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Strategic Environmental Assessment Monitoring Report *for*

Northern Ireland Flood Risk Management Plan

2021-2027

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Abbreviations

APSFR	Area(s) of Potential Significant Flood Risk
AEP	Annual Exceedance Probability
ASSI	Area(s) of Special Scientific Interest
CCAP	Climate Change Adaptation Programme
CCG	Connswater Community Greenway
CCRA	Climate Change Risk Assessment
CDWG CC	Cross-Departmental Working Group on Climate Change
DAERA	Department of Agriculture, Environment and Rural Affairs
DARD	Department of Agriculture and Rural Development
DfC	Department for Communities
DfI	Department for Infrastructure
EBFAS	East Belfast Flood Alleviation Scheme
EIA	Environmental Impact Assessment
ELC	European Landscape Convention
EU	European Union
FAS	Flood Alleviation Scheme
FCS	Favourable Conservation Status
FRMP	Flood Risk Management Plan
HARNI	Heritage at Risk Register for Northern Ireland
LCA	Landscape Character Areas
LWWP	Living With Water Programme
NI	Northern Ireland
NICCAP	Northern Ireland Climate Change Adaptation Programme
NIEA	Northern Ireland Environment Agency
ODPM	Office of the Deputy Prime Minister
PAMU	Planning Advisory and Monitoring Unit
RBD	River Basin District
SAC	Special Area of Conservation
SDIP	Strategic Drainage Infrastructure Programme
SEA	Strategic Environmental Assessment
SFRA	Significant Flood Risk Area (Synonymous with APSFR)
SPA	Special Protection Area
SuDS	Sustainable Drainage Systems
WFD	Water Framework Directive

1: Introduction

This report is a review of the environmental monitoring recommended in the Strategic Environmental Assessment (SEA) Environmental Report for the 1st cycle Northern Ireland Flood Risk Management Plans (FRMPs) 2015-2021. Article 10 of the SEA Directive requires that monitoring be carried out in order to identify, at an early stage, any unforeseen adverse effects due to implementation of a Plan or Programme, and to enable remedial action to be taken. Monitoring is carried out by reporting on a set of Indicators established in the SEA Objectives, which allow impacts on the environment to be measured.

Owing to the high level nature of information produced for assessment, it was not possible for the SEA to present a detailed monitoring strategy based on specific indicators and targets. Instead the Environmental Report proposed a set of generic measures to be used for monitoring of SEA topics. These will be used to identify any unforeseen adverse effects that have occurred from implementation of measures from the 1st cycle FRMPs; not yet complete. This monitoring is being undertaken during development of the 2nd cycle FRMP. Recommendations will also be made on the monitoring strategy to be carried forward for assessment of the implementation of flood risk management measures for the 2nd cycle FRMP.

2: SEA of the Northern Ireland Flood Risk Management Plans

2.1 SEA topics

The SEA Environmental Report for the 1st cycle Northern Ireland FRMPs 2015-2021 established the environmental topics that should be included within the scope of the SEA. The following topics were scoped in for assessment:

- Biodiversity, Flora and Fauna;
- Cultural Heritage;
- Water;
- Geology and Soil;
- Population and Human Health;
- Material Assets;
- Climate Factors; and
- Landscape.

For each of these environmental topics, objectives were set, and an assessment made of how the FRMPs, alone or in combination with other plans, programmes or policies, might impact upon the topic. The SEA considered whether the environmental effects of the Plans were likely to be significant, and identified potential mitigation measures, in line with the UK guidance on SEA 'A Practical Guide to the Strategic Environmental Assessment Directive (ODPM 2005)' and in accordance with The Environmental Assessment of Plans and Programmes Regulations (Northern Ireland) 2004.

3: Monitoring of Effects on SEA Topics from Implementation of the 1st cycle FRMPs 2015-2021

The SEA Environmental Report for the 1st cycle Northern Ireland FRMPs 2015-2021 set out a framework that could be used to monitor any significant effects on the environment arising from implementation of the Plans. As there are uncertainties associated with strategic-level assessment of Plans, monitoring enables a periodic check in order to confirm the accuracy of any assumptions on which the original assessment was based, and to ensure that mitigation measures that were proposed are being effectively implemented and also remain relevant.

The purpose of SEA environmental monitoring is to enable measurement of the following:

- a change in the environmental baseline that will indicate the effects of the plans;
- the significant effects that have been identified during the assessment;
- whether the mitigation measures proposed to offset or reduce the significant effects have been implemented and are effective; and,
- any unforeseen impacts that have occurred.

The monitoring framework proposed in the SEA Environmental Report set out the proposed measures against the SEA topics (**Table 3-1**). The recommended data sources for measures were based on relevant existing monitoring arrangements, where these were available.

Table 3-1: Monitoring Measures for SEA Topics as outlined in the SEA Environmental Report for the NI FRMPs 2015-2021

SEA Topic	Proposed Measures	Proposed Data Source
Biodiversity, Flora and Fauna	Protected sites and species are monitored with regards to their conservation objectives. Any increase in unfavourable/favourable conditions will be monitored in conjunction with the implementation of flood risk management projects as well as any habitat loss/increase.	NIEA carry out monitoring of designated sites and this information will be used.
Cultural Heritage	Historical sites (monuments, listed buildings, archaeological sites, etc.) should be appropriately documented where they are lost or relocated as a result of the implementation of flood risk management infrastructure.	NIEA ¹ could provide this information, as they will have been consulted on a statutory basis in such circumstances.
Water	Water quality will be monitored by the NIEA under the requirements of the Water Framework Directive (WFD). Where the implementation of flood risk management infrastructure will result in modifications to services associated with infrastructure such as sewers or pumping stations further studies should be carried out to ensure these are not impacting on the water quality of water features within northern Ireland.	NIEA assess the status of waterbodies for WFD, including water quality.

¹ The Department for Communities (DfC) is now the responsible authority for cultural heritage

SEA Topic	Proposed Measures	Proposed Data Source
Geology and Soil	The condition and quality of designated sites of geological importance (ASSIs) is subject to ongoing monitoring. This should be reviewed in conjunction with the flood risk management projects.	NIEA carry out monitoring of designated sites and this information will be used.
Population and Human Health	The potential nuisance (noise) effects of flood risk management construction should be monitored. Where flood risk has been identified by modelling, but not verified through historic events, these areas should be monitored to assess if their flood risk potential has been enhanced.	Construction noise can be monitored as part of specific project management. This can be done in-house by Rivers Agency ² .
Material Assets	Benefits from implemented flood risk management measures should be monitored. Rivers Agency ² will assess the cost benefit of a range of measure types prior to the selection of preferred option. Potential effects on private dwellings associated with single property protection advocated in FRMP should be monitored.	Rivers Agency ² will assess the benefits of any flood alleviation scheme. Post event evaluations will be carried out as required. Rivers Agency ² will assess the benefits of any flood alleviation scheme.
Climate Factors	The Climate Change Adaptation Programme (CCAP) provides the proposals and policies by which government departments (including the Department for Agriculture and Rural Development (DARD)) will meet climate change objectives.	This should include an audit mechanism for target meeting.
Landscape	Sustainable Drainage Systems (SuDS) is considered a long term strategy for the management of surface water flooding.	The endorsement of the use of SuDS in the development of future legislation should include the necessary formal monitoring arrangements.

Table 3-2, Table 3-3 and Table 3-4 summarise the progress made to date in the implementation of the Significant Flood Risk Area (SFRA) site-specific measures outlined in the FRMPs for each of the three River Basin Districts (RBDs). Areas of existing or foreseeable future potentially significant flood risk were referred to in the 1st cycle FRMPs 2015-2021 as ‘Significant Flood Risk Areas’ (SFRAs), and are synonymous with ‘Areas of Potential Significant Flood Risk’ (APsFR). Monitoring of effects on SEA topics from implementation of the flood risk management measures is only feasible for physical activities i.e. the construction and operation of Flood Alleviation Schemes (FASs), as both studies and communications activities are unlikely to have any measurable impacts on the environment. Three site-specific FASs have been completed, to date, during the 1st cycle FRMPs 2015-2021; two schemes have been completed in the Belfast SFRA and one in the Newtownabbey SFRA. The East Belfast Flood Alleviation Scheme (EBFAS) was planned and implemented in conjunction with the Connswater Community Gateway (CCG) Project, an urban regeneration project whose objective was to create a 9 km linear park through East Belfast, following the course of the Connswater, Knock and Loop Rivers, and connecting the open and green spaces.

² DfI Rivers is now the responsible authority

Table 3-2: Progress on Implementation of Site-Specific Measures – North-Western RBD

Measure Code	Measure Name	Timetable	Priority	Progress
Omagh SFRA				
UKNI_NW_APSFR_02_01	Omagh Fluvial Flood Risk Assessment and FAS	2015-2021	High	Omagh Feasibility Study Complete
UKNI_NW_APSFR_02_02	Omagh Community Resilience Group	Group established 2015/16 and ongoing	High	Completed 2016
UKNI_NW_APSFR_02_03	Killyclogher Burn & Mullaghmore Burn - FAS	2015-2021	Moderate	Not started
UKNI_NW_APSFR_02_04	Dromore Road Stream - FAS	2015-2021	Low	Not started
UKNI_NW_APSFR_02_05	Fairy Water & Strule River - FAS	2015-2021	Low	Not started
Strabane SFRA				
UKNI_NW_APSFR_03_01	Urney Road Drain & Extension, Designated Watercourses - FAS	2021-	Low	Not started
UKNI_NW_APSFR_03_02	Urney Road Undesignated Watercourses - FAS	2021-	Low	Not started
UKNI_NW_APSFR_03_03	River Mourne - FAS	2021-	Low	Not started
UKNI_NW_APSFR_03_04	Park Road Drain - FAS	2021-	Low	Not started
UKNI_NW_APSFR_03_05	Roundhill Drain - FAS	2021-	Low	Not started
Londonderry SFRA				
UKNI_NW_APSFR_01_01	Ardnabrocky, Ardnabrocky Drain - FAS	2021-	Moderate	Feasibility study ongoing
UKNI_NW_APSFR_01_02	Lower Tullyally, Burnagibbagh - FAS	2021-	Moderate	Feasibility study ongoing
UKNI_NW_APSFR_01_03	Waterside, Woodburn Park Stream - FAS	2021-	Low	Feasibility study ongoing
UKNI_NW_APSFR_01_04	Springtown, Pennyburn Stream - FAS	2021-	Low	Feasibility study ongoing
UKNI_NW_APSFR_01_05	Creggan, Creggan Burn - FAS	2021-	Low	Feasibility study ongoing
UKNI_NW_APSFR_01_06	Foyle Coastal Study	2021	Low	Feasibility study ongoing
UKNI_NW_APSFR_01_07	Foyle Coastal Emergency Response Plan	2015-2021	Low	Completed

Table 3-3: Progress on Implementation of Site-Specific Measures – Neagh-Bann RBD

Measure Code	Measure Name	Timetable	Priority	Progress
Newry SFRA				
UKNI_NB_APSFR_01_01	Newry River - FAS	Feasibility Study by 2016: Construction by 2021	High	Feasibility Study completed 2017 - complex design process envisaged
UKNI_NB_APSFR_01_02	Bridge Street/ Cleary Crescent - Establishment of local community resilience group	Group established 2015/16 and ongoing	Moderate	Completed 2016
UKNI_NB_APSFR_01_03	Coastal - FAS	Feasibility Study by 2016: Construction by 2021 if viable	High	Feasibility Study completed - no viable scheme
UKNI_NB_APSFR_01_04	Coastal Emergency Response Plan	Complete 2016	Moderate	Completed
Portadown SFRA				
UKNI_NB_APSFR_02_01	Upper Bann River/ Annagh River - FAS	Feasibility Study by 2019: Construction post 2021 (next FRMP cycle) if viable	Moderate	Feasibility Study completed
UKNI_NB_APSFR_02_02	Upper Bann River/ Ballybay River - FAS	Feasibility Study by 2019: Construction post 2021 (next FRMP cycle) if viable	Moderate	Feasibility Study completed
UKNI_NB_APSFR_02_03	Upper Bann River/ Ballybay River - Establishment of local community resilience group	2017-2021	Moderate	Not started
UKNI_NB_APSFR_02_04	Upper Bann River/ Ballynagowan River - FAS	Complete 2016	Moderate	Feasibility Study completed
Ballymena SFRA				
UKNI_NB_APSFR_03_01	Ballee Burn - FAS	Feasibility Study by 2019: Construction post 2021 (next FRMP cycle) if viable	Moderate	Not started

Measure Code	Measure Name	Timetable	Priority	Progress
UKNI_NB_APSFR_03_02	Mill Layde Lower - FAS	Feasibility Study by 2019: Construction post 2021 (next FRMP cycle) if viable	Moderate	Not started
UKNI_NB_APSFR_03_03	River Braid - FAS	Pre-feasibility by 2021: Construction post 2021 if viable	Low	Not started
UKNI_NB_APSFR_03_04	Ballykeel - Establishment of local community resilience group	2017-2021	Moderate	Not started
Warrenpoint SFRA				
UKNI_NB_APSFR_04_01	Clonallan Stream Extension - FAS	Feasibility Study post 2021	Low	Not started
UKNI_NB_APSFR_04_02	Milltown Stream - FAS	Feasibility Study post 2021	Low	Not started
UKNI_NB_APSFR_04_03	Coastal - FAS	Feasibility Study by 2021: Construction post 2021, if viable	Moderate	Not started
Antrim SFRA				
UKNI_NB_APSFR_05_01	Sixmilewater 1 - FAS	Design by 2016: Construction by 2018	High	Not started
UKNI_NB_APSFR_05_02	Muckamore - Establishment of local community resilience group	Group established 2015/16 and ongoing	Low	Completed
UKNI_NB_APSFR_05_03	Hollywell Burn - FAS	Design by 2016: Construction by 2018	High	Design ongoing
UKNI_NB_APSFR_05_04	Sixmilewater 2 - FAS	Design by 2016: Construction by 2018	High	Not started
UKNI_NB_APSFR_05_05	Riverside & Masserene - Establishment of local community resilience group	Group established 2015/16 and ongoing	Low	Completed
Banbridge SFRA				
UKNI_NB_APSFR_06_01	Showgrounds Stream - FAS	Construction by 2020	High	Not started

Measure Code	Measure Name	Timetable	Priority	Progress
UKNI_NB_APSFR_06_02	Banbridge Town Culvert - FAS	Pre-feasibility by 2021: Construction post 2021 (next FRMP Cycle) if viable	Low	Not started
UKNI_NB_APSFR_06_03	Continue with established local community resilience group	Group established 2014/15 and ongoing	High	Completed
UKNI_NB_APSFR_06_04	Rifle Park Stream - FAS	Pre-feasibility by 2021: Construction post 2021 (next FRMP Cycle) if viable	Low	Not started
UKNI_NB_APSFR_06_04	Brookefield Stream - FAS	Feasibility by 2020: Construction post 2021 (next FRMP Cycle) if viable	Low	Not started
Coleraine SFRA				
UKNI_NB_APSFR_07_01	Lower Bann River - No specific mitigation measures proposed	Feasibility Study post 2021	Moderate	Not started
Glengormley SFRA				
UKNI_NB_APSFR_08_01	Glengormley, Ballymartin River and tributaries - FAS	Construction by 2021	High	Feasibility study completed
Lurgan SFRA				
UKNI_NB_APSFR_09_01	Clanrolla Stream - FAS	Feasibility Study by 2019: Construction post 2021 (next FRMP cycle) if viable	High	Feasibility study completed March '18
UKNI_NB_APSFR_09_02	Westwood/Sperrin Drive - Establishment of local community resilience group	2017-2021	Moderate	Not started
UKNI_NB_APSFR_09_03	Halfpenny River - FAS	Feasibility Study by 2019: Construction post 2021 (next FRMP cycle) if viable	High	Completed 2010

Measure Code	Measure Name	Timetable	Priority	Progress
UKNI_NB_APSFR_09_04	Knockramer Meadows/ Silverwood Leaves - Establishment of local community resilience group	2017-2021	Moderate	Not started
UKNI_NB_APSFR_09_05	Tirsogue Drain - FAS	Pre-feasibility by 2021: Construction post 2021 if viable	Low	Completed 2011

Table 3-4: Progress on Implementation of Site-Specific Measures – North-Eastern RBD

Measure Code	Measure Name	Timetable	Priority	Progress
Belfast SFRA				
UKNI_NE_APSFR_01_01	Belfast Tidal Flood Risk Study - FAS	Feasibility Study by 2016: Construction by 2021	High	Design - ongoing
UKNI_NE_APSFR_01_02	Develop and implement Coastal Emergency Response Plan	Complete 2016	High	Completed
UKNI_NE_APSFR_01_03	East Belfast Flood Alleviation Scheme (FAS)	Completion of Construction by 2016	High	Completed 2019
UKNI_NE_APSFR_01_04	Glenmachan Project - Phase 1a (Sicily Park/ Marguerite Park) & Phase 2 (Greystown/ Upper Malone)	Completion of Construction by 2017	High	Greystown / Upper Malone – Completed 2019. Sicily Park - Not started.
UKNI_NE_APSFR_01_05	Living with Water Programme - Strategic Drainage Infrastructure Programme (SDIP) for Belfast	Development of SDIP by 2018: Construction works by 2026 were viable.	High	Development of SDIP – Ongoing
UKNI_NE_APSFR_01_06	Cregagh - Establishment of Local Community Resilience Group	Group established 2014/15 and ongoing	High	Completed
UKNI_NE_APSFR_01_07	Establishment of Local Community Resilience Groups	2017-21	Moderate	Ongoing
Newtownards SFRA				
UKNI_NE_APSFR_02_01	Ballycullen Stream - FAS	Feasibility Study by 2019; Construction post 2021 if viable	Low	Not started
Carrickfergus & Kilroot Power Station SFRA				
UKNI_NE_APSFR_03_01	Northwest/ Northeast Diversions and associated watercourses - FAS	Feasibility Study by 2018; Construction post 2021 if viable	Low	Not started

Measure Code	Measure Name	Timetable	Priority	Progress
Bangor SFRA				
UKNI_NE_APSFR_04_01	Northwest/ Northeast Diversions and associated watercourses - FAS	Feasibility Study by 2019; Construction post 2021 if viable	Low	Not started
Newcastle SFRA				
UKNI_NE_APSFR_05_01	Shimna River - FAS	Design by 2016; Construction by 2019	High	Design - ongoing
UKNI_NE_APSFR_05_02	Mourneview Urban Drainage Improvements	Design and Construction by 2016	High	Not started
UKNI_NE_APSFR_05_03	Establishment of Local Community Resilience Group	2017-21	Moderate	Not started
Newtownabbey SFRA				
UKNI_NE_APSFR_06_01	Concrete Row Stream - FAS	Design by 2018; Construction by 2021	High	Completed 2018
UKNI_NE_APSFR_06_02	Greenisland Stream - FAS	Feasibility Study by 2016; Construction by 2021 if viable	High	Not started
UKNI_NE_APSFR_06_03	Three Mile Water - FAS	Feasibility Study by 2019; Construction by 2021 if viable	Moderate	Not started
UKNI_NE_APSFR_06_04	Jointure Bay Stream - FAS	Feasibility Study by 2019; Construction by 2021 if viable	Moderate	Not started
Downpatrick SFRA				
UKNI_NE_APSFR_07_01	Integrated Urban Drainage Study	Feasibility Study by 2018; Construction by 2021 if viable	Moderate	Not started
Dundonald SFRA				
UKNI_NE_APSFR_08_01	River Enler & tributaries - FAS	Feasibility Study by 2019; Construction post 2021 if viable	Low	Not started

3.1 Biodiversity, Flora and Fauna

The SEA Environmental Report (Table 12) for the 1st cycle FRMPs 2015-2021 proposed that monitoring of 'Biodiversity, Flora and Fauna' could entail an assessment of any changes in the conservation condition (i.e. unfavourable/favourable) of protected habitats and species, based on information from the Northern Ireland Environment Agency's (NIEA) monitoring of designated sites.

Article 17 of the Habitats Directive requires that, every six years, all EU Member States report on the implementation of the Directive. The 4th UK Habitats Directive Report was submitted to the European Commission in August 2019, and included a General Implementation Report, Habitat Reports and Species Reports. These outline any changes in UK designated habitats and species in the period 2013-2018. The overall conservation status and trend was reported as 'Favourable' (including Favourable-improving, stable, deteriorating, unknown) for 6 habitats, 'Inadequate' (including Inadequate-improving, stable, deteriorating, unknown) for 8 habitats, 'Bad' (including Bad-improving, stable, deteriorating, unknown) for 62 habitats and 'Unknown' for 1 habitat. Of these, 22 habitats showed improvement in overall conservation status (large improvement, improvement or small improvement), 29 habitats showed no change, 22 habitats showed a decline (small decline, decline or large decline), and 4 were uncertain in comparison with the results of the 3rd UK Habitats Directive Report. For designated species, the overall conservation status and trend was reported as 'Favourable' for 33 species, 'Inadequate' for 24 species, 'Bad' for 16 species and 'Unknown' for 20 species. Of these, 9 species showed improvement in overall conservation status, 47 showed no change, 12 showed decline and 25 were uncertain in comparison with the results of the 3rd UK Habitats Directive Report.

Northern Ireland launched its first State of the Environment Report in 2008, containing 30 indicators that were designed to assist future comparison and measurement of the changing environment. The last full State of the Environment Report for Northern Ireland was published in 2013, and included 30 indicators covering air and climate, water, land and landscape management, biodiversity, built heritage, and waste and resources. In the interim period, the NIEA has published annually a Northern Ireland Environmental Statistics Report, providing annual reports on a range of environmental indicators. The Northern Ireland Environmental Statistics Report 2019 covered eight key themes: demography and public opinion, air and climate, water, marine, land, biodiversity, built heritage and waste. Section 6 of the Report provides key information regarding the current status of biodiversity indicators in Northern Ireland. Monitoring of the condition of features within Areas of Special Scientific Interest (ASSI) for the six year rolling period ending March 2018 indicated that 61% of features were in Favourable condition, 3% in Unfavourable-Recovering and 36% in Unfavourable condition. These results remain very similar to the previous 10 years of reporting. As the designation of protected sites (representing features of national and international importance) is largely complete, there is now a focus on improving the overall condition of sites towards 'favourable conservation status (FCS)' through effective land management to support recovery of the special features within the site. The Environmental Statistics Report 2019 states that in 2017/2018 the proportion of land area under favourable management was 0.2%, similar to the proportion reported in 2016/17. The proportion of marine area under favourable management in 2017/18 was 4.5%, the same as the proportion reported in 2016/17.

Article 12 of the Birds Directive requires that, every six years, all EU Member States report on the implementation of the Directive. The 11th UK Report for Article 12 of the EU Birds Directive was submitted to the European Commission in October 2019. The report format includes both a General Report on the implementation of the Directive (Annex A), and a Bird Species Status and Trends Report containing individual assessments for all relevant bird species (Annex B).

Three site-specific FASs have been completed, to date, during the 1st cycle FRMPs 2015-2021; two schemes have been completed in the Belfast SFRA and one in the Newtownabbey SFRA. **Table 3-5** outlines these schemes and the national and international designated sites associated with these SFRA. All of the associated European sites are designated for the presence of bird species. Strategic-level monitoring of the conservation status and trends of bird species for which the SPAs were designated during part of the FRMPs period (i.e. 2015-2018) can be supported by the results of the 11th UK report. Belfast Lough SPA was designated for the presence of a wintering population of Redshank (*Tringa tetanus*), while Belfast Lough Open Water SPA was designated for the presence of a wintering population of Great Crested Grebe (*Podiceps cristatus*). Annex B of the 11th UK Article 12 Report comprises a Bird Species Status and Trends Report containing individual assessments for 268 bird species in metropolitan UK that are subject to the protection measures entailed in the Birds Directive. This indicates that, for wintering Redshank, the short-term population trend (2004-2016) is decreasing, while the long-term population trend (1980-2016) is stable. For wintering Great Crested Grebe, the short-term population trend (2005-2016) is decreasing while the long-term population trend (1984-2016) is increasing. The latest Condition Assessment (2014) for the Redshank population of Belfast Lough SPA indicates that it is currently at 'unfavourable' conservation status (DAERA 2015a). Threats to the species at this site include changes in the extent and quality of intertidal and open-water habitats, presence of adjoining habitat and coastal protection schemes. The latest Condition Assessment (2014) for the Great Crested Grebe population of Belfast Lough Open Water SPA indicates that it is currently at 'favourable' conservation status (DAERA 2015b). Threats to the species at this site include changes in the extent and quality of intertidal and open-water habitats and disturbance from open water activities (aquaculture, recreational boating, etc.). It is not anticipated that the FASs completed, to date, from the 1st cycle FRMPs 2015-2021, have had any effect on the short-term trends of these bird species. The Concrete Row Stream FAS in the Newtownabbey SFRA and the Glenmachan Project – Phase 2 FAS in the Belfast SFRA were small in scale and duration, while the EBFAS did not involve any coastal protection works that could result in disturbance to the species.

Table 3-5: Site-specific Flood Alleviation Schemes Completed to Date and Associated Designated Sites

SFRA	Scheme Name	Designated Sites – N2K sites and associated ASSIs
Belfast	East Belfast FAS - Phase 1, Phase 2 and Standalone measures	Belfast Lough Open Water SPA Belfast Lough SPA & Ramsar Inner Belfast Lough ASSI Outer Belfast Lough ASSI
Belfast	Glenmachan Project - Phase 2 (Greystown/Upper Malone)	Belfast Lough Open Water SPA Belfast Lough SPA & Ramsar Inner Belfast Lough ASSI Outer Belfast Lough ASSI
Newtownabbey	Concrete Row Stream	Belfast Lough Open Water SPA Belfast Lough SPA & Ramsar Inner Belfast Lough ASSI Outer Belfast Lough ASSI

Recommendations for monitoring effects on Biodiversity, Flora and Fauna from implementation of the 2nd cycle FRMP 2021-2027:

- Monitoring of likely significant effects on biodiversity, flora and fauna should continue on a project by project basis as particular FASs are developed and advanced, through the project level Environmental Impact Assessment (EIA) process. This should include an assessment of likely significant effects on designated sites as well as on local biodiversity.
- The 5th UK Habitats Directive Report (Article 17 reporting) is due in 2025 and will outline any changes in the UK within the timeframe of the remainder of the 1st cycle FRMPs as well as part of the 2nd cycle FRMP. It is recommended that, when available, this report is used to monitor any changes in the status of designated habitats or species within SACs, and to establish whether any changes could be associated with impacts arising from implementation of FASs.
- The 12th UK Report for Article 12 of the EU Birds Directive for the period is due in 2025 and will outline any changes in the UK within the timeframe of the remainder of the 1st cycle FRMPs as well as part of the 2nd cycle FRMP. It is recommended that, when available, this report is used to monitor any changes in the status of designated bird species within SPAs, and to establish whether any changes could be associated with impacts arising from implementation of FASs.
- Environmental Statistics Reports for Northern Ireland are updated on an annual basis. It is recommended that the most up to date report is used to compare any changes in the conservation status of species or habitats within designated sites during the timeframe of the FRMP.

3.2 Cultural Heritage

The SEA Environmental Report (Table 12) for the 1st cycle FRMPs 2015-2021 proposed that monitoring of 'Cultural Heritage' could entail an assessment of any historical sites that were lost or relocated as a result of the implementation of flood risk management infrastructure, with information provided by NIEA³ as statutory consultees for such circumstances. This would be more appropriately dealt with at project (EIA) level. Should any structural approaches be identified for SFRA, the proposals and approaches will be required to undergo assessment through the Drainage (Environmental Impact Assessment) Regulations (Northern Ireland) 2006, which will ensure that any approaches implemented have been agreed through consultation with DfC as a statutory consultee.

At a strategic level, Section 7 of the Northern Ireland Environmental Statistics Report 2019 examines the numbers of scheduled monuments and listed buildings in Northern Ireland, including those which are at risk. An online database 'Heritage at Risk Register for Northern Ireland (HARNI)' indicates properties of architectural or historic merit throughout the country that are considered to be at risk or under threat. A listed building or structure is considered to be at risk when its condition and management is deemed poor and unsustainable, and under threat of deterioration or demolition. The HARNI register gives an indication of changes in the number of buildings and structures at risk. There were 512 buildings and structures listed in 2017/18, an increase of 12 from 2016/17.

The potential for positive impacts of the FRMP on cultural heritage should also be monitored, as FASs can provide protection to heritage sites or features. The FRMPs assessed the potential for adverse effects from flooding on heritage sites, either for the SFRA as a whole, or for an individual water body. It can be expected, therefore, that completion of a FAS in this location will provide protection to any heritage features or sites identified in the FRMP. In the Newtownabbey SFRA, the FRMP assessed the potential adverse consequences of fluvial flooding from the Concrete Row stream. No built heritage sites were listed, for which the completed FAS would afford protection. In the Belfast SFRA, the FRMP assessed the potential adverse consequences on built heritage sites from both fluvial and coastal flooding as a combined measure for all water bodies considered at risk. For fluvial flooding, the potential adverse consequences for all water bodies combined included 8 built heritage sites for a 1% AEP flood event, comprising 7 listed buildings and 1 site and monument record. Completion of the flood protection measures within the EBFAS and Phase 2 of the Glenmachan Project is expected to provide protection against flooding to some of these built heritage sites.

The EBFAS was planned and implemented in conjunction with the CCG Project. While the benefits arising from completion of the CCG Project cannot be directly attributed to the EBFAS, this collaborative arrangement enabled the flood alleviation works to facilitate the development of the CCG Project, a linear walk following the courses of the Connswater, Knock and Loop rivers, and linking together parts of East Belfast. This has enabled the creation of new cultural heritage assets, such as leisure and heritage trails, the C.S. Lewis Public Square, sculptures and the EastSide Visitors Centre.

³ Responsibility now lies with the Department for Communities (DfC)

Recommendations for monitoring effects on Cultural Heritage from implementation of the 2nd cycle FRMP 2021-2027:

- It is recommended that monitoring for adverse effects on scheduled monuments, industrial heritage assets, maritime heritage assets and listed buildings is dealt with at project level. Under the Historic Monuments and Archaeological Objects (Northern Ireland) Order 1995, a Scheduled Monument Consent must be sought from DfC for any proposed works which may alter or disturb the fabric of a scheduled historic monument or its ground surface.
- The detailed flood risk mapping undertaken in development of the 2nd cycle FRMP will provide details of any built heritage sites at risk from flooding. This can be used to monitor the number of built heritage sites or features afforded protection by completed FASs.
- Monitor where heritage assets are used as part of the means to address flood risk – i.e. through historic coastal works, or man-made waterways and historic canals.

3.3 Water

The SEA Environmental Report (Table 12) for the 1st cycle FRMPs 2015-2021 proposed that monitoring of water quality could be based on the data compiled by NIEA for assessing the status of waterbodies for the Water Framework Directive (WFD), which includes water quality. The WFD requires NIEA to protect the status of water bodies from deterioration, and to restore them to 'Good Status'. Implementation is through River Basin Management Plans (RBMPs) that set out the environmental objectives to be achieved for surface water bodies, for each six yearly planning cycle beginning 2015. Overall classification of water bodies uses a combination of biological, chemical and hydromorphological quality elements to assign status into one of five classes from 'high' to 'bad'.

The 1st cycle FRMPs 2015-2021 were designed to follow the same timeframe as the RBMPs, and therefore the next date at which WFD classifications must be reported to Europe is 2021. However, the Department of Agriculture, Environment and Rural Affairs (DAERA) published the Northern Ireland Water Framework Directive Statistics 2018 to update the position since the beginning of the planning cycle in 2015. This indicated the following:

- River status - In 2018, 31.3% of Northern Ireland's river water bodies were classified as 'High' or 'Good' quality, compared to 32.7% in 2015 (based on 450 river water bodies).
- Lake status - The assessment of lake water quality in Northern Ireland is based on 21 lakes with a surface area of greater than 50ha. In 2018, 24% (i.e. 5 lakes) were classified as 'Good' water quality, with the remaining classified as less than 'Good' status, remaining the same as the 2015 classification. While the number of lakes at 'Good' status has remained the same as in 2015, more lakes have now been classified as 'Poor' status since that date (7 instead of 3).
- Marine status – In 2018, 10 of 25 (40%) transitional and coastal water bodies were classified at 'High' or 'Good' status, with the remaining 15 at 'Moderate or worse' status. This compares to 9 water bodies classified at 'High' or 'Good' status in 2015.

As the available interim water quality statistics were produced as an overall national assessment, they cannot be associated with the specific areas where FASs have been completed during the 1st cycle FRMPs, i.e. at the Newtownabbey and Belfast SFRA. The Water Management Unit of DAERA was consulted regarding any knowledge of degradation or improvements in water quality in these areas within the Plan period. They provided the raw data for interim assessment of river water

body status in 2018, on which the national statistics, discussed above, were based. These were used to compare the 2015 WFD status with updated 2018 interim WFD status for river water bodies associated with the completed FASs. In the Newtownabbey SFRA, a FAS was completed for the Concrete Row stream; this is a minor water body and there are no WFD monitoring points for which a comparison can be made. In the Belfast SFRA, the EBFAS comprised work on the Connswater River system; this water body was given a 'Poor' surface water status in both 2015 and 2018. Phase 2 of the Glenmachan Project FAS involved work in the Greystown/Upper Malone area of the Belfast SFRA. This area is in the Blackstaff (Belfast) River Catchment; this river body was given a 'Moderate' water quality status in both 2015 and 2018. Therefore, there is no indication of any degradation or improvement in water quality of WFD monitored water bodies associated with the completed FASs.

Recommendations for monitoring effects on Water from implementation of the 2nd cycle FRMP 2021-2027:

- Reporting for the 2015-2021 WFD planning cycle will be due in 2021, and will outline any changes in Northern Ireland within the timeframe of the 1st cycle FRMPs. It is recommended that, when available, this report is used to monitor any changes in the status of water bodies and establish whether any changes could be associated with impacts arising from implementation of the FRMPs.

3.4 Geology and Soil

The SEA Environmental Report (Table 12) for the 1st cycle FRMPs 2015-2021 proposed that monitoring of 'Geology and Soil' could entail an assessment of any changes in the condition and quality of designated sites of geological importance (ASSIs), based on information from the Northern Ireland Environment Agency's (NIEA) monitoring of designated sites. As discussed in Section 3.1, Section 6 of the Environmental Statistics Report 2019, monitoring of the condition of features within ASSIs for the six year rolling period ending March 2018 indicated that 61% of features were in Favourable condition, 3% in Unfavourable-Recovering and 36% in Unfavourable condition, remaining very similar to the previous 10 years of reporting. **Table 3-5** outlines the FASs that have been completed for the SFRA's outlined in the 1st cycle FRMPs, and the designated sites associated with these areas. There have been no reports of impacts on the Outer Belfast Lough ASSI, which is downstream of these three schemes. No ASSIs designated for features of geological importance are located in the vicinity of the completed FASs, and there has therefore been no other potential for impact.

Recommendations for monitoring effects on Geology and Soil from implementation of the 2nd cycle FRMP 2021-2027:

- Monitoring of likely significant effects on a project by project basis should continue as particular FASs are developed and advanced, through the project level EIA process. This should include an assessment of likely significant effects on designated sites, including those ASSIs designated for geological features. Project level EIA should also assess and monitor any risks to geology and soil from development of FASs.

3.5 Population and Human Health

The SEA Environmental Report (Table 12) proposed that the potential nuisance (noise) effects of flood risk management construction should be monitored, and that this could be carried out as part

of specific project management. It is recommended that this can more appropriately be dealt with at project level. At the detailed feasibility and design stage of any FAS, the Drainage (Environmental Impact Assessment) Regulations (Northern Ireland) 2006 require the proposals and approaches to undergo assessment, to include a requirement for monitoring of construction noise where this has been considered as a potentially significant effect of the proposal.

The implementation of Flood Risk Management measures directly protects the population of these areas against flooding, and the number of individuals directly protected can be monitored, as well as the cost benefit attributable to the schemes. **Table 3-6** outlines the FASs that have been completed for the SFRA outlined in the 1st cycle FRMPs, the number of properties protected by these schemes, average household size in these areas (based on the Northern Ireland Census of 2011), and the approximate number of individuals that this equates to. The FAS for the Newtownabbey SFRA at Concrete Row stream was estimated to provide protection to 29 properties, equating to approximately 70 individuals during a 1% AEP fluvial flood event. Phase 1 of the EBFAS was estimated to provide protection to 259 properties, equating to approximately 593 individuals during a 1% AEP fluvial flood event. Phase 2 of the EBFAS was estimated to provide protection to 1,264 properties, equating to approximately 2,895 individuals during a 0.5% AEP tidal flood event, and to 126 properties equating to approximately 289 individuals during a 1% AEP fluvial flood event. Phase 3 of the EBFAS was estimated to provide protection to 80 properties, equating to approximately 183 individuals during a 1% AEP fluvial flood event. Phase 2 (Greystown/Upper Malone) of the Glenmachan project in the Belfast SFRA was estimated to provide protection to 19 properties, equating to approximately 44 individuals during a 1% AEP flood event.

Table 3-6: Assessment of the Number of Individuals Protected by Completed Flood Alleviation Schemes

Scheme Name	No. of properties protected (approx.) ⁴	Average household size ⁵	No. of individuals protected (approx.)
Belfast; East Belfast Flood Alleviation Scheme (FAS) - Phase 1	259 (fluvial)	2.29	593
Belfast; East Belfast Flood Alleviation Scheme (FAS) - Phase 2	1,264 (tidal) 126 (fluvial)	2.29	2,895 289
Belfast; East Belfast Flood Alleviation Scheme (FAS) - Phase 3	80 (fluvial)	2.29	183
Belfast; Glenmachan Project - Phase 2 (Greystown/Upper Malone)	19 (fluvial)	2.29	44
Newtownabbey; Concrete Row Stream	29 (fluvial)	2.43	70

As discussed previously, the EBFAS was planned and implemented in conjunction with the CCG

⁴ Protection is estimated at the level of a 1% AEP fluvial event, or a 0.5% AEP tidal flood event.

⁵ Average household size as estimated by the NI Census 2011 for Belfast City and Metropolitan Newtownabbey.

Project and, although all the benefits arising from the CCG Project cannot be directly attributed to the EBFAS, the flood alleviation works facilitated the CCG Project and consequently its benefits. The CCG had the ambition to improve the quality of life of people in the area, through the creation of parkland for leisure, recreation, community events and activities. The Final Evaluation report, released in September 2017, reviewed progress through evaluation of project outcomes against a set of Key Performance Indicators⁶. Evaluation of the level of community engagement achieved indicated that all five of the targets were exceeded and, in four cases, greatly exceeded. Initial results from the Physical Activity, Health and Wellbeing component of the evaluation were below the targets anticipated over the short time period monitored. The number of pedestrians, cycle users and anglers increased by 0.7% compared to the baseline figure, but fell short of the target level. The evaluation report concluded that longer-term monitoring would be necessary to further investigate the impact of the CCG on the health and wellbeing of local residents.

Recommendations for monitoring effects on Population and Human Health from implementation of the 2nd cycle FRMP 2021-2027:

- Monitor the cost benefit attributable to completed FASs;
- Assess the number of people protected by completed FASs.

3.6 Material Assets

The SEA Environmental Report (Table 12) proposed that the potential effects on 'Material Assets' be monitored through assessment of the benefits of any FAS, including post-event evaluations as required. For monitoring the effects of implementation of the 1st cycle FRMPs, this includes the cost benefits, the number of properties protected and any infrastructure protected by the completed FASs.

Table 3-6 outlines the FASs that have been completed for the SFRA outlined in the 1st cycle FRMPs and the number of properties protected by each. One scheme has been completed at the Newtownabbey SFRA for the Concrete Row stream, and has been estimated to provide a damage benefit of approximately £2m and protection to 29 properties from fluvial flooding. Phases 1, 2 and 3 of the EBFAS in the Belfast SFRA have been completed, and have been estimated to provide a damage benefit of approximately £11m and protection to 465 properties from fluvial flooding and to 1,264 properties from coastal flooding. Phase 2 of the Glenmachan Project (Greystown/Upper Malone) at the Belfast SFRA has also been completed, and has been estimated to provide a damage benefit of approximately £2m and protection to 19 properties from fluvial flooding.

In addition to properties, the FRMPs assessed the potential for adverse effects from flooding on key infrastructure (i.e. wastewater treatment works, sewage pumping stations, water treatment works, treated water pumping stations, substations and road services), either for the SFRA as a whole, or for an individual water body. It can be expected, therefore, that completion of a FAS in these locations will provide protection to any infrastructure listed.

⁶ [Connswater Community Greenway/East Belfast Flood Alleviation Scheme Final Evaluation Report 2019](#)

In the Newtownabbey SFRA, the FRMP assessed the potential adverse consequences of fluvial flooding from the Concrete Row stream. Two key infrastructure assets were listed (both trunk roads), for which the completed FAS would afford protection. In the Belfast SFRA, the FRMP assessed the potential adverse consequences on key infrastructure assets from fluvial flooding as a combined measure for all water bodies considered at risk. The potential adverse consequences for all water bodies combined included 57 key infrastructure assets for a 1% AEP flood event, comprising 53 electricity substations, 3 sewage pumping stations and 1 trunk road. Completion of the flood protection measures within the EBFAS and Phase 2 of the Glenmachan Project is expected to provide protection against flooding to some of these key infrastructure assets.

The EBFAS, in conjunction with the CCG Project, connects parts of East Belfast and encourages regeneration of this area. Collaborative implementation of the EBFAS has enabled the CCG to create new material assets such as bridges, walkways, a public square and a Visitor's Centre.

The Homeowner Flood Protection Grant Scheme was introduced in 2016 as a pilot scheme designed to encourage the owners of residential properties that have flooded before and/or are located within known flood prone areas, to modify their properties in order to make them more resistant to flooding. The scheme is estimated to provide financial assistance of £960k over 3 years.

Recommendations for monitoring effects on Material Assets from implementation of the 2nd cycle FRMP 2021-2027:

- Monitor the cost benefit attributable to completed FASs;
- Monitor the number of properties protected by completed FASs;
- Monitor the infrastructure protected by completed FASs;
- Monitor the number of properties protected from future flood events by the Homeowner Flood Protection Grant Scheme, and the cost benefit attributable to this scheme.

3.7 Climate Factors

The Climate Change Adaptation Programme (CCAP) provides the proposals and policies by which Northern Ireland's Government Departments will meet climate change objectives. Section 60 (Part 4) of the UK Climate Change Act 2008 requires Departments to set out objectives, proposals, policies and associated timelines to address the risks and opportunities that were identified in the 1st Climate Change Risk Assessment (CCRA) for Northern Ireland. It also requires an assessment of the progress that has been made towards implementing the objectives, proposals and policies.

The SEA Environmental Report (Table 12) proposed that the CCAP should include an audit mechanism for target meeting.

The first Northern Ireland CCAP⁷ outlined the Government's response to the CCRA for Northern Ireland. An Adaptation Sub Group of the Cross-Departmental Working Group on Climate Change (CDWG CC) was tasked with delivering the Adaption Programme, including annual progress reports on its implementation. Chapter 7 of the CCAP considered the use of 'Adaptation Indicators' that could be used by the CDWG CC as a tool for assessing progress on climate change adaptation.

⁷ [NI Climate Change Adaptation Programme](#)

The Climate Change Unit of DAERA has now published an updated Northern Ireland CCAP for the period 2019 – 2024 (NICCAP2). The NICCAP2 identified five key priority areas:

- Natural Capital, including Terrestrial/Coastal/Marine/Freshwater ecosystems, soils and biodiversity (NC);
- Infrastructure services (IF);
- People and built environment (P);
- Disruption to businesses and supply chains (B); and
- Food Security/Global food production (I).

Chapter 15 of this report evaluates the implementation of the 1st Programme (NICCAP1). Annex A outlines the ‘Government delivery plans’, detailing the strategies, policies and action for implementation for each key priority area. This includes, for each identified key priority area: the relevant vision for the outcome objective, the relevant indicators, list of actions with implementation time lines and responsible named department and NI Evidence Report Climate Change risks/opportunities to which the relevant action contributes to addressing. Monitoring of NICCAP2 implementation will be through a mid-programme review that will assess the progress of actions implemented/still to be implemented, the effectiveness of adaptation indicators and progress on delivery of the outcome objectives. In addition, in February 2019 the Department for Infrastructure (DfI) published a “Technical Flood Risk Guidance in Relation to Allowances for Climate Change in Northern Ireland”. This sets out DfI Roads and Rivers and NI Water’s approaches to allowing for climate change in the design of their respective road drainage, storm drainage and river infrastructure. It will also act as a guide for those involved in managing flood risk in relation to development planning and management. Following the formation of DfI, the responsibility for implementation of the FRMPs for Northern Ireland now rests with this Department.

Further to the above assessment of the CCAP, and in order to enable measurable monitoring within the FRMP cycle, the capacity of completed FASs to manage climate change effects can be assessed. The effects of climate change should be effectively managed through the implementation of Flood relief management measures. The EU Directive on the Assessment and Management of Flood Risks (2007/60/EC)⁸, known as the Floods Directive, and The Water Environment (Floods Directive) Regulations (Northern Ireland) 2009⁹ (SR 376/2009)⁹, make it a legal requirement for Climate Change to be considered in the assessment of flood risk. The number of individuals protected from flooding by the FASs completed during the 1st cycle FRMPs was estimated as detailed in **Table 3-6**. The completed FASs were subject to a sensitivity test for climate change, however up to date guidance regarding climate change adaptability was not available at the time of scheme development. New design guidance that takes climate change into account was issued in February 2019¹⁰, and this will be followed during the implementation of any new FASs. This guidance document consolidated and, where appropriate, updated previously existing guidance on allowances for Climate Change in relation to design of drainage and flood risk management infrastructure and was designed to assist engineers and other professionals in their considerations of flood risk. This will facilitate monitoring the adaptability of completed FASs to climate change effects, to include the area and number of properties and other assets benefitting from the schemes.

⁸ [EU Directive 2007/60/EC on the assessment and management of flood risks](#)

⁹ [The Water Environment \(Floods Directive\) Regulations \(Northern Ireland\) 2009](#)

¹⁰ [DfI 2019 - Technical Flood Risk Guidance in relation to Allowances for Climate Change in Northern Ireland](#)

Recommendations for monitoring effects on Climate Factors from implementation of the 2nd cycle FRMP 2021-2027:

- Monitor the number of completed FASs that were designed to be adaptable to climate change projections;
- Assess the number of properties, people and other assets protected against the effects of climate change by completed FASs;
- The mid-programme review of NICCAP2 will be due in 2022. It is recommended that, when available, this report is used to monitor the effectiveness of any adaptation indicators relevant to the FRMPs.

3.8 Landscape

The SEA Environmental Report (Table 12) proposed that the endorsement of the use of Sustainable Drainage Systems (SuDS) in the development of future legislation should include the necessary formal monitoring arrangements.

Since the development of the 1st cycle FRMPs, new legislation has been introduced, 'The Water and Sewerage Services Act (Northern Ireland) 2016'. This Act requires that any person proposing to connect a sewer or lateral drain to a public sewer obtain written approval on the basis of a mandatory sewer adoption agreement. The Planning, Advisory and Modelling Unit (PAMU) of DfI is providing input to the Storm Water Management Group in dealing with the emerging Sustainable Drainage Systems policy for Northern Ireland. In addition, the Living with Water Programme is developing a Strategic Drainage Infrastructure Programme (SDIP) which includes the Belfast SFRA. Development of the SDIP is ongoing (**Table 3-4**), and the aim is for any construction works arising from the Plan to be undertaken by 2026, where viable.

Further to the above assessment of SuDS, and in order to enable more relevant and measurable monitoring within the FRMP cycle, the capacity of completed FASs to protect, maintain and, where possible enhance local landscapes could be assessed. This may only be a feasible monitoring measure for larger projects, those that include the creation of upstream storage, or those where flood alleviation works have been integrated with other landscape regeneration projects. The EBFAS, in conjunction with the CCG Project, enabled the creation of a 9 km linear park through east Belfast, following the course of the Connswater, Knock and Loop Rivers. This blue-green infrastructure has created parkland for leisure, recreation, community events and activities, and allows residents to travel across the city on foot or by bicycle via the 16 km of cycle and walkways.

Landscape Character Assessment is a tool for identifying the features that are particular to a locality and that can be used to categorize the landscape into areas of similar character. Landscape Character Assessment has arisen from the European Landscape Convention (ELC), the first international convention to focus on the protection, management and planning of all landscapes in Europe. A Landscape Character Assessment for Northern Ireland was undertaken in 2000¹¹; this subdivided the countryside into 130 Landscape Character Areas (LCAs), each based upon local patterns of geology, landform, land use, cultural and ecological features. For each LCA, the key characteristics were described and an analysis of landscape condition and its sensitivity to change was made. This can be used to monitor any significant changes in landscape character from implementation of FASs.

¹¹ Landscape Character Assessment for Northern Ireland 2000

Recommendations for monitoring effects on Landscape from implementation of the 2nd cycle FRMP 2021-2027:

- Assess the area of blue/green infrastructure created during implementation of completed FASs (likely only feasible for larger projects, those that include the creation of upstream storage, or those where flood alleviation works have been integrated with other landscape regeneration projects);
- Assess any significant changes to the landscape character from implementation of FASs.

4: Monitoring Conclusions and Recommendations

Monitoring of the implementation of the 1st cycle NI FRMPs has not found any significant negative impacts on the wider environment, based on the SEA topics and indicators. This monitoring has however found localised, significant positive impacts on population, human health and material assets, from the protection of people and property from flood risk in the Newtownabbey and Belfast SFRA.

The 2nd cycle NI FRMP will cover the period from 2021-2027. Monitoring of the SEA topics detailed previously will be required from implementation of FASs during the 2nd cycle FRMP in the identified areas of potential significant flood risk (APSEFR). The SEA Environmental Report (**Table 12**) for the 1st cycle FRMPs proposed a set of generic measures to be used for monitoring of SEA topics (**Table 3-1**). This assessment has provided an insight into how appropriate the generic measures and indicators that were proposed in the SEA Environmental Report are for monitoring purposes. The recommended strategy (measures, indicators and data sources) for monitoring effects from implementation of the 2nd cycle FRMPs 2021-2027 is outlined in **Table 4-1**. For some SEA topics, the proposed measures and data sources remain the same as those that were proposed for the 1st cycle plans (i.e. **Table 3-1**), where this assessment has found them to be suitable; these have been refined, where possible, with the addition of proposed indicator(s). For other SEA topics, alternative measures, associated indicators, and data sources have been proposed that are considered to be more appropriate.

Table 4-1: Proposed Monitoring Measures, Indicators and Data Sources for SEA Topics for the 2nd Cycle FRMP 2021-2027

SEA Topic	Proposed Measures	Proposed Indicator(s)	Proposed Data Source(s)
Biodiversity, Flora and Fauna	Protected sites and species are monitored with regards to their conservation objectives. Any increase in unfavourable/favourable conditions will be monitored in conjunction with the implementation of flood risk management projects as well as any habitat loss/increase.	Change in condition of designated national or European designated sites; Significant changes in existing habitats or species.	Article 17 Habitats Directive reporting for SACs relevant to completed/in progress FASs; Article 12 Bird's Directive reporting for SPAs relevant to completed/in progress FASs; Consultation with DAERA regarding any significant changes in the condition of habitats/species within ASSIs relevant to completed/in progress FASs; DfI data on completed FASs, State of the Seas Reporting.
Cultural Heritage	Historical sites (monuments, listed buildings, industrial heritage, maritime heritage, archaeological sites, etc.) should be appropriately monitored where they are lost, damaged, relocated or discovered as a result of FASs.	Number of cultural heritage (including marine) sites or features that have been afforded protection by completed FASs; Number of historical sites (including marine) that have been lost, damaged, relocated, or discovered during FASs. Number and state of heritage assets used as part of the means to address flood risk – i.e. through historic coastal works, or man-made waterways and historic canals.	Project-specific information on the sites or features at risk from flooding that will be protected by completed FASs; Project-specific information from DfI or via consultation with DfC regarding the loss, damage, relocation or discovery of any historical sites during completed/in progress FASs.
Water	Water quality is monitored by DAERA under the requirements of the WFD. Any changes in status of water bodies will be monitored in conjunction with the implementation of flood risk management projects.	Change in WFD status of water bodies.	WFD reporting of water body status by DAERA.

SEA Topic	Proposed Measures	Proposed Indicator(s)	Proposed Data Source(s)
Geology and Soil	The condition and quality of designated sites of geological importance (ASSIs) is subject to ongoing monitoring. This should be reviewed in conjunction with the implementation of flood risk management projects.	Change in condition of ASSI sites designated for geological features.	Consultation with DAERA regarding any significant changes in the condition of ASSIs designated for geological features relevant to completed/in progress FASs.
Population and Human Health	The implementation of Flood Risk Management measures directly protects the population of these areas against flooding, and the number of individuals directly protected can be monitored, as well as the cost benefit attributable to the FASs.	Number of people protected by completed FASs; Significant impacts on the health or living environment of communities (only feasible to monitor for large collaborative schemes where this information is collected).	Dfl data on completed FASs, providing information on the no. of properties protected; NI Census population statistics on average household size in the scheme areas; Publicly available data on community benefits of completed FASs (only feasible to monitor for large collaborative schemes where this information is collected).
Material Assets	Benefits from implemented flood risk management measures should be monitored, including cost benefits, no. of properties protected and any infrastructure protected by schemes.	Cost benefit attributable to completed FASs; Number of properties protected by completed FASs; Infrastructure protected by completed FASs. Monitor the number of properties protected from future flood events by the Homeowner Flood Protection Grant Scheme, and the cost benefit attributable to this scheme.	Dfl data on completed FASs.
Climate Factors	The effects of climate change should be effectively managed through the implementation of Flood relief management measures. The capacity of implemented schemes to manage climate change effects can be monitored.	Number of completed FASs that have been designed to be adaptable to climate change projections; Number of people protected against the effects of climate change by completed FASs.	Dfl data on completed FASs.

SEA Topic	Proposed Measures	Proposed Indicator(s)	Proposed Data Source(s)
Landscape	Flood management measures should be designed to protect, maintain and, where possible enhance local landscapes. Monitoring can assess the amount of blue/green infrastructure created during the implementation of completed schemes, and any changes in landscape character following implementation of FASs.	Area of blue/green infrastructure (including SuDS) created during implementation of completed FASs (only feasible to monitor for large collaborative schemes where this information is collected, or in cases where FASs create new upstream water storage areas); Any changes to the landscape and / or seascape character from implementation of FASs.	Publicly available data on new blue-green infrastructure associated with completed FASs (only feasible to monitor for large collaborative schemes where this information is collected); Landscape and seascape character assessments for NI; DfI data on completed FASs.



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