

Fish in Rivers Factsheet

SHIRBD

Little Brosna Catchment

Factsheet: 2021/3

The Little Brosna catchment is located within the Shannon International River Basin District and covers an area of approximately 579km². It rises near Dunkerrin, Co. Offaly and flows near Birr Co. Offaly and Roscrea, Co Tipperary. The most significant tributary in the catchment is the Camcor River which is known for its run of migratory trout ('croneen') from Lough Derg which enter the river from July onwards under suitable water conditions. Other tributaries include the Bunow River, the Golden Grove Stream, the Keeloge Stream and the Pallas Stream.

Inland Fisheries Ireland conducts annual nation-wide fish sampling surveys to assess the status of stocks in

Ireland's rivers, lakes and estuaries. This report presents the results of a catchment-wide survey of the Little Brosna catchment undertaken in 2021.

A total of thirty-five sites were surveyed by electro-fishing (CEN 2003) in the Little Brosna catchment from the 10th to 24th of August, 2021. The survey methods included 10-minute timed Electro-Fishing (TEF₁₀) and Area Delineated Electro-Fishing (ADEF (boat)). All TEF₁₀ fish count results were converted to minimum population estimates according to Matson *et al.* (2018).



Little Brosna River at Riverstown (Site 4)



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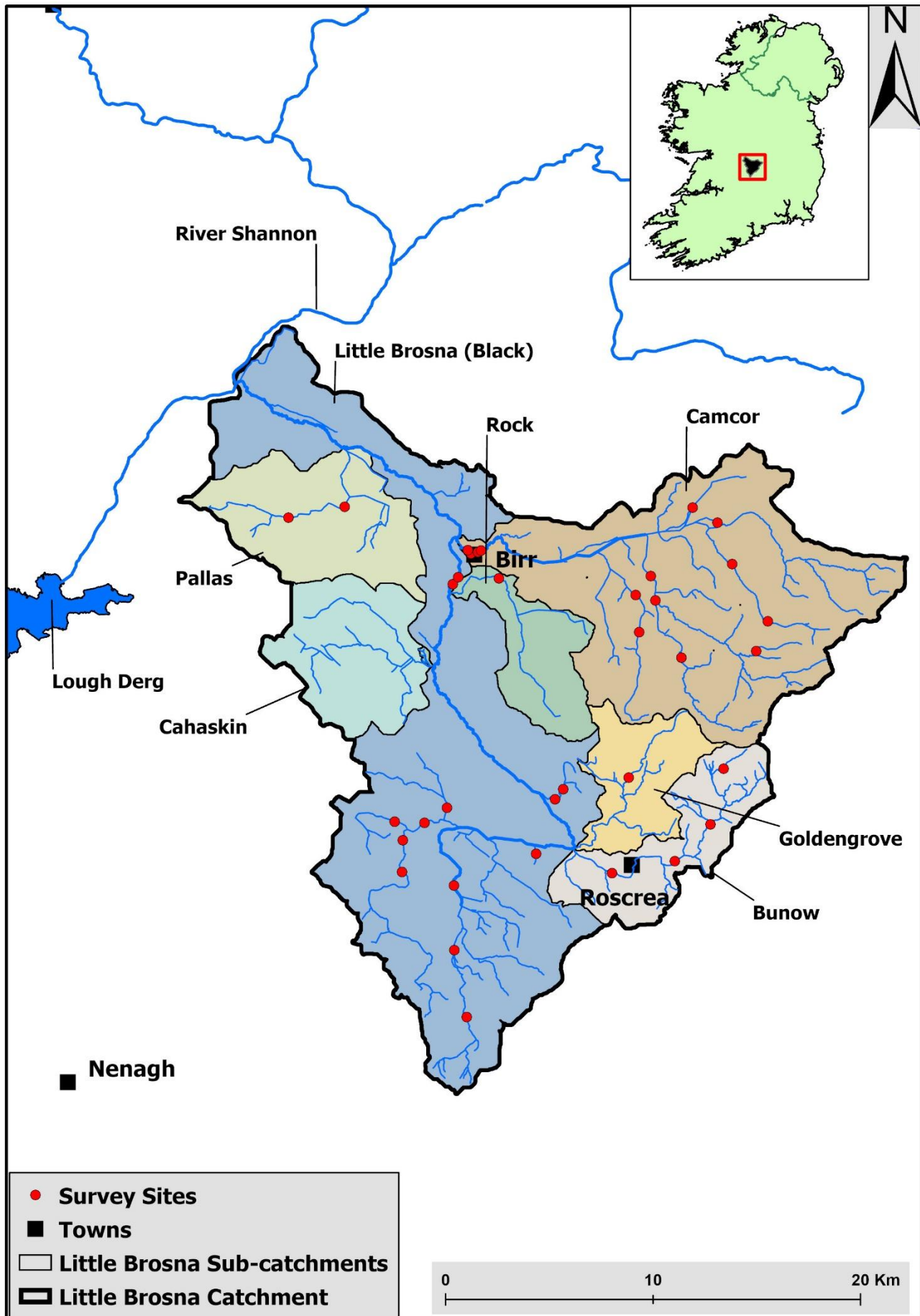


Figure 1. Location of electrofishing survey sites and sub-catchments, Little Brosna catchment, August 2021

Table 1. Site survey details for the Little Brosna catchment, August 2021

No.	Sub-catchment	River name	Site	Method	WFD	Date	
1	Pallas	Pallas stream	Holy Well	TEF ₁₀	-	10/08/2021	
2		Pallas stream	Pallas Br.	TEF ₁₀	-	10/08/2021	
3	Little Brosna & Black	Little Brosna	Riverstown Br.	ADEF (boat)	YES	18/08/2021	
4		Little Brosna	Ballindarra	ADEF (boat)	-	18/08/2021	
5		Glasderry	Agnadouglas	TEF ₁₀	-	11/08/2021	
6		Glasderry	Roscrea	TEF ₁₀	-	17/08/2021	
7		Mounteaton	Moutheaton	TEF ₁₀	-	17/08/2021	
8		Little Brosna	Clonlisk Br.	TEF ₁₀	-	12/08/2021	
9		Kilcomin	Cloghmoyle	TEF ₁₀	-	17/08/2021	
10		Kilcomin	Caolroe Br.	TEF ₁₀	-	17/08/2021	
11		Kilcomin	Clucka North	TEF ₁₀	-	17/08/2021	
12		Kilcomin	Driminduff	TEF ₁₀	-	19/08/2021	
13		Black	Dunnes Br.	TEF ₁₀	-	10/08/2021	
14		Keeloge	Franckfort	TEF ₁₀	-	12/08/2021	
15		Keeloge	South of Motte	TEF ₁₀	-	12/08/2021	
16		Camcor	Glenafelly	Br. 3km E of longford	TEF ₁₀	YES	19/08/2021
17			Glenafelly	Ballyshane Br.	TEF ₁₀	-	16/08/2021
18	Camcor		Drumcullen Br.	TEF ₁₀	-	19/08/2021	
19	Knockbarron		E. of Pass Cross Roads	TEF ₁₀	-	16/08/2021	
20	Camcor		u/s Maltings Pool	ADEF (boat)	-	18/08/2021	
21	Camcor		Upper Oxmantown Br.	ADEF (boat)	-	19/08/2021	
22	Camcor		Oxmantown Br.	ADEF (boat)	-	19/08/2021	
23	Camcor		Drumbane Br.	ADEF (boat)	-	18/08/2021	
24	Fuarawn		Clareen	TEF ₁₀	-	24/08/2021	
25	Fuarawn		Grange	TEF ₁₀	-	16/08/2021	
26	Breaghmore		Knockarey Br.	TEF ₁₀	-	16/08/2021	
27	Breaghmore		Breaghmore Br.	TEF ₁₀	-	24/08/2021	
28	Breaghmore		Lofus Br.	TEF ₁₀	-	23/08/2021	
29	Roscomore		Hundredacres	TEF ₁₀	-	11/08/2021	
30	Rock	Rock	Whiteford	TEF ₁₀	-	11/08/2021	
31	Goldengrove	Goldengrove	Ballyrickard More	TEF ₁₀	-	23/08/2021	
32	Bunow	Bunow	Gorteen	TEF ₁₀	-	24/08/2021	
33		Bunow	Killavilla Br.	TEF ₁₀	-	18/08/2021	
34		Bunow	Benamore Br.	TEF ₁₀	-	18/08/2021	
35		Bunow	Willison Br.	TEF ₁₀	-	11/08/2021	

Pallas, Little Brosna and Black River sub-catchments

Fifteen sites were surveyed in the north-western and southern portion of the Little Brosna catchment during 2021 (Table 1). Two sites (Sites 1 and 2) were surveyed on the Pallas River sub-catchment and 13 (Sites 3 to 15) on the Little Brosna and Black River sub-catchments.

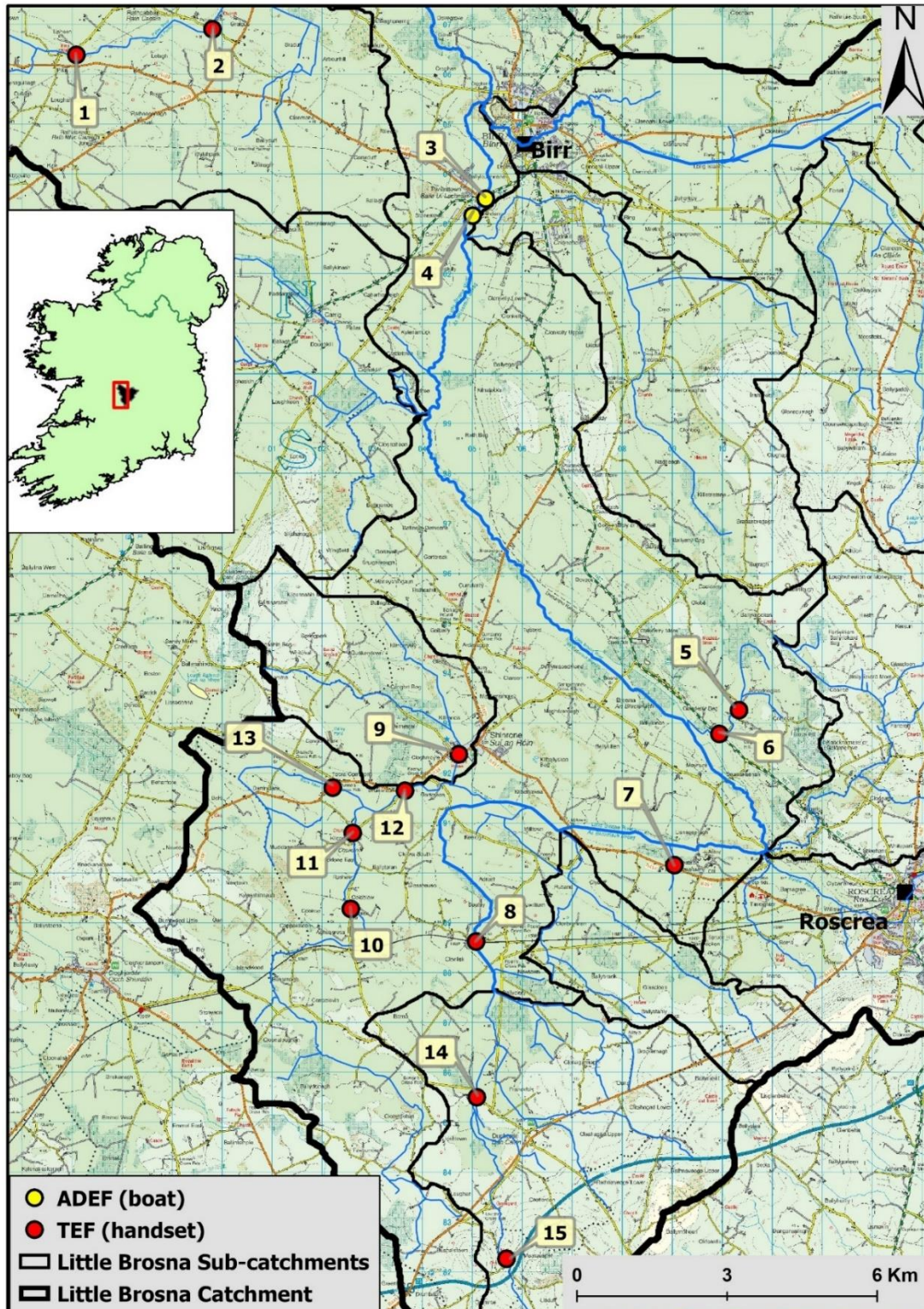


Figure 2. Location of electrofishing survey sites, Little Brosna catchment (Sites 1-15), August 2021

Table 2. Minimum density estimates (no. fish/m²) for the Little Brosna catchment (Sites 1-15), 2021

Pallas Catchment					Black Catchment			
Site no.	1	2			3			
Species	2021	2015	2019	2021	2008	2012	2015	2021
Brown trout	0.161	0.500	0.028	0.205	0.018	0.029	0.196	0.040
0+ brown trout	0.147	0.238	0.017	0.074	0.001	0.001	0.046	0.012
1+ & older brown trout	0.013	0.263	0.011	0.131	0.017	0.028	0.151	0.028
Salmon	-	-	0.228	-	0.009	0.011	0.046	0.004
0+ salmon	-	-	0.194	-	0.003	0.001	-	0.002
1+ & older salmon	-	-	0.034	-	0.006	0.010	0.046	0.002
European eel	-	0.038	-	-	-	-	-	0.001
Lamprey sp.	-	-	-	-	-	0.001	0.003	-
Minnow	-	-	-	-	-	-	0.108	0.003
Rainbow trout	-	-	-	-	-	0.001	-	-
Roach	-	-	-	-	-	-	0.022	-
Stone loach	-	-	0.074	-	0.001	0.001	0.011	-
Three-spined stickleback	-	0.200	-	0.033	-	-	0.003	-
All fish	0.161	0.738	0.330	0.238	0.028	0.042	0.387	0.050
Black Catchment								
Site no.	4	5		6		7	8	9
Species	2021	2015	2021	2015	2021	2021	2021	2021
Brown trout	0.048	0.467	0.146	0.425	0.440	-	0.411	0.292
0+ brown trout	0.001	0.433	0.146	0.425	0.392	-	0.058	0.052
1+ & older brown trout	0.048	0.033	-	-	0.048	-	0.353	0.239
European eel	-	0.050	-	-	-	-	-	-
Minnow	0.005	-	-	-	-	-	-	-
Three-spined stickleback	0.001	-	-	0.400	0.067	-	-	0.067
All fish	0.054	0.517	0.146	0.825	0.506	no fish	0.411	0.359
Black Catchment								
Site no.	10	11	12	13		14	15	
Species	2021	2021	2021	2015	2021	2021	2021	
Brown trout	0.228	0.134	0.607	0.663	0.005	0.336	-	
0+ brown trout	0.021	0.124	0.594	0.663	0.005	0.097	-	
1+ & older brown trout	0.207	0.010	0.013	-	-	0.239	-	
Stone loach	-	0.007	-	0.025	-	-	-	
Three-spined stickleback	-	0.054	0.013	-	0.032	-	-	
All fish	0.228	0.194	0.620	0.688	0.038	0.336	no fish	

Camcor River sub-catchment

Fourteen sites were surveyed on the Camcor River sub-catchment in the north-eastern portion of the Little Brosna Catchment during 2021 (Table 1).

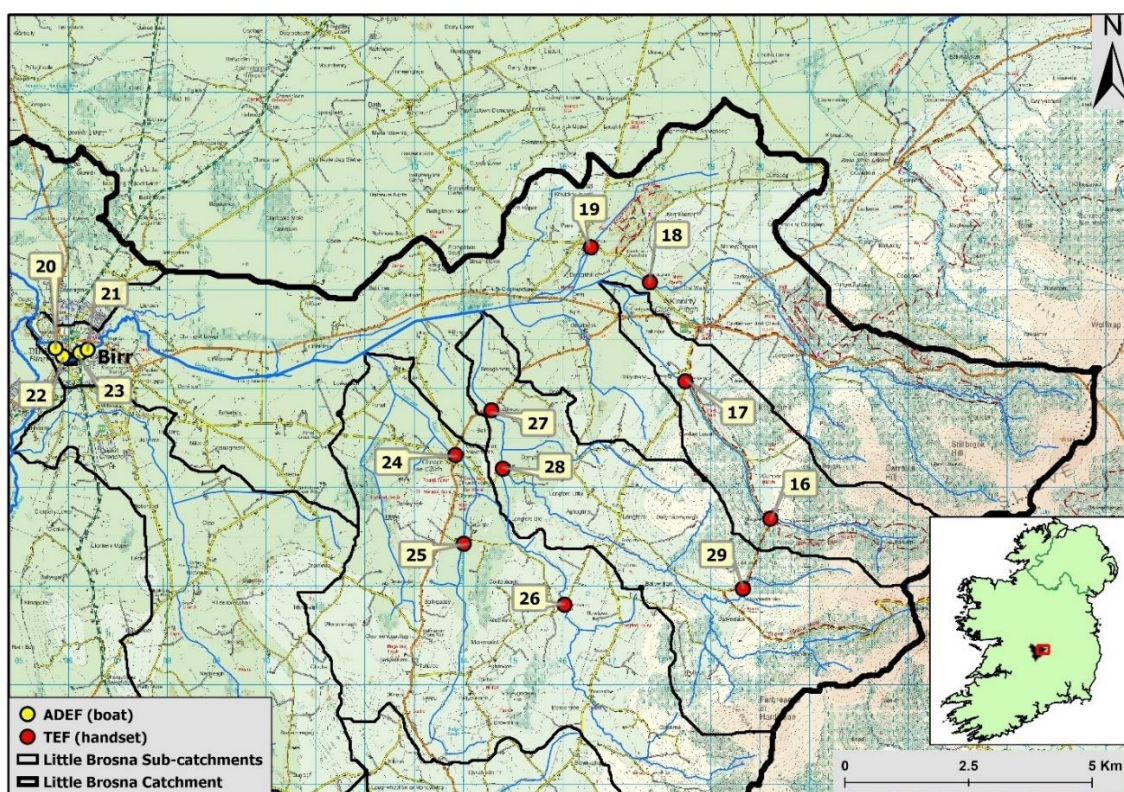


Figure 3. Location of electrofishing survey sites, Camcor River and tributaries (Sites 16-29), August 2021

Table 3. Minimum density estimates (no. fish/m²) for the Camcor River and tributaries (Sites 16-29), 2021

Camcor River sub-catchment									
Site no.	16			17		18	19	20	21
Species	2008	2020	2021	2021	2021	2021	2021	2021	2021
Brown trout	0.300	0.029	0.431	0.234	0.475	0.271	0.054	0.028	
0+ brown trout	0.225	-	0.373	0.188	0.329	0.225	0.001	0.005	
1+ & older brown trout	0.075	0.029	0.059	0.046	0.146	0.047	0.053	0.022	
Salmon	-	-	-	-	-	-	0.001	0.001	
1+ & older salmon	-	-	-	-	-	-	0.001	0.001	
Minnow	-	-	-	-	-	-	0.001	0.004	
Stone loach	-	-	-	-	-	-	-	0.001	
All fish	0.3	0.029	0.431	0.234	0.475	0.271	0.056	0.033	
Camcor River sub-catchment									
Site no.	22	23	24	25	26	27	28	29	
Species	2021	2021	2021	2021	2021	2021	2021	2021	
Brown trout	0.035	0.106	0.247	0.33	0.555	0.355	0.201	0.144	
0+ brown trout	-	0.103	0.182	0.288	0.495	0.245	0.186	0.144	
1+ & older brown trout	0.035	0.003	0.065	0.041	0.06	0.11	0.015	-	
Salmon	0.001	-	-	-	-	0.045	0.033	0.012	
0+ salmon	-	-	-	-	-	0.045	0.033	0.012	
1+ & older salmon	0.001	-	-	-	-	-	-	-	
Lamprey sp.	-	-	-	0.008	-	-	-	-	
Minnow	0.006	-	-	-	-	-	-	-	
Three-spined stickleback	-	-	0.026	-	0.015	-	-	-	
All fish	0.041	0.106	0.273	0.338	0.57	0.4	0.234	0.156	

Rock, Goldengrove and Bunow River sub-catchments

Six sites were surveyed in the south-eastern portion of the Little Brosna Catchment during 2021 (Table 1). One site was surveyed on the Rock, one site on the Goldengrove and four sites on the Bunow River sub-catchment.

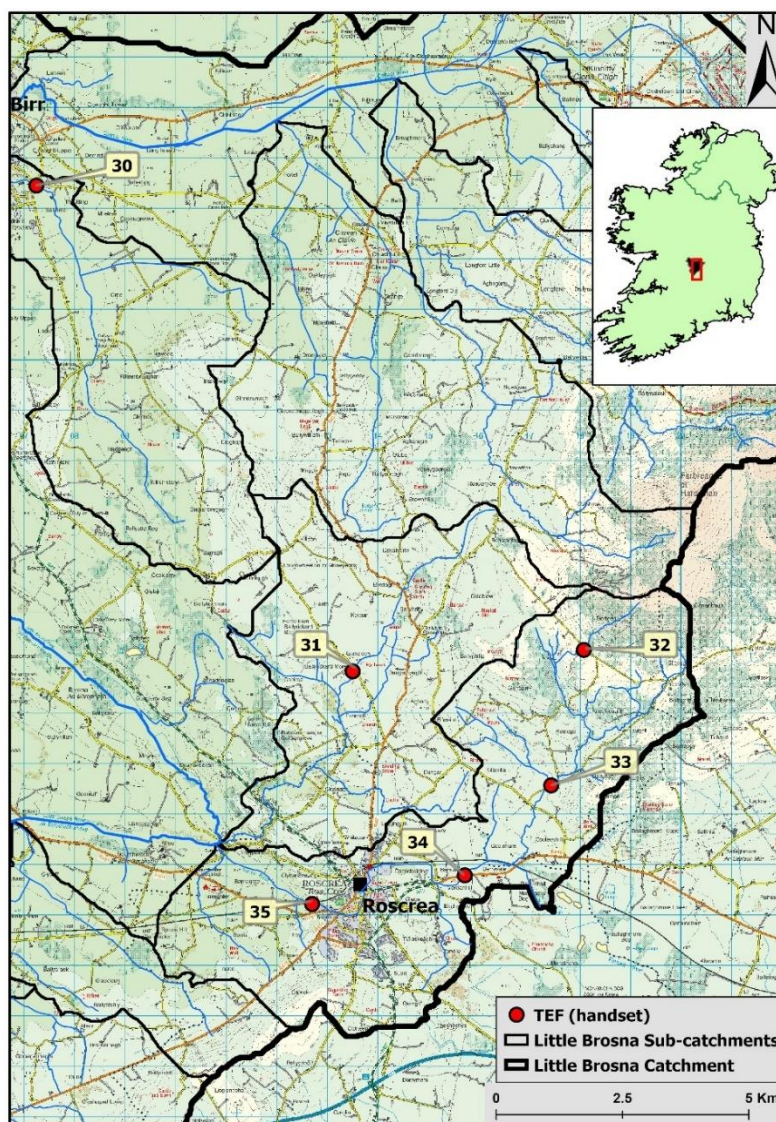


Figure 4. Location of electrofishing survey sites, Little Brosna River catchment (Sites 30-35), August 2021

Table 4. Minimum density estimates (no. fish/m²) for the Little Brosna River catchment (Sites 30-35), 2021

	Rock	Goldengrove	Bunnow Catchment					
Site no.	30	31	32	33	34	35		
Species	2021	2021	2021	2021	2015	2021	2015	2021
Brown trout	0.492	0.021	-	0.522	0.492	1.636	0.300	0.055
0+ brown trout	0.451	-	-	0.393	0.317	0.446	0.170	0.045
1+ & older brown trout	0.041	0.021	-	0.122	0.175	1.190	0.130	0.010
Lamprey sp.	-	-	-	-	-	0.037	-	-
Stone loach	-	-	-	0.014	0.050	1.227	-	-
Three-spined stickleback	-	0.756	-	-	-	-	-	-
All fish	0.492	0.776	no fish	0.536	0.542	2.900	0.300	0.055

Table 5. Fish ecological status for the Little Brosna catchment, 2021. Previous results are shown where applicable (H=High, G=Good, M=Moderate, P=Poor and B=Bad).

Site No.	2008	2012	2015	2019	2020	2021
1	-	-	-	N/A	-	Mod
2	-	-	-	N/A	-	Mod
3	Good	Good	Good	-	-	Mod
4	-	-	-	-	-	Mod
5	-	-	N/A	-	-	Mod
6	-	-	N/A	-	-	Good
7	-	-	-	-	-	N/A
8	-	-	-	-	-	Mod
9	-	-	-	-	-	Mod
10	-	-	-	-	-	Mod
11	-	-	-	-	-	Mod
12	-	-	-	-	-	Mod
13	-	-	-	-	-	Poor
14	-	-	-	-	-	Mod
15	-	-	-	-	-	N/A
16	Good	-	-	-	Poor	Mod
17	-	-	-	-	-	Mod
18	-	-	-	-	-	Mod
19	-	-	-	-	-	Mod
20	-	-	-	-	-	Mod
21	-	-	-	-	-	Mod
22	-	-	-	-	-	Poor
23	-	-	-	-	-	Poor
24	-	-	-	-	-	Mod
25	-	-	-	-	-	Mod
26	-	-	-	-	-	Mod
27	-	-	-	-	-	Mod
28	-	-	-	-	-	Mod
29	-	-	-	-	-	Poor
30	-	-	-	-	-	Mod
31	-	-	-	-	-	Poor
32	-	-	-	-	-	N/A
33	-	-	Good	-	-	Good
34	-	-	Mod	-	-	Good
35	-	-	Mod	-	-	Poor

Table 6. Salmonid % age class structure (where recorded) for the Little Brosna catchment, August 2021

Site No.	Brown trout					Salmon		
	% of catch					% of catch		
	0+	1+	2+	3+	4+	0+	1+	2+
1	93	7	-	-	-	-	-	-
2	33	40	27	-	-	-	-	-
3	29	8	55	8	-	50	17	33
4	1	28	55	15	-	-	-	-
5	100	-	-	-	-	-	-	-
6	89	7	4	-	-	-	-	-
8	10	67	23	-	-	-	-	-
9	17	75	8	-	-	-	-	-
10	10	48	38	5	-	-	-	-
11	91	9	-	-	-	-	-	-
12	98	2	-	-	-	-	-	-
13	100	-	-	-	-	-	-	-
14	29	50	21	-	-	-	-	-
16	85	15	-	-	-	-	-	-
17	79	18	3	-	-	-	-	-
18	69	24	6	-	-	-	-	-
19	83	11	6	-	-	-	-	-
20	2	34	53	8	3	-	-	100
21	20	51	29	-	-	-	-	100
22	-	68	27	5	-	-	100	-
23	3	49	44	4	-	-	-	-
24	75	17	8	-	-	-	-	-
25	87	9	4	-	-	-	-	-
26	89	11	-	-	-	-	-	-
27	69	16	13	2	-	100	-	-
28	93	7	-	-	-	100	-	-
29	100	-	-	-	-	100	-	-
30	92	8	-	-	-	-	-	-
31	-	50	50	-	-	-	-	-
33	73	22	5	-	-	-	-	-
34	26	52	22	-	-	-	-	-
35	86	0	14	-	-	-	-	-

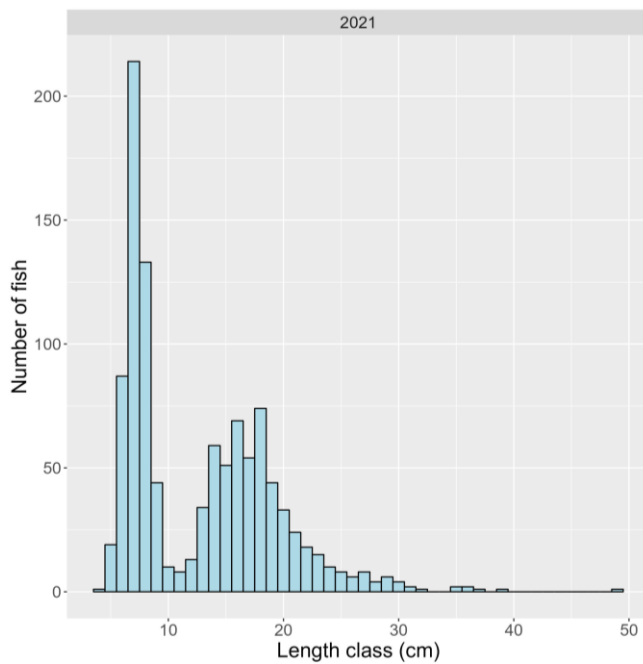


Figure 5. Length frequency for brown trout (n= 1060) in the Little Brosna catchment 2021

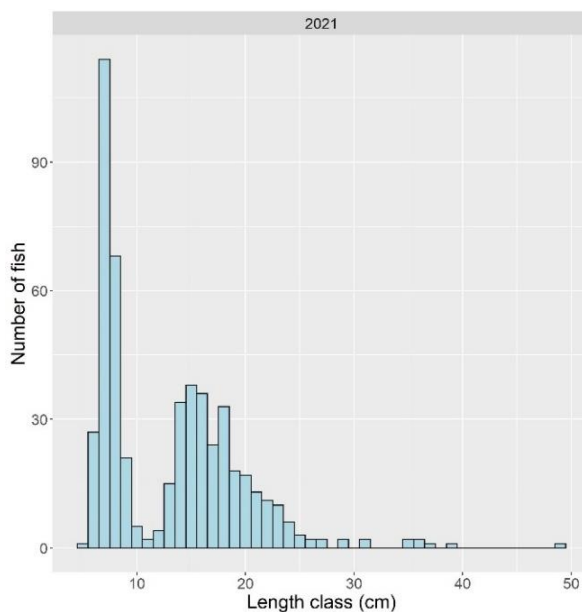


Figure 6. Length frequency for brown trout (n= 515) in the Camcor sub-catchment 2021

Summary

A total of seven fish species were recorded at 35 sites surveyed during the Little Brosna catchment survey in August 2021 (Tables 2, 3, 4 and Figure 7). Brown trout were the most common and abundant species

captured with lengths ranging from 4.5 to 49.7cm. Five age classes (0+, 1+, 2+, 3+ and 4+) were present with 0+ the most abundant.

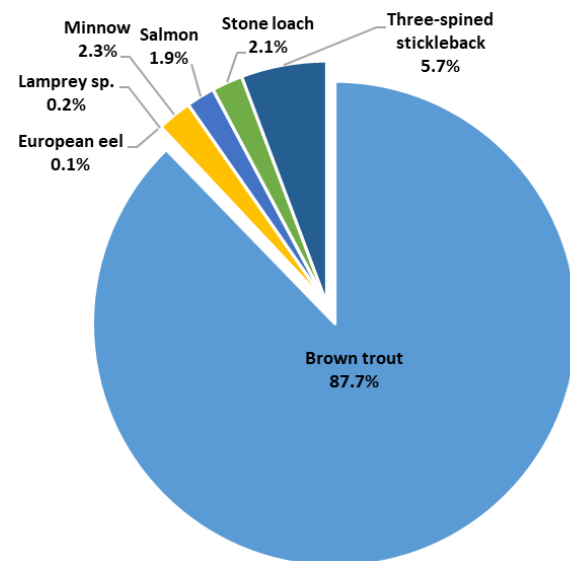


Figure 7. Fish species composition (%), Little Brosna catchment, 2021

The highest density of brown trout (1.636 fish/m²) was recorded at Site 34 (Bunow River at Benamore Br.). The highest density of 0+ brown trout (0.594 fish/m²) was recorded at Site 12 (Kilcomin River at Driminduff), while the highest density of 1+ and older brown trout (1.19 fish/m²) was also recorded at Site 34.

Salmon were caught at seven sites with lengths ranging from 5 to 17.2cm. Three age classes (0+, 1+ and 2+), were present with 0+ being the most abundant cohort.

The highest density of salmon (0.045 fish/m²) was recorded at Site 27 (Breaghmore River at Breaghmore Br.); these were all aged 0+. The highest density of 1+ and older salmon (0.002 fish/m²) was recorded at Site 3 (Little Brosna at Riverstown Br.).

Three-spined stickleback were recorded at ten sites (n=69), minnow at five sites (n=28), stone loach at four sites (n=25), lamprey at two sites (n=2) and European eel at one site (n=1).

The highest density of three-spined stickleback (0.756 fish/m²) was recorded at Site 31 (Goldengrove Stream at Ballyrickard More). The highest density of stone loach (1.227 fish/m²) was recorded at Site 34 (Bunow River at Benamoe Br.); this was a relatively large increase when compared to the 2015 survey.

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 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 32 sites surveyed on the Little Brosna catchment during 2021. Three sites achieved Good status, 23 Moderate status and six Poor status, with the remaining three sites unassigned (no fish recorded). Compared to the previous year's fish ecological status (see Table 5 where applicable), two sites (Site 16 and 34) improved in status, one site (Site 33) remained unchanged, while one site deteriorated (Site 35). Good status sites (Sites 6, 33 and 34) were located on the Glasderry and Bunow rivers in the eastern part of the catchment (Figure 8).

The reasons for the failures and deteriorations in fish ecological status were due to lower-than-expected abundance of type specific indicator species (e.g., salmon and trout), absence of certain age cohorts indicating recruitment failures and/or the presence of a relatively high abundance of tolerant fish species (e.g. three-spined stickleback). Failures and deteriorations

in fish ecological status were likely caused by pressures such as nutrient enrichment, habitat modification and fish passage issues.

References

- CEN 2003 Water Quality Sampling of Fish with Electricity. CEN EN 14011:2000. Brussels. European Committee for Standardization.
- Matson, R., Delanty, K., Shephard, S., Coghlan, B. and Kelly, F. (2018). *Moving from multiple pass depletion to single pass timed electrofishing for fish community assessment in wadeable streams*. Fisheries Research, 198, 99-108.
- SNIFFER River Fish Classification Tool: Science Work. WFD68c, Phase 2. Final Report. Version 6. Edinburgh. Scotland and Northern Ireland Forum for Environmental Research.

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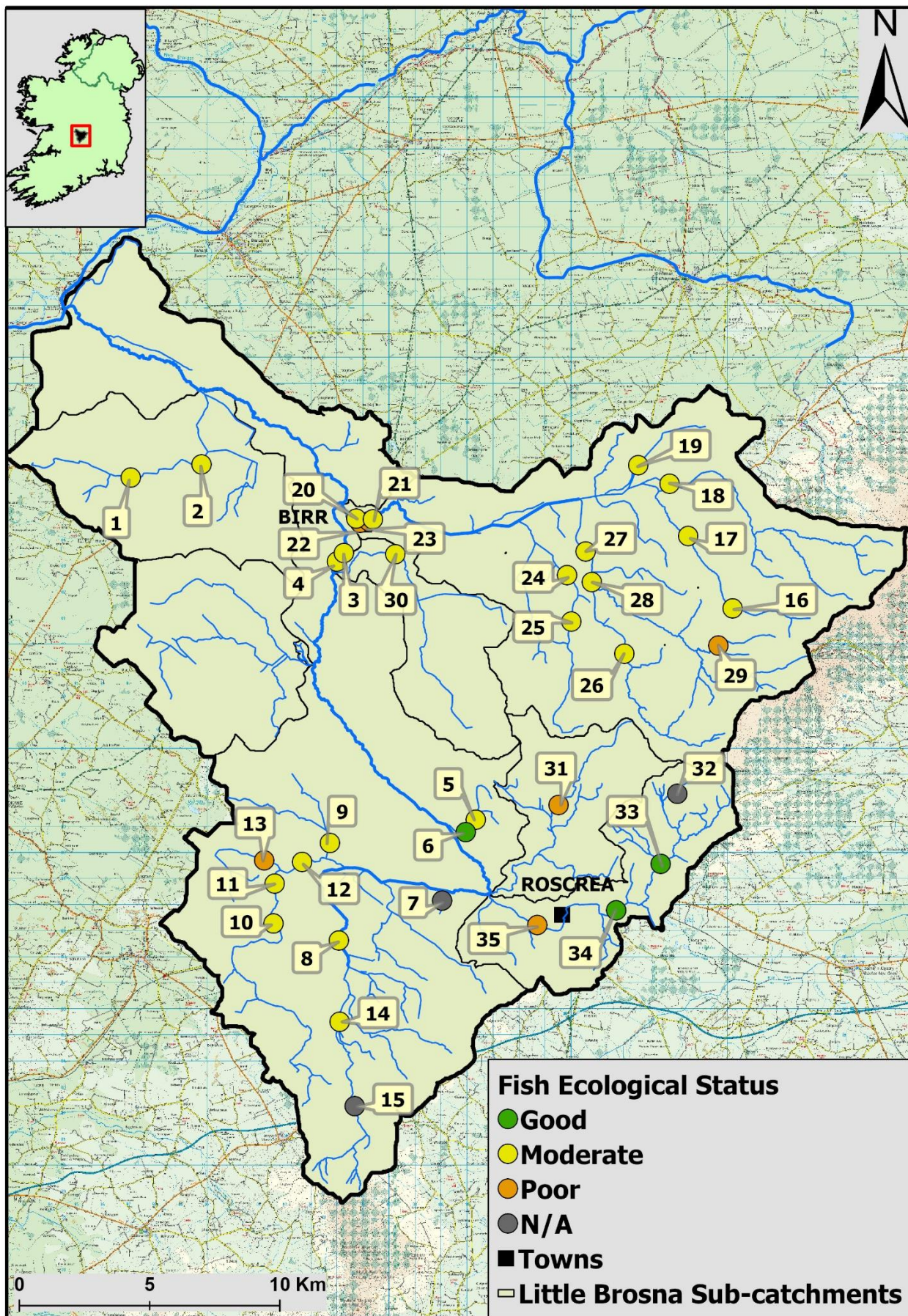


Figure 8. Fish ecological status map of the Little Brosna catchment, August 2021