Life in the Cyclic World: A Compendium of Traditional Knowledge from the Eurasian North

Tero and Kaisu Mustonen Snowchange Cooperative, 2016





Cover: Traditional fish trap in Kolyma region, NE Siberia, late 1800s. Photo from the Jesup North Pacific Expedition, 1897-1902, published with the permission of Institute of the Indigenous Peoples, Russian Academy of Sciences, 2015. Jesup North Pacific Expedition was a major science expedition to the region over 100 years ago. The photos of the expedition have been shared with the Russian Academy of Sciences institutions, originating from the American Museum of Natural History, New York.



Camps of the Chukchi and Yukaghir peoples in Kolyma region, NE Siberia, late 1800s. Photo from the Jesup North Pacific Expedition, 1897-1902, published with the permission of Institute of the Indigenous Peoples, Russian Academy of Sciences, 2015.





Camps of the Chukchi and Yukaghir peoples in Kolyma region, NE Siberia, late 1800s. Photo from the Jesup North Pacific Expedition, 1897-1902, published with the permission of Institute of the Indigenous Peoples, Russian Academy of Sciences, 2015.



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Preface to the Life in the Cyclic World

Tero and Kaisu Mustonen, May 2016

Life in the Cyclic World has been in the making for a decade¹. It is based on the collected, analyzed and assessed traditional² ecological knowledge for the Arctic Biodiversity Assessment³ of the Arctic Council. Between 2012 and 2016 the authors and the Conservation of Arctic Flora and Fauna - CAFF, one of the Council's working groups, exchanged drafts and versions to release this document as a Compendium. However this plan did not materialize and Snowchange Co-op publishes now these materials independently.

We acknowledge and are thankful to the language and content reviews and changes, some of which have been included into this volume, by Tom Barry and Courtney Price from CAFF. Additional thanks to Henry Huntington and Violet Ford for edits and suggestions. Final product and its possible flaws and mistakes are naturally our responsibility.

These materials are made available as planned, and cleared by the involved Indigenous organisations, communities, families and individuals. We hope this document will be of use in the understanding and discussions regarding Eurasian Arctic biodiversity and Indigenous peoples.

Materials and Methods

The TEK materials that have been included in this document come from the oral histories of the Indigenous communities in Norway⁴, Sweden, Finland and Russia. There are some North American Indigenous materials in the first part of the document to position and offer scope to the discussions that follow.

A large body of the present volume is derived from the Snowchange oral history archival materials. All have been published before in scientific monographs, articles, community reports, books and other publicly available materials⁵. All oral histories and Snowchange traditional materials that have been used have been discussed with the representatives of the Indigenous communities and organisations involved in a process that has lasted a decade.

¹ First discussions emerged in the CAFF meeting in Ylläs, Finland in 2006.

² Alternate terms Indigenous, Sámi, Inuit knowledge

³ 2013

⁴ Focus on Sweden, Finland and Russia

⁵ For example Mustonen 2009, Mustonen and Mustonen 2011, Aikio et al. 2010, ACIA 2005, Mustonen and Helander 2004, Mustonen & Mustonen 2009

The principles of free, prior, informed consent – FPIC have been followed to the fullest when possible. More precisely this has included:

- Community workshops: Prior to any decision between 2008-2016 on the TEK materials, small to large –scale workshops have been organised by Snowchange regarding the Life in the Cyclic World materials. The participants of these workshops have included those Indigenous communities and individuals whose voices have been used in the document. The workshops have been held, for the most part, in Vuotso (Finland), Inari (Finland), Utsjoki (Finland), Sevettijärvi (Finland), Tornio (Finland), Jokkmokk (Sweden), Nesseby (Norway), Murmansk, Lovozero, Krasnochelye and Chalme-Varre (Murmansk, Russia), Yakutsk, Neriungri, Iengra, Cherskii, Kolymskaya, Andreyushkino, Krasnushka, Podhovsk, Chaigurginoo (Sakha-Yakutia, Russia), Surgut, Nefteyugansk (Khanty-Mansia, Russia)⁶.
- *Community communications:* In those periods in between community events, when it has been needed, telephone and email conferences have been held with the people involved, including the head of the RAIPON and Focal Point of the Sámi Council for the Eastern Sámi areas.
- *Ownership:* In those cases where Indigenous peoples have worked directly with Snowchange, they own all of their materials and rights to the materials. For the purposes of making them available in publications and articles the copyright has been shared. However they retain all rights reserved.
- *Responsibility:* Snowchange and the authors of this report are solely responsible for the analysis, interpretation and outcomes of the work and possible mistakes it may contain.

Materials have been included from a literature review⁷. Professor Sillanpää⁸ led a project that documented community-based views on socio-ecological realities in Siberia from late 1990s to early 2000s. The published monograph resulting from this work provided additional source materials to the present volume. We met with the various non-Indigenous scholars during and after the publication of the Sillanpää monograph between 2007 and 2011 to ensure the materials are sound, ethically collected and the people involved have been heard.

Methodologically the present volume employs *narrative interpretation*⁹. Indigenous peoples and in some cases, the communities, are seen to be the best interpreters of their observations of change and its meaning. This follows also the theoretical points and emphasis of Smith¹⁰. Additionally Macdonald¹¹, based on a thirty years of community work with the Inuit of Igloolik, advocates the uses of *oral histories* of the Indigenous communities as valid sources of materials regarding Arctic Change. Mustonen¹² stresses the *particular, unique* view, sometimes known as *earthview*¹³ of the rooted

⁶ These community workshops have been held as a part of the self-funded Community-Based Monitoring – CBM work of Snowchange Cooperative which is active and on-going. Consent forms, approvals and draft materials of the primary documents (articles, books, posters) were collected already during the fieldwork period.

⁷ For example Sillanpää 2008, Slezkine 1994 and other sources.

⁸ Sillanpää 2008

⁹ Cortazzi 2001 on narrative analysis, see also Kii7iljuus and Harris 2005

¹⁰ 2005, on including Indigenous voices.

¹¹ 2000

¹² 2009

¹³ Mustonen and Lehtinen 2013

Indigenous community representatives. The present volume is not to solve questions of TEK work. Rather, it captures the 2006-2016 work on traditional knowledge that constituted the basis of Arctic Biodiversity Assessment. In terms of the time span of observations and documented materials, majority of the community voices are from 1999 – 2010 time period.



Jegor Nutendli from the Nutendli Chukchi nomadic community, Lower Kolyma, Sakha-Yakutia, NE Siberia, Russia, greets the morning sun. Snowchange, 2006.



Tero Mustonen in the camp of the Turvaurgin Chukchi nomadic community, Lower Kolyma, Sakha-Yakutia, NE Siberia, Russia with Pyotr Kaurgin (right). Snowchange, 2006.



Kaisu Mustonen (right) with Akulina Kemlil (left) in the camp of the Nutendli Chukchi nomadic community, Lower Kolyma, Sakha-Yakutia, NE Siberia, Russia. Snowchange, 2006.



Part I. Introduction

I. Introduction to the Life in the Cyclic World

1.1. A Need for a Dialogue with the Indigenous Homelands on Biodiversity

This Compendium in two volumes will document and portray the traditional knowledge, observations and viewpoints from several Indigenous communities in the Arctic. Some of these materials have been used in the larger scientific Arctic Biodiversity Assessment - ABA. However given the strict limitations on species and ecosystems within the ABA proper, this Compendium will address the question of what Arctic is especially in the context of Indigenous Peoples and their homelands – using the territorial limit of the Permanent Participants. We wish this document to be expressive and portray views from the ground using the words of the peoples themselves.

In terms of understanding Indigenous knowledge of biodiversity and ecosystems, it is indeed this multiplicity, which is at the heart of the discussion. The fundamental problem underlying the on-going land use problems is this difference of civilizations, which are operating in the same areas of the Arctic. Ultimately this is as well a question of power relations, which can be traced back to the sad histories of the colonization of the Arctic.

We use the baseline understanding that the current Permanent Participants to the Arctic Council – the Arctic Athabascan Council AAC, Aleut International Association AIA, Gwich'in Council International GGI, Inuit Circumpolar Council ICC, Russian Arctic Indigenous Peoples of the North – RAIPON and Saami Council – SC – define through their traditional territories the extent of knowledge and observations shared here. Scientifically this means some of the materials will touch also on the sub-arctic and boreal zone.

These Indigenous Peoples often discuss their communities and territories using the concepts such as homelands, traditional places, nations and so on. For the sake of simplicity and scale we will use from now on the term Indigenous Peoples to refer to all of the Arctic, and in the case of a specific cultural group, such as the Inuvialuit or the Nenets, their self-designated name and community or communities making the observations presented here.

However we will not provide a full survey of all academic texts related to the topic – neither this will be a survey of the situation of biodiversity and Indigenous peoples in



Steven Point, Grand Chief of the Sto:lo First Nation and the former Lieutnant-Governor of British Columbia, Canada. Tero Mustonen, 2007.

various Arctic countries or an academic literature review. Rather we will be providing some viewpoints for discussion. It should be emphasized too that majority of the materials for this volume have been collected through a community-based research under the Snowchange Cooperative¹⁴ or other similar processes. It means the materials presented here have been approved and reviewed in draft format by the representatives of these communities, and in the case where the specific community has not been able to participate in the review process, the specific representative of a Permanent Participant organization¹⁵ has been able to review the process.

The question of Indigenous peoples and understanding of biodiversity is a complex topic. At the CAFF XI Meeting which was held in Ylläs, Lapland, Finland in 2006 the Honorable Grand Chief of the Sto:lo First Nations, British Columbia, Canada, Steven "Xwě lī qwěl těl" Point reflected on the questions of conservation and the Arctic peoples. While the Sto:lo are not an Arctic society, he had been invited to be the keynote speaker for the event because of the formative work that the Sto:lo have accomplished in their communities, together with scientists, on issues of co-management, fisheries and forestry. The Sto:lo have successfully mapped their sacred sites, oral histories and legends together with the governmental agencies and offered both cross-scale and pre-historic views on biodiversity change in the Lower Mainland in British Columbia, Canada. Grand Chief Point stressed dialogue – the two paradigms, to simplify the issue, need to have a discussion in order to understand each other in these perilous times.

¹⁴ www.snowchange.org

¹⁵ Saami Council and RAIPON, including between 2006-2016 for example former Sámi Council President Pauliina Feodoroff (later a Focal Point for Eastern Sámi Work), Chief of the Council of Yugahkir Elders Vyacheslav Shadrin, Professor Vasilii Robbek of the Institute of the Indigenous Peoples of the Russian Academy of Sciences, as well as the individual communities.

And that is where we find ourselves. At an attempt for a dialogue, a meeting, perhaps an encounter between the knowledge systems. This dialogue has not yet taken place in a proper way. Despite the progress that has been made the Indigenous societies of the Arctic feel their viewpoints and an understanding of their worlds and cultures has not happened to the degree it would be reflected in a good manner in the decisions regarding the North. This report will try to further this meeting of cultures. In our opinion, one way to achieve such a dialogue is through the presentation of published community materials and oral histories on the questions of Arctic biodiversity – they allow the the people who are immersed in the Indigenous cultures of the region to authentically make their points. Such a view has not been successfully provided in the past in the Arctic Council fora.

When this Compendium was being discussed one of the aims for the process was to produce a document that could assist resource managers, scientists and other decision-makers and stakeholders to understand better the Indigenous life-worlds. We are glad if this report advances this target.

We hope that the two societies, the settlers in the Arctic¹⁶ and the Indigenous peoples, could start from the beginning to have this dialogue, at last perhaps. And furthermore, we hope this dia-



Tero Mustonen, Filip Jefremoff and Vladimir Feodoroff discuss the salmon observations in a fish camp. Gleb Raygorodetsky, 2012.

logue between civilizations could take place without the asymmetric power relationships it has had in the past – instead a true conversation is needed.

However we wish to say too at the very beginning, that we should not have any preconceptions about the issues surrounding Indigenous cultures. More specifically, given the diversity across the region in terms of human cultures, there are no easy definitions or answers that would work in every place in the same manner. The scale, case and place determine the unique interplay of the relationship between Indigenous community and biodiversity, thus the need for this dialogue.

The Nuataaqmiut Inupiaq hunters of Northwest Alaska who are known for their connections with the sea placed a piece of a beluga whale skin on a pole to indicate to the passing other beluga that the hunters are properly treating the bodies of their dead relatives, enabling their spirits to return to the sea– showing deep connections between the whale, people, sea and the land¹⁷.

As the Inupiaq case illustrates the various and specific Indigenous societies of the region belong into their landscapes – they and their cultures are an integral part of a whole. Recent scholarship¹⁸ confirms this to be true. Other Indigenous scholars from

¹⁶ referring here mostly to Indo-European peoples in the north, such as Swedes, Norwegians, Russians and so on – the concept has other connotations too in Iceland and Faroe Islands

¹⁷ Burch 1998: 93

¹⁸ Helander 1999, Smith 2005, Mustonen 2009, Mustonen and Mustonen 2011

the Northern boreal zone such as Sheridan and Longboat¹⁹ agree. According to them: "Onkwehonwe (unassimilated, traditional Haudenosaunee)…regard any assumption concerning the existence of autonomous, anthropogenic minds to be aberrations that violate the unity, interrelation, and reciprocity between language and psychology, landscape and mind. The ecology of traditional Haudenosaunee territory possesses sentience that is manifest in the consciousness of that territory, and that same consciousness is formalized in and as Haudenosaunee consciousness…Onkwehonwe mind everything because everything minds Onkwehonwe. Haudenosaunee minds are composed not just of visible ecological domains but also by the numinous qualities of those domains that, allowed to mature, express the fullness of traditional territory. Old-growth minds and cultures mature, emerge, and encompass the old growth of their traditional territory."

In order to facilitate the new emerging vision of how Indigenous societies of the North, especially from Eurasia, are connected with their places and landscapes, the theoretical perspectives of the late Even scholar, Vasilii Robbek²⁰ from Republic of Sakha-Yakutia, Siberia are relevant and useful. His words provide a unique window into the issues affecting Indigenous communities and biodiversity and therefore we are providing some space here for his thoughts to get wider exposure. This is our way of providing an example of the dialogue mentioned above.



Nutendli Chukchi nomadic community camp on the tundra, Lower Kolyma, Sakha-Yakutia, NE Siberia, Russia. Snowchange, 2007.

¹⁹ 2006: 366
²⁰ 2007

Robbek was an internationally recognized defender of the rights of the Indigenous peoples in the Russian Federation. He mastered fluently various scholarly fields that covered for example the Even language and philology, functional grammar regarding Tungusic-Manchurian languages as well as the educational and socio-economic needs/ aims of the Indigenous communities themselves. Through his life, which was fueled by his childhood experiences as a member of Even nomadic family, Robbek devoted much time to develop the idea of 're-birth' of indigenous societies of the Arctic.

Robbek²¹ formulated the position of Arctic Indigenous civilizations so that "the great shift from nomadic – with hunting and gathering activities - to settled – with established agriculture and town-building – way of living having occurred nearly 10,000 years ago reveals the most significant change of the human attitude towards nature in the whole history of humankind". In his opinion the last nomads of Eurasia, Nenets, Chukchi, Even and Yukaghir still preserve another kind of understanding of ecosystems and indeed the world.

According to him²² "the forms and manifestations of ethno-ecological traditions are versatile and embrace all spheres of economic activity, material and spiritual culture, religious beliefs and behavior of an individual from birth till death. Obtaining the enormous potential for sustainable development, unknown by the world, this price-less experience is gradually vanishing into oblivion." To Robbek²³ these aspects of the traditional Indigenous life world are all encompassing; "these nature-conservative traditions permeate the whole way of life, the behavior, moral and ethical virtues [of the nomadic civilizations of the Eurasian North]". This is in line with the Indigenous scholarship from North America²⁴ and South Pacific²⁵.

The Arctic biodiversity is now facing environmental challenges, which create concern in the Indigenous nations. The Indigenous peoples' perceptions of biodiversity have been formed based on their dependence on the environment, their values, and their beliefs. These views have been now recognized by the international community in several different areas, including the United Nations, Convention on Biological Diversity, ILO and other fora.

We should recognize these international efforts to the highest order possible. The questions of evolving Indigenous rights and biodiversity are not only limited to questions of the environment; they have expanded in recent decades to cover a vast range of issues ranging from pharmaceutical companies and their interests in gaining access to Arctic genetic resources to intellectual property rights, to name a few.

This Compendium will provide views of biodiversity and change from the Circumpolar societies. Even though oceans separate the North American Indigenous peoples from their Eurasian sisters and brothers, there exist more similarities than differences in the contextual issues regarding cultures, which allow us to speak about "Arctic Indigenous knowledge", even though all of these societies and peoples have their distinct own

²¹ 2007: 10

²² 2007: 10

²³ 2007: 8-9

²⁴ Sheridan and Longboat 2006

²⁵ Smith 2005

cultures. In this Introduction we will utilize viewpoints from Eurasian and the North American North to illustrate what kind of issues exist in the Indigenous peoples relationships to their ecosystems.

However, it is clear that no single text can present all the multi-faceted realities in the different communities. As always this will be a limited view. What makes the materials presented in this Compendium different from the previous Arctic Assessments such as the ACIA report²⁶ is the community connection. In style and methodological choices it is close to the 2002 CAFF report on the Sacred Sites²⁷. The present volume, while containing the ABA-related materials, is an independent research report.

The different Chukchi, Sámi, Yukaghir, Evenk and other communities, families and individuals who have shared materials for the ABA and for this Compendium naturally reserve all further copyrights and their customary traditional rights to their knowledge. It has been shared here to make these publications possible. We as authors are very thankful to all peoples who shared parts of their culture to make this work.



Reindeer is the food security of Siberia. Meat is prepared by the ladies (left). Evenk bread-baking attracts 'Pokemon' reindeer in the Southern Taiga, Neriungri Region, Sakha-Yakutia, Russia. Snowchange, 2006.

In terms of scaling the materials, we refer the reader to also consult with the Sacred Sites Report by CAFF²⁸ for a well-presented view of a Siberian Indigenous situation. As the materials in the TEK Compedium for Eurasia have been collected from dozens of communities, including a great variety of Russian administrative subjects²⁹ across the

²⁶ 2005

²⁷ Haruchi et al. 2002

²⁸ Haruchi et al. 2002

²⁹ republics, oblasts, autonomous regions

region, no universal guidelines or methodology can be presented that would fit into every context³⁰.

This volume is an oral history-driven document as opposed to being a methodological guide or a literature review. The use of these oral histories is in our opinion the only mechanism to offer some unifying themes across scales and regions – from tundra to taiga. The Sacred Sites Report³¹ offers a very good local scale survey into the issues from two Siberian communities. Especially those practitioners that conduct fieldwork should familiarize themselves with this document too.

1.2. Biodiversity – "You Must Be In a Constant Contact With the Land"

This short chapter offers two examples from the indigenous point of view on the meaning of what is often called "biodiversity". As mentioned above, given the similarities in the Indigenous peoples of the North, we can talk of a common "Arctic" view that these communities possess through their traditions and cultures. Again the expressive oral history examples presented here are by no means exhaustive, but they do bring the message across on how Indigenous societies conceptualize the issue themselves.

We can approach this question by listening to some authentic community voices. Gamaillie Kilukishak³², an Inuit Elder, offers an explanation to this question "You need to have the knowledge of the animals and the land that they live on. You must be in constant contact with the land and the animals and the plants". When growing up, Gamaillie was taught to respect animals in such a way as to survive from them. He was taught to treat them as kindly as you would another fellow person. He notes that while there are no ceremonies to what Europeans call nature, people had values and laws to live by. For example, if you came across an abundance of a certain kind of animal, you would take only what you needed. "We do not over-hunt for the sake of the animals."

Kilukishak³³ reflects on the Inuit understanding of time and space: "There is a yearly cycle but it isn't talked about directly in our culture. Rather we are aware of the cycles by living and experiencing them. For instance, we hunt caribou in August because then it has new fur. This new fur lasts longer when used as clothing. In the early spring, which is March, the seals start to have their pups and that's when we start hunting for them. Their skin is new and good for clothing as well. In the summer time, the women start picking berries, which they save for winter or harvest as needed during the summer. There are other small plants that you eat as you walk along when hunting or travelling to another camp. We live in a very harsh environment. With any animal, some years are good and some years are bad. Life is tough. You try to get any food you can – the birds, the ducks and so on. These are birds that start coming up in the spring and are gone again by August or September. All these things are resources you can see, and

³¹ Haruchi et al. 2002

³² 1999: 134

³⁰ for example due to massively varying legal and social context in different Russian regions as well as Finland, Sweden and Norway regarding Indigenous peoples and biodiversity.

³³ 1999: 134

the season they come determine when you use them. One more thing that we believe is that if there was any cruelty to animals, if they were made to suffer or were shot just for the sake of killing them, then some time in the future the animals will attack back or take revenge on the person, his dependants, his grandchildren, and his great grandchildren for such misbehaviour."³⁴

Sámi reindeer herder Johan Mathis Turi³⁵ from the Unihurt siida, Norway, discusses different Western concepts, such as biodiversity, nature and environment from his point of view: "The reindeer is the centre of nature as a whole and I feel I hunt whatever nature gives. Our lives have remained around the reindeer and this is how we have managed the new times so well. It is difficult for me to pick out specific details or particular incidences as explanations for what has happened because my daily life, my nature, is so comprehensive. It includes everything.... When I think of biodiversity it is the same: everything is included. I could not be a reindeer herder without it. It is a necessity. Biodiversity is both art and necessity. The other species, the animals and plants, are important and we use them. The predators are also part of biodiversity. We do not want any animal extinct. Each is part of the whole. Thinking of nature is difficult because, again, everything is included. I think the problem is with how we think when it comes to nature. Environment is that which has been discussed with the authorities. They never talk about the human being so we can never agree, for instance on the protection of nature because for nature to be protected, they must consider the human."



In June the reindeer climb up to the hills to the last snow patches to escape from the clouds of mosquitoes in Finland. Eero Murtomäki, 2009.

34 Kilukishak 1999: 134

³⁵ 1999: 152

1.3. Positioning Traditional Ecological Knowledge

"Traditional knowledge is not something abstract and separated from the context in which it is produced, but it is always related to present."³⁶

The Arctic Indigenous peoples through their traditions sustain the Arctic biodiversity. This knowledge is used to observe, evaluate and form views on the particular situations. This reflects perceptions and wisdom of the environment. It is clear that this repository of cultures is bound in remarkable ways to the subsistence and nature-based economies of the Indigenous communities themselves – if they disappear or sustain fatal damages, so will the knowledge too. Equally central to this is the survival of Indigenous languages – the landscapes, songs, languages and dialects and the peoples are inseparable³⁷ as can be seen in the Linguistics Chapter of the ABA proper.

In academia³⁸ there has been a vast discussion of terminologies – traditional knowledge, Indigenous knowledge, local knowledge are some of the concepts employed.

For the ABA Scientific Report the term "traditional ecological knowledge", or TEK has been used. The original mandate of ABA Scientific Report was to include TEK into every chapter – more precisely "published community-based knowledge should also be included where relevant and appropriate".

TEK is synonymous in this Compendium with Indigenous knowledge, Sámi knowledge, Chukchi knowledge and so on. Instead of a literature review we wish to present in this chapter a few handpicked views on the issue of TEK and to some extend, its relationship with science. In our opinion this makes the point clearer and allows the dialogue to deepen.

Governmental officials and scientists, especially those involved in nature conservation and ecology, often wish to have a clear and straight-forward definition of what "TEK" is and how it can be "used". Using the materials in this Compendium we will make the point strongly that traditional knowledge of the Indigenous peoples cannot be separated from the vast array of practices, languages and specific ways of being³⁹ in which it is embedded across the region. While similarities and key processes can be identified, each case and Indigenous community needs to be properly engaged with and positioned to allow the discussion to flourish and again, the dialogue to emerge.

For example the Inuit of Canada have refined conceptual frameworks regarding Inuit Qaujimajatuqangit or Knowledge. Avatimik Kamattiarniq relates to a concept of environmental stewardship. It puts emphasis on the Inuit and their environment including the notion of environmental wellness. Young Inuit are expected to follow these guidelines in learning about their traditions and ways of life⁴⁰.

³⁶ Kublu et al. in Oosten and Laugrand, 1999:7

³⁷ Krupnik et al. 2010

³⁸ Huntington 1998, Berkes 1999, Huntington 1999, Huntington 2000, Huntington and Fox 2005, Smith 2005, Sheridan and Longboat 2006, Krupnik et al. 2010

³⁹ Mustonen 2009

⁴⁰ Ford 2012





We then turn to the question; What is Indigenous Knowledge⁴¹ and what is it in relation to Western science⁴²? While vast numbers of scholarly articles have been devoted to this topic we try to investigate this question both from the community viewpoint and voices from the scholarly realms. Given the limitations of space, we wish to focus on concrete examples. Such questions on scale, understanding of species, time and space should be relevant to many practitioners in the Arctic for example on protected areas or land use.

John Macdonald⁴³, a long-time scholar of the oral histories of the Inuit of Igloolik, Nunavut, Canada has remarked, "Inuit traditional knowledge is characteristically personal, its acquisition and application, in varying degrees, specific to communities, families and individuals."

As Kublu et al.⁴⁴ discuss the production and transmission of knowledge in Inuit society, they emphasize the importance of the fact that knowledge is always produced in relation to practice. When Inuit children were taught to develop their skills, it included using whatever was appropriate for the task and the use of modern techniques had no negative connotations whatsoever.

If new methods and materials proved to be advantageous, Inuit were always ready to adopt them, and new implements were constantly being tried out. "A balance of experience and innovation is central to the production and transmission of knowledge. The Elders would relate to the young hunters how they hunted caribou with bows and arrows, but that did not mean that they disapproved the use of guns. In qualifying the knowledge of the elders as 'traditional' we should never forget that it was always directed to the future, intended to give a perspective to younger generations so that they were better equipped to face the changes they were facing."

Kublu et al.⁴⁵ criticize the way Inuit knowledge has been understood. Same criticism can be extended to all Indigenous cultures across the Arctic. The general pattern has been to present materials as an objective body of knowledge in which data, theory and opinion are often integrated. In Inuit language and culture there tends to be not much space for generalizations.

General statements are viewed as vague and confusing, whereas specific statements are seen as much more interesting in the information they provide. There should be precision in statements, specifying time, place, subject and object. In the Inuit society all knowledge is social by nature and the idea of objectified true knowledge doesn't hold much attraction or fascination.

It is very important to understand that Elders have a high respect in the Inuit society, and it is their highly personal knowledge and experience, which was supposed to guide the younger generations. Kublu et al.⁴⁶ warn us from assuming that there exist a body

- ⁴³ 2000: 6
- 44 1999
- ⁴⁵ 1999
- ⁴⁶ 1999: 10

⁴¹ IK, TEK

⁴² WS

of objectified knowledge about which all Elders agree, however prepared they are to acknowledge the value of different experiences related to others. "Variation is an essential characteristic of the knowledge of the Elders. As each one has his or her own knowledge, it is absolutely essential that this knowledge is seen as related only to that particular Elder. Once the source, more specifically, the name of the Elder is lost, the knowledge loses its roots and becomes devoid of much value to most Inuit."

Some Indigenous scholars have discussed the similarities and possibilities of dialogue between these frames of reference – science and traditional knowledge. One of them, Alessa⁴⁷ from the Sto:lo Nation claims that there are various unimpressive attempts to rank the two systems of knowing – traditional Indigenous and the Western science. She argues that it makes no sense to subscribe to one or the other completely, such attempts go against a logical argument that more you know from different angles, the more likely you are to understand the workings of the world around us.

Despite the fact that oftentimes traditional knowledge and western science are perceived as two separate, distinct and somewhat incompatible entities, we agree with Alessa⁴⁸, who states that the two systems are very similar in practice and in results they are highly complementary because one works well at small scales (TEK) and the other at large scales (WS), but it is in their origins where they differ.

Alessa⁴⁹ notes that much evidence suggests that TEK has existed as long as we have as a species. "The act of residing, surviving and thriving in a place means that the resident must 'know' her environment in such as way as to repeatedly have a high likelihood of acquiring the types of resources, whether they are physical or not, on a regular basis. The consequences are not the ridicule of one's peers, or the failure to get a research grant, they are sickness, suffering and death". TEK requires long periods of observation in a specific place and the transmission of these observations to others in that place so that they can use them practically and often, starting from a young age.

Alessa⁵⁰ strongly criticizes the tendency of romanticizing TEK by some Western schools of thought, where it is imagined that somehow possessing TEK brings ultimate harmony of the user with his world and no mistakes will be made because all things are magically being known. She argues that such misinterpretations de-validate TEK because they fail to acknowledge that traditional knowledge "is a process where information is accepted or rejected based on receiving knowledge continuously, both directly from the system and from one's colleagues, friends, family and mentors usually to benefit the community and future generations."

The knowledge is not frozen in time or in the "past". Cruikshank⁵¹ discusses the adaptation potential and emergence of a new role of Indigenous knowledge and storytelling based on the lessons learned from the Tlingit and Athabaskan oral traditions and peoples relationship with the glaciers in the Southern Yukon and Alaska: "Environmentalchange narratives associated with melting glaciers now concern global warming rather

^{47 2009}

^{48 2009}

⁴⁹ 2009

^{50 2009}

⁵¹ 2005: 248

than the Little Ice Age. Stories about human encounters that once depicted Euro-American incursions now address implementation of land claims as one step toward a socially more just society. Local knowledge is again being produced in new contexts and is assuming an expanding role in the rhetoric of co-management policies." (kuva)

Another problem that besets the Indigenous knowledge issues is its reduction to quotes, sound bytes and "mere" observations, which seem to have been taken out of context. Scientists are often interested in the specific information a hunter may have, and the worldview, cosmology and the context for the knowledge gets lost – and the dialogue never happens. The problem with short (and random) quotes is that they rarely do justice to any system of knowing.

Cruikshank⁵² argues that in order for us to be able to learn anything from narrative recollections and memories from history, tradition and life experience, which represent distinct and powerful bodies of local knowledge, they have to be appreciated in their totality rather than fragmented into data. Cruikshank criticizes management-driven studies of TEK and environmental parables of often being unable to tap into the range of human engagements with nature – the diverse beliefs, practices, knowledge and everyday histories of nature that might expand the crisis-ridden focus of environmental politics.

Further, she⁵³ makes the important point that such studies actually often organise their data to support single arguments that conform to environmentalists' primary concerns about animals, plants and ecosystems, ignoring what does not fit; "What looks similar on the surface often turns out to have different meanings and different aims. Codified as TEK, and engulfed by frameworks of North American management science, local knowledge shifts its shape. Sentient and social spaces are thus transformed to measurable commodities called "lands" and 'resources'. Indigenous peoples then face double exclusion, initially by colonial processes that expropriate land, and ultimately by neo-colonial discourses that appropriate and reformulate their ideas." This has been a problem also in the TEK work within ABA. The ABA science assessment has suffered from the troubles identified by Cruikshank⁵⁴ as "environmentalists' primary concerns about animals, plants and ecosystems, ignoring what does not fit". There are a number of reasons for this, not all of which can be identified here. Some of them included the lack of skills by the scientists to work with the context, meaning and language of the Indigenous peoples.

Some issues were a challenge in terms of scales – the ABA chapters cover whole regions and countries, while the Indigenous observations used in ABA are by their nature, most of the time, local. So scaling was an issue. And ultimately the very premise that "TEK and science" should be in every chapter of the ABA, without the spaces to explore the both systems on their terms have been a part of the limitations of how TEK is being represented in the ABA process. The present Compendium seeks to address some of these challenges with a more deep investigation of Indigenous knowledge and biodiversity.

⁵² 2005

⁵³ 2005: 259

⁵⁴ 2005





Glaciers are melting in the Arctic, a sign of climate change. Eero Murtomäki, 2005.





Crow is a North Pacific regular. Herring gull stands on a rock in the Pacific Northwest, Canada. Eero Murtomäki.

Oceans are in trouble. Contaminants in the North Pacific and Arctic Ocean affect the molluscs, clams and shellfish – traditional foods of the many of the coastal Indigenous nations. Eero Murtomäki.



Nadasdy⁵⁵ has noted that in the Canadian context there is a growing number of terms that are crucial to ongoing land claims negotiations, wildlife management debates and environmental conflicts in the North. Terms such as land, hunting, resources and property may initially seem straightforward, but are actually fundamentally contested. Even if all parties may agree on their importance, they may mean very different things.

Another important realization is that the cultural notions of cosmology, time, space and scale of the Indigenous peoples are markedly different from the Western linear concepts of time-spaces. They have their own knowledge and terminologies for what is often called an "ecosystem" or a species. Moreover customary laws were understood and applied with the reference to beliefs and values centred on managing and sustaining what is today known as "biodiversity".

Customary laws included how and when to utilize Arctic biodiversity. Some of the Chukchi have "areas" which can be called time-spaces, melding and transforming of time and space, which translate with difficulty to measurement-based understandings of the world. These are places, or times, which transcend usual concepts of linearities.

Various sacred objects, places, stones and beings are examples of such issues. Haruchi et al.⁵⁶ write that "an important finding is also the link between customary livelihoods and sacred sites. Not only are most sacred sites located on or in the vicinity to migration routes, fishing sites or pastures; the active use, maintainance and protection of these sites depend on healthy livelihood systems."

An example of these different perceptions of animals and biodiversity can be seen in Macdonald⁵⁷. He describes how government biologists were about to impose restrictions on a number of polar bears that can be harvested in the Inuit region of Nunavut, Canada. They came to meet with the village representatives of Igloolik. An older hunter objected to the governmental plans, claiming that polar bears are as intelligent or more intelligent than humans, and will only give themselves to be hunted when they [the bears] decide to do so.

His justification of this view came from his own experience of tracking a polar bear on the island of Qaggiujaq in the Northern Foxe Basin. The tracks had ended and there on the tundra was a "rectangular block of ice"⁵⁸. According to the hunter the bear had transformed itself to a block of ice. The biologists had been amused by the story to which the hunter had said that if they did not believe him, they knew nothing about polar bears.

⁵⁵ in Cruikshank 2005: 11

^{56 2002: 11}

⁵⁷ 2000: 18

⁵⁸ Macdonald 2000: 18

1.4. Movement, Cycles and Adaptation to Changing Conditions

The driving engine for the traditional knowledge of the Indigenous peoples in the North is the seasonal cycle of subsistence culture. The use of lands and ecosystems according to the seasons, weather and oral history is the key to the vast repositories of experience-based knowledge.

To conceptualize such systems, Cruikshank⁵⁹ notes that the ability of Athapaskan Indians to adapt to changing conditions of life has been well documented. In the Southern Yukon, native people living there were hunters and fishers whose technology, social customs and semi-nomadic lifestyle were well adapted to the subarctic environment. Since resources varied cyclically, family groups traveled over extensive areas of land during any year in the course of harvesting resources for food, clothing and shelter.

In order to avoid a food shortage from endangering the community, these were not large groups. Every hunting community needed just enough adults able to provide for the needs of its members, including children and old people. People fished for and dried salmon in summer, hunted game animals and dried the meat in fall, stayed relatively immobile in winter to conserve energy, and in spring they began trapping and fishing.

Their movements were never random and if only possible people returned to their familiar camping places year after year. Hunting groups were small during winter when solitary large animals were the main food source but summer allowed much larger congregations at salmon fishing camps or intersections of caribou migrations. Because the migration patterns of animals sometimes changed, hunters were always prepared to modify and change their movements as well⁶⁰.

In the North American Arctic Stern⁶¹ discusses the planning capacity of her people, the Neetsaii Gwich'in. They, like many other native peoples in the Arctic have a relatively short history as a settled community. Stern argues that for much of their existence, the Neetsaii community based its lifestyle upon a series of planned movements. Equipped with an inherited knowledge of the local environment, Neetsaii families moved in strategic accordance with the resources available for them.

Where early accounts of the Neetsaii people by outsiders often portrayed them as nomadic hunters who struggled to survive from day to day, Stern rectifies such thinking. While a great deal of attention must have been placed on surviving "today" and "tomorrow", it remains highly unlikely that the Neetsaii community would have endured as long as they have if their foresight was that narrow. From the perspective of the Neetsaii, survival required planning from day to day as well as season to season, year to year, and even generation to generation⁶².

⁵⁹ 1990

61 **2009**

⁶⁰ Cruikshank 1990

⁶² Stern 2009

In Eurasian North the Sámi siida family and clan territories⁶³ and the seasonal cycles and regional governance of the Yukaghir peoples in Kolyma, Siberia, Russia⁶⁴ are a few examples of the same kind of living on the land. The relationship with an animal a hunter had was understood across the community, region and area.



European Wolverine. Eero Murtomäki.



Opening of the wolverine nest. Eero Murtomäki.

North Sámi Elder Aslak Ola Aikio and Niiles-Antti Aikio with wolverine pups in Utsjoki, Finland. Aslak Ola Aikio was known for his traditional skills and knowledge through-out the region.

Family of Aslak Ola Aikio, used with permission.



⁶³ Holmberg 1927, Mustonen and Mustonen 2011, Mustonen 2012

⁶⁴ Mustonen 2009





Transportation to and between Indigenous communities of the Eurasian North has been revolutionized since the advent of the 'snowmobile revolution' in the 1960s. Here in Russian North, various methods are in use: Buran snow machines on Kolyma River (top), military personnel carrier (middle left) in the Evenk camps of the Southern Siberia, ice roads and convoys on the ice roads of Kolyma (middle right). Helicopters (bottom) provide for the transportation needs of the remote camps and communities of the Kola Peninsula, Russia. Snowchange 2005-2012.

2. Indigenous Governance of the Land

Indigenous peoples have their own perception of the universe⁶⁵. It is their cosmology, way of being with the world. For example, for the Inuit, they have the concept of "sila"66, which can be understood in three principal ways – as an indicator of environment, an indicator of locality and an indicator of intelligence or spirit. Sila encompasses the Earth, its atmosphere, the air, the weather, and various other environmental phenomena such as rainbows, and the aurora – it is an all-encompassing term⁶⁷. For the Yukaghir in Siberia, a similar term is *sukun*⁶⁸ – and all Indigenous nations have their own specific but like-minded notion of their being in the world. (kuva rainbow) When we try to understand the societies and civilisations that occupied the areas of the Circumpolar North and Indigenous territories prior to large-scale outside influences, we need to understand the relationships and communal systems – the Indigenous governance of the Land - that these Nations developed. Only then we can come to terms with and start to understand the complex and many-layered landscapes of the area. More specifically we could speak of icescapes⁶⁹, waterscapes, even dreamscapes in addition to landscapes. In this part we try to portray, using authentic oral history materials from several communities, a vast range of practices and examples of "Indigenous governance".

It is important to state at outset that the distinct Indigenous nations of the Arctic have had their own "governance structures" regarding their homelands – these include the Sámi siida systems, Chukchi territoriality, Yukaghir clan territories, Inupiaq national territories of the Northwest Alaska and so on. These were spiritual systems of reciprocity with the surrounding ecosystems. In short this means the land in all of its manifestations is considered alive and to be in direct contact and communications with the people who belong into that specific part of the land. From this relationship a whole range of local reciprocities, relationships and interactions has developed over millennia.

Indigenous notions of time, space and place operate(d) on a different set of principles than the science-based worldview⁷⁰ despite their similarities too⁷¹ – the preservation of these cosmologies today differs from community to community. It is important now to be reminded of the need for "conversation" that Grand Chief Point referred to as we try to reflect on the Indigenous realities in the context of biodiversity.

Indigenous governance should not be mixed with modern day conservation practices – the view from the 21st Century towards these systems should be employed carefully. These systems have ceased to exist in some parts of the Arctic, are partly still practiced in some regions and are fully functioning in a handful of Siberian communities today.

71 Alessa 2009

⁶⁵ Helander 1999

⁶⁶ Macdonald 2000: 35

⁶⁷ Macdonald 2000: 35

⁶⁸ Mustonen 2009

⁶⁹ Krupnik et al. 2010

⁷⁰ Golovnev and Osherenko 1999, Mustonen 2009



The smelters of Nikel in Murmansk region have completely destroyed the vegetation in the close proximity of the town, and surrounding area due to sulphur releases. This is the former Skolt Sámi central area. Snowchange, 2003.



Lovozero/Luujavre, the capital of the Kola Sámi in Murmansk, Russia, received large amounts of Sámi families after the waves of centralization of villages in the 1930s and in 1960s. Whole families were put to newly-created concrete flats and apartment buildings. Snowchange 2003.

These systems had their occasional dysfunctions. These were not perfect systems of sustainability – they were, as all human societies are, vulnerable and fragile - and fully dependent on the surrounding conditions. But it is important to highlight that these practices operated well within the carrying capacity of a particular ecosystem in most of the cases, even though overharvest was known in some areas. However we should be mindful to impose our modern views on why overharvest happened, and as Burch⁷² reminds us, we need to examine a range of features and reasons for a particular event, especially by utilizing the oral histories of the people themselves.

What is important to understand and contextualize about these systems is that as a whole they managed to maintain the Arctic ecosystems in a relative state of health until the larger process of colonisation took place.

As the imposition of "Western" governance structures, introduced diseases, education, Christianity, roads and other infrastructures on the local indigenous realities have wrecked the capacity of the communities to maintain their own distinct time-spaces over the past 100 years we have seen the rise in the modern conservation practices with the industrial uses of the land, with no appreciation for the previous models of life in the region.

This has meant the Indigenous governance structures and relationships with their homelands have not even been recognized when these areas have been studied or decisions have been made regarding them or their resources. Macdonald⁷³ argues that "among many Indigenous peoples vestiges of the so-called mythic view of the world still persists, but their expressions, particularly in a cross-cultural context, are all too easily characterized and dismissed as mere superstition. Rather, they should be seen as residues of complex patterns of belief and knowing which defined for generations the interrelationship between mankind and the universe."

One of the best-known examples of such a system is the Sámi siida⁷⁴. This Indigenous governance system survived the longest amongst the Eastern Sámi nations, such as the Skolts, Akkala, Ter and Kildin Sámi. Historical records of the Skolts and other Sámi of the area shed light on these issues. Of critical importance are the place names of the Skolts and the stories they tell. (kuva kartta - suonikyläsiida)

The Skolts call themselves "Sä'mmlaž", the Sámi. Their community can be called "siida", "sit", "sijt" or "sijdd" in Sámi. Suenjel or Suonikylä was the last of the Eastern Sámi communities that practiced their own ways of being until 1944 when the war ended this way of life for good. The Skolt Sámi situation prior to 1944 offers the clearest documentation of the Sámi society in these parts of the world, and while each of the Eastern Sámi Nations has their own social and culturally specific systems, the Suenjel stories and knowledges shed a light on land-use and occupancy and life ways which are similar with other communities of the area.

⁷² 1998

⁷³ 2000: 17

⁷⁴ Mustonen and Mustonen 2011

29



This map provides us with a view of the different Sámi families associated with different siidas and their territories in the latter part of the 1800s in the Skolt space. The western neighbours of the Skolts such as the North Sámi, Forest Sámi and Inari Sámi siidas are indicated on the map. Adapted from Mustonen and Mustonen 2011



Men of Suenjel with their sleds and reindeers ready to transport cargo in 1936. Nickul / National Board of Antiquities, Finland. Used with permission.

In the community of Suenjel prior to 1944, the family-controlled territories formed the basis of social organisation. Skolt leader Matti Sverloff writes that decision making happened in family and village meetings during life in Suenjel. This community administration guaranteed an Indigenous sovereign decision-making body for the Skolts. Waters, lands and hunting territories were family-controlled areas. If one family received less and another more, the community administration or council decided to transfer some territories to the family in need⁷⁵. This system existed to provide for a fair and equitable distribution of hunting and fishing territories.

The family ceding some of its territories to the family in need did so through oral agreements. This was a mechanism by which the community controlled the resources they possessed and tried to even out the disparities that might occur. No individuals owned territories in Suenjel; it was owned communally. The highest body of decision-making was the community council called 'sobbar'⁷⁶.

Sverloff remembers that the administration rested on the council of the headmen of each family, called 'norrös'/ 'norraz' who was also called 'sijddsovenj'⁷⁷. This council demarcated fishing territories for each family. In previous times the deer hunting territories had also been decided upon in a similar fashion. Adult males and the headmen of the community could speak up. Widows with children could also speak during the meetings. Women could be present at the meetings. These councils decided on all issues, and these family territories produced all that was needed for the families. The borders were firm but could be changed through oral agreements. These 'temporal borders'⁷⁸ mostly followed water bodies but also along the crest of fell areas.



Summer seining on Lake Moosesjärvi in the Fofanoff traditional summer area in the 1930s. National Board of Antiquities, Finland. Used with permission.

- ⁷⁵ Mustonen and Mustonen 2011
- ⁷⁶ Mustonen and Mustonen 2011
- ⁷⁷ Mustonen and Mustonen 2011
- ⁷⁸ Mustonen and Mustonen 2011

2.1. Two Cases of Documented Indigenous Resource Management in the Take of Wild Animals in the Arctic

This chapter offers two concrete and specific examples from the Canadian North on how Indigenous communities have governed and used their living environments in a manner that has enabled them to continue their autonomous existence while main-taining ecosystem resilience and health. We are using the examples of well-document-ed and community-driven oral history project⁷⁹ as a case to make the point.

The Amitturmiut Inuit⁸⁰ had a practice of letting the land cool down. The Amitturmiut live in northern Foxe Basin. In the past, they habitually used to hunt past Amittuq, southwest to Qarmaqtalik, northwest to Aggu, northeast to Isuqtuq, and east to Pil-ing⁸¹⁸².

In the early 20th century, seven main camps were occupied by the Amitturmiut: Usuarjuk, Alarniq, Iglulik, Iqaluit, Qaiqsut, Iglurjuat and Maniqtuuq. The people of Iglurjuat and Maniqtuuq were collectively known as Akiamiut. These seven camps were the main winter camps, but there were many other locations where people sometimes spent the winter. The main camps were not occupied for year after year.

Amitturmiut believed that if a camp was occupied for too long, the land became hot and dangerous. People had to move away to other areas to give the land a chance to cool⁸³: "A land could only be occupied for three years. No one can live on this land beyond the three years... That was the way they lived, always moving to another (place), never occupying one land beyond three winters.... The land itself was prevented from 'rotting' by this. Should one choose to occupy the land beyond three years, then they are bound to face peril, which might include dearth, therefore they had to follow this rule...No one would have been allowed to live in that land if it had already been occupied for an extended period. Because of this belief Ittuksarjuat requested that Avvajjaq be abandoned shortly before his death⁸⁴... His kinship had to move to a distant place around the Baffin area. He made this request from their own belief and from what he knew and had heard about certain rules regarding treatment of the land. He had requested that no one should live in it for another winter so that the land is given a chance to cool down...Part of this requirement might have some connection to the fact that the game animals in the vicinity of the land under occupancy should be allowed to replenish, as they were the only source of their livelihood. They will their land for another so that they will give the game animals in the surrounding are a chance to return without any disturbance"85.

There were an abundance of resources in the Amittuq region, only one large game animal, the musk ox, was unavailable. All of the raw materials people required could

⁷⁹ Bennet and Rowley 2004

⁸⁰ in the region which is now called Nunavut, Canada

⁸¹ Inuit people felt that they belonged to the land and they named themselves accordingly: each regional group referred to themselves as –miut, people, of their homeregion.

⁸² Bennet and Rowley 2004

⁸³ Bennet and Rowley 2004

⁸⁴ ca. 1944

⁸⁵ Hubert Amarualik in Bennet and Rowley 2004: 383-384





Coasts of Alaska are the homelands of the Eyak, Aleut, Yupiaq and many other Indigenous nations. Eero Murtomäki.



Bald eagle and crow, two birds central to the Indigenous societies of the North Pacific Rim, on the coast of Alaska. Eero Murtomäki.



Swans and mallards. Eero Murtomäki.



Salmon swimming upstream to spawn in Alaska, USA. Eero Murtomäki.

be found except driftwood, which was extremely scarce and as a result, people used bones in place of wood for such items as sleds, qajait, and harpoons. Bones could be used even as a fuel. For the Amitturmiut, the Igloolik area was known as a place where starvation rarely occurred. This was due to the large walrus herds in the area and the ice and wind conditions that created favourable hunting conditions⁸⁶.

The practice of letting the land cool down is also documented in the stories by Mariano Aupilaarjuk: "We used to get told not to live in one area too long; Inuit thought the land would carry sickness if lived in for too long or the animals would get scarce. They didn't like to live in lands that didn't have animals. They used to move camp all the time because they wanted to stay on healthy land. The land we lived on, when we have been in certain areas and come back to them, it is like being welcomed by the land. Even when there are no people on the land, there is a feeling that the land is really yours"⁸⁷.

Further, Mariano Aupilaarjuk explains the Inuit connection with the land and the importance of the wellbeing of the land and its beings. Everything that was needed by the people came from the land and the sea, everything came from them and eventually everything returned to them: "The living person and the land are actually tied up together because without one the other doesn't survive and vice versa. You have to protect the land in order to receive from the land. If you start mistreating the land, then it won't support you ...In order to survive from the land, you have to protect it. The land is so important for us to survive and live on; that's why we treat it as part of ourselves"⁸⁸.

Bennet and Rowley⁸⁹ argue that beyond the stereotype of Inuit struggling to survive in a harsh environment lies another image of their reality, which is less widely appreciated. "Inuit, like everyone else, strove to attain a comfortable, fulfilling, and happy existence on their own terms. They were as successful in attaining it as other peoples, perhaps more than some".

Also, Bennet and Rowley⁹⁰ note that starvation did occasionally threaten a community or all people in a wide area. At such occasion, an Elder might decide to stay behind when the family moved on its unending search for food, making the ultimate sacrifice to lessen the burden on others. "Inuit understood and respected the intimate relationship between sacrifice and survival"⁹¹.

The Innu are a subarctic northern harvesting and hunting culture in Nitassinan; "the land" in Northeastern Canada, spanning the provinces of Quebec and Labrador. Life in the bush is at heart of the Innu culture, each spring and fall many of the Innu travel far into the bush to hunt and fish. The Innu have their own term, Pimaatisiiwin, which translates as the 'good life' or alternatively 'continuous rebirth', to be used to describe the Innu practice of continuous balance.

89 2004

⁸⁶ Bennet and Rowley 2004

⁸⁷ Mariano Aupilaarjuk in Bennet and Rowley 2004: 121

⁸⁸ Mariano Aupilaarjuk in Bennet and Rowley 2004: 118

^{90 2004}

⁹¹ Bennet and Rowley 2004

Daniel Ashini⁹², while talking about the Innu religion, describes their hunting principles. For him the Innu religion is "based on a belief in animal masters and other forest spirits. When we hunt we must show respect for the animal masters. We place the bones of the caribou, bear, marten, mink and other creatures in tree platforms so the dogs do not eat them. We do not overhunt or overtrap areas where animals are scarce. If we do not show respect in this way, the animal masters get angry and punish us by not giving us any animals at a later date. Our elders communicate with the animal masters through dreams, drumming, steam tent, and a form of divination called Matnikashaueu. A caribou or porcupine shoulder blade is placed in the fire until it is charred and cracked. We read the marks to discover the future location of game. Our hunting culture thrives in the bush. We do things that very few non-Innu know anything about. Non-natives think they know us because they see us in the stores and at their hockey rinks, but they don't realize that there is another side to us, a side that they would have trouble understanding unless they spent time with us in the bush."

The same systems are expressed in the various fishing cultures of the Arctic. The human civilizations of the Arctic and Sub-Arctic, the cultures of the Indigenous Chukchi, Sámi, Inuit, Gwitchin, Yupiaq, Aleut, Hanti, Mansi, Yukaghir and others could not have survived all the millennia of the Arctic conditions without the help and subsistence provided by the arctic fish.



Fish is stored in the permafrost underground cellars in NE Siberia. Melting of the permafrost is a threat to these systems. Snowchange, 2012.

92 Laduke 1999: 51



Fishing is central to the Indigenous societies of northern Eurasia: From top left, burbot trappers of Lokka 1973 (Finland, photo Eero Murtomäki) and summer net fishery of Tapani Kiprianov of the Skolt Sámi in 1986 (Finland, photo Harri Nurminen), second row: Oula Aikio with a big northern pike on Lokka reservoir, around 1969-1970 (Finland, photo Pekka Aikio). Vladimir and Paula Feodoroff have harvested small salmon and grayling on Näätämö river 2013-2014. Below, the participants of the Snowchange Festival of Northern Fishing Traditions seining in Sevettijärvi, Finland, September 2014. Chris McNeave.



The Indigenous peoples of the Arctic consider very often their fish to be their brothers and sisters – that is how much they are appreciated as the under-ice fishing methods and successful harvests have meant difference between life and death in the winter conditions.

Indigenous governance systems, such as the Sámi siida which survived until 1940s amongst the Skolt Sámi were based on seasonal rotation of harvest and conservation of fish stocks⁹³. There was a self-imposed three fish per day system amongst the Skolts to avoid overharvesting⁹⁴. Certain rivers and lakes would be left alone, in some instances for years or decades to allow the fish to return after harvest⁹⁵. (kuva)

Aslak Ola Aikio, a North Sámi hunter, knew this system in the wilderness areas of Kaldoaivi in Utsjoki, Finland throughout the 1900s – thus indicating that the siida system exists partly until these times, covered a region of several dozens of kilometers in diameter and approaches the management of fish stocks holistically and by looking at the family or clan territory as a complete whole⁹⁶. The observations of Aikio challenge the notion that traditional knowledge is always 'local scale' – in the case of the functioning siida the governance extended to cover a whole region and interconnections with multiple scales, to use a modern term. (kuva)

The Indigenous peoples of the North are witnessing through their knowledge systems a similar process as outlined by scientific observations. The oceans and waterways are changing, and very rarely for the better. However, there are still spots in the Arctic where the productivity of the seas is very healthy. Some regions enjoy good catches of cod for example. Not surprisingly however these same spots, which have been saved so far from overexploitation, are now the next targets of the international fishing fleets.

Indigenous peoples and the fish have been in a relationship for millennia. Their observations are not just monitoring data or recent human observations of the situation in the local ecosystems. They are deep, old, spiritual and contain multi-layered information. However, also contemporary Indigenous knowledge as well may open up much-needed new linkages, which have not been realized before.

In the future studies of fish and the Arctic ecosystems, one of the much-overlooked source of information are the place-names of the Indigenous peoples, many of which tell precise information about spawning locations, fishing spots and other events, stories and knowledge regarding the fish. Indigenous knowledge can help us restore our respectful relationship with the fish again. TEK and Indigenous governance has its limits too – it cannot provide or form easily relationships to invisible environmental toxins such as permanent organic pollutants or a rapid acidification of water-bodies – a lake may appear to be healthy and water clean, even though the water has a very low pH.

⁹³ Mustonen and Mustonen 2011: 25

⁹⁴ Mustonen and Mustonen 2011: 69

⁹⁵ Mustonen 2012

⁹⁶ Mustonen 2012: 42-43
2.2. Loss of Indigenous Governance, Arrival of Overharvest and Preserved Knowledge of Limits

The Indigenous governance of land has to be framed in the context of what happened when the colonial period in the Arctic began. Brody⁹⁷ discusses the extermination and overexploitation of Canadian Sub-Arctic and Arctic in regional scale and in terms of trends to whole populations. He is one of the scholars who have worked across the North American Arctic from Alaska to Canada since 1970s to investigate Indigenous subsistence economies from the community level. Since his work several other scientific and TEK studies have been conducted in the region. However Brody⁹⁸ makes relevant cross-regional analysis of community realities, historical events, totality of the Indigenous cultures in the landscape and surviving practices in terms of hunting economies.

He claims that hunting has got a bad name in part as a result of the decline in wildlife caused by European activities taking bowhead whale and beluga as examples. These species, upon which the largest concentrations of Inuit depended, were almost exterminated by European and American whalers between 1800 and 1900. Also the whalers in such numbers as to deplete both Western and Eastern Arctic stocks by up to 80 percent slaughtered walrus - one of the best foods for humans and sledge dogs.

Brody⁹⁹ argues that gold rushes of the late nineteenth century and spread of agriculture and white trapping between 1900 and 1930 caused significant decline or redistribution of ungulates in the North American sub-Arctic. This is one of many such documented cases where the whole system of Indigenous governance crashed with the arrival of the settlers to their home regions, again across the region in terms of scale. Brody¹⁰⁰ goes further to argue, that amongst most Indigenous Arctic peoples the communities emphasize their outmost respect for the land and the animals. This respect has formed a successful basis for autonomic resource management in the Arctic also in the historical times.

Brody¹⁰¹ claims that the basis of this governance rests on the Indigenous worldview. The communities that Brody has worked with have indicated that in their oral histories there was no clear line separating humans from animals in the "Myth times". Some of the oral histories even indicate sexual relations between people and birds and mammals. These narratives persist even until today.

We can glimpse such interconnections in the words of the late Yukaghir-Chukchi reindeer herder Grigorii Velvin¹⁰² who was a well-known storyteller and keeper of his people's culture. He lived in the Lower Kolyma region of Republic of Sakha-Yakutia, Russia. In 2005 he told the following oral history regarding Yukaghir relationship with bear: "About relatives, about my family. Mother of my grandmother, grandmother of my

^{97 1987}

⁹⁸ 1987

⁹⁹ 1987: 65

¹⁰⁰ 1987

¹⁰¹ 1987

¹⁰² he passed on in Spring 2010

mother. They were Yukaghir. There used to be people from Alai. Especially from my mother's side, they were Yukaghir from Alai. They were considered to be 'proper' Yukaghir. Mother of my grandmother told the story that our Ancestor is the Bear. One of the ladies got married...She got lost and met a bear. The bear took her as his bride. When the bear would leave its nest, it would close the opening with a big rock so that the woman would not leave the den. Once however she managed to escape. She ran to her relatives and said: "He will come after me for sure, please butcher and sacrifice a white reindeer as an offering." Her people followed her orders, made the offering on a campsite and went away themselves. It is told that the bear took the reindeer and left the area. In a way they made a bargain. And thus she was able to escape. She gave birth to a child and that is how our family got started. This family has this oral history. Therefore the Yukaghir here, our tundra Yukaghir do not touch the bear. It is our ancestor. This is a legend that the mother of my grandmother told. I have heard it. My grandmother told it to my mother and my mother passed it on to me."¹⁰³



A reindeer has been captured during the separation on tundra, Kolyma, Republic of Sakha-Yakutia, Russia. Snowchange, 2007

According to Brody¹⁰⁴ hunters have a detailed knowledge regarding the animals they hunt. These detailed and intimate relationships are forms of personal science. They constitute a system of understanding that reveals and secures the peoples' absolute dependence on the land. Given the vast experience Brody¹⁰⁵ has on the issues, we should consider this carefully. This dependence signifies a precarious balance between animals and humans. It underlines that hunters need to kill animals in order to live. The disappearance of animals means that the people will die of starvation. Thus, dependence entails vulnerability.

¹⁰³ Mustonen 2009

¹⁰⁴ 1987

¹⁰⁵ 1987

This relationship between the hunter and the hunted has in-built equality. Brody¹⁰⁶ therefore seems to indicate that the worldview of the hunter is considerate of the animals, and yields "what materialistic Westerners consider to be a spiritual dimension to knowledge." Inuit claim that due to this relationship number of animals, which are harvested, will not diminish. Brody¹⁰⁷ forcefully argues that "in this double approach to animals, many hunting peoples express and seek to resolve a tension between respecting and killing animals. For them, respect is a system of wildlife management that includes harvesting."

In the Russian Arctic Anderson¹⁰⁸ argues that within the Indigenous Evenk people in Siberia there are limits on the harvesting of the animals in place, even if they are not codified in such an explicit manner as the wildlife management agencies prefer. Evenk hunters talk about the law of the tundra, whereby the hunter never took so many animals that only single specimen would be left. Things should be in pairs. Taking animals is also regulated by certain responsibilities. According to Anderson this is best illustrated by the respect shown for the meat taken from the land.

Many of the Siberian communities link the survival of their knowledge with the ongoing subsistence. Indigenous Mansi P.A. Vakhrushev¹⁰⁹ discusses the question of traditional Mansi livelihoods and the relationship between the Mansi and their local ecosystems. His approach to traditional Mansi fishing shows that hunting and fishing activities are being used in the reproduction of Mansi culture, thus illustrating the reciprocal nature of the relationship, one acts as a saviour for the other, irrespective of which is which: "Society cannot consist just of surgeons and professors. Somebody has to catch fish. Our way of life is such that we never catch more fish than we need. If people catch fish in normal way, there will always be fish tomorrow. We have no conflicts with newcomers as long as they respect our rights and do not fish in our waters. The local indigenous traditions will not die because someone always has to catch the fish"¹¹⁰.



Small salmon of Näätämö river, Finland. Snowchange, 2012

- 106 1987
- ¹⁰⁷ 1987: 77
- 108 2000: 126
- ¹⁰⁹ Sillanpää 2008: 159
- ¹¹⁰ in Sillanpää 2008: 159

As P. A. Vakrushev from the Mansi people noted that "the local indigenous traditions will not die because someone always has to catch the fish", the traditional hunting and fishing practices are acts of continuing, strengthening and reproducing cultures. Very often the people who are still engaged with the traditional activities remark that should all these activities cease or subsistence species disappear, people and their distinct cultures will face peril. "If there are no reindeer herders, our people will disappear" is a saying by the Kola Sámi in Russia. "It is in our blood to be salmon fishermen" is an anecdote by the Inupiaq in Unalakleet, Alaska¹¹¹.

The Nenets people are one of the most Arctic societies in the world – on the Yamal Peninsula they extend far beyond the 70th Parallel in their nomadic life. They have often been mentioned as a people who has been amongst the most successful to resist modern state pressures while maintaining their own civilisation¹¹². Incidentally they are at the very heart of the contemporary oil and gas boom in Siberia. M.I. Ledkova puts an emphasis on how the Nenets have always treated nature with care. Whenever they had gone hunting or fishing, they only took as much game and fish as they needed. They believed that in this way they maintained the necessary balance between man and nature¹¹³. Nenets Rosa Kanukova shares her memories of gathering eggs of ducks and partridges: "If there were seven eggs in the nest, we would take four and leave three. We did not know the word ecology, but we just always did it this way"¹¹⁴.

According to Aleksei Pichkov¹¹⁵, the Nenets culture is fundamentally associated with the land. Aleksei himself had never wanted to leave the place where he had been raised. He also had his own quota system in place when ever hunting or fishing. For example, when hunting geese, he would never shoot more than two since that was all he needed and when fishing, two or three fish were enough for him. He says that his system was aimed at preserving nature.

In many cases, people are still very aware of the traditional rules concerning hunting and fishing, however, these rules are not always being followed in the present time due to various reasons. Market economy creates a need for specific items such as walrus tusks, and this easily leads to overharvest of walruses where other parts of the animal are discarded unused. There is an example of such overexploitation of walrus from Igloolik area in 1970s where Elders' committee successfully was organised to stop such behaviour¹¹⁶.

Tatayana Achirgina discusses the situation in Chukotka. "All Eskimos [Siberian Yupiaq] emphasize their connection with the sea – boys have dreams of becoming hunters. The sea gives birth to our whole life. There are, however, some disturbing changes. For example, hunters have often killed walruses only for their tusks and not for living – that's sacrilege". Raisa Mihkaylovna Zotova talks along the same lines as she discusses traditional Eskimo [Siberian Yupiaq] culture and the survival of Eskimo [Siberian Yupiaq] beliefs: "Those beliefs hold never to do harm to nature; they don't ever take what's

¹¹¹ Mustonen and Mustonen 2009

¹¹² Golovnev and Osherenko 1999

¹¹³ Sillanpää 2008: 199

¹¹⁴ Sillanpää 2008: 199

¹¹⁵ Sillanpää 2008

¹¹⁶ Freeman and Carbyn 1988

unnecessary. Now that principle is broken sometimes, because life is so very hard, but nevertheless, the greatest part of the beliefs is preserved"¹¹⁷.

Already in the 1980s Riewe and Gamble¹¹⁸ have noted that "In Aboriginal times the Inuit actively managed their wildlife resources through a complex set of beliefs and taboos, harvesting and storage techniques, sharing systems, and by adopting a dispersed and mobile settlement pattern that served to decrease their impact upon wildlife resources." Further, there are a variety of examples available on how despite disruption and change in the post-contact era, Arctic peoples actively continue to use customary laws and practices in resource management¹¹⁹.

Sarah James, Gwich'in from Alaska has stated: "We are the caribou people. Caribou are not just what we eat; they are also who we are. They are in our stories and songs and the whole way we see the world. Caribou are our life. Without caribou we wouldn't exist"¹²⁰. This thinking encompasses Indigenous homelands.



Loons. Eero Murtomäki.

- ¹¹⁹ see for example chapter 7, AHDR
- ¹²⁰ in Williams 2009: 189

¹¹⁷ Sillanpää 2008: 568

¹¹⁸ 1988: 31

3. Conclusions

3. Conclusions

We have summarized the Indigenous being in their world in the Figure 1. It is by no means a complete view, but one that tries to draw together the various voices and oral histories to provide a view of a cyclic world in which the Indigenous societies of the Arctic live. Similar documentations have been tried in the past¹²¹. All of them are flawed, as living cultures cannot be properly represented in a model. However, we offer this chart as an indicative figure for those that try to conceptualize the total life world of Arctic Indigenous peoples while recognizing their heterogeneity.

We have illustrated in this introduction a view of Indigenous societies and their perceptions of the environment and at the same time portrayed some examples of Indigenous governance models of ecosystems from the Arctic. Much has been omitted; we have not included a discussion on the sacred places of these societies¹²² or a deeper reading of the spiritual connections as the main focus of the Compendium deals with the specific topic of "biodiversity and Indigenous peoples". Emphasis has been on the oral histories of the peoples themselves.

Similarly the gender-based views on biodiversity have not been discussed at length, even though we have tried to illustrate the issues by including both the women and men from the communities in this Compendium. Others might have wished to see a throughout survey of biodiversity issues and the varying legal and political situations in the different countries of the Circumpolar North. We have not produced such survey because we wished to portray and allow the carriers of the cultures themselves to express and explore the topics internally and directly from the communities.

In a nutshell it is crucial in our opinion to understand that the Indigenous societies of the Arctic have their own, surviving worldview and positions and interpretations regarding the universe, which in some ways are completely different from the "Western" perceptions of the same phenomena. Yet, as Alessa¹²³ argues, both science and TEK are human systems and they have their similarities too. If we accept this as a principle point of departure we may perhaps have a chance at the "cross-civilizational" dialogue that Robbek¹²⁴, Grand Chief Point and others have called for.

Indigenous peoples have been heavily involved in asserting their views on Arctic biodiversity in many forums, and have asserted and continue to assert their views in many ongoing policy-making processes. Their views are now recognized as part of the formal environmental decision-making. It is time we initiate a respectful and all-encompassing dialogue between arriving societies and the Indigenous peoples on how to manage and preserve the Arctic for generations to come.

¹²¹ Berkes 1999, Zavalko 2004

¹²² Haruchi et al. 2002

¹²³ 2009

¹²⁴ 2007

In the next section, titled "Life in the Cyclic World" the various community oral histories of biodiversity and change can be found. Most of them include the Sámi home areas of Fennoscandian North¹²⁵ as well as the Northern territories of Russian Federation.

The materials position Eurasian TEK first into a historical context in the different countries where the permanent participants¹²⁶ live. Much emphasis is put on the Siberian context due to the vast size of the region. Then different disturbances and damages are reviewed which impact the lands, waters, and air of Eurasia. Some of the industrial exploitation such as mining, hydropower and oil and gas production has permanently wrecked Indigenous lands, cultures and practices. Coastal and river-wide issues are explored too. We then move to the observations that various communities have made regarding mammals, fish and birds. In conclusions we summarize the observations and messages collected for the ABA and presented here in this Compendium and offer some recommendations for the way ahead.



¹²⁵ Norway, Sweden, Finland

¹²⁶ i.e. the Indigenous peoples of the Arctic



1. "All Change is Observed"

Compendium illustrates through community-based Indigenous oral histories examples of change – how the lands, waters, air and animal species are being observed by the different nations of the region. These cases from the communities offer a unifying and holistic view, rather than the sectoral and species-based views though which they manifest in the actual ABA report and chapters.

Again, it is important to note, that the divisions of what the Arctic is and how it is defined here include the taiga, or (north) boreal in addition to the tundra peoples and communities, following the mandate from the Permanent Participants of the Eurasia¹²⁷. The observations presented here are by no means exhaustive.

Similarly there exists a large body of scientific documents and historical descriptions about the Indigenous communities of the Eurasian North – the materials, such as articles, monographs and other scholarly publications derived for this Compendium have been chosen using a method that follows the latest in Indigenous scholarship – we have put the focus on a community-based partnership¹²⁸ with the communities themselves, or in some cases¹²⁹ on the researchers and Indigenous organisations working with the communities, to present the oral histories and authentic voices of the people themselves.

Not all people will agree with such a methodological choice – the notion of a community-based and culturally-appropriate engagement with the Indigenous societies of the Eurasian North is an emerging trend in scholarship regarding traditional knowledge and biodiversity issues as well as climate change studies¹³⁰. It has been welcomed, especially in questions of large-scale, human-induced ecosystem changes¹³¹.

Secondly the method places a lot of emphasis on oral histories of the peoples themselves, especially in those communities where the transfer of knowledge rests still on the tradition, such as in the nomadic societies of Sakha-Yakutia¹³². The evolving international Indigenous scholarship¹³³ strongly argues for community-based view,

¹²⁷ RAIPON, Saami Council

¹²⁸ see more in Preface

¹²⁹ Sillanpää 2008

¹³⁰ Helander 1999, Smith 2005, Mustonen 2009

¹³¹ Mustonen et al. 2010

¹³² Robbek 2007

¹³³ Smith 2005

especially on the questions of biodiversity. Indigenous scholars¹³⁴ make the argument, that the Indigenous societies located in the Eurasian North, have their own knowledge of nature and indeed, the world. The survival of this Indigenous traditional mind and cosmologies in all of their divergent forms and languages is as crucial as the survival of Arctic biodiversity.

Our main engagement in this Compendium rests on the statement from the Introduction – "all change is observed". Flowing from Figure 1., we concentrate on this main body of TEK materials on the notions of forced change and unknown, disturbing change. Change in itself is the driving force of the Indigenous life-worlds in the Eurasian North – in short it's a life in the cyclic world. Slezkine¹³⁵ describes this: "for life to continue, one had to give some of one's own and receive something else in return. The Master of the Waters brought his riches and was fed the fruits of the Earth; the animals who came to be killed received food for their souls; and a lineage that married off a woman obtained bride wealth or labour. All things had their spiritual owners or counterparts who needed to be placated, propitiated, or bribed¹³⁶. Every successful kill or catch was a gift, and every slaughter a sacrifice."

A key question for the survival of the Indigenous societies of the region is the capacity to respond to the disturbing, often imposed changes in their worlds. Some of the phenomena of today, such as the multi-faceted impacts of climate change on the Arctic Indigenous societies, are new changes. Weather lore and change are discussed only indirectly in this Compendium, given the lack of space.

However we should recognize it as one of the main drivers affecting the region¹³⁷ as is evident in the words of Alexey Nikolayevich Kemlil, a Chukchi reindeer herder from the Turvaurgin community in Sakha-Yakutia, who reports that "all of the tundra is on the move now. Many forest animals are coming to tundra now. Even the moose have moved to tundra"¹³⁸. Similarly the reindeer herders of the community report that the capercaillie have started to appear on the tundra, away from the forest zone and their amounts have increased¹³⁹.



In Finnish Lapland the willow grows up to be as tall as a man. Eero Murtomäki.

- ¹³⁴ Helander 1999
- ¹³⁵ 1994: 7
- ¹³⁶ usually by a shaman
- ¹³⁷ Arctic Council 2005
- ¹³⁸ Mustonen 2007
- ¹³⁹ Mustonen 2007

1.1. Historical Context of Change in the Indigenous Societies of Eurasia

Outsiders and members of the mainstream societies have explored the histories of the Indigenous societies of the Eurasian North, especially Russian Arctic, since $1200s^{140}$, in some cases earlier. Today the Eurasian North consists of Norway, Sweden, Finland and Russian Federation. When we try to understand the northern societies of the region today, the Indigenous observations cannot be removed from the larger, imposed colonial process that has taken place in the region since 1400s, but more so between 1900-2012. To offer context we agree with Slezkine¹⁴¹ in his historical analysis that:

"Over the last one thousand years, East Slavic agrarian society with its increasingly elaborate social and legal institutions has expanded to include and partially absorb numerous hunting and pastoral groups. No longer "foreigners" but still alien insofar as they remained "unsettled", these peoples have repeatedly posed a challenge to government officials, Orthodox missionaries, and assorted intellectuals seeking to define Russianness and otherness to both Russians and others. ... The foragers of the "northern borderlands" have rarely threatened the settled/Christian/civilized world and have remained invisible in most versions its [Russias] past. Yet of all the non-Russian subjects of the Russian state and of all the non-Russian objects of Russian concern, it is the circumpolar hunters and gatherers who have proved the most difficult to reform and conceptualize. From the birth of the irrational savage in the early eighteenth century to the repeated resurrection of the natural man at the end of the twentieth, they have been the most consistent antipodes of whatever it meant to be Russian. Seen as an extreme case of backwardness-as-beastliness or backwardness-as-innocence, they have provided a remote but crucial point of reference for speculations on human and Russian identity, while at the same time serving as a convenient testing ground for policies and images that grew out of those speculations."

It is important to remember that environmental and climatic change does not happen in a vacuum, instead most of the disturbing change in the Indigenous communities is a result of the events of the last centuries by the European nation-states. Scholars such as Slezkine¹⁴² offer in addition to throughout historical review a crucial philophical positioning of Indigenous peoples in the evolution of the Russian state through the history. Next we take a summarized look at the situation in the countries of the region in the context of Indigenous (IK) or Traditional Ecological Knowledge (TEK).

1.2. Russia

The vast territories of the Russian Federation with her 89 subjects came to existence in the political transformations of 1991. Majority of the last nomadic Northern Indigenous peoples' communities reside in the Russian periphery, which is the largest physical landmass of the Arctic.

¹⁴⁰ Slezkine 1994: 2-39

¹⁴¹ 1994: ix

¹⁴² 1994

Russia is a society still in process of transformation. The unstable years of 1990s have been replaced with quasi-authoritarian regimes of the 2000s and 2010s, under presidents Putin and Medvedev. Since 2000, after the abolishment of the Ministry of Environment on the federal level, uncertainties of nature protection, Indigenous rights and conflicts with oil and gas exploration have emerged as significant processes for the Indigenous communities.

Given the sheer size and significance of Russia to the Eurasian Indigenous societies, it is worth investigating in brief some events of the colonial process in more detail. A throughout view of the relationships between the Indigenous peoples of the North and the varied manifestations of the Russian state has been provided by Slezkine¹⁴³.

As opposed to the Western European powers and their interest in learning all about the new colonies, at first the Russian expansion to the North, conducted by the Cossacks, was mostly to do with economic profits, and securing those profits, not to convert or disrupt the societies themselves in the 1600s: "The Cossacks were to find out if a new 'new river' had any potential as a source of 'profit for the sovereign' and if it did, to secure it by imposing tribute on the local 'foreigners'"¹⁴⁴. Role of science was, early on, to provide some information about the natives and their customs to improve economic efficiency. In a marked difference, the early intruders to Siberia and North did not impose new place names, as opposed to the situation in North and South America and elsewhere¹⁴⁵.

The Indigenous societies were made to pay "iasak" taxes to the state, a system that existed for centuries in the North. In the 1700s the attention, partly driven by the reforms of the Peter I, shifted to defining the various Indigenous societies into a "civilizational" hierarchy¹⁴⁶, nomads and hunters being on the lowest possible levels, or "crude"¹⁴⁷. At the same time, trade intensified, and resulted in many of the communities being on constant debt to the traders – in this way the state secured large systems of fur trade and fishing spots. In the Northeastern and Eastern parts of Siberia, China and Americans also played a role in the trading networks all the way to early 1900s¹⁴⁸.

Slezkine¹⁴⁹ argues that the arrival of Russian state and its agents had profound impacts on the taiga and tundra societies in the 1700s and 1800s, even though different minorities exerted influence over others too: "still, it was the non-native influence that had the most profound economic and social effects. Disease, the introduction of new technology, the destruction of forests, the extermination of animals, and the various administrative pressures forced large numbers of people to migrate to new areas or modify their economic activities". There were some exceptions¹⁵⁰, such as the Chukchi "who remained "fully independent until well after the collapse of the Russian empire"¹⁵¹. In the late 1800s and especially early 1900s the most changes resulted from

¹⁴⁸ ibid. 100-101

¹⁵⁰ Mustonen 2009

¹⁴³ 1994

¹⁴⁴ ibid. 38

¹⁴⁵ ibid. 40

¹⁴⁶ compared to the Russians themselves, who were "perfect"

¹⁴⁷ ibid. 56

¹⁴⁹ 1994: 102

¹⁵¹ Slezkine 1994: 103

intensified, and often uncontrolled arrival of settlers to the peripheries. The recurring revolutions of the day also influenced the instability of the situation. Especially the October Revolution caused great changes to trade and land use: "trade broke down completely in most areas. The Arctic and subarctic areas were isolated from the rest of the country, and various native groups were isolated from each other. There were no guns, ammo, nets, kettles, flour, oil or sugar. There were no more fairs: the nomads withdrew to distant tundras and lived off their reindeer"¹⁵². Reindeer herds across the region collapsed, in some regions up to 75%.

The early Soviet years included more progressive debates in the young administration regarding policies of the Indigenous peoples, Committee of the North in its different manifestations argued for careful approach to the Indigenous communities. On the ground "advance of the peasants, disappearance of animals" and other problems continued¹⁵³. Many of these policies came and went. Attempts were made to convert the Indigenous societies into Soviet-style collectives, and various ethnographers and activists travelled to the tundra to meet with the communities in the 1920s and 1930s.

But then Stalin resumed power and large waves of violence emerged from Moscow during the late 1920s and 1930s, in form of purges and campaigns to quickly Sovietize the natives. "Kulaks", rich peasants, were "found" also amongst the Indigenous communities and they were often persecuted as enemies of the state. For example, in Kolyma, it was determined that 73 percent of the people were "kulaks"¹⁵⁴. This process was connected with the rapid collectivisation of all peoples, reindeer, and equipment. Fishnets and traps were lost to the state or collective farms, sometimes without any compensations¹⁵⁵. Slezkine argues that "the whole culture of the native northerners was hostile to the revolution and progress"¹⁵⁶.

Shamans, the Spirit People of the Indigenous communities are the most important carriers of the traditional culture. Stalin's purges targeted these individuals in 1930s with a brutal force, ranging from use of physical force and violence to brainwashing in the form of "revolutionary missionaries". Slezkine¹⁵⁷ argues that "the Khanty vision of the apocalypse was of course the bright future according to the cultural revolutionaries. The encounter of these two interpretations led to numerous arguments, clashes and misunderstandings. The kul'tbazy¹⁵⁸ and the red tents – these harbringers of things to come – were not welcome: "You are wasting your time in coming here. We don't need any red tents. Our fathers and grandfathers didn't know of any red tents and they lived better than we live now. We'll manage without them, too."

The violence reached its peak in 1930s, and triggered Indigenous peoples to tell the arrivals things in a straightforward manner, as one Khanty lady said: "Why are you Russians trying to prevent us from living our way? Why do they take our children to school and teach them to forget and to break up the Khanty ways? They'll take our

- ¹⁵³ ibid. 165-166
- ¹⁵⁴ ibid. 199
- ¹⁵⁵ ibid. 196-197
- ¹⁵⁶ ibid. 199
- ¹⁵⁷ 1994: 230

¹⁵² ibid. 132-133

¹⁵⁸ cultural bases

children to school, and then take them to Leningrad. There they'll forget their parents and won't come back home. You like children, for example, so how would you feel, if they took away your children and taught them to despise everything about the way you live? Would it make you feel good?"¹⁵⁹

After the Second World War, the industrialisation proceeded rapidly in the North. This process was fuelled by the later Stalin-era method of using forced labour in the Arctic and other peripheral locations¹⁶⁰. Many Indigenous individuals, sometimes whole communities, disappeared, were executed or otherwise damaged during the period from 1930s to 1950s¹⁶¹.

For example on October 11, 1937, men from the NKVD arrived to Ozerko, a small Sámi village on the Kalastajasaarento¹⁶² Peninsula in Murmansk region. Yegor Andreyevitch Snaulin, a Sámi, as well as his three sons, Yegor, Nikolai and Matvei were arrested. The last of the sons, Yuri, was arrested ten days later. All of them were executed, imprisoned or had disappeared¹⁶³. Soviet regime composed songs in glory of the Arctic conquest:

Happiness came into tundra And brought warmth A Russian visited our tent And spoke about Moscow In out tent we read books by all by ourselves Who gave us such a good life? Our dear Our best friend, Our Sun – Stalin!¹⁶⁴

After Stalin passed away in the early 1950s, discussions continued in the Soviet North, whether the Indigenous peoples should be settled down or the nomadism "reformed".¹⁶⁵ Plans were drawn to make the nomads produce grains and other agricultural products. Simultaneously the northern ecosystems had undergone great changes in short period of time. Kolyma road network increased tenfold, Noril'sk nickel combine was in full swing, and "north-western Siberia emerged as the largest oil and gas-producing centre in the USSR and thus the focus of a new nation-wide development strategy."¹⁶⁶

The oil and gas exploration has been a persistent threat to the survival of the Indigenous societies of the Russian North for decades. Impacts to the local biodiversity have been significant. Yuvan Sestalov¹⁶⁷, a famous Mansi author and a poet from Siberia has described the destruction of the taiga in the poem "Thought of a Capercaillie on a

¹⁶² Poluostrov Rybatzi

166 ibid. 337

¹⁵⁹ Slezkine 1994: 237

¹⁶⁰ ibid. 237

¹⁶¹ Mustonen and Mustonen 2011: 92

¹⁶³ ibid. 92

¹⁶⁴ ibid. 299

¹⁶⁵ Slezkine 1994: 299

¹⁶⁷ 1976: 71-72

Larch Tree":

I belong to the Mansi I am Capercaillie Bird of the Voguls I am very sad Because the Taiga is covered over From the smokes of the fires

There is ash in my ears Smoke in my eyes To where I could escape This destruction?

As a sacred bird I believe in the wisdom of the Fire The Sacred Tree keeps me On his branches

Seven colourful pieces of cloth Has been hung from the branches. Still the larch-bark curls up Into seven tongues.

When he was chasing game The hunter travelled here He brought in front of me a hare As a sacrifice.

Is my destiny therefore Mine – being the Sacred Bird -Sitting at the top of the Sacred Tree To burn in the Sacred Fire?

During the 1950s and 1960s the Indigenous communities had become "irrelevant to the industrialization effort"¹⁶⁸. They were economically unviable and useless. Many villages were closed down in the 1960s across the Arctic zone. For example in the Khanty-Mansi Autonomous District the number of villages dropped from 650 into 126, on Sakhalin Island all Indigenous communities were closed down as a part of this centralization policy¹⁶⁹.

Nomadic lifestyle was reformed too. Herders had to adapt to "nomadism as a production" as opposed to a way of life. This meant that the organization of professional "brigades" for the reindeer herding across the region¹⁷⁰. In the Soviet descriptions of the time the Indigenous societies had arrived towards "civilization at last". Or as Slezkine

¹⁶⁸ Slezkine 1994: 338

¹⁶⁹ ibid. 340

¹⁷⁰ ibid. 341

describes this moment: "A former shaman throws his wooden idols under a tractor to help the Russian driver get out of a ditch; a dying hunter ignores an ancient prediction to lead his geologist son to a rich mineral deposit in the tundra; and old kolkhoznik fishes in a taboo spot and comes back with a spectacular catch", and so on¹⁷¹. Total equality had, officially, arrived. Individual characters like Ulukitkan, a wise Evenk person and Dersu Uzala, populated the Soviet minds with stereotypes and images of the Indigenous societies.

Much of this trend continued to mid-1980s when things began to change. As a part of the perestroika period initiated by Gorbachev, the vast ecological damages and the real situation in the Arctic communities began to emerge. "Almost overnight the reading public discovered that the Indigenous economy as a whole was a mess, that resettlement had been a disaster, that the elimination of nomadism had been a sham, and that reindeer herding was steadily declining"172. Weapons were controlled by the state. restrictions on Indigenous harvest prevented traditional food gathering or fishing activities and so on.

Slezkine¹⁷³ argues that between 1960s and late 1980s: "reindeer herds had been depleted 25 percent, Amur basin fish resources by 95 percent; and the



The Sacred Tree of Tuora-Kel, central Sakha-Yakutia. Tero Mustonen.

total fishable waters in Khanty-Mansi district by 96 percent. During the years 1976-77 1.2 million hectares of reindeer pastures had been destroyed in the Yamal-Nenets Autonomous District: In 1986, 900 tons of oil had been spilled in the Harutei-iaga river; and in 1987, 6 tons of copper, 10 tons of arsenic, and 27 tons of zinc had been dumped into two Amur tributaries. Every year, the Amur paper mill poured 50 million cubic meters of water into the river, and the Nenets Autonomous District had already lost 25 percent of its reindeer pastures." In late 1980s every other native who died, did so due to injury, murder or suicide, most of which were alcohol-related.

171 ibid. 354

¹⁷² ibid. 372

¹⁷³ 1994: 373



Symbols of the Soviet power remain in the administrational area of Cherskii, Lower Kolyma, Sakha-Yakutia, Russia. Snowchange, 2006.



Given the freedoms of the reforms and the disbanding Soviet Union in the early 1990s, Indigenous leaders formed the Association of the Numerically Small Peoples of North in 1990¹⁷⁴. Many rights and reforms were initiated during this period and the organisation evolved eventually into RAIPON of today. Many prominent authors, such as Sangi, tried to develop systems of land use and reservations as mechanisms to protect the traditional governance and land use in areas where it was still feasible. The times allowed for direct criticism of the Soviet policies of the Indigenous peoples and the restoration of national identities began across the region.

The results of the emergence of the Indigenous "re-birth"¹⁷⁵ have varied across the great length of the Eurasian North. This space does not allow all of the various processes to be explored. Several problems persist from the viewpoint of preservation of traditional mind – "thousands of young northerners were said to have lost their ethnic identity along with their mother tongue and traditional skills" by the 1980s¹⁷⁶. To bring these themes into a relevant bridge with ABA, in short the best TEK resource in the Russian context is the survival of Indigenous communities on the land across the North.

Legally, the Constitution Act of 1993 as well as the several Federal laws on Indigenous rights inside Russia, provide some windows of opportunity. However, it is the self-determined drive of these communities to return to taiga and tundra since 1991 that has enabled them to usher in a 'neo-traditional' time as late Pika¹⁷⁷ called this process.

The various laws have allowed several reindeer communities in the Russian North to establish 'Obschinas', or family/clan based territorial units on their subsistence areas. These obschinas do not own their territories, but in some regions have had the rights to exclusive use of these lands.

The Federal Law No 82-F3 1999 defines the obshchina¹⁷⁸ in the following way:

Obshchiny and other forms of social self-governance are forms of self-organi sation of individuals, belonging to the Numerically Small Peoples, united on the basis of blood kin relations (family, kin) and/or territorial-neighbourhood principles, created with the aim to protect their original territories of inhabit ancy and to protect and develop their traditional life-ways, economies and culture¹⁷⁹.

Fondahl et al.¹⁸⁰ argue that in the period since the fall of the Soviet regime Indigenous leadership has called for a reform of relationship between the state and the aboriginal peoples. The target of these arrangements would be "optimum land tenure organization". The establishment and creation of the obshchina communities would be the engine for this Indigenous territorial reform.

- ¹⁷⁹ Vladimirova 2006: 320
- 180 2001

¹⁷⁴ ibid. 378

¹⁷⁵ Robbek 2007

¹⁷⁶ Slezkine 1994: 383

^{177 1998}

¹⁷⁸ spelling varies

Fondahl et al.¹⁸¹ also position the possibilities of the obshchinas into the wider fabric of the Russian context: "Aboriginal 'land claims' affect the future geographies of resource development, and can play an important role in the tug-of-war between regional governments and Moscow, as well as sculpting the opportunities of aboriginals to determine their own futures." However the development of the legal status of such communities depends on the larger direction of the Russian society¹⁸². Recent policy focus on exploitation of the northern resources¹⁸³ seems to indicate a trend of lost opportunities for the Indigenous land tenure and communal rights.

It is thus important that the current context of Russian and Fennoscandian Indigenous realities is defined as emerging. Of interest here are the continuing surviving nomadic and semi-nomadic civilizations of Eurasian North. They do not possess formal legal recognitions to a large degree, but are maintaining their own systems of knowledge and being with the surrounding ecosystems¹⁸⁴.

2006-2016 period has seen new transformation and centralisation of land and resources to Moscow, federal centre. It puts the survival of the legal tools allowed inside the obschina system under question. There are no clear results of this process yet, other than the fact that there are several local conflicts inside the Russian North on these questions.

Since late 1980s, the Russian Association of Indigenous Peoples of the North, Far East and Siberia – RAIPON, has been the primary organisation in the federal level to advance Indigenous peoples agenda. Its offices are located in Moscow. RAIPON has regional member organisations, which organise annual meetings and consultations with local Indigenous leaders.

There are some problems with representation¹⁸⁵ and consultation, but RAIPON remains a significant network to address these questions. It has as well participation in the Arctic Council structure as a permanent participant. Latest strategy of RAIPON is to influence the development of issues by integrating with ministries and governmental structures in the new context as well as large international participation in many active projects. It is important to say however that RAIPON does not receive state funds and thus still exists as an independent actor¹⁸⁶.

In the Russian North there are some regional Indigenous peoples organisations, such as the Association of the Kola Sámi, Yasavey of the Nenets Peoples and Inuit Circumpolar Council-Russia for the Chukotka Yupiaqs. Especially Yasavey has demonstrated significant participation in resource extraction and land conflict issues over the past 15 years.

Russian Academy of Sciences has its Institute of the Indigenous Peoples in Yakutsk, Republic of Sakha-Yakutia and several other institutes and organisations which have

¹⁸¹ 2001

¹⁸² 2001

¹⁸³ Mustonen & Mustonen 2011

¹⁸⁴ Balzar 1996, Fondahl 2001, Anderson 2002

¹⁸⁵ few women, few reindeer herders

¹⁸⁶ Between 2012-2016 the independence of RAIPON from state structures has become questionable.

worked and continue to work with Indigenous Knowledge. Success of these projects and activities varies. Arctic Council, Northern Forum and UNEP have, with a variety of degrees, succeeded in climate change and Indigenous projects inside Russia.

One important project is worth mentioning here, which is the UNEP/GEF sponsored ECORA Project in Nenets Autonomous Region, Chukotka and Republic of Sakha-Yakutia. Among its goals are conservation of biodiversity; providing reliable means of support for the local population, including the Indigenous peoples; minimization of biodiversity threats, minimization of fragmentation and degradation of natural ecosystems and preserving natural territories in their natural condition. ECORA ended in 2010 but could be a future template for Indigenous land governance combined with the best practices of conservation.

The best adaptation capacity for the Indigenous communities rests in their autonomy to produce food for their peoples, which means subsistence and traditional livelihoods even under the rapid, new conditions of change. Indigenous communities have to struggle against bad policy, greed, mega-projects and other social and political issues in addition to climate and weather changes.

As an example of these multi-faceted, simultaneous processes the Evenk of Iengra, Sakha-Yakutia who have taken the full force of Soviet gold and coal mining in their territories in the past, are now under impacts from hydropower and Transneft oil pipeline constructions. This all comes on top of new weather and changes in snow and ice conditions.

An Indigenous leader from Sakha-Yakutia, Vyacheslav Shadrin, Head of the Council of the Elders of the Yukagir Peoples feels that throughout the years of traditional land use Indigenous peoples have created a specific system of interaction with nature; they have developed ecological ethics, which is now threatened by industrial development and market economy. Alienation of Indigenous peoples from their lands for coal mining resulted in reduction of reindeer pastures; moreover, these lands are not re-cultivated¹⁸⁷.

Additional difficulties are caused by the impossibility of foreseeing the weather for more effective choice of herding routes. Hunters face difficulties caused by late freezeup. They are not able to timely go to their hunting areas; transportation routes become longer due to having to circle the lakes; autumn movement of fur animals is missed; late and deep snow causes fast wearing of BURAN snowmobiles and their spare parts¹⁸⁸; many hunters are left without harvest due to changed migration routes and terms of wild reindeers, geese and ducks. The lives of hunters who go hunting without waiting for the ice to become thick enough are in danger. Accidents with hunters are more frequent.

Fishermen also face difficulties. Changing water regime causes changes in the terms of summer and autumn fish run; composition and population of fish are changing; some fishy lakes are disappearing due to the melting of permafrost; ice fishing is sometimes

¹⁸⁷ Mustonen 2009

¹⁸⁸ snowmobiles, variators, collars, buckets, etc

missed due to late freeze-up. Accidents with fishermen have also become more frequent due to bad ice conditions.

Indigenous peoples in the Siberian communities explain these processes in a very interesting way according to Chief Shadrin. Some local people say human influence on nature brings forward ecological factors – a lot of machines and cities that pollute the atmosphere, less forest due to clear cuts and fires, breaking ecological balance. According to the people in Sakha-Yakutia for example the nature gave up "helping" and "trusting" people, "the spirits are angry" because of breaking traditional taboos, especially the one for gathering of mammoth bones¹⁸⁹. Some claim that these are cyclic recurrence of the occurring events according to Chief Shadrin - again, a viewpoint from life in the cyclic world.

In conclusion, the Russian North preserves the last full nomads of the Arctic – the Nenets, Chukchi, Even and Evenk to mention a few peoples. Simultaneously Russia, given its problems in society and needs of reform, enters the second decade of the 21st Century in a state of flux – only uncertainty and change are constants.



Pyotr Kaurgin, a Chukchi reindeer herder, stands on a collapsed permafrost site. The Chukchi have documented these sites on their own as the melt proceeds. Pyotr Kaurgin, 2007.

¹⁸⁹ Mustonen 2007

1.3. Fennoscandia: Norway, Sweden, Finland and Northwestern Russia

In this context Fennoscandia means the three nation states, Norway, Sweden and Finland. Denmark, Greenland, Faeroe Islands or Iceland are not covered here. Space here does not allow a full exploration of historical analysis such as Slezkine¹⁹⁰ for Russia. 1808-1917 Finland was a Grand Duchy of Russian Empire so the same state policies on Indigenous peoples applied as in Russia proper.

'Sapmi', homeland of the Indigenous Sámi peoples, is located in Northern Fennoscandia. There are several Sámi nations, or groups, which have specialized in their particular territories and ecosystems. This is best reflected in the variety of Sámi languages around Fennoscandia. So the best human resource of Indigenous knowledge in the region rests with the survival of Sámi languages, some of which are endangered or threatened. Such is the case with the Inari Sámi or Skolt Sámi languages. North Sámi, the biggest of these languages, is likely to survive at least for the next 20 years.



Skolt Sámi children from Sevettijärvi meet with President of Finland mr. Sauli Niinistö (right) and mrs. Jenni Haukio, wife of President, in Autumn 2015 in Turku, Finland. School of Sevettijärvi, 2015. Used with permission.

Due to varied political histories of the three nation-states of the region, the human resources regarding the Indigenous Knowledge are varied as well. In the case of Sweden and Norway, it is only the Sámi who have rights to conduct the age-old reindeer herding, which is a resource for the Sámi. In Finland, due to different social and political context, Finns also have reindeer herding cooperatives, paliskunta¹⁹¹ as well as the Sámi, even though there are marked differences in the deeper substance of these practices. One of the powerful organisations to do with Indigenous Knowledge is the state-established Association of the Reindeer Herding Municipalities of Finland.

Political rights of the Sámi peoples have been recognized in various ways in all of the three countries. Norway is often mentioned to lead the process, due to new legislation of Finnmark Act from 2003, which allows the Sámi some measurable participation in land use and resource decision-making. Sweden is formulating her Sámi policies. Finland is the worst of the three countries if we measure the implementation of Indigenous rights due to the special identity and settlement histories of Northern Finland.

Constitutional Acts of the three countries provide the Sámi peoples with rights to language, culture and a way of life. Marked differences surface immediately after this commonality, however. Land or water rights have not been recognized in Finland, and since the events of Autumn 2007 and Spring 2016, where clear cutting threatened key Sámi forest ecosystems, many of the Sámi have felt that renewed cultural genocide and assimilation is under way. Ministries of Justice, Environment, Foreign Affairs and Forestry are usually the ones, which have responsible roles for the Sámi issues in Oslo, Stockholm and Helsinki.

These Ministries have publicly endorsed a joint Nordic Sámi Convention as a common policy goal to deal with the Indigenous peoples in the three countries. Currently this process has been stalled. In Finland over the 2011-2016 period a new process of rede fining who a Sámi person is has changed also the national debate. Outcome of this turn of events remains open.

All of the three nation-states have established Sámi Parliaments, which are the highest ruling self-governance bodies for the Sámi. In addition to this, the Sámi Council, consisting of the Sámi living in four countries in which they live represents the Sámi civil society and external relations to Arctic Council and the United Nations, for example to the Permanent Forum of the Indigenous Peoples.

There are some scientific centres and stations in the Northern part of Fennoscandia, some of which are engaged in research and partial recognition of Indigenous Knowledge. They include, but are not limited to, the Arctic Centre in Rovaniemi with their international and EU sponsored research, Finland, the Abisko Research Station in Sweden, Nordic Sámi Institute in Norway and the several programmes of the University of Tromssö in Norway.

In addition to this there are regional museums, such as Ajjte in Sweden, Siida Sámi Museum in Finland and Museum of Varangerbotn in Norway, which have local and region al TEK initiatives. Civil society organisations to do with recognition of TEK include

¹⁹¹ Mustonen et al. 2010

Alliance for Finnish Nature, Greenpeace, Bellona, Taiga Rescue Network, regional cultural organisations and regional media, such as Sámi TV and Radio as well as news-papers.

The context of use of Indigenous Knowledge of the Sámi varies in the four countries in which they live. Climate change is perceived to be a threat and an impact among many – the backlog of unresolved macro-changes imposed on the Sámi remains perhaps higher in a list of priorities to adapt to than the weather or biodiversity change. Sámi are aware of the capacity and limits of their existence to be able to adapt in the rapidly changing contexts and new threats, which emerge.



Sacred stone of Akankivi in lake Sompiojärvi. Pekka Aikio.

Past processes to which the Sámi have tried to formulate responses and adaptations to include imposition of taxes, Christianity and rule of nation states over them since 1500s. More recently imposed changes have included, but are not limited to, assimilation policies into the Nordic societies, creation of large industrial hydrodams and reservoirs such as Porttipahta and Lokka in the Finnish Sámi areas, mining and forestry practices many of which are

new or on-going, such as the one in Nikel, NW Russia. Many people feel that adaptation may be possible, if the survival of language, TEK and living territories are guaranteed – none of these are guaranteed and therefore many Sámi put their primary focus on these, and not directly to climate impacts in the current context.

More specifically in the context of ecological, weather and climate changes, the Sámi have witnessed unparalleled changes to winter conditions. Extreme temperature changes, changes in snow and ice formations, unstable and warm winter conditions and warmer summers are some of the observed changes. Especially the winters 2006-2007 and 2007-2008 are the warmest on record.

In the Eastern Sámi areas of Finland in Sevettijärvi, cold summers have wrecked bird populations, especially ptarmigan – cloudberries have suffered too. Along the Neiden, one of the main Atlantic salmon rivers left in Norway and Finland, mosquitoes have been absent for twelve years. This comes on top of the changes in traditional foods, such as the Atlantic salmon¹⁹². Local Sámi fishermen have expressed their concerns as large amount of tourists are allowed to fish along the Neiden – impacts from human urine have caused the river to eutrophicate.

¹⁹² Mustonen and Feodoroff 2013

Some North Sámi in Vuotso, Finland have switched fish diets away from trout and salmon to more 'southern' species, such as pike and perch¹⁹³. For reindeer herding, change has meant that as the natural foods, such as lichen, are under ice cover from the new ice rain that falls in the autumn and freezes the ground, feeding with fodder has been forced on the reindeer herders. Little state support has been given to this activ-ity¹⁹⁴.

In the North-eastern Swedish-Norwegian borderlands, where the Sámi conduct reindeer herding during the winter of 2006-2007 several families of Sámi utilized their savings and personal belongings to pay for the extra foods to reindeer from their own pockets. These personal and family resources are now gone, and the winter 2007-2008 is more warm than the year before, yet the people do not have the funds to compensate. The Sámi have as well chosen to adapt and use TEK and share it by participating in several scientific and policy initiatives¹⁹⁵. There are however bitter voices coming out which point to battle fatigue and disappointment in the field of non-results even though the Sámi chose to participate in these activities¹⁹⁶.

To offer a context from Finland and Russia, Pauliina Feodoroff, former President of the Sámi Council, Finland analyzed that the Sámi are dealing with forestry, mining, tourism, wind power, land allocation and industrial impacts in addition to climate change. Therefore the total impact of all of these processes is that the Sámi *cannot* adapt to this change¹⁹⁷ – for example if adaptation is only used to mean that boats will be used to transport reindeers across non-freezing lakes on top of all other imposed changes, many Sámi ask, if any adaptation can take place.

Fishermen and reindeer herders produce knowledge, but there is a need for women's knowledge and voices to be heard internally in Sápmi. Feodoroff has said that there is a need to discuss short term and long-term adaptations¹⁹⁸. On short-term technology, such



Pauliina Feodoroff

as transportation tools, motorbikes, and others can be used to compensate and adapt to new conditions, but on long term there is a need to discuss whether reindeer herding needs to be ended as a way of life and culture, because it cannot survive in the new conditions and multiple changes. The current colonial system of administration and politics prevents natural adaptation of the Sámi to these changes according to President Feodoroff.

¹⁹³ Notes with the herders of Purnumukka 2001-2016, T. Mustonen 2016

¹⁹⁴ ACIA 2005

¹⁹⁵ such as the Arctic Climate Impact Assessment, Convention on Biological Diversity and others

¹⁹⁶ See more on the Jokkmokk situation in Syrjämäki and Mustonen 2013

¹⁹⁷ in Mustonen and Mustonen 2011

¹⁹⁸ in Mustonen and Mustonen 2011

Solutions might come out of community-level networks and discussions, but currently there are no funds for neither Sámi nor international community-to-community discussions. Topics of biodiversity, climate change and adaptation are mentioned in academic and other fora, but the needs and wishes of the communities are not addressed or heard. Uncertainty and unknown processes that bypass the communities cause distrust and further disillusionment in the communities.



Modern day reindeer movements amidst the road system (top) and herding with ATVS (bottom). Eero Murtomäki.



2. "Cyclic World" – Natural Cycles as a Basis of Indigenous Lifeworlds

In this part of the Compendium, we explore the Indigenous relationship with the lands, seas and rivers – the building blocks of the Indigenous world of the Eurasian North. As described in the Introduction, these geographical areas have been under Indigenous governance for a millennia – in some more remote communities, such as in Lower Kolyma region in Sakha-Yakutia, this governance continues, at least in part, to this day.

The Indigenous laws and governance rest on the natural cycles – while they have always changed, the life-world has been able to adapt to change because its own institutions, whether it was the Sámi siida or the Yukaghir clan-structures, survived and utilized traditional knowledge and oral histories as mechanisms of adaptation.

Anthropologist Peter Jordan has worked with the Indigenous Malyi Iugan Khanty peoples in Western Siberia and argues that the Indigenous landscape "far from being a isotropic plain, is characterized by seasonally shifting mosaics of different ecological resources, each qualitatively different and seasonally specific. The riverside¹⁹⁹ forms the focus of activity in the summer, the 'near' forest the autumn focus and the outlying hunting grounds are the winter season locus of dispersed activity"²⁰⁰. Jordan argues that decisions for example regarding nature conservation areas have disrupted and interfered with through "enforced establishment of a Zapovednik reserve" on inherited Indigenous land use areas²⁰¹.

Anderson²⁰² discusses the Indigenous Taimyr Evenk uses of the land in the older times writes. According to him "a competent tundrovik²⁰³ who could effect a proper relationship within the sentient ecology of the lower Yenisei valley would have the knowledge and indeed the entitlement to travel extensively...Rather than interpreting an extensive land-use system as the result of a vulnerability to hunger and poverty, it is better to understand Evenk movements as being the product of a multiplicity of strategies each meaningful in its own right"²⁰⁴. This view that is present through the Evenk, Khanty and other Indigenous views emphasizes the varied relationships the communities have to their landscapes.

As positioned before, in terms of understanding Indigenous knowledge of biodiversity and ecosystems, it is indeed this multiplicity, which is at the heart of the discussion. The fundamental problem underlying the on-going land use problems is this difference of civilizations, which are operating in the same areas of the Arctic. Ultimately this is as well a question of power relations, which can be traced back to the sad histories of the colonization of the Arctic. Only with a postcolonial understanding as starting point new avenues of research and cooperation are possible in the current context.

¹⁹⁹ for the Khanty

²⁰⁰ Jordan 2003

²⁰¹ Jordan 2003: 260-261

²⁰² 2002

²⁰³ tundra person, ie. Indigenous

²⁰⁴ Anderson 2002: 147

Given the imposed changes on these cyclic worlds, in the following we explore the observations of forced and disturbing change on the Indigenous life in Eurasian North.

2.1. Disturbances to the Lands

In the Eurasian North, land is life. To use a common Indigenous term, "l/Land" refers here to what ecologists and western scientists call different specific terrestrial ecosystems and species. "Land" in the Circumpolar Indigenous rhetoric is not easy to define, but usually it is understood to be an all-encompassing sphere(s) of life, filled with myth times, sacred places, stories, songs, dreams, human actions, events, beings and non-linear views of space. In short majority of the Indigenous societies of the Eurasia conceptualize their being as belonging to their homelands. "The Indigenous landscape is decoded by stories and names and old knowledge. Every place name has a meaning." Galina Varlamova, Evenk Elder, in Yakutsk, Sakha-Yakutia, Siberia, Russia²⁰⁵

As an example of this, in the Kolyma area in Eastern and Northeastern Sakha-Yakutia, Siberia, Russia, the connection between local Indigenous peoples and the landscape is very old. The Yukaghir peoples of Kolyma have still knowledge regarding the mammoth. Vyacheslav Shadrin²⁰⁶ the current head of the Yukaghir Council of Elders, has said that: "when there is an earthquake, we say that the mammoth are running. We have even a word for this [animal], holgot." In the contemporary times many of the communities are witnessing the collection of mammoth bones from the earth as the permafrost is melting in the region, which according to the local Indigenous spirituality should not be done as mammoth is a very powerful spiritual being and its bones should not be disturbed.



On Shaman Mountain. The local sacred carved symbols of the Evenk have been destroyed by mining team. Neriungri region, Sakha-Yakutia, Russia. Snowchange, 2006.

in Mustonen 2008: 15

²⁰⁶ Mustonen 2009: 203

And as Dmitri Nikolayevich Begunov, a Chukchi reindeer herder from Cherski in Lower Kolyma, Sakha-Yakutia explains about the connections that the local Indigenous peoples have to their ecosystem: "I was born in the tundra, without any doctors. I have lived all my life in the tundra, naturally it is my home. When we live in tundra we live in close interaction with Nature. For example a small bush is only a small bush to some people, but to me it tells many things. I can read from it what kind of a bird has been here...If I need to find something, for example if we have lost some reindeer, I can ask the fire by feeding it. And the fire starts to answer; it turns to a certain direction. And if I travel to this direction I will find the reindeer. Nature feeds me. It helps me. I can speak with the grass, bushes and water – I can speak with all things. I am connected to all things. I can be connected with the fire...It feeds me. This is a life for me. It is inborn. Our Elders did not pray, they just talked with nature. I can do the same. I just talk with the fire in the tundra. Tomorrow I will be lucky, Nature has heard me. I just talked with it."²⁰⁷

Scale is of the essence. Stories and specific terminologies from the communities demonstrate that the local languages and biodiversity have been connected for several millennia. Deep knowledge of the ecosystems ranges in scale from a whole region²⁰⁸ to a single species, such as the case with the role of the wild mushrooms. Some of the species, such as Amanita were considered powerful medicines by the spiritual peoples of the various Indigenous nations.

People use these medicines in times of special need and therefore in the internal governance structures of the Indigenous communities the selected individuals can use these medicines for the various ceremonies and rituals. This knowledge persists. The Yukaghir peoples of Republic of Sakha-Yakutia, NE Siberia use mushrooms both historically and today. Amanita²⁰⁹ is used as a spiritual medicine, tobacco and thyme leaves smoked, and tea and shelf fungus²¹⁰ used for drinking²¹¹.



Amanita Eero Murtomäki



Snowy Owl. Eero Murtomäki

- ²¹⁰ Polyporus sulphureus
- ²¹¹ Arasejin et al. 2007: 599

²⁰⁷ Mustonen 2009: 196, 211

²⁰⁸ Mustonen 2012

²⁰⁹ Amanita muscaria

As the Arctic Biodiversity Assessment takes stock of the current status of the lands in the Circumpolar region, the observations collected here regarding the health of the lands and waters reflect notions of disturbances. Following the idealized theoretical model presented in the Figure 1, we need to keep in mind, that if the Indigenous governance of the lands and waters is allowed to be, the particular situation in a given location would follow its own local context. Therefore the focus on these observations rests on imposed or new change that the local Indigenous community peoples have priorized as an observation. Many of these changes are forced, disturbing changes.

An example of such a new issue is, as has been reported often, the various impacts of climate change. As changes take place in the homelands of the Indigenous peoples, it is important to pay attention too to the ways they try to understand these events. In Sápmi, Sámi area, late Sámi reindeer herder Ilmari Vuolab spoke of observing new bird species that have spread from more southern latitudes²¹². "I have seen hoopoes and other species that are not familiar here."

According to Ilmari, mink is the worst of all arrival species. "Minks have spread and become more and more common. I believe they come here both from south [of Finland] and from Norway. Minks are real pests; they eat fish from creeks and ptarmigans and whatever they can catch." Sámi herder Taisto Länsman had similar observations. "I haven't seen mink here before and they are common [now]. Mostly I have seen them here on the banks of the river Pulmanki but I don't know where they come from"²¹³

In many parts of the Siberia, a change within a lifetime has been profound. Whole land use patterns have shifted as is evident in the oral histories of Nikolay Anatolievich Monastyrev, a Dolgan who was born in 1953 and lives in the settlement of Volochanka which is situated at the centre of Taimyr region. Nikolay describes how during Soviet times people had hunted where they lived, on their lands in the taiga. Now hunting mainly takes place around the settlement.

He says that their ancestral lands are actually situated further down the local river Dudypta, a great distance from the settlement. There is also some fishing around Volochanka but the waters near-by have very little fish in them. Nikolay Anatolievich explains that the local environmental impacts of the industrial activities have been profound. He describes how the near-by river had been much deeper before and there had been more fish in it. The lakes close-by are deteriorating which means that he has to fish in the tributaries located further away from the village²¹⁴.

In Northeastern Siberia two Chukchi communities of the region, Turvaurgin and Nutendli, practice nomadic reindeer herding in the region. Lower Kolyma tundra terrestrial ecosystems are undergoing a significant change according to several separate observations. This means that the members of the communities traverse large areas as a part of their annual migrations with the reindeer²¹⁵. Their observations include for example increased erosion along the River Kolyma, disappearing lakes and increased flooding.

²¹² Helander et al. 2004: 295

²¹³ Helander et al. 2004: 295

²¹⁴ Karpukhin 2008b: 244-253

²¹⁵ Mustonen 2009: 239

Vyacheslav Kemlil, the head of the Chukchi community Nutendli, took an significant new migration, a retraditionalized event, with the reindeer from base camp of Nutendli in Krasnushka to Chokurdakh²¹⁶.

Nikolai Yegorovitch Volkov, an Elder from the local Kolymskaya village, accompanied Vyacheslav on this trip. Kemlil and Volkov made note of the changes they saw. Kemlil reports on his observations on the Western bank of Kolyma: "I made constant observations. Many things have changed significantly. Local hunters and fishermen confirmed our observations. Several of the lakes have disappeared. What used to be big mounds or hills have now collapsed and diminished because the permafrost is melting. The mounds that used to contain ice at the core have as well now melted"²¹⁷.

These messages, driven by climate and weather change, bring us to the notion of speed of a change. In the traditional perception of the life-world there are rhythms and cycles that govern the actions of the people. Now, as "Earth is faster", the speed of change has brought another unseen factor to the people such as the observations made by the reindeer herders of the Chukchi community of Nutendli, who have reported increased and accelerated growth of willows on the banks of the Kolyma River. "Willows grow much faster now on the banks of Kolyma. As well in the summer pasture areas along the Arctic Ocean tundra willows are more plentiful. On River Suharnaya the willow bushes are much bigger"²¹⁸. The Nutendli herders attribute the expansion of the willow to the tundra to the warming and melting of permafrost which they have observed.

Elders of the Kolymskaya village reported in 2006 that willow are moving to tundra and to river banks. They said: "It tells of the changes which are under way. You should graze cows and horses, not reindeer on these spots. All of the tundra is covered with willows and bushes. It grows very fast now. We do not know how we can herd reindeer in the middle of these changes"²¹⁹.

On the other side of Eurasia, Sámi woman Larisa Avyedeva from Luujavre community in Kola Peninsula has witnessed new species of plants which have arrived to the territories of the Kola Sámi 2001-2004: "We never saw them before. This is what we have observed. New plants have arrived here and on tundra. Rivers and lakes are filled with small-flowered a kind of duckweed²²⁰ and the lake started to bloom. Life of the fish is more difficult and likewise peoples fishing opportunities as lakes grow closed up with the new plants....For example we have now water lilies²²¹, in our river Virma. None of that was before. As well we have seen plantains. Here in Lovozero we have many plantains now and none before"²²². Similar concerns have been expressed regarding Skolt Sámi lakes on the Finnish side of the border, especially in Opukasjärvi lake system, which is connected with the Neiden river where the local people have observed and reported increased vegetation on lakes to have developed over the past 50 years.

²¹⁶ This East to West migration was approximately 700 kilometres long, and began 21st November 2005 and ended 10th February 2006.

²¹⁷ Mustonen 2009: 239

²¹⁸ Mustonen 2009: 236

²¹⁹ Mustonen 2007

²²⁰ Lemnaceae

²²¹ Nymphaeaceae

²²² Cherenkov et al. 2004: 325-326

Similarly in Sweden, Sámi reindeer herder Rune Stokke from Jokkmokk has observed that "earlier, there were many lakes with water horsetail, which is also good support fodder for the reindeer, growing in them. I have noticed that water horsetail doesn't grow in certain lakes the way it used to, and we don't know the explanation for that, either. In certain lakes the water horsetail grew so robustly that it was practically impossible to row your boat through them during summer, but now, in the last five-six years I have noticed that there is no water horsetail growing in there – so, all of a sudden, you can just drive your boat in [the lake]. And then there are lakes that seem to be filled with vegetation, but we found an explanation for that. We believe it is because the lakes were fished a lot with seine in the 1960s and to some extent in 1970s, but after that it was stopped. And it's obvious that when you fish that way, the net moves along the bottom [but since the net fishing stopped,] the plants had a chance to grow back"²²³

Indigenous societies of the Eurasian North are communities where silences and specific speech events carry a lot of weight. An observation by a traditional reindeer herder is significant in itself. A certain change on the land or regarding animals has been noted, and therefore becomes a relevant issue to be marked for further investigation. A communal visual or oral history emerges when a whole community of Indigenous peoples decides to share such a relevant observation with outsiders. And again, these are collections of oral histories over the past decade that point to a large-scale system shift in the Indigenous worlds of Eurasia, but they represent only a fraction of the views and problems that these societies are facing.

2.1.1. Oil and Gas of Siberia

In all of Eurasia, if we need to choose a specific issue that has caused most change to traditional Indigenous uses of the land in the past 100 years, the production of fossil fuels, namely oil and gas, can be chosen as an example. The Indigenous Nenets people living in the Nenets Autonomous Region²²⁴ as well on the Yamal Peninsula²²⁵ have preserved nomadic lifestyle of reindeer herding. They have witnessed several periods of structural changes from pre-colonial times to the large herds of the 1990s and 2000s in the post-Soviet era²²⁶.



Oil is the economic basis of Russia's might. Oil tanker on Kolyma delta, Sakha-Yakutia. Oil depository in Khanty-Mansia. Snowchange, 2016

²²⁵ Yamal-Nenets Autonomous Okrug

²²³ Hiltunen et al. 2004: 267-268

²²⁴ Okrug

²²⁶ Forbes et al. 2009: 22041-22048

The Nenets have had several waves of resistance against intrusions into their world. For the Nenets, their style of reindeer herding and nomadic lifestyle was in direct conflict with the policies of the Soviet state²²⁷. One of the most significant impacts that they have witnessed regarding biodiversity and territorial changes is the intensifying oil and gas industries in Yamal and other parts of Nenets homelands²²⁸. Especially Yamal is important to industries as it contains significant untapped gas deposits.

A famous Nenets herder and leader Dmitry Horolye has stated that: "Reindeer herding faces similar challenges across the planet. One of these problems is expansion of industries to the lands used by reindeer. In some parts of the world permanent irreversible damage has been caused to the reindeer herders by this activity. Lost territories cannot be reclaimed. The last decades 1960 to 1990 of Soviet Union differ from the Scandinavian and other Northern European developments. Natural resource exploitation was conducted by destroying the land and taking of lands away from local control. Indigenous people and local inhabitants had no means of opposing this process. The only thing to do was to avoid contact and silently observe the fantastic violence to nature. As well ecologists remained silent and observed; everything that happened was for the good of the state. Search and exploitation of natural gas and oil fields took place without any consent or consultation from the local people. As a result of this trend millions of hectares of ancient reindeer herding pastures were polluted and ruined. This was a form of criminal exploitation of energy resources. In many territories reindeer herding was discontinued because there were no more pastures left. In addition to this reindeers were poached"229

The Nenets have been able to demonstrate remarkable adaptation skills to the imposed changes in their territories in Yamal and elsewhere²³⁰. One such local example is from 1990 from Yamal when an exploratory oilrig was threatening a crucial Nenets fishery close to Yarto Lake. The Nenets of the Yaptik-Sale tundra opposed the placement of the infrastructure. Anatoly Hudi explained that the impacts will reach Ob Bay as well²³¹. The rig was placed to an alternative location.

Overgrazing, climate change and unclear administrational situation regarding subsistence rights continued to stress the Nenets of Yamal in the 1990s²³². More recently the Nenets of Yamal have faced intensive and increased developments. There are approximately 630, 000 reindeer and 5000 nomadic Nenets now on Yamal. Numbers are a historical high. These large reindeer herds have transformed some tundra territories from shrub-dominated areas into graminoid-dominated areas.

The industries have contributed to this process. The gas development in the tundra zone of Yamal is only beginning, but is causing impacts already. For example the loss of Nenets subsistence and herding territories including sacred and spiritual sites, seismic surveys, exploratory drilling and road construction are having their impacts such as

²²⁷ Golovnev and Osherenko 1999: 105, 116 - 117, 148 - 149

 ²²⁸ Nuttall et al 2005: 675-678, Ferguson and Viventsova 2007: 35-38, Forbes et al. 2009: 22041-22048
²²⁹ Horolye 2004: 405-407

²³⁰ Nuttall et al. 2005, Ferguson and Viventsova 2007, Forbes et al. 2009

²³¹ Golovnev and Osherenko 1999: 105, 116 - 117, 148 - 149

²³² Golovnev and Osherenko 1999

around the Bovanenkovo gas field²³³.

The road construction opens the tundra to newcomers unfamiliar with the Nenets and their ecosystem as well as the customary laws of being on the land. These processes have led as well to impacts on fish resources, as the unsustainable fishing has decreased stocks. Construction of infrastructure, such as bridges and quarries, has impact on the lakes on which the Nenets depend for summer subsistence food as a part of their nomadic round.

Forbes et al.²³⁴ argue that the Nenets have been able to adapt to loss of territories and other impacts because of the on-going nomadic livelihood and the adaptation capacities it brings. Especially flexible are the "smaller privately managed herds" which can make land use decisions easier than the large herds preferred by the cooperatives of the Yamal peninsula. Formal legal instruments are not functional so the Indigenous processes are at the heart of the adaptations.

In the Nenets Autonomous Region the Nenets civil society organisation, Yasavey has over the years taken strong stand on the issues of resource development. Vladimir Kotkin, a representative of Yasavey said in 2003: "Some of you might wonder why are we doing these things. The answer is quite simple: We have always lived here and we will live here in the future. Our mission is to support small Indigenous nations of Nenets Region. That is why we want to be sure that we have a right to know how the State of Russia plans to exploit natural resources in this area. Oil production affects the lives of reindeer herding Komi and Nenets peoples. Herding is the single most impacted livelihood because of oil production. Crude oil production leads to pollution of terrain and to forced purchase of pasturelands because they are ruined. Problems and conflicts will ensue between different stakeholders. Mostly this has an impact on reindeer herders, fishermen and hunters. Inhabitants in villages are impacted less but some way or the other they as well feel these processes in their lives"²³⁵

The issue of Russian oil and gas production has been the focus of several Arctic research initiatives in the past years²³⁶. Many of them involve sophisticated collaboration of satellite tracking and mapping as well as respectful use of the traditional knowledge of the Nenets herders. The natural resources production is a significant geopolitical and economic security issue for Russia as the main source of foreign capital comes from the export of these assets.

Therefore the Nenets interaction with the oil and gas companies is linked to a global energy production, which has dimensions for the whole planet. A solution framework has been suggested by Andrei V. Golovnev and Gail Osherenko. They have outlined a "reconfiguration of the Yamal district with increased autonomy from the Okrug" in the spirit of co - management between the Indigenous peoples and the non-natives²³⁷. Forbes et al.²³⁸ argue that "if any system in modern Russia is in a position to survive

²³³ Forbes et al. 2009

²³⁴ 2009

²³⁵ Kotkin 2003

²³⁶ for example Forbes et al. 2009

²³⁷ Golovnev and Osherenko 1999

²³⁸ 2009

such an onslaught²³⁹ it is the Yamal²⁴⁰ because of its accrued experience with coexistence, financial wherewithall from oil and gas revenues and a widely acknowledged vibrant nomadic culture." Nenets herder Dmitry Horolye remains confident that "oil and gas comes and goes, but reindeer stays forever"²⁴¹.

In other parts of Russia the oil industries have caused concern. Nadezhda Vasilievna Novik of the Ket Nation from the village of Kellog in the Turukhansk district, the Krasnoyarsk region confirms these issues for the oil development impacts.

According to Novik the Vankorskoe oil deposits nearby her homearea were developed under an impression that the local population would be compensated for the loss of their hunting grounds. This was the reason why the Ket people agreed with the development in the first place. According to Novik, local people have not been adequately compensated and hunters are observing severe forest damages, which they believe are caused by the Norilsk combine in charge of the industrial process. New proposals for the economic development of the natural resources in the area are under way, but there is a total lack of environmental assessment of such developments, Novik regrets²⁴².



Oil and gas comes and goes, but reindeer stays forever. Snowchange, 2014.

In Northwestern Siberia G.I. Bardin, a Khanty from the city of Khanty-Mansiisk in the Khanty-Mansiisk Autonomous Okrug highlights the changes in Khanty lifestyle and the prospects of cultural survival in the times of continuous environmental degradation of Khanty lands. In the past twenty years over one million hectares of land that had been used by local Indigenous people for their traditional activities has been taken over by

²³⁹ of resource development and modernity

²⁴⁰ region

²⁴¹ Horolye 2004

²⁴² Karpukhin 2008: 264-268

the oil industry. "Lands for maintaining a traditional lifestyle are few and far between. Much will depend on the family. If the parents are engaged in traditional occupations they may pass their knowledge on to their children. There are also a few people with higher education who live at the nomad camps. So long as there are deer to hunt, a traditional culture will persist".²⁴³

Khanty Afanasy Ivanovich Rynkov lives in the taiga on his ancestral clan lands near the Vyngo river. Rynkov discusses the impact of oil companies in his region: "There is neither game or fish. Things would be different if there had been no road or groups.



Evenk herder Zhenya with children in winter camp, Iengra, Sakha-Yakutia, Russia. Snowchange, 2006.

No doubt the oil companies have had a devastating effect on our life. They came by themselves. I was born and grew up here. We led peaceful lives. Everything was different then. Nobody told them to come here. The companies have spoilt everything here, drilled the land. Our Khanty don't work with the oil companies"²⁴⁴.

Rodislav Jakovlevich Lozyamov, a Kazym Khanty from the settlement of Dakogorshkovo, Khanty-Mansi Autonomous Okrug works as a watchman at a local oil-rig and as a hunter at a trade station. Lozyamov has observed the impacts of oil industry in his area: "Once we let the oil companies in, there was no going back. We cannot undo the roads or the oil-rigs. The land is damaged, whether we sign a contract with them or not; the land is still drilled. The fish and game have gone, we no longer hunt for commercial reasons. Even on a lucky day one can't catch as much as we used to. We used to fish more than 20 tons per year, nowadays 2 tons would be very lucky. The number of deer has decreased dramatically, we mainly use cars and snow tractors to reach the areas in which the deer roam"²⁴⁵.

2.1.2. Land and Modernity in the Eurasian North in the 1900s

The rapid modernisation of the Siberian peripheries caused great damages to the Indigenous communities in Siberia in the 1900s. Vladimir Kirgeev, of Selkup nation, was born in 1942 in the village of Igotkino, Kolpashevsky district, Tomskaya oblast. Kirgeev is the chair of the regional Association of the Indigenous People of the North. Vladimir Kirgeev remembers how people were forced to settle in villages for electrification purposes. In the Narymskii area there were 739 farms and those who resettled the area received cows through special government programs. The environment in the

²⁴³ Novikova 2008: 154-160

²⁴⁴ Novikova 2008: 174-179

²⁴⁵ Novikova 2008: 174-179

region had been damaged and poisoned with phenol from industrial plants located in Kemerovo. Also birds and fish had been affected. According to Kirgeev, one time it had been possible to deliver a thousand ducks to a store whereas now it was not possible to hunt ducks for commercial purposes. Also there was almost no sturgeon²⁴⁶.

Modernity and the expanding Soviet state brought new waves of migration to the former Indigenous homelands. Viktor Andreevich Korotkikh of the Ket nation was born in 1942 in the village of Kellog in Turukhansk District, the Krasnoyarsk region. He remembers a time when most Ket people had reindeer but when the outsiders came to the region, almost all reindeer that belonged to the Kets and other Indigenous people by a long held custom were simply shot and eaten by the newcomers. Korotkikh has also observed that as more outsiders have come to his region the fires in the taiga have become more frequent²⁴⁷.



Aerial view of the remote, fly-in community of Sosnovka, Murmansk, Russia. Snowchange, 2014.

2.1.2.1. Hydropower

The demand for energy in the aftermath of the Second World War changed the Sámi universe. Main impacts came in the form of hydroelectric stations and dams. The Vuotso forest region is the southernmost of the Sámi territories of Finland. It has been

²⁴⁶ Funk 2008: 226-228

²⁴⁷ Karpukhin 2008a: 263-267
for millennia a forest Sámi stronghold where reindeer herding, hunting and subsistence fishing have been the main activities. Over 120 years ago, due to border closures in Northwestern Finland²⁴⁸ a group of North Sámi families migrated and settled in the Vuotso-Sompio area²⁴⁹. This area is also occupied by Finnish settlers.

The area has witnessed significant impacts from industrial development in the past 40 years. By far the biggest ecological disaster that local Sámi have experienced has been the construction of the Lokka and Porttipahta reservoirs in the 1960s and 1970s and the massive clear fellings preceding the construction.

No community consultations were organized. Best lichen areas for grazing where flooded and Sámi had to transport 5 000 reindeer away from the grazing grounds because of the construction. The specific grazing grounds were excellent autumnal pasture areas for the reindeer. As well, in the local river Tankajoki the salmon used to migrate all the way to Tankapirtti area. This was before the reservoirs came. The Isohaara Powerplant connected to the reservoirs blocked the salmon from entering upstream.

Local Sámi fondly remembered the times when even a 17 kilogram salmon could be caught from the river Tankajoki. In addition to the ecological impacts the construction of the reservoirs has caused significant cultural, social and economic stress to the local Sámi in the past 40 years²⁵⁰.



The traditional pine log buildings of the Mutenia village were saved from burning. A view of the Lokka reservoir in 1970s, Lapland, Finland. Eero Murtomäki.

²⁴⁸ at the time a part of Russia

²⁴⁹ Mustonen et al. 2010. The North Sámi who live in the area arrived there in late 1800s due to the closure of state borders.

²⁵⁰ Mustonen et al. 2010

Similar stories can be heard from Sweden. Per Ola Utsi is a Sámi reindeer herder in Sirges sameby, the largest Sámi village in Sweden. He has observed the hydroelectric development in the region: "They say that waterpower is environmentally friendly energy, but I say that stands for those that don't live there. For those of us that live next to a big reservoir it isn't environmentally friendly. It is inflicting damage. My way of living is damaged. My environment is damaged. My source of livelihood is damaged. You have to take another perspective. You cannot say that waterpower is green energy. It is a lie. It is green for some, but not for me. This point is easily forgotten."²⁵¹



The regulated waters of the lake Áhkájávrre, Jokkmokk region, Sweden. Carl-Johan Utsi, 2013. Used with permission.

Controversial Akkats Hydropower Station with Sámi symbols, Jokkmokk, Sweden. Snowchange, 2013.

In Siberia, hydroelectricity has caused changes too. Local Indigenous fishermen of Kolyma River report that the hydroelectric stations further up the Kolyma are causing changes to the spawning of fish in Lower Kolyma. For example vendace²⁵² has suffered from this development.

The Pokhodsk Sovhoz used to catch 800-900 tons of river fish prior to the construction of the hydroelectric station, but now the lower waterlevels have had impacts on the fish. Renowed reindeer herder, a Chukchi-Yukaghir Grigori Ivanovich Velvin of Cherski explains about his observations: "We can see the impacts of the hydroelectric station. In order for the fish to spawn properly you need a proper level of water and temperature. Hydroelectric stations upstream are releasing water which is of different temperature. We have seen changes now, especially in 2005.²⁵³"

2.1.2.2. Forestry

Several Indigenous societies of Eurasia are depended on the old-growth forests of taiga for their subsistence economies. While industrial forestry began already in 1500s in some parts of the taiga, its impacts and on-going presence cause concern in the communities. The clear-cut methodologies of the post-WWII forestry have transformed whole landscapes in the region.

²⁵¹ Hiltunen et al. 2004: 263

²⁵² Coregonus albula

²⁵³ Mustonen 2007



In 1960s the forestry activities were started in the so-called 'protective forest zone' (of an old-growth zone that was designated to be left alone) in Inari, Finland. Eero Murtomäki.



The pulp mill of Kemijärvi needed the timber from the forests of Lapland, Finland. It was closed in the 2000s. Eero Murtomäki.

Stefan Mikaelsson is a Sámi reindeer herder by trade and he lives west of Harads – a small town by the River Luleälven. He belongs to the Udtja Sámi village²⁵⁴, which is considered a 'forest Sámi' community because its pasturelands lie in the forest area situated below a high mountain range.

Mikaelsson's concerns arise over the well-being of reindeer husbandry – or rather the lack thereof. In his opinion, the forest industry and air pollution are to blame for the poor condition of the forests, thus leading to the harder circumstances for the reindeer husbandry. "Old forests are diminishing and the average age of trees has fallen from 120 to 90 years due to the new forest law that allows companies and private forest owners to clearcut forests that are not fully grown. I have enjoyed being in the forest for many, many years since I started to follow my father when he went to see his herd, but now I have noticed changes. The trees are not as green as they used to be – the colours are different – and it feels to me like they are saying that they don't feel so well."²⁵⁵

Different lichens, growing on the ground as well as the trees, are the most important winter nutrition for the reindeer. It takes time for lichen to grow and the early cuttings prevent the tree lichen²⁵⁶ from being used by the reindeer as food. Old-growth trees are better producers of the tree lichen – therefore they are a crucial asset to the reindeer economy. Furthermore, the need for transporting timber leads to building dirt roads that destroy also the ground lichen. This leads to extra work and expenses in the form of supplementary feeding of the reindeer, especially during winter.

Often ignored in land use and forestry planning, lichen systems and their availability are in fact crucial factors in the Indigenous reindeer-herding societies of the Eurasian North. The late, great Oula Aikio, well-known North Sámi leader from the community of Vuotso (Sompio), Finland was known for his knowledge of land, herding territories and reindeer skills. Recently his diaries were made²⁵⁷ public – the entry from 1966 demonstrates the links between weather and seasonal planning cycles of the herders in Finnish Sámi community:

January 1966. Radio is telling that a house in Vuotso has been burned, India and Pakistan are negotiating on peace, Kosygins representative has travelled to North Vietnam, the subway system in New York is on strike and our reindeer round-up separation has been announced. This winter will be very bad for reindeer, lichen has frozen and reindeer can only see it just like through glass (there is an ice layer on top of the lichen preventing reindeer eating it). There is nothing to praise in the life of a reindeer. It has been often cold, close to -40°C. On the 1st February the thermometer shows –49°C.²⁵⁸

The availability and access to lichen for the reindeer in Eurasian North is a complex topic. The state-imposed reindeer management systems, such as the paliskunta-system in Finland have disrupted the Sámi management of lichen areas and reindeer pastures as a part of the Indigenous free-ranging nomadic herding. This has led to severe depletion of lichen in some areas and a larger loss of land use knowledge amongst the

²⁵⁴ sameby

²⁵⁵ Hiltunen et al. 2004: 261-262

²⁵⁶ 'beard moss'

²⁵⁷ (partly)

²⁵⁸ Mustonen et al. 2010: 74

Sámi²⁵⁹.

Impacts on the reindeer herding are familiar too in the Inari Sámi areas of Finland. In the post-war years the Indigenous Inari Sámi culture, language and governance structures in the Nellim area have become endangered and eroded. This is due to many simultaneous developments, including the loss of land rights and siida-system, imposition of schooling and state rule, modernization of reindeer herding and on-going disputes regarding lands and waters of the area to name a few developments. As a little-known history the state of Finland sold 176 square kilometers of state land to Soviet Union in 1947 close to the Paatsjoki river area – this fact has not been discussed much in the larger Finnish society.

In recent decades the larger society has imposed several natural resources activities, including road construction and forestry on the lands and waters of the Nellim area. Plans for mining and railroad construction exist. The United Nations²⁶⁰ has called for a moratorium on industrial land use in the region. This Moratorium should be in place until such a time a solution will be made between Sámi land uses and ownership and the relationship with the claims the Finnish state has on these lands in 2005.

The contemporary reindeer herders of Nellim belong to a handful of Sámi families and one of these is the Paadar family²⁶¹. Previously the Nellim herders have herded as members of the state-governed reindeer herding cooperative "Ivalon paliskunta". This paliskunta has divided into two distinct reindeer herds and the Nellim herd uses separate winter pastures as the main stock of the Ivalon paliskunta herd, for example so that the spring pastures of the Nellim herd are mostly located in the wilderness areas of Sarmitunturin erämaa-alue away from grazing areas of the Ivalon paliskunta proper²⁶². The members of the Nellim community have therefore a long-term experience from working inside the state-governed reindeer herding community.

Since 1990s the Nellim herders have entered into various disputes with their herding partners in other parts of the Ivalon paliskunta reindeer co-op unit. In the 2000s the herders from Nellim have entered into legal and land-use conflicts with the state and state forestry company "Metsähallitus" over the rights of the reindeer to utilize lands which have been clear-felled for the purposes of industrial logging. Various national juridical rulings have been made regarding these disputes²⁶³. In 2016 due to the new legislative reforms, these conflicts spilled over the whole Finnish Sámi area with Metsähallitus.

Some of the conflicts have been solved through long-term agreements²⁶⁴. It is worth noting that these agreements that the Nellim herders achieved with the state organizations led to several similar agreements on conservation of timber lands for the purposes of reindeer herding between 2009 and 2011²⁶⁵.

- ²⁶⁴ Metsähallitus 2011
- ²⁶⁵ Metsähallitus 2011

²⁵⁹ Mustonen et al. 2010

²⁶⁰ 2005

²⁶¹ Mustonen 2011b

²⁶² Mustonen 2011b

²⁶³ Mustonen 2011b

In the Kola Peninsula²⁶⁶ the Sámi reindeer herders point out that "when reindeer return from the sea, they follow special mushroom 'ways'. Reindeer herders know these ways and the only thing they need to do is to agree on the time of returning. Therefore the availability of mushroom is another crucial component of the larger reindeer-herding complex of interactions in the Eurasian North.



In the dining table of reindeer, both lichen and mushrooms are served. Eero Murtomäki.

Regeneration of forests bring additional concerns too. New trees of foreign origin, for example, the beach pine²⁶⁷ have also been introduced in northern Sweden. Stefan Mikaelsson goes on to say: "The forest industry has been supported by the authorities to import trees that grow very fast, but they didn't look so much upon the quality of the timber - and definitely not on the possibility of having reindeer husbandry in the areas they operate", Mikaelsson claims. He adds: "These plantations mean it is very hard to travel by snowmobile and they make locating yourself difficult since they are grown in straight lines. Also the reindeer seem to avoid these areas.²⁶⁸"

According to Mikaelsson, the quality of water has suffered as well in his neighbourhood. After cutting down a forest, it's common practise to dig ditches in the soil, which results in faster flow of water from forest to rivers and lakes. "I've noticed that small rivers are looking like the rivers in India, they are more brown than blue. The one good thing about the actions taken by the forest industry has been that people show they are Sámi in a much higher degree than for the past ten to twenty years, and that is very positive.²⁶⁹"

²⁶⁶ Mustonen and Mustonen 2011: 101

²⁶⁷ Pinus contorta

²⁶⁸ Hiltunen et al. 2004

²⁶⁹ Hiltunen et al. 2004

In Siberian taiga similar observations have been made. F.I. Isypov, born in 1928, lives in the forest like his Mansi ancestors and only visits village to fish. He says that before the arrival of the forest industry moose and reindeer were plentiful in the region but now that the forests have been cut down there aren't many animals left to hunt. Isypov himself never found any sense of accomplishement when he worked for forest industry for a short period of time. He says that trees were often cut down and left to rot and sometimes they were let to clog and deteriorate the condition of rivers²⁷⁰.

Indigenous governance of the land has been greatly challenged in those parts of the taiga where forestry has entered. Sergei Sychin, a Selkup, lives in the village of Ivankino in the Kolpashevsky district, Tomskaya oblast. He is a head of the administration of the STU Fishing Collective Farm.

Of note is the knowledge that Sergei describes regarding how local people used to hunt not in groups but alone traditionally. People did get together to gather berries and nuts. Each family had its own territory. Today there are hardly any places left where a successful hunt would be possible. Sergei says that in the past there had been taiga, 45 km across the Ob River in the Chainsky district near the border with the Novosibirsk oblast.

Today there is no forests left in the taiga after the Chainsky and Parabelsky forest-processing plants have harvested the pine forest throughout the whole region. In earlier time people had more space for hunting, the borders extended further and they also knew the region well. They had been able to travel up to the Togur River and knew other waterways located some fifty to sixty kilometers away²⁷¹.

Mining has become the latest threat to survival of both subsistence economies and ecosystems in the Eurasian North. In some cases, both domestic and international mining companies exert influence over a whole region, such as is the case in Kola Peninsula in 2010s²⁷². Mining companies enter the Arctic peripheries promising jobs, and economic profits once the mines are opened. The Indigenous communities have much to say regarding the process if there was a functioning dialogue with the companies.

2.1.2.3. Mining

The mining "boom" has reached even the most remote communities of Eurasia, such as the Chukotkan Peninsula. Yuri Borisovich Diachkov lives in the village of Markovo in the Chukotski Autonomous Okrug. He belongs to the Indigenous Chuvan nation and teaches art at the village school. Yuri Diachkov says that there are major problems in the economic situation of the region.

He believes that the industrial development is needed in Chukotka, but it should take place under careful consideration of its environmental impacts. "It should be done the way it is done abroad, in Alaska for example. Development in Alaska takes place with

²⁷⁰ Novikova 2008

²⁷¹ Funk 2008: 227-235

²⁷² Mustonen & Mustonen 2011

good planning which is a huge difference from the way it is done here." Yuri describes that after the gold had been dredged in Chukotka, thousands of barrels had been left behind leaving the rivers polluted. He also adds that local people have benefited very little form the industrial development in the region²⁷³.



Industrial megaprojects, such as this coal mine in Southern Sakha-Yakutia, have wrecked the Indigenous homelands of Russian North and Far East. Snowchange 2007.

Grigory Ivanovich Rynavryntyn was born in the village of Ilirnei in the Bilibinsky district into a family of reindeer herders. He currently lives in Anadyr where he works as a researcher. Mining industry is active in the Bering district. "It had done a lot of harm to reindeer husbandry by destroying vast areas of their pasture lands".

Grigory says that flying in helicopter enabled one to see that tundra had scratches and scars on it face from caterpillar tractors and wherever one looked there were piles of barrels lying in the ground and oil that had been spilled. Grigory explains that after gold has been extracted, the miners do not restore the land, probably because it is cheaper to pay the fine. Grigory has observed that in some areas rivers have dried up because everything had been dug over. The situation is similar in the Chaunsky, Shmidtovsky and Anadyrsky districts. Grigory Rynavyntyn also voices his great concern over possible oil extraction in the area²⁷⁴.

Indigenous peoples on the land have made their own decisions regarding the mining, where they can. Larisa Sergeevna Rakhtyrgyrgyna was born in the village of Ryrkaipii, Shmidtovsky district, Chukotka. She belongs to a family of reindeer herders. She

²⁷³ Bat'yanova 2008: 512-515

²⁷⁴ ibid. 531-534

describes the conditions in the Shmidtovsky district which is considered the industrial district of Chukotka. Only a few Chukchi are involved in the mining work, most of it is carried out by outsiders.

Larisa sees that mining has a great impact on traditional Chukchi lifestyle, especially as it interferes with reindeer herding. She related on an occasion when her brother and her future husband were young men travelling on the tundra with their reindeer and found an ingot of gold on a hill. The man who would become Larisa's husband got very excited and started to make plans about what to do with the piece of gold whereas her brother took the piece and threw it into a lake. He said: "This should remain between us. If we tell anyone that there is gold here, then there will no longer be any pasturing in this spot for our reindeer as we have always done.²⁷⁵"

Tatyanana Yuryevna Achirgina was born in the village of Markovo in Chukotka. Her nationality is Eskimo²⁷⁶ and she lives and works in Anadyr as a head of the Eskimo National Cultural Centre. Tatyanana has seen the industrial development begin in Chukotka.

It began in 1950s with the construction of Eultin Ore Mining and Processing Enterprises and tin mining in Chaun district. The 1960s was a golden age for industry in the region and a nuclear plant was built. Roads were constructed and the population increased dramatically. In recent years, gold and ore mining have become less profitable.

Only a few indigenous peoples have been taking part in industrial development, it has always been so", Tatyanana says. She sees that there is a need for new industrial development initiatives in the area, but ecologically sensitive methods are needed since earlier development has polluted the river in the region.

In the Providenya district the populations of marine mammals have declined due to the activities of Gorizont Prospecting Artel. "We often learn of plans for industrial development only by accident; for example we have learned about the shelf oil-field development project from the American side, and we began to write about it. The authorities often hold back ecological information from us that is important for the society. That's why we often support something without being aware of the ecological consequences.²⁷⁷"

2.1.3. Nature Conservation and Eurasian North²⁷⁸

If modern extractive industries have caused disturbances to the land, incidentally the conservation of ecosystems has caused conflicts by and with the Indigenous peoples too.

Malla is the oldest nature reserve in Finland. It was established 1916 to protect the unique mountainous ecosystem from deleterious human impacts, specifically firewood

²⁷⁵ ibid. 533-536

²⁷⁶ Siberian Yupiaq

²⁷⁷ Novikova 2008b: 553-556

²⁷⁸ with contributing author Hannu Heikkinen, University of Oulu

logging, and to satisfy the needs of scientific research. Malla reserve is located near the village of Kilpisjärvi²⁷⁹, proximate to the mountainous borders of Finland, Sweden and Norway.

Today, Malla is classified as IUCN category 1a, which forbids all human activities that alter the natural environment. Malla reserve is considered of high value due to its primary forests and rich biodiversity; in particular its rare vascular plants²⁸⁰ growing on dolomite influenced low alpine sites²⁸¹.



Kilpisjärvi, Finland. Eero Murtomäki.

Malla Strict Nature Park, Lapland, Finland. Eero Murtomäki



Globeflowers (Trollius europaeus) in bloom in the birch forest at the bottom of a fjell that has accumulated nutrients from the melt water of the highlands. Eero Murtomäki.



The nesting success of Gyrfalcon depends on the available ptarmigan and rock ptarmigan stocks. When the bird numbers are low, the Gyrfalcon can only rear one young offspring. Eero Murtomäki.

Reindeer herding is emblematic of Europe's only recognized indigenous people - the Sámi and Malla was utilized by them as pasture for wild and domesticated reindeer long before the reserve was founded. However, it is quite obvious that historical grazing pressure was not constant or high every year, but within specific temporal scales it was most likely intense, much like other subarctic-alpine points of comparison²⁸².

Reindeer herding was prohibited in Malla Reserve in 1981. It was further administered under strict reserve regulations in 1993. In practice, full-scale reindeer herding ended

^{279 69°04&#}x27;N, 20°40'E

²⁸⁰ e.g. Arenaria norvegica, Viola rupestris ssp. Relicta

²⁸¹ Jokinen 2005

²⁸² Olofsson & Oksanen 2005

around 1955 with the fencing of borders between Finland and Norway that prevented reindeer herds from moving across the borders²⁸³. The prohibition of reindeer herd-ing and resulted repetitive illegal reindeer grazing has strained local social relations between Sámi and scientists for decades.

In turn of the millennium the administrative official, Metla, was urged to fence the whole reserve, but herders requested evidence as to the effect of grazing. Furthermore, there were scientific interests to determine what kind of changes would take place if the entire reserve were to be fenced. In short, the results of multidisciplinary study were that the reindeer grazing had multiple, negative, positive and neutral impacts on different species, included the endangered²⁸⁴ ones.

Thus the categorical exclusion of reindeer did not get scientific support without clear definitions which species the conservation measures were to support and which spe-



In 1970s reindeer were allowed to roam inside the Malla Reserve. Sámi reindeer leader Antti Oula Juuso scans the herd. Eero Murtomäki.

cies we could let feel the impacts, e.g., for losing grazing based competition advantages. Instead, it became obvious, that particularly scientific long-term ecological reserves needed protection from grazing effects. The tensed social relations between local Sámi villages prevented negotiations of controlled herding experiments.

The conflict is tricky one and has continued as unsettled and the illegal grazing is a continuous threat in the Nature Reserve Malla. Conflict calls for settling and it sounds fair, that if the general public considers the benefits of reindeer exclusion greater than allowing traditional pasture utilization, the juridical viewpoint stipulates at least decent compensations to be paid to the local Sámi communities for their lost traditional grazing rights.

²⁸³ Jokinen 2005

²⁸⁴ red listed

We slowly move away from the lands of the Indigenous peoples and turn towards the oceans and marine lifeways in the Arctic. Conservation of aquatic resources, species and areas causes similar disturbances and conflicts, if the process is not well-planned and communities properly consulted. In the Russian Pacific zone, Dorfei Semionovich Berezin²⁸⁵ was born on Bering Island to a family of Bering Aleuts, a greatly marginalized Indigenous community.

He described the impacts of the national park that has been created on the island. In general, he says, the impacts have been negative on the well-being of the indigenous Aleut population and its involvement in traditional occupations. Dorofei has been accustomed to the traditional Aleut way of life since childhood. He tries to keep the traditional livelihoods as much as the regulations allow. He says that fishing is practically the only traditional activity left. National park officials interfere too much with the local ways of life.

Berezin has fond memories from the earlier years when it was easier to hunt for food. He described how in the spring the community would hunt sea lions from the shore. "Seal hunting would start in July. In those days men usually killed seals that were 3 to 4 years old for both the skins that were sent to Leningrad and for the meat which was salted and stored for the winter. Fishing would start in the late spring; there was more than enough fish for everyone and even enough to feed their dogs."²⁸⁶

In the past fishing had been good in the rivers that the local people have always used for their subsistence. Today, the park regulations only allowed three fish per fisherman over the whole summer period. This means that local people have started to poach. Berezin notes that the underlying cause for the illegal fishing, almost universal phenomenon on the island including the fishing inspection personnel, is the deteriorating standard of life of resident islanders²⁸⁷.

Nina Sergeevna Popova is an Aleut born in Mednyi Island. Her family was forced to leave Mednyi Island in 1969 during the resettlement of the community due to the inaccessibility of the island. She now lives in the village of Nikolskoe on Bering Island. Nina Popova described how she can only partially lead a traditional way of life because of quotas and hunting and fishing regulations.

Her father used to support the family by seal hunting and preserving the meat by salting it. The family caught a lot of fish and hunted for wild birds. Today, Nina says, it is nothing like that. She and her family still preserve the seal meat by salting it, but seals are hunted by someone else, not her family.

Nina Popova remembers how in her childhood the eggs of wild birds had been a part of the Aleut diet and she had been taught to live at one with nature. "I remember, for example, that when we were small our father would always say: 'we will live for as long as we can preserve what we use.' He taught us not to kill for the sake of killing, but only for food. And when we hunted for food, we followed our sense of how much we would need. For example, in the past, the eggs of wild birds would be brought in by boats.

²⁸⁵ Meschtyb 2008

²⁸⁶ Meschtyb 2008: 577-580

²⁸⁷ Meschtyb 2008: 577-580

People were allowed to take as many eggs as they needed. But if later someone saw that a family had taken a certain number of eggs and ten days later threw away rotten eggs, this family would be boycotted. If people did not use what they took, it meant that they did not know their own needs and were too greedy. They had wasted eggs someone else could have used and upset the ecological balance."²⁸⁸

Zinaida Ivanovna Kvasiuk is a former President of the Aleut Association. She lives in the village of Nikolskoe on the Bering Island. Zinaida Kvasiuk believes that the poorly thought out economic and administrative policies have upset the ecological balance on the Bering Island and are deteriorating and hindering the traditional Aleut way of life.

Zinaida says that the local community used to have a structured economic life based on fishing, hunting of marine mammals, and a little bit of farming, so despite the harsh island conditions they were self-sufficient people. Zinaida Kvasiuk's brother Ivan Ivanovich Vozhikov, a seal hunter, would take his holidays in the beginning of hunting season like most men on the island.

They would travel to the interior of the island about twenty kilometers from the village. A national park has been established in the centre of the island and Zinaida is critical on how it is administered when seen from the Aleut point of view. She says the park does not do enough for environmental protection but hinders the traditional Aleut activities in the area. Zinaida is adamant that the Aleut people cannot live without seal and sea-lion meat and she herself not without fish²⁸⁹.

Gennadii Mikhailovich Yakolev was born on Mednyi Island in 1935. He now resides in the village of Nikolskoe on the Bering Island. Gennadii Yakolev has fond memories of his native island and recalled how people had hated to move from there. "How else can you regard an eviction from your own home?"

Traditional livelihoods have been the basis of Yakolev's way of life. He took great care in describing the annual cycle in nature and how the Aleuts have followed those cycles in their hunting and fishing practices and explained how animals have been hunted for food and clothing and how fish was preserved so that there would be enough food for the winter. Gennadii described the delicacy and significance of traditional foods of the Aleut diet: "The fat of a seal for Aleut people is like butter for others".

He reflected on the question whether the eggs of wild birds were best enjoyed raw or boiled and pointed out that the meat of a very young seal is never as tasty as that of a three or a four year old animal. Yakolev described the cycle of nature on his native island Mednyi and how the entire community had been involved in this cycle, including all of their children. For Gennadii the traditional use of nature is not only a means of providing food but it also has a specific cultural ideology. "I try to take my grandsons with me so that they can also learn to become accustomed to real Aleut food."

Gennadii Yakolev says that the official bureaucracy at the federal and regional levels interferes far too much with the traditional economy of the region. He feels that the

²⁸⁸ ibid. 576-582

²⁸⁹ ibid. 576-582

bureaucracy which for him represents the mainstream culture at its most absurd, has done far too much harm in its senseless directives and policies. The overall impact of the national park in the centre of the Bering Island has placed the traditional Aleut activities under a vast array of different regulations.

It now seems impossible to hunt any marine mammals because all have been placed in the Red Book as endangered species. While some hunting is allowed, it conflicts with the Aleut ideas, such as the permission for hunting very young seals, which has never been done by the Aleuts before. Fishing for food has been restricted by a complex set of regulations and a person trying to make a living based on his traditional skills is met with a frustrating amount of paperwork.

Nikolai Nikolaevich Tiuterev has similar ideas as Gennadii Yakolev, he describes how in the past the local community had hunted for seals in the summer and winter, but now it is only permitted in the autumn and by specially accredited hunters. Tiuterev recalls the earlier years when locals were permitted to hunt sea-lions and seals but now this has been banned. He finds the official explanations difficult to understand: "Our ancestors hunted these animals and their numbers never decreased. Yet, today, the authorities are afraid that we will exterminate them. In the past, when somebody needed a couple of seals for food, they would hunt for them. Why would we want to waste seals by over-hunting? It provides meat for the whole village."

Nikolai Tiuterev also commented on tight fishing regulations and quotas: "New regulations state that it is necessary to go to lake Sarannoe but this is a considerable distance from the community and there is no transportation for local fishermen. Many people do not always receive any fish, especially pensioners." All these regulations interfere with the practices of the traditional economy and Aleut livelihood. Moreover, Nikolai Tiuterev believes that all of it is having a negative impact on the self-worth of the Aleut people as an indigenous culture²⁹⁰.

2.2. Disturbances to the Waters: Seas and Rivers

Some of the Indigenous nations of Eurasia depend on the oceans and coastal areas for their way of life – to them the waters and seascapes are as crucial as the land is to the inland hunters and reindeer herders. All communities depend on the freshwater for their household use, fisheries and transportation routes. In this chapter we investigate Indigenous views which discuss observations regarding water-bodies and large-scale changes – more specific contemporary local materials on fish will be included the third chapter.

2.2.1. Connections to Waters

River Kolyma, one of the great Siberian rivers, is a lifeline for the local Chukchi, Even, Yukaghir and other Indigenous peoples. Dmitri Nikolayevich Begunov, a Chukchi

²⁹⁰ ibid. 577-584

reindeer herder from the town of Cherski in Lower Kolyma tells a story of these interconnections: "A son of my relative drowned three years ago. We were looking for him for a month but did not find him. Then on the following morning I got up and I could see the Kolyma River clearly from home. I fed the fire, (which is our ancient ceremony), and I said that we need to bury you Kolya, but we do not know where you are. After one hour we could see something, a black object floating down the Kolyma. We went to check it out and it was him, Kolya."²⁹¹



Fishing in the Kolyma region, NE Siberia, late 1800s. Photo from the Jesup North Pacific Expedition, 1897-1902, published with the permission of Institute of the Indigenous Peoples, Russian Academy of Sciences, 2015. Jesup North Pacific Expedition was a major science expedition to the region over 100 years ago. The photos of the expedition have been shared with the Russian Academy of Sciences institutions, originating from the American Museum of Natural History, New York.

The oldest fishing net that has been found in the Eurasian North is a 10 000-year-old seine from the Karelian Isthmus discovered in 1913 by Finnish scholar Sakari Pälsi in the Antrea community, confirming the age-old role of communal fishing in the area²⁹². In particular, under-ice net fishing during winter has been a vital practice in the region. Through the millennia indigenous cultures have developed systems of interaction with their landscapes, icescapes and dreamscapes. Hunting and fishing are at the heart of these systems of reciprocity. It is important to identify the key elements of such systems so that they can be understood when the questions of biodiversity changes, land use and fishing are discussed.

The fishing culture of the Skolt Sámi Nation, with traditional territories of Suenjel and Petchenga at the Finnish-Norwegian-Russian borderlands, illustrates one of these

²⁹¹ Mustonen 2009: 211

²⁹² Huurre 2001

systems. Relationships with specific lakes and rivers are encoded in oral traditions, including taboos and rules of behavior. One example concerns Lake Reksjavr in the Suenjel territory. The spirit of the lake is very observant and should be minded at all times. One cannot make noise on this lake. There are rules for how the nets should be

times. One cannot make noise on this lake. There are rules for how the nets should be put in the water. On this lake, special words instead of everyday Skolt words have to be used, so the lake possesses its own micro-vocabulary²⁹³. This identifies how closely the indigenous languages are tied to their environment.

An example of fish conservation by the Skolts takes the form of autumn harvest practices for spawning whitefish and other species. Many families had fishing traps on spawning rivers in the autumn, but great care was taken regarding the resources. During a given autumn, the trap would be on the creek for two or three nights. After that the creek would be left alone for three years. This ensured the dispersal of fishing effort over many different water bodies so that the fish in each creek would spawn and not be overharvested, helping to maintain populations, biodiversity and ecosystem integrity. The same practice applied to all water bodies in the Suenjel area for the Skolts²⁹⁴.



Filip Jefremov caught a grayling with a hand net in River Rautu 31.5.1990, Sevettijärvi, Finland. Harri Nurminen, used with permission.

On the species level, the Skolt Sámi views of pearly freshwater mussels are interesting in the Finnish-Russian borderland²⁹⁵. The case makes the point between long term Indigenous uses of the waterbodies, reflections of these relationships in place names and oral histories. Skolts were harvesters of these mussels and are mentioned in

²⁹³ Nickul 1934

²⁹⁴ Sverloff 2003

²⁹⁵ Veersalu 2008: 50-66

taxation documents for 1608-1611 AD around fjord Uuravuono and in taxation documents for river Lutto²⁹⁶ around 1738. River Inarijoki is mentioned by J. Fellman to be a place of harvest as well.

At the beginning of 20th Century only Kola Sámi still continued to harvest the pearly freshwater mussel. Profits went to travelling merchants. Skolt Sámi language contains several types and ways to describe pearls found in mussels, some words borrowed from Russian. Sámi had exclusive rights for harvest in certain rivers. Some of the place names of the region reflect these practices - Osekjaurash for Family Feädät Osk²⁹⁷, Leventijaurash and Leventoaij²⁹⁸.

Hlebnvaar on the Eastern bank of River Koallanjok is a Russian toponym connected with an ancient story of a Skolt Sámi finding three pearls in one mussel and taking them to the Russian Czar. When Czar asks what does Skolt want in return, he replied that he wants to have bread for the rest of his life – thus name Hlebnvaar for the hill. River Raakkujoki in Petsamo area in Paatsjoki tributary as well as River Nautsijoki has been possibly used by Inari Sámi harvesters²⁹⁹.

Harvest was more abundant in Suonnejelsijdd³⁰⁰ than in Peäccamsijdd or in Paaccjogasijdd. Muetkksijdd - Muotka sijdd has been as well plentiful in harvest. Famous harvesters were Iivana I Semenoff, Iivana II Semenoff and Outas Semenoff in Suonnejelsijdd, in Peäccamsijdd Dormidon Jefremoff and Propoki Jeffremoff. Semenoffs protected good mussel rivers, you could not use them for logging operations.

Traditional knowledge indicated that pearls exists mostly in old and "bent, curved" mussels – these are referred to as "marker mussels". Skolt Sámi harvested mussels between end of June and mid July when waters were warm. This was done by wading and diving, mussels lifted by hand. There are records of a harvest from mid-July to end of August. You insert a stick to a mussel which closes on the stick and you can pull it up. Greatest pearls are close to the fjell areas.

In rivers that flow from South to North there is more direct sunlight so the sun beams hit the bottom for longer period and the mussels are under Southern river bank, under a tree. There are more pearls in the rivers that flow from West to East but they are shinier in the rivers that flow from South to North. Pearl can move from one mussel to another. If you do not take mussel carefully enough, mussel can release pearl away³⁰¹.

Shining of pearls was considered supernatural. Eastern Sámi think it is caused by the copper shining. They sacrificed copper coins to rivers. On River Joutasjoki Skolts sacrificed silver coins to the river and to the Spirit of the Water³⁰² so that he would release his own treasures – the pearls. This traditional law was repeated across the region of the Eastern Sámi. On Kola Peninsula the Water Spirit is known as vodjanik and once a

²⁹⁶ Skolt Sámi territory

²⁹⁷ Sverloff

²⁹⁸ Leventin

²⁹⁹ ibid. 50-66

³⁰⁰ referring to siida as a traditional Sámi territory

³⁰¹ ibid. 50-66

³⁰² In Saami Tsahatse halddole

mussel harvester died while collecting mussels on a certain river – after this river was not disturbed as the Spirit showed its displeasure.

Shamans have used mussel shells to cause rain on an island in Lake Iijärvi. A shaman took very small shells from the intestines of a grayling³⁰³. Mussels are not only depended on salmon. As well sea trout rivers are mussel rivers. Mussels do not come up to West or North of River Lutto but to South and East. Perhaps this has to do with the temperature of the waters³⁰⁴. Nowadays the freshwater mussel is completely protected in the area and no Indigenous harvest remains.

The indigenous systems of governance and harvest have been undergoing changes throughout the past 400 years in the Eurasian North. Subsistence fishing is still one of the key place-based knowledge repositories, especially under-ice subsistence fishing across the Fennoscandian North and into Siberia which is crucial to many families for food, culture and tradition. In terms of ecosystem biodiversity, the indigenous subsistence fishing can be a key monitoring system, providing information on the health of the water bodies.

2.2.2. Oceans and Coasts of Eurasia

Tatyana Achirgina³⁰⁵ from Chukotka, Siberia, discusses close proximities with the Arctic Ocean: "All Eskimos emphasize their connection with the sea – boys have dreams of becoming hunters. The sea gives birth to our whole life. There are, however, some disturbing changes. For example, hunters have often killed walruses only for their tusks and not for a living – that's sacrilege. In most cases however our people are not able to leave their native places³⁰⁶ and so we are gradually losing our connection to the sea."

In Middle Siberia, in the Nenets Autonomous Region, Lukin³⁰⁷ reports that ringed seal and bearded seal are hunted in the shallow water on the Southern and Eastern coastlines and sandbanks of the Kolguyev Island. In addition, the Atlantic walrus can be seen in the warmer periods of the year. Seals are not sold anymore. The sea mammal hunting has, however, a big symbolic value as a historical source of livelihood especially for those Nenets families who have been living in the island for a longer time.

Similarly as on the Nenets islands, the subsistence economies still thrive on the coasts of Chukotka - Eskimo³⁰⁸ Oleg Alikhanovich Dobriyev³⁰⁹ described the nature of the hunt at sea: "On a hunt everybody is guided by the behaviour of a whale. It's more difficult with the walruses, for they float in a more confusing way, although they come to surface sooner. Usually, our group consists of four or five boats and two whaling boats."

Oleg also talks about how in the past every part of the whale was used as there had

³⁰³ In North Sámi it is called skálzu

³⁰⁴ ibid. 50-66

³⁰⁵ Novikova 2008b: 554-557

³⁰⁶ Indigenous home lands

³⁰⁷ 2005: 28

³⁰⁸ Siberian Yupiaq

³⁰⁹ Novikova 2008b: 261

been a processing plant in Lorino and whale blubber was shipped to the continent at that time. "Now we don't know what to do with it, we throw the extra blubber away. But it is not wasted as birds eat it up over time. Nature has a non-waste technology. There is no skin left, everything is taken away." The village of Lorino catches alltogether 50 to 60 whales per year. The hunting season opens as soon as the ice is gone in the middle of June. "Family members take part in cutting and curing. Every family procures as much meat as it needs. Children go too. It's very exciting for them. All year they keep asking us when are we going to go hunting?"³¹⁰

However, the modern times have started to influence even the most remote areas in the Arctic. Raisa Mikhaylovna Zotova³¹¹ was born in Providenya, Chukotka to an Eskimo³¹² family. She is medical doctor and works at the polyclinic and at the R&D Centre. Dr. Zotova describes the situation in the region: "The economic development of Chukotka has influenced the life of Eskimos because the environment has deteriorated and land rehabilitation is not being realized. Atmospheric pollution leaves its mark. Living in the permafrost zone means that filtration occurs very slowly, all the pollutants remain on top of the ground, the reindeer then eat it, and finally people eat their meat. The same thing happens to the sea. Nobody cleans oil spills, especially in cold waters. The pollutants do not disappear without a trace. Once we brought a whale³¹³ and the meat was polluted with spilled oil."

The Siberian coastline and the coastal waters carry legacies of the Soviet times. Presence of nuclear-powered marine equipment and ships presents the most urgent sitespecific environmental danger along the Russian Arctic coast today. There are the nuclear icebreakers of Atomflot, the nuclear submarines of the Northern Fleet of Russian Navy, and the nuclear-powered power stations in Bilibino in Chukotka and Polarnyi Zori on the Kola Peninsula.



Abandoned ships on the Kola Fjord, Murmansk, Russia. Snowchange, 2003.



Old historical photograph of a nuclear submarine on the Kola Fjord, Murmansk, Russia. Museum of the Northern Fleet, used with permission.

- ³¹⁰ Novikova 2008b: 261
- ³¹¹ ibid. 554-557
- ³¹² Siberian Yupiaq
- ³¹³ to the shore

While these and their impacts are reasonably well known, the impacts from nuclearpowered lighthouses along the length of Northern Sea Route have received less attention. Nonetheless, they exemplify the potential secondary effects on land of shipping activities offshore. The indigenous obschina or ancestral community of Nutendli, inhabited by Chukchi and Yukagir reindeer herders, is located at the northeastern corner of the Sakha Republic, in the Kolyma River Delta³¹⁴.

Chukchi reindeer herder and traditional singer Vyacheslav Kemlil is the leader of Nutendli. The territory of this Indigenous community borders Chukotka. It is located at roughly 69 degrees north latitude. The northern border of the reindeer territory is the Arctic Ocean. The coastal zone is the summer reindeer herding area of Nutendli and the community has its subsistence fish camp in Chalavurova.



Vyacheslav Kemlil's "Tundra Awakens in the Spring" performance at international Snowchange 2005 Conference in Anchorage, Alaska, USA. Lawrence Dick.

One of the topics of concern has been the presence of nuclear powered lighthouses along the reindeer-herding route of Nutendli brigades. Two or three lighthouses are in close proximity to the summer pastures used by the community. Vyacheslav Kemlil reports that fences surround the lighthouses and that there are warning signs in Russian indicating that people should not approach these sites. Especially during the polar night from November to January, the beams of the lighthouses are visible for long distances to the herders. The signs indicate that there is a health hazard if these sites are approached.

Kemlil has warned his fellow herders not to approach the lighthouse zone.

The herders suspect that the site contains high levels of radiation. Kemlil reports³¹⁵ that his community thinks that lichen absorbs radiation easily. Therefore it would be dangerous to allow the reindeer graze close to the coastal lighthouses. The community has now imposed a kilometre-wide avoidance zone around the lighthouses to minimize risks and to prevent the reindeer from getting ill.

Kemlil said that the nuclear material itself is located underground. He says that carcasses of arctic fox, ducks, geese, and ptarmigan have been seen at the very close proximity of the lighthouse along the Nutendli route. There is a suspicion that the radioactive materials of the lighthouses are leaking and affecting the local ecosystem. Krashnushka is the base camp of the Nutendli community. It serves as the supply base for the nomadic reindeer brigade and hosts the community nomadic school constructed in 2002.

³¹⁴ Mustonen 2009: 231

³¹⁵ Mustonen 2009: 231

A local resident once suggested that the power system from a nuclear lighthouse be brought to Krashnushka to power its electrical system, in order to achieve energy independence. The Nutendli community declined to pursue this idea³¹⁶. The Nutendli example is but one of many cases in which indigenous coastal residents are affected by nuclear-powered lighthouses along the Russian coast. These lighthouses still provide guidance for ships transiting the Northern Sea Route as well as those entering local harbours along the way.

Yet they have not been adequately maintained and therefore are unreliable as navigational devices, in addition to posing an environmental threat. The absence of reliable information causes concern amongst the local people, who do not know if their actions to avoid the sites are unnecessary or insufficient. The future of Arctic shipping may not depend on these lighthouses, but they remain as a tangible reminder of the history of Arctic shipping and the hazards that local residents may face if they have little information and no voice in what occurs in the areas where they live.

In addition to physical hazards, the forced relocations of people changed the situation on the Russian coasts. Anatoly Matveyevich Ankatagin³¹⁷ is an Eskimo³¹⁸ and he was born in 1948 in the village of Lavrentiya. Anatoly was only a few months old when the whole village was relocated and his family was resettled in Old Chaplino. "The adults were very much against the idea of moving from Lavrentiya where we already had a genuine national hunting area. The new place was located around a bay where coastal people had never settled."

Anatoly's family was relocated to place that was at least twenty kilometers away from their seasonal hunting grounds. "The resettlement caused many problems. Travel to hunting place took too much time; it was very hard to find where to live in these regions. There were also problems with transporting prey as the meat often went bad and had to be thrown away. This was always a great source of frustration for hunters."

With respect to the industrial development of Chukotka, Ankatagin is straightforward: "The further from our village, from our reserve hunting areas, the better. But if industry should be build next to us, I would not welcome it because it will leave us without sea animals. I personally have never seen how they work in industry but I have read a lot – they do it in a barbaric manner with no respect for the integrity of the land."

Ankatagin has observed a variation in the population sizes of marine mammals from year to year. He says that hunting does not have such impact on the populations but it is caused by pollutants: "We had been getting bare, hairless seals and lakhtaks³¹⁹ several times, they had most likely lost their fur because of black or solar oil." For Anatoly the industrial development of Chukotka has not had any positive impact on the wellbeing of its indigenous people³²⁰.

Similar views as expressed by Ankatagin are heard in the words of Yury Vladimirovich

³¹⁶ Mustonen 2009: 231

³¹⁷ Novikova 2008b: 555-559

³¹⁸ Siberian Yupiaq

³¹⁹ bearded seal

³²⁰ Novikova 2008b: 555-559

Yatta, who is an Eskimo³²¹ born in New Chaplino, Chukotka. He has hunted marine mammals for the past sixteen years. He describes the situation in his region: "According to our Elders, they had lived very well in Old Chaplino – Unazik. There were always a lot of animals there, while where we are now, we have to travel far for them. When there are no animals around, we have to seek them in spring as far away as Arakam-chechen Island which is more than 100 km away from here. If there is drift-ice, then lakhtaks³²² and walruses happen to be among the ice-floes, so we shoot them mostly. We were resettled here from a fertile place. Even in winter you have to go a pretty long way to the edge 15 to 20 km. Hunters travel there by snowmobiles or dog-drawn sledges. In winter the only weapon I have is my carbine which is enough to get a seal or walrus. We used to shoot these sea mammals by the hundreds but today one or two animals per hunter seem to be enough."³²³

2.2.3. River is a Lifeline, Lake a Sacred Provider

The Teno River, or Deátnu in Sami, is the most important river in the area and it carries an excellent stock of wild Atlantic salmon. Many of the Utsjoki Sámi community members voiced the importance of the River Teno and its salmon stocks. A common opinion was that there are fluctuations in the amount of salmon swimming upstream and that the couple of past years had been excellent salmon years³²⁴. In 2009 the catches were lower again.



River Déatnu, or Teno (in Finnish), the lifeline river of the North Sámi, after ice breakup. Eero Murtomäki.

- ³²² bearded seal, I. Erignathus barbatus
- ³²³ Novikova 2008
- ³²⁴ Helander et al. 2004: 291-298

³²¹ Siberian Yupiaq

In early 2000s Sámi fisherman Aslak Antti Länsman observed that "as water level rises the salmon move upstream to the small tributaries. And the fishing methods don't work as the water turns clayish. The river is important, it gives life." Relying on statistics and his knowledge, according to Sámi Ilmari Tapiola from Utsjoki community the river is changing in new ways: "Teno ice breakup has been delayed every year now. Usually it takes place at the end of May." More recent observations in the community in 2010s point to earlier breakups. The ice breakup in Neiden river south of Teno has started earlier in the past 10 years and takes place in a rush, creating floods and ice dams not seen before.

Jouni Tapiola, a late salmon fisherman lived all his life on the banks of Teno following the rhythms and flows of the river. He spoke at length of the river conditions and changes. "In shapewise Teno has stayed the same. Some local places, like the Outakoski rapids, may fluctuate 20 to 30 meters but this is because of the sandy river bottom. The water is at risk. It is like crystal clear water so even little pollution can be noted early on. The biggest pollutant is agriculture; cow sheds. Especially on the Norwegian side where agriculture is well subsidized. But there has been efforts to clean them [the cowsheds in Norway] to decrease emissions. It is said that the Teno water is no longer drinkable. And it can be so. I don't want to drink the water anymore. It has become somewhat eutrophic. The riverbanks used to be very barren; only rocks, as long as I remember there were no brushes growing there. Willow is an indicator if it starts growing. Some is now growing and it indicates some amount of pollution".



A fisherman rowing on River Déatnu. Eero Murtomäki.

Jouni Tapiola from Kaava has been a fisherman for all his life and he spoke thoroughly of his experiences. "In my childhood there were no children's plays. It was fishing and it was nice to spend time on the river. Especially when it once in a while jerked and we got a fish. In 1936, I was maybe ten years old, it was still allowed to practice active net fishing, kulkutus in the fall, it was forbidden in 1938 and is now allowed only in spring. In active net fishing there was a boat on both sides of the river and the net spread out in between. In the middle there was one boat where the fish were collected. The whole pack moved downstream with the flow. Anyway, it was a matter of life so we fished all the time to get and store food. Other means of fishing back then were with dam, with rods and with seines. The wartime changed the fishing. The sea area was full of mines so no one dared to fish there. Here on Teno, all nets were made of hemp we couldn't get any hem thread so the nets rottened little by little. All this allowed more salmon to swim into the river and in 1945 I remember how there was so much fish in the Teno. But there were replacement nets and dams were built again so the salmon got less."

There have been changes to the Teno salmon over the years and there are threats in the air that could affect its presence. Jouni Tapiola spoke of these issues, stressing the connections between the ocean and the river. "There has been improvement on the salmon stock. It was in the 1970s that the Norwegians prohibited this trawl-like sea fishing. Already in the next year we had small salmon swimming upstream. Nowadays the sea is being fished out of shrimp that is leaving the salmon with only little shrimp to feed on. This has caused the colour of salmon to fade. It is not as red as Atlantic salmon from the Arctic Sea used to be. And the flesh or meat, that used to be much thicker in the past. Back then a salted salmon fillet was like a wood board. This is also due to overcatching shrimp. The farmed salmon is a threat to the wild species in many ways. It has pulled down the salmon price. Now the price for real salmon from Teno is half of what it used to be. Cod is now more expensive than salmon and after the war a kilo of cod was cheap. I don't know what they feed to the farmed salmon but somehow they've managed to colour it red. It is very oily or greasy fish."

Jouni Tapiola ranked the salmon parasite, Gyrodactylus salaris, as the number one threat to the River Teno and its salmon stock. He hopes that the parasite could be prevented from entering the river and polluting the salmon. "It [the wild salmon] means so much [to the Sami], in income ways. If there wasn't salmon swimming up this river, I don't think there would be any settlement either.³²⁵"

Aslak Ola Aikio was one of the most respected Sámi people along the river. Born in 1931, Aslak Ola grew up in a Sámi community of Ohcejohka, or Utsjoki, in the Northernmost Finland in times when there were no real road connections. The River Teno offered the route to travel and it was the source of food, namely the Atlantic Salmon. As a very young boy he learnt to work , herd to the reindeer, fish for salmon and hunt. As part of the social integration impelled by the dominating culture, he also learnt to speak Finnish.

In summer and fall 2003, Aslak Ola often sat down to tell about his thoughts regarding nature and her laws. This was what he had learnt and heard, in the form of oral histories, during his decades as a hunter and fisherman. One time at his home in Äimäjoki Aslak Ola said:

³²⁵ Helander et al. 2004: 291-298

There have been so many salmon rivers in Finland too, but we haven't been able to keep them [alive]. And with the sea, we think that there is always catch in the sea.

I don't think so.

Here the Arctic Ocean was thought to be endless source and people were convinced the cod would never run out.

My father asked to voice his opinion in a meeting.

- I think they didn't understand his irony when asked how they are sharing the catch of the Arctic Ocean.
- Since it was done by figures, my father asked how could they put a figure on endless resource.

At that time you could fish with no lure, with a bare hook.

It wasn't about luring the fish to take the bait but just waiting for one to come across the hook.

But now there is no [fish], cod is much more expensive than salmon these days. It is that way around now.

And yet the salmon farms are bankrupt.

This is what I tell you, it is a lesson... for nature cannot be exploited. If you do that, it is you who will suffer for it in the end.³²⁶



North Sámi fisherman and hunter Aslak Ola Aikio carrying a 29,6 kg salmon he caught in Déatnu river in Utsjoki, Finland. Collections of the Aikio Family, used with permission.

³²⁶ Mustonen 2012

In the Russian North, subsistence fisheries remain a crucial food source. Konstantin Alekseevich Dzhurmii, a Selkup, was born in the village of Ivankino in Kolpashevsky district, Tomskaya Oblast. Konstantin talks about fishing practices and the state of the rivers in his area. In late November when the Puriianga river usually freezes, everyone gathers there to fish with lanterns, wicks, traps and nets. In December the fish migrate to the smaller creeks because there is not enough oxygen in the river. In the creeks people are able to use nets and catch also the small fish.

Fishing has to stop in March because near Kemerovo waste is being dumped into the river and that makes the fish sticky and peels the skin of people's hands. Even if this wasn't the case, fishing in general is banned in the springtime. Sterlet, l. Acipenser ruthenus is one of the only species that can be caught during the spring season. Sterlet is more common in the Ket river than in Ob since the water is cleaner in Ket. The reason and justification for fishing sterlet in the springtime is that the local people depend on it to survive. Local fishing is usually conducted in groups and the catch is divided based on need. In the past local practice has been to divide the catch evenly³²⁷.

Elizaveta Egorovna Golubeva, a Chuvan, lives in the village of Markovo in the Chukotka Autonomous Okrug. She makes the strong case between post-Soviet realities of no income and the crucial dependencies on subsistence economies. Elizaveta is a teacher of Chukchi language and she describes the bad economic situation in the region. People don't get paid and have to wait for their salaries for several months: "We survive on fish. Also, almost everybody has greenhouses and kitchen gardens."

Elizaveta says that local people are observing the harmful impacts on their local environment caused by industrial activity. There is a gold-dredging operation 'Topolinyi' nearby the village of Markovo. Local people have seen a lot of dead fish. Elizaveta noted that there had been an ecological service in Markovo which used to monitor the condition of the fish but it has been closed down³²⁸.

Emilia Borisovna Balchikova makes a similar case. She was born in the Chuvan village of Markovo in the Chukotka Autonomous Okrug. She lives in Anadyr now but periodically she comes to stay in Markovo where she finds life easier. Emilia Balchikova has concerns over industrial gold mining in the region, she says that it upsets the ecological balance in the region.

"We live thanks to the river. The river feeds us. Along the banks of the river there are lots of berries. But mainly it is by fishing. From the beginning of time people have been fishing here, although there are fewer fish now." Emilia also describes how nowadays poachers would barbarically destroy the fish for caviar³²⁹.

Yevgeny Remkylen has already observed disturbing changes in Chukotka. He was born into a family of Chukchi reindeer herders in the village of Rytkuchi, Chaunsky



Arctic cloudberry. Eero Murtomäki.

³²⁷ Funk 2008: 227-231

³²⁸ Bat'yanova 2008: 512-515

³²⁹ Bat'yanova 2008: 511-516).

district. He describes the impacts of gold digging in his region and says that when the mining companies had dredged the nearby rivers in their search for gold they had not consulted the local population at all. This had resulted the disappearance of fish spawning areas in the upper reaches of the rivers and destruction of many areas used as important reindeer pastures³³⁰.

In Central Siberia, the before-mentioned oil industry damages rivers well beyond the actual site of production. Damages can persist for decades. Eugeny Jakovlevich Lozyamov is a Kazym Khanty who lives in the village of Sutomino and works at the local fishery. "We fish in the small Sakhalinka river that flows into the Ob river. We block the whole river, setting a net now into which the fish swim. It is a small enterprise. We fish for sturgeon, starlet, white salmon and whitefish. Whitefish have disappeared. This year³³¹ we fished only 30 tons against 90 tons two years ago. That is because of the oil. Some three years ago an accident happened. There are oil-rigs near the settlement and near the fishery."³³²

Similar views are expressed by Sergei Sychin, a Selkup, who lives in the village of Ivankino in the Kolpashevsky district, Tomskaya oblast. He is a head of the administration of the STU Fishing Collective Farm. According to Sergei Sychin the local residents are very dependent on the river and its fish to survive since hunting is not as good as it used to be. Mostly fishing takes place during winter since fish is easier to preserve during the cold season.

Sychin says that the environmental damage caused by the industry has been considerable in the region and local residents are still greatly suffering from the impacts. Until year 1966 two local fishermen held the record for the largest fish catch in the Russian Federation. The period from 1975 to 1990 was a time of extensive industrialization in the region. Lakes were drained and over a million cubic meters of forests were clear-cut. Now industry is in recession but the traditional economic activities of local residents, hunting and fishing, have been seriously damaged by the previous industrial activities³³³.

Also the same concerns have been raised along the great Yenisey. Arsenty Semenovich Doroseev of the Ket nation was born in 1929 in Ust-Kureika. He grew up in the taiga and after retirement he returned to the forest. "I like hunting and fishing, this is my life". Arsenty describes how the Yenisei river has become polluted as a result of industrial development.

The quality of drinking water has worsened and fish, that people depend on for their survival, has been contaminated. "Everything is dumped into the Yenisei", Arsenty says. He is also very concerned about the plans to build power stations along some waterways in the region and worries how this would affect the quality of water in the whole water system³³⁴.

³³⁰ Bat'yanova 2008: 532-534

³³¹ 2001

³³² Novikova 2008a: 174-180

³³³ Funk 2008: 227-230

³³⁴ Karpukhin 2008: 263-267

As mentioned before, the weather change is a major driver for change in the North. The warming has altered whole waterbodies, as is the case in the Lower Kolyma area of Sakha-Yakutia, where the local Chukchi and Yukaghir reindeer herders have reported that the permafrost is melting and this is causing, among other things, the disappearance of whole lakes as well as changes to the water system.

Alexey Nikolayevich Kemlil, a Chukchi reindeer herder of the community Turvaurgin, describes this process on the Western side of the Kolyma River: "There have been changes to the permafrost. In the past ten years several lakes have disappeared both from the taiga and tundra area where we have our reindeer migration. Lakes have become rivers and drained out. You can see this in the tundra, but even more on the forest zone. This impacts on the fishing for sure. One of the lakes disappeared, but the fish got stuck in the bottom and died of course. Wetlands and marshes are as well more, how to say, deeper or not so solid. Close to the rivers like Chukatsha there are depression faults and holes on the ground. The marshlands cannot be used anymore for reindeer travelling."³³⁵



As the permafrost melts, river banks collapse as here in Kolyma, Siberia and the marshmires become impassable during the summer time. Tero Mustonen (top), Eero Murtomäki (below).



335 Mustonen 2009: 246

3. Indigenous Traditional Economies, Livelihoods and Cultures



Jegor Nutendli, the Elder, reindeer herder and knowledge holder of the Chukchi people in Kolyma, Siberia, passed away in late 2015. Mr. Nutendli was well-known story-teller, traditional singer and oral custodian of the Chukchi lore. He spoke several regional Indigenous languages. Mr. Nutendli worked with Snowchange for over a decade from 2005 to 2015. He shared his traditional knowledge, observations and lifeways of the Indigenous societies of Sakha-Yakutia, especially Kolyma region. With utmost clarity he recalled stories of the 'American' trade in the region in the early 1900s, life in the tundra in full nomadic times, and the transformations of the 20th century around him. His observations and oral histories of climate change contributed to several peer-reviewed science monographs and articles. Snowchange, 2014.

As outlined in the Figure 1., today reindeer herding, hunting, fishing, gathering economies and other forms of being on the land constitute the most significant point for observations of change as well as interaction for the Indigenous nations of Eurasia. Nuttall et al.³³⁶ explored the impacts of climate change on the communities in previous Arctic Council assessments.

We have focused on the voices from the communities here and relied on the observations people have prioritized. In Chapter 2 we explored region- and system-wide observations, in the context ranging from impacts of modernity, oil and gas production, hydro-stations and other impacts to legacies of nuclear contamination. In this chapter the scale will change.

Now the emphasis will be, given the specific observations and relationships that people have as a part of their subsistence economies, on changes in fish, animals and birds. As an example of this, brown bear, l. Ursus Arctos is an animal that lives usually in the taiga zone of Sakha-Yakutia, but is occasionally seen as well in the tundra zone, such as in the Lower Kolyma region.

³³⁶ 2005

Chukchi Elders such as Jegor Nutendli on the Eastern bank of the Kolyma delta say that there are many brown bears in the tundra zone now. They have come from the forest zone to the tundra. Earlier above the Chukchi-Yukaghir renowed reindeer herder Grigori Ivanovits Velvin of Cherski explained about the deep relationship that the local Indigenous peoples have with the bear in Kolyma region of Siberia. Alexei Gavrilovich Tretyakov, a retired reindeer herder from the community of Andreyushkino in the region says the same: "We know that the bear is a sacred animal. That is why we do not shoot the bear, we do not eat its meat. It is sacred to us"³³⁷.

The relationship between "species" as understood in a biological and scientific sense and the Indigenous knowledge regarding these beings and animals is hard to bring into an easy dialogue. In addition to the kind of relationships that Grigorii Velvin discusses above, another example of these different perceptions of biodiversity can be seen in Macdonald³³⁸. The notions of blood and kin relationships with animals, transformations and myth-dream times and landscapes translate uneasily into the language of "species" and modern ecology.

The observations in the following have been divided into rough "categories" of mammals, fish and birds – even though such categories are against the traditional view of the Indigenous peoples. However this compromise is offered to ease the readers into the knowledge of the people in a more organised manner.

A collection of observations from vastly different communities across Eurasia, the biggest continent on Earth, clearly leaves great gaps. In some instances the observations of the people may be far away from the expectations of the scientists. Given the very limited resources both within ABA proper and this Compendium, the oral history materials here should be seen as starting points and we fully encourage the future assessments and inquiries of biodiversity in the Arctic to take note of these baseline events and explore them further – in good dialogue with science. These surveys should be carried out as locally as possible and with the full participation of the people in the communities – then our views of change will become even more clear.

3.1. Mammals

Subsistence economies persist in the Eurasian North, especially in the post-Soviet realities of Siberia. Anna Pavlovna Berezkina is a Chuvan Elder living in the village of Markovo in the Chukotka Autonomous Okrug. Indigenous Chuvans would traditionally trap for furs. Father of Anna Berezkina was a Chuvan hunter and trapper. She describes how all kinds of fur-bearing animals could be hunted in the region, notably polar fox.

Local people would also fish, both alone and in groups. Fish would be dried since there was no salt. "Today we are only allowed a small limit of fish. Not even enough to feed oneself. So people began poaching, of course." Anna Berezkina describes how people used to preserve barrels of berries: black currants, red currants and cloudberries. They still do today, usually without sugar; there either is none or it is too expensive. "I do not

³³⁷ Mustonen 2009: 212-213

³³⁸ 2000: 18

remember people ever having holidays, they always worked. There has always been poverty. Or at least, we lived at the subsistence level"³³⁹.

Similarly, the reindeer herding, a major innovation across the Eurasian North, is the driving engine for the survival of the Indigenous nations of the region. Yakov Kymet³⁴⁰, a Chukchi journalist in Anadyr, Chukotka Autonomous Okrug made this connection clear in the summer 1999: "Our local and regional authorities usually consider reindeer husbandry only from the point of view of its potential impact on the economy of this region. But reindeer husbandry should never be seen as simply some kind of branch of economic activity. It is a way of life for many people. In fact, it is life itself for this region as it has been for centuries." Grigorii Andreevich Tynakergav³⁴¹, Chukchi from the same region, agrees: "Reindeer herding makes this world richer. One day the mining of gold and other minerals will come to an end here. Reindeer herding, on the other hand, will always be able to go on."



The reindeer herd of brigade four of the Turvaurgin nomadic community, Lower Kolyma, Sakha-Yakutia, Russia. Snowchange, 2006.

Interrelationship between insects, especially gadflies and reindeer herding stresses the link of observations across habitats and ecosystems. Therefore mosquitoes and other insects are constantly being observed by the herders. Late Sámi Elder Niillas Vuolab, a

³³⁹ Bat'yanova 2008: 511-516

³⁴⁰ Bat'yanova 2008: 529

³⁴¹ ibid. 536

reindeer herder from Kaldoaivi, Finland described with a great accuracy the deadly impact of reindeer throat botfly³⁴² and gadflies³⁴³ on the reindeer. Sometimes the impacts had been fatal as the reindeer throat botfly and caribou nostril flies blocked the throat of the reindeer. This was affecting especially the calves.

Gadflies were not as severe on their effects but in the hot summer air there used to be a yellow cloud following the reindeer as they moved. "Nowadays all insects are so few. I haven't seen too many gadflies during a summer now." Niillas' son Ilmari Vuolab was on the same track. "Gadflies and all insects have diminished a lot. I remember stories how there used to gather clouds of insects on people's yards. You could tell who had cattle, cows and sheep, by the amount of insects buzzing around the yard. But I think all insects are less today^{344"345}.

Members of the Sámi obschina, or Indigenous community Piras have their basecamp on the Western shores of the Lovozero lake in the Murmansk region of Russia. Andrey Yulin, head of the community, has observed the collapse in number of mosquitoes in the summertime, and this is blamed on the dry summers of 2002-2004.

As well, "strange hornets", which have not been seen before, have appeared in the forest areas of Murmansk³⁴⁶. Vladimir Galkin, another member of the Piras obschina, concluded: "Judging by the last year³⁴⁷, there are almost no mosquitoes left in Lovozero. It can be real evidence that the climate is changing. Even some species of southern bugs and spiders appeared in tundra"³⁴⁸. Irina Kaneva, a Komi from Krasnochelye wilderness village in the middle of the Kola Peninsula, has made the following observation in 2006: "Now the black flies appear before the mosquitoes, this is something new"³⁴⁹.

Equally crucial food source as domestic reindeer for the Siberian communities is the wild deer, where it still persists. Urbanisation has changed the harvest. Gennady Nikolaevich Maimaga, a Dolgan living in Dudinka, was the Chair of the Association of the Indigenous Peoples of the Taimyr. Gennady Maimaga passed away in year 2000. For Maimaga and other people living in an urban community it was not possible to hunt enough wild reindeer. According to Maimaga, wild reindeer would not frequently pass by the city nowadays. In the past, 70 to 80 thousand wild reindeer were present in August-September whereas today the number is only 30 thousand³⁵⁰.

The fluctuations and changes to the migratory routes of the wild animals have caused impacts on the reindeer herding. Kristofor Nikolayevich Tretyakov, a Yukaghir reindeer herder from Andreyushkino in the Lower Kolyma region reported in 2005 that the wild deer³⁵¹ never came to the village area, but that year they appeared.

- 345 Helander et al. 2004: 294
- ³⁴⁶ Mustonen et al. 2004
- ³⁴⁷ 2001
- ³⁴⁸ Mustonen et al. 2004
- ³⁴⁹ Mustonen and Mustonen 2011
- 350 Karpukhin 2008: 244-247
- ³⁵¹ Rangifer tarandus

³⁴² Cephenemyia trompe

³⁴³ Tabanidae

³⁴⁴ 2004

Wild reindeer stample all lichen according to Tretyakov³⁵². Expert Dmitry Syrovatsky confirms that wild reindeer stamples pastures around Andryushkino and this impacted greatly domestic reindeers numbers.

Wolf has been called the doctor of the tundra and taiga. In the traditional view of the Indigenous cultures it has its place amongst the creatures of the wild, even though it is oftentimes seen in Siberia and Sámi territories as an adversary and a threat to the reindeer, which in their turn are the main staple of the communities. Such is the case in Kolguyev, where Lukin³⁵³ reports that there used to be wolves on the island, but during the wolf-killing campaigns in the Soviet times all the wolves were killed. However, especially in more traditional communities, the wolf is remembered as a powerful being who helps the spiritual people.

Indigenous communities of Lower Kolyma, Sakha-Yakutia region report that the wolf population is stable and healthy. The wilderness of Kolyma can sustain a healthy population of wolves especially after the intensive hunting practices of the Soviet times are now over. Reindeer that have fled to join wild deer in the region are good source of food for the wolves.

Elder Akulina Kemlil from Nutendli said that "wolves attack those reindeer who are travelling with the wild deer. Reindeer moves slower than a wild deer. Therefore they are like baits to the wolves." Vyacheslav Kemlil reports on the Kolyma wolves: "we have two kind of wolves here. The forest wolves are more red, they have red in their skin. Local tundra wolves are bigger and light-colored"³⁵⁴.

Alexey Nikolayevich Kemlil, a Chukchi reindeer herder from the Turvaurgin community reports that "there is more wolves now³⁵⁵ than before. Wolves attack more our reindeer and I suspect this to come from the fact that there are more reindeer who are travelling with the wild deer now. Elders say that the wolves come here after the wild deer and in recent years the wolf numbers have increased a lot"³⁵⁶.



Wolf, gumpe in Sámi language, in Finnish Lapland. Eero Murtomäki.

- ³⁵⁴ Mustonen 2007
- ³⁵⁵ 2006
- ³⁵⁶ Mustonen 2007

³⁵² Mustonen 2007

³⁵³ 2005

Sámi also know their gumpe, the wolf. The Skolt have had a view that wolf takes only a specific reindeer, one that has been marked for him since birth. Another belief has been that the wolf sees the other parts of the herd only as stones, and goes after the one meant for him. Traditional hunter Aslak Ola Aikio from Utsjoki, Finland, was famous because when he was young he ran after a wolf for a whole day³⁵⁷. Aikio observed the "clanking" sound of the wolf jaw when the animal runs.

Late Sámi Elder Niillas Vuolab, a reindeer herder from Kaldoaivi, Finland remembered times when there were a lot of wolves in the area. Relationship with the wolf was more intimate during the decades when the Sámi stayed with their herds through the year. "After the war there were many wolves here, no-one really counted them though. But there were several packs plus some couples to add up with few lonely ones too. We had to herd the reindeer constantly because of these predators. If a pack of say, ten wolves would come hunting, with one single attack they could take ten reindeer. Another attack or another pack, and it would be another ten reindeer!" Since then few wolves have appeared in the region³⁵⁸.

Non-indigenous reindeer herder Arkady Khodzinsky raised an extremely interesting issue regarding wolves in Kola Peninsula, Russia. He spoke of the arrival of "Scandinavian" wolves to the region. This proves to be a bizarre future challenge to the ecologists, as the numbers of wolves in Scandinavia remain so low that it is very difficult to envision a large migration to the Kola Peninsula.

Therefore the presence of the new breed of wolves remains an enigma. "The number of wolves grows every year. They are cunning. They are not real wolves, northern wolves. I think they are some kind of Scandinavian species, not the one from around here. Our wolf attacks a reindeer from the front and goes after the throat if it wants to kill the reindeer. But this new kind just kind of snaps from the rear and front. It is not a wolf, it is a hooligan. It is not normal. I think it has arrived from someplace in Scandinavia, it is not from here. Northern wolf is such that it weighs up to 70 kilograms - that is for sure. I know because I have seen them. It is like a machine. But this is more like a dog, it has a brown tail and ears standing upwards. It is not a real wolf. People are saying this is a Scandinavian wolf but not an Arctic Circle wolf. Yes, they have arrived from somewhere else. The northern wolf is rare and very nice to come by"³⁵⁹.

Dmitry Afanasyevich Matrehin, late head of the State Farm in Krasnochelye, central part of Kola Peninsula, made the comment that "there are regular problems with wolves. In 1997 or 1998 there was a big migration of wolves from the Archangelsk region, the bay froze up and they passed here over the ice, there was a big lot of them. And they were exterminated within three years then. But for the last years the wolves have been coming from the side of the Terskij bereg³⁶⁰, Umba and Kandalaksha rayons. In our area there are no permanently living wolves. Once we learn where the wolves are, we agree with somebody, for instance, we have permanent customers, such as [person named] Rezvih from "Belomorskij rybak"³⁶¹ company, he likes wolf hunting

³⁵⁷ Mustonen 2012

³⁵⁸ Helander et al. 2004: 294

³⁵⁹ Cherenkov et al. 2004

³⁶⁰ southern coast of the Murmansk region

³⁶¹ "White Sea fisherman"

and is interested about it, he comes here every year, they only shot one this year, but it could be up to five wolves. Once a wolf family is established, we try to eliminate it as soon as possible.³⁶²"

Perhaps a reason why wolf is a target of such an intensive hunt in Murmansk can be explained by its impacts on reindeer, but also on moose which is a subsistence food source to many in the region. Widespread poaching makes the situation worse. Members of the Sámi obschina, or Indigenous community Piras have their basecamp on the Western shores of the Lovozero lake in the Murmansk region of Russia.

Vladimir Galkin from the community has made the following observation: "Moose abundance has totally decreased. It can be called barbarous hunting³⁶³. For example, hunting season in Lovozero and all Murmansk region is closed by the 28th February. And then in April some serious guys from St. Petersburg arrive. They have licenses for moose hunting in April. You know that moose mothers will have calves in May. These moose mothers are shot off before calves are born. That's why moose's abundance is totally decreasing now. Our Severomorsk huntsmen and regional hunting inspection shoot moose near Kitza during autumn. There are no trees on this territory and that's why it is easy to catch groups of moose, shoot them and take their meat to meat packing and processing factory where they receive money. They don't care about the future. They live only in present day. They've shot almost all moose on their territory and begin to use our territory. They begin their "raids" in January and continue it up to the period until ice melts. If this continues for about 5 years, nothing will last here, neither bear nor moose³⁶⁴."



A moose wounded during the hunt can run for a long time and die after a long period of suffering. Eero Murtomäki.

³⁶² Mustonen and Mustonen 2011

³⁶³ which is the main reason of the collapse

³⁶⁴ Mustonen et al. 2004: 342-343

Vasily Kanev, a Komi reindeer herder from Krasnoschelye, central part of Kola Peninsula, adds to the wolf discussion in August 2006 that "Yes, wolf is more common to meet now, but not polar wolves, there are dhole, l. Cuon alpinus and red wolves l. Canis rufus and other colours, but all with wolf habits! The height is the same, but the colour is different. Because there is grey wolf, but those are different ones.³⁶⁵"

Observations of the herders and other community people focus naturally primarily on those interactions which are related to their subsistence economies. Such is the case also with the polar bear as Lukin³⁶⁶ reports from Kolguev Island, Nenets Autonomous Region, Russia. She writes that polar bears visit yearly during the late winter. The polar bear used to be hunted earlier. Further east along the coast the Indigenous fishermen of Pokhodsk, Sakha-Yakutia remember that in 2005 there were 26 polar bears that floated on an ice floe to the coast of the Arctic Ocean.

Ice floe then took off to the north and the polar bears were stranded close to the Kolyma Delta on main land. In the past the polar bears have stayed on the Arctic islands of the East Siberian Sea and occasionally two or three may be stranded on the mainland, but 26 was a record³⁶⁷.

WWF Expert, Fedor Yakovlev³⁶⁸ from the Sakha Department of Biological Resources, Ministry on Nature Protection, observed 27 polar bears in 2005 on coastal area in Kolyma delta on territory of 15 kilometres. It was for the first time to record so many animals once. After that he indicated that migration along the coast became usual for polar bears in Lower Kolyma due to late sea ice freeze and many bears could be observed on the mainland.

Polar fox is another truly Arctic mammal that has played a role in the subsistence economies of the communities. Populations of this animal have fluctuated greatly across the region. For example, much-respected Sámi hunter Heikki Länsman spoke of the last observation of an arctic fox in the Kaldoaivi region, Finland and said that it was some 10 to 15 years ago. "I haven't seen the arctic fox in a long time.³⁶⁹"

Sámi reindeer herder Rune Stokke has made observations about the red fox and arctic fox in the mountain areas of Jokkmokk, Sweden: "Last year³⁷⁰ we had a lot of red foxes, but maybe it was because we had a warm summer and rodents and such had survived³⁷¹ – there were an incredibly large amount of foxes.³⁷²" Sámi Gun Aira concludes: "The arctic fox has disappeared. It has almost died out, possibly the red fox has gained a larger dominance. It really doesn't belong up in the mountains.³⁷³"

Sámi in Jokkmokk have paid attention to other changes in the mammals too. Elli-Karin

³⁶⁵ ibid.

³⁶⁶ 2005

³⁶⁷ Mustonen 2007

³⁶⁸ 2009

³⁶⁹ Helander et al. 2004: 294

^{370 2002}

³⁷¹ the winter

³⁷² Hiltunen et al. 2004: 261-262

³⁷³ Hiltunen et al. 2004: 261-262
Pavval from Tuorpon sameby lives in Tårrajaur about 40 km from Jokkmokk. According to her she hasn't seen mountain lemmings lately. "When I was a child we saw them yearly.³⁷⁴"

Herder Stokke from Jokkmokk, Sweden reflects that "beaver has made an incredible increase³⁷⁵ in the last 20 or 30 years. It was a really rare case if you even saw a beaver thirty years ago, but now they have several communities around Kåbdalis. And even all the way up near Naustajaure and Tjaveljåkkå. They were sighted up in the summer-lands last year³⁷⁶, they've never been seen there before.³⁷⁷"

Weather change and warmer temperatures have started to bring new species to the North. Reindeer herder Sakari Keskitalo from Sompio, Finland recalled seeing a roe deer, l. Capreolus capreolus as a proof of new arrival species. "Five years³⁷⁸ ago I saw two in Vassama. Last fall one was circling around right next to the border³⁷⁹. It was going around the hill using the road; it was coming toward us. It is twice I have spotted a roe-deer"³⁸⁰. Alexei Gavrilovich Tretyakov is a reindeer herder from Andreyushkino community in the Lower Kolyma region, Sakha-Yakutia. He has observed the sable to move to tundra in the past 20 years. He says that they have come from a far, from the taiga zone³⁸¹.

Some new arrivals are not related to the warming, rather to human-induced introductions. Vladimir Nikolaevich Tobolzhin was born in 1955. Tobolzhin belongs to the Selkup nation and lives in the Kolpashevsky district in Tomskaya oblast. When Nikolai Tobolzhin was a child, mink was introduced in the region and because of this the number of polecats and ermines have noticeably decreased in the area. Nikolai remembers the first time he shot his first mink; he was still in school and had to ask his grandfather what animal it was. His grandfather who had served a prison sentence in the Far East had been able to identify the animal as mink³⁸².

Spirindon Konstantinovich Spirindonov is an Yukaghir elder from the of Nelemnoye settlement in the Republic of Sakha-Yakutia. According to Spirindonov hunting has greatly changed since his childhood. He says that there are virtually no squirrels left in the area whereas before they were hunted in thousands. One of the reasons for the disappearance of squirrels is the introduction of sable since these animals prey on squirrels. Spirindonov was concerned also about the sable, he worries that the over-hunting may have caused the disappearance of sable as well³⁸³.

Late Evenki hunter and reindeer herder Vladimir Kolesov from Iengra, Sakha-Yakutia reflected in 2005 that "there are no stories regarding the sable.³⁸⁴" Words of Kolesov

- 379 to Russia
- ³⁸⁰ Mustonen et al. 2004: 281
- ³⁸¹ Mustonen 2007

- ³⁸³ Pluzhnikov 2008: 442-446
- 384 Mustonen 2009: 97

³⁷⁴ Hiltunen et al. 2004: 266

³⁷⁵ in its population

^{376 2002}

³⁷⁷ Hiltunen et al. 2004: 266-267

 $^{^{\}rm 378}\,$ refers to 1997

³⁸² Funk 2008: 228-230

are crucial because he makes the point that traditional knowledge has not formed relationship to all new arrivals, whether they are mammals, fish or birds. Speed of change, either man-made or naturally driven, has been so significant, that the cultures have not had the time to react and adapt.



In the high fjells of Fennoscandia Red Fox has replaced Arctic Fox, the native northern species. The plentiful lemming years are also a thing of the past. The forest clear cuts in Lapland have diminished the number of squirrels. Tero Mustonen (top), Eero Murtomäki (bottom).



3.2. Fish

	Yoik of the Salmon
	Salmon swims
	Along the bottom of the water
	That powerful strong fish
1	And precious fish
Carles .	Which swims on
	Even if the stream would go through the Earth
	There he goes again
	To the upstream of the river
	And turns so black there
	And becomes such
	That you cannot eat him
	Not even in a dire need
	And then he returns
	Back down
	Where he came from
	To the vast open spaces of the ocean
	Where there are many salmon
	Again he is transformed
	Into as bright as he used to be
	When he reaches his ocean again
	When he has a lot of herring to eat
	He grows fat again
	And becomes the same
	As he was before
	- as recorded by J. Fellman in the 19th Century in Sápmi ³⁸⁵

River Näätämö, Finland. Skolt Sámi Optic History Archives, 2013.

The human civilizations of the Arctic, the cultures of the Indigenous Chukchi, Sámi, Inuit, Gwitchin, Yupiaq, Aleut, Hanti, Mansi, Yukaghir and others could not have survived all the millennia of the northern conditions without the help and subsistence provided by the arctic fish. The Indigenous peoples consider very often their fish to be their brothers and sisters - that is how much they are appreciated as the under-ice fishing methods and successful harvests have meant difference between life and death in the winter conditions.

"Yoik of the Salmon" that opens this chapter is one of the oldest documented Sámi yoiks or traditional songs from the 19th Century. The Indigenous peoples' cultures songs and traditional stories included - contain precise and relevant knowledge of the ecosystems in which these humans have survived for so long. The Yoik of the Salmon is a good example of this - it tells of the journey that the Atlantic Salmon takes in the

³⁸⁵ in Aikio et al. 1974: 175-176

rivers of Sápmi, the Sámi homeland of the European North. The salmon, being an anadromous creature of two worlds, the river and the sea, as well tells its story in the song between the two realms it traverses. After spawning he is no good to eat, and therefore returns to "the vast open spaces of the ocean" to get healthy and fat again by eating herring.

Scientists have determined this Sámi song to be ancient, it was old already when the pyramids were being built - so it tells of the depth of knowledge and interrelationships regarding fish that have been encoded in the traditional culture of the Sámi for so long. Arctic Char, Northern Pike, Cod, and many other species are as relevant to the Indigenous peoples as the salmon to the Sámi.



Atlantic Salmon caught on river Näätämö, Finland. Skolt Sámi Optic History Archives, 2013.

Yet the Indigenous observations from

Alaska³⁸⁶, to Sámi areas³⁸⁷ to far reaches of the Siberian Arctic³⁸⁸ tell that the arctic fishes are in trouble. Oceans are becoming empty. There are areas where the salmon is expanding north to the high Arctic as the waters are getting warmer which is the case in the Inuvialuit Home Settlement area of the Northwest Territories of Canada. Similar reports are heard from the Kolyma River in the Russian Arctic³⁸⁹ where local Indigenous fishermen have caught sea medusae in their nets.

Augerot³⁹⁰ reports that the chum salmon populations, especially in the Russian Arctic are relatively unknown, "including some that extend farther into the Arctic than do any other species of the salmon"³⁹¹. First Pacific Herring was caught by the community of Pokhodsk on the Kolyma River in 2006³⁹².

Overharvest is common and is seriously threathening the survival of the Indigenous communities of the North, many of which depend on subsistence fishing for survival, especially in Russian Arctic.

Jerry Ivanoff, a well-respected Inupiaq salmon fisherman from Unalakleet, Alaska, has said that "...they brought in the American fleet and they were doing the same thing, catching millions of tons of fish and towing out my salmon as my catch, millions of tons of it with no economic return to the people who are suffering... Our ability to survive as

³⁸⁶ Mustonen et al. 2009

³⁸⁷ Helander et al. 2004: 293

³⁸⁸ Mustonen 2007

³⁸⁹ Mustonen 2007

³⁹⁰ 2005: 68

³⁹¹ Augerot 2005: 68

³⁹² Mustonen 2007

native people depends a lot on that fish and it's stable in our diet. All governments are hurting us. In the international scene, the pirates come out here beyond the two hundred mile limit, even within the limit and catch whatever they can. Japanese with their 100-mile nets catch all species, catch all marine mammals and whatever they can pull into that boat. Of course with a country that has no natural resources they come here and take what we've survived with for generations, I'm worried (of that).^{393"}

The Indigenous peoples of the North are witnessing through their knowledge systems a similar process as outlined by scientific observations. The oceans are changing, and very rarely for the better. However, there are still spots in the Arctic where the productivity of the seas is very healthy. Some regions enjoy good catches of cod for example. Not surprisingly however these same spots which have been saved so far from overexploitation are now the next targets of the international fishing fleets.

Indigenous peoples and the fish have been in a relationship for millennia. The observations are not just monitoring data or recent human observations of the situation in the local ecosystems. They are, as the Sámi Yoik of the Salmon demonstrates, deep, old, spiritual and contain information which is beyond scientific assessments. However, contemporary Indigenous knowledge as well may open up much-needed new linkages which have not been realized before, as Huntington³⁹⁴ demonstrates in Western Alaska with beluga whale and beaver.

Inupiaq Elder Charles O. Degnan from Unalakleet, Alaska for example has made a very interesting observation regarding the Pacific Salmon: "I've seen... There's lot of dead ones, you know, there's no question about that. But I've seen fish coming back down, going to the ocean, get out to the ocean and they keep swimming. What I figured, maybe some of them get well after they get back to the saltwater. Generally they don't eat anymore once they get to the river, they have to go on and if the trip upriver is really tough and they die during they're job there that's natural but I think some of them make it back out. But it's really hard to prove.³⁹⁵"

In the future studies of fish and the Arctic ecosystems, one of the much-overlooked source of information are the place-names of the Indigenous peoples, many of which tell precise information about spawning locations, fishing spots and other events, stories and knowledge regarding the fish. Indigenous knowledge can help us restore our respectful relationship with the fish again. As the Arctic changes, we are as well realizing that the fish ecosystems of the North are far more complex than previously known.

Sámi fishermen of Kaldoaivi region in Finland know that there is freshwater flounder in the Pulmanki lake³⁹⁶. Taisto Länsman, a retired Sámi reindeer herder recalls that there were more than enough of it in his childhood but that is has diminished in numbers now³⁹⁷. Also salmon migrates to the lake and according to Taisto, summer 2001 was good salmon year in Lake Pulmanki as well³⁹⁸.

³⁹³ Mustonen et al. 2009

³⁹⁴ 1998, 1999, 2000

³⁹⁵ Mustonen et al. 2009

³⁹⁶ Helander et al. 2004

³⁹⁷ in 2004

³⁹⁸ Helander et al. 2004: 293



Sámi fishing for Arctic Char on lake Porojärvi, Finland in 1970s. You can see the movement of the fish through the ice hole as the water is crystal clear. Amongst the snowmachines the 'Larven', a popular Swedish skidoo, but which was almost unknown in the Finnish Lapland. Eero Murtomäki.

The scientific truths and rules that once were seen as adamant and rigid, have to yield to a new understandings of interdependencies and interrelationships as well as new phenomena. There is a regime shift going on in the Arctic waters. We have just to come to terms with the broader knowledges of the Arctic waters, before they all become empty because of human greed.

In fact a community-based engagement in 2000-2012 produced very interesting results for the changes in rivers, oceans and lakes regarding the populations. Since 2004 as a part of the ECORA Project the Lower Kolyma river has been a target of on-going monitoring regarding the fish stocks. Presence of new species in the fisheries of the Indigenous communities has caused concern too.

Local Indigenous fishermen from Pokhodsk and Nutendli report that nelma has decreased significantly on the Kolyma River³⁹⁹ in Sakha-Yakutia. The size of the nelma has as well decreased. In early 1990s one-meter nelma was a common catch, but no more. Some fishermen report that there have been incidences of phosphorous fish along the Kolyma. The fish glow in the dark. Local Indigenous fishermen from Pokhodsk and Nutendli report that the first Pacific Herring was caught on Kolyma in 2006⁴⁰⁰.

The professional fishermen of Pokhodsk think that the diseases that they have observed in the fish in 2000s and the increased cancer levels in the humans among Kolyma are to do with the dumped barrels of chemical, possibly radioactive materials to the East Siberian Sea and the Kolyma Delta. The observation is that these barrels

³⁹⁹ Mustonen 2007

⁴⁰⁰ Mustonen 2007

have now corroded and started to leak.

Fjodor Innokentyevich Sokorikov, former head of the fishing sovhoz in Pokhodsk blames the changes to the gold mining impacts in the tributaries of Kolyma⁴⁰¹. ECORA Expert, Dr. Matvey Tyaptirgyanov confirms significant decreasing in the numbers of nelma in Kolyma river.

The message from Pokhodsk and Nutendli includes the observation that the Kolyma sturgeon stocks have collapsed. They blame the hydroelectric station and the regulation of water levels as the sturgeon needs deep spots of the river to spawn. The last proper year for the sturgeon was 1996 and now for 10 years it has been missing almost totally⁴⁰².

Amounts of muksun have decreased as well. Fjodor Innokentjevich Sokorikov, former head of the fishing sovhoz in Pokhodsk reports that muksun was caught in the amounts of 1500 tonnes annually in the 1980s but says that "in late 1980s and early 1990s" there was overfishing and that is why it has collapsed now⁴⁰³. Flounder has decreased significantly on coast of the Arctic Ocean but it has appeared on the Kolyma River. It used to come to the delta parts of the Kolyma River where the river meets the Arctic Ocean. Also dolphins and whales have swam up the Kolyma Delta⁴⁰⁴.

Fishermen from Pokhodsk and Nutendli report that chum salmon has increased significantly on the Kolyma River. Especially on the year 2005-2006 it was very plentiful and a similar peak in numbers was in 1986⁴⁰⁵. Augerot⁴⁰⁶ reports that the chum salmon populations, especially in the Russian Arctic are relatively unknown, "including some that extend farther into the Arctic than do any other species of the salmon"⁴⁰⁷. ECORA Expert, Dr. Matvey Tyaptirgyanov confirms significant increasing of keta numbers in Kolyma river. About 140 thousand juveniles of keta were released in Kolyma River in 1999 and 2002. Sakha experts observe success of this project. 2000 keta could be caught during one day.

The Kola Peninsula, home of the Eastern Sámi peoples contains some of the most pristine Atlantic Salmon rivers in the world, such as Ponoi and Varzina. The dozens of lakes in the middle of the Peninsula provide a crucial subsistence food source to the local Indigenous peoples, the Sámi and another minority, the Komi, who settled in the region in 1880s.

Kola Peninsula ecological situation is dire West of the rough line between Kandalaksha and city of Murmansk⁴⁰⁸. However, the wilderness parts of the Peninsula are in healthy condition⁴⁰⁹. Sámi residents live mostly now in the village of Lovozero.

⁴⁰¹ Mustonen 2007

⁴⁰² Mustonen 2007

⁴⁰³ Mustonen 2007

⁴⁰⁴ Mustonen 2007

⁴⁰⁵ Mustonen 2007

^{406 2005}

⁴⁰⁷ Augerot 2005: 68

⁴⁰⁸ south to north

⁴⁰⁹ Mustonen and Mustonen 2011



Drying is an age-old practice to preserve fish. Whitefish on Kolyma, Siberia (top), northern pike on lake Inarijärvi, Finland (bottom left) and perch hanging in Chalme-Varre, wilderness seasonal community on Kola Peninsula, Russia. Tero Mustonen (top & bottom right), Eero Murtomäki (bottom left).





Lake Lovozero south of the present-day village is a crucial subsistence lake for the local people, as Andrey Yulin from Piras community explains in 2008: "People catch Arctic Char as well as, salmon, trout⁴¹⁰, in the upper part of the lake; there depth is around 32-42 meters. Practically all fish species of Kola Peninsula are represented here. You can catch whitefish, Arctic Char, and salmon trout there. Arctic Char spawns are on the river Tsaga and in a nearby stream. The largest Arctic Char spawns are in Korzhin and then it swims away to a depth of 30 meters. The majority catch fish in the so-called upper lake. Lovozero is divided into 2 parts: the lower lake and upper lake. There has been no Arctic Char in the lower lake for 10 years. I do not know why it is so. It could happen because of the flow from the river Virma. Arctic Char does not live in dirty water; it needs clean water and a definite water temperature"⁴¹¹.

Vasily Lukov, a reindeer herder from Lovozero has observed fish changes: "There is less fish. It comes up the river rarely, mostly in springtime when there is at least some water. Much wastewater has been poured to the river Seredivan. It flows from the village of Revda to our lake. There is a steel refinery and the waters around there look like milk occasionally. Here the water is now cleaner, almost like spring water. It used to be rusty"⁴¹².

Vladimir Philippov, another reindeer herder agrees: "Strangely enough the fish have diminished in size. There is hardly any fish left! There is whitefish. Here in lake Popovo for four years we could not catch any perch, but now we can get it again. There was a time that for four years you could not catch a single one"⁴¹³.

Field studies in the area around sacred lake Seidozero have yielded evidence of whitefish death every August-September. The whitefish are covered in green slime. Local member of the Piras community have observed some kind of gas releases from Seidozero for appr. 10 years now, as in 2006: "But there was a case with fish, two years ago⁴¹⁴, one year ago and this year again⁴¹⁵ there was a nasty thing on the Seidozero. Some gas came from the bottom of the lake and all the fish broke to the surface with belly up. Then people from Murmansk came to carry out fieldwork. The lake is clean in itself, but what the gas was - nobody knows"⁴¹⁶.

As well in the neighboring lake Lovozero Indigenous fishermen have caught Lake Trout and Arctic Char with malformed eyes⁴¹⁷. Andrey Yulin of the Indigenous obschina "Piras" has observed in 2004 that "I've heard that someone had caught ide."

Vladimir Galkin from the same community agrees: "We've seen ide near Tumanka and we see it here from time to time. I used to catch it last year"⁴¹⁸. According to Vladimir there have been some changes in lake Lovozero.

⁴¹⁰ lake

⁴¹¹ Mustonen and Mustonen 2011

⁴¹² Cherenkov et al. 2004: 327-328

⁴¹³ ibid. 327-328

^{414 2004}

⁴¹⁵ **2006**

⁴¹⁶ Mustonen and Mustonen 2011

⁴¹⁷ Mustonen and Mustonen 2011

⁴¹⁸ Mustonen et al. 2004

He as well has been reflecting on the relationship between lack of subsistence seining and the fish stocks in the tundra lakes of Murmansk region: "Regardless of the fact that perch abundance has decreased, we often see it in Lovozero. People didn't take perch into consideration earlier. Burbot is a water 'janitor', cleaner, as you know. Now it's caught every day in large amounts. In addition to it, there is no pike in Lovozero now. I'd like to add one interesting fact. There are a lot of sick fish in tundra lakes now. The main reason for it is that it is forbidden to catch fish there now. Our Ancestors cleaned the bottom of a river while catching fish and the fish used to eat normal forage. That's why plenty of fish gathered at definite places and everything was in balance. The fish used to be large and now its abundance has totally decreased. However, there is no connection between decrease in fish abundance and prohibiting fish catching. The main reason of it is nature. This situation can be compared with the following: for example I've built a wooden house and went to live to another place. I haven't been to my house for three months. When I returned I found it totally destroyed. However, if I lived in this house for all the time I wouldn't have such problem.⁴¹⁹"

The Atlantic Salmon rivers of Kola Peninsula have been rented by several international tourist fishing companies, sometimes kilometres long stretches of the river are now in the possession of companies, leaving the local Sámi out of the salmon fishing. The local administration has provided the Sámi with some quotas for inland fishing, for example it is allowed to catch 1,7 kg of white-fish, 2,5 kg of pike, 3 kg of perch and about 7 kg of burbot, per year⁴²⁰.

But these regulations are not often followed as the quotas are seen as too small for survival, al Vladimir Galkin illustrates: "I have right to take not more than 5 kg of fish after fishing. What should I do if I caught a pike for instance that weights 10 kgs? Should I cut a half of fish and leave it? I have to cross 60 km of tundra in order to reach place where I fish.⁴²¹"

Former Western Kola Salmon rivers, such as Tuloma have been impacted with hydroelectric development, as Vladimir Galkin from Piras has observed: "It seems to me that the main reason why there is no sea fish in Lovozero is the hydroelectric power station. There are a lot of sea fish in Par and Kolm lakes. Sea fish manages to reach these lakes despite high rapids. People caught almost all salmon in Karas lake.⁴²²"

Andrey Zaharov, a Sámi from Krasnochelye, has observed however some changes and an introduced salmon in Ponoi: "There are no new fish species, only salmon has become little smaller in size, maybe these are just the last 2-3 years like that. Actually, humpback salmon, has been coming up here, I don't know who introduced it, for about 7-8 years now. It used to come up here once in 3 years, our own humpback salmon, now it comes up all the year round. This is nonsense. I have seen a few underwater videos by fishermen showing how humpback salmon attacks the salmon, it is very aggressive fish with short life period, the big male humpback salmon is about 10-15 kg and salmon cannot manage it, the young ones of 2-3 kg could be yet fought back

⁴¹⁹ Mustonen et al. 2004

⁴²⁰ Mustonen and Mustonen 2011

⁴²¹ Mustonen et al. 2004: 343-344

⁴²² Mustonen et al. 2004: 343-344

by salmon.423"

So far Eastern Kola salmon rivers have not been impacted from industries, but the current intensive planning of mining operations from Fedorova Tundra to wilderness village of Krasnochelje and beyond may change the situation. There is an international effort under way to document Kola Sámi subsistence hunting, fishing and traditional land use and occupancy areas so that crucial sites can be registered and indicated to the industries⁴²⁴.



Northern hunting and fishing cultures have existed in the European North since Time Immemorial. A rock carving in Alta, Norway. Eero Murtomäki.

3.3. Birds

Beings of the air - birds - are very prominent in the northern traditions. They fly highest towards the sky._Raven⁴²⁵ is familiar to all peoples of the Circumpolar Region. In the cosmologies of the peoples of the tundra and taiga Raven plays a significant role. For the Chukchi raven is a cultural hero, to the North Pacific coast⁴²⁶ peoples a trickster character and/or the one who brings light to the world.

It has been said that the peoples of the Raven share results of the hunting or fishing trip. As long as these particular systems of reciprocity exist, a people exist. The Lower Kolyma Region of the Republic of Sakha-Yakutia, Siberia, Russia is one of the few locations in the Circumpolar North where full nomadic lifestyle continues amongst the local Chuckhi, Yukaghir and Even peoples.

⁴²³ Mustonen and Mustonen 2011

⁴²⁴ Mustonen and Mustonen 2011

⁴²⁵ Corvus corax

⁴²⁶ of North America

Kristofor Nikolayevich Tretyakov, a Yukaghir reindeer herder from the Kolyma region explains about this relationship:

– A reindeer herder here told that wolves had killed a reindeer.

- He went to the place where it happened and set his traps for the wolves.

– After a while he came back to check them; he could see that something black was in the trap.

- Perhaps it is a wolf or a wolverine, he thought.

– He came closer and saw that it was a raven, which had been stuck to the trap from one toe.

– He wanted to release it with his hands, but the raven kept pecking him with its beak.

– The man took a cloth from the sled he had with him and took the raven to his lap without any troubles.

- The raven did not move at all.

- He shook the raven and threw it to the ground.

- The raven took off and flew for some metres.

- Then he calmed down, screeched for a couple of times and flew away.

- After one or two days the man was travelling and saw an elk.

– His sled was so full that an elk could not fit there so there was no sense to shoot the elk.

- But the elk kept on running directly in front of the sled and snow machine.

– Then the elk turned from a corner of the path and man continued straight on.

- After some time the man noticed the elk again.

- It came to the same place where the man was.

- The man took his rifle automatically and fell the elk with one shot.

- They needed to use the whole night to transport the elk.

- The man needed to take his things first to the camp where the shelter was and he needed some extra hand to help him to cut the elk to pieces.

– It took them the whole night.

– On the following day he was driving again and he saw suddenly a wolverine.

– On the second day.

– He shot the wolverine.

- First he got an elk and now he got a wolverine too.

– And the reindeer herder thought that the raven is sending these animals to him instead of the raven.

- The raven was thanking the man in this way.

- There is this kind of connection for sure.⁴²⁷

⁴²⁷ Mustonen 2009: 223-224



Older Ravens demonstrate their positions of power to the younger birds. Eero Murtomäki.

This story indicates that a system of reciprocity between the hunter and the Raven exists. The story also exemplifies how the position of Raven is complex and multi-faceted in the tundra ecosystem of Lower Kolyma. It is a carrion bird, cleaner of tundra, a bird of knowledge, sharer of things; a messenger.

In this story the Raven tells us of the need to understand the tundra in the form of practices and visions. If we impose our assumptions about the Raven, or its place in the ecosystem, without proper experience of interaction that can only be accumulated over years and years of living in the tundra, we overlook and exclude significant elements of the understanding of how the tundra cycles and evolves.

Arctic and northern birds have always been a major food source to the communities of the Indigenous nations of Eurasia - especially the various goose species. Arkady Khodzinsky, a reindeer herder from Lovozero community on Kola Peninsula has observed the following: "There is very little goose now. It used to be that they were all over. Before, when we were at the camp and we would see geese we would know the spring is coming. Nowadays we see no geese. Occasionally one or two flocks fly over but this is a rare event.⁴²⁸"

In some parts of the coastal Siberia, goose stocks are doing better, as on the Kolguev Island in the Nenets Autonomous Region, Russia where the Indigenous Nenets hunt goose. The density of white-fronted goose and bean goose is very high with about 400,000 geese breeding in the island every year⁴²⁹.

⁴²⁸ Cherenkov et al. 2004: 326

⁴²⁹ Lukin 2005: 27



Brant and Canada geese can be observed on seashore locations. Bean geese prefer the marshmires inland. Eero Murtomäki.



Further east, Pjotr Serafimovich Agafonnikov, an Even Indigenous hunter, now retired, from the community of Andreyushkino, in Sakha-Yakutia has observed that climate has changed in the region. This has not impacted on the birds yet. Geese in the Lower Kolyma region arrive still precisely on 5th May to the tundra. However he has observed that owls in the tundra are now nesting during snowy period, earlier than usual⁴³⁰.

Reindeer herders of the Chukchi Indigenous community Turvaurgin, 4th Brigade report that the common scoters have changed their migration routes in the tundra of Western Lower Kolyma region between 2005 and 2007⁴³¹. Professional fishermen of Pokhodsk have made the observation that the "black Canadian goose"⁴³², with black necks have appeared now in tundra⁴³³.

Pjotr Kaurgin from Turvaurgin has also observed that white cranes have appeared there in more numbers⁴³⁴. This is a very rare species and there are not more than 2000

⁴³⁰ Mustonen 2007

⁴³¹ Mustonen 2007

⁴³² possibly I. Branta canadensis

⁴³³ Mustonen 2007

⁴³⁴ Mustonen 2007

white cranes in the world. ECORA project's expert, Dr. Andrey Degtyarev⁴³⁵ indicated that some of them are observed in Kolyma tundra. The ECORA fieldwork showed that white cranes have appeared there in more numbers.

Sometimes the views of the scientists and the Indigenous peoples come into conflict regarding their observations. Such is the case in Kolyma, where reindeer herders of the Chukchi Indigenous community Nutendli have reported that in the year 2005 they observed many dead birds on the Eastern bank of the Kolyma River. As well the amount of swans, on Kolyma had collapsed 2005-2006⁴³⁶. But ECORA project's expert, Dr. Andrey Degtyarev⁴³⁷ indicated significant increasing of swan's number in Kolyma area as a whole⁴³⁸. He doesn't have any data on the cases of mass death of swans or other birds.

In Finnish Sápmi changes to bird populations have been noted by the people. The late reindeer herder Ilmari Vuolab had noted that ducks were increasing again after a time when all kinds of ducks were disappearing from the region⁴³⁹. "But then again, what we call sea birds, like long-tailed ducks, velvet scoters and common scoters -they are all gone. There used to be great flocks of them and now they are so few.⁴⁴⁰"



Ptarmigan trap is being set. If the trap and the catch are buried under snow, the red string helps to find the right location. Eero Murtomäki.

Heikki Länsman, a Sámi ptarmigan trapper in Utsjoki, Finland shared his views and experiences as a respected and experienced hunter. He makes the point between income, weather change and subsistence. "This season⁴⁴¹ has been very good, it hasn't been this good ptarmigan year since long. Summer and spring times determine the following ptarmigan season. If the spring conditions are favourable there will be plenty of offspring. There have been poor ptarmigan years as well but in the long run the hunting has been the same. The bird population has been balanced. Today the price of fuel is higher but then again, so is the price of ptarmigan. Approximately two ptarmigans make up a day's fuel spent. To cover all expenses I need to trap at least four in a day.

- 435 2008
- ⁴³⁶ Mustonen 2007
- 437 2008
- 438 2006-2007
- 439 Helander et al. 2004: 293
- 440 Helander et al. 2004: 293
- 441 2004

It is not that much profit though. [If climate would warm and the snow melt] that would mean an end to ptarmigan trapping. It is an old traditional way of hunting for the Sámi so it would have an effect on the culture. Trapping cannot be done during unfrozen ground. Those hunting with good dogs are the only ones able to hunt when there is no snow."



Rock ptarmigan, a close relative of the ptarmigan, spotted here on top of a fjell in Finnish Lapland in September. Their camouflage is almost perfect. Rita Lukkarinen.

Since 2004 to 2009 the ptarmigan stocks have collapsed⁴⁴², and many Sámi blame this development on poorly regulated sports hunting on traditional Sámi territories where state agencies are selling permits to hunt ptarmigan⁴⁴³.

In the Sámi community of Purnumukka in Finland reindeer herder Niila Nikodemus, an Elder, voiced his observations: "There used to be more birds, such as capercaillies, ptarmigan and others. We needed not go far to hunt them. We trapped ptarmigans here on the riverbank. They used to come sit on the field and on the nearby birch trees. But I have not seen them like that for decades. Yeah, I don't know why this has happened. It is not because of hunting. It could be that as there are now more roads winding here, more hunters have arrived, massive amounts. As it was only locals hunting before; the numbers stayed"444. Heikki Hirvasvuopio, another reindeer herder agrees regarding the community of Kakslauttanen: "Especially the ground birds, we could be talking about extermination almost when compared to the past amounts. I used to hunt quite much alongside reindeer herding back in those days so I have a good idea of the stocks. We cannot even talk about the same amounts during the same day. This is true especially with ptarmigans, capercaillie and ground birds. With small singing birds the same trend is noticeable. Nowadays it is silent in the forest - they do not sing in the same way anymore. It used to be that your ears would get blocked, as the singing was so powerful before. They [singing birds] have disappeared completely as well."445

- ⁴⁴³ Helander et al. 2004: 293-294
- ⁴⁴⁴ Mustonen et al. 2004

⁴⁴² December 2009

⁴⁴⁵ Mustonen et al. 2004: 277-278

Veli-Matti Mutenia sees the crash in bird stocks as a sum of various factors. "First of all it is affected by hunting itself and the efficiency of the hunting. For example capercaillie and wood grouse have been protected even for some time to get the stock on the rise again. Then there is all forest cutting adding up. Affecting are also all issues related to small predators; all hawks are now under protective measures and foxes are allowed to hunt only with a legstring⁴⁴⁶; iron traps are forbidden. Guns used for hunting have improved and dogs have developed; they are better these days. And there are so much more people hunting now."

According to Veli-Matti one thing has not been studied enough in relation to diminishing numbers of ground birds. "There are hundreds of kilometers of wire-netting fence spread out in the nature, also here in our area. How much are ground birds dying because of that? A bird cannot see it too well; the loops are so big in the fence. It is known that even moose get caught in those fences. And reindeer have been seen stuck on them.⁴⁴⁷"

In Murmansk region birds constitute a significant part of the local peoples' diet. During hunting trips changes to other bird species have been noted too. The members of the Sámi obschina, or Indigenous community Piras have their basecamp on the Western shores of the Lovozero lake in the Murmansk region of Russia. Vladimir Galkin from the community has made the following observation: "There are a lot of hazel hens, in tundra now. There are a lot of hazel-hens around Seid Lake⁴⁴⁸ and even more in Krasnoschelye region since it is a southern territory. However, people stopped shooting hazel-hens. That's why there are plenty of them in region now.⁴⁴⁹"

Arkady Khodzinsky, a reindeer herder from Lovozero community on Kola Peninsula has observed the following: "There are no birds of prey anymore. Very small number of those remain. Every one has disappeared somewhere. We used to see northern goshawks, they would fly high and scream. It was nice to follow them in the sky. All of them have disappeared and I do not know where.⁴⁵⁰"

Vladimir Philippov, a reindeer herder from Lovozero community on Kola Peninsula has observed the following: "It is very interesting that we used to have lots of swifts. They are no longer here. Have they disappeared? I think they have. We used to see them always on the beaches. But now they have disappeared somewhere. The same has happened with arctic terns. Near the island of Vitchii they have almost disappeared.⁴⁵¹"

⁴⁴⁶ footsnare

⁴⁴⁷ Mustonen et al. 2004: 277-278

⁴⁴⁸ a famous sacred place of the Sámi on Kola Peninsula

⁴⁴⁹ Mustonen et al. 2004: 341

⁴⁵⁰ Cherenkov et al. 2004: 326

⁴⁵¹ Cherenkov et al. 2004: 326

4. Impacts to Indigenous Cultures, Languages and Mind - Conclusions

And so we arrive at the conclusions of the Life in the Cyclic World. We have reviewed dozens of Indigenous observations across the Eurasian North, ranging in scale from whole ecosystem changes⁴⁵², regions⁴⁵³ to traditional knowledge about single species.

In the introduction, the point was made that Indigenous societies have had their own kind of environmental governance in the past. Or as Sheridan and Longboat⁴⁵⁴ put it eloqently: "Onkwehonwe (unassimilated, traditional Haudenosaunee)... mind everything because everything minds Onkwehonwe. Haudenosaunee minds are composed not just of visible ecological domains but also by the numinous qualities of those domains that, allowed to mature, express the fullness of traditional territory. Old-growth minds and cultures mature, emerge, and encompass the old growth of their traditional territory."

This Compedium regarding traditional knowledge materials from Eurasia for the Arctic Biodiversity Assessment has tried to illustrate, using the oral history materials which have been documented in partnership with the communities themselves, a land under change. Using Indigenous knowledge frameworks (Figure 1) we have argued that change in itself is a crucial component of the whole system of Indigenous life-world and governance.

However, imposed, and often unknown change is something that is reflected in the materials from a vast range of Indigenous communities from Norway and Sweden all the way to the Aleutian Islands in the North Pacific. We hope the document Life in the Cyclic World illustrates in a clear manner the different issues of the Indigenous societies of the region, and allows non-Indigenous readers to better position the oral histories and knowledges of the cultures in the future - not to dismiss them as "mere anecdotes" or "stories".

Equally important to the communities themselves will be the question of survival of Indigenous knowledge, language and mind. Vasilii Robbek, an Even scholar and leader from Yakutia, has argued for the establishment of nomadic schools as an engine of a "rebirth" of these societies and their cultures:

"During the recent decade of Indigenous Peoples of the North, Siberia and Far East... discussed the single vital question of the present-day reality - to be or not to be - to preserve themselves in the 21st Century as a self-reliant ethnic group or to assimilate and dissolve in the million-strong mass of Russians, to lose the centuries-old culture, languages, customs and tradition. The successful solutions of the issue depend on the [capacity] to overcome the generation gap, not just on ethnic level but even deeper - on the internal level of a nomadic family. The united efforts during the recent decade have resulted in the solution which is the creation of a completely new education system for Indigenous peoples of the North with the formation of various types of nomadic

⁴⁵² (such as the case of Lokka and Porttipahta reservoirs

⁴⁵³ oil and gas impacts in Yamal

^{454 2006: 366}

schools as the core constituent.455"

The nomadic schools address the key component for survival - maintainance of indigenous knowledge systems in the middle of rapid changes⁴⁵⁶. They provide communitybased mechanisms to allow young indigenous children to stay in their homelands and embrace both the modern education and the inherent cosmology of their cultures.



Children in the nomadic camps of Sakha-Yakutia – life in the taiga of Evenk (top and middle center) as well as in the tundras of the Chukchi (bottom left and right) are the natural homes of these Indigenous children. Snowchange, 2016.

Eurasian Indigenous societies are slow cultures or rather, cultures of slow. Things change at their own pace - however, in these times, it is precisely the speed of imposed change that has become a cause of concern to many local peoples. This is illustrated by the words of one of the Skolt Sámi leaders, Pauliina Feodoroff:

455 Robbek 2007: 53

⁴⁵⁶ Mustonen 2009

"The first genocide and destruction against the Sámi peoples and our society began in the 1500s and 1600s. Unless there are dramatic changes in the near future, the Sámi culture will die, disappear in my lifetime...Sámi knowledge is knowledge about how to be with your environment, how to have your relationships with humans and with the world. Therefore the most effective ways to control a people are to destroy the things that reality consists of for that people. In the North this ancient knowledge has been beaten and destroyed for centuries in order that the indigenous peoples would forget this knowledge. If there is nothing else to do, at least we can try to prolong things. To play for more time to survive. We can try to gather indigenous knowledge from the old people who possess it. We can try to create safe havens of ecosystems, which contain our knowledges - the fjells, forests, and lakes which remain in pristine condition."⁴⁵⁷

What we can say already is that to learn from the mistakes of past we need to make sure we maintain and provide support to those existing Indigenous management regimes still in place. In practice this can be achieved through community-based attempts to revitalize for the languages and knowledge systems embedded in practices such as nomadic reindeer herding in Siberia and explore best practices of co-management to allow a respectful dialogue between the Indigenous and scientific worlds to continue to produce the best possible results for Arctic biodiversity. The question of Indigenous rights and claims, while not directly a part of this assessment, need to be addressed too to solve these issues.

The Arctic Biodiversity Assessment has shown over the past four years important steps in the right direction. Now we need to continue towards regional and local implementation of these messages contained in this Compendium to make sure we act while we still can.



Arctic Tern brings the summer to the North. Eero Murtomäki.

⁴⁵⁷ in Mustonen and Mustonen 2011: 14

Executive Summary

Life in the Cyclic World has been in the making for a decade. It is based on the collected, analyzed and assessed traditional ecological knowledge for the Arctic Biodiversity Assessment of the Arctic Council. Between 2012 and 2016 the authors and the Conservation of Arctic Flora and Fauna - CAFF, one of the Council's working groups, exchanged drafts and versions to release this document as a Compendium. However this plan did not materialize and Snowchange Co-op publishes now these materials independently.

These materials are made available as originally planned, and cleared by the involved Indigenous organisations, communities, families and individuals. We hope this document will be of use in the understanding and discussions regarding Eurasian Arctic biodiversity and Indigenous peoples.

The TEK materials that have been included in this document come from the oral histories of the Indigenous communities in Norway, Sweden, Finland and Russia, main focus being on the last three countries. There are some North American Indigenous materials in the first part of the document to position and offer scope to the discussions that follow.

A large body of the present volume is derived from the Snowchange oral history archival materials. All have been published before in scientific monographs, articles, community reports, books and other publicly available materials. All oral histories and Snowchange traditional materials that have been used have been discussed with the representatives of the Indigenous communities and organisations involved in a process that has lasted a decade. The principles of free, prior, informed consent – FPIC have been followed to the fullest when possible. Materials have been included from the oral history archives of the Snowchange Cooperative and a literature review. Main focus of the materials is 1999-2010.

Part 1 of the Compendium is a much-needed overview of the traditional knowledge and biodiversity of the Indigenous peoples of the Eurasian North. It includes reflections on the socio-ecological systems of the Indigenous Nations of this region. Questions of traditional customary systems, oral histories and governance are included. Critical examination of overharvests and their historical context is analyzed. Part 2 includes an extensive description of the shifts and imposed changes of the region from late 1800s to the 2010s. Special focus includes oil and gas development, modernity, hydropower and forestry, mining, nature conservation, oceans, rivers, lakes and fisheries, mammals and birds. In the conclusions an initiative of nomadic schools for Siberia is proposed as one of the mechanisms to preserve traditional knowledge and communities on the land.

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Igloolik Inuit have an extensive knowledge of the celestial phenomena and starlore. Courtesy of John Macdonald, 2002. Used with permission.

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