resulted in flooding of a neighbours garden and garage.

A survey has been undertaken and options are being considered.

3.3.5 Roads and Transport Depot – Kingussie, Badenoch

The Roads and Transport depot has been partially flooded on two occasions with the loss of around 200 Tonnes of salt from the stockpile taking place on each occasion.

Substantial bunding work is required to prevent this regular flooding but the presence of existing outfall drainage through which flood water will backfeed gives rise to problems.

Evaluation of options is ongoing.

3.3.6 A9 Footpath at the Hairpin, South of Dunbeath Water, Caithness

A flood in March 2000 washed away the footpath.

Due to unstable ground and ongoing risk of flooding it is proposed to relocate the footpath further back from the edge of the slope.

Land acquisition is required and this is currently ongoing.

3.3.7 7 West Park – Strathpeffer, Ross-shire

Flooding from a field across a private road and into a garden is occurring. An obstruction in a stone culvert is causing the problem.

The North of Scotland Water Authority (NOSWA) inserted a 150mm diameter PVC pipe to take the water through a 450mm by 450mm stone culvert during work to a water main, which crosses at right angles to the culvert.

NOSWA accepts the responsibility for the problem and works are planned to rectify the situation.

3.3.8 Garve, Ross-shire

The river is flooding and causing water to back up.

The solution has been established as lowering of the river outlet at the East end of Loch Garve. The works are awaiting the availability of finance.

3.4 Appraisal of Flood Risks of the River Enrick, Drumnadochit, Inverness-shire

Following three recent flood events on the River Enrick The Highland Council commissioned the consulting engineers Halcrow Crouch to assess the flooding risks.

This assessment included:

- a) A review of the 1990 flood study with identification of changes during the last decade.
- b) An inspection of the valley from Corrimony to Urquhart Bay.
- c) Consultation with the River Enrick Riparian Committee.

The report concluded that the last decade has seen an increase in the number of floods and that the development of a flood warning system is a good way of managing flood risk.

The report also made recommendations for the short and medium term. These recommendations include the clearing of tree debris, rip rap protection, monitoring of structures, monitoring of erosion, with the recommendation that further feasibility studies and flood risk assessments be carried out.

This report was completed in March 2000 and is currently being evaluated.

3.5 Appraisal of Flood Risks on the River Coiltie, Drumnadrochit, Inverness-shire

Following two recent flood events on the River Coiltie where properties were affected by significant bank erosion. The Highland Council commissioned the consulting engineers Mott MacDonald to examine what measures could be taken to prevent further erosion taking place.

The assessment was to:

- a) Examine the preventative work already undertaken
- b) Examine and identify the flood risk locations between the Borluim Bridge and Upper Lewiston.

The study has not yet concluded.

3.6 Reporting of Floods -Definition of Flood

- 3.6.1 In the preparation of this report and the compilation of the flood incident register it became apparent that there is inconsistency in the reporting of flooding as administrated by the 8 Areas of the Highland Council. The definition of flooding is being interpreted differently and this will need to be addressed.
- 3.6.2 It is recognised that flooding can be interpreted as ponding on the highway as a result of a blocked drain to inundation of residential and commercial properties. Whilst localised ponding does fall within the definition of flooding within the Act its reporting does not achieve the aims of goals that the Act set out to deliver.
- 3.6.3 Due to the size of the Highland Council Area, the topography and weather conditions that are experienced, a very significant number of very minor 'flooding' incidents occur. To report on very minor flooding incidents imposes a significant administrative burden with no net benefit. The result of reporting such incidents could not be of assistance in the policy making and the targeting of scarce resources. A definition of flood is thus proposed to clarify the trigger point for the reporting of an incident.

3.6.4 Definition of a flood in respect of reporting shall be:-

- a) Flooding of residential or commercial buildings.
- b) Flooding causing damage to residential or commercial properties.
- c) Damage to roads and associated structures, drains, culverts and the like with an estimated cost of action/rectification in excess of £2,500.
- d) Flooding resulting in the complete closure of a public road.

3.6.5 The targeting of flood reports will aid in the prioritisation of flood prevention schemes.

3.6.6 The issue of minor flooding will continue to be addressed, with reaction to incidence on a day to day basis. The issue also falls into the complaints procedure when such flooding is reported by members of the public. The procedure with dealing with complaints is included in the Roads and Transport Service Quality System and is implemented on receipt of such a complaint.

4. Measures Taken to Prevent or Mitigate the Flooding of Non Agricultural Land Since November 1997

4.1 Implementation of the Flood Prevention Policy

Following the Roads and Transport Committee approval of the Flood Prevention Policy on the 11 June 1997, this policy has been implemented throughout the Highland Council Area.

The policy, see Appendix A, is structured into four sections these are:-

1. Assessment.
2. Works.
3. Formal Flood Prevention Schemes.
4. Review.

4.2 Assessments

The Highland Council Policy on Flood Prevention identifies that assessments shall be carried out, this accords with the requirement of the Flood Prevention and Land Drainage (Scotland) Act 1997.

The policy states that these assessments will be prioritised as follows:-

- a) Known areas of flooding.
- b) Urban areas, in order of size of population and possible risk of flooding.
- c) Rural areas, in order of possible risk of flooding.

In reality alongside the assessments identified above, there are reactive assessments undertaken for a number of other reasons, these include:-

- a) Reporting of flooding incidents from Highland Council staff, elected members and members of the public.
- b) Flooding risk evaluation requests from Highland Council staff, elected members and members of the public.
- c) Consideration of development land potential.
- d) Consideration of individual developments and planning applications.

To date **155** assessments have been undertaken. The information with regard to each assessment is held in a data base, a list of the assessments undertaken and examples of which can be seen in Appendix D.

4.3 Works

4.3.1 Non Reported Works Relating to Flooding

The Highland Council is divided into 8 Areas, each administered by an Area Roads and Transport Manager. Flooding events are managed by the relevant Area Roads and Transport Manager.

It is the role of the Area Roads and Transport Manager to initially assess the flooding event and take such emergency measures as deemed appropriate. Often flood events are localised and no residential or commercial properties are affected. Where the cause of the flooding is established and remedial measures are of minimal costs then these are undertaken.

Works that fall into this category are gully emptying, offlet cutting, removal of vegetation, removal of debris and the like. These works are usually undertaken as an emergency response.

Where flooding events are known to re-occur, local procedures are in place to implement signing, sand bagging and the like at times of impending flood or during flood events.

Due to the minor nature of these floods the reporting of these events are not routinely logged.

4.3.2 Reported Works Relating to Flooding

4.3.2.1 Flood Prevention Walls on Harbour Street, Nairn

A serious flooding incident occurred on the 24/25 December 1999, resulting in a number of properties on Harbour Street, and other parts of the Fishertown area of Nairn.

This area had a history of flooding and whilst not frequent the consequences in respect to damage to property and stress and disruption was significant. The historical response was sandbagging in reaction to both flood warnings and flooding events.

Various options for flood protection were considered and the preferred solution of the construction of a flood protection wall was approved by Committee on 29 February 2000.

An 80m wall has now been constructed. This wall has gaps to accommodate paths which will be sandbagged when flooding occurs.

4.3.2.2 Clearance of Auldearn Burn, Auldearn, Nairn

During the flood of the 17 July 1997 the Auldearn Burn overflowed its banks and water entered the vents of some of the houses in the Balmakeith Park housing scheme. The water did not rise to floor level but 12 houses were threatened and water was around one meter deep across the road in this area.

The flooding resulted from the burn overflowing, the capacity of the burn had been compromised by siltation build up and vegetation growth. The proposed rectification was the clearance of the burn and reprofiling over a length of 500m.

These works were completed towards the end of 1997.

4.3.2.3 Flood Prevention Works at Piperhill, Cawdor, Nairn

Flooding of a residential property at Piperhill near Cawdor was known to occur as a result of water flowing off adjacent fields crossing the road and entering the cottage.

The problem was established as inadequate capacity from a nearby road gully and associated soakaway.

The works completed in 2000 included pipework over several hundred metres to connect the gully to a positive drainage outfall and the lowering and construction of the path around the house to prevent future flooding of the property.

4.3.2.4 Loch Awe Quarry off the A837, Sutherland

In 1999 quarrying activities resulted in the diversion of a burn through the quarry this resulted in the flooding of culverts and the inundation of the road with debris being spread on the highway.

To rectify this problem the main stream was re-diverted through the quarry workings and the construction of a detritus trap prior to discharge into the road culverts.

Headwall works and stabilisation works in the vicinity of the culverts together with cleaning out was undertaken

4.3.2.5 C15 at Sputie, Sutherland

The C15 road has a history of localised flooding. Inadequate capacity of the watercourse gave rise to overtopping flooding both the road and adjacent crofting land.

Sedimentation and debris build up together with vegetation growth was removed, the waterway area of the watercourse was enlarged and regraded over a length of approximately 1km.

4.3.2.6 C11/U457 at Fleuchary, Sutherland

Flooding of the C11 and U457 roads was occurring at Fleuchary. The problem of flooding was associated with a lack of drainage in the area.

A new watercourse of in the order of 500m was constructed to provide a drainage path and outfall into the River Evelix.

4.3.2.7 A837 Langwell Flats, Sutherland

Flooding of the A837 at Langwell Flats was occurring at a number of locations, investigation determined lack of capacity and failure of the stone culverts in the vicinity.

Works were undertaken to replace the culverts with increased capacity with localised retraining of approach ditches.

4.3.2.8 A894 Skiag, Sutherland

Inadequate highway drainage resulted in water from the adjacent hillside flooding across and through the carriageway which resulted in a landslip and wash out of the road over 100m.

The embankment was rebuilt, the scheme included the construction of filter drains and slope drainage to prevent a repeat of the flooding incident.

4.3.2.9 C14 Coalpit Road – Brora, Sutherland

Flooding of the River Brora, and inadequate protection of the road embankment resulted in the embankment failure and loss of a 45m length of carriageway. Water flowing from the adjacent hillside exacerbated the failure.

The embankment was rebuilt and the toe was rock armoured to protect from future flooding incidents. Filter drains were constructed to intercept water from the hillside from flowing across the road.

4.3.2.10 Kyle of Lochalsh, Lochalsh

As reported in the last flood report, railway sleepers covering a water course were failing resulting in flooding. Works have been undertaken to repair/replace the sleepers to remove the problem.

4.3.2.11 Somerled Square – Portree, Isle of Skye

Problems of flooding were being experienced as a result of a surcharging manhole.

Works have been undertaken to the manhole to improve flow characteristics and minimise surcharging of the manhole.

4.3.2.12 A87, Dunvegan Road, Portree, Isle of Skye

A watercourse is piped across the Trunk Road and thereafter through Jewsons, a builders merchants. The capacity is insufficient and in heavy rainfall results in flooding to gardens and surface water running across the road into Jewson's yard.

The pipework under the road has been investigated and the faults rectified. Restrictions in capacity still exist in the pipework under Jewsons yard. Jewsons have been informed but have yet to rectify these restrictions.

4.3.2.13 Sconser Area, Isle of Skye

Flooding in the Sconser area was identified as due to blocked culverts in the last flood report.

These culverts have now all be cleared.

4.3.2.14 River Coiltie, Lewiston, Drumnadrochit, Inverness-shire

The River Coiltie has a large river catchment with steep side slopes, which result in rapid running of rainwater and snowmelt. The river is therefore subject to flash floods. Such an event occurred on 3 June 1997 with the result that property and Tigh na Allt at Lewiston was severely affected by erosion of the riverbank.

The existing rock armour protection upstream of the property was extended and reinforced to prevent future erosion occurring.

4.3.2.15 King Brude Road, Inverness

Thunderstorms in the Scorguie area of Inverness on 9 September 1997 resulted in the storm water system becoming overloaded. Water escaping under pressure washed out the underlying gravel layers beneath King Brude Road resulting in partial collapse of the road surface at the junction with Pict Avenue.

The pipework under the road has been investigated and checked for restrictions. Soft spots were excavated and the road re-surfaced in bituminous macadam.

4.3.2.16 Cradlehall Park, Smithton, Inverness

A burn flowing through Cradlehall Park burst its banks on 4 November 1997 with the result that water entered the property at 112 Cradlehall Park.

When the floodwater abated, the bank was repaired and additional manholes constructed to catch and divert floodwater should it re-occur.

4.3.2.17 Birchwood Brae, Culloden

On the evening of 4 November 1998 a major culvert at Birchwood Brae became blocked with debris and gravel washed down from upstream woodland resulting in water flowing over the road and into adjacent garden ground and around property.

The culvert was cleared out, the culvert grid repaired and additional trash screens were constructed along the channel on the approach to the culvert.

4.3.2.18 Resaurie, Smithton, Inverness

On 3 December 1997 the burn between Tower Brae, Culloden and Resaurie, Smithton became blocked as gravel from bed and bank erosion blocked the road culvert. Debris and silt washed into garden of houses at Cranmore Drive, Culloden.

When floodwater subsided the gravel deposits were excavated from the mouth and from within the culvert.

4.3.2.19 Slackbuie Crescent/Culduthel Place, Inverness

Floodwater on 3 December 1998 affected the South Western perimeter of Inverness, water built up in the Slackbuie channel, overtopped the flood banks and threatened properties in Green Drive, Culduthel Place and Slackbuie Crescent.

Water was diverted from these areas into an attenuation area at Culduthel Road.

The same situation re-occurred on 30 December 1998.

4.3.2.20 Culduthel Road, Inverness

Water build up again re-occurred on 7 January 1999 in the Slackbuie channel and on this occasion once the attenuation area was full the raised water level threatened properties in Green Drive.

Once the floodwater had subsided the Slackbuie channel was deepened and the flood banks extended to improve water flow and water retention.

4.3.2.21 Merlin Crescent, Inverness

Property at 28 Merlin Crescent was flooded by water from the Mill burn. Floodwater on 16 January 1999 caused massive transportation of silt and gravel blocking culverts under the Southern Distributor Road and the entrance to the piped system under Merlin Crescent.

An exercise was undertaken to remove silt and debris from the riverbed.

4.3.2.22 Harris Road/Diriebught Road, Inverness

On 10 April 1998 the Millburn flooded, seriously affecting Harris Road and Diriebught Road, Inverness. Sandbags were delivered to flooded properties on these roads.

As part of a programme of remedial works a flood wall was constructed on Harris Road to prevent water ingress into Bridge House, the property adjacent to the Millburn.

4.3.2.23 River Coiltie, Lewiston, Drumnadrochit

The Clunebeg Bridge, which had been damaged in the floods of August 1997 and subsequently closed to vehicles and pedestrian traffic, was demolished to mitigate the risk of the bridge collapsing in a future flood event. Should the bridge have collapsed, adjacent property would have been at serious risk.

4.3.2.24 Drumdevan Road, Inverness

Significant flooding of the Drumdevan Burn on the night of 4 November 1999 resulted in the property at No 29 Drumdevan Road being flooded. The homes between No 29 to 37 Drumdevan Road were sandbagged to prevent water ingress to the properties.

Following this flood event Messrs. TRL Consulting Engineers were commissioned to examine and confirm flood studies previously undertaken.

LOCHARDIL BURN – BANK – EXTENSIVE MAINTENANCE WORKS??

4.3.2.25 River Ness, Inverness

On Sunday 28th November 1999 a band of heavy rainfall affected a wide area around Inverness from Beauly extending through Inverness to the Balloch and Smithton area and a number of flooding incidents occurred which are listed as follows.

- a) A862 Beauly - water from agricultural land to the north side of the A862 in Beauly village resulted in the culverts through the village at the north end being unable to cope with the floodwater. The hairdressing salon on the Main Street in Beauly was provided with sandbags during the evening to prevent flooding of the property.
- b) Inverness, 20 Miller Road – a report was received of water in the car park at Miller Road. This was inspected but there was no immediate danger to houses. The situation was monitored throughout the evening.
- c) Drumdevan Road – the potential for flooding occurring at Drumdevan Road was recognised and a monitoring exercise undertaken. Concern was expressed by Nos. 23, 35, 37 and 45 and sandbags were provided for emergency purposes if required.
- d) Castle Heather Road, Inverness – at 20:00 hours it was reported that the burn had burst its banks near Mason Road and properties in this area were at risk from flood water. Sandbags were supplied to the houses at risk in Castle Heather Road to ensure that water did not enter the properties.
- e) B9006 Inshes – water from the Caulfield Road area flooded the B9006 and entered the Inshes Veterinary Practice flooding the premises. Sandbags were requested however these were not sufficient to prevent flooding of the property.
- f) Smithton, 130b to 141 Murray Terrace – a report was received of floodwater adjacent to the houses however due to the widespread nature of the flooding in this area, no action could be taken.
- g) Blackwell Court, No. 37 – water began collecting in the porch of this property and the occupants collected sandbags to prevent further ingress of water.
- h) Balloch, 17 Cameron Avenue – the culvert adjacent to 17 Cameron Avenue became blocked with the result that water overflowed and was diverted down the side of the property however no actual flooding occurred within the house itself.

- i) Ryecroft, Caulfield Road North – a report was received of the burn overflowing adjacent to the property however no action could be taken to alleviate the situation.
- j) B9006 Culloden Moor – flooding was reported at the Keppoch Inn. The adjacent farmland was saturated with water which accumulated and ponded across the public field between fields. The B9006 had to be closed to traffic as the water in these natural depressions became too deep to safely allow traffic to enter. Road closure signs erected.

4.3.2.26 Millerton View, Scorguie

Floodwater run off from the arable land uphill of Craig Phadrig on the western side Inverness resulted in floodwater affecting gardens and house foundations in Millerton View. Due to the widespread run-off no action was possible.

4.3.2.27 Cottage at Meikle – Urchany, Nairn

This cottage had a history of flooding problems. The problem arose when a house was built in a low area which previously released flood water. On the other side of the road fast flowing forestry ditches carried a lot of silt and caused build up of detritus in the drainage system.

Cawdor Estates agreed to install silt traps and The Highland Council carried out some earthworks within the grounds of the house in question, removed a small bank and shaped the driveway so that any water crossing the road would not be trapped. This work was carried out in March 1998, and no further problems have been encountered.

4.3.2.28 B863/A82 Junction – Glencoe Village, Lochaber

Flooding of croft houses at Carnoch was being caused by existing ditches being unable to cope with heavy rainfall.

Works were undertaken to install additional drainage.

4.3.2.29 Foyers Road – Kinlochleven, Lochaber

Pipes at this location had collapsed leading to flooding, these pipes have now been replaced.

4.3.2.30 A82 Corriegour Hotel, Loch Lochy, Lochaber

The existing culvert at this location suffers from infill from material washed down from the hillside and beach material being blasted up from Loch Lochy. This reduction in flow capacity causes a flooding threat to both the Corriegour Hotel and the A82 Trunk Road.

The culvert has been periodically cleaned to remove accumulations and restore flow capacity.

4.3.2.31 Glencairn, Mallaig, Lochaber

The house called Glencairn in Mallaig was subject to flooding at the rear of the property during periods of heavy rain. A watercourse, which drains the hillside, passes through the back garden of the house. Ground water also was appearing in the garden, coming from the rock faces and raised terrace garden. This water collected in a low point on the footpath outside the back door to within a few centimeters of the floor level.

The existing outfall culvert draining this area was of insufficient flow capacity and was also choked.

The culvert was replaced with a larger diameter pipe.

4.3.2.32 Avoch, Ross-shire

Restricted waterway combined with high tides caused problems at Burnside Cottage.

In March 1999 the burn was widened and deepened through the worst section past Burnside Cottage, approximate length 130m.

4.3.2.33 Burns Crescent – Dingwall, Ross-shire

The river floods adjacent properties when there is a combination of high tides and large flows in the river.

Action was taken in October 1997, the river was widened and cleaned out through the section beside and downstream of the houses for a length of 660m. The bank was also raised beside the two properties most affected.

4.3.2.34 Watergate – Fortrose, Ross-shire

Flooding was occurring as a result of surcharging of the pipe network.

A new larger diameter pipe was installed in September 1997.

4.3.2.35 Chapleton Place – Muir of Ord, Ross-shire

A pond was overtopping and flooding was occurring adjacent to properties. There was no positive outlet from the pond.

An outfall drain was installed in 1997 to protect the properties.

4.3.2.36 Main Culvert – Strathpeffer, Ross-shire

The main culvert had insufficient capacity to cater for the flows in periods of high rainfall. Inspection identified choking by tree roots and detritus build up.

In April of 2000 the top section of 180m was jetted and cleaned. It is planned to complete the clearing of the remainder of the culvert when finance permits. Negotiations to take place with NOSWA regarding cost sharing.

4.3.2.37 Strathburn Area – Gairloch, Wester ross

Flooding occurs at the sheltered housing and below the butchers shop and car park.

Invert and embankment repairs were carried out in April 2000. Further works are required to protect the road at Ginn Place and to protect the embankment below the main car park. River realignment will be required.

4.4 Formal Flood Prevention Schemes

No flood prevention schemes constructed under a formal Flood Prevention Order have been undertaken since the last flood prevention report.

4.5 Review

In view of the short period of time from implementation of the Flood Prevention Policy no review has been undertaken to date.

4.6 Emergency Planning

The Highland Council have an Emergency Planning Unit whose responsibility it is to plan for emergency events and also coordinate resources in reaction to emergencies. Flooding is covered and coordination of response to flooding events occurs.

Following recent flood events it became apparent that the resources of The Highland Council and the emergency services were not being optimised.

Serious flooding of the Fishertown area of Nairn occurred, but the flood warning in its then format was insufficient to trigger a response from the Council, or the police to prevent flood waters entering properties.

It was recognised that steps were required to be put into place in order to better assess the risk of flooding.

The emergency plan has been amended that on identification of the possibility of a flood from the Scottish Environment Protection Agency (SEPA) in respect of their monitoring system, a flood support group would convene at The Highland Council, Emergency Operations Room, Inverness.

This group is drawn from :

- a) The Highland Council
- b) SEPA
- c) Police
- d) Fire Service, and
- e) The Coastguards, if applicable.

The object of these parties in meeting is to alert relevant bodies of the flood risk, establish availability of resources and coordinate a reaction to a flooding event, with the aim of minimising the impact of flooding by improving coordinated response.

All relevant information would be available to this group. The bulk of the information would be obtained from river telemetry, however, additional information will be obtained from weather forecasts, rainfall, lying/melting snow, observers, tide tables, tide surge warnings and historical information.

A development that is planned is the setting up of a Flood Helpline, where members of the public can phone to obtain information on the state of flooding or the conditions of watercourses and rivers. It is hoped that this can be implemented when the necessary funding package has been agreed and established between the relevant bodies.

5. Flooding Events of Non Agricultural Land Since November 1997

5.1 Reported Flood Events

All occurrences of flooding of non agricultural land recorded by The Highland Council since the publication of the previous report is contained in Appendix C.

5.2 Serious Flooding Events

Two serious flooding events have occurred since the publication of the last flood report in 1997. The severity of these flooding events was very significant in terms of damage and disruption and warrants further detailed description in this report.

It is also recognised that serious flooding occurred on the 24/25 December 1999, the areas affected were in Inverness and Nairn, inundation of houses by flood water occurred. Failure of the emergency procedures in Nairn triggered a reappraisal of the Highland Council's Flood Plan which is discussed in paragraph 4.6 of this report.

5.2.1 Flooding Mid-February 1998

Background

During the week ending on 14th February 1998 exceptionally heavy rainfall was experienced throughout the western seaboard of the Highland area. This rainfall was exceptionally heavy in Wester Ross and Skye but also extended to Sutherland and Lochaber.

Although there were many instances of flooding due to choked culverts and stream overflow over this period there were also situations where damage occurred to the fabric of the road structure and where remedial works were required.

The damage to the road structure included scour of embankments, scour of foundations, collapse of retaining walls and landslips.

During this period there were a large number of roads which were closed to all traffic, remedial works in some of these areas were required to restore the roads to their original condition.

Problem Areas

Details of locations where problems occurred are as follows:-

Sutherland

Skiag – Landslip occurred in embankment. Road reduced to single way working. Remedial works to reinstate embankment carried out.

Oldany Bridges, Drumbeg – Bridges overwhelmed by severe flooding.

Ross & Cromarty

Inverpolly Bridge – Abutment undermined. Bridge collapsed. Bailey bridge in place. Design in progress for replacement bridge.

Gairloch area – Severe flooding throughout an extensive area. Landslips and scouring of embankments experienced on many roads. Emergency repair works undertaken.

Skye & Lochalsh

Uig Retaining Wall – Retaining wall collapsed in middle of contract. Road closed to traffic. Reinstatement of wall completed utilising gabion baskets.

Arnisdale Road – Landslips and erosion of retaining walls. Stabilisation measures in place utilising rock blanket and rock fill.

Glen Beag – Extensive damage due to landslips and scour. Road washed away in a number of areas. Road closed for extensive periods. Rock fill utilised for remedial works to reopen road. Reinstatement works completed.

Stromeferry, Ardnarff – Scour of carriageway edge.

Sallachy – Landslip and damage to bridge. Remedial works undertaken utilising rock fill.

Lochaber

Acharacle – Extensive flooding in the area of Moss Road, Dorlin and Newton.

Bracora – Exceptionally high water levels in Loch Morar with flooding to top of safety fence level.

Kinlochleven – Severe flooding with water across the road.

Glencoe and Ballachulish – Blocked culverts and extensive flooding.

Fort William – Severe flooding and blocked culverts at various locations around the town including Achintee and the Swimming Pool.

5.2.2 Inverness

Following a period of continuous rain on 26 April 2000, particularly over the eastern part of the Inverness area, it became apparent that an emergency flood response team would be required and this was established in the Control Room of the Roads and Transport Service at Diriebught Road at 17:00 hours.

Diriebught Road

Extensive flooding occurred on Diriebught Road. Sandbags were delivered to Diriebught House, the cottages on lower Diriebught Road and at the Beefeater Restaurant at the junction with Millburn Road.

As floodwaters rose the road was closed to all vehicles other than emergency vehicles.

Drumdevan Road

The Drumdevan Road continued to rise throughout the day. Sand bags were delivered to vulnerable property, in particular No 29 and 31 Drumdevan Road but the water eventually rose to 700mm around the house, well above damp proof courses and above floor level, which resulted in extensive flooding of the properties.

The flooding became so extensive that the sand bagging became ineffective.

Lodge Road

A call was received by the Council with regard to Lodge Road, a crew attended the scene at 0015, however the water was entering the property from under the floorboards and sandbagging was ineffective.

Burn Road

A call was received at 0330 hours requesting that sandbags be delivered to 14 Burn Road. This was done and the house was protected.

Green Drive

No actual flooding of properties occurred but garden ground was affected. Pumps previously installed coped and kept flood water to a minimum.

Other Urban Locations

Culduthel Road had to be closed to vehicular traffic due to extensive flooding around Inverness Royal Academy.

As flood waters built up the Fire Service requested the wall on Culduthel Road be breached to prevent flood water affecting the properties Loch Earn and Benmore.

Over the night large timber sleepers and telegraph poles were washed down under the Southern Distributor Road causing a partial blockage of a culvert at Falcon Avenue, the flood waters affecting garden ground at Merlin Crescent.

Extensive edge damage occurred on Leys Brae where the drainage system was unable to cope with water commencing at the top of the hill and unable to escape due to the road side banks which enclose the Road.

Inverness Rural Areas

Birchwood Place – Culvert inlet checked several times to ensure it did not become blocked by debris and gravel, no flooding occurred.

B9006 Culloden Road at Inshes/Westhill – Road flooded due to water coming from fields and burns down main road choking gullies. Whole length and width of road badly affected by flowing water up to three feet deep.

Caulfield Road/Cradlehall Park Junction – Extensive flooding of the road duct due to surcharging manholes and inability of road gullies to cope with the volume of water.

Trentham Drive, Westhill – Manholes surcharging and water flowing along and across the road.

Reasurie Road, Smithton – Culvert inlet choked with debris and gravel. Water flowing across road and flooding driveway and gardens of Cranmore Drive.

Murray Road, Smithton – Low spot in the road flooded due to water from overflowing culvert. Road gullies became choked with silt and debris.

Murray Place, Smithton – Inlet to culvert choked with debris causing water to flow around houses and down Murray Place, causing flooding on Murray Road, then flowing through gardens and road of Murray Place.

Ferntower Avenue, Culloden – Culvert partially choked by debris causing large flooded area at rear of houses and across the public road.

Barn Church Road, Balloch – Road flooded and closed for 5 hours. Drainage system could not cope with flood water.

Torris Road, Balloch – Burn surcharging and flowing onto Torris Road, then Cameron Avenue.

Rectification

Flood protection works at Drumdevan Road are ongoing and detailed in paragraph 4.3.2.24 of this report.

The Inverness Flood Prevention Scheme currently at the design stage is identified in paragraph 3.2.5 of this report.

FLOOD PREVENTION AND LAND DRAINAGE (SCOTLAND) ACT 1997
BIANNUAL REPORT, JULY 2000

APPENDIX A

**ROADS AND TRANSPORT
FLOOD PREVENTION POLICY**

FLOOD PREVENTION AND LAND DRAINAGE (SCOTLAND) ACT 1997
BIANNUAL REPORT, JULY 2000

APPENDIX B

**EXTRACT FROM
THE HIGHLAND COUNCIL STRUCTURE PLAN
NATURAL HAZARDS**

FLOOD PREVENTION AND LAND DRAINAGE (SCOTLAND) ACT 1997
BIANNUAL REPORT, JULY 2000

APPENDIX C

REPORTED FLOODING OCCURRENCES
NOVEMBER 1999 TO JULY 2000

APPENDIX D

ASSESSMENTS