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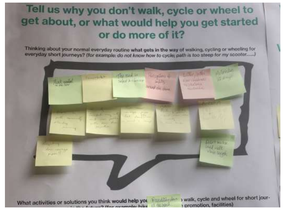

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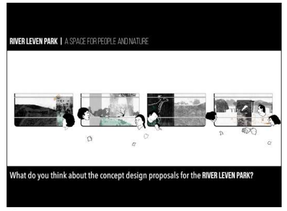

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1 Fish in the classroom exercise at Methilhill Primary School (image: Methilhill Primary School)
2 Postcards from the Leven exercise with Levenmouth Academy pupils (image: Fife Council)
3 Mountfleurie Primary School pupils releasing fish fry as part of outdoors exercise (image: Mountfleurie Primary School)
4-6 Photos from the second engagement event at Methillhill Senior Citizens Centre
7 Behaviour change comments recorded at the second engagement event
8 Locals give their say at the BRAG market in September
9-10 Stills taken from the Journey through the River Leven Park animation

Concept Design Task 2 - Community Engagement

A fundamental part of the Connectivity Project has been about engaging with the local community and addressing issues raised through the development of the Concept Design Masterplan. Fife Council, the workstream lead assisted by Iglu Studio, have achieved this through the facilitation of public events, online and social media events and collaboration with project partners including Forth Rivers Trust, SEPA and principle funding body Sustrans.

While a separate detailed report of the Connectivity Project engagement work to date has also been produced (Levenmouth Active Travel and River Park Concept Design - Engagement Report), the following overview summarises the process so far and emerging community desired outcomes.

Stakeholder event

The first engagement event undertaken as part of the Concept Design phase was a stakeholder event organised by Fife Council in November 2019. Invitations were sent out to over 100 local stakeholders, businesses and community groups with 59 recorded attendees participating in the event. This introductory session intended to outline the ambition and scope of the project at an early stage to generate local support and ensure that the broad design principles for the River Park formulated in the Stage 1 Visioning Report were consistent with the views of key local figures. It was a productive exercise: the participants were unified in supporting improvements to the river valley which would benefit the local community and provide recreation facilities and better access to a valuable greenspace.

Public engagement events

Two public events were then scheduled to assess early opinions of the existing river valley from the community to be followed by a third event where an initial draft Concept Design Masterplan for the River Park would be presented and reviewed with locals in person. The first two events were held in Leven and Methilhill in February and March respectively: the final event was cancelled due to the onset of the Covid-19 pandemic. Again, like the stakeholder event, the participants at the two events were fully supportive of the project aims and furthermore were able to provide precise information about both positive and negative issues such as favourite routes for walking, running and dog-walking, wildlife spotting, flooding, fly-tipping and anti-social behaviour amongst others. One of the predominant themes to emerge was that accessibility within the river valley was problematic for wheeling and very limiting for many people with impairments.

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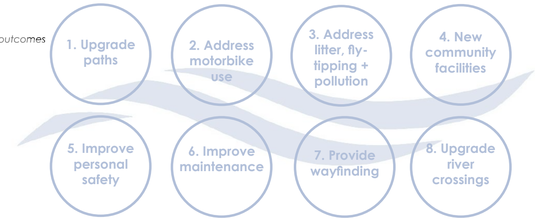
1 Initial community desired outcomes



Several locals re-iterated that the majority of the existing desire lines throughout the valley were in fact the most practical and direct routes: this knowledge has proven hugely useful to inform the proposed path network.

Alternative engagement

With the onset of the Covid-19 pandemic, the engagement team had to create alternative means of maintaining a connection with the community, usually through digital platforms. This included,

- The release of historic photos of the valley and surrounding area on Twitter as part of local history month
- The organising of an Accessible Rivers Photo Competition on Facebook, the winner of which received over 500 votes
- Cognitive mapping exercises undertaken by local Levenmouth Academy pupils
- Further encouragement to contribute to the Commonplace map resource on theleven.org
- Setting up an information stall at BRAG community markets in Leven which gathered a range of comments from all age groups
- Working with local organisations to distribute emergency food aid packages
- The creation of an animation which outlines the initial Concept Design River Park proposals
- Online 'Town Hall' events open to the public to comment and provide feedback on the initial Concept Design Masterplan proposals.

Engaging with seldom heard voices

From the beginning of the process, the project team have sought to engage with seldom heard members of the community. This included hosting one of the public events at a senior citizens centre, setting up a job club discussion and site visits with the Department for Additional Support within Levenmouth Academy. Furthermore, the animation, titled A Journey Through the River Leven Park, has been narrated and subtitled to provide accessibility to those with sensory impairment. Engagement with seldom heard voices has been thorough so far and the project team will continue to liaise with a range of groups, charities and organisations during the detailed design phase to ensure that the Connectivity Project addresses the social justice principle set out in the Executive Summary on page 5.

A Journey Through the River Leven Park

The launch of the animation in October 2020 was in support of the public presentation of the initial Concept Design Masterplan. The masterplan was accompanied by a conversation through Facebook, an extensive questionnaire and two on-line 'Town Hall' events. The events provided the opportunity for locals to talk to the project team, comment on the masterplan and leave feedback. The overall response was very positive in support of the proposals with many people requesting to become more involved in the Leven Project.

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View of wetland adjacent to Burn Mill Dam

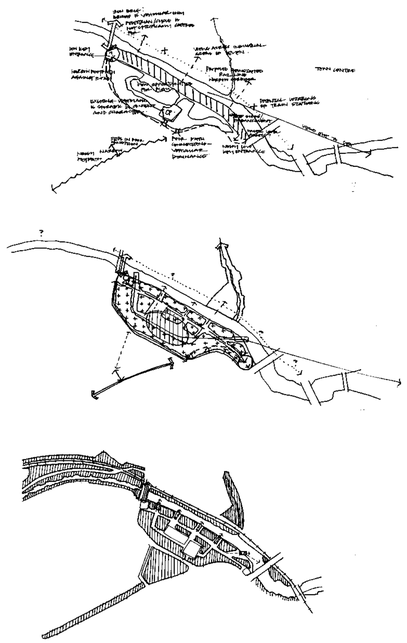
Design narrative

The following section illustrates the narrative process of the masterplan and the initial concept design proposals. As with the macro scale research approach taken during Stage 1 Visioning, the design process for the Connectivity Project first investigated the broad landscape and socio-ecological dynamics within the wider context of Levenmouth (highlighted in Section 1 of this report). In particular, the communities, the links between them and their environments.

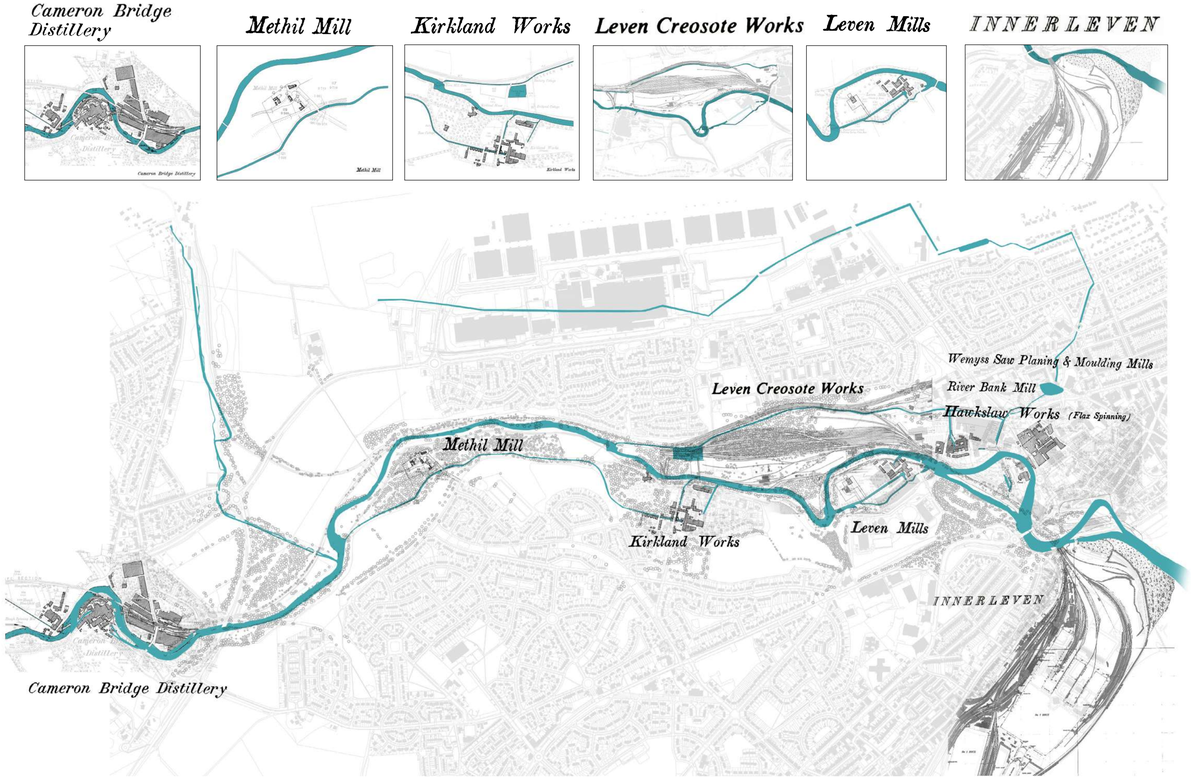
This section begins with the introduction of the primary concept guiding the design of the masterplan - how the restructuring and light-touch upgrading of key areas of focus at existing crossing points of historical significance can provide new social spaces for communities to meet and interact with nature.

It is followed by the River Park Concept Design Masterplan with key proposals and features identified in the accompanying legend. Explanation and examination of the masterplan is provided through a breakdown of the primary framework layers which influenced and shaped the design. The primary framework layers have remained the core elements of the project throughout: the river, connectivity, the green network, the rail-line, heritage and play.

The masterplan is further explored by the conceptual design and illustrations of six areas of focus (gardens). The section concludes with analysis and initial concept design proposals for each garden and more detailed visualisations for the Burn Mill Garden.



^ *Design development sketches of Iron Brig Garden*



Flow / Lines

As evidenced earlier through the progression of historic maps the River Leven valley evolved from its pre-industrialised state in the William Roy Highlands 1747-1752 map through various industrial guises to its current state.

An extensive lade and weir system, already visible in the OS 6 inch 1843-1882 maps, was constructed to provide hydro power to the nearby mills and introduced a sense of order and geometry to the natural flow of the river, bringing linear forms into the landscape.

Remains of the former industry have almost disappeared from the river valley; the Connectivity Project aims to discreetly reference the industrialised past through the formation of a linear river park with six designated areas of focus (gardens).

Spaces for people and nature

This is a river park for people and wildlife, including garden spaces which will accommodate a greater intensity of social activity than other areas of the river park.

The six gardens are strategically located around a connecting point within the river park, placing greater emphasis on social activity yet maintaining ecological quality. In the spaces surrounding the gardens the emphasis is placed on ecology though visitors are still able to be immersed in nature. These stretches are more ecologically focused, will require less maintenance and there will be opportunities throughout the river park to provide moments for interaction between people and nature.

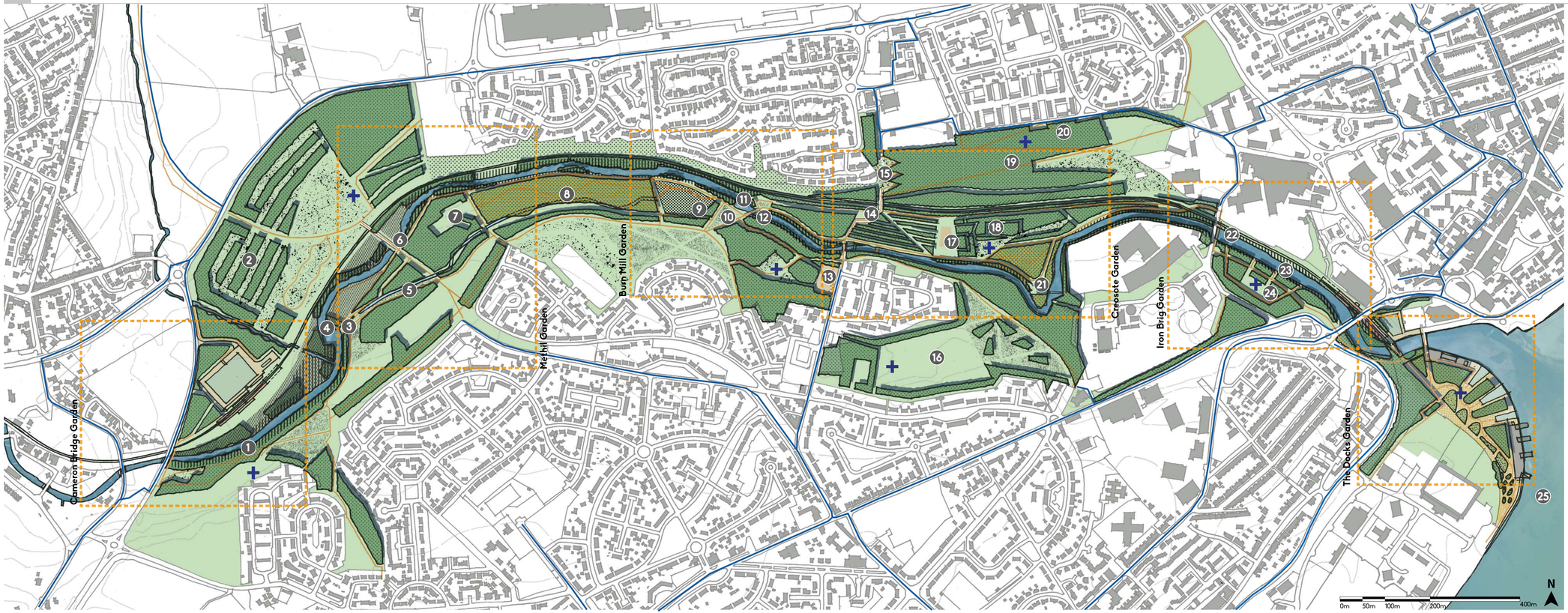
Concept Design Masterplan

The Concept Design Masterplan is illustrated on the following pages. This is the first distillation of the concepts above, the information gathered and comments received into a visual form, around which the process of delivering the River Park can begin in earnest. The 6 key framework layers which informed the design of the masterplan are set out and then in more detail the garden areas of focus.

Pre-industrialised state

Industrialised state

Future state



Legend

Proposed river valley path network - Smooth surface to Sustrans specifications

Proposed priority active travel network - Smooth surface to Sustrans specifications

Woodland - Existing woodland to be retained and reinforced with new native planting

Grassland / low meadow - Existing grassland to be maintained regularly

Wet Woodland - Existing woodland thinned, managed and enhanced to establish flood tolerant area

Grassland / high meadow - Existing grassland to be allowed to grow and renaturalise (good for biodiversity)

River margin and embankment reinforcement - Including slope stabilising solutions

Wildflower - Existing grassland planted with wildflowers

Floodplain - Existing wetland and low-lying river margins to be protected and managed to accommodate flooding

Pollinator space - Existing south facing slope planted for nectivorous insects

Gardens, Detailed Design Areas - Areas of focus where communities can meet, play, relax and socialise

Proposed play spaces - Including natural play elements such as mounding and tunnels. Potential for other play equipment.

Features

1. Woodland walk extended with viewing platforms through trees
2. Proposed agroforestry trial landscape
3. New viewing platform at Kirkland Dam
4. Weir/dam upgraded to allow fish migration
5. Former lade re-opened and exploration route
6. Existing river bridge crossing upgraded to new active travel bridges across river and new rail-line
7. Proposed Heritage trail focal point of former Methil Mill
8. Re-connected lade and raised boardwalk through wet woodland
9. Green roof shelter and observation hides above wetland
10. Central gathering space with seating, wildflowers and interpretation boards
11. New fishing platform at Burn Mill Dam, upgraded to allow fish migration
12. New active travel bridge over pipe
13. New housing units (16 no.) for Kingdom Housing Association, currently under construction
14. New active travel bridges to cross rail line and the river
15. Switchback pathway to address steep gradient down to river
16. Community pitches and play facilities
17. Potential community hub location with WC facilities
18. Experimental community gardens and growing spaces
19. Potential new pathways and community spaces within woodland
20. Proposed lookout platform at top of slope
21. Wet-woodland and river facilities - Canoeing? Screening of existing pipeline with vegetation?
22. New active travel bridge / crossing to Iron Brig
23. Viewing platforms cantilevered over river, through woodland, from Iron Brig Garden
24. New co-designed community play space and car park
25. Potential for seeding coastal fringe with seagrass

The River

The river itself was the very spark that started The Leven project. Physically, culturally and historically the river lies at the heart, the very centre of the first phase of The Leven Programme, the Connectivity Project. Historically the river powered the economic growth of the surrounding area and it is a fundamental tenet of the project that the river will again drive the regeneration of the town and local area.

Studies of the project area, both completed and on-going, have identified the richness and diversity of the habitats, the flora and fauna of the river, assets that already provide benefits to the community, but that also draw people into the valley and as such need to be valued and protected. To this end a number of key measures will be realised including the replacement of the two existing weirs (Burn Mill and Kirkland Dams) with fish friendly structures, and reinforcement of the existing Otter protection areas.

Landscape measures will include improvement works to the river embankments through natural means, reinforcement and replanting of existing woody features (Willow stands), interplanting of existing habitats where required and the removal of litter and invasive non-native species.

Additional proposals are being considered to address and accommodate for existing and future pressures along the river from climate emergency including flooding, erosion and pollution.

Connectivity

The path network builds on the existing assets of the site, the formal and informal routes that locals use every day. From extensively walking the paths on-site ourselves, we have marked and recorded the profiles of the existing routes (see page 20) and established, along with an understanding of the landscape context through which they move, their current functionality and the potential future use they could provide.

The path network has been informed by Sustrans guidance, including traffic-free routes and greenways design guide, and aims to provide traffic free routes for walking, cycling and wheeling. Consideration has been given to maintenance operations and will be taken further at the detailed design stage.

The path network proposals incorporate both the local and the wider setting. At the local level how and where the paths cross the river is a fundamental consideration and will include the design of new bridge structures. At the wider scale, gateways, access points and DDA compliance are all relevant aspects, as well as providing important connections to neighbouring villages (Kennoway), routes (Pilgrims Way, Fife Coastal Path), facilities (Diageo) and features (Leven High Street, Bus Station etc).

Green Network

The fundamental asset of the Connectivity Project, of the River Leven as a whole, is the existing green network that runs throughout the river valley. Key to that structure is the native mix of species providing enclosure, screening, food, shelter and valuable local habitats.

The approach to the Connectivity Project has from the start been about retaining and maintaining as much of the inherent assets of the valley. Retention of the woodlands not only provides a sense of familiarity, but maintains established ecologies and habitats, gives spatial structure to the site and underpins the amenity assets of the site.

Whilst maintaining the existing woodland is key to the project, there is a requirement to make it 'fit for purpose', whether that is a change in functionality or to ensure it's robustness in tackling the impacts of the climate emergency such as flooding, erosion and drought. As such the woodland has been considered on a long-term strategic basis of reinforcement, replanting and re-structure.

The masterplan proposals suggest re-naturalising areas of the existing amenity grassland to improve biodiversity within the river park and allow a more relaxed, differentiated grassland management scheme with less frequent mowing. This is manifested in a maintenance scheme which ranges from less frequent cutting of the 'high meadows' and more frequent cutting of the 'low meadows.'

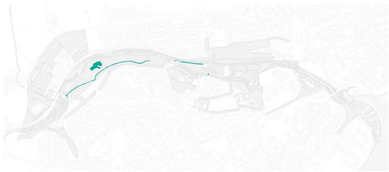
Rail-line

Reinstatement of the Levenmouth rail-line is now a reality. In the first stage of the project there was uncertainty about whether it would be live again or would form the basis for a memorable walking experience, but from the start of the second stage of the project the reinstatement was guaranteed.

As such the rail-line, the rail corridor and the potential station locations have been a primary factor in the design development of Stage 2 of the Connectivity Project.

Whilst the masterplan does not dictate the alignment of the rail track or the location of the rail stations, associated elements are being considered to make positive contributions, such as protection to sensitive ecological zones, visual identifiers to add to the legibility of the gardens within the park, and as a generator of landmarks along the river valley, bridges, stations etc.

At the same time there are realities that accompany the inclusion of a working rail-line. These include the need to make adequate provision for the movement of wildlife and people across or under the tracks, tunnels, bridges etc. These factors have been woven in to the masterplan process and form the base of the network of routes and runs.



Heritage

As explained in earlier sections of the report, the River Leven valley evolved from its pre-industrialised state (William Roy Highlands 1747-1752 map) through various industrial guises to its current state. The installation of an extensive lade system to power the various mills located along the riverbanks physically altered the character and form of the landscape, introducing a sense of order and geometry to the natural flow of the river and bringing linear forms into the landscape. The traces of the lades are part of a number of proposals to revive and reveal the traces of the river's industrial heritage.

Remains of the former industry that have almost disappeared from the river valley will be discreetly referenced within the designated areas of focus, the Gardens. The exact details of the re-emergence of these traces could be determined with locals, heritage groups and the council. This will ensure that the focus is not on the elite industrialists but on the stories of the local people whose everyday lives and journeys revolved around the industrial areas in the river valley. Where there is an absence of physical presence, programmes and stories can provide a memory of place and people.

Heritage is not limited to an industrial focus but should also consider the natural heritage of the valley such as new native hedgerows and flax seed planting to reference their use for spinning linen in the mills. There could also be an intervention which guides the visitor towards the impressive ancient willows which flank the river, as well as making vital links and connections with the wider natural heritage assets of Mid-Fife.

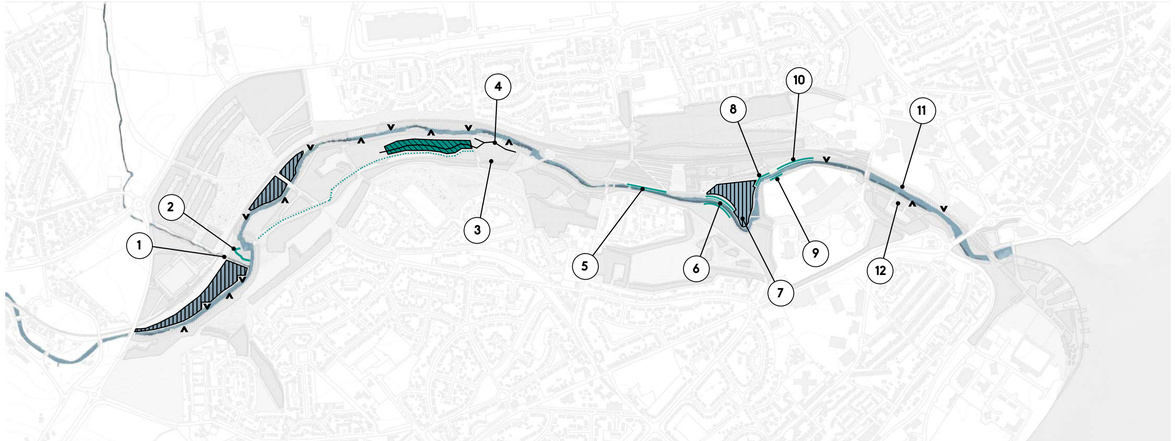
Play

With no existing play facilities within the Connectivity Project area play is not an immediately recognisable element in the structuring of the river park. However, prioritising natural play will provide opportunities for individuals, groups, families and classes to interact with each other and the landscape, to learn, to have fun and to explore. The river park provides a fitting opportunity to use play as a major framework element.

The Iron Brig Garden is seen as a particular opportunity for the community to co-design a play experience that can adapt and change with generations, with environmental needs and to really take ownership of the park.

Out-with the Iron Brig Garden the 'play' strategy is to provide for free and natural play that is multi-functional, that engages with a wide range of demographics, and sets a standard for future public space development. This natural play will be woven throughout the river park in designated areas and along movement routes.

The final point to identify is that play provision will be fundamental to the consideration and provision of 'Health and Well-Being' for Leven and the immediate communities of Methil up to Kennoway and down to Buckhaven.



River Park
River restoration proposals (selected - full detail of proposals available in CBEC Concept Designs xx)

Legend

- Mixed riverside planting (trees and wetland vegetation) and reprofiling/wetland scrapes
- Strategically placed, alternating large wood structures (eg tree trunks) to enhance physical diversity and habitat
- Wet woodland conversion (wetland scrapes and native vegetation planting)
- Re-connect lade for wet woodland enhancement/ development
- Green bank protection / reprofiling

1. Re-align Kennoway Burn and improve morphological diversity
2. Construct natural-type fish bypass channel
3. Vegetation thinning to allow enhanced wetland habitat
4. Raised boardwalk above wetland and extending into wet woodland (location indicative)
5. Geotextiles added to left bank to improve marginal habitat and provide more naturalised frontage
6. Gabion basket removal and green bank protection measures to stabilise bank toes (if required)
7. Improved vegetation diversity including selective thinning and screening of pipeline with native species
8. Green bank protection to replace boulders
9. Green bank protection to stabilise right bank toe where required
10. Bank reprofiling to create inset floodplain and improve conveyance during higher flows
11. Wildflower mix added along left bank
12. Improve vegetation diversity with native tree/shrub planting

Note: For more detailed information on river restoration proposals please refer to CBEC Concept Designs, report in progress)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Flood Alleviation

One of the key principles to alleviate flooding would be to target measures at the root causes of degradation (such as upstream erosion and deforestation) as well as the symptoms. CBEC Eco-engineering specialists have produced concept design proposals for the area within the River Park in collaboration with Iglu (selected interventions are indicated on the adjacent map). All of the measures proposed have been considered to reinstate natural processes to allow the river (and tributaries) to recover by themselves.

Any detailed design measures will accord with Fife Council's Adopted FIFEplan (2017) which sets out key planning polices and proposals for the development and use of land across Fife. A number of the FIFEplan policies have direct applicability to the wider River Leven project including sustainable services, and implementation of green infrastructure complying with green network requirements. Policy 12 (Flooding and the Water Environment): is particularly relevant, stating that development proposals will only be supported where they do not adversely impact on ecological quality of the environment. Any flood risk and surface drainage measures will be designed and managed to avoid or reduce the potential for surface water flooding and to ensure that the floodplain is safeguarded. Underpinning all proposals will be the imperative to protect and enhance natural heritage and improve access to woodlands, green networks/greenspaces and path networks. Furthermore all proposals should increase biodiversity in the wider environment whilst protecting habitats and species.

Floodplain management

In line with the exploratory approach to the landscape of the river valley, the approach to flood accommodation and management is seen as an opportunity rather than a constraint. With climate change bringing the prospect of rising tides, fiercer storms and run-off from surrounding residential and agricultural lands, rising waters will be considered as part of the detailed design stage for the River Park masterplan - indicative areas for floodplain storage .

Ground-breaking examples include Rotterdam's approach to climate change where the construction of multi-purpose facilities become emergency reservoirs, public spaces and gardens that act as sustainable drainage facilities and retention ponds. The principle is to let water in where possible and adapt to it, rather than struggle to keep it out.

Following an initial review of the ongoing Levenmouth Flood Risk Assessment there appears to be an increasing risk from rising fluvial and coastal waters, a risk that leaves some areas within the floodplain vulnerable to flooding. Whilst not a comprehensive solution, as upstream measures are needed, accommodation of flood waters within the River Park would be an important step. A number of key measures were proposed in the River Leven Restoration Project report by RSK, March 2020 (commissioned by Fife Council) and have been further developed by CBEC, who have produced Concept Design proposals for river restoration measures such as:

- Accommodating flood water within low-lying areas of the floodplain and potentially within the large, but contained, expanse of the Creosote site (awaiting results of flood modelling undertaken by Atkins as of 22 Sep 2021)
- Opening up and reconnecting the historic Methil Mill Lade.
- Forming areas of wet woodland through management and replanting of existing areas of woodland
- Creating overspill storage areas, dipping ponds and enhanced wetland areas
- Increasing diversity of existing habitats such as wetland and grassland
- Thinning and vegetation enhancement of existing wetland pond at Burn Mill Garden
- Reinforcing and stabilising existing embankments, including measures to reduce energy of the river
- Replanting and vegetation enhancement along river banks, in particular planting of stands of willow trees.

In addition to the specific measures outlined above accommodation would be guided by effective river restoration principles including improvement of the overall ecosystem integrity and biodiversity, along with enhanced habitat value through appropriate new planting and management of existing woodland assets.

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1 View from Kirkland Dam
2-3 Flooding at footbridge near Kirkland Dam

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Riparian corridor

The riparian corridor, or zone, is the interface between the land and a river or stream, forming the link between the two environments. (The word 'riparian' is derived from the Latin ripa, meaning river bank). Riparian zones are important in terms of the river's ecology, habitat and environmental resource management, protecting stream banks from erosion, providing a storage area for flood waters, and providing food and habitat for fish and wildlife.

Environmental benefits can include:

- Providing habitat for many species, otters, water voles, etc and increased biodiversity
- Linking fragmented and isolated habitats through which species move
- Providing habitat and food for aquatic species such as fish and invertebrates
- Strengthening river banks, reducing the risk of bank erosion and flooding
- Reducing the impact of diffuse pollution on the water environment by providing a barrier to, and breaking down, pollutants before they reach the watercourse
- Reducing the risk of flooding by increasing the channel 'roughness', slowing and stopping flows increasing downstream
- Amenity and recreation provision.

This important area of the River Leven provides shelter and food for wildlife, and just as importantly, it can also provide protection from flooding and erosion in addition to filtering run-off from agricultural fields and pollution from surrounding industrial areas.

CBEC have built on the initial opportunities identified by RSK to improve the resilience and morphology of the the riparian corridor through proposals such as large wood structures, green bank protection and re-profiling, wetland improvement and native planting.

It is noted that any potential restoration or modification works to the river or riparian corridor will require consideration of a number of constraints / requirements including, but not limited to, land ownership.

Bank modification / reinforcement

As with much of the River Leven valley, the corridor within the River Park area has not been maintained for many years. With selective interventions there are opportunities for bank protection, modification and re-profiling to help introduce a diversity of habitat forming erosion–deposition processes to restore natural flow dynamics, morphological diversity and improve habitat conditions for key aquatic and riparian species.

There are also sections of the riverbank that have eroded, presenting potential future conflicts with neighbouring facilities and functions such as the embankment along the northern edge of the Donaldson James & Sons Timber yard.

The stretches of embankment that have been identified for potential modification works have been highlighted by CBEC and illustrated on the map on page 48. The detailed design works will ascertain the precise extent of these bank re-profiling works in order to determine channel dimensions, gradients and associated predicted flow rates to ensure that no detrimental erosion will take place.

Weir modification

SEPA have identified that both the Kirkland and Burn Mill weirs / dams act as major barriers for migrating fish, needing modification and the inclusion of fish passes to allow upstream access to spawn and feed. Modification could also benefit other aspects of the river including:

- Allowing more natural water level variations upstream
- Reducing interruptions to sediment transport
- Allowing the development of more varied flow types upstream
- Allowing movement of fish between suitable habitats.

CBEC's Concept Design proposals include a natural-type fish bypass channel at the Kirkland Dam to be implemented within 5 years (see map on page 50) and the removal of the Burn Mill Dam within 10 years.

After obtaining the relevant permissions, SEPA will appoint external specialist consultants to investigate the feasibility of one or more proposed solutions at each site.

9 MASTERPLAN | PRIMARY FRAMEWORK LAYERS - THE RIVER [Illustrating the proposals]

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1 *View from southern bank near Kirkland Dam*
2 *View east from footbridge*
3 *View west of Burn Mill Dam*
4 *View of Methilhill wetland adjacent to Burn Mill Dam*

Other potential options for mitigating the environmental effects of the weirs identified in the RSK report include the following:

- Lowering of the weir crest elevation
- Cutting of a new bypass channel. The head loss is spread over a significant length of channel, usually without any areas of supercritical flow velocity. There should be sufficient velocity and flow at the outlet to attract migrating fish
- Notching of the weir crest to provide a local area of lower head loss
- Installation of a fish pass. Essentially a separate, small channel through which the total head loss of the weir is separated out into smaller steps, usually with small resting pools between miniature weirs, notches or baffles
- Construction of a downstream cascade
- Exact proposals will be subject to further investigations and discussions between the relevant statutory bodies.

Replanting

An essential aspect of the river / riparian improvement works would include the management and replanting of willow stands and native trees along the rivers edge. At present there are significant stands of ancient willow and wetland trees along the rivers edge that create habitat niches, shading and areas of slower flow that act as fish refuges. These trees and vegetation stands also provide foraging sites for species such as otters.

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A full survey of the trees along the river, their health, quality and likely longevity is required as on initial visual inspection there appears to be a range of trees, of varying age and quality, some that need replacement and some that need reinforcement and replanting.

Any replanting of the banks would be carried out in accordance with SEPA guidance - Engineering in the Water Environment Good Practice Guide: Riparian Vegetation Management Second edition, June 2009(Document reference: WAT-SG-44).

In addition to reinvigorating the existing waterside trees, replanting would not only replace older existing trees but strengthen banks: a key factor in determining channel form and habitats which can affect the quality of in-stream habitats.

This strengthening will also reduce the risk of flooding, slowing and alleviating surface run-off. The vegetation will also offer a buffer strip that can protect water quality by reducing the impacts of diffuse pollution.

Importantly the aim of any new planting would be to achieve a cover of vegetation on river banks which is appropriate to the site and includes species native to the area with a multifunctional purpose of stabilising the bank, creating good wildlife habitats and creating an aesthetically pleasing landscape. Low impact management interventions are required in these areas including selective planting, INNS control and deadwood management, as disturbing banking and the existing biodiversity on the banks could cause more damage than good.

Wetland Improvement / Creation

CBEC have identified several areas for both the improvement of existing wetland habitats and the creation of new scrapes/reprofiling measures. These two measures would provide significant advantages for key species, improve biodiversity and water quality (by filtering water runoff and sediment flows), reduce potential erosion and help to mitigate flood risk.

The reinstatement of the former lade from Kirkland Dam will reconnect the existing wet woodland to the river and presents significant opportunities for flood storage as well as providing a sediment sink. Further investigation will be required during Stage 3 - Detailed Design.

In respect of existing pond and wetland habitats the Green Network Biodiversity and Habitats Phase 2 Report set out the results of a 2019 ecological survey that identified thirteen water bodies (ponds, marshes, ditches and flushes) in the river valley. The survey identified a lot of potential to improve the quality and biodiversity of these habitats through a range of conservation management options, with particular involvement and engagement of local volunteers particularly in respect of planting activities.

The adjacent map indicates seven wetland projects recommended for progression by the Green Network Biodiversity and Habitats Phase 2 Report (July 2020). These projects have been prioritised as they currently do not support breeding amphibians and their enhancement would hugely improve biodiversity.

The main actions identified are the creation or extension of areas of permanent open standing water with new wildlife ponds created and several areas of existing habitats and ponds refurbished. Other actions within wetland areas include the installation of boardwalks, dipping platforms and educational trails.

Specific existing features identified for improvement include the SUDs pond serving Mountfluerie, the expanse of the Methilhill wetland and the lade pond at Kirkland Dam. The Burn Mill wetland is regarded as a wetland centrepiece of the river valley and as such the masterplan has focused on this asset as a core focus for community use and project development.

9 MASTERPLAN | PRIMARY FRAMEWORK LAYERS - THE RIVER [Illustrating the proposals]

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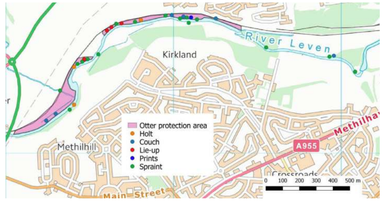
Otter protection areas

Otters are very much present within the river valley, using the area heavily as there is plenty of cover in the form of emergent, marginal grasses and vegetation to allow them to enter the water safely and then return to their burrows to rest. Pools to fish in and cover to hide in when they are resting are both plentiful in this section of the River Leven.

An otter survey carried out by FRT (Leven Connectivity Project Green Network Phase 1 Report June 2019) found many spraint sites along extensive lengths of the banks identifying rest sites and holts among the trees and in the grass. Otter activity is concentrated within the western half of the river valley, in inaccessible and undisturbed places where there is minimal human disturbance. The FRT report proposed the creation of two otter protection areas. With the reinstatement of the Levenmouth rail line providing the necessary separation from human activity, the River Park proposals have identified these protection areas as part of the Green Network proposals.

Otters are a charismatic and popular species and have provided a base for FRT engagement and activities with the public. Continued otter interpretation and materials should be used to enhance and instigate engagement with the community and schools including visits and journeys along the riverside.

Otters, bats, nesting birds, Atlantic salmon, European eels and lamprey, along with Invasive Non Native Species, are all present within the river valley and will all be appropriately considered before carrying out any works. It is known where these species are present within the site and where their preferred habitat is located. Accordingly paths and active travel routes have been designed to protect these sensitive areas from disturbance to enable new habitats and ecological proposals to establish.



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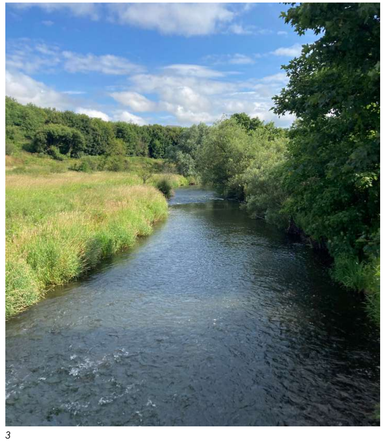
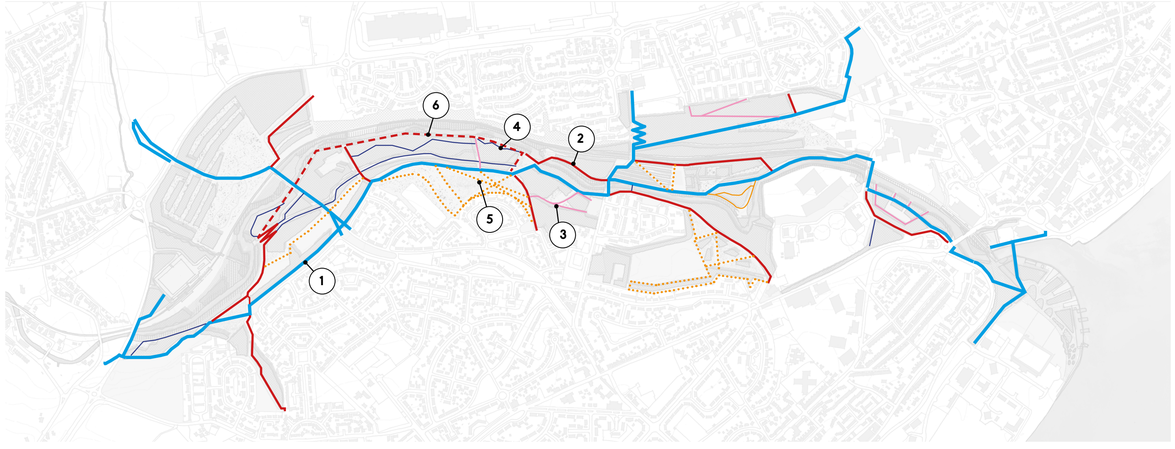


3

IMAGES < ^

1 Photo of otter (Image credit: Jacquelyn Johnston, FRT)
2 Map indicating survey area, and otter signs including a suggested area to be retained for otter protection (FRT Leven Otter and Water Vole Survey p11)
3 View of the River Leven east from existing pedestrian bridge near Kirkland Dam



River Park
Path network hierarchy proposals

Legend

- Primary route (shared use, 3.5m wide)
- Secondary route (shared use, 3m wide)
- Secondary route raised walkway (shared use, 3m wide)
- Tertiary route (shared use, 2.5m wide)
- Non-cycling route (2m wide)
- Mown grass path (2m wide)
- (1) Path profile type (see adjacent page)

Note: The proposals set out above and opposite are indicative based on current Sustrans guidance for traffic-free routes. The exact detail and design of these routes will be subject to further discussions with Sustrans and stakeholders to ensure that the routes meet functional requirements whilst not adversely impacting the landscape.

1. PRIMARY ROUTE

This is the key west-east route through the river park for all users. It will be accessible for all with gentle gradients and allows for shared use with both cyclists and pedestrians at 3.5m width.

2. SECONDARY ROUTE + 6. RAISED WALKWAY

These routes will provide supplementary paths throughout the river park and extend into communities. Like the primary routes, the paths will be accessible for all to Sustrans required specifications providing 3m width for shared use between cyclists and pedestrians. The example tile 6 shown adjacent illustrates how a perforated steel route could be fixed with screw piles above the existing pipeline running alongside the river.

3. TERTIARY ROUTE

This route still permits shared use at the minimum width of 2.5m though it is expected to be less frequently used as the primary and secondary routes.

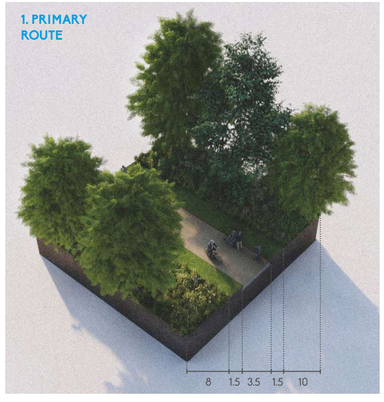
4. RAISED BOARDWALK

This route has been designed for sensitive habitats such as the wetland, the river's edge and the re-opened mill lade. The materiality will be finalised during Stage 3 - Detailed Design and is indicatively illustrated as perforated steel grating walkways.

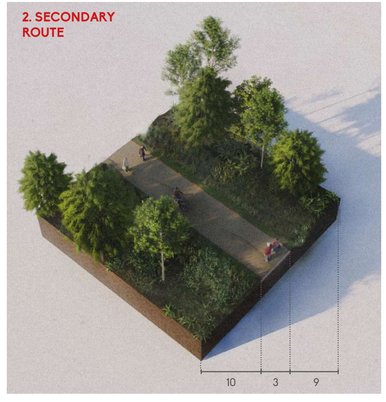
5. MOWN GRASS PATH

These paths will be mown through grassland areas several times a year to maintain accessibility. The example shown adjacent is for a 6m wide route though widths will fluctuate throughout the river park depending on the surrounding habitat.

1. PRIMARY ROUTE



2. SECONDARY ROUTE

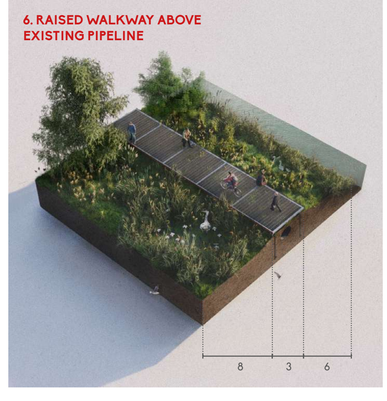


3. TERTIARY ROUTE

4. RAISED BOARDWALK

5. MOWN GRASS PATH

6. RAISED WALKWAY ABOVE EXISTING PIPELINE



All measurements in metres

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Paths

To develop the Concept Design Masterplan, the project team had to really understand the site through the routes people use to move in, around and through the river valley. Since Stage 1 - Visioning, Iglu Studio have extensively walked, analysed and surveyed the existing path network comprising tarmac, concrete, mud and grass routes.

The existing routes that people take, the worn paths and muddy tracks are there for a reason: they are logical and functional direct routes from that fit the existing landscape form, features (slopes, vegetation, river) and destinations. Where new facilities, features and functions have been proposed, new paths have been added to connect to this existing network. (Note: all new proposed paths will be monitored to see how people use them, and adjusted if necessary). The approach to establish a path network for the river park has been sense checked with the community at public events and through online engagement.

Consequently, the existing path network has formed the basis of the connectivity framework layer for the Concept Design Masterplan.

From this robust foundation routes have been considered in terms of accessibility, use, function, requirement and traffic free requirements. A hierarchy has been rationalised with Primary, Secondary, Tertiary, and non-cycling routes (see pages 40-41). Mown grass paths also have a place within this network.

Existing retained / upgraded

Not all existing desire lines have been incorporated into the proposed path network. Where this is the case these paths will be retained as they are, informal routes appropriate to function and place. Existing paths that do form part of the network will be upgraded and reconstructed as to ensure they comply with existing national or Sustrans guidance for paths and access for all / traffic free routes.

Traffic free routes that are to provide access for all and comply with Sustrans guidance are the Primary, Secondary, and Tertiary routes. These routes at present are proposed to be fully constructed shared use paths with edging and foundations as required, varying in width from 3.5m to 2.5m. The final design and detail of the paths will need to be appropriate to place and as such will be subject to further discussions with stakeholders and funders.

Certain routes will not comply with Sustrans access for all guidance but will still provide accessibility for a range of users. These routes will still be safe and appropriate to their use and function but may be constructed from non-compliant materials (timber boardwalks, whindust paths etc) or may be designed with narrower or variable widths. These routes will be used where landscapes require a more unique and place sensitive solution.

Proposed new

Proposed new routes will make connections within the River Park to link residential areas, allow communities to access the river and existing assets of the area, as well as provide for proposed future facilities.

As with the upgraded existing routes, where required new routes providing access for all will be in compliance with Sustrans guidance, fully constructed with edging and foundations as required, varying in width from 3.5m to 2.5m. Where routes such as boardwalks will not be in compliance with Sustrans access for all guidance, they will still provide accessibility for a range of users in a safe and appropriate manner to their use and function.

It should be noted that all new paths, steps and ramps, will be designed and constructed in accordance with current guidance including Cycling by Design 2010 (Revision 2, July 2020) and Sustrans traffic-free routes and greenways design guide.

IMAGES ^ >

1 Concrete path above existing pipeline south of the river
2 Mud path crossing the former Mill Lade at Kirkland Dam
3 Whindust path south of the river at Methil Brae residential area
4 Flooded grass path adjacent to the wetland at Burn Mill Dam
5 Fibredec surfacing in a woodland setting

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Boardwalks / raised walkways

Boardwalks and raised walkways are proposed in specific areas of the river park to address landscape sensitivities or existing construction issues.

Boardwalks are proposed within and along the Methilhill wetlands to maximise access with a minimum footprint and impact on the habitat. The raised boardwalks will be able to withstand fluctuating water levels and flooding, as well as providing platforms at different times of the year for 'dipping' and 'netting' (typical activities proposed for outdoor education trips the park can accommodate).

In addition to the boardwalks through sensitive landscape areas a raised walkway is proposed above the line of the existing mains sewer that runs on the south side of the river from the Kirkland Dam to the wetland at the Burn Mill Dam.

The potential complexities of building on or over an existing sewer pipe means that a cautious approach must be taken with the proposed installation of a metal framed walkway, fixed by screwpile foundation rods, that sits above the existing concrete path on top of the pipe. This will not only minimise any potential conflict during construction but will also provide for ease of access should the pipeline (or sections of it) need to be accessed or replaced.

It should be noted that raised walkways are being considered for other areas in the River Park as a climate resilient measure to accommodate potential future flood events. Discussions have been held with Atkins, the consultants producing the Flood Risk Assessment, and will be on-going during Stage 3 - Detailed Design.

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Construction materials

Construction materials for the paths within the river park will need to be cognisant and coordinate with the wider Active Travel Network. In addition, any material choice for Sustrans compliant and funded routes will need to accord with and be approved by Sustrans. To this end the masterplanning team have been researching materials that other Sustrans funded schemes have used. An example material is Fibredec surfacing (see image above) which was used for a cycle path project in a sensitive woodland setting with site constraints at Wisemans Bridge, Stepaside, Pembrokeshire.

Paramount is the installation of suitable materials which will not negatively impact on the habitats through which the paths will run whilst at the same time ensuring that routes are safe, secure and have a long-term maintenance guarantee.

One of the other factors being considered in the initial material consideration process is the ambition to realise a zero waste project, potentially the first of its kind in Scotland. As such the choice of material will be vital; whilst asphalt is the base standard surface material costed it is not a preferred material.


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IMAGES ^

1 Angers Saint-Laud train station, Angers, France
2 Luchtsingel footbridge, Rotterdam
3 Eysturkommuna Town Hall, Faroe Islands

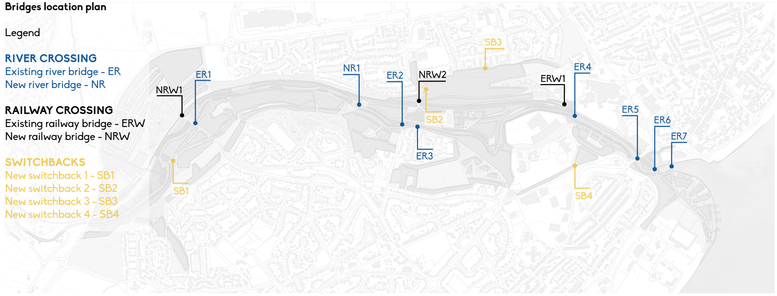
Bridges location plan

Legend

RIVER CROSSING
Existing river bridge - ER
New river bridge - NR

RAILWAY CROSSING
Existing railway bridge - ERW
New railway bridge - NRW

SWITCHBACKS
New switchback 1 - SB1
New switchback 2 - SB2
New switchback 3 - SB3
New switchback 4 - SB4



Existing bridges


ER1


ER2


ER3


ER4


ER5


ER6


ER7


ERW1

RIVER CROSSING
ER1 Existing - Pedestrian timber and metal bridge in Methilhill area to be replaced
ER2 Existing - Concrete vehicular bridge
ER3 Existing - C-listed metal footbridge from former Kirkland Works
ER4 Existing - Iron Brig, vehicular bridge, proposed refurbishment under review
ER5 Existing - Bawbee Bridge, on-going improvements works
ER6 Existing - Metal rail bridge at river mouth to be refurbished
ER7 Existing - Concrete bridge at river mouth to be refurbished
NR1 Proposed - New active travel bridge at Burn Mill Garden

RAIL CROSSING
ERW1 Existing - Metal footbridge west of Iron Brig to be replaced
NRW1 Proposed - New active travel bridge north-west of ER1
NRW2 Proposed - New active travel bridge in the Creosote Garden

Bridges

Within the river valley there are **eight existing bridges, seven cross the river (ER1-7)** and **one bridge that crosses the old rail line (ERW1)**. All are in poor condition, require further structural assessment and in a number of cases full replacement.

The Concept Design Masterplan proposes to retain all existing crossings and to introduce three new bridge crossings: **two new rail bridges (NRW1 and NRW2)**, and **one new river bridge (NR1)** (above the existing pipeline at the Burn Mill Garden, see visual on page 89). All bridges would be traffic-free and shared use for pedestrians and cyclists. Of the existing bridges the masterplan proposes the replacement of two bridges across the river **(ER1 and ER 2)** and the improvement or refurbishment (where possible) of the remaining five bridges across the river **(ER3, ER4, ER5, ER6 and ER7)**.

Bridges will be needed to cross the new rail-line and to cross the river but these structures should not be perfunctory structures that simply provide access. In a similar fashion to the red pavilions in Parc de la Villette in Paris, the bridges should be iconic structures that sit in the landscape as landmarks, a place to meet, talk and socialise with others in the community and a means to use to orientate yourself. The images opposite show three such iconic bridges that have inspired our deliberations.

Bridge precedents

Angers Saint-laud train station, Angers, France is a distinctive structure that has been designed as more than just a railway crossing. It is a new urban landmark where the wooden frames have been designed to provide a place for people to stop, linger, watch the trains arrive and depart, cross and meet, shaping the relationship between the passers-by, and with the place. The bridge becomes a path and a destination.

Luchtsingel, Rotterdam (Luchtsingel means "air canal") is a unique bridge in Rotterdam that was the world's first crowd-funded public infrastructure project. A 400-metre-long pedestrian bridge runs through a building and across roads and railways to connect three previously disconnected areas of the city, including the recently renovated Rotterdam Central Station with the historic Laurenskwartier district.

Eysturkommuna Town Hall, Faroe Islands bridges across a river to physically and symbolically connect two formerly separate municipalities on the Faroe Islands. Pedestrians cross the river using a walkway that leads across the building's green roof.

Gateways

Gateways can create a sense of arrival and exit: they are proposed at key junctions where the routes from the river park connect to the Active Travel Network. These gateways have the potential to provide a successful connection and smooth transition in terms of spatial requirements, to deliver high quality public realm and to enhance the sense of character of the River Park.

The gateways could become places where people agree to meet, to stop and exchange stories of their days journey. To this end these spaces will be generous, providing seating areas, informal play for all with sculptural landmarks and land art.

Steps and ramps (switchback)

The majority of travel routes will be easily accessible by all with longitudinal crossfalls within acceptable guidelines. However there are a number of points where the existing situation is out-with Sustans compliant gradients, and potentially hazardous and exhausting to people with limited mobility. Some of these locations already have steps but the majority are in poor condition and will need to be replaced. The installation of switchback routes is proposed at these locations to enable access for all. Initial locations are outlined below and illustrated on the adjacent map but are subject to further discussion with the project team during Stage 3 - Detailed Design to ascertain if there are other locations to address.

SB1 - Kirkland Dam
SB2 - Creosote site (accessing to and from the north)
SB3 - Montgomery Drive
SB4 - Methilhaven road (south of the water treatment plant)

Signage and wayfinding

Signage and wayfinding are important detailed elements of any project involving travel, movement and connectivity. Careful consideration is required to balance the need for clear, visible and consistent directional information, with the need to minimise any potential visual impacts, avoid street furniture clutter and maintain the character of place. This is especially relevant in the River Park where it is imperative to protect existing habitats and wildlife.

Having set out the key parameters for signage within the river valley, it is understood that the River Park signage should connect to and correspond with a range of other routes, including the wider Active Travel Network, Fife Coastal Path, and the Pilgrims Way. To this end the masterplanning team have already been engaged in conversations with Fife Coast & Countryside Trust about their signage strategy set out in their new design guide, Fife Outdoor Tourism Infrastructure Design Guide, September 2020.

Signage and wayfinding has to be accessible for all and include people of different abilities and ages. Local access groups and national bodies such as the RNIB and the Alzheimer's Society will be part of the conversation. Text, colours, textures, sounds and braille will be considered to ensure the on-ground measures are truly inclusive for all.

Lighting

In a similar manner to signage and wayfinding, lighting within the River Park will have to balance the positive benefits of lighting of routes and places for safety of movement, security of property, and other activities at times of darkness, against the need to minimise any potential light pollution.

It is known that human health and ecosystems can be adversely affected by excessive artificial lighting. As such the aim is to balance the need for any lighting proposal against the negative effect it may have on the environment. In particular, artificial light at night has negative and deadly effects on many creatures including amphibians, birds, mammals, insects and plants as light pollution radically alters their night-time environment by turning night into day. This affects sleep, migration, breeding and hibernation patterns, and even basic requirements such as hunting.

River Park
Green Network

Legend

- Woodland
- Wet woodland
- High grass
- Low grass

WOODLAND

Woodland expansion within the River Park is fundamental to the improvement of the Green Network. The planting of new woodland stands to buffer and extend existing woodland fragments will create vital ecological connections for improved species movement.

WET WOODLAND

Increasing wet woodland cover in the valley has numerous benefits for climate resilience, including carbon storage, alleviation of flooding impacts, habitat creation and increased biodiversity.

HIGH GRASS

Fife Council have already adopted a grassland renaturalisation initiative within the river park area allowing native flowering grasses to flourish and support insect pollinators. Less mowing of these high grass areas coupled with plug planting of wildflowers can create vast swathes of seasonal colour whilst also saving on maintenance costs.

LOW GRASS

Some areas of regularly maintained grass are necessary to allow locals to relax and play. These areas have been carefully considered with proximity to play areas and residential areas - the majority of the river corridor is either high grass or scrub/woodland.

9 MASTERPLAN | PRIMARY FRAMEWORK LAYERS - GREEN NETWORK [Illustrating the proposals]

Woodland Structure

Produced during Stage 1 - Visioning, the Phase 1 Habitat Survey included a map illustrating the distribution of vegetation and woodland types within the river valley. Building on this base during Stage 2, a survey was commissioned to identify and assess all woodlands within the river valley and develop a management plan with recommendations for improving biodiversity and habitat quality. The report was undertaken by Mark Hamilton Landscape Services and was completed in May 2020.

In summary the report identified a total 46.39 ha of woodland in the river valley. The majority of woodlands in the valley are relatively young (1-15 years), although there are smaller quantities of semi (15-35 years) and early mature trees (35-60 years). Composition is mostly broadleaved and native, but there are some areas of non-native trees as well. Most of the woodland is healthy, but there are some areas of slope erosion, limited rooting in poor soils, competition due to lack of thinning, waterlogging, poor drainage and Chalara ash dieback.

The Scottish Government has set statutory targets for the reduction of Greenhouse gas emissions (GHG) in Scotland through the Climate Change (Scotland) Act 2009. One of the ways in which they aim to meet this target is through increased woodland cover. The River Park masterplan proposes to contribute through the improvement of the existing woodland, including both the reinforcement of woodland compartments and the planting of new mixed native woodland. In addition, proposals include supporting sustainable adaptation of the river park area to a changing climate through the conversion of identified blocks of woodland to wet woodland, and the proposed introduction of agro-forestry at the western end of the project site. These proposals are in addition to a community focused initiative of planting tiny forests as outlined on page 66 and illustrated in the Habitat Toolkit supporting document.

Mixed Woodland

In the main the proposals for the mixed woodland within the river park fall into two programmes,

1. The management and expansion of existing woodland compartments, and
2. The planting of new mixed native woodland.

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1. Management and expansion of existing woodland

The management report identified the need, throughout the river valley, to thin existing woodland compartments, selecting individual trees (usually the non-natives) for removal to reduce crowding and competition, allowing for better canopy development and more diverse successional woodland understorey layers.

Areas of existing woodland that are currently unmanaged or subject to low levels of maintenance are identified for potential 8ha expansion through the planting of native trees. This would reduce habitat fragmentation and improve connectivity of the Green Network throughout the river valley.

Other management options proposed included:

- Creating deadwood habitats
- Constructing beetle bands and hibernaculae for amphibians
- Wildflower planting, sowing and bulb planting
- Erection of bird and bat boxes
- Edge pruning along path corridors
- Pruning and brashing of woodland edges.

IMAGES ^ >

1 View of existing woodland east of Kirkland Dam
2 Example of mixed native planting west of Kirkland Dam
3 View of wet woodland west of Burn Mill Dam (Image credit: Forth Rivers Trust)
4 Photo of agroforestry at Glensaugh Farm (Image credit: James Hutton Institute)

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2. Planting of new mixed native woodland

There is also significant scope to expand the overall area of woodland in the Leven valley through new planting. This would not only help realise a robust landscape that addresses climate change and enhances environmental sustainability, but also reconnect fragmented sections of the river valley woodland structure, enhance habitats and create beautiful habitats for both wildlife and people to enjoy.

Woodland areas are more effective and have more impact when they are large. The expansion of existing woodland and new planting will significantly add to the already sizeable 46ha of woodland in the river valley. This could provide a great opportunity to engage with the community. As such, Iglu Studio have developed a series of Habitat Toolkits including one for woodlands, which will be used to facilitate discussions with locals to determine the most suitable sites, species and how they can get involved.

New woodland blocks should have a complex structure of layers starting from the canopy down, made up of the tallest (or climax) species, a lower shrub layer with plenty of structural complexity and finally a field layer with shade tolerant specialist woodland plants including ferns, bluebells and wood anemone. Dead wood is a key woodland habitat and will be retained. In addition, woodlands will be created to provide food and shelter for bats and birds, and where possible to make conditions attractive for lost species such as newts, owls and red squirrels.

9 MASTERPLAN | PRIMARY FRAMEWORK LAYERS - GREEN NETWORK [Illustrating the proposals]

3

Wet Woodland

Wet woodland is deciduous woodland often found on floodplains and as small patches within larger wooded areas when damp ground is colonised by species such as willow, birch and alder. Whilst wet woodlands can be sensitive to changes in climatic conditions, the masterplan proposes to create wet woodland areas on the southern side of the river to accommodate flooding within the valley and act as a natural management technique to mitigate erosion and improve water quality.

In addition wet woodland is an extremely rich habitat for invertebrates, supporting a large number of species particularly associated with willow, birch and alder. Unfortunately due to clearance and land use conversion there has been a considerable loss of wet woodland habitat in Britain during the last century. Therefore the realisation of a strong and healthy wet woodland within the valley is seen as a key element to increase biodiversity in the River Park.

The wet woodland will be implemented through a gradual and sensitive management process, removing and substituting existing trees in poor condition with new wetland species. It is crucial to maintain a diversity of species, sizes and age classes of trees and shrubs. This will encourage complexity in the structure and species composition of the ground vegetation.

It should be noted that retaining significant quantities

4

of standing and fallen dead wood is essential, along with controlling the spread of invasive and non-native trees and shrubs. In addition, a mosaic of sub-habitats with bare mud or peat, level and higher moss-covered areas are important for many wet woodland insects and invertebrates as they provide spaces to retreat if water levels rise.

Wet, boggy habitats are very fragile and easily damaged by trampling, so it is proposed that access to and through the wet woodland areas would be via boardwalks or raised platforms in order to minimise or avoid disturbance.

Agroforestry

Agroforestry is the integrated use of trees on a farm or small holding for a wide range of benefits. It is referred to as silvopastoral where livestock is managed and silvoarable where crops are grown.

As noted earlier, the Scottish Government has set statutory targets for the reduction of GHG emissions in Scotland through various measures including increased woodland cover. This increased woodland cover includes the expansion of agroforestry in Scotland.

In line with this principle, an area of approximately 15.4 hectares of existing agricultural land at the north western end of the River Park is proposed for adaptation to agroforestry.

The proposal was conceived as a community / social based scheme that would look to evolve the current commercial agricultural landscape to one that provides for local community food production, a key aim of which would be local jobs and training, including apprenticeships. In addition, a number of external factors support the introduction of agroforestry: localism resulting from Covid_19, Brexit, and Climate Change, which the National Farmers Union sees as the challenge of the time (Business Green, Michael Holder, 21 May 2020). Agroforestry would provide a number of environmental benefits similar to those identified in a recent report by ClimateXChange Scotland (Scotland's centre of expertise connecting climate change research and policy) titled 'Agroforestry in Scotland – potential benefits in a changing climate 2018.'

The potential benefits of increasing the use of agroforestry practice in Scotland, include,

- Facilitation of climate change mitigation through carbon capture
- Improved animal welfare
- Improved ecological condition, especially of soils and water courses
- Reduced pest load due to natural predation
- The 'legacy' effect of leaving land in a better ecological state for the next generation
- Improvement of the visual landscape
- Nutrient retention and nutrient cycling
- Landscape (woodland) connectivity and biodiversity improvement, generating new opportunities for wildlife.
- Cost savings
- Income generation

More species of insects and a greater abundance of insects are found in agroforestry than in conventional agriculture. The same applies to birds, with more species (both open-field and woodland bird species) and a greater abundance recorded in agroforestry systems.

Whilst Iglu Studio have been researching agroforestry schemes in Scotland including the research being carried out by the James Hutton Institute at Glensaugh Farm (see image 4) in Aberdeenshire there is a great deal of further research to be carried out and importantly conversations with landowners and the wider Levenmouth community.

Tiny Forests

Tiny forests are based on forest management methods developed in the 1970s by Japanese botanist Dr Akira Miyawaki. The trees are planted at high density, at a rate of around 3 trees per square metre, essentially mimicking nature. When a gap appears in a natural forest, tree seeds will germinate quickly in response to the new opportunity and then compete, shooting up to grab the light. This approach leads to a density of growth which captures a lot of carbon and which is impenetrable, excluding people to the benefit of wildlife.

"Scientific modelling has shown that four years after planting, one tiny forest will grow up to five times faster and absorb up to 30 times more carbon compared with traditional monoculture tree-planting schemes; attract more than 500 species of animals and plants; process 30,000 litres of rainfall; improve air quality through dust reduction; and reduce noise and heat."

Catherine Early, Yourweather.co.uk, March 2020 – Small is beautiful – tiny forest promises big wins for environment

This thread is ongoing with members of the Green Network workstream from NatureScot, FRT and Iglu in communication with the charity Earthwatch, the only UK partner of IVN, the organisation leading the tiny forest movement. While the preference would be to collect tree seed from a range of native species in the area and grow them until they are large enough to plant out, native saplings and whips could be sourced from local nurseries. The proposal is that the tiny forest(s) would be a community-led project; from site selection, to planting and subsequent maintenance of the trees, at least for the first couple of years. After that it is hoped that the trees can then be left to create a perfectly formed mini-forest.

The UK's first 'tiny forest' was planted in early 2020 in Whitney, Oxfordshire, led by environmental charity Earthwatch and Whitney Town Council.

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Grassland

Whilst the river valley includes a wide range of habitats, (See Phase One Habitat Survey on page 21), a significant proportion of the area consists of amenity grassland. Amenity grassland is essentially areas of closely mown grassland which are both labour intensive and poor for biodiversity with no structural complexity. Whilst they provide spaces for play and recreation, there is little scope for natural play or educational programmes.

The masterplan presents the opportunity to re-naturalise some areas of amenity grassland and subsequent conversations should be held with community groups to explore how these areas can be improved for wildlife and people. To help facilitate these conversations, an ecological Habitat Toolkit booklet was created as part of the production of the River Park Concept Design Masterplan. It includes a chapter which outlines the significance of naturalised grasslands and provides step by step illustrations to enable the community to create and establish wildflower meadows.

9 MASTERPLAN | PRIMARY FRAMEWORK LAYERS - GREEN NETWORK [Illustrating the proposals]

2

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4

< ^ **IMAGES**

1 View of existing renaturalising grassland near Kirkland Dam
2 Birdsfoot trefoil wildflower found throughout the River Leven valley
3 Meadowsweet wildflower found throughout the River Leven valley
4 Yellow flag wildflower found throughout the River Leven valley

Wildflowers

One of the striking aspects about the existing landscape of the river valley is the array of wildflowers already within the river valley. The Green Network team have been engaged in discussions with the Grounds Maintenance Service team at Fife Council (FC) to understand the intent and goals of the current maintenance programmes, and to develop a focused programme to support the establishment of wildflower meadows within the River Park.

The creation and management of native wildflower meadows can significantly contribute to the delivery of public body duties on biodiversity and climate change, and with Scotland having lost 97% of lowland wildflower meadows since WWII the River Park presents a great opportunity to reverse this loss and create new meadows.

Wildflower meadows have a range of benefits including,

- Long-term cost savings
- Carbon sequestration and reduced emissions due to less use of machinery. (Potential to sequester twice as much carbon as forestry)
- Biodiversity benefits more species than amenity grass
- Potential for energy production from biomass of cuttings
- Health benefits
- Community involvement and partnership working
- Potential for related activities around flowers including skills development, learning and education

Despite these benefits, successful establishment and management of the meadows could depend on community support. The maintenance regime should be flexible with clear lines of communication between FC and the community. The project team see the creation of wildflower meadows as an opportunity to get young people involved to learn new skills and boost job prospects. Creating meadows is a great way to engage people with the environment at a time when many seem to be separated from it, to profit from the health and well-being benefits, and to provide opportunities for people to learn about meadows and their local wildlife.

Pollinator corridors

The Green Network (GN) workstream, in conjunction with BugLife, has developed a network of proposed pollinator corridors to improve biodiversity through a connected system of greenspaces which includes roadside verges, arable land, school grounds, parks and the river valley itself (see page 17).

The River Leven valley is seen as one large pollinator corridor, potentially forming the core of the network due to its diversity of habitats. To and from the river valley, the proposal could create up to approximately 32km of pollinator routes, many of which will overlap with the proposed Active Travel Network throughout Levenmouth.

Within the river valley the range of habitats considered for the creation of pollinator corridors includes wet grassland, species-rich grassland, rough grassland, woodland and tree-lined avenues, meadows, open mosaic habitats and south facing banks. Areas out-with the river valley included schools and park grounds, roadside verges and paths adjacent to arable land.

The creation of the corridors is seen as a community-based programme involving engagement with local schools, groups and organisations, training them in activities such as digging and turning soil, scattering seed and planting hedgerows, fruit tree whips and plugs. Some maintenance will be required, and volunteer groups will be invaluable in looking after their respective 'patches.'

It is suggested that a legacy organisation or a social enterprise, perhaps a Friends of the River Park group be established to develop and maintain the pollinator routes. If this was achieved it is hoped that other traditional methods of grassland management such as scything could be offered for long term volunteers. This would also help with interpretation, training and branding to create a local feeling of shared ownership and reduce the risk of vandalism.

River Park
The Rail Line

Legend

Reinstated rail line

Proposed footpath / Existing footpath to be upgraded

1. Proposed footpath on A915
2. Proposed car park and bus stop / turning area - 150 spaces
3. Proposed waiting shelters with station footbridge and lift access
4. Proposed waiting shelters
5. Proposed car park and bus stop / turning area
6. Existing footpath to be upgraded

Note: The proposals set out above are indicative based on most recent Network Rail concept designs (as of September 2021)

9 MASTERPLAN | PRIMARY FRAMEWORK LAYERS - THE RAIL LINE [Illustrating the proposals]

Rail line

Network Rail's concept design proposals for station layouts at Cameron Bridge and in Leven itself have been shared with the Levenmouth community as part of a consultation exercise in June 2021 (highlighted in the map on page 68). Further detailed design development, Stage 3, will continue in 2022 and be fed into the masterplan.

The route of the new rail line is proposed along the route of the former railway. There will be adjustments necessary to ensure that the new line accords with current guidance on horizontal alignment. In preparation, works along the existing line have included the removal of existing trees, in line with discussions between Network Rail and Forth Rivers Trust. The removed trees have been chipped and used locally, and currently there is a future programme of woodland and tree replanting works within the River Park area into which the Green Network workstream and Iglu are already inputting recommendations.

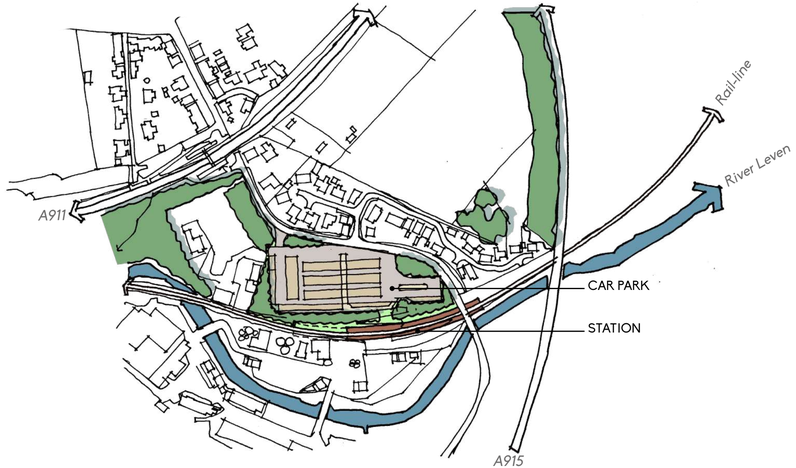
Stations

"Railway termini are our gates to the glorious and the unknown. Through them we pass out into adventure and sunshine, to them, alas! we return". E. M. Forster

Prior to the two Option 4 train station locations being finalised for both Cameron Bridge and Levenmouth, Iglu Studio collaborated (along with the wider Leven Project team) with Network Rail to assess the options available, of which there were twelve options and variations.

Network Rail consultants, Atkins, produced optioneering reports for station layouts in January 2020, and February 2020, with eight and twelve options respectively. The optioneering process looked at a range of determining factors including,

- Connectivity
- Accessibility
- Catchment Area
- Land availability
- Stakeholder requirements and feedback
- Engineering
- Constructability
- Maintainability
- Functionality



^ *Cameron Bridge Station - Option 3 - 3a & 3b Former Station Site Option - February 2020*

As part of the masterplan development process Iglu Studio produced a supporting document Rail Station Options - Masterplan Considerations which assessed all twelve options (see example Option 3 sketch layout above) through the lens of the River Park Masterplan. This process involved looking at factors such as flooding, connectivity and sustainable travel, proximity to residential neighbourhoods, landscape architecture, ecology, and urban design. A series of existing and proposed diagrams considered the general positive (+) and negative (-) factors as well as more specific detailed elements such as bridges and crossings. Iglu Studio also included alternatives where it was felt appropriate.

In addition to an assessment of the proposed station locations Iglu Studio considered the potential design of the stations, highlighting a selection of leading precedent examples (see adjacent page) along with the features and implementation required. An initial list of facilities that should be considered as part of the station development includes,

- Toilets
- Ticket points
- Charging points
- Cycle stands
- Information points
- Wi-fi
- Work stations
- Lighting, seats, bins etc
- Delivery lockers

9 MASTERPLAN | PRIMARY FRAMEWORK LAYERS - THE RAIL LINE [Illustrating the proposals]

"There's something about the sound of a train that's very romantic and nostalgic and hopeful".

Paul Simon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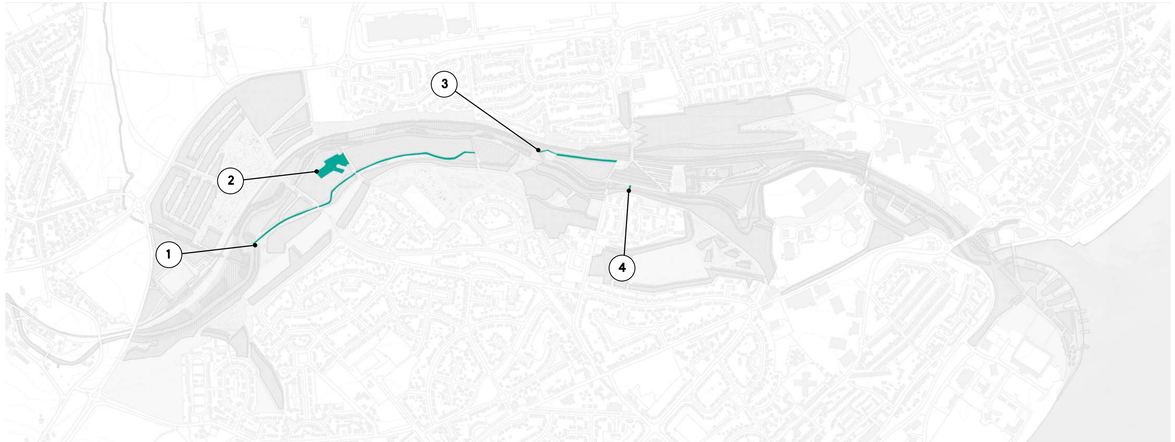
IMAGES >

1 *Fish Market, Bergen, Norway*
2 *Tunnel Hoop, Kew Gardens*
3 *Dieser Helsingborg, Germany*
4 *Promenade Samuel de Champlain, Canada*
5 *Kohta Train Station*
6 *Waiting area, Barneveld, Holland*
7 *Tram stop Alicante*
8 *Bus stop*
9 *Bus shelter, Aachen, Germany*
10 *Metro station, Lusanne, Switzerland*
11 *UCCA Dune Art Museum, China*
12 *Barnevald Noord Station, Holland*



River Park Heritage

Legend

1. Re-opened historic lade with accessible for all path
2. Site of the former Methil Mill
3. Former Burn Mill Dam lade
4. C-listed footbridge from former Kirkland Works dating from the late 19th century

HERITAGE

The elements highlighted in the map above provide a starting point to reference the visible historic traces remaining in the River Park area.

As described previously in the Primary layer pages on the river (p48-53), the re-opening of the former Methil Mill lade which connects from the Kirkland Dam to the Methilhill wetland will both divert excess water runoff into the wet woodland and provide an interpretative boardwalk route where visitors can learn more about the history of the lade and the mills it serviced.

The site of the former Methil Mill includes old stone work and hardstanding which appear to map out the footprint of the buildings. As a secluded yet open area of the river valley this area would be ideal for a heritage intervention. This could take the form of drystane dyke seating which maps the building footprint. This reference to the industrial heritage could be complemented with associated hedgerows as a nod to the natural heritage of both the valley and the agricultural fields of Fife.

There is an inaccessible C-listed footbridge which formed part of the Kirkland Works, the re-opening of this bridge to connect with the active travel network would bring it back into use as a useful shortcut across the river.

The heritage strategy is an ongoing thread with many new ideas emerging from the recent NHLF bid workshop session which included representatives from many of the Leven Project partner agencies. This thread will be continued into 2022 with particular emphasis on engagement to extract the stories and memories of locals who used to frequent the river valley.

9 MASTERPLAN | PRIMARY FRAMEWORK LAYERS - HERITAGE [Illustrating the proposals]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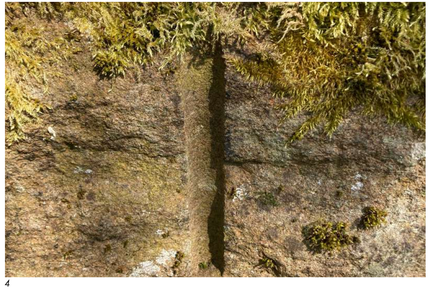

4

^ IMAGES

1-4 The site of the former Methil Mill

Introduction

Levenmouth's industrial heritage of mining, mills and the rail line presents an opportunity to tell the story of the area, not to eulogise it, but to frame it from the perspective of the community through their lens and their stories.

The Collapsing of Timelines graphic and Flow / Lines concept sketch in the design narrative on pages 42-43 reveal the footprint of the industrial past within the river valley. Having mostly been lost, removed or buried, the majority of these traces are invisible though the land endures.

Hidden History Trail

Through a similar approach to the National Trust for Scotland's Kiltyrie Hidden History Trail in the Ben Lawers Nature Reserve, we are keen to tell the stories of the people who lived along the banks of the river, who crossed the river, made their living from the river and how their lives have been connected to the Leven, the adjoining land and the sea.

One of the remnants of the former industrial past is the former lade stretching from Kirkland Dam to the wetland at the Burn Mill Dam. Careful re-opening of the lade will not only provide an opportunity to establish a heritage trail along the southern flanks of the river but also mitigate future flooding.

Local vernacular

Further to the research, digs and investigations to be carried out by Fife Council and Historic Environment Scotland, revealing the local vernacular should be complemented by conversations with the community.

Perhaps we will hear stories of the dramatic changes to the river and peoples lives in the past, their current relationships with the river, and their aspirations and hopes for the future. A storybook of the River Leven telling not just the tales of the elite but everyday, local people.

1

As you stroll across the open grassland keep your eyes open for the grey heron. Listen out for the rustle of the majestic willows. Look down for the paw print of an otter in the mud, and suddenly you are on a journey into the past on a trail that tells of Levenmouth's hidden heritage, subtle details of lives and places you would not know unless the buried detail and features of the landscape told you the story.

^ > IMAGES

1 Excavation at Ben Lawers for the Kiltyrie Hidden History Trail
2 Sculpture Garden at the Kröller-Müller Museum

9 MASTERPLAN | PRIMARY FRAMEWORK LAYERS - HERITAGE [Illustrating the proposals]

2

Interpretation

Access for all should be a fundamental principle for any heritage interpretation. The development and design process will involve people of all abilities, all ages, and all levels of familiarity and knowledge about the river valley. It is important to extend the invitation as widely as possible from the start of the process.

Our initial approach to introduce heritage references within the River Park does not involve traditional interpretation panels. Even if interesting they can be counter-productive and age quickly if sited incorrectly and constructed with sensitive materials. More significantly, interpretation panels can be seen as creating cultural homogenisation, and a loss of the individuality of the river. To counter this the intention is to weave information into the structures, the features and spaces of the landscape. This can take a range of forms, perhaps where stories are laser cut into the metal balustrade of a bridge, or engraved into the timber façade of a birdhide. Perhaps it will involve 'old school' leaflets or 'new school' QR codes for your smart phone.

Interpretation is not seen as a one-way process. It is hoped that users of the park will contribute and feed in to interactive maps or websites such as Slowways, https://slowways.uk/, a new website created by walkers who contribute information to establish a network of walking routes using existing footpaths to connect all of Great Britain's towns and cities as well as thousands of villages.

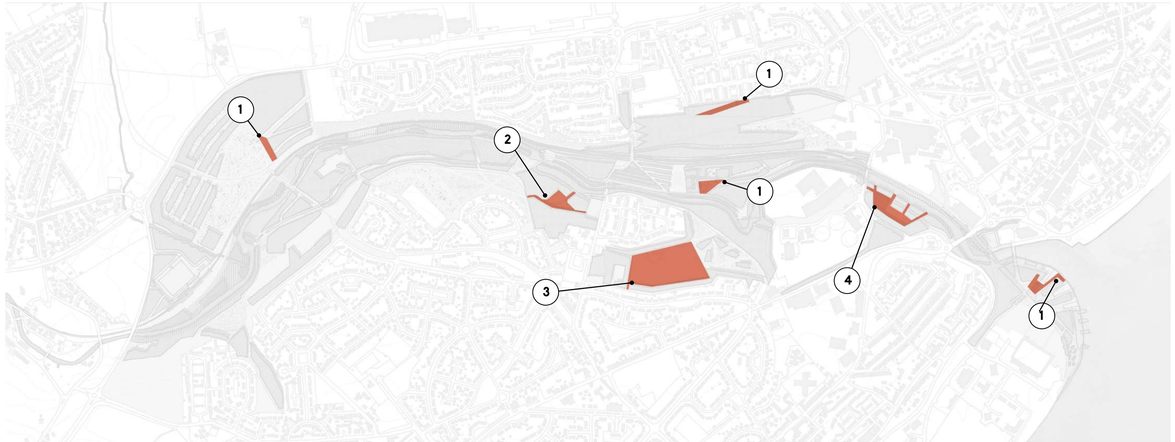
Interpretation will include a process of evaluation to sense check that it is effective or requires tweaks to meet agreed objectives. Ultimately though we want people to think for themselves. Part of this process will be the need to stimulate all the senses where possible. What can people see, hear, feel, smell and taste? What can people take away and what will they remember from visiting the River Park?

Landmarks / Sculptures

Throughout the development of the masterplan, ideas for sculptures and landmarks have been part of the conceptual process. From discussions with Scottish Canals about the Kelpies and Helix Park at Falkirk to the on-going proposals of the breaching whales at the river mouth.

The River Park presents opportunities to incorporate sculptural content, monuments and landmarks within the landscape. Recent global events have shown that the inclusion of monuments is a complex and difficult process but the inclusion of artworks and sculptures that reflect the people and place, record heritage and realise cultural assets, can be a good thing to reinforce identity, as well as provide a cultural draw to Levenmouth.

One inspiring example of this is the Kröller-Müller Museum (see adjacent image), the national art museum and sculpture garden in Otterlo in the Netherlands. The museum and art gallery house famous works of art set in a park that covers 5,500 hectares of woodland, heath, and grasslands. A place where anyone is free to roam on foot or bike and a great precedent example for the River Park.



River Park
Play

Legend

1. Natural play opportunities alongside path infrastructure
2. Area with play mounding
3. Potential for multi-purpose sports low grass pitches
4. Iron Brig Garden play equipment based on large circular elements visible in nearby industrial yard

PLAY

Natural play opportunities will be integrated alongside the primary and secondary river park routes as part of the Sustrans Places for Everyone funding. It is envisaged that each garden area will have some elements of play provision included.

This is an ongoing thread which will be further explored and developed during detailed design in 2022.

9 MASTERPLAN | PRIMARY FRAMEWORK LAYERS - PLAY [Illustrating the proposals]

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^ IMAGES

1 The industrial yard opposite the Iron Brig
2 Still from the Journey through the River Park highlighting a proposal for play elements based on the nearby context

Introduction

Play is a core driver of the proposals for the River Park. It is the intention to maximise the natural opportunities that the site offers, to be inclusive of all abilities, ages and all levels of familiarity, and as such it is vital to involve the right people in the process from the start: the community, social groups, schools, parents, care givers, Fife Council, other stakeholders, and most importantly children.

Play provision will accord with guidelines from Play Scotland[1] and other policy guidance to ensure safe and secure play without stifling inventiveness, inquisitiveness, and exploration. Play is intended to be fun, but also to be educational, contribute to life lessons, and crucially create confidence, a sense of purpose and a feeling of comfort. Children learn by doing, exploring and experiencing the world around them and to this end the ambition is for all children and young people to enjoy high quality play opportunities within the river park. Play which is stimulating, that provides access to nature, and contributes on a daily basis to learning, whether in childcare, nursery or school.

At the time of writing this report during the Covid-19 pandemic, it is even more important that the mental well-being of children and young adults is at the forefront of decisions made and actions realised. Children who play outdoors more often have better social networks, are more confident and are more involved in their local communities. The Play Scotland website outlines research evidence demonstrating "that playing is also central to children's spontaneous drive for development, and that it performs a significant role in the development of the brain, particularly in the early years. Play and recreation facilitate children's capacities to negotiate, regain emotional balance, resolve conflicts and make decisions."

Whilst all children and young people have the right to play and the right to learn (enshrined in the UN Convention on the Rights of Children), providing quality open and green spaces for children to explore and spend time outdoors appears to be more challenging than ever. The River Park though, can provide a vast range of opportunities, offer an unrestricted invitation to play outdoors and enhance learning so that children's health, well-being and development can thrive. With the input of the community, stakeholders and children themselves, diverse green spaces and landscapes that empower playing and learning can be realised.

1

To realise these intentions and aims, the Concept Design Masterplan has two core aspects to the play strategy: firstly, a series of fixed (more formal) play areas, or stations, that help to give a sense of structure, legibility and coordination, and secondly a series of small, informal natural play opportunities alongside travel routes that connect neighbourhoods and schools.

It should also be noted that initial conversations have been had with Inspire Scotland to explore possible avenues for collaboration.

IMAGES ^ >

1-2 Playmounds and natural play areas at Draper's Field, London
3 Children playing on grassy parapet at Parc du Grand Pré, Brittany, France

REFERENCES

1 https://www.playscotland.org/play/playful-learning/outdoor-play-and-learning/

9 MASTERPLAN | PRIMARY FRAMEWORK LAYERS - PLAY [Illustrating the proposals]

"Wherever they live, children and young people of all ages and abilities should be able to play outdoors, in a variety of ways, in high quality spaces, within sight of their homes, or within easy walking distance, where they feel safe whether or not they are accompanied by adults."

Getting it Right for Play: The Power of Play.

2

3

Natural Play

The design of play has changed radically over recent years moving away from static, fenced, fixed equipment play parks that are inflexible and costly to maintain. The increasing use of natural materials, undulating surfaces and imaginative landscaping has allowed children and young people to experience irregularity and develop the skills and abilities necessary for assessing physical risk.

Natural features and spaces allow freedom of expression where trees, rocks and water provide the canvas to learning everything from seasonality to engineering. Who of a certain age has not learnt to build a dam in a burn, or to set up home in a house of branches, twigs and leaves? Play Scotland identifies that the presence of natural features has a positive effect on children and young people's social contacts, concentration, self-control and ability to deal with stressful events.

Natural environments also have the innate ability to be flexible, to change over time, offering opportunities for imaginative, creative, dynamic, social and decision-making play that change and evolve as the child does. This also offers benefits to those supporting, funding and maintaining play spaces as equipment can be replaced with minimal cost, on a regular basis and remain relevant to changing economic and societal factors. It certainly negates the current malaise of the often blandness of existing play facilities which offer few opportunities for exploration and imagination for children to stretch and challenge themselves.

Children often want to play outdoors but the reality of Scotland's unpredictable weather can limit opportunities. Therefore a range of natural play spaces is essential, some with safe shelter, some without, that can be flexible to accommodate changing climatic, residential and education patterns.

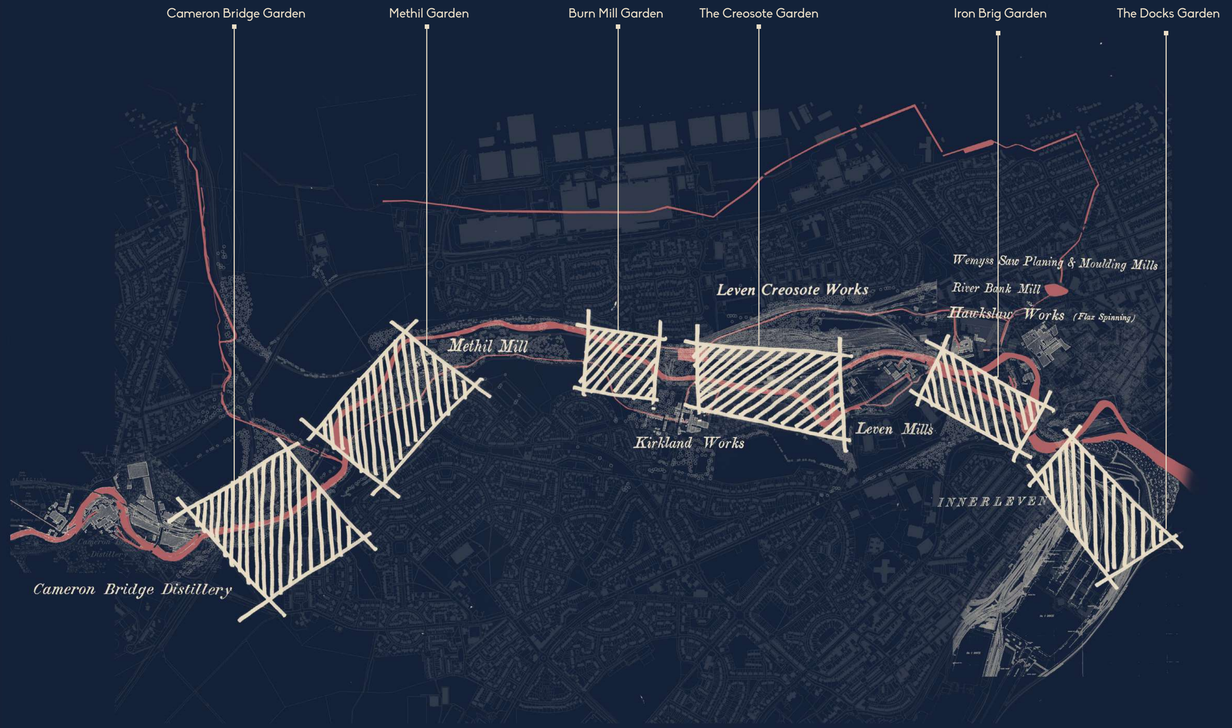
Community Co-Design

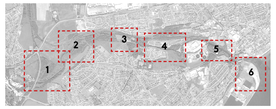
We use co-design here in a broader sense to refer to the creativity of designers and people not trained in design working together in the design development process.

The project team understand the importance of working with the community and this is no different when designing and developing play spaces. We are keen to work with locals both within and out-with the River Park. The proposed Iron Brig Garden presents a great opportunity for co-design to develop a major play space, a focus for community events and activities, similar to the Baltic Street Adventure Playground in Glasgow.

It is also true that children's outdoor play commonly takes place in the streets and open spaces nearest their homes, so it is essential to work with the community beyond the river park and to connect the river park to residential areas to ensure the safe movement of children. Safe movement from street to play space is good for friendships, socialisation, developing independence and learning about risks or challenges as children benefit from not just the physical exercise but also healthy social interaction.

A linear river park containing six gardens





1. Cameron Bridge Garden site

3. Burn Mill Garden site

5. The Iron Brig Garden site

2. Methil Garden site

4. The Creosote Garden site

6. The Docks Garden site

Existing Situation

Overview

Habitats

The approximately 9 hectare woodland plantation to the north of this area is between 20 to 30 years old with a good mix of native species. The semi-natural riparian woodland contains many large, mature trees. There are also significant areas of dense scrub and a stretch of marshy grassland which is classified as an otter protection area. The River Leven itself flows through this area.

Character

This area within the river valley is arguably the least accessible of the six areas of focus, subsequently with the least evidence of current human use. The character fluctuates from a narrow, dense, steep, sunken and shady woodland to a busy A road and overpass. The river itself is partially hidden from view from the southern riverbanks.

Constraints

The steep southern slopes have heavily degraded whindust paths with limited room for widening the walkway. The A915 is a very busy road linking St. Andrews and Kirkcaldy. The otter habitat on the northern edge of the riverbanks should be protected during any construction works. The re-opening of the rail-line and subsequent rail corridor will limit the public space available.

Opportunities

The dense riparian corridor has been left unmaintained for many decades and presents a significant landscape feature to protect and enhance. Similarly, the area of otter habitat is of particular ecological importance and any design moves should avoid any disturbance. The installation of a new train station within this area means it will be a key arrival point for visitors and as such needs to be well connected with the river park and the path network.

Site photos

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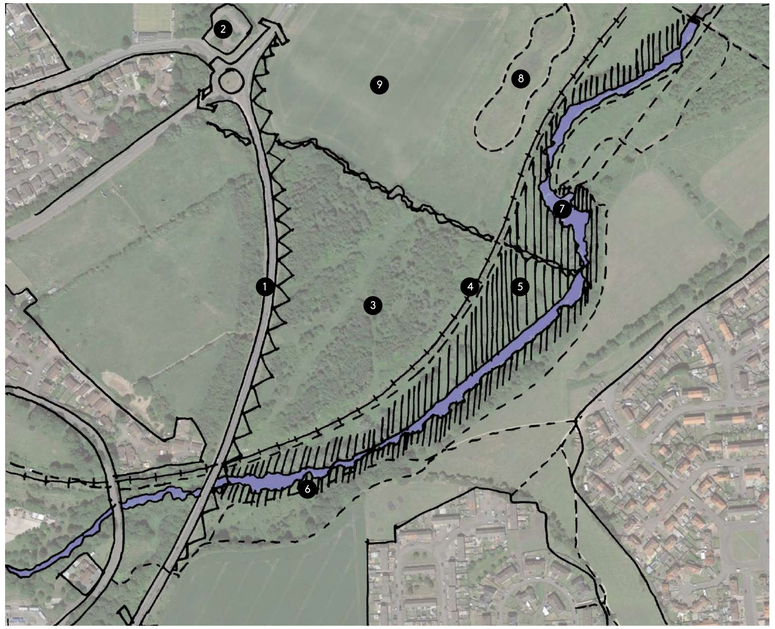
^ IMAGES

1 The current pedestrian crossing across the A915
2 Dirtpath above southern river bank
3 Birch forest to east of A915
4 View of Kennoway Burn from rail-line bridge

Existing Situation

Overview



EXISTING SITUATION ZOOM

Legend

- **Key ecological features**
- **Informal path network**
- **Disused rail-line**
- **Physical barrier**

1. Main road A915 and vehicular bridge
2. Windygates car-park
3. Semi-mature mixed woodland plantation
4. Disused Levenmouth rail-line
5. Otter protection zone
6. Steep embankment/river edge and woodland
7. Kirkland Dam
8. Suds feature
9. Arable land

Cameron Bridge Garden - Case studies

1. Lund Institute of Technology (LTH), Lund

Relevance: The relevance of this project is very much focused on the way the designers at LIT addressed the water's edge of old clay quarry pits, whose rims have steep drops, almost vertical, creating new social spaces and hubs. The concept was to make the steep edges to the water accessible, creating socially attractive places and promenades, to sit, watch and enjoy the views with friends and colleagues. The steep embankments have a resonance with the southern slopes of the River Leven and the introduction of a cantilevered walkway and platforms could provide opportunities for moving along the rivers edge, as well as 'look outs' through the trees.

2. The Burnley Bouldering Walk, Melbourne

Relevance: A hidden gem in Melbourne, is the inspiration for activating the unused spaces of the Cameron Bridge area. Located underneath the city link motorway, is an oasis of fun and activity through a series of climbing walls (3No) built as part of the infrastructure and offering a free training ground. The walls are accessible by path, cycle, bus and car. The walls offered opportunities and ideas for how the western gateway (under the A915) could be handled and designed.

3. The Landscape Therapeutic Park, Brilon

Relevance: The Landscape Therapeutic park in Brilon is of particular interest for the Cameron Bridge Garden with its contrasting spaces of open meadow and steep forest slopes, beautiful trees, fragrant flower meadows and hilly grassland. The use of recurring elements such as comfortable benches, the colour red and explanatory lettering help to provide unity, a sense of place and directionality for users of the park. The image adjacent (3) illustrates how paths are marked to orientate travellers and also provide informal resting opportunities.

4. The Chronograph Museum, Rezé

Relevance: The museum was designed to act as a beacon in the local landscape and has been staged on three different levels: the ground and first levels dedicated to exhibitions and public entrance, and the top terrace and belvedere which enable the visitor to read and understand the wider landscape.

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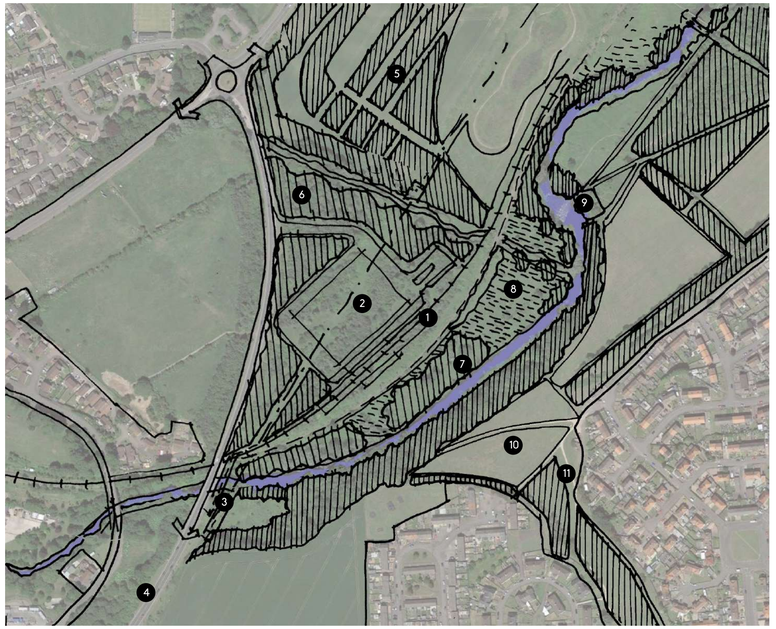
1 Lund Institute of Technology, Sweden
2 The Burnley Bouldering Walk, Australia
3 The Landscape Therapeutic Park, Germany
4 Le Chronograph Museum, France

Concept Design Proposal

Overview



Key moves

1. Reconstructed rail-line, re-aligned with new train station at western end of site.

2. Train station car park to be 'fitted' within existing woodland block.

3. Proposed pedestrian bridge connected with train station and housing to west and south.

4. Improved crossing along A915

5. Agro-forestry adaptation from arable land

6. Existing woodland block to be reinforced with new planting/structural green framework

7. River edge/embankment reinforcement and enhancement with new planting

8. Enhance existing otter protection area, reconnect to the floodplain

9. Upgraded viewing platform at Kirkland Dam

10. Wildflower meadows as open welcoming space

11. Tiny forest to build on existing woodland stands on the edges of the amenity grassland and provide continuous habitat connectivity with CLEAR Buckhaven orchard/hedgerow proposals to the north-west of Levenmouth Academy

Existing situation

Overview

Habitats

The Methil Garden encompasses an area which includes neutral grassland, marshy grassland, amenity grassland, both semi-natural and plantation broadleaved woodland and the River Leven itself.

Character

This area feels almost rural compared to other stretches of the river valley with only fleeting glimpses of the A915 and housing at Mountfleurie visible from the riverside.

The character of the area fluctuates between peaceful and enclosed grassy riverside verges to dense wet woodland and large open mown grassy spaces within the parkland next to the housing on Poplar Road.

Constraints

The Kirkland Dam presents a significant fish barrier. There are no existing formal paths in the area, all routes are either mud or grass tracks which acutely limit accessibility for people who use mobility aids.

Opportunities

This area provides great opportunities to access the river up close and appreciate the sense of being "in nature." There is an opportunity to reference the existence of the former Methil Mill, the footprint of which is still visible within a small clearing within the woodland.

Site photos

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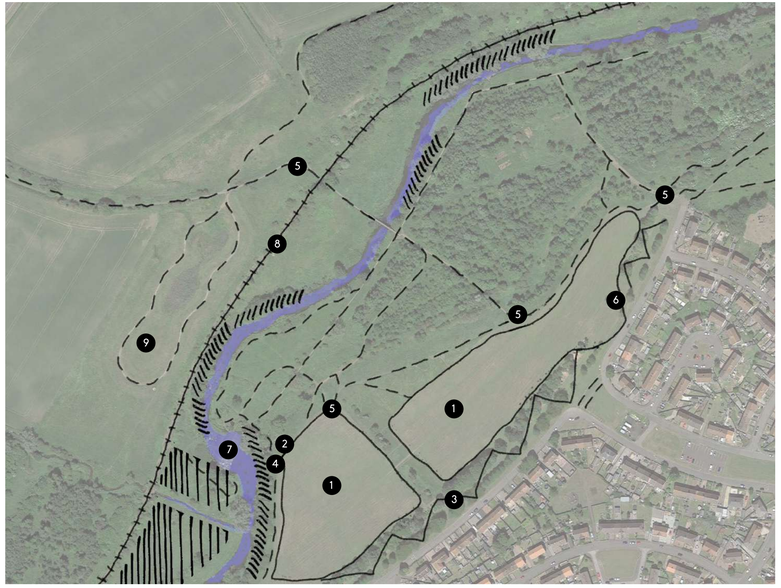
IMAGES

1 The river's edge
2 Existing pedestrian bridge
3 View south from bridge
4 View of existing tree rows adjacent to Poplar Road

10 AREAS OF FOCUS | METHIL GARDEN [Illustrating the proposals]

Existing situation

Overview



EXISTING SITUATION ZOOM

Legend

- **Key ecological features**
- **Informal path network**
- **Disused rail-line**
- **Physical barrier**

1. Large areas of amenity grassland
2. Degraded timber steps
3. Visual barrier
4. Steep slopes with dense riparian edge
5. Unofficial entrances
6. Fragmented woodland habitat
7. Kirkland Dam
8. Disused rail-line
9. Suds feature

Case studies

1. Queen Elizabeth Olympic Park, London

Relevance: This switchback path highlights good practice of a suitable gradient to provide access for all. The planting palette provides a physical buffer between the hard surfaces. Although this example is distinctively urban in character the principles can be applied to the proposed switchback path in the Methil Garden.

2. Grand Voyeaux Regional Nature Reserve, Congis-sur-Thérouanne

Relevance: The raised boardwalk example broadly outlines the aesthetic proposed for a river edge walkway (though the surface materiality may need to be more robust than timber, eg. perforated steel). The boardwalk would most likely be installed using screw piles which are literally wound into the ground - this will allow for both ease of removal at the end of its design life and the continuing flow of water beneath the walkway.

3. Parc de Lancy, Geneva

Relevance: This project illustrates how subtle interventions can indicate the presence of a hidden landscape feature, in this case a series of steps guide the visitor to a river hidden behind dense vegetation. Perpendicular to the river, the steps follow the curve of the valley and accentuate the morphology of the terrain.

4. Girona's Shores, Girona

Relevance: This project demonstrates how a bottom-up / co-design approach to landscape management can enable the swift installation of small scale interventions, how a differentiated maintenance regime can immediately improve biodiversity and introduce the practice of agroforestry at a relatively low cost and how hosting events and festivals with an emphasis on horticulture, land art and public art can expand opportunities for engagement with the community.

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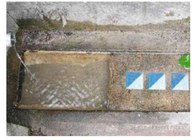

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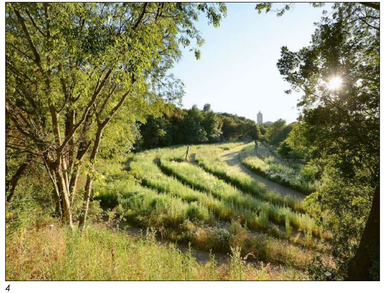

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1 Queen Elizabeth Olympic Park, England
2 Grand Voyeaux Regional Nature Reserve, France
3 Parc de Lancy, Switzerland
4 Girona's Shores, Catalonia, Spain

Concept Design Proposal

Overview

Key moves

1. Introduction of a switchback path will provide a smooth surfaced route at a gradient no steeper than 1:14, allowing access for all to the river's edge.

2. Re-opening the former lade will allow for periodic flooding to flow into the existing wet woodland with a series of raised boardwalks allowing visitors to explore. This move brings a new purpose for the lade whilst maintaining its historical significance.

3. Proposed native woodland planting to provide visual enclosure and connect existing habitats. Scatter log piles of removed, thinned trees from adjacent wet woodland to provide hibernaculum. *[Also potential for local productive urban forestry partnership between the community, Wemyss Estates and Donaldson's Timber Merchant]*

4. Mow broad paths through grassland and allow the rest to naturalise [Potential involvement of urban sheep flocks rather than mowing as a more sustainable means of maintenance]

5. New hard surface paths inbetween existing tree rows to create a distinctive promenade leading to the main entrance of the garden

6. New hard surface paths help to create a clear central entrance to the garden from Poplar Road

7. Extend rows with interspersed trees and hedgerows to provide continuous habitat for birds and bats

8. Formalise clearing of the area associated with the former Methil Mill with details to reference the footprint of the buildings [to be developed further]

9. Raised perforated steel boardwalk alongside river's edge provides a clear route for visitors to use without trampling grasses

10. Upgraded and widened bridge

11. New bridge/underpass/crossing required over rail-line [to be developed further]

12. Formalise desire line from Mountfleurie housing into key connecting pedestrian/cycle route with gateway feature

Existing Situation

Overview

Habitats

This area includes a diverse range of habitats. From the tall, scattered scrub on either side of the river (including the pollinating south-facing slopes) to large areas of broadleaved woodland and the only swamp habitat within the project boundary. There is also a significant area of amenity grassland at the foot of the southern slopes.

Character

The character of this area alternates from a secluded wetland space and tranquil riverside walkway to dense woodland. To the south the topography flattens out with a large open space of low meadow grassland. Generally the area is well used by the community for fishing and dog-walking.

Constraints

The Burn Mill Dam is a significant fish barrier which restricts upstream access. Flooding issues have been identified next to the existing wet woodland. Overall, the path network is mainly consituted of informal desire lines or poor quality materials with the pipeline walkway particularly narrow.

Opportunities

The unique wetland swamp provides a significant opportunity to enhance and protect. The area is a central meeting point of several routes and therefore lends itself to recreation and social activity. It is also a suitable location for a new bridge, potentially above the existing pipe. There are many secluded spaces within the woodlands which could be upgraded with raised boardwalks.

Site photos

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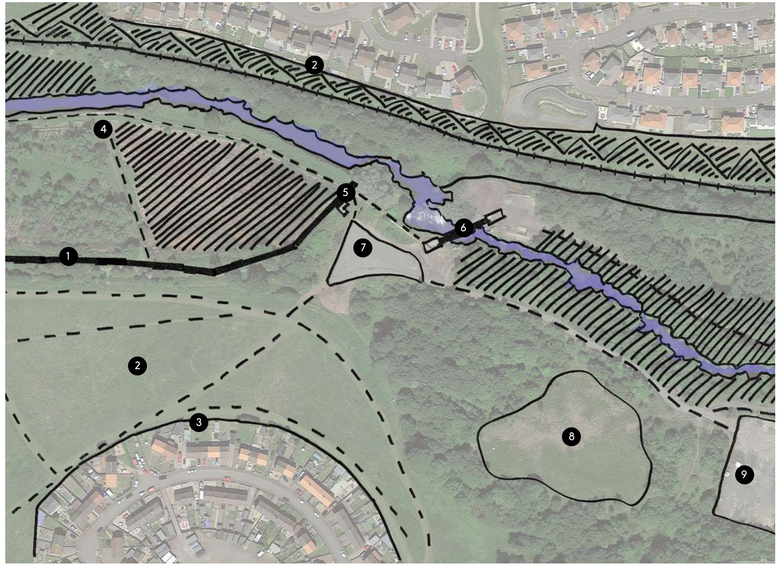
IMAGES

1 Burn Mill Dam
2 Flooded area between the swamp and the wet woodland
3 Bulrushes in the swamp during Spring
4 Narrow concrete walkway above pipeline adjacent to the river

Existing Situation

Overview



EXISTING SITUATION ZOOM

Legend

Key ecological features
Informal path network
Disused rail-line
Physical barrier

1. Former lade from Kirkland Dam
2. Area of amenity grassland
3. Backs of housing facing away from the river
4. Area prone to flooding
5. High barrier to step over (approximately 0.5m)
6. Pipeline
7. Poorly compacted whindust area
8. Area classified as ephemeral/short perennial disturbed land in Phase 1 Habitat Survey [former site of Kirkland Works]
9. Area classified as derelict land by Fife Council Vacant and Derelict Land Audit 2018 [also former site of Kirkland Works *steel foundry]*

Burn Mill Garden - Case studies

1. Parc du Chemin de L'Ile Nanterre, Nanterre

Relevance: The timber raised platform above this tranquil stretch of the River Seine was constructed primarily as a fishing spot, though it also acts as a resting spot where visitors can sit on the edge. The pool of water above the Burn Mill Dam has been identified as an ideal fishing location where a similar platform could be installed.

2. Half-Mile Line, Massachusetts

Relevance: The hand-made, in-situ raised boardwalk allows visitors to observe the previously inaccessible wetland, furthering shared knowledge of the merits of the habitat and increasing the likelihood of preservation.

3. Park am Gleisdreieck, Berlin

Relevance: This urban park in Berlin maintains the site's 'wild' aesthetic, which evolved from its previous use as a railway yard subsequently to a large post-industrial space, through the installation of minimal interventions. The adjacent image illustrates some of the key principles for the Burn Mill Garden: maintaining existing vegetation, providing new lighting, installing seating areas and upgrading surfacing.

4. Jock Marshall Reserve Nature Walk, Victoria

Relevance: The lightweight bridge structure incorporates seating, leaning rails and is wheelchair accessible. The tree trunk shaped mesh patterns on the corten steel balustrade panels reflect the purpose of the boardwalk - to protect the vegetation of the nature reserve below.

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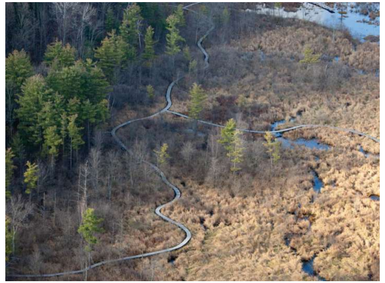

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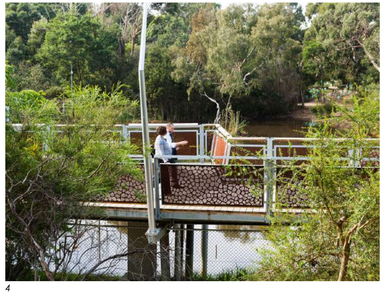

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^ **IMAGES**

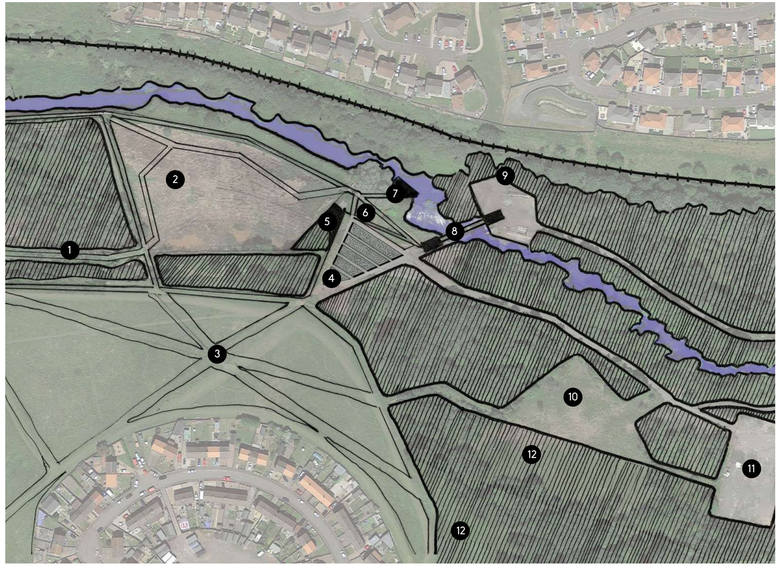
1 Parc du Chemin de L'Ile Nanterre, France
2 Half-Mile Line, Massachusetts, USA
3 Park am Gleisdreieck, Germany
4 Jock Marshall Reserve Nature Walk, Australia

10 AREAS OF FOCUS | *BURN MILL GARDEN*

[Illustrating the proposals]

Concept Design Proposal

Overview



Key moves

1. Re-connected lade (from Kirkland Dam) with associated raised boardwalk through wet woodland, opportunities to create new wetland ponds

2. Raised boardwalk above swamp with resting spots and educational engravings to share knowledge of wetland habitats

3. Reorientate mown grass paths to connect to new path network

4. Central plaza space with renaturalising grassland borders and 2m wide mown paths between, key connecting area with long 5m seating benches for pedestrians and cyclists to take a break

5. Green roof structure to provide shelter and hang-out spot for local young people

6. Switchback path to allow access for all down to the river's edge and the fishing platform

7. Timber deck raised platform across still pool above the Burn Mill Dam for fishing and relaxing

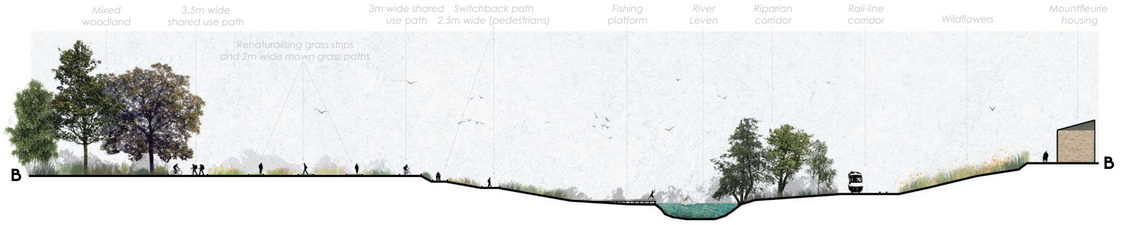
8. New pedestrian bridge above the existing pipe

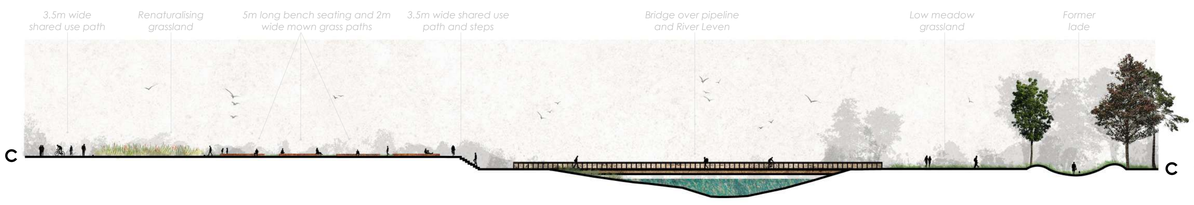
9. Reference former lade *[detail to be developed]*

10. Natural play area with mounding, tunnels, climbing walls *[detail to be developed with reference to former industrial use as Kirkland Works]*

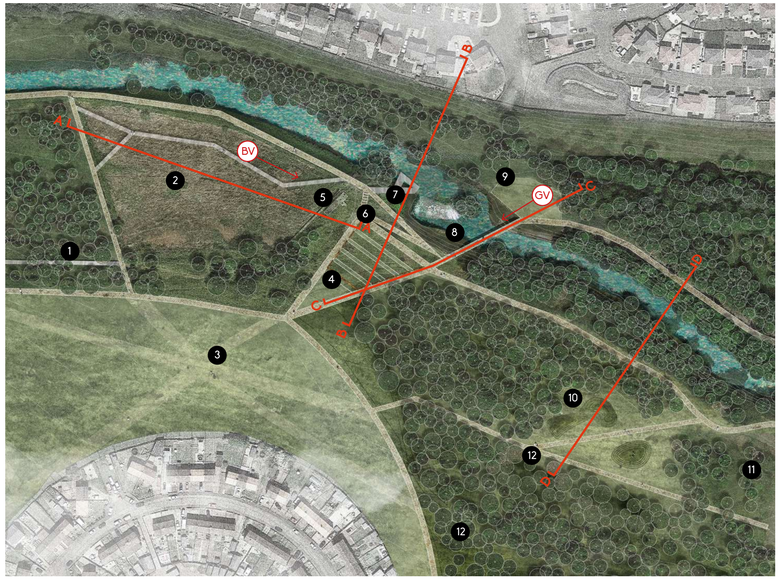
11. New social housing (16 units)

12. Extend broadleaved woodland with native species to provide habitat for birds and bats





10 AREAS OF FOCUS | BURN MILL GARDEN [Illustrating the proposals]



Key moves

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9. Reference former lade *[detail to be developed]*

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11. New social housing (16 units)

12. Extend broadleaved woodland with native species to provide habitat for birds and bats

BV Birdseye view visualisation over proposed Burn Mill Garden

GV Ground level visualisation over proposed Burn Mill Garden

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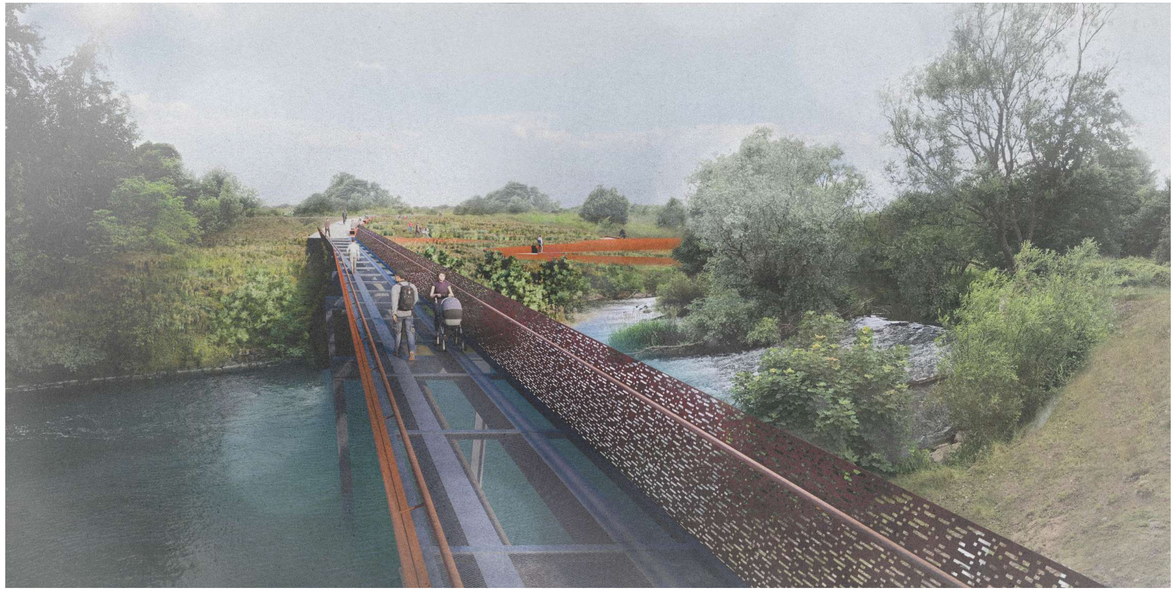
10 AREAS OF FOCUS | *BURN MILL GARDEN*
[Illustrating the proposals]



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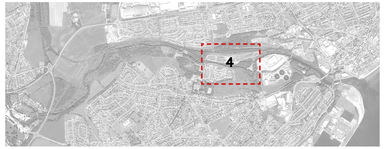
IMAGES < ^

1 Birdseye view above the wetland looking east across the Burn Mill Garden
2 Perspective view from proposed active travel bridge across pipeline looking west towards Burn Mill Garden

Existing Situation

Overview



Site photos

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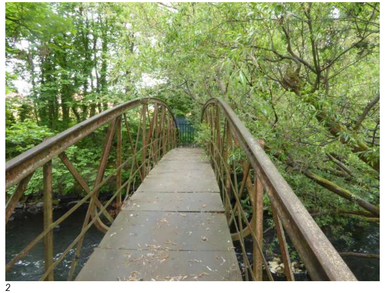

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Habitats

This large area encompasses a broad range of habitats, from the mature trees in the riparian corridor to the native shrubs dominating the disused railway embankment north of the Creosote site. Within the Creosote site itself, a wide variety of shrub and tree species are vigorously regenerating alongside scattered patches of colonising flora. There are also large areas of mixed woodland to the north and neutral grassland to the south.

Character

The general character of the area is post-industrial with many visible remnants of previous uses, including disused rail-lines, retaining walls and old materials such as bricks and concrete. A long walkway alongside the river above a pipeline provides a popular access route for locals. Overall the area is flat and open on the north side of the river until the slopes below the Mountfleurie housing. To the south the slopes are much steeper as the land form was raised on top of former coal waste.

Constraints

The area is currently heavily used by dirtbikers, there are potential issues with flooding on the low-lying Creosote site. The tidal zone extends up to the Dam Wood. There is also potential contamination of the soil within the Creosote site - detailed investigations are planned by Fife Council.

Opportunities

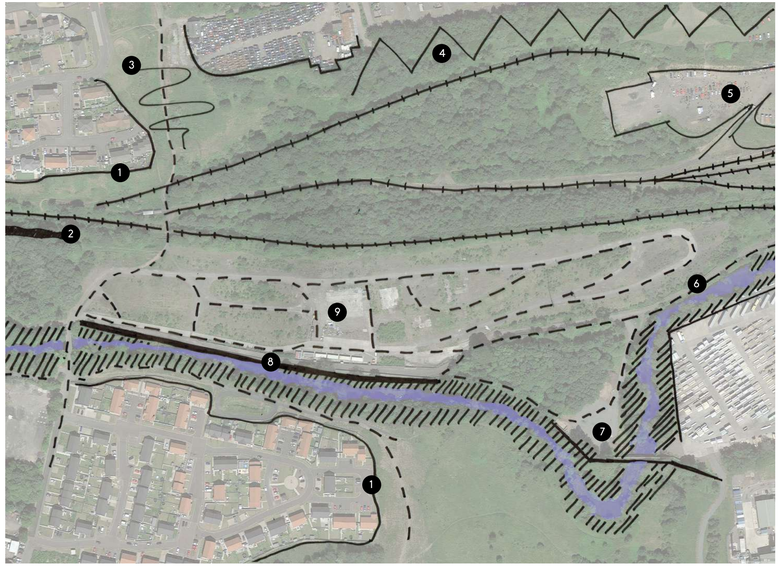
This is the largest of the six areas of focus with arguably the most potential for transformation. The open mosaic habitat on previously developed land in the Creosote site provides a unique opportunity, proposals should aim to preserve elements of this habitat. The potential to allow for periodic flooding should be further explored once more detailed flood survey information is available to the design team.

^ IMAGES

1 Southern entrance into the Creosote site
2 C-listed footbridge from former Kirkland Works, late 19th century
3 View of the river from raised walkway above pipeline
4 Gorse and regenerating woodland on southern banks below the Dam Wood

Existing Situation

Overview



EXISTING SITUATION ZOOM

Legend

- **Key ecological features**
- **Informal path network**
- **Disused rail-line**
- **Physical barrier**

1. Fenced housing development, predominantly facing away from the river
2. Disused former lade extending from Burn Mill Dam
3. Steep slope limits accessibility for all
4. Dense woodland on steep slopes, mostly inaccessible area
5. Fife Heritage Railway
6. Riverbank erosion
7. Area prone to flooding
8. Pipeline underneath retaining wall alongside river until the Dam Wood where it is raised and crosses into the waste water treatment plant
9. The creosote site requires a full investigation and to determine potential pollutant linkages associated with its former use

Case studies

1. Zollverein Park, Essen

Relevance: A former colliery, this site has been transformed into a large urban park which retains the regenerating woodland and provides a new clear structure for visitors.

2. Parc du Grand Pré, Brittany

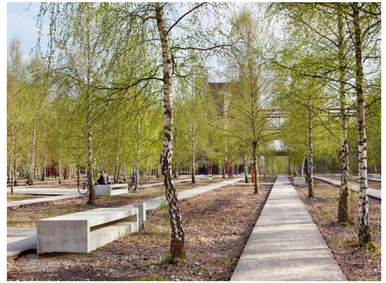
Relevance: This park in northern Brittany is an exemplar project on many levels, from its similar context of a public park which leads the visitor towards the sea to the subtle design references to the surrounding valley. It is perhaps the pinewood plantation which is most thought-provoking: a future woodland which invites the community to observe its growth and provide maintenance.

3. Test Unit / Agile City, Glasgow

Relevance: The Test Unit 2016 project was a prototyping experiment in architecture and public space creation which used a derelict site along the Union Canal as a testing grounds for a hands-on alternative to formal education.

4. Baltic Street Adventure Playground, Glasgow

Relevance: This small charity-run playground in Dalmarnock highlights the importance of community-based projects led by motivated and dedicated local champions.
Baltic Street Adventure Playground was created to provide a supervised environment which encourages children to use their imagination to build their own play space. It is now expanding its scope to include community growing with the recent construction of wheelchair accessible raised planters within the playground and a University of Glasgow led research project looking at the logistics of setting up a community food hub in Dalmarnock.



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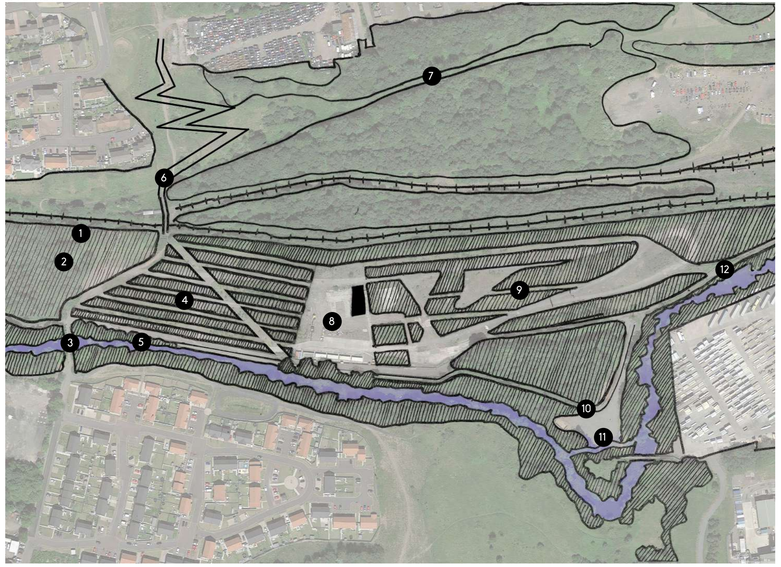
^ **IMAGES**

1 Zollverein Park, Germany
2 Parc du Grand Pré, France
3 Test Unit / Agile City, Scotland
4 Baltic Street Adventure Playground, Scotland

Concept Design Proposal

Overview



See Appendix page 134 for alternative design layout for the Creosote Garden

Key moves

1. Reference existence of former lade through landform / incorporate new seating element or sculpture *[detail to be developed further]*

2. Extend woodland up to path edge

3. Upgraded pedestrian bridge

4. Vegetation strips of existing regenerating shrubs and trees, community orchard, hedgerows, growing plots

5. Re-open and upgrade C-listed footbridge dating back to the late 19th century *[survey needed to examine structural capacity, to be further developed]*

6. Switchback pedestrian bridge across re-opened rail-line to allow access for all

7. New woodland promenade to provide access to the garden via Montgomery Drive (Mountfleurie)

8. Central plaza with new community hub building, spaces for seating and shelter, areas of natural play and start of running tracks around extended woodland (100m, 200m, 500m). Approach Fife Heritage Railway to see if any unused rolling stock is available for sculpture or play. *[Details to be further developed]*

9. Extended woodland to provide continuous habitat across the site incorporating existing patches of regenerating vegetation and open mosaic habitat on previously developed land. Spaces surrounded by vegetation provide secluded opportunities for seating, play, sculpture, exercise and sensory elements.

10. Raised boardwalk to allow excess stormwater to enter the area whilst maintaining pedestrian access

11. Secondary flow option identified in RSK report. Potential for spaces with landform features for natural flood management techniques such as wetland creation, retention ponds, rain garden *[to be developed further once more detailed flood risk information is available]*

12. Opportunity for riverbank restoration - bank grading to increase capacity of channel

Existing Situation

Overview

Habitats

This is the smallest area and covers only three different habitats: broadleaved plantation woodland, dense scrub on the north side of the river and the river itself.

Character

The character varies from a protected, thick woodland to the adjacent working industrial area. The valley is quite steep and the existing routes are somewhat disconnected from river, both visually and physically.

Constraints

The route across the river via the Iron Brig lacks a footpath for pedestrians and the bridge appears too narrow to provide space for both vehicles and a walkway. The woodland is partially isolated and surrounded by industry and loud/busy roads.

Opportunities

The proximity to Leven's town centre is a positive opportunity to create better pedestrian connections. The sheltered spaces within the woodland are well suited for adaptation to new activities, play and resting spots.

Site photos

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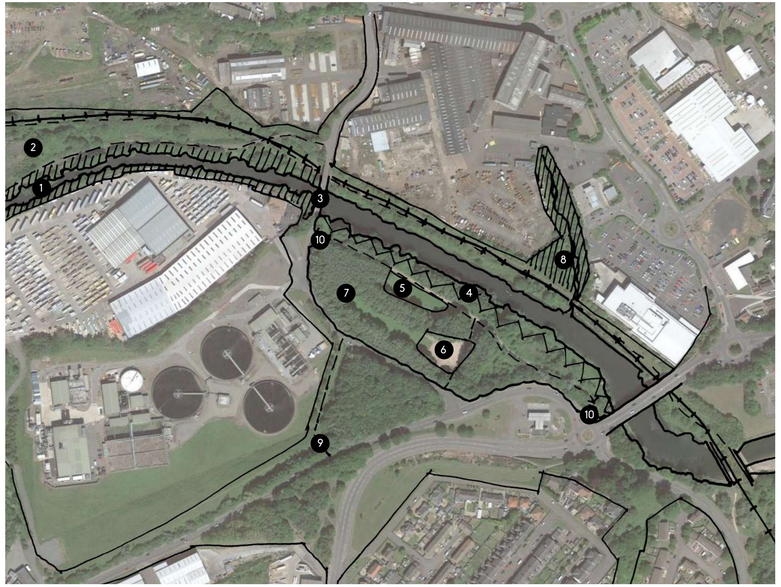
IMAGES

1 View from north of the river showing the Iron Brig
2 Industrial yard on north side of the river
3 Disused car park within the woodland area
4 View west looking upstream showing retaining wall to the right and woodland to the left

Existing Situation

Overview



EXISTING SITUATION ZOOM

Legend

Key ecological features
Informal path network
Disused rail-line
Physical barrier

1. Low-lying river edge, some signs of erosion
2. Edge of Creosote site, rough scrubland
3. The Iron Brig, provides vehicular crossing but no provision for pedestrians
4. Rising embankment to river. Views across to industrial estate and wider residential area of Leven
5. Open space within woodland
6. Car park
7. Broadleaved woodland
8. Minor tributary to river (fenced off and inaccessible)
9. Steep steps and path
10. Entrances to woodland (Bawbee Bridge area lacking pedestrian crossing)

Case studies

1. Elbe Waterfront Park, Riesa

Relevance: The architectural mark of the lookout tower in the Elbe Waterfront Park provides a key inspiration for the Iron Brig Garden. The park area is enclosed and framed by woodland but through the woodland glimpses of the Leven could be realised, stretching further across the industrial yards on the northern bank of the river. The lookout structures (Hafenwaechter) could offer views in to the wider surroundings of the park including the coastal fringe to the east. The structures are seen as taking inspiration from the industrial heritage of the area, and sitting on the high point of the local landscape they are hoped to provide an iconic marker to locals and visitors alike.

2. Draper's Field, London

Relevance: Draper's Field is a public park in east London, a legacy of the 2012 Olympics. The Iron Brig Garden is seen as an opportunity to realise a play and community focus space within the River Park for Methil, Leven and wider communities beyond. The design encourages children and young people into sport through play and informal activity – health and well-being, education and connectivity.

3. Ypres WWI Landscape Memorial, Ypres

Relevance: Whilst the Ypres landscape is the antithesis of the Iron Brig Garden, the restrained but informative design applied to the project is the reason for inclusion in this section. The light touch of the raised paths, the strong gateway entrances, and the materiality that reflects the place and historical traces are qualities which will be highly relevant to the detailed design phase of the River Park.

4. Wonder Wood at the Skørping School, Rebild

Relevance: The Wonder Wood at Skørping School has an emphasis on encouraging the students to be more energetic, particularly those who normally lead less active lives. The design complements the natural setting of Skørping School, encouraging participation and learning amongst students and the local community through an active interaction with nature. This approach is fundamental to the Leven Connectivity project; multifunctional places, educational facilities and design that utilises the local, natural assets. A 'forest loop' runs through the playground, comprising a raised wooden walkway incorporating various activities along its route, including a balance beam, ladders, benches and a treetop house.

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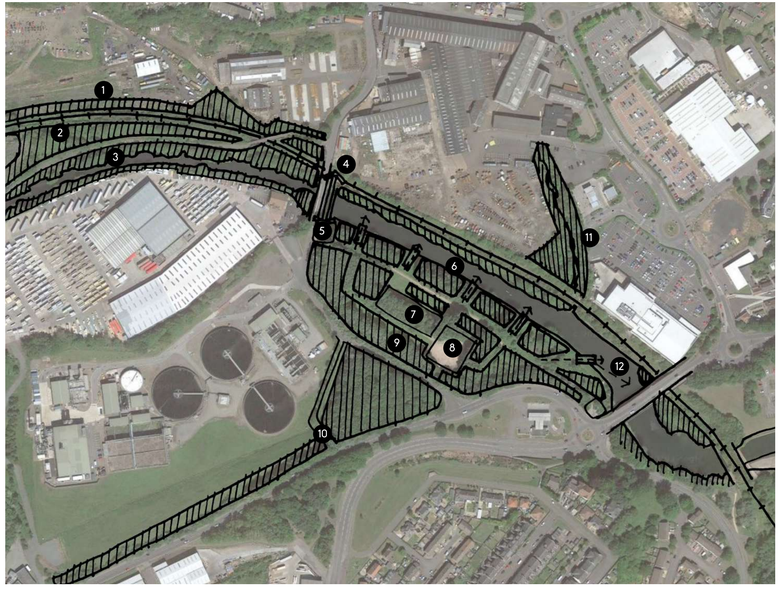
1 Elbe Waterfront Park, Germany
2 Draper's Field, England
3 Ypres WWI Landscape Memorial, Belgium
4 Wonder Wood at the Skørping School, Denmark

10 AREAS OF FOCUS | *THE IRON BRIG GARDEN*

[Illustrating the proposals]

Concept Design Proposal

Overview



Key moves

1. Barrier planting to rail-line [subject to detailed design/layout of rail-line corridor]

2. End of Creosote site to feature experimental planting programme

3. Existing river edge to be reinforced with bank modification, re-profiling and new planting palette

4. New pedestrian bridge connection across the river

5. Upgraded entrance into Iron Brig Garden (parkland)

6. River embankment modification including toe bank removal to create more natural riverbank and morphological processes to occur.

7. New play space with native planting [Details to be further developed]

8. Existing car park retained and upgraded

9. Existing woodland restructured and reinforced

10. Existing path and steps formalised and reprofiled [Details to be further developed]

11. Existing tributary to be incorporated into river walk experience

12. Proposed viewing platforms and walkways along river edge *[Potential for views out to sea to be explored further]*

Existing Situation

Overview

Site photos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Habitats

Unfortunately this area was not surveyed as part of the Phase One Habitat Survey. The site of the former power station is classified as derelict land but there is a large adjacent woodland to the west and a smaller woodland stand to the south. The site of the former power station could potentially include open mosaic habitat on previously developed land though this would need to be surveyed to be confirmed.

Character

The character of the former power station area is clearly post-industrial with open unobstructed views across the Firth of Forth and towards Leven town centre. Colonising pioneer vegetation is establishing on the open ground. This area also contains the estuary of the river.

Constraints

At present the area is unwelcoming with fences and disused bridges. Further investigations of any site contamination should be undertaken.

Opportunities

The proximity to Leven town centre presents a significant opportunity with the right pedestrian connections. undertaken. Furthermore, the area is essentially a coastal waterfront and thus provides many opportunities to encourage coastal habitats (e.g. sea grass) to thrive. The intention for this large area should be to create a meaningful public space which can adapt to potential rising sea levels.

IMAGES

1 View of disused footbridge to former power station
2 View from disused footbridge
3 Blocked entrance to Docks area from South Street
4 View of Harbour View car park on periphery of former power station area (note fishing on top of seawall to the right of image)

Existing Situation

Overview

EXISTING SITUATION ZOOM

Legend

- **Key ecological features**
- **Informal path network**
- **Disused rail-line**
- **Physical barrier**

1. Derelict land of former Methil power station
2. Rail-line bridge covered with regenerating vegetation
3. Disused footbridge to former power station
4. Bawbee Bridge
5. Small tributary to the river
6. Rising embankment to river
7. Car Park
8. East Fife Football Club

Case studies

1. Dania Park, Malmö

Relevance: A classic coastal project that addresses the waters edge in bold fashion, offering different ways to be close to the sea, ranging from simple access to purposeful challenges. The materiality of the detailed design is visually and physically engaging from local coastal boulders to native timber promenades. The park experiences similar environmental conditions to Leven with a range of weather from sunny days to violent autumn storms, calm and frosty winters.

2. Air Castles, Malmö

Relevance: The Air Castles are look out towers also located in Malmö. They are an example of the potential design exploration that the Leven could incorporate. Lookout towers, nests, that offer the opportunity to rise above the public place, see far and wide where the land and sea come together. The towers could reflect the forms of structures found in the former power station, and are envisaged as incorporating renewable technologies such as solar 'skins' and micro-turbines in the form of shimmering scales.

3. Glenorchy Art and Sculpture Park, Tasmania

Relevance: This art and sculpture park is located on the Hobart waters edge in Australia. It shows how post-industrial spaces can provide a spectacular setting for art, sculpture and experience. The Methil docks have space and potential to not only accommodate the terminal station for the re-opened train line but also recreation and entertainment uses for the local community, and provide a new arts hub for Fife.

4. Franklin Wharf, Tasmania

Relevance: Franklin Wharf is also located on the Hobart waterfront and is aimed at providing improvements for the public, whilst maintaining the functions and character of a working wharf. The project is relevant due to its conceptual ideology. It discards the notion of public space as type, and promotes instead an appeal to the intellectual capacity of people to enquire, interpret and enjoy urban environments which are not designed urban public spaces.

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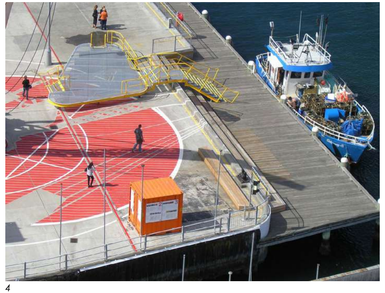

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Instead of making new public space on the wharf, the concept is one of "granting public permission" - keeping it as a working area maintains the wharf as a wharf, and the visitor as a visitor. Something that is hoped to become the norm around the edges of the wider docks area.

^ IMAGES

1 Dania Park, Sweden
2 Air Castles, Sweden
3 Glenorchy Art and Sculpture Park, Tasmania, Australia
4 Franklin Wharf, Tasmania, Australia

Concept Design Proposal

Overview

Key moves

1. Levenmouth rail-line station platforms
2. Car park for train station
3. Reconfiguration of Docks area to increase coastal habitat, profile takes the form of 'intertidal fingers'
4. Coastal habitat testing grounds
5. Viewing towers / renewable energy creators
6. Raised viewing platforms and activity space
7. Existing vegetation stand reinforced and re-profiled
8. Reinforced green barrier to station car park
9. Introduce formal crossing point at bridge [may require change to road carriageway / roundabout - to be further explored]
10. River tributary to incorporate walkways and activity spaces
11. Upgraded play facilities in the Iron Brig Garden