



HOCHSCHULE
NEUBRANDENBURG
University of Applied Sciences

NATURA ET CULTURA
BÜRO FÜR UMWELTPLANUNG UND UMWELTBILDUNG

Influences of beavers (*Castor fiber*) on the spawning dynamics of trout (*Salmo trutta*) in the North German lowlands

Part 2: Migratory behaviour of sea trout (*Salmo trutta trutta*) at beaver dams

Torsten Ode, Natura et Cultura - office for environmental planning and environmental education

Partners: State Angling Association Mecklenburg-Western Pomerania, University of Applied Sciences Neubrandenburg, State Research Centre for Agriculture and Fisheries Mecklenburg-Western Pomerania

Introduction

- Trout has two life cycles in the River Linde
 - River-resident trout (mean fork-length: 23 cm)
 - Migratory trout (mean fork-length: 53 cm)

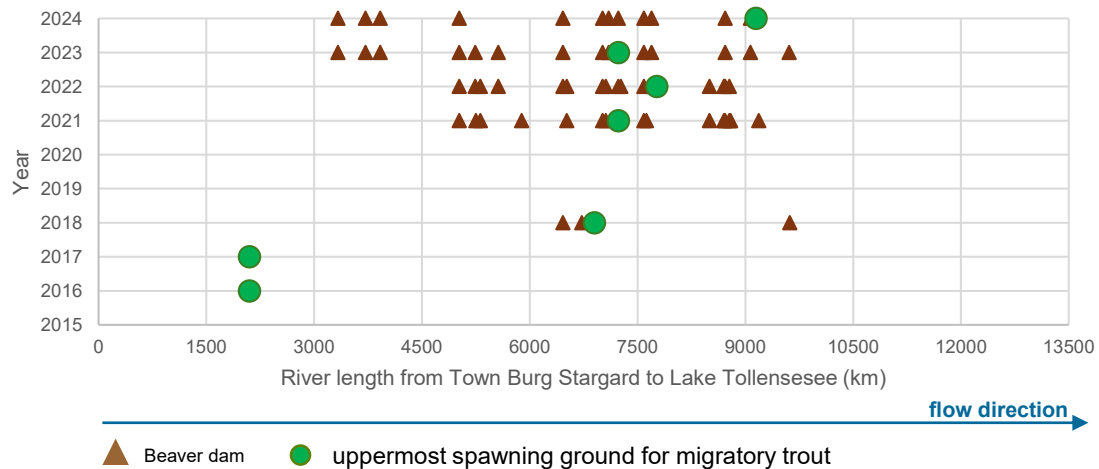


River-resident trout: 23 cm



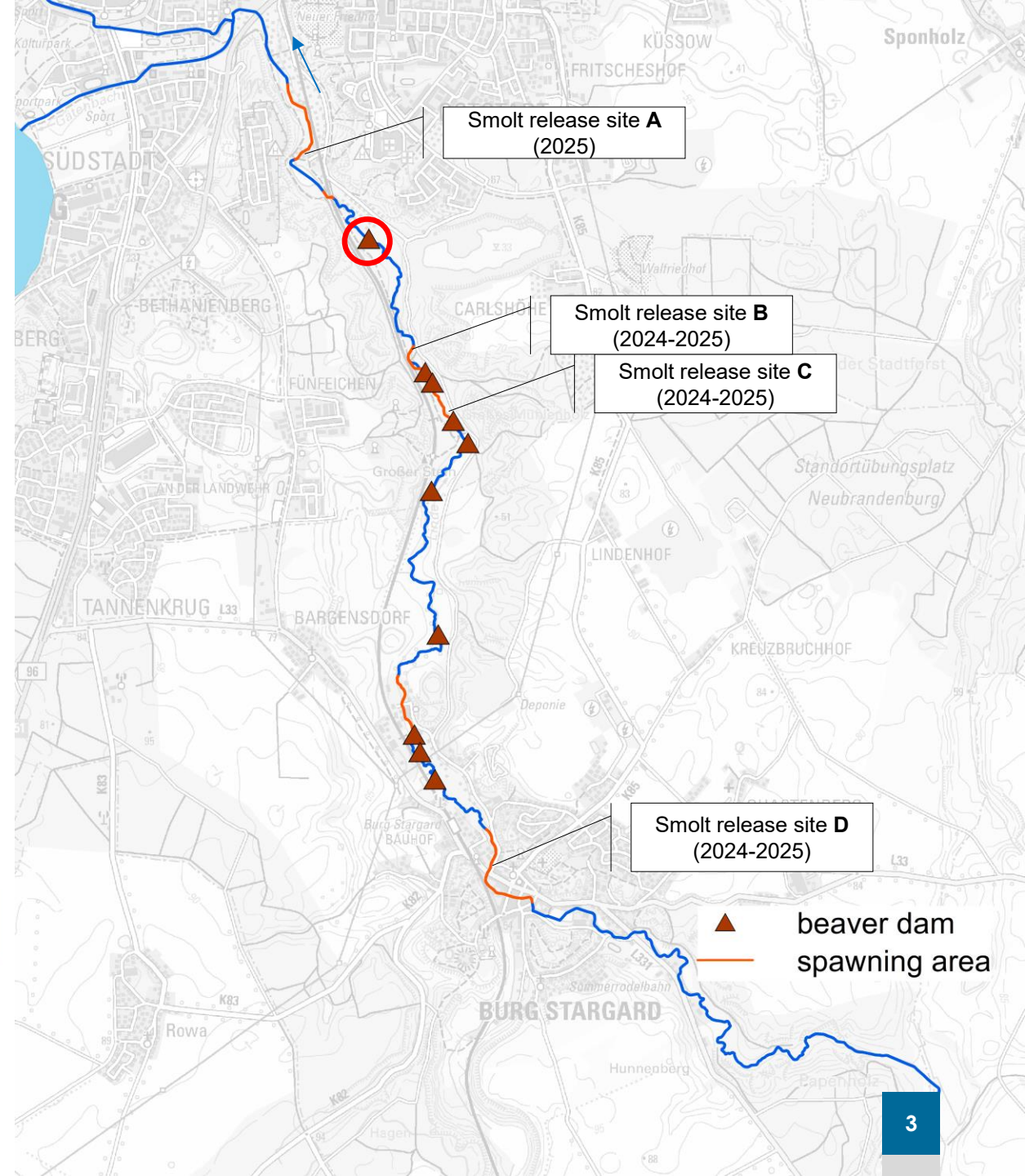
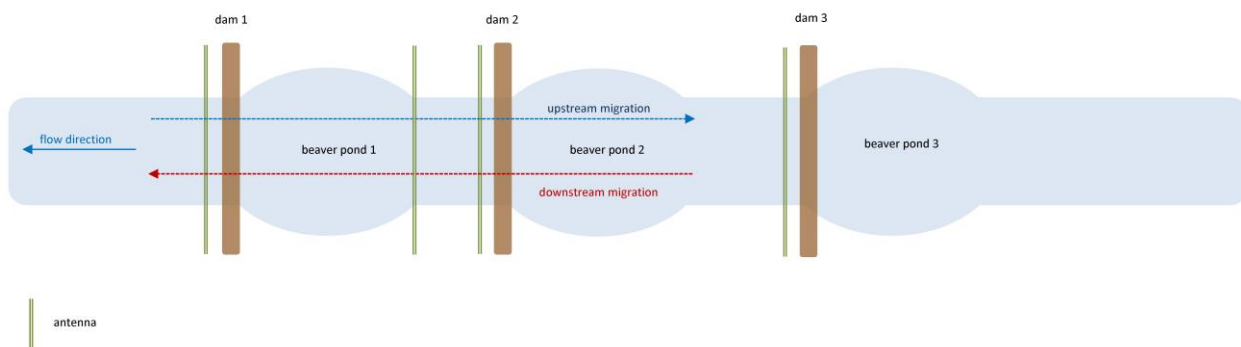
Migratory trout: 79 cm

- Spawning activities of migratory trout in the upper reaches of the Linde declining since 2018



The investigation

- Project duration: 2022-2027 (field work 2023-2026)
- First study in the Baltic Sea region on the behaviour of migrating trout at beaver dams using PIT tags
- Research questions:
 - 1. Do beaver dams impede spawning migration to spawning grounds?
 - 2. Do beaver ponds/beaver dams have an impact on smolt migration?
 - 3. *Are there differences in species composition/abundance in modified and control sections?*
- Methods
 - Marking trout with Passive Integrated Transponders (APT12 Biomark)
 - Migration movements at beaver dams are recorded using PIT antennas



Results – spawning migration

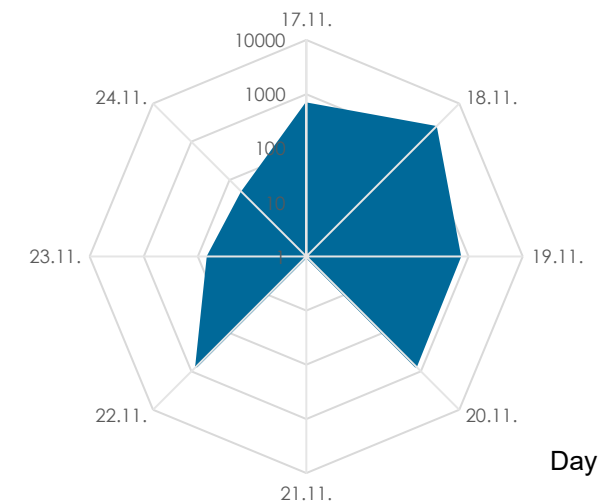
- High motivation to pass the beaver dam
 - Intensive search along the banks for possible points of ascent
 - Migration during daytime
 - Many attempts to jump over the dam (injuries in some cases)



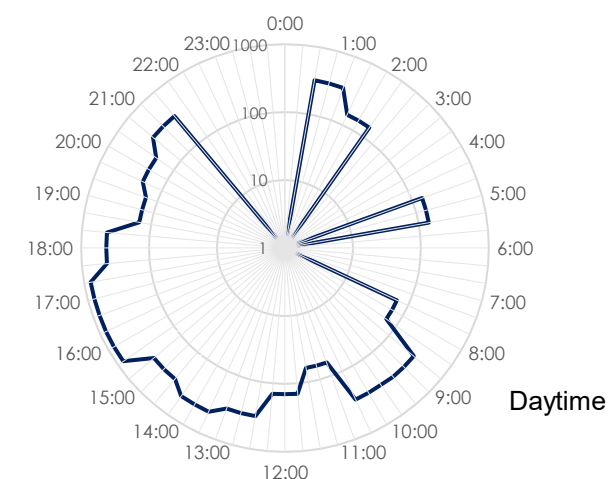
17.11.2023



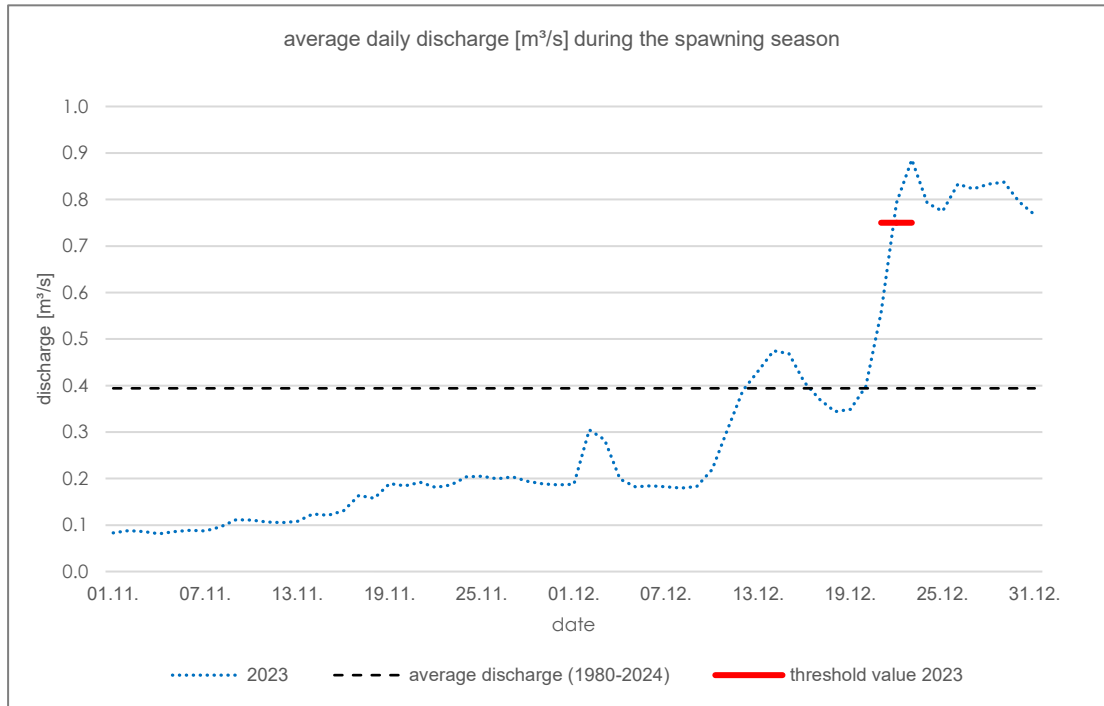
12.12.2023



male; 81 cm
marked 400 m below antenna 17.11.23



Results – spawning migration

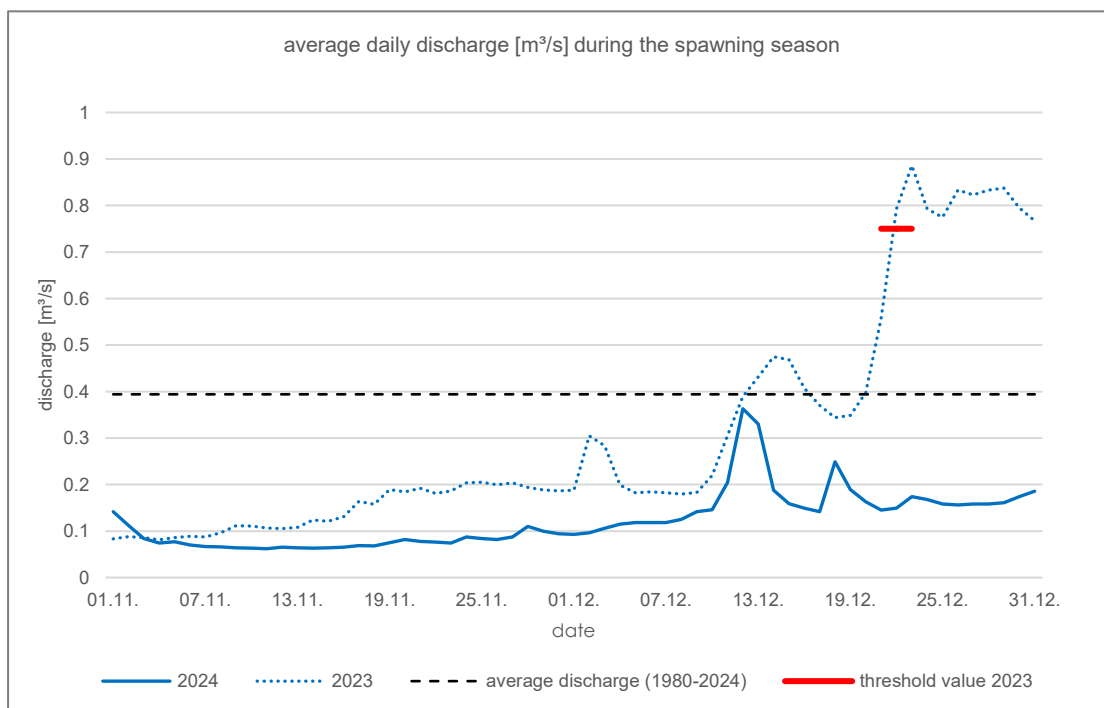


Year	2023
No. of individuals detected below dam 1 (female/male)	17/4
No. of successful passages (female/male)	7/0
No. of failed passages (female/male)	10/4
passage efficiency (%)	41.2/0.0

- Delays caused by low flow conditions can lead to a reduction in the number of spawning fish in the upper spawning areas



Results – spawning migration

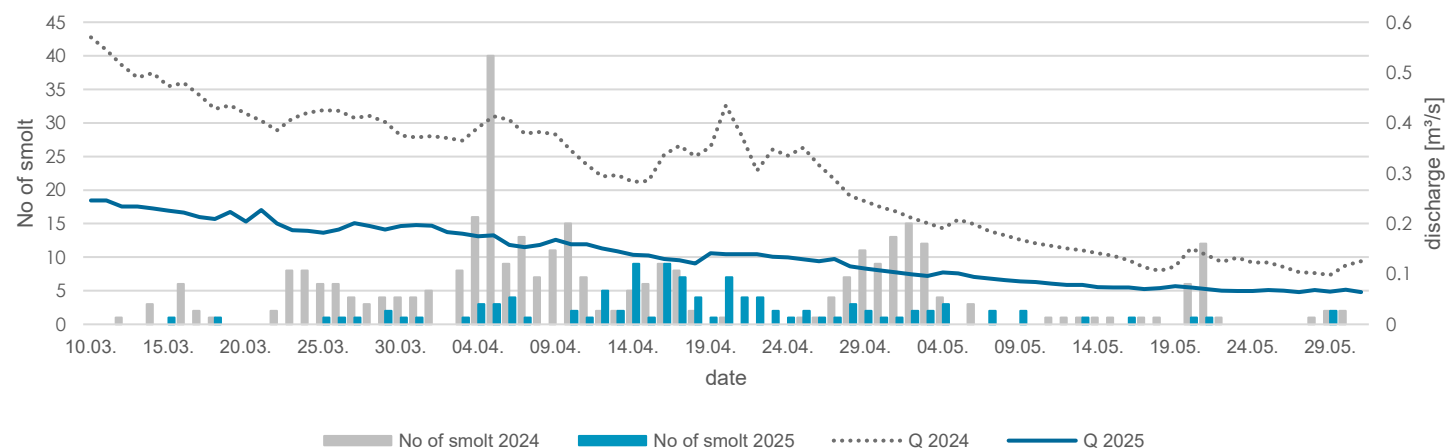


Year	2023	2024
No. of individuals detected below dam 1 (female/male)	17/4	16/10
No. of successful passages (female/male)	7/0	0
No. of failed passages (female/male)	10/4	16/10
passage efficiency (%)	41.2/0.0	0.0/0.0

- Low flow conditions can completely impede migration to the upper spawning areas



Results – Smolt migration



2024

	flow direction →		
release site	D	C	B
distance to Lake Tollensesee (km)	11.17	6.22	5.68
No. of tagged trouts	117	87	111
No. of beaver dams	10	1 (+2*)	1*
total length of the beaver ponds (m)	1085	213	0
No. of trout successfully migrated	55	50	55
percentage of tagged trout	47.0	57.5	49.5

*partially damaged

2025

	D	C	B
release site	D	C	B
distance to Lake Tollensesee (km)	11.17	6.22	5.68
No. of tagged trouts	163	21	44
No. of beaver dams	4	3	1
total length of the beaver ponds (m)	455	527	260
No. of trout successfully migrated	5	11	20
percentage of tagged trout	3.1	52.4	45.5

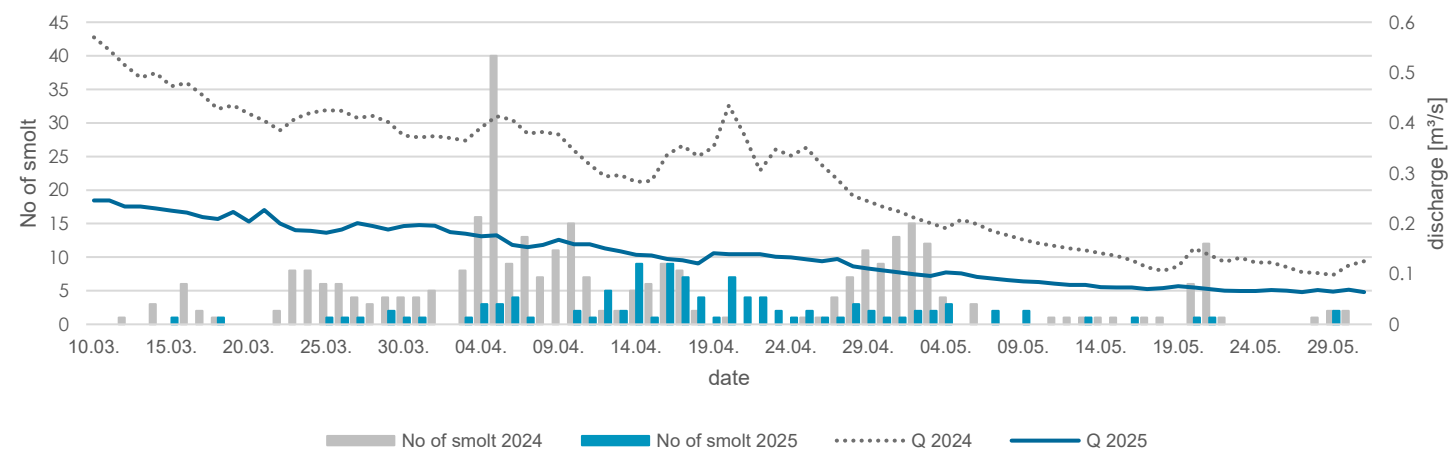


Dam No. 1 Burg Stargard, 27.03.24, 0,41 m³/s



Dam No. 1 Burg Stargard, 24.04.25, 0,13 m³/s

Results – Smolt migration



2024

release site	D	C	B
distance to Lake Tollensesee (km)	11.17	6.22	5.68
No. of tagged trouts	117	87	111
No. of beaver dams	10	1 (+2*)	1*
total length of the beaver ponds (m)	1085	213	0
No. of trout successfully migrated	55	50	55
percentage of tagged trout	47.0	57.5	49.5

*partially damaged

2025

release site	D	C	B	A
distance to Lake Tollensesee (km)	11.17	6.22	5.68	3.45
No. of tagged trouts	163	21	44	41
No. of beaver dams	4	11	3	1
total length of the beaver ponds (m)	455	1165	527	260
No. of trout successfully migrated	5	2	11	20
percentage of tagged trout	3.1	1.2	52.4	45.5
				82.9



heron, 06.04.2024



heron, 03.05.2023

Conclusion

- Spawning migration:

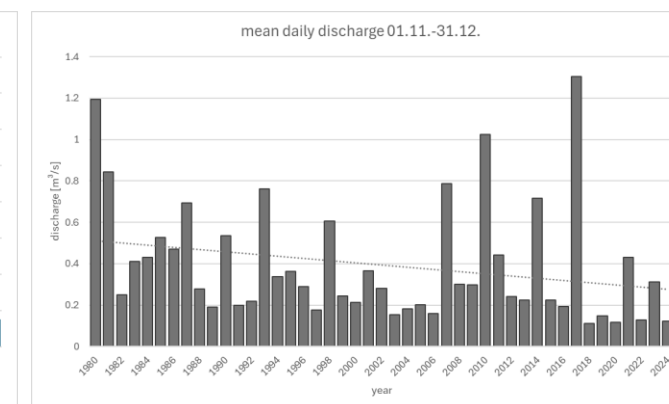
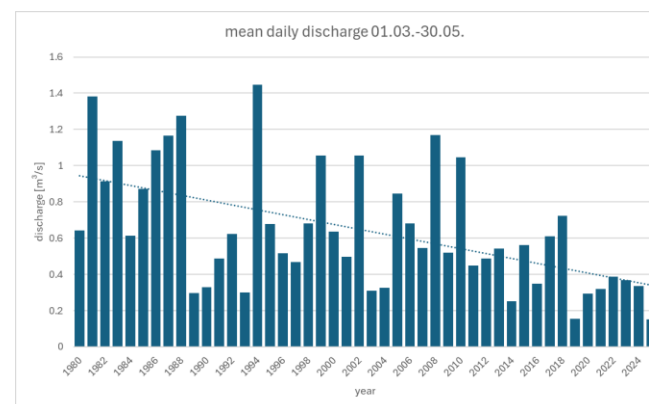
- Migrating trout show a high level of motivation to reach their spawning grounds at beaver dams
- Passing a dam depends on discharge and local situation
- Under low flow conditions, beaver dams can delay or completely impede migration
- Trout then usually spawn in less suitable or already used spawning grounds downstream
 - unsuitable habitat conditions or intraspecific competition can lead to higher mortality rates among the fry

- Smolt migration:

- Success of downstream migration is obviously dependent on the discharge
- Under low flow conditions single beaver dams can impede the downstream migration
- Higher predation suspected at beaver dams

- What can be expected in the future:

- Lower flows during peak migration periods
- Negative effects on local populations of migratory trout cannot be precluded





Thank you for your attention!



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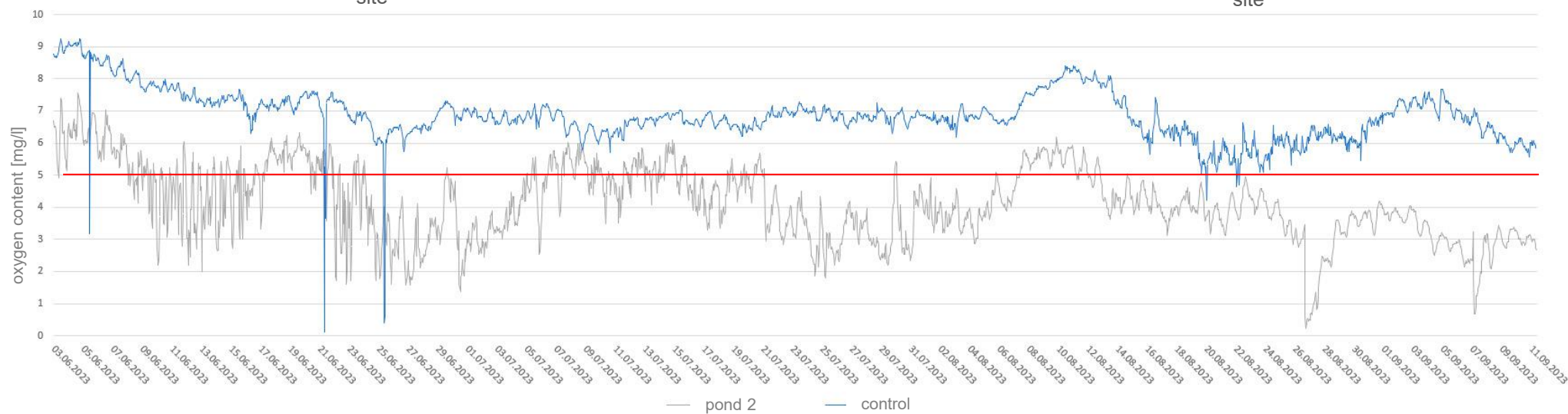
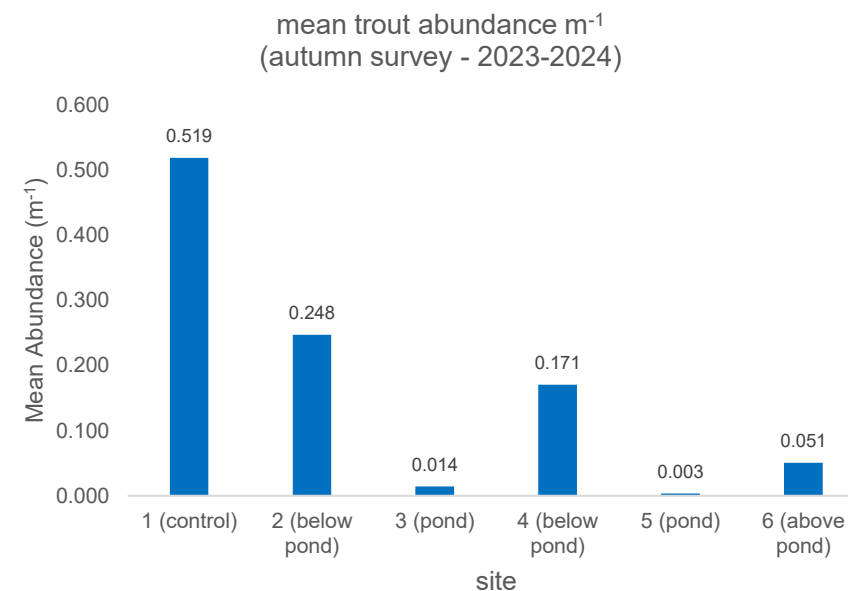
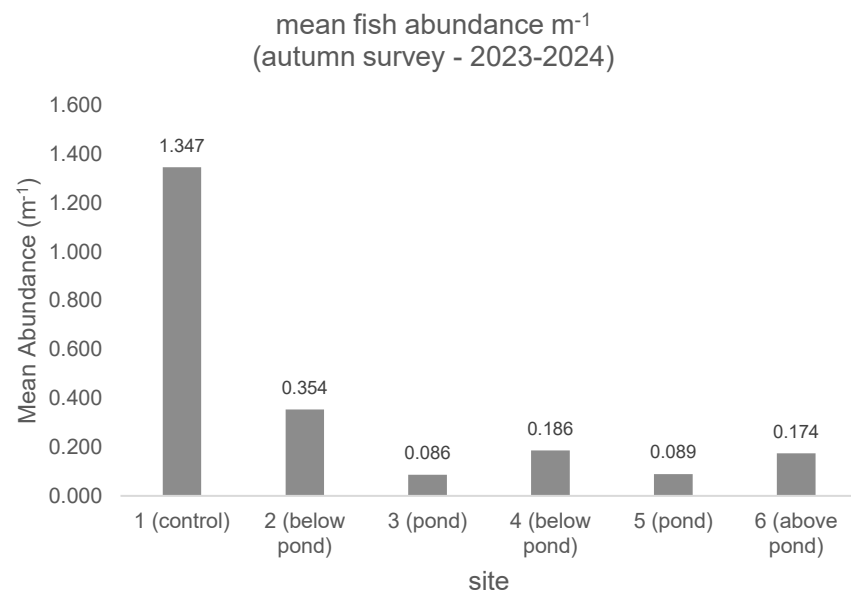
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Results – differences in abundance and species composition



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