Don District Salmon Fishery Board

Our River In Harmony

YTHAN DSFB HABITAT IMPROVEMENT PLAN 2025

Draft for Approval

Hydro scheme and step-pool fish pass on the Keithfield Burn

Introduction

This report outlines opportunities for habitat restoration within the Ythan catchment, to be delivered through the Ythan and Don Service Level Agreement (SLA) in 2025. Based on previous restoration work carried out by the Don DSFB staff, several key techniques and locations have been identified for improvement. These include, but are not limited to:

- Assessing Potential Debris Obstructions for Fish Passage
- Ranunculus Weed Cutting
- Gravel Washing
- Reviewing Fish Passage

These activities aim to enhance habitat quality and build upon past restoration efforts. We acknowledge that additional priorities may emerge, as identified by the Ythan DSFB.

This plan is based on an allocation of 26 days for habitat restoration under the SLA.

1. Assessing Potential Debris Obstructions for Fish Passage

In 2024, three locations within the Ythan catchment were assessed for debris obstructions, and mitigation actions were taken where necessary:

- **Ebrie Burn:** A large tree had bridged the channel, causing an accumulation of natural and manmade debris that hindered smolt passage.
- **Fyvie Estate (Mainstem):** An accumulation of dead elm was eased in spring to improve smolt passage. A follow-up in autumn showed no further concerns.
- **Fourdon Burn:** Several wooden pallets had jammed, creating a debris buildup. Removal restored normal stream flow.

Proposed 2025 Actions

We propose continued assessment of these locations and additional sites identified during 2024 redd counts. Notable sites include:

- **Seggat:** A windblown tree has been identified.
- **Fourdon Burn:** Four trees bridging the watercourse require evaluation.
- **Little Water:** Satellite imagery has identified a large quantity of windblown trees, figure 1.

These sites will be assessed to determine whether they pose risks to fish passage. If necessary, partial easing will be conducted, while naturally occurring large woody structures (LWS) will be left intact unless they obstruct migration. Additionally, manmade debris (e.g., fencing materials, plastics) will be removed to prevent blockage formation.

Figure 1. Aerial view of windblown trees for investigation on the Little Water.

Table 1. Activity details.

River/Tributary	Grid Reference	Activity	Time Scale	Job Description
River Ythan, various tributaries	NA	Assessing Potential debris obstacles for fish passage.	5 days	Monitor debris obstacles at key periods of fish migration to ensure passage, intervene where required.

2. Ranunculus Cutting

Targeted removal of the aquatic weed Ranunculus can enhance spawning habitats by preventing fine sediment accumulation. The Ebrie Burn, which has high sediment loads due to land use and historical canalisation, is particularly affected by Ranunculus growth.

In 2024, Ranunculus clearing was conducted at 10 sites along a 5 km stretch from Drumwhindle Bridge to Glenebrie Bridge. Ranunculus weed growth had smothered areas of suitable spawning gravels. Following weed clearing these spawning sites were restored allowing salmon and trout to access weed free spawning gravel as illustrated in figures 2 and 3 below.

Figure 2 & 3. Before and After images of ranunculus removal.

A long-term solution could involve tree planting along the Ebrie Burn to provide shade and naturally reduce Ranunculus growth. Key planting locations identified through the habitat surveys carried out in 2023 could be utilised.

In 2024, 5-man days were allocated for this task to be completed, when in fact the task took 7 days to complete.

Table 2. Activity details.

River/Tributary	Grid Reference	Activity	Time Scale	Job Description
Ebrie Burn	Between NJ93590 40270- Glenebrie to NJ 93300 35820- Drumwhindle Bridge	Weed Cutting	7 days	Cut Ranunculus at key spawning sites to prevent sediment buildup.

3. Gravel Washing

As previously mentioned, the Ythan catchment has a high fine sediment load and when coupled with existing land use and historical canalisation, this results in a very uniform channel with limited habitat diversity.

In locations with low gradient and wide channels glides and riffles form typically presenting ideal conditions and substrates for spawning by salmon and trout. However, these areas also suffer from the accumulation of fine sediments which can result in compaction of the gravels leading to poorer quality spawning substrate.

The Wild Trout Trust have developed a technique to improve the quality of these spawning gravels in catchments like the Ythan by using leaf blowers and pressure washers to mobilise trapped sediments in the gravel.

Over the past few seasons, we have adopted this approach at selected sites to improve areas currently monitored in our weekly redd counting programme to great effect. Last year a reach in the Fyvie redd count site was selected and following an application for a SEPA licence works commenced in early autumn in advance of the spanwing period.

The results of these works were very successful with a total of 13 salmon redds, 5 sea trout redds and 1 brown trout redd recorded on the recently 'cleaned and loosened gravel', figure 4. A significant upturn from the 2 salmon and 0 sea trout and brown trout recorded the previous season (2023). Refer to River Ythan Spawning Summary 2024 for further details.

Yellow dots indicate the locations of freshly cut redds at the recently cleaned spawning gravels.

Figure 4. Freshly cut salmon redds below Fyvie bridge at 2024 gravel jetting site. Yellow dots indicate the locations of freshly cut redds at the recently cleaned spawning gravels.

For 2025, the site at Chappel of Seggat on the main river has been selected following a site inspection of the spawning substrate which revealed it was heavily compacted with fine sediment reducing the quality of spawning substrate present. Despite an upturn in redd counts across the whole Seggat redd count reach during 2024, the location proposed would benefit from gravel washing, figure 5.

Figure 5. Chappel of Seggat, proposed site of compacted gravel delineated by white polygon.

Table 3. Activity details.

River/Tributary	Grid Reference	Activity	Time Scale	Job Description
Chappel of Seggat	NJ 72793/42705	Gravel Jetting	6 days	Use leaf blowers to remove fine sediment, dig and rake gravel to improve spawning conditions.

4. Reviewing Fish Passage

One of the simplest forms of restoration which can be undertaken in a catchment to improve stocks of migratory salmonids is the removal or easing of barriers to migration. The Ythan catchment has several significant partial and possibly complete obstructions to migratory fish depending upon the condition of the structure, the flow conditions and the life stage and species of the fish concerned.

The Ythan DSFB in partnership with the River Ythan Trust has already undertaken the removal of the Bronie burn opening over 10km of habitat upstream for migratory salmonids. However, through our previous years SLA delivery, we have identified several possible structures which we recommend reviewing.

- **Fourdon Burn Weirs (Fyvie):** A two-stage sheet piling weir, owned by Scottish Water, restricts fish movement in low to moderate flows. Communication with Scottish Water needs to be re-established.
- **Lady Anna Falls Hydro Fish Pass (Keithfield Burn):** Concerns exist over the design and efficacy of the step-pool fish pass. Repeat redd counts have shown no salmon activity upstream since 2018.
- **Mill of Elrick Hydro (Ebrie Burn):** A defunct hydro scheme continues to abstract water, creating a 900m depleted reach and significant migration challenges.

Following consideration of these structures by the Ythan DSFB we could seek to progress some of these proposals through the SLA in terms of taking on an active role by liaising with regulatory bodies, structure owners and key stakeholders to explore mitigation strategies, through correspondence and site meetings on behalf of the Ythan DSFB.

<u>Fordoun Burn Weirs in Fyvie</u>

A two-stage sheet piling weir on the lower Fourdon burn by the village of Fyvie presents issues for fish passage during times of moderate to low flows. It is owned by Scottish Water and is designed to protect an asset which runs between the two structures.

Scottish Water have considered easing the structure recently and discussed this matter with the Ythan Board and Jim Kerr (Don DSFB Senior Fisheries Officer) during 2024, but correspondence has since ceased.

The structure pictured in figure 6, is not maintained and with corrugated sheets protecting the outer wall of Fyvie garage having now fallen into the river presents a danger to fish as well as potentially obstructing passage further.

Resuming correspondence with Scottish Water would allow the Ythan DSFB to establish any timelines for interventions associated with this site.

Figure 6. Two-stage sheet piling weir on the lower Fourdon burn by the village of Fyvie, owned by Scottish Water.

Lady Anna Falls Hydro Fish Pass on Keithfield Burn

The fish ladder associated with the hydro scheme at Lady Anna Falls, on the Keithfield burn has raised concern for fish passage. The site is located a couple of hundred meters upstream from the confluence with the Ythan and is owned by Haddo Estate which was an early adopter of the micro hydro scheme movement in the late 2000's - 2010's. At the time of its installation regulators (SEPA) hadn't provided detailed guidance on these micro hydro schemes and the scheme was commissioned with the existing in situ step pool fish pass, figure 7.

Some concern was raised over the efficacy of the existing design given the number and size of the steps as well as the turbulent water present in each pool. Remedial works to the masonry of the existing fish pass was undertaken when the hydro scheme was commissioned but no material changes were made to the design and its efficacy.

Since 2018 the annual repeat redd count surveys undertaken through the SLA have not identified any salmon redds upstream of this site on the Keithfield burn. A single sea trout redd was recorded in 2018 at the site however we believe this to be a misidentification for a trout redd. Since that point only brown trout redds have been identified.

With this information to hand and the previous concerns raised around the efficacy of the fish pass for a range of species and sizes we would suggest that this is investigated furhter. Fish pass assessments using SNIFFER Coarse resolution rapid assessment methodology to assess barriers to fish migration can be undertaken which would help understand the pressures associated with the fish pass and present opportunities for further discussion. Reviews of historical data and surveys of fish and habitat upstream could also be considered to advance the understanding of the Kiethfield burn and potential impacts on migratory fish access through the Lady Anna Falls Fish Pass.

Figure 7. Lady Anna Falls step pool fish pass on left and hydro on right.

Mill of Elrick Hydro on the Ebrie Burn

The now defunct Mill of Elrick Fishery and Hydro Scheme is still abstracting water from the Ebrie Burn. This has resulted in a depleted reach of approximately 900m on the Ebrie Burn posing issues for fish migration in both directions. The intake structure is poorly designed and has inadequate controls over the flows being abstracted, figure 8. The risk to fish being damaged as they exit over the spillway from the lade is also significant.

Concerns over fish passage were shared with SEPA on behalf of the Ythan DSFB following the identification of the structure during a walkover survey of the Ebrie burn during 2024, following on from previous concerns over a decade ago.

Please refer to '**Mill of Elrick Report August 2024 – Don – Ythan DSFB'** for more details. Appendix 1.

Jim Kerr emailed SEPA with the following concerns (below) on behalf of the Ythan DSFB in August 2024. Some correspondence was had with the local SEPA team, but little action has resulted. The local team explained that this topic had been passed to an internal team designated with addressing more challenging barriers across Scotland. They have responded to confirm that this barrier is on their list to be looked at under River Basin Management Plans process, but it wouldn't be possible to put a timescale on when things will be progressed.

Concerns

- Uncontrolled abstraction with no commercial activity.
- Extensive depleted reach 900m, with minimal flows in comparison to abstraction channel.
- Inadequate intake design.
- Current intake design in state of disrepair and at risk of failing, which could result inadequate flows through the Ebrie channel for the existing fish and aquatic life living in the depleted reach.
- Current intake design causing obstruction to fish passage on Ebrie channel, no notch placed in centre of boards.
- Lack of screens to prevent fish being drawn through the hydro scheme.
- No hands-off controls or measure indicator.
- Inadequate spillway design posing potential serious damage or death to fish.

Figure 8. Denoted channels on the Ebrie burn at the Mill of Elrick water abstraction site.

We would request that there needs to be greater control placed upon the abstraction by the regulators, SEPA. The potential damage, loss and delay caused to smolts migrating downstream in either channel currently is not acceptable and likewise for the issues surrounding upstream passage of salmon and sea trout with reduced flows through a depleted reach of 900m. Given there is no economic activity associated with either structures (the hydro and fishery) this should result in action in a much quicker timeframe.

Table 4. Activity details.

River/Tributary	Grid Reference	Time scale	Description
Ythan, Ebrie burn and Keithfield burn	NA	8 days	Liaise with stakeholders to address fish passage concerns.

Summary

This plan builds on previous restoration efforts while addressing newly identified opportunities. The total allocated 26 days will be distributed as follows:

Table 5. Activity details.

Activity	**Time Frame**	**Allocated Days**
Assessing Potential Debris Obstructions for fish Passage	April-May	5 days
Ranunculus Cutting	July-August	7 days
Gravel Washing (Seggat)	September	6 days
Reviewing Fish Passage	April-March	8 days

Any unused days will be reallocated to other priority tasks identified during the season.

Jim Kerr
Senior Fisheries Officer
The Don DSFB

Appendix 1.

Ebrie Burn - Mill of Elrick

Walkover Survey Assessing Abstraction and Fish Passage Concerns on behalf of the Ythan DSFB

20/08/2024

On 20.08.2024 at 13.30 hours I carried out a follow up walk over inspection of the Mill of Elrick Archimedean Screw hydro scheme on the Ebrie Burn, Grid reference NJ 93328 41286. Since my last site visit on 9th of January 2024, the water level has dropped, and I was able to get a better look at both channels.

The right channel feeds the depleted section of the Ebrie burn, and the left channel feeds the abstraction intake, for the now defunct Mill of Elrick Fishery and Hydro Scheme. Figure 1 below showing the two channels in question.

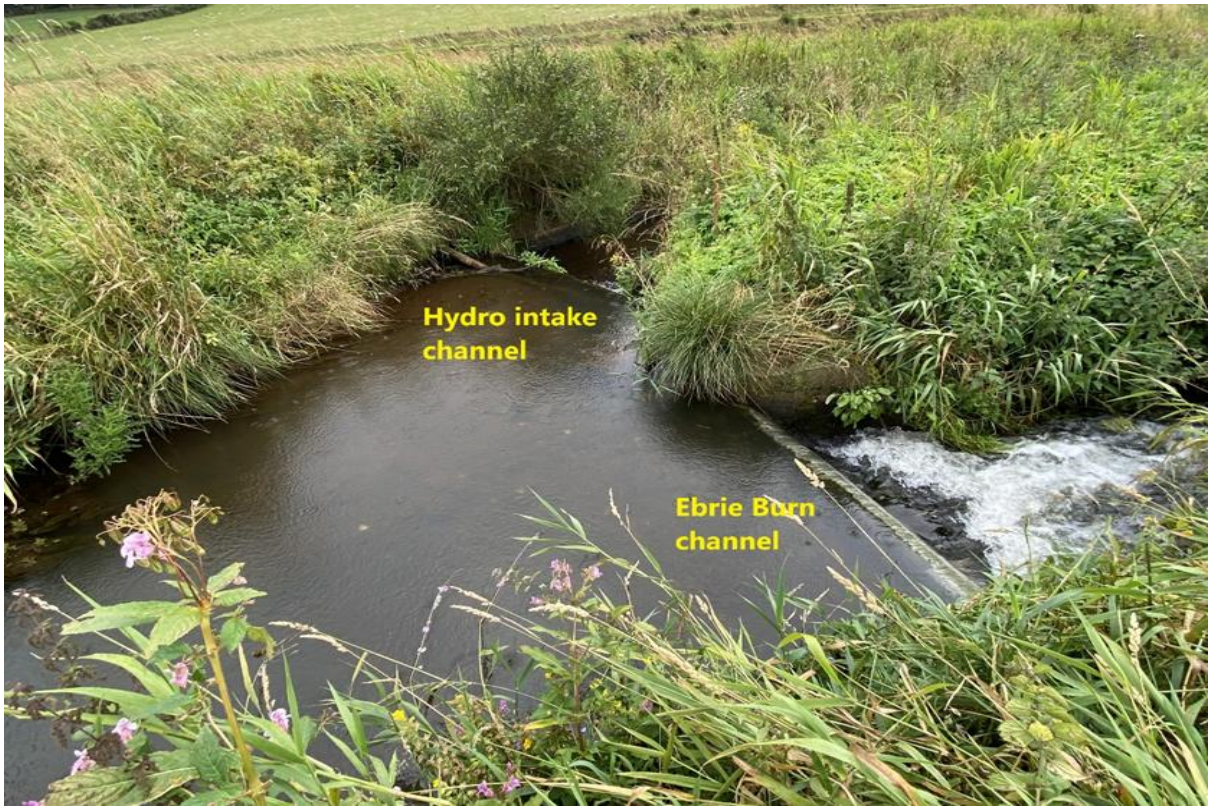

Fig 1. Denoted channels on the Ebrie burn at Mill of Elrick water abstraction site.

The now defunct Mill of Elrick Fishery and Hydro Scheme are still abstracting water unnecessarily currently. This has resulted in a depleted reach of approximately 900m on the Ebrie Burn posing issue for fish migration.

The intake structure is poorly designed and has inadequate controls over the flows being abstracted. At the top of the Hydro intake channel there are two thin wooden boards which have been placed to check the flow. Pressure from behind the boards has caused a noticeable bow in the centre, the boards also show signs of decay and are at risk of failing. If these boards were to breach, it will result in most of the water being drawn into the abstraction channel, leaving very little flow if any down the depleted channel of the

Ebrie burn. This would be devastating for the fish and invertebrates in the depleted Ebrie Burn. See figures 2 & 3 below of the two boards in question.

Fig 2, above showing bow in centre of boards at top of abstraction channel

On the Ebrie channel there are also wooden boards that have been placed, these boards have no notch in the centre to allow fish to freely ascend over this obstruction.

Fig 3. Below showing boards placed at the top of the Ebrie burn channel causing obstruction.

Approximately 900m further downstream is a spillway where water exits from the hydro scheme lade. This is a very steep decline with rocks at the bottom and wire mesh on the face. Salmon and sea trout smolts migrating downstream through the hydro scheme lade, have to exit over this spillway which could possibly cause serious injury, entrapment or death, figure 4.

Fig 4, Spillway from hydro scheme.

Concerns

- *Uncontrolled abstraction when neither commercial activity requires flows currently.*
- *Extensive depleted reach and channel 900m with minimal flows in comparison to abstraction channel.*
- *Inadequate intake design.*
- *Current intake design in state of disrepair and at risk of failing, which could result inadequate flows through the Ebrie channel for the existing fish and aquatic life living in the depleted stretch.*
- *Current intake design causing obstruction to fish passage on Ebrie channel, no notch placed in centre of boards.*
- *No abstraction controls present at point of intake.*
- *Lack of screens to prevent fish being drawn through the hydro scheme.*
- *No hands-off controls or measure indicator.*
- *Inadequate spillway design and potential serious damage or death to fish*