



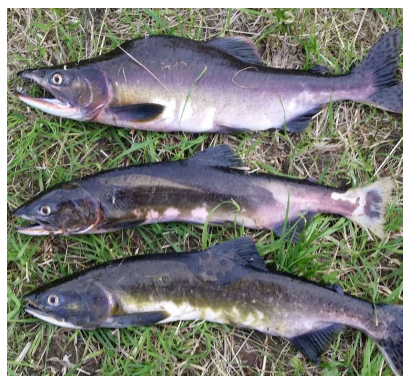
International collaborative research on pink salmon

Kjetil Hindar, Ingebrigt Uglem, Odd Terje Sandlund, Henrik Berntsen, Peder Fiske, Karl Øystein Gjelland & Eva Thorstad



Background

- The 2017 pink salmon invasion in Europe was a surprise to salmon management
- Vital questions are unanswered
- Management needed



Pink salmon in ICES Report

- WGNAS (ICES Working Group on North Atlantic Salmon) 2013: NASCO has asked ICES to advise on the potential threats to Atlantic salmon from exotic salmonids
 - ▶ [Introductions –1979] ... they disappeared when the introduction stopped in 1979.
 - ▶ [Introduction 1985] This single pink salmon egg transfer from an odd-year population resulted in the establishment of local self-reproducing populations in the White sea rivers of Murmansk and Archangelsk regions
 - ▶ [Rainbow trout] susceptibility to salmon lice (*Lepeophtheirus salmonis*) and where they co-occur also host parasites such as *Gyrodactylus salaris*.
 - ▶ spawning in pink salmon seems to be terminated before the spawning of Atlantic salmon starts.
 - ▶ competition can occur in small rivers [...] when pink salmon enter streams in large numbers and aggressively push overwintered autumn run Atlantic salmon out of holding pools to non-typical habitats.
 - ▶ Pink salmon fry migrate to sea in early summer, shortly after emerging from the gravel.

www.nina.no



Niemelä, E. et al. 2016 Report

Pink salmon in the Barents region

With special attention to the status in the transboundary rivers

Tana and Neiden, rivers in North West Russia and in East

Canada

Niemelä, E., Johansen, N., Zubchenko, A.V., Dempson, J.B., Veselov, A., Ieshko, E.P., Barskaya, Yu., Novokhatskaya, O.V., Shulman, B.S., Länsman, M., Hassinen, E., Kuusela, J., Haantie, J., Kylväaho, M., Kivilahti, E., Arvola K-M. and Kalske, T.H. (ed.)

Office of the Finnmark County Governor

Department of Environmental Affairs

Report 3-2016 [Authors from Finland, Norway, Russia, Canada]

www.nina.no



ICES Climate Workshop 2017

- WKCCISAL (ICES Workshop on Potential Impacts of Climate Change on Atlantic Salmon Stock Dynamics 2017)
 - ▶ ... at least in the southeastern North Pacific Ocean, odd-year populations appear to be benefiting from climate change more than even-year populations (Irvine et al. 2014 TAFS 143).
 - ▶ It is therefore possible that pink salmon reproducing in Norwegian rivers may benefit from climate warming, and continue to extend their distribution, thereby increasing their potential interaction with Atlantic salmon.
 - ▶ ... pink salmon may never be significant competitors with Atlantic salmon.
 - ▶ Results [in Northwest Atlantic] indicate that altered trophic dynamics caused by changing ocean conditions under CC [Climate Change] negatively influenced Atlantic salmon.

www.nina.no



Edinburgh meeting Sept 2017

- Professor Colin Bean, Scottish Natural Heritage, organised a one-day workshop 21.09.17
- UK, Ireland, Iceland, Norway, France, Germany, Finland, and Denmark participated
- National reports on recent spread; ecology; rapid Risk Assessment (Gordon Copp, CEFAS); common data gathering (Colin Bean); genetics (John Gilbey, Marine Scotland and Eric Verspoor, UHI Scotland); eDNA (Jens Carlson, UC Dublin)

www.nina.no



Need for collaboration

- Invasion
- Origin
- Odd- vs even-year
- Timing of life-history
- Local salmonids
- Parasites
- Salmon farming
- *Why 2017?*
- *Russia and Norway?*
- *Why 2016 Norway?*
- *Emergence autumn?*
- *River interactions?*
- *Atlantic or Pacific?*
- *Unaffected?*

www.nina.no



Research questions that need collaboration

- ▶ What is the geographic origin of pink salmon entering European rivers 2017?
- ▶ One source, or several sources, and how can we distinguish between the two?
- ▶ Can pink salmon <25 cm found in brackish fjords autumn 2016 come from local spawners 2015?
- ▶ If so, can they carry *Gyrodactylus salaris* between rivers?
- ▶ Is emergence in late autumn (Scotland, S Norway) found elsewhere, and is the effect on other salmonids different from spring emergence?
- ▶ Can territory-defending pink salmon attack migrating sea trout and sea charr, as well as Atlantic salmon?
- ▶ Is commercial salmon aquaculture unaffected by migrating pink salmon?

www.nina.no

