

**Cramond Weirs:  
Dowie's Mill and Fair-A-Far  
Preliminary Ecological  
Appraisal**

Final report

December 2016



Rivers and Fisheries Trust of Scotland  
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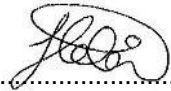
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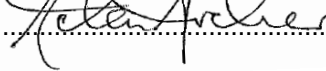
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## Contract

This report describes work commissioned by River and Fisheries Trust of Scotland (RAFTS). Frances Tobin of JBA Consulting carried out this work.

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## Purpose

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## Acknowledgements

JBA would like to thank The Wildlife Information Centre for provision of protected species and local wildlife site data.

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## Executive Summary

JBA Consulting was commissioned by the Rivers and Fisheries Trusts of Scotland (RAFTS), working in partnership with the Scottish Environment Protection Agency Water Environment Fund (SEPA WEF), to undertake detailed design of fish passage improvements at Fair-a-Far and Dowie's Mill weirs near Cramond on the River Almond.

As part of this package, JBA Consulting was commissioned to undertake a study to carry out design work and subsequently to prepare contract documentation for project managing, building and site supervision in order to deliver fish passage improvements at Fair-a-Far and Dowie's Mill weirs, River Almond, Edinburgh.

A desk study and an Extended Phase 1 Habitat Survey have been undertaken to determine the ecological value of the location of the weirs and adjacent land, where applicable. Evidence of protected species was searched for and an assessment of the status and condition of the habitats and ecological features on site for supporting rare or legally protected species was made.

The weirs are located within 2km of the Firth of Forth SAC, SPA and Ramsar site. Due to the proximity of the works and the potential for adverse impacts on the interest features of this multidesignatory site, the works require assessing under the Habitat Regulations. Furthermore, the weirs are located within the River Almond LBS and SINC site and adjacent to the Dalmeny Estate LBS. Liaison with the council is, therefore, required prior to works commencing.

The left (western) bank of the River Almond is bordered by ancient woodland BAP habitat. Access to the weirs from this bank will likely involve tree removal which will reduce the ecological value of this habitat. Recommendations have been made to undertake a tree survey if tree felling is required within ancient woodland BAP habitat. Furthermore, the sites fall within the Cramond Conservation Area and, as such, any tree removal or works will need to be agreed by the council.

The River Almond is of good ecological value for otter. No evidence of otter was found during the survey, however there are records for otter within the River Almond. There is the potential for adverse impacts on otter for commuting during the works, however this is not considered to be significantly adverse. It is advised that the works footprint is inspected by an ecologist for otter holts prior to the works commencing to ensure that the works will not cause damage or destruction to an otter's resting place.

The works are likely to adversely impact fish passage during the construction phase due to localised dewatering of the channel and restriction of flow to facilitate the works. However, in the long term, fish passage will be improved by removing obstacles in the channel. Works should be scheduled outside the salmon and trout spawning season (i.e, October to February, inclusive) to ensure that there is no significant impact on salmonid species.

Several records of bats were available for the survey area and the value of the survey area for bats was considered to be low. However, the river and woodland edge provides a foraging and commuting corridor for bat species. Night time working should be avoided or conducted under downward facing directional, cowled lighting to reduce light spill. No bat roosts were identified during the survey, but it is recommended that if any mature trees, or trees noted to have limited bat roost potential, are inspected for roosts by an ecologist and/or are subject to soft felling, in winter, where necessary. Provided that these actions are followed, no significant impact on bats is expected from the works.

The woodland habitat is of good value for breeding birds and the River Almond is of value for Dipper. Vegetation removal, if necessary, should be undertaken outside of the bird breeding season (i.e., March to September, inclusive) or preceded by a nesting bird survey if undertaken within the breeding season. It is also recommended that the weir structures and works footprint are inspected for Dipper nests if works are undertaken during the breeding season.

No evidence of badger was found during the survey, however there are numerous records within 2km of the weirs. Minor disturbance to badger may arise if works are undertaken during night time hours. It is, therefore, advised that works are undertaken during daylight hours where possible and any night time working is done under spot lights and direct away from woodland areas. Furthermore, any excavation left overnight should be covered to prevent exploration by badger.

No records of Great Crested Newt, reptiles, Water Vole or Red Squirrel were available for the survey area and no evidence of these species was found during the survey. These species are not considered to pose a constraint to the works.

In summary, provided that appropriate mitigation is implemented, and liaison with relevant bodies is conducted prior to the work, it is not considered that the works to Dowie's Mill Weir and Fair-a-Far weir will be significant adverse on protected species or habitat. Furthermore, the works are considered to promote the ecological functioning of the River Almond (specifically for fish movements) in the medium to long-term.

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## Abbreviations

|              |   |
|--------------|---|
| AA .....     | Appropriate Assessment                                      |
| BAP .....    | Biodiversity Action Plan                                    |
| BCT .....    | Bat Conservation Trust                                      |
| BD-1 .....   | Birds Directive Annex 1                                     |
| CIEEM.....   | Chartered Institute of Ecology and Environmental Management |
| cSAC.....    | Candidate Special Area of Conservation                      |
| DBA.....     | Desk-based Assessment                                       |
| EPS .....    | European Protected Species                                  |
| HRA .....    | Habitats Regulations Appraisal                              |
| JBA .....    | Jeremy Benn Associates                                      |
| LBAP .....   | Local Biodiversity Action Plan                              |
| LBS .....    | Local Biodiversity Site                                     |
| LNR .....    | Local Nature Reserve  |
| LWS .....    | Local Wildlife Site   |
| MAGIC .....  | Multi-agency Geographic Information Centre                  |
| NNR .....    | National Nature Reserve                                     |
| NPF.....     | National Planning Framework                                 |
| PAN.....     | Planning Advice Note  |
| PEA.....     | Preliminary Ecological Appraisal                            |
| pSPA.....    | Potential Special Protection Area                           |
| RAFTS .....  | River and Fisheries Trust Scotland                          |
| RDB .....    | Red Data Book   |
| SAC.....     | Special Area of Conservation                                |
| SBL .....    | Scottish Biodiversity List                                  |
| SEPA .....   | Scottish Environmental Protection Agency                    |
| SINC .....   | Site of Importance for Nature Conservation                  |
| SNH .....    | Scottish Natural Heritage                                   |
| SPA.....     | Special Protection Area                                     |
| SPP.....     | Scottish Planning Policy                                    |
| SSSI.....    | Site of Special Scientific Interest                         |
| SWT .....    | Scottish Wildlife Trust                                     |
| TWIC.....    | The Wildlife Information Centre                             |
| UK BAP ..... | UK Biodiversity Action Plan                                 |
| W&CA .....   | Wildlife and Countryside Act 1981 (as amended)              |



# 1 Introduction

## 1.1 Brief and Scope

The River and Fisheries Trust Scotland (RAFTS), in partnership with the Scottish Environment Protection Agency (SEPA) and River Forth Fisheries Trust (RFFT), is commissioning projects to deliver fish passage solutions at in-river barriers. As part of this package, JBA Consulting was commissioned to undertake a study to carry out design work and subsequently to prepare contract documentation for project managing, building and site supervision in order to deliver fish passage improvements at Fair-a-Far and Dowie's Mill weirs, River Almond, Edinburgh (see Figure 1-1, overleaf).

As part of the commission, a Preliminary Ecological Appraisal (PEA) of the proposed works at the weirs was undertaken which involved identifying potential ecological constraints to the works and recommendations for mitigation measures, where applicable. A desk-based assessment and baseline field survey was undertaken to determine the ecological value of the land within the works footprint (i.e. the weirs and immediately adjacent land), and of adjoining land in the wider environment, where applicable. The likely impacts of the works on protected and/or notable species, habitats and designated nature conservation sites have also been identified and appropriate mitigation measures recommended where necessary.

This PEA was undertaken in advance of any design works for the site and is intended to act as a baseline appraisal, providing objective recommendations to feed into the subsequent design work and project progression.

## 1.2 Site Location and Proposed Works



Figure 1-1: Study Area

The weirs are located in the downstream extent of the River Almond before it reaches the Firth of Forth estuary, within Cramond, Edinburgh. Dowie's Mill Weir is located at OS Grid Reference NT17912 75631 and Fair-a-Far weir is located at OS Grid Reference NT18406 76426.

The proposed works include the removal of Dowie's Mill Weir, including the failing weir structure, and deployment of boulders in the channel upstream, to approximately the footbridge, to manage flow velocity. At Fair-a-Far Weir, the proposal is to install a new fish pass in the weir to replace the existing one which is not successful.

## 2 Legislative Context - Legislation, Planning and Other Guidance

### 2.1 Wildlife Legislation and Statutory Site Protection

The primary legislation in Scotland covering nature conservation and wildlife protection is outlined below. The legislation makes it an offence to kill or capture certain animals including birds, or to remove certain native plants. The law also protects certain animals from disturbance including disturbance of their nests and / or resting places. This section is not intended as a detailed appraisal of wildlife legislation, but aims to provide a summary context to support the impact assessment.

#### 2.1.1 Habitats Directive and Conservation (Natural Habitats, &c.) Regulations 1994

In Scotland the Habitats Directive is transposed through a combination of the Habitats Regulations 2010 (in relation to reserved matters) and the Habitat Regulations 1994. These Regulations afford protection to certain species identified in the Habitats Directive, including those requiring strict protection (European Protected Species).

The Habitat Regulations 1994 (as amended in Scotland) implement the species protection requirements of the Habitats Directive in Scotland on land and inshore waters (0-12 nautical miles). There are various Schedules attached to the Habitats Regulations including Schedule 2 and 4 which relates to European protected species (fauna and flora, respectively) and Schedule 3 which relates to those animals in Annex V of the Habitats and Species Directive whose natural range includes Great Britain.

The designation and protection of domestic and European Sites e.g. SSSIs, Special Protection Areas (SPA) and Special Areas of Conservation (SAC) falls within these Regulations.

Public bodies (including the Local Planning Authority) have a duty to have regard to the requirements of the Habitats Directive in carrying out their duties i.e. when determining a planning application.

The Habitat Regulation Assessment requirements protect European sites by requiring that any plan or project which may have a 'likely significant effect' on a site (either individually or in combination with other plans or projects) must be subject to an Appropriate Assessment of its implications for the site in view of the site's conservation objectives. The HRA process is mandatory under the Habitats Directive implemented through The Conservation of Habitats and Species Regulations 2010 (as amended). As part of the process Scottish Natural Heritage (SNH) must be consulted.

The HRA is a multi-stage process through which Appropriate Assessment (AA) is carried out, if in the primary Screening stage of the HRA it is determined that the project may have an adverse impact upon a Natura 2000 site. Such plans or projects may only proceed if they will not adversely affect the integrity of the European site concerned, without the decision of the over-riding public interest.

#### 2.1.2 The Wildlife and Countryside Act 1981 (as amended)

The Wildlife and Countryside Act (W&CA) 1981 (as amended) constitutes an important statute relating to the protection of flora, fauna and the countryside within Great Britain. Part 1 of the Act deals with the protection of wildlife. Most European Protected Species (EPS) are now covered under the Conservation of Habitats and Species Regulations (as amended) however certain species and activities are still covered by the W&CA. The W&CA also covers possession of species listed in the various schedules. In Scotland the W&CA is amended by The Nature Conservation (Scotland) Act 2004 and The Wildlife and Natural Environment (Scotland) Act 2011.

##### 2.1.2.1 Nature Conservation (Scotland) Act 2004

The Act serves to make provisions in relation to the conservation of biodiversity; to make further provision in relation to the conservation and enhancement of Scotland's natural features; to amend the law relating to the protection of certain birds, animals and plants; and for connected purposes. Under Section 2(4) of the Act a Scottish Biodiversity List, a list of animals, plants and habitats that Scottish Ministers consider to be of principal importance for biodiversity conservation in Scotland, was compiled.

#### 2.1.2.2 Wildlife and Natural Environment (Scotland) Act 2011

The Wildlife and Natural Environment (Scotland) Act (WANE Act) is an Act of the Scottish Parliament to make provision in connection with wildlife and the natural environment; and for connected purposes.

#### 2.1.3 Protected Species

Certain species and species groups are afforded specific protection under the Conservation (Natural Habitats, &c.) Regulations 1994 and the Wildlife and Countryside Act 1981 (as amended). Relevant species and levels of protection are detailed below.

#### 2.1.4 Breeding Birds

All wild birds are protected under the Wildlife and Countryside Act 1981 (as amended). This makes it an offence to:

- intentionally take, damage or destroy the nest of any wild bird whilst it is in use or being built,
- take, destroy or possess the egg of any wild bird.

Furthermore, certain species receive additional protection under Schedule 1, which extends protection away from the nest whilst they have dependent young.

Those species listed on Schedules A1 and 1A receive additional protection which makes it an offence to intentionally or recklessly:

- at any time take, damage, destroy or interfere with any nest habitually used by any wild bird included in Schedule A1; and
- at any time harass any wild bird included in Schedule 1A.

#### 2.1.5 Otter

The European otter *Lutra lutra* is a European Protected Species protected under the Conservation (Habitats &c) Regulations 1994, making it an offence to:

- deliberately capture, injure or kill an otter,
- deliberately disturb an otter such as to affect local populations or breeding success,
- damage or destroy an otter holt, possess or transport an otter or any part of an otter,
- sell or exchange an otter.

Otters also receive protection under the Wildlife and Countryside Act 1981 (as amended), this makes it an offence to:

- intentionally or recklessly disturb any otter whilst within a holt,
- intentionally or recklessly obstruct access to a holt.

#### 2.1.6 Badger

Badgers and their setts are protected by the Protection of Badgers Act 1992. This Act has been supplemented by the Wildlife and Natural Environment (Scotland) Act 2011. This makes it illegal to kill, injure or take a badger, or to interfere with an active sett, including blocking an active entrance or allowing a dog to enter the sett. Furthermore, under this legislation, it is illegal to dig for, cruelly ill-treat, or tag a badger.

#### 2.1.7 Water Vole

The Water Vole is protected under the Wildlife and Countryside Act 1981 (as amended). This makes it an offence to:

- intentionally kill, injure or capture a Water Vole,
- possess or control a Water Vole, living or dead, or any part of a Water Vole,
- intentionally or recklessly damage, destroy or obstruct access to any place of shelter, or disturb a Water Vole within such a place,
- sell or offer for sale a Water Vole living or dead, or part of a Water Vole.

### 2.1.8 Bats

All UK bat species are European Protected Species under the Conservation (Habitats &c) Regulations 1994. It is an offence to:

- deliberately kill, injure or capture any bat,
- intentionally or recklessly disturb a bat, or deliberately disturb a group of bats,
- damage or destroy, or intentionally or recklessly obstruct access to, a bat roosting place,
- possess, or sell (living or dead) any bat or part of a bat.

Furthermore, amendments to the Regulations (2007-2012) include, under Regulation 40, that it is no longer a defence to state that killing, capture or disturbance of bats or the destruction of their roosts was an incidental or unavoidable result of a lawful activity.

### 2.1.9 Red Squirrel

The Red Squirrel is listed on Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). It is an offence to intentionally or recklessly:

- kill, injure or take a Red Squirrel,
- damage, destroy or obstruct access to any structure or place which a Red Squirrel uses for shelter or protection (a drey),
- disturb Red Squirrel when it is occupying a structure or place for that purpose,
- possess or control, sell, offer for sale or possess or transport for the purpose of sale any live or dead Red Squirrel or any derivative of such an animal.

### 2.1.10 Great Crested Newt

The Great Crested Newt is a European Protected Species under the Conservation (Habitats &c) Regulations 1994. This makes it an offence to:

- kill, capture or disturb a Great Crested Newt,
- take or destroy the eggs of a Great Crested Newt,
- damage or destroy the breeding or resting places of Great Crested Newt.

It also receives additional protection under the Wildlife and Countryside Act 1981 (as amended) making it illegal to possess or control any Great Crested Newt, living or dead.

### 2.1.11 Reptiles and Amphibians

Legal protection varies considerably for different species. Smooth Snake *Coronella austriaca*, Sand Lizard *Lacerta agilis* and Natterjack Toads *Epidalea calamita* are European Protected Species receiving the same protection as Great Crested Newt. Under the Wildlife and Countryside Act 1981 (as amended) Adder *Viperus berus*, Grass Snake *Natrix natrix*, Common Lizard *Zootoca vivipara* and Slow Worm *Anguis fragilis* are protected from intentional killing or injuring, additionally Common Frogs *Rana temporaria*, Common Toads *Bufo bufo* and other newt species are prohibited from sale.

### 2.1.12 Non-native Invasive Species

Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) lists 62 plant species, or groups of plants, and 69 animal species. The major amendment to this Act in Scotland is found in the Wildlife and Natural Environment (Scotland) Act 2011. It is an offence to release or cause to spread in the wild any of these species. Of particular note are Japanese Knotweed *Fallopia japonica*, Himalayan Balsam *Impatiens glandulifera*, Giant Hogweed *Heracleum mantegazzanum* and Signal Crayfish *Pacifastacus leniusculus*.

## 2.2 Policy and Planning

The following sections outline the policies that are relevant to the study area and the proposed scheme at national and local levels.

### 2.2.1 National Planning Framework

The National Planning Framework (NPF) sets the context for development planning in Scotland and provides a framework for spatial development. It sets out the Scottish Government's



development priorities over the next 20-30 years and identifies national developments which support the development strategy.

#### 2.2.2 UK Biodiversity Policy Guidance

'The UK Biodiversity Action Plan (UK BAP) (UK Biodiversity Partnership, 2007)' was developed in response to The Earth Summit, held in Rio de Janeiro in 1992. The UK BAP lists a number of priority habitats and species for conservation action in the UK. Although the Action Plan does not confer any statutory legal protection, in practice many of the species listed already receive statutory legal protection under UK and/or European legislation and are a material consideration in planning decisions.

As part of the action plan process, LBAPs must be produced for every county in the UK. LBAPs highlight local biodiversity issues and set out a series of objectives and action plans for the conservation of priority species and habitats where they occur in each district, county or region.

#### 2.2.3 Scotland's Biodiversity: It's in Your Hands - A strategy for the conservation and enhancement of biodiversity in Scotland (2004)

"Scotland's Biodiversity: It's In Your Hands (Scottish Executive, 2004)" is a landmark strategy for Scotland. It sets out a vision for the future health of our biodiversity, and maps out a 25 year framework for action to conserve and enhance biodiversity for the health, enjoyment and well-being of all the people of Scotland.

#### 2.2.4 Scottish Planning Policy, Scottish Government, 2010

The Scottish Planning Policy (SPP) is the statement of the Scottish Government's policy on nationally important land use planning matters. Within the policy, the importance of Scotland's natural heritage and biodiversity are highlighted as considerations for planning and development. For example, presence of EPS within a site will require suitable mitigation measures to ensure that the development or plan does not adversely affect the species or its conservation status.

#### 2.2.5 Planning Advice Note 60

This Planning Advice Note (PAN) 60 provides advice on how development and the planning system can contribute to the conservation, enhancement, enjoyment and understanding of Scotland's natural environment and encourages developers and planning authorities to be positive and creative in addressing natural heritage issues.

## 3 Ecological Baseline

### 3.1 Methodology

A desk study and baseline field survey have been undertaken to determine the ecological value of the location of the weirs and adjacent land, where applicable.

### 3.2 Desk-based Assessment

Prior to undertaking the survey, searches of databases and online data sources containing information on ecological records and important sites for nature conservation were made. The following sources were used to inform the baseline desk-based assessment:

- Multi-agency Geographic Information Centre (MAGIC; 2015)
- Scottish Natural Heritage ([www.snh.gov.uk](http://www.snh.gov.uk))
- Cramond Angling Club ([fishalmond.co.uk](http://fishalmond.co.uk))
- River Almond Barriers Ecological Appraisal (Atkins, 2015)
- River Forth Fisheries Trust

Relevant statutory nature conservation sites within 2km of the study area were recorded, including:

- Ramsar Sites (International designation),
- Special Area of Conservation (SAC) and Special Protection Area (SPA) (European designations),
- National Nature Reserves (NNR) and Sites of Special Scientific Interest (SSSI) (National designations) and
- Local Nature Reserves (LNR) (Local designation).

Furthermore, data for protected and notable species within 2km of both weirs was supplied by The Wildlife Information Centre (TWIC), dated 18<sup>th</sup> December 2015 within 2 km of the structures. TWIC also provided information of locally designated sites within this search radius.

### 3.3 Ecological Walkover Survey

An Extended Phase 1 Habitat Survey was carried out at the site by Frances Tobin BSc ACIEEM on 14<sup>th</sup> and 15<sup>th</sup> November 2015 in order to identify all habitats and ecological features present and to inform the potential of the site for protected and notable species.

The methodology of the Extended Phase 1 Habitat Survey, as detailed within the JNCC Handbook for Phase 1 Habitat Survey (JNCC, 2010), involves classifying parcels of land using specified habitat types and consideration of the status and condition of the site for supporting rare or legally protected species.

As part of the survey, the following actions were carried out:

- Mapping of habitats on and adjacent to the site, following the Handbook of Phase I Habitat Survey. Habitat codes contained within the JNCC Handbook for Phase 1 Habitat Survey (JNCC, 2010) were used to produce a habitat map for the site.
- Recording of any evidence of protected species found on the site (e.g. otter, badger, reptiles, Water Vole, Red Squirrel) and assessment of habitat potential for these protected species.
- Assessing habitat suitability for reptiles and Great Crested Newts.
- Recording of bird species observed (by sound and sight) and suitable habitat for use by birds; and
- Recording of any non-native invasive species present, such as Japanese Knotweed *Fallopia japonica*, Himalayan Balsam *Impatiens glandulifera* and Giant Hogweed *Heracleum mantegazzianum*.
- Identification of features with the potential to support roosting bats *Chiroptera spp*:
  - The trees on site were inspected from the ground using binoculars for their bat roost potential in line with good practice guidelines (Hundt, 2012). Features searched for included holes, cracks / splits, loose bark, hollows / cavities, staining

indicative of bat use, dense epicormic growth and Ivy *Hedera helix*. Trees were categorised for their bat roost potential using Bat Conservation Trust (BCT) Tree Categories (3, 2, 1 and 1\*), where a Category 3 tree has no potential and a Category 1\* tree is highly suitable, capable of supporting larger roosts.

The survey, in conjunction with the desk based assessment provides information for potential opportunities for ecological enhancements as a result of the works.

### 3.4 Approach to Evaluation

The approach to the evaluation of the ecological resources followed the *Guidelines for Ecological Impact Assessment* (2006) produced by the Institute for Ecology and Environmental Management (IEEM), now Chartered Institute of Ecology and Environmental Management (CIEEM) and *Biodiversity and Environmental Impact Assessment: A Good Practice Guide for Road Schemes* (Byron, 2000).

#### 3.4.1 Summary of Biodiversity Value

The significance of an impact on an ecological/nature conservation receptor is based on the nature conservation value of a receptor habitat or species combined with the perceived magnitude and duration of an impact. The criteria for assessing biodiversity value of habitats, designated sites and species are given in the following Table 3-1. These values have been used to evaluate the importance of the ecological receptors at the site and thus facilitate impact analysis of the development works at the site.

Table 3-1: Nature conservation value criteria

| Scale   | Value                 | Criteria   |
|---|-----------------------|--|
| <b>Very Local (within Study Area)</b>               | Very Low / Negligible | <ul style="list-style-type: none"> <li>Areas of habitat considered to appreciably enrich the habitat resource within the study area.</li> </ul>  |
| <b>Local (i.e. within 3km radius of study area)</b> | Low                   | <ul style="list-style-type: none"> <li>Areas of habitat considered to appreciably enrich the habitat resource within approximately 3km radius of the study area.</li> <li>Areas of habitat that is rare within approximately 3km radius of the study area, or scarce or localised on a county scale.</li> <li>A regularly occurring, locally significant population of a locally important species.</li> <li>A regularly occurring, locally significant number of a locally important species during a critical phase of its life cycle.</li> <li>A regularly occurring, locally significant total number of more than one locally important species.</li> </ul> |
| <b>Regional / County (within West Lothian)</b>      | Medium                | <ul style="list-style-type: none"> <li>County sites and other sites that meet the published ecological selection criteria for designation, including LNR and Local Biodiversity Sites (LBS).</li> <li>A viable area of habitat identified as rare in the county or regionally scarce or localised.</li> <li>Any regularly occurring, locally significant population of a county important species.</li> <li>A regularly occurring, locally significant number of a county important species during a critical phase of its lifecycle.</li> </ul>   |
| <b>National</b>                                     | High                  | <ul style="list-style-type: none"> <li>A nationally designated SSSI, NNR, Marine Nature Reserve (MNR), or a discrete area that meets the published selection criteria for national designation (e.g. SSSI selection guidelines).</li> <li>A viable area of a priority habitat identified in the UK BAP, or smaller areas of such habitat that are essential to maintain the viability of a larger whole.</li> </ul>  |

|                      |           |  |
|----------------------|-----------|--|
|                      |           | <ul style="list-style-type: none"> <li>Any regularly occurring population of a nationally important species that is threatened or rare in the region or county.</li> <li>A regularly occurring, regionally or county significant population of any nationally important species.</li> <li>A regularly occurring, regionally or county significant number of a nationally important species during a critical phase of its life cycle.</li> </ul>   |
| <b>International</b> | Very High | <ul style="list-style-type: none"> <li>An internationally designated site or candidate site (SPA, potential SPA (pSPA), SAC, candidate SAC (cSAC), Ramsar site, Biogenetic Reserve).</li> <li>A viable area of a habitat type listed in Annex I of the Habitats Directive, or smaller areas of such habitat that are essential to the maintenance of the viability of a larger whole.</li> <li>Any regularly occurring population of an internationally important species that is threatened or rare in the UK, i.e. a Red Data Book (RDB) species, or listed as occurring in 15 or fewer 10km squares in the UK (categories 1 and 2 in the UK BAP), or of uncertain conservation status, or of global conservation concern in the UK BAP.</li> <li>A regularly occurring, nationally significant population of any internationally important species.</li> <li>A regularly occurring, nationally significant number of an internationally important species during a critical phase of its life cycle.</li> </ul> |

### 3.4.2 Impact Evaluation

The overall impact will depend on the predicted sources and magnitude of impacts. An ecologically significant impact is defined as an impact (negative or positive) on the integrity of a defined site or ecosystem and/or the conservation status of habitats or species within a given geographical area. Impacts can be direct or indirect. Direct impacts include habitat loss and fragmentation. Indirect impacts include disturbance, severance of food resources and changes in ecological relationships. Some impacts are short-term and relate only to the construction phase, whilst other impacts are long-term and relate to the operational phase of the project.

### 3.4.3 Probability

The following confidence levels were adopted to describe the confidence that can be placed in the baseline data or the evaluation and predicted impact:

- Certain / near certain - probability estimated at 95% chance or higher
- Probable - probability estimated above 50% but less than 95%
- Unlikely - probability estimated above 5% but less than 50%
- Extremely unlikely - probability estimated at less than 5%
- Uncertain - no estimate of probability is available.

### 3.4.4 Characterisation of Change and Impact

Table 3-2 shows how the magnitude of impact is determined and Table 3-3 shows how the overall impact is determined from a combination of the magnitude and original biodiversity value of the site feature.

Table 3-2: Magnitudes of Impact

| Magnitude                    | Criteria   |
|------------------------------|--|
| <b>Major Negative</b>        | Impact with serious consequences and/or on a large area  |
| <b>Intermediate Negative</b> | Impact with undesirable consequences                     |
| <b>Minor Negative</b>        | Discernible negative impact and/or on a small area       |
| <b>Neutral</b>               | No impact or no discernible impact                       |
| <b>Minor Positive</b>        | Discernible positive impact and/or on a small area       |
| <b>Intermediate Positive</b> | Impact with favourable consequences                      |
| <b>Major Positive</b>        | Impact provides substantial gains and/or on a large area |

Magnitude of impacts at construction and operational phases of the Project will be assessed as being Major, Intermediate, Minor and Neutral. The significance of the impact is summarised in Table 3-3. Of note, the magnitude of impact has been subdivided to reflect the nature of the impact (positive or negative)

Table 3-3: Criteria for assessing the significance of impacts

| Magnitude of Potential Impact | Nature conservation value |                           |                           |                           |                         |
|-------------------------------|---------------------------|---------------------------|---------------------------|---------------------------|-------------------------|
|                               | Very High                 | High                      | Medium                    | Low                       | Very Low/<br>Negligible |
| <b>Major Negative</b>         | Major adverse             | Moderate–Major adverse    | Moderate adverse          | Minor–Moderate adverse    | Negligible              |
| <b>Intermediate Negative</b>  | Moderate–Major adverse    | Moderate adverse          | Minor–moderate adverse    | Minor adverse             | Negligible              |
| <b>Minor Negative</b>         | Minor–Moderate adverse    | Minor–Moderate adverse    | Minor adverse             | Minor adverse             | Negligible              |
| <b>Neutral</b>                | Negligible                | Negligible                | Negligible                | Negligible                | Negligible              |
| <b>Minor Positive</b>         | Minor–Moderate beneficial | Minor–Moderate beneficial | Minor beneficial          | Minor beneficial          | Negligible              |
| <b>Intermediate Positive</b>  | Moderate–Major beneficial | Moderate beneficial       | Minor–Moderate beneficial | Minor beneficial          | Negligible              |
| <b>Major Positive</b>         | Major beneficial          | Moderate–Major beneficial | Moderate beneficial       | Minor–Moderate beneficial | Negligible              |

For example an Intermediate Negative impact on a Medium Value ecological receptor suggests a resulting impact of Minor–Moderate Adverse significance.

### 3.5 Limitations to Survey

The survey was conducted in mid-December which falls outside the optimal survey period for non-native invasive plant species and habitat surveys.

Access to the river from the left bank was not possible due to the gradient of the slope. Therefore, inspection of the riparian zone was made using binoculars.

In view of the large number of trees forming woodland habitat within the immediate vicinity of the weirs, and given the uncertainty of the location(s) and extent of tree removal, individual trees were not subjected to a bat roost potential assessment. However, recommendations have been made to resurvey individual trees once the works have been finalised (see section 6.2.4.1).



## 4 Results

### 4.1 Desk Based Assessment

#### 4.1.1 Statutory Designated Sites

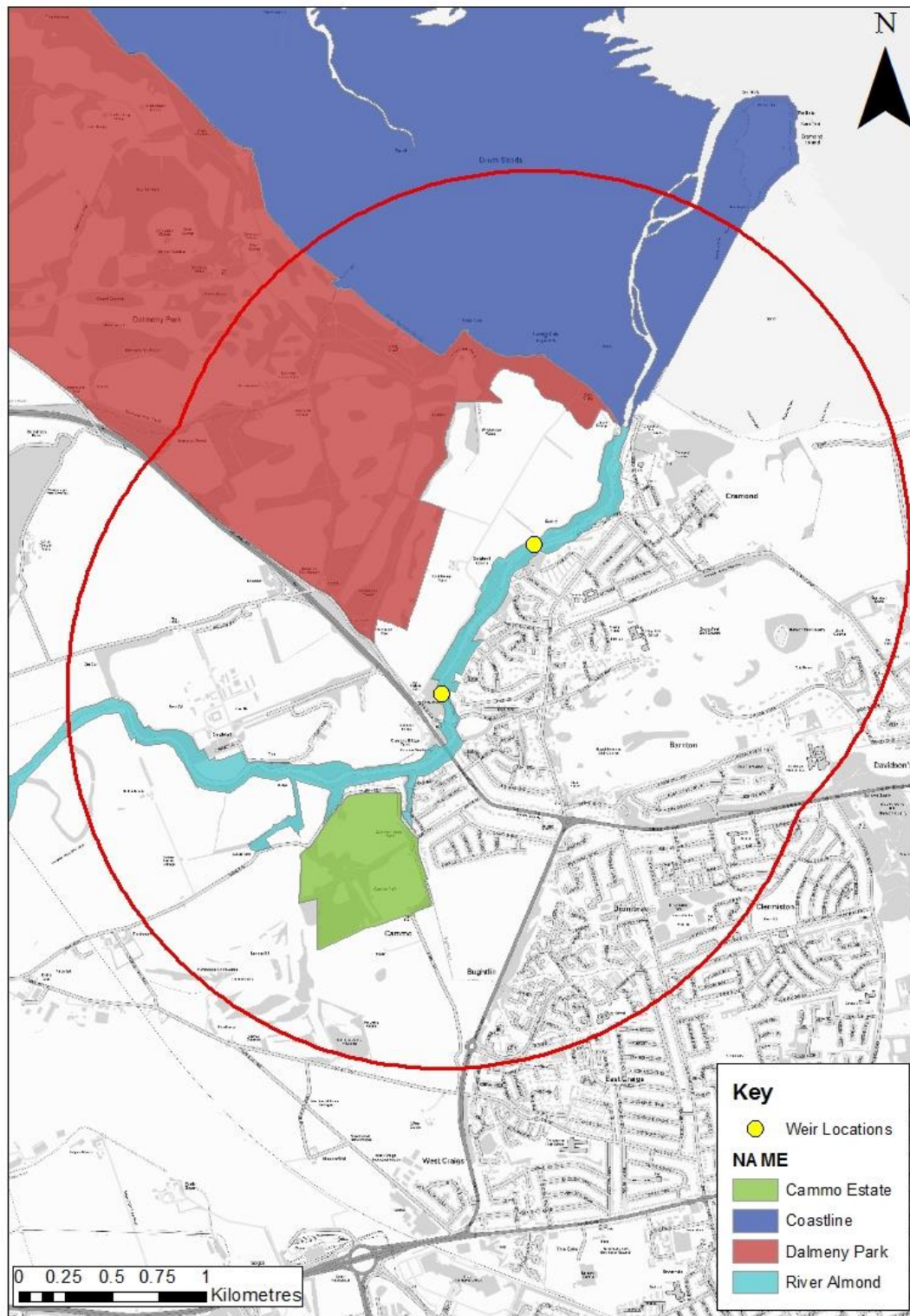
No statutory designated nature conservation sites are located within the site boundary itself, however the Firth of Forth SPA, Ramsar and SSSI sites are located within 2km downstream of the weirs (c.0.8km from Fair-A-Far weir and c.1.7km from Dowie's Weir). The Firth of Forth is a large coastal area comprising a complex of estuaries, mudflats, rocky shorelines, beaches and saltmarshes. It stretches from Alloa Inches in the River Forth to Fife Ness and Dunbar in the east. The reasons for the designations of the site are detailed further in Table 4-1.

Table 4-1: Statutory sites within 2km of the works

| Name                  | Designation | Reason for Designation  |
|-----------------------|-------------|---|
| <b>Firth of Forth</b> | SPA         | <p>This site qualifies under Article 4.1 of the Directive (79/409/EEC) by supporting populations of European importance of the following species listed on Annex I of the Directive:</p> <p>On passage:<br/>Sandwich Tern <i>Sterna sandvicensis</i></p> <p>Over winter:<br/>Bar-tailed Godwit <i>Limosa lapponica</i><br/>Golden Plover <i>Pluvialis apricaria</i><br/>Red-throated Diver <i>Gavia stellata</i><br/>Slavonian Grebe <i>Podiceps auritus</i></p> <p>This site also qualifies under Article 4.2 of the Directive (79/409/EEC) by supporting populations of European importance of the following migratory species:</p> <p>Over winter:<br/>Knot <i>Calidris canutus</i><br/>Pink-footed Goose <i>Anser brachyrhynchus</i><br/>Redshank <i>Tringa totanus</i><br/>Shelduck <i>Tadorna tadorna</i><br/>Turnstone <i>Arenaria interpres</i></p> <p>The area qualifies under Article 4.2 of the Directive (79/409/EEC) by regularly supporting at least 20,000 waterfowl. Over winter, the area regularly supports 86,067 individual waterfowl (WeBS 1991/2-95/6) including.</p> |
|                       | Ramsar      | <p>The site qualifies under Ramsar Criterion 5 and 6.</p> <p>Criterion 5 -Assemblages of international importance - Species with peak counts in winter:<br/>Criterion 6 – species/populations occurring at levels of international importance.</p>  |
|                       | SSSI        | <p>The site is designated as a SSSI for its importance for a variety of geological and geomorphological features, coastal and terrestrial habitats, vascular plants, invertebrates, breeding, passage and wintering birds.</p>  |

#### 4.1.2 Non-statutory Designated Sites

TWIC provided locations of Sites of Importance for Nature Conservation (SINC) and Local Biodiversity Sites (LBS) within 2km of the weirs, designated locally for supporting habitats and species of merit. Figure 4-1 and 4-2, below, show the locations of these locally designated sites in relation to the weirs. Of note, the River Almond itself is designated locally as a SINC and LBS.



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Figure 4-1: SINC sites within 2km of the weirs

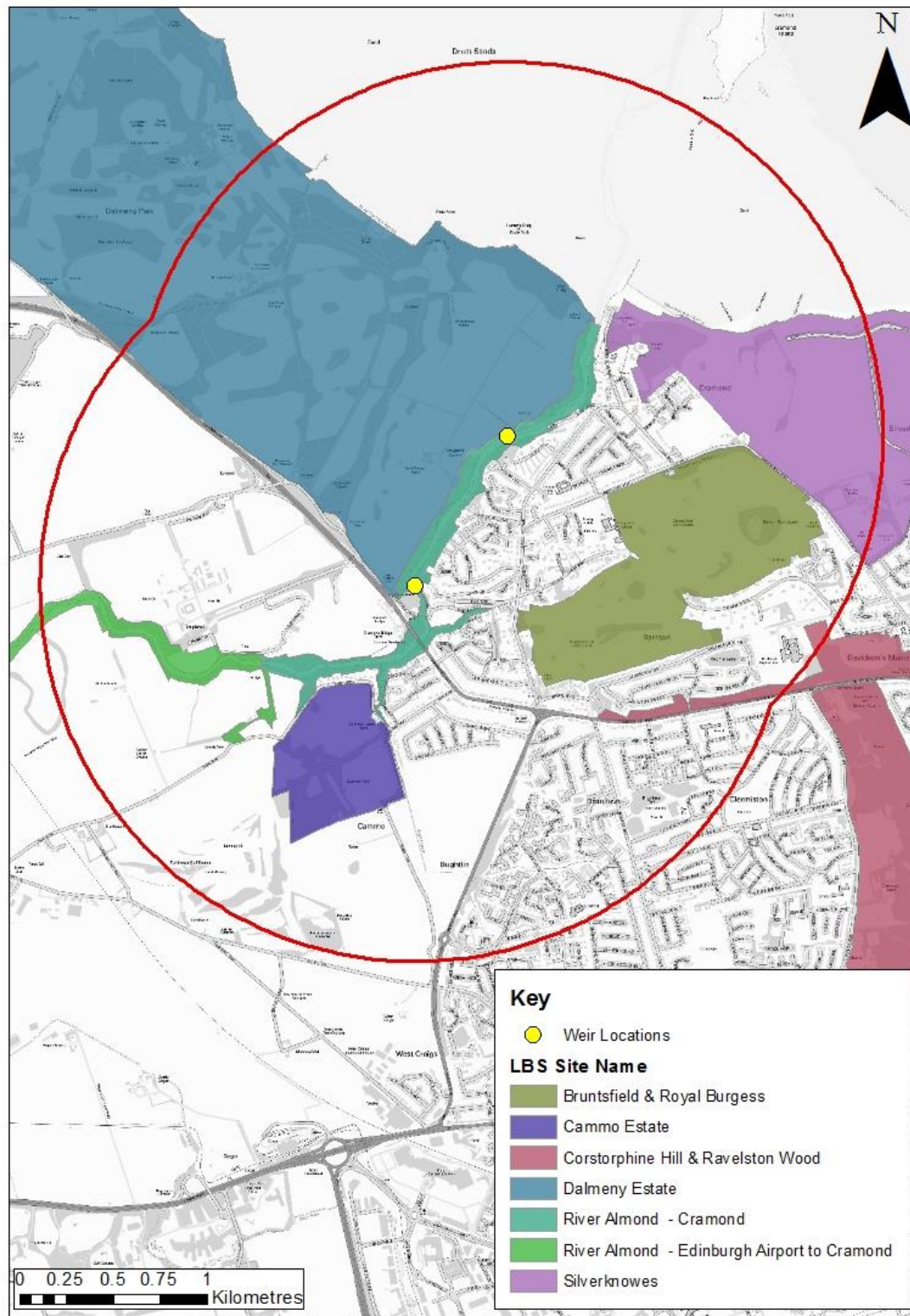


Figure 4-2: LBS within 2km of the weirs

#### 4.1.3 Protected Species

##### Fauna (excluding birds)

The data search from TWIC returned numerous recorded of protected species within 2km of the survey area. The following table (Table 4-2) details the results of this data search, including main legislative protection awarded to each species, the date of the most recent record and location. Of note, only species recorded post-2000 have been included, however historical species of particular interest have been considered where appropriate. Furthermore, only the most recent record at



each location has been provided where there are more than one recorded for a given location. The locations of records for sensitive species (bats, otter and badger) have been omitted from the table. It is important to note that a lack of species records does not infer that this species is absent from the area.

Table 4-2: Protected Species within 2km of the site. Data provided by TWIC.

| Common Name          | Latin Name                        | Designation                            | Date  | Location | Distance to weirs (km)                                |
|----------------------|-----------------------------------|--|---|----------|---|
| Terrestrial Mammals  |                                   |  |   |          |   |
| Bat Species          | <i>Chrioptera spp.</i>            | Habitats Directive Annex 4, W&CA       | 10 records between 1985 and 2002. Only one record post-2000.  |          |   |
| Pipistrelle Bat      | <i>Pipistrellus pipistrellus</i>  |  | 3 records between 1992 and 1996                               |          |   |
| Brown Long-eared Bat | <i>Plecotus auritus</i>           |  | 1 record in 1997  |          |   |
| Badger               | <i>Meles meles</i>                | Protection of Badgers Act 1992         | 85 records between 1905 and 2012. 15 records dated post-2000. |          |   |
| Otter                | <i>Lutra lutra</i>                | Habitats Directive Annex 2 and 4, W&CA | 2 records dated 1995 and 2009.                                |          |   |
| Marine Mammals       |                                   |  |   |          |   |
| Common Porpoise      | <i>Phocoena phocoena</i>          | Habitats Directive Annex 2 and 4       | 2005  | NT195772 | 1.3km NE (Fair-a-Far Weir)<br>2.1km NE (Dowie's Mill) |
| Grey Seal            | <i>Halichoerus grypus</i>         | Habitats Directive Annex 4             | 2012  | NT1978   | 1.6 km N (Fair-a-Far Weir)<br>2.6 km N (Dowie's Mill) |
| White Beaked Dolphin | <i>Lagenorhynchus albirostris</i> | Habitats Directive Annex 4             | 2002  | NT195777 | 1.6km NE (Fair-a-Far Weir)<br>2.5km NE (Dowie's Mill) |
| Amphibians           |                                   |  |   |          |   |
| Common Toad          | <i>Bufo bufo</i>                  | UK BAP                                 | 2014  | NT183754 | 1 km S (Fair-a-Far Weir)<br>450 m SE (Dowie's Mill)   |

Several records for bats were returned from the data search from TWIC, however all records are dated 2000 and before, with the exception of one record of an unidentified bat from 2002.

No records of Great Crested Newts were returned from the data search and the only amphibian records within 2km of the weirs refer to Common Toad. Furthermore, there are no records of reptiles within 2km of the weirs.

No records of fish were returned from the data search from TWIC. However, the River Almond is a known salmonid site (RFFT, 2016)<sup>1</sup> and Cramond Angling Club is active along the river reach surveyed as part of this commission. Within the Forth District 997 Salmon and 391 Brown Trout were caught in 2014, however those rivers which have significant barriers, of which the River Almond is one, yielded much lower numbers (Association of Salmon Fishery Boards (AFSB) and RAFTS, 2015).

Several records of species listed on the Scottish Biodiversity List (SBL) were also available from the data search. In addition to national and international protection, all bat species, otter and White-beaked dolphin are listed on the SBL. Furthermore, Roe deer is also listed on the SBL and has been recorded within 2km of the weirs.

1 RFFT (2016) Fish Species [online] Available at <http://www.fishforth.co.uk/rfft/fish-species/>. [Accessed 19.07.16]

## Birds

The data search also returned numerous records for birds (protected and notable) within 2km of the works. Table 4-3 provides details of the records for bird species listed under Annex 1 of the EC Birds Directive (BD-1) and/ or Schedule 1 of the Wildlife and Countryside Act (W&CA) which are awarded special protection under this law. Records dated pre-2000 have been excluded from the table.

A lack of species records does not infer that this species is absent from the area.

Table 4-3: Protected Birds within 2km of the site. Data provided by TWIC.

| Common Name              | Latin Name              | Legislation  | Date      | Location | Approximate distance to site   |
|--------------------------|-------------------------|--------------|-----------|----------|--|
| <b>Kingfisher</b>        | <i>Alcedo atthis</i>    | BD-1<br>W&CA | 2009      | NT183763 | 0.1km W (Fair-a-Far Weir)<br>0.8km NE (Dowie's Mill)<br><br>4 records  |
|                          |                         |              | 2004      | NT1876   | 0.6km SW (Fair-a-Far Weir)<br>0.3km N (Dowie's Mill)<br><br>2 records  |
|                          |                         |              | 2000-2002 | NT174745 | 2.1km SW (Fair-a-Far Weir)<br>1.2km SW (Dowie's Mill)                  |
| <b>Bar-tailed Godwit</b> | <i>Limosa lapponica</i> | BD-1<br>W&CA | 2011      | NT1977   | 0.8km NE (Fair-a-Far Weir)<br>1.7km NE (Dowie's Mill)<br><br>2 records |
|                          |                         |              | 2012      | NT2076   | 1.6km E (Fair-a-Far Weir)<br>2km E (Dowie's Mill)                      |
|                          |                         |              | 2013      | NT1876   | 0.6km SW (Fair-a-Far)<br>0.3km N (Dowie's Mill)                        |
| <b>Barn Owl</b>          | <i>Tyto alba</i>        | W&CA         | 2000-2002 | NT174745 | 2.1 km south (Fair-a-Far Weir)<br>1.2 km S (Dowie's Mill)              |

Records of Whooper Swan *Cygnus cygnus*, Golden Plover *Pluvialis apricaria*, Common Tern *Sterna hirundo* and Sandwich Tern *Sterna sandvicensis* were also returned from the data search. All records for these species are pre-2000.

In addition, 22 species listed on the SBL were recorded within 2km of the weirs post-2000. These are listed in Table 4-4, below.



Table 4-4: Birds Listed on SBL within 2km of the weirs (post-2000)

| <b>Birds Species (Common Name, Latin Name)</b>         |  |                                      |
|--|--|--------------------------------------|
| *Barn Owl  | Herring Gull <i>Larus argentus</i>       | *Sandwich Tern                       |
| *Bar-tailed Godwit                                     | Kestrel <i>Falco tinniculus</i>          | Siskin <i>Carduelis spinus</i>       |
| Black-headed Gull<br><i>Chroicocephalus ridibundus</i> | *Kingfisher                              | Skylark <i>Alauda arvensis</i>       |
| Bullfinch <i>Pyrrhula pyrrhula</i>                     | Lapwing <i>Vanellus vanellus</i>         | Song Thrush <i>Turdus philomelos</i> |
| *Common Tern   | Linnet <i>Carduelis cannabina</i>        | Swift <i>Apus apus</i>               |
| Curlew <i>Numenius arquata</i>                         | Redwing <i>Turdus iliacus</i>            | Tree Sparrow <i>Passer montanus</i>  |
| Dunlin <i>Calidris alpina</i>                          | Reed Bunting <i>Emberiza schoeniclus</i> | *Whooper Swan                        |
| Golden Plover <i>Pluvialis apricaria</i>               | Robin <i>Erithacus rubecula</i>          |                                      |

\* Primary protection under BD-1, BD-2 and W&CA (including Schedule 1)

## Flora

The data search provided records of protected plant species within 2km of the weirs. Of particular note, Bluebell *Hyacinthoides non-scripta*, which is protected under Schedule 8 of the Wildlife and Countryside Act have been recorded within the area. Other species of interest are those listed on the SBL provide in the table below.

Table 4-5: Flora on the SBL located within 2km of the weirs (post-2000)

| <b>Species (Common Name, Latin Name)</b> |                                      |
|--|--------------------------------------|
| *Bluebell                                | Oak <i>Quercus</i> sp.               |
| Black Poplar <i>Populus nigra</i>        | Scot's Pine <i>Pinus sylvestris</i>  |
| Creeping Thistle <i>Cirsium arvense</i>  | Spear Thistle <i>Cirsium vulgare</i> |
| Marsh Thistle <i>Cirsium palustre</i>    |                                      |

### 4.1.4 Non-native Invasive Species

No non-native invasive species were returned from the data search by TWIC. However, Atkins (2015) noted presence of Japanese Knotweed, Himalayan Balsam and Giant Hogweed within proximity to the weirs.

### 4.1.5 Habitats

Woodland on the north bank of the River Almond within the study area falls within the Ancient Woodland Inventory (Figure 4-3). The woodland, which comprises Sycamore *Acer pseudoplanatus*, Ash *Fraxinus excelsior* and Beech *Betula* spp. is an ancient woodland of semi-natural origin. This habitat is listed under the UK BAP.

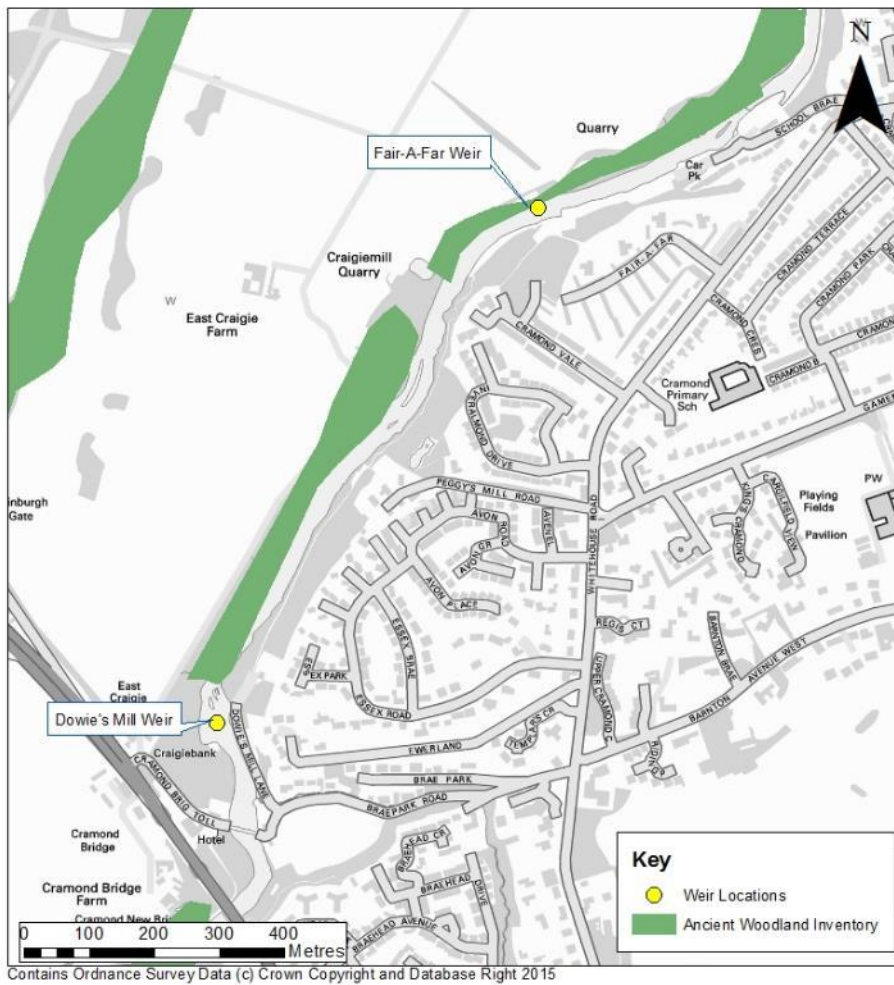


Figure 4-3: Ancient Woodland Inventory

OS mapping and the findings of a feasibility and optioneering report, produced by Atkins (Atkins, 2015), indicate the presence of several ponds within 500m of the weirs. The locations of these, as identified through a review of OS mapping, are detailed in Table 4-6 below.

Table 4-6 - Location of ponds within the locality of Fair-a-Far Weir and Dowie's Mill

| Weir Name         | Pond locations | Distance to Weir |
|-------------------|----------------|------------------|
| Fair-a-Far Weir   | NT 18228 76332 | 190m SW          |
|                   | NT 18230 76051 | 380m SW          |
| Dowie's Mill Weir | NT 17493 75624 | 410m W           |
|                   | NT 17860 75351 | 290m SW          |
|                   | NT 18230 76051 | 490m NE          |



#### **A1.1.1 - Broadleaved Woodland - Semi-Natural**

Riparian broadleaved woodland is located along both river banks and comprise tree species including Sycamore, Alder *Alnus glutinosa*, Beech and Ash. Ivy *Hedera helix* dominates the woodland floor along the steeper inclines. Where the gradient is less severe, Bluebells *Hyacinthoides non-scripta*., Nettle *Urtica dioica* and other species are present within the ground flora. Vegetation growth was limited and much of the ground was covered in leaf litter at the time of the survey. Many of the trees within this woodland are mature and the woodland on the left bank (west) falls within the Ancient Woodland Inventory and is a UK BAP habitat. This habitat is considered to be of high ecological value.

#### **A2.1.1 - Coniferous Woodland - Semi Natural**

A small area of coniferous woodland is located adjacent to the river, just upstream of Dowie's Mill Weir. The tree species present in this habitat include Norway Spruce *Picea abies*. The understorey in this parcel of land is dominated by invasive non-native weeds, Nettle and some Bramble *Rubus fruticosus* agg. The ecological value of this habitat is considered to be low in relation to the value of the surrounding habitat and the nature of the ground flora.

#### **B4 - Improved Grassland**

A small area of grassland, measuring approximately 0.9ha in size, is present east of the river. This field is grazed by Shetland ponies and bordered by fencing and walls. This habitat has poor species richness and Perennial Rye Grass *Lolium perenne* dominates the species composition. This habitat, within context to the survey area, is considered to be of negligible to low ecological value due to the homogenous species composition. Other areas of improved grassland are present in small areas along the river, particularly along the right bank towards the confluence with the Firth of Forth estuary.

#### **G2.1 - Running Water - Eutrophic**

The River Almond is a large fast flowing waterbody which flows west to east and drains into the Firth of Forth estuary. The river is contaminated by heavy metals, resulting from historic land use, and eutrophication from sewage discharge. The river is approximately 20m in width along the length surveyed. Some islands are present within the surveyed reach which are dominated by Willow *Salix* spp. growth. Generally the in-channel vegetation is very limited along the extent, which is, in part, attributable to the fast flow of the channel. Some aquatic species were noted within the margins, where the water exhibited a slower flow rate, with Reed Canary-grass *Phalaris arundinacea* and a small amount of Pondweed *Potamogeton* spp. being evident downstream of Fair-a-Far weir. The River Almond is evaluated to be of medium ecological value - the classification as medium is derived from the fact that Otter, salmonids and birds (which are considered to have Regional or County importance) are found here.

#### **G1.1 - Standing Water**

A pond is located adjacent to arable fields, identified from OS mapping and aerial imagery, and broadleaved woodland habitat on the left bank of the river. This pond was not accessed as part of the survey, but has been mapped to identify its location in relation to the works. Based on the land use adjacent to the pond and likely run off resulting from intensive agriculture, it has been classed as eutrophic, although this is a speculative assumption.

#### **J1.1 - Arable**

Arable fields dominate the land use north to the river within the Dalmeny Estate. These fields are bordered by defunct hedgerows and at the time of the survey were notably being used by Greylag Geese *Anser anser*. This habitat is of low ecological value due to the managed nature and poor species richness. However, this habitat was considered to be of moderate ecological value for birds, especially wintering geese.

#### **J3.6 - Buildings**

Residential properties are present within the locality of Dowie's Mill Weir. These houses are heritage features and are listed (Category C(S)). The buildings will not be impacted by the works in terms of ecology, therefore a full inspection was not conducted. No obvious entry points for bats were noted, however there may be entrance points that were not visible from ground level.



Downstream of Fair-a-Far weir is the remains of the old mill house on the right bank. The structure is devoid of a roof and no suitable roosting features were identified. The ruins and the Fair-a-Far weir itself are listed buildings (Category B).

In general, the buildings within the survey area were considered to be of low-medium ecological value.

#### 4.2.1.1 - Bare Ground

This habitat describes the road and footpaths within the site and the car park adjacent to the playground. This habitat is of negligible ecological value as it supports no vegetation growth and suffers frequent car movements and footfall from members of the public.

#### 4.2.1.2 - Other Habitat

A children's play area is present at the south of the site (Target Note 5, Figure 1-1). This area is surrounded by fencing and is considered to be of negligible ecological value for protected species.

### 4.2.2 Protected Species

#### Birds

A formal bird survey was not undertaken as part of the site visit, however all birds observed during the survey (by sight and/ or by sound) were recorded. The data search returned a record for Kingfisher 100m from Fair-a-Far Weir, however, the banks of the River Almond within the survey area are in general not considered to be good nesting habitat for Kingfisher due to the vegetation cover and substrate. Kingfishers generally nest in sandy sheer banks with entry to the nest not obstructed by vegetation (RSPB, 2015). The following table details bird species identified on site during both days and indicates the conservation status of each species. Of note, none of the species identified on site are listed on Annex 1 of the Birds Directive or on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) and only one species, Black-headed Gull, is featured on the SBL.

Table 4-7 - Bird species recorded during the site walkover

| Species Common Name | Species Latin Name                | Conservation Status |
|---------------------|-----------------------------------|---------------------|
| Dipper              | <i>Cinclus cinclus</i>            | Amber               |
| Grey Heron          | <i>Ardea cinerea</i>              | Green               |
| Goosander           | <i>Mergus merganser</i>           | Green               |
| Mallard             | <i>Anas platyrhynchos</i>         | Amber               |
| Woodpigeon          | <i>Columba palumbus</i>           | Green               |
| Black-headed Gull   | <i>Chroicocephalus ridibundus</i> | Amber               |
| Wren                | <i>Troglodytes troglodytes</i>    | Green               |
| Blackbird           | <i>Turdus merula</i>              | Green               |
| Carrion Crow        | <i>Corvus corone</i>              | Green               |
| Grey Wagtail        | <i>Motacilla cinerea</i>          | Red                 |
| Great Tit           | <i>Parus major</i>                | Green               |
| Blue Tit            | <i>Cyanistes caeruleus</i>        | Green               |
| Chaffinch           | <i>Fringilla coelebs</i>          | Green               |
| Goldfinch           | <i>Carduelis carduelis</i>        | Green               |
| Greylag Goose       | <i>Anser anser</i>                | Amber               |
| Starling            | <i>Sturnus vulgaris</i>           | Red                 |



### Bats

No evidence of bats was found during the survey, however there are several mature trees within the riparian woodland along the River Almond which may offer suitable roosting opportunities for bats. A tree that overhangs Dowie's Mill Weir was considered to be a Category 2 tree (in line with BCT guidance) showing no obvious potential but it supports some limited potential features for roosting bats. A review of photographs taken at the time of the survey indicate that the trees on the left bank have negligible-low bat roost potential, due to the age of the trees; however, detailed inspection of the trees was not undertaken at the time of the survey due to the large quantity of trees present and the uncertainty in the extent and location of tree removal.

Buildings within the vicinity of Dowie's Mill Weir may offer some roosting opportunities due to the age and condition of the structures. However, a full inspection of these properties was not conducted during the survey.

### Badger

No evidence of badger was recorded during the survey. However, several mammal runs were present along the embankment on the right bank. The land adjacent to the survey area is considered to be of good ecological value for badger in terms of sett digging and foraging. There are numerous records of badger, recent and historical, within 2km of the weirs and it is likely that the weir locations fall within badger territories.

### Otter

No evidence of otter was found during the survey, however the River Almond provides excellent foraging and commuting habitat for this species. Furthermore, there are many prominent features, including exposed rocks within the channel which provide good areas for sprainting. No otter spraints were observed during the site visit; however, the survey follows heavy rainfall and adverse weather which would have likely washed away any spraints that may have been present. Furthermore, as the water level of the channel was high it is possible that any other evidence would have been submerged. The River Almond within the survey area also provides medium potential for otter, in terms of holt / couch sites, on the banks of the river, particularly on the left bank where public access is restricted; the right bank suffers disturbance from public footfall and dogs which likely will act as deterrents to otters on this side of the river. The weirs themselves, however are not considered to be suitable for otter rest sites and no holts / couch sites were noted within immediate proximity of either weirs.

### Red Squirrel

No Red Squirrels were observed during the survey, however several Grey Squirrels *Sciurus carolinensis* were recorded within the woodland. No dreys within the trees along the river bank were noted; Red Squirrels are not considered a constraint to the proposed works on either weir.

### Water Voles

The River Almond is considered to be unsuitable for Water Vole due to the size of the river and the velocity of the flows within the assessed reach. Furthermore, no evidence of this species was recorded during the survey and no records for Water Vole were returned from the data search (Section 4.1.3). There are no working constraints relating to Water Voles.

### Fish

The River Almond is a known salmonid river and trout *Salmo* spp. were seen within the upper reach of the survey area upstream of the road bridge. The river bed substrate comprises gravel, silt and sand which provides good spawning habitat for salmonids. However, of note, the weirs pose barriers to fish migration upstream and these gravels are considered to be unutilised for spawning in the present situation.

### Reptiles

The survey was undertaken at a suboptimal time for identifying reptiles on site and no observations of reptiles was made on either of the days. The habitats and features along the length of river surveyed, and within the wider environment to the north of the river, offer low ecological potential for reptiles with limited refugia habitat and basking features present. The immediate locality of the works are considered to be low ecological value for reptiles. Reptiles are not considered a constraint to the proposed works on either weir.

### Great Crested Newts

The data search did not return records of Great Crested Newts within a 2 km radius of the weirs. Furthermore, the site location falls within the 'marginal' geographic location for Great Crested Newts according to the Great Crested Newt Habitat Suitability Index (ARG, 2010), which suggests that presence is less likely than in other parts of the UK.

The survey area is considered to be generally suboptimal for supporting Great Crested Newts. The terrestrial habitat, particularly the understory of broadleaved woodland habitat, provides opportunities for refugia and there are four ponds located within 500m of the weirs according to a review of Ordnance Survey mapping. However, all of these ponds fall outside of the works footprint and of the ponds identified in Table 4-6, only two of these retain terrestrial habitat connectivity to the site. One of these ponds (OS Grid Reference NT 182760, Target Note 2, Figure 4-4) was accessed during the site visit and was found to be dry and exhibiting considerable terrestrial species growth, suggesting that the pond remains dry throughout the year and is therefore unsuitable as a breeding site for Great Crested Newts. It is therefore considered highly unlikely that Great Crested Newts are inhabiting the works area.

### Non-native Invasive Species

Grey Squirrel were observed on several occasions within the riparian woodland at the site. Japanese Knotweed and Giant Hogweed were also noted within the riparian zone along the river. Of particular note is a large stand of Japanese Knotweed and some Giant Hogweed located on the left bank of the river directly adjacent to, and upstream of, Dowie's Mill Weir. Some Japanese Knotweed has also colonised the weir at the leftmost extent. Locations of Japanese Knotweed and Giant Hogweed have been given in Figure 4-3 (Target Note 4).

A small stand of *Cotoneaster* *Cotoneaster* spp. is located on the right bank at NT179756 (Target Note 3). Furthermore, *Rhododendron ponticum* is located on the right bank adjacent to the footpath approximately NT182762 (Target Note 1). These species are not considered to pose a constraint to the works due to the location of these species in relation to the weirs.

## 5 Impact Assessment

### 5.1 Impacts on Designated Sites

#### 5.1.1 Statutory Sites

Being situated 0.8 km from the nearest weir structure that is proposed for works, there is a potential for Firth of Forth SPA, Ramsar and SSSI to be adversely impacted by the construction phase of the works. Without appropriate mitigation being put in place, there is a potential to mobilise silt and materials from the removal of Dowie's Mill Weir and fish pass installation at Fair-a-Far weir. This could result in impacted the integrity of the interest features of Firth of Forth, including aquatic/semi-aquatic habitats and the avifauna it supports.

#### 5.1.2 Non-statutory Sites

The River Almond is locally designated as a SINC and LBS. As the works are to be undertaken within these sites, particularly Dalmeny Estate LBS which abuts the River Almond to the west, there is the potential for these sites to be adversely impacted during construction. As the aim of the works are to improve passage within the lower reaches of the River Almond, the post-construction ecological impacts are considered to be beneficial.

Dalmeny Estate LBS is located adjacent to the left bank of the River Almond. If access is made from this side, minor adverse impacts to the site may arise, however these are likely to be limited to the construction phase.

No other locally designated sites are considered to be impacted by the works.

### 5.2 Habitat Impacts

#### 5.2.1 Habitats recorded during Phase 1 Habitat Survey

##### Running Water

The nature of the works to the weir structures means that the river habitat will be directly impacted. During the construction phase, the impact on this habitat is considered to be moderately adverse (certain), however the works will result in an improvement to the watercourse in the long term by removing obstructions to flow and improving fish passage upstream. Therefore, in the long term it is considered that there will be a moderate to major beneficial impact (near certain). This also serves to promote the achievement of targets under the Water Framework Directive.

##### Broadleaved Woodland

As a result of the works it is likely that some of the trees within close proximity to the weirs will require felling to facilitate construction and access. This is considered to constitute a minor-moderate (probable) adverse impact on this habitat, particularly given that it is designated a UK BAP habitat (see section 5.2.2, below).

##### Bare Ground and Improved Grassland

The siting of the compounds has yet to be determined but placement is likely to be on bare ground habitat located towards the south of the site and within an area of improved grassland north of the Fair-a-Far Mill ruins. These habitats are of negligible and low ecological potential respectively. Impacts on the bare ground habitat is negligible (certain) and impacts on the improved grassland is likely to be negligible-minor adverse (probable) in the short term, limited to the construction phase, provided that any areas left bare as a result of the works are re-seeded. In the long term, impacts on these habitats are considered negligible (near certain).

#### 5.2.2 BAP Habitats

Ancient woodland habitat may be adversely impacted by the works if access is undertaken from the left bank as tree removal will be required to access the river for construction works. This could constitute a minor-moderate adverse (probable) impact on this habitat. It should be noted that the removal of trees from an ancient woodland will have a long term impact on the habitat as young trees do not offer the same ecological conditions/ niches as mature trees. Furthermore, these trees are designated Tree Preservation Orders (TPOs) and will require permission ahead of being

subject to any intrusive arboricultural operations. The access route will be determined by the contractor and so any impacts will be dependent on the route chosen.

## 5.3 Impacts on Flora and Fauna

### 5.3.1 Otter

The site provides good habitat for otter and several records of otter were returned from the data search with one recent record in close proximity to Dowie's Mill weir. The precise location of this record, however, is sensitive. Works within the River and riparian zone may adversely impact this species in terms of disturbance during the works (minor-moderate adverse, probable) and potential damage and destruction to an otter resting place/ holt if found within the works footprint (major adverse, unlikely). No evidence of otter was found during the site visits, however due to the weather conditions prior to the survey it is likely that any evidence was washed away or submerged. Furthermore, no otter holts were identified at or within close proximity to Dowie's Mill Weir or Fair-a-Far and the weirs themselves are considered unsuitable for otter holt sites, although the adjoining riparian habitat does offer potential for otter holts. It is unlikely that destruction or disturbance of or to an otter holt will result from the works, provided appropriate mitigation measures are undertaken (see Section 6.2.8).

### 5.3.2 Fish

Temporary disturbance to fish passage may occur as a result of the works, however this is considered to be limited to the construction phase. The works will likely result in localised dewatering of the channel which will reduce the width of the river, forming a constriction to water movement through the works. This is unlikely to be significantly detrimental as, although restricted, there will be free passage for fish through the works site, however a minor adverse (probable) impact on fish may be expected. In particular, this could be detrimental to lamprey, which occupy marginal silt habitats and could be exposed during dewatering. Lamprey are protected by national and European legislation.

There is the potential for significant adverse impacts on salmonid species if in channel works are conducted during spawning season. In-channel works, including dewatering of localised sections of the watercourse, construction activities within the channel and placing of boulders upstream of the current Dowie's Mill Weir to reduce the flow rate, would all detrimentally impact spawning habitat for salmonids and may kill or harm any eggs or fish within the works area. This would result in a major-moderate impact (probable). However, with mitigation in place, for example timing the works outside spawning seasons, and monitoring and fish rescue during the works (see Section 6.2.6), the impacts may be reduced.

The works aim to improve the fish passage through the section of river by removing the barrier caused by the weirs. After completion of the works, the impact on fish, particularly migratory salmonids, is considered to be moderate-major beneficial in the long term, likely outweighing any temporary negative impacts.

### 5.3.3 Badger

Disturbance to badgers during foraging and commuting may arise as a result of the works, if they are undertaken after daylight hours, resulting in a minor adverse impact (unlikely). The data search from TWIC suggests that badgers are active within the survey area and have been very active historically with many setts recorded within the wider environment. Impacts on badgers is likely to be minor adverse during construction. No residual impacts are foreseen on badgers.

## 6 Conclusions and Recommendations

### 6.1 Conclusion

The removal of Dowie's Mill Weir and the installation of a new fish pass at Fair-a-Far weir has the potential for long term benefits for fish, particularly salmonids, allowing fish passage through the area. Furthermore, improvements to the river in terms of fish ecology will promote Water Framework Directive compliance and therefore has benefits for the ecological functioning of the River Almond. Adverse impacts on habitats, designated sites and species can be limited or prevented providing that appropriate mitigation actions, such as timing the works appropriately, construction good practice and liaison with statutory bodies are carried out. Recommendations to mitigate adverse impacts and to promote ecological and environmental benefits within the site and wider environment have been provided below. It is considered that if the following recommendations are adhered to, that there will be no significant detriment to protected species or their environs.

### 6.2 Recommendations

#### 6.2.1 Statutory Designated Nature Conservation Sites

The proposed works require assessment under the Habitat Regulations to ensure that the integrity of the interest features of Firth of Forth designated site (Ramsar, SPA and SSSI), situated >0.8 km downstream of the closest works site, is not adversely impacted by the works. A Habitat Regulation Appraisal (HRA) Screening Assessment should be undertaken to identify any potential adverse impacts and/ or uncertain impacts and an Appropriate Assessment (AA) will be conducted if any possible impacts are identified during the screening process.

#### 6.2.2 Non-statutory Designated Nature Conservation Sites

Liaison with the local authority prior to the works is advised due to the works within LBS and SINC sites. Appropriate mitigation measures and working methodologies should be discussed to ensure that there is no residual adverse impacts on these sites.

#### 6.2.3 Tree Removal

It is advised that liaison with the local authority regarding Tree Preservation Orders (TPO) is undertaken prior to any arboriculture works. The works fall within Cramond Conservation Area and as such changes to the character of the area, including removal of trees, particularly those designated as TPOs, will need to be agreed by the council.

Furthermore, if the removal of trees established within ancient woodland (located beyond the left (western) bank of the River Almond) is required as part of the works (for access or otherwise), it will be necessary to conduct a further tree survey and Arboricultural Impact Assessment (AIA) in order to prevent any valuable trees from being adversely impacted by the works. This will need to be undertaken by a competent arborist following guidance contained within *BS5837: Trees in relation to design demolition and construction*.

Additionally, further inspections of trees with a potential to support bat roosts (particularly sub-mature and mature trees) will need to be undertaken if these are scheduled for significant arboricultural works, such as de-limbing and felling (see sub-section 6.2.4, below).

#### 6.2.4 Bats

##### 6.2.4.1 Roosting

It is unlikely that, if access is taken from the right (eastern) bank, considerable tree removal will be required to facilitate the works. However, should any sub-mature and mature trees require felling as part of the works (i.e. trees which generally feature a stem diameter of >300mm), they should first be visually inspected by an experienced ecologist for any evidence of roosting bats. It is possible that these may require further activity surveys should they be determined as having a moderate-high potential to support bat roosts. Furthermore, it is advised that guidance detailed in Bat Habitat Assessment prior to Arboricultural Operations (Natural England, 2010) is followed when felling any trees identified as having negligible-low roosting potential for bats, such as the tree overhanging Dowie's Mill Weir.

The guidance states that:



- Work should be carried out between late August and early October or between March and April, wherever possible;
- Prior to felling or removing timber with bat potential, workers should conduct a visual inspection for signs of bats;
- If bats or roosts are discovered, prior to or during operations, works should stop immediately and a suitably qualified ecologist and/or Natural England contacted to advise the way forward; and
- Work should be conducted in a sensitive manner, and where reasonably practicable, timber with bat potential should not be directly sawn through. If such timber is removed, it should be left at the base of the tree for at least 48 hours.

#### 6.2.4.2 Foraging and commuting

It is advised that measures are taken to minimise disturbances to locally commuting and foraging bats for the duration of the works. If works are scheduled for the period between April and September, when bats are most active, any night time working should use directional lighting rather than floodlights to avoid causing unnecessary disturbance to foraging and commuting bats during the works. Lights should be fitted with a directional cowl to avoid unnecessary light spill and should be directed away from any potential foraging/commuting habitats (e.g. treelines).

#### 6.2.5 Breeding birds

All vegetation clearance works should be conducted outside the bird breeding season which runs between March and September inclusive. If any tree removal is required within the bird breeding season a pre-works survey should be carried out to identify the location of any nests within the works footprint. Any nests found will need to be safeguarded until the chicks have successfully fledged.

Furthermore, as the survey area is of good value for breeding dipper, it would be advised that the works area is checked for dipper nests if works are undertaken within the bird breeding season. If nests are found within close proximity to the weirs, thus likely to be disturbed by works, the works will need to be postponed until the chicks have successfully fledged. Dippers tend to have two broods each year and thus, it is unlikely to be able to determine whether the brood is the first breeding attempt or the second one in the year, unless nests are identified early in the season.

#### 6.2.6 Fish

The River Almond is a salmonid river and as such it is important that the works are scheduled outside the spawning season for salmonid species. For trout, spawning takes place in mid-October and continues through to early January. For Salmon, spawning occurs between November-December but in some localities, particularly in larger rivers, this may extend from October - late February. Therefore, it is recommended that no in-channel works are undertaken between October and February inclusive. Furthermore, provision of fish rescue and monitoring will be required during the construction works.

#### 6.2.7 Badger

In order to limit disturbance to commuting and foraging badger within the area, it is advised that works are undertaken during daylight hours where possible and any night time working is done under spot lights and direct away from woodland areas. Furthermore, any excavation left overnight should be covered to prevent exploration by badger.

#### 6.2.8 Otter

No evidence of otter was made during the survey and the weirs themselves do not provide suitable habitat for holt sites. However it is considered an appropriate precaution to undertake a pre-works survey prior to in-channel and bankside construction works along the river banks within the works footprint in view that the proposed construction works are due to start in late-June 2016, which is >5 months from the initial survey at the site. If an otter holt is identified within the works area, a license will be required from SNH and mitigation measures such as installation of artificial otter holts may be required. If no holts are identified mitigation measures to reduce disturbance to foraging and commuting otter should be implemented. Such measures should include covering of all excavations over night to prevent exploration by otter.

### 6.2.9 Non-native Invasive Species

Himalayan Balsam was noted within the Atkins (2015) report to be present within proximity to the weirs. No Himalayan Balsam was identified within the works area, however the survey was conducted at a suboptimal time to survey for flowering plants.

Japanese Knotweed and Giant Hogweed are also present on the left bank directly adjacent to Dowie's Mill Weir (the location of these infestations are shown as Target Note 4 in Figure 4-3). It is therefore recommended that this area is avoided during the works and access to the weir is made solely from the right bank. However, Japanese Knotweed is also exhibiting growth on part of the weir structure. If this part of the weir structure cannot be left in situ, and/or if works cannot avoid areas on the left bank which are infested, an Invasive Non-Native Species Management Plan should be produced following guidance from SNH and the UK government to ensure that the spread of Japanese Knotweed, and other invasive species does not occur as a result of completing the works. Appropriate measures are likely to include spraying with or cutting and injection of glyphosate herbicide. Alternatively, if low impact works are required, it may be appropriate to instate a cleaning area to ensure that contaminated soils are not unintentionally moved off of the site during the works. Further advice from SEPA should be sought in relation to conducting such works by a watercourse.

Giant Hogweed contains a chemical toxic to humans which sensitises and causes severe, long term blistering to the skin when it is exposed to sunlight. Control of Giant Hogweed is also likely to be required, however this is likely to only be imperative if access to the site must be made by the left bank, close to the infestation. If access can be made from the right bank only, it is unlikely that the stand of Giant Hogweed will be disturbed. However, management should be considered as a biodiversity enhancement following guidance from The Giant Hogweed Best Practice Manual (Nielsen, C *et al.*, 2005).


## 6.3 Pollution Prevention Guidelines (PPG)

Appropriate mitigation measures should be implemented to ensure that habitats within proximity of the works are not degraded as a result of pollution events during the construction phase. This mitigation should include:





- Abiding by relevant PPG produced jointly by the Scottish Environment Protection Agency (SEPA), Environment Agency and the Environment and Heritage Service of Northern Ireland.
- Any chemical, fuel and oil stores should be located on impervious bases within a secured bund with a storage capacity 110% of the stored volume.
- Biodegradable oils and fuels should be used where possible.
- Drip trays should be placed underneath any standing machinery to prevent pollution by oil/fuel leaks. Where practicable, refuelling of vehicles and machinery should be carried out on an impermeable surface in one designated area well away from any watercourse or drainage (at least 10m).
- Emergency spill kits should be available on site and staff trained in their use.
- Operators should check their vehicles on a daily basis before starting work to confirm the absence of leakages. Any leakages should be reported immediately.
- Daily checks should be carried out and records kept on a weekly basis and any items that have been repaired/replaced/rejected noted and recorded. Any items of plant machinery found to be defective should be removed from site immediately or positioned in a place of safety until such time that it can be removed.


## Appendices

### A Photographs

|   | Photograph  | Comment   |
|---|---|---|
| 1 |    | Cotoneaster on the bank upstream of Dowie's Mill Weir |
| 2 |   | Woodland adjacent to Dowie's Mill Weir.               |
| 3 |   | Overhanging tree at Dowie's Mill Weir.                |



|   |   |   |
|---|---|---|
| 4 |    | Downstream of Dowie's Mill Weir               |
| 5 |   | Japanese Knotweed at Dowie's Mill Weir        |
| 6 |  | Japanese Knotweed growth on Dowie's Mill Weir |
| 7 |  | Fair-a-Far Weir                               |

|   |  |                               |
|---|--|-------------------------------|
| 8 |   | Downstream of Fair-a-Far Weir |
| 9 |  | Mammal runs on embankments.   |



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