Loch Kemp Storage - EIA Report (Additional Information)

AI Appendix 13.3: Dochfour Weir and Issues Relating to the Upstream Passage of Adult Atlantic Salmon and the Downstream Passage of Atlantic Salmon Smolt

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1.1 Introduction

1.1.1 Loch Kemp Storage Ltd (the Applicant) has appointed Aztec Management Consultants (Aztec) to provide an expert opinion on upstream passage of adult Atlantic salmon (*Salmo salar*) and the downstream passage of Atlantic salmon smolt at the Dochfour Weir under existing conditions. This report considers the relationship between water levels in Loch Ness, flows in the River Ness and the role of Dochfour Weir in governing those flows and the resulting effect on upstream and downstream salmon passage through the weir.

1.2 Dochfour Weir

1.2.1 Loch Ness and Loch Dochfour are classified as impounded reservoirs. The existing impounding works consist of the Dochgarroch Lock, the east bank of the canal from the Lock to the waste weir, the waste weir, service weir and the outlet sluice structure beside the service weir at the east bank of the outlet of the loch at Ballindarroch. The total length of the impounding works is about 1,020 m (Aecom 2016). While the weir was constructed during the first half of the 19th century, Aecom (2016) list the following additions / restorations to the weir:

- 1972-73 Construction of outlet sluice structure by North of Scotland Hydro-electric Board as part of the Foyers Pumped Storage Scheme on the east bank of Loch Dochfour at Ballindarroch (see Image 1). The invert level of the sluices is given as 14.32 m AOD. This facility is operated by SSE Renewables. It incorporates two electrically operated lifting gates, each controlling an orifice 7.9 m wide and 0.9 m high, with sills at elevation 14.33 m AOD.

Image 1: SSE Renewables Outlet Sluice Structure on the East Bank at Ballindarroch (taken from Aecom 2016)

- The level of the main fish pass crest at the Ness (Dochfour) Weir is at a level of 14.93 m AOD (see Image 2);

- The smolt pass level (also referred to as the 'smolt chute') at the Ness Weir is 15.48 m AOD (see Image 2); and
- A smolt sluice is operated by Scottish Canals adjacent to the Dochgarroch Lock which must be fully operational between 1st April to 1st July annually to allow smolt which have travelled to the lock gates to egress to the River Ness (see Image 2). This is situated on the east wall of the lock. Restoration works were carried out to this smolt sluice in 1997.

Image 2: Aerial Image of Dochfour Weir (taken from Google Earth[1]), showing the SSE Renewables operated sluice system (green arrow), the main 'fish pass' on the weir (red arrow) and the smolt pass / smolt chute on the weir (blue arrow) and the smolt sluice at the Dochgarroch Lock (yellow arrow).

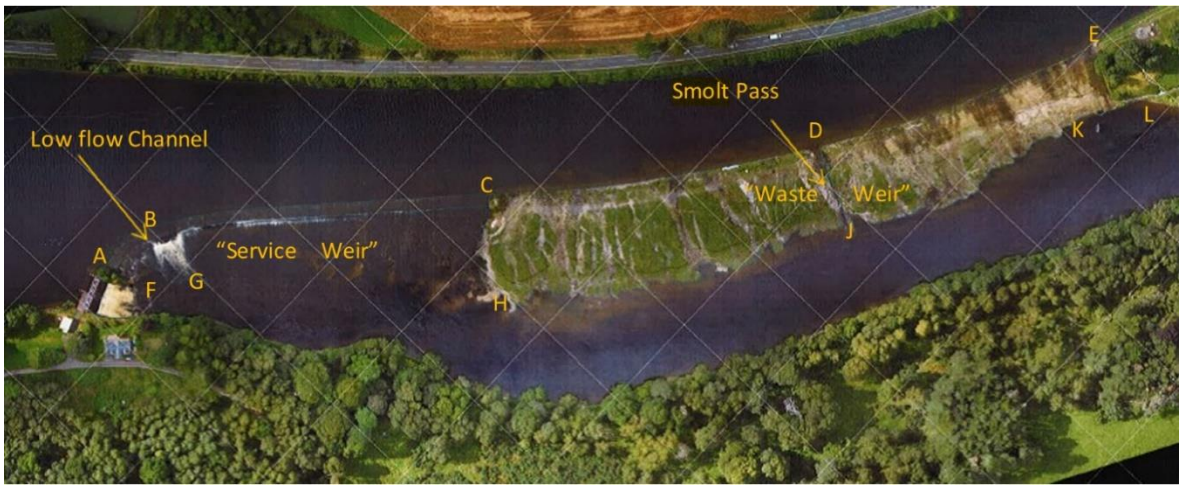
[1]Airbus, CNES / Airbus, Getmapping plc, Maxar Technologies (2024). Available at: https://www.google.com/maps/search/dochfour+weir/@57.42567,-4.3134611,656m/data=!3m1!1e3?entry=ttu&g_ep=EgoyMDI0MDkwOC4wIKXMDSoASAFQAw%3D%3D [Last Accessed 11/09/24]

1.2.2 The service weir crest is defined by a cast iron cap. A stone pitched glacis downstream of the iron cap slopes at about 1 on 20 and is approximately 7 m broad. A low section about 30 m from the right-hand end of the weir (shown as B-G in Image 3) serves as a fish pass.

1.2.3 A stone pitched channel, 1.5 m in width and 0.3 m deep, crosses the glacis approximately 150 m from the northern end of the waste weir (shown as D-J in Image 3).

1.2.4 In 2017 Scottish Canals carried out sheet piling works along the length of the weir to stabilise the structure.

Image 3: Dochfour Weir (taken from Aecom 2016)



1.3 Loch Ness Water Levels and River Ness Discharge

1.3.1 The Loch Ness catchment is a large SW-NE oriented highland catchment. The bedrock is predominantly impermeable, less than half of which is overlain with superficial deposits. The catchment is mountainous with significant afforestation and grasslands. Elevation in the catchment ranges from approximately 7m to over 1,100 m, with a median elevation of approximately 350 m. The catchment has a total area of 1,834 km^2.

1.3.2 Loch Ness is fed by the major Rivers Moriston, Enrick, Oich and Tarf. Significant portions of the upstream catchment draining to these rivers are controlled by existing SSE Renewables hydro schemes. These hydro schemes and their inherent storage plus the SSE Renewables sluices at Dochfour provide SSE Renewables the ability to regulate inflows to and outflows from Loch Ness. In addition, the Caledonian Canal plays a regulating role by both introducing and removing volumes of water from Loch Ness on a daily basis.

1.3.3 The existing Foyers pumped storage hydro (PSH) scheme 'stop pumping' level is 15.27 m AOD, as detailed in **Volume 1, Chapter 7: Water Management** of the EIA Report for the Loch Kemp Storage Scheme. The Applicant understands that this level is dictated by the agreement between British

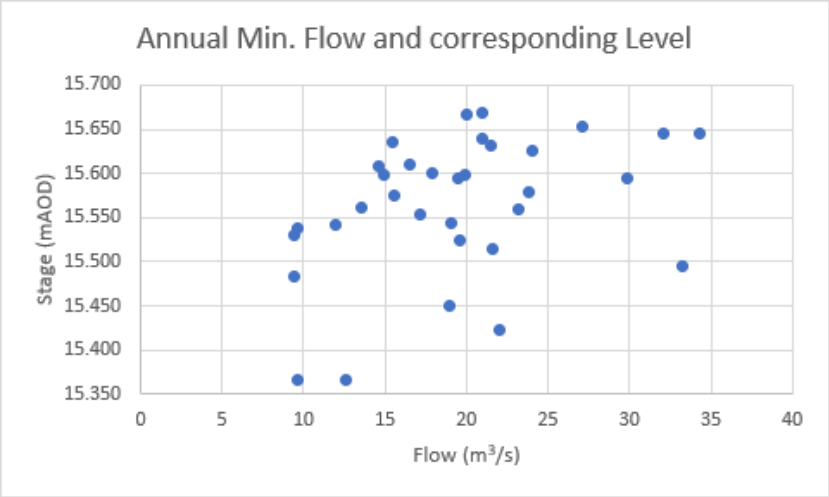
Waterways (BWB, now Scottish Canals) and North of Scotland Hydro-Electric Board (NoSHEB, now SSE Renewables) in 1970. This level ensures sufficient water to provide safe navigation over the lower cill at Dochgarroch Lock.

1.3.4 The lowered portion of the service weir which forms the fish pass is approximately 14.92 m AOD in height. Assuming loch levels remain regulated to the stop pumping level for Foyers of 15.27 m AOD there would always be a flow over the fish pass of circa 350 mm when the Foyers PSH Scheme is operational.

1.3.5 Based on SEPA water gauge data taken from Foyers[2], water levels have dropped to the 15.27 m AOD level (but not below) at increasing frequency over the past 10 years to 2024 with 24 occasions in 2022. These periods are predominantly in late summer when there is less rainfall volume in the catchment and the Caledonian Canal is in frequent usage. However, there has only been one day where the water level in Loch Ness has fallen below 15.27 m AOD since 1990 (on 24/05/2023). Gauging data from this event confirms that the flow in the River Ness did not drop below 24 m^3/s.

1.3.6 A review of SEPA gauged data for the River Ness for the period 1990 to 2024[3] indicates that flows in the River Ness have dropped below 24m^3/s multiple times at various points throughout the years. This is illustrated in the Graph 1 below which relates Annual minimum flows in the River Ness, and the corresponding stage observed in Loch Ness on the same day. The figure illustrates that there is not a strong relationship between stage and flow at the lowest flows, indicating the impact of the SSE sluice operation.

Graph 1 Annual Minimum Flow in River Ness v Stage (Water Level) in Loch Ness



1.3.7 Review of the SEPA gauging data available at Foyers and the River Ness confirms that even during periods of low water there is always flow over the fish pass on the service weir and through the SSE Renewables sluices. If SSE Renewables completely shut the sluices due to low water levels, the head

[2]Available at: https://www2.sepa.org.uk/waterlevels/default.aspx?sd=t&lc=498342 [Last Accessed 11/09/2024]

[3] Available at: https://www2.sepa.org.uk/waterlevels/default.aspx?sd=t&lc=234287 [Last Accessed 11/09/2024]

would increase and push more flow over the weir, including over the fish pass. Either way, it can be concluded that water flow is going into the River Ness via the weir even in extreme conditions where water levels are at or below 15.27 m AOD.

1.3.8 This serves as evidence that there is not an observed risk of the Dochfour Weir arrangement going dry and creating dangerously low flows for salmon passage due to the operation of PSH schemes in Loch Ness, subject to the implementation of stop pumping levels at or above the level allocated to the existing Foyers PSH scheme of 15.27 m.

1.4 Ness System Salmon Fishing

1.4.1 The Ness District Salmon Fisheries Board (NDSFB) website[4] details salmon catch information from 1952 to 2022.

1.4.2 There is no fish counter in operation on the lower reaches of the River Ness and catches of grilse (1SW fish), salmon (multi-sea-winter fish (MSW) and a category of MSW fish termed Spring salmon (MSW fish caught before the end of May) recorded each year are proxy for the status of salmon in the system.

1.4.3 Catch returns are the main indicator of adult run size available for the Ness system. Catch statistics are collected annually by Marine Scotland Science (MSS). NDSFB is also able to collect data directly from proprietors twice per year. The size of the run can be used as a measure of its status by comparing the annual run against a long-term average.

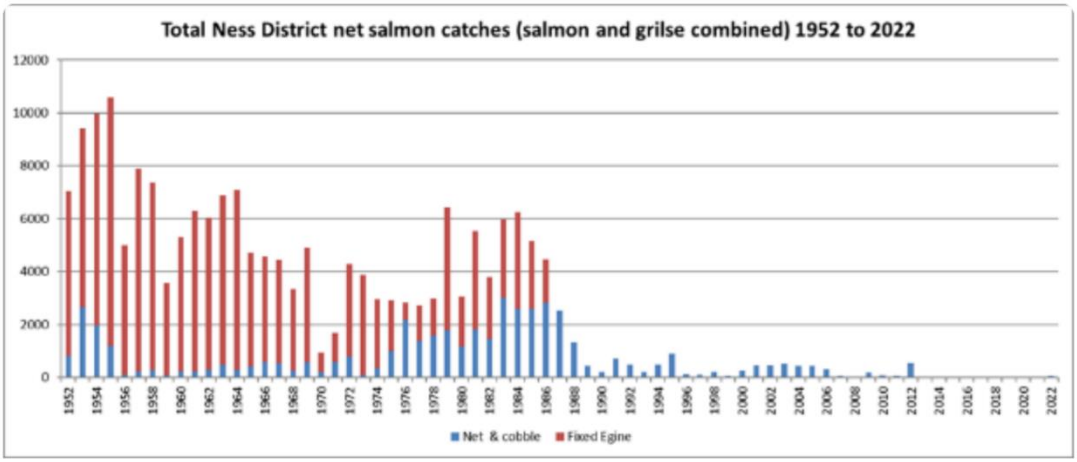
1.4.4 The late running fish, for which the River Ness was famous, have declined severely, as they have in every river in Scotland. This change in the runs affects catches in the lower beats in particular. There are signs that the spring run has at least stabilized and there may be signs of improvement.

1.5 Ness Salmon Net Catches

1.5.1 Many of the original salmon netting stations in the Ness district were 'bought out' by the Atlantic Salmon Conservation Trust (ASCT) in the 1980s. This resulted in a significant reduction in the total numbers of net caught salmon reported in the district (see Graph 2). Those remaining are net and coble fisheries, which use a 'sweep net' paid out from a boat and worked from the shore. However, commercial net catches of salmon in the Ness district have not been made since 2012, with the exception of a small commercial catch in 2022.

[4] Available at: www.ndsfb.org [Last Accessed 11/09/2024]

Graph 2: Total Ness District net Salmon Catch for 1952-to 2022 (taken from www.ndsfb.org)



1.5.2 The NDSFB website[4] details salmon rod and line catches in the Ness system for three categories of salmon for the years 1952 to 2022 (see Graph 3) as follows:

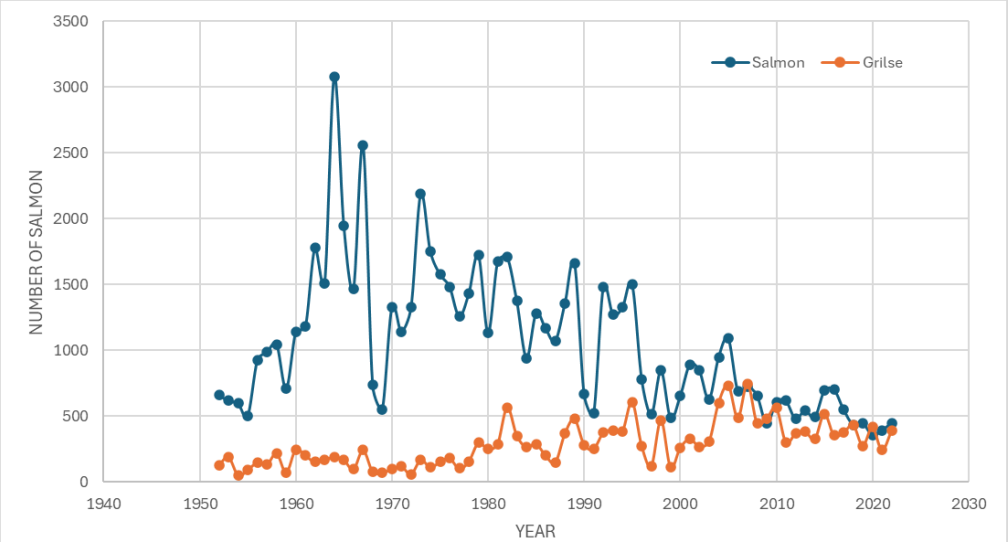
- Grilse or 1-sea-winter salmon (1SW) which generally enter the system during the summer months and later;
- Salmon or multi-sea-winter salmon (MSW) which enter the system from the early months of the year (mainly 2SW maiden fish but also includes previously spawned fish; and
- A sub-category of MSW salmon termed Spring salmon (MSW maiden fish taken on rod and line before the end of May)

1.5.3 The interpretation of long-term salmon rod catch data for a catchment the size of the Ness requires careful consideration of fishery and societal changes which have occurred since the commencement of data collection in 1952.

1.5.4 Notable changes include the almost total elimination of the commercial harvest during the 1980s and the enormous change from angling harvest to catch and release which has been widely practiced for more than two decades. Other changes include angling regulations related to allowable methods.

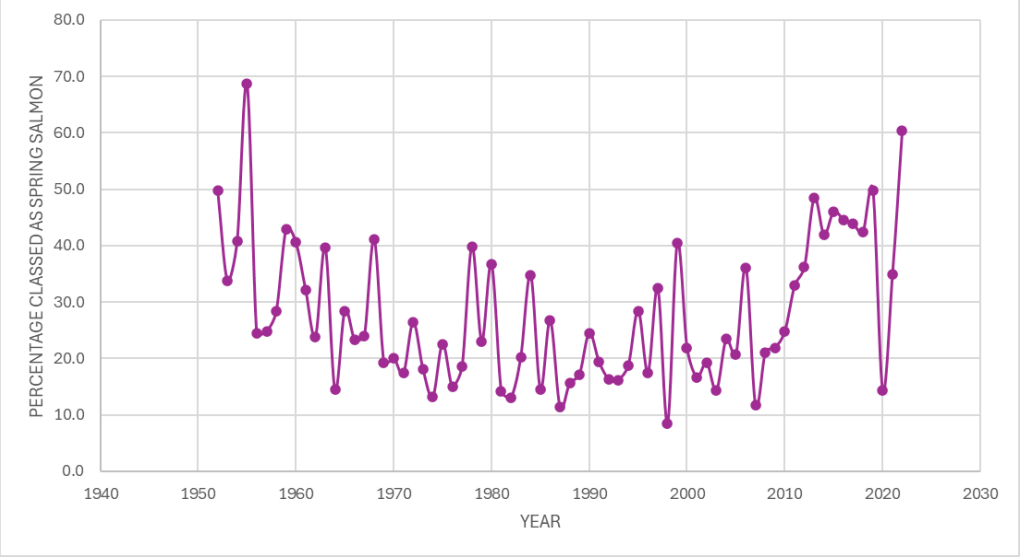
1.5.5 The termination of most of the commercial fishing effort in the 1980s does not appear to have stemmed the long-term decline in salmon rod catches on the Ness system while grilse catches have gradually improved over time (see Graph 3). This 70 year time frame does not support any cyclical relationship between 1SW and MSW fish relative abundance although this time frame may to too short to demonstrate this.

Graph 3 Salmon and grilse rod catches on the Ness System During the Years 1952-2022 (taken from www.ndsfb.org)

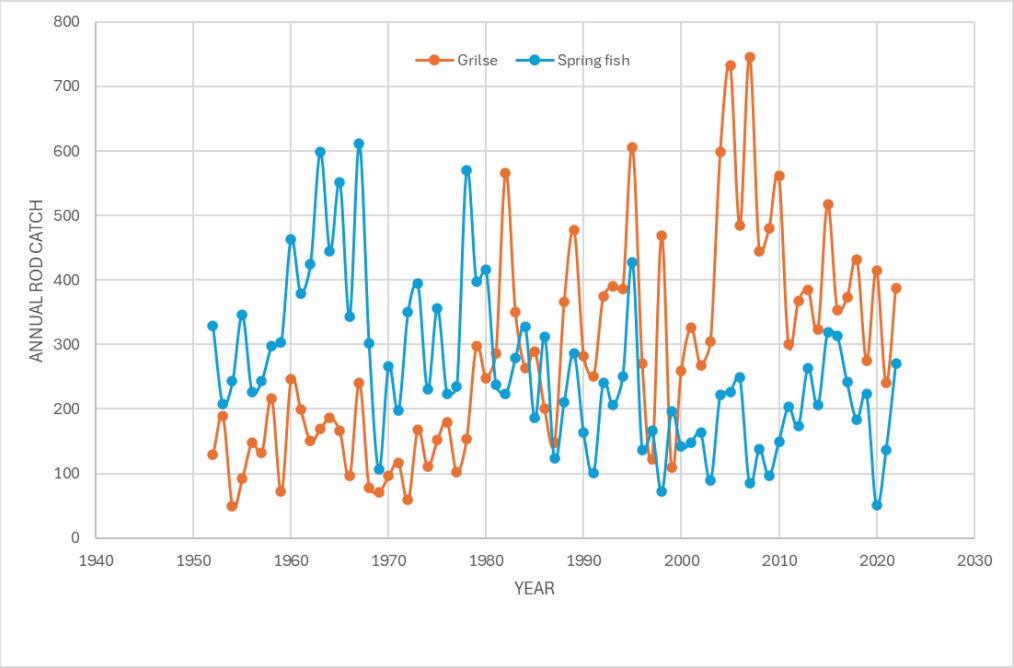


1.5.6 Graph 4 illustrates that the relationship between the number of grilse and Spring salmon taken by anglers over 70 years is highly variable but there is evidence of periods when one or other predominated in catches. This may be related to the fact that Spring salmon accounted for varying percentages of the total salmon (MSW and previously spawned fish) catch made each year.

Graph 4: Percentage of Salmon taken on Rod and Line in the Ness System annually, which were Classed as Spring Fish. Note that Covid-19 related Angling Restrictions Operated in 2020 (taken from www.ndsfb.org).



Graph 5: Number of Grilse (1SW) and Spring Fish (mainly 2SW) taken on Rod and Line in the Ness System Annually During the Years 1952 to 2022 (taken from www.ndsfb.org).



1.5.7 The objective of the preceding text and Graphs 2-5 is to emphasise the extensive record of salmon rod catches on the Ness system, which have been made more than a century after the construction of the Caledonian Canal and Dochfour Weir. It is now widely accepted that the marine survival of salmon smolt and salmon post-smolt is at an extremely low ebb compared with survival rates of even a few decades ago. Despite this situation, the NDSFB data illustrates that grilse catches on the Ness systems appear to be on the increase, while salmon catches continue their long-term decline.

1.6 Salmon Angling on the River Ness

1.6.1 Information on the nature of salmon angling on the River Ness has been obtained from the website www.fishpal.com[5], which provides information on salmon fishing and salmon catches on the River Ness.

1.6.2 The Dochfour Weir in the background of Image 4 is clearly discharging water over its entire length and via the centrally located fish pass during low water conditions, as illustrated by the exposed gravel bank

[5] Available at: FishPal - buy fishing permits for salmon, trout and grayling [Last Accessed 11/09//2024]

Image 4: Salmon Angling on the River Ness during Low Water Conditions (taken from Fishpal.com)

1.6.3 There are a total of four salmon and sea trout recreational fisheries on the River Ness as follows:

Inverness Angling Club (4.8 km double bank fishing / Maximum number of rods fishing 12)

1.6.4 Salmon and grilse run the River Ness throughout the year so there is always the chance of a fish for the dedicated angler — from opening day on February 1st, when the big springers are running to the rivers Moriston, Oich and Garry, to the end of the season on October 15th. Catches of salmon and grilse increase from June onwards as the summer runs enter the river.

1.6.5 The Conservation of Salmon (Annual Close Times and Catch and Release) (Scotland) Regulations 2014 prohibits the retention of any rod caught salmon from the start of the season until 31st March. In addition, it has been agreed that throughout the River Ness (to further protect spring fish) no salmon may be retained from 1st April until 30th June. Anglers must practise catch and release during these periods.

1.6.6 From 1st July to the end of the season on 15th October all hen fish of any size and any cock fish over eight pounds (27 inches / 69 cm) must be released. All coloured and unseasonable fish must also be released.

Ness-Side (2.0 km double bank fishing / Maximum number of rods fishing six)

1.6.7 The fishing season on the River Ness runs from the 1st February until the 15th October. In the early part of the season spring salmon destined for the upper reaches of the Ness system will all make their way through Ness-Side. This presents the angler with a good opportunity to bag a fresh run spring salmon.

1.6.8 As the season progresses the River Ness continues to produce fresh run fish, with sea liced fish being caught right up until the last day of the season, the 15th October.

Ness Castle (1.6 km double bank fishing / Maximum number of rods fishing five)

1.6.9 The River Ness hosts one of the most productive summer and autumn runs of salmon in the North of Scotland with fresh fish being caught up to the last day of the season, October 15th. Ness Castle Fishing is arguably one of the most productive salmon beats on the River Ness. Fresh fish run throughout the year. However, the most productive period is from early July until the season ends in October.

Dochfour (3.5 km double bank fishing / Maximum number of rods fishing six)

1.6.10 The Upper beat stretches from the weir at Loch Dochfour for approximately 1.6 km and provides excellent spring fishing and in summer is best suited to low water conditions, though certain pools still fish well in high water.

1.6.11 The lower beat comprises a 1.9 km stretch, and includes the former lower Dochfour and Laggan beats. This beat fishes best in medium-high water conditions.

1.6.12 The beats generally hold fish for most of the season but this depends on the time of year and conditions. Loch Ness acts as a filter and as a result the river Ness never colours in a flood and it's rare that anglers can't fish because the water is too high. In a dry summer Dochfour can still fish in low water which helps slow fish down when they're running upstream.

1.6.13 The first fish are normally caught in March, and the spring fishing has been excellent in recent years with May generally the best month. August and September are traditionally the best summer months, though October is now becoming a good month too with fresh fish.

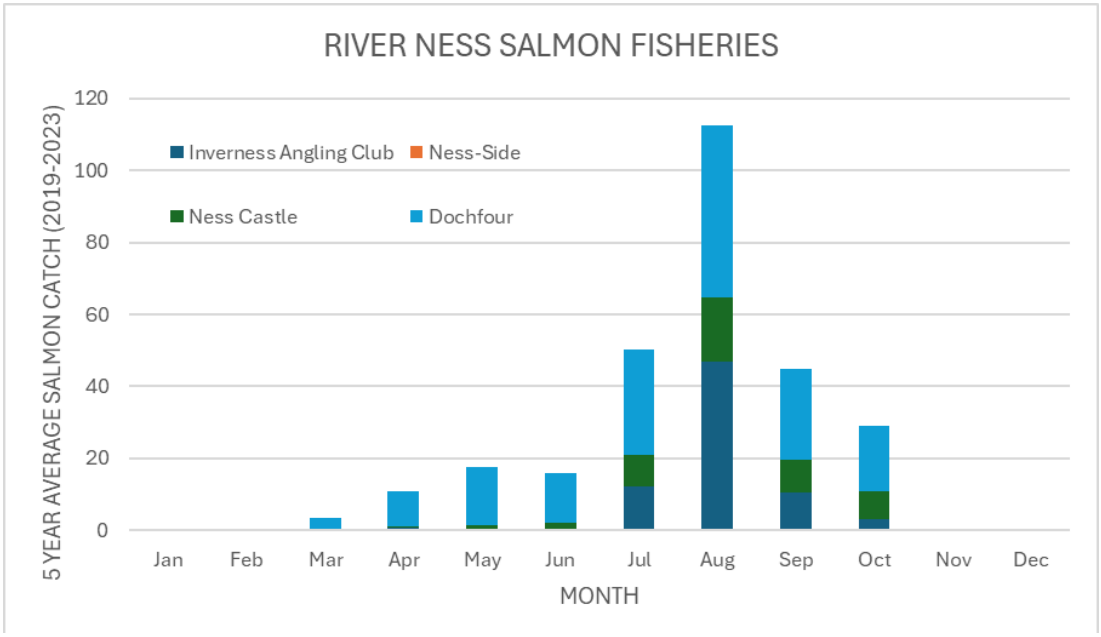
Salmon Catches on the River Ness

1.6.14 The website www.fishpal.com[5] details the average salmon catch (and release) made on each of the above fisheries (except Ness-Side) for five years (2019-2023) and the catch data for each month are presented in Table 1 and Graph 6 below.

Table 1: River Ness Salmon Catches 2019-2023 (5 Year Average Catch) (data obtained from www.fishpal.com)

Month	Inverness Angling Club	Ness-Side	Ness Castle	Dochfour	Totals
Jan	0		0	0	0
Feb	0		0	0	0
Mar	0.2		0	3.2	3.4
Apr	0.8		0.2	10	11
May	0.6		0.8	16.2	17.6
Jun	0.4		1.8	13.8	16
Jul	12.2		8.8	29.4	50.4
Aug	46.8		17.8	47.8	112.4
Sep	10.6		9	25.4	45
Oct	3		8	18.2	29.2
Nov	0		0	0	0
Dec	0		0	0	0
Average	74.6		46.4	164	285

Graph 6: River Ness Salmon Fisheries (data obtained from www.fishpal.com)



1.6.15 It is evident from the data illustrated in Table 1 and Graph 6, that the greatest catches on the River Ness annually are made during the months July-October, inclusive.

1.7 Behaviour of adult Atlantic salmon after entry to freshwater

1.7.1 Throughout the British Isles, many rivers support what are called spring salmon or early running multi-sea-winter salmon. Typically, these fish enter freshwater during the early months of the year (January-March). In freshwater systems with large catchment areas and long river channel lengths, these fish move through the lower reaches of the river quickly and within a matter of weeks can be within striking distance of their natal stream and spawning area. They may be in freshwater for, perhaps, up to ten months before spawning and may be quiescent for most of this time at a favourite lie or resting place before finally pushing on to the actual spawning area when freshwater discharge and water temperature conditions and their maturation status dictate. Thus, it is no surprise that the salmon fisheries on the River Ness record very few of these early running multi-sea-winter salmon during the early part of the year (up to and including May) as these fish are intent on progressing to sites which are relatively close to their natal streams / spawning areas. Dochfour Weir poses no obstacle to these fish as flows in the River Ness are typically high during the early months of the year and water levels in Loch Ness and the River Ness would drown out the weir most of the time.

1.7.2 The grilse (1SW) and summer salmon (2SW) typically enter the river from June onwards. These summer salmon typically spawn in the lower reaches of mainstream rivers and streams in large catchments. It is therefore not surprising that they predominate in catches from July onwards However, fish passage at a weir involves a volitional decision on the part of each individual fish and if their spawning area is located further downstream in the River Ness there is no compunction on these summer fish to ascend

the weir even if it is passable. Many of these summer fish likely ascend as far as Dochfour Weir and over several weeks drop back to suitable lies lower down in the river adjacent to spawning areas (Image 5).

Image 5: Salmon redds on the River Ness (taken from NDSFB Ness Fisheries Management Plan 2023-2028)

1.8 Dochfour Weir and the upstream passage of adult Atlantic salmon

1.8.1 Images 6 and 7 show the nature of the discharge over the weir and via the SSE Renewables operated sluices. In both images, with different upstream water levels, the SSE Renewables sluice system is discharging water to the River Ness.

Image 6: Dochfour Weir During High Water Levels (Photo taken from www.bbc.com (March 2018))

1.8.2 Image 6 clearly shows flows across of the entirety of the Dochfour Weir during a period of higher water levels. It also shows flows over the fish pass and through the SSE Renewables sluice system. Image 6 was taken in March 2018. Based on the SEPA flow gauge at Foyers the Loch Ness water level that month was approximately 15.7 m AOD with periods in the month at 15.85 m AOD, which is the likely water level in the Image 6 as the waste weir (highest section of the weir) sits at 15.76 mAOD. (Peak average water levels can be upwards of 16.8 m during mid-winter months).

Image 7: Dochfour Weir During Low Water Levels (Photo taken from Google Earth (May 2023)[1])

1.8.3 Image 7 is an aerial image taken from Google Earth[1] and illustrates water flowing over the lower fish pass section of the weir into the River Ness during a period of higher water levels. Image 7 was taken on 25th May 2023. Based off the SEPA flow gauge at Foyers, the Loch Ness water level was approximately 15.65 m AOD during this period. This is considered a low flow period when levels are not discharging over the main weir sections and only via the fish pass / SSE Renewables sluice.

1.8.4 The length of the lower section of weir with overflowing water in Image 7 (i.e. the main 'fish pass') is estimated to be 15-16 m. In Image 7, water is also being discharged through the SSE Renewables sluice system.

1.9 Adult Atlantic Salmon Burst Swimming Speeds

1.9.1 When considering the suitability of a manmade structure, such as a weir or a fish pass, to facilitate the upstream passage of adult Atlantic salmon, it is useful to have information on the water depth and velocity circumstances which will prevent the upstream movement of adult salmonids.

1.9.2 In the USA, the Federal Energy Regulatory Commission produced a report (Anon. 1995), which presented the details of such circumstances. In their consideration of the water depth and velocity under which adult salmonids would be able to move upstream successfully, they considered that the following conditions would act as an effective velocity barrier to upstream migration:

- A horizontal apron with a length of at least 4.6 m and water depth that does not exceed 15.2 cm; and
- Minimum water velocities of 5.48 m/sec, 6.70 m/sec and 7.92 m/sec were recommended for coho salmon, chinook salmon and steelhead trout, respectively.

1.9.3 General criteria for salmonid velocity barriers include the following:

- Maximum water depth of 15.24 cm with a minimum water velocity of 4.87 m/sec on an apron at least 4.57 m in horizontal length.

1.9.4 In another water velocity barrier comment, Anon. (1995) reported that a water velocity of less than 4.87 m/sec may not exclude salmonids from entering a draft tube and that draft tube discharge (or generating flow discharge) velocities of greater than 6.1 m/sec across the entire draft tube opening should exclude the entry of any fish.

1.9.5 Burst swimming speeds (the maximum swimming velocity that a fish is capable of sustaining for up to 20 secs). The burst swimming speed for salmonids is approximately 7 body lengths per second (bls). Consider a MSW (multi-sea-winter) salmon in the River Ness measuring 1 m in fork-length[6]. Such a fish has a burst speed of 7 m/sec which can only be maintained for up to 20 seconds.

1.9.6 Assuming levels in Loch Ness/Dochfour are regulated to not breach the minimum of 15.27 m AOD (as set by the Foyer PSH stop pumping level), at Dochfour Weir the following conditions can apply:

- Loch Ness low water level: 15.27 m AOD (i.e, the Foyers PSH stop pumping Level);
- Dochfour Weir main fish pass crest level: 14.93 m AOD;
- Width of main fish pass estimated at approximately 15 m[7];
- Length (weir downstream slope) of main fish pass estimated at approximately 7 m;
- Depth of water passing over the main fish pass at low water level: 0.34 m[8];
- Estimated discharge over Dochfour Weir at the main fish pass: 5.1 – 7.3 m^3/s Velocity of water on the downstream slope of the fish pass: 0.5- 1.5 m/sec.

1.9.7 Based on the calculation above, and on the findings in Anon. (1995) hydraulic conditions would not prevent any adult Atlantic salmon moving upstream from the River Ness through the Dochfour Weir fish

[6] The length of a fish measured from the tip of the jaw or snout with closed mouth to the centre of the fork in the tail (i.e., the middle caudal fin rays)

7 As measured on Google Earth

8 15.27 m AOD – 14.93 mAOD = 0.34 mAOD.

pass, even at low loch water levels commensurate with stop pumping level of the existing Foyers PSH scheme.

1.9.8 When water is discharged through the SSE Renewables sluice system (see Images 6 & 7) adult Atlantic salmon can also select this upstream passage route as the velocity of water through the sluice system and the depth of the water are both below and above the stipulated conditions, which would represent a velocity barrier for upstream migrating adult Atlantic salmon.

1.10 Atlantic Salmon Smolt Passage Downstream at Dochfour Weir

1.10.1 Over the past decade or so, the annual rod catch of salmon and grilse on the Ness system have hovered around 1,000 fish (see Graph 3), with salmon numbers slightly higher than grilse numbers.

1.10.2 The marine survival of smolt to grilse (1SW) has been in the region of 5% in recent years with the percentage survival of smolt to salmon (MSW and mainly 2SW) somewhat less, approximately 3%. For the purposes of this assessment, it is proposed to use an overall smolt to returning adult salmon (grilse and salmon) estimate of 4%. These estimates are widespread for salmon populations throughout the British Isles.

1.10.3 In the first instance, there is information in the scientific literature (e.g. Solomon and Potter (1992)) which indicates that recreational fisheries for Atlantic salmon, which are regulated in terms of angling density (generally low) and angling methods (generally fly only – except during high water conditions), typically exploit early running spring salmon at levels approaching 30% and summer running grilse at levels approaching 15%, with both averaging out at 20%. The fact that most fish taken by anglers in recent years are released, inflate catches because many fish will be recorded on more than one occasion.

1.10.4 Thus, a calculation of the number of salmon smolt migrating from the Ness system can be estimated as follows:

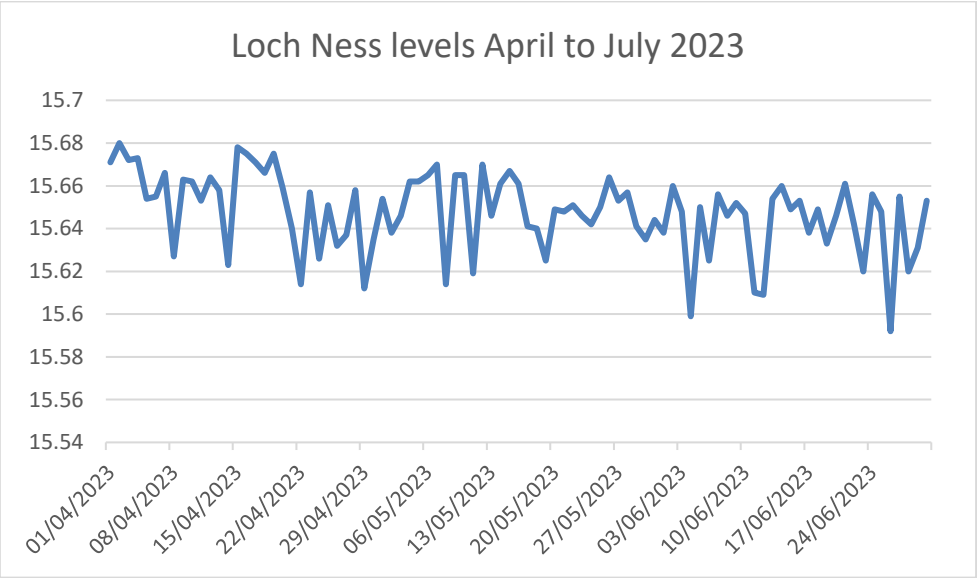
- Grilse and salmon annual catch: 1,000;
- Run of grilse and salmon into the system: 5,000; and
- Number of smolt migrating from the Ness system annually: 125,000.

1.10.5 These salmon smolt typically migrate to sea during a temperature window of 7-13^{o}C and during the months March through to June in the case of the Ness system. They migrate during all hours of the day and may exhibit preferences for daylight hours and hours of darkness at different times of the migrating period.

1.10.6 With the exception of some anecdotal evidence from June 2020, no records have been identified of large numbers of migrating smolt leaping from the water immediately upstream of Dochfour Weir and the surrounding waters at any loch level, which strongly suggests that these migrating smolt are not regularly delayed on their migration to the sea at this man made structure and therefore the Dochfour Weir does not present a significant barrier to downstream migration of Atlantic salmon smolt. It should also be noted that during the period when smolts are migrating downstream (typically April through June) water levels in Loch Ness would be expected to be well above the level of 15.27 m AOD (the 'stop

pumping level for Foyers PSH), as illustrated by Graph 7 which shows gauged water levels in Loch Ness for the period April to July 2023.

Graph 7: Loch Ness Levels (m AOD) in April to July 2023



1.10.7 It should also be noted that during recent salmon smolt tracking work on the Ness system by Lothian (2022), nearly all tagged smolt migrated into the River Ness via the Dochfour Weir (over the weir or via the fish pass or through the SSE Renewables operated sluice system) and not via the Caledonian Canal.

1.11 Conclusion

1.11.1 In summary, there is no evidence that Dochfour Weir impedes the upstream migration of adult salmon back to their natal spawning grounds and only anecdotal evidence, confined to June 2020, that the downstream migration of salmon smolt to the River Ness is impeded. Furthermore, fish passage through the weir when the Loch Ness level is at the stop pumping level of the existing Foyers PSH scheme (15.27 m AOD) or above provides good conditions for upstream and downstream fish passage over the weir. As the stop pumping level that would be allocated to the Loch Kemp Storage Scheme through its CAR Licence will be above the Foyers stop pumping level, it can be concluded that the operation of this scheme would have no impact on upstream or downstream salmon migration through the Dochfour Weir compared to the existing baseline conditions.

1.12 References

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