Reduction of cyprinid fish populations by seine fishing at four lakes in Boden in autumn 2025; Svartbyträsket, Vittjärvträsket, Bodträsket and Buddbyträsket

General

Svartbyträsket, Vittjärvträsket, Bodträsket and Buddbyträsket are four close and partly adjacent lakes beside the town Boden and its villages. The lakes have suffered unnaturally high nutrient contents and bloomings of blue-green algae even though external nutrient loading to the lakes has decreased from past. Therefore, more focus has been given for possible sources of internal loading.

Reduction fishing of cyprinids is one of the methods, and a relatively inexpensive one, for reducing internal summertime loading of nutrients and algae problems as well as increasing water clarity. The method suits best to the lakes where the highest nutrient contents and murkiest water are observed during warmest summer months, July-August, when the feeding activity of fishes is most intense.

A Finnish (autumn) seining method for fishing of cyprinids has been developed during the last 30 years, starting from early 1990s. In small lakes (about <100 ha) it can be used throughout a year but especially in large lakes the technique is most cost-effective in autumn and cooling water when cyprinid fishes tend to shoal to dark refuges like deep areas of a lake during daytime. If dark refuge is not available, the fish may also hide to rivers, brooks, even ditches, or to littoral vegetation. In cooling water cyprinid fishes can meet their needs for daily feeding during twilight and night and thus being exposed for visual predators like pike and fish-eating birds during the daytime is an unnecessary risk. The biggest cyprinids like adult bream and tench may still stay in open and illuminated water layer because their risk for predation is low.

Target catches

The four lakes had already been fished first intensively in 2018-2020 and then moderately in maintenance phase in 2021-2024 with high catches of cyprinids for such northern lakes:

	Svartbyträsket (137 ha)	Vittjärvträsket (100 ha)	Bodträsket (100 ha)	Buddbyträsket (374 ha)	Altogether (711 ha)
fykenets 2018	10000				10000
seining 2018	12100		7500	20800	40400
fykenets2019	1900				1900
seining 2019	19600	12300	8600	10250	50750
seining 2020	13930	11970	8800	12150	46850
seining 2021	5800	10090	2900	10105	28895
seining 2022	4120	3700	7100	5300	20220
seining 2023	7450	4000	2650	7600	21700
seining 2024	7790	1920	1850	5900	17460
kg	82690	43980	39400	72105	238175
kg/ha	604	440	394	193	335

The situation in lakes has improved and thus the aim for fishing 2025 was to maintain the good results and trends (maintenance fishing). Target catches were set as 15 – 30 kg/ha and the fishing days needed was estimated as twelve. The plan was the same as in the previous four years:

		target catch		fishing
	area ha	kg/ha	kg	days needed
Svartbyträsket	137	30	4100	4
Vittjärvträsket	100	30	3000	3
Bodträsket	100	30	3000	2
Buddbyträsket	374	15	5600	3
	711		15700	12

Seining and its circumstances

The seining took place on 1. -12. September including 12 fishing days and 19 seine hauls (Table 2). The seine used was a 314 m long and 6 m deep cyprinid bottom seine. Weather was suitable for echo sounding and seining on all days.

The weather and daily temperatures were steady during the fishing. Surface water temperature varied between 14…16,5 °C from day to day and from lake to lake without any trend. Secchi depths were measured as 280 cm in Svartbyträsket (140 cm in autumn 2024), 170 cm in Vittjärvträsket (180 cm) and 150 cm in Bod- and Buddbyträsket (150 cm). The dark daytime refuge in deep water is generally achieved when water depth is more than twice the Secchi depth. Thus there was a daytime refuge available for fishes in all four lakes which promoted catches.

No signs of bluegreen algae were observed at any of the four lakes. At Svartbyträsk water was exceptionally clear.

During the fishing of Bod- and Buddbyträsket, there was a technical failure in the biogas plant process, which limited the export of catch fish there and thus also the number of seine hauls due to full containers. One day was used to lift up known bottom trees that complicated seining in these lakes.

Catches

The target was achieved with a 21690 kg (31 kg/ha) catch. The catches per area were at about the same in all four lakes (variation 28…32 kg/ha) The catch consisted mainly (85 %) of roach and bream. Roach was the main catch at Svartbyträsket and Buddbyträsket while bream at Bodträsket. At Vittjärvträsket proportions were even (Table 1, Figures 1 and 2). The average catches per seine haul (19) and per fishing day (11) were 1142 and 1972 kg.

About 1854 kg predatory fishes were released back to the lake in good condition (2436 kg in 2024). They consisted of pikeperch (gös, 906 individuals,346 kg), pike (gädda, 927 ind., 596 kg) and predatory perch (abborre >15 cm, 5023 ind., 912 kg) (Table 1). The prey-predator ratio (kg/kg) in the total catch was about 11,7 (7,2 in 2024). The population of predatory perch was still strong at Vittjärvträsk and had strengthened also at Buddbyträsket (Table 1)

Fishes were mostly found and caught from the deepest or moderately deep areas of the lakes (Figures 3 and 4).

Notices and conclusions

The four lakes are very suitable for reducing cyprinid fishes by autumn seine fishing. The target catches have been achieved both during the intensive phase and now at the maintenance phase, and with relatively low fishing effort and cost. During the intensive phase 2018-2020 the seine fishing cost for the 138 ton catch was altogether 7 SEK/kg. In the first four years of the maintenance phase 2021-2024 the cost was 11,4 SEK/kg. Now the cost was 11,03 SEK/kg. The figures are just for the fishing and do not include any side costs like transport and handling of the catch. In our seine and fykenet fishing contracts cost per kg has varied typically in a range of 1-20 SEK/kg. We consider costs under 12 SEK/kg cost-effective and 13-23 SEK/kg reasonable. Prices over 23 SEK/kg are costly and with these figures one should consider adjusting or changing the methods.

The total catch for 2018-2025 is now 260 ton. The wet biomass of cyprinid fishes contains 0,8 % phosphorus and 2,5 % nitrogen. Therefore the fishing 2018-2025 has removed directly about 2100 kg phosphorus and 6500 kg nitrogen from the lakes' ecosystems (Table 2). The (fishing) cost for the removed phosphorus is 1104 SEK/kg P.

The water clarity and Secchi depth 280 cm at Svartbyträsket may be a sign that the lake is achieving a new ecologically stable state [1)]. In any case the gradual improvement from 2018 is impressive.

1) M. Scheffer, S. Hosper, M. Meijer, B. Moss, E. Jeppesen: Alternative equilibria in shallow lakes. Trends Ecol. Evol., 8 (1993), pp. 275-279

Thanks!

Thanks for the good organization of the project for Emilia Björkemyr from Boden municipality.

Arto Hautala
Fisherman, Fish biologist
www.vårdfiske.fi

Eemeli Koivisto
Fisherman, Fishing technician

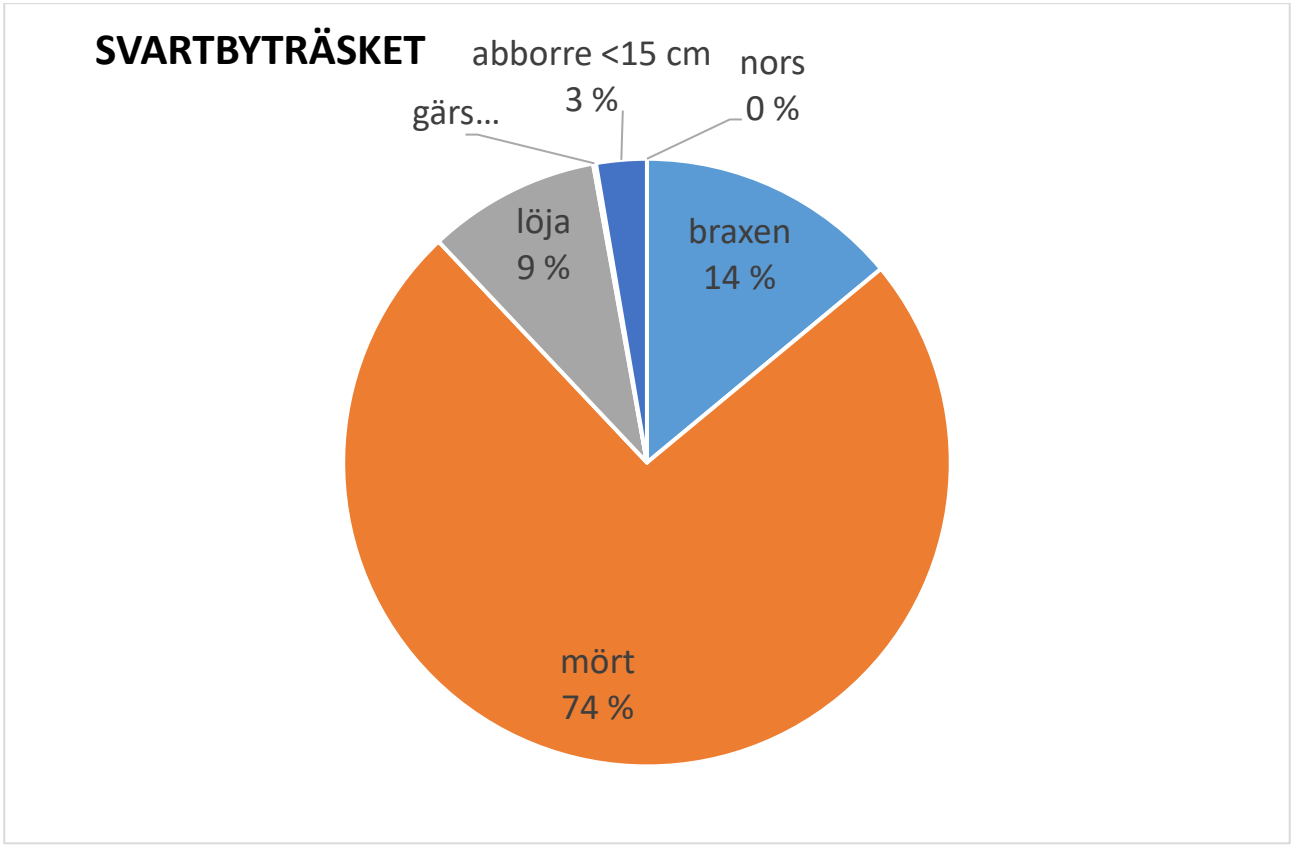
A catch of from Bodträsket

Table 1. *The hauls and catches in the reduction fishing of cyprinids by seining in the Boden lakes in autumn 2025. An excel file with a clearer and more complete fishing diary has been sent separately for the client.*

DRAG					FÅNGST kg						ROVFISKAR								
nummer	sjön	datum	längd m	ytan ha	braxen	mört	löja	gärs	abborre <15 cm	nors	total vitfisk fångst kg	k	Gös n	Gös kg	Gädda n	Gädda kg	Abborre >15 cm n	Abborre >15 cm kg	rovfisk fångst kg	vitfisk-rovfisk förhållande kg/kg
1	Svartbyträsket	1.9.2025	200	4,0	48	462	72	0	18	0	600		81	24	4	4	20	3	31	19,2
2	Svartbyträsket	1.9.2025	150	3,8	48	462	72	0	18	0	600		127	51	5	8	151	23	81	7,4
3	Svartbyträsket	2.9.2025	180	3,6	0	1420	78	1	1	0	1500		444	178	5	8	225	34	219	6,9
4	Svartbyträsket	2.9.2025	100	2,0	5	100	0	0	45	0	150		142	57	10	15	113	17	89	1,7
5	Svartbyträsket	3.9.2025	100	2,5	245	300	140	5	10	0	700		50	15	3	6	65	10	31	22,8
6	Svartbyträsket	3.9.2025	100	1,0	200	0	0	0	0	0	200		0	0	0	0	2	0	0	666,7
7	Svartbyträsket	4.9.2025	200	4,0	5	171	0	0	4	0	180		61	18	1	1	61	9	28	6,3
8	Svartbyträsket	4.9.2025	180	3,6	0	0	0	0	10	0	10		0	0	0	0	3	0	0	22,2
9	Buddbyträsket	5.9.2025	180	3,6	310	140	10	0	240	0	700		0	0	159	80	773	139	219	3,2
10	Buddbyträsket	5.9.2025	240	4,8	750	1250	0	0	500	0	2500		0	0	91	46	21	3	49	51,4
11	Buddbyträsket	6.9.2025	200	4,0	943	363	15	15	116	0	1450		0	0	148	74	360	54	128	11,3
12	Buddbyträsket	6.9.2025	160	3,2	360	1260	70	20	72	18	1800		0	0	114	57	310	47	104	17,4
13	Buddbyträsket	7.9.2025	200	4,0	450	825	75	0	150	0	1500		0	0	104	83	140	28	111	13,5
14	Buddbyträsket	8.9.2025	230	4,6	805	1265	58	40	115	17	2300		0	0	85	68	220	44	112	20,5
15	Bodträsket	9.9.2025	160	3,2	360	720	24	16	80	0	1200		0	0	40	20	145	22	42	29
16	Bodträsket	9.9.2025	260	4,6	1350	250	25	25	150	0	1800		1	3	38	19	47	7	29	62
17	Buddbyträsket	11.9.2025	240	4,8	510	850	0	10	330	0	1700		0	0	71	36	12	2	37	45,6
18	Vittjärvträsket	12.9.2025	230	4,1	210	240	0	0	150	0	600		0	0	34	51	1965	393	444	1,4
19	Vittjärvträsket	12.9.2025	220	3,3	880	880	0	0	440	0	2200		0	0	15	23	390	78	101	21,9
				69	kg 7479	10958	638	132	2449	35	21690		906	346	927	596	5023	912	1854	11,7
					% 34,5	50,5	2,9	0,6	11,3	0,2	100	kg/ha								
											31									
					Svartbyträsket															
					kg 551	2915	362	6	106	0	3940									
					% 14	74	9	0	3	0	100	kg/ha								
											29									
					Bodträsket															
					kg 1710	970	49	41	230	0	3000									
					% 57	32	2	1	8	0	100	kg/ha								
											30									
					Buddbyträsket															
					kg 4128	5953	227	85	1523	35	11950									
					% 35	50	2	1	13	0	100	kg/ha								
											32									
					Vittjärvträsket															
					kg 1090	1120	0	0	590	0	2800									
					% 39	40	0	0	21	0	100	kg/ha								
											28									

Table 2. *The catches in the reduction fishing of cyprinids in the Boden lakes in 2018-2025.*

Alltogether 2018-2025 (711 ha)					
21690	seining 2025				
17460	seining 2024				
21700	seining 2023				
20220	seining 2022				
28945	seining 2021				
46850	seining 2020				
50750	seining 2019				
40400	seining 2018				
1900	fykenets 2019 (Robert Westin et al.)			**Removed in catch**	
10000	fykenets 2018 (Robert Westin et al.)			**P kg**	**N kg**
259914	kg			**2079**	**6498**
366	kg/ha				
Svartbyträsket (137 ha)					
3940	seining 2025				
7790	seining 2024				
7450	seining 2023				
4120	seining 2022				
5800	seining 2021				
13930	seining 2020				
19600	seining 2019				
12100	seining 2018				
1900	fykenets 2019				
10000	fykenets 2018				
86630	kg				
632	kg/ha				
Buddbyträsket (374 ha)					
11950	seining 2025				
5900	seining 2024				
7600	seining 2023				
5300	seining 2022				
10105	seining 2021				
12150	seining 2020				
10250	seining 2019				
20800	seining 2018				
84055	kg				
225	kg/ha				
Bodträsket (100 ha)					
3000	seining 2025				
1850	seining 2024				
2650	seining 2023				
7100	seining 2022				
2900	seining 2021				
8800	seining 2020				
8600	seining 2019				
7500	seining 2018				
42400	kg				
424	kg/ha				
Vittjärvträsket (100 ha)					
2800	seining 2025				
1920	seining 2024				
4000	seining 2023				
3700	seining 2022				
10090	seining 2021				
11970	seining 2020				
12300	seining 2019				
46780	kg				
468	kg/ha				



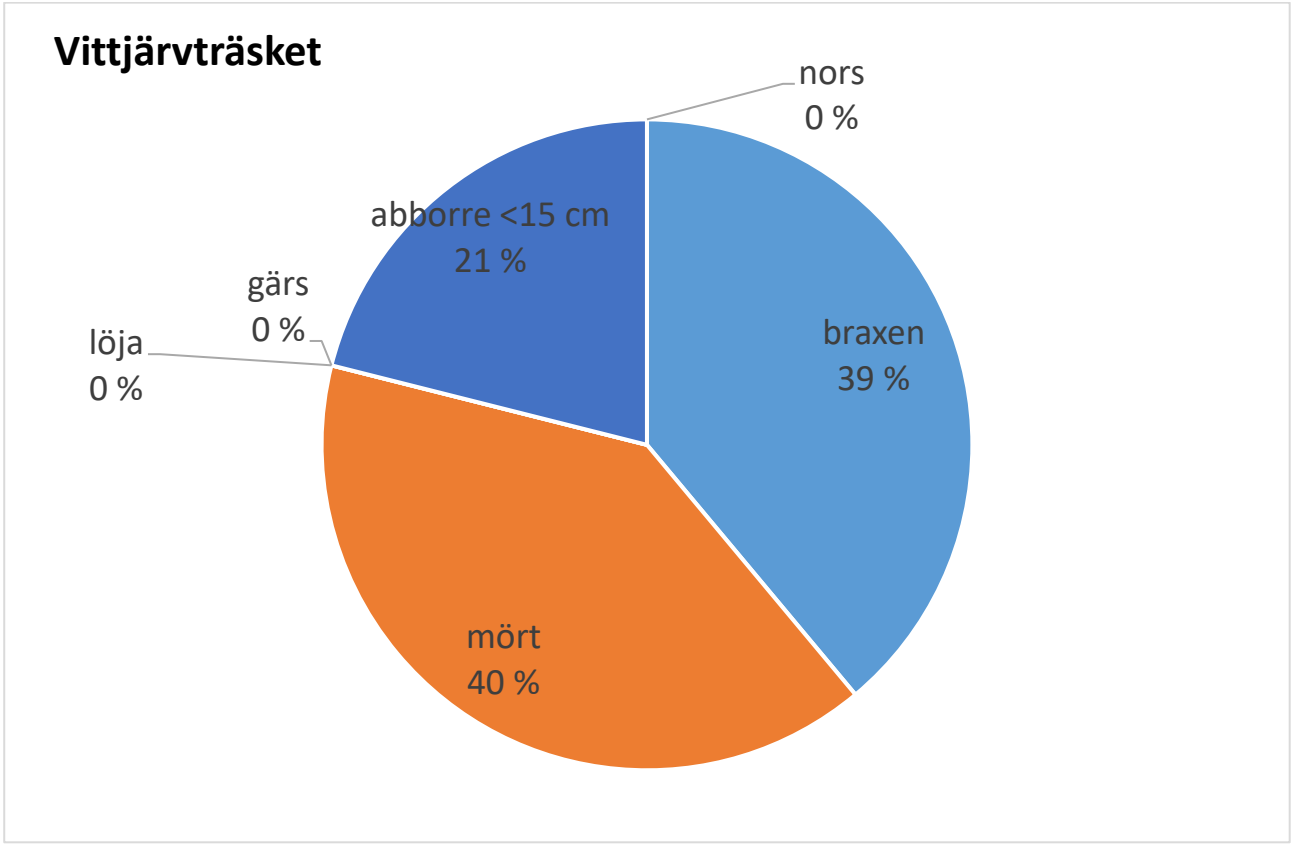


Figure 1. *The composition of catch in the reduction fishing of cyprinids by seining in Svartbyträsket and Vittjärvträsket in autumn 2025*

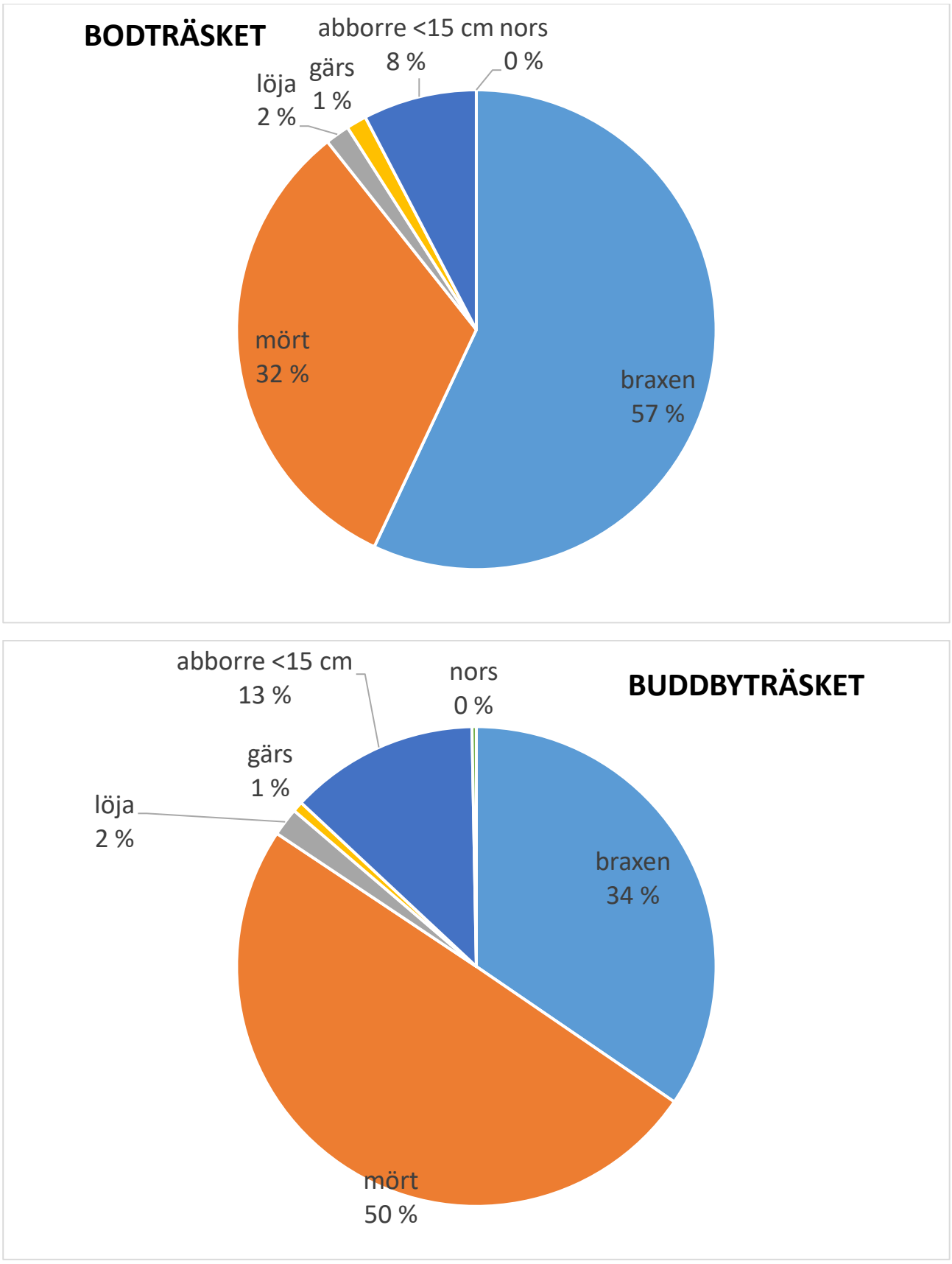


Figure 2. *The composition of catch in the reduction fishing of cyprinids by seining in Bodträsket and Buddbyträsket in autumn 2025*

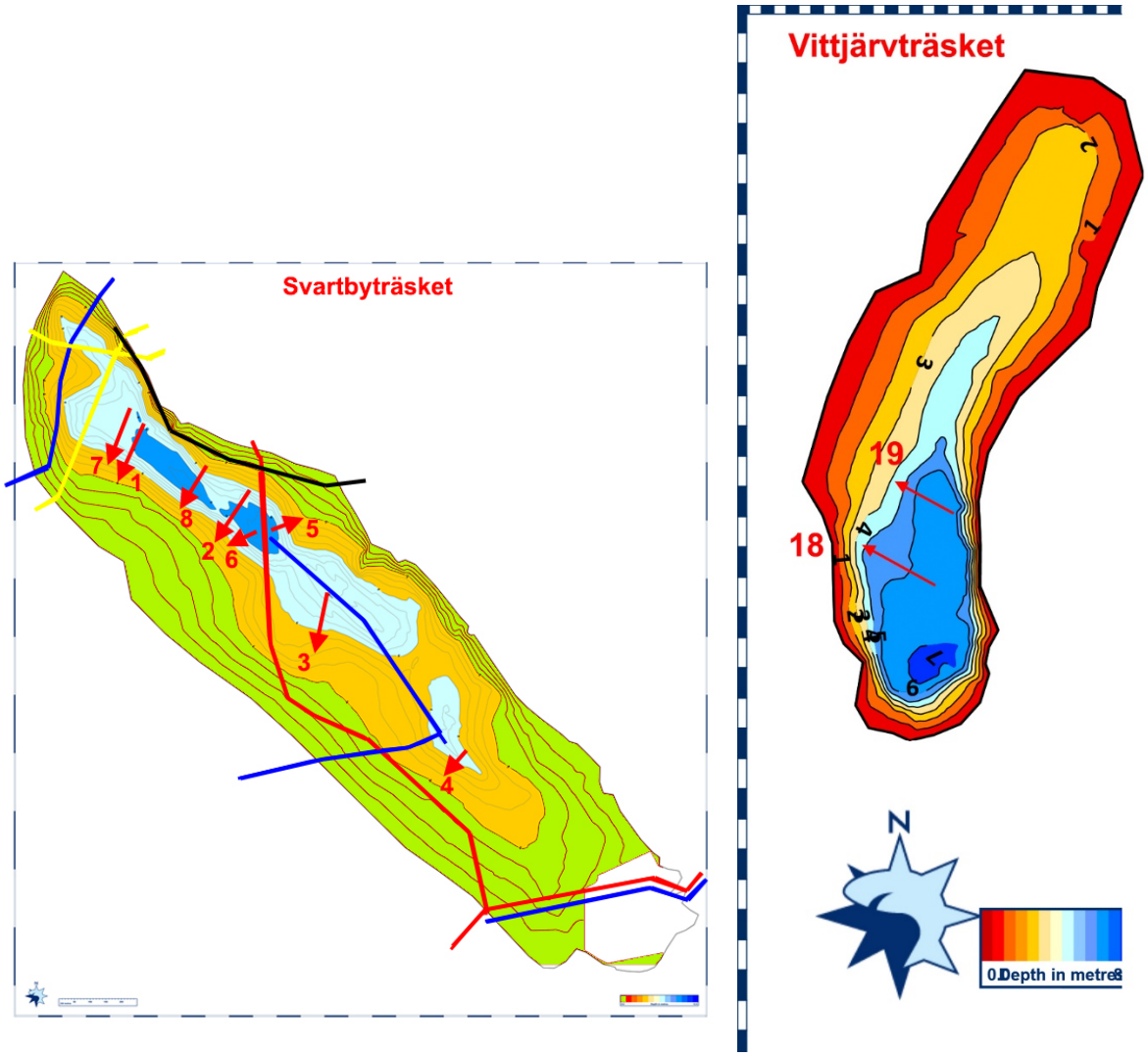


Figure 3. *The locations of the hauls made in the reduction fishing of cyprinids by seining at Svartbyträsket and Vittjärvträsket in autumn 2025. The haul numbers correspond to Table 1.*

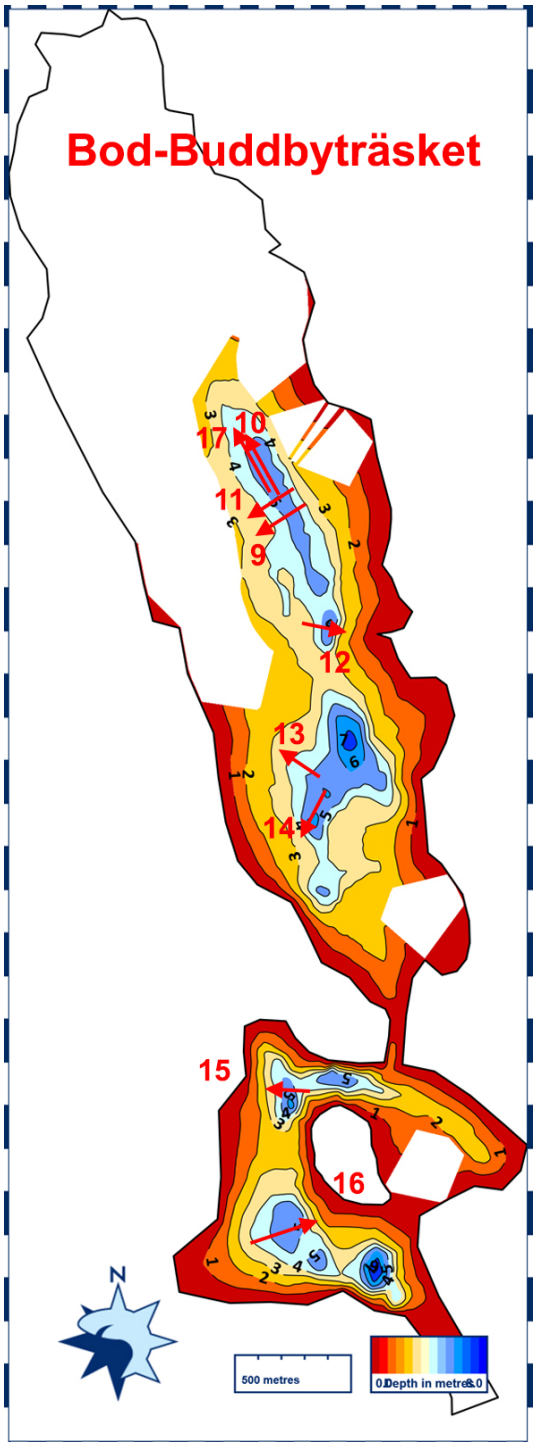


Figure 4. *The locations of the hauls made in the reduction fishing of cyprinids by seining at Bodträsket and Buddbyträsket in autumn 2025. The haul numbers correspond to Table 1.*