

Teno Salmon as a model for adaptive co-management in the Arctic (ISAMA)



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@TenoSalmon
@TenonLohi
@FishConGen



Turun yliopisto
University of Turku



Atlantic salmon (*Salmo salar*)

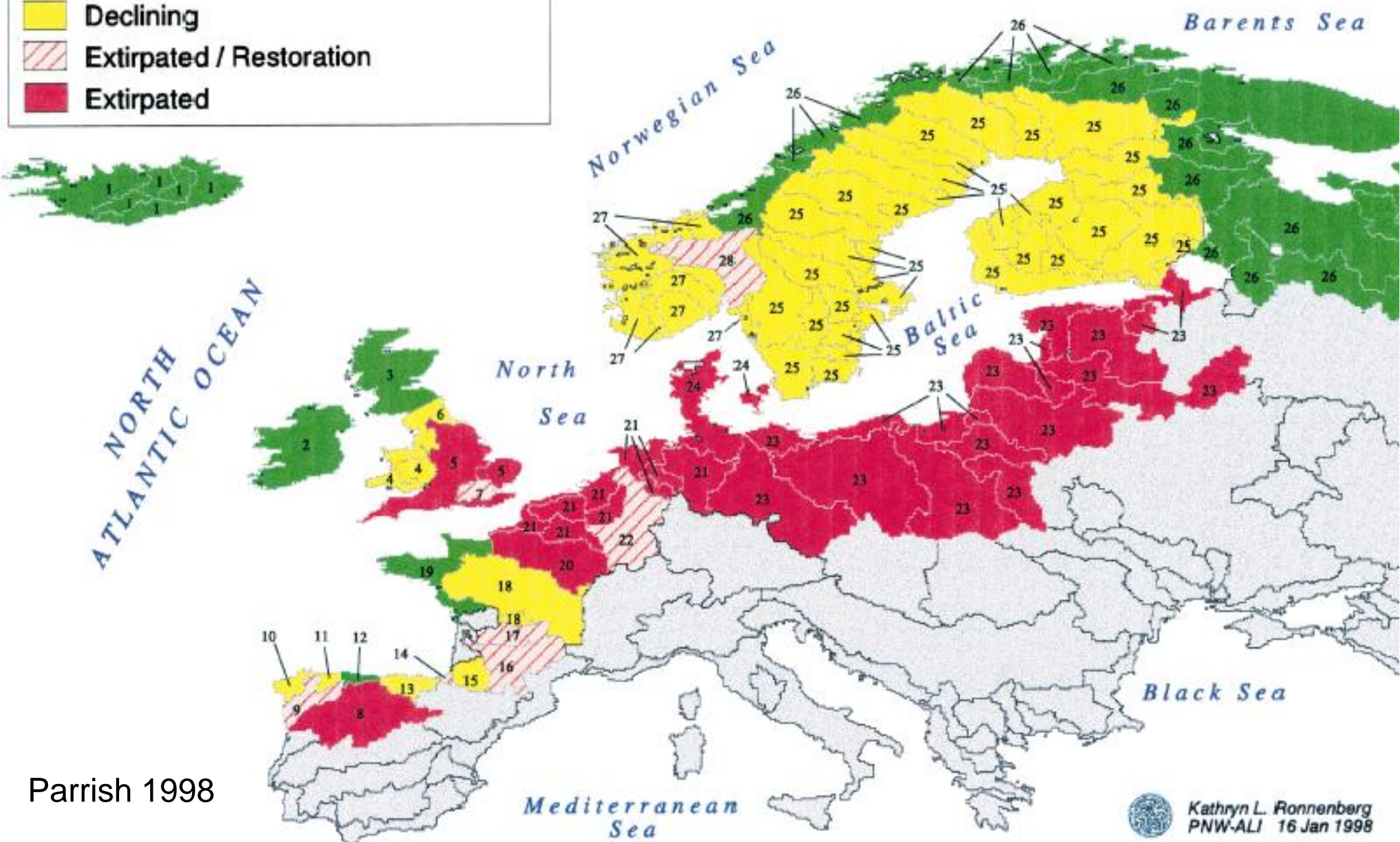


Tastes good
Fun to (try to) catch
Anadromous

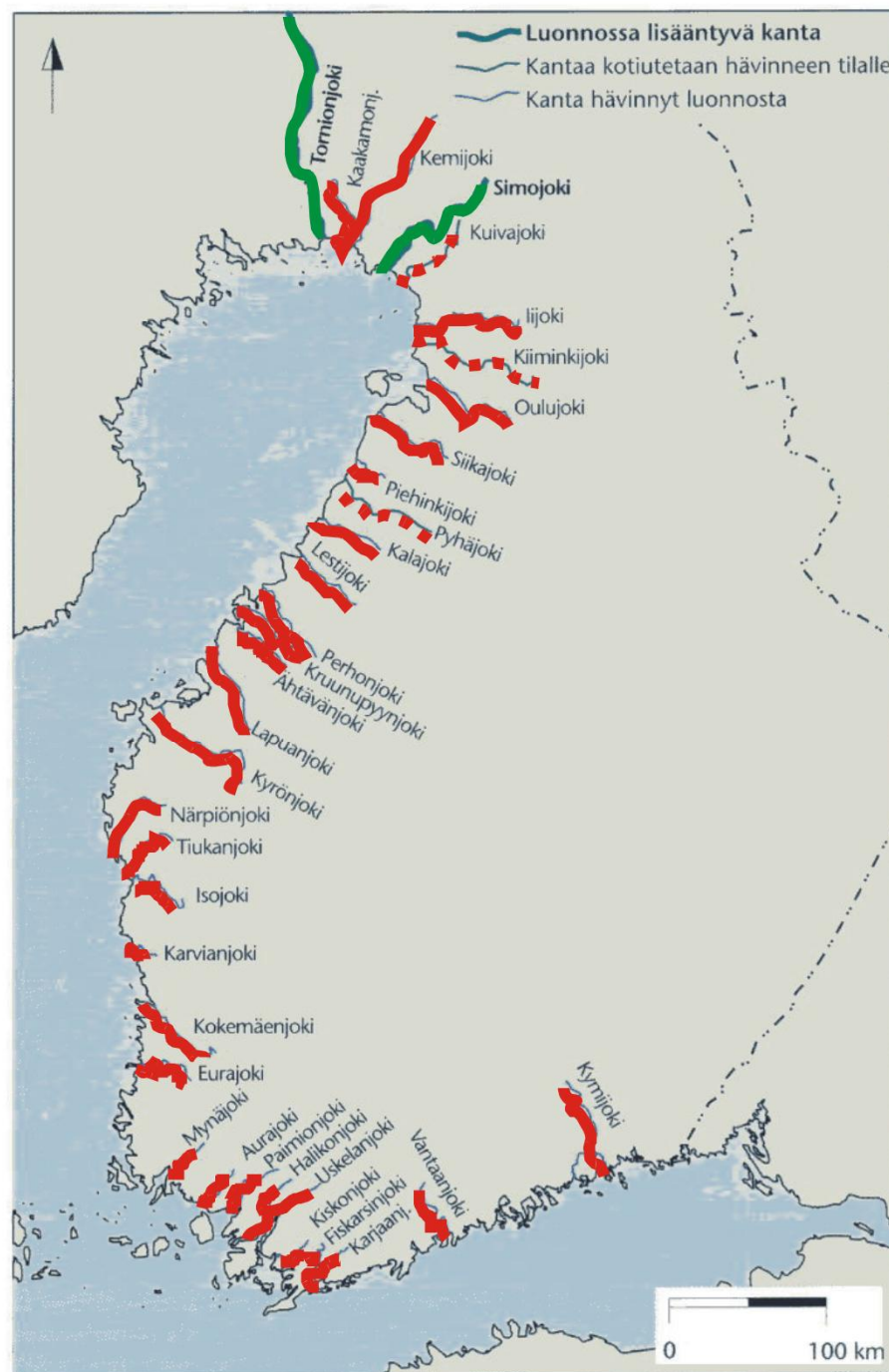
Atlantic Salmon Population Status

- Outside Range of Atlantic Salmon
- Stable
- Declining
- Extirpated / Restoration
- Extirpated

Major European Basins

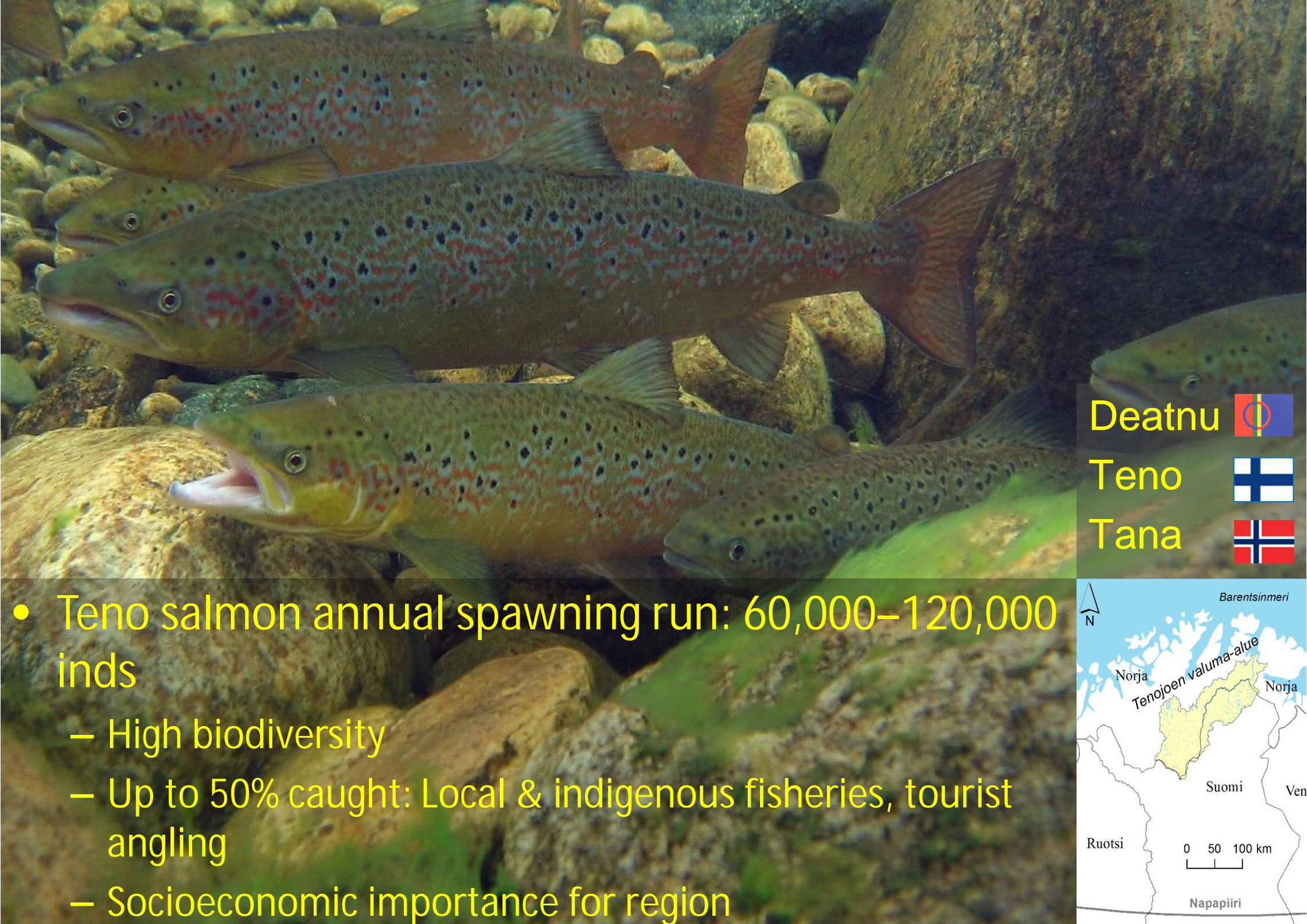


Parrish 1998



Suomen alueelta Itämereen laskevat entiset ja nykyiset lohijoet. Alkuperäinen lohikanta lisääntyy luonnossa enää vain Tornionjoessa ja Simojoessa. Näiden kantojen lisäksi viljelyssä ovat Iijoen ja Nevan lohikannat sekä Oulujoen istutuksiin käytetty ns. Montan kanta.

From: Vastavirtaan, RKTL, 2002



Deatnu



Teno

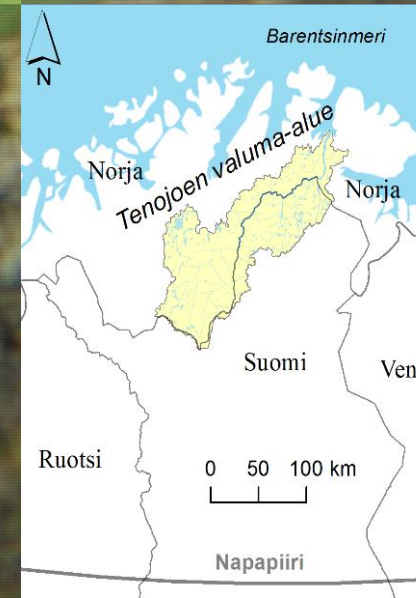


Tana



- Teno salmon annual spawning run: 60,000–120,000 inds

- High biodiversity
- Up to 50% caught: Local & indigenous fisheries, tourist angling
- Socioeconomic importance for region



29120438 4.4

Riista- ja kalatalouden tutkimuslaitos
35 Kalantutkimusosasto 4.1+
PL 193, 00131 HELSINKI 13

Nro

Kalavesi... *Uusjoki*

Kunta... *Uusjoki*

Kalalaji... *Lehti*

Kokonaispituus... *56.5 mm*

Paino... *1630 g*

Sukupuoli... *Naaras*

Sukukypsyys... *1/3*

Pydys... *Verkko*

Aika... *4.7-85*

Nimi... ..

Osoite.. ..

83-2209

- >150 000 scales available
 - 1970-2016
 - Multiple locations

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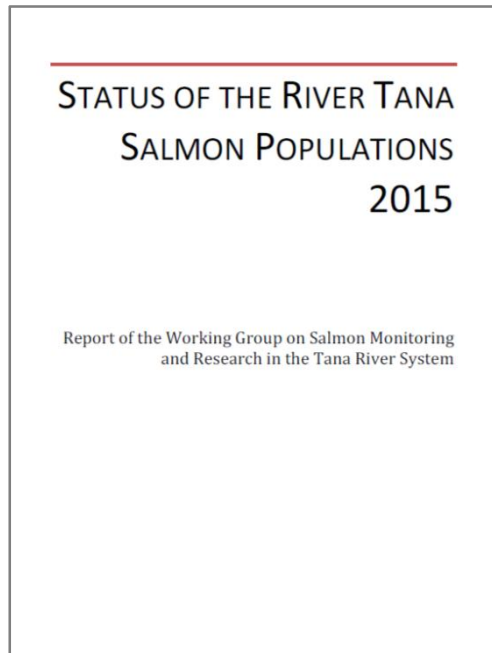
Nimi... *...*

Osoite... *...*

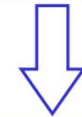
83-2209

- Ecological information (life history strategy)
- Genetic material (population structure)
- Citizen science (links end-users & researchers)

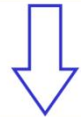
Current Teno salmon management



International management



Bilateral management



Scientific advice

- What's lacking? Model for predicting future stock size & composition

Integrative science for adaptive co-management in the Arctic (ISAMA)



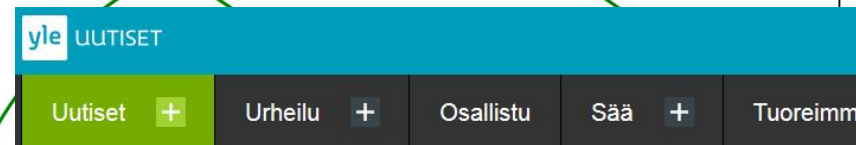
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Evolutionary genetics
(Primmer)

Population ecology
(Erkinaro)



Sub population
diversity
Conservation
genetics



UUTISET > ROVANIEMI

Rovaniemi 20.10.2015 klo 13:05 | päivitetty 21.10.2015 klo 5:41

Luke lakkauttaa Utsjoen ja Kolarin toimipisteet Lapista

Luonnonvarakeskuksen (Luke) uudistaminen lakkauttaa kaksi toimipistettä Lapista. Suunnitelman mukaan Lapista lakkautetaan Utsjoen ja Kolarin toimipisteet vuoteen 2018 mennessä.

THULE-INSTITUUTTI



Aims

- Utilize the long term scale archive to characterize ecological & genetic changes in stocks (1970-2015)
- Identify anthropogenic/climatic factors that contribute to these changes
- Study the forms of local knowledge and knowledge co-production
- Develop an approach to combine local user and scientific knowledge for adaptive co-management

First achievements 1

- Identified a major gene controlling age at maturity in salmon
 - Same gene also linked to pubertal age in humans

LETTER

doi:10.1038/nature16062

Sex-dependent dominance at a single locus maintains variation in age at maturity in salmon

Nicola J. Barson^{1*}, Tutku Aykanat^{2*}, Kjetil Hindar³, Matthew Baranski⁴, Geir H. Bolstad³, Peder Fiske³, Céleste Jacq⁴, Arne J. Jensen³, Susan E. Johnston⁵, Sten Karlsson³, Matthew Kent¹, Thomas Moen⁶, Eero Niemelä⁷, Torfinn Nome¹, Tor F. Næsje³, Panu Orell⁷, Atso Romakkaniemi⁷, Harald Sægvog⁸, Kurt Urdal⁸, Jaakko Erkinaro⁷, Sigbjørn Lien¹ & Craig R. Primmer²



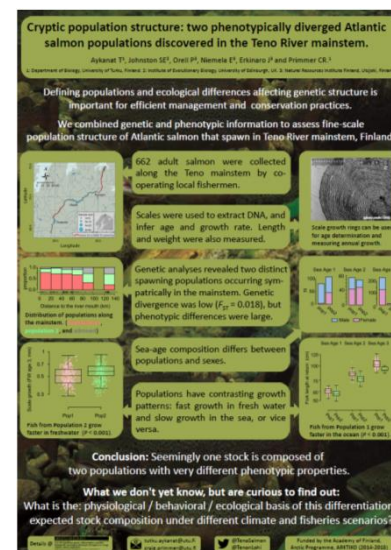
First achievements 2

- Unexpected discovery of cryptic sub-populations in the Teno mainstream using genetic and scale data



Low but significant genetic differentiation underlies biologically meaningful phenotypic divergence in a large Atlantic salmon population

TUTKU AYKANAT,* SUSAN E. JOHNSTON,*† PANU ORELL,‡ EERO NIEMELÄ,‡ JAAKKO ERKINARÓ‡ and CRAIG R. PRIMMER*

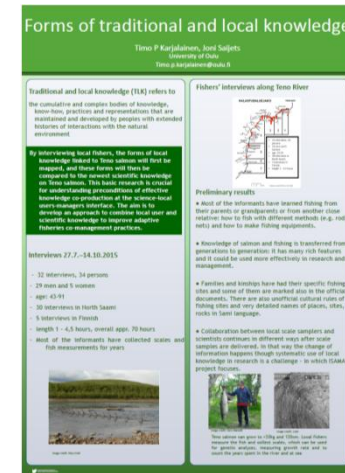


First achievements 3

- Detailed analysis of life-history diversity across 40 years in 9 locations

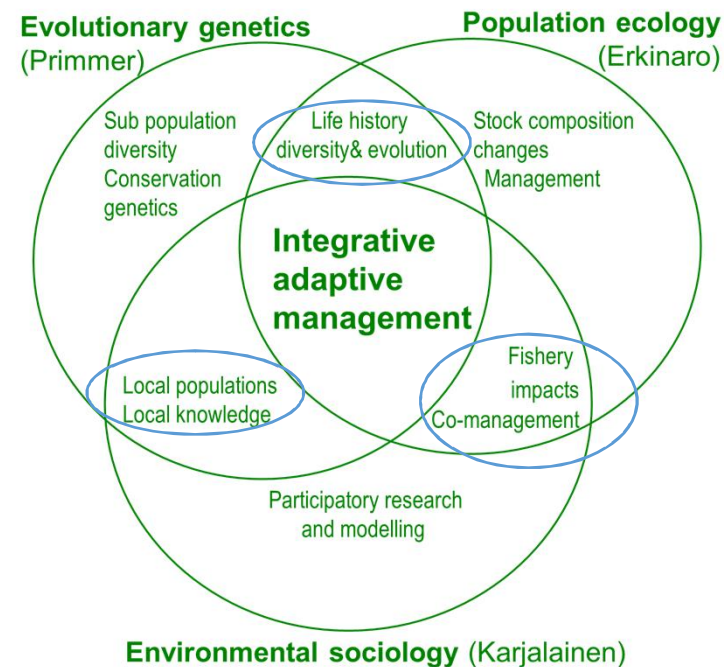
First achievements 4

- Interviews with 34 fishers conducted
 - 29 men, 5 women; aged 43-91
 - 31 in Northern Sami language, 5 in Finnish



Coming up

- Participation in annual information day with MMM, Luke & local fishers in Utsjoki (next week)
- Herd of Finnish politicians visiting Utsjoki next month
- Linking of ecological, genetic and social science project components
 - Bayesian model for predicting future abundance



Thanks!



ACADEMY
OF FINLAND

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Photos: Panu Orell, Jaakko
Erkinaro, Eero Niemelä