

Annex 10.6.

Monitoring of function of spawning sites of within project ReBorN (LIFE15 NAT/SE/000892)

Patrik Olofsson

County Administrative Board of Norrbotten 2020



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Summary

To monitor one of the expected results, that the number of spawning sites (Fig. 1) for Atlantic salmon and brown trout will increase and to ensure that the sites are functional and used by the targeted fish species we have monitored a sample of created spawning sites within the project.

During 2016-2020 we have monitored 152 different spawning areas in 12 different rivers in the Counties of Norrbotten and Västerbotten. Some of the areas have been monitored more than one year and a total of 289 unique monitoring visits have been done. The results show that spawning has occurred on 161 out of 289 (55,7 %) occasions.



*Figure 1. Spawning salmon at a restored spawning area in river Linaälven 2018.
Photo: Mikael Nilsson, Fiskmiljö Nord AB*

Background

One of the objectives in the ReBorN project was to create 2300 spawning sites.

To control their function, a minimum of 30 restored spawning areas will be visited during year 3, 4 and 5 of the project.

This action is necessary to monitor one of the expected results of action C.2., i.e. that the number of spawning sites for Atlantic salmon and brown trout will increase. Although the number of spawning sites restored during the project is known, we need to ensure that the sites are functional and really used by the targeted fish species.

A spawning site (bed) is considered to be around 6 m² in size, based on smaller brooks. In larger rivers huge spawning areas can be created and they can be as large as 2000 m². In order to be able to compare the results from both smaller and larger rivers it is the term area that is mainly used in this report.

Method

By using waders and bathyscope the created/restored spawning areas and sites are visually checked whether they have been used by salmon and/or trout. It is possible to see spawning fish at the sites if they are functional, and it is also possible to see tracks in the gravel from previously spawning fish (spawning pits). The action is done during September and October, which is the spawning time of salmon and trout.

Results

In the County of Norrbotten 82 unique monitoring visits have been conducted in 10 different rivers between 2017 – 2020 (Table 1).

Table 1. Number of spawning areas in the County of Norrbotten where spawning has occurred.

River	2017 (number of used spawning areas)	2018 (number of used spawning areas)	2019 (number of used spawning areas)	2020 (number of used spawning areas)
River Vassaraälven (within project area Kalixälven)	3 of 5	14 of 26	Not monitored	21 of 31
River Linaälven (within project area Kalixälven)	0 of 1	2 of 3	Not monitored	Not monitored
River Stockforsälven (within project area Piteälven)	Not monitored	1 of 3	2 of 3	Not monitored
River Vitbäcken (within project area Piteälven)	Not monitored	Not monitored	1 of 2	Not monitored
River Åbyälven	Not monitored	1 of 2	2 of 2	Not monitored
River Byskeälven	Not monitored	1 of 3	Not monitored	Not monitored
River Långträskälven (within project area Byskeälven)	Not monitored	Not monitored	1 of 2	Not monitored
River Råneälven	Not monitored	Not monitored	2 of 3	Not monitored
River Rutnajoki (within project area Råneälven)	Not monitored	1 of 2	2 of 2	Not monitored
River Solälven (within project area Råneälven)	Not monitored	1 of 2	Not monitored	Not monitored
Total number of monitored spawning areas	6	41	14	21
Total number of confirmed use of spawning areas	3	21	10	31

In the project area Piteälven spawning areas have been monitored at eight occasions and on four of those spawning had occurred.

In the project area Åbyälven spawning areas have been monitored at four occasions and on three of those spawning had occurred.

In the project area Byskeälven spawning areas have been monitored at five occasions and on two of those spawning had occurred.

In the project area Råneälven spawning areas have been monitored at nine occasions and on six of those spawning had occurred.

In the project area Kalixälven spawning areas have been monitored at 62 occasions and on 38 of those spawning had occurred. In river Vassaraälven a more detailed study has been done (Table 2.).

Table 2. Results from monitored spawning areas and spawning sites in River Vassaaälven.

River Vassaraälven	2017	2018	2020
No. of spawning areas	5	26	31
No. of spawning sites	55	175	227
No. of spawning at area	3	14	21
No. of spawning pits	11	30	60
Spawning/area	60,0%	53,8%	67,7%
Spawning/site	20,0%	17,1%	26,4%

During 2020, 31 spawning areas consisting of 227 different spawning sites were visited. There were traces of spawning activity in 21 of the areas and the total number of spawning activities were 60 (different spawning pits). Spawning had occurred on 67,7 % of the areas and on 26,4 % of the different spawning sites.

In the County of Västerbotten 197 unique monitoring visits have been conducted in two different rivers between 2016 – 2020 (Table 3.).

Table 3. Number of spawning sites in the County of Västerbotten where spawning has occurred.

River	2016 (number of used spawning areas)	2017 (number of used spawning areas)	2018 (number of used spawning areas)	2019 (number of used spawning areas)	2020 (number of used spawning areas)
Lögdeälven	6 of 6	1 of 1	11 of 15	17 of 40	5 of 14
Mjösjöån	Not monitored	3 of 3	Not monitored	17 of 59	25 of 59
Total number of monitored spawning areas	6	4	15	99	73
Total number of confirmed use of spawning areas	6	4	11	34	30

In river Lögdeälven spawning areas have been monitored at 76 occasions and on 40 of those spawning had occurred.

In river Mjösjöån spawning areas have been monitored at 161 occasions and on 45 of those spawning had occurred.

In total 152 different spawning areas have been monitored between 2016 – 2020 in the two counties and a total of 289 unique monitoring visits have been done. Traces of spawning activity have been noticed on 161 (55,7 %) occasions.

Discussion

One of the objectives in the ReBorN project was to create 2300 spawning sites (6 m²). By the end of field season 2020 more than 10 000 spawning sites have been created. Smaller areas or single sites are mainly created or restored in small brooks. Larger areas that are made up of many sites are restored in larger rivers like the main channels of the rivers Råne-, Kalix- and Lögdeälven. These spawning areas can be as big as 2000 m² at some places where lots of gravel in the right sizes where found and other conditions where favorable (Fig. 2). The spawning areas are usually located at the top of a rapid (river neck, where calm water pass over into a rapid).



Figure 2. A large spawning area (~ 2000 m²) at Snasko in river Råneälven. It stretches from the river neck and 200 meters upstream. Photo: Andreas Broman, CABN

As seen in Table 2 the number of spawning sites and areas have increased over the years as the project been running. This means that spawning fish in the river get more and larger areas for spawning by every year and hopefully don't have to compete amongst themselves in order to find good spawning beds. The result is also depending on the amount of fish that is spawning each year both stationary fish and anadromous fish that migrates up into the river for spawning each year. More mature fish in the river, the more signs of activity will be noticed.

The monitoring in 2020 was not complete due to a couple of different factors. In the County of Västerbotten there was very high water levels in the autumn when the monitoring was taken place which made the monitoring difficult and only 14 areas where visited in the mainstem of river Lögdeälven, however 59 areas were visited in river Mjösjöån. In the County of Norrbotten it was snow and cold making the monitoring though, although 31 spawning areas in river Vassaraälven was monitored (Fig. 3). No monitoring where conducted in the other rivers in the County of Norrbotten.



Figure 3. Monitoring of spawning area in river Vassaraälven in October 2020.

Photo: Fiskmiljö Nord AB

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