Fisheries, fish passage and habitat protection guidance

Department of
Agriculture, Environment and Rural Affairs
An Roinn
Talmhaíochta, Comhshaoil agus Gnóthaí Tuaithe
Depairtment o'
Fairmin, Environment an' Kintra Matthers
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Legislation

DAERA Inland Fisheries is a core branch within Marine and Fisheries Division of the Department of Agriculture Environment and Rural Affairs. It has a statutory remit for the conservation, protection, development and improvement of salmon and inland fisheries as outlined in the Fisheries Act (NI) 1966 (as amended). DAERA Inland Fisheries is the implementing authority under the Convention for the Conservation of Salmon in the North Atlantic. This treaty requires signatory states to develop programmes of work to conserve, rationally manage and improve Atlantic salmon populations and their habitats within their jurisdiction.

Applicable Sections of the Fisheries Act (NI) 1966 as amended within the DAERA jurisdiction.

- Section 47 - covers the applicant's responsibilities relating to Penalties for Pollution and the consequences of causing or permitting the release of any Deleterious materials into any waters.

- Section 48 - It is an offence to wilfully take, sell, purchase, or have in his possession the spawn or fry of salmon, trout or eels; or wilfully obstructs the passage of the fry of salmon, trout or eels; or injures or disturbs the spawn or fry of salmon, trout or eels; or injures or disturbs any spawning bed, bank or shallow where the spawn or fry of salmon, trout or eels may be. It is an offence to remove material from the river bed without the consent of DAERA. This specifically applies to the culverting and/or diverting of a watercourse including any temporary crossings or diversions. Any works required within the watercourses including realignment, headwalls and culverting, must be permitted. More information can be found at - Application for a permit under section 48 of the Fisheries Act (NI) 1966 | Department of Agriculture, Environment and Rural Affairs. Conditions may be applied to any permit issued regarding timing of works etc. and a CMS/CEMP should also be provided as part of the application process.

- Section 14 - Any such works are also likely to remove fish or require a fish rescue and the applicant should be aware that this will require permission. More information can be found at - Application for a permit under section 14 of the Fisheries Act (NI) 1966 | Department of Agriculture, Environment and Rural Affairs.

- Section 54 - Relates to the Construction of fish passes in dams in rivers (maintenance of fish passage over any dam). Where a dam is constructed in a river, a fish pass sufficient to permit the free passage through the dam of salmon, trout and eels at all times shall be provided and maintained by the owner of the dam.

Definitions -

- *"dam" means a dam, weir, dyke, sluice, embankment or structure built or placed in or in connection with any river for or in connection with the sustaining of water for any purpose [but does not include an embankment erected solely to prevent erosion of the banks of the river or to protect adjacent lands from flooding].*

- *"fish pass" means a channel for the free run or migration of fish in, over or in connection with an obstruction in a river, lake or watercourse and includes a fish ladder or any other contrivance which facilitates the passage of fish.*

It should be noted as per Section 212 of the Act this applies throughout Northern Ireland, DAERA must approve plans, sections and specifications prior to any works taking place.

Further information can be found at - Inland Fisheries Statutory Approvals Sections | Department of Agriculture, Environment and Rural Affairs (daera-ni.gov.uk).

If the applicant has any queries Inland Fisheries can be contacted at - IF.StatutoryPermissions@daera-ni.gov.uk

Bridges

Clear span bridging is the preferable option, causing no changes to riverbed and banks and no impact on fish migration. If piers are required, they should be slim line to minimise changes to the channel. Riverbed and bank work should be executed using natural materials. Bridges should accommodate angler access and mammal passage.

Culverts

Culverts should not obstruct or delay fish passage. In order to ensure fish passage, the depths and velocities of flow in culverts should be within the swimming capabilities of the resident and migratory fish species. The design of the culvert entry and exit conditions must also be within the swimming capabilities of the resident and migratory fish species.

- Where possible, arch-type, “bottomless” units should be used to retain the natural stream bed.
- Where an arch-type ‘bottomless’ unit is not possible, a box culvert incorporating the design principles set out hereafter should be used.
- The use of round/oval/pipe culverts should be limited to short runs and temporary crossings.

Design Principles

1. Culverts should be as short as possible.
2. Where the topography allows, culverts should be laid to remain backwatered in drought flow to a depth of not less than 500mm at the upstream invert, thereby providing a fish passage over their full length.
3. In all cases, provisions must be made to ensure that the velocity of flow will be less than the swimming speed which can be comfortably maintained by the weakest upstream migrant fish species.
4. Transition pools should be formed at each end of the culvert to allow upstream migratory species to enter and exit without stress or delay.
5. Culverts should be day lit over their full length: if necessary, light-ports should be provided at suitable intervals.
6. The use of debris screens should be avoided.

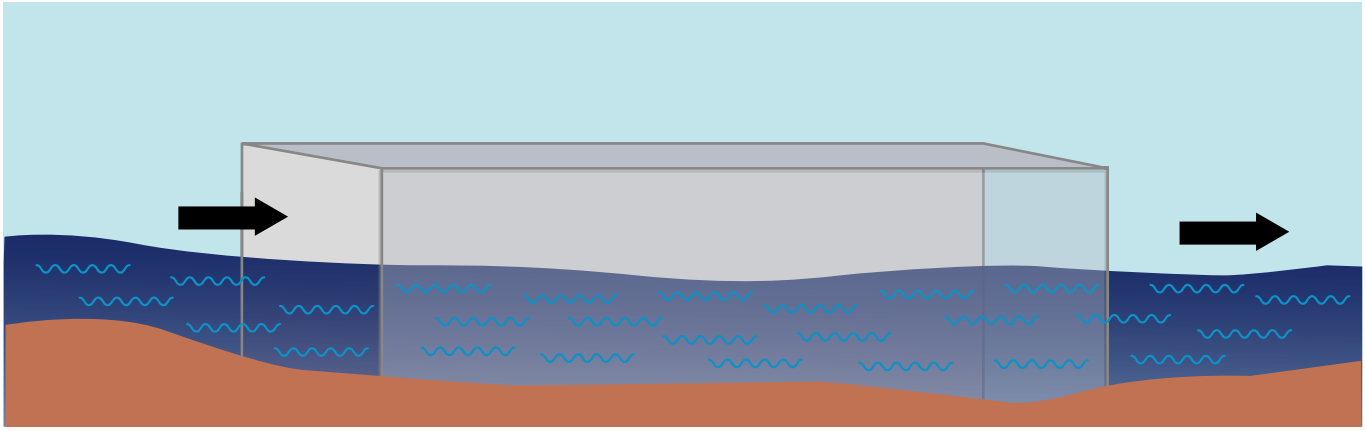

Figure 1: Oversized Box Culvert Permanently Watered.

Design Options

1. Culverts must be oversized and, generally, laid below the riverbed grade level by approx. 500 mm.
2. Where the bed gradient is too steep for full backwatering, the best option for achieving low velocity and adequate fish passage is to provide a fish-pass at the downstream end, as shown in Figure 2.
3. If fish passage cannot be provided, the downstream water level may be raised by providing one or more ponding weirs below the outfall. Such weirs should have fish notches to facilitate upstream movement. The pools formed by weirs should provide adequate resting and take-off conditions for fish.
4. In some cases it may be acceptable to use notched baffles to control the velocity and provide fish passage in the culvert. As already recommended the culverts should be oversized to compensate for flood conditions.
5. In unique circumstances, shaping and roughening of the invert may serve to provide flow conditions suitable for fish passage, especially during low flow. The objective is to create a low flow channel along the centre of the culvert with offset notches.

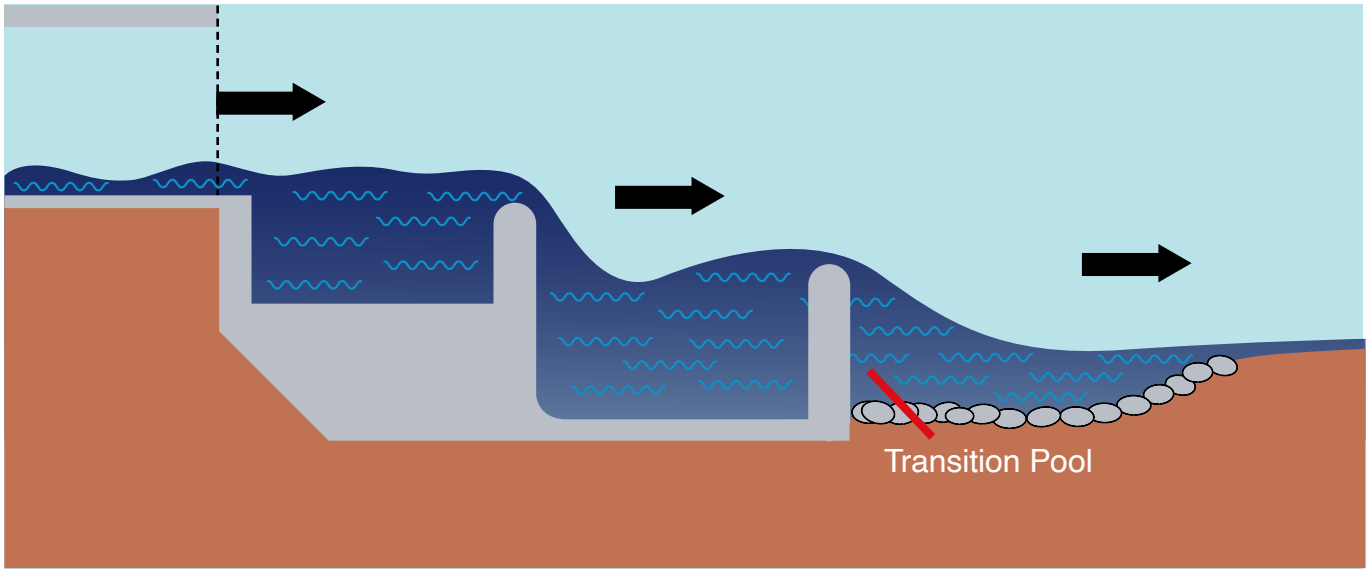

Figure 2: Fish Pass and Transition Pool at the Downstream End of the Culvert.

Examples of Swimming speeds for some UK fish of 15cms fork length at 10°C and eel of 30cms at 15°C (SWIMIT version3_3 Nov 2006)

Species	Mean Burst Speed		Median Sustained Speed		90%ile Sustained Speed	
	ms-1	bls-1	ms-1	bls-1	ms-1	bls-1
Roach	1.27	8.46	0.70	4.67	0.45	3.00
Dace	1.35	9.00	0.58	3.87	0.48	3.20
Chub	1.30	8.67	0.93	6.20	0.53	3.53
Trout	1.35	9.00	1.17	7.80	0.81	5.40
Eel	1.14	3.80	0.25	0.83	0.11	0.37

Permanent River Diversions and/or Realignments

Permanent diversions are not encouraged. However, in limited circumstances permanent diversions will be permitted. Where a new channel is created, this channel should display hydraulic and morphological characteristics fulfilling the requirements of fisheries habitats. Where bed and bank work is required in permanent river diversions and/or realignments, this work should be undertaken using natural materials.

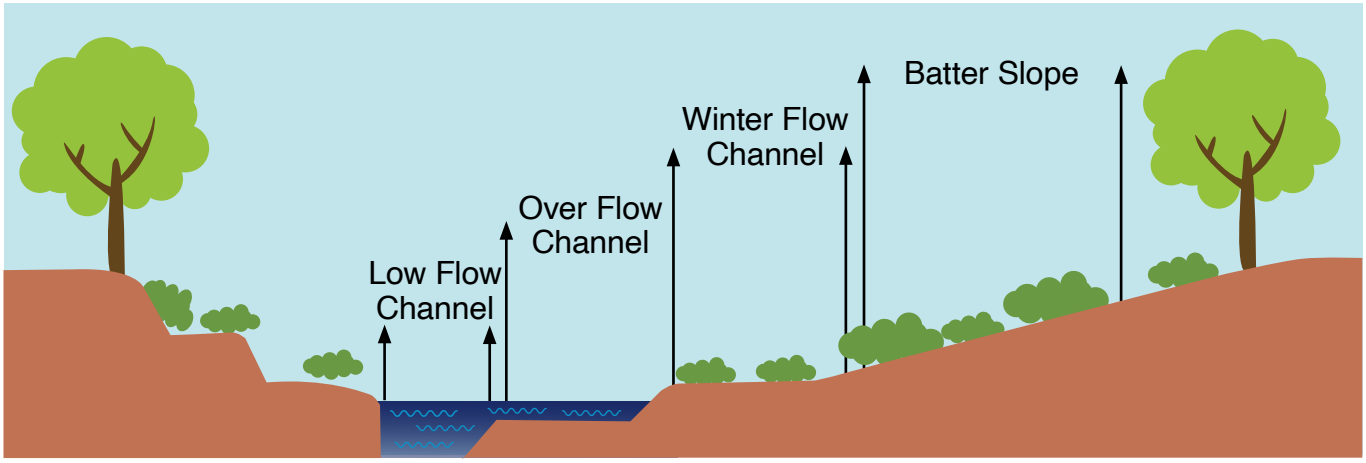

Figure 3: Example of realignment design.

Instream Works

Instream works may only be carried out in accordance with DAERA Inland Fisheries general requirements as set out below:

1. Preparatory works, such as constructing temporary crossings, forming cofferdams, creating diversions, must be carried out in accordance with an approved Method Statement and under supervision by DAERA Inland Fisheries officers.
   Similar requirements apply during removal and reinstatement.
2. All works should follow best practice biosecurity protocols.
3. Instream machine works should be minimised. Any machinery working in the watercourse must be protected against leakage or spillage of fuels, oils, greases and hydraulic fuels.
4. Instream earthworks must be executed in a manner which minimise the mobilisation of sediments to/within the watercourse.
5. Construction works, especially those involving the pouring of concrete, must be conducted in the dry and in suitable weather conditions.
6. Cofferdams kept dry by pumping, must discharge via agreed attenuation measures before return to the watercourse. Such discharges may require consent under Article 7 of the Water (NI) Order 1999. More information can be found at - Regulating water discharges | Department of Agriculture, Environment and Rural Affairs
7. Appropriate mitigation measures must be taken to ensure against spillage of concrete or leakage of cement grout from within cofferdams.
8. Temporary watercourse diversions may be used to facilitate working in ‘dry riverbed conditions’, subject to permission by DAERA Inland Fisheries. Advance notice of temporary watercourse diversions must be given to DAERA Inland Fisheries within the specified timeframe. A Method Statement must be furnished and approved by DAERA Inland Fisheries. Such approval will be subject to DAERA Inland Fisheries satisfaction that the diversion channel can be so designed as to accommodate fish migration at all times.
9. When creating a diversion channel, arrangements should be made for ‘authorised’ personnel to remove all fish from the natural channel before the flow is diverted. This is done by submitting a Section 14 application to DAERA Inland Fisheries. DAERA will assess the application and advise on appropriate mitigations. Once consent has been granted, the consent holder is deemed an ‘authorised’ person and is responsible for any staff under their supervision to carry out the operation within the terms of authorisation.

Summary of the General Requirements

- In salmonid catchments, all in-stream works should be carried out during the period May to September (see table below). It should be noted that depending on location within the catchment, sensitive time periods may vary.
- No instream works shall be carried out without the written approval from DAERA Inland Fisheries. A method statement must be agreed well in advance.
- DAERA Inland Fisheries should be given sufficient notice before pre-approved in-stream works commence.
- If a fish removal/relocation exercise is required work must be carried out by authorised personnel with appropriate permissions from DAERA Inland Fisheries.
- There must be no discharge of suspended solids or any other deleterious matter to watercourses.
- Fish passage must be maintained at all times.

Appropriate timings for works

January	Instream Works Not Permitted	• Some late spawning • Incubation of eggs continues • Kelts descending
February	Instream Works Not Permitted	• Incubation of eggs continues • Kelts descending • Spring Salmon runs
March	Instream Works Not Permitted	• Incubation of eggs continues and swim-up of young salmonids begins • Spring Salmon runs • Coarse fish spawning
April	Instream Works Not Permitted	• Incubation ending • Swim-up on-going • Young salmonids dispersing • Smolts migrating to sea • Coarsefish spawning
May	Instream Works Permitted	• Young salmonids migrating downstream into nursery areas • Smolts migrating to sea • Coarse fish spawning and fry dispersing
June	Instream Works Permitted	• Young salmonids in nursery areas • Adult Sea Trout returning to rivers • Coarse fish spawning and fry feeding
July	Instream Works Permitted	• Grilse and Sea Trout moving upstream
August	Instream Works Permitted	• Low river flows • Sea Trout run tailing off
Sept	Instream Works Permitted	• Low River flows
October	Instream Works Not Permitted	• Spawning run commences as flows increase
November	Instream Works Not Permitted	• Spawning and incubation of eggs underway
December	Instream Works Not Permitted	• Spawning and incubation of eggs continues

It should be noted that depending on location within the catchment, sensitive time periods may vary.

Examples of best practice culvert design

Example 1

Box culvert accommodating fish passage via baffles and corridor for mammal passage.

Example 2

Image showing box culvert on the A4 with precast low flow channel included within the box design recreating the natural channel bed.

Example 3

Image showing box culvert from A6. Recreation of riverbed within the vertically over heightened culvert allowing light to permeate throughout.

Example 4

Image showing stepped pools leading to box culvert accommodating fish passage.

Example 5

Image showing A31 Magherafelt Bypass culvert with natural collection of bed material taking place towards the culvert exit.

Examples of poor practice culvert design

Example 1

Example of poor fish passage, flow spread across weir crests and no pool for fish to jump from to ascend steps.

Example 2

Example of poor design of a 'Hanging Culvert', this has a drop from the outflow to the water below creating a barrier to fish migration.

Useful links

We would encourage engagement with NIEA Pollution prevention team - nieapollutionprevention@daera-ni.gov.uk

Further advice can be found at the following sources:

We would also ask that they consider the standing Advice which is available at: https://www.daera-ni.gov.uk/publications/standing-advice-development-may-have-effect-water-environment-including-groundwater-and-fisheries

Construction Method Statements:

https://www.daera-ni.gov.uk/articles/construction-method-statements

Outline Construction Environmental Management Plans:

https://www.daera-ni.gov.uk/articles/outline-construction-environmental-management-plan-cemp

Key Environmental Considerations:

https://www.daera-ni.gov.uk/topics/key-environmental-considerations-planning-consultations

Drainage Plans:

https://www.daera-ni.gov.uk/articles/drainage-plans

There are a number of relevant Guidance documents for the Prevention of Pollution that should be referred to. A full list of these guidance documents can be found here:

https://www.netregs.org.uk/tools/guidance-for-pollution-prevention-gpp-documents/

For further information:

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