Fish stock survey of the Newtown catchment, Co. Mayo

22 September 2023

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Author (s):	Michael Millane Philip Thornton				
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1.0	Draft issued	Michael Millane Philip Thornton			21/09/2023
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1. Background

Inland Fisheries Ireland (IFI) Western River Basin District (WRBD) requested assistance from IFI Research & Development to undertake a fish stock survey of the Newtown Catchment. The request formed part of the pre-works baseline surveying of this channel which is subject to a fisheries habitat enhancement plan of which associated funding has been applied for under the Salmon and Sea Trout Rehabilitation, Conservation and Protection Fund.

2. Study area

The Newtown catchment is a small, low-land stream system flowing into the inner Moy Estuary comprising a total channel length of 7.6 km. Land use surrounding the catchment is primarily associated with livestock farming. Recent Water Framework Directive status assessments have deemed the water quality as *good* (based a on modelled assessment for period 2016-2021) or *moderate* (based on expert judgement for period 2013-2018). The system is not officially designated as a salmon river for the purposes of annual scientific stock assessment and associated catch advice. Nevertheless, it is considered to have small stocks of salmon, sea trout, brown trout and eels. It is important to also note that the Newtown is an OPW channel and has been subject to arterial drainage and periodic drainage maintenance.

3. Method

A total of ten sites (N1 to N10) were surveyed in the catchment. This included eight main channel sites (N1−N8) and two tributary sites (N9 and N10) (Figure 1; Table 1 and Appendix 1). The survey was conducted on 13 July 2023 by Philip Thornton (IFI WRBD) and Michael Millane (IFI R&D). The catchment-wide electrofishing (CWEF) method (Crozier and Kennedy 1994; Gargan *et al*. 2008) was used to establish the status of resident fish stocks at each of the survey sites. This standardised approach is primarily used to assess salmon fry distribution and relative abundance in river systems throughout Ireland as part of the annual salmon scientific stock assessment which informs the regulation of salmon angling. As part of this, the number of salmon and trout fry and parr encountered at each site are recorded and the mean number of salmon fry is then calculated for the whole catchment. A mean catchment-wide number of 17 or greater salmon fry indicates a healthy level of juvenile salmon production. This method is semi-quantitative and uses electrofishing backpacks and a five-minute timed fishing per site. It targets shallow riffle sections of rivers typical of the spawning and nursery habitat of salmon and trout. Additional site habitat characteristics such as % substrate composition, habitat issues, aquatic vegetation type and % cover, % of canopy cover and the presence of other fish species encountered are also recorded during the survey.

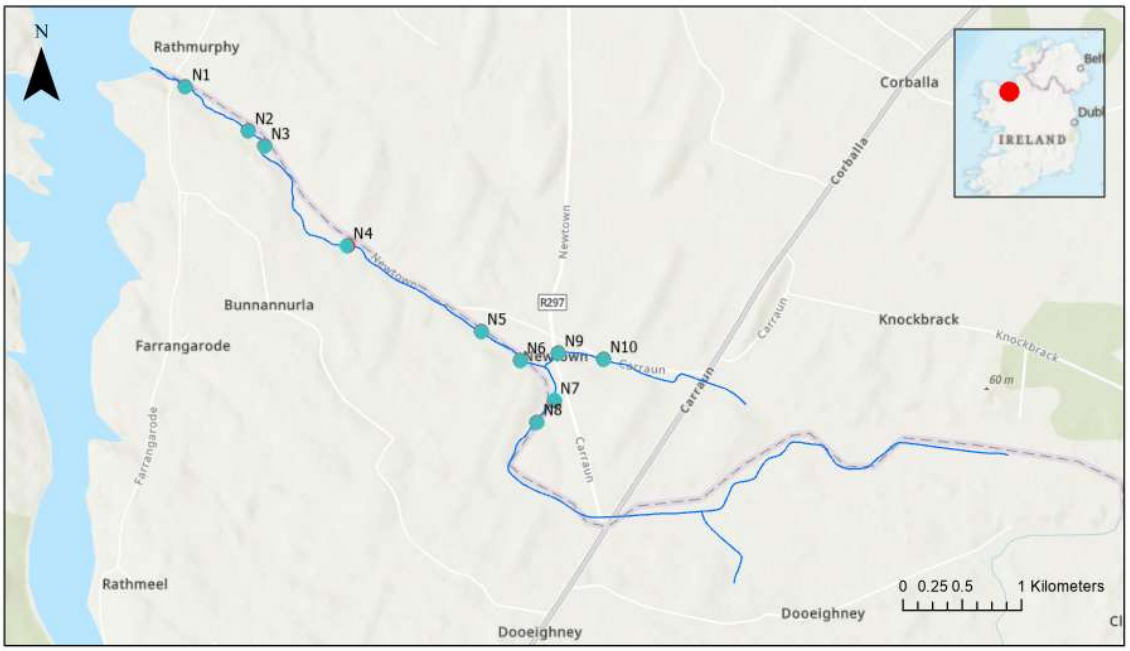

Figure 1 Locations of the sites surveyed in the Newtown catchment (sites N1−N10) .

Table 1 Characteristics of the sites surveyed in the Newtown catchment.

Site no.	Co-ordinates	%Bedrock	% boulder	% cobble	% gravel	% sand	% mud /silt	Instream vegetation (% cover)	Instream vegetation type	Canopy cover over site (%)	Known spawning area for salmonids
N1	526181 824226		5	50	30	15		20	*Apium* sp., filamentous algae, moss	40	N
N2	526489 824005		10	50	20		20	10	Moss	40	N
N3	526568 823929		60	30	10			50	Algae	60	N
N4	526969 823430				80		20	90	*Apium* sp.	*5*	Y
N5	527624 822996		10	60	30			30	*Apium* sp.	*30*	Y
N6	527817 822851			50	40		10	30	*Apium* sp; *Mentha* sp.	*5*	Unknown
N7	527981 822651			30	60		10	20	*Apium* sp.	*10*	Unknown
N8	527894 822546	40	10	30	20			30	*Apium* sp., filamentous algae	*1*	Unknown
N9	528005 822883	60		10	30			40	*Apium* sp., filamentous algae, *Lemna* sp.	*0*	Y
N10	528229 822849	40			30		30	40	*Apium* sp., filamentous algae	*1*	Y

4. Results and discussion

Small numbers of fish were recorded during the survey (Table 2). Salmon fry were only recorded in very low abundance in the mid-catchment at sites N8, N9 and N10. No salmon parr were encountered. Trout fry and parr were recorded throughout the system but not at all sites surveyed, with the greatest number encountered at site N10. Eels were also recorded throughout the system but again, not at all sites and stickleback were encountered at only two sites in the lower catchment, N2 and N3 (Table 2). The results suggest that this system is not a significant producer of diadromous salmonids, at least in its current state, but may hold reasonable stocks of eel. The low numbers of salmon recorded throughout the catchment are well below what would generally be considered to be a healthy stock although the river is unlikely to have been a significant producer of salmon in the past due to its small catchment area.

Table 2 Results of the electrofishing survey undertaken in 2023 in the Newtown catchment (numbers of fish per species encountered) and associated habitat issues of note.

Site no.	Salmon		Trout		Eel	Stickleback	Cattle ingress	Dense canopy cover	Excessive instream vegetation	Excessive siltation	Gravel compaction
	Fry	Parr	Fry	Parr							
N1			4	3	14						Y
N2			1	1		Y		Y			Y
N3			1		3	Y		Y	Y		Y
N4					1		Y		Y	Y	Y
N5			2								
N6			2	1			Y				
N7					1		Y				
N8	1				6						
N9	4		3	2			Y		Y		Y
N10	2		9	5	3		Y		Y	Y	Y

In general, the habitat throughout the system and associated hydromorphological regime is considered to be in a moderate to poor state. It is important to note that the Newtown system is an OPW channel and has been subject to arterial drainage and periodic drainage maintenance which is likely to have notably altered the natural character of the riverine habitat. Filamentous algae indicative of excessive nutrient input was observed at a number of sites and large sections of the channel had an excessively high abundance of in-stream vegetation. Gravel compaction, cattle ingress and excessive siltation were also observed in some sites (Table 2). As such, salmonid spawning areas appear to be generally very confined and remain

somewhat degraded where present. In addition, the riparian zone at some sites is vulnerable to livestock ingress, with no limitations on access, particularly where the river channel directly traverses active pasture land. Such factors are likely to limit the potential for the system to maximise its salmonid production and continue to preclude the future presence of healthy salmonid stocks unless addressed by appropriate fisheries management and associated habitat rehabilitation measures.

5. References

Crozier, W.W. and Kennedy G.J.A. (1994). Application of semi-quantitative electro-fishing to juvenile salmonid stock surveys. *Journal of Fish Biology* 45:159-164.

Gargan, P., Roche, W., Keane, S. and Stafford, T. (2008). Catchment-wide electrofishing Report. Central Fisheries Board, Mobhi Boreen, Dublin 9.

6. Appendix 1

Figure 2 Newtown catchment site N1.

No photo taken

Figure 3 Newtown catchment site N2

Figure 4 Newtown catchment site N3.

Figure 5 Newtown catchment site N4.

Figure 6 Newtown catchment site N5.

Figure 7 Newtown catchment site N6.

Figure 8 Newtown catchment site N7.

Figure 9 Newtown catchment site N8.

Figure 10 Newtown catchment site N9.

Figure 11 Newtown catchment site N10.

Inland Fisheries Ireland
3044 Lake Drive,
Citywest Business Campus,
Dublin 24,
Ireland.
D24 CK66

www.fisheriesireland.ie
info@fisheriesireland.ie

+353 1 8842 600