Snowchange Discussion Paper #9
Näätämö River Collaborative Management Project
Work Report May 2014 – September 2015

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1. Introduction

Näätämö watershed territory is 3160 km^2, and it is a cross-border river, flowing from Finland to Norway on the coast of the Barents Sea[1]. On the Norwegian side the basin was diminished 526 square kilometres when the waters of Garsjö, Kjerringsvatn and Förstevannene lakes were diverted towards the Gandvik watershed for hydroelectricity in 1951[2]. This human-induced diversion also diminished the Näätämö river flow on the Finnish side. Indigenous tribes of Eastern Sámi have been harvesting salmon on Näätämö River, at least in documented cases, from 1500s[3]. The current Sámi population of Skolts arrived to the watershed in 1944 from Petsamo region.

Since 2011 the Skolt Sámi, Indigenous peoples of the watershed, with several organisations, and other local people, such as the Kven in Neiden, Norway, have implemented collaborative management steps[4] to increase climate resilience of the basin and secure improvements to the survivability of Atlantic salmon and culture surrounding it. Nordic Council of Ministers and the United Nations University have funded the project since it began, with small breaks in-between. This report documents the co-management activities and other relevant actions and events in the basin from May 2014 to September 2015.

Since April 2014 the Näätämö collaborative management steps have proceeded both locally, and internationally. Observations of river change continued rigorously, while the work expanded to cover possible sites of ecological restoration such as the river Vainosjoki and lake Sevettijärvi sub-catchment areas.

Festival of Northern Fishing Traditions brought Indigenous Siberian and other Sámi delegations to the Näätämö basin to co-learn about the steps taken and to introduce their own solutions to the issues affecting Northern Rivers, cultures and peoples. In Summer 2015 the Näätämö measures were referred to in the high-level Climate Change: Risk Assessment report, commissioned by the UK, China, India and US governments as an independent report. Funding of the activities on the ground continued to be supported by the UN and Nordic Council of Ministers for 2014. In 2015 the funding switched to Sámi organisations, Snowchange Co-op budget, and small-scale new partnerships were initiated with the Nordic IPBES and the Danish-led "Nordic Resource Management"[5], that will continue to partner with the Näätämö project also in 2016.

In the Ponoi watershed large-scale poster exhibits and community workshops were held, including remote wilderness villages of Krasnochelye, Sosnovka and Kanevka throughout the 2014-2015. Kola representatives took active part also in the Festival of Northern Fishing Traditions in September 2014. Those efforts are documented in this report.

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[1] Niemelä et al. 2015: 5
[2] Niemelä et al. 2015: 5
[3] Niemelä et al. 2015: 7
[4] See more at www.snowchange.org
[5] This initiative has the following aims: *(i) Further development and testing of standards for the involvement of citizen knowledge in decision-making about the use of resources, (ii) Strengthened capacity to use citizen knowledge, (iii) Communication of the experience.*

Näätämö Co-management Team at Snowchange Cooperative and in the involved Sámi organisations wishes to thank for the 2014-2015, in no particular order: *Vladimir Feodoroff, Paula Feodoroff, Juha Feodoroff, Veikko Feodoroff, Jouko Moshnikoff, Satu Moshnikoff, Teijo Feodoroff, Toini Sanila, Tiina Sanila-Aikio, Miina Sanila, Natalia Sanila, Tanja Sanila, Kaisu Mustonen, Sergey Zavalko, Virve Sallisalmi, Stefan Mikaelsson, Gleb Raygorodetsky, Anna-Mari Markkola, all of the Khanty / Jugra Delegation to the Festival, the Kola Sámi coordination team, School of Sevettijärvi, School of Selkie, Norm Snow from the Inuvialuit Joint Secretariat, Canada and all others who helped. All photos Skolt Sámi Visual-Optic Archives & Snowchange unless otherwise stated.*

Global flows of inspiration are interpreted by a new generation of young Skolt Sámi artists. Monami Frost, a tattoo artist, as seen by Elina Moshnikoff.

2. Weather Observations 2014-2015

During this component of the co-management project, Sámi registered weather changes and observations, especially new events, in diaries and on forms, tested in partnership with the Nordic Resource Management Project from Denmark for the 2015 season.

2.1. Season 2014

An Elder in her 70s records the weather in Sevettijärvi region daily. She observes also the changes in birds and unexpected events[6]. Some of the key documentation from May to December 2014 included:

- Early May was unusually cold until 15th, but ice breakup at the deep pool of Nilijoki was on time, on the 16th.
- Leafs sprouted 31st May. In Early June some over 25 degree days were reported. It snowed on the 16th June 2014.
- During mid-summer weather remained cold, rain, and sleet fell with strong winds. Early July continued in cold weather from the northeast. Finally between 6th and 13th, July the warm summer weather arrived, with temperatures soaring up to 28 degrees. Another warm spell was experienced in 18th to 27th, July, with highs of 29 degrees.
- August began warm, and it lasted until the 10th, after which the weather cooled. In early September strong winds prevailed. First frosts arrived in late September.
- 10th October is a marker day for the Elder, as she begins to winter feed the birds at this time. First snow appeared on the 13th, October and the deep pond froze 20th October. Temperatures plunged down to -8 C in late October.
- November zigzagged, from 0 to -20 C all the time. Mid-month blizzards arrived with low pressures and rest of the month was mild frosts, at -5C.
- December 2014 was mild with snowstorms, 12th December it was so warm the snow started to fall to the ground from roof. Then at Christmas cold spells arrived with temperatures down to -25 and -28C. 29th December the temperature rose 18 degrees from -28C to -10 in ten hours, a rapid shift[7].

Elsewhere in the region, one of the most dramatic, and potentially devastating events took place on 4th November 2014. An oil tanker M/T Triathlon[8] was anchored on the Bøkfjord[9], close to the delta of river Näätämö[10]. Due to strong winds in a storm, reaching up to 35 m/s, the anchor of the ship failed, and sent the vessel adrift in the fjord. What is relevant is that within the space of 30 minutes the winds shifted from a documented 17 m/s to 35 m/s per second and the anchor failed[11].

[6] Snowchange Sevettijärvi Oral History 250715a
[7] Snowchange Sevettijärvi Oral History 140915a
[8] 270 meters long tanker with 70,000 tons of Russian crude oil.
[9] The salmon travelling to the river Näätämö pass this fjord on their annual migration. It is categorized as a 'national salmon fjord' in Norway.
[10] YLE 240215
[11] YLE 240215

The ship was approximately 400 meters away from the shore cliffs before it was brought under control by the towing ships. The event was categorized as a "High Risk Near Miss" according to industry reports[12].

2.2. Season 2015

In 2015 the Elder in Sevettijärvi reported that the spring and summer have been very rainy and windy, unusually so. Only one day has emerged above 25 degrees in this season by end of July. Prominent winds from the N and NW have brought the cold spells into the area according to her. These winds also may have a role to play in the lake Sevettijärvi bank erosion[13] (see below). It is always cloudy, a '*bit like a nuclear winter*.'[14] Oven has to be heated even during summer, which is unusual. In general the weather type has destabilized according to her.

Ice breakup has been stable in the lakes, around 10th May inland both for 2014-2015. In terms of arrival of migratory birds, the some of the more prominent observations can be seen for spring 2015:

- Wagtail[15] arrived on time
- European pied flycatcher[16] also was on time as usual
- Common merganser[17] arrived early in 2015, already on the 24th April, when it usually comes to Sevettijärvi around 7th May
- Tringa[18], the waders, arrived 9th May
- Coal tit[19] was a new arrival to the area in New Year
- Pine crossbeak[20] arrived already in February to the feeding areas, when it usually arrives in mid-March[21]

A Skolt Sámi reindeer herder and fisherman in his 60s observed in mid-July that water levels decreased from 9th July 2015, which marked the highest water point of the season[22]. Northern pike harvest had been very hard in the spring due to high levels of water and strong water flow[23].

An observation that he had made with another experienced Skolt fisherman was that along the deep ponds of the main Näätämö River, there had been '*yellow roe*'[24], which the fishermen took to indicate that parts of the salmon spawning had failed in autumn 2014-Spring 2015.

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[12] YLE 240215
[13] Snowchange Sevettijärvi Oral History 250715a
[14] Snowchange Sevettijärvi Oral History 250715a
[15] *Motacilla alba* in Latin
[16] *Ficedula hypoleuca* in Latin
[17] *Mergus merganser* in Latin
[18] *Tringa* in Latin
[19] *Parus ater* in Latin
[20] *Pinicola enucleator* in Latin
[21] Snowchange Sevettijärvi Oral History 250715a
[22] Snowchange Sevettijärvi Oral History 240715
[23] Snowchange Sevettijärvi Oral History 240715
[24] Snowchange Sevettijärvi Oral History 240715, Snowchange Sevettijärvi Oral History 250715c

This was possibly due to full-freeze of the river so that no water remained and the shallow spots froze all the way to the bottom, thus preventing the healthy development of eggs.

Arrival of salmon was late in summer 2015 due to the cold weather. Graylings, which usually are driven away from the deep ponds by salmon males prior to spawning, could be found still in mid- to late –July in the ponds[25]. Winds have been very strong the whole season and they do not stop even for the evenings[26]. Leaves appeared on trees prior to the grass on the ground[27].

New priorities of ecological restoration emerged also during the summer 2015 oral history documentation[28]. Two respected Skolt fishermen in their 60s indicated that in the 1960s and early 1970s the state agencies had conducted explosions to affect water flow in two new sites:

- Rapids of Opukasköngäs in early 1970s
- Rapids of Kolttaköngäs in late 1960s[29]

These directions will be explored in the coming years when the restoration of the watershed sites proceeds.

[25] Snowchange Sevettijärvi Oral History 240715, 250715c
[26] Snowchange Sevettijärvi Oral History 240715
[27] Snowchange Sevettijärvi Oral History 250715c
[28] Snowchange Sevettijärvi Oral History 240715
[29] Snowchange Sevettijärvi Oral History 250715c gives the 1969-1971 to be the years when these events took place

3. Responses and International Steps 2014-2015

2015 began with a celebration of the first five-year of the co-management project in Näätämö, including the preparatory year 2010-2011. This was done by organising a poster exhibition[30] during the Indigenous Film Festival 'Skabmagovat' in Inari, Finland. Later the posters travelled to Sevettijärvi to be permanently exhibited at the school. The exhibit was dedicated to the late Leif Rantala, a great scholar of Eastern Sámi peoples, who passed away suddenly in late 2014.

In early March 2015 a delegation from the Indigenous peoples of Tanzania, the Maasai arrived in Sámi areas for cooperation talks. Snowchange and the Näätämö team worked with the Africans to discuss possible cooperation directions. A key theme emerging from the three- day meeting was the possibility to export and utilize the land use documentation as a model to improve the situation the Maasai are facing in their homelands, including climate resilience. The event was co-sponsored by the United Nations Association of Finland.

In Spring 2015 the Eastern Sámi Atlas[31], which compiled land use, ecological and climate issues from the Skolt and other Eastern Sámi territories into a monograph form, was awarded in the USA. The International Association for Borderland Studies gave the book the 'GOLD ABS Past Presidents Prize' for the best book of the year[32]:

"The Eastern Sami Atlas was selected as the gold award winner because it was a unique and rich study of Sami culture and history in a cross-border context. The book is based on an extensive project to resurrect, document, compile and express the Sami experience, not only as an indigenous culture but one that crosses borders and is enriched by this process. This book is exemplary of the deep ethnography, geographical analysis, and synthesis that is possible and indeed necessary to comprehend how borders and culture touch and combine in our globalizing world, and how the border experience may be documented and explored. The Eastern Sami Atlas is an achievement in border publication and a model for other extensive projects to document and comprehend the meeting of borders and cultures."

This unexpected honour raised the Skolt efforts to revitalize culture and seek steps to address climate issues back into media highlight for a moment in Finland.

In July 2015 the governments of India, the UK, USA and China worked with Snowchange and other experts to release the influential "Climate Change: Risk Assessment". This report documents the various risks facing global society, if not urgent action is taken on climate change. The Näätämö steps were referred to in the Arctic chapter as an action the Skolts are taking. The report also referred to the Kola Sámi, saying, "their traditional calendar is off-balance"[33]. In 2015 the Näätämö co-management project and associated actions were

[30] Posters available at http://www.csap.cam.ac.uk/projects/climate-change-risk-assessment/
[31] Mustonen and Mustonen 2011
[32] http://www.snowchange.org/2015/05/eastern-sami-atlas-wins-a-major-international-prize/
[33] http://www.csap.cam.ac.uk/projects/climate-change-risk-assessment/

featured several times in national[34] and regional media in addition to international media coverage[35], this was true especially in the context of the Climate Risk Report.

[34] YLE 2015a, 2015b
[35] http://ourworld.unu.edu/en/fishers-of-eurasian-arctic-come-together-in-a-time-of-war

4. Predator Fish Harvest and Living Maps Project

The predatory fish harvest was conducted from April 2014 to September 2015 focusing on:

- burbot along the sub catchment areas of river Silisjoki
- northern pike along the lake Opukasjärvi and river Silisjoki

These harvests constitute crucial co-management steps as the cultural harvests of northern pike and burbot, both of which are affecting smolt survival and salmon spawning results, went down over the past decades. Three Skolt Sámi fishermen in 2014 and two Skolt Sámi in 2015 conducted the harvests. However, especially the northern pike harvests in Spring 2015 suffered from very high water levels and resulting strong flow, which prevented the use of nets in some parts of the catchment area[36].

Since 2014 the co-management organisations have been developing 'living maps' of Sámi water and land occupancy, cultural materials and environmental observations. The work has proceeded and expanded into a dialogue with the US-based National Snow and Ice Data Center, and the ELOKA Project[37].

The project staff has mapped Land use of the Eastern Sámi actively since 2007[38]. In the current frame the Sámi themselves have produced cultural materials and careful, hand drawn maps of their home region to be digitalized. Three maps from the Skolt area form a test of layering method with the ELOKA Project. This aspect of the co-management work is expected to expand 2015-2016, as the draft maps become more available and into use.

[36] Snowchange Sevettijärvi Oral History 240715
[37] www.eloka-arctic.org
[38] Summarized in Mustonen and Mustonen (2011), Eastern Sámi Atlas

5. Restoring Past Damages – River Vainosjoki

One of the most concrete steps in the 2014-2015 period has been the review of the ecological situation on river Vainosjoki, the sub-catchment area of Näätämö. Concrete attempts to restore the stream ecology were taken after two years of preparatory work. In 1968-69 state forestry enterprise Metsähallitus dredged the Vainosjoki together with Kuoshnijoki River to improve salmon access upstream[39]. According to historical catch diaries some salmon was caught upstream at lake Räkkijärvi[40].

In September 2013[41] the stream situation was reviewed with local Skolt Sámi and international experts during extreme low water period. Starting in January 2015 discussions proceeded with the regional Center for Commerce, Transport and the Environment on seeking funds to restore the Vainosjoki catchment area. In early March 2015 meetings were held in Rovaniemi with the representatives of the Center. Afterwards a work plan was initiated in Keväjärvi and Sevettijärvi on a two-step restoration activity:

A. Restoring of lost spawning gravel areas on the three small ponds towards the lower river Vainosjoki in Spring 2015: Gravel would be transported from local bank site and applied with care by hand by the local Skolt Sámi herders and fishermen
B. A full restoration project would be initiated in cooperation with the Center, Metsähallitus, municipality of Inari and the co-management team in 2015-2016: Parties agreed that the sub-catchment area needs urgent attention and full-scale restoration measures to improve the ecological status of the river.

The funding application for Plan A was submitted to the state authorities in March. Response is expected towards November, the latest. Meanwhile the stream situation was explored in July 2015 during high water for ecological indications.

[39] Niemelä et al. 2015: 27
[40] Niemelä et al. 2015: 27
[41] Mustonen and Feodoroff 2014

6. Review of the Three Small Ponds on the Lower Vainosjoki, July 2015

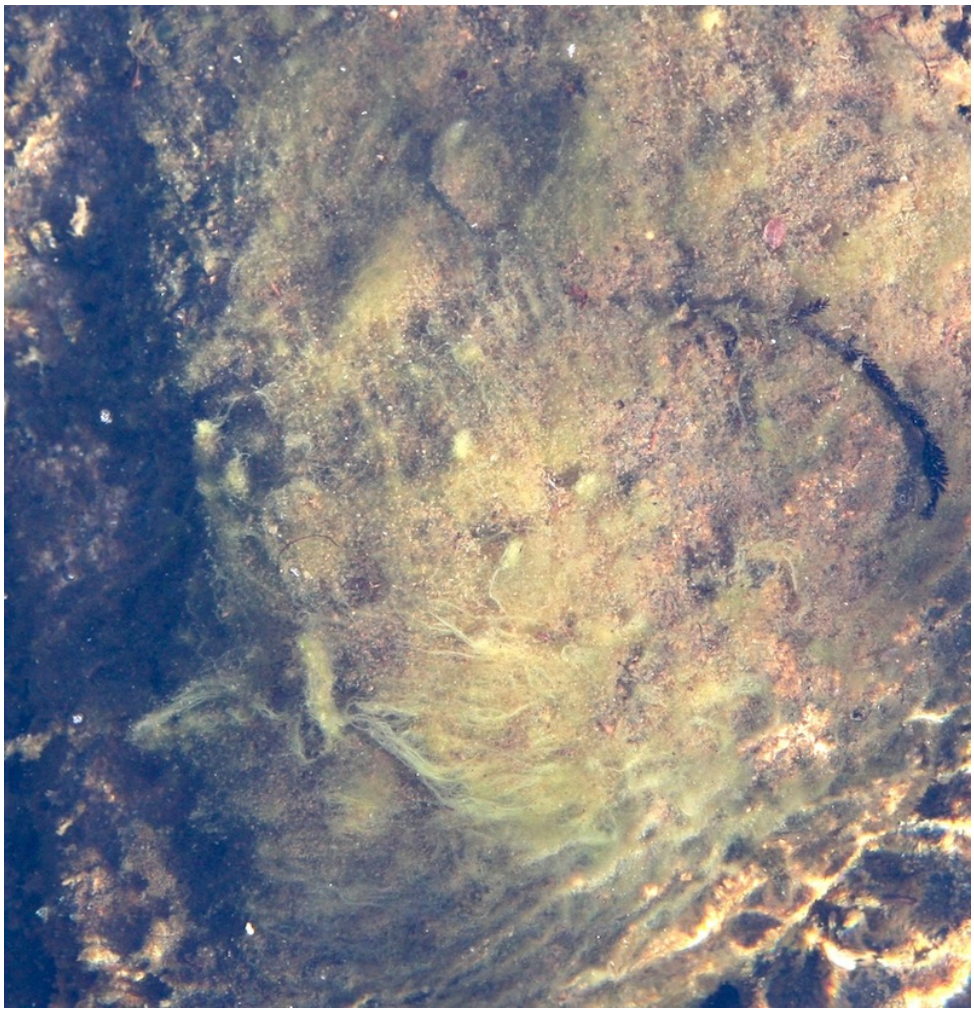
The past, human-induced changes to the flow and stream structure of the river Vainosjoki are clearly visible during high water in July 2015 (above).

6.1. Preliminary Survey of River and Bank Plants

Salix lapponum[42] along the Vainosjoki stream, with some branches dead, most likely as a result of natural floods. Regional interviews[43] from the close-by strict natural reserve Kevo, in the North Sámi watershed area of Deatnu, reported long-term deaths of Salix lapponum, for causes still unknown, in at least 2-4 sites along Kevo, Kaldoaivi and Paistunturi areas further North.

[42] In Finnish *pohjanpaju*
[43] Informal Snowchange meetings with fishermen and hunters, July 2015

Green algae[44], which indicates there is nutrient loading on the river Vainosjoki sub-catchment area. The same algae has been reported on field visits and Skolt Sámi visits in 2013 and 2014 and is observed to be expanding.



Menyanthes[45], an endemic plant growing along Vainosjoki. The Skolt Sámi have used it for medicinal purposes over centuries. In the bottom close to the Menyanthes is a nutrient matter that has sedimented and the caught water again due to the water levels.

[44] Most likely in Latin Cladophora glomerata, in Finnish *Viherahdinparta*
[45] In Latin Menyanthes trifoliate, in Finnish *raate.*

Dried up green algae along the river.

6.2. Survey of Visible Water Quality, Vainosjoki

Foam formations caused by nutrient loading and colored by some iron discharges. This is a natural phenomenon in waters with nutrient loading during high water levels and flooding.

Dried foam on the river stones and rocks.

6.3. Nutrient Loading From Past Herding Activities: Ponds and Small Lakes

The expansion of aquatic plants into the small pond of Nililompolo (above) in the direct vicinity of lake Sevettijärvi seems to indicate an increased loading of nutrients from upstream, from river Nilijoki sub catchment area[46].

Local Skolt Sámi indicate the nutrient loading may have begun about 20-30 years ago[47]. This is connected with the new observation made by several Sámi in the community about a now discontinued practice of winter-feeding of reindeer on the deep ponds of the Näätämö catchment area[48]. Oral history materials indicate the feeding has not taken place along the main river course; rather it has been practiced along the sub-catchment areas of the watershed.

One Sámi[49] provided a description of the practice:

The artificial feeding of the reindeer began perhaps 10-15 years ago, perhaps already in 1980s. At first it was done on the ponds and parts of the Näätämö lakes. The initial thought was that hay, which was used in the feeding, would not cause any problems on the lakes or rivers. However the observations indicate that both the feces from the reindeer and the rotting hay in the lakes, ponds and river bottoms may be a source of nutrients in the watershed. This might explain the indicator plant species and other phenomenon along the basin, which clearly points to a nutrient load. In the absence of agriculture and industrial forestry, clearly something has happened which is a driver for the nutrients.

[46] Snowchange Sevettijärvi Oral History 250715a
[47] Snowchange Sevettijärvi Oral History 250715a
[48] For example Snowchange Sevettijärvi Oral History 250715a
[49] Specific oral history material details withheld due to local requests.

The Skolt Sámi usually fed 50-150 reindeer at once on a pond every other day. This was due to the 'hard winters' of 1985-87, with very cold frosts and deep snows. Usually the feeding is from January to March. It was first conducted to maintain the reindeer connection with humans, i.e. to keep them accustomed to humans. Later the practice was continued due to poor lichen pastures and weather impacts. No mushrooms in the autumn for food, too dry summers and unexpected drying of marshlands has caused the pressure to increase the artificial feeding.

The authorities have also taken steps to control this feeding of reindeer on the lake and river ice. The Center of the Environment of Lapland issued a statement on the issue in 1993[50] to forbid the practice. It was also strongly discouraged in the *Poromies* professional journal already in 1993[51]. The Center estimated, in the absence of scientific records, the loading perimeters caused by the practice:

- the reindeer urine and feces is expected to contain 30-35 % dry matter if it eats artificial fodder, and 41-48 % on a diet of lichen and natural foods. This means the output contains total Nitrogen between 6,8 – 11 g/kg (average 6,6 g/kg) and Phosporus 0,5 – 2,9 g/kg
- it is comparable in impacts to other domestic animals and their output, such as cow, pig
- The Center estimated that one reindeer would produce about three kilograms of feces and one kilogram of urine per the time they visit a water body (one fifth of a day).
- This leads to a loading of 170 g of feces and 40 g of urine / reindeer daily on the feeding spots, resulting in average 255 kg feces and maximum of 60 kg of urine on specific spots per month.
- These result in average 3,5 – 5,6 kg of nitrogen and 0,3 – 1,5 kg of phosphorous on the feeding areas annually. Urine produces 0,2 – 0,7 kg nitrogen and 0,02 – 0,08 phosporous on site.
- The Center determines therefore that this has impacts to the ecological status of the rivers and lakes where it has been done, in addition to the load from the hay itself and the dust from the hay[52]. This speeds up eutrophication process along the basin and increases the use of oxygen along the waters.

Metsähallitus, the state forestry agency, who controls the land use and lands of the Näätämö basin, issued a degree in 2005 forbidding the practice[53]. The herders moved the feeding grounds in recent years to marshlands, away from the water bodies. The nutrient impact from the practice remains on the basin.

[50] Lapin ympäristökeskus 2006
[51] Poromies 1, 1993: 52
[52] Lapin ympäristökeskus 2006
[53] Metsähallitus 2005

7. Lake Sevettijärvi Catchment Area: Restoration Spots

A brief survey of aquatic plants on the lake Sevettijärvi, around cape Martinniemi indicates the lake is in good ecological condition in terms of nutrient loading:

Long-stalked pondweed[54] (above), visible at the sandy bottom of the lake, is a species thriving on mesotrophic and eutrophic lakes with clear to darkened water visibility. It is an indication there is little nutrient loading at this part of lake Sevettijärvi.

Slender Tufted-sedge[55] along the lake Sevettijärvi. Sandy bottoms indicate no nutrient or nutrient loading has accumulated on the northern shore of cape Martinniemi.

[54] In Latin Potamogeton praelongus, in Finnish *pitkälehtivita*

8. Erosion: July 2015

One of the key topics in the village of Sevettijärvi, both amongst the local Finnish people and the Skolt Sámi, has been the health and situation in the lake Sevettijärvi itself. Put in historical context the erosion issue has been identified numerous times by the local residents, including the Skolt Sámi:

- Village Association of Sevettijärvi had called for 'raising of waterlevels' on the lake in a letter 13th May 1994[56].
- Another meeting was held on the 28th, August 1995 to speed up the solutions to problems of erosion and other issues[57].
- A letter had been sent to the Center of the Environment to speed up the issues on 11th, August, 1998[58]. They continued to press for the restoration plan also in 2010, 2011.
- A plan to restore and repair the damages, written by engineer Timo Alaraudanjoki, was released 24th, January 2000[59]. The municipality of Inari approved the plan for action on 4th September 2000.
- Inari municipality reviewed the situation on 5th September 2011 and urged the state authorities to tackle the erosion problem on a letter 14th March 2012[60].
- The Skolt Sámi Village Council agreed in a letter 17th, August, 2010 to the steps to restore the Sevettijärvi basin and banks. The only exception was that a possible raising of water levels on the lake would, according to the Skolt Sámi, affect the spawning and fish production of lake trout and grayling. This was justified also with many unknown factors. The level of water originally on lake Sevettijärvi, prior to the removal of the old bridge at Jäniskoski rapids is unknown. Therefore the medium levels of water on the lake remain an educated guess. The Skolt Sámi Village Council proposed that dredging in selected sites and marking of the low water areas would be enough to achieve the needed results[61].

The photographs from 2008 document the low water levels of that autumn[62]:

[55] in Latin Carex Acuta, in Finnish *viiltosara*
[56] Sevettijärven mökkiläiset, 2010
[57] Sevettijärven mökkiläiset, 2010
[58] Sevettijärven mökkiläiset, 2010
[59] Sevettijärven mökkiläiset, 2010. Plan reference number Tnro 1396L0058: "Sevettijärven ympäristötyöt". It was estimated the cost of the plan in 2000 would be 588,000 Finnish marks.
[60] Inarin kunta, 2012.
[61] Kolttien kyläkokous 2010
[62] All of the 2008 photos by Annikki Komeros

Sevettijärven vedenkorkeus
syksyllä 2008. Taustalla
Varpuniemen päätila

In July 2015 the co-management team surveyed the visible sand terrain erosion along the center of the village, in close proximity to the school and Skolt Sámi buildings and cape Martinniemi, north shore:

North shore erosion affects the pine trees, which grow close to the shore along the ‘school cape’ (above).

Erosion has caused cup –structure sites on the northern side of cape Martinniemi (above).

Erosion is prominent on the north bank of cape Martinniemi (above).

What is the reason for the sand bank erosion on the specific spots[63] along the lake Sevettijärvi?

Several theories have emerged. Oral history materials documented during the visits in July 2015[64] indicate a link with weather change and the erosion. Some of the Elders have recorded a change of north winds, especially during spring, when the high water levels open these banks to increased wave action. This might be an indicative reason as the erosion is fully missing from western, southern and eastern banks of the lake.

Connected with this explanation are local Finnish residents' observations that the rapids of Jäniskoski are releasing 'too much' water during the spring and summer[65], speeding up the erosion along the banks. Oral history observations make the case for a long-term effect, which has been on-going for at least 10 years.

Restoration options that have been mentioned by local people over the years include:

- Reinforcement and protection of these banks with man-made materials, such as weirs or stones
- Controlling the outflow at the rapids of Jäniskoski[66]
- Dredging parts of lake Sevettijärvi

[63] Most prominent on the 'school cape' and cape Martinniemi, but limited to the north side of the sites.

[64] Snowchange Sevettijärvi Oral History 250715a

[65] Snowchange Sevettijärvi Oral History 250715b

[66] The local Finns approve, but Skolt Sámi have been hesitant regarding this option, calling into consideration the crucial role the rapids plays in grayling and trout spawning and habitat.

9. Festival of Northern Fishing Traditions, September 2014: Songs of Peace in a Time of War

After years of preparation, the Northern Forum, Snowchange Co-op and Sámi organisations organised a week of "Festival of Northern Fishing Traditions" in September, 2014. Gleb Raygorodetsky and Tero Mustonen reported on the festival in the following essay:

A Festival of Northern Fishing Traditions in Finland brings together local and Indigenous communities of Eurasian North.

As the war between Russia and Ukraine rages on and pressures on the Indigenous peoples of Eurasia, especially in Russia increase, opportunities for peaceful sharing of approached to renewing place-based traditions of local communities and Indigenous people on both sides of the divide, seem far and few in between.

Once upon a time, not that long ago, but long enough, a Finnish professional fisherman and keeper of his people's traditions, Mr. Olli Klemola, had a vision. A Festival must be organized to bring together Indigenous and local fishermen from across the Arctic to focus on the issues critical to their survival but have been largely missing from most Arctic-focused debates, discussions, and gatherings – community-based traditional fisheries, traditional knowledge, songs, handicrafts, harvest methods and watershed restoration approaches, all important to the Finno-Ugric peoples of Finland, Sámi areas and Siberia. The Snowchange Cooperative, a non-profit NGO and a long-term partner of the United Nations University's Traditional Knowledge Initiative, brought Mr. Klemola's vision to life this fall by convening the meeting together with its partners.

Despite the challenging geo-political conditions, the Festival of Northern Fishing Traditions,

held in mid-September, brought together Indigenous Skolt, Kola and Swedish Sámi with Siberian Khanty and Finnish traditional fishermen to promote and exchange community-based solutions to the challenges of environmental and cultural degradation and climate change faced by all of Northern Eurasian peoples.

In mid-September, a large delegation of Indigenous people and fisheries officials from Russia's Siberia, travelled to North Karelia, Finland where they spent four days around lake Puruvesi, participating in traditional Finnish fisheries using seines and fish-traps. One of the cleanest lakes in Europe, Lake Puruvesi has EU-recognized sustainable harvest of vendace stocks and clear water visibility down to 12 meters.

Modern-day seining fishery represents a unique traditional lake fishery. The oldest net found in the world was from Karelia in early 1900s, about 300 kilometers from Puruvesi, was over 10,000 years old. This traditional fishery has historically maintained healthy populations of vendace.

Through the power of example Finnish fishermen demonstrated the importance of communal seining to the Siberian Khanty; when people are on the lake together, they can defend their waters against harmful intrusions such as trawling. Puruvesi and neighboring Saimaa lakes are globally recognized also for their biodiversity – the water system is home to the now extremely endangered lake-bound Atlantic Salmon (*Salmo salar* m. *saimensis) and* unique Saimaa ringed seals (*Pusa hispida saimensis)*, numbering only in hundreds.

After the first part of the Festival wrapped up in Puruvesi, the Siberian Khanty delegation and Finnish fishermen travelled to the village of Sevettijärvi, home of the Skolt Sámi, Indigenous peoples of the European North, whose traditional territory had spanned from eastern shores of lake Inari to the western part of Kola Peninsula, in todays Russia. Chief Veikko Feodoroff, leader of the local Skolt Sámi, welcomed the delegation, by emphasizing that this is the last village where the Skolt Sámi still survives as a spoken language.

Having survived re-locations, several wars, colonial intrusion by Finnish settlers and loss of culture and language, the Skolts are making an impressive comeback to re-build their institutions, re-vitalize their culture and land-based practices and address climate change impacts in innovative, new ways.

Second part of the Festival kicked off with a round-trip hike of over 15 miles to the river Näätämö, the central waterway in the Skolt Sámi world. New delegates from Finland and other countries arrived to the event, including the President of the Swedish Sámi Parliament, Mr. Stefan Mikaelsson and representatives of the Kola Sámi from the Murmansk region of Russia.

The visit to the river was organized to share Indigenous delegates' experience between of using traditional knowledge, and land-based practices to help heal the past social, cultural and environmental damage, such as loss of language and intergenerational passing of knowledge as well as past dredging and state actions to wreck the sub-catchment areas of Näätämö. Climate change impacts have emerged as a new threat. Näätämö catchment area is the site of the first collaborative management plan in Finland, an initiative that introduces Skolt Sámi traditional knowledge to the management of this Atlantic Salmon-spawning river. This initiative has been coordinated by the Saa'mi Nue'tt cultural organization in partnership with the Snowchange Cooperative and supported by the United Nations University and Nordic Council of Ministers.

In addition to documenting environmental observations and historic land use in the area, the co-management fisheries plan for Näätämö salmon aims to create enabling conditions for the Sámi to be involved in managing the fish stocks, including ecosystem restoration of spawning grounds of the Atlantic salmon, and control of predator fish, which has been benefitting from increased water temperatures due to climate change.

Combining science and Indigenous knowledge the efforts along the Näätämö River are leading to the restoration and preservation of watersheds in the changing Arctic. Such initiative makes the Skolt Sámi formerly invisible family- and clan- based uses of the river visible for the first time to authorities, meaning Sámi knowledge has to be taken seriously in the future steps of managing the watershed.

The Khanty delegates, in turn, shared their experience of forming an non- governmental

organization “Save Jugra” in 1990s, to combat negative impacts of rapidly expanding Russian and international oil and natural gas industries. The Siberians struggling with vast environmental impacts to their traditional lakes and rivers welcomed the exchange of experience and approaches with their brothers and sisters from the Näätämö River watershed.

On the last day of the Festival, early Saturday morning, all participants gathered on the shores of lake Sevettijärvi, next to the village school and tribal offices of the Skolt Sámi. Cold sun rose above the mist coming from the lake. It was below freezing – a sign of a winter approaching. It was good time to go seining.

Vladimir Feodoroff, a Skolt Sami Elder, together with his younger brother Juha, and few helping hands from the international delegation, took the seine net out on the lake. On the shore, everybody waited for the nets to be set.

When a signal was given, the delegates from Skolt Sámi, Luleå Sámi, Kola Sámi, Americans, Siberian Khanty and other nationalities started to pull the seine. Suddenly, a song broke out, “We are seining! We are trying to catch fish!” As the seine approached the shore, everybody sang, as if having found a common language. The song reverberated across the lake and the seine came in brimming with a lot of whitefish! The lake heard the song of the people pulling the seine together, as we all should in this time of vast changes in the Arctic and around the world. A great ending to the Festival.

“In a time of war, let us sing the songs of peace”, concluded Tero Mustonen, the Finnish organizer of the Festival from Snowchange. Olli Klemola’s dream of exchanging practical skills, experiences and traditional knowledge of northern fisheries was finally realized. The next Festival planned for 2015 in the Khanty Mansi Autonomous Region of Siberia, Russia. Please come and help us pull the seine!

10. Skolt Village Council Approves Co-Management Project

A major step took place on the 3rd May 2015 at the annual meeting of the Sevettijärvi Skolt Sámi village Council. The Council decided to "*start cooperation with the Näätämö Co-management project and thus advance the Skolt Sámi participation in issues of status of river Näätämö, culture, revitalisation of traditional fisheries and to reform the dialogue with the state authorities*."[67]

Skolt Sámi Village Council stressed that the restoration of the lake Sevettijärvi and the sub-catchment area around it should remain a priority in the process. This formalized the relationship between the co-management activities and the highest Indigenous governance body of the Skolt Sámi.

One of the focal points of international management of Näätämö watershed is the Skoltfoss fish ladder in Norway[68]. Skoltfoss has been a focal point of *collective fisheries* of both Eastern Sámi and the Finns since 1500s[69]. First attempts to create a ladder, to "assist salmon getting upstream" were initiated already in the 1800s[70]. Between 1899 and 1930s different experts assessed that fish ladders could be built with explosives on the rapids. The Skolt Sámi were against the idea.

Notion of fish ladders co-incided with the plans to construct several hydroelectric stations on the Näätämö River:

- The idea was to produce electricity for the needs of the Kirkenes mine.
- State of Finland was initially in favour of this development.
- A major lake for hydroelectricity was thought to be the lake Iijärvi on the Finnish side, so that the water levels would have been raised three meters. This would have dried Näätämö totally during summer months all the way to lake Opukasjärvi. Lake Sevettijärvi was also seen as a possible reservoir in the 1940s.
- A turn to discontinue the hydroelectricity plans took place in 1950s when the endemic käpälänuotta –fishery was seen to be a part of cultural heritage and the idea of traditional fisheries strengthened. The final decision to abandon this plan was taken by the Norwegians in 1951.[71]

Fish ladder was eventually constructed in 1967. There was local resistance and the ladder did not function properly, and it was revised several times over the past 50 years[72]. Niemelä et al.[73] summarizes their 100-year review of the ladder developments by saying that it helps small salmon upstream, but it is not effective with bigger fish.

[67] Kolttien kyläkokous 2015
[68] Niemelä et al. 2015
[69] Niemelä et al. 2015: 8-9. The ownership and governance of the rapids has been a source of conflicts since 1800s and the time of arriving settlers.
[70] Niemelä et al. 2015: 3
[71] Summarized from oral history materials and Niemelä et al. 2015.
[72] Niemelä et al. 2015: 24
[73] 2015: 85

In the summer 2015 the Skolt Sámi Village Council representatives visited with state authorities from Norway and Finland, on the Skoltfoss fish ladder. All parties agreed on an annual review of the ladder and issues affecting the river and salmon to be jointly discussed[74].

[74] Saa'mi Nue'tt 2015

11. Co-Management in Science and State Governance

In 2014-2015 the Näätämö Co-management project results also were presented in various scholarly meetings at the Arctic Summit in November 2014 in Yakutsk, as well as in Finland. Peer-reviewed article appeared in the AMBIO journal in 2015, capturing the visual-optic history methodology as a mechanism to monitor northern environmental change in the terms and cultural context of Indigenous peoples, as stated in the abstract:
This article explores the pioneering potential of communal visual-optic histories, which are recorded, painted, documented, or otherwise expressed. These materials provide collective meanings of an image or visual material within a specific cultural group. They potentially provide a new method for monitoring and documenting changes to ecosystem health and species distribution, which can effectively inform society and decision makers of Arctic change. These visual histories can be positioned in a continuum that extends from rock art to digital photography. They find their expressions in forms ranging from images to the oral recording of knowledge and operate on a given cultural context. For monitoring efforts in the changing boreal zone and Arctic, a respectful engagement with visual histories can reveal emerging aspects of change. The examples from North America and case studies from Eurasia in this article include Inuit sea ice observations, Yu'pik visual traditions of masks, fish die-offs in a sub-boreal catchment area, permafrost melt in the Siberian tundra and early, first detection of a scarabaeid beetle outbreak, a Southern species in the Skolt Sámi area. The pros and cons of using these histories and their reliability are reviewed[75].

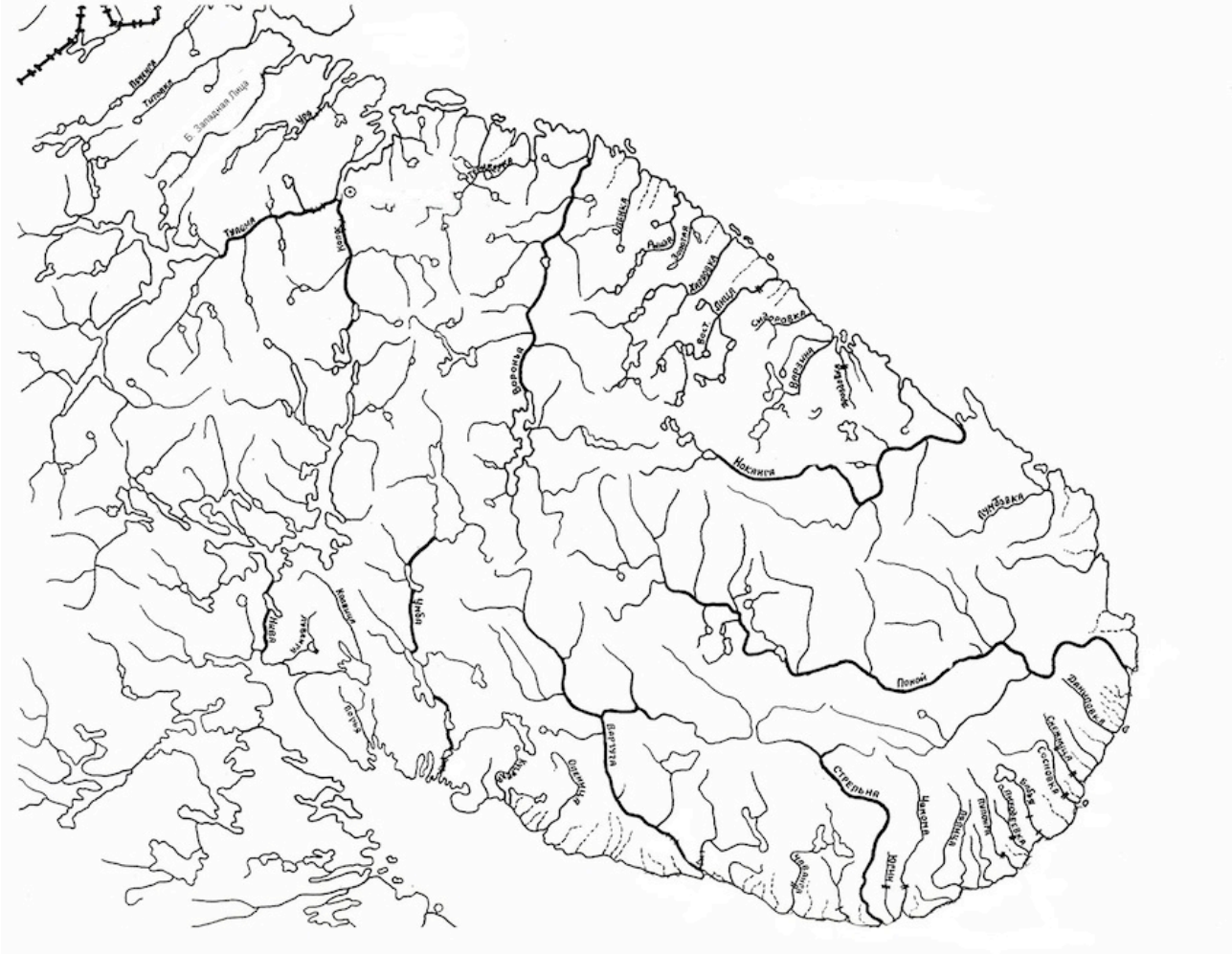
2014-2015 saw the collaborative management steps take some root in governance structures, which have a relationship with the state. This included the quota systems introduced by Metsähallitus on the Näätämö tourist harvest and on-going discussions between Metsähallitus, other state agencies and the co-management team on river Vainosjoki restoration.

Simultaneously the governance bodies in power, such as the Finnish-Norwegian Border River Commission[76], continued their top-down decision models as before, however, with some references to climate impacts in the region emerging:

- Research regarding Deatnu and Näätämö river and salmon needs to be concentrated to the Deatnu region
- Salmon farming continues to possess a threat to the wild salmon rivers in the region
- The regulation of water levels on lake Inari basin needs to address impacts of climate change. Impacts are expected to be: shorter winter periods, increased water flow during early winter and heavier spring floods. This will leave the levels of lake Inarijärvi waters to be 'undesirably low.' Therefore the power plants operating on the Paatsjoki river basin need to address these impacts in their flow and uses of the water. This will address the climate impacts on the lake Inarijärvi and may have positive results regarding autumn-spawning fish.
- Salmon parasite Gyrodactylus salaries continues to be on top of the agenda regarding the possible impacts to Näätämö salmon[77]

[75] Mustonen 2015
[76] Regulated by the treaty of the same name, available at http://www.finlex.fi/fi/sopimukset/sopsteksti/1978/19780018
[77] Lapin ELY-keskus 2015

12. Events in Kola Peninsula Ponoi Catchment Area



Major watersheds of Kola Peninsula, map provided by Sergey Prusov / PINRO.

Collaborative management steps advanced also in the sister project along the Ponoi River, Murmansk region from Spring 2014 to September 2015. In cooperation with the local stakeholders, the project produced set of 14 posters of the results between 2012-2014. They were released in late Summer 2014[78].

After the opening exhibit they were delivered to the Governor of Murmansk Region in October 2014 by the project coordinators. Then the posters were 'taken on the road' to be a part of series of workshops in the remote wilderness communities of Ponoi, including Krasnochelye, Sosnovka and Kanevka from late 2014 to Spring 2015.

Results of this activity were very positive. Participants felt that the posters convey the urgency, ecological, climate and social concerns from the villages in a proper manner. On the 29th January 2015 there was a major 'Ponoi' Event: "Flow of Life" held in Lovozero, central village of the peninsula. It was designed for the youth and children where they learned about

[78] Available at http://www.snowchange.org/pages/wp-content/uploads/2014/08/19082014_pieni.pdf

the culture, salmon and the river. English-language work report was released about the results of these events[79].

Towards the summer 2015 the project partners discussed next steps in the Ponoi region and applicability of the model across the region. Two directions emerged from the discussions:

- Focus on the cultural heritage[80], including wooden architecture of the Ponoi villages to be explored in 2015-2016
- Possible expansion of this model to the Voronye basin in the Murmansk region to collect oral histories and traditions of another watershed.

[79] Available at http://www.snowchange.org/pages/wp-content/uploads/2015/02/Snowchange-Discussion-Paper-6-.pdf

[80] Eskola 2015 has explored the Pomor heritage and endemic fisheries at the southern Kola coast. He reports that many 'unknown' or little-known archaeological findings have emerged from these areas, including a bronze idol in human shape in the 1900s. The idol was with five arrows, 22 cm in height, 5,5 cm wide, and head 8,7 cm. It has been later reported as stolen.

12.1. Fish Deaths of Kola in 2015

Outside the sphere of activities of Ponoi, but still close-by, a major outbreak of lethal fungi *Saprolegnia* infection affected the Murmansk wild salmon, reported in early August[81]. Finnish experts identified the outbreak to late July[82]. The cause of the event was blamed on the "extensive fish farming operated by Russkoye More"[83]. This is because the company keeps too many salmon in too little cages. Escapees have spread diseases to wild populations in Tuuloma, Kitsa and Kola rivers. Company denied responsibility in August 2015[84]. Fish farming expanded three-fold between 2010-12, from 5,2 to 16,9 thousand tons[85]. For 2015 the expectation is 25,000 tons[86].

Local media called the event "ecological catastrophe"[87]. Governor Kovtun acted swiftly and introduced a moratorium on Murmansk salmon fisheries within days[88]. The infection has led to "massive fish deaths"[89] in the Kola Rivers. Vetenary authorities in the region has assessed that the outbreak may be caused by Ulcerative dermal necrosis – UDN, with unusually cold waters affecting the situation[90]. Finnish experts positioned the origin point of the problem either at Upper Tuuloma rainbow trout hatchery or the fish farms on the coast[91].

Norwegian authorities played down the risks and identified the issue to be quite 'normal' in domestic waters too[92]. Russkye More, the company that has been seen to cause the outbreak, operates facilities close to the Norwegian border, not far from the Näätämö catchment area. In the Pechenga fjord, there are at least 150 pins for salmon[93].

In September 2015 the same company was suspected of dumping distorted fish outside Murmansk[94]. Regional authorities to the Russkoye More operations and the outbreak of August connected these fish. Legal action "might follow"[95].

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81 Barents Observer 2015a
82 Personal communications with Eero Niemelä, 18th August, 2015.
83 Barents Observer 2015a. There are two companies operating on fish farms in Kola: Russkoye More-Akvakultura and Russky Losos. Before 2014 Russkoye More produced only trout, but in 2015 delivered 4500 tons of salmon and 600 tons of trout to the markets (Barents Observer 2015d).
84 Barents Observer 2015a
85 Barents Observer 2015b
86 Barents Observer 2015c
87 Barents Observer 2015a
88 Barents Observer 2015b
89 Barents Observer 2015b
90 Barents Observer 2015b
91 Personal communications with Eero Niemelä, 18th August, 2015
92 Barents Observer 2015c. Regional dialogue between authorities in Norway and Russia over aquaculture is seen to be "weak".
93 Barents Observer 2015c
94 Barents Observer 2015d
95 Barents Observer 2015d

13. Conclusions 2014-2015

The activities and events of the Spring 2014 – Autumn 2015 in the co-management project expanded to international arena and simultaneously reached out to ecological restoration, driven by Indigenous traditional knowledge and science.

In 2014 and 2015 Sámi reported unusual weather events, including temperature changes of over 15 degrees in the span of 10 hours in mid-winter. Storm winds of November 2014 triggered a severe danger, when the oil tanker almost ran aground on the fjord close to Kirkenes. The possibility of oil spill, and thus significant impacts to Näätämö salmon, was closer than ever before. In August 2015 the outbreak and subsequent fish deaths in close proximity to the Norwegian and Skolt waters reminded that the economic investments for quick gains might produce lethal results.

The questions of ecological restoration of Näätämö basin focused on two directions – the damaged Vainosjoki was surveyed as a pilot site and the lake Sevettijärvi erosion spots provided direction for the wishes of the villagers. A new issue, the nutrient load affecting many parts of the catchment site, due to the past feeding practices of reindeer, was detected using water plan surveys, oral history interviews and literature review. This will remain in the focus this decade in restoration activities.

International recognitions continued for the project. UNEP partnered with the co-management project to produce salmon and Sámi materials for the UNEP LIVE web service. United Nations Climate Change Framework Convention assessed the river project as a part of the Momentum for Change process and Näätämö ended up in second stage of projects to be considered best practices. Similarly, the co-management project was slated to be the "European River 2015"[96], and made it the semi-finals. These recognitions point to the innovations and new solutions the Näätämö project has produced. It has been featured in international and national media several times 2014-2015. The Festival of Northern Fishing Traditions brought international Indigenous delegates to the basin in September 2014.

Along Ponoi the materials from the past years travelled as an exhibition in the wilderness villages to a great success. Most importantly, the local Pomor, Komi and Eastern Sámi began to discuss possibilities of *reviving* the 'lost' villages, such as Ponoi, on the delta.

In other developments in the region to do with Sámi culture and heritage, the Skolt Sámi *gramota* scrolls, were positioned to be included into the UNESCO Memory of the World archive. An associated documentary film is slated to be released in Autumn 2015 describing the process.

In September 2015 a major archaeological find was discovered outside Kirkenes, in close proximity to the Näätämö basin[97]. As a symbol of our era, hardly more telling juxtaposition could be found – rock art find had been identified on the site of a proposed multi-million euro oil terminal with ties to the Russian production sites and companies[98].

[96] Organised by the International River Foundation.
[97] Barents Observer 2015e. The find was initially assessed to be 7000 years old.
[98] Barents Observer 2015e

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