

Pink salmon in Tana - eDNA analyses

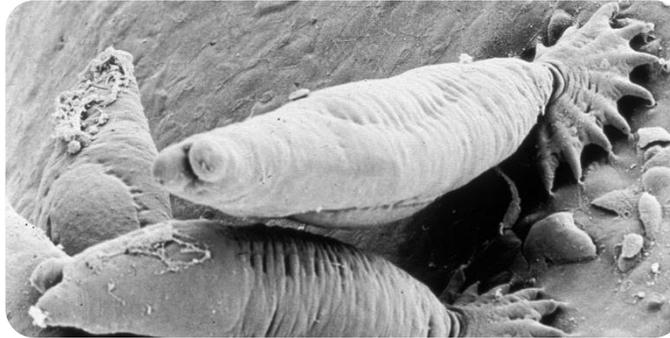
Frode Fossøy

NINA and eDNA

River pearl mussel



Gyrodactylus salaris



Northern pike



Bees and pollination



Reindeer and CWD



Great-crested newts



Insects



NINA eDNA kit



eDNA and invasive freshwater fish

www.nina.no

1299 NINA Rapport
Bruk av miljø-DNA for overvåking av fremmede fiskearter – utvikling av artsspesifikke markører for gjedde, mort og ørekyt

Frode Fossøy, Sondre Dahle, Line Birkeland Eriksen, Merethe Hagen Spets, Sten Karlsson & Trygve Hesthagen



 NINA Norsk institutt for naturforskning

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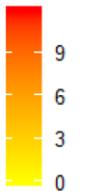
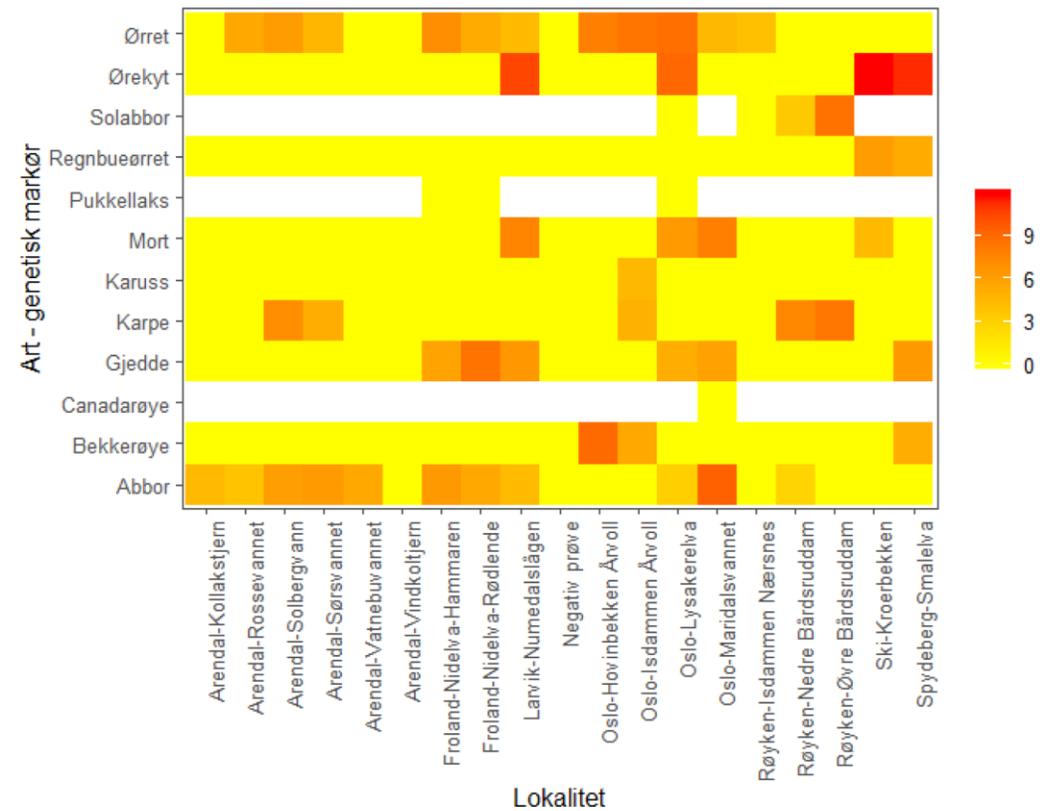
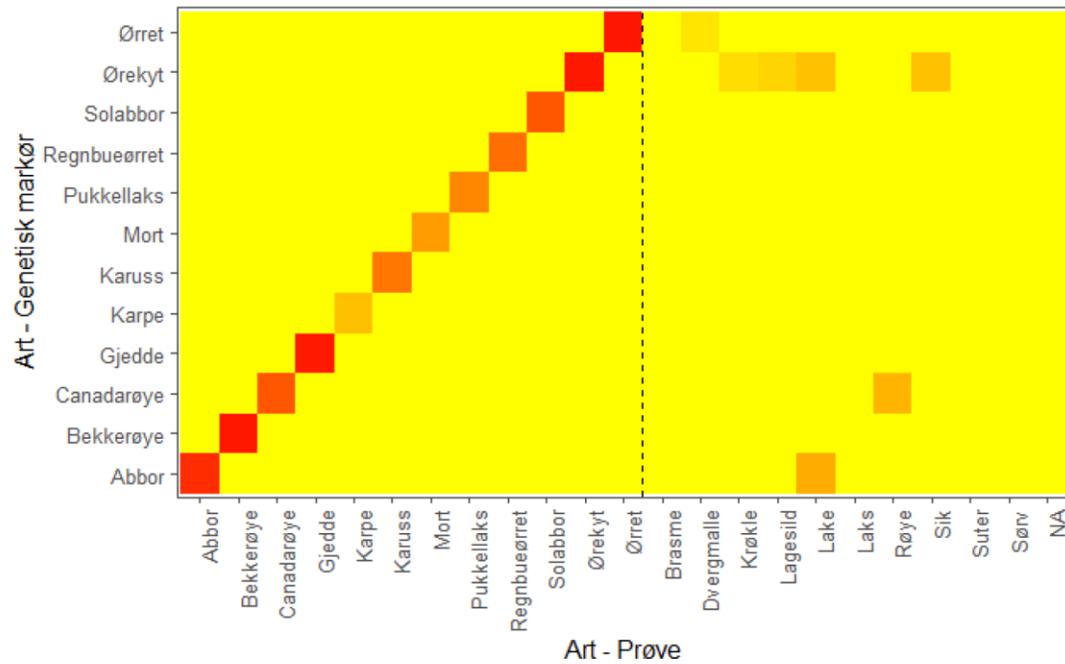
1586 NINA Rapport
Bruk av miljø-DNA som supplerende verktøy for overvåking og kartlegging av fremmed ferskvannsfisk

Frode Fossøy, Jens Thaulow, Marc Anglès d'Auriac, Hege Brandsegg, Rolf Sivertsgård, Tor Atle Mo, Odd Terje Sandlund, Trygve Hesthagen

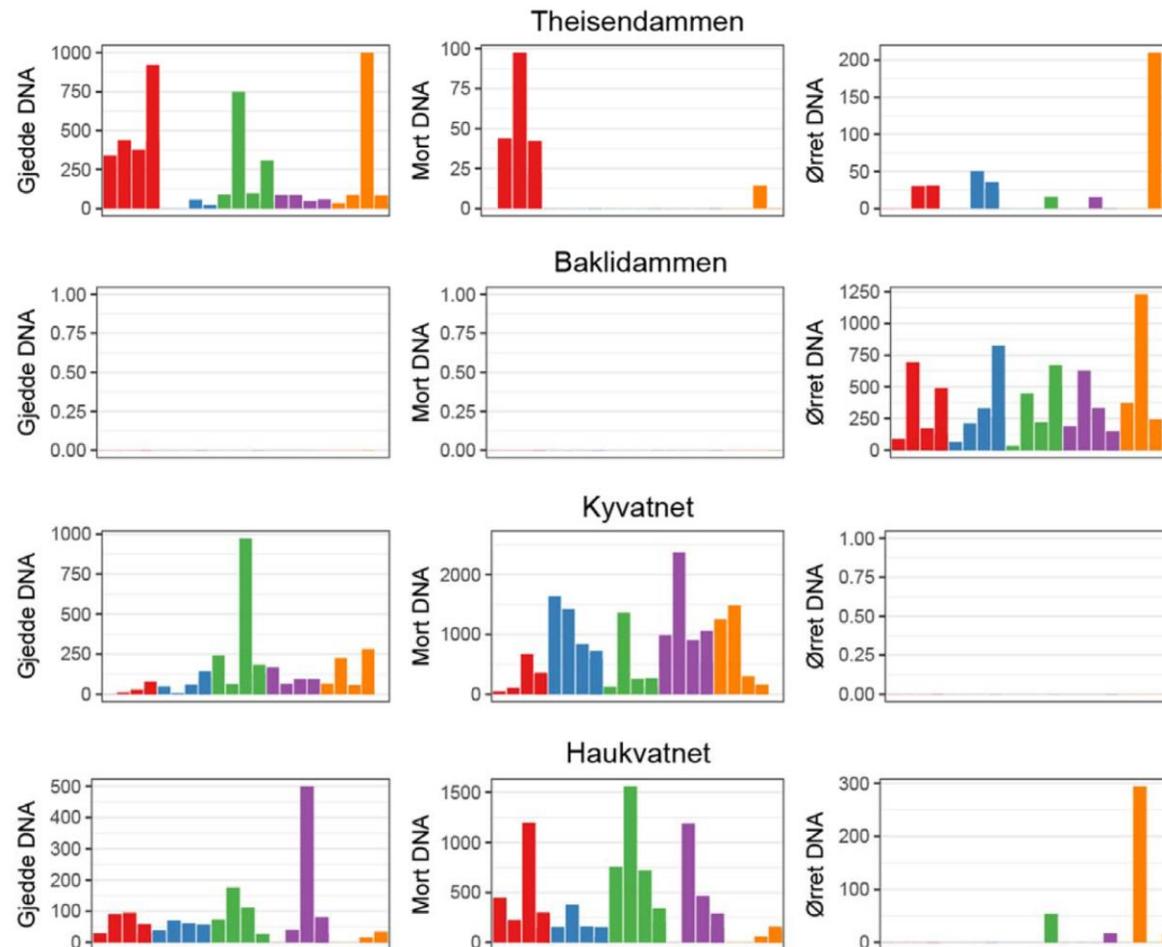


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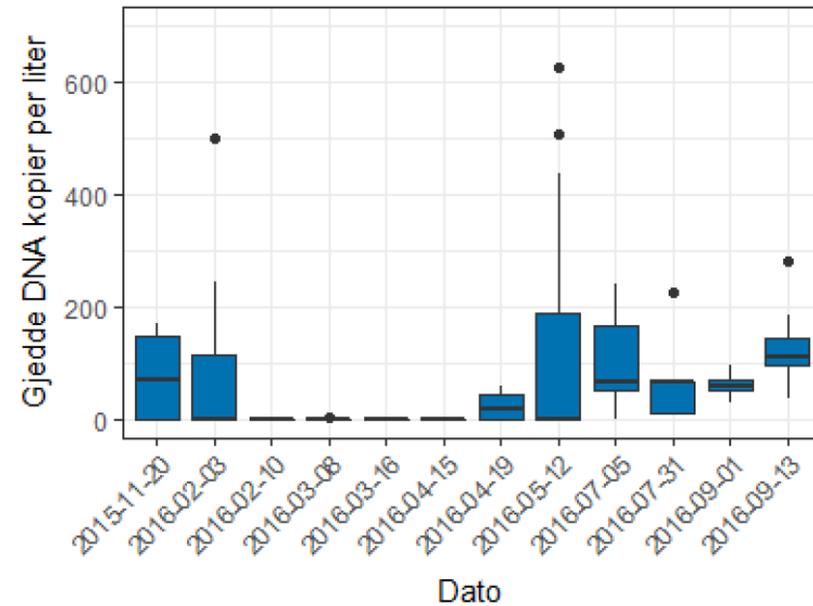
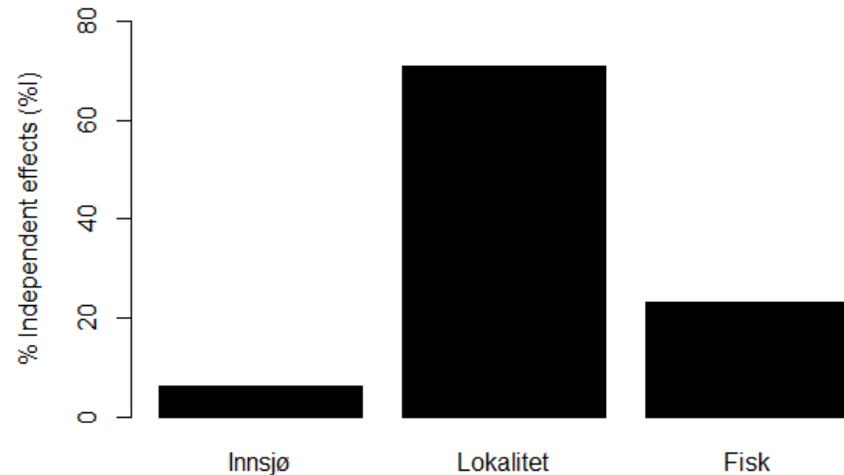
eDNA and invasive freshwater fish



eDNA and invasive freshwater fish

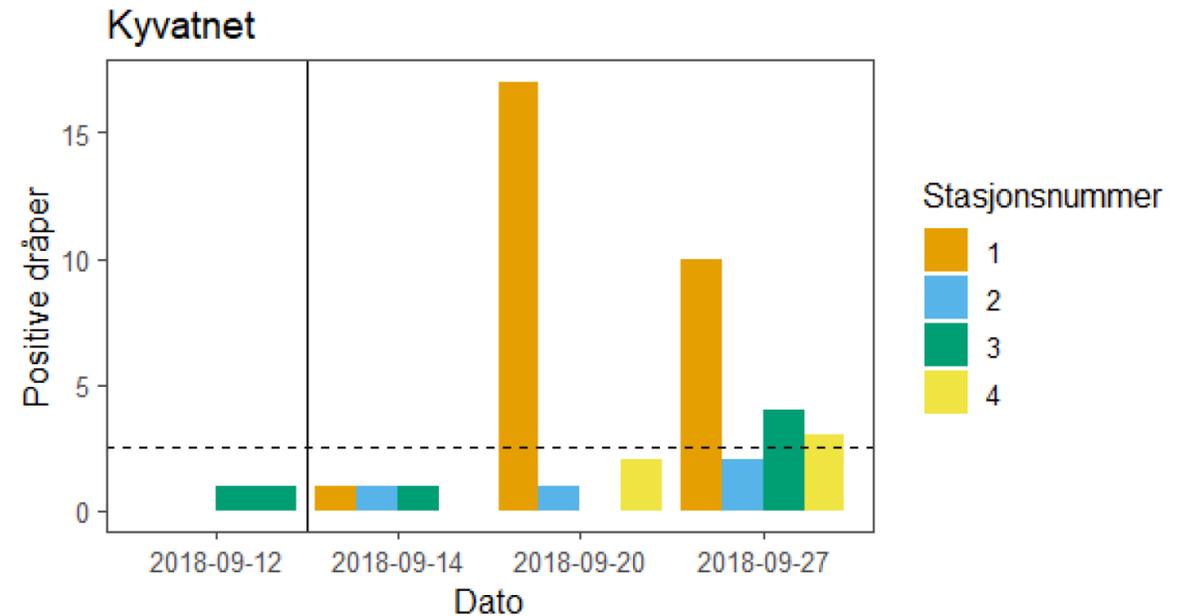
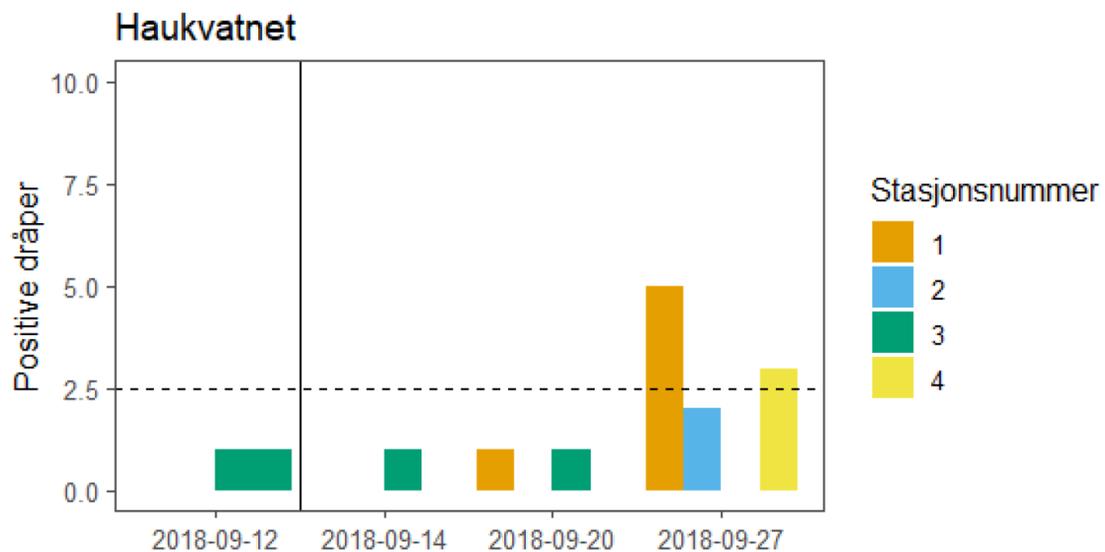


eDNA and invasive freshwater fish

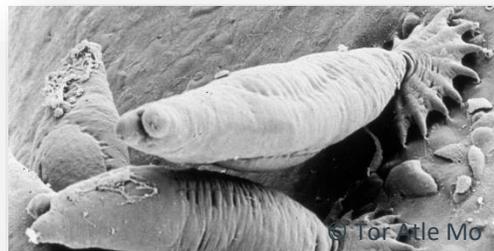


eDNA and invasive freshwater fish

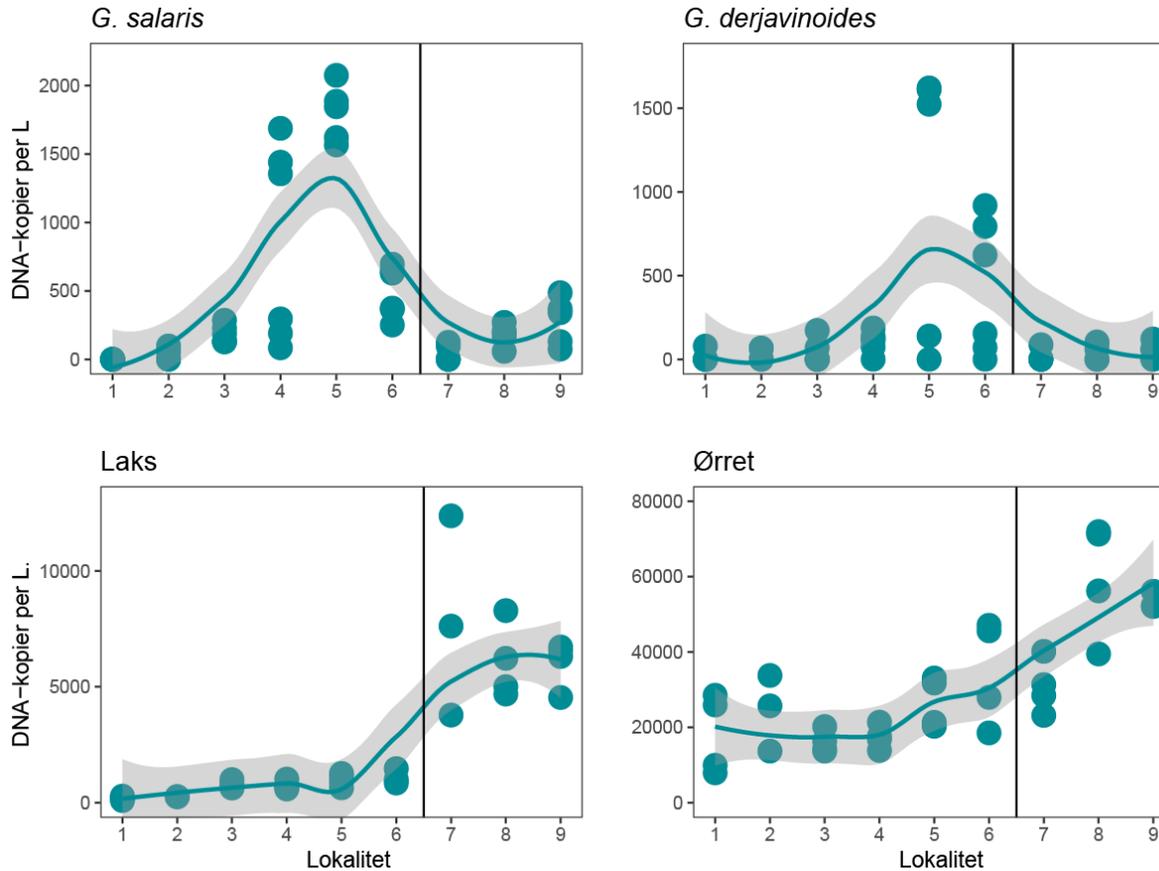
- Limit of detection
 - 20 trout of 20 gram in each lake



Gyrodactylus salaris in Driva



Gyrodactylus salaris in Driva



Received: 10 December 2018 | Revised: 28 September 2019 | Accepted: 4 October 2019
DOI: 10.1002/edn3.45

ORIGINAL ARTICLE

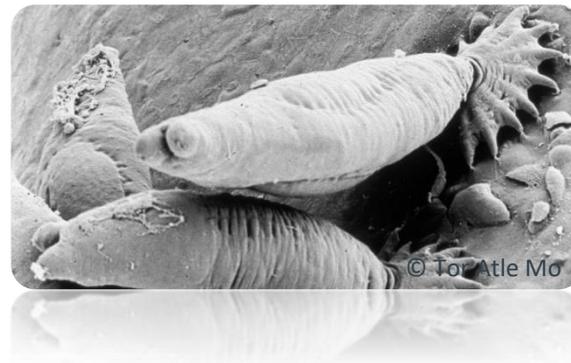
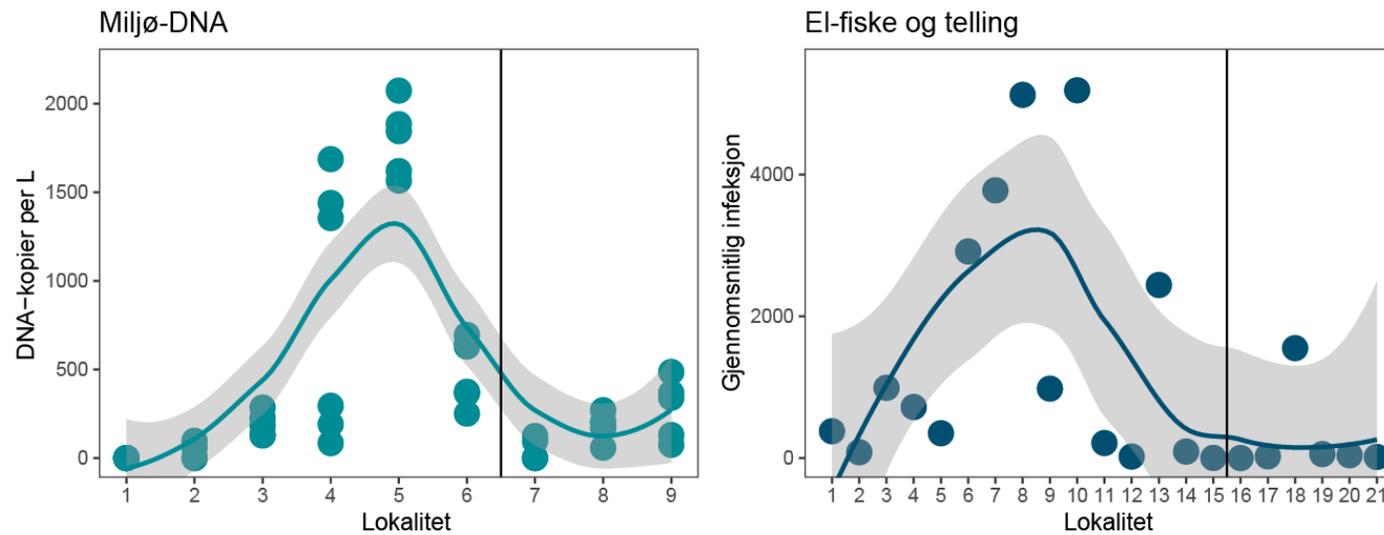
Environmental DNA
WILEY

Monitoring presence and abundance of two gyrodactylid ectoparasites and their salmonid hosts using environmental DNA

Frode Fossøy | Hege Brandsegg | Rolf Sivertsgård | Oskar Pettersen | Brett K. Sandercock | Øyvind Solem | Kjetil Hindar | Tor Atle Mo



Gyrodactylus salaris in Driva



Gyrodactylus salaris in Driva

- eDNA occupancy modelling

Filtertype	<i>G. salaris</i>			<i>G. derjavinoidea</i>		
	psi	theta	P	psi	theta	p
0.45 μm	0.84 (0.55-0.98)	0.93 (0.71-0.99)	0.78 (0.64-0.88)	0.82 (0.51-0.99)	0.83 (0.52-0.99)	0.48 (0.31-0.68)
2.0 μm	0.84 (0.56-0.98)	1.0 (1.0-1.0)	0.95 (0.85-0.99)	0.85 (0.56-0.99)	0.90 (0.70-0.98)	0.94 (0.82-0.99)

1 L vann

10 L vann



Miljø-DNA og fremmede fiskearter

www.1000rivers.net – Citizen science



INTERNATIONAL FISH EDNA PRO

HOME PROJECT BACKGROUND PROJECT PARTNERS SAMPL



Combining citizen science with eDNA to survey river fish communities



CSH Cold Spring Harbor Laboratory **bioRxiv** THE PREPRINT SERVER FOR BIOLOGY

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Environmental (e)DNA detection of the invasive pink salmon *Oncorhynchus gorbuscha* during the 2017 Norwegian invasion

Laura M. Gargan, Frode Fossey, Tor A. Mo, Jeannette E. L. Carlsson, Bernard Ball, Jens Carlsson
doi: <https://doi.org/10.1101/651554>

This article is a preprint and has not been certified by peer review [what does this mean?].

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ABSTRACT

The pink salmon *Oncorhynchus gorbuscha* was introduced from its native range in the Pacific to Northwest Russia several times since the 1950's. While this species has been regularly observed in rivers in Northern Norway since that time, there has been an upsurge in the numbers of odd-year *O. gorbuscha* individuals observed in rivers in southern Norway in recent years, and particularly in 2017. Although the wide-scale effects of this species presence are currently uncertain, there are concerns regarding potential competition between *O. gorbuscha* and native species – most notably the Atlantic salmon *Salmo salar*. Environmental (e)DNA is becoming a widely used tool to monitor rare and invasive species in aquatic environments. In the present pilot study, primers and a probe were developed to detect *O. gorbuscha* from eDNA samples taken from a Norwegian river system where the species was observed. Water samples were taken at both upstream and downstream locations of the Lysakerelva river during Autumn 2017 (to coincide with spawning) and during late Spring 2018. Autumn samples were positive for *O. gorbuscha* at both sampling locations, whereas

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Subject Areas

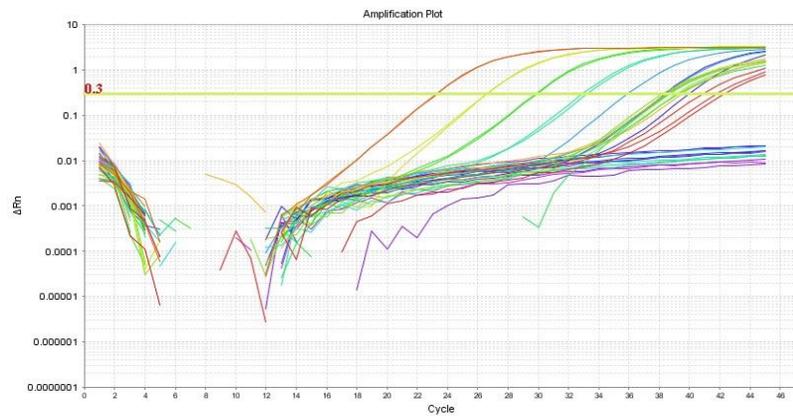
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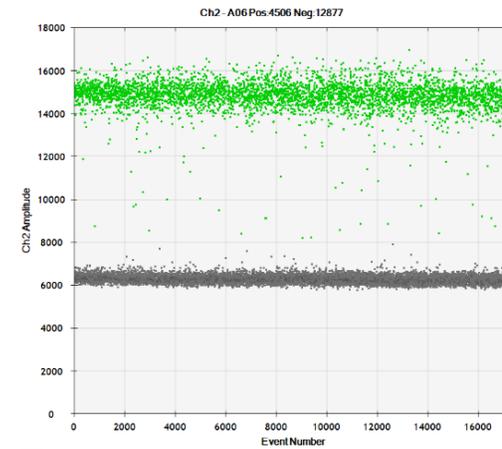


Species-specific analyses

qPCR



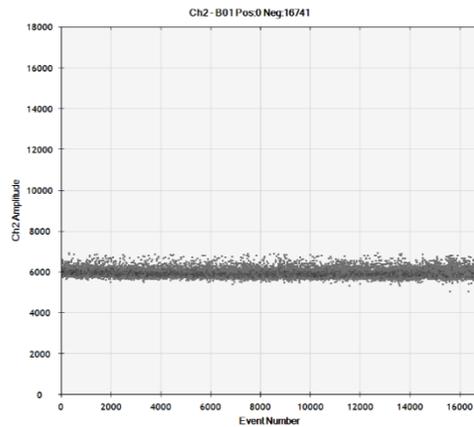
ddPCR



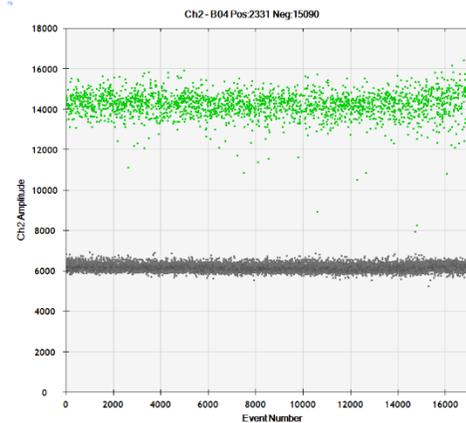
ddPCR quantification of eDNA



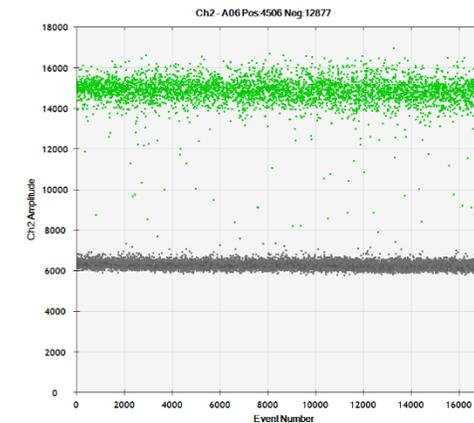
Prøve 1
NEGATIV



Prøve 2
169 DNA kopier/ μ l



Prøve 3
353 DNA kopier/ μ l

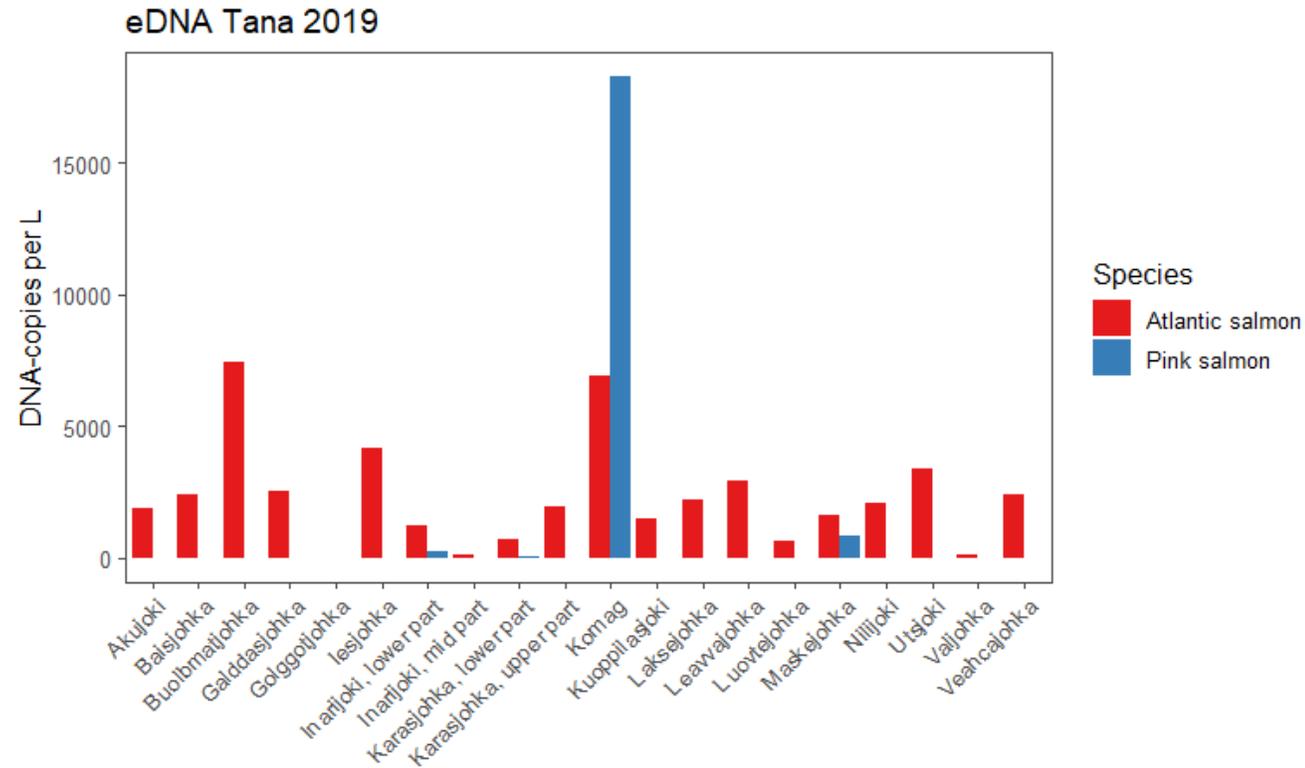


Why ddPCR over qPCR?

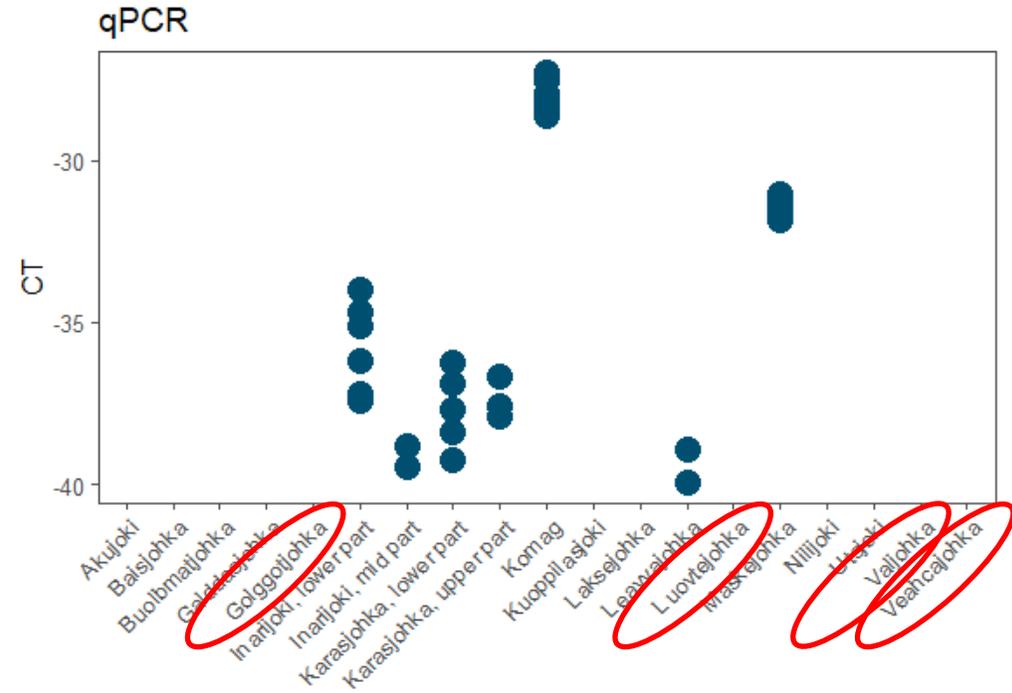
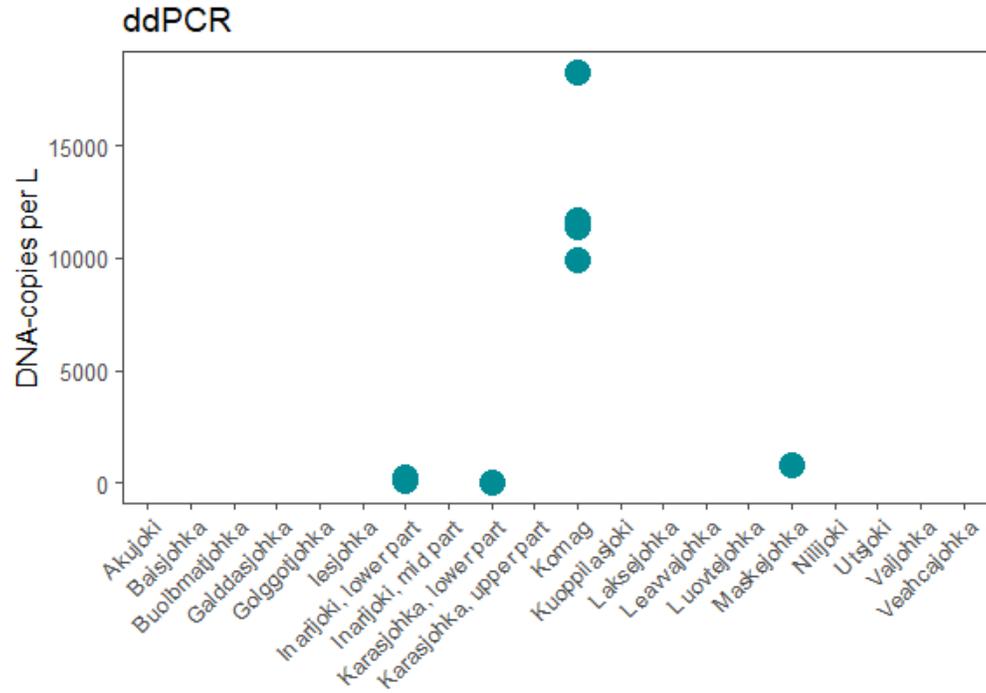
1. Endpoint PCR (0 or 1)
2. No standard curve needed
3. No replicates needed
4. Less sensitive to PCR-efficiency
5. Accumulative

Pink salmon in Tana

- ddPCR



Pink salmon in Tana



Cooperation and expertise for a sustainable future

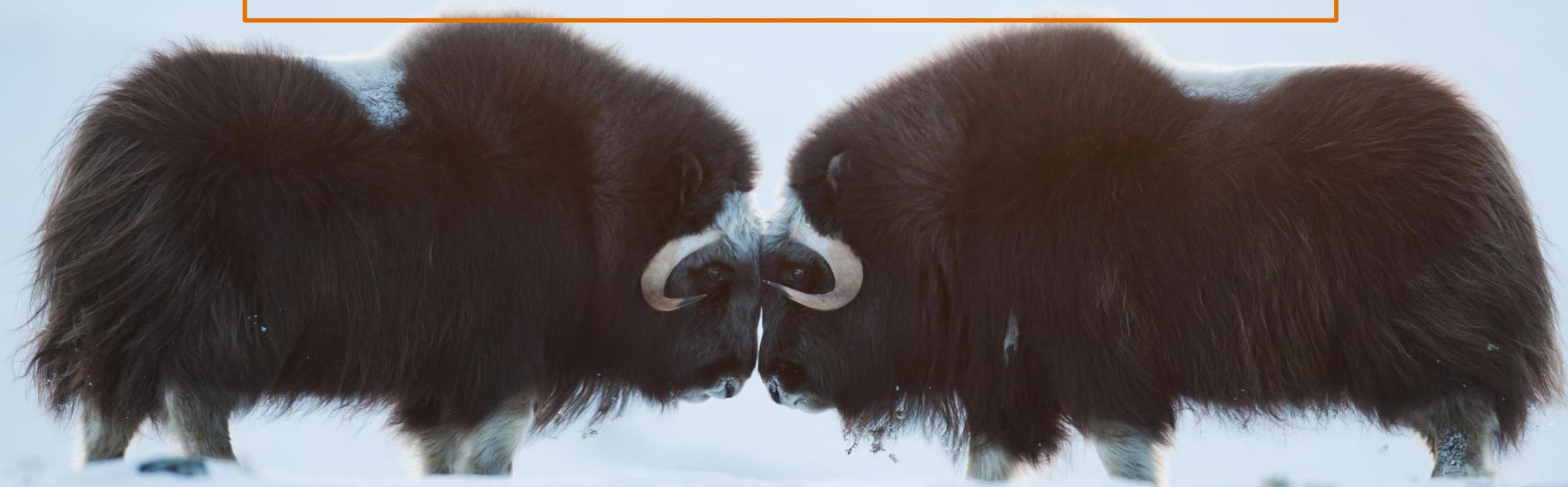


Foto. A. Staverløkk