

Isle of Wight Strategic Flood Risk Assessment MK2

Appendix C SFRA GIS Data Discussions



June 2010

Source Data Discussion

Many datasets were requested for use in this SFRA, and these were primarily received from the Isle of Wight Council and the Environment Agency. These geographic data had various formats by which they were made available and originated from different sources (e.g. digitised paper maps, survey data and satellite data).

The following is a short description of the source data GIS data used during the course of the SFRA. Where available, the reference scale of the map has been included in order to indicate the maximum scale of use for which the map was intended.

Ordnance Survey Basemap

A high level topographic map which provides an overview of the Island and the RDA's was used as a basemap where detailed ordnance information was not required. This map includes data such as the road network, green areas and contours. The data of this map was captured at 1:50,000 reference scale.

Mastermap

Mastermap data was made available by the IoW Council. This dataset is an accurate source of ordnance survey data that informed the SFRA at RDA and site specific scale. The reference scale of the dataset differs depending on the degree of urbanisation, with urban areas having a capture standard of 1:1,250 while for rural areas detail is reduced.

Potential Development Sites

Potential development sites were supplied the IoW Council and included several different datasets of 'Sites', 'Large Sites' and 'Employment Sites'. This dataset identified those areas on the Island that were/might be considered for development. The reference scale of this dataset is unknown. Section 6 provides further details of the potential development sites on the Island.

Geology

Geological maps of the Island were sourced from the British Geological Society (BGS) on behalf of the Council. The datasets included solid (bedrock), drift (superficial), artificial geological maps, as well as linear geological features and areas of mass movement. The reference scale of these maps are 1:63,360. The mass movement dataset is discussed in greater detail in Section 7.3.1.

Soils

Soils data for the Island was sourced from a national gridded dataset of soils. This dataset is comprised of 1km² cells with attributed values for the percentage composition of various soils for the cell of interest. The dataset also



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contains a HOST value for the soils in the cell. Given that the data originated in a 1km² grid, specific detail about the spatial distribution of soils was lacking. Section 7.3.3 provides additional detail.

Groundwater Vulnerability

A digital dataset of groundwater mapping was provided by the Environment Agency. These maps show the vulnerability of groundwater as a combination of aquifer type and soils. The reference scale for this dataset is 1:100,000. Since soils data are included in the dataset, it was possible to supplement the less accurate national soils grid. Sections 7.3.1 and 7.3.2 discuss this dataset in greater detail.

Source Protection Zones

Source Protection Zones were provided by the Agency for the Isle of Wight. The zones show the risk of contamination from activities that might cause pollution to aquifers used for public water supply. The closer the potential contamination activity is to the abstraction point, the greater the risk classification. The reference scale of this dataset is unknown. Section 7.3.1 provides further information.

Environment Agency Main Rivers

The main rivers on the Island were sourced from an Environment Agency dataset of rivers defined as larger streams and rivers, including smaller watercourses of local significance.

Fluvial and Tidal Flood Outlines for Zones 2 and 3

The Environment Agency provided a digital dataset of the Island which outlined those areas affected by flooding. The data was divided according to flood zone 2 and 3, as well as fluvial and tidal. This data is sourced from modelling done for the Agency which used Synthetic Aperture Radar (SAR) elevation data.

Environment Agency Flood Model Outlines

The Environment Agency provided flood model outlines of various return periods for some of the rivers on the Island, including the Medina, Monkton Mead and Western Yar. This data was used where necessary, to update the fluvial flood outlines provided by the Agency. The accuracy of the datasets is dependant on the modelling process and its input data. The application of this data is discussed further in Section 5.

Historic Flood Outlines

Historic flood outlines were also provided by the Agency. The past flooding events included the years 1974, 1993, 1999 and 2000. The annual exceedence probability of the flood outlines is unknown, and as such, they were used to supplement the existing flood outlines. The reference scale of these outlines is unknown and is dependant on the



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accuracy of the original data and the scale at which they were digitised. Sections 2 and 6 provide further information about historic flooding on the Island.

Flood Defences

The National Flood and Coastal Defence Database from the Agency was the source for the location, extent and level of protection of flood defences on the Island. The reference scale of this dataset is unknown.

Data Precision

Each data source has an associated level of precision. The groundwater water vulnerability mapping has a reference scale of 1:100,000. Whereas LiDAR data has a 2 metre resolution, which means that each 2m by 2m area of land is assigned a single elevation value. Much of the Island wide data (e.g. Groundwater Vulnerability Mapping, Source Protection Zones and Soils Data) come from national data sets, the spatial precision of which is low, but appropriate for strategic Island wide assessments. The individual potential development sites are attributed with values derived from these low precision national datasets (e.g. the generalised classifications of infiltration SuDS suitability, groundwater vulnerability and runoff potential). It must be noted that the precision of the data does not increase despite the analysis being performed on the smaller site specific scale.

It is important that the site specific detail of the datasets covered in the following section be considered in respect to the level of accuracy of the source data. The reference scale of any of the original source data should be deemed as the maximum scale at which the data is considered accurate.

Datasets Produced by the SFRA

‘Sites Database’

The purpose of this section is to detail the method by which the potential site attribution dataset was created. Much of the relevant detail is mentioned in previous sections, and therefore the intention is to provide an overview of how a single attribute was assigned to a site which was covered by multiple attribute values. The attribute fields in this dataset were derived as follows:

PERC_FZ1

This defines the percentage area of the site which falls within Flood Zone 1.

PERC_FZ2

This defines the percentage area of the site which falls within Flood Zone 2.



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PERC_FZ3a

This defines the percentage area of the site which falls within Flood Zone 3a.

PERC_FZ3b

This defines the percentage area of the site which falls within Flood Zone 3b.

FRA_REQ

Sites were categorised into those requiring and not requiring a FRA. This was determined by whether or not a site was within any of the flood zones as recorded by the fields (Func_FP, FZ3_T, FZ3_F, FZ2_T and FZ2_F) and whether or not the site was over 1ha. Sections 3 and 4 provide an overview of the flood risk zones as defined by PPS25.

FUNC_FP, Func_FP, FZ3_T, FZ3_F, FZ2_T and FZ2_F

Each site was attributed as to the flood zones into which it either partially or completely fell. This categorisation was independent of scale, such that a site was accordingly attributed even if only fractionally touched by a flood zone. Details about the flood zones as defined by PPS25 are found in Section 3.

PROBABILIT

By assessing whether a site fell within a flood risk area, and the maximum flood risk posed, it was possible to assign a qualitative attribute to each of the affected sites corresponding to the qualitative descriptions used by PPS25. This attribution applied a precautionary approach by identifying the greatest flood risk posed to a site.

APP_USES

The various fields recording flood risk to the sites allowed for an initial assessment of appropriate land uses for each site. Thus a site falling outside the flood zone was attributed as not having any restrictions in terms of suitable uses, while for sites falling within flood risk zone, a precautionary approach was used, identifying the most severe flood risk falling on the site, and specifying appropriate uses accordingly. It is therefore advisable to consult the site specific flood risk definition dataset to determine the site distribution be consulted. Table D.2 of Annex D PPS25, as replicated in Appendix B provides further information.

HISTORIC

Historic flood outlines were provided by the Environment Agency for the Island. These outlines provided supporting information of those areas already identified at risk of flood as defined by the functional floodplain, flood zone 2 and flood zone 3 as well identifying potential flood risk areas not included in the Environment Agency



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maps. The sites were therefore attributed with the month and year for each of the historic floods which they intersected. This categorisation was independent of scale, such that a site was accordingly attributed even if it only fractionally passed through a historic flood zone. Section 3 contains further detail about historic flooding on the Island.

M_RIV_BUFF

A generic assessment of the influence of major rivers on flood risk was carried out, since the fluvial flood risk zones as defined by the Agency do not cover all the main rivers on the Island. It was therefore agreed at a meeting between the IoW Council, the Agency and Entec (on the 18 September 2007), that a 20m buffer would be applied to all major rivers on the Island. Sites that intersected the buffered rivers were then attributed accordingly. This advice is in line with current Agency requirements, since as the Environment Agency is a statutory consultee under Town and Country Planning Act, their authority extends past areas within Flood Zone 2 and 3, and includes development within 20 metres of main rivers. The buffer is 20m either side of the main river centreline.

WAVE_RISK

The assessment of potential Wave exposure risk is detailed in Section 5. The objective of the assessment was to identify areas potentially susceptible to wave action and spray. A three tier classification has been applied which is based upon a consideration of the exposure of the coastline, prevailing wind and recorded wave heights. The coastline has either been classified as having a high, Medium or low risk of potential wave exposure. The purpose of which is to indicate to future developers that this potential risk should be assessed and addressed when developing along the coastline, so that development can be appropriately designed.

FLUVIAL_CC

Climate change on fluvial flood risk was also necessary to assess, since rainfall intensities and hence peak river flows are likely to increase on the Island in the future, resulting in the extension of current fluvial flood zones. Section 4 discusses this in more detail, and provides clarity on the assumptions and simplifications made.

Once areas of fluvial climate change were identified, it was then possible to attribute the sites with an attribute as to whether or not they intersected the identified fluvial climate change areas. A site was accordingly attributed even if it only fractionally passed through an area “*of Fluvial Floodplain Potentially Sensitive to Climate Change*.” (See Figure 15 in Appendix A for the areas identified as being potentially sensitive)

SUDS_SUIT and SUDS_VUL

The applicability of SuDS on the Island was a component of the work undertaken as part of the SFRA. This was done in order to provide a site by site generalisation of the suitability of SuDS as categorised by attenuation vs. infiltration techniques. Section 7 provides a description of the origin of the datasets used to attribute the sites, and the processing involved to arrive at the two SuDS classifications.



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SUDS_SUIT was assigned to each site it describes the suitability of infiltration SuDS techniques. If a site was predominantly in an area of ‘high’ infiltration suitability, and only a small portion was intersected by a ‘low’ infiltration suitability area, a worst case scenario was assumed, and the resulting *SUDS_SUIT* attribution for that site was recorded as ‘low’. Areas of mass movement were assigned a low suitability

SUDS_VUL this classification describes the potential for the contamination of groundwater. This assessment was based on Groundwater protection Zones and three classifications of were produced, low, medium and high. As with *SUDS_SUIT* a worst case scenario was assumed in that if a site was predominantly in an area of low contamination potential but with a small portion in an area of medium contamination potential – the site was assigned a medium contamination potential.

RUNOFF_POT

A component of all FRA’s is the requirement for an assessment of site drainage to be undertaken. This process is site-specific and would be inappropriate for the purposes of a SFRA, as 7.3.3 details. Nonetheless, an initial Island wide assessment of runoff potential was carried out, since it provides a preliminary indication of runoff.

This assigned a qualitative attribute to each site of very low, low, medium, high or very high. This attribution was determined through the *SPR_HOST* for each site, which in turn was assigned according to the *HOST* classification for the site. Unlike much of the previous attribution in the dataset, *RUNOFF_POT* required that the predominant *HOST* class for each site be assigned as the attribute value for that site. Therefore, each site was attributed according to the *HOST* class most prevalent (assuming a site was intersected by more than one class). It should be noted though, that some sites were not covered by the original *HOST* dataset, and were therefore attributed as ‘unknown’.



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