Into the wild and back again

Hatching ‘wild salmon’ in western Norway

Map 1 Europe, Norway, Voss
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Abstract

This thesis is based on five and a half months of fieldwork in Voss, Norway, where I worked fulltime as a volunteer at the local hatchery, learning to produce the Vosso salmon, *Vossolaksen*.

Salmon has been important for coastal communities in Norway for many years, but the relationship between the humans and the fish are changing. While the rise of aquaculture have drastically increased the number of ‘farmed salmon’ living in pens along the coast, the population of ‘wild salmon’ in the rivers are decreasing. The situation has caused a counterproductive public debate fuelled by the dichotomies of the ‘wild’ and the ‘farmed’ salmon.

The Vosso salmon, *Vossolaks*, were on the brink of extinction, but has been enrolled in collaboration project between public management, salmon researchers, the local hatchery and the aquaculture industry, all working together to re-establish the *Vossolaks* salmon strain.

Through a focus on salmon-in-the-making, this thesis gives an empirical account of the lives of the current *Vossolaks* and show how it is enrolled in a network of humans, non-humans and technologies while still maintaining its status as a ‘wild’ fish. Furthermore, the thesis seeks to be a moderate contribution to the continuous discussions about binary oppositions and the deconstruction of these.
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1 Prologue

I was sitting on a table, dangling my legs as I watched Helene and Erik work. They were standing in front of another table across the room, with three buckets in front of them, all coloured blue and I knew they were filled with water and fish. The fish were about fifteen centimetres long, and both Erik and Helene picked up one of them at a time and brought them close to their face and looked at them closely from every angle. Most of them were tossed in a fourth bucket standing on the ground behind them, but some were placed in one of the three buckets in front of them instead. We had spent the entire day outside in the river planting roe, and had only had time to go home for an hour to grab some food, before we had to return to work. We all felt slightly tired, but looked forward to the event that was going to take place later that afternoon. Erik turned around after a while and picked up the bucket behind them, walked back up to the fish tanks on the other side of the room and poured the content back into one of them. He stood watching the tank for a few minutes before he turned around and said, “not pretty enough for the state secretary,” while laughing at his own comment. “What is it about the ones you keep?” I asked, and jumped down from the table and walked over to see the fish that were still in the buckets on the table. Helene shifted her movement slightly with a fish in her hand and replied, ‘well, all of these are sort of the most ugly fish we got here, and it is a shame to use them if they are extra ugly.” “What do you mean ‘ugly’,” I asked. “With worn dorsal fins and things like that. Since they might end up on television, we got to make the best out of it, and only present the best ones of the bunch”, and tossed the fish in her hand into the bucket of the prettiest of the ugly fish that we would take with us.

My fieldwork was conducted in Voss, a small sized town with about 14 000 inhabitants located in the western part of Norway. The municipality of Voss is 1815 km², and is the largest in Hordaland fylke. Although there are scattered residences

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1 All names on people used in this thesis are fictional.
2 All of this will be explained in chapter three.
3 Norway is divided into 19 administration units called fylker. The closest English translation is county.
throughout the municipality, half of the inhabitants live in or close to the small city area. The downtown area is called Vossavangen as it is located near a lake called Vangsvatnet. The city is known both in Norway and internationally for its beautiful and mountainous nature and the recreational opportunities that comes with it. Every year, the city hosts the famous Ekstremsportveko, the extreme sports week, which attracts tourists from all over the world, filling the sky with skydivers, the rivers with rafters and crowding the local pubs.

During my five and a half months in Voss, I lived in a bedsit in the basement of a family of five, sharing a kitchen and bathroom with an eighteen-year-old girl from a neighbouring small town. In this part of the country, most of the teenagers that live in the smaller towns have to move out from their parents home at the age of sixteen, because the schools are only located in the more populated areas. From the front of the house, we had a view of the entire lake and all the mountains raging on the opposite side. The view was spectacular on a clear day, and during the summertime, paragliders would jump from the top of the mountainside the house was located on, and soar straight over our heads and all the way down to the city centre. From my bedroom window in the basement though, all I could see were the tyres of the family car. Although the city of Voss formed the surroundings of my thesis, the city itself and its inhabitants do not have the leading role in this story.

“But where do the fish come from?” I asked Helene, as we were getting ready to leave with the chosen batch. “You remember when we did the tagging earlier, and some of the fish were sorted out because they were too small?” she asked. I nodded, clearly remembering the standing straight up-and-down for two weeks while tagging fish, which I had participated in that winter. “Here they are. They are going to be released into the river in summer, but since the state secretary wanted some fish, and we have already released all the others, these will have to do”. The fish were one year old, and should have migrated to the ocean by now, as the anadromous salmon do. But these were late bloomers, and Erik and Helene thought they needed another year in the river before they were ready for their journey. They had been living in a

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4 Tagging practice that will be described in chapter four.

5 Anadromous fish live parts of their lives in freshwater and parts in saltwater.
fish tank in one of the production rooms since the tagging in March, and some of them had visible scars on their bodies, like worn dorsal fins, giving evidence of a life in captivity.

The lake is part of Vossovassdraget, the Vosso river system, with its many tributaries cutting through the landscape on the mountainous western coast. Vossovassdraget is the biggest river system on the west coast of Norway, and the majority of the rivers are located within the municipality of Voss (Barlaup 2004:7). The river system starts high in the mountains of Vinje and creates rivers and waterfalls on its way down to the ocean. It passes Vossavangen, the city centre, and the brackish water area at Bolstad, before it blends in with the salty water in the fjord of Osterøy and at last reaches the ocean outside the city of Bergen.

While Helene was packing her diving suit and three waders for the ministry officials into the car, Erik and I packed the fish. We filled a see-through bag, roughly 60cm*30cm big, with approximately ten litres of water before pouring in the twenty or-so fish. I sat down on my knees, holding up the bag of water and fish, while Erik stuck a black tube into the bag. The tube was connected to an oxygen tank, and he closed the bag with his hands while turning a wheel on the tank, filling the bag with oxygen, making it look like a balloon. I held on to the top of the bag so that the oxygen would not escape as Erik pulled out the tube, and tied the opening shut with a blue string. I held open a second bag, and Erik turned the bag of fish upside down and into the new bag, before tying that up with a new piece of blue string. He carried the bag of fish into the van where Helene sat waiting. “Have you packed the roe?” he asked her. “Yes, we are ready to go,” she said and nodded towards a white polystyrene box tucked into the back of the van.

Vossovassdraget is the home of the Atlantic salmon called Vossolaks, the Vosso salmon. According to Barlaup (2004; 2008) the Vossolaks is known for its size, and is supposedly the worlds’ largest Atlantic salmon, and has been an important income for fishing communities along the river. Since the 1980s though, the Vossolaks has been on the brink of extinction. When the decrease of the salmon population first became apparent, the Vossolaks was ‘fredet’, protected as an endangered species in 1992, a
protection still upheld today making salmon fishing illegal. The protection of the Vossolaks was strengthened in 2007, when the entire river system was classified as a nasjonalt laksevassdrag, a ‘national salmon river system’, a status granting further protection against damaging interventions and activities in general and not just prohibition against fishing (Ministry of Environment 2007). However, the river is open for trout fishing and fishing for inland fishes, so the chance of accidentally catching a salmon are present. But if this happens, the fish has to be released back into the river. In the summer of 2011 though, there were many rumours about illegal fishing; where fishermen were pretending to fish for trout, but mainly caught salmon, an activity that can be difficult to control.

And so we went, the prettiest of the fish and a box of roe in the back, Erik in the drivers seat, and Helene and I in the double front seat. The city centre was crowded with people coming home from work, but most of the traffic was heading in the other direction, and we were through after about three minute, give or take a minute or two. The lake was glittering in the spring sun and the snow on the mountains around Voss was melting more and more each day. “Looks like the river knows who’s coming and shows itself from the best side” Erik chuckled as we drove on the highway toward the meeting place. “Hopefully they will be here in time and don’t miss out on the sun” Helene responded as the car slowed down and came to a halt at a bus stop.

The salmon population remained low throughout the 1990s, and the condition of the river attracted the scientific gaze of the marine biologists from the research institutions. Vossoprosjektet is a research project initiated by the Directorate of Nature Management in 2000, with the intent of revealing the cause of the decrease, and find the best measures that could help ensure the future of the Vossolaks (Barlaup 2004, 2008). The reports, Barlaup 2004 and 2008 were published as a result of this research project. Based on the perceived threats, five measures were recommended; increased cultivation measures, measures for reducing the high mortality rate due to sea lice from the fish farms within the migration route, measures against escaped farmed salmon that can out compete the original salmon, controlling the water quality and reducing the effects of river regulations and physical interventions within the river (Barlaup 2008:11-12). Based on the research from Vossoprosjektet, the Directorate of
Nature Management and Fylkesmannen in Hordaland County\textsuperscript{6} initiated a *redningsaksjon*, a rescue mission for the *Vossolaks*. The goal of the rescue mission is to re-establish and rebuild the salmon population within a time span of ten years, from 2010 to 2020 (Fylkesmannen 2009). The rescue mission operates with three major initiatives: large-scale cultivation, measures against the threats, and additional research to identify any unknown threats that might exist (ibid.).

We had cleared the chosen area of garbage and other unattractive signs of human life the day before, so the idyllic area covered in green grass and hundreds of ‘hvitveis’, ‘anemone nemorosa’, was ready for the state secretary. We took out the equipment from the car and carried it down to the riverbank, placing the bag of fish about a hundred metres further down the riverside. Helene pulled on the diving suit and sat down with her feet in the water; holding on to the red flag connected to the box of roe that lay bobbing in the water surface. After a while of sitting around and waiting, a car pulled up. We all turned our heads expectantly, but both Helene and Erik turned their heads around again when they saw who it was. “Who is it?” I asked. “They are journalists from the newspaper. At least one of them knows a bit about our work,” Erik replied. I watched the two men as they climbed down the small hill from the road to the riverbank. The younger of the two was carrying a big camera around his neck. “The delegation hasn’t arrived yet?” the older one asked. “Fashionably late,” smiled Erik as he was reaching out to shake the man’s hand.

According to the Directorate of Nature Management, 20% of Norway’s 481 salmon rivers have grown extinct (Directorate of Nature Management 2012). But while the population of salmon in the river are rapidly decreasing, the numbers of Atlantic salmon living in pens on fish farms along the coast are increasing. The aquaculture production is 1300 times bigger than salmon fisheries (Directorate of Nature Management 2012). This not only makes it highly important to Norway’s national economy, but also for the working communities along the coast. But the rise of the aquaculture has had severely negative consequences, especially for the salmon in the river. Research shows that the farming industry has had an effect on the salmon

\textsuperscript{6} *Fylkesmannen* is one of three authorities in each county, serving as the king and governments’ representative.
population in the river through a massive increase of sea lice, which can be fatal to the fish in large quantities. There are also, for various reasons, constantly events in which hundreds and thousands of salmon escape the pens. Although there are disagreements on how well they can survive in the river, research has shown that many become mature and try to spawn in the rivers, and outperforming the salmon in the river both physically and genetically (e.g. Barlaup 2004, Hindar and Diserud 2007). Even though the reasons for the decrease of salmon in the river are complicated and cannot solely be blamed on the farming industry, the current state has led to a polarisation in the public debate between the supporters of the farming industry on the one side, and the supporters of the salmon in the river on the other.

Several people joined us on the riverbank within the next fifteen minutes, amongst them a local politician from the same political party as the state secretary, a few other journalists, nature management officials and landowners. They were standing around the area, waiting. The spectators were chatting amongst themselves and I eavesdropped on them all. The politician was willingly talking about the previous time he had met the state secretary and how he looked forward to meeting her again. One of the journalists turned around to face Erik and asked, “no fish farming people here today?” Erik replied, “no I guess not,” as he turned around to face Helene, who was standing in the river in a dry suit and diving goggles on with a shovel in her hand. “Have you said anything to the ‘Vossolaug’?” he asked quietly so that the spectators could not hear him. She shrugged her shoulders and answered, “I don’t know. I think I did. But I’m not sure” before she lowered her head underwater and started digging in the riverbed with the shovel.

The ‘fish farming people’ the journalist was referring to were members of Vossolaug, the Vosso guild, a project initiated by some of the main aquaculture companies in the region. When research showed that the farming sites located on the Vossolaks’ migration route might have been accomplices in the extinction of the salmon, a collaboration between the biggest aquaculture companies arranged joint ‘de-licing’ in the pens in the period when the salmon is thought to migrate past the pens. Many of the same companies founded the Vossolaug in 2008 with the goal to “re-establish the population of Vosso salmon to a level where it is again able to
sustain itself through natural spawning” (Vossolaug 2009:5) (own translation). The project frame is five years, from 2008 to 2012, and has for the most part focused on financial help and improved technological infrastructure. The Vossolaug entered into a partnership with other private and public investors to meet the expenses laid out in the investment- and operating budget, and met the costs of over 11 million NOK\(^7\), where the majority came from the aquaculture companies (Vossolaug 2010:6).

After the journalist had mentioned the farming companies, the conversation went on about the salmon in the pens. I knew that some of the fishermen in Voss had strong opinions about this particular salmon, and I started to listen more carefully to what they were saying. Erik and Helene were preparing for the arrival of the state secretary, and did not participate in the conversation.

**The local politician:** It is a bit disgusting (ekkelt) eating that salmon, because the fluid seeps up when you fry it. I don’t know if that’s penicillin\(^8\) or what it is they put into that fish.

**Journalist:** I hear you should cook it in the oven instead of the frying pan. It gets better like that. But it is fatter than the wild salmon, isn’t it? And the red colour in the fat comes out when you fry it.

**Man1:** Yes, I hear they inject this red colour into the fish to make sure that they have the right colour, and that is what comes out when you fry it.

The others seemed shocked at this information.

**The local politician:** And you don’t see that in wild fish at all?

A couple of the others shook their heads.

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\(^7\) 11 mill NOK = almost 1.2 mill GBP (04.05.12)

\(^8\) Reference to use of penicillin in fish farming in the 1980s, a practice not performed today.
Journalist: “You know, a salmon isn’t only a fish, it’s so much more. If the salmon is gone from the river, something is wrong. Someone has tampered with something. But if the salmon is there, everything is okay. That’s just the way it is.”

Everybody nodded in agreement and several of them stood with their arms crossed around their chests and looking out on the river. Suddenly, a car pulled up and everything changed.

According to the Directorate of nature management, the salmon population of each river has adapted to specific rivers through thousand of years. This is shown by the relation to the water flow, temperatures, available nutrients, diseases and the ability to return to its natal river. The adaptation has caused genetic differences between the populations (Directorate of Nature Management 2012.). The directorate, in coordination with the Department of Environment, Fylkesmennene and the local municipalities, has the official responsibility for salmonide management in Norway. The management is based on the 'law of salmonides and freshwater fish', whose goal is to secure the protection and use of the natural population of fish. The law states that the salmonides shall be managed in accordance with the Norwegian biodiversity act, the goal of which is to safeguard the genetic diversity of species (Ministry of Environment 1993; Ministry of Environment 2009) All of the salmon populations, even neighboring populations within the same river system are therefore managed as separate species. The salmon in the pens are the same specie as the salmon in the river; they are all salmo salar, Atlantic salmon. But there are differences between the two, on a genetic level. The salmon in the pens in Norway are not genetically modified, but selectively bred to meet certain characteristics: speedy growth, disease resistance and flesh colour to name a few (Directorate of Nature Management 2012). They contain genes from different stocks of salmon and the selective breeding has led to a lower genetic variation than amongst its wild cousin. According to the Directorate, big genetic variations within the wild salmon stocks are important when the salmon populations in nature are adapting to changes in the environment, and the Norwegian Biodiversity Information Centre has therefore, somewhat controversially, classified escaped ‘farmed salmon’ as an alien species, based on the threat to the wild
salmon stocks in this regard (Gederaas, Salvesen and Viken 2007). If salmon from the pens breed with salmon from the river, “the wild salmon strains may lose their unique adaptation to the particular river system from which they come” (2007:38.) The hybrid offspring are believed to, in the long term, change the original strain with their poorly adapted genes, which is contrary to the foundation of the salmon management. (See Lien and Law 2011)

“The delegation” consisted of the state secretary, two other ministry employees from the ministry of environment and two people from the directorate of nature management, one of the government agencies under the ministry of environment. The spectators that had gathered on the riverbank almost ran ahead to meet them, leaving Erik, Helene and I behind. The secretary climbed down the hill with a huge grin on her face, and shook everybody’s hand as they approached her. Her eyes were flickering around as one of her followers explained who the different people were. I tried to stay in the background so that I did not have to explain who I was, as I only wanted to observe the event. This was not particularly difficult, as the others closed in on her in a tight circle as Erik explained about the fish. Erik gave her the waders and asked if anybody else wanted to join her in the water. The two other ministry officials grabbed the waders and pulled them on quickly. Helene helped guiding the state secretary into the water so that she could get a closer view on what she was doing. Helene picked up the box of roe to show them, and the cameras started flashing rapidly. Helene explained while digging the roe into the riverbed while the state secretary listened, but kept her face toward the crowd and the grin still wide across her face.

So far we have seen that the salmon in the pens and the salmon in the river have been kept discursively apart, even though they are the same species. Where there previously had been just one, the rise of the salmon aquaculture in the 1970s created two kinds of salmon: the villaks, wild salmon, and the oppdrettslaks, the farmed salmon. There are several examples when an animal species become domesticated; the prefix “wild” is attached to the animals of the same species that are kept outside the domestication (Treimo 2007:62). In Norway we have villsvin, wild-pigs, villsau, wild-sheep and villrein, wild-reindeer, because we also have domesticated pigs, sheep
and reindeer. The same thing happened to the salmon. As described above, the salmon in the river and the salmon in the pen are the same species. Treimo suggests that the only real difference is that they “live in different ways” (Treimo 2007:63) (own translation). Hence, the salmon in the river has become known as villaks, ‘wild salmon’, while the salmon in the pen have become oppdrettslaks, ‘farmed salmon’. The salmon themselves are of the same specie, but the categorisations are enacted as two kinds of salmon in a classification system where they are perceived to be two kinds of fish with different qualities and attributes. Lien and Law explain how the ‘wild salmon’ are perceived as ‘the real thing’, representing the ‘wilderness’, while the farmed salmon represents human interference and society (Lien and Law 2011:74).

When they had taken enough pictures of the planting of the roe, Erik gestured toward the bag of fish that lay further up the riverside. The crowd started moving towards it in groups of two and three. The local politician never walked more than a step from the state secretary’s side, and kept talking about something else than salmon. Erik shook his head and told the journalist that they would have liked them to stay focused on the issue of the salmon now, since it was why they were there in the first place. When everyone arrived by the bag, the cameras were pulled out again and many of the spectators commented upon the peculiar sight of the fish swimming inside the bag. It did not seem like anyone had seen anything like it before. Erik, the state secretary, and the politician sat down. Erik picked up the bag of fish and the cameras started flashing with the three of them grinning and the fish swimming frantically around inside the bag. Erik opened the bag and poured the fish into a bucket. The state secretary hopped into the river, still with her face towards the cameras and the grin across her face. The spectators’ with cameras sat down and continued shooting while Erik gave her a colander with fish, which she could lower into the water. “Wow, these fish is incredible,” she said as she lowered the colander with her face still turned toward the cameras. Some of her companions stood behind the photo crew, smoking cigarettes and smiling at her affectionately. “How old are they?” she asked Erik. “They’re a year old,” he responded. “Wow, really nice ‘villaks’. So big and strong,” she replied. Erik didn’t respond to that comment. After about half an hour, the delegation and the spectators had left, leaving us standing both bewildered and
amused, picking up cigarette stubs from the ground where the anemone nemorosa once had been.

One of the methods for the re-establishing of the *Vossolaks* as posited by the rescue mission is the ‘large-scale cultivation’ of *Vossolaks*. Cultivation means that fish are artificially hatched and reared at a ‘hatchery’, and the fish are released into the river at some point. Hatching in Norway has traditionally been done to improve local fisheries. The first person who artificially hatched fish in Norway was supposedly a man named Jacob Sandungen around 1850 AD (Berg 1986:24). Sandungen had invented a way of hatching fish by himself, and had been doing it for years before anyone started talking about fish hatching in Norway, and had been ridiculed and met with indignation because he tried to “intervene in God’s arrangements” (Berg 1986:24)(own translation). But by the end of the year 1855 however, 8 new hatcheries had been built throughout the country, and within the next year, 35 hatcheries had been established (Berg 1986:24). Magnus Gabriel Hetting, the first inspector of fisheries in Norway, published the first hatchery instruction manual in 1855, explaining hatcheries based on a simple system of boxes and gravel (Berg 1986:24) (see also Hetting 1856). Today, wild fish hatcheries are a fairly common way of enhancing wild fish populations or improve local fisheries, but can also be done because of water encroachments and to re-establish and re-build populations, like the *Vossolaks* (Skår et.al 2011) Between 2005 and 2009, 8 million salmon were released into the river through hatchery operations in Norway. The *Vossolaks* are hatched and reared at a hatchery, and released into the river at some point. The salmon will migrate to the ocean and return to river Vosso to spawn, thus ensuring the future population of *Vossolaks*. I conducted fieldwork as a volunteer working full time at the local hatchery where the *Vossolaks* are cultivated, and this is the starting point of this thesis.
2 The hows and whys of studying salmon

While salmon have been an important factor in the lives of local communities along the coast, the Norwegians’ relations with salmon are changing (NOU 1999, Treimo 2007, Berg 1986). History has shown that when an animal is domesticated, their wild origin often disappears. The ‘wild salmon’ is on the brink of extinction in Norway, and the situation is precarious. While entire salmon strains are threatened by extinction, the salmon itself is becoming hybridized by the many ‘farmed salmon’ that escape the fish farms every year. Since the nature management in Norway are grounded upon the notion of preventing genetic disturbance in the ‘wild salmon’ strains, this is seen as a problem. Most Norwegians are aware of the situation, as fierce debates about the issue are constantly depicted in the media. Instead of working together to find a solution, the ‘farmed salmon’ and the ‘wild salmon’ are portrayed as binary oppositions by some of their respective supporters and the public debate resemble old western movies, where eternal enemies face each other and the first who draw wins.

The Vossolaks might just be another example of a nearly lost salmon strain, but the situation here is different. The rescue project is the only functioning collaboration project between the public management, aquaculture industry, salmon researchers and local hatcheries in Norway. As the reader might have picked up, the meeting with the state secretary was not only about the salmon. In fact, very little was said about the situation of the Vossolaks at all, and it seemed to be a mere publicity stunt for the state secretary. This shows how the ‘wild salmon’ in general, and the Vossolaks in particular, has become an important symbol for environmental care, an esteemed value in current Norway. But instead of focusing on the agendas of everyone involved in the project, I turn the attention to the main character in this charade, the salmon.

The Vossolaks is a ‘wild salmon’, but the story expressed a connection between the fish and materialities that normally are not considered in relation to ‘wild salmon’,
fish tanks, tagging, oxygen tanks, polystyrene boxes and digging roe into the river substrate. With the use of human and technological help in a grand scale, the *Vossolaks* are currently being hatched and reared at Voss Hatchery. This thesis seeks to give an empirical account of the life of the *Vossolaks* in the current situation, through a practice approach. This approach will show that the fish is connected in large networks of peoples and things, while still maintaining its status as ‘wild’.

**Newcomers to the farm: Atlantic salmon between the Wild and the Industrial**

This thesis is part of a research project called "Newcomers to the farm: Atlantic salmon between the Wild and the Industrial". The project recognize the special situation Norway is in as a leading country in the development of aquaculture, and also the country in the world with the largest amount of wild Atlantic salmon. This situation leaves the country with a unique challenge in nature management and business development (Newcomers to the farm 2012). Project leader and Professor Marianne Lien has, alongside Professor John Law, conducted fieldwork at a farming company in western Norway, post.doc Gro Ween has conducted fieldwork in the Tana river in northern Norway, while master student Anita Nordeide has conducted fieldwork amongst anglers in the river Namsen in Nord-Trøndelag. Together we seek to explore the salmon in the interface between the wild and the industrial, both in terms of domestication, and in relation to the cultural image of the wild salmon as opposed to the farmed salmon. My project focuses on the latter, and as this thesis will show, the *Vossolaks* is truly between the wild and the industrial.

**Challenging dichotomies**

There is a strong cultural image in Norway, of a ‘wild salmon’ opposed to the ‘unnatural’ farmed salmon. I suggest that the polarization of the debate is fuelled by traditional Western ideas of the ‘wild’ as ‘untouched’, because the term ‘wild’ itself embodies a dualistic image of humans as outside nature, and “*reproduce categorical binaries between society and nature, human and animal, domesticated and wild*”
The ‘wild salmon’ and the ‘farmed salmon’ is thus on each side of a dichotomy strongly embedded in ideas about the world – ‘wild salmon’ as ‘nature’, and ‘farmed salmon’ as ‘culture’. This is a part of a Euro-American practice that “has always happily generated complex and messy realities while pretending to itself at the same time that the categories and divisions embedded in these realities were clear, concise, and stable” (Lien and Law 2011:83). The word ‘nature’ derive from the nascere, which means to ‘be born’, and connotes with that which has been given from birth, independent of human activities. The notion has been thought of as the opposition to the ‘artificial’ products of humans (Pálsson forthcoming). Townsend describes the dichotomy between nature and culture as an unstated assumption that ‘nature’ is ‘out there’, while ‘culture’ is ‘in here’. While ‘nature’ is the living and non-living element of the environment, the ‘culture’ is in the human mind, and anthropologists can “find out about it by asking the right questions and observing behaviour” (Townsend 2009:21).

Franklin argue that earlier anthropological texts understood nature both as a universal symbolic other and that there was an infinite variety of conceptualisations of nature, but not interested in nature as an object of study, only as a symbolic and linguistic framework for the social (Franklin 2002:6-7). The dichotomy was unquestioned for a long time, and Claude Lévi-Strauss argued that it was a universal structure, “hardwired in the human brain” (Townsend 2009:21). Both anthropologists and other social scientists have since argued against these binary oppositions, because they misrepresent reality in fixing exclusionary categories that in practice have fluid boundaries.

Machnaghten and Urry have written one of the most influential accounts about this topic. They argue that no singular ‘nature’ exist, only “a diversity of contested natures” (Macnaghten and Urry 1998:2). Hence, the dualist perception of nature and culture is invalid. Nature is at once socially constructed, but also “performed as well as a lived or dwelt experience” (Franklin 2002:7). They argue against three tendencies in environmental studies; environmental realism, environmental idealism and environmental instrumentalism. Realist studies focus on nature as a real entity substantially external to human practice. Idealist studies on the other hand, argue that
there are underlying values that relate to nature, and that these values need to be identified and critiqued. Instrumentalism focuses on individuals and groups relations to nature through cost-benefit analysis and contingent valuation schemes. (Machnaghten and Urry 1998:2; Ween and Flikke 2009:8). They too argue that these kinds of studies tend to fix nature as a static externality, which reproduce the dichotomies between nature and culture. A better approach is “to approach nature as produced through social practices” (Ween and Flikke 2009:8) (own translation).

The practice approach is not solely argued in relation to studies of ‘nature’ as a whole. In his analysis of the guinea pigs in the highlands of the guinea pigs in the highlands of Ecuador, Archetti argue that change is best understood when studied in practice. He shows that the guinea pig can be seen as a form of ‘code’ with clearly defined meanings, and how the social and symbolic aspect of the guinea pig are entangled in a wide spectrum of social relations and religious beliefs. He argues that the best way to analyse these types of ‘codes’ is “if we can be able to see how the code is expressed in practice” (Archetti 1986:43). He explains further that if the “element of practice” is lacking in a cultural analysis, the ethnographer are in danger of portraying the culture as a fixed system unable to change. I seek to approach the Vossolaks in a similar fashion.

Because of the location of the current Vossolaks, this approach will involve a lot of technical depictions. Laura Rival has argued for an anthropological approach to technology. She has criticised earlier anthropologists for “ignoring the practical knowledge of the living habitats of animal species” (Rival 1996:145-6). In her article about the mediatory role of technology amongst the Huaorani in the Amazon, she seeks to show that a detailed account of the technologies of hunting can “shed new light on the interface between society and nature” (Rival 1996:145).

New approaches

Ween and Flikke describe two central theoretical directions in recent studies of nature that seek to challenge the dualist perception of nature and culture: the phenomenological approach, and the performative approach. While the phenomenological approach focuses on a being-in-the-world, the performative
approach focus on the doing-in-the-world, and ‘how the material is being done in specific times and spatial contexts’” (Damsholt and Simonsen 2009:13) (own translation).

Damsholt and Simonsen points out that while the phenomenological accounts are centred on a human subject, the performative accounts might not be. The performative approach is often tied to Actor-Network-Theory (ANT). A significant factor in the ANT-tradition is the understanding that not only humans can be actors with agency, but objects, things and animals can be actors as well (see Ween and Flikke 2009; Damsholt and Simonsen 2009). Alfred Gell has pointed out that humans tend to imagine that things do have agency when encountering an effect. For example, “we may accuse car of treachery if it breaks down when we need it” (Miller 2005:13). To understand animals and objects in this relation, the ideas of nature and culture as binary oppositions are invalidated, because nature can no longer be defined in ways other than “through the practices that constitute it” (Ween and Flikke 2009:8). According to Latour can ‘actors’ in this sense be understood as the nodes in the networks that have an effect, and what those nodes are can only be found empirically (Damsholt and Simonsen 2009:24). Pálsson has argued that ANT is an important approach in this manner, because nature cannot be described any other way than “through the practises that constitute it” (Ween and Flikke 2009:8) (own translation).

Lien and Law argue that a focus on practices and performativity allows for an empirical approach to dualisms of nature and society without using the same dualisms as part of the analytical tools (Lien and Law 2011:69). An anthropologist who has attempted to avoid the dualist perception is the American anthropologist Stefan Helmreich, with omitting to use the words ‘nature’ and ‘culture/society’ at all, but instead referring to the practices that may be described as such with ‘life forms’ and ‘forms of life’ instead (Helmreich 2009). In Norway in general, and especially in Voss, ‘nature’ is highly present in everyday speech and cosmological ideas, so to me, ‘nature’ is an emic term. When I use ‘nature’ in this thesis, I understand is as Franklin define it, “Nature is not for us a concrete reality that may be like this or like that, but
an idea or series of ideas which specific people (in specific times ad places) use to frame and understand their world” (Franklin 2002:21-22).

Some have brought these ideas further, and through the focus on animals as actors, have created a new disciplinary approach called “multispecies ethnography” (Helmreich and Kirksey 2010). Although anthropological research on animals are nothing new, Helmreich and Kirksey argue that the new genre of anthropology are different because the animal no longer appear on “the margins of anthropology – as part of the landscape, as food for humans, as symbols,” but is being pressed into the foreground of the study (e.g Raffles 2010, Lowe 2010). Multispecies ethnography deals with how organisms “shape and are shaped by political, economic, and cultural forces” (Helmreich and Kirksey 2010:545). More specifically, multispecies ethnography study “contact zones where lines separating nature from culture have broken down, where encounters between ‘homo sapiens’ and other beings generate mutual ecologies and coproduced niches (Helmreich and Kirksey 2010:546)

**Performativity and the ‘wilderness’**

William Cronon portrays this notion of ‘wilderness’ as “an island in the polluted sea of urban-industrial modernity” (Cronon 1995:69; Lien forthcoming). The term embodies the dualist perception as nature that is outside the human realm. As described in the Prologue, the term ‘wild salmon’ emerged after the rise of the aquaculture industry, and is used to distinguish the salmon in the pens from the salmon in the river. Following Cronon, the term ‘wild salmon’ is problematic in it self, because it “carries with it the dualism of humanity and nature as opposite poles” (Lien forthcoming).

Franklin argues that even though Machnaghten and Urry eschewed the dualist perception of nature and culture, they seem to understand nature as something elsewhere, “places we have to drive to or drive through,” rather than places we encounter everyday (Franklin 2002:8)
Whatmore and Thorne points out that the understanding of “the species and spaces of wildlife as the antipodes of human society means that, to ask what wild is, simultaneously, a question of its whereabouts” (Whatmore and Thorne 1998:435). In defining an animal as ‘wild’, they are located outside the ‘human society’. Through the examples of the ‘wild’ animals used in the military vernacular of Imperial Rome and the scientific vernacular of endangered species, they seek to show that wildlife has been performed since the amphitheatres of the Romans. In doing so, they seek to understand the notion of ‘wildlife’ as:

“a relational achievement spun between people and animals, plants and soils, documents and devices, in heterogeneous social networks that are performed in an through multiple places and fluid ecologies”

(Whatmore and Thorne 1998:437)

These relations are grouped under what they call ‘topologies of wildlife’. To understand wildlife as a relational and fluid achievement, two performative moves has to be made; realising that the ‘wild’ is not situated in fixed places, and a focus on the animals as actors. This approach, they argue, will “render the experience of radical difference delineating the human from the animal, the civilized from the wild” (Whatmore and Thorne 1998:437). They argue that a performative approach to ‘wildlife’ can change the utopian understanding of ‘wilderness’ as a sanctuary, because it will show how we are entangled with it (Whatmore and Thorne 1998:450).

The hidden hatchery

Hatcheries have existed in Norway since the middle of the nineteenth century, but the fact that ‘wild salmon’ have been artificially hatched for so long has not changed the dualist visions of the ‘wild’ and the ‘farmed’ salmon. Treimo explain that hatcheries have not been elaborated in the public discourse in Norway, so the practice has not been questioned in relation to the salmon’s status as ‘wild’ (Tremio 2007:62). Because of this, the dualistic understanding of the ‘cultural farmed salmon’ and the ‘untouched wild salmon’ has been upheld. But it is not solely in public discourse that fish hatcheries have been neglected.
In the 1990s, SIFO (the National Institution for Consumer Research) conducted a survey about the attitudes to and the consumption of fish in Norway. One of the respondents explained that they had reacted in a negative way when they had found out that the salmon they had caught had “been outplaced”. The negative reaction to this salmon was explained that it was because the salmon had been placed into the river human hands, which is negative because “you are no longer in nature” (Døving 1997:247) (own translation). The survey showed that the dualist perception of the ‘farmed’ and ‘wild’ salmon was profound in the Norwegian population, but nowhere in the survey, nor in the appendix showing the questions that was asked the respondents, is wild fish hatcheries mentioned. The Norwegian anthropologist Døving later conducted an analysis based on the findings in this survey. Inspired by Leach, he wanted to analyse the cognitive categorisations of ‘edible’ and ‘inedible’ animals in Norway. In his analysis, ‘the field’ and ‘the wilderness’ are portrayed as two spatial categories in the Norwegian mind. The products that are edible are affected by these categories, and all that which has been sowed in ‘the field’ can be harvested and eaten. The food from ‘the field’ are therefore ‘culture’, “both in the literal sense and in practice” (Døving 1998:54) (own translation). ‘The wilderness’ on the other hand, is ‘nature’, “a place outside human control where Norwegians can go out and fetch (hunt for) food” (ibid.). He moderates this clear distinction with the English notion of ‘game’, animals that are under some form of human protection but still perceived as ‘wild’, which he explain to be a form of ‘managed wilderness’ (Døving 1998:57). But he did not have to go to England to find an example that could moderate the dichotomy. The fact that ‘wild fish’ has been artificially hatched and ‘outplaced’ into the river by human hands for over 150 years, and continue to do so without changing the status of the fish as ‘wild’ is completely ignored. I believe that this example underpin Treimo’s claim that the tradition of fish hatching has been largely ignored in public debate, and that Døving, as the majority of the Norwegian people, just didn’t know about it.

Døving’s depiction of ‘the wilderness’ as outside the human realm resonance with the utopian idea of ‘wilderness’ as Cronon and Whatmore&Thorne have argued against. This thesis seeks to nuance this dualistic view through the empirical case of the
Vossolaks. It is not my intention to say that the use of ‘wild salmon’ is wrong, on the contrary, I want to show how the category is not fixed, but have fluid boundaries. Without the conceptual baggage of the ‘wild’, a more fruitful debate about the situation might be achieved.

Salmon ranching

Norway is not the only country in the world with hatchery traditions. Salmon ranching is “the practice of releasing young fish into the marine environment and allowing them to roam and grown in the wild until maturation and harvest” (Isaksson 1997:1188). There are two different types of ranching practices: private and semi-private. The private is “large-scale releases of salmon smolts by private companies with the intent of harvesting all the salmon upon return at the release site”. Ranching of Atlantic salmon this way is done mostly in Iceland. The semi-private ranching practice on the other hand, is conducted in Japan and Alaska, with Pacific salmon. A semi-private ranching is when “cooperative companies of fishermen release salmon to enhance local fisheries” (Isaksson 1007:1189). These ranching practices differ form the Norwegian hatcheries, because all the returning adults are to be caught when they return, and they are not allowed to spawn in the river. The Norwegian hatcheries are more similar to what Isaksson define as “stock enhancement activities” where public or private sectors hatch and release salmon for mitigation or restoration purposes (1997:1189). But even though the purpose of the hatching and the fishes themselves are different, I will still compare the situation in Voss with ranching throughout the thesis when suitable.

Methodological considerations

Early afternoon on the fifteenth of February 2011, I was standing alone on the train platform and looking nervously around me, as I saw my train leaving the station. I was surprised that it was so much snow, and kept jumping up and down to keep warm. The family I was going to stay with had suggested that they could come and pick me up at the station, which I had agreed to, but they never confirmed it, so I was a bit nervous if they were going to show up. The train from Oslo had been packed, but
only a few people got off at Voss Station, and they all disappeared quickly in every direction. I had brought a huge hot pink suitcase with me, because I had thought it would make it easier for them to recognise me. That was clearly unnecessary. Not only was I standing alone on the platform, the suitcase only amplified the unmistaken fact that I did not really belong there. On the edge of the platform, I saw a man around 35 years old coming towards me in a slow pace. He looked slightly nervous, and didn’t look directly at me. Was he the one coming to pick me up? I tried to pick up my luggage and walk towards him, but it was heavy, and the cold had made my fingers white and stiff. He was coming closer, and I was trying to make eye contact without staring too much, in case it was not he after all. He finally looked up and asked; “Line?” His name is Martin, and he was the father of the family. His wife, Kine, was still at work, and the three children were at his parents’ house, a couple of houses up the road. During the five-minute drive from the station to the house, he showed me the closest place to buy food and which way the location of the hatchery was. “You can’t really get lost in Voss,” he said in a humorous voice. And with that, my fieldwork had begun.

Entering the field

I had chosen the Vossolaks because an informant of my academic advisor had told her about the project. While doing research on the Internet, I found the latest report from Vossolauget, and it seemed like this was the place to start my queries. In October 2010, I flew to Bergen to meet the chairman of Vossolauget. At this time, I was oblivious to the distinction between Vossolauget, Vossoprosjektet, the rescue mission, and the Hatchery⁹, and was under the impression that I was meeting the chairman of everything. Even with my lack of knowledge I managed to explain my intentions to him, and expressed my interest in working with the fish first hand. He thought it was a good idea, and decided to vouch for me and talk to the operation manager at the Hatchery on their next meeting. It was not until January that I got a call from the project manager, giving me the final go-ahead and said that I was accepted by the Hatchery and my fieldwork could finally begin.

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⁹ Hatchery written with capital H refers to the organisation, while hatchery with lowercase h refers to the hatchery building.
The Hatchery as a part-time society

For the majority of my informants, the Hatchery is first and foremost a workplace, and I was unable to spend my entire time at Voss with them. In this respect, doing fieldwork at a hatchery in Norway might not meet the traditional criteria of anthropological fieldwork in ‘villages’ and ‘groups’. But my fieldwork resembles Lien’s fieldwork in the marketing department of a Norwegian food manufacturing company, where she could only spend the normal working days with her informants, and not join them at home. She argues that the marketing department can be seen as a ‘part-time-society’. According to Luckman, “modern man is a part-time citizen in a variety of part-time societies” (Luckmann 1978:282; Lien 1997:28). People are part of several part-time societies where they owe partial allegiance to each of these societies instead of living within one world system at all times. Because of this, Lien argues that ethnographic accounts of these part-time societies are justified (Lien 1997:29).

Through my volunteering work at the hatchery, I was able to participate in everything that happened to the salmon while I was there, and the majority of my thesis is based upon participant observation in the hatching and rearing of the Vossolaks. Because of the nature of the work, I was able to conduct as many unstructured interviews as I felt the need for. While Lien’s marketing department was extremely busy, and the workers leaving the office for hours at the time, this was never a problem at the Hatchery. There were only rarely any stressful moments at all, and the caretakers were seldom in a hurry. Much of the work involved standing around and watching the fish in the tanks to see how they behaved, watching machines as they were pushing fish around, just controlling the procedure, driving around the Vosso river system to take water samples or driving back and forth between the Hatchery and Evanger. Through the work at the Hatchery, I was also able to attend board meetings and seminars and catch up on the latest information about salmon over a cup of coffee with the caretakers and the many visitors that visited the Hatchery.
Positioning and ethical considerations

As a fellow Norwegian, I shared the ‘doxa’ of my informants to a certain degree. But what I did not share was their knowledge of salmon. I was one of those Norwegians who had never heard about a hatchery before, and never even seen a living salmon in my life. I did not know what an Atlantic salmon was, or that this salmon was different from the Pacific salmon. One of the caretakers asked me once if I had taken any biology classes at University or in school, and I said no. They all chuckled at my response, and the person asking me said, “How do you understand anything we’re doing?” “That’s what I’m trying to figure out” I replied.

All information about the salmon, and the salmon projects at Voss are based on information I received during my fieldwork and information collected the following year. Since I did not know anything about salmon when I arrived, some errors might have occurred because of this. I might have misunderstood what was being told, or my questions might have been misunderstood or have been unclear.

There are more sceptics to the Vossolaks project than are being portrayed in this thesis. While I only met two people who openly questioned parts of the project, there were rumours that there were others as well. I chose not to investigate these further, mainly because of time limitations, as I did not encounter these rumours until my fieldwork was coming to an end. Also, with regard to my complete oblivion to anything salmon related upon my arrival, it took me the entire fieldwork to decipher the cultivation process and everything that was going on at the Hatchery. If I had had more time, I would have sought out these voices.

Thesis structure

The prologue introduced the empirical context of this thesis, and the current chapter have introduced the theoretical framework for doing anthropological research on salmon. Chapter three locates the field further, as we are introduced to the people and fish at the Hatchery. Chapter four follows the fish’s movements through the year as they are reared and prepared for a life outside the Hatchery. The preparation takes place through a series of tagging practices, all of which are meant to answer questions
about their lives outside the Hatchery. Chapter five follow the fish from the Hatchery and into the Vosso river system. The sixth chapter describe the events in which the salmon return from the river, not merely physical, but also in visual and audible ways. In these various returnings, the salmon may or may not give answers to the questions asked by the salmon biologists as described in chapter four. The chapter will also show how the Norwegian nature management create classification systems that produce anomalies, shown through a case where the Vossolaks themselves become the anomaly. The final chapter analyses and sums up some of the questions discussed throughout the thesis.
3 Hatchery lives

Although the fate of the salmon are decided in public offices and meeting rooms around the country and in laws and regulations decided by the public management, the fish themselves are nurtured to life at Voss Hatchery before they are released into the river. This chapter locates the field further and introduces the people and fish that make this happen.

Voss Klekkeri

I had only worked at the Hatchery for a week or so, and the Norwegian winter was living up to its standards as extremely cold and snowy. I had walked the twenty-minute distance from my house and had finally reached the hatchery where I quickly crossed the motorway and walked in the front door. I stood there for a minute, trying to shake the snow from my winter coat, feeling that my feet were wet. The winter boots I had bought in Oslo before I left just was not good enough in this environment. The distinct smell of dog food coming from the bags of food lying in the entrance hall, hit me, reminding me of the confusion I had felt the first time I had seen them. The dog food belonged to the Norwegian Association of Hunters and Anglers (NJFF) that shared the building with the Hatchery. I walked upstairs and looked around the corner to see if Knut was sitting in the sofa, but there was no one there. He had not arrived yet. I undressed and hung my coat over the railings on the staircase, and walked into the office overlooking the parking lot. Bodil, Erik, and Helene were sitting at their desks, all three working on their computer. “Good morning,” I said as everyone turned to face me. “Good morning,” they said in unison before turning back to their screens. I sat down in my usual chair in the corner behind the door and waited.

Like in the rest of Norway, Voss has a long tradition of fish hatcheries. The first hatchery in Voss was most likely built around 1925, located at Bulken and financially supported by Hordaland County and the county’s fishing association (Tveit 2000:56-
Throughout the 20th century, several hatcheries with differentiating success was in operation around Voss, and a hatchery located at Rognsfossen was in operation from 1957 until the new hatchery was built in 1989 after the drastic decline in the Vossolaks population (Tveit 2000, Barlaup 2004, Barlaup 2008).

The new hatchery is called Voss Klekkeri, Voss Hatchery, and is located a twenty-minute walk outside the city centre of Voss. The hatchery building is a brown and rectangular hatchery as seen in the picture above. On the ground floor you find an entrance hall, a storage room, an engine room, a unisex toilet and an area where you can hang your diving suit, coveralls and so on. These areas are for humans and land animals, and the rooms where the fish are kept will be explained later in this chapter. A staircase leads up to the first floor, where you find the office, a lunchroom with a sofa and a kitchenette, and an engine room with machines that control the water and oxygen level for the fish tanks. The office windows face the parking lot as seen in the picture below. Hanging on the walls all over the staircase and the first floor are old pictures and artifacts of salmon and salmon related activities, tools used for fishing in the old days, and information posters. The old photographs portray fishermen, mostly male, standing beside a various amount of – what seemed to me at least – gigantic slain salmon. The information posters tell about the different types of salmon that exist in the world and where to find them, or show pictures of the salmon at different developmental stages. You can also learn how to identify a ‘farmed salmon’; shortened gills and worn dorsal fins.
The caretakers

There were six paid employees at the Hatchery while I was there. My closest contacts at the Hatchery and the ones I have chosen to portray in this thesis are called Erik, Helene, Bodil and Knut. Because of reasons concerning anonymity issues, I have chosen to not introduce them in detail, but they are all white, Norwegian and educated in nature related areas. Two of them are biologists. In addition to these four, a married couple is caretakers at ‘Evanger’, a fish plant located a twenty-minute drive from the hatchery. More information will follow on ‘Evanger’ later in this chapter.

In addition to the paid employees, a group of approximately 8 people work at the hatchery on the weekends on a voluntary basis. The hatchery also makes use of other voluntary or paid help during the year. Some stages in the fish’ life cycles demand a bigger workforce than others, and some of the members of the hatchery group and local landowners help out at dugnader. During my time at the hatchery, two youths from the schools in the area were deployed at the hatchery a few days a week. In the summertime, when about 200 000 fish are to be tagged the hatchery use a local workforce of around thirty youths aged thirteen to nineteen, who spend two weeks of their summer vacation at the hatchery as a summer job. There are no workers at the hatchery at night, but there is always someone on phone duty. This means that if anything happens with the machinery at the hatchery, an alarm goes off, sending a message to a mobile phone the one on duty carries with him, the person on telephone duty need to drive as fast as they can to the hatchery and fix the problem. If the problem is connected to the oxygen level in the tanks, the fish can possibly choke and die if it is not fixed soon.

I sat in my usual chair behind the door and watched the snow falling silently outside the window while the others continued working on their computers. Bodil was doing some office work, while Helene was searching the web for some gloves they needed.

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10 *Dugnad* is a Norwegian practice where people meet to perform a maintenance task on communal areas of some kind, on a voluntary basis.

11 See chapter four for further explanation of tagging practices.
“I can’t find the ones we used last year. They were so much better than the other ones,” she complained and Erik turned toward her, taking off his glasses. He had been checking the Internet for the latest salmon news. “You keep on searching, while Line and I go check on the fish,” he said and looked at me. I nodded ‘yes’ in response and got up at once.

A Vossolaks’ life cycle

The image above shows how the Atlantic salmon’s life cycle in the river, and the English terms commonly used to describe the different stages. Although the Vossolaks’s location is different, it develops similarly. The salmon’s life at the Hatchery will be further explained in the next chapter, but a short introduction to the terms used in Voss will follow.

The salmon life cycle begins when the females’ egg, eggs, have been fertilized by the male’s melke, milt. The fertilized eggs are called rogn, roe, and if the roe survive the first difficult months of its life, it becomes augerognt, eyed roe, named after the now visible pair of black eyes that the embryo within the egg have developed. A newly hatched salmon is called plommenesekkyngel, yolk sac alevin, which is tiny larvae-like creatures with a ‘yolk sac’ attached to its belly, giving it the nutrition it needs to survive the first months. When the yolk sac has been emptied, the term yolk sac is removed from the Norwegian term, and it is called yngel. In English, this state is called fry. The fry become parr, parr, after a few months. The parr is characterised as
“dark, cryptically coloured fish with spotted markings on the upper part of the body and barred blue flanks” (Youngson and Hay 1996:23). After a year, the parr go through the smoltification, the smoltification process that morphologically change the salmon so they can live in salt water. The parr turn into smolt, smolt, and changes colour in the process, now looking like miniature salmon, but with the dark dots barely visible along the flanks. This is the last stage any fish reaches at the Hatchery, because by then, all of them have been released into the river. When they return to the river system to spawn as adult salmon, they are either tert, salmon that have spent one year at sea, mellomlaks, two years at sea, or storlaks, who have spent three or more years at sea.

**Røkting**

*Røkting* is the Norwegian name of the daily caretaking of the fish at the Hatchery, and the caretaking was often expressed in relation to the welfare of the fish. The legal basis for caring for animals in Norway is based on the Animal Welfare Act. §3 of the Act state “*animals have intrinsic value independent of the usefulness ('nytteverdi') they may have for humans. Animals shall be treated well and protected from the risks of unnecessary stress and strain*” (Ministry of Agriculture and Food 2009) (own translation). To prevent the fish from unnecessary stress was of major importance to the caretakers, and a lot of time was spent watching the fish in the tanks to see if they behaved ‘normally’, and indication that they were not stressed.

Other caretaking practices involved the feeding of the fish, picking out dead fish or roe, cleaning tanks and equipment in order to prevent illness or infections, controlling the oxygen levels and the water temperature and cleaning the rest of the hatchery as well. As Erik told me when we were on our fourth day cleaning the same kind of equipment; “*this is what hatchery work is all about. Cleaning, cleaning and more cleaning. And a little bit of fish*”.

Every morning starts with a ‘morning routine’, where the caretakers walks around the fish, picking out the dead fish if there are any, measuring the oxygen levels and the water temperature, and feeding the fish. The amount of feed is changed continuously
as the fish grow in accordance with the ‘förfaktor’, the feed conversion ratio (FCR). The FCR is the amount of food consumed divided by biomass gain, and the formula for measuring the amount of food is: average weight*number of fish*FCR. When I asked Helene about how she measured this, she said that she plotted in the numbers on a computer, and the correct amount of food popped up automatically. “But it’s mostly only a proposal, because we know how much the fish here eat, and it’s not always correct. So we change the number if it’s not right.”

‘Sluserommet’, the sluice room, marks the transition from the entrance hall into the production rooms where the fish are kept, and because of regulations and disease control, you have to change your shoes here if you want to proceed. A bench is placed across the room, and on the other side of the bench stand a number of white clogs and white rubber boots you can put on, that are only supposed to be used inside the production rooms. In some cases when there are more visitors than white shoes, the employees mix a disinfectant tablet called ‘Virkon’ with water, and the visitors dunk the soles of their shoes in the pink fluid to kill any potentially lethal bugs. In addition to the changing of shoes, there are posters that say to wash your hands properly.
To the left after the sluice room is a small room with no windows called ‘klekkerommet’, the hatching room. A poster on the door tells us to turn off the lights when we exit the room and to keep a low noise level. This is the room where all the salmon roe lie until they hatch. From early winter and until springtime, thousands of small orange roe lie in incubators alongside both sides of the room, each incubator divided into several trays filled with roe.

In addition to the hatching-room, there are two production rooms called gamlerommet, ‘the old room’, and nye rommet, ‘the new room’. The first room you enter is the old room, which consists of fifteen square and green fish tanks, each equipped with one broom, one fish scooper and one food dispenser. The food dispenser is connected to the roof through a power outlet and the dispenser pushes out food into the tanks all day. The time-lapse can be set at your preference, and is changed according to the fish’ changing needs. All around the tanks are a cluster of black pipes, transporting water to and from the tanks. The water comes from the river streaming next to the hatchery, so the fish lives in the same kind of water they would have if they were staying in the river. The fish first come into this room when they have hatched in the hatching-room and some stay until they are one-year-old while others move out after a few months. The movement of the fish will be described in the proceeding chapters.
We walked around all the tanks to see if there were any dead fish in them. In each tank swam hundreds of fish against the current, so from our point of view they seemed to be situated in the exact same location all of the time. The fish were around 10 cm long, darker at their back than their bellies, and tinted green. No dead fish were floating on the water surface today. Erik took the sheet of paper lying on top of the first tank. The sheet told him how much food each tank needed. A green and white bag marked EWOS contained small and brown foul-smelling pellets and I took a see-through measuring cup and filled it with the amount of pellets Erik told me to. When I came close to the tank, most of the fish quickly swam to the other side of the tank, trying to avoid me. I placed the food evenly around the food dispenser so that the feeder would push out the food a little bit at the time. I did this in all the fifteen tanks, and put away the measuring cup before going into the new room to see what Erik was doing.

An information pamphlet I borrowed from one of the employee’s state that the fish eat the same pellets used in fish farming, and it consists of a mixture of fishmeal, fish oil, grains and soy. The nutritional contents of the pellets are proteins, fats, carbohydrates, vitamins and minerals, and colourings. When the fish are newly hatched, the pellets are tiny and resemble sand, but as they grow, they are fed with pellets adapted to their size. The presentation also said that if the fish is not getting enough food, the fish becomes skinny and ‘ugly’. The term ‘ugly’ is explained with biting of fins, and picking of eyes.

The new room looks a lot like the previous room, except it is painted grey and there are only five fish tanks, each tank considerably larger than the green ones. The tanks are similarly equipped with brooms and scoopers, but because they can contain a larger quantity of fish, they have two food dispensers, both larger than the dispensers in the old room. As mentioned in the introduction, the main strategy of the Vossolaug is increasing the production of smolt from about 20-30 000 to 150-200 000 smolts. To be able to meet this increase, the hatchery therefore had to expand its premises. With financial help from the Vossolaug, the new room was finished in 2009, and is the newest addition to the hatchery, hence the name ‘the new room’. The workers at the
hatchery kept the two rooms discursively separate, I guess mostly of pragmatic reasons than anything else.

Erik kept moving black tubes and other equipment around, so I paced the around the room not quite sure what to do, trying to stay out of the way. There are two windows in the room, and I stood looking out of them both for a while. The first overviews the river, and the caretakers frequently stood watching the sometimes dramatic amount of water streaming past. Out of the second you see further down the river and the motorway that runs on the other side of the building. A small door is barely visible on the slope leading down to the river underneath the motorway a few metres outside. Erik suddenly brought in a ladder, and he placed it on the other side of the room and started climbing up. The ladder faced a small door, approximately 1 meter high, and located about three meters up the wall. He opened the door and went inside. He emerged carrying a food dispenser, and tried to climb down the ladder with the dispenser on top of him. I jogged over to the ladder and tried to hold on to it, in a futile attempt to prevent him, or it, from falling. He climbed down without problems, placed the food dispenser on the other side of the room, and went up the ladder again. This time, I followed him, and stood on top of the ladder to receive the second dispenser. The door leads to a loft used as a storage room, and if you go through the
loft, you enter the lunchroom through a similarly small door on the other side of the room. There were many dispensers lying around the room. “I sometimes sit up here and watch the salmon in the tanks,” he said as I turned around and watched the fish tanks from above. “They don’t know you’re here, so you can see how they behave when they are alone,” he continued. The fish tanks were empty now, but would be filled with fish in a few months time. “We’ll bring in the fish when they are ready,” Erik said and gave me the dispenser. It was hard to hold on to, and quite heavy. I esd not used to this kind of physical work, and it was hard to climb down the ladder with one hand, while the other was holding on to heavy and unstable equipment, and at the same time trying to prevent Erik from seeing that my life was flashing before my eyes. About half way through bringing down all the dispensers, Erik suggested that we switched places, and I gladly accepted.

The door under the motorway is a third production room, the home of ‘auren’ (salmo trutta); the trout. A local power company called ‘Voss and Omland Power Company’ has a hydropower production site nearby, and gave the room to the hatchery because they apparently didn’t need it anymore. The trout production at the hatchery is very small compared to the salmon production, with only about 10 000 roe hatched. In my time at Voss, two trays in the incubator room were occupied with trout, and if I had not been told that they were a different fish, I would not have seen the difference. They hatch approximately at the same time as the salmon, and stay in the room under the motorway until summer, when they are released. Local landowners pay for the production, and they are set out in mountain lakes in the area in the summer. This practice has a long tradition in Norway, and is upheld where the landowners want to fish for trout in ponds and lakes where there normally are no trout. Because of the difference in numbers, the trout require less attention than the salmon, but the employees feed and check in on them a couple of times a day, usually at the end of the morning routine.
Erik decided that we should take a trip to Evanger to check on the fish there since he had not been there for a few days. The others would stay at the hatchery and continue doing office work, but he asked if I wanted to join him. I prepared a fresh pot of coffee that we could bring with us, and we would eat our lunch in the barrack by the plant. The snowing had ended outside, but the temperature was still very cold, so I was glad I had put on a lot of clothes that morning. Bodil looked at my shoes and made a critical facial expression as I was preparing for our departure. “You don’t have a different pair of shoes? You’re going to get wet in those,” she said. I looked down at my city winter boots and shrugged. “Maybe you can borrow Helene’s shoes,” she suggested, and Helene kindly lent me her much more suited shoes. They too were two sizes too big, but they were very thick and waterproof with big rubber soles, much more prepared for the amount of snow outside. We drove to Evanger in the hatchery van while Erik tried to teach me the names of all the nooks and crannies of the river system as we drove past. The last bit of road is a small road circling through mountain tunnels, and the snow and ice made the road unstable and slippery. I clung to the handle above the door while Erik continued to talk and drive just as fast as on the motorway, seemingly unaffected by the rough conditions. Through the naked trees beside the road, the fish plant became visible some hundred metres down the mountainside in the water below, and I leaned over to get a better view.

Even with the new production room, the hatchery needed more space to handle the increase in smolt production. A freshwater cultivation plant was therefore built in
Evangervatnet, the Evanger water located a twenty-five minute drive from the hatchery. ‘Evanger’ is the name people commonly use when they talk about the plant. Mattilsynet has granted Voss Klekkeri a special permission for the plant, as cultivation plants in freshwater areas are usually not allowed in the area. The plant was established during the summer of 2008, and has permission for keeping 200 000 salmon from the middle of August to the middle of May. A neighbouring couple that owns part of the land the plant is located on are employed as røktere, the caretakers, and have responsibility for the day-to-day feeding and supervising of the plant. They get paid for two hours of work every day, and have other jobs beside the caretaking job, so the fish are left mostly to themselves. The caretakers at the hatchery do not come here everyday, but perhaps a couple of times a week to deliver or retrieve equipment, meet the veterinarian who checks the fish once a month.

Erik did not want to drive all the way down to the barrack because of the icy downhill and the high probability that the car would get stuck down there. We therefore parked a little further along the way, and walked back toward the hilltop and down toward the plant. The road was extremely slippery, but Eric set off using his rubber shoes as skis, steering with a big red shovel he dragged behind him. I on the other hand, forced my way down by the end of the road where there was more snow than ice, and tried to balance my weight with the thermos and coffee cups in one hand, and the other sticking out of the steep slope on the left, trying not to fall down. Erik was at the bottom almost finished with shoveling away the snow from the entrance with a huge grin on his face by the time I finally arrived. We went into the barrack and ate our lunch and drank a cup of coffee before we put on thick coveralls and lifejackets in case we should fall into the freezing water. “Has anyone ever fallen into the water?” I asked. “Nope,” he responded. “And we’re not going to either.” I nodded, feeling pessimistic.

The red barrack is a small hut with one room and a dysfunctional toilet. It is located on shore, and is used for the storage of equipment: coveralls, gloves, life vests, papers, and a freezer for dead fish and so on. The barrack also provides much needed shelter for the caretakers during winter, and when the fierce rain makes it hard to work out on the plant. The plant itself is located about hundred meters off the shore,
connected to land by a bridge. There are four fish pens on the plant, each pen approximately 10*5 metres. The pens are called ‘\textit{nøter}’ (plural), each pen a ‘\textit{not}’ (singular). A birds netting cover the entire plant so that the curious birds attracted to the fish and constantly surrounding the area would not eat them.

*Picture 8 Evanger*

The bridge out to the plant was covered in snow, and we had to kick the snow and ice away so that we could walk there. The water was covered in thick ice and the entire bridge was stuck to it, almost being dragged under water. But as we reached the plant, I could hear a humming noise and saw that the water in the pens was not covered in ice. “What is making that sound?” I asked. Erik pointed toward a blue construction tied to the plant a couple of metres outside the bridge. “It’s a propeller. It makes the water to move so the ice won’t stick in the pens,” he answered. But as we arrived at the plant, we could see several dead fish in the water surface in three of the four pens, and a thin layer of ice covering half the pen furthest away from the propeller. “This is what I was afraid of,” Erik said and leaned against the fence of the pen. “Since it was so terribly cold this weekend, the propeller could not do its job properly.” The weekend had indeed been extremely cold, with temperatures below minus 30 degrees Celsius. He found a long scooper and lifted up the fish, while explaining further, “the fish jump a lot, so if its ice, they get stuck on it, and die.” He scooped up all dead fish and put them in a see-through freezer bag. “We’ll give them to the veterinarian to play with,” he said and chuckled. I carried the bag, studying the 26 dead silvery fish. They were between 8 and 13 cm long, basically the same as the
ones in the old room back at the hatchery but slightly darker, and looked like miniature copies of adult salmon.

Whenever there were dead fish in the pens they were usually placed in a plastic bag in the freezer in the barrack with a note telling the date the fish had died. These fish were to be given to the veterinarian, and he/she did bring some of them along once in a while. When I asked what they would do with them, the caretakers shrugged their shoulders and said, “don’t know”. The remaining fish are moved from the hatchery to the plant in the middle of August, when they have outgrown the hatchery. The fish that stay at Evanger are usually referred to as Evangerfisk while the fish at the hatchery are referred to as hatcheryfish, even though the fish themselves are the same kind.

I was walking around the plant as Erik was checking the food dispenser, moving equipment around, or leaning over the fence, watching the water surface. The water was dark and I could barely envision the thousands of salmon swimming below. When Erik seemed happy with today’s work, we carefully climbed the icy hill up to the car and changed our shoes before we got in. Erik dropped me off at the city centre and I slowly walked back up to the house where I was staying. Kine and the kids returned from work at the same time, and I said ‘hello’ to them before I entered the house and started writing my fieldnotes of the day.

Concluding remarks

This chapter has given an introduction to the people, places and salmon that are part of Voss Hatchery. The hatching of fish has a long history in Voss, but the practices have changed after the rescue projects were implemented, with the addition of the Evanger cultivation plant and new technologies. Through the feeding of pellets, the flesh of the Vossolaks is directly connected to fisheries around the world, and they eat and grow by the same means as the ‘farmed salmon’. Even though the Hatchery has become more standardized, as in using technological means to hatch fish much similar to those in the aquaculture industry, some attempts of standardizations, like the FCR, are adapted to meet local knowledge, showing the knowledge of hatching
Vossolaks are still based on years of caretaker-vossolaks relations. The next chapter will describe the lives of the Vossolaks at the Hatchery in further detail, and the discursive and material categorizations of the fish, as they are prepared for a life outside the Hatchery.
4 Rearing and preparing the Vossolaks

Although the rokting and cleaning is an important part of the caretaking of the salmon, a lot of time was spent keeping different categories of fish apart, and the most time-consuming practice was the tagging. The Vossolaks at the Hatchery are divided and grouped into categories from the time they are fertilized, and continue to be so all the way through the cultivation system, each category having their own set of practices. This chapter will follow some of these practices. The tagging was done for two purposes. The tags are first and foremost identification marks that allow the involved parties to “make a good evaluation of the cultivation measures” (Skår et.al. 2011:34). If the Vosso river system were suddenly filled with salmon, they would not have known that it was a result of the cultivation measures if they were not able to identify the fish, and they would not be able to evaluate the stock development. While the biologists have identified some of the threats to the salmon in the river, they do not know all of them, and therein lies the second purpose: to find out if the length of the migration and the sea lice are precarious threats.

There are two generations of fish at the Hatchery every spring, because of the salmon’s life cycle, and it was therefore learning about roe and one-year-olds at the same time. The majority of the fish are moved out of the Hatchery and into the river at different points of the season, so that there is no singular story of a salmon’s life at the Hatchery. However, I have chosen to portray the rearing and preparing of salmon in chronological order following the salmon’s development, so the presentation of the salmon’s life in this chapter is therefore a simplification, as these practices in reality take place continuously and in parallel.

The roe

All the roe lie in the hatching-room that was described in the previous chapter, in the two kinds of incubators that go alongside the two longest walls in the room. At most, all of the trays in the incubator are occupied by thousands of roe, lying in water from
the river streaming next to the building. The roe do not need much caretaking at this stage, except keeping the water flowing to secure the oxygen level, and daudrognplukking, dead-roe-picking. When alive, the roe are orange, raging from bright orange to dark almost burgundy coloured circular eggs. But when they die, they turn foggy white. The white roe have to be extracted from the trays every other day, because the caretakers fear that they will spread infections. If the dead roe were not picked out quickly, they acquired fungus, and formed a sticky membrane twice its own size, causing the other roe to stick to it, and die of the fungus. The membrane formed quickly, and several of the white roe looked like tiny suns in the tray, that first time I participated in the picking, with the fungus looking like the sun’s rays.

It was my very first day at the hatchery, and we were going to perform the ‘daudrognplukking’ for the first time. Erik and I had put on the thick coveralls and I had tucked the woollen scarf tightly around my neck and shoulders. We went into the sluice-room and put on the white rubber boots that always stood behind the bench dividing the room in two. Erik found a plastic bag with several white cotton gloves inside and gave them to me. “These have been washed, so they’re clean and good to go. Dig around in there, and you’ll probably find some that fit you,” he said and went into the hatchery-room. The gloves were of different size and shape, but I found two that were similar enough, and put them on. I carefully tread over the doorstep and into the pink mixture inside, dunked my feet and walked inside. Erik had turned on the radio, and the sound of pop tunes filled the small room. He gave me some plastic gloves and I pulled them over the cotton gloves and over the sleeve of the coverall so that I would not get wet. Amongst all the orange roe in various sizes lie white roe, some visible and some only barely visible. Erik pulled out a drawer and gave me a hose and a tweezers. “You can try them both and see which one you prefer. I use a hose,” he said as he sat down on a stool and opened another drawer at the other end.

Apart from minor differences in size and colour, all the roe in the hatching-room look more or less the same; even the trout look similar to the salmon. But the roe were kept separate as two groups, both discursively and materially. The two groups were called Vossorogn, Vosso-roe, and genbankrog, gene-bank-roe. The Vossorogn are fertilized through a practice called ‘stryking’, stripping, where the salmon’s belly is massaged
until the salmon release the eggs or milt, and the two are mixed in a bucket. I was not able to participate in this during my time at Voss, due to the time of year it is practiced, but the event was often talked about, especially amongst the volunteers. The salmon are caught in the Vosso river system by rod at *stamfiske* (*broodstock-fishing*), a *dugnad* arranged by the Hatchery every autumn. The fish is brought to the hatchery alive, and is kept in tanks until they are spawning. Since the *Vossolaks* is protected, this is the only way for locals to legally fish for salmon. One of the most active volunteers kept asking Erik and Helene when the *stamfiske* would start and was very anxious that they would forget about him. They reassured him that they would contact him as soon as they knew. When I asked him if he went fishing often he replied; “*When I was a kid, I went fishing every day after school. And I loved it. But I’m not that interested anymore. If I could have fished maybe a day or two during the season, I would have, but not at the current price. I’m not THAT interested.*”

Between 1991 and 2001, the Hatchery delivered broodstock fish to the ‘*levende genbank*’, the living gene bank, located in a town called Eidfjord. 78 families of *Vossolaks* were given to the gene bank, and milt from 77 salmon males was frozen in a sperm bank between 1986 and 1996 (Barlaup 2004:142). The first ‘living gene bank’ was created in the county of *Sør-Trøndelag* in 1989, with the intention of keeping salmon strains protected when the rivers were infected by the deadly virus *gyrodactylus salaris*. The gene bank in Eidfjord where the *Vossolaks* and other salmon strains are kept was created in 1991, owned by the Directorate of Nature Management and operated by the hydropower company Statkraft AS (Barlaup 2004:143). This means that *Vossolaks* are kept in tanks on land and stripped when spawning, and the fertilized roe are kept at the gene bank until they become *augerogn*, eyed roe. The *augerogn* are transported to the hatchery by car in white boxes made of polystyrene and filled with ice. They are disinfected upon arrival and placed in the hatching-room with the *Vossorogn*, but put in different incubator trays. Where all the gene bank roe had previously come from Eidfjord alone, the gene bank in Sør-Trøndelag called Haukvik had been given *Vossolaks* material from Eidfjord and produced *augerogn* of *Vossolaks* for the first time in 2011. Although the two categories normally were grouped together, a distinction was made because the caretakers did not think that the *Haukvikrogn* was as good as the *Eidfjordrogn*.
I placed myself in front of the outdrawn tray, and saw many white roe amongst the sea of orange. I decided to watch Erik for a while and see how he did it. He had already started with his tray, and was sucking on the hose in the one end, and moving it back and forth in the tray like a vacuum cleaner. Once in a while, he took out the hose from his mouth and spit out water and roe from his mouth and into the bucket where he placed the dead roe. I looked back at my tray, at the little suns and at the unwashed and stained hose, and decided to try the tweezers first. Erik had told me to be extra careful, and not touch the roe lying next to the dead ones, because the roe were fragile at this stage, and was easily killed. I calmly and carefully took the tweezers and led it into the tray and closed it around a white roe. I lifted it up, and several orange roe had stuck to the membrane of fungus. I could see Erik using his fingers to push them away, so I placed my other hand in the tray and pushed them away very carefully. I dropped the dead roe in the bucket standing on the floor.

Every roe that was picked out had to be counted and noted, something that was possibly quite hard to do, when the numbers closed in on 500 in one tray. The numbers of dead roe were usually much lower than that, but the Haukvikrogn had very high death rates compared to the others. The reason why the dead roe were counted and written down on separate sheets, was that the categories were divided into many groups. All the roe in each separate tray belonged to one group, and each group had to be kept separate from the other groups. The groups were divided after the date they arrived at the hatchery, the Eidfjordrogn for example, had the subcategory A,B,C,D,E,F and G, all of which had to be kept separated until they were transferred to Evanger. The Vossorogn were divided after their parents: each parent had an identification number and the mother and fathers number were written on a post-it on each tray. The Vossorogn subcategories did not have any effect after the roe had hatched and all the roe gathered in the fish tanks, but the genbankrogn kept their respective groups until they were towed to the ocean as smolt.

I had picked out all the roe from my first tray, and asked Erik what to do. He told me to write down the number of dead roe I had picked, and pointed me towards a red binder that was lying on the only table in the room. I walked over and opened the
binder. Inside were many sheets, one for each tray. I looked back at the tray I had emptied, and it was named G4. I turned over the pages until I found the sheet called G4. Numbers and dates were scribbled down and on the next blank line, I wrote 16\textsuperscript{th} of February 2011, 48 dead roe picked.

**Fargebad**

The first tagging practice is called ‘fargebad’, colour bath. This tagging is done to all cultivated *Vossolaks*, no matter where they were fertilized. This creates a means of identifying the cultivated *Vossolaks* from the small amount of non-cultivated *Vossolaks* that might be still reproducing in the river.

Erik decided that we were finished with the ‘daudrognplukking’ for the day, and we changed our clothes and walked up to the lunchroom. Erik had been upstairs to put on the coffeemaker, so there was a fresh pot of coffee waiting for us. As we were sitting in the lunchroom, he in the chair, and I in the sofa, I mentioned that it seemed like the roe had different colours. The ones he had picked had seemed darker than the others. He nodded as he took a sip of his coffee. “That’s right. It’s because they arrived later than the others, so they have been coloured most recently.” I thought about what he just said, but come to the conclusion that I did not understand. “Coloured?” I asked. He laughed a little when he remembered that I did not know anything about anything. He lowered his cup and explained; “it’s a tagging procedure. It’s a simple and cheap way of tagging, so we do it to all the roe we have here. It’s called ‘fargebad’ (colour-bath) and we leave the roe in coloured water for seven hours. This way they get a red ring in their brain, and if you look at the brain through a magnifying glass, you can see the ring. So we will know that the fish is ours. That it’s a cultivation fish.” “What kind of dye is it?” I asked. Erik thought for a moment. “I don’t know. I never asked.”

Erik later showed me the bottle of dye that they used, and written on the bottle were name Alizarin. According to the Norwegian Veterinary Institute, “Alizarin complecone (ALC) (Anthraquinone, 1,2-dihydroxy, C_{14}H_{8}O_{4}, CAS 72-48-0, MW 240.22) occurs naturally in “madder root” (eng) (Rubiaceae, Rubia tinctorum L) and belongs in the group anionic dye and are considered moderately water-soluble (...
From the end of the 1800s, ACL was synthetically obtained and are today used as dye, as well as starting material for other dyes in the textile industry” (Moen, Holthe and Hokseggen 2011:8). The Alizarin turns the water into a dark burgundy coloured fluid, and when the roe lie in the mixture for seven hours, the Alizarin binds to calcium-rich structures leaving a mark in the otholith. The otholiths are hard structures that resemble human teeth. There are three pairs of otoliths in the fishes’ ear, and the alizarin brands the otholiths with a red circle that can be visible in the fishes’ brain for at least seven years (Moen, Holthe and Hokseggen 2011; Norwegian Veterinary Institute 2005:4.6.5)

About a month later, the veterinarian was coming for an inspection at the hatchery, and Erik had to explain to Bodil how to check the ‘fargebad’ while he was showing the veterinarian around, because the ‘fargebad’ could kill the roe if you did not pay attention. Bodil was a bit anxious since she had never done it before, but Erik was confident that she would manage. “There are two things you got to have control over in addition to the temperature; the oxygen and the pH-levels.” The three of us were standing in the hatching-room, and Erik was picking up the different measuring units as he explained. “The oxygen-level should be around 100, but everything over 50-60 is acceptable. If it is a little low, you can lift the trays so that the water circulates a bit. The pH-level should be between 7.0 and 7.4. Preferably 7.2.” Bodil frowned and asked “but what do I do if it’s not right?” Erik responded, “you mix in a buffer”. He walked toward the cabinet and took out a small plastic bottle with a yellow cork. It contained a white powder with a sugary consistency. ‘Buffer’ was written on the bottle in thick, black ink. Erik explained, “you mix some of this in the fargebad.” He brought out a second bottle and pretended to dip it in the fargebad. “I take a little bit of water and a little bit of buffer, shake it well, and pour it back in.” Bodil did not seem reassured. “How much buffer?” she asked. “Just a pinch (knivsodd). Just enough.” Erik said. She started to laugh and shook her head as she turned to me before she said “Just enough? I can’t do that. You got to have experience with this stuff to know that. I don’t. Can I kill them?” Erik shrugged his shoulders and stuttered a bit. “I’ve done this bunch of times. And they live perfectly fine, don’t they?” “But can I kill them? Is it possible?” “Well. Yes.” She nodded her head up and down and brought her hand to her face. “That’s all I wanted to know.”
To make it a bit more complicated, some of the roe are branded twice. This is the *genbankrogn* and they are branded twice. All the *genbankrogn* are branded at the gene banks before they are transported to the hatchery, but they still undergo the branding procedure when they have arrived. The salmon originating from the genebanks therefore have two ‘*rings in their brains’*. This way, all interest they may have in a particular fish caught in the river, can be traced back to the exact place it was conceived. Although the tag is ‘*simple and cheap’*, the fish has to die and it’s brain sent to a laboratory for it to ever have a function. To read the tag, the otolith has to be removed from the fishes’ ear, mounted and polished (Norwegian Veterinary Institute 2005:4.6.5) Since the *Vossolaks* is protected, so it is in fact illegal to kill a *Vossolaks* without a reason related to the cultivation or the research project, it is therefore only rarely of any use.

Still, the ‘red ring’ did save hundreds of fish from being killed while I was in Voss. To make sure that all the cultivation fish have ‘*proper Vossolaks’ DNA’*, tests are conducted on each salmon used for reproduction, and one of these tests suddenly revealed a possible hybrid parent in one tray of roe. ‘*The father might be a hybrid, so we have to wait and see what the next test say,*’ Erik told me when we were standing in the hatchery-room looking down into the tray of roe. ‘*What will happen to them if they are hybrids?*’ I asked. ‘*Then we’ll pour them into the sewer,*’ he replied. Since the hatchery is operating on a solo pure-DNA basis, these roe could not be allowed to hatch. The hundreds of eggs in the tray marked with that fish’s number were therefore possibly at mortal peril. But the possible hybrid’s brain was dissected and revealed a colour-tag. The ring was taken into account as the decisive factor and overrode the ambiguous DNA-result, and the roe could keep on living and still become wild *Vossolaks*.

**The alevin and the fry**

By mid-May, all of the roe in the incubators had hatched, become alevins, and disappeared below the mats in the incubator trays. It was time to move them from the
hatching-room to the old room, but a lot of preparations had to be made prior to the moving.

“The most important thing we do is to make sure that the fish aren’t completely stressed out,” Erik told me as we were doing the last preparation. “So that’s why we are going to put all of these on top of the tanks.” We were in the old room, and he pointed towards the brown wood boards that had been leaning against the wall ever since I got there. “The fish can hide underneath them, as it casts a shadow on half of the tank. So they feel secure underneath it.” The boards were heavy and we had to climb in and out of the tanks several times to put them in place. Each board had to fit with the board on the neighbouring tank so that they would not fall into the tank and accidentally crush the fish. They did indeed cast a shadow in the tank, and Erik tossed in three mats under them. The square mats were similar to the ones in the incubator trays, made of a rubbery material and with spikes underneath, creating a shelter for the newly hatched fish. Each tank was filled with water, and Erik checked the current to make sure that it was not too strong. Since the fish were tiny and fragile at this point, the current was almost invisible to the naked eye. “Are we going to connect the feeders to the outlet?” I asked Erik, holding the power connector in my hand. “Nah,” he shook his head, “they won’t be interested in eating anything today”. The alevins still had their yolk sac attached, and were getting all the nutrition they needed from them.

The week prior to the moving, every fish tank, every feeder and every piece of equipment had to be cleaned. The floors in the old room had to be scrubbed and washed, and we had to climb into every tank to scrub it with a soaped sponge. The cleaning of the tanks had been a smelly procedure, and as Knut had opened the sieve in the first of the tanks, I had jumped backwards and shoved my face in my scarf while howling, as the smell from the pile of dirt and old excrements had hit me without warning. Knut just laughed and continued cleaning the tank.

I was standing by the tank as Erik fetched the first tray of fish. He carried it by hand and gently moved it up side down and the fish fell into the water. It was an amazing sight. The dark coloured fish were about 1cm long and 3mm wide, and the 15-16 000
fish swam in all directions. The swarm of fish reminded me of a beehive, and we both stood watching them, as they appeared to be in a complete panic. They found the mats within a minute, and after a short while, all the fish had found a safe haven underneath the mats. Thousands of tiny tails wagging back and forth stuck out from the mats, making them look like toupees, with the hair blowing in the wind. Erik chuckled “furry”, and returned to the hatching-room to fetch the next tray.

Meanwhile, I stood watching the ones in the tank. Around the bottom lay dirt and other small objects from the tray, which had been brought in with the water from the river. But also gathering on the sieve was a bunch of fish, all various shades of grey. Helene had arrived and came over to see what I was looking at. She nodded, “yes. There’s going to be a lot of daudfiskplukking in the near future.” She showed me a sheet she was holding. “We have to pick every morning, and write down the number of dead, so we can keep track of how many fish we have.” Erik had come back and dropped another tray in one of the other tanks. “You can start picking, Line” he said and gave me a scooper. The net on the scooper was stretched tight around a square frame, so it looked more like a spade with holes rather than a regular scooper. Erik came back with a black bucket filled with hot, steaming water and placed it on the floor next to me. He took the scooper and dipped it into the tank. With a swift motion he had scooped it underneath the dead fish and calmly brought it to the surface. “We have to count every fish and write it down,” he said. He counted 29 fish. “There’s a lot in the beginning. Some don’t survive the shock of being moved, and others were already dead. And some are just kroplingere, so they die.” All the fish were put down into the bucket with hot water. “This way, they die instantly if they aren’t entirely dead.”

Kroplinger (cripples), are fish that have been born with physical deformity. The most common deformity was fish with a curved body shape. Somewhere along the body, the body twisted and turned the wrong way. Some of them could swim, but some swam in circles and was clearly limited by their deformity. Another deformity was the Siamese twins, with either two heads and one tail, or one head and two tails. They could usually swim just fine, but they were killed anyway. The caretakers explained that they would not have survived in the river, because their disability would prevent them from finding food and make them an easy target for predators. They also said
that the other fish would notice that there was something wrong with them, and pick
on them. The fish that died by themselves turned grey, then a lighter grey after a short
period of time and then turned white in the end. They were caught in the current and
gathered on or around the sieve, so they were fairly easy to spot. When finished with
the picking, the black bucket of hot water and dead fish were poured into the drain
running along the room.

The alevins become fry when the yolk sac disappears. The alevins remained
underneath the mats for a long time, before some of them finally dared to come out.
After a while, all the tiny fish, starting at about 0.5 cm long, started swimming in
formation with the current. There morning routine was much more time consuming
than average during the first month, as the *daudfiskplukking* were taking a lot of time.
The fry kept outgrowing the fish tanks, so new tanks had to be filled with water and
the tanks ‘divided’, meaning that half of the fish in the tanks were to be moved into a
new tank manually. During the first few weeks, tanks had to be divided almost
everyday, and all the movements had to be recorded accurately so as to not loose
track of the different categories.

**Fettfinnekling**

The second kind of tagging is called ‘*fettfinnekling*’, adipose fin clipping, where
the entire adipose fin is cut off with a nail scissor. If the cutting is done properly, the
fin will never grow back, and the lacking fin is highly visible on the grown salmon
even for an untrained eye. This way, the fish has a physical mark connecting it to a
hatchery upbringing, and it will be easier to identify the cultivated salmon amongst
other salmon when they return to the river to spawn in a few years time. The fin
clipping takes place twice a year. Every year, the Hatchery host a two week session of
fin-clipping, where a group of kids aged thirteen to nineteen, are paid to cut over 150
000 fry. These are the fry that are later moved to Evanger, and become *Evangerfisk*.
The fry that stay at the hatchery are called *klekkerifisk*, and are not fin-cut when fry,
but as parr the following spring. In 2011, a group of about thirty kids were cutting the
fry, but the empirical accounts below are from March the same year, when I was part
of the cutting the adipose fin of the parr.
Erik, Helene, Knut and I were standing in the new room in one of the first weeks of March. I was jumping up and down to loosen up my body, which felt extremely stiff after the monotonous work the previous two days. I could feel my joints ache with just the thought of another two weeks of doing the same thing. We placed the necessary equipment on the table in front of us; each needing two white basins, a colander, a bucket of water and a small scissor normally used for clipping nails. A homemade wooden length measurer was placed on top of another white basin filled with water, and a small blue machine was placed on the end of the table. I had put on an extra pair of white cotton gloves underneath the see-through plastic gloves today, hoping that they would at least keep a tiny bit warmer. Having your hands in water close to freezing point for eight hours a day is not particularly comfortable. Although Erik had finally turned on the floor heating, I had still put on an extra pair of thick woollen socks and closely buttoned the thick coverall around my three pairs of sweaters and scarf. The cold wind was howling and the snow was falling heavily outside the little window, as Erik turned on the radio and another day of tagging could begin.

The first large-scale tagging of salmon was conducted on sockeye salmon in Canada in 1931, when over 350 000 smolt got one of their ventral fins cut off (Quinn 2005:86). Adipose fin clipping has been practiced at the Hatchery since the 1990s, to keep track of the released fish. As we shall see in chapter five, all fin cut fish are believed to be cultivation fish and are treated accordingly. As explained in the introduction, one of the threats against the Vossolaks is escaped ‘farmed salmon’, and the farming industry is working on measures to prevent fish from escaping their farms. On a salmon seminar I attended in May, there was a proposal suggesting that
the farming companies could start fin-cutting their fish, so that they would be
recognisable in the river, no matter how young they were when they escaped. This
would affect the cultivated fish, but the Directorate of Nature Management argued
that since the amount of adipose fin clipped ‘wild fish’ are so much lower than the
amount of ‘farmed fish’, adipose fin clipping ‘farmed salmon’ would be the best
solution. The others would have to find a new way to tag their fish (Skår et.al
2011:35).

The salmon jumped around frantically in the barrel for a minute, before their
movement grew slower. After a few minutes, they were lying motionlessly on the
bottom. Helene, Knut and I each got a batch of the anesthetized fish in our basins,
and we all picked up our nail scissor. I had gotten the hang of it now, but it had taken
me a while to get used to it. The others had clearly done this several times before, and
their experienced hands had worked the fish without concern or problems. After a
while I had learned that it was best to place the fish in my right hand, and the scissor
in my left, with me being left-handed and all. If I reached for the fish with my thumb
and middle finger twisted, I could turn the fish around in only one movement, the
head of the fish resting on my palm, and one of the side fins caught between my little
and ring finger. This prevented the fish from twitching, and kept my thumb and index
finger free to keep the tail in place. My left hand would use the scissor to cut of the
fin. The scissor had to be pointed upwards, or else the blade would cut into the fish’s
flesh and he or she would start bleeding. The water quickly made the scissors rusty,
and it was difficult to cut of the entire fin in one movement without tearing off the
skin.

Forsøksfisken
During those weeks in March when we were cutting the adipose fin of the parr, we
also performed another kind of tagging, called snutemerking, nose tagging. We cut
and tagged all the klekkerifisk, but while all the evangerfisk were fin-cut by the kids,
only one group are nose tagged the following year by the biologists. As we shall see
below, the nose tagging creates groups of fish that become “forsøksfisk”,
experimental fish.
A new week of tagging had just begun, and Helene, Knut and I were standing in front of our batch of fish, measuring their length and cutting their adipose fin. The radio was playing the same pop music as they did every day, and the monotonous beep from Eriks tagging had not changed. In front of him stood a blue, square and portable machine with a few buttons on top. All of the fish the rest of us cut, we placed in a separate colander and handed them to Erik. He took one fin-clipped fish at the time and placed it headfirst into a small ‘cap’ on one side of the machine. As he pushed the fish slightly into the cap, he used his left hand to press one of the buttons on top. The machine let out a small ‘beep’, and the fish twitched slightly, even if it was properly anesthetised. “You can see the entrance wound, if you look at it in the proper light,” he said when he noticed me watching him. I dropped the fish in my hand back into the bucket, and walked over to the window with him. He held the fish close to the window and turned it around so that the light struck the fish from different angles. Suddenly I saw a tiny dot in the middle of the fish’s nose. The machine had shot an approximately 2mm long metal wire into the fish’s head.

The metallic wire is called a Coded Wire Tag (CWT), a tagging practice developed in the United States, where approximately 50 million Pacific salmon are tagged for management purposes each year (Norwegian Veterinary Institute 2005:4.6.4). The Hatchery has nose tagged the Vossolaks since 1994. The tag is a magnetised piece of stainless steel that is shot into the salmon’s nasal cartilage. The wire is 1.1 x 0.25 mm

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12 Picture source: http://www.bt.no/migration_catalog/article2165382.ece/BINARY/w380/630345+%5BVossolaks+i+trønderasyl+Villa%284%29%5D.jpg
long and is inscribed with a number that can be read under a microscope. There are several kinds of tags used in scientific research on salmon, but most of them have been fastened on the outside of the fish’s body, for example around the dorsal fin. This has had serious physical implication for the fish, and the invention of the CWT made it easier to experiment with salmon, as the fish apparently does not notice the tag. But the CWT do have one problem; if not inserted properly, it can wander around inside the body and either exit through the skin, or kill it (Quinn 2005).

“But, how can the tag be read?” I asked Erik in the office when he took out the packet of wires. “Each tag has a number on it. It is very important that we take care of the first tag and wouldn’t insert it into a fish. That’s why we needed the oranges,” he said. “ahaa,” I said, chuckling to myself. Earlier that morning, Knut had asked about the oranges, and everybody had gotten really stressed out. I did not understand why it was so important that we had oranges when we were going to spend the entire day tagging fish. I had just come to the conclusion that they all desperately wanted oranges for lunch. This made much more sense.” We went back to the new-room where we were going to do the tagging, and Erik shot a wire into a small piece of orange peel. “We take care of the first piece of wire, and the last. This way, all the numbers in-between the numbers that or on those pieces belong to one group. We just have to make sure that we don’t mix the group,” he said as he went out of the room. Helene had just arrived, and came into the room. I asked again, “but how do you read them?” She put on her plastic gloves before she answered. “We can’t read them when the fish is alive, because we have to physically take it out and read the number in a microscope. So all the fish with ‘snutemerke’ have to die. It’s a shame, but it has to be done. So what can you do.”

The experimental fish are part of the research about the reasons why the Vossolaks disappeared, and the experimental fish are used in order to find out if the sea lice have anything to do with the disappearance, and if the dropping point have anything to do with it. The experimental fish at the hatchery were sorted into four groups. Two of the groups were fed with SLICE, a feed with medicine for sea lice, three weeks before the salmon were towed to the ocean. The other two groups received regular food. When the groups were towed to the ocean, they were dropped on two different locations;
one group fed with SLICE, and one group without on each location. This is done every year, and in the future when the salmon return, the numbers may give them answers they need.

The smolt

The fry turn parr by the end of summer, and stay so until they turn smolt in May. Because of the time span of my fieldwork, I did not participate in the rearing of the parr. But after the adipose fin clipped fry has been transported to Evanger, they stay in their tanks and pens until the next spring, and they are not moved nor tagged in this period. The adipose fin cutting and the CWT-tagging described above were performed on salmon that had spent ten months in the tanks at the hatchery. As May approached, the parr were changing.

The fish grew rapidly and when winter turned into spring, they became restless and jumping in their pen. Often we would find fish on the floor around the pens, so we had to check constantly so that we could throw them back into the pen before they died. Helene and I were standing in the new-room. She had scooped up twelve fish from the pen, and placed them in a bucket of water in front of us. She had placed a length measuring unit, a scale, a tweezers and a sample tray on the table. “We have to continuously check the smoltification process,” she said while she gave me a pencil and a sheet. “Why?” “So we know how far along they are. So we don’t release them into saltwater before they are can live in it”. She took the first salmon from the bucket and snapped the fish’s head with her fingers. The fish jerked and she held it over the sink and snapped it again. It stopped twitching and became limp in her hand. She measured its weight and length and told me to write it down on the sheet. Next she picked it up and held it approximately 10cm from her face and looked at it while squinting slightly. “Hmm,” she said and placed it down on the table. “Note that it’s fin-cut and the back fin shows no wear”. I noted what she said as she took the tweezers and positioned the head between her fingers, exposing its gills. “You sample the middle gill,” she said and fastened the middle of the three red gills with her tweezers and snatched it out. She put the fish in a colander she had placed in the sink, and carefully placed the gill in a small tube on the sample tray.
The smoltification process is monitored throughout the spring, and the gills are sent to a laboratory to check if the ATPase-enzyme that reveal if the fish is prepared for a life in salt water. By the time they were ready for releasing in May, they had grown rapidly, and all of the smolt were now approximately 20 cm long, clearly looking like salmon. The releasing will be described in the next chapter, but before they could be released, one more tagging practice was performed on a fifteen chosen smolt.

The acoustic smolt

While we were working at Evanger one day in May, three biologists from Bergen came to the plant to conduct an experiment with some of the salmon. They had spent a lot of time picking out fifteen fish from one of the pens, continuously discussing the size and shape of the fish, and if they were fitted for the experiment of not. I wanted to find out what they were doing with the salmon, so as the others left Evanger for work elsewhere, I stayed behind to watch the scientists work.

The three men were standing over the fifteen fish discussing their size. The fish they had collected were some of the biggest smolt I had ever seen here, probably twenty centimetres long, but the biologists seemed to think that they were a bit small for whatever it was they wanted to do with them. They decided that they did not have any choice, as the next pen contained smaller fish than these. They would have to do. One of them scooped up the first fish and we all went into the barrack, were the fish was placed into a bucket filled with anaesthesia. After a few silent minutes, the fish had calmed down and sunk to the bottom of the bucket. One of the men scooped it up and placed it in front of the man sitting at the table, who had put on plastic gloves and a mask covering his nose and mouth. He cut the fish’s abdomen with a scalpel, and placed a black object into the belly of the fish. With the fish being about 20 cm long, and the object being approximately 2,5 cm long with a diameter of nearly 1 cm, this looked like a big procedure for the patient. The biologist closed the belly and sewed it tight with a needle and thread connected to two small scissor-like tools, which he operated easily with both his hands. When the wound was closed, the fish was thrown into a bucket of fresh water and we all waited to see if it would wake up or not. After a few minutes it did and they conducted the procedure on all fifteen fish. The
awakened fish were swimming slightly skewed at first, but after a while they all seemed fine. I stood watching them recover from the surgery, as one of the biologists came over to me and said; “It seems brutal. I know it does. The fish are small, and the objects large. But we have all taken an animal experiment course, and the government has approved this experiment. So it’s perfectly legal. It just looks brutal”

The objects were called acoustic tags, and the tags were connected to receivers called “lyttebøyer”, listening buoys, that were located several places along the fjord all the way out to the ocean. When the fish would swim past one of these buoys, the tag would give out a signal, and basically be telling the scientists where and when they were there. We shall return to the experiment in chapter six.

The unfit

Although the criteria for becoming a Vossolaks is that the fish has original Vossolaks DNA, some selective processes were practiced during the fin-cutting, with two consequences for the fish in question. First, some of the fish did not meet the expected criteria for becoming experimental salmon and were not CWT-tagged. Second, some of the fish did not meet the criteria of even becoming Vossolaks at all.

I could see Knut turning some of the fish around at regular intervals, pressing their bellies with his fingers. In some cases these fish were put in Erik’s bowl of soon-to-be CTW-tagged fish, but once in a while, these fish were put into the basin with the smallest fish, even though they clearly were above 11,5 cm. “Why did you put that there? Isn’t it big enough?” I asked the next time he did it. “Oh, it’s a ‘gyteparr’” he responded and continued his work. Erik could obviously see the huge question mark on my face and said; “that’s parr that has matured too early. They’re not supposed to do that, but there are always some of them. We don’t think they will turn smolt this year because of it though, so we don’t want to use them in the experiment.” This got me wondering where the small ones would go if not at sea, and asked about it. Helene responded; “we group them together, and release them into the river in the summer. They would probably be killed in the farming industry, because they would not want to spend any more money on them. But we don’t have to think like that, and we don’t
want to create a ‘sorteringssamfunn’ (sorting-society), so we give them a chance to turn into smolt when they are ready."

Helens reference to the sorteringssamfunn, the ‘sorting society’, is a Norwegian discursive phenomenon with negative connotations, concerning reproductive technology and the possible systematic selection of unwanted humans these technologies may result in. The notion is often connected with early ultrasound and the possible sorting away of foetus with genetic traits that shows that the foetus have Downs syndrom. According to the Norwegian anthropologist Melhuus, the notion “points to some understandings and contradictions in the comprehension of the Norwegian society” (Melhuus 2012:34). The meaning of Helene’s statement could therefore not have been clearer; the cultivation of fish farming is less morally ambiguous than fish farming.

The ones who could not become forsøksfisk, but still become Vossolaks were the ones who did not follow a ‘standard’ development cycle. The gyteparr is called precocious parr in English, and these are fish that become sexually mature when they are parr. It was considered normal for a certain number of fish to be gyteparr, because there are also gyteparr in the river. In the river, they try to compete with the adult males and mate with the adult females (Youngston and Hay 1996:23). They were therefore not killed, but they were not allowed to participate in the experiments. While the gyteparr were early bloomers, some of the fish were late bloomers, and these too could not become experimental fish. The late bloomers were the parr that were growing too slowly, and were under 11,5 cm long by the time of the cutting. They were not expected to be able to go through the smoltification process in time for the releasing, and if they were towed to the ocean as the others, they would die. To measure the length of the fish, we were to use a wooden length measurer. But the measurer was seldom used by any other than myself. The employees could easily measure the length of the salmon by simply using their own hands and fingers as reference point, and only double-checking some once in a while. I on the other hand, had to check every fish, until one day, without noticing it, I could tell exactly how long the fish were with just a touch.
The small and the sexually mature fish were kept in a separate tank until they were released into the river in summer, and these are the ‘ugly’ fish that the state secretary was releasing as described in the prologue of this thesis. Even though they were ‘ugly’, they could become Vossolaks. The fish that could not even become Vossolaks, were the cripples. As described under above, some of the alevins and the frys are called cripples because of their congenital physical deformity. Most of these cripples are picked out and killed during the first month of their lives, but the amount of fish in the tanks made it impossible to spot and kill all of them. And although they were not believed to be able to survive for long, some did.

We had been tagging fish for a couple of days when I saw an odd shaped fish in my bucket. I picked it up and looked at it more closely. The fish was lying motionlessly in my hand, and on the head was a huge lump making the head at least twice as big as the others. I have never seen anything like it at the Hatchery, but I remember a newspaper article I had read years ago, about a fish that had been caught in a river in northern Norway. The fish had had a similar lump on its head, and the newspaper article had named it ‘monster fish’. According to the article, the fish had been an escaped farmed salmon, and apparently was evidence that fish farming was harmful to the fish. I stared at it for a minute, until Knut took it from my hand and threw it headfirst into the floor. The lumpy fish, about 5 cm long, twitched slightly before it fell silent and laid on the ground along with a handful of cut off fins while we turned around and continued our work.

Several cripples had survived the year in the fish tanks, and the normal euthanasia procedure was to throw it into the ground as hard as possible. The noise of the crushed scull resonated throughout the room, and it made me uncomfortable, even though I knew the fish was anaesthetised and that the hard concrete floor probably killed it instantly. I did not want the others to think that I was hypersensitive or a coward, so whenever I got a cripple in my bucket, I calmly scooped it over in Knut’s bucket without him noticing. One day when Helene and I were working alone, she told me that she did not care for the euthanasia method either, so she filled a small bucket with anaesthesia and just left them in there so that they would die from an overdose of anaesthesia instead. I took the opportunity to ask her again why they
killed the cripples even after they had shown that they could survive for a year, and she responded: “because they wouldn’t have survived in the river. Here, they don’t have to fight for the food, so they can survive, even though they can’t function properly.”

‘Evangerfisken’ and ‘klekkerifisken’

In chapter three I explained how the smolt at the hatchery and the smolt at Evanger were the same kind of fish. They are all smolt deriving form the genbankrogn, so they all arrived at the hatchery as augerogn from the gene banks. But the discursive distinction between the klekkerifisk and the Evangerfisk was explicitly stated many times during my fieldwork, and I kept wondering what the difference between them was. At first I imagined it to have something to do with the fact that the Vossolaug finance the Evangerfisk, since I was told that the fish themselves were exactly the same. One time during my fieldwork, the hatchery received a request from a science institute if they could get twenty fish for an experiment, and they asked specifically if they could get Evangerfisk. I did not react to it at the time, because it took me a while to decipher the origin of the different groups of fish, but the difference in interest toward the Evangerfish continued from many holds. The subject was brought up when Helene mentioned something in passing about the difference between the two fish to a visitor at the Evanger plant, a biologist who had worked with Helene before.

Helene mentioned something about the Evangerfisk that I could not hear, but the visitor asked her if there were any difference between this fish and the fish at the hatchery. She responded, “Yes, there’s a theory that this fish (the Evangerfisk) have received a more natural development and behaviour while being here”. The visitor, a biologist herself, nodded and asked “Because of the natural lighting and temperature and such?” Helene looked out onto the pens and thought for a moment before she answered, “Yes, the smoltification is probably more natural because of that. And they smoltificate sooner here than at the hatchery, so I guess it’s true. But still, research has shown us that the smoltification window is bigger than we have believed, and include almost the entire month of May. So different development is actually completely normal. But still, they say that their behaviour is more normal because
they have more space.” Erik had heard what we were talking about and came over.
“But the fish up at the hatchery are also elusive. When we get close to the fish tank,
they change direction and try to hide. So they too have kept their instincts,” he said,
while all the others nodded. Helene continued, “But here, they might have come in
close contact with predator fish, which is likely circling around here all the time,
making them behave differently than the hatchery fish. But still, the predators never
reach them, so they might learn that they are nothing to fear, and become an easy
target.”

The Evangerfisk and the klekkerifisk are the same kind of fish, and they are equally
colour-tagged twice and lack the adipose fin. The fish themselves are therefore more
or less identical. But the conversation above shows that even though DNA and
inheritance are a major factor in the creation of the Vossolaks, the environmental
impact does have a say in what counts as ‘natural’ or not. Scarce explain how the
hatchery salmon are thought of as inferior to the ‘wild’ salmon partly because they
have not learned how to survive in the wild (Scarce 2000:103). If ‘natural’, as Helene
put it, in this case can be said to be ‘more wild’, which it is plausible to suggest, the
Evangerfisk is believed by many to be wilder than the klekkerifisk. But they all live in
enclosed space, in the same kind of water. But the location is different. While the
klekkerifisk is staying on land, the Evangerfisk are staying directly in the river. Can
this be said to have an effect on the concept of ‘wild’?

Concluding remarks

Although the caretakers try to prevent selection, an invasive intervention and
something that is laden with negative connotations in Norway, there are some
selective practices. The tagging of the Vossolaks is done in order to answer questions
about the situation in the river and oceans that the biologists do not know. They ask
questions like; does the cultivation work? Exactly where in the river system is the
problem? Through the tagging, the salmon take these questions with them as they are
released into the river.
5 Into the wild

Whereas the salmon in the previous chapters have been located in the Hatchery’s controlled environment, this chapter will describe the events in which the salmon are moved to where they belong: the wild. The transfer from the Hatchery into the river and ocean are described as ‘releasing’ the fish. During the spring of 2011, we released approximately 600,000 Vossolaks into the Vosso river system and the ocean, through three sets of practices called rognplanting, settefisk and smoltslep, all of which will be examined below.

Rognplanting

*Rognplanting*, the planting of roe, is a practice where the salmon roe are dug directly into the substrate in the river after they have become *augerogn*.

The rivers of Voss were not particularly welcoming in April, with the ice-cold water originating from the melting snow in the mountains and still drifting blocks of ice left over from the winter, but the planting made going for a dip necessary. The planting had been delayed for too long already, and some of the roe had started to hatch. Fortunately, the Hatchery was prepared with dry suits and special gloves preventing us from feeling the agonizing cold. The water level was expected to fall significantly during the summer, so the roe could not be planted too close to the riverside. If they were, the roe would end up on shore when the water level fell, making our efforts pointless as the roe would die. The others were worried that the substrate best suited would be too far out in the river and unavailable to us. But this was not the first year where the conditions had been rough, the others told me. One year, they had to tie a rope around their bodies, and someone had to stand ashore holding on to the rope, dragging them alongside the shore so that they would not get caught downstream. When we arrived at the first planting site though, their experienced eyes saw no reason for being that careful that day, and even though the fierce river looked intimidating to me, they walked into it without any form of security. I stayed behind on
the river shore, tying red ‘flags’ to the boxes of roe so that they would be visible through the water and easier to find when it was time to collect them after the salmon had hatched. I sat on a rock with a box of roe in my hands. The roe were very fragile at this stage of development, and any change of environment could cause severe harm. Amongst the orange and red\(^{13}\) roe, a few white and foggy ones had emerged. I tried to open up the box to pick them out, but it was shut too tight and I did not want to hurt the other roe. Hopefully, the dead roe would float out before they infected the others. Erik and Helene were standing a few metres away from me in the river, and only their backs and top of their snorkels were visible above the water.

None of the *genbankrogn* is planted, only the *Vossorogn*\(^{14}\). Approximately 2 dl roe are filled in white boxes as depicted above, each containing approximately 1120 salmon. The boxes create shelters for the roe inside, but allow them to escape when they are hatched. The red plastic strips are called ‘flags’, making them easier to find in autumn. The eggs cannot survive out of water for long, and are transported from the hatchery to the location of the day in polystyrene boxes filled with ice cubes. The boxes are planted a few metres a part, only a couple of boxes at the same location, because too many salmon in one place cause fierce competition, and less salmon will

\[^{13}\] They are all the same species, but the difference in colour derives from a practice called colour bath, *fargebad*, see chapter four.

\[^{14}\] *Vossorogn* are roe deriving from the stamfiske, explained in chapter three.
live through early adolescence. The Vosso river system consists of many tributaries, and planting the roe throughout the entire system takes time.

*The others returned from the river, and we walked back up to the parked car. I was the chauffeur of the day since I was the only one in waders and not a dry suit, and we climbed into the car and headed to the next planting location. The only dry suit available was too big for me, and I decided it was better to stay on land and observe. As Erik walked off with a bucket of roe in the opposite direction, I remained on land, keeping the rest of the roe safe. Helene climbed into the water, and I handed her the roe, one box at the time. The current did not seem strong, but she struggled as she walked towards me and I stepped into the river to hand her the box. “Just make sure that you don’t go in above your knees,” Helene said, “because then you can lose control.” I stood watching Helene as she planted the roe. Only her back and snorkel were visible above the water, and I could see her move from side to side as she dug into the substrate with her shovel.*

![Picture 12 Rognplanting](image)

In their article on recreational angling in Yorkshire, England, Bear and Eden explain how the anglers “attempt to mimic or tune in to” certain characteristics of the particular fish they are trying to catch (Bear and Eden 2011:338). One of their informants explains how he observes the fish he is trying to catch for a long time, learning its behaviour and eating patterns. “Having observed the fish’s habits, Mick
then engages with these, feeding it for an extended period, simultaneously
accustoming the barbell to his habits, before including a hook with the bait and
catching the fish’’ (Bear and Eden 2011:342). The anglers learn how the fish behaves
in order to be able to mimic its movements and catch it easier. As Helene’s comment
below shows, so do caretakers.

I had been absent from the hatchery one weekend, attending a seminar in Oslo, and
had unfortunately missed a planting session. They rarely did any Hatchery work
during the weekends, but because of the flooding they had to seize the opportunity
when the water level suddenly allowed it. Helene and I were both wearing waders and
standing in the middle of the calm river, enjoying the longed-for spring sun warming
our faces as she told me about it. “We arranged a dugnad, and managed to recruit
five biologists from Bergen. The weather was so nice, just like today, and the
cloudless sky and the lack of wind made the water calm and transparent, providing
perfect conditions for planting.” I looked down at the water to see what she is talking
about, and kicked the rocks on the riverbed with my highly visible feet. The rocks
floated effortlessly around my shoes. I looked back at her, while she said with a smile
on her face; “we didn’t even have to use shovels to dig the spawning pits, we could
just wave our hands back and forth like this, exactly like she uses her tail when she’s
digging”. She then showed me how by gesturing her hands in a waving motion
alongside the riverbed, hitting the rocks like her hand was the tail of the spawning
salmon.

Like the anglers of Yorkshire, Helene and the biologists mimic the bodily behaviour
of the spawning salmon to create an authentic spawning pit. This is the only time
during the lives of the Vossolaks that the caretakers directly enter the water alongside
the salmon, but as we shall see in the next chapter, they attempt to mediate their world
through other means.

I watched Helene climb out of the water in her dry suit, and we walked back up to the
car, and drove further down the road to pick up Erik who was walking beside the
trafficked motorway in his dry suit with an empty bucket in his hand. The wind had
increased in strength and I shivered as I stepped out of the car at the next location.
The river flow was even stronger here, and after planting only a few boxes of roe, Erik decided that it was too risky to continue. “The flooding is just causing too much water,” he said as he un-zipped his dry suit and climbed ashore. “We just have to wait until the water level falls. Hopefully it will only take a few days,” he said, while Helene followed him on shore. Before we drove back to the hatchery, we decided to eat our lunch and drink the coffee we had brought with us, sitting on the field next to the ferocious river.

The roe that are not planted stay in the incubator trays in the hatching room for a few more months until they start to hatch, and the caretakers at the Hatchery are busy cleaning tanks and preparing for the alevins to be moved into the old room. During the early months of summer, the alevin turn fry, and continue to grow as they learn how to eat. In chapter four I described how the fish kept outgrowing the tanks, and the tanks had to be ‘divided’. But after a while, all the tanks were occupied, so in order to make space, the settefisk had to be released. The fish were now about 2cm long and able to eat the small sandy pellets they were given. Hopefully they would be able find food on their own in the river.

Settefisk

According to Norwegian encyclopaedia settefisk means “artificially hatched young fish fed a while before put into fresh water or sea for future growth” (Store Norske Leksikon 2012) (own translation). The term is often used in fish farming for all salmon in the freshwater phase (Magnussøn 2011:58). The settefisk at the Hatchery are also artificially hatched, but while the ‘farmed settefisk’ are transported into pens in the fjord, the Vossolaks are settefisk when they are released into the river as fry in summer.

The others had dropped me off by the side of the road, and Erik had pointed me in the right direction. “But stop when you arrive at the bridge down there. We’re not supposed to release anything after the bridge”, he said. Summer was finally here, and the warming sun felt nice after the long cold winter. By my side lay a bag of fish, a blue bucket and a colander. The bag of fish is a see-through plastic bag that is filled
with oxygen so that the fish can stay in it for a shorter period of time. I took a deep breath and picked up the fish and gear and started walking toward the river shore, where I filled the bucket with water from the river and punched a hole into the bag with my thumb. I slowly lifted up the bag and started pouring the content into the colander, which I had placed on the ground next to me. A handful of one-inch-long fish fell into the colander and I quickly picked them up and poured them into the bucket. I repeated the action until all fish were transferred from the bag to the bucket, and started walking on the slippery path that was the river shore. The bucket was heavy, making it hard to balance on the wet rocks. After a couple of metres, I put the colander into the bucket, filling it with a handful of fish, brought the fish to the river and released them into the water. The tiny fish swam in all directions, and were out of sight within seconds.

It was early July, and Erik, Helene, Knut, three volunteers and I were out releasing settefisk. We had packed the bags at the hatchery, and we were all dropped off with a bag each at different points along the river so as not to release the fish too close to each other. As described in the story above, the fish were transported from the hatchery in a bag filled with water and oxygen and transferred from the bag and into a bucket of water on location, just like the fish that the state secretary released in the
prologue. We walked with the buckets of fish alongside the river, releasing the fish into the water with the colander, a handful of fish every few metres. But Erik’s orders to stop by the bridge made me wonder, and I asked him about it in the car on our way home.

“Why was I not supposed to release anything below the bridge?” I asked after we all had met up by the car. One of the volunteers had walked through a meadow of stinging nettle, so they had decided that today’s work was done. “Well,” he said as he started the car and drove out on the road, “not all of the landowners are equally happy with our work. Especially not in this part of the river, because this part isn’t really a salmon river because of the waterworks located downstream.”

While the salmon are known for their extreme resilience and their ability to jump up high waterfalls, the dams created by the hydropower companies in the area are too high, even for the salmon. The rivers upstream are therefore used as a ‘nursery area’ for the fish, which can swim down the waterfall when they are ready to migrate to the ocean, but never be able to come back. This may cause a higher number of returning salmon, and ensure that the salmon return to the upper part of the river system, and not stop to spawn downstream. The landowners in that part of the river had apparently voted for or against the releasing in this area, and although the majority of the landowners had voted yes, some of them did not want the Hatchery to release salmon on their land. But the salmon is completely oblivious to the invisible borders between the different land areas, and neither them, nor the people, can do anything about their movements between these areas. Even though the creatures living in the river are uncontrollable, the landowners still act on their legal rights to control the movements on their land, even if it does not change the fact that the salmon will still enter their part of the river. I tried to get a hold of a map showing all the borders, but I could not get one.

A few days later I was on my own again, releasing salmon further up the river. Erik was on the other side, but out of hearing distance. Considering Erik’s comment, I could feel the pulse rising when I turn around and a man suddenly stood right behind me with a fishing pole. “What are you doing?” he asked and wrinkled his eyebrows. I
could not tell if the look was just caused by the sun or if it was scepticism behind.

“Ehhh” I replied and looked over at Erik. He had seen the man, and stood motionless on the other side, looking directly at us. I turned to the man who had not changed his position. “I’m releasing salmon,” I said. “Salmon? But there’s no salmon in this part of the river. You know that.” “Yes? But. We release it here so that they can grow up here, and then exit to the ocean. We believe that more grown salmon will return to Vosso if we do it like that.” He continued to look at me and over at Erik. “That’s my boss,” I said a bit too loud. “He knows more about it than I do.” He looked back at me and finally said, “I hear you do a really good job down there at the hatchery. I just fish trout once in a while. We have a lot of that in this part of the river.” I drew a sigh of relief and nodded. He walked down toward the river and started fishing while whistling a tune. I turned around with my bucket of fish and walked quickly in the opposite direction. I later told Erik about it, and he just laughed. “They think that the salmon will cause too much competition and hence reduce the trout population.”

“Oh,” I replied. “Will they?” He just shrugged his shoulders and said “don’t know”.

I did not ask the stranger if he was a landowner or not, but he did not seem like someone who opposed our work. And neither did any of the many landowners that participated in dugnads the Hatchery arranged. Since the releasing of the settefisk took quite a lot of time, some of the landowners released settefisk on their property. We packed bags of fish at the hatchery, and the landowners came to collect them on their way home from work. Many of them seemed to have done this many times before, and did not seem surprised by the see-through bags of fish or asked questions about the procedure.

In addition to the fry that were released as settefisk, the parr that had been sorted out during the adipose fin clipping were also released. While the state secretary released some of them, the rest were released the same way as the fry. The same thing was expected to happen with the Evangerfisk\textsuperscript{15}. Some of these fish would not grow big enough to become smolt, and they had to be sorted out so that they would not be towed to the ocean with the rest, as they would die due to their inability to live in

\textsuperscript{15} The fish staying at Evanger production plant from August to May.
saltwater. But while the klekkerifisk had been sorted out easily during the tagging, the sorting of the Evangerfisk was a bit more complicated.

“It’s going to take some time to get started, but when it’s started, we just have to wait until it is all finished” Helene said. “So, we need some provisions,” Erik said, and pulled in at the grocery store. “I’ll be back,” he said and jumped out of the van. The weather report predicted heavy rainfall and recommended everyone to stay inside if it was not absolutely necessary to go out. Erik, Helene and I were on our way to Evanger to start the sorting of the fish there. I started shivering just thinking about the long and wet day we had ahead of us. Erik bought some nuts and chocolates to help us through the day, and Helene had brewed an extra pot of tea. The weather on our way to Evanger was very foggy and the visibility was bad. But Erik knew the road by heart, and we arrived in no time. The rain poured down around us as we jumped out of the van and ran into the barrack. We decided to stay there for a few minutes, to see if the rain would clear up a bit. The coveralls, rubber boots and life jackets were going to be our protection from the rain, and the caps and scarves would keep us relatively warm. We had a cup of tea and stood looking out at the pens while we drank and waited. After a short while, the rain actually came to a halt, and we headed out to start the day’s work.

Since the fish had not been sorted since August, the caretakers would not have been able to sort out the smallest ones like at the hatchery. Each pen therefore had to be emptied of fish, and the fish sorted and placed either in a new pen if they were big enough, or transported to shore where they would be packed in bags and released. When the fish tanks at the hatchery were emptied, the water level was dropped and the fish could be scooped up, as there was just a little water left. But the water was not going anywhere here in Lake Evanger, so the emptying of the pen was much more difficult and needed a lot more equipment.

The sorting required three machines. All of the machines were given to the Hatchery after the Vossolaugs participation. The machines are standard equipment in fish farming, but the employees at the hatchery had previously done all these kinds of operations by hand. The first of the machines were the VAKI Heathro Fish Pump.
The pump is a blue and silver construction that sucks the fish out of the pen and pushes them out into your chosen location. The fish, water and residue are transported in hoses that come in various lengths to match the distance of your choice.

“I had never seen anything like it in my life”, Helene told me as we were watching the fish pump in motion and drinking a cup of tea. The thick clouds had unexpectedly lightened and the drizzle was almost imperceptible compared to this morning’s rain. This made us all cheerful. “We were visiting EWOS’ big research facility, and they had a fish pump that pumped the fish over the entire courtyard and into a separate building. The sight of the fish inside the hose was just fantastic.” I could see what she meant, as I stood watching the fish get sucked out of the water and into the fish pump. We could see the silhouettes of the fish inside the hose, and almost all the fish turned around and fought the suction. The biggest ones managed to swim in the opposite direction for several metres before they had to give up and disappeared inside the pump. After a short while, they flew out on the other side and continued on their journey to the next location.

The fish pump is connected to the second machine called VAKI Fish Grader, which sorts the fish into different groups according to the size. The grader’s main body circulates and when the pump pushes the fish into the grader, they fall down into the chamber that matches their size. The different chambers then take them into a new set of hoses that transport them into their respective locations. To make sure that there was enough water for the fish to slide through the hose, an electric devise that pumped up water directly from the lake was used.

The third and final machine was the bio-scanner. I had heard about the bio-scanner since my first day at the hatchery, when Erik had taken me on tour of the plant. I had noticed that the fish in one of the pens was different than the others, and seemed to have a white line across their backs. Erik had explained to me that the white lines across their backs were ‘ryggfinneslitasje’, worn dorsal fins. The fish nibble on each other’s dorsal fins, which can be spotted from above. Erik had been clearly unhappy about this, and according to him, this was a typical feature of the ‘farmed salmon’, and something they wanted very much to avoid at the Hatchery. “But I think that
“there are more fish in this pen than we think” he said while pressing the feeders buttons. “Usually we weigh all the fish by hand, so we have full control of how many fish there are. But the Vossolaug gave us this counting-machine that was supposed to do the job for us. Apparently they use them a lot at the farming sites, because they have much more fish than us. But I do not think it works properly. It counted wrong. So we have been feeding this pen way too little. And so, they bite each other instead.”

The VAKI bio-scanner Fish Counter looks like a white miniature water slide, where the fish are pushed through and an infrared sensor at the end of the slide counts the salmon as they slide past. But the caretakers at the Hatcher were worried that it was unable to count the small ones since the fish that had been counted with the use of the bio-scanner had injured dorsal fins. “If it had worked, it would have been fine. But it doesn’t work. The counting took much longer when we did it manually, but at least we had control over the amount of fish in each pen. Now we don’t know,” the caretakers expressed. So they were not optimistic when they mounted the bio-scanner to the fish grader now.

I stood leaning over the rail to get a better view of the scanner. The fish were sucked into the grinder, fell through the right chamber and were pushed into the scanner. They nearly flew past the infrared sensor before they were tossed into the pen. A few of them lay motionlessly on the surface for a few seconds before they came to life and swam straight down and into the dark water. Helene and Erik were both looking at the screen and pressing the buttons while checking the instruction manual. “Now we can’t even turn on the screen” Erik said and shook his head. The fish came falling into the scanner on top of each other, and when one of them got its side fin caught in a crack and we had to stop everything to save it, they decided to give up. “There’s no use. Maybe we’ll send it in for repair,” he said and removed the entire thing.

On one of my last days at the hatchery, I saw him tucking in the machine in bubble wrap and cardboard boxes. He had mentioned its malfunctioning to one of the representatives of the farming industry, and to quote Erik, “he seemed genuinely worried about it”.
We had finished all the sorting and started walking toward land, where the smallest fish had been pumped into a small container on shore. “Well, that wasn’t many,” Helene commented as we looked down into the container. “This is nothing compared to last year,” she said and turned around to face Erik. He had already started packing the fish into the bags, and seemed impatient. “The landowner is coming any minute now, so we have to pack them real quick,” he said. I volunteered to help, and together we packed 8 bags of fish. The landowner came driving down the steep slope toward the barrack where we were packing. “Good afternoon,” he greeted us kindly and opened the trunk of his car. “Am I getting all of these?” he asked and Helene nodded. “Yes, there are less fish than we thought, so you can have them all. Just remember to release them in different places,” she said. “Of course,” the landowner replied. I recognised the landowner as the mechanic in the auto repair shop close by, where I once had picked up Erik’s car. “Why are they fewer than you thought?” he asked as we helped him carrying the bags into the car. “These are the smallest ones, so the rest are apparently bigger than we thought,” somebody replied. “What? I get the leftovers?” he said with a smile on his face.

Planting of roe and releasing newly hatched fry are practices that have been performed by hatcheries in Norway since the middle of the nineteenth century. The planting of roe and releasing of settefisk resemble these traditional practices in many ways; even though dry suits and oxygen filled bags are more recent inventions. The releasing of the settefisk from Evanger on the other hand, involves much heavier use of technology, and shows that the practices are changing. The next section will depict the last of the three releasing methods, as the smolts are towed to the ocean by boat.

Smoltslep

When I arrived at the Hatchery one morning in May, the mood seemed different than before. We had spent the last week with monotonous cleaning of the hatchery in preparation for the alevins, so I was glad something else was going on. Erik was wandering around the hatchery with a post-it in his hands, occupied by his own

16 See prologue for description about the packing of fish in bags.
thoughts. Helene was making coffee and tea, and loading raincoats and rubber boots in the van. I simply tried to stay out of their way as they worked, and waited to be told what to do. Finally Erik seemed ready and asked with a smile on his face. “Ready for the big day?” I smiled at him and nodded. We jumped into the van, Erik in the driving seat and Helene and I in the double passenger seat. It had rained all morning, but as we drove toward Evanger, the weather seemed to clear up, and the sun broke through the thick clouds just as we arrived at the plant. The transportation truck had arrived already, and the driver greeted us with a huge grin on his face as he was leaning toward the side of the truck with a cup of coffee in his hands. “You’re late.” he pointed out in a humorous voice while taking a sip of his cup. The first day of the annual towing sessions had begun.

Although the planting and releasing of settefisk had required outside help at times when the work load had been too much for the caretakers, the towing demanded much more help, and it attracted a lot more attention than the other events. During the six towing sessions from Evanger, and the one from the hatchery, many interested people came to watch or participate in the release. The salmon biologists from Bergen came to conduct experiments on the salmon, the fish manager in Hordaland (fiskeforvalter), the state’s nature inspectorate (Statens Naturoppsyn, SNO), EWOS and the veterinary institute visited to see how the towing took place, and the Norwegian broadcasting company, NRK, made a feature of the event.

Helene, Veronica and I were standing by the fish pump, while Erik was hoisting up the net in the pen so that the hose could reach the fish easier. The driver was controlling the hose at his end by the barrack. Veronica, the fish manager in Hordaland, was visiting the plant because she wanted to see how the towing was executed. I had met her earlier that month at a salmon seminar. Like Helene, Veronica reacted with the same kind of fascination, and was equally mesmerized by the strong salmon fighting the current. “This is the weirdest thing I have ever seen,” she said and leaned down to get a better view. All three of us were looking at the salmon in the hose when Helene suddenly jumped up and rushed toward the pump. I looked up at the driver, who was jumping up and down with his hands outstretched, and even though we could not hear him over the sound of the pump and the rush of
wind, he was obviously shouting. Helene pressed the stop button, and the driver kept shaking his head.

The fish’s first step on the way to the ocean is the transfer from the pens to the transportation truck. The fish are pumped up by the fish pump as described in the previous segment, but instead of being pumped into the sorting machine, the fish are pumped directly into the truck parked next to the barrack. The pump can easily handle the distance and pushes the salmon all the way into the truck. But as the description above shows, the communication with the driver and the ones operating the pump is not always that easy. If the pump is not stopped at the right time, the tanks in the transportation truck overflow with water, and the fish left in the pump are pumped over the edge of the tank. Luckily, this did not happen often.

The transportation truck was designed for transportation of fish, and the driver told me that he usually worked in aquaculture. The Hatchery used to transport the fish themselves, which was a very time-consuming practice: “We had to drive back and forth all day long when we were moving the fish. It took hours. It was also bad for the fish, because we used scoops and buckets and you could see that the fish lost many scales in the process. The truck is gentler for the fish.” The trailer is equipped with five fish tanks connected to oxygen. Each tank can transport approximately 3000 fish of smolt size. The driver handles the hose that the fish are pumped through, and
makes sure that the tanks are filled with the correct amount of fish, something he uses his eye vision to calculate. The driver explained me, “We have some knowledge of what’s going on back in the truck. I had a girl from the university with me for a while. She studied what was going on back there, with the oxygen levels and ph levels and all that. And I have a monitor inside, next to the driver’s seat.”

When the truck is full with all the approximately 15 000 fish it can handle, the driver take them from Evanger to the quay of Bolstad where the towing boat will be waiting. This is about a ten-minute drive, and although parts of the road are narrow and bumpy, the driver manoeuvres the truck perfectly around the obstacles.

The crew were waiting in the boat and came out to greet us when we arrived. I asked Helene who they were, and she said that they had been hired by the Vossolaug and came from Hordaland, but she did not know anything else about them. “So they get paid for doing this?” I asked. “Yes, of course,” she replied and jumped on the boat. The truck driver opened the doors to the truck and worked very fast as he tied a new hose to the first tank. The towing tank (slepetank) was tied to the side of the boat, a green construction build from two round perforated tanks. Inside one of the tanks was a video camera, broadcasting the events below to the crew. One of the crewmembers explained, “This give us a clear sight of what’s going on down there, and how they behave, and how they’re doing. If they behave like normal, the speed is alright. If not, we have to slow down.” The driver pulls out a light blue see-through hose and opens up the tanks in the truck, one by one. He works in rough movements, and with a cigarette in his mouth, he opens the first one and the fish inside come splashing into the hose. The fish are basically flushed from the car to the ground, over to the boat and down into the towing tank tied next to it so quickly that they don’t have any
chance of fighting the current. We look at the fish inside the hose when suddenly a fuzzy white object passes by. It is a ‘daudfisk’, a dead fish. The others laugh.

When all the fish have been transported into the towing tank, the boat anchors up just a couple of hundred metres into the river, exactly where the fresh river water meets the salty water of the Bolstad fjord. Here they stay for twelve hours, to “lukte litt på vannet”, (smell the water) as Erik puts it. The fish are thought to find its way back easier if they get familiar with the water in the area, hence Erik’s statement that the fish were to smell the water. Early morning, when the tide is right, the boat starts towing the fish towards the ocean. Since they have to monitor the speed very carefully so as not to upset the fish, this usually takes about two days.

While the roe and the fry that are released are colour-tagged, the smolts that are towed to the ocean are also adipose-fin-clipped, and some are CWT-tagged. The reason for this is that the researchers want to know if the length of the migration and lice infestation has anything to do with the survivability (see chapter four). Even though all the salmon now have been released into the wild, this is not the last we see of them. In order for the project to succeed, the salmon has to come back again.
Concluding remarks

The events detailed in this chapter illustrate that the ‘wild’ is not as easily defined as the dichotomies portray, both in terms of the fish as wild, and the rivers as wilderness. Different people with different attitudes and wants own the river, and landowners try to control the movements of the caretakers on land and in ‘their’ parts of the river. As for the fish, I repeat Treimo’s quote; “‘wild’ become a prefix to various animal- and plant names as they are domesticated / cultivated. The significance is the opposite of tame, grown, civilized” (Treimo 2007:62). In this matter, both the practice of rognplanting and the name itself, is contradictory to the meaning of ‘wild’ as Treimo put it. Planting usually refers to the planting of seeds of vegetable origin. But the flowers and grains originating from this practice are not commonly referred to as ‘wild flowers’. Following Treimos logic in the quote above, the planted flowers are the exact opposite of wild. They are ‘farmed’ so to speak. Scarce follows Treimos logic in describing the hatchery salmon in North America, and argues that the use of ‘the agrarian model’; in reference to agrarian terms in hatchery activity is proof that the hatchery salmon belong to the ‘culture’ side of the dichotomy. The practices of rognplanting and the planting of seeds are similar in character; the digging of earth to create a pit, the placing of small living subjects into that pit, and putting the earth back on top to cover it from the world above, where it stays until they decides to break out of the surface as a plant reaches for the sun, or a living salmon swims off to find food. Rognplanting should therefore be considered a ‘farming’ activity, but the salmon originating from the planting are characterizes as ‘wild’ salmon. The practices look the same, but they are not the same. Even though I encountered one man who believed that ‘God’ would have fixed the salmon strain ‘himself’ if the humans had given ‘him’ the time to do so, I did not meet anyone who questioned the Vossolaks’ status as wild.
6 …and back again

It was my last day in Voss, and my last chance to meet a full-grown Vossolaks returning to the river for the spawning season. Sjur had been working for twelve hours the previous day, and said that he felt exhausted when he spoke to Helene on the phone. But there were still salmon that had to be taken care of, and I could join to see how he did it. Sjur was in his mid-twenties and one of the few persons I had met who was my age. I had only met him a month before, but I had heard stories about him from my other informants since my arrival at Voss. He had chosen a career as a salmon biologist, and people of the older generations seemed to be looking at him like some sort of hero. They told me that he was “something else”, not like the other young people in town who “didn’t know anything about the salmon”. It was the middle of summer, and the weather was warm, but the water still fairly cold, yet he was wearing nothing but a pair of shorts as he drove in a small orange boat to the bridge were we were standing. I quickly understood why; as we started working with the fish, the boat rapidly filled with water, soaking my clothes and making me shiver with cold. The ‘kilenot’ had caught a dozen fish during the day, which he had collected in a separate pen waiting to be registered. And to my great joy, there were a big one swimming in the tiny not.

The oceans of the world are vast and largely unknown. Although marine biologists today are expanding their knowledge about these extreme depths\(^{17}\), fairly little is known about the salmon’s adult lives in the ocean, and the Vossolaks is no exception. But when they return to the Vosso river system to spawn, the biologists are ready. However, the biologists and the caretakers also use other means in order to find out about the underwater world of the salmon. This chapter will therefore start with these methods, before returning to that summer’s day in the ‘kilenot’ when I met a full-grown salmon for the first time.

\(^{17}\) See Helmreich 2009
Mediating the salmon world

In his analysis of microbial biologists in the Pacific Ocean, Helmreich (2009) describe an expedition where the biologist sought to find deep-sea microbes that eat methane. These, they believed, would give them information about global biogeochemical processes that sustain the system of the Earth. The microbes can be found near tubeworms living in the muddy methane-rich zones of the deep ocean floor. To be able to find these microbes, the biologists would therefore have to find and collect these tubeworms. The only problem was the ocean floor being 1500 meters below water surface (Helmreich 2009:31-32). Although the Vosso river system is nowhere near that deep, the biologists and the caretakers face some of the same challenges that the microbial biologists in the Pacific Ocean faced; how to decode “the message from the mud” as one of Helmreiches informants put it, referring to the mud on the ocean floor (Helmreich 2009:31). Helmreiches microbial biologists work with several media, or materialities, in their search for the tubeworms, and through these media they “engage with mediation – watery, televisual, digital, biotechnological – at every step” (Helmreich 2009:32). Where the microbial biologists use research vessels, robots and computers in order to find the information they are looking for, the biologists and the caretakers at Voss use similar materialities like cameras, screens and listening buyos.

Visualizing salmon

Where the freshwater Vosso meet the saltwater Bolstad fjord, the two kinds of water mixes and become so-called brackish water. All anadromous fish from Vosso have to migrate through this area on their way to the ocean, which makes it an interesting area for everyone working with the salmon. About a hundred metres above this area, a square gray box is hanging on a pole a few metres up the river shore. Inside the box is a set of knobs, buttons, wires and monitors. The monitor is divided into four parts, and if you are standing more than a foot away, you can see slight movement on the screen. But if you look more closely, you can see that the screen is actually portraying the riverbed, just a few metres from where you are standing, and rocks, driftwood and plants are moving in the current.
Erik, Helene and I were on our way to a seminar, and had just reached the borders of Voss municipality when we started talking about something that had been decided on the previous board meeting. Helene was telling me about a documentary she had seen on a Norwegian television program. The documentary had used underwater cameras to document the salmon’s behaviour during the spawning season, and the beautiful and clear pictures had impressed her. She said enthusiastically; “many people seem to think that the salmon doesn’t have distinct behaviour like land animals do, but that documentary clearly shows that they do. It was wonderful to see it. Hopefully the underwater cameras we are getting will picture the salmon in a similar way. Because there are really no reason for killing the salmon to enjoy it, when you can see them on tape like that”.

The documentary she was telling me about is called ‘Den ville laksen’, “The wild salmon”, which depict the salmon as clear as day, as the spawning mother digs her spawning pits and the potential fathers fight for her acceptance (Nilsen and Nilsen 2002). The people behind the documentary explain that they want to make people view the salmon in a different way, and enjoy the fish without having to catch and/or kill it. The quote above shows that Helene too was positive to this. And she was not the only one I met that had these views on enjoying the salmon. Several people that I spoke to in Voss, even though they enjoyed eating salmon, they were positive to experiencing the salmon this way. At the annual board meeting of the foundation of Voss Hatchery earlier that spring, the board agreed to use last year’s profit on four underwater cameras. It was a costly operation considering the Hatchery’s limited budget18, but they all agreed that a glimpse of the salmon underwater was more important than the cost. And so four cameras were lowered into the underwater world of the salmon, and the monitor located on the river shore of Bolstad as described in the story above provided a means of 24-hour observation, or at least when the daylight and water conditions approved. But only the employees at the hatchery had access to the screen, and we did not see any fish when we where there. The cameras were rented, and the owner would go through the footage at the end of the season and

18 This has not been paid for by any of the external investors, like the Vossolaug, but by the regular operation budget.
give them a DVD, hopefully portraying the migrating *Vossolaks* on their way to the ocean.

The biologists use the underwater camera technology in their attempt to increase their knowledge on smolt migration, something they were paying particular attention to in my time at Voss. As we were standing on the quay watching a batch of salmon being towed towards the sea, a male biologist told me excitingly; “on the 18th of May at 13:06, about 20 smolts swam through the trap! They were too far from the camera to tell if they were salmon or trout, but still, we’re almost positive.” He was referring to a fish trap set up at a farming location of one of the farming companies involved in *Vossolaug*, where a camera is mounted, catching the fish on tape as they swim past, and apparently giving the researchers new information about their habits. A similar camera could also be found at Evanger, but without the same results.

*Erik, Ulrik and I were on Evanger to meet the veterinary and take an ATPase-test. Ulrik was a local kid who was working at the hatchery for a week instead of being at school. As we were sitting in the barrack, I noticed a cardboard box in the corner. I walked over to see what it was and looked down at the cluster of black cords sticking out from it. Ulrik noticed immediately and came over. He dug his hands into the box and grabbed the cords and started pulling them out. Erik turned around and said “Ah. Maybe we should try to get that thing working today.” Ulrik and I looked into the box and back at Erik. “What is it?” I asked. Erik came over and pulled the entire thing out of the box. “It’s a camera. We got it from the farmers. We have been asking for it for a long time, and now we finally got it. I think it’s just a leftover from one of the plants, but still. They have many and we had none. Now we have one.” In the end of the extremely long cord was a round-shaped camera. In the other end was a remote control. Ulrik was enthusiastic for the first time since his arrival a few days earlier, so Erik decided that this was indeed the day to test the thing.*

As Erik explained, the camera was another gift from one of the farming companies in the *Vossolaug*, and indeed he was right. At a meeting with the *Vossolaug*, the camera came up in the conversation, and the representative from the company that had given them the camera said; “it was just lying around anyway. We don’t use that kind
anymore. And they wanted it, so we gave it away”. But the camera did not come with any instructions, or perhaps Erik was not interested in the instruction, so the execution of the camera was not clear.

Neither of us had ever used a camera like this before, so it took quite a bit of trying and failing before we could lower it into the pen. We tied a rope to the camera and slung the rope across the short length of the rectangular pen. The camera hung in the middle, about 2 metres down in the water. Although the weather was cloudy, we could not see anything on the remote control except the reflection of our expectant faces. There was equipment shoved under a plastic cover next to the feeder, so we went over there, popped the control under it along with our heads to eliminate the glare. Ulrik wanted to handle the controller, and started pushing the buttons. The camera could be turned around and up side down and the screen showed the steam of fish swimming in front of the camera. The resolution of the black and white screen was fairly low and the image was grainy. It was basically the same as looking into the not with the Polaroid glasses on. After a few minutes, Ulrik got bored and gave the remote to me. I played with it a little, until both Erik and I shrugged our shoulders and I asked “What are you going to do with this exactly?” and he raised his eyebrows and answered, “You tell me” and walked away.

Like the fish pump and fish grader from the previous chapter, underwater cameras are standard equipment on salmon farms all over the world. Lien describes a salmon farm in Tasmania that uses cameras for feeding purposes. A farm worker "(...)observe salmon feeding directly in front of the camera and the pellets as they sunk past the camera lens” (Lien 2007a:175). The feeding of the fish had become more precise as the camera provided more accurate information about the fishes’ behaviour than just watching their movement on the surface as they had done previously (Lien 2007a). But since wild fish hatcheries usually do not have cultivation plants in rivers only tanks on land with good visibility, this technology has not been used before.

Conversing with salmon

In chapter four, I described ‘the acoustic smolt’ a surgical tagging conducted by the three biologists on the salmon as part of the continuous research. The project was
intended to make the salmon *speak* to the biologist on their way through the fjord (see chapter four). All the fifteen acoustic smolts from Evanger were dropped just outside the plant, and were expected to exit the river within a day and continue on their way through the fjord to the ocean.

Similar experiments had been done to *Vossolaks* before. During the summer of 2003, an experiment was conducted with Vosso salmon from the hatchery and wild salmon from a near-by hatchery called Dale. The salmon survived the procedure, and the scientists could monitor the salmon’s movements in the fjord. The experiment showed that the salmon started to behave unusually when they arrived at *Nordhordalandsbrua*, the second longest bridge in Norway that was built in 1994. The unusual behaviour was that the salmon started swimming back and forth several times before they passed the bridge, an unexpected behaviour. The conclusion that was drawn from this was that the bridge corrupted the normal migration route of the smolt, and that the bridge was therefore partly responsible for the decrease in the salmon population (Barlaup 2004:131). The biologists who conducted the experiments have recently withdrawn this conclusion. The new conclusion is that there exist a special kind of trout in the estuary of the river Vosso that mainly feed on smolt. They now believes that the fish did not swim back and forth because of the bridge, but because they were in the belly of the trout (Vossolaug 2011:13).

While the previous experiments have led to a conversation with the salmon and they had answered the researcher’s questions, albeit different answers to different questions at different times, the days went by without any signals from the acoustic smolt from Evanger. After a while, the biologists came to the conclusion that the fish probably had not survived the procedure after all, and no fish conversation could be made.

**Smoltskruen**

If you were back at the river shore with the grey box and monitor screening the under water world of the salmon described earlier, and you were looking towards the brackish water part of the river, you would see a bridge crossing it, leading to a farm on the other side. In the middle of the water, you could see a big construction tied to
the bridge and both sides of the river. This construction is called ‘smoltskruen’, the smolt screw. The construction is shaped like a funnel, and contains a rotating device that traps anything that comes into it in a box. Like Helmreiches biologists bring with them tubeworms from the deep oceans, the purpose of the trap is to physically catch the migrating smolt. When the device is brought back to shore, the biologists can examine the migration, and see how many smolts has been caught and what they look like.

We were checking the monitor to see if anything interesting had happened since last time we were there, but the only thing that had changed, was a bird’s nest on top of the box. We unfortunately had to remove the nest in order to open it, but no salmon appeared on the screen. Further down the river we could see that the smolt screw was brought to land, and several people were moving around by the shore. We decided to go and have a look at what they were doing. The farmer and landowner living at the farm by the bridge is the one in charge of the daily caretaking of the catcher, and we arrived at the farm at the same time as his daughter-in-law and grandchildren came home from work and school. The daughter-in-law came marching towards us, pointing at a black car parked next to a tractor. “Could you tell them to park somewhere else?” she said in an angry voice. “People live here you know” she barked and marched away. The car belonged to the biologists, and even though they had been told to park alongside the road next to the house and not in their driveway, they apparently had a habit of forgetting that. We walked over the lawn and toward
the people near the river. They were all grown men, and I had seen most of them before. The farmer were holding on to a rope tied to the catcher, observing the biologists as they were standing around a black bucket that I knew were probably filled with fish. The farmer greeted us kindly and told us that the rope tied to the opposite riverside had been ripped apart by the storm that weekend, so the catcher probably would ont bee in use any more this season as the current was too strong. I peeked over a biologists shoulder, and in the bucket swam five fish.

A master thesis about the time before Vossolaugt tells of irritation amongst landowners in the Vosso river system who felt overrun by the researchers who “made themselves comfortable (‘tok seg til rette’) in the river system without considering or asking the landowners” (Løken 2010:23). I raised this claim with my informants, who thought it gave the wrong picture of the situation. But the daughter-in-laws reaction witness that the projects might be considered intrusive by some of the local people.

Although the catcher only covers a very small area of the river, the amount of fish caught is believed to give an impression of when and in how large shoals the salmon migrate. But the farmer had been right, and the catcher did not function properly the rest of the spring. What was most interesting to me was to see the difference in size between the few fish that were caught throughout the weeks the catcher was in use. In the black bucket swam five fish that looked like they were two completely different species.

“What are the two small ones?” I asked. They looked up at me and back at the bucket. “They are salmon smolt just as the other ones. They are just smaller,” one of them replied, and grabbed one of the fish to show me. On its lower back was a tiny adipose fin still intact, and as I raised my eyebrows in surprise, the biologist looked at me and nodded, “wild”.

I had never seen any smolt that had not been smoltified at the hatchery before, and these fish were much smaller than the ones I knew. This made me interested, and I asked Erik about it as we were driving back to the hatchery. The caretakers often described the appearance of the Vossolaks in relation to the ‘farmed salmon’, but
there was also a difference between the smolt at the hatchery, and the fish that had become smolt in the river. I asked him if the wild salmon could have been planted or released as ‘settefisk’, and he nodded in confirmation. This was the first time I experienced a clear distinction between the *Vossolaks* at the hatchery and the *Vossolaks* in the river, but it would not be the last. The same category would appear on that summer’s day in July when I met a full-grown *Vossolaks* for the first time, and we now return to the initial story of the chapter.

**Registering the returnees**

The year before my stay at Voss, 130 wild salmon *tert*\(^{19}\) had been caught in the inner parts of the fjord, a significantly higher number than the previous years (Vossolauget 2010:14). The number was explained in relation to the rescue projects, and there was much excitement about the expected returnees this spring, because the first *mellomlaks* from the project were expected to be amongst them. But to be able to identify the returning fish as *Vossolaks*, they would have to be caught first.

**Catching the fish**

This is done through a practice called ‘*gjenfangst*, recapture (also referred to as ‘*forskningsfangst*’). This must not be confused with *stamfiske*\(^{20}\), where returning adult are caught further up in the river. The recapture takes place in the fjord, either at Stamnes, or Trengereid. The main techniques used in the recapture are the use of ‘*sitjenot*’, and ‘*kilenot*’. In the ‘*sitjenot*’, the fisherman sit in a tiny hut built on one of the steep mountainsides rising on each side of the fjord. The location of the hut make the fishermen able to see several metres below the water surface, and actually see the salmon as they enter the river where they have built a trap using fishing nets. When the salmon enters the trap, the fisherman in the hut release a big stone connected to the entrance of the trap, sealing the salmon inside (Barlaup 2008:136).

\(^{19}\) A ‘*tert*’ is a returning salmon that has spent one year in the ocean. A ‘*mellomlaks*’ has spent two, while the ’*storlaks*’ have spent three or more years in the ocean before returning.

\(^{20}\) Broodstock-fishing, see chapter four.
The pictured ‘kilenot’ on the other hand, do not require the fisherman to be present at all time for it to function. According to ‘Noregs grunneigar og sjølaksefiskarlag’, the Salmon Net Fishing Association of Norway, the ‘kilenot’ was first used in Jæren in 1820 (Noregs Grunneigar og Sjølaksefiskarlag 2012). When the salmon swim upstream, a long fishing net connected to the shore lead the salmon into a labyrinth of nets, trapping the fish inside. It was in a ‘kilenot’ I visited Sjur that day.

We drove past the ‘kilenot’ to see if any salmon had been caught there since he had been there last. No salmon were swimming inside the enclosed space. He pointed toward forward and I turned around to see where we were heading. A couple of hundred meters from the ‘kilenot’, I could see four buoys indicating a fish net. Sjur slowed down as we got nearer, and I could see that the buoys were attached to a fish net, creating a pen. “There are about ten salmon in there” he said, and brought out a scooper. He had moved the salmon from the ‘kilenot’ and placed them in the pen to make the registration easier. He scooped up one fish at the time, taking samples, me writing down what he told me on an envelope. Every fish in the pen were going to get registered and either released or put back again into the pen, depending on what kind of salmon it was. The enormous mountains enclosing the fjord prevented the sun from reaching us even though it was still only early afternoon. I was watching the few

21 Source: Noregs Grunneigar og Sjølaksefiskarlag 2012.
houses that were located on the other side of the fjord as we worked. Children were playing around the house and several cars were parked in the driveway. From the smoky smell in the air, I could tell that a barbecue was taking place. My attention was quickly drawn back to the boat, as Sjur pronounced that the next one was a big one. He struggled with the salmon as he was trying to bring in into the boat.

Identifying the fish

Sjur had already transferred the fish from the ‘kilenot’ into another pen about hundred metres from the trap, where he kept them until he could register them properly. The pen was rather small, but reached many meters down into the water. To scoop up the fish, he had to pull up the net, but make sure that they would not be able to jump out of it before he could scoop them into the boat. The fish were put in a blue container while it was being registered. The container was homemade by cutting out a rectangular hole in a blue plastic box of some sort. The container was filled with a small amount of water so that the fish could stay in there for a short period of time. Sjur kept refilling the container with water, as the fish were moving around and splashing out the water inside. He registered one fish at a time, and either released it into the river, put it back in the pen, or killed it. Where it went depended on the kind of fish it was, which will be explained below.

The fish put up a fight, but he scooped it into the boat and into the blue container. He quickly stated that this was a hatchery produced female salmon. I tried to look at her to see why he could so easily state that it is a she, but since she was not spawning yet, and therefore did not have the characteristic colours of a spawning salmon, they all looked the same to me. Sjur explained that he had ‘rokta’ since he was sixteen, so he was fully confident of his estimation. She was not the biggest salmon he had seen so far in the season, and he did not seem impressed at all. The biggest fish I was accustomed to at the hatchery was the one-year-old smolt closing in on 20 cm, and the last couple of weeks I had been working with the fry who was now almost 5 cm long. So to me, she looked like a giant. The container was too small, and the fish kept moving around, but he measured it with a tape measurer and decided that it was

22 Name of caretaking of fish, see chapter three.
110 cm long and probably three years old. He had given me a stack of envelopes where I was writing down the measurements, and wrote down the numbers. “The adipose fin has been clipped, so she’s hatchery produced,” he said, and I ticked that off as well. He took out a tweezers and scraped off scales from her side. The small, silvery scales where glittering even without the sun, and he gently pushed down scales into the envelope I was holding open for him. I closed it and put it amongst the other small envelopes filled with the other fishes’ scales.

Picture 2 shows the registration envelopes. The date, length, weight, sex and potential damage or wounds were ticked off and written down, and Sjur would finish the rest when he was done for the day. I asked where the envelopes were sent to, and he replied “I’ll bring them to Bergen with me. It’s probably going to be me who has to go through them all anyway.” But there was one thing he had to check in addition to the measurements mentioned before she could be identified and her fate made clear. He brought out the metal detector.

He placed the detector in front of her nose, and it let out a small beep and the red light started blinking. He picked her up and turned around to release her back into the pen. I had heard about the strength of the salmon, but I had not anticipated her reaction. She starts flipping in Sjur’s hands and she suddenly landed in the middle of
the small boat. She flips about frantically, kicking her tail and head into the bottom of
the boat and came flying towards me. He jumped on top of her, trying to grab her
without hurting her too much, and I was gaping as I saw how seemingly little affected
she was by having the grown man on top of her. Suddenly he was able to push her
over the edge of the boat and back into the pen, where she disappeared into the dark
sea and out of sight. But she could not go far. She had a nose tag, she’s
an ‘experimental fish’. She had to die.

As we know from chapter three, the CWT-tagged fish are called ‘experimental
salmon’ and the only way to read a CWT-tag is by killing the fish and physically
removes it from the fishes’ nose. This mean that all ‘experimental fish’ has to die, and
are not allowed to spawn in the river. Several of the hatchery employees mentioned
that this was a shame, but “at least we strip them before we kill them” as Erik said.
The ‘experimental fish’ are kept in a pen in the river until autumn, when the hatchery
employees collect them and transport them back to the hatchery where they are kept
until they are ready to spawn. Afterwards they are killed and their CWT-tag read
under a microscope. The number will tell which group that fish was in when it was
towed to the ocean. As described in chapter three, the four different experimental
groups were released in two different locations, the salmon in one of the two groups
at each location given food containing medicine against sea lice. All fish without
CWT-tag on the other hand, are released back into the river to spawn further up the
river system. In the pen that day were several fish without CWT-tag, and most of
them were lacking the adipose fin just like the big salmon above. The lacking adipose
fin makes them ‘hatchery fish’ and original Vosso salmon, and they are allowed to
spawn in the river. But some of the salmon still had their adipose fin intact, and this is
where we return to the new category I described earlier at the rotating smolt catcher.

Most of the fish were lacking the adipose fin, and even though a few of them had a
visible scar where it was supposed to be, most of them showed no trace of ever having
had one. The fins I had spent hours and days cutting in the winter had been tiny, and I
had never seen an adult salmon with the fin intact up close. But a few of the salmon in

23 The ‘stripping’, or ‘stryking’ is a practice where the eggs and milk form the salmon are removed
from the salmon by hand and the fertilization take place in a bucket at the hatchery.
the pen did indeed have the fin intact. And it was not tiny. The size naturally varied with the size of the fish, but the absence was highly visible when compared like this. “Are they wild salmon?” I asked Sjur when he leaned over the edge of the boat to release one of the fish with the fin intact. “Yes”, he said. “Some of the fish probably didn’t get their fins cut. I have heard that the youths were kind of sloppy workers,” he said with a grin on his face. He referred to the two weeks every summer when local kids were working at the hatchery, cutting of the fin of all the fish that was going to be transferred from the hatchery to Evanger. I chuckled and remembered this year’s sloppy workers. His assumptions could indeed be correct. “Or they might have grown back” he continued. He lowered the salmon slowly into the water, and with a final kick of the tail, the salmon disappeared under water and out of sight. Sjur stood watching it as it swam away and said, “that one might actually have been a wild one. A wild, wild one.”

It is fair to assume that Sjur here refers to the same salmon the biologist showed me in the rotating smolt catcher. If this is correct, the ‘wild wild’ salmon are salmon smoltified in the river and not at the hatchery. They could either have been conceived directly in the river by a male and female salmon, or they have originated from the released Vossorogn. When DNA-tested, all of these fish will presumably show that they have original Vosso salmon DNA. The only way to trace them back to the hatchery is by checking their ears for the red ring. But as described in chapter four, this can only be checked under a microscope at the laboratory after the fish has been killed. But in the ‘kilenot’, all fish with adipose fin intact were released into the river and registered as wild salmon.

The event described shows that the recapture is not done simply to count the fish. The scale sampling is practiced so that each fish can be categorized in the group it belongs with. Since the research started in 2000, the number of returnees has been registered and categorized into three categories; wild salmon, farmed salmon and unknown (Vossolauget 2010:14). The right category is decided after using the scale samples for DNA-testing. The DNA can trace the particular fish back to either a farmed origin, an

24 All roe kept at the hatchery are tagged with alizarin, see chapter four for description.
original Vosso salmon origin, or an unknown origin, when the DNA do not match the Vosso salmon DNA but they are not farmed. But as we have seen, the categorization ‘wild salmon’ is a complex category, including salmon conceived at the hatchery, but released into the river as roe or fry, salmon conceived in the river without any human help, or salmon smoltified at the hatchery, but without a CWT-tag. All the ‘wild salmon’ are released back into the river after registration and are allowed to spawn there, except the CWT-tagged fish that are brought to the hatchery. The ‘farmed salmon’ are killed instantly if they have visual signs of a farmed upbringing, something that is not always the case. The ‘unknown’ are likely to be released back into the river, unless they thought it was a farmed salmon and therefore got killed.

Becoming anomalous

When my time at Voss was coming to an end, I became aware of a situation in a neighbouring river that I had not yet heard about. In conversation with one of the many salmon biologists in Hordaland, the biologist I spoke to briefly claimed “the Vossolaks are now littering the rivers of Arna” (“nå driver Vossolaksen og forsøpler Arnaelva”). I did not understand what he meant, but I took notice of it, because the term forsøpling is a strong negative word, commonly thought of as an action where someone intentionally leaves garbage where it can be displeasing to others or be environmentally harmful in any way. I kept wondering how a salmon could litter a river, and I asked the caretakers about it. They explained that a lot of Vossolaks apparently had ‘strayed’ into the river Arna. “At first they were excited that they finally had all that salmon, but when they found out that it was Vossolaks, they got worried”. ‘Strayers’, feilvandrere, are salmon that return to the ‘wrong’ river. A certain percentage of strayers are normal and even necessary, but the amount of Vossolaks in Arna exceeded the standardised amount. There were no new information about the situation by the time I finished my fieldwork, but I followed the situation as it progressed throughout the autumn of 2011. The last part of this chapter will follow the event as it occurred based on public letters about the issue, because I believe that the event give interesting insight into the classificatory schemes the nature management in Norway is based upon.
The river Arna has suffered from great industrial emissions since the 1960s, which caused a breakdown in the salmon population in the river. The upper part of the river has also been used in the drinking water supply to Bergen, so that the water flow in parts of the river has at times been very low. In 1982, electro fishing used to monitor the salmon population showed no young salmon left in the river (Kålås and Johnsen 2000). To create a future salmon population, the local fishermen’s association bought 2-3000 alevins from a neighbouring hatchery called the Dale hatchery in 1985. In 1988, they started their own hatchery in Arna based on the salmon from the Dale hatchery. Through the use of scale testing on adult salmon in the river between 1997 and 1999, 46% of the submitted samples showed farmed salmon origin. But only the fish that were thought to be ‘wild’ were submitted for sampling, so the unrecorded amount is probably much higher. A report made to find the biological grounds for the management of the river state;

“After twenty years of heavy contamination and at least five years of farmed salmon run, spawning and probably reproduction, you should think that the salmon stock in the river Arna were genetically altered. However, fishermen with long experience claim that there still are salmon in the river with the same shape and colours like the original Arnalaks” (Kålås and Johnsen 2000:1)

(own translation)
Although the biologists write that the current population should have been based on strayers and in addition to “biological contamination” from the escaped ‘farmed salmon’, local fishermen say that they can recognise the fishes’ morphological features and pigmentation. Hence, the biologists ground the future management in the on the fact that they cannot exclude that an original salmon strain might still exist and should therefore be managed as one (Kålås and Johnsen 2000).

On the 14th of October 2011, the Fylkesmann issued a statement that said that all Vossolaks in the river Arna was to be killed. Almost 30% of all caught fish in the river had been Vossolaks, and this was believed to be a problem because “the preservation of the individual character of each strain are the basis for the management of wild salmon in Norway.” (Hauge and Haugland 2011). The letter continues claiming, “you cannot exclude the fact that part of the primeval strain has helped forming the genetic basis” of the salmon in the river today, and therefore the salmon has to be managed as an individual strain (Hauge and Haugland 2011). In a report from the Directorate of Nature Management, the killing of the Vossolaks in the neighbouring rivers are explained in relation to the genetic impact “that can be very unfortunate” without further explanation (Skår et.al 2011).

‘Salmo Group’, an association of family-owned farming companies, issued a reply on the 6th of December, 2011, where they claim that the statement was met with confusion on a meeting the local fishing association. The reply points out several factors in what they claim to be an abuse of the Norwegian Biodiversity Act (Ministry of Environment 2009). According to Salmo Group, the location of the river ensures a consistently large variation within the salmon population because the salmon are led into the river by geological factors, as it has always been. The foundation of the current salmon population are also based on strayers and salmon from the Dale hatchery, and they point out that the salmon from Dale might have been part Vossolaks in the first place, since all the rivers are located close to each other (Hitland 2011).

The letter from Fylkesmannen says that the Vossolaks can be recognised by the lack of the adipose fin (Hauge and Haugland 2011). The reply from Salmo Group points
out that although there were 148 adipose fin clipped fish amongst the 545 caught salmon in Arna in 2011, a percentage of these fish might as well come from the Dale hatchery, who also fin-clip their fish (Hitland 2011). And as we know from the previous chapters in this thesis, not all the Vossolaks are fin-clipped. The only fin-clipped fish are the fish that has been towed to the ocean as smolt. The majority of the Vossolaks produced at the hatchery are released through planting of roe and as setefisk, but these fish are not recognisable in any other way than the red rings in their brains. The letter states that the strayed Vossolaks derive from the towed smolt, but say nothing about the other released fish. In the fishing regulations of the river Arna in 2012, the fin-cut ‘wild salmon’ are grouped together with the escaped ‘farmed salmon’, and are not counted as a wild fish. As the local fishing association put it: “Some Vossolaks will be drawn to Storelva in 2012 as well, and we want to remove as much of this fish as possible” (Arna fishing association 2012). The Vossolaks, a precious and protected wild salmon in the Vosso river system, are no longer wild and are beaten to death in the river Arna.

The statement and the execution of the killing of the Vossolaks in Arna were controversial, and neither the biologists nor the nature management officials all agreed that this was necessary, but over 150 Vossolaks were still killed. The biologists’ use of the word forsopling, made me think of Douglas’ famous quote: ‘dirt is matter out of place’. Following Douglas, ‘dirt’ is relative. Shoes for example, are not dirt by themselves. But shoes on the dinner table however, become dirt in that situation. Sauce on you dinner plate are food, but sauce on your shirt, are dirt. Vossolaks in the Vosso river system are not dirt, but Vossolaks in river Arna, becomes dirt, it becomes an animal anomaly. Douglas describe an animal anomaly as “an element which does not fit a given set or series” (Douglas 1966: 47). Later she modify the description of an anomaly as “(...) not installed in nature but emerge from particular features of classificatory schemes” (Douglas 1990:25). Following Douglas, the Vossolaks become dirt in the river Arna because there exists a classificatory system where everything is arranged systematically within that particular system. As was explained in the letter from the Fylkesmann, the official management of salmon in Norway are based upon a system that ties a particular salmon to a particular river. This is not a given, but the result of a choice that has become standardised. A certain
amount of *straying* from this system are accepted as necessary, but when the amount exceeds the accepted percentage, the straying salmon becomes *“matter out of place”* and has to be removed (Douglas 1966).

Anomalies are an inevitable aspect of classification schemes, but the confrontation of these anomalies are done in different ways. The one thing they have in common, are that the anomalies cannot be ignored, because ignoring them would risk that people lose trust in them. Douglas portray five ways of confronting the anomalies; through defining the anomaly as a peculiar event, executing physical control, making them illegal, defining them as dangerous, and incorporating them in rituals (Douglas 1966:49-50). The killing of the *Vossolaks* can clearly be defined as an execution of physical control over the anomaly. As the cultures in western Africa that kill twins immediately after birth because two people cannot be born at the same time from the same womb, the *Vossolaks* is killed because the prefix *Vosso* tie the salmon to the river Vosso, and not the river Arna (Douglas 1966:49).

Similarities with practices around the world can be drawn. Lien describes an organization in Tasmania who works with environmental restoration and biodiversity protection. Much of the work is about weeding out so-called ‘invasive’ species, for example species that have spread with the garden waste of the local residents. The residents’ plant ‘exotic’ plants legally bought in Tasmania in their gardens, but when the same plants spread outside the garden, they become ‘invasive’, ‘pests’, ‘weeds’ (Lien 2007b). Similarities with the *Vossolaks* can be drawn. As long as the *Vossolaks* stay in ‘the garden’, the Vosso river system, they are fine. But once they ‘spread’, they become strayers, *feilvandrere*, and are ‘weeded out’.

**Concluding remarks**

The previous chapter showed how local landowners try to control the movements in the river to a certain extent. The situation in Arna shows how the nature management try to control the movement on the entire coastline. The two cases resemble each other, but on a different scale. What both of them show, is how the idea of the wilderness, if the wilderness is in the oceans and rivers, it is not untouched. Even
though no one can control the salmon’s movements the way they want, there is no lack of trying. The Arna case also gives interesting insight into the category of ‘wild’ and its strong connection to ‘where’. Although the Vossolaks is a wild salmon, it’s only wild in the river where it was born. If they swim anywhere else, they will not fit in the classification scheme the nature management have produced, and they become ‘matter out of place’. What then, about the ‘wilderness’ dichotomy? Nothing I experienced during my fieldwork would imply that the Vossolaks is moving toward the ‘society’ end, instead, the ‘wild’ becomes even ‘wilder’, as the contours of a new categorization is appearing; the ‘wild wild’.
7 Thinking with salmon

The super-salmon

The sound of the news reporter made me run into my room. On the television I could see the Vossolaks swimming in the tank, and the reporter claiming, “The world’s biggest Atlantic salmon, the Vossolaks, can now be saved from extinction. By the end of this month, 180 000 smolts are going to be towed out to the sea from Bolstad, and the number of salmon returning to spawn this season will have multiplied.” I chuckled as I recognised a landowner at Bolstad, sitting with an old picture of a salmon fisherman holding a gigantic salmon. “The biggest one I’ve seen was captured by one of the Englishmen who came here after the war, it was 65 pounds. Close to 30 kilos that is “ he told the reporter who sat nodding beside him. Next we see images of the biologists working in the river. We learn from the reporter that “the Vossolaks “has in reality come to life artificially, hatched from roe from Vossolaks collected at the gene bank. The rescue mission of the salmon, which is considered as unique as the Bengal tiger, has been significantly stepped up. The results are uplifting.” We are cut back to the landowner with the picture of the big salmon, while the news reporter finishes “It is again hope that British salmon lords can come back and fish salmon of 30kg.”

A local news station made this TV spot during the towing of the smolt to Evanger. The comparison between the Vossolaks and the Bengal tiger was a rhetorical strategy that was often used in relation to the Vossolaks. The mayor of one of the neighbouring municipalities of Voss that have supported the project, explained to the local newspaper that the ‘wild salmon’ are commonly thought of as the Norwegian Panda. One of my informants explained that Norway has an international obligation to rescue the Vossolaks, because the rest of the world expects us to do so, “just like we expect the Africans to take care of the lions and antelopes”. This rhetoric connects the Vossolaks and all the ‘wild salmon’ in Norway to international concerns, but by doing
so, the idea of ‘wild salmon’ become a static category as a representative of environmental consideration.

A comparison to Kalland’s ‘super-whale’ can be drawn. Kalland describes how whales have been "turned into a totem for many people in the western world” as a representative of the environment and animal care (Kalland 1993:3). Throughout the 1990s, whaling was highly criticised by environmental and animal rights movements. Since whales fall between the categories of mammals and fish, they are an anomalous category that, according to Kalland, has attracted environmental and animal rights groups to create a ‘super-whale’, by “lumping together traits found in a number of species” (Kalland 1993:4). The traits of the ‘super-whale’ is its age and wisdom, it is the largest animal on earth with the biggest brain on earth, the most friendly and singing the most beautifully. But no whale has all of these characters, but the ‘super-whale’ exceeds these realities. Hence, the whale becomes the “guardian of values now lost” and an ‘aboriginal of the oceans’ (ibid).

The way many people actively try to create the ‘wild salmon’ into an icon of ‘wilderness’ is similar the ‘super-whale’. The journalist who participated in the meeting with the state secretary stated, “a salmon isn’t only a fish, it’s so much more. If the salmon is gone from the river, something is wrong. But if the salmon is there, everything is okay. That’s just the way it is. Here, the salmon not only represent parts of nature, but it represents nature itself. The ‘wild salmon’ becomes a guardian of nature, and if the salmon disappear, nature, or the way we want nature to be, disappears with them.

Descola argues that people’s modes of relation with the environment are based on a restricted number of patterns and templates that are “never very coherently or systematically expressed” (Frankling 2002:65-66). He has claimed that one can discern three “schemes of interaction”, predation, reciprocity and protection. The ‘protection scheme’ prevails when a “collection of non-humans is perceived as dependent upon humans for their reproduction and welfare” (Descola 1996:90). The non-humans in question are closely linked to the humans who protect them on a collective basis, “and they appear genuine components” of a whole society of units
within a society (ibid.). The salmon has a long tradition in Norway, and might be seen as a genuine component, at least of Norwegian ideas of nature. If Norwegian’s ideas about the salmon can be thought of in relation to Descola, the protection of the species is more important than the absence of humans in their lives, showing that the boarders of the ‘wild’ are not fixed, but fluid, depending on the situation of nature.

**Governed nature and anomalies**

But the ideas of how we want ‘nature’ to be, is not fixed, but constantly re-made through legislative changes and shifting ideas about how we want nature to be (Scarce 2000). A global attention to biodiversity and environmental protection has led to the creation of a super-salmon that it is our job to protect, in order to restore ‘nature’.

While talking about salmon practices from the past, many of my informanst laughed about the way salmon were moved from one river to another, without thinking about what this did to their genomes. According to Emmelin and Kleven, there are a number of characteristics that is typical for the public nature management in Sweden and Norway; a reductionistic approach with a tendency of ‘scientism’, where so-called scientific arguments are perceived as more important than ethics and morals (Emmelin and Kleven 1999; Magnussøn 2000). This way of thinking match the foundation for salmon management based on genes, and all argumentaion why the Vossolaks have to be killed is based on this logic, even though there are disagreements about this, especially amongst the biologists who argue that the strayers eventually will adapt to their ‘new’ river like the previous salmon had done.

The political management of nature create a type of knowledge that is “*neither science nor politics*” and that this knowledge arranges and classify nature in a particular way (Ween and Flikke 2009:8). In her article about a new Norwegian national park, Ween describes how terms like ‘sustainable development’, ‘biodiversity and ‘wilderness’ are mobilised in documents and public management, and confirming the national park as a ‘wanted nature’ (Ween and Flikke 2009:12).

As the Arna case showed, nature management standards lead to a categorisation system that classifies species as fixed categories. But like the landowners in chapter
five could not control the movements of the salmon in ‘their’ parts of the river, the management cannot control which river the salmon chooses to migrate back to. When the salmon do not behave according to plan, they become anomalies, and following Douglas, anomalies have to be dealt with. In this case, they are killed.

Concluding remarks

The ‘topology’ of the Vossolaks includes gene banks, laboratories, automobiles, landowners, tourists, and fisheries in distant countries through the pellets they eat and through official management legislatives that eventually kill them if they recede from the patterns that the same official management have enacted. If this is so, they hardly fit the Euro-American understanding of the wild as untouched. Yet, the Vossolaks still inhabit the status as a ‘wild fish’, and further, the salmon even counts as nature itself. Through this thesis, I have showed that the concepts of ‘wild salmon’ are more complicated than what the public dualistic presentation give room for. Human involvement, or the lack of it, is not necessarily the decisive factor of becoming a ‘wild salmon’, but it is a matter of being the right kind of fish, at the right place, at the right time.
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