Agenda Item 9.1
For Information

Council

CNL(12)29

Annual Report
on Actions Taken Under Implementation Plans

EU – Sweden

Annual Report on actions taken under Implementation Plans
for the Calendar Year 2011
EU-Sweden

Section 1: Details of any significant changes to the management outlined in the introduction to the Implementation Plan.

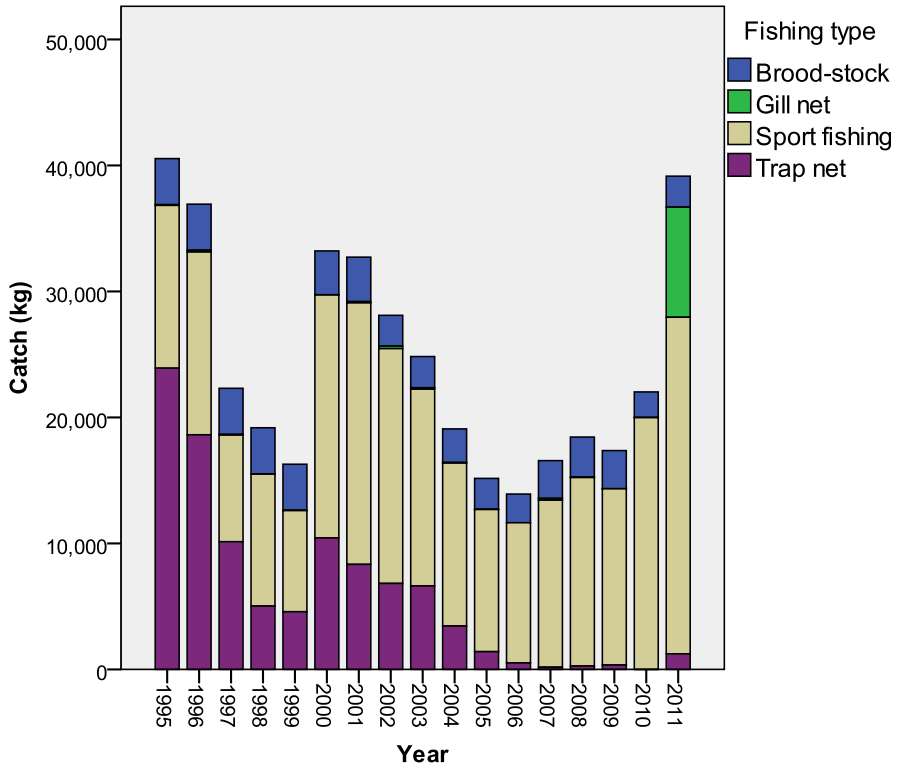
There has not been any significant change to the implementation plan in 2011.

Section 2: A description of any significant changes in the status of stocks and information on catches. The Council has asked that the following information on catches be provided:

- **(a) the provisional catch of salmon in tonnes for 2011;**
- **(b) the confirmed catch of salmon in tonnes for 2010;**
- **(c) an estimate of unreported catch in tonnes for 2011;**
- **(d) the number of salmon caught and released in recreational fisheries in 2011.**

a) The total salmon catch in 2011 was 39.1 tonnes and 8485 individuals (average weight 4.6 kg). This was the highest catch recorded since 1995. 25% of the catch was taken on the coast with gill nets and salmon traps.

There has been an increasing trend in catch from 2006 to 2011, in spite of comparably low recruitment. The average total catch during 1995-2011 was 24.5 tonnes (±2.1 standard error). In numbers the average the period 1995-2011 was 6543 (±697 S.E.).



Total reported catch of Atlantic salmon (kg) in Sweden 2000-2011 divided into different kind of fisheries. Trap nets and gill nets are used in coastal fisheries.

b) The catch of 2010 was 22.015 tonnes and 5175 individuals.

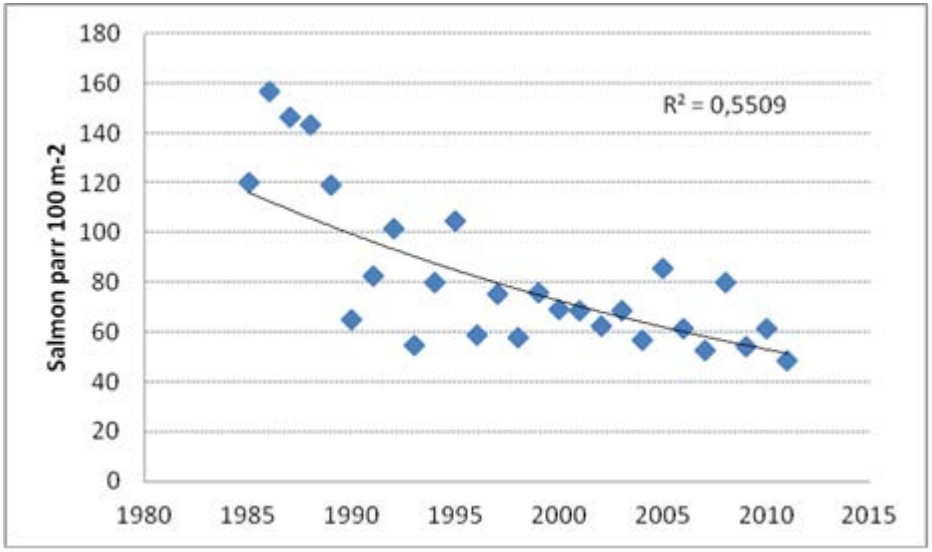
c) The total unreported catch of Atlantic salmon in the year 2011 was estimated to be 4 tonnes or about 10 % of the national catch.

d) 6% of the catch was caught and released. The low proportion due to the fact that 74% of the catch is reared salmon, which is generally not released back. In wild rivers the proportion of C&R may reach 48 % (River Örekilsälven), and even 59% (River Säveån, tributary of River Göta älv).

Section 3: A description of any new factors which may significantly affect the abundance of salmon stocks.

Commercial catches of salmon with gill nets on the coast has been insignificant during 1995-2010.
However, during 2011 a gill net fishery directly targeted at salmon started in the southern part of the Kattegatt with at total catch of 1966 salmon (8.7 tonnes). This has led to a significant increase of Atlantic salmon fishing in Sweden. The catch constitutes 23% of the national catch weight.

Wild salmon parr densities in salmon rivers in western Sweden are still on a historical low level (period 1985 – 2011). During (1985-89) the average parr density was 137 Atlantic salmon parr per 100 m^2, but declined to 59 parr in 2007-2011, a decline of 57%. The decline seems to continue, and national actions are required.



Average wild salmon parr densities of 17 selected salmon rivers (49 sites) on the Swedish west coast in the period 1985-2011. Data from the Swedish Electrofishing RegiSter (SERS) at SLU Aqua, Institute of Freshwater Research.

Due to the spread of the parasite *Gyrodactylus salaris* a monitoring programme was launched 2001 continuing the monitoring programme that started in 1995. At present only nine out of 23 rivers are uninfected but there has not been any new infections since 2005 when river Himleån was infected. The majority of uninfected rivers are in the northern part of the Swedish west coast, i.e. close to Norway.

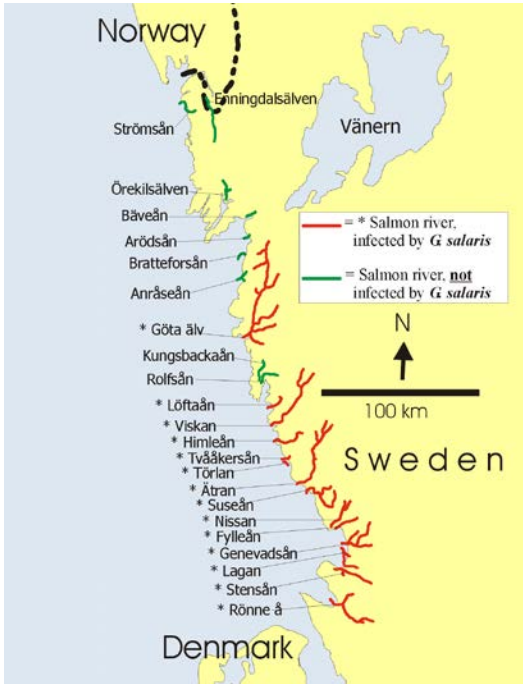
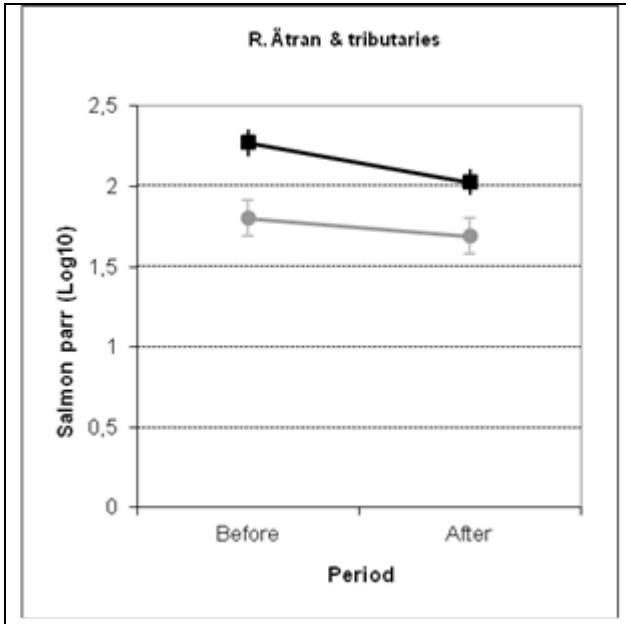
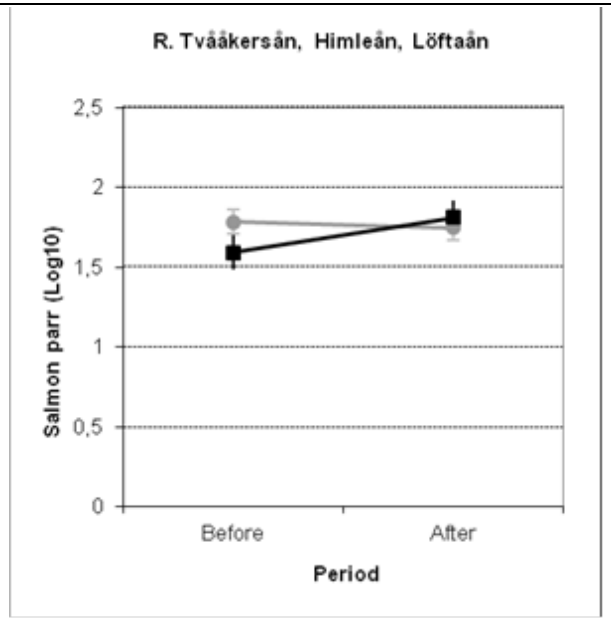


Figure. Map showing the position of Swedish salmon rivers on the west coast. Further, the distribution of the ectoparasite Gyrodactylus salaris is shown.

The Gyro-monitoring programme was evaluated in spring 2011. Preliminary results indicate that although individual parr with many parasites will have impaired growth and eventually die, no effects can be seen at the population level according to our large scale electrofishing surveys (Degerman & Petersson 2012 in preparation). Comparing the parr abundance before infection with *Gyrodactylus* with after and comparing with reference sites in uninfected rivers showed no significant differences. The trend (Pearson r) in parr abundance over time was compared with Meta-analysis between infected rivers and reference rivers. The trend did not differ.





Development of parr abundance 1985-2010 in infected rivers (black) compared to references (gray) before and after the first year of Gyrodactylus in the infected river. River Ätran & tributaries with infection 1991, rivers Tvåkersån, Himleån and Löftaån with infection in 2004.Corresponding comparisons were made for all infected rivers. (From Degerman & Petersson in prep.).

During 2008-2011 the prevalence of Gyrodactylus in infected river has been 45%, as compared to 71% in 2001-2007. The number of parasites per infected fish decreased over time since the first year of infection. Using a so called non-linear regression and transition model (Log Normal cumulative) the model indicated that after 43 years there will be a transition to lower number (<5) of parasites per fish. It is suggested that northern stocks may be more sensitive to Gyrodactylus salaries as they are isolated from southern stocks (and the Baltic) by high saline ocean waters with >30 PSU, as compared to circa 20 PSU in the southern part of the Swedish west coast.

Section 4: An account of all actions taken under the Implementation Plan with regard to the management of salmon fisheries; habitat protection and restoration; aquaculture and related activities; and other influences affecting salmon abundance or diversity (including the marine environment).

Management Action	Reporting Update	Achieved Management Action (Yes, No, Ongoing, Completed)
Fisheries Management		
No new regulations of the fishery have been implemented in 2011.		Completed
In the index river Ätran work has continued to establish the catch efficiency of the smolt trap that has been operating since the middle of 1950s. Tagging of migrating wild salmon smolt has been carried out and an extensive electrofishing programme is running. Monitoring of returning spawners continues in the tributary Högvadsån.		Ongoing
Monitoring of parr populations is undertaken annually in 17 of 23 rivers. It is not one joint programme, but several smaller, all reporting to the national database.		Ongoing
Fish counter established in River Enningsdalsälven.		Completed and adjusted 2011
Fish counter established in R. Nissan.		Completed installation in 2011
Smolt trap operated in River Himleån		Ongoing 2011-2013
In 2011 164,544 reared smolts were released. Of these 73% were 1 one year old (with lower recapture rate). During the period 2000-2010 the average number of		Ongoing

released reared smolt annually has been approximately 170 000.		
Tagging of reared salmon smolts are carried out in Rivers Göta älv, Lagan and Nissan. Releases from 1995-2008 have not shown any trend in recapture rate for River Lagan or River Nissan. The average recapture rate for reared 2yr old smolt was 0.47-0.73%, and for 1 yr old 0.30-0.48%. The number of Carlin-tagged reared smolt has been 3000 annually 2006-2011. In the Index River up to 500 wild salmon smolts are Carlin-tagged each year. The recapture rate has been 1.7%.		Ongoing
Habitat Protection and Restoration		
Liming of 18 of 23 rivers. It is estimated that 50% of the smolt production would be lost without liming.		Ongoing since 1976
River restoration in R. Smedjeån, R. Stensån, R. Kungsbackaån.		Completed during 2011
Improvement of fishway in River Fylleån.		Completed during 2011
Nature reserve established in the mid-reach of River Rönne å (Herervadskloster).		Completed during 2011
Elimination of the lower-most power plant in River Ätran at Falkenberg.		Ongoing 2009-2014
Three new fishways under planning in R. Rolfsån.		Ongoing 2009-2014
Fish counter established in R. Enningdalsälven.		Completed and adjusted 2011
Fish counter established in R. Nissan.		Completed installation in 2011, not tested.

Aquaculture and related activities		
Gyrodactylus salaris monitoring, All non-infected rivers and selected infected rivers are screened annually.		Ongoing since 2001
Other influences affecting salmon abundance or diversity (including marine environment)		
A genetic study was carried out in 2011 in River Göta älv and tributaries to evaluate effect of annual releases of farmed salmon on wild stocks.		Completed
A genetic study was started in 2011 in River Rönne å and tributaries to evaluate effect of annual releases of farmed salmon on wild stocks.		Ongoing 2011-2012

Section 5: Details of any proposed revisions to the Implementation Plan.

Revision of the Implementation plan will be ongoing 2012. Urgent items are:

The increase of mixed-stock fishery on the coast in 2011 has to be addressed. The proportion of wild fish in the catch is unknown as is the proportion of reared to wild fish. As wild stocks continue to decline any increases of fishing on these stocks must be avoided.

There is also a mixed stock fishery in three rivers (Göta älv, Nissan and Lagan) where wild fish is caught along with reared (fin clipped) fish in sport fishing. A ban on landing wild fish or a bag limit in these rivers is needed. The bad status of wild stocks in the tributaries of Göta älv and Nissan was pointed out by HELCOM (see below).

HELCOM report Salar (Salmon and sea trout populations and rivers in the Baltic sea, Helcom 2011) stated that several stocks on the Swedish west coast (Kattegat) was below 50% of potential smolt production and required urgent action.

Catch statistics from sport fishing is only voluntary, and often catch & release, proportion of wild fish and sex of fish is not reported.

Gill net fishing is allowed due to immemorial usage in one river (River Rolfsån). No catch statistics are available, and the effect on the stock cannot be evaluated.

No conservation limits for salmon have been adopted due to lack of reliable data on spawners in the index river. The catch efficiency of the spawner trap is not evaluated.

The programme for monitoring of parr in rivers is declining since funding is lacking from some sources in the future. The monitoring programme has to be established at a required national level for long time ahead as it is the major source of stock monitoring of salmon (see figure on parr abundance above).

As the database of fish tagging is owned and run by private companies (hydropower companies) it is difficult to quality assure data for international work. The quality of the data handling and processing needs to be addressed.