

Technical Appendix 8.4: Fisheries

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ANNEXES

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1.0 Introduction

This Technical Appendix has been prepared to accompany Chapter 8 of the Oliver Forest Wind Farm ('the Proposed Development') Environmental Impact Assessment (EIA) Report.

It presents detailed methodologies and results of desk studies and field surveys completed to establish baseline conditions with regard to fisheries. This was in order to identify any potentially important/critical fish habitat which may be impacted by the Proposed Development.

It should be read with reference to the following:

- Figure 8.1: Statutory Designated Sites For Nature Conservation Ecological Interest.
- Figure 8.10: Fisheries Survey Plan.

The following species of conservation significance are considered:

- European eel - Council Regulation (EC) No 1100/ 2007) establishing measures for the recovery of the stock of European eel; listed by International Union for Conservation of Nature (IUCN) as 'Critically Endangered', listed on the Scottish Biodiversity List (SBL) (Watching Brief Only) and listed as a UK Biodiversity Action Plan (BAP) Priority Species;
- Atlantic salmon – listed on Annex II of Habitats Directive¹, Salmon and Freshwater Fisheries (Consolidation) (Scotland) Act 2003, SBL (Conservation Action Needed & Avoid Negative Impacts) and listed as a UK BAP Priority Species;
- brown trout/sea trout - SBL (Conservation Action Needed) and UK BAP Priority Species;
- freshwater pearl mussel – Schedule 5 of the Wildlife and Countryside Act (1981) and Annex II of Habitats Directive SBL (Conservation Action Needed) and UK BAP Priority Species;
- river lamprey - Annex II of Habitats Directive, SBL (Avoid Negative Impacts) and UK BAP Priority Species;
- brook lamprey - Annex II of Habitats Directive, SBL (Avoid Negative Impacts); and
- sea lamprey - Annex II of Habitats Directive, SBL (Avoid Negative Impacts) and UK BAP Priority Species.

Only common species names are used throughout this Technical Appendix. Scientific names for all fisheries species referenced are provided in Annex A.

2.0 Methodology

2.1 Desk Study

The desk study has included a review of the following key sources summarised in Table 1.

Table 1 – Desk Study Key Sources and Information Sought

Key Source – incl. Date	Information Sought	Search Area
NatureScot's Sitelink https://sitelink.nature.scot/home - 2022	Proximity to statutory designated sites, with ecological interests.	Within 10 km of the site (as shown on Figure 8.1).
The Wildlife Information Centre (TWIC) - October 2022	Non-statutory designated sites for nature conservation with qualifying ecological interests, and existing ecological records.	Within 2 km of the site.
Consented Whitelaw Brae Wind Farm – April 2024	Existing fish (and freshwater pearl mussel) records from baseline field surveys.	Search areas used for surveys for the consented scheme.

¹ Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora.

Additional peer-reviewed literature and industry guidance has also been reviewed and is referred to where relevant.

In addition, the Scottish Environmental Protection Agency (SEPA) River Basin Management Plan², Scotland's Environment Map³, freshwater pearl mussel information web page (Joint Nature Conservation Committee, 2022⁴), and the Tweed Fisheries Management Plan 6th Edition⁵ were reviewed for relevant fisheries information.

2.2 Field Survey

A fish habitat survey was undertaken on 20 and 21 October 2022.

The Fisheries Survey Area comprised all sections of watercourses within and adjoining the site, as shown in Figure 8.10.

The survey aimed to identify any areas of critical fish habitat within the Fisheries Survey Area including spawning, nursery, juvenile and adult holding areas, juvenile lamprey habitat, and freshwater pearl mussel habitat.

An initial gradient analysis of the Fisheries Survey Area was completed based on the contour intervals in GIS, and during an initial walkover prior to survey. This allowed the identification of all linear 100 m stretches of watercourses within the site with a gradient of $\geq 6\%$.

All stretches of watercourses with a gradient of $\geq 6\%$ are considered to be unsuitable or non-productive fish habitats for Atlantic salmon and brown/sea trout. Mills (1973) found that gradients of $<3\%$ were favourable for Atlantic salmon; whilst sea trout were found to spawn in streams with gradients up to 4% . Most populations of lamprey occur where the average stream gradient is $1.9 - 5.7$ m/km, being rarely found where gradients exceed 7.8 m/km or 0.78% (Maitland and Campbell, 1992). Whilst gradients of $\geq 6\%$ are considered to be typically unsuitable for fish fauna, it is recognised that small, isolated, populations of brown trout may occur in locally suitable habitats in stretches with steeper gradients.

The watercourses within the site were systematically walked (including in-stream inspections where required) and the habitats were mapped according to the classification presented in Table 2.

Specifically, the survey focused on the identification of the following:

- spawning habitat for salmonid and lamprey species;
- nursery habitat for lamprey species;
- areas of habitat important for juvenile salmonids (fry and parr);
- areas of habitat important for adult holding areas; and
- areas of suitable substrate and flow conditions for supporting freshwater pearl mussel.

The habitat classification used followed that of the Scottish Fisheries Co-ordination Centre (SFCC) Habitat Surveys Training Course Manual (SFCC, 2007), the Environment Agency's Restoration of Riverine Salmon Habitats Guidance Manual (Hendry and Cragg-Hine, 1997) and a review of key habitat requirements for other species of conservation significance including lamprey, salmonids and freshwater pearl mussel (e.g. Maitland, 2003; Hendry and Cragg-Hine, 2003; Skinner *et al.*, 2003; Gardiner, 2003).

Each watercourse within the survey area was visited. Detailed analysis was undertaken at sample points within any diverse geomorphological and hydrological conditions within each watercourse. Samples were taken at each of the representative sections of each watercourse.

The following information was collected at each sample location: channel gradient; substrate composition (% bedrock, boulders >256 mm, cobbles $65-256$ mm, pebbles $4-64$ mm, gravel $2-4$ mm, coarse sand $0.5-2$ mm and fine sand/silt/peat <0.5 mm); average wetted channel width (m); average depth (m) and turbidity (1 [clear] – 3 [turbid]).

Any potential barriers to fish movement within watercourses were also recorded and a photograph was taken at each sample point (as shown in Annex B).

Any watercourse not surveyed was discounted based on conditions being appraised as unsuitable for fisheries, without the requirement for further detailed sampling surveys. This could include watercourses/ditches that were dry during the survey or sufficiently overgrown with vegetation (for example) that the potential for the watercourse to support fish populations was discounted.

² <https://www.sepa.org.uk/data-visualisation/water-environment-hub> (Accessed 15 March 2023).

³ <https://map.environment.gov.scot/sewebmap/> (Accessed 15 March 2023).

⁴ <https://sac.jncc.gov.uk/species/S1029/> (Accessed 15 March 2023).

⁵ [Tweed Fisheries Management Plan | River Tweed](#) (Accessed 15 March 2023).

Table 2 – Fish River Habitat Classifications

Cat.	Habitat Type	Description	Species Suitability
1 1a 1b 1c	Unsuitable Steep > 10 % gradient 6-10 % gradient Other – ephemeral, shallow drains, dry beds	Usually 1 st – 2 nd order watercourses with steep gradient, ≥6 % slopes (often substantially greater), abundant bedrock, lack of fixed substrates, high velocity (e.g. headwaters/rivulets). Also includes less steep ephemeral stretches (e.g. headwater sources), shallow drains and modified watercourses with dry beds.	No productive fish habitat, although some species may migrate through these areas (also refer to 7. Rapids) depending on whether they represent a migration barrier.
2 2a 2b	Spawning Habitat Salmonids Lamprey	Stable “gravels” of minimum 15-30 cm depth, optimal 20-30 mm, not compacted or with excessive silt/sands (<20 % by weight) for salmonids. Lamprey spawning habitat where ‘gravels’ include sands. Often at tail end of pools or upstream ends of riffle-runs ensuring oxygenated substrate. Can also be found at end of weir pools.	Spawning habitat - Atlantic salmon (c. 9 m ² per pair) and sea/brown trout; lamprey.
3	Riffle	Shallow (< 20 cm) and fast flowing, with upstream-facing wavelets which are unbroken (although often some broken water), with substrate dominated by gravel and cobbles.	Fry (0+) habitat – Atlantic salmon/ brown trout/sea trout.
4 4a 4b	Run Shallow (< 0.5 m deep) Deep (>0.5 m deep)	Generally deeper (20-40 cm) and less steep bed compared to riffle, with substrate of boulders, cobbles and gravels. Usually disturbed, rippled surface. Often located immediately downstream of riffle.	Mixed salmonid juvenile habitat. Fry (0+) & Par (1+) habitat - Atlantic salmon/ brown trout/sea trout.
5 5a 5b	Glide Shallow (<0.5 m deep) Deep (> 0.5 m deep)	Shallow gradient stretches with smooth laminar flow with little surface turbulence and generally > 30 cm deep; water flow is silent. Often located below pool.	European eel; non-productive salmonid habitat, although may provide some shelter for adults.
6 6a 6b 6c	Pool Plunge/Scour pool Meander pool Weir/bridge pool	No perceptible flow, eddying and usually > 100 cm deep. Substrate with high proportion of sand and silts. Often located on the outside of meanders, but includes natural scour or plunge pools and artificial weir pools.	Adult refugia Atlantic salmon, sea/brown trout, European eel.
7 7a 7b 7c	Rapids Steep - >10% gradient Moderate – 6-10% gradient Low - <6% gradient	Sections of relatively steep gradient with fast currents and turbulence, with mixed flow types, including free-fall, chutes and broken, with obstructions such as large boulders, rock outcrops and falls.	Negative feature for migratory species and may pose a migratory barrier; elvers and eels limited to velocity of <0.5 m/sec and 2.0 m/sec respectively; lamprey to 2 m/sec.
8 8a 8b	Banks of fine sediment of silts and sands Optimal Sub-optimal	Limited flow (sometimes back-flow) allowing deposition of silts/sands, not anoxic, with/without riparian trees. Optimal habitat is stable fine sediment and sand ≥15 cm deep with some organic detritus. Sub-optimal habitat includes small areas of deposited silts/sands behind boulders.	Lamprey ammocoete nursery and adult refuge.
9 9a 9b 9c 9d 9e	Vegetation features Riparian trees (tunnel) Flow constriction Aquatic macrophytes Emergent macrophytes Large woody debris	Closed woodland canopy forming tunnel vegetation In-stream emergents, boulders, narrowing of channel, etc. Stands of aquatic and floating vegetation Stands of emergent (usually marginal) vegetation LWD forming dams, etc.	Tunnel riparian trees may be negative feature for salmonids, although tree roots and fallen trees may provide refugia for Atlantic salmon/ brown trout/sea trout and European eel. Aquatics/emergents provide cover for fish, particularly juveniles.
10	Obstructions to migration	Impassable waterfalls, rapids, flow constrictions, weirs, bridge sills, culverts, shallow braided river sections, pollution preventing upstream migration.	All migratory species; impassability varies between species. Leaping ability: <3.7 m Atlantic salmon; <1.81 m trout; European eel and lamprey none.
11 11a 11b 11c	Other features Side channel Backwater Artificial channel	Includes other channel features, with side channel (connected to main channel) and backwaters. Artificial channels may comprise either man-made banks and/or beds.	Side channel/backwater often important refugia for juveniles. Artificial channels have limited diversity and are often non-productive fish habitat.

Personnel

The survey was undertaken by C. Nisbet a full member of the Chartered Institute of Ecology and Environmental Management (MCIEEM), fully trained on fish habitat survey as part of Level 3 Management of Electrofishing

Operations qualification as accredited by the SFCC. He has been undertaking fish habitat surveys at comparable sites across Scotland for over 16 years.

Limitations

Water levels were elevated following recent rains at the time of survey however, it is considered the fish habitat survey provides a representative picture of the suitability and value of the site watercourses for fish fauna. The survey is therefore considered not to be subject to any significant limitations.

3.0 Results

3.1 Desk Study

Statutory Designated Sites for Nature Conservation

A review of NatureScot's Sitelink identifies that the site does not form part of any statutorily designated site for nature conservation with faunal qualifying features.

There are however two such designated sites within 10 km of the site as summarised in Table 3 and shown in Figure 8.1.

Table 3 – Statutory Designated Sites. SAC - Special Area of Conservation, SSSI- Site of Special Scientific Interest

Designated Site	Distance and Direction from the site	Fish Qualifying Interests
International		
River Tweed SAC	Immediately adjacent to the site to the south-east	Atlantic salmon. Brook lamprey. River lamprey. Sea lamprey.
National		
River Tweed SSSI	Immediately adjacent to the site to the south-east	Atlantic salmon. Brook lamprey. River lamprey. Sea lamprey.

Non-statutory Designated Sites for Nature Conservation

There are three non-designated sites for nature conservation within 2 km of the site (Glenmuck Bog, Hawkshaw Bog and Talla Reservoir), although none of the sites list any fish as 'notable' species.

Classified Waterbodies

SEPA's River Basin Management Plan confirms that there are two classified watercourses within the Fisheries Survey Area. These comprise the River Tweed, which flows along the southern boundary of the site (W1 on Figure 8.10), and Fruid Water which is a tributary of the River Tweed flowing into the Fruid Reservoir (W7 on Figure 8.10). The River Tweed is classified as having moderate ecological status and moderate access for fish migration. Fruid Water is classified as having good ecological status and high access for fish migration.

Barriers to Fish Migration

Although much of the Tweed catchment is barrier-free for fish migration, numerous major man-made barriers are located upstream of the Fisheries Survey Area, including reservoir dams and a ford located at Haughead on the Wooler Water⁶.

⁶ 6mp-02a-salmon-plan.pdf (rivertweed.org.uk) (Accessed 15 March 2023).

Existing Fish Records

The desk study from TWIC returned no fisheries records within 2 km of the site.

Historic records of European eel, Atlantic salmon and brown/sea trout were returned, including from the River Tweed, Fruid Water, Talla Water and Kingledoors Burn, but these were from ≤ 2006 .

Electrofishing surveys for the consented Whitelaw Brae Wind Farm, revealed the high/very high presence of Atlantic salmon (including fry) in the River Tweed, but low presence in the Fingland Burn and Hawkshaw Burn. Trout on the other hand, including fry, were present in high numbers in Fingland Burn and Hawkshaw Burn. No evidence of lamprey identified or freshwater pearl mussel however, the potential for freshwater pearl mussel to be present in the wider Tweed catchment was not discounted.

3.2 Fish Habitat Survey

A description of all of the watercourses surveyed is presented below, including a summary of channel characteristics at the time of survey.

Fish habitat data for all surveyed sample points (1-27), including channel dimensions, gradient and substrate composition, are included in Annex B. Photographs from the sample points are given in Annex C. Figure 8.10 shows the watercourses and sample points.

W1- The River Tweed (Main Stem) – Sample Points 1, 7, 11, 18 and 24

Watercourse W1 is the River Tweed. The River Tweed is a SEPA classified watercourse and is assessed as having moderate overall ecological status and high access for fish migration. The section of the River Tweed that lies within the Fisheries Survey Area is also part of both the River Tweed SAC and SSSI.

W1 lies within open farmland throughout the Fisheries Survey Area.

Watercourse W1 lies on a shallow gradient, which is itself considered to be passable by migratory fish.

The substrates present in W1 contain elements of finer stone (pebble and sandy gravels), particularly in shallower sections, and are suitable for salmonid fry and parr, with the deeper sections which comprise much of the Fisheries Survey Area being suitable for larger salmonids.

Depositional silt was limited throughout the Fisheries Survey Area, but there were occasional sub-optimal patches present (largely < 15 cm in depth) in bankside margins where the flow was slower and where small indentations in the banks have trapped fine sediments therefore rendering W1 sub-optimal for juvenile lamprey (ammocetes) within the Fisheries Survey Area.

W2 – Bield Burn and Tributaries – Sample Points 2, 3, 4, 5, 6

The Bield Burn is a moderately steep watercourse that runs along the eastern boundary of the site. It is unclassified and tributes into the River Tweed to the south of the site. The burn comprises a mix of boulder, cobble, pebble and gravel substrates within the channel. It is partially shaded from the adjacent forestry plantation and has a gradient of 6-10 % along most of its extent therefore rendering it sub-optimal for migratory fish fauna.

Its most significant tributary is a minor, unnamed watercourse (sample point 3) near the southern extent of the Bield Burn which, is itself shaded by trees. This tributary contains a similar substrate composition to the Bield Burn and has a gradient of approximately 5 %. It may support low numbers of non-migratory fish and has some limited suitability for small numbers of migratory salmonids also, albeit limited by shade and scale. Depositional silt suitable for juvenile lamprey species was not recorded.

The remaining tributaries on the Bield Burn tributaries (sample points 4-6) are all very minor, ephemeral-type headwaters and are of little value for fish fauna.

W3 – Gala Burn and Tributary – Sample Points 8, 9, 10

W3, the Gala Burn (sample points 8 and 10) is a minor tributary of the River Tweed which flows through the centre of the site in a southerly direction. The channel is dominated by larger boulder and cobble substrates and contains bedrock. It lies on moderately steep terrain and flows through shaded, woodland through much of its extent, which, along with its minor nature, has reduced its suitability for fish. There are some moderate rapid sections present and small waterfalls (up to c. 0.5 m) present which reduce migration suitability further.

There is a single tributary of the Gala Burn (sample point 9) within the Fisheries Survey Area. This is an ephemeral-type watercourse, with little flow evident at the time of survey.

W4 – Hallow Burn – Sample Points 12, 13

Hallow Burn is a minor tributary of the River Tweed that flows through the site in a southerly direction. Its lower reach lies on a shallow gradient, but the majority of the watercourse flows through moderately steep terrain. Flow

conditions largely comprise shallow run flow types over larger substrates in the southern reaches and smaller (pebble, gravel and some peat) to the north.

Hallow Burn is of limited suitability for fish fauna, but may support small numbers, especially in the lower, shallower gradient sections, near its confluence with the River Tweed.

W5 – Long Slack – Sample Point 14

Long Slack is a minor tributary of the River Tweed which flows through the site largely in an east-north-east direction before joining the main stem of the River Tweed. Like the majority of the watercourses within the Fisheries Survey Area, it is of a very minor nature and is only 0.5 m in diameter. It is partially shaded, but its southern banks are surrounded by open farmland.

Long Slack has a run/riffle type flow over boulder, cobble pebble substrate and its shallow gradient has led to the build-up of finer silts within the channel, which provides suitable juvenile lamprey habitat. It also has the potential to support low numbers of migratory and non-migratory fish.

W6 – Menzion Burn – Sample Points 15, 16

Menzion Burn lies to the south of the site and flows in a northerly direction into the River Tweed. This watercourse does not flow through the site. Its lower reaches fall into the River Tweed SAC but not into the SSSI boundary.

Menzion Burn is one of the more substantial tributaries of the River Tweed that lie within the Fisheries Survey Area. It is approximately 2 m wide and supports a largely run/riffle flow condition over a range of substrates from sand and gravel to cobble, with small amounts of larger boulders present in-stream. There are no barriers to migratory fish noted, and this watercourse is considered to provide suitable spawning and juvenile habitat for migratory salmonids and non-migratory fish.

W7 – Fruid Water – Sample Point 17

The Fruid Water is a SEPA classified watercourse with an overall status of good. Similarly to the Menzion Burn it flows from the south prior to joining the River Tweed near the southern extent of the site. This watercourse does not flow through the site.

The Fruid Water supports a range of flow conditions and has some finer potential spawning substrate, but the watercourse does contain small waterfalls at its lower reaches, which limit its suitability for fish migration.

W8 – Rigs Burn and Tributaries – Sample Points 19, 20, 21, 22, 23

Rigs Burn (sample point 19) is approximately 1 m wide and supports a largely run/riffle flow over a largely cobble, pebble, gravel substrate. There is no barrier present from its confluence with the River Tweed and it is considered to provide good juvenile habitat for both migratory and non-migratory fish fauna.

It is considered to be less suitable for salmonid spawning and juvenile lamprey due to a lack of finer sands and depositional silt within the channel and its margins respectively.

The tributaries of Rigs Burn (sample points 20-23 inclusive) are all peaty ephemeral headwaters and are of little suitability for fish fauna.

W9 – Glenbow Burn and Tributary – Sample Points 25, 26, 27

Glenbow Burn and its tributary eventually tribute into the Kingledores Burn, which flows into the River Tweed. The stretches of these watercourses within the Fisheries Survey Area are all peaty headwaters and are of limited suitability for supporting fish fauna.

4.0 Summary

The watercourses within the site all drain into the River Tweed catchment. The River Tweed is internationally designated as an SAC (and nationally designated as a SSSI) on partial account of its Atlantic salmon and lamprey species populations. There are two SEPA classified watercourses within the Fisheries Survey Area – The River Tweed and the Fruid Water (a tributary of the River Tweed). The River Tweed has an overall ecological status of moderate. The Fruid Water is currently assessed as having good overall ecological status. There are some minor waterfalls within the Fisheries Survey Area which will likely reduce potential for fish migration through Fruid Water and Bield Burn. The main stem of the River Tweed is highly suitable for a range of migratory and non-migratory fish of all ages and the Menzion Burn and Rigs Burn offer spawning and juvenile habitats for fish however, the majority of the watercourses lie on moderately steep to steep gradients and many are peaty headwaters with low-negligible suitability for fish.

No evidence of freshwater pearl mussel was identified during the survey, although watercourses, particularly the River Tweed have potential to support the species.

5.0 References

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ANNEX A - SCIENTIFIC NAMES

Table A-1 provides common and scientific names of fish species (and freshwater pearl mussel) included in this Technical Appendix.

Common Name	Species Name
Atlantic salmon	<i>Salmo salar</i>
Brook lamprey	<i>Lampetra planeri</i>
Brown trout / sea trout	<i>Salmo trutta</i>
European eel	<i>Anguilla Anguilla</i>
Freshwater pearl mussel	<i>Margaritifera margaritifera</i>
River lamprey	<i>Lampetra fluviatilis</i>
Sea lamprey	<i>Petromyzon marinus</i>

ANNEX B - PHOTOGRAPHS

Photograph 1: Sample Point (SP) 1.



Photograph 2: SP 2.



Photograph 3: SP 3.



Photograph 4: SP 4.



Photograph 5: SP 5.



Photograph 6: SP 6.



Photograph 7: SP 7.



Photograph 8: SP 8.



Photograph 9: SP 9.



Photograph 10: SP 10.



Photograph 11: SP 11.



Photograph 12: SP 12.



Photograph 13: SP 13.



Photograph 14: SP 14.



Photograph 15: SP 15.



Photograph 16: SP 16.



Photograph 17: SP 17.



Photograph 18: SP 18.



Photograph 19: SP 19.



Photograph 20: SP 20.



Photograph 21: SP 21.



Photograph 22: SP 22.



Photograph 23: SP 23.



Photograph 24: SP 24.



Photograph 25: SP 25.



Photograph 26: SP 26.



Photograph 27: SP 27.



ANNEX C - ENVIRONMENTAL DATA

Sample locations (Sample Point) are illustrated on Figure 8.10 with photographs of sample points provided in Annex B.

Table C-1: Environmental data from SP1 – SP27

Location			Substrate Composition (%)							Channel Information				Habitat Type
Sample No/ Photo	Easting	Northing	Bed-rock	Boulders >256 mm	Cobbles 65–256 mm	Pebbles 4 – 64 mm	Gravel 2 – 4 mm	Coarse sand 0.5 –2 mm	Peat/fine sand/silt <0.5 mm	Av. Wetted Width (m)	Av. Depth (m)	Turbidity (1 [clear]-3[turbid])	Channel Gradient (%)	
1	310218	624725	0	0	30	40	30	0	0	7	0.7	1	1	2a, 2b, 3, 4b, 8b
2	310013	624802	0	10	20	40	30	0	0	1	0.4	1	3	4a, 9
3	309793	624963	0	10	20	40	30	0	0	1	0.1	1	5	3, 4a, 9
4	309677	624977	0	0	0	0	0	0	100	0.5	<0.1	1	6-10	1c
5	309576	625133	0	0	0	0	60	40	0	0.5	0.25	1	6-10	1c
6	309578	625233	0	0	20	50	30	0	0	0.5	0.25	1	6-10	1c
7	309766	624343	40	50	10	0	0	0	0	5	0.5	1	1	2a, 2b, 3, 4b, 8b
8	309165	624289	20	40	10	20	10	0	0	1	0.4	1	6-10	6a, 7a, 9
9	309183	624296	0	0	100	0	0	0	0	0.5	<0.1	1	6-10	1c
10	308492	624513	0	0	40	50	10	0	0	0.5	0.25	1	0.5	1c
11	309013	623782	0	10	30	30	30	0	0	7	0.9	1	1	2a, 2b, 3, 4b, 8b
12	308970	623773	0	10	40	30	20	0	0	1	0.2	1	2	4a
13	308350	623892	0	0	0	50	20	0	30	0.5	0.2	1	6-10	4a
14	308805	623785	0	10	20	20	0	0	50	0.5	0.25	1	3	3, 4a
15	309171	623452	0	0	20	40	30	10	0	2	0.35	1	2	2a, 4a, 5a
16	309335	622920	0	10	30	30	15	15	0	2	0.25	1	3	2a, 3, 4a
17	308804	622866	10	25	30	15	10	10	0	2	0.4	1	6-10	2a, 3, 4a, 7a
18	308463	623215	0	0	40	30	20	10	0	7	0.7	1	2	2a, 2b, 3, 4b, 8b
19	308117	623059	0	0	30	50	20	0	0	1	0.3	1	4	3, 4a
20	307332	623716	0	0	50	50	0	0	0	0.5	0.1	1	6-10	1c
21	307290	623731	0	0	80	0	0	0	20	0.5	0.2	1	6-10	1c
22	307209	623737	0	0	40	40	20	0	0	0.5	0.1	1	6-10	1c
23	307215	623648	0	0	0	50	50	0	0	0.5	0.1	1	6-10	1c
24	308030	622909	0	20	40	20	20	0	0	6	0.65	1	2	2a, 2b, 3, 4b, 8b
25	308251	624890	0	0	0	0	0	0	100	0.5	0.1	1	5	1c
26	308105	624747	0	0	0	0	0	0	100	0.25	0.1	1	6-10	1c
27	308105	624728	0	0	0	0	0	0	100	0.5	0.1	1	6-10	1c