

# FORUM

University of Edinburgh  
Postgraduate Journal of Culture and the Arts  
Issue 16 | Spring 2013

<b>Title</b>	Molecularising Nature: How Scandinavian Wolves Became Natural
<b>Author</b>	Håkon B. Stokland
<b>Publication</b>	FORUM: University of Edinburgh Postgraduate Journal of Culture and the Arts
<b>Issue Number</b>	16
<b>Issue Date</b>	Spring 2013
<b>Publication Date</b>	05/06/2013
<b>Editors</b>	Laura Chapot & Lizzie Stewart

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# Molecularising Nature: How Scandinavian Wolves Became Natural

**Håkon B. Stokland**

Norwegian University of Science and Technology

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*This paper examines the construction and stabilisation of Scandinavian wolves as natural and worthy of protection. I argue that molecular biology was crucial to this process, and that the most significant work of the molecular biologists was to construct boundaries between pairs of categories, such as natural and unnatural.*

Environmental historian William Cronon has argued that nature is a human construction; not in the sense that the nonhuman world is unreal or exists only in language or minds, but in the sense that “the way we describe and understand that world is so entangled with our own values and assumptions that the two can never be fully separated” (25). The BBC documentary series *Unnatural Histories* (2011) represents one of the more interesting recent explorations in popular media of that which we see as natural, as it examines how the iconic wild places of the Serengeti, Yellowstone National Park, and the Amazon have been shaped by humans over time. Bearing Cronon’s argument in mind, however, the greatest achievement of the series is that it also investigates how these places have come to be viewed as natural and wild in the first place. As the processes of constructing nature often have great impact on the politics concerning both nature and humans, they should be obvious targets for critical examination by scholars from the social sciences and the humanities.

Constructions of nature often require a great deal of work by scientists, and this work usually remains hidden once something has begun to be understood as natural (Asdal 139-172). Anthropologist and historian of science Bruno Latour has argued that scientists are commonly perceived to be able to transcend their values by scientific methods and instruments and access the natural world without mediation (*Politics of Nature* 10-18). It is this view of science, according to Latour, that in large part accounts for the weight given to the natural sciences in political matters. Further, this understanding has left science largely unscrutinised by the social sciences and the humanities, despite the integral role played by the natural sciences in society. However, by showing that values and assumptions are present in scientific research, Latour has argued that scientists too partake in constructions of different natures and what we understand as natural (*Science in Action*). Hence, science should not be excluded from investigations of nature and that which is perceived as natural within the humanities and social sciences. On the contrary, if scientific work has been central to the construction of naturalness as in the case of the Scandinavian wolves, it should itself become the focus of such investigations.

After being more or less absent from Scandinavia for a hundred years, wolves have returned and at present the population counts around 300 animals (Wabakken et al., “Recovery” 6). The new

population of wolves has grown continually in numbers during the last thirty years. These wolves are, however, not the same as the wolves which were living in Scandinavia in the nineteenth century; they are new in many respects, some of which I shall investigate in this paper. For example, no one questioned whether the nineteenth-century wolves were natural or Scandinavian. These categories, and the questioning of them, are properties of the new wolves.

Nikolas Rose has studied the molecularisation of humans from a biopolitical perspective, investigating how the application of molecular biology in medicine has changed the way in which we understand ourselves as humans; that is, how life is now understood and acted upon at the molecular level, and how this process has “so modified each of its objects [such as the brain, the cell, or the human body] that they appear in a new way, with new properties, and new relations and distinctions with other objects” (12). This paper represents a brief exploration into the molecularisation of nature, and how our views and treatment of nature change by the application of molecular biology in nature management. My main argument is that this subdiscipline of the life sciences has played a decisive role in the construction of the new wolves as objects of government, that is, of how we understand and treat them. More specifically, I shall argue that molecular biology has been crucial to the process of stabilising the wolves as new, natural, Scandinavian, and vulnerable. The wolves’ status regarding these categories has been controversial, as the categories have been closely linked to the politics of their protection. Further, I shall argue that the most significant work of the molecular biologists has been to explicitly or implicitly construct boundaries between pairs of categories such as natural and unnatural, an activity which has been possible only through the intertwining of materiality and language, science and politics.

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After being intensively hunted in the mid-nineteenth century, the historical and rather large population of wolves in Norway and Sweden remained at a minimum from the 1860s to the 1960s. By 1969 the population was considered functionally extinct by wildlife biologists, after the last known wolf in Norway, known as Fridtjof, was shot in 1964 (Myrberget 165, 170-172). Wolves were nevertheless established as a protected species in Sweden and Norway by 1971, and in the early 1980s a family group of wolves was discovered right in the middle of the two countries – about 1500km from the nearest population of wolves in Finland and Russia (Ellegren et al. 1662). This group founded what has become the present Scandinavian population (Wabakken et al. 2001 715).

As is the case in most places to which wolves have returned during the last few decades, controversy followed. When the family group was discovered in 1983 in southern Norway, it did not take long before accusations were made that the wolves had been illegally reintroduced from zoos by conservationist organizations, scientists, nature managers and/or politicians generally in favour of conserving nature. The accusations were directed in particular towards conservationist organizations that had investigated the possibilities for reintroducing wolves in the 1970s. As part of these investigations, and in order to enable potential reintroductions, the conservationists had contacted several zoos in Scandinavia for the purpose of establishing breeding stations for wolves. The

conservationists were, however, explicit in their intention to proceed within the constraints of official law and politics (Norderhaug 2-4). Additionally, the historic Scandinavian population was considered extinct, and not even biologists found it plausible at the time that wolves could migrate over 1500km. These accusations soon turned into a question of the wolves' right to remain in Scandinavia: if it could be proved that they had been reintroduced by humans, they would most likely be put to death, as it is illegal to import and release animals without permission; on the other hand, if they were remnants from the former population of wolves, they would receive strict protection. Their lives depended, so to speak, on whether human hands had been involved in their presence in this particular place; on whether they were understood to have arrived naturally, or unnaturally.

It was not until 20 years later, however, that anyone was able to go beyond pure speculation, following scientific advances achieved by the Centre for Evolutionary Biology at the University of Uppsala, Sweden. The centre, specialising in molecular evolution and evolutionary genomics, had developed methods for analysing the genetic history of different animals such as birds and horses. By bringing in to their laboratory hair, body tissue, feces, and teeth from present and historic Scandinavian wolves, and additionally from wolves in zoos and in Finland and Russia, the geneticists could investigate the past of the new wolves in Scandinavia. They proved conclusively that the wolves had not been reintroduced from zoos (Sundqvist 1964). They also established that the wolves were not survivors from the historic Scandinavian population, but that they originated from the population in Finland and Russia (Flagstad et al. 878; Vila et al. 93-94). This meant that the most powerful accusation was disproved. However, it was still fully possible that the wolves had been reintroduced from Finland or Russia by humans (Linnell 384).

In order to establish such a history of the wolves, the geneticists had to construct new boundaries. Even though there are but minuscule variations in the genetic material of the four groups of wolves involved in the analysis – present Scandinavian, historic Scandinavian, Finno-Russian, and captives in zoos – the molecular biologists were able to draw demarcations between them, and place each wolf in one group, based on tiny physical fragments. Though the line between the zoo wolves and the present Scandinavian ones was definite, the differences between the other three groups were continuous. The latter is not surprising, as there have been migrations – and therefore gene exchanges – between the Scandinavian and the Finno-Russian populations over the centuries. The molecular biologists were nevertheless able to distinguish between the two historic populations, and determine that the present Scandinavian population was based on wolves from the Finno-Russian one. And even though the current Scandinavian population was formed only twenty years earlier by two wolves from Finland/Russia, the geneticists concluded that it constituted a separate population. By constructing new boundaries, the geneticists in Uppsala had in large part disproved the accusations claiming that the wolves had been reintroduced. And even though the accusations of reintroduction could not be completely disproved, the wolves were now accepted by most – and importantly by those in nature management and politics – as natural. In addition, the genetic analysis and construction of boundaries between different wolf populations identified the wolves neither as survivors of the

historic population in Scandinavia nor as part of the current Finno-Russian one, but rather as a new Scandinavian population.

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The naturalness of the new wolves has, however, been questioned in yet another and even more fundamental way. Since the wolves reappeared in the early 1980s, claims have been made by people who oppose their preservation that the wolves, or at least some of them, were hybrids: either wolves and dogs had been deliberately hybridised and let out, or wolf bitches had mated with dogs and delivered hybridised cubs (Vila et al. 94). In this case, it was not merely a link to humans that potentially made the wolves unnatural; it was the existence of domesticated genes at the very core of their being. The claims of hybridisation could not, however, be proved or disproved until the technology and knowledge of molecular biology was made available: certain dog races are very similar to wolves, and the variations between wolves both in size and fur makes it impossible to definitively separate hybrid from pure wolf based on appearance. So the claims did not receive much attention within politics or nature management, until a family group of wolves was reported by a biologist as having suspicious behavior and appearance. One of the cubs was later observed playing with a dog in a number of domestic gardens, and it did not take long before the family group had become famous through national news media (“Vanskelig”; “Radiometerket”). The deputy managing director of the Norwegian Directorate for Nature Management called the scenario of hybrid wolves a faunal catastrophe, and announced that they would be put to death immediately if this was the case (“Hybrider” 7). For once, people who favoured preservation of the wolf population and feared for the pureness and naturalness of it, and people who opposed preservation and wanted to get rid of the animals whatever they were, were in agreement. Some of the members of the family group were anaesthetized and radio collars attached to them, in case they might wander off before genetic analyses could be undertaken.

However, the genetic differences between wolves and dogs are not necessarily more easily distinguishable than physical traits: dogs are descended from wolves, and have been treated as a subspecies of wolves since 1993.<sup>1</sup> Their genetic materials have much in common, and where the wolf ends and the dog begins is unclear. Once again it was required of the geneticists to draw a defining line through a continuum of variations. At first the geneticists were sceptical, and questioned whether it would be possible to genetically differentiate between wolf and hybrid. Only reluctantly did they accept the task of determining what these animals were, a task that involved establishing whether the wolves were to be considered natural or unnatural, and whether they should be allowed to live or be put to death. In this case the molecular biologists in Uppsala refused to draw a definitive line, but based on body tissue from one of the cubs found it highly probable that they were in fact hybrids (“Dødsdom”). The conclusions of their report were convincing enough for the Norwegian Directorate for Nature Management, which effected a hunt for the cubs within days. Two were shot within the next two months, but the two remaining cubs were never found. Strong evidence suggested, however, that they were killed illegally by unauthorized hunters (“Ulvehybrid”). The wolves that were

considered unnatural were thus removed from the Scandinavian population, and this left the status of the remaining wolves even more natural and pure: firstly by being defined as natural in opposition to the hybrids, and secondly as they had been rescued from the domesticated genes.

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Ever since the family group from 1983 started to grow in numbers, nature managers and people arguing for their preservation had cautioned that they might suffer from inbreeding. But until body tissues from the wolves were brought into the laboratory in Uppsala, it was not possible to know this for certain, as the wolves had few visible degenerative signs of inbreeding. After processing the materials in the laboratory, however, the geneticists concluded that the population of more than one hundred had originated from only three wolves: the founding pair and one other immigrant from Finland that joined the group in the early 1990s (Vila et al. 93-95). This insight was achieved by generating genetic profiles for the wolves from which the scientists had been able to gather tissue samples, which constituted most of the wolves in the population, and inducing profiles for the rest. In this process the relationship between most of the wolves was mapped, and not much later an almost complete pedigree of the population was produced.

The pedigree made it possible to calculate a so-called coefficient of inbreeding; that is, a measure of how inbred the wolves were, based on the probability of an offspring inheriting the same gene from both parents (Liberg et al. 1-3). But even though the molecular biologists had developed methods to measure inbreeding, drawing a line between healthy and inbred wolves was a very different matter, and remained obscure. However, the analysis showed that the Scandinavian wolves were more closely related than siblings. The rhetoric of this knowledge, which has become sort of a slogan for many people who argue for their preservation, proved powerful enough to stabilise an understanding of the wolves as being vulnerable. The vulnerability of the wolves has later had a major influence on the politics towards them. Immigrants from the Finno-Russian population, for example, have received stricter protection than Scandinavian wolves because of their potential to reduce inbreeding. It has also become the main argument used by conservationists in defending the current size of the population and insisting that it should be allowed to grow.

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In conclusion, the molecular knowledge and technology produced by scientists from the Centre for Evolutionary Biology at the University of Uppsala have contributed strongly to a transformation of the perception and treatment of wolves in Scandinavia. From being veiled in uncertainty and so difficult to manage, the wolves are now understood and treated as a stabilised construction: the new Scandinavian wolves. They are accepted in politics and nature management as natural, Scandinavian, vulnerable, and therefore worthy of protection. This does not mean that politics and management always favours the wolves; in fact, many people advocating their preservation would argue that the wolves are treated so carelessly that their survival is at risk. Additionally, the stability of this construction does not go beyond the complex of politics and management; it is generally not accepted

by people who oppose the preservation of the wolves, many of which still argue that the wolves have been illegally reintroduced, that they are not Scandinavian and that they are not vulnerable. However, the fundamental politics of protecting the wolves is at present non-negotiable, and this is in no small part due to what might be called the molecularisation of the wolves.

As we have seen, however, this molecularisation consisted not only in making the tiny fragments of wolf bodies reveal secrets about the animals' past and present; it also involved classifying wolves according to binary categories such as natural and unnatural. These categories were not found in the genes of the wolves, and they were not invented by the molecular biologists. They were products of a heated controversy that the scientists were hired to resolve. The molecular biologists were, however, not always able or willing to draw boundaries between these categories. Their findings were nevertheless used to fortify the categories and boundaries that were expected to exist, and only in this way could their work stabilise understandings of the wolves in Scandinavia as safely within the categories of natural, Scandinavian, vulnerable, and worthy of protection. In this respect, it was through the intertwining of molecular biology and politics that the wolves' inner molecular structure was made decisive for how we understand and treat them.

## Notes

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1. Though the taxonomic relationship between dogs and wolves is still subject to contention, the general trend since 1993 has been to include dogs (*familiaris*) within *Canis lupus* as the subspecies *Canis lupus familiaris* (Nowak 257).

## Works Cited

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- Asdal, Kristin. *Politikkens natur – naturens politikk*. Oslo: Universitetsforlaget, 2011. Print.
- Cronon, William ed. *Uncommon Ground: Rethinking the Human Place in Nature*. New York: W. W. Northon, 1996. Print.
- “Dødsdom uten sikkert bevis.” *Norsk telegrambyrå* 29 Jan. 2000. Print.
- Ellegren, Hans et al. “The Genetical History of an Isolated Population of the Endangered Gray Wolf *Canis Lupus*: A Study of Nuclear and Mitochondrial Polymorphisms.” *Philosophical Transactions of the Royal Society: Biological Sciences* 351 (1996): 1661-1669. Print.
- Flagstad, Øystein et al. “Two Centuries of the Scandinavian Wolf Population: Patterns of Genetic Variability and Migration during an Era of Dramatic Decline.” *Molecular Biology* 12 (2003): 869-880. Print.
- “Hybrider skal avlives.” *Aftenposten Aften* 29 Oct. 1999. Print.
- Latour, Bruno. *Science in Action: How to Follow Scientists and Engineers through Society*. Milton Keynes: Open University Press, 1987. Print.
- . *Politics of Nature: How to Bring the Sciences into Democracy*. Cambridge, Mass.: Harvard University Press, 2004. Print.
- Liberg, Olof et al. “Severe Inbreeding Depression in a Wild Wolf (*Canis Lupus*) Population.” *Biology Letters of the Royal Society of London* 1 (2005): 17-20. Print.
- Linnell, John D. C. et al. “The Origins of the Southern Scandinavian Wolf *Canis Lupus* Population: Potential for Natural Immigration in Relation to Dispersal Distances, Geography and Baltic Ice.” *Wildlife Biology* 11 (2005): 383-391. Print.
- Myrberget, Svein. “Ulvens status i Fennoskandia.” *Naturen* 93 (1969): 160-172. Print.
- Norderhaug, Magnar. *Vern av ulven i Norden*. Report to WWF Norway and Norges Naturvernforbund. Stockholm, 1973. Print.
- Nowak, Ronald N. “Wolf Evolution and Taxonomy.” *Wolves: Behaviour, Ecology, and Conservation*. Ed. David L. Mech and Luigi Boitani. Chicago: University of Chicago Press, 2003. 239-258. Print.
- “Radiometerket ulv i hage på Nesodden.” *Norsk telegrambyrå* 25 Jan. 2000. Print.
- Rose, Nikolas. *The Politics of Life Itself: Biomedicine, Power, and Subjectivity in the Twenty-First Century*. Princeton, N. J.: Princeton University Press, 2007. Print.

Sundqvist, Anna-Karin, et al. "Y Chromosome Haplotyping in Scandinavian Wolves (*Canis Lupus*) Based on Microsatellite Markers." *Molecular Ecology* 10 (2001): 1959-1966. Print.

"Ulvehybrid er trolig ulovlig drept." *Aftenposten Morgen* 7 Apr. 2000. Print.

*Unnatural Histories*. Dir. Andrew Murray et al. BBC 2011. TV Series.

"Vanskelig farskapssak i Østfolds skoger." *Norsk telegrambyrå* 28 Oct. 1999. Print.

Vila, Charles et al. "Rescue of a Severely Bottlenecked Wolf (*Canis Lupus*) Population by a Single Immigrant." *Proceedings of the Royal Society of London B* 270 (2003): 91-97. Print.

Wabakken, Petter, et al. "The Recovery, Distribution, and Population Dynamics of Wolves on the Scandinavian Peninsula, 1978-1998." *Canadian Journal of Zoology* 79 (2001): 710-725. Print.

---. *The Wolf in Scandinavia and Finland: Final Report from Wolf Monitoring in the 2011-2012 Winter*. Elverum: Høyskolen i Hedmark, 2012. Print.

### **Author Biography**

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Håkon B. Stokland is currently a PhD student at the Norwegian University of Science and Technology. His thesis will investigate the research and management of wolves in Norway since the 1960s. The project is situated at the intersection of science and technology studies, environmental history, history of science, and policy history.