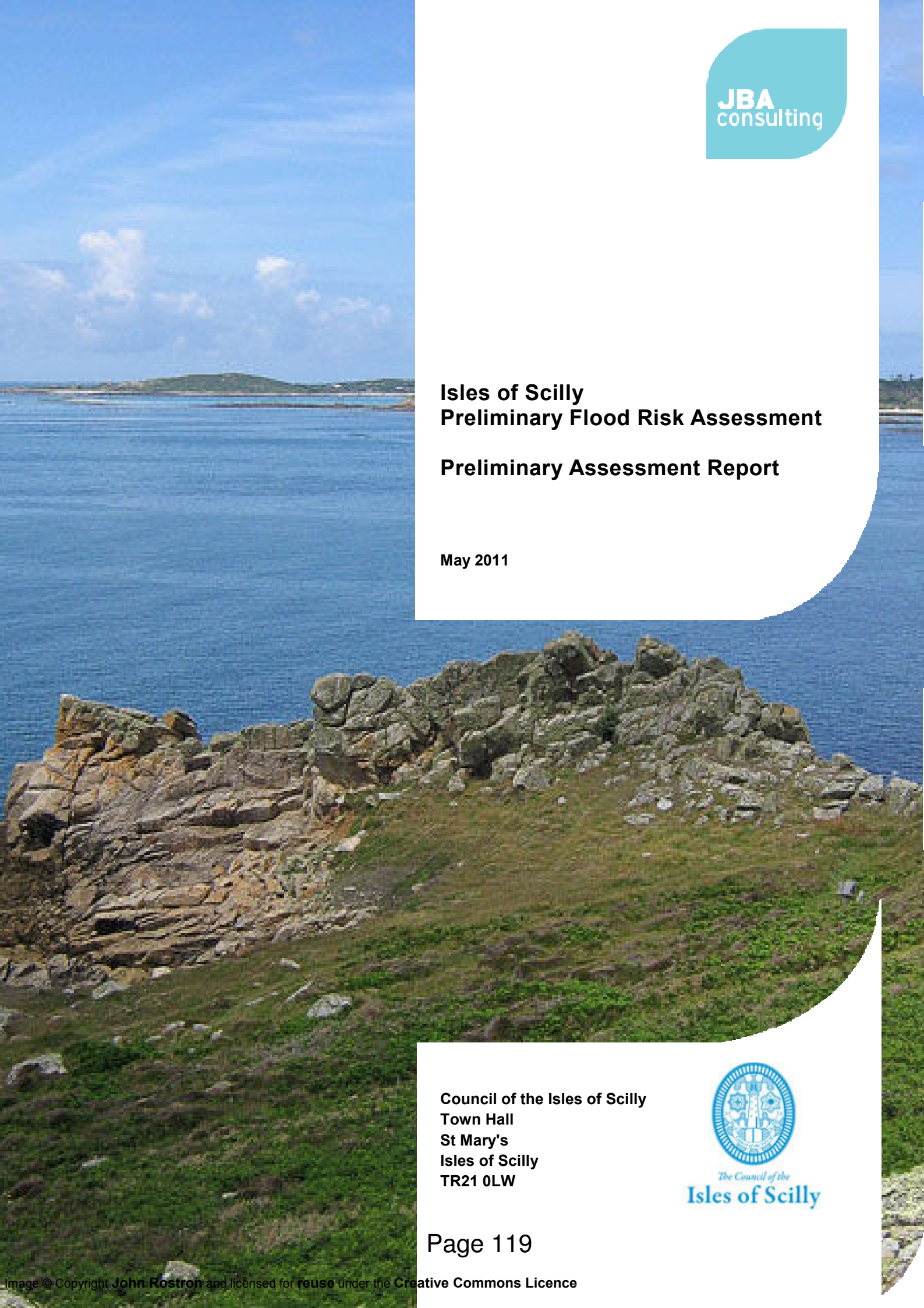

Isles of Scilly
Preliminary Flood Risk Assessment

Preliminary Assessment Report

May 2011

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Revision History

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Draft 17th June 2011		David Senior
Final submitted to EA		David Senior

Contract

This report describes work commissioned by, on behalf of the Council for the Isles of Scilly.

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Purpose

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References

Defra and WAG guidance on Flood Risk Areas 2010; Environment Agency (2010 and later amendments) Preliminary Flood Risk Assessment (PFRA) Final guidance and annexes and guidance notes associated with Environment Agency data as dated. Standard text on climate change and development in Sections 5.4 and 5.5 © Environment Agency

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Executive Summary

This Preliminary Assessment Report for the Isles of Scilly has been prepared as part of the duties established under the Flood Risk Regulations 2009. It is due for submission to the Environment Agency by 22nd June 2011. The Regulations transpose and implement the requirements of the European Floods Directive, which aims to provide a consistent approach to managing flood risk across Europe.

The first stage of the process is to undertake a Preliminary Flood Risk Assessment (PFRA). This involves the review of past floods and the potential for future floods, as well as determining and reviewing the presence of any "areas of significant flood risk", the so called Flood Risk Areas. Where such Flood Risk Areas have been determined, on the basis of national guidance issued by Defra and Welsh Assembly Government (WAG), Lead Local Flood Authorities (LLFAs) are required to review and if necessary propose amendments to the indicative areas using locally held information. No Flood Risk Areas have been proposed for the Isles of Scilly.

The Council for the Isles of Scilly, as the Unitary Authority and a LLFA, has a responsibility under both the Flood Risk Regulations 2009 and the Flood & Water Management Act 2010 for managing local flood risk. To meet this duty, the Council for the Isles of Scilly has completed the PFRA and assessed flood risk from local sources of flooding from surface water, groundwater and ordinary watercourses, together with any interaction with drainage systems, sewers and other sources. The EA is responsible for assessing the risk of flooding from main river, the sea and large reservoirs.

The assessment of local flood risk has involved the collection and review of readily available information on past floods across the 5 inhabited islands of the Isles of Scilly held by the Council and partners, such as Cornwall Council and the Environment Agency. National datasets have been made available to LLFAs by the Environment Agency in order to assist with PFRA analysis; however not all of these datasets cover the Isles of Scilly. This review has then been supplemented by an objective assessment of the potential risks of future flooding across the Islands.

The PFRA has been undertaken by means of a desktop study. Due to the lack of surface water or fluvial flood outlines it was not possible to obtain specific counts of the number of people or properties at risk of flooding on the Islands. A select amount of data has been made available with regard to past flood events. This data has been utilised where possible to help identify possible areas of risk.

The PFRA process helps strengthen and underline the importance of partnership working and the need for sharing information. A database structure now exists to record the mandatory information necessary for documenting all future floods. This will be of value and greatly assist the PFRA review process in 6 years time.

Understanding and communicating local flood risk in this way will provide the foundations for developing the Council's Local Flood Risk Management Strategy. Work on this is due to start later this year as part of the duties under the Flood & Water Management Act 2010. The Local Strategy will define how flood risk is to be assessed and managed across the Islands in future years. The PFRA analysis has provided the opportunity to inform how this future strategy will be taken forward.

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Abbreviations

Term or Abbreviation	Definition
AONB	Area of Outstanding Natural Beauty
Assets	Structures, or a system of structures used to manage flood risk
AStGWF	Areas Susceptible to Groundwater Flooding
AStSWF	Areas Susceptible to Surface Water Flooding
Catchments	An area that serves a river with rainwater. Every part of land where the rainfall drains to a single watercourse is in the same catchment.
CFMP	Catchment Flood Management Plan
Cultural heritage	Buildings, structures and landscape features that have an historic value. These are also known as heritage assets.
Defences	A structure that is used to reduce the probability of floodwater or coastal erosion affecting a particular area (for example a raised embankment or sea wall)
Defra	Department for Environment, Food and Rural Affairs
EC	European Commission
EC Inspire Directive	Implemented by the 'Inspire Regulations 2009'. The main aim being to improve the quality, consistency and accessibility of spatial data sets and services for environmental data.
FCERM	Flood and coastal erosion risk management
Flood	The temporary covering by water of land not normally covered with water
FMfSW	Flood Map for Surface Water
Flood Risk Area	An area determined as having a significant risk of flooding in accordance with guidance published by Defra and WAG.
FWMA	Flood and Water Management Act
GHG	Greenhouse Gasses
GIS	Geographic Information Systems
Groundwater	Water which is below the surface of the ground and in direct contact with the ground or subsoil
HSWGW	Historic Surface Water and Groundwater
Indicative Flood Risk Areas	Areas determined by the Environment Agency as indicatively having a significant flood risk, based on guidance published by Defra and WAG and the use of certain national datasets. These indicative areas are intended to provide a starting point for the determination of Flood Risk Areas by LLFAs
JFrism	JBA Consulting's bespoke 'Flood Risk Metrics' GIS tool.
LLFA	Local Lead Flood Authority
Local flood risk	Flood risk from sources other than main rivers, the sea and reservoirs, principally meaning surface runoff, groundwater and ordinary watercourses
Main River	A watercourse shown as such on the Main River Map, and for which the Environment Agency has responsibilities and powers
NRD	National Receptor Dataset – a collection of risk receptors produced by the Environment Agency

Ordinary Watercourses	All watercourses that are not designated Main River, and which are the responsibility of Local Authorities or, where they exist, IDBs
Preliminary Assessment Report	A high level summary of significant flood risk, based on available and readily derivable information, describing both the probability and harmful consequences of past and future flooding
Preliminary Assessment Spreadsheet	Reporting spreadsheet which LLFAs need to complete. The spreadsheet will form the basis of the Environment Agency's reporting to the European Commission
PFRA	Preliminary Flood Risk Assessment
PPS25	Planning Policy Statement 25
Receptor	Something that may be harmed by flooding
Regulations	The Flood Risk Regulation 2009
Resilience	The ability of the community, services, area or infrastructure to withstand the consequences of an incident
Risk	Measures the significance of a potential event in terms of likelihood and impact
River Basin District	There are 11 river basin districts in England and Wales, each comprising a number of contiguous river basins or catchments. The Environment Agency is responsible for collating LLFA reports at a river basin district level
SACs	Special Area of Conservation
SFRA	Strategic Flood Risk Assessment
Source	The origin of a hazard (e.g. heavy rainfall, strong winds, surge etc)
SPAs	Special Protection areas
SSSIs	Sites of Special Scientific Interest
Surface runoff	Rainwater (including snow and other precipitation) which is on the surface of the ground (whether or not it is moving), and has not entered a watercourse, drainage system or public sewer
SWMP	Surface Water Management Plan
UKIP09	UK Climate Change Projections 2009
WAG	Welsh Assembly Government

1. Introduction

1.1 Scope of the Report

The Council for the Isles of Scilly has new duties as a Lead Local Flood Authority (LLFA) to manage local flood risk across the authority. The focus and responsibilities for the council in this new role are to assess and manage local flood risk from sources such as surface water, groundwater and ordinary watercourses. The Environment Agency (EA) is responsible for assessing the risk of flooding from main rivers, the sea and from large reservoirs. There are however no ordinary watercourses or main rivers located on the Isles of Scilly.

One of the first obligations is to complete a Preliminary Flood Risk Assessment (PFRA), required under the Flood Risk Regulations 2009. These Regulations transpose and implement the requirements of the European Floods Directive. This aims to provide a consistent approach to managing flood risk across Europe and to manage and reduce the risks that floods pose to human health, the environment, economic activity and cultural heritage.

This report presents the findings of an assessment of local flood risk and the past and potential future impacts of flooding across the 5 inhabited islands. It has to be provided to the EA by 22nd June 2011 as part of a national submission to be reviewed and then published and sent to the European Commission in December 2011.

The Flood Risk Regulations 2009 establish a flood risk management framework consisting of four stages that will be reviewed on a 6-yearly basis, namely:

- To prepare a Preliminary Assessment Report on past floods and potential future floods
- To identify Flood Risk Areas (FRAs) where flood risk is deemed nationally significant
- To produce appropriate Flood Hazard and Flood Risk Maps for FRAs
- To prepare Flood Risk Management Plans for FRAs

This Preliminary Assessment Report presents the outcomes of the first two stages that together make up the PFRA process, namely the assessment of local flood risk and the identification of any Flood Risk Areas, where the risk of flooding is considered significant.

The Defra and Welsh Assembly Government guidance sets out the criteria and thresholds for assessing whether a risk of flooding is of national significance. This has confirmed there are no indicative Flood Risk Areas in Scilly, based upon the nationally available information. This report includes a review of this determination in respect of any locally held information.

For any agreed Flood Risk Areas where flood risk is deemed significant, these will be subject to the further stages outlined above, namely the preparation of Flood Hazard and Risk Maps by 2013 and the production of Flood Risk Management Plans by 2015.

1.2 Objectives and Approach

The overall aim and objective of the PFRA process is to carry out a high level exercise designed to make use of all existing and readily available data, in order to review past floods and the potential for future floods across the Isles of Scilly.

The key objectives are to:

- Identify partner organisations involved in local flood risk management and engage in the PFRA process through ongoing collaboration
- Establish agreed systems for future data management, sharing and storage
- Describe the adopted approach to the PFRA

- Undertake an assessment of past floods across the Isles of Scilly from local sources of flooding and summarise the consequences and impacts of these events
- Assess the potential harmful consequences of future flood events within the unitary authority
- Review and update the authority-wide system to enable the recording of all relevant information for future floods
- Review the provisional national assessment of indicative Flood Risk Areas provided by the EA and provide explanation and justification for any amendments required to the Flood Risk Areas.

The assessment of local flood risk has involved the collection and review of readily available information held by the Council for the Isles of Scilly as well as partners such as Cornwall Council and the EA, on past floods across the 5 inhabited islands. National datasets have been made available to LLFAs by the EA in order to assist with PFRA analysis; however these datasets do not all cover the Isles of Scilly (e.g surface water mapping). There are no ordinary watercourses or main rivers located on the islands which means that the Isles of Scilly do not feature in the EA Flood Zones. The Council for the Isles of Scilly serves as the last remaining public water authority in the UK and are therefore responsible for water supply and sewage disposal. As a result of this there is no need, or requirement to liaise with additional external water companies.

Due to the lack of available data, it has not been possible to conduct any further detailed analysis as a means of assessing potential future flood risk. Documents such as the Shoreline Management Plan, Emergency Flood Plans 2010 and the Flood Risk Assessment carried out in 2009 for the 5 Islands School Redevelopment have been utilised to help identify potential sites at risk.

Understanding and communicating local flood risk will provide the foundations for developing the Council's Local Flood Risk Management Strategy. Work on this will be commencing later this year, once the National FCRM Strategy has been published, as part of the duties under the Flood & Water Management Act 2010. The Local Strategy will define how flood risk is to be assessed and managed across the Islands in future years. The PFRA analysis has therefore also been used as an opportunity to inform how this future strategy will be taken forward.

The PFRA process is also an opportunity to review, strengthen and promote local partnership and information sharing arrangements between the local risk management authorities. It represents one of the first activities to be performed in accordance with the new requirements established under the Flood & Water Management Act 2010. Roles and responsibilities of operating authorities have now been clarified, as has the need for partner organisations to cooperate and share data and information in a spirit of partnership. This delivers on two of the central recommendations of the Pitt Review into the Summer 2007 floods.

A further objective and outcome of this work is for there to be an agreed data management system that will be used by the Council for recording all the critical information relating to all future floods that occur across the Islands. Historic incidents of flooding are rare, and as a result of this there was little in the way of recording protocol. Very little data is available for use within this PFRA and it is important to amend this process going forward. Using Annex 1 as a template, a new system will be developed such that any future flood events are thoroughly recorded, including a number of fields that are not yet mandatory but will be required in further cycles of the PFRA process. This will ensure that comprehensive records are collected and recorded in the correct format, greatly simplifying the future revision of the PFRA and updating of "past floods" which will be required in 6 years time.

1.3 Study Area

The Unitary Authority of the Scilly Isles is located 28 miles off the most westerly point of the British Isles, Lands End. Although separated from mainland Cornwall unitary authority since

1890, it is still linked through some services and forms part of the Ceremonial County of Cornwall.

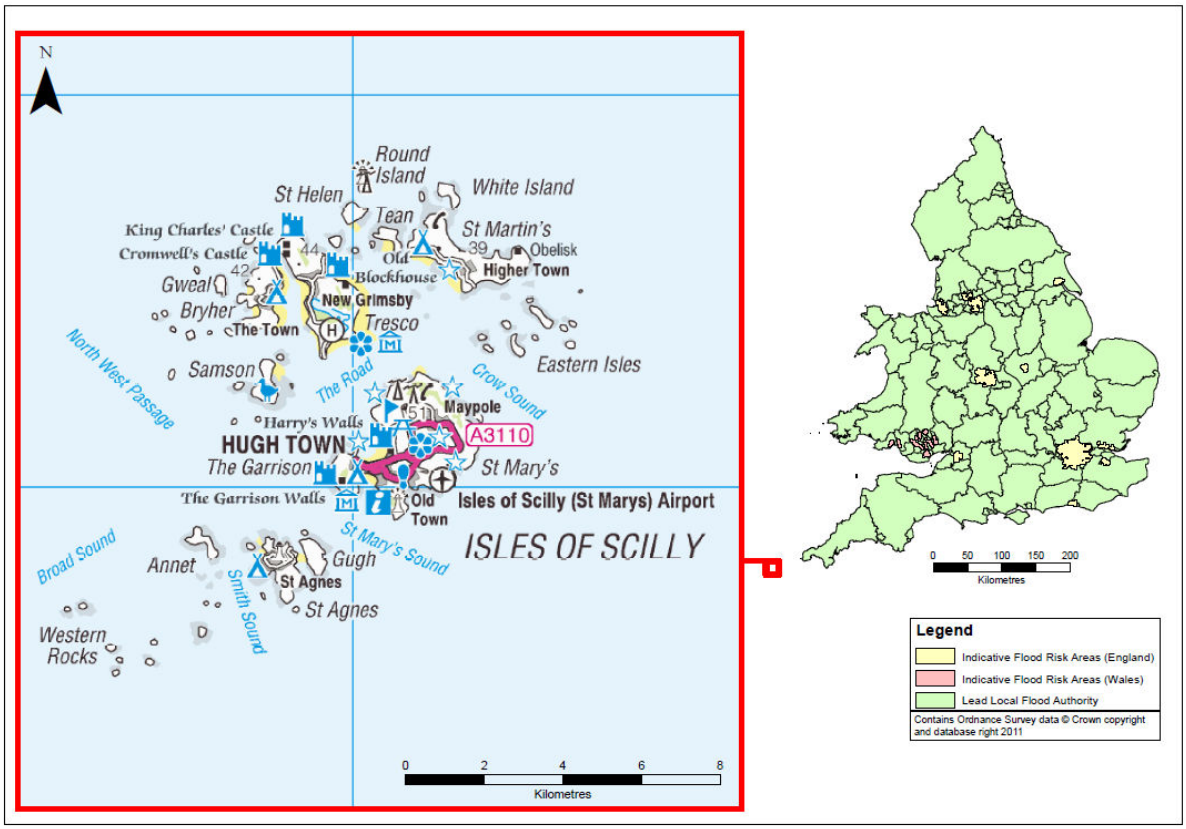

Figure 1.1 Location Plan Showing Indicative Flood Risk Areas

The islands form an archipelago, or clustering, of 5 main inhabited islands and over 100 uninhabited islets, all forming part of the granite intrusion known as the Cornubian batholith. Various additional intrusions of the same type can be found throughout Cornwall, namely in St Austell and Bodmin Moor. The area is known for having one of the mildest climates found in the British Isles which is due to the moderating effect of the North Atlantic Ocean which helps to secure the main agricultural product for export which is cut flowers.

The Isles of Scilly are in most part owned by the Duchy of Cornwall; only the built up area of Hugh Town known to be freehold. Any uninhabited islands or untenanted land is leased to the Isles of Scilly Wildlife Trust with the exception of the island of Tresco which is let in its entirety to the Tresco Trust.

Cumulatively, the islands total a land mass of 16.01 km^2, the 5 inhabited islands making up roughly 90% (14.38 km^2), and have a combined population of 2,153. The most densely populated area on the Islands is Hugh Town, the main town of St Mary's where the highest point of the island is 51mAOD.

	Population	Area (km^2)
St Mary's	1666	6.29
Tresco	180	2.97
St Martin's with White Island	142	2.37
St Agnes with Gugh	73	1.43
Bryher with Gweal	92	1.32
Uninhabited Islands		1.58
Total	2,153	16.01

Table 1.1 Isles of Scilly - Island Information

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2. Lead Local Flood Authority Responsibilities

2.1 Governance and Partnership

The Flood & Water Management Act 2010 has defined an enhanced role for local authorities so that they take on the responsibility for leading the co-ordination of flood risk management in their area. The Council for the Isles of Scilly, as one such Lead Local Flood Authority (LLFA), is responsible for all local flood risk management within the authority. Due to the absence of ordinary watercourses, this primarily originates from surface water and groundwater sources, as well as any interactions between all sources of flooding, such as coastal flooding, where these could impact upon local sources.

These new duties also define the EA as the responsible body for the management of flood risk from main rivers, large reservoirs and the sea. The EA is also responsible for providing a strategic overview on all flood risk matters.

Partnership working between all the risk management authorities has been recognised as of the upmost importance for effective flood risk management. Duties to co-operate and share information are now included in the Act and the Regulations. These responsibilities now form a central principal in the delivery of the PFRA and the future development of the Isles of Scilly Local Flood Risk Management Strategy.

It is recognised that it is essential for all stakeholders - such as neighbouring authorities, the EA, Internal Drainage Boards (IDBs), and Water Companies - to be fully engaged and working together to understand any flood risk issues that may impact upon the authority. The Council for the Isles of Scilly is the last remaining public water authority, therefore it does not have any reliance on or links to external water companies. Similarly, due to the absence of watercourses on the islands, there is no IDB to consider. Despite forming part of a separate unitary authority, the Council for the Isles of Scilly does have some linked services with Cornwall Council and still forms part of the ceremonial county of Cornwall.

The Council of the Isles of Scilly forms part of the Devon, Cornwall and Isles of Scilly Local Resilience Forum (LRF). Regular partnership meetings are held between the Council, the LRF and the EA, providing an opportunity to share information and ensure that all possible flood risk is understood. Work is underway to establish the governance arrangements of this group, including the consideration of a Memorandum of Understanding that will set out the aims, objectives and responsibilities of member organisations.

This partnership will play a crucial role in the future delivery of local flood risk management services. It has been considered that such partnership working helps facilitate more effective communications with residents at flood risk, as well as provide more co-ordinated emergency response plans and longer term management strategies. It provides the integrated approach as originally recommended by the Pitt Review, helping to deliver the PFRA now and to prepare the foundations to the Local Flood Risk Management Strategy required in the future.

2.2 Communication

The Devon, Cornwall and Isles of Scilly Local Resilience Forum provides the opportunity for regular liaison and communication with local risk management authorities. These meetings help to clarify roles and responsibilities as well as to plan for the effective future management of local flood risk. They provide an opportunity for partners to share data, information and knowledge, and to agree a co-ordinated plan of flood management and response. This partnership approach helps to optimise locally available resources and experience, as well as to identify funding opportunities and agree local flood risk management priorities

This forum provides the opportunity to communicate this shared understanding and the agreed management actions across the council and between partner organisations. It also enables the vital link to be made with local communities and members of the public directly affected and at flood risk.

As a Category 1 responder under the Civil Contingencies Act 2004, the Council for the Isles of Scilly have a duty to warn, inform and advise the public in the event of an emergency. To this end, the weather is monitored and where a threat is anticipated, precautionary warnings can be issued via a number of means:

- Council website,
- Community message board,
- Tourist information office,
- Town Hall,
- Radio Scilly,
- Posters,
- Door knocking (where appropriate)

Communication can be made with the Council via the website.

3. Methodology and Data Review

3.1 Information from EA

The methodology for undertaking this PFRA is based upon the national guidance prepared by the EA and the Ministerial Guidance produced by Defra and WAG. The latter provides the thresholds and criteria used for determining Flood Risk Areas where the risk of flooding is identified as significant. The EA guidance has explained the technical detail behind the PFRA, the form of the report and how to apply the Defra/WAG guidance on significant risk.

The EA has also provided CDs containing supporting information and made available national datasets distributed via DataShare, including:

- Maps, spreadsheets and GIS layers of all places above local flood risk thresholds and the clusters then created in determining Flood Risk Areas
- Details on the consequences of flooding to historic assets and Pollution, Prevention & Control (PPC) sites

Two national datasets showing surface water flooding extents have been made available by the EA to LLFAs, namely:

- Areas Susceptible to Surface Water Flooding map (AStSWF) - derived from one rainfall event with three susceptibility bandings: less, intermediate and more.
- Flood Map for Surface Water (FMfSW) - derived from two rainfall events dividing into two depth bandings: 1:200 rainfall and 1:200 rainfall deep, as well as 1:30 rainfall and 1:30 rainfall deep.

There are also four national datasets on groundwater flooding detailed in the EA guidance, including the Areas Susceptible to Groundwater Flooding broad-scale map.

There are however additional details on DataShare of information relating to past floods, including the Historic Flood Map and Flood Event Outlines, although primarily focussing on flooding from main river and the sea. The Historic Surface Water and Groundwater (HSWGW) Geodatabase has not been available, although this does contain some records originally submitted by local authorities.

The national methodology applied by the EA does not cover the Isles of Scilly, which has resulted in there being limited data available for use in this PFRA. The Isles of Scilly have not been mapped for fluvial flood risk due to the lack of any main river or ordinary watercourse. It has also not been included in the pluvial surface water mapping extents for the British Isles (Flood Map for Surface Water Flooding or Areas Susceptible to Surface Water Flooding). The national data could not therefore be calculated due to the absence of any comparative flood extents.

Whilst the information above all relates to differing flood sources and records of past events, another key dataset provided by the EA and used in the PFRA is the National Receptor Dataset (NRD). This relates to receptor vulnerability to flooding and provides details of social, economic, environmental and cultural receptors including residential properties, hospitals, schools, electricity sub-stations and critical transport infrastructure. This data set does cover the Isles of Scilly and has been provided for use in this PFRA; however its use is again limited by the lack of flood mapping data which could be used to help identify areas of risk.

3.2 Information from Council for the Isles of Scilly

Locally held data and information on past flooding is limited as there have been very few incidents of flooding on the Islands.

Due to the lack of national data, reports such as the Shoreline Management Plan, Emergency Flood Plans 2010 and the Flood Risk Assessment carried out in 2009 for the 5 Islands School Redevelopment have been utilised to gain a better understanding of any potential sites at risk from local sources of flooding. There is no database of past flood events to speak of.

3.3 Data Availability, Quality and Limitations

Much of the data provided by the EA has been made available under licence to the LLFAs. These data have, in turn, been licensed for use by both the Council for the Isles of Scilly and by JBA Consulting in preparing the PFRA.

3.4 Data Management Systems

Through the process of investigating records of past floods, it has been identified that an updated flood event and data storage system will be required by the Council. This should be based upon the PFRA reporting template set out by the EA in Annex 1 to this Preliminary Assessment Report to ensure consistency. Mandatory fields within the PFRA reporting template should be included as well as some of the additional fields that are likely to be required in the future.

This will ensure all the required information on flood events is captured in the future, recorded in the correct format for direct input to future PFRA reviews. This will greatly simplify and make for a more efficient means of submitting the required information on past floods. It will also ensure all local flood events are captured and assessed.

This system will be shared both right across the various council departments and with the EA, enabling interchange of data and the recording of all flood events, regardless of responsibility or source. Arrangements for data sharing, co-operation and partnership are in place for sharing information and recording of any flood event information in a consistent and complete manner. This will provide an invaluable archive of quality assured flood records.

4. Past Flood Risk

4.1 Introduction

This section summarises the relevant information collected and analysed on past floods within the county from local flood sources. This has been derived from the records described in Section 3 above.

The Flood Risk Regulations refer to past floods which had "significant harmful consequences". However, while "significant" has been defined in terms of national risk used to identify Flood Risk Areas, there is no such definition in terms of past floods from local sources. The guidance leaves this for individual LLFAs to determine as circumstances and approaches vary.

4.2 Significant Harmful Consequences

The information provided by the EA does not extend to the Isles of Scilly. The combined population of the 5 inhabited Islands is just over 2000 people. It is therefore unlikely that any blue squares, indicating significant risk (flooding to 200 people or more) would have been highlighted for the Isles of Scilly, this is however unproven but as a result there are also no nationally significant Flood Risk Areas identified for the Isles of Scilly.

Whilst there may not be any areas of *nationally* significant flood risk, there may be areas where *local* flood risk has been a potential issue in the past and remains a risk in the future. The PFRA analysis has therefore been carried out focussing on these areas, utilising the various reports supplied by the Council for the Isles of Scilly.

In considering thresholds for local flood risk across the Islands, emphasis has been placed upon ensuring the PFRA process is used to also inform and provide a consistent basis and foundation for the forthcoming Local Flood Risk Management Strategy. There are efficiencies to be gained from dovetailing the two processes and ensuring one consistent approach. This will also avoid any unnecessary duplication of effort.

Consequently the approach adopted for the PFRA reflects this integrated approach. The spreadsheet included in Annex 1 for example provides a consistent and comprehensive template that helps define the information to be requested by the Council when investigating flood events. This will help capture the important information for all future flood events and form the basis for *all* future flood event recording. The information can then be transferred to a single archive database system, to provide a comprehensive data source for future PFRA revisions. It will also inform and help the development and ongoing maintenance of the Local Strategy.

Flooding is a traumatic, damaging and potentially life threatening event. Flood events will vary in scale according to the extent and intensity of the rainfall. Whilst the major events will capture the media headlines, smaller events are also important to understand as these could be pointers and an early alarm of problems with the drainage infrastructure, such as asset condition, blocked or collapsing culverts etc.

4.3 Past Flood Events

Past flood events on the Isles of Scilly are very rare, with only a handful of events standing out in memory. Also, due to the scarcity of these events any record of flooding tends to have been compiled on an ad hoc basis. The data available for use in this PFRA are therefore limited.

It is understood that there have been 3 main storm events where flooding also took place, 'The Great Storm of 1744', 16th/17th December 1989 and more recently in October 2004. No further information has been supplied for the 1744 or 2004 events, however there is information relating to December 1989. This information identifies that although there was

some surface water flooding, the main threat imposed on the Isles of Scilly was from coastal flooding. Coastal defences were inundated and weakened by the storm, particularly in the area of Porthcressa which caused a potential risk of flooding to Hugh Town. There are no reports however of flood water actually entering properties. Coastal flood risk is the responsibility of the Environment Agency and not a source of local flood risk. It has not therefore been considered further as part of this PFRA.

The Council is aware of 1 property, The Mermaid Inn Hotel which has flooded on more than one occasion. The hotel is located to the western extent of Town Beach in Hugh Town, St. Mary's. At times of tide-locking, sewage has been forced back into the property through the toilets located in the basement (below sea level). At times, this may have occurred due to a combination of tide-locking and excess surface water run-off. This may have inundated the drainage system, leaving it unable to cope with the amount of water within the system, resulting in the discharge of sewage into the property. However, this flood event is not felt to be significant on a European scale and has not therefore been populated in Annex 1.

Consequently, it is concluded that there have been no significant past local flood events from local sources of flooding, namely surface water and groundwater. The rare flood events that have occurred on the Islands are related to sea flooding at times of high tide and storm. The EA is responsible for flooding from the sea so these events have not been assessed further here.

5. Future Flood Risk

5.1 Introduction

This section of the report summarises any relevant information on future floods and provides a foundation for informing future flood risk strategies fro the Islands.

The national guidance issued by Defra and WAG sets out the criteria used for defining significant flood risk and the Flood Risk Areas. In developing the methodology for assessing flood risk, threshold levels were defined for the key Flood Risk Indicators as follows:

- Number of People > 200,
- Non-Residential Properties > 20,
- Critical Infrastructure > 1

This process resulted in maps of 'Hotspots' or places above the thresholds, defined where 1 km grid squares meet the significance level set for at least one of the key Flood Risk Indicators shown above.

Where 5 or more "hotspots" were touching within a 3km^2 roving grid, they were deemed to form a cluster and if the amount of people at risk of surface water flooding within this cluster exceeded 30,000 it was then classed as an indicative Flood Risk Area (IFRA). This data is shown in Figure 5.1 below.

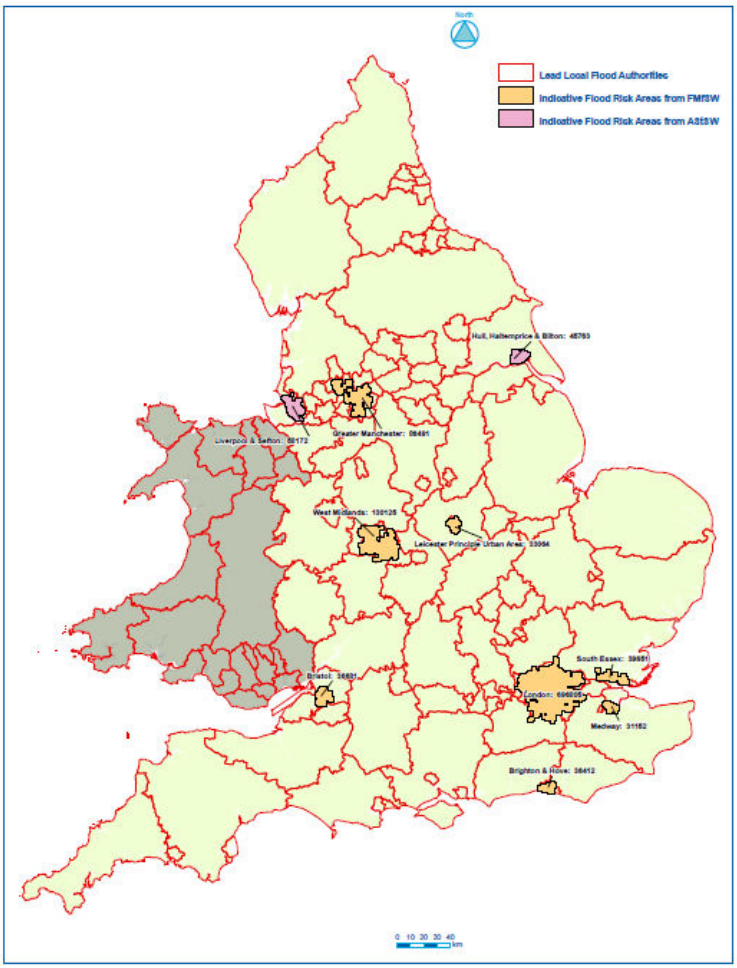

Figure 5.1 Nationally Identified Flood Risk Areas

As mentioned, the national data does not extend to the Isles of Scilly and could not therefore been used to supplement this report. Also, due to the lack of both phase 1 (Areas Susceptible to Surface Water Flooding) and phase 2 (Flood Map for Surface Water) surface water flood maps, the Areas Susceptible to Groundwater Flooding (AStGWF) and of course Flood Zones 2 and 3, it has not been possible to assess the potential future risk posed on the Isles of Scilly.

5.2 Locally Agreed Surface Water Information

The Isles of Scilly have not yet been mapped for surface water flooding, and are not therefore covered by either the Areas Susceptible to Surface Water Flooding (Phase 1), or the Flood Map for Surface Water (Phase 2) flood maps for the UK.

There is no locally agreed surface water information at this time. However, due to the essential nature of this data it is hoped that this will become available for future PFRA analysis.

5.3 Future Floods and Consequences

As mentioned in section 5.1 of this report, a lack of data and flood outlines has not made it possible to assess the future floods and potential consequences brought about by local flood sources.

Annex 2 has been completed accordingly and it is hoped that further information will be made available to allow for this analysis to be carried out sufficiently during future PFRA analysis

5.4 The Impacts of Climate Change

The Evidence

There is clear scientific evidence that global climate change is happening now. It cannot be ignored.

Over the past century around the UK we have seen sea level rise and more of our winter rain falling in intense wet spells. Seasonal rainfall is highly variable. It seems to have decreased in summer and increased in winter, although winter amounts changed little in the last 50 years. Some of the changes might reflect natural variation, however the broad trends are in line with projections from climate models.

Greenhouse gas (GHG) levels in the atmosphere are likely to cause higher winter rainfall in future. Past GHG emissions mean some climate change is inevitable in the next 20-30 years. Lower emissions could reduce the amount of climate change further into the future, but changes are still projected at least as far ahead as the 2080s.

We have enough confidence in large scale climate models to say that we must plan for change. There is more uncertainty at a local scale but model results can still help us plan to adapt. For example we understand rain storms may become more intense, even if we can't be sure about exactly where or when. By the 2080s, the latest UK climate projections (UKCP09) are that there could be around three times as many days in winter with heavy rainfall (defined as more than 25mm in a day). It is plausible that the amount of rain in extreme storms (with a 1 in 5 annual chance or rarer) could increase locally by 40%.

- Key Projections for South West River Basin District
- If emissions follow a medium future scenario, UKCP09 projected changes by the 2050s
- relative to the recent past are
- Winter precipitation increases of around 17% (very likely to be between 4 and 38%)
- Precipitation on the wettest day in winter up by around 12% (very unlikely to be

- more than 24%)
- Relative sea level at Plymouth very likely to be up between 12 and 42cm from 1990 levels (not including extra potential rises from polar ice sheet loss)
- Peak river flows in a typical catchment likely to increase between 11 and 21%

Increases in rain are projected to be greater near the coast than inland.

Implications for Flood Risk

Climate changes can affect local flood risk in several ways. Impacts will depend on local conditions and vulnerability.

Wetter winters and more of this rain falling in wet spells may increase river flooding. More intense rainfall causes more surface runoff, increasing localised flooding and erosion. In turn, this may increase pressure on drains, sewers and water quality. Storm intensity in summer could increase even in drier summers, so we need to be prepared for the unexpected.

Rising sea or river levels may increase local flood risk inland or away from major rivers because of interactions with drains, sewers and smaller watercourses.

There is a risk of flooding from groundwater in the district. Recharge may increase in wetter winters, or decrease in drier summers.

Where appropriate, we need local studies to understand climate impacts in detail, including effects from other factors like land use. Sustainable development and drainage will help us adapt to climate change and manage the risk of damaging floods in future.

Adapting to Change

Past emission means some climate change is inevitable. It is essential we respond by planning ahead. We can prepare by understanding our current and future vulnerability to flooding, developing plans for increased resilience and building the capacity to adapt. Regular review and adherence to these plans is key to achieving long-term, sustainable benefits.

Although the broad climate change picture is clear, we have to make local decisions against deeper uncertainty. We will therefore consider a range of measures and retain flexibility to adapt. This approach, embodied within flood risk appraisal guidance, will help to ensure that we do not increase our vulnerability to flooding.

5.5 Significant Local Developments

It is possible that long term developments might affect the occurrence and significance of flooding. However current planning policy aims to prevent new development from increasing flood risk.

In England, Planning Policy Statement 25 (PPS25) on development and flood risk aims to "ensure that flood risk is taken into account at all stages in the planning process to avoid inappropriate development in areas at risk of flooding, and to direct development away from areas at highest risk. Where new development is, exceptionally, necessary in such areas, policy aims to make it safe without increasing flood risk elsewhere and where possible, reducing flood risk overall."

Adherence to Government policy ensures that new development does not increase local flood risk. However, in exceptional circumstances the Local Planning Authority may accept that flood risk can be increased contrary to Government policy, usually because of the wider benefits of a new or proposed major development. Any exceptions would not be expected to increase risk to levels which are "significant" (in terms of the Government's criteria).

6. Identification of Flood Risk Areas

6.1 Indicative Flood Risk Areas

As has been explained, the national guidance has not been applied to the Isles of Scilly and no indicative FRAs have been defined.

6.2 New Flood Risk Areas

Flood events are very rare on the Isles of Scilly, with only one property known to have flooded internally. In this instance, this was not as a direct result of local sources of flood risk.

No Flood Risk Area has been proposed.

7. Next Steps

7.1 Review

This Preliminary Assessment Report forms a part of the PFRA process that addresses the requirements defined by the Flood Risk Regulations. These place a duty for LLFAs to assess both the impacts of past floods and the consequences of future floods. They are also required to identify whether flood risk is significant, by applying national guidance to define Flood Risk Areas. For these areas, there are further duties to prepare Flood Hazard and Risk Maps by 2013 which in turn inform the Flood Risk Management Plans that will be required by 2015.

The next step is for the Council of the Isles of Scilly to undertake an internal review of the PFRA, involving appropriate committee members and officers. This will need to be completed in time to meet the deadline for submission to the EA of 22nd June 2011.

The EA must then review, collate and publish all PFRA submissions, in time to meet the 22nd December 2011 deadline for final submission to the European Commission. It is also proposed that the PFRA is published on LLFA websites at this time, in accordance with the requirements of the EC Inspire Directive.

With no Flood Risk Areas defined within the Isles of Scilly, there will be no further requirement under the Regulations for the Council to undertake Hazard and Risk Mapping, or the subsequent production of Flood Risk Management Plans. It is however important to remember the PFRA will have to be reviewed and revised again in 2016 as part of the 6 yearly cycle of flood risk planning.

It is important that by 2016, surface water mapping is extended to include the Isles of Scilly, ensuring that more in depth analysis can be carried out as part of the next PFRA cycle.

7.2 Local Flood Risk Management Strategy

In preparing the PFRA, the opportunity has been taken to establish the foundations for preparing the Council of the Isles of Scilly Local Flood Risk Management Strategy. This will be required later this year under duties contained in the Flood & Water Management Act 2010.

The PFRA process has also helped strengthen and underline the importance of partnership working between the risk management authorities and the need for sharing information through the Devon, Cornwall and Isles of Scilly Flood Resilience Forum. A comprehensive database in which to store future flood information should be compiled to record all mandatory information necessary for documenting any future flood events. This will be of benefit and greatly simplify the PFRA review process due in 6 years time.

The details of critical infrastructure and properties at risk of flooding will also help inform the Council for the Isles of Scilly Multi-Agency Flood Plan (MFP) and assist in emergency planning and response.

The Local Flood Risk Management Strategy will define how flood risk is to be assessed and managed across the Islands in future years. The PFRA analysis has provided the opportunity to prepare for and inform how this future strategy will be taken forward.

Appendices

A.1 - Records of past floods and their significant consequences (Preliminary Assessment Report spreadsheet)

A.2 - Records of future floods and their consequences (Preliminary Assessment Report spreadsheet)

A.3 - Records of Flood Risk Areas and their rationale (Preliminary Assessment Report spreadsheet)

N/A

A.4 - PFRA Review Checklist

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