

# Pink Salmon Synthesis: Outcomes from the October 2022 Northern Hemisphere Pink Salmon Experts Meeting



Dennis Ensing & Jim Irvine

IYS Synthesis Symposium 05/10/2022



# Northern Hemisphere Pink Experts Working Group



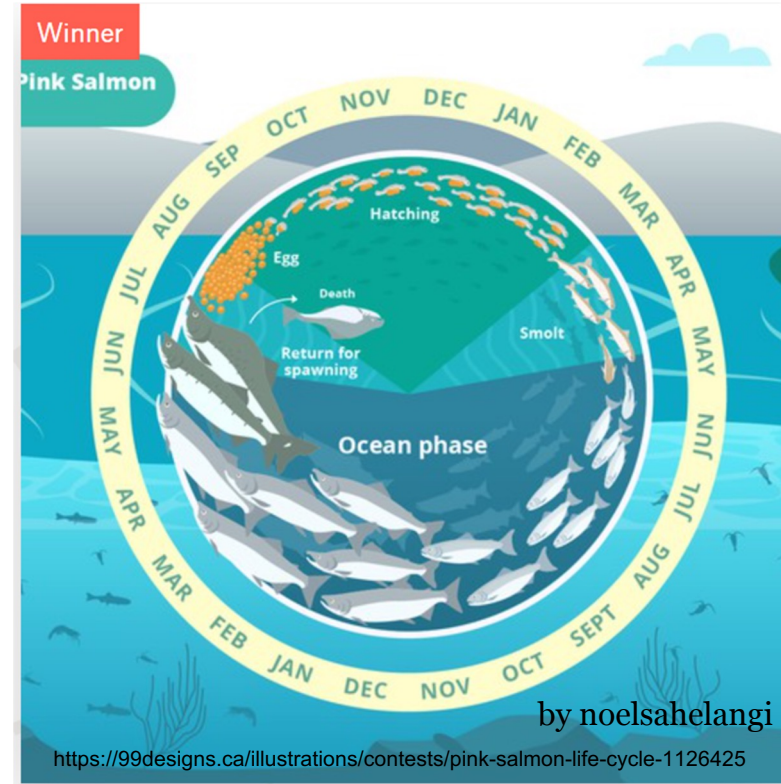
- ICES WGDIAD/NPAFC Inter-ocean-basin expert group on Pink salmon range expansion
- Idea spawned at the 2016 NASCO meeting
- Further developed after the 2021 Atlantic-Pacific Salmon Round Table
- Virtual meetings during spring/summer 2022
- October 2022 meeting in Vancouver to evaluate changes in distribution & abundance in the Northern hemisphere



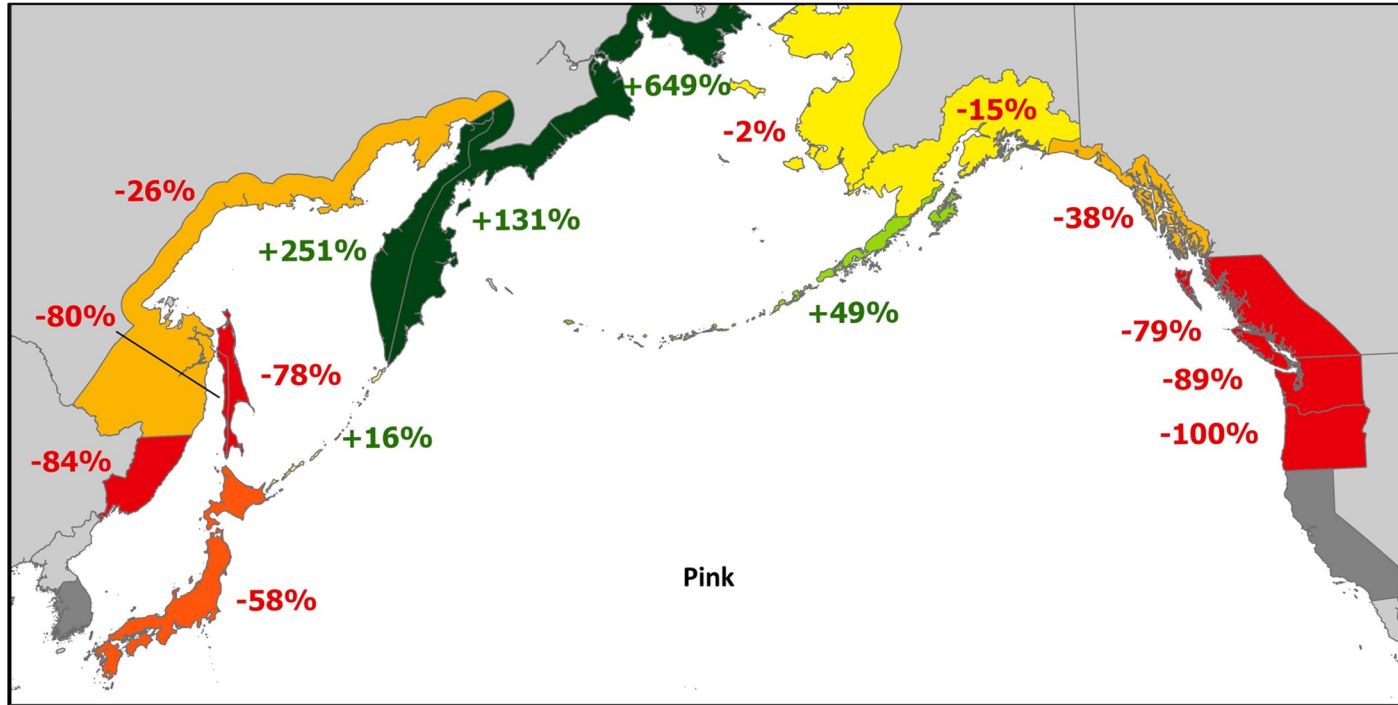
Northern Hemisphere Pink Salmon Workshop Attendees Oct 2-3 2022

# Pink Salmon Life-cycle

- **Strict two-year lifecycle**
- **Genetically distinct odd & even-year broodlines**
- **Very short freshwater stage**
- **Most abundant anadromous salmonid in the North Pacific**
- **Homing not precise, sometimes to areas of coastline rather than individual rivers**
- **Boom & bust cycles**

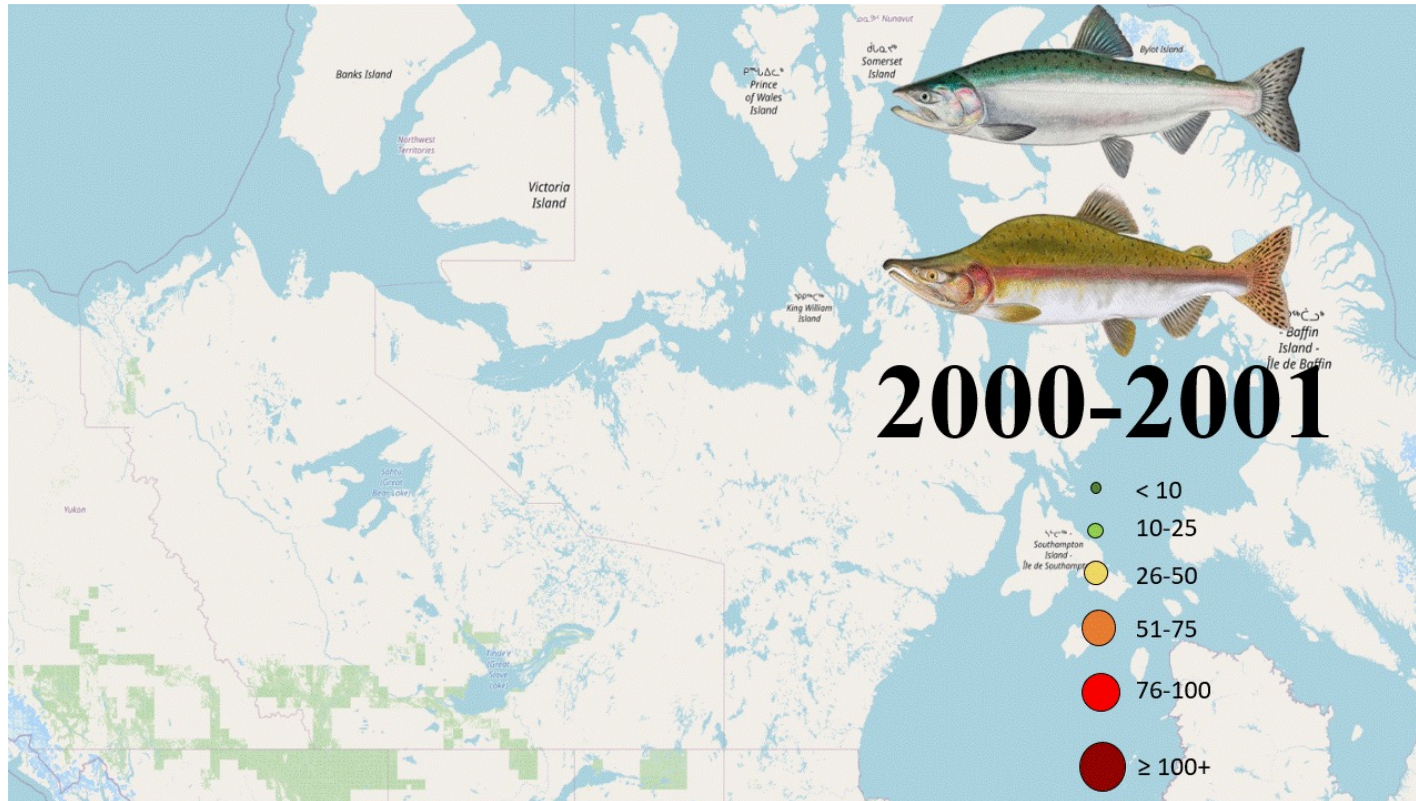


# Recent Changes in Pink Salmon Abundance in N Pacific



Comparison of average annual Pacific pink salmon catch by species & region 2017-2021 vs. 2007-2016

# Changes in distribution and abundance of Pink salmon

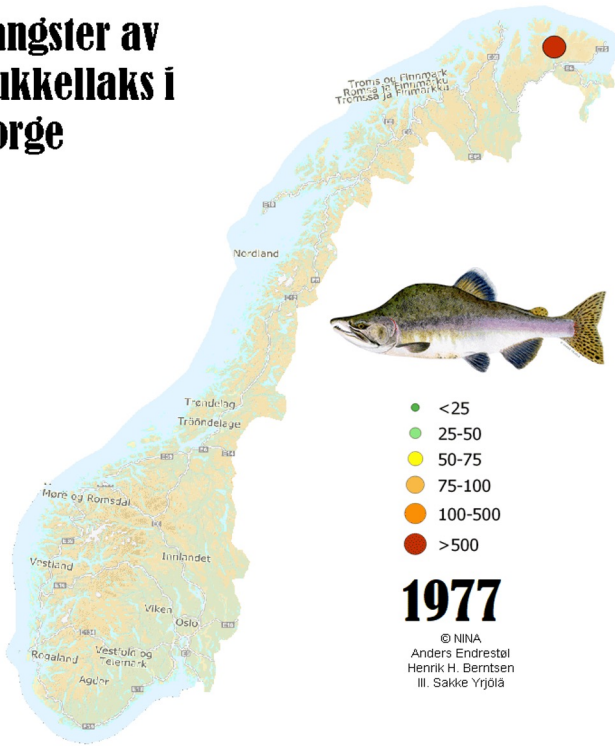


Occurrences of pink salmon caught by subsistence harvesters and provided to Arctic Salmon from 2000 to 2021

# Changes in Distribution and Abundance of Pink Salmon



## Fangster av pukkellaks i Norge



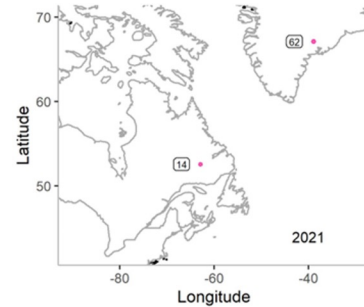
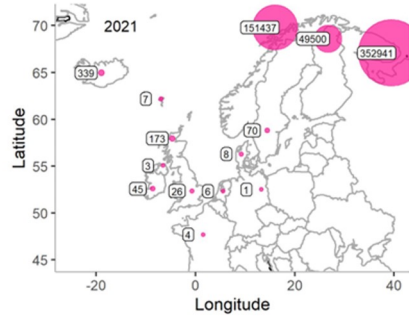
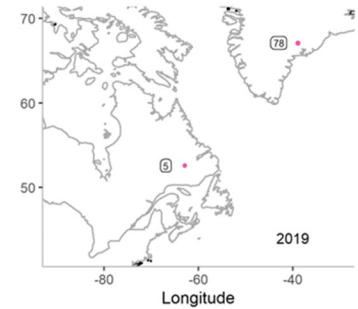
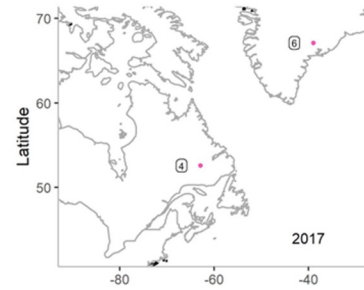
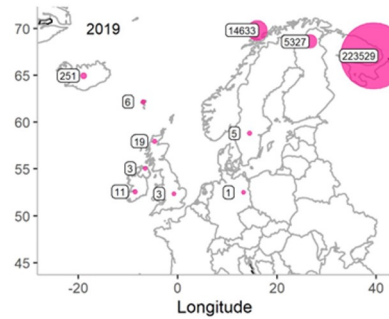
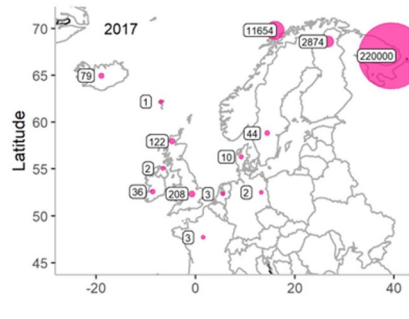
**1977**

© NINA  
Anders Endrestøl  
Henrik H. Berntsen  
Ill. Sakke Yrjölä



Prusov and Zubchenko, 2021

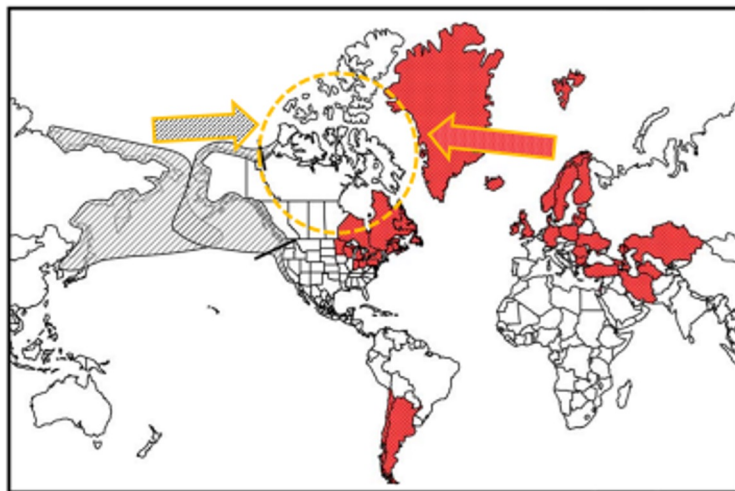
# Changes in distribution and abundance of Pink salmon



# North American Arctic Expansions: Where are they from?



Expansions from the Pacific native range



Expansions from introduced populations in the Atlantic

Crawford & Muir 2008



# Potential Ecological Consequences (+ positive; - negative) of Invasive Pink Salmon



## Marine

- Interspecific competition for food
- Trophic cascade effects
- Predation on juvenile fish
- + Food source
- + Harvesting opportunities

## Freshwater

- Interspecific competition in spawning areas
- Decaying pinks & low flow could -> to low  $O_2$  -> mortality of other salmonids
- Pathogens
- + Pink carcasses, eggs and fry -> nutrients for ecosystem & food for other fish

# Current Pink Salmon Monitoring Approaches Outside Native Range

**Environmental DNA**

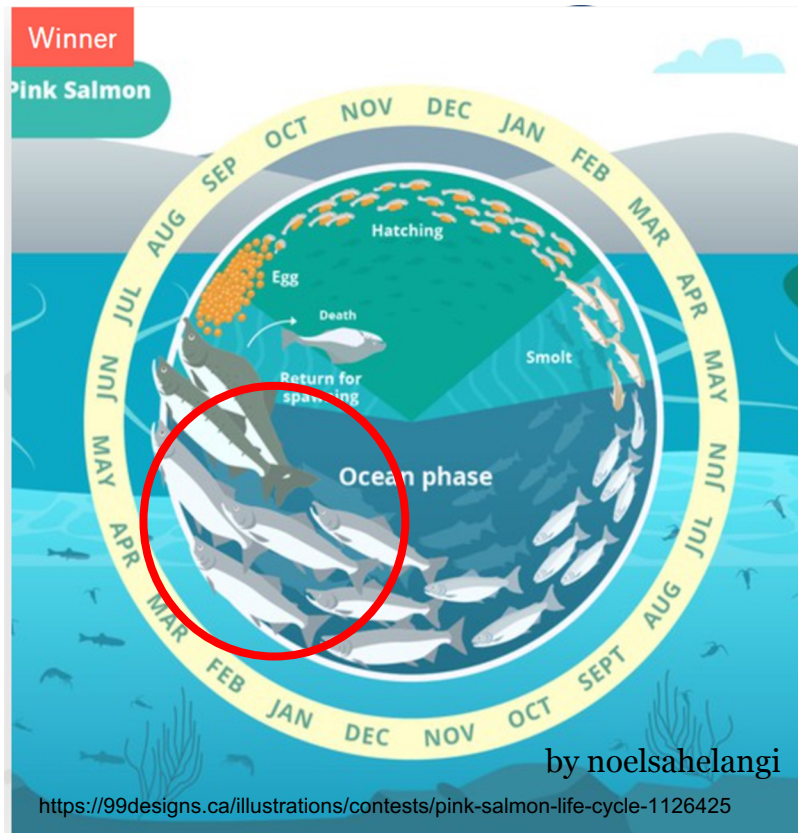
**Sampling of subsistence harvest (Arctic & Greenland)**

**Opportunistic marine sampling (Norwegian herring survey)**

**Adult sampling in freshwater primarily using existing Atlantic salmon escapement monitoring infrastructure**

**Genetic analysis of origin**

**Ad-hoc reports commercial & recreational fishers**



# Differences among nations re Management of Alien Pink salmon

## Approaches not Consistent

**Norway: extensive eradication programme gov't policy but some advocate sustainable fisheries**

**Finland: unwanted, but no eradication programme**

**Russian Federation: manage Pink salmon as a resource (in Barents & White Sea areas)**

**UK (England & Wales): prohibit releases once caught**

**UK (Northern Ireland): existing legislation regards Pink salmon same as Atlantic salmon**

**Canadian Arctic - generally unwanted but increasing concerns**



# Future Collaborations on Pink salmon



- **ICES Working Group North Atlantic Salmon (WGNAS): recommendation for annual reporting of Pink salmon in North Atlantic**
- **NASCO standing working group on Pink Salmon (future)**
- **ICES/PICES/NPAFC Working Group Pink Salmon (recommended)**
- **Northern Hemisphere Pink Salmon Experts Group**
- **Need to engage ICES Working Group Baltic Salmon and Sea trout (WGBAST)**

# Future Research & Management Priorities



- **Coordinating collection of baseline abundance, ecological and climate related data**
- **Focussed freshwater monitoring of juvenile Pink salmon in North Atlantic/Arctic & marine monitoring in N Atlantic**
- **Sampling designs to monitor impacts of Pink salmon in the North Atlantic/Arctic (e.g. capitalize on natural experiment in Atlantic (odd years have pinks, even years do not))**
- **Evaluate selective capture & removal methods (e.g. purse and beach seines, reef nets. resistance board floating weirs, traps, fences, fish wheels)**
- **Better understanding of ecosystem linkages; interactions among species; improved application of eDNA, modern genetic tools, and modelling approaches**



# Take Home Messages

## **Expect the Unexpected, Especially with Climate Change!**

- Changes in migration timing, age composition, habitat use??

## **Pinks are on the Move!**

- Approaching N American Arctic:
  - from the east (Russia->Norway->Britain->Greenland->Labrador->E Canadian Arctic->?)
  - and the West (N Pacific->W N Amer Arctic->?)

## **Collaboration (sharing knowledge) & Outreach are Key!**

# Questions/Discussion?

