

2. THE FLOODPLAIN RISK MANAGEMENT PROCESS

2.1 Introduction

The formulation and implementation of floodplain risk management plans is the cornerstone of the policy. Management plans can eliminate the ad hoc decision making which has contributed to many present day flooding problems.

As with other local planning processes, management plan formulation and implementation is generally a council responsibility. However, DIPNR has an expanded role in regional planning and in specific rural areas, as indicated in Section 3.2. To avoid confusion, Section 2 has been written assuming that council is the responsible authority. The process is identical where this role is performed by DIPNR.

The manual has been prepared to assist councils in formulating management plans through the floodplain risk management process, as depicted in Figure 2.1. This

process is directly linked to council’s strategic planning process as council needs to examine the merit (including impacts on personal safety and property damage) of different types and extents of development in the various flood prone areas. Formulation of strategic plans provides for proper and full consideration of the complete range of land use and management options and their interaction with flood risk.

Broad community involvement in the plan preparation, from the beginning, should produce the best prospect for community acceptance of, and commitment to, the resulting management plan.

The remainder of Section 2 discusses the steps in the management process with more detailed information provided in the relevant Appendices. Appendix C links together the steps in the management process and the other appendices.

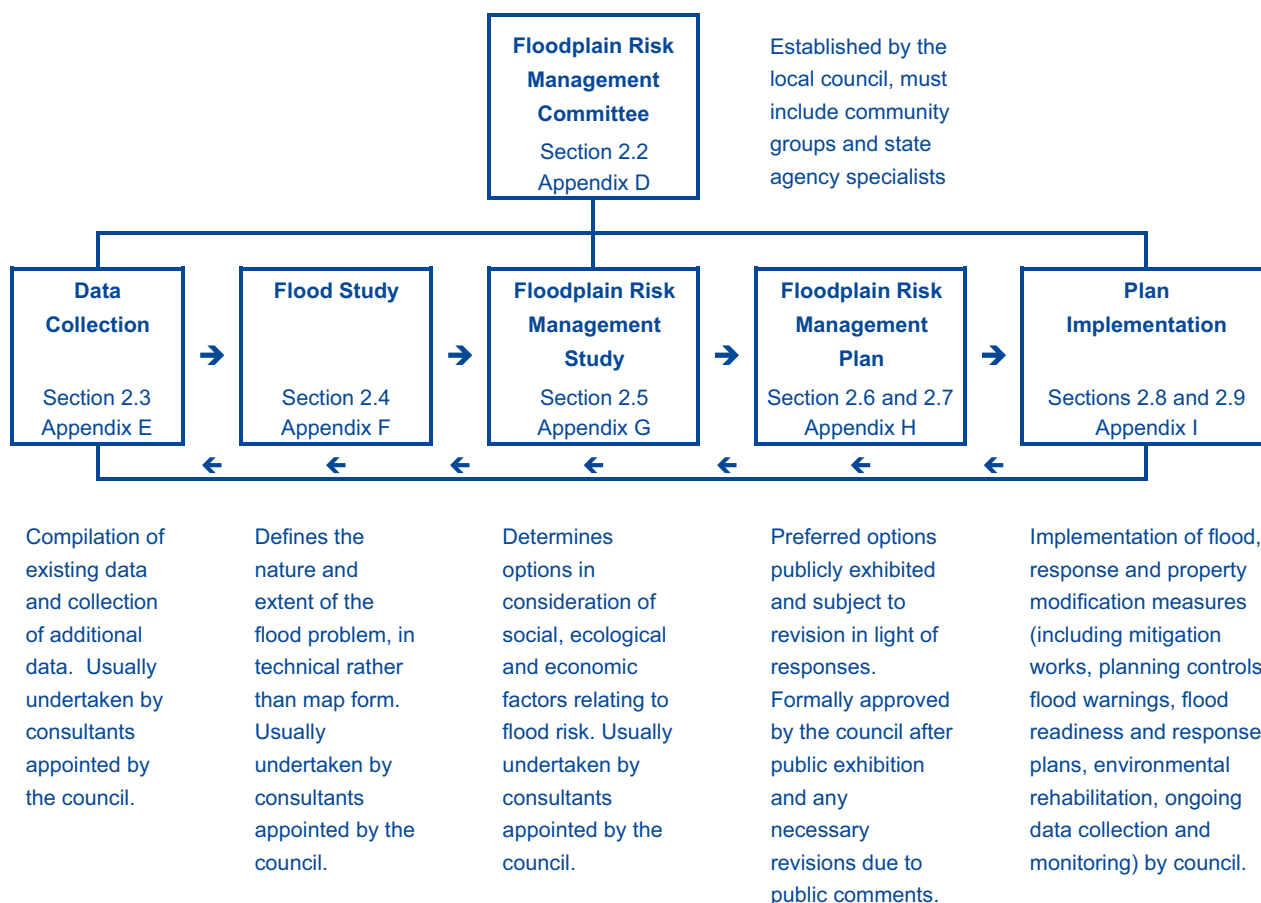


FIGURE 2.1 - The Floodplain Risk Management Process

2.2 Floodplain Risk Management Committee

The first formal step in the process is the formation of a committee chaired by council. It is advisory in nature, as responsibility for planning matters lies with council as a whole. Therefore it should report directly to council or its appropriate executive committee.

Membership of and the role of the committee are discussed in Appendix D. Its principal objective is to assist council in the development and implementation of one or more floodplain risk management plans for its service area. The committee is both the focus of, and a forum for, the discussion of technical, social, economic and ecological issues and for the distillation of possibly differing viewpoints on these issues.

Local government boundaries rarely follow catchment boundaries, therefore it may be necessary to establish a committee involving a number of adjoining councils. One instance is where floodplain risk management measures in one council area are likely to influence the effectiveness of management measures or flooding behaviour in another council area. The establishment of a committee representing a number of council areas can result in a more holistic appraisal of flooding, social and ecological issues, successful implementation of risk management strategies, and more efficient use of expertise.

Once the committee has completed the prime task of developing the management plan including its implementation strategy, and council has adopted these, it is suggested that a limited group remain to oversee implementation.

2.3 Data Collection

A variety of data are required to assess flood behaviour and the effectiveness, costs and benefits of management measures. It is important to define the data currently available and that needed for the study, to identify information gaps. The management committee should initiate studies, where gaps exist, to collect the social, economic, flooding, ecological, land use, cultural, and emergency management data required in management studies. Where relevant data exists (discussed in Appendix E) this should be collated and referred to in investigations.

Data collection should not be seen as an end in itself, but as input to enable preparation of properly informed studies, management plans and floodplain risk management decisions.

2.4 Flood Study

A flood study is a comprehensive technical investigation of flood behaviour (Appendix F). It defines the nature of flood risk by providing information on the extent, level and velocity of floodwaters and on the distribution of flood flows across various sections of the floodplain (shown in Figure 2.2) for the full range of flood events up to and including the PMF.

Major components of a flood study involve determining discharge (hydrologic aspects) and water levels, velocities, etc (hydraulic aspects) for floods of varying severity.

A variety of analytical tools can be used in flood studies, depending on the data available, the flow situation, the nature and extent of development, and the level of detail required. Detailed studies are generally necessary in both urban and rural areas, because knowledge of flood characteristics is required to deal with existing problems, future development and the continuing flood risk.

The flood study also determines hydraulic and hazard categories within the floodplain for the potential range of floods and land use scenarios in order to consider cumulative affects. The manual recognises three hydraulic categories (floodways, flood storage and flood fringe) and two hazard categories (high and low), as described in Appendix L.

Investigating the full range of flood events up to and including the PMF enables changes in the nature and consequences of flooding to be assessed as flood severity increases. These may include increases in velocity and depth, changes in hazard category, the creation of 'islands' (which may be completely inundated in larger events), and the number of properties inundated etc.

Determining appropriate areas for and types of development generally depend upon flood exposure of the land, as defined by hydraulic and hazard categorisation in consideration of isolation (see Appendix L6).

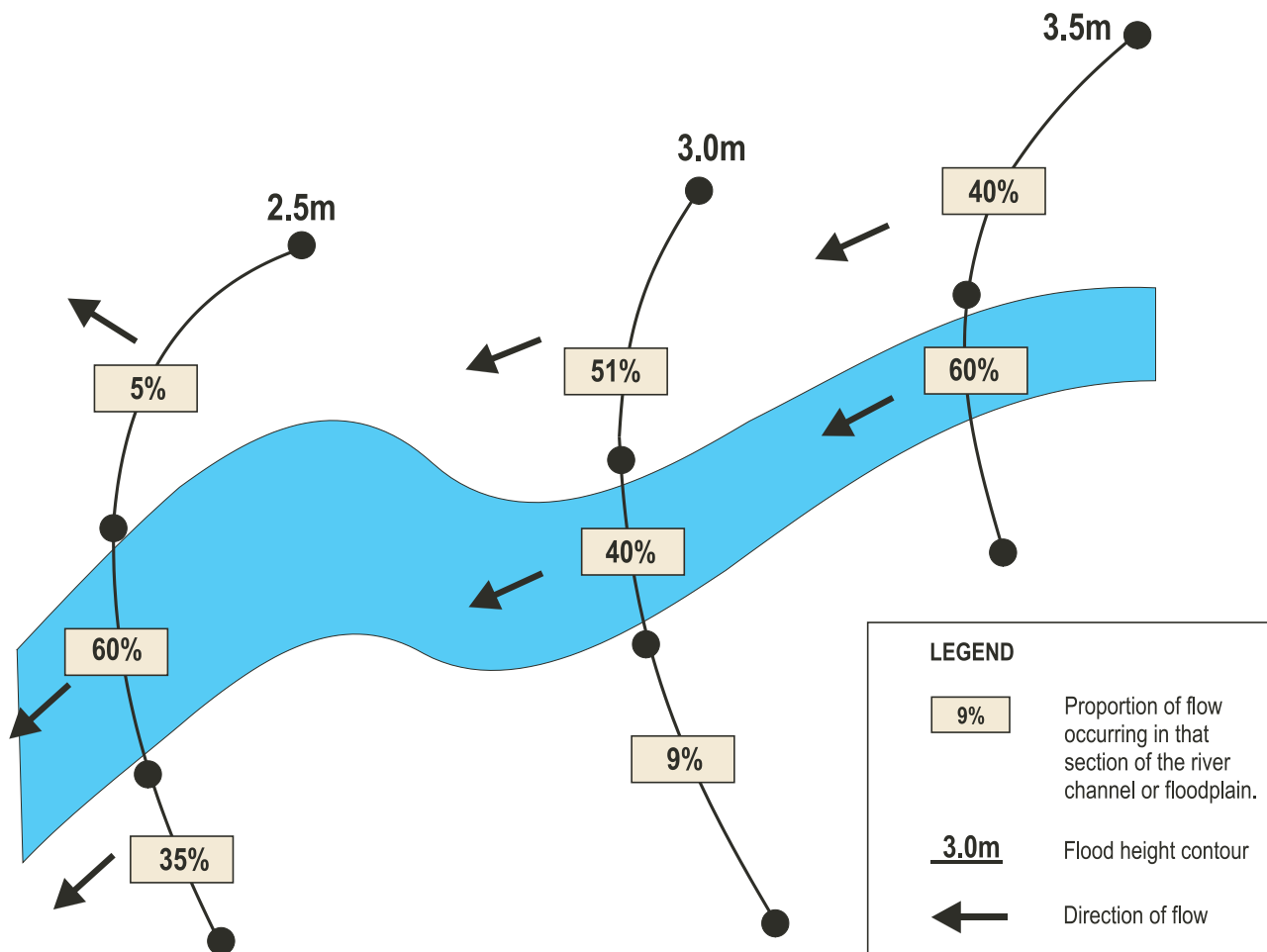


FIGURE 2.2 - Example of Basic Flood Study Information Presentation

This information is also weighed objectively in selecting FPLs (see Appendix K).

Finally, climate change which is postulated to occur due to the enhanced greenhouse effect will affect flood behaviour as sea levels may rise and the pattern of flood producing storms may intensify. The potential impacts need to be considered as discussed in Appendix F.

2.5 Floodplain Risk Management Study

The purpose of a management study is to identify, assess and compare various risk management options and consider opportunities for environmental enhancement as part of mitigation works, as outlined in Appendix G.

The management study draws together the results of the flood study and data collection exercises. It provides information and tools to allow strategic assessment of the impacts of management options for existing, future and continuing flood risk on flood behaviour and

hazard and the social, economic, ecological and cultural costs and benefits of options. It also provides the basis for robust decision making in the management plan.

A management plan generally involves a mix of options as it is unusual for a single management option to manage the full range of flood risk. Determining the optimum mix of measures can require complex studies, exercise of professional judgement and extensive community consultation. Typical options considered are indicated in Table 2.1 and should include:

- property modification measures including development controls in new areas, and voluntary purchase and house raising in developed areas;
- response modification measures such as evacuation and associated operational logistics; and
- flood modification measures including levees and bypass channels.

Property Modification Measures	Response Modification Measures	Flood Modification Measures
Zoning Voluntary Purchase Voluntary House Raising Building and Development Controls Flood Proofing Buildings Flood Access	Community Awareness Community Readiness Flood Prediction and Warning Local Flood Plans Evacuation Arrangements Recovery Plans	Flood Control Dams Retarding Basins Levees Bypass Floodways Channel Improvements Flood Gates

TABLE 2.1 - Typical Floodplain Risk Management Measures

The impact of management works or proposed developments on flooding behaviour elsewhere, should be assessed on a cumulative rather than individual or ad hoc basis within the context of the management plan. This includes both the effect of development on flood behaviour and the number of people who may require evacuation, particularly in rare flood events. Where mitigation works are considered, they should be designed to produce nett positive ecological outcomes, where practical and feasible.

Appendices J to M provide additional advice to aid in management study preparation including Appendix L, which provides advice on hydraulic and hazard categorisation and Appendix M, which has advice on flood damage determination. Appendix J provides details on the typical management options available to address the full range of risk, as indicated in Table 2.1.

Appendix K discusses the derivation of FPLs for works and development controls. FPLs can indicate the level of the protection provided by flood or property modification measures. As noted previously, it is generally neither feasible nor socially or economically justifiable to adopt the PMF as the basis for such FPLs. The FPL for residential dwellings would generally be based around the 1% AEP flood event plus an appropriate freeboard (typically 0.5m) unless there are clearly identified benefits from a higher FPL which outweigh the associated costs. The FPL for protection works, such as a levee, may be different due to the economics of the situation, ecological impacts, the physical limitations of the site, community concerns, and the height floods can rise above ground level in the area.

Unless the PMF is used as the basis for any FPL, a larger flood than the one used to determine the FPL, can always occur. It is not a matter of if but when. The difference in flood

levels, damages, and the area of inundation and the number of dwellings to be evacuated in the PMF event relative to the event upon which the FPL is based, serves to alert a council to the upper limit of the costs and consequences of flooding.

2.6 Floodplain Risk Management Plan

The purpose of a management plan is to provide input into the strategic and statutory planning roles of councils. It does not, by intent, purport to be the only document relevant to development of flood prone land. The management plan provides the type of information necessary for adequate forward planning for flood prone land.

The advantages to both councils and the community in general of having a properly considered management plan in place include:

- having a proper basis for managing and using flood prone land to provide a balance between danger to personal safety and economic losses due to flooding, and social, ecological and cultural interests. This provides the current and future community best value from managing and using its floodplains;
- optimising use of community infrastructure, such as roads, water supply and sewerage;
- minimising personal danger to residents, visitors and emergency response personnel and community flood damage;
- strategically assessing future developable land so the impacts of its development on flooding and the affects of flooding on the development can be effectively considered. This provides a sound basis for incorporating floodplain

risk management outcomes in revising council's EPIs and development controls. It allows the community to grow in a responsible and socially cohesive fashion in consideration of flood issues. It also provides for increased certainty, from a flood perspective, for development applications in line with the relevant EPI requirements; and

- having a basis for more timely assessment of development applications for flood prone land, especially where council's EPIs and development control plans and/or policies have been altered, in light of the management plan, to incorporate appropriate zonings, and flood related controls. Individual development applications are thus limited to the best way to achieve the required outcomes on individual sites.

Preparation and finalisation of the plan is discussed in Appendix H.

2.7 Review of an Adopted Management Plan

Review of management plans should be triggered by the following instances:

- time, review regularly, around every 5 years;
- after significant flood events which provide additional data on flood behaviour;
- where significant changes occur to the factors influencing the decisions in the plan, including changes to local flood plans;
- where impediments to implementation exist that warrant a review; and
- where changes in future land use trends outside those considered in the management plan are proposed.

This review should account for changes across the full range of issues originally addressed and consider any associated emergent issues.

2.8 Plan Implementation

Once a management plan has been adopted, it needs to be implemented, as discussed in Appendix I.

Certain components can be implemented relatively quickly, such as incorporating flood related development controls into policy and EPIs and flood education including public awareness programs. Others require additional investigations and design, and funding.

It is unlikely that any management plan could be implemented immediately in its entirety. For example, availability of funding will determine when mitigation works can commence. Consequently, an implementation strategy is required to stage components dependent on funding availability and the management plan needs to consider adoption of interim measures. The implementation strategy should be developed during the preparation of the management plan and incorporated in the plan.

2.9 Funding for Management Measures

If a council seeks State Government financial assistance for implementation measures, it is required to provide the following advice which may be derived from the management study, as a minimum:

- methods used to seek public comment and take account of submissions received;
- methods used to formulate a balanced, community acceptable management plan; and
- details of environmental and cultural assessment of mitigation works and safeguards proposed to minimise any adverse impacts and maximise positive ecological opportunities. All proposed works are subject to environmental assessment under the EP&A Act.