RIVER ALMOND BARRIER PROJECT, DOWIES MILL WEIR EASEMENT EXHIBITION AND ONLINE COMMENT REPORT

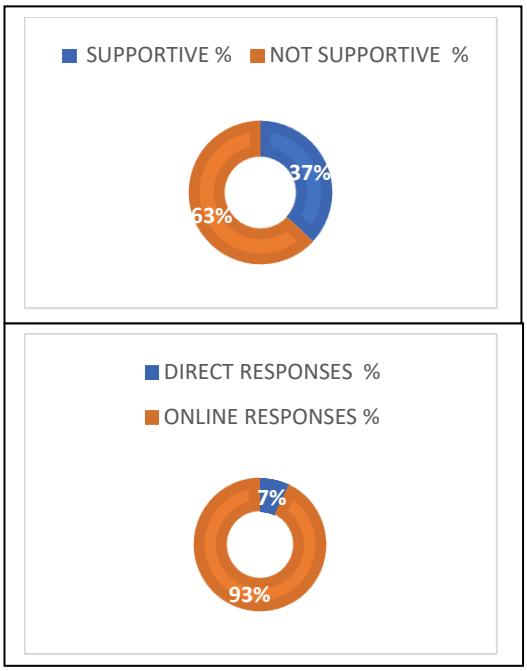
The City of Edinburgh Council (CEC) hosted an exhibition and mechanism to make comment on detailed proposals to ease the current barrier to fish migration at Dowies Mill, River Almond from 21/01/2019 – 25/02/2019. Additional support and expertise was provided by Scottish Environment Protection Agency (SEPA) Restoration Specialist and members from the Forth Rivers Trust (FRT).

Most people who attended were aware of the improvements undertaken at Fair-a-Far weir fish pass. Feedback suggested that many people may have benefited from an understanding of the wider benefits of the project, key reasons why the project was being delivered, who was delivering it and what the grant aided funding can be spent on. While several public meetings were held during project progress, feedback suggests that this could have been communicated clearer and earlier in the project. The process described above and subsequent themed responses detailed below will offer answers to questions raised, specifically on the detail of pre-existing reports and survey work, environmental models or other specialist information and define further required evidence or information as required and detail the next steps.

Responses received – 163

Estimated number of people attending the exhibition – 150 people

Supportive	=	37%
Not Supportive	=	63%
Responses direct	=	7%
Responses through online mechanism	=	93%
Requests for further Information	=	5%



Major Themes / Categories

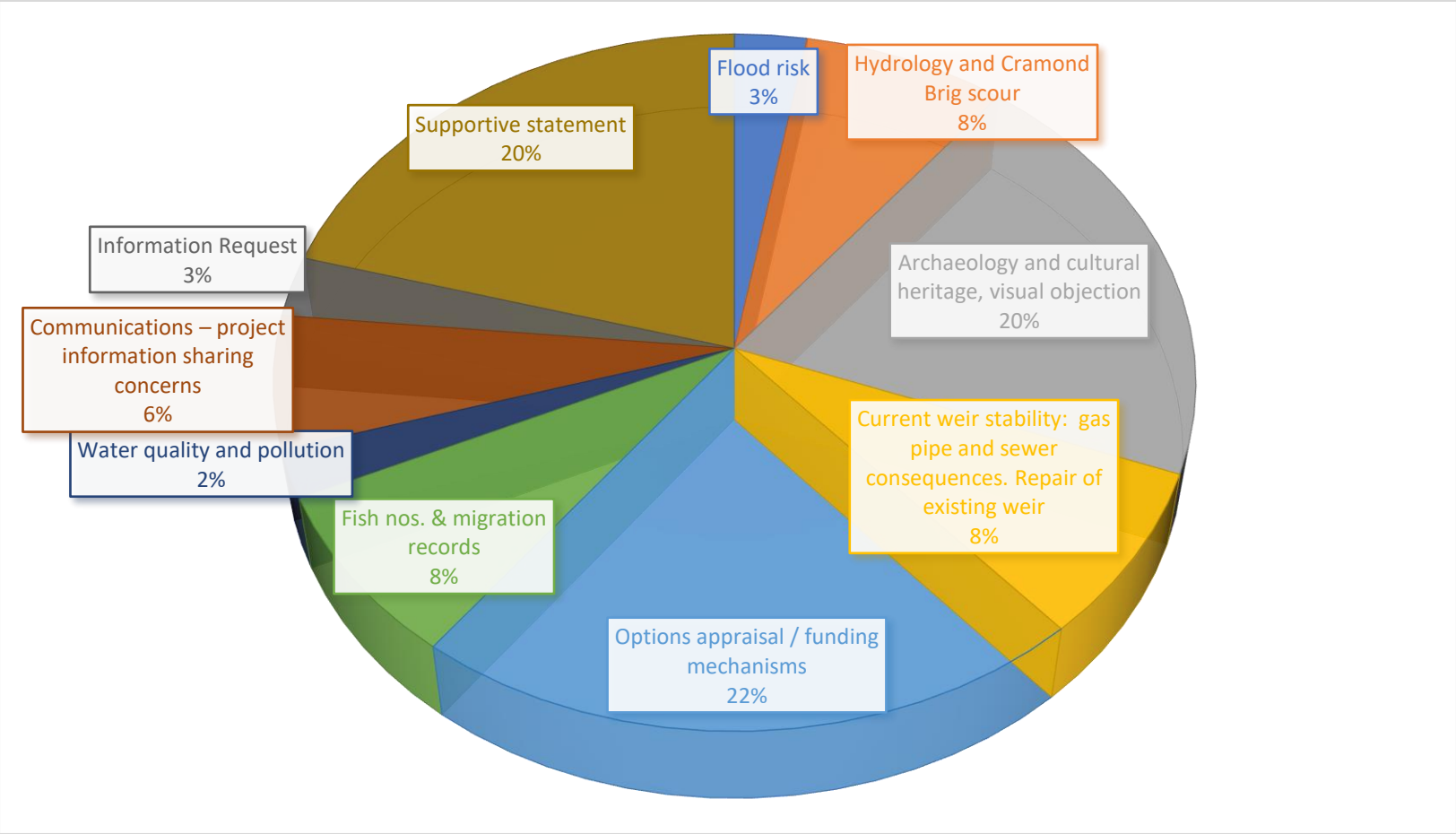
1. Flood risk
2. Hydrology and Cramond Brig scour
3. Archaeology and cultural heritage / visual concerns
4. Current weir stability, gas pipe and sewer consequences
5. Options appraisal / funding mechanisms
6. Fish nos. (including Fair a Far justification, possibly to be completed independently)
7. Water quality and pollution
8. Communications
9. Information Request
10. Supportive Statement

RESPONSES (THEME FREQUENCY)

Respondent percentage comment by subject (some responses raised more than a single theme)

THEME / QUERY TYPE	% raised by theme
Flood risk	5
Hydrology and Cramond Brig scour	14
Archaeology and cultural heritage, visual concerns	36
Current weir stability: gas pipe and sewer consequences. Repair of existing weir	14
Options appraisal / funding mechanisms	39
Fish nos. & migration records	14
Water quality and pollution	4
Communications – project information sharing concerns	11
Information request	5
Supportive statement	37

PERCENTAGE RESPONSES



Flood Risk

Public quote: "The proposal will increase flooding risks…"

Any works in rivers which increase risks of flooding would not be supported by SEPA or the council. The fact SEPA funded options appraisals with associated survey and modelling ratifying the easement approach suggests no risk of increased flooding.

Level 3 Flood Risk Assessment (Mott MacDonald, August 2014) states;
"Hydrological analysis of the River Almond has been undertaken with the aim of generating flood flows to input into a hydraulic model. The aim of the modelling study is to understand how removal of Dowies weir and Fair-a-Far weir from the watercourse will impact flood risk in the chosen study area. Historically, weir structures have been used to attenuate flow, with water being re-routed for use to drive mills of various types (Fair-a-Far weir); or to reduce flow velocities upstream and hence scour, thereby protecting in-channel structures (Dowies weir). It is generally perceived that removing a weir from a watercourse will allow peak velocities to increase in that vicinity, which has the potential to impact flood risk. Therefore, hydraulic modelling and a Flood Risk Assessment are required to be undertaken to understand the impact of removing this type of structure".

The River Almond flows from south to north through Cramond and Barnton, with the upstream extent of the model located just upstream of Queensferry Road Bridge and the downstream extent located approximately 600m downstream of Fair-a-Far weir.

At Dowies, under the existing channel and structure configuration, water levels at this location are partially controlled by the weir crest. The deletion of the weir in the model removes the backwater influence of the structure, lowering the peak water levels upstream significantly and providing a slight reduction in the peak levels downstream. Upstream of Queensferry Road Bridge and Cramond Brig there is little difference in the inundated area and there are only small reductions in modelled flood levels in the channel. This suggests that peak flood levels in this reach are at least partially controlled by the Cramond Brig bridge structure rather than Dowies weir. This would appear to be a reasonable conclusion considering that the geometry of the Cramond Brig causes a significant reduction in convective area compared to the open channel at this point".

JBA Consulting Appendix D - Hydrological Assessment March 2017 indicates under differing flows a reduction of between 130mm and 350mm around the Cramond Brig and between 3mm and 14mm at the A90 where the preferred partial weir removal and river restoration option is shown. This modelled representation indicates a reduction in flood risk.

CEC Floods and Structures suggest;

"From the information available, the proposal with regards to flood risk seems fine, although all data should be re-evaluated using 30% climate change figure and an updated flood risk assessment (FRA) report should be provided based on the specific option, including drawings showing proposed flood extents against existing. With this work already completed it should just be a case of re-evaluating using 30% climate change figure".

Regulation of flood risk is undertaken by the local authority and will be taken into account during planning stages.

Hydrology and Cramond Brig Scour

Public quote "The proposal will increase water flow and damage the Cramond Brig, sewer pipe and mains gas running across the river"

Removing or allowing Dowies weir to fail (as suggested likely in Dowies Mill Weir Structural Inspection, AECOM, 29/10/2018) would result in increased water velocity and associated risks to additional scour of structures and services. The preferred easement option includes the construction of a smaller check weir directly upstream of the services which enables the ability to maintain existing water levels at these locations.

As part of the optioneering scope and as a consequence of previous public meetings, a piece of work was commissioned (Dowies Mill Weir – Preliminary Works, Cramond, Edinburgh, Order of Cost Estimate 1, AECOM December 2018) which details scenarios where services or structures are compromised or require remedial actions. These costs are considerable so design and mitigation against damage is paramount.

The Cramond Brig has existing scour apparent. CEC Floods/Structure undertook remedial works in 2014 to Cramond Brig consisting of soundings to the apron.

JBA Appendix D Underwater and Scour Assessment 2015 suggests Cramond Brig to be in fair to good overall condition on the day of examination. The following recommendations were made:

1. Mass concrete infill to the areas of voiding/plucking/undermining in the invert.
2. Remove all tree debris.
3. Undertake repointing and masonry repairs to maintain integrity.

It is expected that further assessment is required to determine if additional scour protection is required therefore any works will include repairs to the Cramond Brig apron will ensure it is left in better condition than at present.

Estimated costs for scour assessment is £1,000/day with 2 days required.

Archaeology and Cultural Heritage, Visual Concerns

Public quote "The proposal will result in a loss of impounded millpond water, the aesthetically scenic views downstream from the Cramond Brig and riverside walk and ruin the area's industrial heritage that it is famous for."

The proposed easement approach at Dowies will result in a loss of the impounded water directly downstream of Cramond Brig, around 2/3 will be removed with 1/3 retained behind the new check weir construction built just above the mains services. During public meetings held in 2014/15 and throughout the course of Fair-a-Far improvement project, it became clear that retention was favoured over any removal and that retaining as much of the millpond and weir structure as possible was important.

The Scottish Government funding awarded for such projects is specifically for the removal of barriers to fish migration. In the case of Fair-a-Far weir, it is structurally sound, a designated heritage feature, there was an existing fish pass that required upgrades and repair/fish pass improvement was the preferred option. Regarding Dowies Mill weir, the fact the existing structure is in poor condition and likely to fail, the fact there is no current fish pass provision, the fact the weir was breached and patched in the past and now looks unsightly together with logistical requirements (services and bridge scour), the proposed option is favoured.

Mitigation against the change in aesthetics include retention of ponded water below the Brig, appropriately sized, shaped, coloured and placement of rock, soft engineering on the riverbank along Dowies Mill Lane through scour protection overlaid with seeded coir matting and willow mesh. Once greened up, this section of river will look naturalised. Improved interpretation will be installed indicating the historic significance Dowies Mill has in relation to milling and the industrial revolution.

While not a designated heritage feature, the significance of the weir itself will be impacted, and will be mitigated for by a programme of recording prior to, and during removal. The retention of an area of impounded water should reduce impact on the setting of the Category A Listed bridge, and also reflect the historic millpond. The area has high archaeological potential, not only for the post-medieval industrial works, but for evidence for occupation and exploitation of riverine resources from prehistory onwards. Any groundworks associated with works to the weir will require appropriate archaeological mitigation (FAS Heritage, Dowies Mill Weir Cultural and Heritage Assessment, Feb 2016).

JBA Consulting Landscape and Visual Appraisal 2016 says," the removal of Dowies Mill Weir would reduce the influence of historic industrial features in the landscape and the evidential heritage value of the pooled water in favour of a pre-industrial and more naturalistic character, although some impounded water will remain to protect services. The aesthetic implications of such a change are

subjective and it may be argued that this would represent a neutral or even beneficial change in the landscape and visual resource.

Visual effects are generally limited to recreational and residential properties adjacent to the weir. A moderate-substantial adverse, notable visual effect is expected for the River Almond Walkway (part of the Core Path network) due to changes in visual composition and character of the river. Again, this may arguably be neutral or beneficial over the long term, once vegetation has established and the more naturalistic appearance of the channel becomes accepted. No notable effects are expected for residential receptors, although the loss of pooled water, change in channel character and short-term construction effects may result in moderate adverse effects at most".

CEC City Archaeologist was engaged at project fruition with an expectation that archaeological watching briefs will be required throughout duration of works, that the final proposal will take into account landscape and heritage values and that these aspects should be finalised and addressed for scrutiny during the planning process required for the project.

With the proposed easement option essentially re-naturalising the river, it is worth noting that the weir that will be mostly removed is a little over 300 years old, the Cramond Brig pre-dates this so it could be said the original view from Cramond Brig is being restored.

Present Condition of Dowies Mill Weir, Gas Pipe and Sewer

Public quote "I believe that clearing of the current weir, repairing the structure and installing improvements for fish passage would offer the best solution…"

The Dowies Mill Weir Structural Inspection (AECOM 29/10/2018) states;

"Significant scouring and undercutting exists along the downstream edge of the broad crested weir, occurring over much of its length. Scouring of the toe zone removes passive resistance and will continue to undermine the weir foundation. On inspection, the upper part of the weir appears largely intact and on the surface, appears fairly substantial. However, there are some concerns about the condition of the stone fill material beneath the concrete apron. Further significant voiding may exist and remain undetected below the concrete slab which may be 'bridging' across voids.

Taking cognisance of the above, remedial works could be undertaken to further stabilise the weir and greatly reduce the risk of any catastrophic failure in the future which could lead to the uncontrolled release of river bed sediment from upstream and potential damage to existing structures. As such, significant remedial works are considered to be required to ensure it remains in a serviceable condition for years to come".

River Almond Feasibility and Optioneering Study to Improve Fish Passage (Atkins 15/09/2015) states;

"The result of the options appraisal process suggests on the balance of benefits and risks that the option to be taken forward based on technical factors at Dowies Mill Weir is removal. Removal is preferred over investment in a fish pass primarily due to the poor condition of the weir which presents a significant risk factor to any engineering works. However, due to the poor condition of the structure and some limited passability under certain flow conditions an alternative initial approach could be taken forward considering a low cost informal easement option using rock material won on site. If this is implemented, monitored, and found to be ineffective, the suggested option for development is then full removal if scour risk at the Cramond Brig is sufficiently mitigated".

Appendix E, Archaeology, Visual and Amenity Assessments: Almond Weirs - Planning and Environmental Appraisal – DOWIES MILL WEIR (Atkins 2015) indicates the potential for environmental or social risk to be moderate and that there is a requirement to take into account the site lies within a Conservation Area amongst other designations, there are several listed structures nearby, several access routes run through or are nearby and there will be archaeological remains in the works area. Careful and sustained engagement should be carried out with relevant CEC Officers in relation to archaeology, biodiversity and conservation, trees and access. This has been the case and will continue.

Fair-a-Far Weir merited retention (as stated previously), Dowies Mill Weir does not due to the lack of existing fish pass, and the current poor condition of the structure. Scottish Government funds issued to the council are for the identified preferred option of weir removal which is considered to be the most long term sustainable and cost-effective approach at this site.

It's also worth noting here the legislation relating to the impoundment of water as it relates directly to the millpond below the Cramond Brig and its functionality. Retention of the weir will require a licence from SEPA.

An impoundment is any dam, weir or other structure that can raise the water level of a water body above its natural level. The uses of impoundments include:

- the creation of a new reservoir;
- flood storage;
- maintaining or raising water levels within a wetland;
- raising the water level of a natural loch, estuary or even coastal waters.

'On-line' impoundments hold back water in wetlands, rivers, lochs and estuaries, and consequently affect downstream flows, sediment transport and migration of fish.

'Off-line' impoundments are built on land to store water (including surface run-off, groundwater or land drainage).

Typically, an impoundment is regarded as 'off-line' if there is no river/estuary flowing in. Impoundments are regulated by the Water Environment (Controlled Activities) (Scotland) Regulations 2011 (CAR) and their amendments.

Licences – impoundments that pose a moderate to high risk of environmental damage will either need a simple licence or – for activities that need a more complicated environmental assessment – a complex licence. A licence depends on the identification of a 'responsible person', who must ensure

compliance with the conditions of the licence. In both cases, an application charge will apply and the activity may also be subject to an annual subsistence charge.

If you own or operate any of the following, you will require some form of authorisation from SEPA:

- Engineering aspects involved in the construction or alteration of a dam, weir or other works impounding water.
- Management of a dam, weir or raised loch – particularly in terms of water levels, downstream flows and fish passage.
- Off-line flood storage that collects water during flood conditions and then releases this water when river levels fall (though this requires authorisation under the engineering regime

See section 6 of the CAR practical guide:
https://www.sepa.org.uk/media/34761/car_a_practical_guide.pdf

Due to Dowies Mill impoundment being historic, no license is currently in place and if an application is required, and if applied for the criteria for installing suitable fish passage will not be met.

Options Appraisal / Funding Mechanism

Public quote "What is needed, is fair and proper consideration of all the options that are available for Dowie's Mill Weir, not just the removal..."

As owners of Dowies Mill Weir, CEC are obliged to maintain the structure and fulfil requirements under certain legislation. The Head of the Water Environment Team within the Environmental Quality and Circular Economy Division, Environment and Forestry Directorate, Scottish Government stated in February 2019;

"The provision of fish migration at any existing impoundment (e.g. weirs and dams) is the responsibility of the structure owner(s) under the Water Environment (Controlled Activities) (Scotland) Regulations 2011 ('CAR'). However, funds may be available under certain circumstances to help owners of those structures that are redundant and no longer have an economic use.

The Scottish Government (SG) may provide support for the engineering costs to improve fish passage at local authority owned weirs that meet the following criteria.

- an identified priority in Scotland's River Basin Management Plan;
- no longer in active use;
- not a commercial asset of the current owner, including dormant or 'mothballed' assets.

SG funds are not available for the ongoing maintenance of redundant structures.

Any weir owner is expected to follow an objective and systematic approach of investigating available fish passage improvement options and determining a preferred option which represents a long term, sustainable and cost-effective solution to fish passage. I understand that in 2015 Atkins undertook such an assessment at Dowies Mill weir and determined that the most long term, sustainable and cost-effective solution was full removal of the weir. This was based on the balance of various documented risks and benefits, and in particular took account of the poor condition of the weir. This option was appraised by SEPA's Water Environment Fund and the Scottish Government offer of grant was made on the basis that the project would be carried out in line with the appraised option.

Weir owners may propose any option which achieves the required degree of fish passage, and it is therefore a matter for the Council to determine whether they wish to bring forward an alternative option. However, it must be clearly understood that the Scottish Government's offer of grant is for the option currently on the table, and that the funds cannot be used for a different option that has not been appraised in line with due process. A new proposal for Dowies Mill Weir would therefore have to be appraised by WEF to enable a full assessment of the costs and benefits of the proposed solution. It should also be clearly understood that the grant offer from Scottish Government is to enable the provision of fish passage only, and funds will not be made available for any rebuild or structural improvement of a weir to enable its long-term retention, for any purpose".
The easement option fulfils grant criteria requirements, is cost effective where weir condition is taken into account and protects upstream bridge abutments/foundations and services from scour.
Other options are to:

- do nothing – not practically possible due to legislative requirements and current weir condition.
- Modify the weir – not preferred due to risk of failure and temporary nature of any improvements
- fully remove the weir – preferred but not cost effective due to possible impacts on Cramond Brig and services
- re-build the weir and install a technical fish pass – funding would not be forthcoming to enable this option due to previous cost-benefit analysis associated with overall project criteria. Estimated costs for this are around £1.2 million, double the cost of the existing preferred option (see Dowies Mill Weir – Preliminary Works, Cramond, Edinburgh, Order of Cost Estimate 1, AECOM December 2018).

With eight weirs scheduled for improvements on the River Almond and significant public money invested, SEPA and Forth Rivers Trust supporting the easement approach at Dowies and technical evidence to justify this option, CEC propose easement of Dowies Mill Weir. Delays in reconsidering options could result in a loss of central funding requiring the City of Edinburgh Council to cover costs.

Dowies Mill Weir – Preliminary Works, Cramond, Edinburgh, Order of Cost Estimate 1 (AECOM December 2018) suggests an estimated cost for Dowies Mill Weir rebuild and installation of technical fish pass to be double the amount of money CEC is currently in receipt of that currently covers costs for the preferred easement option. The expensive option does not meet criteria for central funding and if pursued, the current funding CEC are currently in receipt of would be removed.

Following on below is some evidence showing the main aspects of fish passage options at weirs. It's worth noting that easement and rock ramp options provide a more natural solution that, all other things being equal are more appropriate at a site. The tables demonstrate a much wider benefit for removal/easement/rock ramps than technical fish passes including Larinier (super active baffles) and also improved swimming performance for the key fish species / groups of fish species.

Table 1 Default aspects of the main fish passage options at weirs (AECOM)

Fish Pass Option	Hydromorphology/ Sediment Continuity	Other Ecology (Habitat benefits etc)	Buildability	Cost (High/ Medium/ Low)	Maintenance Commitment	Comparative performance based on generic aspects
Removal of weir structure	✓✓✓	✓✓✓	✓	✓	✓✓✓	Most favourable option
Partial removal	✓✓	✓✓	✓	✓	✓✓	
Notching weir crest	✓	-	✓✓	✓✓✓	✓✓	
Rock Ramp	✓✓	✓✓	✓	✓	✓✓	Secondary options
Bypass channel	✓✓	✓✓	✓	✓	✓✓	
Hurn type for flat V weirs	-	-	✓✓✓	✓✓✓	✓	
Low cost baffle solutions for crump and sloping weirs	-	-	✓✓✓	✓✓✓	✓	
Preliminary Weirs (Pre-Barrages, Check Weirs)	-	-	✓✓	✓✓	✓	
Plain Baffle Denil	✓	✓	✓	✓	✓	
Alaskan 'A' Denil	✓	✓	✓	✓	✓	
Super Active Baffle (Larinier)	-	-	✓	✓	✓✓	Tertiary options
Chevron Side Baffle	-	-	✓	✓	✓	
Brush Furnished and Canoe Fishway	-	-	✓	✓	✓✓	
Pool and Traverse	-	-	✓	✓	✓	
Vertical (pool and) Slot	-	-	✓	✓	✓	
Shallow V Notch weir	-	-	✓	✓✓	✓	

Table 2 Information indicating the relative suitability of each of the main fish passage options at weirs (AECOM)

Fish pass Option	Relative advantages	Where may not be suitable	Able to provide upstream salmonid passage?	Able to provide upstream cyprinid passage?	Able to provide upstream eel passage?*
Removal of weir structure	Would provide environmental benefits and potentially remove maintenance commitments	May not be suitable if removal may impact local infrastructure , if weir is an important Heritage feature or serves an active purpose	✓	✓	✓
Partial removal	Would provide environmental benefits and likely reduce commitments		✓	✓	✓
Notching weir crest	Relatively straightforward and low cost option	Not suitable at weirs with large head difference (more than 1m if salmonid passage is required/ more than 0.5m if cyprinid passage is required)	✓	✓	×
Rock Ramp	Can provide multi species passage and is semi natural solution providing wider environmental benefits	Functions at relatively low gradient (up to 5%) and so may not be feasible at sites with limited space for a fish pass	✓	✓	✓
Artificial bypass channel		Functions at relatively low gradient (up to 2.5% in upland environments and often up to 1% in more lowland environments) and would also require neighbouring land to be available. Thus may not be feasible at sites with limited space for a fish pass	✓	✓	✓
Hurn type for flat V weirs	Can function at high gradients (up to 20%) and is a relatively cheap and straightforward retrofit solution Can provide a fish pass option at gauging weirs	Only suitable for salmonids and not cyprinids and at flat V type weirs	✓	×	×
Low cost baffle solutions for crump and sloping weirs	Relatively inexpensive technique and can provide a fish potion at gauging weirs	Only suitable for salmonids and not cyprinids and at flat V type weirs	✓	✓	×

Fish pass Option	Relative advantages	Where may not be suitable	Able to provide upstream salmonid passage?	Able to provide upstream cyprinid passage?	Able to provide upstream eel passage?*
Preliminary Weirs (Pre-Barrages, Check Weirs)	Can be used to overcome large head differences through succession of preliminary weirs	Functions at relatively lower gradients than other formal fish pass options (up to 10%)	✓	✓	×
Plain Baffle Denil	Comparatively straightforward design and construction	Prone to blockage and unable to provide passage to a limited number of species	✓	× ✓	×
Alaskan 'A' Denil	Can function at high gradients (up to 25%) and at relatively low flows	Augmentation of downstream attraction flow may be needed at many sites	✓	× ✓	×
Super Active Baffle (Larinier)	Can function at high gradients (up to 15%). Able to provide multi species passage unlike other baffle options. Can provide fish passage at gauging weirs.	Operating range is quite narrow and so installation would need to be accurate to ensure pass functions as intended.	✓	✓	×
Chevron Side Baffle	Can function at high gradients (up to 20%). Can operate at sites with large variation of head difference.	Relatively high risk of blockage and only suitable for salmonids	✓	×	×
Brush Furnished and Canoe Fishway	Can potentially be used over large head differences (likely space may limit the maximum head difference that could be overcome)	Functions at lower gradients than other formal fish pass options (up to 8%)	× ✓	✓	×
Pool and Traverse	Can function at moderately high gradients (up to 12.5%). Typically low maintenance requirements	Can be relatively expensive. Less suitable in environments where larger loads (such as cobbles) are regularly transported	✓	✓	×
Vertical (pool and) Slot	Can provide multiple species passage	Functions at lower gradients than other formal fish pass options (generally between 5 and 12.5%)	✓	✓	✓
Shallow V Notch weir	Can provide multiple species passage and not prone to blockage	Not suitable at weirs with large head difference (more than 1m) and function at low gradients (up to 5%)	✓	✓	×

Fish numbers, Water Quality and Pollution

Public quote: "Where are the figures or survey results of the impact of the new fish ladder further down the River Almond towards Cramond?"

The distribution of salmon and other native migratory fish in the Almond is currently extremely limited and this is mainly due to the effect of migration barriers. Many parts of the Almond catchment are expected to be capable of sustaining fish production if fish can gain access to available habitat.

The majority of the catchment has either moderate, good or high water quality (Figure 1). Fish abundance could be particularly high in the middle and upper catchment where the higher water quality reaches exist. Ensuring migration into these areas is therefore important. Removing barriers would consequently be expected to improve salmon and other fish distribution considerably throughout the catchment.

Figure 1: Water Quality in the main stem waterbodies of the Almond catchment

(Orange = Poor, Yellow=Moderate, Green=Good, Blue=High) (SEPA)

Overall, removing barriers to migration on the Almond would, over time, be expected to result in most of the fish communities achieving at least a moderate condition. This would represent a considerable improvement on the present classification and expand the distribution of salmon and other fish in the Almond, with consequent increases in smolt output and adult returns. Water quality problems are unlikely to cause significant chemical barriers to migration, as shown by other successful examples of salmonid restoration elsewhere in Scotland (the well documented recovery of salmon in the Clyde being an example).

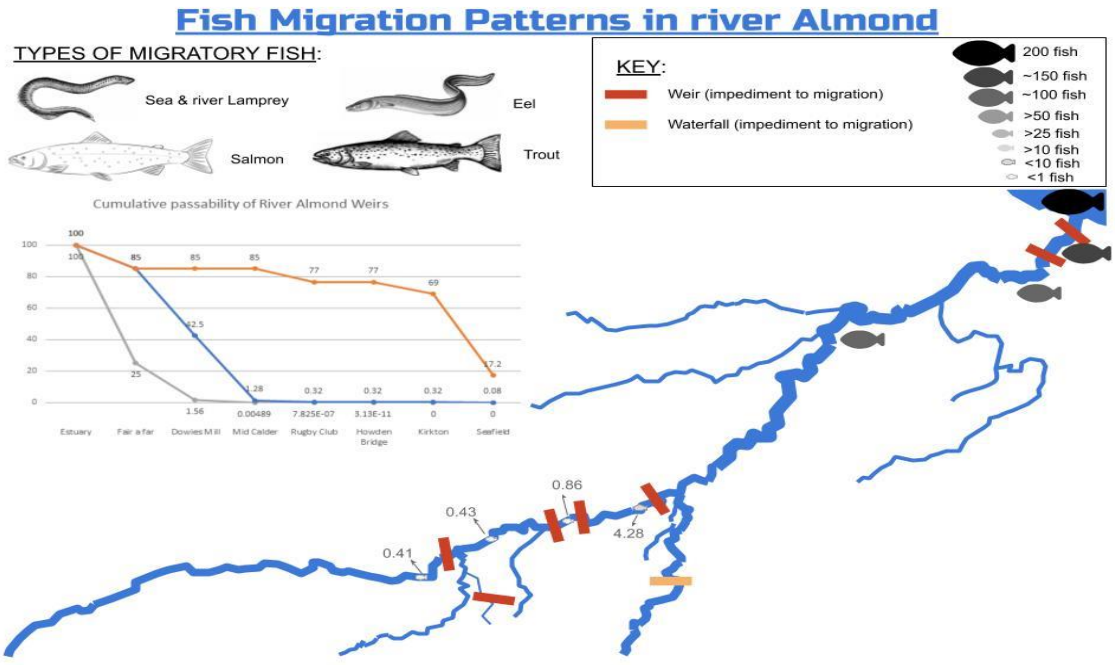
Fish results at impacted water quality sites around Scotland are generally equivalent, or one class higher, than the water quality classification. Which is further encouragement that removal of physical barriers is an important step to improved overall native river ecology (Table 3).

Table 3. A comparison between water quality and fish ecology results at Moderate water quality sites across Scotland (58 sites assessed, SEPA).

	Fish ecology result				
Water quality result	Bad	Poor	Moderate	Good	High
Moderate	5%	10%	42%	29%	14%

While water quality in this catchment has improved during the post-industrial period current improvements in abundance, fishery production, and fish classification may remain limited in areas of the poorest water quality. However, Scottish Water (SW) are responsible for most of the water quality impacts in the Almond and SEPA is already working with Scottish Water to further improve water quality in the catchment, specifically identifying what measures are needed to meet ecological standards in the river, including the increased health of fish populations. The timeframe for completion of this work, set out in the Scottish River Basin Management Plan, is by 2027. Final options for improvement have not yet been finalised but could include direct reduction of pollution from SW assets, sewage treatment works and combined sewer overflows.

Indications are that once a barrier is removed, recovery of spawning ground is almost instantaneous, certainly within 3 or 4 years thereof. Catch and release sampling is scheduled at Fair-a-Far fish pass for 2019/20 period with assistance from Stirling University for tagging. This method is much better than camera counts as there is an ability to age, sex and tag fish. The location of both Dowies and Fair-a-Far Weirs are key to this whole process –



The knock-on effect of opening up these spawning grounds is vast: increased fish numbers will result in beneficial effects for otter, heron, kingfisher and a host of other birds, mammals and insects.

The Edinburgh Biodiversity Action Plan (EBAP) in line with green networks, adopting a network approach recognises the importance of taking a more integrated, landscape-scale approach e.g. river basin management on a catchment scale. Previous legislation such as the Water Framework Directive (2000) and The Water Environment and Water Services (Scotland) Act 2003 has advocated a network approach.

A network approach recognises that species depend on each other in complex relationships; that movement across or through the environment requires proximity or connectivity of habitats and that some species require different habitats for different aspects or life stages. There is also recognition that energy and information are carried through natural systems, and that water, nutrients and elements such as carbon are cycled, stored and recycled in complex and inter-dependent ways. This is logically linked in the concept of blue networks, freshwater streams, ponds, lochs, wetlands connecting to estuarine, coastal and marine.

The key pressures on biodiversity such as pollution, spread of invasive species and wildlife disease, climate change and marine exploitation all require to be addressed using an integrated, adaptive approach on a much broader scale.

As an example in the Edinburgh context, the project to remove barriers to fish passage along the River Almond fits well into the network approach and delivers benefits from an environmental and economic viewpoint. Specific committed outcomes within the EBAP document relating to River Almond are shown below.

B17	Blue networks - Riparian	Identify opportunities for natural flood management or other enhancement projects arising from the flood risk plans.	CEC Planning and Transport; SEPA
B18	Blue networks - Riparian	Identify opportunities for river restoration which can be funded through the Water Environment Fund.	RAFTS, SEPA, CEC Planning and Transport
B31	Blue networks - Riparian	Deliver the River Almond barriers project by identifying the best solution for improved fish passage on the river, either removal of obstructions or construction/repair of fish passages.	CEC Environment, Rivers and Fisheries Trust, SEPA.
B33	Blue networks - Riparian	After completion of the River Almond barriers removal project, monitor fish species and numbers moving up and down river post construction.	RAFTS, SEPA

It is worth noting that if fish passage is not achieved at Fair – a – Far , the council will need to undertake further easement work to achieve this.

Communication

Public quote: "There have been reports available since 2015, with 'final' reports being submitted in March 2017 – almost two years ago. These could have been shared with organisations and individuals in the community..."

Feedback suggests communication regarding the project could have been improved. The public meetings held on the 11th of May 2015 and 26th of August 2016 highlighted the project aims, the key stages to be undertaken and preferred methods for fish passage.

A lull in proceedings occurred whilst further studies were undertaken across all 8 sites on the River Almond, this preceded works at Fair-a-Far amongst others which have now been completed (4 weirs are complete, with a 5th ongoing in 2019).

With the project now well underway it is now the time to proceed with improvement work at Dowies Mill. All supplementary evidence was on display at the exhibition held at the Maltings, Cramond Foreshore from 22/01/19 – 26-01/19 with technical expertise on hand from SEPA and FRT. City of Edinburgh Council Officers were briefed on proceedings and able to assist with questions and enquiries. Complimentary to this, an online mechanism to comment opened for a period of 4 weeks where a selection of the most relevant documents and surveys was available electronically and further upon request.

With several barrier removal projects ongoing on the River Almond and Avon, hundreds of reports, appraisals, models, surveys and assessments have been undertaken. With restricted timeframes associated with supplementary grant funding from Heritage Lottery and others involved with wider project delivery, cross-boundary local authority locations for works, diminishing resource throughout this period and changes in the make-up of lead partners, we are at the point where the reports and surveys have been completed and are available as required. We have presented these and gathered feedback. All further requests for information have been provided. We now feel a sufficient period was made available for comment, this include a requested extension.

Supportive Statements

37% of respondents included supportive statements for the project. A sample of these responses are shown below.

"Anything to help return these industry affected rivers is fantastic, great improvement to the environment, not just the fish."

"Investing in weir removal is necessary to make Scotland's rivers meet EU standards / minimal ecologic requirements"

"This project has obviously been looked at long and hard by folk who know their stuff. I am in favour and hope the fish come back."

"Very interesting project which will bring massive benefits for the environment and economy of the local community. Well done everyone involved. Fully support the removal of this weir as the benefits to the environment and wildlife outweigh the heritage of the weir."

"Fully support the re-naturalisation of the river and getting rid of the industrial era vandalism in the river."

"I am interested in any improvements on the river that return it to a more natural state. The weirs were installed at a time when technology was not available to power the mills with none of the modern guidance and regulation to safe guard wildlife. Society in general and a few wealthy individuals have benefited enormously from rivers like the almond. Now that the mills are long gone, it is time to hand back the river to nature and ensure that all species can move up and down stream unhindered. "

"There seems to be some inaccurate information being given out by certain local groups, scaremongering that the works will cause flooding. The information provided at the drop in event was very impressive and this statement is not true. I was pleased to see that this had been considered and that there was in fact a reduction of possible flooding likely from the works."

"I think that the proposals are sensible. The dam is a comparatively recent structure and is not in its self an attractive feature."

"Its removal is likely to promote biodiversity and if it also helps regeneration of fish in the river Almond then its removal would be an additional benefit."

https://youtu.be/DJFWnFDubls An Introduction: RiverLife Almond and Avon Project

Next Steps

1. RiverLife Almond and Avon board to consider responses and associated requirements
2. Consult elected members
3. Prepare report for City of Edinburgh Council Transport and Environment Committee – likely after summer recess
4. Await committee findings and implement:
    - Carry out any additional surveys
    - Update any existing docs with latest figures/policy updates etc.

Progressive requirements would then be:

- Decide project management protocol
- Planning application
- Appropriate licensing
- Tendering process

References

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