

Fish in Rivers Factsheet

The Avoca River Catchment is located within the Eastern River Basin District and covers an area of approximately 650km². The Avoca River begins as two major tributaries, the Avonbeg and Avonmore Rivers. Both flow in south easterly directions, joining at the Meeting of the Waters in Co. Wicklow before becoming the Avoca River and reaching the sea at Arklow. The Aughrim river (flowing from the Derry Water and River Ow) flows in an easterly direction before joining the Avoca River below Woodenbridge, Co. Wicklow. Geology is comprised of siliceous granite and Ordovician slate (EPA, 2016). The primary land use types include agriculture, with significant pockets of forestry located throughout.

Mines adjacent to the Avoca River produced copper, iron and other metals from the 17th century up until 1982. Leachate from the mines has resulted in serious pollution problems along a significant length of the Avoca River channel (from the mines to the sea at Arklow) and has been identified as a significant pressure on water quality.

Upper portions of this catchment are within the Wicklow Mountains Special Area of Conservation. This

is a SAC for a number of habitats listed in Annex I of the EU Habitats Directive, including alluvial wet woodland, floating vegetation, tidal mudflats and estuaries. Several species (e.g. sea, river and brook lamprey, freshwater pearl mussel, twaite shad, Atlantic salmon and otter) listed in Annex II of the same Directive are also present throughout this SAC, adding further to its conservation value (NPWS, 2015).

Inland Fisheries Ireland conducts annual nation-wide fish sampling surveys to assess and report the status of stocks in Ireland’s rivers, lakes and transitional waters. This report presents the results of a catchment-wide electro-fishing (CEN 2003) survey, carried out in the Avoca Catchment over the 2023 and 2024 survey seasons. Three sites were surveyed in each of the Avonmore and Derry sub-catchments on the 25th and 26th of September 2023. Twenty-six sites were surveyed between the 1st to 5th of July 2024.

The survey methods included 10-minute timed Electro-Fishing (TEF₁₀), and Area Delineated Electro-Fishing (ADEF handset). All TEF₁₀ fish count results were converted to minimum population estimates according to Matson *et al.* 2018.



Glendasan River at Leadworks (Site 10), Co. Wicklow.

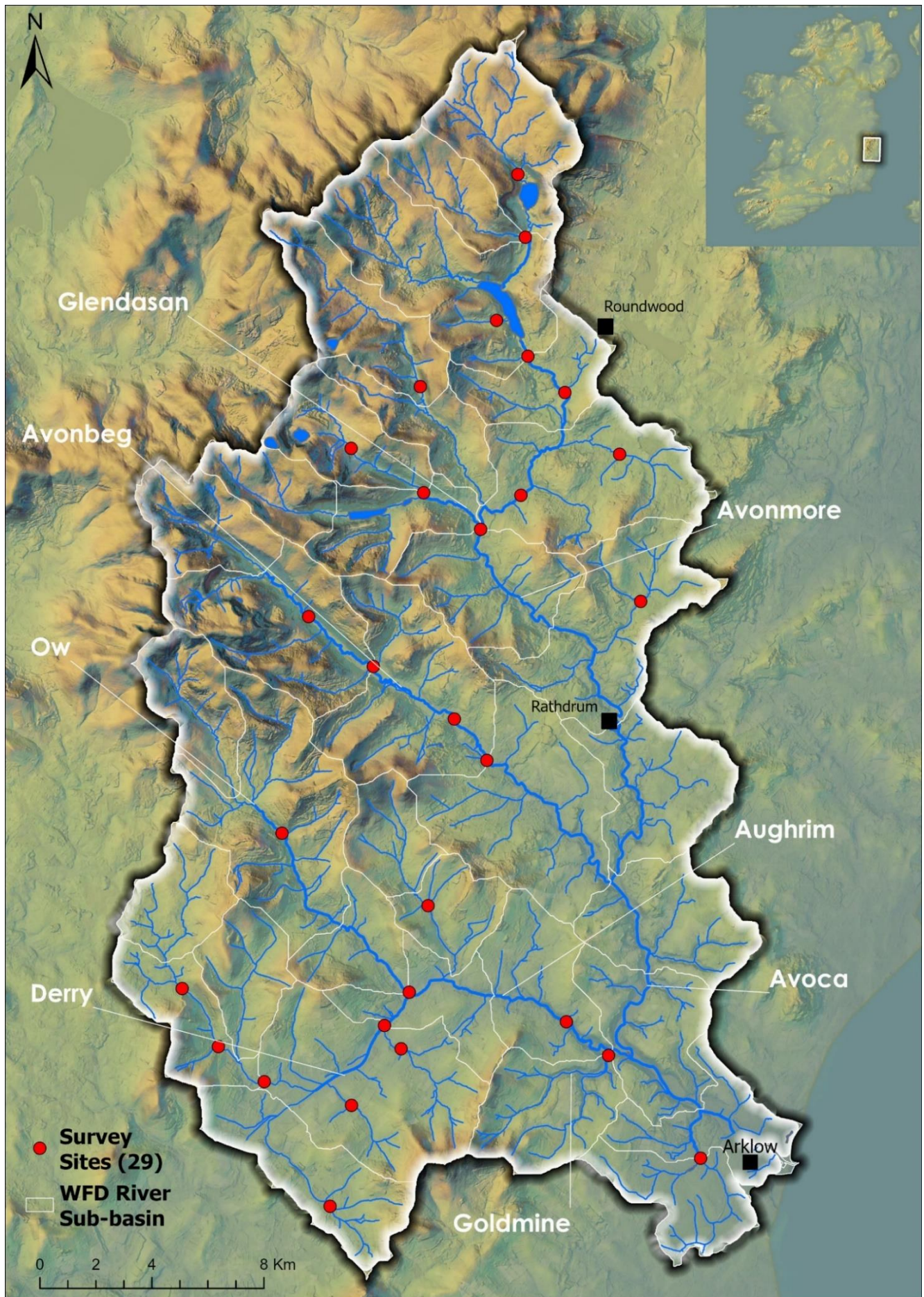


Figure 1. Location of electrofishing survey sites on the Avoca River catchment, 2023 & 2024. Sub-catchments and WFD River Sub-basins are also highlighted.

Avonmore, Glendasan and Avonbeg sub-catchments.

Sixteen sites were surveyed in the Avonmore, Glendasan and Avonbeg sub-catchments in 2024. This included nine sites on the Avonmore, three sites on the Glendasan and four sites on the Avonbeg sub-catchment. One long-term Water Framework Directive (WFD) surveillance monitoring (SM) site was surveyed on the Avonbeg River at Greenan Bridge (Site 16) (Figure 2 and Table 1).

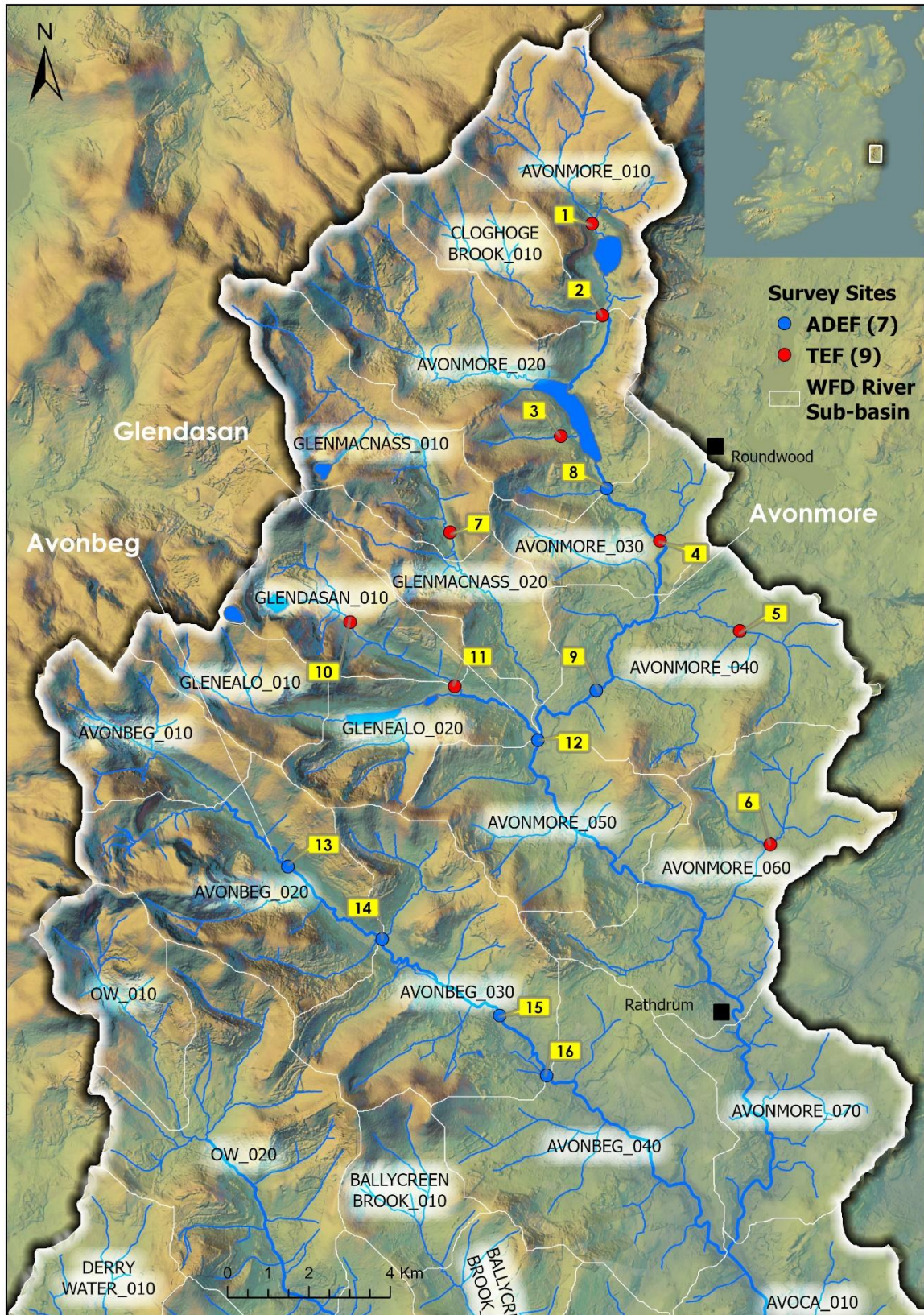


Figure 2. Location of electrofishing survey sites and waterbodies: Avonmore (sites 1-9), Glendasan (sites 10-12) and Avonbeg (sites 13-16), sub-catchments, 2024.

Table 1. Site survey details, Avoca River Catchment, July 2024.

No.	WFD Sub-basin	River	Site	Method	WFD	Date
Avonmore sub-catchment						
1	Avonmore_010	Cloghoge	Luggala Lodge	TEF (Handset)	No	04/07/2024
2	Cloghoge Brook_010	Cloghoge Brook	Knocknacloghoge	TEF (Handset)	No	04/07/2024
3	Avonmore_020	Carrigeenshinnagh	Carrigeenshinnagh	TEF (Handset)	No	04/07/2024
4	Avonmore_030	Ballinacorbeg	Ballinacorbeg	TEF (Handset)	No	04/07/2024
5	Avonmore_040	Moneystown	Castlekevin	TEF (Handset)	No	04/07/2024
6	Avonmore_060	Garryduff	Montiagh East	TEF (Handset)	No	03/07/2024
7	Glenmacnass_010	Glenmacnas	Mall Hill	TEF (Handset)	No	04/07/2024
8	Avonmore_020	Avonmore	Oldbridge	ADEF (Handset)	No	04/07/2024
9	Avonmore_040	Avonmore	Trooperstown	ADEF (Handset)	No	04/07/2024
Glendasan sub-catchment						
10	Glendasan_010	Glendasan	Leadworks	TEF (Handset)	No	03/07/2024
11	Glendasan_010	Glendasan	Roundtower	TEF (Handset)	No	03/07/2024
12	Glenealo_020	Glendasan	Ballard Bridge	ADEF (Handset)	No	05/07/2024
Avonbeg sub-catchment						
13	Avonbeg_020	Avonbeg	Mine	ADEF (Handset)	No	01/07/2024
14	Avonbeg_020	Avonbeg	Drumgoff Bridge	ADEF (Handset)	No	01/07/2024
15	Avonbeg_030	Avonbeg	Riverside	ADEF (Handset)	No	02/07/2024
16	Avonbeg_030	Avonbeg	Greenan Bridge	ADEF (Handset)	Yes	01/07/2024



Glendasan River at Roundtower (Site 11), Co. Wicklow.

Table 2. Minimum density estimates of fish (no. fish/m²), for the Avonmore, Glendasan and Avonbeg sub-catchments (Avoca River Catchment), July 2024 and September 2023 (previous results are shown where applicable).

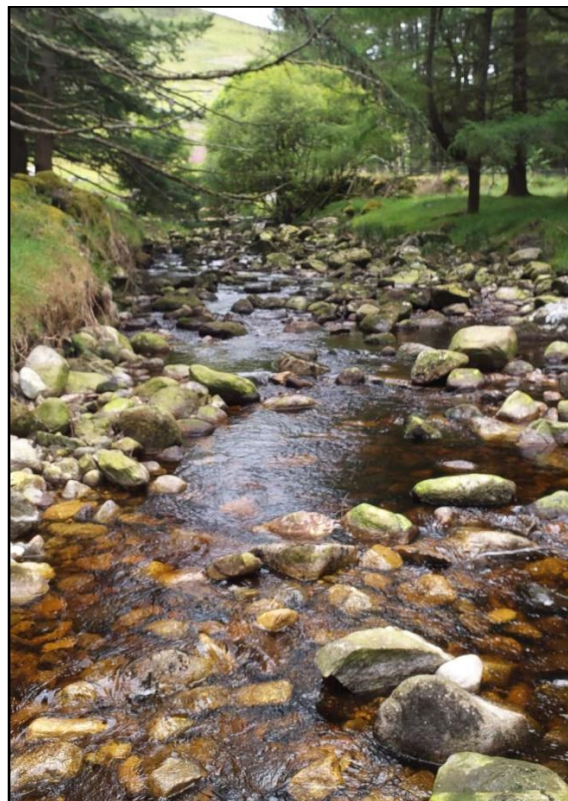
		Avonmore						
Site no.		1	2	3	4	5		
Species		2024	2024	2024	2023	2024	2023 2024	
Brown trout		0.177	0.037	0.131	0.086	0.155	0.235 0.418	
0+ brown trout		0.151	0.009	0.015	0.086	0.124	0.076 0.084	
1+ & older brown trout		0.026	0.028	0.116	-	0.031	0.159 0.335	
Salmon		-	0.009	-	0.012	-	- -	
0+ salmon		-	-	-	-	-	- -	
1+ & older salmon		-	0.009	-	0.012	-	- -	
European eel		-	-	-	-	-	- -	
Lamprey sp.		-	-	-	-	-	- -	
Minnow		-	-	-	0.018	-	- -	
Three-spined stickleback		-	-	-	-	-	- 0.094	
All fish		0.177	0.046	0.131	0.117	0.155	0.235 0.512	
		Avonmore					Glendasan	
Site no.		6	7	8	9	10		
Species		2023	2024	2024	2024	2024	2017 2024	
Brown trout		0.181	0.325	0.097	0.082	0.025	0.073 0.055	
0+ brown trout		0.062	0.180	0.008	0.019	0.006	0.016 -	
1+ & older brown trout		0.119	0.145	0.089	0.063	0.020	0.057 0.055	
Salmon		-	-	-	-	0.130	- -	
0+ salmon		-	-	-	-	0.079	- -	
1+ & older salmon		-	-	-	-	0.051	- -	
European eel		-	-	-	-	-	- -	
Lamprey sp.		-	-	-	-	-	- -	
Minnow		-	-	-	-	-	- -	
Three-spined stickleback		-	-	-	-	-	- -	
All fish		0.181	0.325	0.097	0.082	0.156	0.073 0.055	
		Glendasan			Avonbeg			
Site no.		11		12	13		14	
Species		2017	2024	2017 2024	2024	2024	2024	
Brown trout		0.040	0.173	- 0.029	0.014	0.031		
0+ brown trout		0.010	0.067	- 0.011	0.005	0.005		
1+ & older brown trout		0.030	0.106	- 0.018	0.009	0.026		
Salmon		-	0.016	0.012 0.047	0.070	0.038		
0+ salmon		-	-	0.012 0.018	0.039	0.024		
1+ & older salmon		-	0.016	- 0.029	0.032	0.014		
European eel		-	-	- 0.011	-	-		
Lamprey sp.		-	-	- -	-	-		
Minnow		-	-	- 0.004	-	-		
Three-spined stickleback		-	-	- -	-	-		
All fish		0.040	0.189	0.012 0.090	0.084	0.069		
		Avonbeg						
Site no.		15		16				
Species		2024	2010	2013	2017	2024		
Brown trout		0.035	0.016	0.032	0.007	0.017		
0+ brown trout		0.007	-	0.013	0.007	0.007		
1+ & older brown trout		0.028	0.016	0.019	-	0.010		
Salmon		0.042	0.089	0.109	0.012	0.058		
0+ salmon		0.028	0.003	0.013	0.005	0.051		
1+ & older salmon		0.014	0.086	0.096	0.007	0.007		
European eel		-	0.003	-	-	0.003		
Lamprey sp.		-	-	-	-	-		
Minnow		-	-	-	-	-		
Three-spined stickleback		-	-	-	-	-		
All fish		0.077	0.107	0.141	0.020	0.078		

Table 3. Brown trout % age class structure (where recorded), Avoca River Catchment (Sites 1-16).

Site No.	% of catch			
	0+	1+	2+	3+
Avonmore				
1	88	12	-	-
2	25	50	25	-
3	13	63	25	-
4	83	17	-	-
5	25	55	20	-
6	58	38	4	-
7	9	55	36	-
8	23	57	17	2
9	22	33	45	-
Glendasan				
10	-	100	-	-
11	46	42	12	-
12	38	37	12	13
Avonbeg				
13	33	67	-	-
14	15	69	8	8
15	20	53	20	7
16	36	55	9	-

Table 4. Salmon % age class structure (where recorded), Avoca River Catchment (Sites 1-16).

Site No.	% of catch		
	0+	1+	2+
Avonmore			
2	-	100	-
9	61	37	2
Glendasan			
11	-	100	-
12	38	62	-
Avonbeg			
13	55	45	-
14	62	38	-
15	67	33	-
16	82	18	-



Cloghoge Brook at Knocknacloghoge (Site 2), Co Wicklow.

Table 5. Fish ecological status, Avonmore, Glendasan and Avonbeg sub-catchments, July 2024.

Site No.	2010	2013	2017	2023	2024
Avonmore sub-catchment					
1	-	-	-	-	M
2	-	-	-	-	M
3	-	-	-	-	M
4	-	-	-	M	M
5	-	-	-	G	G
6	-	-	-	G	G
7	-	-	N/A	-	M
8	-	-	-	-	M
9	-	-	-	-	M
Glendasan sub-catchment					
10	-	-	M	-	P
11	-	-	M	-	G
12	-	-	N/A	-	M
Avonbeg sub-catchment					
13	-	-	N/A	-	M
14	-	-	-	-	M
15	-	-	-	-	M
16	G	G	P	-	M

Ow, Derry, Aughrim, Goldmine and Ballyduff stream sub-catchments.

Thirteen sites were surveyed in the Ow, Derry, Aughrim, Goldmine and Ballyduff stream sub-catchments in 2023 and 2024. This included two sites on the Ow, seven sites on the Derry, two sites on the Aughrim, one site on the Goldmine and one site on the Ballyduff stream sub-catchment (Figure 3 and Table 6).

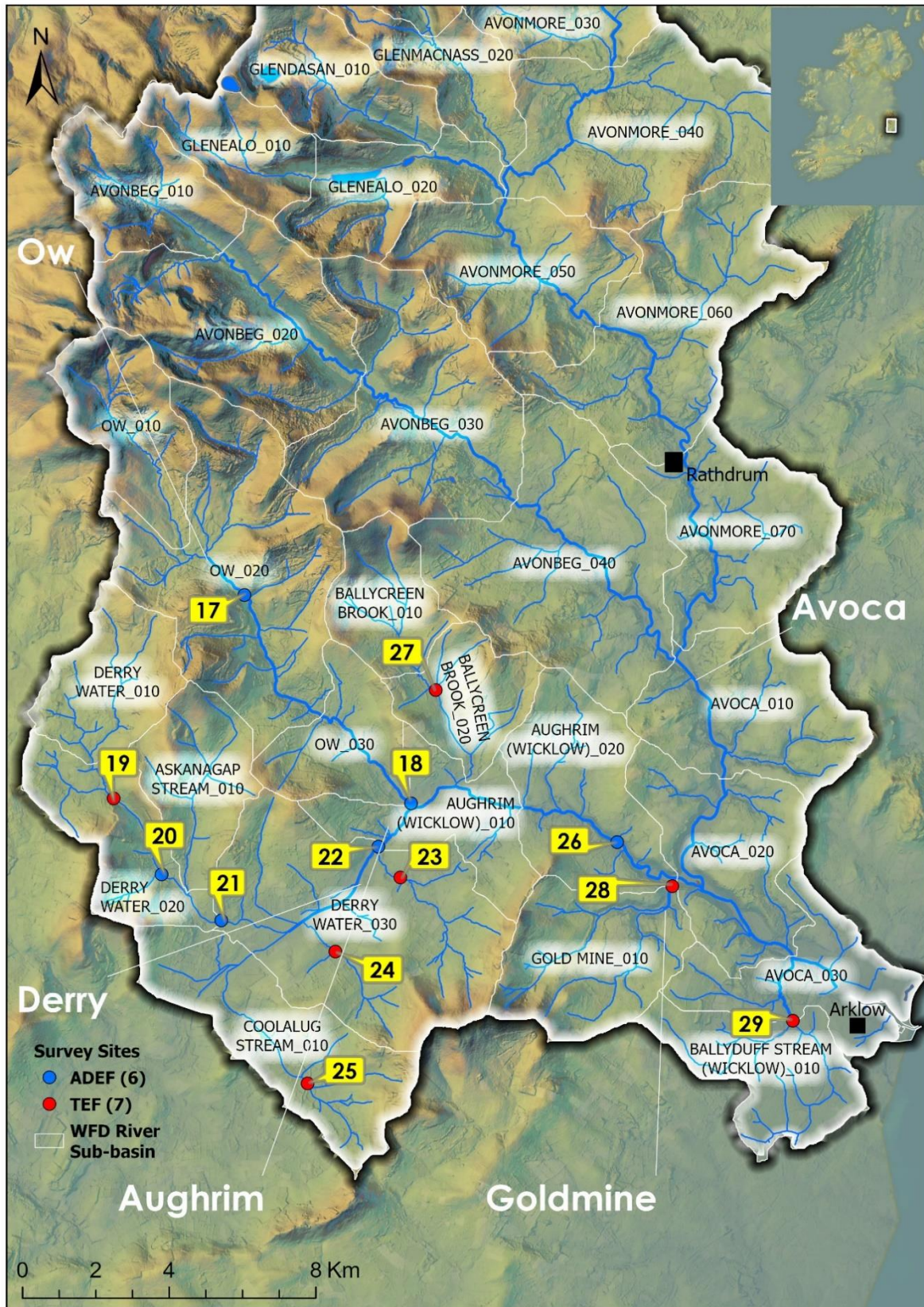


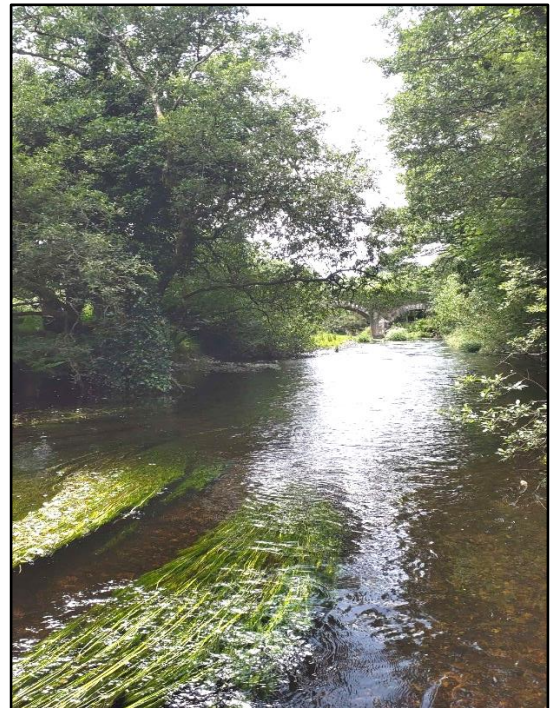
Figure 3. Location of electrofishing survey sites and sub-basin waterbodies: Ow (sites 17-18), Derry (sites 19-25), Aughrim (sites 26-27), Goldmine (Site 28) and Ballyduff stream (Site 29), sub-catchments, 2023 and 2024.

Table 6. Site survey details for the Ow, Derry, Aughrim, Goldmine and Ballyduff stream, 2023 & 2024.

No.	WFD Sub-basin	River	Site	Method	WFD	Date
Ow sub-catchment						
17	Ow_20	Ow	Iron Bridge	ADEF (Handset)	No	02/07/2024
18	Ow_30	Ow	Rednagh Bridge	ADEF (Handset)	No	02/07/2024
Derry sub-catchment						
19	Derry Water_020	Derry	Slieveroe	TEF (Handset)	No	02/07/2024
20	Derry Water_020	Derry	Ballycumber Bridge	ADEF (Handset)	No	02/07/2024
21	Derry Water_030	Derry	Baile an Ghleanna	ADEF (Handset)	No	02/07/2024
22	Derry Water_030	Derry	Annacurra	ADEF (Handset)	No	02/07/2024
23	Derry Water_030	Derry	Kilpipe Bridge	TEF (Handset)	No	26/09/2023
24	Derry Water_030	Derry	Mucklagh	TEF (Handset)	No	26/09/2023
25	Coolalug stream_010	Coolalug	Ballyday	TEF (Handset)	No	26/09/2023
Aughrim sub-catchment						
26	Aughrim (Wicklow)_020	Aughrim	Knocknamohill	ADEF (Handset)	No	03/07/2024
27	Ballycreen Brook_020	Aughrim	Macreddin Bridge	TEF (Handset)	No	05/07/2024
Goldmine sub-catchment						
28	Gold mine_010	Goldmine	Coolgaroo Bridge	TEF (Handset)	No	05/07/2024
Ballyduff sub-catchment						
29	Ballyduff stream_010	Ballyduff	Ballyduff North	TEF (Handset)	No	03/07/2024



Electrofishing on the Ow River at Iron Bridge (Site 17), Co. Wicklow.



Derry River at Annacurra (Site 22), Co Wicklow.

Table 7. Minimum density estimates of fish (no. fish/m²), for the Ow, Derry, Aughrim, Goldmine and Ballyduff sub-catchments (Avoca River Catchment), July 2024 and September 2023 (previous results are shown where applicable).

	Ow		Derry				
Site no.	17	18	19	20	21		22
Species	2024	2024	2024	2024	2008	2024	2024
Brown trout	0.168	0.096	0.215	0.334	0.055	0.259	0.095
0+ brown trout	0.071	0.043	0.017	0.057	0.007	0.038	-
1+ & older brown trout	0.098	0.052	0.197	0.277	0.047	0.222	0.095
Salmon	0.138	0.088	-	-	0.61	0.019	0.025
0+ salmon	0.138	0.076	-	-	0.37	0.015	0.005
1+ & older salmon	-	0.012	-	-	0.24	0.004	0.02
European eel	-	-	-	-	0.029	-	-
Lamprey sp.	-	-	-	-	-	0.026	-
Minnow	-	-	-	-	-	-	-
Roach	-	-	-	-	-	0.008	-
All fish	0.306	0.184	0.215	0.334	0.694	0.312	0.12
	Derry		Aughrim		Goldmine		Ballyduff
Site no.	23	24	25	26	27	28	29
Species	2023	2023	2023	2024	2024	2024	2024
Brown trout	0.429	0.243	0.32	0.05	0.069	0.216	0.804
0+ brown trout	0.225	0.139	0.271	0.018	0.011	0.041	0.136
1+ & older brown trout	0.204	0.104	0.049	0.032	0.058	0.175	0.668
Salmon	-	-	-	0.079	-	-	-
0+ salmon	-	-	-	0.071	-	-	-
1+ & older salmon	-	-	-	0.008	-	-	-
European eel	-	-	-	0.002	-	0.051	0.043
Lamprey sp.	-	-	-	-	-	-	-
Minnow	-	-	-	0.002	-	-	-
Roach	-	-	-	-	-	-	-
All fish	0.429	0.243	0.32	0.132	0.069	0.267	0.847



Aughrim River at Knocknamohill (Site 26), Co. Wicklow.

Table 8. Brown trout % age class structure (where recorded), Avoca River Catchment (Sites 17-29).

Site No.	% of catch				
	0+	1+	2+	3+	4+
Ow					
17	42	56	2	-	-
18	45	52	3	-	-
Derry					
19	11	39	50	-	-
20	17	58	25	-	-
21	15	81	3	1	-
22	-	81	14	5	-
23	53	32	15	-	-
24	59	35	6	-	-
25	86	8	6	-	-
Aughrim					
26	37	56	7	-	-
27	22	67	11	-	-
Goldmine					
28	24	67	9	-	-
Ballyduff					
29	20	73	5	-	2

Table 9. Salmon % age class structure (where recorded), Avoca River Catchment (sites 17-29).

Site No.	% of catch		
	0+	1+	2+
Ow			
17	100	-	2
18	87	13	3
Derry			
20	80	20	25
21	18	82	3
Aughrim			
26	37	56	7

Table 10. Fish ecological status, Ow, Derry, Aughrim, Goldmine, Ballyduff sub-catchments, July 2023 and 2024.

Site No.	2008	2023	2024
Ow sub-catchment			
17	-	-	G
18	-	-	G
Derry sub-catchment			
19	-	-	M
20	-	-	M
21	-	-	M
22	-	-	M
23	-	G	-
24	-	G	-
25	-	G	-
Aughrim sub-catchment			
26	-	-	G
27	-	-	M
Goldmine sub-catchment			
28	-	-	G
Ballyduff sub-catchment			
29	-	-	G



Ballyduff River at Ballyduff North, Co. Wicklow (Site 29).

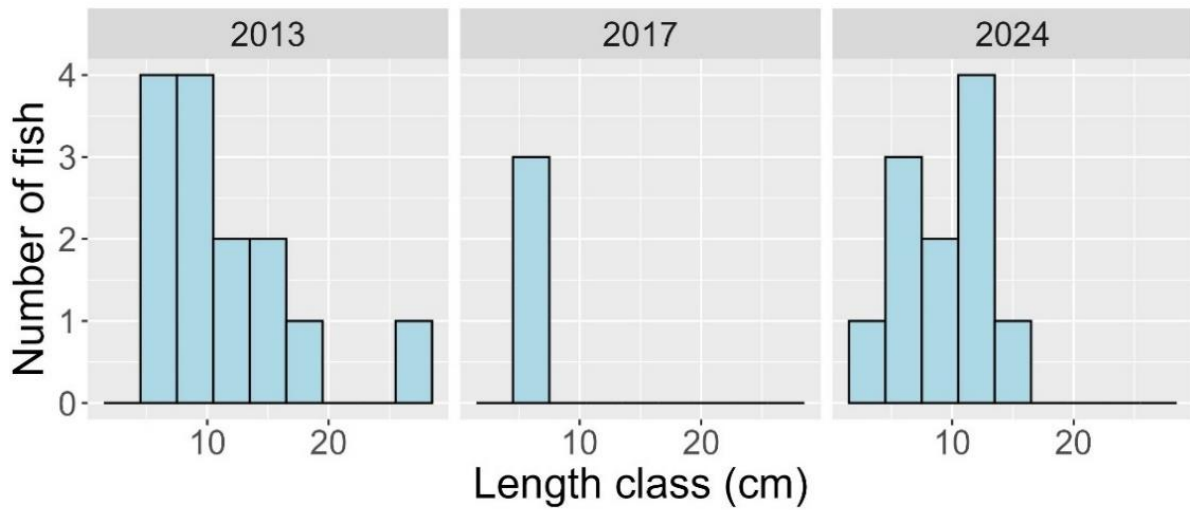


Figure 4. Length frequency distribution of brown trout (2013 n= 14, 2017 n= 3, 2024 n= 11) at Site 16 (Greenan Bridge), a WFD surveillance monitoring site in the Avoca River Catchment.

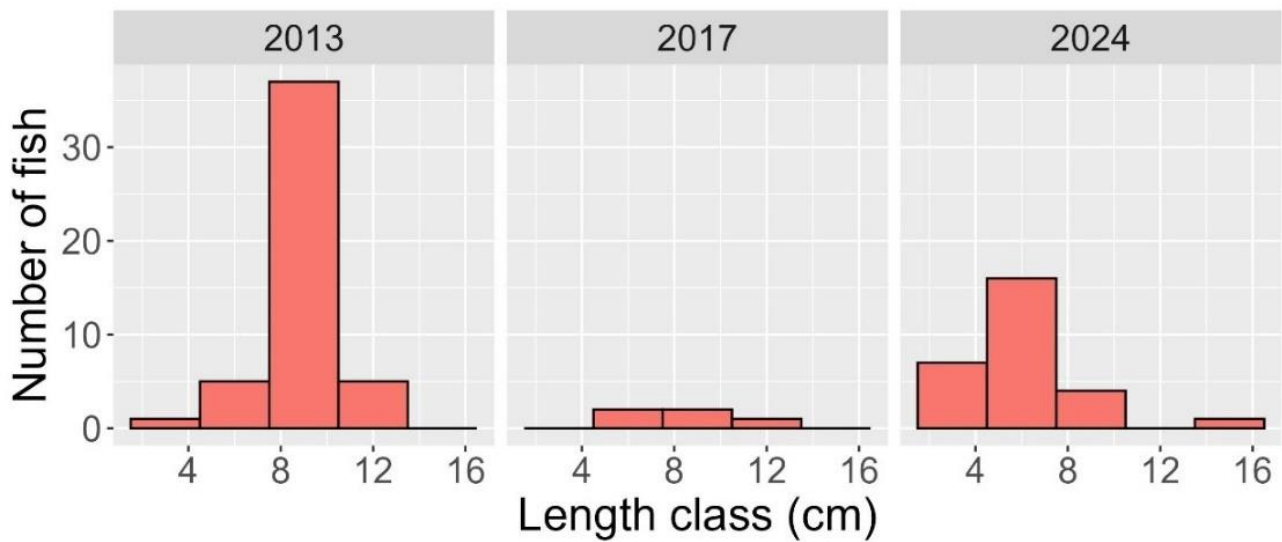


Figure 5. Length frequency distribution of salmon (2013 n= 48, 2017 n=5, 2024 n= 28) at Site 16 (Greenan Bridge), a WFD surveillance monitoring site in the Avoca River Catchment.



Aughrim River at Macreddin Bridge, Co. Wicklow (Site 27).

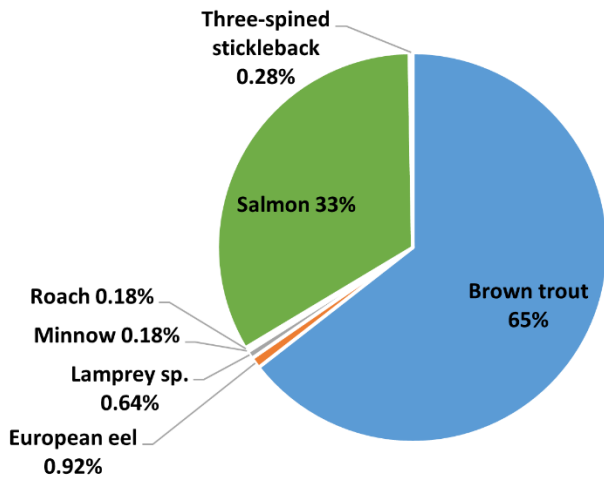


Figure 6. Fish species composition (%), Avoca Catchment, 2023 & 2024.

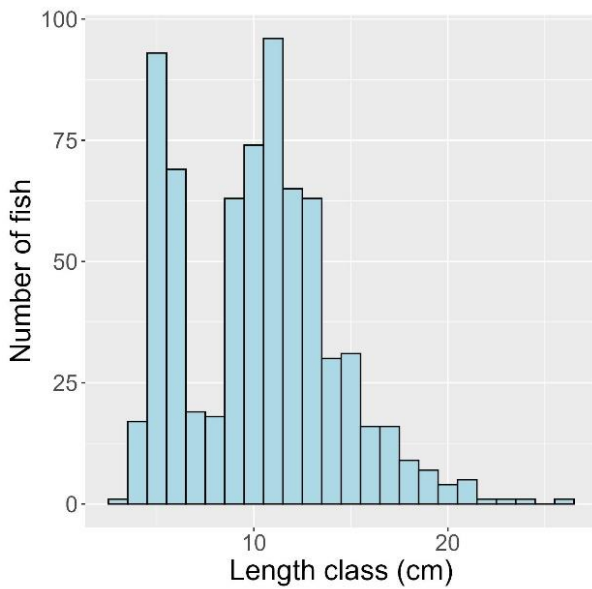
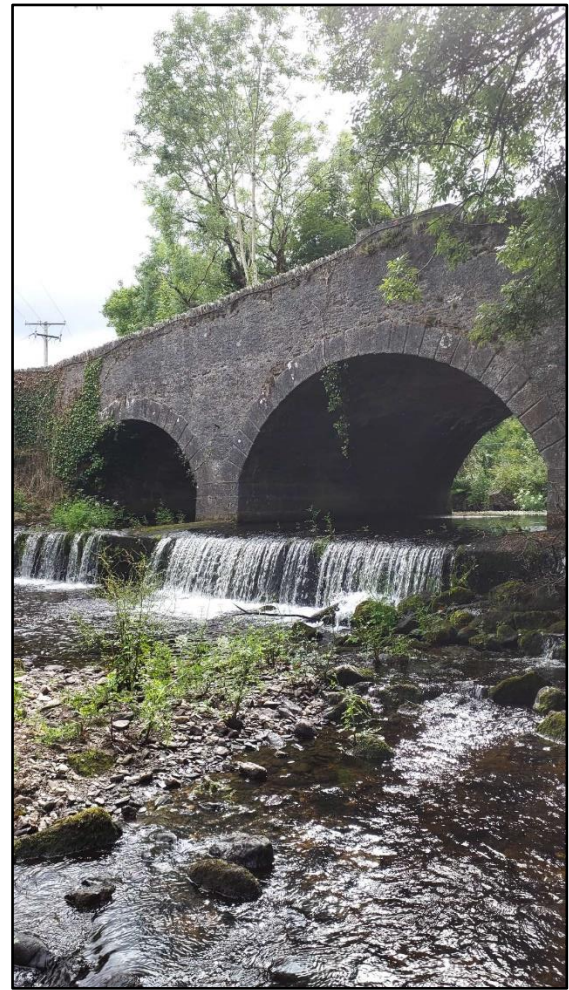


Figure 7. Length frequency distribution for brown trout (n = 792), Avoca Catchment, 2023-2024 (No. sites = 29).



Electrofishing at Greenan Bridge on the Avonbeg river, Co. Wicklow (Site 16).



Ballinlen Bridge (Derry sub-catchment) (Site 21)

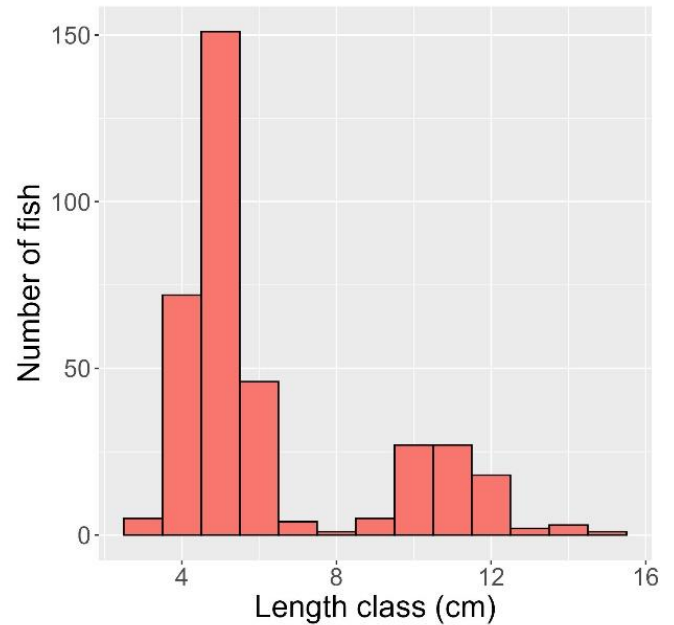


Figure 8. Length frequency distribution for salmon (n = 362), Avoca Catchment, 2023-2024 (No. sites = 13)

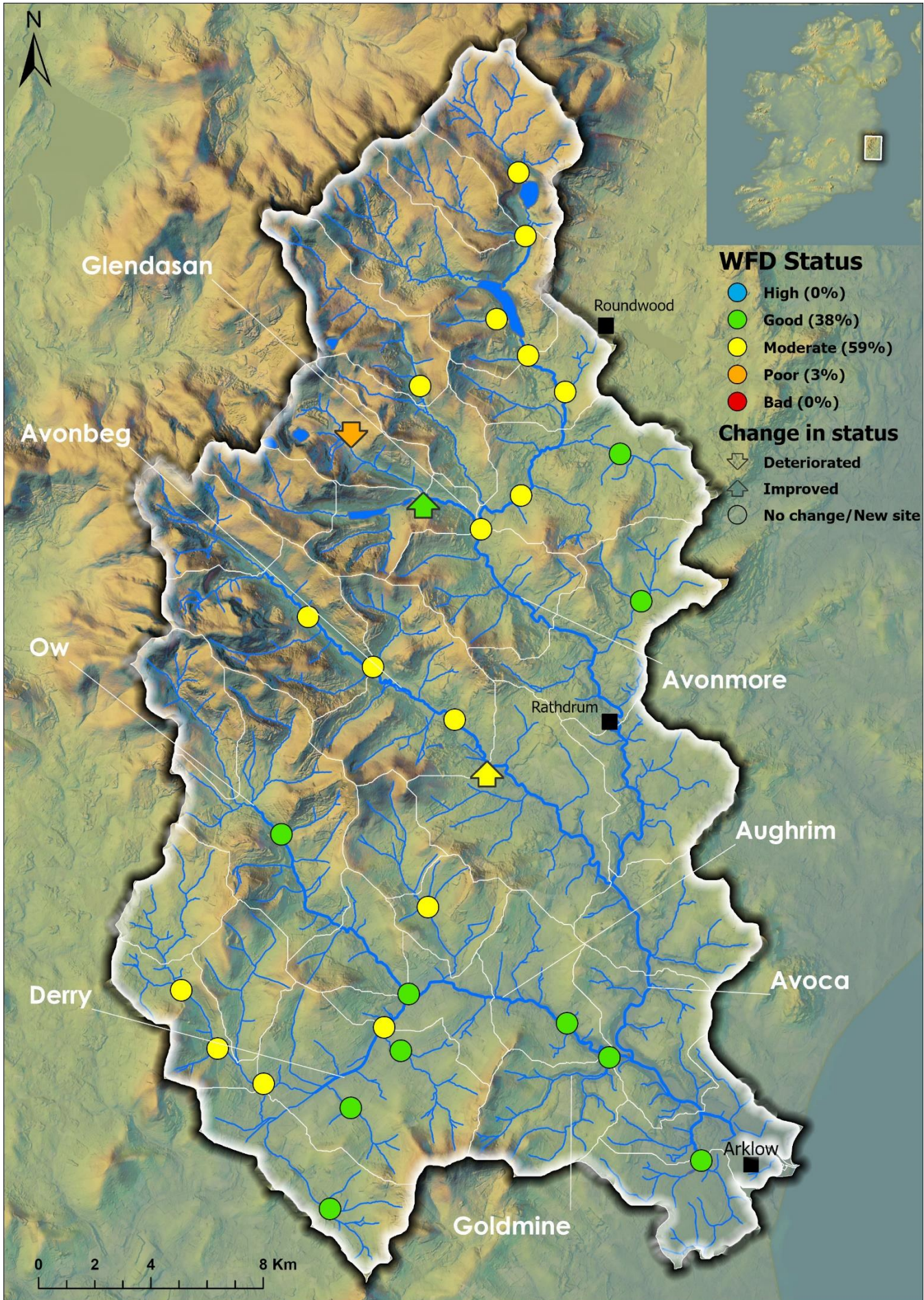


Figure 9. Fish ecological status in the Avoca River Catchment, 2023 & 2024. Arrows indicate a change in status since previous surveys (where applicable).

Summary

A total of seven fish species were recorded across 29 sites surveyed on the Avoca River Catchment in 2023 and 2024.

Brown trout was the most common species present (29 sites, 100%), followed by salmon (13 sites, 45%), European eel (5 sites, 17%), minnow (2 sites, 7%), Lamprey spp., roach and three-spined stickleback (one site each, 3%).

Brown trout was also the most abundant species recorded, captured at all sites surveyed, followed by salmon, European eel, lamprey spp., three-spined stickleback, minnow and roach.

Brown trout ranged in length from 3.7 to 26cm. Five age classes were present (0+, 1+, 2+, 3+ and 4+) with 1+ being the most abundant cohort. The highest density of brown trout (all ages combined) (0.804 fish/m²) was recorded at Site 29 (Ballyduff North) in the Ballyduff stream sub-catchment. The highest density of 0+ brown trout (0.271 fish/m²) was recorded at Site 25 (Ballyday) in the Derry sub-catchment. The highest density of 1+ & older brown trout (0.668 fish/m²) was also recorded at Site 29.

Salmon ranged in length 3.4 to 15.2cm. Three age classes were present (0+, 1+ and 2+), with 0+ being the most abundant cohort. The highest density of salmon (all ages combined) (0.260 fish/m²) was recorded at Site 9 (Trooperstown) in the Avonmore sub-catchment. The highest density of 0+ salmon (0.158 fish/m²) and 1+ & older (0.102 fish/m²) salmon were also recorded at Site 9.

A Water Framework Directive fish classification tool (FCS2) was developed for Irish rivers in 2011 (SNIFFER 2011). The tool works by comparing various fish community metric values within a site to those

predicted for a site under un-impacted conditions. In general, a site will achieve High status if all indicator species (e.g. both salmonid cohorts 0+ and 1+ and older) are present and in expected numbers. Status will decline if such cohorts are missing, are in poor abundance, or if more tolerant species proliferate.

Fish ecological status was assigned to twenty-nine sites surveyed in the Avoca Catchment during 2023 and 2024. Eleven sites were assigned Good status, with seventeen sites Moderate and one site Poor. Seven sites were surveyed previously on this catchment and assigned fish ecological status. When compared with their most recent previous surveys, two sites improved (sites 11 and 16), one site (site 10) deteriorated, and four sites remained unchanged (Tables 5 and 10; Figure 9).

The reasons for the failures (i.e. moderate or lower status) in fish ecological status were due to lower-than-expected abundance of type specific indicator species (e.g. salmon and trout) and absence of certain age cohorts indicating recruitment failures. Failures and deteriorations in fish ecological status can be caused by pressures such as nutrient enrichment, habitat modification and fish passage issues.

References

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