Agenda item 6.3
For information

Council

CNL(17)21

Annual Progress Report
on Actions Taken Under the Implementation Plan for the Calendar Year 2016

EU - Sweden

CNL(17)21

Annual Progress Report on Actions taken under the Implementation Plan for the Calendar Year 2016

The primary purposes of the Annual Progress Reports are to provide details of:

- any changes to the management regime for salmon and consequent changes to the Implementation Plan;
- actions that have been taken under the Implementation Plan in the previous year;
- significant changes to the status of stocks, and a report on catches; and
- actions taken in accordance with the provisions of the Convention

These reports will be reviewed by the Council. Please complete this form and return it to the Secretariat **no later than 24 March 2017**.

Party:	**European Union**
Jurisdiction/Region:	**Sweden**

1: Changes to the Implementation Plan

1.1 Describe any proposed revisions to the Implementation Plan
(*Where changes are proposed, the revised Implementation Plans should be submitted to the Secretariat by 1 December).*

No changes. The Swedish Government ordered 2015 from the responsible national authority an investigation for a national plan for the future conservation and management of salmon and sea-running brown trout for both stocks in the Baltic sea and the Atlantic. The plan was delivered in late 2015 but has not yet resulted in any changes in the implementation plan.

1.2 Describe any major new initiatives or achievements for salmon conservation and management that you wish to highlight.

A ban has 2014 been imposed on gill-net fishing for salmon at the coast at water depths >3m. Implementing actions as information and control has been done in 2015. Thereby mixed stock fishing on the coast is avoided.

2: Stock status and catches.

2.1 Provide a description of any new factors which may significantly affect the abundance of salmon stocks and, if there has been any significant change in stock status since the development of the Implementation Plan, provide a brief (200 word max) summary of these changes.

The lowered recruitment of salmon (parr abundance) from 1985 – 2008 was in spite of substantially reduced marine fishing, and in spite of extensive and successful liming

programmes, river bed restorations and establishment of new and improved fish ways. Without these management and restoration efforts the salmon stocks would have been much smaller.
The stocks have improved since 2011. The spawning run in 2011 was strong and the number of fry and parr in the rivers has increased considerably**.** The electrofishing monitoring has shown an increase of fry (0+) and parr (>0+) the years 2012-2016.

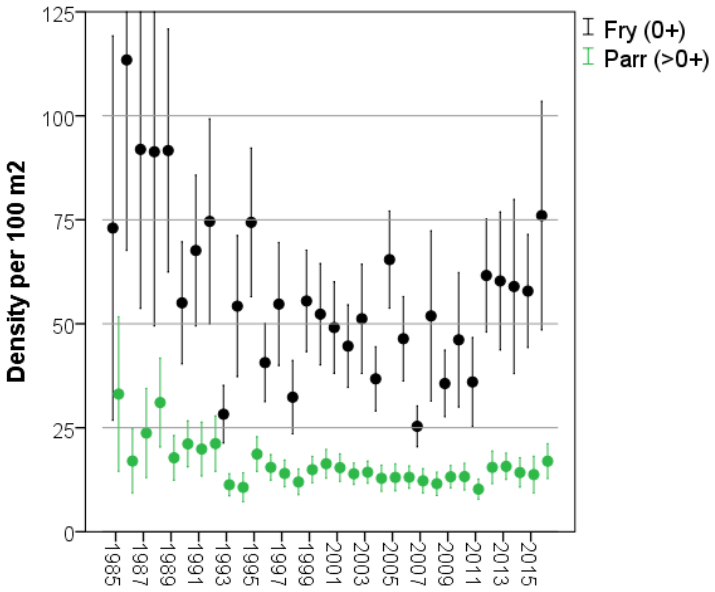


Figure. Mean salmon fry and parr abundance (no. per 100 m^2) of 22 selected salmon rivers (105 sites, 2381 fishing occasions) on the Swedish west coast in the period 1985-2016. Trend line is Loess regression. Data from the Swedish Electrofishing RegiSter (SERS).

In 2013 and 2016 there were again a weak spawning runs due to impaired sea survival. We use Fulton condition factor as a proxy for sea growth and survival. This factor alone accounts for 71% of the variation in the spawning run in the index river in 2000-2016.

2.2 Provide the following information on catches:*(nominal catch equals reported quantity of salmon caught and retained in tonnes 'round fresh weight' (i.e. weight of whole, ungutted, unfrozen fish) or 'round fresh weight equivalent').*

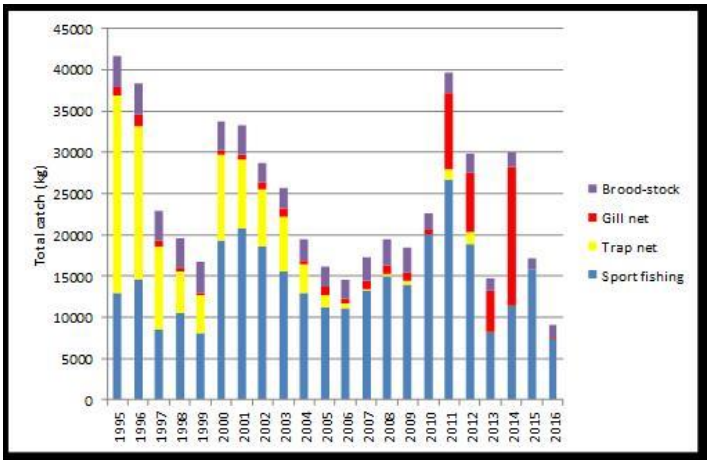
	In-river	Estuarine	Coastal	Total
(a) provisional nominal catch (which may be subject to revision) for 2016 (tonnes)	9.03	0	0	9.03
(b) confirmed nominal catch of salmon for 2015 (tonnes)	17.688	0	0	17.688
(c) estimated unreported catch for 2016 (tonnes)	0.5	0	0.5	1
(d) number and percentage of salmon caught and released in	18%, C&R Catch and release (C&R) is generally only carried out when angling in rivers with wild salmon (with adipose fin), whereas people fishing in			

recreational fisheries in 2016.	rivers with reared salmon generally do not release caught fish back. C&R is voluntary and there is no total statistics of the magnitude. Although a thorough statistics is lacking, the C&R proportion evidently increases over time.

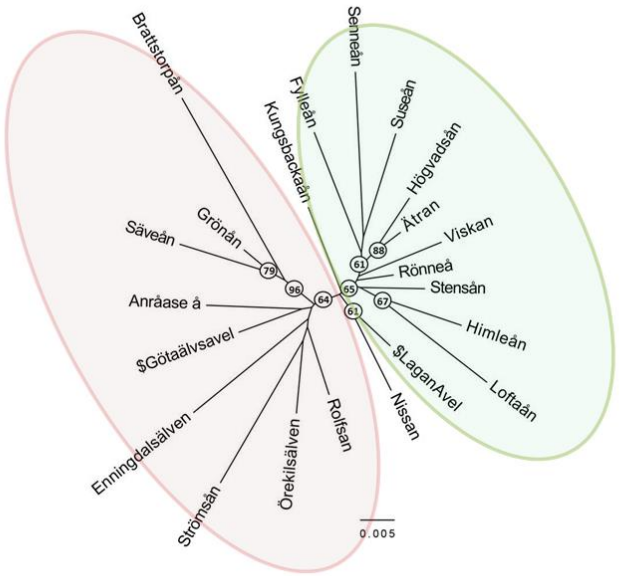
3: Implementation Plan Actions.

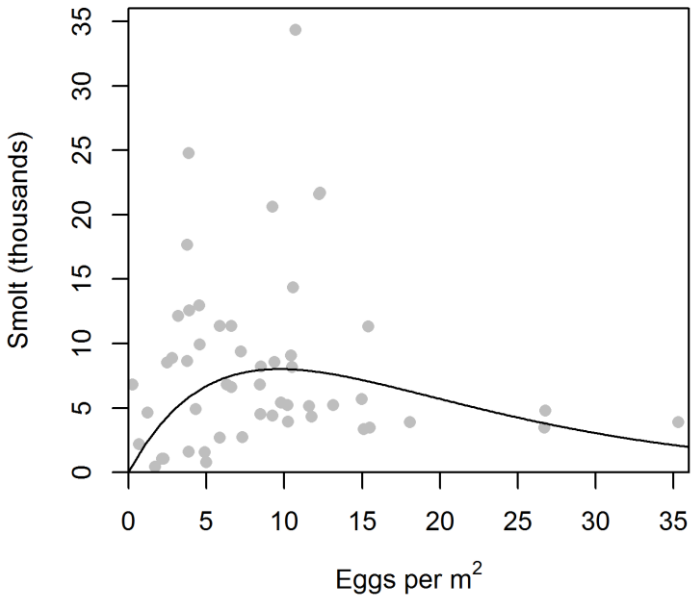
3.1 Provide an update on progress against actions relating to the Management of Salmon Fisheries (Section 2.8 of the Implementation Plan).

Note: *The reports under 'Progress on Action to Date' should provide a brief overview with a quantitative measure of progress made. While referring to additional material (e.g. via links to websites) may assist those seeking more detailed information, this will not be evaluated by the Review Group.*

Action F1:	Description of Action (*as submitted in the IP*)	Implementing new fishing rules to lessen exploitation of wild salmon in rivers with low status.
	Expected Outcome (*as submitted in the IP*)	Increased stocks through lessened exploitation.
	Progress on Action to Date *(Provide a brief overview with a quantitative measure of progress. Other material (e.g. website links) will not be evaluated.)*	Commercial fishing for salmon on the coast was insignificant in 2015-2016. The figure below show catches (harvest) 1995-2016 for the Swedish west coast. Gillnet (red) and trap net (yellow) were former commercial mixed-stock fisheries on the coast.  Further, the C&R in rivers has increased to 18% and in individual rivers maximum legal size is imposed. There is a bag limit of two salmonid fish in sport fishing on the coast. The fishing mortality for salmon was estimated to be very low in this fishery even before the bag limit was introduced. It is estimated that the bag limit will result in nearly none fishing mortality for salmon in sport fishing in the sea. Sea-trout is the target species for salmonid fishing on the coast.

	Current Status of Action	Ongoing
	If 'Completed', has the Action achieved its objective?	
Action F2:	Description of Action (*as submitted in the IP*)	Phasing out mixed-stock fisheries on wild salmon in reared rivers, and mixed-stock fisheries on the coast.
	Expected Outcome (*as submitted in the IP*)	Increased stocks through lessened exploitation.
	Progress on Action to Date *(Provide a brief overview with a quantitative measure of progress. Other material (e.g. website links) will not be evaluated.)*	New legislation with ban on using gill nets for salmon fishing was implemented in 2014 (depth >3 m). There is no information on illegal mixed-stock fishery in the sea during 2015 and 2016 (see action F1). Mixed stock fisheries on the coast are today trifling, occasional catch of salmon in gillnets by non-commercial fishermen (see action F1). However, there is still mixed stock fishery in the two major rivers (River Lagan and Göta älv) with releases of reared salmon in the main watercourse and natural smolt production in tributaries. The proportion of wild salmon caught as by-catch is estimated at 2% in River Lagan and 25% in River Göta älv.
	Current Status of Action	Ongoing
	If 'Completed', has the Action achieved its objective?	
Action F3:	Description of Action (*as submitted in the IP*)	Fin-clipping of reared salmon and trout, annually ca 180,000.
	Expected Outcome (*as submitted in the IP*)	Allows for reared and wild salmon to be distinguished.
	Progress on Action to Date *(Provide a brief overview with a quantitative measure of progress. Other material (e.g. website links) will not be evaluated.)*	Successfully implemented since 2005. During the period 2000-2016 the average number of released reared salmon smolt annually has been approximately 170,000.
	Current Status of Action	Ongoing
	If 'Completed', has the Action achieved its objective?	
Action F4:	Description of Action (*as submitted in the IP*)	Genetic base line of salmon stocks.
	Expected Outcome (*as submitted in the IP*)	Stocks in mixed-stock fisheries identified. International exchange of data possible.
	Progress on Action to Date *(Provide a brief overview with a quantitative measure of progress. Other material (e.g. website links) will not be evaluated.)*	The genetic base line is completed and a report will be published in late 2017. Data from 18 of 23 stocks have been compiled. Below is a preliminary analysis for a genetic baseline from the most southern river (right) to the most northern river (left). From the results it has been suggested to divide the Swedish stock complex into two management units.

		
	Current Status of Action	Completed
	If 'Completed', has the Action achieved its objective?	Yes
Action F5:	Description of Action (*as submitted in the IP*)	Running monitoring in index river (smolt & spawner census, tagging of smolt, electrofishing).
	Expected Outcome (*as submitted in the IP*)	Stock-recruitment data, sea survival, run-timing, diversity of stock, age at smolting, age in the sea.
	Progress on Action to Date *(Provide a brief overview with a quantitative measure of progress. Other material (e.g. website links) will not be evaluated.)*	The efficiency of the traps in the index River Ätran have been evaluated and the results have been used to establish Biological reference points as requested by NASCO. Otherwise the index river monitoring is progressing as planned.
	Current Status of Action	Ongoing
	If 'Completed', has the Action achieved its objective?	
Action F6:	Description of Action (*as submitted in the IP*)	Establishing Conservation Limits & Management Targets from index river data and habitat surveys.
	Expected Outcome (*as submitted in the IP*)	Individual river assessment facilitates management and advice.
	Progress on Action to Date *(Provide a brief overview with a quantitative measure of progress. Other material (e.g. website links) will not be evaluated.)*	We will present at the WGNAS meeting 29 march-7 April 2017 the Conservation Limit and Management Target suggested for the index river and how to transport these data to other rivers. The CL is 4.5 eggs per m^2 of suitable habitat and the spawning target 9.7 eggs. The Ricker stock-recruitment function is presented below.

		
	Current Status of Action	Ongoing
	If 'Completed', has the Action achieved its objective?	
Action F7:	Description of Action (*as submitted in the IP*)	Establishing in-river exploitation levels, through tagging/returns & catch and effort statistics in two rivers.
	Expected Outcome (*as submitted in the IP*)	Aiding MTs, and also required for International assessment through ICES
	Progress on Action to Date *(Provide a brief overview with a quantitative measure of progress. Other material (e.g. website links) will not be evaluated.)*	Data on in-river exploitation has successfully been gathered for the index river for 1985-2016. Compare F6 regarding new information on trap efficiency and BRP's. As for other rivers it is difficult to obtain data on fishing effort as reporting is not required according to Swedish legislation.
	Current Status of Action	Ongoing
	If 'Completed', has the Action achieved its objective?	
Action F8:	Description of Action (*as submitted in the IP*)	Improving catch statistics (C&R, effort)
	Expected Outcome (*as submitted in the IP*)	Aiding MTs, and also required for International assessment through ICES.
	Progress on Action to Date *(Provide a brief overview with a quantitative measure of progress. Other material (e.g.*	According to Swedish law the national authority cannot force non-commercial fishermen to report catches. There is a successive work with information

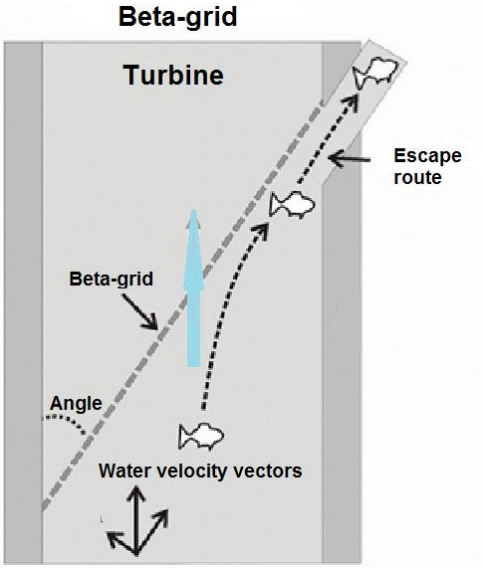
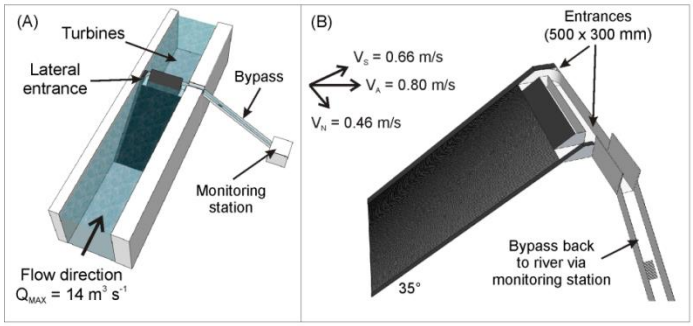
	website links) will not be evaluated.)	to persuade non-commercial fishermen to provide catch statistics of good quality. For commercial fishermen this is compulsory. Still unreported catches are expected to make up a maximum of 10% of the total catch, but the actual number is probably lower. This unreported catch is mainly due to gillnet fishing on the coast by non-commercial fishermen. By establishing large fishing protected areas, closed season (gillnet fishing is only allowed May to September), minimum size of fish landed, restrictions on mesh size used the fishing effort is restricted. In 2017 a new project will be launched at increasing reporting and quality of non-commercial data.
	Current Status of Action	Ongoing
	If 'Completed', has the Action achieved its objective?	
Action F9:	Description of Action (*as submitted in the IP*)	Reducing over-exploitation of MSW in rivers through restrictions on landing large fish. (Compare F1.)
	Expected Outcome (*as submitted in the IP*)	Increased egg deposition. Action aimed at weak stocks or where catches are unreported/uncertain.
	Progress on Action to Date *(Provide a brief overview with a quantitative measure of progress. Other material (e.g. website links) will not be evaluated.)*	There has been no national action here, but individual actions undertaken by the anglers in certain rivers as a result of information exchange. In River Örekilsälven the fishing season is commenced one and a half month later than usual to avoid fishing on spent salmon and large MSW that ascends early. Other voluntary restrictions beyond the national legislation are implemented in other rivers. During autumn 2015 a report was published on the effect of introducing maximum lengths or/and no catch of females on egg deposition in Swedish rivers. "Spjut, D. & E. Degerman, 2015. Effekter av fångstbegränsningar på spöfiskad lax (Effects of catch restrictions in river fishery on stocks). SLU Aqua report 2015:19, 29 p".
	Current Status of Action	Ongoing
	If 'Completed', has the Action achieved its objective?	
Action F10:	Description of Action (*as submitted in the IP*)	Coordinating and securing monitoring of recruitment (parr) in rivers.
	Expected Outcome (*as submitted in the IP*)	Securing monitoring in at least 17 of 23 rivers, preferably all rivers if feasible.
	Progress on Action to Date	Successively some monitoring sites are abandoned by

	(Provide a brief overview with a quantitative measure of progress. Other material (e.g. website links) will not be evaluated.)	local and regional authorities. In 2017 the national monitoring has been increased with 20 sites to compensate for this.
	Current Status of Action	Ongoing
	If 'Completed', has the Action achieved its objective?	
Action F11:	Description of Action (*as submitted in the IP*)	Initiate and support formation of fish management units in salmon rivers
	Expected Outcome (*as submitted in the IP*)	A more effective decision process involving fishing rights owner regarding decision on CL, regulation of fisheries, data collection, habitat restoration.
	Progress on Action to Date *(Provide a brief overview with a quantitative measure of progress. Other material (e.g. website links) will not be evaluated.)*	Fish management units are already formed in many of the rivers. An inventory was made in 2015 by the need to form additional fish management units. The inventory showed that there was a need for management units in a few smaller rivers and in some parts of the larger rivers, mainly in the county of Halland. Information exchange and discussions with the different river managers and land owners are ongoing. In rivers where the fishing right owners are not united in river management units it is more laborious to take and keep contact and decide on voluntary regulation of the fisheries. However, the catch of salmon is generally very low in rivers where management units are missing.
	Current Status of Action	Ongoing
	If 'Completed', has the Action achieved its objective?	

3.2 Provide an update on progress against actions relating to Habitat Protection and Restoration (Section 3.4 of the Implementation Plan). ***Note:*** *The reports under 'Progress on Action to Date' should provide a brief overview with a quantitative measure of progress made. While referring to additional material (e.g. via links to websites) may assist those seeking more detailed information, this will not be evaluated by the Review Group.*		
Action H1:	Description of Action (*as submitted in the IP*)	Continued liming of acidified salmon rivers and tributaries
	Expected Outcome (*as submitted in the IP*)	Increased pH, lowered toxic aluminium. Increased juvenile survival, increased biodiversity.
	Progress on Action to Date *(Provide a brief overview with a quantitative measure of progress. Other material (e.g. website links) will not be evaluated.)*	All salmon rivers and their tributaries with salmon that require liming are present included in a liming program. Of the 23 rivers 20 (91%) are limed, some only in tributaries above the salmon habitat. The effect is monitored with samples of water chemistry, benthic invertebrates and electrofishing. The results are

		evaluated annually by the County boards and reported to the Swedish Agency for Marine and Water Management. Generally the goal of keeping pH above 6 and the levels of labile aluminium at non-toxic levels are reached. Certain years a few of the salmon reaches may face short periods during spring thaw with lowered pH (5.5-6).The exact extent of such periods is not summarized but it is insignificant for the salmon production in every river, and the liming programs are successively adapted. A recent (2016) internationally published evaluation showed that the frequency of acid episodes has declined exponentially in limed rivers, as a consequence of successive adjusted of lime doses and strategies. As a consequence the ecological status of the fish fauna has reached that of fish in neutral reference rivers. (Holmgren, K., E. Degerman, E. Petersson & B. Bergquist. 2016. Long term trends of fish after liming of Swedish streams and lakes. Atmospheric Environment 146: 245-251)
	Current Status of Action	On going
	If Completed, has the Action achieved its objective?	
Action H2:	Description of Action (*as submitted in the IP*)	Habitat surveys compiled, quality assured and new data added if required.
	Expected Outcome (*as submitted in the IP*)	Quality controlled data on salmon habitat and quality compiled in a database.
	Progress on Action to Date *(Provide a brief overview with a quantitative measure of progress. Other material (e.g. website links) will not be evaluated.)*	A report has been compiled. It shows that there is 311 hectares of spawning and rearing habitat of salmon on the Swedish west coast today. This means that the available habitat has increased with 16% since 1999. This is mainly due to new fishways, liming operations and habitat improvement. From these data and the results from the index river the present total smolt production has been predicted to be 110 000 smolt annually.
	Current Status of Action	Completed
	If Completed, has the Action achieved its objective?	The objective is achieved, and is an important part of setting CL.
Action H3:	Description of Action (*as submitted in the IP*)	Plan for continued habitat restoration in salmon rivers. (Also including H2 & H4)
	Expected Outcome (*as submitted in the IP*)	Plan in 2015, with the cooperation of the County Administrative Boards. Different plans exist.

	Progress on Action to Date *(Provide a brief overview with a quantitative measure of progress. Other material (e.g. website links) will not be evaluated.)*	There has in 2015 started a joint work of the three regional counties and the Swedish University of Agricultural Sciences to coordinate plans. Further, this work will result in an EU Life application aimed at further restoration and a common tool-box for future work.
	Current Status of Action	Ongoing
	If Completed, has the Action achieved its objective?	
Action H4:	Description of Action (*as submitted in the IP*)	Establishing criteria for BAT (best available technology) for hydropower generation.
	Expected Outcome (*as submitted in the IP*)	Plan in 2015. Implemented in all Counties.
	Progress on Action to Date *(Provide a brief overview with a quantitative measure of progress. Other material (e.g. website links) will not be evaluated.)*	This was published in December 2015 at the web site of the Swedish Agency for Marine and water management. The main results have also been presented at NASCO annual meeting 2015 by: Carlstrand, H. & E. Degerman, 2015. Progress in developing best available technology for hydropower generation. NASCO. CNL(15)4, 12 s. **Establishing criteria for Best Available Technology (BAT) in Sweden** Establishing BAT is a joint project of the Swedish Agency for Marine and Water Management, the hydropower industry, County boards and Universities. So far four reports have been published. The project has focused on: • fishways; • technical installations to facilitate environmental flow regulation (not ecoflows as such); and • maintenance and monitoring. *Fishways and upstream migration* The recommendation is that fishways at artificial dams should allow migration for all species and age groups. Nature-like fishways are preferred (e.g. bypass, rocky ramp, fish slope, bypass through the dam). A maximum slope of 5% (extreme 9%) is used unless passage would be difficult for species other than salmon in which case a technical fishway may be installed. For technical fishways, the vertical slot design is preferred over pool and weir and finally Denil. The

		design of technical fishways should also allow weak swimming species to pass. The depth in technical fishways should be at least 1m with a flow of $1m^3/s$ for salmon and large sea trout and depth of 0.5 m and flow of 0.5 m^3/s for smaller sea trout and other species. The attraction flow should be 5% of the flow at the site and the fishway entrance should be in a suitable location. Sluices and elevators are not recommended. *Fishways – downstream migration* Fish larger than 10 cm (smolt) should always be screened away from the turbines. Physical screens are preferred over behavioural techniques (electricity, sound, light, bubbles etc). Beta-screens with an angle of 30° are preferred before alpha-screens and the least preferred solution is other types of screens (e.g. louvre).  ***Figure**. A beta-grid located upstream of the turbine can direct smolts and kelts into the fishway*  ***Figure**. An alpha-grid upstream from the turbine can direct smolts and kelts into the bypass. Note that the screen covers the entire depth and width of the channel.*

		Screens should be installed from the surface all the way to the bottom with 10 - 18 cm spacing between the bars. The flow in the fishway should be at least 2% of the flow at the site. *Technical installations facilitating environmental flow regulation* Automatic regulation of flow at dams is preferred, allowing better monitoring and less pronounced alterations in flow. The outlets from power plants and dams should allow bottom and surface water of different proportions to be used in order to avoid high temperatures and facilitate sediment transport. Safety installations are required to avoid loss of water in the river bed due to technical failures.
	Current Status of Action	Completed
	If Completed, has the Action achieved its objective?	Objective achieved
Action H5:	Description of Action (*as submitted in the IP*)	Establishing criteria and workflow for surveillance of hydropower plants according to Environmental Law & BAT.
	Expected Outcome (*as submitted in the IP*)	Plan in 2015. Implemented in all Counties.
	Progress on Action to Date *(Provide a brief overview with a quantitative measure of progress. Other material (e.g. website links) will not be evaluated.)*	Still not finished. This awaits action from the Swedish Agency for Marine and water management.
	Current Status of Action	Ongoing but delayed
	If Completed, has the Action achieved its objective?	

3.3 Provide an update on progress against actions relating to Aquaculture, Introductions and Transfers and Transgenics (Section 4.8 of the Implementation Plan). ***Note:*** *The reports under 'Progress on Action to Date' should provide a brief overview with a quantitative measure of progress made. While referring to additional material (e.g. via links to websites) may assist those seeking more detailed information, this will not be evaluated by the Review Group.*		
Action A1:	Description of Action (*as submitted in the IP*)	Monitoring of *Gyrodactylus salaris*
	Expected Outcome (*as submitted in the IP*)	Updated information on G. salaris distribution and infection.

	Progress on Action to Date *(Provide a brief overview with a quantitative measure of progress. Other material (e.g. website links) will not be evaluated.)*	The monitoring programme continues as planned, although the programme is now more focussed on the index river and some rivers at risk of infections of Gyrodactylus. During 2015 a new river was infected (River Rolfsån in the county Halland) and this is now monitored intensively. The last river that was infected before that was River Himleån in 2005. The Swedish authorities consider G. salaris to be a great threat to remaining uninfected stocks. Protective measures have been undertaken to avoid spreading the parasite, e.g. ban on stocking salmonid fish in the whole catchment of not infected rivers. A report on the situation was compiled in February 2017 and submitted to the NASCO secretariat. (Degerman, E. & H. Carlstrand, 2017. **Gyrodactylus salaris in Sweden; management and monitoring.)**
	Current Status of Action	Ongoing
	If Completed, has the Action achieved its objective?	
Action A2:	Description of Action (*as submitted in the IP*)	Genetic screening of alien (escaped) salmon. (Compare action F4).
	Expected Outcome (*as submitted in the IP*)	Determination of origin of alien salmon. Based on established base line (action F4).
	Progress on Action to Date *(Provide a brief overview with a quantitative measure of progress. Other material (e.g. website links) will not be evaluated.)*	Awaiting the genetic baseline. Although alien salmon have been gathered and will be evaluated along with the presentation of the baseline during 2017.
	Current Status of Action	Ongoing
	If Completed, has the Action achieved its objective?	

4: Additional information required under the Convention

4.1 Details of any laws, regulations and programmes that have been adopted or repealed since the last notification.

No changes

4.2 Details of any new commitments concerning the adoption or maintenance in force for specified periods of time of conservation, restoration and other management measures.
No changes
4.3 Details of any new actions to prohibit fishing for salmon beyond 12 nautical miles.
No actions
4.4 Details of any new actions to invite the attention of States not Party to the Convention to matters relating to the activities of its vessels which could adversely affect salmon stocks subject to the Convention.
No actions
4.5 Details of any actions taken to implement regulatory measures under Article 13 of the Convention including imposition of adequate penalties for violations.
No actions