

## *1. Prelude – looking at a river*

This story begins on a walk with an unusual kind of gangster, Rune Hylby, the kingpin of *the Gravel Gang of Zealand*<sup>1</sup>. Along with his fellow gang members, he is committed to what at first sight seems a very peculiar activity. Like many other similar volunteer groups throughout Denmark, they spend their weekends as river caregivers, putting great big heaps of gravel and rocks into small rivers in preparation for the arrival of a charismatic animal – the sea trout. Sea trout are both adventurers and home lovers. From early summer to late autumn, trout leave the fiords to reach river headwaters, but to spawn successfully, they need a bed of clean gravel. With their tails, the females bury the fertilized eggs under a small layer of tiny rocks directly in the river bed, where they lie until ready to hatch. Once hatched, the juvenile trout, called parr, need food and cover. The gravel is ideal habitat for the nymphs the parr feed on, and the larger rocks provide spots for dwelling and cover. Once the trout reach a sufficient size, they venture into the salty seas where they grow to sexual maturity and return to the stream or river in which they were born in to do their part to continue the circle of life. But this way of answering why gravel matters only raises much larger questions. How to explain that Rune and his gang – Moderns of the Western world – are in such a rush to make bridal beds for silvery fish? And what happened to the gravel in the first place?

To answer these questions I try to keep up with Rune as he carries out a mission along the tiny stream of Truelsbæk. It is no more than one meter wide where it enters Tempelkrogen, a fiord in Western Zealand. On its final stretch, the stream is canalized and runs through ameliorated land that was once a meandering river valley. As the demand for farmland grew with ferocity in the 20<sup>th</sup> century, many Danish streams were heavily modified to drain adjacent wetlands. But this is a story I will save for later. Further upstream, Truelsbæk flows through a patchy and mostly naked landscape of big mono-crops and farmhouse backyards. Only in a few places does the river follow its original, natural course. It has been allowed to do so because steep hills prevent the heavy machinery of industrial agriculture to work near the banks. Crossing the stream are big concrete bridges, supporting the highway and railroad to Copenhagen. It is a landscape shaped for production and export, typically Danish. But for Rune it has other meanings. Where I see ruin, he sees promise. In the gravelly river bottom he looks for small diggings indexing that sea trout have spawned. His eyes alight with excitement, he notes each spawning bed meticulously on a printed out map. It is a curious art of noticing at play here, as Rune admires the environment he himself has helped make. The grand total for the days is 62 digs, which are now home to a new generation of trout that will be born into the world with the assistance of a truckload of gravel. They are the lucky ones in the

precarious life of sea trout.

Rune tells me that earlier in the year, when the big trout conquer the spawning beds in aggressive competition, he likes to sneak out in the middle of the night to watch them pair up in the glow of his headlamp. He even arranges walks on which the public can join him on sea trout safaris, although normally these take place during the day. He likes to tell what he calls “*the good story*”. In order to keep morale high among his volunteers, he is a generous praiser as well as storyteller. In the economy of voluntariness, Rune highlights the two things he can give: recognition in the shape of praise, and positivity in the shape of optimistic blog posts and newsletters. But who praises the gang-leader, and what keeps his positivity going, I ask him. With characteristic bricolage, he answers that working as a teacher for autistic children, he is used to having to notice success on his own. After a pause, he explains that his motivation is the feeling of *making a difference*. And besides, pushing a big rock into the river makes him feel like a six-year old. Exactly what kind of difference he is talking about is the riddle of this study – what kind of imagination drives Rune and his gang to try to mend these degraded rivers? Although a compelling exponent of his groups successes, on our drive home in the car Rune reveals a crack in his optimism. He says; “*It saddens me when in order for something to have value, it must make a profit. When our core value is; does it pay?*” Good stories in troubled times alerts us to the nagging question; what of all the bad stories?



*The spawning bed of a sea trout couple is revealed by the freshly turned over lighter gravel.*  
Photo credit: Grusbanden

## *2. Introduction*

This is a big story from a small place probing some possibilities of continued livability on Earth for humans and others. It takes place in a thoroughly Anthropocene setting; the Danish countryside. As the glaciers retreated at the end of the last Ice Age, they left behind a flat, soft and moldable land which today, 11.700 years later, has become one of most cultivated countries on the planet. Farmland covers almost two thirds of Denmark<sup>ii</sup>, and making room for it has required an intrepid, monumental and stubborn effort which has dramatically changed landscapes. As a country so thoroughly shaped by anthropogenic activities, Denmark is an adventurous and messy site for probing what is at stake in the Anthropocene.

Denmark is also my native country, and Truelsbæk is no more than a few kilometers from where I grew up. Remembering that anthropology relies on relations to study relations, engagement in the site can be a strength, not a weakness, as long as it is tempered by reflexivity. In this specific case, it proved valuable as access to the ethnographic group was uncomplicated. When I was 12 years old, gang-leader Rune taught me fishing at an evening class in a nearby Holbæk, and remembered me when two decades later I reached out to ask if he would participate in the study. Although he, and the other informants he helped point me to, had only a very vague idea of what anthropology is, they were elated that someone took an interest in their projects and would talk for hours on end. Invariably, these informal interviews would turn into intense discussions about philosophies of life, politics, ethics and the overall direction the world is taking, as I tried to make sense of their notion of making a difference. In this paper, I trace some of the paths they suggested to canvas the entanglements prompting their projects. In order words, I write from a position of engagement and empathy in both in the landscapes of my home, and with the river caregivers who try to change them. The academic challenge confronting me in writing this paper then, is not so much maintaining neutrality, but rather making good use of subjectivity. The obvious trap, which I've struggled to avoid, but nonetheless may have from time to time fallen into, is projecting on to the ethnographic field – a creation of in my own making (Madden, 38:2010) – too many grand abstractions. Writing the paths my informants suggested has been a cocktail of curiosity, rage, optimism and despair, and a constant struggle to remain true to anthropological aim of understanding the native's point of view (Geertz 1974) – in this storm of ideas and emotions. In the final chapter (p.19), I will reflect upon what this engagement may have obscured in my analysis.

Sketching major anthropogenic transformations of Denmark's landscapes forms the first part of this

enquiry, asking which kinds of *environmental imaginations* (Purdy 2016) were at play in the endeavor. Furthermore, I explore what happens if dominant ideas of progress are considered instead as both driven by, and leading to, *precarity* (Tsing 2015). This historical analysis will form the context for the main ethnographic material. The human informants are members of volunteer groups like Rune, who have set themselves the challenging task of restoring degraded rivers back to life. This work has been going on for some 30 years and represents a rare, if moderate, success story in the reconstruction of Danish 'nature'<sup>iii</sup>. I will consider what kind of environmental imagination informs their activities to shape the Anthropocene in unexpected ways as 'conservation' projects paradoxically unfold in a world without 'nature'. As part of this analysis, I will be assisted by the disruptive liveliness of *multispecies ethnography* (Tsing 2015) and ask what sea trout and other river animals may tell us about the difference-making activities of the river caregivers.



*Gang-leader Rune holding an exceptionally large sea trout which was caught by electro-fishing – a method used to artificially produce sea trout smolt to help boost stocks. Behind him is a short zone of 9 meters which used to be mandatory by law to protect aquatic life and water from agriculture's nutrient and pesticide discharge, but which has since been made voluntary by the current Danish government as part of a political crusade against what they call “environmentalist tyranny”<sup>iv</sup>. Behind the zone: scalability in action. Photo credit: Grusbanden.*

### 3. *Environmental imaginations in precarious times*

To help formulate an answer to the key question introduced above - what kind of difference is Rune and his gang making - I will introduce some key theoretical concepts to accompany us in the historical and ethnographic analysis. I already mentioned the Anthropocene – a compound of the Ancient Greek terms *anthropos*, meaning 'human', and *kainos*, meaning 'new' or 'recent'. The term was popularized by Nobel-prize winning atmospheric chemist Paul J. Crutzen in 2000 (Purdy, 1:2015) to describe a new geological epoch after the Holocene in which human activity outranks other forces in driving drastic planetary environmental, climatic and geographic change. Most scholars agree that the beginning of the Anthropocene coincides with the industrialization and rise of capitalism during the latter part of the 18<sup>th</sup> century, when emissions of greenhouse gasses, world population, technological advances and many other factors begin to rise exponentially in what is known as the Great Acceleration (Haraway 2016, Stoermer and Crutzen 2000).

'Environmental imagination' is a concept I borrow from Purdy (2015), who defines it as “...*how we see and how we learn to see, how we suppose the world works, how we suppose that it matters and what we feel we have at stake in it. It is an implicit everyday metaphysics, the bold speculations buried in our ordinary lives.*” (Purdy, 7:2015) Unlike ideology or ontology, it is a concept that highlights connections and helps us to notice how environmental imaginations are shapers of anthropogenic change histories of different kinds. A feature of environmental imaginations is that “they organize the world by simplifying it, highlighting some realities and casting shadow on others” (Purdy, 26-27:2015). However, the concept casts a shadow of its own – human imagination is not the sole builder of the environment, although a prominent one in the Anthropocene.

Conceptual inspiration from the anthropologist Anna Tsing and her book “*The Mushroom at the End of the World*” (2015) might do the trick. Tsing's project is building a new theoretical framework for talking about ecology and economy in relation to each other in order to challenge progress as the all-encompassing conceptual framework of modernity. Her methodology combines ethnography, biology and history to tell “a rush of stories” (Tsing, p.37:2015) that are rooted in concrete localities, as well as able to gesture to the very broadest levels of world history. Tsing applies concepts from the humanities on ecological domains, and concepts from biology on historical domains. In this way, she very elegantly sidesteps the nature:culture dichotomy - a monumental theoretical problem that has haunted anthropology throughout the second half of the 20<sup>th</sup> century (Descola 2013).

The concept 'assemblage'<sup>v</sup> is a good place to begin for understanding her method. It refers to the different species that come together in a particular habitat at a given time. What happens when species meet? Since Darwin, biology has answered this question with competition, and focused on predator-prey relations and reproductive success. These were the driving forces of evolution that lead to gradual improvement of the species through natural selection. The discovery of the gene offered a site for the material expression of Darwinian theory, leading to the 'modern synthesis': a powerful story of how life evolves through adaptive properties of self-contained, self-replicating genes<sup>vi</sup>. According to this theory, nothing transformative happens when organisms meet – change is only possible on the genetic level. The explanatory power of the modern synthesis is that from the most infinitesimal level – the gene – it can scale up to higher levels like organism, population and species exactly because change is restricted to the self-contained genetic level. To tell the story of life, we need only the lonely gene, not the world around it nor the histories of species' encounters. In this view, a gathering of species is no more than the sum of its parts.

This kind of scientific theory are often labelled reductionist and have been the focus of much critique from certain schools in the humanities<sup>vii</sup>. The reductionist logic is often attacked on both scientific<sup>viii</sup>, ethical and political grounds, one obvious reason being that it is in many ways conspicuously congruent with liberal economics and capitalist notions of progress. However, the way genes work is an empirical question – albeit an immensely complex one. In recent decades the orthodox theory of evolution described above has been challenged from within evolutionary biology itself, leading to novel ways of understanding what it means for a species to survive: “*One of their [researchers of developmental biology] most surprising findings was that many organisms develop only through interactions with other species...As biologist Scott Gilbert and his colleagues write, 'Almost all development may be codevelopment. By codevelopment we refer to the ability of the cells of one species to assist the normal construction of the body of another species.' This insight changes the unit of evolution.*” (Tsing, 141-142:2015)

This brings us back to the assemblage, but now it looks quite different. The meeting of species is more than the sum of their parts – they are engaged in what Tsing calls *collaborative survival*. This is quite different from survival in the orthodox, darwinian sense. It allows history back into thinking about evolution because encounters can be transformative. Collaboration is work across difference through encounters that inevitably lead to contamination. Encounters “...*change who we are as we make way for others*” (Tsing, 27:2015); purity is impossible. In challenging the modern synthesis, Tsing makes a synthesis of her own that combines the insights from the paradigm shift in biology

with what has been called “speculative feminism” by Donna Haraway (Haraway, 3:2016). Parallel to the historical devaluation of women's work to birth children and nurture them, the work of the bacteria inside us, the trees that make the air we breathe or the fungi that transform rock into earth through their digestion, has gone largely unnoticed and unappreciated, in contrast to the often celebrated work of progress. Surviving takes collaboration, and life always depends on others. This synthesis forms a methodology Tsing calls “*Arts of noticing*” that has the ambitious scope of telling stories about how Earth is shaped by creatures that by living, transform it. History, in Tsing's conception, does not begin with culture and human exceptionalism, but rather with the myriad of life forms that have made this world livable through their encounters and relationships.

We can now turn to Tsing's other object of analysis; capitalist production. We saw earlier how scale was a feature of reductionist science. Tsing thinks of *scalability* as a concept that bridges (some) scientific and (many) capitalist projects: “*Progress itself has often been defined by its ability to make projects expand without changing their framing assumptions. This quality is “scalability”...the ability of a project to change scales smoothly without any change in project frames.*” (Tsing, p.38:2015). The parallel – as we have seen in the above example – in scientific projects is making “*...one's research framework apply to greater scales, without changing the research questions...*” (Tsing, p.37-38:2015). Similar to how the self-contained unit is a defining feature of scalable science, *alienation* is a defining feature in capitalist production. But Tsing uses the concept of alienation in a much wider sense than its originator Marx, and applies it as a potential attribute of not only humans, but animals too. Alienation is at work in capitalist logics of commodification when things are torn from their life-world to become objects of exchange (Tsing, 121:2015). A great icon which combines scalability and alienation is the mono-crop of modern agriculturalist production - a neatly ordered homogeneity of self-contained organisms. The mono-crop is space in which little or nothing assembles, no transformative encounters happen and history – in Tsing's environmental imagination - is brought to a halt.

Finally, Tsing argues it is myopic to understand the Anthropocene – ‘the Epoch of Man’ – as the final triumph of Culture's intentionality over a passive Nature. While it is self-evident that humans manipulate and exploit the environment to our own interest, there is a proliferation of precarious events that alert us to the unintended consequences of modern 'progress'. Most days, newspapers will report about massive anthropogenic change; rising global temperatures, collapse in bee populations, species at the brink of extinction or high levels of man-made pollutants in amphipods living in the deepest trenches of the oceans. Tsing's point is that we often “*...imagine such precarity*

*to be an exception to how the world works. It's what “drops out” from the system. What if...precarity is the condition of our time – or, to put it another way, what if our time is ripe for sensing precarity? What if precarity, indeterminacy, and what we imagine as trivial are the center of the systematicity we seek?”* (Tsing, 20:2015). Thus, thinking with precarity changes social analysis as a stand-in for progress to disrupt the way we imagine both ecology, history and humans.



*A typical Danish landscape, thoroughly shaped by human activities. Agriculture covers almost 2/3 of Denmark's total territory. Author's photo.*



#### 4. *The deconstruction of Danish nature*

In the following, I will trace the environmental imaginations and their historical power which co-created today's Danish landscape. Largely an Anthropocene creation, these landscapes are best understood through the two most dramatic kinds of anthropogenic impact; amelioration projects and industrial agriculture. Nonetheless, a brief visit to the distant past is a worthwhile excursion to provide a context for more recent changes.

As the climate began to get warmer at the end of the Pleistocene massive glaciers began to retreat from the landscapes that much later came to be named Denmark. Newly exposed rivers were flushed dramatically by the melting water, leaving rocks and gravel covering the bottom forming ideal habitats for salmonids. On land, trees like birch, fir and hessle – recent arrivals from the south - colonized Denmark in fertile soil ploughed by glaciers<sup>ix</sup>. Indeed, many kinds of world-shaping activities unfolded even before the first bands of hunter-gatherers entered the stage<sup>x</sup>. Once agricultural technology arrived from the south 6000 years ago, major anthropogenic change began as forests were cut down to make space for planting crops. Large amounts of nutrients such as phosphor and nitrogen released by soil erosion lead to eutrophication - a biological process during which a algae feeding on the nutrients bloom in huge numbers, depriving the water of oxygen causing mass death of aquatic animals by asphyxiation. This is just one of many examples of how humans changed ecologies both on land and in the water in pre-historic times, but which nonetheless pale in comparison the more recent developments which I will now present.

The history of amelioration projects dates back to the 18<sup>th</sup> century, but it was not until the 20<sup>th</sup> century an unprecedented desire for expansion accelerated dramatically (Hansen, 163:2008). The ambition of the amelioration cause<sup>xi</sup> was to salvage productive farmland from marginal wetlands, river valleys and shallow fiords. The environmental imagination was strictly utilitarian; soil, in contrast to water, was an element on which wealth could be accumulated and progress unfold. “Nature” was imagined only in terms of its instrumental value. A symptomatic quote comes from Kristen Bording, a Social Democratic minister of agriculture<sup>xii</sup> who upon the completion of an enormous project, the amelioration of Vildmoserne in Jutland, wrote: *“Instead of desolate, barren, grim, uninhabited and useless swamps, which provided neither employment, dwelling nor value of any kind, there is now a busy activity working the fields – a pioneer land – where thousands of farmers, workers and other Danish citizens find occupation, homes and a secure livelihood.”* (quoted in Hansen, p.136:2008, my translation)

The logics of progress and scalability were integral in this work – the transformation of worthless nature into productive agricultural lands was scaled up to potentially include more or less the entirety of the Danish territory. But as Tsing points out, “*scalability is not an ordinary feature of nature. Making projects scalable takes a lot of work.*” (Tsing, p.38:2015) This proved true in the case of amelioration – tremendous capital were needed to carry through monumental feats of geo-engineering, for example the canalization of Skjern river<sup>xiii</sup> – Denmark's largest river in terms of volume. The canalization of rivers had two main purposes. One was to make them run in straight lines in order to fit better with the square logic of the ploughed field. The other was to dig the rivers deeper into the ground in order to dry out adjacent meadows through drain pipes. In addition to the rocks and gravel which disappear from the river during the initial amelioration, the discharge from drain pipes is full of fine sediment which covers the river bottom in silt. It is mainly this kind of environmental degradation river caregivers try to compensate for one barrowload of gravel at the time.

The key actors in this transformation were private enterprises, most notably Hedeselskabet, and the Danish state, which provided loans and capital. The involvement of the Danish state was motivated by precarity. The shocking crash of Wall Street in 1929 led to global economic depression. As stock prices dropped and unemployment soared to over 40% in the early 1930s, the belief in the invisible hand of free markets suffered. The Keynesian economic doctrine recommended expansive financial policies in the form of public investments in infrastructure improvements as a way to mitigate economic depression and create jobs in a market suffering from lack of capital. “*We live in evil and dark times. A crisis haunts the world*”, said Danish prime minister Stauning in 1932 (quoted in Hansen, 149:2008, my translation). A famous campaign slogan of his read; “*Stauning – or chaos!*”. In 1933, Stauning masterminded the Kanslergade conciliation, a historic political agreement taking dramatic measures against a collapsing economy. A key initiative became to reinvigorate the amelioration cause in Denmark which really gained momentum through the alignment of capitalist speculation and political attempts to navigate through precarious times. Amelioration appealed to the liberal party Venstre because it would accommodate the constant demand of their key voter base, farmers, for more land. The Social Democrats, eager to save their working class voters from the precariat, had job-creation in mind. In Hedeselskabet there was no shortage of potential projects waiting to be realized. In the precarity of the crisis they saw opportunity. They presented a list of over 300 concrete suggestions for river regulation and amelioration projects with a total cost of 12 mio. Danish kroner (Today's equivalent, 391 mio.) which became part of the extensive bill that passed with a broad coalition of political parties

supporting it (Hansen, 150:2008). Kjeld Hansen, a leading expert on the history of amelioration projects in Denmark, sums up the period 1933-1970 as follows :“...*the politicians agreed on a plan intended to save the country from an acute crisis of economic depression, but the financial help [to Hedeselskabet and other private companies] in times of trouble was made into a permanent and privileged right, and the crisis into a permanent condition – also in times of abundance and growth...Suddenly it became profitable to...drain the river valleys and regulate any and all rivers or put them in pipes...For Hedeselskabet, the conciliation marked the beginning of a glorious period of unprecedented economic growth.*” (Hansen, 163:2008, my translation).

The farmland salvaged by the amelioration projects, in combination with the previously existing farmland, are today dominated by industrial agriculture production of monoculture crops. Scalability is a defining feature of this kind of food production, which relies on the strict homogeneity of mono-crops and singular rhythms of plant maturation achieved through pesticide use, chlormequat and other such techniques, rendering much of Denmark a desert in terms of biodiversity. 61% of the country is taken up by agricultural production<sup>xiv</sup>, 81,3%<sup>xv</sup> of which is used to grow fodder for livestock. Liquid manure, mostly from large scale pig farms, used as fertilizer is today a primary reason a majority of Denmark's freshwater resources are in a poor environmental condition due to eutrophication<sup>xvi</sup>. The conservation status of natural habitats in Denmark is measured according to criteria set down in the EU's Habitats Directive. Of the 13% of Denmark that are defined as natural areas, more than 90% are considered to have a moderately or severely unfavorable conservation status<sup>xvii</sup>. One example is sea trout. It is estimated that Danish rivers historically produced 2,64 million juvenile sea trout each year. In 1997, that number was 0,117 million – a 93% decline<sup>xviii</sup>, reflecting that more than 90% of Danish rivers have been either canalized, put into drains or otherwise affected by humans in order to maximize agricultural expansion<sup>xix</sup>. The fate of sea trout is by no means an exception but rather the rule in a country where biodiversity continues to decline as landscapes almost nation-wide have been subjected to anthropogenic impact. Indeed, life is precarious for many kinds of critters, finding themselves in lifeworlds neighbored by dominance of industrial agriculture.

The historical deconstruction of Danish 'nature', political pressure from the current government against basic environmental protection of rivers<sup>xx</sup> and industrial agriculture's present dominance over the landscape, are topics that stir great emotion and resentment among the river caregivers. Indeed, it clashes quite fundamentally with their own projects. More precisely, it is this context of monumental world-making projects shaped by utilitarian environmental imaginations in the past

and present that makes the work of the river caregivers both necessary to them - and almost impossible. In every talk I had, there was a constant going back and forth from great enthusiasm about ongoing or future projects, and despair over the general state of the environment. In the light of this, the optimism Rune's displayed during the walk that opened this rush of stories is perhaps best understood as the gang-leader's responsibility to keep despair at bay in order to muster the energy to act against the instrumental value logic that dominates the current political establishment. With this in mind, it is now time to return to ethnographic analysis and the guiding question: what does Rune mean when he speaks of making a difference?



*An example of river modification to improve draining of surrounding land. When rivers are selected for environmental restoration, a main strategy is to bring the river bed into contact with the river valley. Photo credit: Unknown, reproduced from Hansen, p. 218:2008*

## 5. Making a difference

In this chapter, I will further probe the environmental imagination driving the projects of the river caregivers, and finally present my interpretation of the kind of difference they talk about making. The analysis is based on ethnographic material collected through informal, qualitative interviews with three key informants besides Rune. Furthermore, I will include material from the Facebook group “Bevar de Forhadte Vandløb” (BDFV) comprised of around 15000 loosely organized members engaged in political activism for ecologically centered river management. All the river caregivers I spoke with are active members of BDFV, although some informants preferred practical work – giving body to their words – over the more abstract political struggle.

The river caregivers can be said to constitute a sub-culture, although their emblems, as we shall see, are not cultural artifacts but biological organisms. What sets them apart is an environmental imagination in fundamental opposition to the dominant ideologies – those sketched in the previous chapter. The river caregivers, although in opposition, rely on the mercy of their antagonists. In order to carry out projects, river caregivers must first get approval from river management councils<sup>xxi</sup>, in which both environmental and industrial interests are represented. Since the vast majority of land along rivers is owned by industrial farmers, any “modification” of the river – such as putting in rocks and gravel - must meet their acceptance. Two of the informants, in addition to their other volunteer work, held seats on river management councils. They both reported that their river management councils had become sites for increasing conflicts reflecting a much more heated political debate over defining the purpose of a river; ecology or water diversion. One informant told me this story from his local river management council. A farmer wanted to dig a local stream wider and deeper to increase water diversion, but didn't see this as detrimental to ecological interests. *“There will be more water in the river, which means room for more fish. So what's the problem?”*, he asked the informant. The river, in the farmer's logic, was scalable, and it took the informant quite a while to explain to the farmer why bigger wasn't better ecologically speaking. Another informant told me of a string of tiresome meetings with no compromises in sight. The farmers were opposed to a project to restore sea trout runs with gravel, since it is perceived to lead to a higher water level in the river, increasing the risk of flooding nearby fields. Finally, the informant proposed for the council to hold a meeting by the river, to which the farmers reluctantly agreed. He then showed them the project he had in mind, after which the farmer who owned the land remarked; *“Is that all?”*. In a few minutes the entire council agreed that a few wheelbarrow loads of gravel would hardly change water levels significantly and the project got approved. Such stories of dialogue and

compromise are plentiful, but must also be seen in relation to the strategically modest proposals of the river caregivers. Their dreams for restoring rivers go much beyond gravel and rocks – ideally, they would like to put as many Danish rivers as possible back in their natural state. Such dream projects do come true from time to time, but generally on the municipal level, and not as part of any national environmental strategy.

The key informants, as well as the vast majority of volunteers, are passionate anglers. Whenever I asked an informant about the origins of his engagement in giving care to rivers, the answer I would consistently receive was 'childhood'. It was during childhood, they explained, that fishing adventures became defining in identity formation, as their imaginations were invaded by fish and other creatures living in or near the watery world. In a cultural, non-genetic sense, catching the first fish was a transformative encounter – a violent meeting of species paradoxically creating a lasting bond of affection. This hints that Ingold's (2011) phenomenological concept of *dwelling* would be a useful path to follow in order to explore how ways of life – in the most literal sense of the expression – shape environmental imaginations. However, this is an aspect I will not explore further in this paper. Instead, I propose an alternative path: sea trout genetics. Like our favorite mushroom picker Tsing, genetics are integral components in the environmental imagination of the river caregivers and their projects.

The strategy the Gravel Gang and other such groups have adopted to help sea trout proliferate is not a matter of total consensus within the wider sports fishing community. In the 1970s, coastal sea trout fishing grew in popularity to become the most sought-after species for recreational fishing in Denmark. Due to the massive anthropogenic impact on most rivers, a key environment in the lifecycle of the sea trout was largely destroyed, and stocks were at a historical low. Catching one on rod and reel was a quest for the truly fanatical and many an angler fished for months or even years without ever hooking one. In the past 40 years, three main strategies have been employed by anglers to replenish sea trout stocks. The first was releasing hatchery smolt in huge quantities along the coastline, which helped improve both the quality and the popularity of the fishing quite dramatically. However, there was a problem. Each river has its particular strain of fish, genetically adapted to that particular environment. Furthermore, a wild sea trout knows where it comes from. When the fish reaches sexual maturity, it returns to spawn in the river in which it was born. The early hatchery releases were genetically mixed fish of more or less random origin. They didn't quite know where to go. Rather than swimming up the rivers to spawn, the hatchery trout could be found milling around the locations where they were first released, providing excellent sports-

fishing, but not much else. Many of the trout were also sterile - so called triploids – which would grow to impressive sizes having no other purpose in their lives than eating. Gradually, a second strategy was adopted to accommodate the genetic histories of the fish. By electro-fishing<sup>xxii</sup> the rivers prior to the spawning period, hatchery smolt could be produced by mixing the eggs and sperm of the few wild fish that still returned to the damaged rivers. The fertilized eggs would then be taken to a hatchery. Once the eggs hatched, the smolt would spend the first year of their lives in tanks, feeding on pellets before being released near or in the rivers in which their parents came from. This practice is still widespread today to help boost sea trout stocks, but the preferred strategy of my informants is river restoration. One of the reasons for this is strictly scientific. An ongoing study<sup>xxiii</sup> based on angler participation shows that 80% of sea trout caught in Isefjorden come from the natural production of wild fish, while only 20% are hatchery fish<sup>xxiv</sup>. The natural smolt production of trout in the rivers feeding into Isefjorden (Truelsbæk is one of them) is estimated around 20000 yearly, a number which is boosted by the release of 100000 hatchery smolt yearly. So even though the ratio of wild cp. with hatchery smolt production is 1:5, the catch ratio of wild adult sea trout cp. with hatchery trout is 4:1. Informants explain this striking difference in smolt survivability with reference to the lack of exposure of hatchery smolt to proper nurturing. Spending their first year removed from their natural lifeworlds, growing up in a plastic tank, they fail to learn what it takes to stay alive, and become vulnerable to predation as well as poor predators themselves.

This is where it gets interesting ethnographically and ecologically. The first strategy follows a logic we have already encountered in capitalist modes of production. Sea trout, imagined as self-contained units without genetic histories or ecological connections, could be scaled up to produce instrumental value for satisfying anglers' demand for better catch rates. Today this strategy is no longer employed, but a minority of anglers yearn for the excellent fishing they enjoyed back in the early days of mass-releases. However, for the majority – and certainly for my informants – the strategy is considered completely misguided and often talked about derogatorily as “put and take”<sup>xxv</sup>- fishing. The second strategy – accommodating genetic histories in hatchery raised smolt by electro-fishing wild fish prior to spawning – is still widespread. It has been successful in rebuilding wild sea trout populations in many Danish rivers, almost always in combination with restoring natural habitat and spawning grounds. But besides the local scientific studies (corroborating with studies from many other similar cases) indicating that hatchery smolt mortality is high in spite of wild genetics, the informants had additional motivations for preferring river restoration as their main strategy. In fact, their work has much bigger implications.

Although all the informants come have a passion for sports-fishing, they emphasized repeatedly that their river restoration work had little or nothing to do with ensuring better fishing for themselves and others. In fact, one informant I talked to for several hours failed to mention fish at all. He was too busy talking about herons, kingfishers, elm trees, water ranunculus and all the other species assembling along the rivers he had worked to restore. Another remarked that the quality of the fishing had always been a secondary concern in his restoration work - the environment and the welfare of trout was the primary value. In order to carry out the work he needed anglers to pay for the gravel and other expenses, but he considered them “*a necessary evil*”. When I asked him about the difference between a hatchery trout and a wild one he answered: “*A wild fish is a history – a continuity that is unique. When I have an adult sea trout in my hands I hold a very special synergy...It is a sign of a world that works. So many things have to be okay for it to exist, all the stages in its life cycle. With a hatchery fish, a lot of those stages have been skipped.*” Another informant defined the value of sea trout as follows; “*If wild trout are in the river, everything else is too...A trout indicates the whole [ecology].*”

We are now able to return to the question of what kind of difference the river caregivers make which started this enquiry. In the emic perspective, putting gravel in rivers is to make possible the unfolding of sea trout, and other critters', histories. A wild sea trout carries the history of a functioning eco-system – it depends on others to have become. Attributing history to trout is partly a lesson learned from the practice of smolt releases. That said, the monumental intrinsic value of sea trout was often articulated in contrast to the degradation of nature nationally and globally, and history was attributed not only to trout, but also to rivers which one informant described as “the arteries of the world”, most of which are today clogged up, unable to carry out the vital forces of ecological histories. Making a difference then, goes beyond fish, and includes a world-making activity which, as we have seen, clashes fundamentally with the modern history of anthropogenic impact on Danish landscapes, and must navigate a complex political and social landscape.

In the etic perspective, attributing historical subjectivity to non-human animals brings us back to Anna Tsing and her “arts of noticing”. In Tsing's terminology, we can say sea trout are potential members of an assemblage. However, for species to assemble, they need lifeworlds. This is exactly what the river caregivers are trying to create - restoring a river is to help histories continue. But this is far from the only feature their environmental imagination share with her. Indeed, by following very different routes, Tsing and the river caregivers have arrived at very similar imaginations. One informant, pre-dominantly engaged in environmental politics through the group BDFV, considered



this the most important activity in his life – a chance to “make a difference” through political activism. Although deeply concerned about global environmental destruction, he felt powerless against it: *“On my darkest days, I ask myself the question: ‘was having children the right thing to do?’...In the big perspective, earth will probably rebound, but man may go extinct. If that turns out to be the case, we brought it down upon ourselves. But I feel a certain solace thinking about Earth rebounding. Although it is a poor comfort.”*

Another informant, active in both BDFV and a river restoration group called “Vandstjerne”<sup>xxxvi</sup>, said this: *“Somehow we as a species must learn how to think social relations not only with each other, but with the entire globe. All the tiny ants, the birds, the water – all of it.”* Although none of the informants were familiar with the Anthropocene as a concept, they have all sensed its precarity.

- i Den sjællandske Grusbande.
- ii “Sådan ligger landet – tal om landbruget 2016”, p. 6
- iii I try to avoid using the concept nature for a number of reasons. Raymond Williams (1980), amongst many others, has drawn attention to its immense complexity and multivocality: ”In [the] actual world there is...not much point in counterposing or restating the great abstractions of Man and Nature. We have mixed our labour with the earth, our forces with its forces too deeply to be able to draw back and separate either out. Except that if we mentally draw back, if we go on with the singular abstractions, we are spared the effort of looking, in any active way, at the whole complex of social and natural relationships which is at once our product and our activity.” (Williams, 9:1980)
- Here are just two problems: In the Anthropocene, anthropogenic impact is planetary (climate change being just one example) and there is no nature separate from humanity (Purdy, 2015). Furthermore, nature implies the ”*innate* disposition of things” (O.E.D.), connoting passivity and automatism in opposition to ”culture” implying *acquired* qualities, i.e. history. This structure of a key binary oppositions thus leads us to anthropocentric analysis, limiting our imagination of how the world is made and life works.
- However, in the ethnographical analysis I will use ”nature” as it carries meaning for the informants, and they use it often.
- iv <http://ekstrabladet.dk/nyheder/politik/dansktopolitik/ny-miljoeminister-hylder-opgoer-mod-miljoetyranni/5972994>
- v To avoid confusion, the term assemblage has been used in social theory with a different meaning. It was developed by Deleuze and Guattari in the book “A Thousand Plateaus” (1980), but Tsing’s use is – as mentioned – inspired by biology.
- vi Hawkins, a famous proponent of evolution based on the genes self-containment writes: “We are survival machines – robot vehicles blindly programmed to preserve the selfish molecules known as genes. This is a truth which still fills me with astonishment.” (Hawkins, 4:1989)
- vii Norwegian eco-philosophers Arne Naess and Hjalmar Hegge are prime examples. See for instance ”Menneskets forhold til naturen i historisk og filosofisk perspektiv”, in references.
- viii A famous example is the debate in the 1970s between the biologists E. O. Wilson and Stephen J. Gould about the trajectory of evolutionary development. Wilson claimed it is linear, Gould that it is dialectical. There is a great lecture series from Stanford University online discussing this: <https://www.youtube.com/watch?v=oKNAzl-XN4I>
- ix Geoviden, nr.1, 2007, p.3
- x Geoviden, nr.1, 2007, p.2
- xi ‘In Danish historical accounts, the many amelioration projects are referred to as “Landvindingssagen” - the amelioration cause.
- xii From 1924-26, 1929-1945 and 1947-50.
- xiii Just three decades after the completion of the canalization of Skjern River, it was restored back to its natural shape through the largest habitat reconstruction project in Danish history.
- xiv In addition to the considerable amount of land dedicated to growing fodder domestically, soy imported from Brazil and Argentina takes up the equivalent of 28% of the total Danish agricultural land. (“Sådan ligger landet – tal om landbruget 2016, p.10)
- xv “Sådan ligger landet – tal om landbruget 2016”, p. 37
- xvi Geoviden, nr. 1, 2007, p. 8
- xvii “Sådan ligger landet – tal om naturen 2016”, p. 15
- xviii <http://fishingzealand.dk/grusbanden/indsatsomrader/>
- xix <http://www.fiskepleje.dk/vandloeb/vandloebbsbiologi>

- xx A way too complex dimension to get into in the present paper.
- xxi Vandløbsrådene
- xxii Electro-fishing is not deadly to fish. The fish is momentarily stunned by the power-field of an electrode submerged in the river, but quickly regains consciousness.
- xxiii [http://www.fiskepleje.dk/Nyheder/2016/04/Oerreder-i-isefjorden?id=ed207e4e-82b4-46b4-8ef8-b91ae6b1d235&utm\\_source=newsletter&utm\\_media=mail&utm\\_campaign=](http://www.fiskepleje.dk/Nyheder/2016/04/Oerreder-i-isefjorden?id=ed207e4e-82b4-46b4-8ef8-b91ae6b1d235&utm_source=newsletter&utm_media=mail&utm_campaign=)
- xxiv The study is able to distinguish between wild and hatchery fish because the hatchery smolt prior to release get their adipose fin cut off.
- xxv Put-and-take lakes are regularly stocked lakes where anglers, for a daily fee, can catch non-native rainbow trout of giant proportions. It may be surprising to the outsider (although maybe not to the social scientist), but within the sports-fishing world there are countless subgroups ordered in a kind of hierarchy based on the preferred species and techniques. Fly fishers generally consider themselves to be vastly superior to all other groups, but they can nonetheless agree with spinning gear fishers that put-and-take fishers are the lowest of the low. The basis for that evaluation has to do with the dichotomy artificial:natural. The more natural the fish, the better it is. Put-and-take lakes are stocked with mainly non-native rainbow trout and are thoroughly artificial. The first strategy is thus despised by many for scaling up the logic of the put-and-take lake to the entirety of Denmark's coastal habitats.
- xxvi "The Water Starworts" - an aquatic plant the presence of which indicates excellent ecological conditions.