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Wanted and unwanted nature: Invasive plants and the alien–native dichotomy

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Abstract

This thesis explores how plants are perceived and categorised as alien, invasive and native respectively at individual, professional, and political levels. The thesis demonstrates how perceptions of and interactions with plants happen in ways that do not always correspond to the environmental authorities definitions of alienness and nativeness. As alienness and nativeness are concepts that are spatiotemporal in character, the labelling of plants as alien or native often involve value-laden discussions over belonging, as well as demarcations of wanted from unwanted nature. The questions this thesis seeks to address, in essence, are the following; how are alienness, invasiveness and nativeness perceived and expressed at individual, professional, and political levels? And, how is the categorisation of invasive alien species, as applied by the environmental management sector, perceived at individual and professional levels?

Empirically, the thesis is based on two qualitative case studies: (1) a study of individual domestic gardeners in selected locations in the county of Oppland, Norway; and (2) a study of professionals, namely planners, landscape architects and environmentalists, and their disagreements over what plants to categorise as alien or native at the time when the former airport of Fornebu, in Oslo, was developed into a site for recreation, housing, and business. Both studies were researched through talking–whilst–walking interviews which allowed investigation of how categorisations and perceptions of species related to interactions with plants. The level of international and national environmental politics and management, where official definitions of alienness, nativeness and invasiveness are formulated, was investigated through a literature review serving as a crucial context for the two qualitative studies.

Analytically, the thesis rests on a combination of different theoretical perspectives that enable an investigation of alienness, nativeness and invasiveness at individual, professional, and political levels. At the individual level, Ingold's (2000) notion of dwelling as a mode of being-in-the-world has been combined with insights from more-than-human geography (for example Wolch & Emel 1998; Whatmore 1999; Matless 2000; Philo & Wilbert 2000; Jones & Cloke 2002; Whatmore 2002, 2003; Cloke & Jones 2004; Whatmore 2006), and in particular studies of human-plant relationships which focus on social agency as both a human and a non-human capacity (see for example Head & Atchison 2009). In this thesis, human-

plant relationships in domestic gardens have been studied to illuminate how domestic gardeners' embodied experiences with plants correspond to the terminology and policies on alien, invasive species applied by the environmental management sector. At the professionals' level, I am inspired by the intellectual historian Quentin Skinner's (2002) perspective of concepts as speech acts, in order to investigate how the landscape architects, planners and environmentalists at Fornebu perceived and related to plants as well as the concepts alienness, nativeness and invasiveness.

One refereed book chapter and two peer-reviewed journal papers have been written based in the empirical investigations. The first paper (paper 1) investigates how alienness, nativeness and invasiveness are practiced in domestic gardens in Oppland. The concepts alien and native as applied by environmental authorities did not correspond to the gardeners' embodied experiences with plants. Most of the gardeners in the Oppland study were aware of the environmental authorities' warnings about alien species, but still did not necessarily associate the concept of alien with something negative. The domestic garden can be compared to a private laboratory, where gardeners feel autonomous and in control when experimenting with invasive or climatically unsuited plants. However, as the negative focus on invasive alien species is increasing in scientific, political, and public arenas, the perception of alien species as unwanted has emerged in the context of gardens. The Oppland study revealed that gardeners changed their behaviour and attitudes when they recognised certain species as problematic to control, i.e. they are invasive. As domestic gardens are products of both nature and culture, and are largely controlled environments in the semi–private domain, the gardeners' perspectives and experiences have largely been overlooked in Norwegian environmental policy–making. It is however a well-studied fact that domestic gardens can severely affect the composition of biodiversity through alien species spreads (see for example Fremstad & Elven 1997a; Zagorski et al. 2004; Dehnen-Schmutz et al. 2007). Consequently, it is important to be aware of how alienness, nativeness and invasiveness work in domestic gardens in order to improve communication between environmental authorities and garden owners.

In the Fornebu study, Skinner (2002) enabled an investigation of how concepts were used as rhetorical tools in the conflict at Fornebu. The conflicting groups of professionals (i.e. planners and landscape architects versus the environmentalists) agreed on how the former airport at Fornebu was to be developed according to the approved landscape plans, but

disagreed over which plants should be termed alien or native. Paper 2 discusses whether the planting of alien species at Fornebu can be termed environmental criminality. While the alien plantings at Fornebu did not classify as an environmental crime at the time (in 2007), the Fornebu case raises questions related to what type of environmental problem the introductions of invasive, alien plant species represent and how such plantings should be categorized judicially and morally.

While the value-based aspects of alienness and nativeness are debated in academic literature, less focus has been centred on the closely related concepts of 'black listed' and 'red listed' species. Through the Fornebu study, paper 3 raises concern over how not only alienness and nativeness but also red lists and black lists were used rhetorically by interest groups to argue for an ideal nature at Fornebu. Paper 3 demonstrates that the black listing of alien species and red listing of endangered species are management tools which are founded on value-laden and constructed temporal thresholds (i.e. the year 1800) which largely implies idealising and 'freezing' past nature conditions serving as a measuring-stick for the future. The conflict at Fornebu with landscape architects and planners on the one side and environmentalists on the other demonstrates how labels such as alienness, nativeness, black listed and red listed contribute to ascribe species a particular status as wanted or unwanted. The different opinions about what counts as wanted and unwanted nature across scientific disciplines such as ecology and landscape architecture is a serious challenge if environmental authorities wish to succeed in halting the spread of alien, invasive species. In sum, the Fornebu study demonstrates that nativeness and alienness, as well as black lists and red lists, may be used as rhetorical tools to strengthen the positions and actions of different groups. It is therefore important to pay attention to the intentions of utterances (as argued by Skinner 2002), and to realise that red lists and black lists are not merely objective tools for policymakers, but can be used rhetorically in ways that may influence the actual composition of biological diversity as well as actual planning and management.

Reflections over nature–culture relationships in human geography (for example Fitzsimmons 1989; Cronon 1995; Braun & Castree 1998; Coates 1998; Castree & Braun 2001; Whatmore 2002; Castree 2003) have stimulated a critical questioning of the rigid alien-native dichotomy in this thesis. This thesis demonstrates that the myriad ways that humans and plants interact in social, cultural, and historical contexts are of importance to how categorisations of alienness and nativeness are expressed and perceived. In environmental

politics, humans are clearly part of the solution as well as the problem associated with invasive alien species spreads. As alien species policies and legal frameworks are currently in the making in Norway, there is still an open question how legal regulations of species introductions will be formulated as well as what social, cultural, economic and ecologic implications such regulations will have. The thesis contributes to the general societal debate on the management of species by demonstrating that alienness and nativeness are not 'objective' scientific categories, but rather ambiguous concepts influencing the shifting and contingent status of species as wanted or unwanted. Moreover, the thesis brings a social science contribution from the discipline of human geography to a debate largely dominated by natural science. Empirically, the thesis provides qualitative cases from Norway, which is a country where little prior research has been undertaken from a social science perspective. In particular questions concerning how domestic gardeners relate to their plants have been largely ignored by Norwegian environmental authorities.

Within the scientific discipline of geography the thesis adds to the more-than-human debate where studies on human-animal relationships have dominated, with two empirical case studies of human-plant interactions. Theoretically, the thesis further contributes by combining perspectives related to dwelling and more-than-human geography with Skinner's linguistic focus on what can be done with discursive categories and the associated material consequences. On a more general level the thesis can be considered as a contribution to fundamental societal and academic debates regarding what nature is and should be, and moreover, a reminder that such debates are permeated with values that have implications for our green environments as well as the composition of biodiversity.

Sammendrag

Avhandlingen undersøker hvordan planter oppfattes og kategoriseres på personlig, profesjonelt og politisk nivå som henholdsvis fremmede, stedegne eller invaderende. Oppfatninger og kategorisering av planter er mangfoldige og stemmer ikke nødvendigvis med definisjoner og vurderinger som miljøforvaltningen bruker når det gjelder fremmede og stedegne arter. Hva som er fremmed og hva som er stedegent må relateres til et gitt sted og tidspunkt for å gi mening. Diskusjoner knyttet til hva som er fremmed og hva som er stedegent åpner for verdidebatter om tilhørighet og spørsmål rundt hva som er ønsket eller uønsket natur. Avhandlingen stiller følgende overordnede spørsmål; Hvordan oppfattes og uttrykkes fremmedhet, stedegenhet og invaderende egenskaper hos planter på henholdsvis personlig, profesjonelt og politisk nivå? Og hvordan oppfattes miljøforvaltningen sine definisjoner av fremmedhet og stedegenhet på personlig og profesjonelt nivå?

Avhandlingen er basert på to kvalitative case-studier: (1) en studie på 'personlig nivå' av hageeiere og deres hager i ulike lokaliteter i Oppland fylke, og (2) en studie av 'profesjonelle' aktører, det vil si planleggere, landskapsarkitekter og miljøvernere i en konflikt rundt hvilke planter som kunne kalles fremmede og stedegne i forbindelse med etterbruken av den nedlagte flyplassen på Fornebu utenfor Oslo. Konflikten foregikk i perioden hvor det tidligere flyplassområdet ble gjenoppbygget som rekreasjonsområde og som areal for boligbygging og bedriftsetablering. I begge studiene ble intervjuer foretatt utendørs og til fots siden dette åpner for samrefleksjon rundt hvordan planter oppfattes og kategoriseres som del av sosialt situerte praksiser. Det politiske nivået, der internasjonale og nasjonale retningslinjer utformes, ble undersøkt gjennom en litteraturstudie av relevante dokumenter som representerer en viktig kontekst for de to empiriske studiene.

Avhandlingens analytiske rammeverk kombinerer ulike teoretiske perspektiver som har gjort det mulig å studere både situerte erfaringer på individnivået og diskursive kategorier på profesjonelt og politisk nivå. For å nærme meg den erfaringsbaserte kunnskapen til hageeierne, kombineres Ingolds (2000) perspektiv om væren-i-verden ('dwelling') med analytiske perspektiver fra 'more-than-human geography' (for eksempel Wolch & Emel 1998; Whatmore 1999; Matless 2000; Philo & Wilbert 2000; Jones & Cloke 2002; Whatmore 2002, 2003; Cloke & Jones 2004; Whatmore 2006). Et sentralt moment innenfor more-than-human geography er at sosiale fenomener ikke kun oppfattes som menneskelige produkter, men som

formet gjennom samspillet mellom mennesker og 'ikke-mennesker' (Head & Atchison 2009). I avhandlingen har jeg studert relasjoner mellom mennesker og planter for å kunne undersøke i hvilken grad miljømyndighetenes definisjoner og bruk av begrepene fremmed og stedegen finner gjenklang i hageeieres erfaringer med og oppfatninger. Videre, på det profesjonelle nivået brukes idehistorikeren Quentin Skinner (2002) sitt perspektiv på begreper som aktive talehandlinger, som inspirasjonskilde for å undersøke hvordan landskapsarkitekter, planleggere og miljøvernere under utbyggingen av Fornebu oppfattet og forholdt seg til begrepene fremmed, stedegen og invaderende egenskaper i planter.

Det empiriske arbeidet har resultert i et fagfellevurdert bokkapittel og to fagfellevurderte vitenskapelige artikler. Den første artikkelen (paper 1) i avhandlingen handler om hvordan begrepene fremmed og stedegen 'praktiseres' i private hager i Oppland, eller med andre ord, hvordan hageeiere forholder seg til, erfarer og beskriver plantene sine. Definisjonene av fremmed og stedegen slik de er gitt av miljøforvaltningen samsvarte i liten grad med hvordan hageeierne oppfattet og forholdt seg til plantene i hagen. De fleste hageeierne i Oppland- studien kjente til myndighetenes advarsler mot invaderende fremmede arter, men oppfattet allikevel ikke begrepet fremmed som noe negativt. Den private hagen kan sammenliknes med et laboratorium hvor hageeierne har kontroll og kan eksperimentere med invaderende eller lite hardføre planter. Oppfatninger av begrepet fremmed ser imidlertid ut til å være i endring, siden det sterke negative fokuset på invaderende fremmede planter fra vitenskapelig og politisk hold og i mediene bidrar til at flere planter oppfattes som uønskede i hagesammenheng. Oppland- studien viste at hageeierne endret oppfatninger og praksis når de opplevde at planter tok overhånd og ble vanskelige å kontrollere. Siden hager er både natur- og kulturprodukter som i all hovedsak befinner seg innenfor den private sfære, har hageeieres erfaringer og oppfatninger i stor grad vært oversett i norsk miljøforvaltning. Det er imidlertid et velkjent faktum at hager kan påvirke det biologiske mangfoldet gjennom spredningen av fremmede arter (se for eksempel Fremstad & Elven 1997a; Zagorski et al. 2004; Dehnen-Schmutz et al. 2007). Det er viktig å være bevisst på hvordan begreper som fremmed og stedegen oppfattes i settinger som tradisjonelt har vært oversett i miljøforvaltningen for å kunne bedre kommunikasjonen med hageeierne om skadevirkninger ulike invaderende fremmede arter kan ha.

I forbindelse med Fornebu-studien fungerte Skinners perspektiv på språk som talehandlinger som analytisk verktøy. Studien fokuserte på hvordan begreper som stedegen,

fremmed og invaderende art ble brukt retorisk i konflikten på Fornebu. De to gruppene (planleggere og landskapsarkitekter på den ene siden og miljøvernere på den andre) var enige om hvordan Fornebu skulle se ut på papiret i de offisielle plandokumentene, men var i praksis uenige om hvilke planter som kunne kategoriseres som fremmede og stedegne. Den andre artikkelen i avhandlingen (paper 2) viser hvordan de to gruppene oppfattet begrepene fremmed og stedegen svært ulikt. Videre viser artikkelen hvordan juridiske og verdibaserte standarder ble knyttet opp mot begrepene fremmed og stedegen gjennom en debatt om miljøkriminalitet. Plantingen av fremmede arter på Fornebu kunne i lys av datidens regelverk ikke regnes som miljøkriminalitet, men Fornebu som case belyser introduksjon av invaderende fremmede arter som miljøproblem og reiser etiske og juridiske spørsmål rundt dette.

Mens verdidebatter knyttet til fremmede og stedegne arter er tema for debatt innenfor både samfunnsvitenskapelig og naturvitenskapelig litteratur, har det vært mindre fokus på de nært beslektede begrepene 'svartelistet' og 'rødlistet' art. Med utgangspunkt i Fornebu casen belyser den tredje artikkelen (paper 3) i avhandlingen hvordan fremmed, stedegen, og også rødlister og svartelister, ble brukt retorisk av interessegrupper for å promotere hva som var den ideelle Fornebu-naturen. Artikkel 3 tar videre for seg det diffuse og verdiladede tidsperspektivet som ligger implisitt i det at arter settes på svarteliste for invaderende fremmede arter eller rødliste for truede arter. Svartelisting og rødlisting av arter bygger på et statisk natursyn der visse tilstander i naturen 'fryses i tid' og idealiseres. Fornebu-konflikten illustrerer hvordan merkelapper som fremmed, stedegen, svartelistet eller rødlistet er med på å gi både plantene og bruken av dem status som ønsket eller uønsket. Ulike oppfatninger innenfor ulike fagdisipliner som landskapsarkitektur og økologi rundt hva som er ønsket og uønsket natur skaper utfordringer i kampen mot spredning av invaderende fremmede arter. Kort oppsummert demonstrerer Fornebu-studien hvordan fremmed og stedegen er begreper som kan brukes retorisk for å fremme ulike typer argumenter og ulike typer natur. Det er derfor viktig å fokusere på hvilke intensjoner som ligger i begrepsbruken (i tråd med Skinner 2002). Videre er et sentralt poeng at svartelister og rødlister ikke er objektive forvaltningsredskaper, men at disse er bygget på implisitte verdivurderinger, og at bruken av dem kan påvirke sammensetningen av biologisk mangfold så vel som landskapsplanlegging og forvaltning.

Teoretiske betraktninger innenfor geografifaget knyttet til natur-kultur relasjoner har bidratt til nyansering av begrepsparet fremmed-stedegen i avhandlingen (for eksempel Fitzsimmons 1989; Cronon 1995; Braun & Castree 1998; Coates 1998; Castree & Braun 2001; Whatmore 2002; Castree 2003). Dette begrepsparet fremstilles gjerne som rigid motsetning eller dikotomi der de fremmede artene assosieres med uønsket menneskelig påvirkning på det såkalt naturlige. Avhandlingen viser at de mangefasetterte måtene mennesker og planter samhandler på i ulike sosiale, kulturelle og historiske kontekster henger sammen med hvordan begrepene fremmed og stedegen praktiseres og oppfattes. I miljøpolitikken er mennesker både en del av løsningen og en del av problemet med hensyn til spredningen av invaderende fremmede arter. Politikkutformingen på dette feltet er fremdeles i støpeskjeen i Norge og det er et åpent spørsmål hvordan det juridiske rammeverket rundt introduksjon av fremmede arter vil utformes samt hvilke sosiale, kulturelle, økonomiske og økologiske konsekvenser de nye reglene vil få. Mot dette bakteppet er avhandlingen et innspill i en generell debatt om forvaltningen av arter og natur gjennom å påpeke at fremmed og stedegen ikke er objektive vitenskapelige kategorier, men diffuse begreper som påvirker hva som til enhver tid oppfattes som ønsket eller uønsket natur. Videre er avhandlingen et samfunnsvitenskapelig og geografisk bidrag til en slik debatt som i stor grad har vært dominert av naturvitenskap. Empirisk bidrar avhandlingen med to norske, kvalitative studier til et felt der lite har vært gjort i norsk sammenheng fra samfunnsvitenskapelig hold. I Norge har miljømyndighetene i stor grad oversett problemstillinger knyttet til hvordan ulike grupper forholder seg til hageplanter og begreper som fremmed og stedegen. Det har vist seg å være en utfordring for norske miljømyndigheter å nå fram til hageeiere med sitt budskap om hvilken trussel invaderende, fremmede hageplanter kan utgjøre. I lys av dette bidrar avhandlingen med nyttig kunnskap om hvordan hageeiere forholder seg til planter og til begreper som fremmed og stedegen. Denne kunnskapen kan være et bidrag til å lage bedre og mer målrettede informasjonskampanjer myntet på hageeiere.

Teoretisk bidrar avhandlingen inn i den geografiske debatten rundt forhold mellom mennesker og natur ved å fokusere på planter, der dyr tradisjonelt har fått størst vitenskapelig oppmerksomhet. Nyere studier som kategoriseres under paraplybegrepet more-than-human geography fokuserer på dynamiske og gjensidige relasjoner mellom mennesker og planter, og det er innenfor dette feltet at avhandlingen kommer med sitt bidrag. Analytisk kombinerer avhandlingen perspektiver innen for dwelling, more-than-human geography og Skinner sin mer lingvistiske fokus på hva som kan gjøres med diskursive kategorier og hvilke materielle

konsekvenser dette har. På et mer generelt plan kan avhandlingen ses på som et bidrag til grunnleggende samfunnsmessige og akademiske debatter rundt hva natur er og burde være, og ikke minst som en påminnelse om at disse debattene er verdidebatter som har materielle konsekvenser for de grønne miljøene som omgir oss og for selve sammensetningen av det biologiske mangfoldet.

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PART 1

1. Introduction

Fig. 1: Garden lupins (*Lupinus polyphyllus*) (Photo: Anders Often, Norwegian Institute for Nature Research, 2010).

I have a childhood memory of a hot summer day when I walked barefoot together with my grandmother in her garden picking flowers with which to decorate the dinner table. I remember in particular the flowerbed with tall, slender garden lupins that were glowing in

their colourful splendour: bright blue, purple, pink, and yellow. When placed in a large crystal vase at the centre of the table they brought the smell of summer into my grandmother's shady living room. Until recently, I have imagined garden lupins as plants that have 'always' been a natural part of gardens and decorative elements along railway tracks and roadsides in Norway. I was therefore surprised and saddened when I realised that the lupin of my childhood had ended up on a list of unwanted species, namely the 2007 as well as the 2012 Norwegian Black Lists (Gederaas et al. 2007; Gederaas et al. 2012). Recently, through a regulation of the 2009 Norwegian Nature Diversity Act, the Norwegian Directorate for Nature Management has suggested prohibiting sales and introductions of garden lupins and other species which are now cast as invasive alien species. The lupin is thus not such a natural part of Norwegian flora as I had imagined. It was introduced in the 1830s as an ornamental garden plant from North–America (Elven & Fremstad 2000), and has since been spread throughout Norway, not least by the Directorate of Public Roads, due to its nitrogen–fixing qualities which stabilise roadside soils following construction work (Fremstad 2010). According to Fremstad (2010) the garden lupin alters the nutrient content of soils and may out–compete other native species, and is thereby termed an invasive alien species. The history of the garden lupin turning into an invasive alien species illustrates larger on-going nature–culture debates that are discussed in this thesis through a focus on plants and the categorisation of them into wanted and unwanted forms of nature. The categorisation of the garden lupin as an invasive alien species affected my own understanding of the plant. From being a beautiful summer plant in my childhood memories it has become problematic and a plant I have decided to avoid in my own garden. This has led me to reflect on questions like what is really at stake for the environmental authorities and what are we debating when we determine whether plants or species in general are categorised as either alien or native? Moreover, why do such categorisations matter? In essence, the thesis focuses on how categorisations of species as invasive alien or native relate to perceptions of plants, and consequently, the associated practical and political implications of categorising species as wanted or unwanted.

Although it is easy to identify that species like the garden lupins spread in an invasive manner and dominate wide areas, it is difficult to *observe* their alienness or nativeness. Scholars from both natural and social sciences agree that alienness and nativeness are not inherent qualities of any species (Warren 2007; Preston 2009). Thus, while invasiveness *is* an actual quality of a given species regardless of its status as alien and native, alienness and nativeness should rather be seen as temporally and spatially dependent characteristics, hence

involving cultural and social projections onto the natural world. Temporally, highly ambiguous thresholds are drawn between the time before and after 'nature was natural' (Warren 2007; Chew & Hamilton 2011), as alien species are associated with human–assisted spread to areas they could not otherwise have reached on their own. This has spatial consequences when boundaries are drawn between what is seen as the place of origin of a species and locations into which that species later are spread. The spatiotemporally contingent nature of these categorisations has thus rendered alienness and nativeness ambiguous and subject to contestation and controversy across scientific disciplines as well as within professions like for example landscape architecture. These issues are explored in this thesis.

It is important to underline that the primary focus in this thesis is the study of practices, categorisations, and perceptions related to alienness. Consequently, I focus on nativeness as categorised in a dichotomous relationship with alienness. Accordingly, nativeness is discussed as a contrast to alienness and I have chosen not to research aspects related to nativeness detached from alienness. Moreover, invasiveness is discussed as an attribute of species, and as a characteristic that has placed the alien species phenomenon on the political environmental agenda. Politically, the focus on alien species is steered by a precautionary approach, and consequently alien species that are invasive or potentially invasive are kept under scrutiny (see for example Gederaas et al. 2007; Gederaas et al. 2012). Invasiveness is thus addressed as both a species attribute and as a 'management tool' when combined with the term alien.

1.1. Ambiguous categorisations and the alien–native dichotomy

There are two issues in particular that surface as concerns related to alienness and nativeness as ambiguous concepts. First, the definitions of 'invasive alien' and 'native' applied in environmental policies and management measures are spatially based and in large measure lack a temporal axis of belonging. The influential 1992 Convention on Biological Diversity (CBD) defines an *alien* species as one that has been moved by the help of humans to an area outside its natural range and has managed to establish and reproduce in this location. Moreover, invasive alien species are those that threaten biodiversity (CBD n.d.). Alien species and invasive alien species are commonly contrasted to *native* species, which are species defined by the International Union for Conservation of Nature (IUCN) as 'occurring within its natural range (past or present)' (IUCN Council 2000:4). This spatially based 'native–alien dichotomy' implies a nationalisation of biodiversity and a parallel dismissal of 'non–national'

alien species which has gained considerable foothold through the CBD as Parties to the Convention are obliged to implement Article 8h and thereby take national measures to prevent, control, and eradicate all species categorised as alien. Deciding on a temporal threshold for species belonging is, however, largely the responsibility of national authorities and scientists.

Second, the definitions of alien and native give importance to the manners in which species have been spread; species dispersed by the help of humans are categorised as alien, whereas species that spread naturally are seen as native. The issues of spatiality and temporality and the manners of spread emanate from concerns mainly voiced from the field of natural sciences. The issues have laid a powerful base for an increasing number of scientifically founded management tools to combat the spread of invasive alien species, such as a Global Invasive Species Database[1], a list of 100 Worst Alien Species[2] in the world, regional portals on invasive alien species (for example the Nordic NOBANIS network[3]), and national 'black lists' (see for example Gederaas et al. 2007; Gederaas et al. 2012), which are designed to alert policymakers of ways to prevent, control, or eradicate invasive alien species, and to keep management attention on alien species that may become invasive in the future. By contrast, threatened native species are put on 'red lists', which are intended as guides to conservation efforts and to function as 'a sobering indictment of what we humans have done to our natural world'.[4] An apparent paradox in such species listings is that not all alien species are termed alien, and not all red–listed species are native. Some alien species are rather termed 'genetic resources' in the 1992 CBD or 'agro biodiversity' by the Food and Agriculture Organisation of the United Nations[5] while others are red–listed as part of cultural agricultural landscapes (Kålås et al. 2010) and hence not considered 'natural' in the sense of being wild or untouched by human influence.

1.2. Researching categorisations of plants

In this thesis the ambiguities of the terms alienness and nativeness are researched by focusing on plants. Plants have been exchanged since the dawn of agriculture (Diamond 2005), and

[1] http://www.issg.org/database/welcome/
[2] http://www.issg.org/worst100_species.html
[3] http://www.nobanis.org/
[4] http://www.iucnredlist.org/news/iucn-red-list-natures-early-warning-system
[5] http://www.fao.org/docrep/007/y5609e/y5609e01.htm

consequently the values ascribed to them have varied throughout human history according to their attributes and use. For example, plants have played crucial roles as cash crops (see for example Schiebinger 2005), as ornamentals (Browne 1996; Schiebinger & Swan 2005), and as weeds (Alderman 2004; Chew 2009; Walter & Binimelis 2009). Moreover, '[p]lants have particular characteristics and capacities – for example, they live in distinctive collectives and have particular patterns of mobility – that affect how we as humans attempt to 'manage' them.' (Head 2012, 168–169). Categorisations of plants as alien and native are increasingly contested due to their capacities to be both useful and harmful. Hence, a focus on plants enables important insights into how valuation of species is spatiotemporally contingent.

1.3. Politicising plants

In environmental management there is a tendency to focus attention on invasive alienness rather than native invasiveness (Gederaas et al. 2007; Norwegian Ministry of the Environment 2007). This illustrates how plants, through their status as (invasive) alien or native, have become *politicised* as either wanted or unwanted species. Categorising species as invasive alien or native is a politicised practice that comes in many guises, such as when associated with racism and ideology through native–only policies (Peretti 1998; Hettinger 2001; Gröning & Wolschke–Bulmahn 2003), or in post–colonial settings where native versus alien status is used in nation–building strategies (Olwig 2003; Van Sittert 2003; Head & Muir 2004; Coates 2006; Goldstein 2008; Trigger 2011). In a Norwegian context, and with particular relevance for this thesis, plants are politicised as wanted or unwanted based on environmental concerns rather than racism or post-colonialism. The demarcation of alien from native species is a quite recent nature conservation strategy as Norway has experienced less severe alien invasions than, for example, Australia and New Zealand due to its location on the outskirts of Europe and its relatively cold climate (Tømmerås et al. 2003). As a result, the national legislative framework is still in the making.[6] Focus on preserving wild, pristine nature from various human disturbances is, however, far from recent in Norwegian nature management (see for example Berg 1986), yet it is not until the late 1990s that the alien–native status ascribed to

[6] Norwegian environmental authorities such as the Norwegian Ministry of the Environment and the Norwegian Directorate for Nature Management are currently implementing legal measures (Nature Diversity Act 2009), political strategies (Norwegian Ministry of the Environment 2007), and supporting the compilation of alien species black lists (Gederaas et al. 2007) and red lists (Kålås et al. 2010).

species, both plants and animals, has become a tool for nature management in Norway (Sandlund et al. 1996; Norwegian Ministry of the Environment 2007).

1.4. Objectives and research questions

Given that alien and native species in general, and plants in particular, are currently subject to political, scientific, and public attention, it is important to emphasise that even though a discussion about alienness and nativeness is about 'words and terminology', it is necessary to establish that this discussion 'goes beyond semantics' (Head 2008, 373). Alienness and nativeness are concepts that 'do work' (cf. Skinner 2002) or serve as tools to legitimise visions of ideal nature. Paying attention to what can be *done* with concepts opens the possibility of alternative insights than merely asking what concepts *are* or *mean*. This thesis investigates how perceptions of and interactions with plants correspond to the terminology and policies formulated and applied by the environmental management sector, where the human–nature dichotomy dominates and thus makes it possible to employ what appear to be random temporal and spatial scales for categorising species as alien or native.

Perceptions, categorisations, and interactions with plants are examined along three interacting levels. First, they are examined at the level of individual embodied experiences and reciprocal encounters with plants through a qualitative study of domestic gardeners in selected locations in the county of Oppland, Norway. Second, they are examined at the level of professionals, which in this thesis refers to people that engage with plants through a profession (for example landscape architects and planners) or represent a particular sector interest (for example environmentalists). Consequently, such people do not operate as private individuals, but rather according to, for example, specific organisational interests or work instructions. At the level of professionals, the thesis explores how landscape architects, planners and environmentalists disagreed over what plants should be categorised as alien and native during the development of the former airport at Fornebu, in Oslo. Third, the individual and professional levels interact with the level of national and international environmental management sectors where plants are categorised as invasive alien or native. This level of environmental politics and management serves as a crucial context for the individual and professional levels.

The objective of the thesis is to study how individual (i.e. domestic garden owners in Oppland) and professional (i.e. planners, landscape architects and environmentalists at

Fornebu) perceptions and categorisations of plants relate to the categorisations of alienness and nativeness as applied in environmental policies and management. This objective has led to the formulation of the following main research questions:

How are alienness, nativeness and invasiveness perceived and expressed at individual, professional, and political levels?

How is the categorisation of invasive alien species, as applied by the environmental management sector, perceived at individual and professional levels?

First, it is vital to emphasise that at political and managerial levels there are also practices, i.e. people work and *do* things. Politics is mere politics, unless put into practice. Within the context of this thesis, at this level, the alien–native dichotomy is seen as discursive practice. Accordingly, the political context is investigated through how it becomes manifested at lower levels through what individuals and professionals do. The research questions are addressed through three sets of empirical qualitative materials: a qualitative study of domestic gardening in Oppland, a qualitative study of the conflict at Fornebu, and a literature review of secondary sources tracing the historical roots of the current alien–native dichotomy, that serves to contextualise the two qualitative studies.

1.5. Theoretical perspectives

Plants reside at all three levels under discussion, i.e. individual, professional, and political, but in rather different ways. To explain this in more detail, *perceptions* of species are embodied, relational, and storied (Ingold 2009) and also socially, culturally, and historically situated. How plants are perceived depends both on sensuous and reciprocal experiences with their agencies (for example their invasive, aesthetic, or robust behaviour) and on engagement in situated practices (by, for example, being skilled in gardening, professionally trained in planning and landscape architecture, or environmentalists skilled in the activist work of an NGO). Both perceptions and *categorisation* of plants are socially contingent and are thus shaped by as well as shaping the contexts in which they are situated. *Context* can be defined as consisting of both human actors and histories of ideas, in addition to non–humans and objects and materialities of politics (Asdal 2012, 382). It is important to note that *concepts* are

not only mental constructions of the human brain but also flexible categories that 'gather their meaning from the relational properties of the world itself' (Ingold 2000, 409). Thus, not only the *agencies* of plants but also their socially contingent status influence how they are perceived, categorised, and consequently, 'practised'. Perceptions of plants may significantly differ from categorisations of plants when concepts like alien or native do not resonate with sensuous or socially situated experiences. However, if categorisations of plants acquire a status as socially and politically accepted, perceptions of the plants may be influenced or altered accordingly. To exemplify, a plant such as the garden lupin is currently categorised as alien to Norway. Due to its invasive behaviour and because of its date and mode of introduction, it is distinguished from native species. Whereas its invasive behaviour may be experienced and thereby directly influence perceptions of it, its status as alien requires knowledge about *when* it was introduced and *how* it has been introduced. Thus, the garden lupin's status as alien may not resonate with individual perceptions of the plant. However, because garden lupins are currently black listed, and the species is subject to negative attention politically, publicly, and scientifically, their alien status may influence perceptions of it as unwanted.

This example is ultimately an argument for the need to see the world as a co–constitution of the human and the non–human which imply a shift in scientific focus from representations and social constructions to practices (for example Nash 2000; Thrift 2000; Whatmore 2006). Such a perspective implies paying specific attention to the reciprocal interaction between human and non–human agents and an awareness of the active roles non-humans play in shaping the world we live in. A shift in scientific focus from representation to practice does not mean discarding studies of for example discourses and social constructions all together, but rather studying what discourses or representations do and how humans and non-humans affect each other (Whatmore 2006). Along these lines of reasoning, non-humans like animals or plants have become the main characters in various academic studies by geographers through what has become known as 'more–than–human' geography (for example Wolch & Emel 1998; Matless 2000; Philo & Wilbert 2000; Jones & Cloke 2002; Cloke & Jones 2004; Robbins 2004; Matless et al. 2005). In short, more–than–human geography provides a theoretical framework with which to study relational achievements between humans, non–humans, and social, cultural, and historical contexts (see for example Castree 2003; Whatmore 1999; 2002; 2003; 2006; Jones 2009). The rather diverse body of work that has been labelled more-than-human geography draw on insights from various theoretical fields

such as Science and Technology Studies (for example Haraway 1997), Actor Network Theory (for example Latour 1999), anthropology's interests in material culture (for example Appadurai 1986; Ingold 2000), and environmental history (Brid 1987; Cronon 1995). In this thesis, I draw in particular on insights from more–than–human geography in combination with Tim Ingold's notion of dwelling as a mode of being–in–the world, which concerns the continuous and intimate engagements between human and non–human species and the surroundings (Ingold 2000). This combination of theoretical insights enables an exploration of how ambiguous concepts are negotiated in relational encounters between plants and humans at the individual level of the domestic gardener. At the professionals' level, I extend these insights to also using intellectual historian Quentin Skinner's (2002) perspective on concepts as speech acts, and consequently with a focus on what can be done with concepts in addition to what they mean or represent. In what follows, I will outline the two selected studies which demonstrate how the 'ambiguous nature' of concepts materialises and is expressed at different levels, i.e. how invasive alien and native species are practised by individuals and professionals, and through national policies and environmental management measures.

1.6. The study areas

1.6.1. The domestic garden study in Oppland

Domestic gardens represent secluded, often privately owned spaces, where gardeners are relatively free to experiment with plants. Gardens can be considered as extensions of private houses where people can exercise their autonomy within the limits of socially accepted norms (Blomley 2005). The study thus explores how people relate to plants within a space that is considered relatively free from public responsibilities, yet where the boundaries are fuzzy and plants often spread beyond garden fences and into nearby areas. People's orientation towards the environment is largely conditioned by their own everyday experiences and values (Macnaghten & Urry 1998) and consequently, the environmental management sector's categorisations of alien and native species do not necessarily influence how individual gardeners relate to their plants. As a result, this study enables a demonstration of how ambiguous concepts such as invasive alien and native species are made sense of and negotiated through concrete sensuous experiences with plants. The following research questions are addressed in Paper 1, Part 2:

- In what ways do domestic gardeners engage with plants in their gardens?
- Are the categories of 'alien', 'native' and 'invasive' as defined by environmental authorities settling in the garden?

1.6.2. From airport to housing, business, and recreation: the Fornebu study

Conflict arose at Fornebu regarding the native and alien status of the plants used to develop the area into a green site for recreation and housing after the airport was closed down in 1998. Fornebu was selected as a case study because it is a public space of national interest subjected to environmental regulations. A contentious issue during the development works was the planting of alien species in the buffer zones that were established to shield two neighbouring nature reserves of national interest. The conflict evolved over a relatively short time–span (1998-2008), in parallel with the first political steps in Norway towards a coherent policy on alien species. The Fornebu study enabled exploration of how the status of certain plants changed from being acceptable within landscape planning into being politically and scientifically unwanted and disputed. More to the point, the professionals at Fornebu argued over a public landscape that was subject to more rigorous decision–making and legal regulations than would be the case for, for example, a domestic garden, which would largely slip unnoticed from environmental authorities' gaze due to its semi–private status (Longhurst 2006). Through the Fornebu study, I explore how the planners, landscape architects and environmentalists related to the ambiguities of alienness and nativeness, and what implications such ambiguities have for landscape planning and environmental management. The study addresses whether the planting of alien species can be considered an environmental crime, and at Fornebu this involved heated discussions over what species could rightfully be categorised as alien or native (Paper 2). Further, the implications of the value–based and ambiguous perceptions of time in the accompanying black listing and red listing of species is investigated, in addition to how the terms black listed and red listed can be used rhetorically to legitimise arguments in environmental conflicts (Paper 3). The following research questions are addressed in Paper 2:

- Can the spread of alien species be considered environmental criminality?
- What are the implications of categorising alien species as environmental outcasts?

Whereas Paper 2 concentrates on the aspect of alienness, nativeness, and questions concerning environmental criminality, Paper 3 investigates the importance of questioning the

temporal dimensions emanating from Paper 2 in particular. Paper 3 addresses the following research questions:

- How were the environmental management sector's categorisation of plants perceived and put into practice by the involved planners, landscape architects and environmentalists at Fornebu?
- How did the ambiguous and constructed temporal thresholds implicit in species categorisations affect the redevelopment of Fornebu?

1.7. Relevance of the thesis for research on alien species and environmental management

The thesis contributes to the field of research on alien species and to environmental management in several ways. Firstly, the thesis contributes as a social science contribution from the scientific discipline of human geography to a research field that has been largely dominated by natural science. Currently, most natural science studies focus on questions related to what alien species *are* for example what makes alien species invasive (Ehrlich 1986; Roy 1990; Williamson 1999), how they spread (for example Harrison 1993; Lodge 1993; Brown 1995; Vitousek et al. 1996; Meyers 1997; McKinney and Lockwood 1999), what makes ecosystems vulnerable to invasion (Crawley 1987; Levine & D'Antonio 1999; Stohlgren et al. 1999), the associated consequences for native species and ecosystems (for example Wilcove et al. 1998; Williamson 1996; Simberloff 2000a; Schindler et al. 2001), and how alien species can be managed and controlled (for example Ruesink et al. 1995; Simberloff 1997; Mack et al. 2000). Framed as critique against such natural science research, a broad body of research *either* focuses on how public attitudes are related to species' attributes rather than their bio geographical origin (for example Czech et al. 1998; Montgomery 2002; Lodge & Shrader–Frechette 2003; Zagorski et al. 2004; McNeely 2005; Nordgaard 2007; Lundberg 2010; Binggeli 2011; Fischer et al. 2011; Schüttler et al. 2011; Selge & Fischer 2011; Selge et al. 2011; Sharp et al. 2011) *or* questions the wider political and scientific implications of categorising species as native or alien (for example Olwig 2003; Colautti & MacIsaac 2004; Gobster 2005; Helmreich 2005; Larson 2005, 2008, 2011; Clergeau & Nuñez 2006; Coates 2006; Warren 2007; 2011; Knights 2008; Eskridge & Alderman 2010; Chew 2011; Trigger 2011). The current study contribute to the research field and the wider debate about biological diversity by presenting qualitative research on

encounters *between* humans and plants as relational and reciprocal while simultaneously paying attention to the surrounding social, cultural, and historical contexts. Secondly, the thesis adds to the more-than-human debate within the discipline of human geography by focusing on plants rather than on animals, which have been far more common. Investigations of human-plant interactions enable extended insights into the complex manners non-humans other than animals are co-players in constituting social phenomena. Thirdly, the thesis contributes theoretically to the field of human geography and beyond by combining theoretical perspectives related to dwelling and more-than-human geography which can be referred to as a 'doing nature' perspective with Skinner's linguistic focus on what can be done with discursive categories. The combination of these theoretical perspectives has enabled an exploration of concepts as simultaneously context-dependent discursive tools and products on sensuous human-plant encounters.

Fourthly, the thesis contributes to the general societal debate on the management of species in Norway. Norwegian environmental authorities tend to focus on alienness and nativeness as 'objective' management tools, where the temporal and spatial ambiguities involved in the alien–native categorisation seem at best taken for granted or, at worst, ignored (as outlined in more detail in chapter 2). Thus, although nativeness and alienness are not robust terms (Head 2012, 174), they are used as largely unquestioned axioms for management. To date, research on human perceptions, experiences and encounters with alienness and nativeness within the plant world is largely missing, which makes this study unique in a Norwegian context.

1.8. Summary of Papers 1-3

The research questions and theoretical approaches selected in each of the three papers presented in Part 2 of the thesis are summarised in Table 1 below.

Table 1: Theoretical framework and research questions of Papers 1–3

Paper :	Theoretical framework:	Research questions:
Paper 1: Politicising plants: dwelling and invasive alien species in domestic gardens	Draws on Ingold's (2000) notion of dwelling in combination with insights from more–than–human geographies, i.e. relational agency (for example Jones & Cloke 2002; Cloke & Jones 2004; Whatmore 1999; 2002; 2003; 2006; Head & Atchison 2009) in order to explore how plants are perceived and categorised by garden owners.	- In what ways do domestic gardeners engage with plants in their gardens? - Are the categories of 'alien', 'native' and 'invasive' as defined by environmental authorities settling in the garden?
Paper 2: Native nature and alien invasions: Battling with concepts and plants at Fornebu, Norway	Skinner's (2002) conceptual approach is used to explore intentions in how the concepts alien and native are used.	- Can the spread of alien species be considered environmental criminality? - What are the implications of categorising alien species as environmental outcasts?
Paper 3: Wanted and unwanted nature: Landscape development at Fornebu, Norway	Skinner's (2002) contextual approach is drawn upon in the exploration of the categorisations of plants as 'alien' and 'black listed', or alternatively, 'native' and 'red listed'.	- How were the environmental management sector's categorisation of plants perceived and put into practice by the involved planners, landscape architects and environmentalists at Fornebu? - How did the ambiguous and constructed temporal thresholds implicit in species categorisations affect the redevelopment of Fornebu?

Paper 1: Politicising plants: dwelling and invasive alien species in domestic gardens

Qvenild, M., Setten, G. & Skår, M. Forthcoming in Norsk Geografisk Tidsskrift-Norwegian Journal of Geography, subject to minor revisions.

The paper examines the domestic garden as a key space where human–nature, or more specifically, human–plant relations are engaged, debated, and understood. Gardens are considered as porous phenomena set within the current debate about the spread of invasive alien plants as an environmental problem. The paper aims to link political debates on (un)controlled species movement with an analysis of dwelling and further investigates how scientific language and concepts are perceived and practised in the context of the domestic garden. The empirical material is based on talking-whilst-walking interviews with gardeners in Oppland. The paper shows that the domestic gardeners do not 'practise' the alien–native dichotomy in their gardens, but rather relate to their plants in dynamic, relational, and embodied ways. Theoretically, the paper is situated within the emerging field of human–plant geographies and draws on Ingold's (2000) dwelling perspective. A key point here is that human perceptions are not caused solely by humans but through reciprocal attunements between body–subjects and their embodied surroundings. Although the 'official' definitions of alien and native species are de–coupled from the species they are meant to describe, the concepts are still products of dwelt–in worlds, and have the capacity to influence human–plant relationships.

Paper 2: Native nature and alien invasions: battling with concepts and plants at Fornebu, Norway

Qvenild, M. 2012 in Ellefsen, R., Sollund, R. & Larsen, G. (eds.) Eco–global Crimes: Contemporary Problems and Future Challenges, 233-255. Farnham: Ashgate.

The paper focuses on how different professionals, i.e. planners, landscape architects and environmentalists sought to legitimise their visions of ideal nature during the refurbishment of Fornebu as a location for recreation, housing and business after the close-down of the airport in 1998. Drawing upon the work of political philosopher Quentin Skinner, the paper investigates how alienness and nativeness were perceived, categorised, and used by the planners, landscape architects and environmentalists. While the conflict appears to have been about concepts, many more issues surfaced, such as the strong sense of disappointment felt by the local environmentalists who envisioned a different kind of landscape at Fornebu, and the various non–humans agencies that entered the debate with unexpected force; i.e. the wood chips, thick layers of soil, birds, fast–growing vegetation, drought–tolerant red–listed species, and native seeds that would not germinate. Furthermore, an underlying dimension of the conflict turned out to be about fear of future threats from the alien plants and their unpredictable behaviour. Thus, the environmentalists' decision to report The Norwegian Directorate of Public Construction and Property (Statsbygg) to the police for having committed an environmental crime by planting alien species was evidently as much about strong feelings of disappointment over how the landscape had been constructed, as about the spread of alien species as an environmental crime. At the time when fieldwork was carried out, the alien plants had only been the cause of worry and not really dispersed as feared. The paper concludes that the plantings at Fornebu did not classify as an environmental crime within the given context, but illustrates how legal and moral standards change along with changed use of concepts.

Paper 3: Wanted and unwanted nature: Landscape development at Fornebu, Norway

Qvenild, M. Forthcoming in Journal of Environmental Policy & Planning, subject to minor revisions.

The paper centres on the conflict over alien and native species in the reconstruction of the pre-airport Fornebu into a site for recreation, housing and business, and in particular the challenges related to the value–based and temporally contingent aspects of species categorisation. The paper has used insights from the political philosopher Quentin Skinner's work to focus on intentions folded into the use of different concepts, and how environmental management measures such as black lists for alien species and red lists for endangered species rest upon a perception of time that involves idealising and freezing certain processes and conditions in nature. Crucially, red–listing involves singling out species considered worthy of conservation, while black–listing serves as a measure to identify species that are alien and unwanted. At Fornebu, the environmentalists used the terms 'black–listed' and 'red–listed' rhetorically to argue for certain species and nature conditions. The paper shows how black lists and red lists can be used rhetorically in environmental debates to strengthen the credibility of an argument and claims of 'ideal nature'. Moreover, the ambiguous temporal perceptions implicit in species listing have implications for landscape planning, as the lists have retrospective effects and make it difficult to select the 'right' types of plants. The paper argues that while environmental managers and policy–makers need to take into account the temporally arbitrary and value–based aspects of species listings and categorisation, landscape architects and planners need to take invasive alien species as a serious environmental threat.

1.9. Outline of the thesis

The thesis is divided into two parts. Part 1 consists of the chapters 1-6. Chapter 1 is the introduction, which explains the relevance of the thesis and outlines the research questions as well as providing a summary of the three papers (Paper 1–3). Chapter 2 outlines the wider international and national context for the empirical studies including the historical background that has conditioned the current environmental management and categorisation of alien and native species. It also gives an overview of the current legal regulation of alien species in Norway. Thereafter, chapter 3 presents a literature review, which gives a brief introduction to some key topics of research in invasion biology in particular and natural sciences more generally concerning alien species, and further situates the thesis within the larger body of work critiquing current natural science categorisations of alien species. Next, chapter 4 outlines the key theoretical insights that have been important for the research design and writing of the three papers. This is followed by chapter 5, the methodology chapter, which outlines the premises for selection of methods and study areas. Chapter 5 also explains the talking–whilst–walking research method and how the different sets of research material was analysed. Chapter 6 moves on to discuss key findings from the papers 1, 2 and 3 in relation to the research questions and the theoretical framework outlined in chapter 4. Finally, Part 2 presents the three papers.

2. Background

This chapter outlines the historical roots of the current categorisation of alien species as a threat to native species in international and national biodiversity politics. I start by looking at the international setting and then turn my attention to the Norwegian situation, as these provide important contexts to the papers in Part 2.

2.1. International context: Species categorisations and the alien-native dichotomy

While the spread of species has caused numerous problems to humans throughout history, such as the spread of diseases and loss of crops (see for example Crosby 1972; Diamond 2005), a relatively recent invention is to categorise all types of species groups and the associated negative impacts of their spreads as a 'unified' singular phenomenon: invasive alien species. Invasive alien species spreads are currently placed on the international agenda as a common high–priority environmental problem. To understand how alien species, and in particular alien plants, have become high–priority biodiversity politics, I start with the influential categorisation of alien species addressed in the 1992 Convention on Biological Diversity (CBD) and then move on to trace the historical roots of this categorisation.

2.1.1. The Convention on Biological Diversity: categorisations of wanted and unwanted nature

As the only legally binding international convention in its field, the CBD strongly influences national policies on alien species, as the Parties to the Conventions are obliged to implement the Convention within their national legal frameworks.[7] As a core concept of the Convention,

[7]Other measures related to the spread of alien plants are numerous but not comprehensive like the CBD in terms of comprising all species groups; the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES, or the Washington Convention 1975), the International Convention for the Control and Management of Ships' Ballast Water and Sediments (BWM) (2004), the United Nations Convention on the Law of the Sea (UNCLOS 1994), the International Plant Protection Convention (IPPC 1987), the Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement, 1995), Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora (also known as the Habitats Directive) (1992), the EU Council Regulation on the protection of species of wild fauna and flora by regulating trade therein (2003), the IUCN Guidelines for the Prevention of Biodiversity Loss Caused by Invasive alien species (2000), the IMO technical guidelines for the control and management of ships' ballast water to minimise the transfer of harmful aquatic organisms and pathogens (1997), the Pan-European Biological and Landscape Diversity Strategy (1995), the IUCN/SSC Guidelines for Re-Introductions (1995), the International Civil Aviation

biodiversity is defined as 'the variability among living organisms from all sources … and the ecological complexes of which they are part' (Article 2)[8]. Takacs (1996, 11) has investigated how biodiversity has become established as a powerful concept, and argues that the entities and processes that we now term biodiversity were earlier referred to as 'natural variety, flora and fauna, wildlife, fellow creatures, wilderness, or simply, nature'. According to Takacs, biodiversity has become a powerful concept in environmental policy–making because it is diffuse in character, thus enabling each one of us to find in it what we cherish. In addition, biodiversity includes both the known and unknown, and thereby glosses over vast biological and ecological knowledge gaps (Takacs 1996, 86).

Although by definition alien species are part of biodiversity, such species are currently portrayed also as threats to biodiversity. More specifically and importantly, the biodiversity under threat often seems to refer to native biodiversity. Woods (2001) argues that alien and native are closely related 'cluster–concepts', i.e. both concepts refer to particular traits that are typical of what it means to be native or alien, but not conditional. Woods claims that 'we will often find species which exhibit some, but not all, of the characteristics which are typical of native species' and similarly a species can be termed alien without possessing all the typical characteristics of alienness (Woods 2001, 176). Importantly, the boundaries between what it means to be alien and native are spatially and temporally rather fuzzy. However, in the media as well as in biodiversity politics, an illusion of a clear–cut alien–native dichotomy is constantly reproduced by the use of strong metaphors (see for example The Guardian 24 February 2010; 4 October 2010; 1 March 2011). Politically, alien–native species measures have become part of a larger trend to manage and protect nationalised biodiversity. Specifically, prior to the implementation of the CBD, a global regime where valuable plant materials were considered the common heritage of mankind was threatened by new biotechnology and patent laws in the second half of the 20th century. The coming into force of the CBD led to new nationalised systems of access and benefit sharing to supplier–countries by reaffirming national sovereignty over plant material to the country of origin (Fowler 2001). Thus, today, the country of origin has significant spatial authority to control

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Organisation (ICAO Assembly) Resolution A-32-9: Preventing the introduction of invasive alien species (1998), and Agenda 21 (UNCED 1992).

[8] http://www.cbd.int/convention/articles/?a=cbd-02

biodiversity that previously had been considered a common resource of mankind (ibid.). My argument is that by legally nationalising biodiversity, the responsibility to protect it also became a national duty, which may have created a stronger awareness of invasive alien species threatening national boundaries and native species. From this perspective the CBD has encouraged spatial territorial claims to biodiversity, and these claims have created political boundaries which unite those species perceived to belong while excluding those not belonging.

When approaching an understanding of why alien species are currently portrayed as one of today's major threats against global biodiversity and native species, it is important to realise that species have been exchanged throughout human history. Mcneill (2003, 33) identifies four main historical phases of alien species spread: the Neolithic period and early spreads of domesticated plants; the Roman Empire around 100 BC to 200 AD; the Crusades c.1000-1350; and the Columbian exchange in the period 1450-1750. The fourth phase has been substantially accelerated in our era of globalised trade and movement, and has by far had the largest impact on the world's biota. For the purpose of this thesis, I highlight selected issues of the comprehensive history of alien species spreads that illuminate how current categorisations of alienness and nativeness have been framed historically. I start by describing how alien and native species were perceived by early biologists, in contrast to how the later influential ecologist Charles Elton came to describe alien species in the 1950s as an 'ecological explosion'. Finally, I will show how Elton has greatly influenced today's categorisations of alienness and nativeness.

2.1.2. Early biologists, alien and native species

Biology emerged as a scientific discipline in the wake of Charles Darwin's *The Origin of Species* published in 1859 (Darwin 2003 [1859]). Together with Darwin, Alfred Russel Wallace was influential in enabling scientific documentation of alien human–assisted spreads and native species dispersals through his identification of six distinct bio–regions on the earth where species originated (Davis 2009). Darwin studied invasive alien species to test his theory of natural selection, i.e. alien species having their own evolutionary histories while co–existing with native species (Cadotte 2006). To Darwin, alien species thus became examples of natural selection, and in particular invasive species that rapidly occupied favourable conditions. In line with Darwin, early biologists documenting species at the time were mainly

concerned with recording the occurrences of alien and native species and explaining their roles in ecological processes (Cadotte 2006, 22). These early biologists were, however, largely lacking a coherent terminology. In the mid–1800s, British amateur botanist H.C. Watson developed a classification terminology in response to the lack of terms experienced by British botanists, who otherwise did not know how to describe the new species they discovered (Chew 2006). At the time, the botanists used the term native for wild and uncultivated vegetation regardless of geographical origin. Watson was dissatisfied with the situation and came up with a list of classifying terms in his four–volume work *Cybele Britannia* (referred to in Chew 2006). Among these were terms for native species which he defined as 'aboriginal British species; there being little or no reason for supposing it to have been introduced by human agency' (Chew 2006, 29). Alien, on the other hand, was described as 'either presumed or certainly known to have been originally introduced from other countries' (Chew 2006, 30). Watson never suggested native British plants to be superior to alien, or that alien species should be suppressed. Rather, his terminology was intended to contribute to the classification of native species. In sum, the early biologists were primarily concerned with documenting species invasions and occurrences, and studied invasive alien species to test their theories of how species could survive and reproduce in novel conditions (Cadotte 2006, 28). Those who voiced concerns over the damaging effects of invasive alien species were mainly scientists addressing impacts on agriculture, i.e. vermin destroying crops (Davis 2009).

According to Chew (2006), the focus started to change by the turn of the 19th century, when alien species were increasingly categorised as unwanted and harmful to native species. However, it was not until the 1980s that alien species became a distinct research topic through invasion biology, which in turn became a sub–discipline of biology influenced by the work of the British ecologist Charles Elton (Cadotte 2006). Elton's contribution towards bridging natural science and biodiversity politics through a framing of invasive alien species as a global environmental threat to native species and territories is of particular importance to this thesis.

2.1.3. Invasion biology and Charles Elton

In the 1980s a sub–discipline of biology, 'invasion biology', emerged along with a growing focus on conservation issues and environmental problems in Western societies (Davis 2009).

Of importance to the field of invasion biology were the perspectives of the British ecologist Charles Elton voiced in his classic book *The Ecology of Invasions by Animals and Plants* (Elton 2000 [1958]), which has stimulated enormous amounts of research on invasion biology (Simberloff 2000b). Elton has been termed an uncrowned father of invasion biology (Chew 2006; Richardson & Pyšek 2006; Ricciardi & MacIsaac 2008), and his lines of argument as well as his use of strong value–based language has, according to Davis (2009), strongly influenced environmental policies and public attention world–wide (Davis 2009). Elton (2000 [1958], 15) argued that

> [i]t is not just nuclear bombs and wars that threaten us, though these rank very high on the list at the moment: there are other sorts of explosions, and this book is about ecological explosions. An ecological explosion means the enormous increase in numbers of some kind of living organism – it may be an infectious virus like influenza, or a bacterium like bubonic plague, or a fungus like that of the potato disease, a green plant like prickly pear, or an animal like the grey squirrel. I use the word 'explosion' deliberately, because it means the bursting out from control of forces that were previously held in restrain by other forces.

According to Elton, the movement of species beyond their natural bio geographical barriers could have detrimental effects on the biological life on the planet. Davis et al. (2001, 100) argue that Elton largely has influenced the focus of biological invasion as a unique phenomenon separate from ecological succession, which thus required special scientific explanation. This has led to a 'dissociation between invasion ecology and the rest of ecology' (Davis et al. 2001, 97) with a strong focus on a few detrimental headline invaders, such as the grey squirrel (*Sciurus carolinensis*), the salt cedar (*Tamarix ramosissima*), and black rats (*Rattus rattus*) (ibid.). Davis (2006) identifies two different historical 'paths' within invasion biology; one path is inspired by Elton, where invasion ecology is separated as a research field from the rest of ecology, and the other path is that of the Asilomar Conference, held in 1964 by the International Union of Biological Sciences, which claimed that biological invasions should be studied alongside native species spread and consequently as part of ecological succession (Davis 2006). According to Davis (2006, 43) there was considerable concern over the normative nature of Elton's approach among Asilomar Conference participants. In short, scientists attending the Asilomar Conference embraced scientific diversity and complexity,

whereas Elton's warlike metaphors made the 'messy world' of alien species and uncontrolled movements clearer for policy–makers, managers, and the media to understand.

2.1.4. The alien–native dichotomy entering the international policy agenda

Recent media coverage of alien species has expanded on Elton's rhetoric by employing metaphors of ill health, such as 'disease', 'plague', and 'infection', which underlines species' 'out–of–placeness'. By implication, military reactions such as eradication and control measures to protect the native species are justified (Cresswell 1997, 337). Importantly, Elton's militaristic metaphors have appealed to particularly troubled countries and regions of the world. North America, Australia, and New Zealand are examples of places that have experienced great ecological and financial problems due to alien invasions, and in such places nature conservation and restoration initiatives have long been guided by the focus on geographical origin of species and a clear distinction between native and alien. The use of the alien–native distinction has been less dominant in Europe, which has a long historical tradition of introductions, spread, and naturalisation of alien species, such as archeophytes, i.e. cultural weeds such as Common Fumitory (*Fumaria officinalis*) and Milk Thistle (*Silybum marianum*), introduced before the year 1500 AD (Davis 2009). Crucially, the scientific focus of documenting species in earlier centuries has been largely replaced by strong value–based politics (Haber 2008, 92) in line with the militaristic terms used by Elton. Similarly, Haber (2008) claims that, in general, the conservation debates have become increasingly characterised by value–based arguments. He claims that people known for their involvement in the conservation debates in the USA, such as the renowned American environmentalist Edward O. Wilson, became strong agitators for biodiversity conservation. Wilson's articulate petition to prevent biodiversity loss strongly contributed to the passing of the CBD in Rio de Janeiro in 1992 (Haber 2008, 92), which included a separate article 8 h on the prevention, eradication, and management of alien species.

The Norwegian CBD delegate, Peter Johan Schei, worked alongside the US delegates to implement the alien species issue in the text of the Convention (P.J. Schei, personal communication 2011). Schei argues that genetically modified organisms (GMOs) were a much hotter topic at the time, but the US were determined to place invasive alien species on the international policy agenda because several American studies were pointing to the severe economic impacts caused by some headline invaders such as kudzu (*Pueraria lobata*) or zebra

mussels (*Dreissena polymorpha*) (see for example Perrings et al. 2005). In addition to being a CBD delegate negotiating the initial convention text, Schei was also a member of the Scientific Committee on Problems of the Environment (SCOPE) established by the International Council of Scientific Unions in the 1980s to document the nature of the invasive alien species issue (Mooney et al. 2005). On SCOPE's initiative, a UN–sponsored conference on alien species was hosted in Trondheim, Norway, in 1996 titled the Norway/UN Conference on Alien Species, which led to the establishment of the Global Invasive Species Programme (GISP) (Sandlund et al. 1999). This made invasive alien species a priority item for environmental policy–makers world–wide (Mooney et al. 2005). Further, by the 1990s invasion biology had become a separate institutionalised discipline in both the USA and Europe. Eventually, alien species were identified as one of the greatest threats to biodiversity by the European Environmental Agency (EEA) in 1998, and in 2000 the IUCN developed its Guidelines for the Prevention of Biodiversity Loss Caused by Invasive alien species. The establishment of alien species as inappropriate species and ecological threats to native biodiversity was thus a political and scientific fact by the turn of the millennium.

2.2. Categorising alien species in Norwegian environmental politics

Despite the outcome of the Norway/UN Conference on Alien Species held in Trondheim in 1996 (Norway/UN Conference on Alien Species), there has been relatively slow progress in implementing policies on alien species in Norway. As a country with a fairly cold climate, situated on the outskirts of Europe, Norway has been comparatively free from alien species invasions compared to, for example, the US, New Zealand, and Australia. Attention paid to alien species as an environmental problem was, however, noted already in the 19th century. Experiments involving introducing various alien species to Norway as sources of food and recreation were common (see for example Berg 1986). There were many creative attempts to introduce, for example, new edible species of fish that could fill available ecological niches in Norwegian nature and provide new possibilities for fishing and hunting. In 1855 a governmental fishery agency was established, and one of its primary duties was to introduce different species of fish such as brown trout (*Salmo trutta*), Atlantic salmon (*Salmo salar*), whitefish (*Coregonus lavaretus*), char (*Salvelinus alpinus*), and cisco (*Coregonus albula*) to lakes and watercourses where they did not already exist (Berg 1986). North–American species such as brook trout (*Salvelinus fontinalis*) and rainbow trout (*Oncorhynchus mykiss*) were introduced to Norway in the late 19th and early 20th centuries (Huitfeldt–Kaas 1918; Grande

1964), as these were highly valued food and game resources. For example, brook trout was assumed to be better adapted to living in the acidified water bodies in Southern Norway. Other examples of the agency's work included the introduction of two species of black bass (*Micropterus salmoides* and *Micropterus dolomieu*) from Germany towards the end of the 19th century (Landmark 1888; Berg 1986). Also, several bird and game species were introduced and spread to new localities, for example hare (*Lepus timidus*) (Wildhagen 1949), common pheasant (*Phasianus colchicus*) (Thiis 1960), grey partridge (*Perdix perdix*) (Tangen 1974), and Canada goose (*Branta canadensis*) (ibid.). In addition, attempts were made to establish several species of penguins (*Aptenodytes patagonica*, *Eudyptes chrysolphus*, and *Pygoscelis papua*) (Lønø 1961) but these were not successful.

Some of the introductions did not come without warnings. For example, Rasch (1852) warned against the spread of northern pike (*Esox lucius*) while Huitfeldt–Kaas (1928) warned against the spread of char (*Salvelinus alpinus*). Thus, it was not coincidental that the first nature conservationists, who had organised themselves into a National Association for Nature Conservation,[9] expressed their concern to Norwegian authorities in the beginning of the 20th century about the introduction of alien species into Norwegian nature (Berntsen 1977). The National Association for Nature Conservation, which mainly consisted of idealist nature scientists, civil servants, and military officers, were lobbying for the establishment of national parks in Norway. They were highly concerned that such untouched areas were going to be ruined by human activities, including species introductions. In their annual report for 1918–1919 they strongly condemned the proposed introduction of chamois (*Rupicapra rupicapra*) to the area of Jotunheimen: 'Chamois is not and has never been at home in Norwegian nature; it would seem equally out of place in Jotunheimen as an Egyptian Sphinx in a Norwegian village museum' (quoted in Berntsen 1977,82).

Animals and fish were not the only species to cause concern. Plants were equally placed under scrutiny by several botanists actively participating in the National Association for Nature Conservation and working towards the preservation of several native plant species and important botanical habitats. Renowned Norwegian botanist Axel Blytt compiled a list of spread and accidentally introduced plant species in 1870 (Holmboe 1900, 130), but also stated elsewhere that several naturalised alien plants had become 'citizens of the Norwegian flora'

[9] *Landsforeningen for naturfredning i Norge*, established in 1914.

(Ouren 1959, 97). At the end of the 19th century the plant geography of Norway lacked a systematic description of introduced species, a task which the botanist Jens Holmboe started in 1900 by describing the spread of 19 alien 'weeds'. Holmboe mentions some earlier sources, such as Schübeler's work in the period 1873–1875 on the Norwegian history of cultural plants which includes some descriptions of spreading weeds, different references in Axel Blytt's work, Larsen & Greve's list of ballast plants from 1870, and Bryhn's register of some accidentally introduced plants near the Norwegian capital of Kristiania (present–day Oslo) in the period 1874-1876 (Holmboe 1900, 130). Holmboe uses the concepts '*weed*', '*alien*' and '*adventives*' interchangeably to describe the plants. His focus clearly is on the bothersome and importunate plants that have been introduced through human activities, and he argues that the authorities should intervene and enforce laws to prohibit further introductions (Holmboe 1900, 140). However, nature preservation was of little concern to the authorities and the population at large. At the beginning of the 20th century, the National Association for Nature Conservation, with its 200-300 members, was nevertheless quite influential and managed to lobby for Norway's first Law on Nature Protection, which was enacted in 1910. Further it succeeded in preserving by royal decree several areas of high botanical interest, several native plant species and individual trees, some areas of native forest, and some picturesque waterfalls (Berntsen 1977).

Nature conservation was at the time clearly an elite phenomenon dominated by conservative concerns of protecting national values such as flora, fauna, and picturesque, iconic landscapes against industrial developments (Berntsen 1977). While the association seemed very up to date on international developments and worked for, for example, the establishment of national parks from the beginning of the 20th century, it took c.60 years before the first Norwegian national park of Rondane was realised. One of the reasons was that nature conservation in Norway was poorly organised at governmental level. The Ministry of Religion and Education was responsible for nature protection, and as the number of cases concerning environmental preservation increased, they were forwarded to numerous other ministries for discussion.[10] A separate Ministry of the Environment, the first of its kind in the world, was established in 1972 as a result of growing public concern with the risk of a global environmental crisis in the 1970s. The Ministry of the Environment's main task was to balance economic growth with the conservation of Norwegian natural resources (Berntsen

[10] The Norwegian name for the Ministry of Religion and Education is *Kirke- og Undervisningsdepartementet*.

1977). Importantly, the early conservative mind–set of preserving untouched native nature from human disturbance has largely prevailed in Norwegian nature management.

2.3. Norwegian legal regulations concerning alien species

As has been the case in Norway and in other European countries, harmful alien species had been treated fragmentarily, both scientifically and legally, depending upon the administrative sector or species group (Shine et al. 2005). Multiple legal measures in Norway have traditionally regulated different aspects of alien species introductions: an aquaculture law (2005), an animal health law (1974), a law concerning regulations of species introductions (1997), a salmon and freshwater fish law (1992), a food production and food safety law (2003) that includes phytosanitary measures, a products and services law (1976), a shipping security law (2007), a forestry law (2005), a customs law (2007), and a game species law (1981). It may be noted that the Salmon and Freshwater Fish Law of 1992 prohibited introduction of alien species as well as the movement of fish between watersheds. However, Norway has largely lacked a sufficient legal framework to coherently address the obligations of Article 8 (h) of the CBD. Alien species spreads was a topic that politicians had little prior knowledge of, as is evident from the Norwegian Minister of the Environment's opening speech at the Norway/UN Conference on Alien Species in 1996

> I must admit that when I first heard that the subject for this conference was alien species, I regarded this as a purely scientific matter. After being introduced to the subject, I am now aware of the fact that alien species may cause environmental damage and economic loss. (Sandlund et al. 1996, 7)

In 1997 a national seminar addressing the introduction and spread of alien species in Norway was held to address issues raised at the Norway/UN conference held in the previous year. The participants included scientists and nature managers from the Norwegian Directorate for Nature Management, and the aim was to identify the existing knowledge of alien species in Norway, in order to obtain an overview of relevant legal tools for addressing alien species, and finally to make recommendations for a national strategy on alien species that would specify both research needs and political measures (Viken & Sandlund 1997). While the governmental goal of working against the spread of alien species was repeated yearly throughout the period 1999–2006 (Riksrevisjonen 2005-2006, 11), a Norwegian strategy for dealing with invasive alien species was not launched until May 2007. The strategy was cross–

sectorial in character, which means that several ministries had worked together to coordinate common initiatives as well as sector–specific measures against alien species.[11] The strategy is described as an 'important element of the Government's efforts to achieve its biodiversity target', which was 'to halt the loss of biodiversity by 2010' (Norwegian Ministry of the Environment 2007, 2). A further important step has been the Norwegian Nature Diversity Act, which entered into force on the 1st of July 2009. The Act was novel in Norway as it addresses all administrative sectors and combines a focus on both sustainable use and conservation of nature (Sørensen 2010). The Act includes management objectives for habitat types and species with the clear objective of preventing the loss of species or habitats. Of key importance is the precautionary principle in situations where sufficient knowledge about the risk of damaging biodiversity is lacking (Sørensen 2010). Further, the user pays principle delegates the costs of preventing the negative impacts of, for example, the introduction of alien species on biodiversity upon the responsible person or institution. In addition, importing or introducing alien species to Norway requires a permit and the applicant carries the burden of proof that the species is not harmful or invasive (Sørensen 2010). Exemptions from the law are plants that are unlikely to spread beyond domestic gardens or designated cultivated areas (Nature Diversity Act 2009). A separate regulation on the introduction of alien species under the Nature Diversity Act is currently subject to a public hearing and suggests a list of species based on the Norwegian Black List, which will be prohibited from introduction into Norway (Norwegian Directorate for Nature Management 2010).

2.4. Key management tools: red lists and black lists

Black lists (of alien species) and red lists (of threatened or vulnerable species) have become scientifically recognised tools applied in decision–making processes within the field of biodiversity conservation (Jørstad & Skogen 2010). Although there is no international standardised methodology for undertaking risk analysis and compiling black lists (Gederaas et al. 2007), the IUCN has, in fact, since the 1960s developed a methodology for red–listing threatened and endangered species. The IUCN methodology is currently the most

[11] A number of ministries have cooperated in drawing up Norway's strategy: the Ministry of Fisheries and Coastal Affairs, the Ministry of Finance, the Ministry of Defense, the Ministry of Health and Care Services, the Ministry of Justice and the Police, the Ministry of Education and Research, the Ministry of Agriculture and Food, the Ministry of Petroleum and Energy, the Ministry of the Environment, the Ministry of Trade and Industry, and the Ministry of Transport and Communications (Ministry of the Environment 2007: 4).

acknowledged and comprehensive way of compiling such lists (Rodrigues et al. 2006) including the 2006 and 2010 Norwegian Red List (Kålås et al. 2006; 2010). The IUCN lists two major goals related to the assessment of the threat status of species: (1) to identify species in need of conservation efforts in order to cope with global extinction rates, and (2) to document changes in the global state of change of biodiversity (Vié et al. 2008). The species assessed are assigned to one of the following categories: Extinct, Extinct in the Wild, Critically Endangered, Endangered, Vulnerable, Near Threatened, Least Concern, and Data Deficient (Vié et al. 2008). Assignments of species according to these criteria are based on assessments of population trend, population size and structure, and geographic range of species. Moreover, species classified as Vulnerable, Endangered, and Critically Endangered are regarded as 'threatened'. While the IUCN Red List criteria were developed for use at a global level, they are increasingly used at national and regional levels (Keller & Bollmann 2004).

The assignment of establishing both a Norwegian Red List (Kålås et al. 2006; 2010) and a Norwegian Black List (Gederaas et al. 2007; Gederaas et al. 2012) was given to the Norwegian Biodiversity Information Centre (NBIC), which was established in 2005 under the Ministry of Education and Research. The role of the NBIC is to 'help to feed Norwegian society with up–to–date and easily available information on species and habitats' (Gederaas et al. 2007, 3). While the 2006 and 2010 Norwegian Red Lists are based on the IUCN's methodology, the 2007 Black List was based on risk analyses of alien species divided into three categories: *Low risk*, which are 'species which most probably have no, or no significant, negative impacts on indigenous biological diversity'; *Unknown risk*, which refers to 'species about which too little is known to assess whether they have negative impacts on indigenous biological diversity', and *High risk*, which refers to '[species] that have negative impacts on indigenous biological diversity' (Gederaas et al. 2007, 10). A new edition of the Norwegian Black List, which was launched on the 12th of June 2012, operates with a broader number of categories for risk assessment; no risk, low risk, potentially high risk, high risk and very high risk. Only the species placed in the two latter categories (i.e. high risk and very high risk) have been included on the 2012 edition titled *Alien species in Norway – with Norwegian Black List* (Gederaas et al. 2012) which constitutes 217 species. In sum, the differences between the 2007 and 2012 Black lists illustrates the dynamic nature of such lists where new species are included while others may be included. Challenges related to the black listing and red listing of species will be critically addressed in Paper 3, in Part 2 of this thesis.

This chapter has established the political and managerial context conditioning current management approaches towards invasive alien and native species. As has been illustrated in this chapter, policies and management approaches are influenced by scientific framings of the 'alien species threat'. Simultaneously, political incentives and agendas steer scientific research as has been exemplified with the establishment of invasion biology as a separate scientific sub-discipline. The next chapter moves on to analyse relevant natural and social science debates on alien species. As natural science framings largely have influenced current policies and management strategies on invasive alien and native species, a growing literature critiquing established 'truths' may contribute to move policies and management in novel directions.

3. Literature review

The main purpose of this chapter is to situate the empirical findings within the larger body of scientific work discussing and critiquing current categorisations of alien species. First, I outline relevant research on alien species in invasion biology and the broader natural sciences concerning alien species, and then move on to discuss a growing critique. The findings of the thesis in relation to this body of work are discussed in the three papers and chapter 9.

3.1. The natural science 'nature' of the alien species problem

In the wake of Elton's book titled *The Ecology of Invasions by Animals and Plants*, published in 1958, invasion biology detached itself from biology and became a rapidly growing sub–discipline of ecology, with its own journals, scientific and educational programmes, institutes, and local and national agencies (Davis et al. 2001; Davis 2009). In the Scientific Committee on Problems of the Environment's (SCOPE) book on invasive alien species, edited by Mooney et al., Harold Mooney (2005, 1) frames such spreads as a 'resource problem' in the sense that such species negatively affect 'goods and services valued by society'. So, according to also Perrings et al. (2005), the current concerns of alien species are not only 'narrowly' related to their ecological impacts on biodiversity, particularly on oceanic islands where many species are driven to extinction, but also to their impacts on economic production sectors such as agriculture, forestry, and fisheries. The economic impacts of invasive alien species are estimated to cost millions of US dollars. As an example, the damage caused to industrial plants in the USA and Europe by zebra mussels (*Dreissena polymorpha*) has been estimated to have an annual economic impact of USD 3000-5000, whereas the economic impacts of leafy spurge (*Euphorbia esula L.*) and knapweed (*Centaurea stoebe* L.) due to loss of rangelands in the USA are estimated to approximately USD 129 million per year (Perrings et al. 2005, 22).

At its most basic level, the alien species problem is caused by humans spreading species to places beyond natural bio geographical barriers. As pinpointed by Charles Elton in 1958, human trade and travels have resulted in massive species spreads that have severe implications for native species communities that have developed distinct characters over hundreds of millions of years (Simberloff 2000b). Thus, while species and natural ecosystems have evolved in relative isolation throughout the millennia, the human–assisted spread of

species beyond physical bio geographical barriers disturbs the world's biota in various ways. The increases in globalised trade and travel in the 20th century combined with climatic changes have speeded up the rate of species spreads (Mooney et al. 2005). This has been termed a 'homogenisation' of the world's biota (Brown 1995; McKinney & Lockwood 1999), which refers to a process whereby local species richness will increase as a result of introductions, whereas the global diversity of species will decrease as rare species are replaced by more common generalists (Brown & Sax 2004). However, critics of the 'homogenisation' thesis (for example Rahel 2002; Davis 2003; Sax & Gaines 2003) argue that it is unlikely that a few headline invaders will succeed in wiping out the world's biological diversity. Research indicates that there are very few incidences of alien species driving native species to extinction due to competition (Mooney & Cleland 2001; Davis 2003; 2009). Nevertheless, alien species spreads may have severe consequences, such as altering habitats, which in concert with habitat fragmentation and climate change may lead to increased pressure on rare and threatened species (Haber 2008).

After a species has been spread, numerous factors influence the ability of that species to establish in a new location. There are considerable scientific discussions concerning to what extent certain environments are more susceptible to species invasions than others (see for example Crawley 1987; Williamson 1996; Levine & D'Antonio 1999; Stohlgren et al. 1999), a discussion I do not develop further here. Rather, it is sufficient to say that 'it is the interplay between environment, species, and chance that will decide upon actual fate of the introduction' (Weidema 2000, 31). Importantly, the CBD addresses only species considered to be harmful, which is generally interpreted to mean ecologically harmful (Mooney et al. 2005, 5). Ecological harm can occur at *species level* (i.e. through competition and displacement of native species or predation on native species, in addition to causing the spread of parasites and pathogens), at *genetic level* (i.e. through disturbance of genetics and adaptation of native species, or by leading to the extinction of native species), and at a *community and ecosystem level* (i.e. by causing changes in habitat structures or altering the composition of native fauna and flora) (Weidema 2000). In addition, Mooney (2005, 5-6) characterises the negative impacts on human societies of alien species that operate as

> fire simulators and cycle disrupters, water 'depleters', animal disease promoters, crop decimators, forest destroyers, fishery disrupters, impeders of navigation, 'cloggers' of water works, destroyers of homes and gardens, grazing land destroyers, species eliminators, noise polluters and modifiers of evolution.

Thus, scientific and management concerns over invasive alien species are related both to the economic impacts on societies and to ecological impacts on other species and ecosystems. In the next section, I discuss a selected part of the critique of the categorisations species as 'invasive alien species' and the associated alien–native dichotomy.

3.2. Critiques of natural science categorisations

A consequence of the CBD has been a heightened focus on invasive alien species as a key management issue in order save the world's biodiversity, as outlined above. Consequently, both funding and interests in researching invasive alien species as an environmental problem have been boosted within natural science disciplines, and particularly within invasion biology (Davis et al. 2001). The research on invasive alien species from ecological and also economic perspectives has further resulted in criticism from various disciplines such as human geography, history, philosophy, sociology, and anthropology, and lately also from natural scientists themselves (for example Davis 2009). In order to gain an overview of the various aspects covered in the critical literature on alien species I undertook a literature search based on keywords identified through a broad reading of relevant texts on alienness and nativeness. Based on the broad reading, which is not exhaustive, I have divided the literature into works centring on *perceptions of species* with the associated subheadings: 'Public antagonism to alien species control'; 'Public perceptions of species' and 'Re–thinking human–nature relationships'. Moreover, literature focusing on scientific and environmental managements' *categorisations of species* as alien or native is arranged under the subheadings: 'Criticism of value–based language'; 'The dual status of alien as ill–makers and resources'; 'The changed status of alien historically', and 'Temporal aspects of nativeness and alienness' (see Table 2 for an overview of the associated, but far from exhaustive, references on the topic). It is important to note that the categories overlap and several of the cited works could fit in several of the categories.

Table 2: Topics raised in critical literature on alien species

Topics of concern	Literature
PERCEPTIONS OF SPECIES	
1. Public antagonism to alien species control	for example Veitch & Clout 2001; Genovesi 2007; García–Lorente et al. 2008; 2011; Marshall et al. 2011; McNeely 2011; Rotherham & Lambert 2011; Simberloff 2011
2. Public perceptions of species	for example Czech et al. 1998; Montgomery 2002; Lodge & Shrader–Frechette 2003; Head et al. 2004; Zagorski et al. 2004; McNeely 2005; Head & Muir 2006a; 2006b; Norgaard 2007; Lundberg 2010; Binggeli 2011; Fischer et al. 2011; Schüttler et al. 2011; Selge & Fischer 2011; Selge et al. 2011; Sharp et al. 2011
3. Re–thinking human–nature relationships	for example Jones & Cloke 2002; Cloke & Jones 2004; Hitchings & Jones 2004; Robbins 2004; Bakker & Bridge 2006; Head & Muir 2006a; Head 2007; Kull 2008; Head & Atchison 2009
CATEGORISATION OF SPECIES	
1. Criticism of value–based language	for example Fine & Christoforides 1991; Cresswell 1997; Coates 1998; 2006; Peretti 1998; Sagoff 1999; Heller & Matza 2000; Hettinger, 2001; Subramaniam 2001; Woods 2001; Chew & Laubichler 2003; Olwig 2003; Simberloff 2003; Gobster 2005; Helmreich 2005; Larson 2005; 2008; 2011; Clergeau & Nuñez 2006; Eskridge & Alderman 2010
2. The dual status of alien species as ill–makers and resources	for example Kendle & Rose 2000; Alderman 2004; Foster & Sandberg 2004; Chew 2009; Walter & Binimelis 2009
3. The changed status of alien species historically	for example Cooper 2003; Gröning & Wolschke–Bulmahn 2003; Hughes 2003; Smout 2003; Van Sittert 2003; Cadotte 2006; Davis 2006; Jerolmack 2008
4. Temporal aspects of nativeness and alienness	for example Warren 2007; Ginn 2008; Chew & Hamilton 2011; Head 2012

The debates outlined in Table 2 have relevance for how I have come to frame my own research, and in the next two sections I briefly go through some of the key arguments in turn. I start by describing the three topics focusing on public perceptions of species and then outline the four topics critiquing problematic aspects of the alien–native categorisations in environmental politics and natural science.

3.2.1. Perceptions of species

First, several studies have outlined the importance of focusing on public perceptions, and specifically on what is listed as point 1 in table 2 'public antagonism to alien species control' when nature managers are designing their strategies and information campaigns towards invasive alien species (for example Lodge & Shrader–Frechette 2003; Genovesi 2007; Norgaard 2007; García–Lorente et al. 2008; 2011; Rotherham & Lambert 2011). García–Lorente et al. (2008) argue that as perceptions about impacts and benefits of species vary greatly, so do perceptions of species introduction and eradication. Managers should consequently take such issues into account to ensure that their information campaigns will be successful (García–Lorente et al. 2008). Secondly, scholars have investigated related issues that can be categorised as 'public perceptions of species', and how perceptions of alien and native species may influence environmental management options. Selge et al. (2011) argue that the attributes of species (for example their perceived harm, controllability, and attractiveness) are more influential in the shaping of public attitudes towards species than their native or alien status. This is echoed in a number of studies (see for example Czech et al. 1998; Montgomery 2002; Schlegel & Rupf 2010; Binggeli 2011; Fischer et al. 2011; Schüttler et al. 2011; Selge & Fischer 2011).

Thirdly, there have recently been interesting efforts within human geography undertaken towards 're–thinking human–nature relationships', including the relationships between humans and plants (see for example Jones & Cloke 2002; Cloke & Jones 2004; Robbins 2004; Kull 2008; Head & Atchison 2009). Crucially, agency is being re–thought in radical ways (Whatmore 1999; 2002; 2003) as relationally spun between humans, things, and non–human species (in line with for example Latour 1993). Importantly, this means that plants are seen as active agents that take part in creating new regional landscapes (Kull 2008) and can consequently 'be understood as non–human agents, with a potential to act, to bend space around themselves, to facilitate dependence and even to translate the will of others into

their own articulation' (Jones & Cloke 2002, 8). This aspect has so far largely been overlooked in social and natural science literature on alienness and nativeness. It is within this body of work that this thesis is framed and I will outline relevant works in more detail in Chapter 4. For now I only point out that the papers in Part 2 illustrate the importance of contextualising the concepts of alien and native by paying attention to how they are perceived, as well as of investigating the relational agencies between humans and non–humans (see in particular paper 1).

Crucially, public perceptions of species are positioned in dynamic relationships with the categorisations of species as alien or native. In the proceeding section, I will examine the selected literature critiquing current categorisations of species within what can largely be cast as natural science and environmental politics and management.

3.2.2. Categorisation of species

Firstly, Coates (1998, 135) argues that 'what we think and feel about animals and plants – regardless of their nationality – often tells us more about human culture and values than it does about other species'. This becomes apparent when looking at the language used to describe alien and native species, and several studies have raised 'critique of the value–based language' used in invasion biology, biodiversity politics, and the media. The manner in which the concepts alien and native are impregnated with values is illustrated through the use of militaristic metaphors by invasion biologists (Larson 2008), as these help in 'getting the message across' (Chew & Laubichler 2003, 53) to policy–makers and the public. The metaphors may help to explain complex social problems (Fine & Christoforides 1991) by linking phenomena that are very dissimilar, for example, the threat of alien species can be linked to threats from foreign people to native territories (Fine & Christoforides 1991; Olwig 2003; Coates 2006) or to ill health, such as 'disease', 'plague' and 'infection', which underlines these plants' 'out of placeness' (Cresswell 1997, 337). Maasen & Weingart (cited in Larson 2005) further claim that metaphors work as transporters of meaning between science and society. Policymakers, nature managers, and natural scientists have been accused of categorisation programmes against alien species based on prejudices and assumptions (see for example Lundberg 2010), or in other cases without a common, well–designed strategy (Walter & Binimelis 2009). Chew (2009) reasons that conservation–motivated scientists categorise alien species such as tamarisk (*Tamarix spp.*) as monsters, and focus attention on

eradicating them rather than dealing with more complex environmental problems such as water shortage. Thus, by using strong value–based language scientists get their message across by playing on fear (Gobster 2005; Eskridge & Alderman 2010), and may then risk losing scientific credibility (Larson 2005; Clergeau & Nuñez 2006). Others go further and claim that the negative bias against alien species in management and invasion biology reflects racist and xenophobic attitudes (Peretti 1998; Sagoff 1999; Heller & Matza 2000; Subramaniam 2001).

This leads to the second category identified, 'the dual status of alien species as ill–makers and resources', and hence to the 'changed status of alien species historically', the third category standing out in the literature reviewed. Many alien species have a dual status of being both harmful and useful, and thus categorisations of them may change from one historical context to another (for example Cooper 2003; Gröning & Wolschke–Bulmahn 2003; Hughes 2003; Smout 2003; Alderman 2004; Foster & Sandberg 2004; Cadotte 2006; Davis 2006; Jerolmack 2008; Chew 2009; Walter & Binimelis 2009). This highlights a point central to this thesis, namely the importance of contextualising categorisations of alienness and nativeness, and investigating how these concepts relate to perceptions of species. This is pursued in more detail in all three papers in Part 2.

Much of the above–mentioned literature questions or criticises value judgements that are implicit in natural science research, environmental politics, and the management of alien and native species. A final point I would like to raise is the implicit, although rarely explicitly expressed, 'temporal aspects of nativeness and alienness' in environmental management. Related to this fourth category, Warren (2007) claims that 'alien' and 'native' are relative terms as they rest on ambiguous timescales, and consequently, no species are in themselves alien, but become so to particular environments and moments in time. Warren proposes a 'damage criterion' that focuses on species' behaviour rather than their spatiotemporal origin. Richardson et al. (2008, 296) responded to Warren's proposition by claiming that he 'dangerously oversimplifies' issues related to biological invasions and that distinguishing native from alien is both achievable and essential. Richardson et al. (2008) claim that a damage criterion alone is not sufficient for dealing with the problem, as damage is often delayed and difficult to quantify. Thus, Richardson et al. (2008) largely dismiss the critique and argue for the excellence of the *objective* techniques applied in formulating intervention strategies. However, their argument has not calmed the critical voices towards the ambiguous

spatiotemporal demarcations applied in biodiversity politics and invasion biology. Demarcating nativeness from alienness is commonly done through the selection of a temporal threshold where nativeness is associated with that which was present before, for example, the beginning of the Neolithic period (as this is when the widespread cultivation of crops began), or before Columbus' arrival in America in 1492 (Chew & Hamilton 2011). In Australia, the year 1788 has been selected as a threshold that marks the arrival of British colonisers (Head 2012). Ginn (2008) argues from a New Zealand post–colonial setting where preservation of native nature is considered a nation–building project, and alien species are thus considered a threat to the new post–colonial imagined community of New Zealand. Ginn (2008, 16) disputes the use of a 'pre–colonial baseline for measuring ecosystem health or ecological restoration projects' and calls for a re–thinking of New Zealand nature that

> requires learning to live with the relations that have made up the many beings that inhabit New Zealand, rather than an act of collective forgetting of colonisation, and a spatial paranoia that imposes rigid classification on a messy world.

In a country without a colonial past, such as Norway, the year 1800 has been selected to make sure that species do not simultaneously end up on black lists and red lists, and moreover, because there is little prior knowledge of species spreads before the year 1800 (Norwegian Biodiversity Information Centre, personal communication 2012).

The above discussion leads to a related aspect of alien–native categorisation, namely the role of human assistance in rendering species alien by moving them into new territories (Chew & Hamilton 2011). Within invasion biology, nativeness becomes a revocable state while becoming alien is a permanent state. Consequently, humans render nature unnatural (i.e. alien) and are responsible for protecting what is left of 'pristine' or native nature. This illustrates how current environmental politics give humans responsibility for securing the survival of their own kind as well as other creatures on the planet in an evolutionary, inter–generational perspective (Macnagthen & Urry 1998). Katz (1998, 48) claims that within this mind–set nature is turned into an accumulation strategy whereby apparently nothing, apart from alien species, should be allowed to become extinct or destroyed as it may prove useful or profitable to humankind. This has led to preservationist strategies that involve attempts to arrest time 'in the interest of a supposedly pristine nature which, of course, is neither bounded nor static' (Katz 1998, 54). Thus, species conservation that includes measures to deal with

invasive alien species spreads implies a notion of time that seems contradictory. Determining what processes and elements are worthy of conservation crucially involves demarcating wanted from unwanted nature, and importantly what kind of past to preserve. Lowenthal (1993) terms this a nostalgic approach that involves changing both the past and the present by selecting certain elements of the past that are taken as measuring sticks for the present and the future. Of particular importance to this thesis, is that this paradox is rarely reflected upon in biodiversity politics or in conservation measures. Consequently, the demarcation of wanted from unwanted species largely takes place as an implicit process of biodiversity politics and natural science research (see for example Larson 2007 for a review) and consequently the associated value–based choices are rarely explicitly discussed. Temporal ambiguities related to the black–listing and red–listing of species are further discussed in paper 3, in Part 2.

This chapter has presented selected relevant literature and perspectives related to the alien–native phenomena, and further discussed critiques of these arguments. The discussed literature on perceptions and categorisations of the alien–native dichotomy has heavily influenced the theoretical and methodological framework of this thesis, as well as the writing of the three papers presented in Part 2. In the next chapter (chapter 4), I hence outline the theoretical perspectives of the thesis in more detail.

4. Theoretical perspectives and key concepts

This chapter outlines the theoretical insights that have been of importance for the research design, field work, and subsequently for writing the synthesis and the three papers. The data from the two empirical studies span different levels, i.e. the individual embodied experiences of domestic gardeners (paper 1) and those of professionals at Fornebu (papers 2 and 3). Both studies are based in and contextualised by the natural science categorisations of alien and native species that have become established in international and national environmental policies and management. To grasp the dynamic and more critical relationship between perceptions of plants and categorisations of them as alien and native, there is a need to draw on and analyse much more explicit social, cultural, and historical contexts and accompanying value judgements. Consequently, theoretical approaches from the social sciences in general and human geography in particular, have been needed. These are crudely outlined in Table 3 and further discussed in the current chapter.

Table 3: An overview of key theoretical insights related to Papers 1–3 (Part 2)

Paper	Topic	Key theoretical insights
Paper 1: Politicising plants: dwelling and invasive alien species in domestic gardens	The paper examines the domestic garden as a politicised space contributing to alien species spreads. It focuses on how the concepts alien and native are negotiated by domestic gardeners, and demonstrates that domestic gardeners relate to plants' attributes rather than their geographical origins.	- A focus on what is *done* with the concepts alien, native and invasive rather than merely on what things or actions *mean* (in line with Skinner 2002) - Perceiving agency as both a human and non-human capacity (in line with Whatmore 1999) - Studying language as an embodied skill in dwelt–in worlds (Ingold 2000)
Paper 2: Native nature and alien invasions: Battling with concepts and plants at Fornebu, Norway	The paper investigates the planting of alien species at Fornebu as environmental criminality. Further, it illustrates how the concept of alien species recently has been redescribed as environmentally problematic in environmental management and its associated consequences for those involved at Fornebu.	- A focus on what is *done* with the concepts alien, native and invasive rather than merely on what things or actions *mean* (in line with Skinner 2002) - Studying language and concepts as materially embedded rhetorical 'tools' that do work (Skinner 2002)
Paper 3: Wanted and unwanted nature: Landscape development at Fornebu, Norway	The paper focuses on the Fornebu conflict and discusses value–based and temporally contingent aspects of species categorisation, particularly related to black lists and red lists that have consequences for landscape planning.	- A focus on what is *done* with the concepts alien, native and invasive rather than merely on what things or actions *mean* (in line with Skinner 2002) - Studying language and concepts as materially embedded rhetorical 'tools' that do work (Skinner 2002)

The theoretical insights schematically presented in Table 3 are discussed in turn below. Importantly, insights from anthropologist Tim Ingold (2000) and explorations of human–nature relationships within more–than–human geography (for example Whatmore 2006) have been influential when studying domestic gardeners' relationships with plants, while insights from political philosopher Quentin Skinner (2002) have been important when exploring the dispute over plants at Fornebu. A focus on 'doing' inspired by conversations in human geography has been crucial for both studies. Essentially, this implies increased scientific focus on actions and what is done in situations under study rather than trying to reveal hidden structures behind socially constructed phenomena. This perspective will be described in detail below.

In the following, I start by discussing relevant developments within human geography from debates over the 'nature of nature' via the 'cultural turn' and finally towards a 'doing' nature perspective applied in this thesis. I then move on to discuss concerns relating to the agency of non–humans, i.e. the plants under scrutiny, which now engages a number of geographers researching more–than–human geography, before turning to how Ingold's dwelling perspective adds to this relational approach. Finally, I explain how a focus on how concepts are used inspired by Skinner supplements the 'doing' nature conversations in human geography.

4.1. The problematic 'nature of nature' in human geography

To contextualise my theoretical approach, it is necessary to outline some of the ways that human–nature relationships have been perceived and studied in human geography. There has been an enormous interest in researching this topic over the last two decades, sparked by Margaret Fitzsimmons' (1989, 106) complaint over the 'peculiar silence' on the question of nature in human geography (Castree & Braun 2001). This interest should be seen as a reaction to the tendency of portraying Nature as a singular category in Western philosophy, where the term generally has been given three overlapping meanings: *external nature*, *intrinsic nature*, and *universal nature* (Williams 1983, 219; Castree & Braun 2001, 6-8). External nature implies an understanding of 'wild' entities that are 'untouched' by humans and separate from society. Intrinsic nature refers to an understanding of nature as something inherent and an essential quality applied both to 'human nature' and to 'external nature'. This entails seeing nature as fixed and unchanging, i.e. an understanding defined by essential qualities (Castree &

Braun 2001). The meaning of universal nature involves an understanding that focuses on the physical world with its species as a global ecological system. The concept of a universal nature has roots in pre–Enlightenment thought, i.e. to the perception of a 'Great Chain of Being' linking all species, including humans, with an organic Holy whole (Abram 1996). These ways of perceiving nature with a capital 'N' lie at the core of Western thinking and natural science methodologies. From pre–Socratic philosophers, we inherited the idea that the 'great variety of phenomena which surrounds us could all be impounded under a name and talked about as a single object' (Macnaghten & Urry 1998, 37). Inspirations from early thinkers such as Galileo and Descartes have framed an ontological position where intentional agency is associated with a rational human mind that is superior to the passive objects of Nature (Abram 1996). One of the implications of such a dualistic perspective was a split within the sciences; natural sciences studied Nature, while the social sciences traditionally concentrated on human societies and culture (Macnaghten & Urry 1998; Asdal 2004). The split has become increasingly difficult sustain, not least due to, for example, pressing environmental problems and climate change. It is first and foremost social scientists that have acknowledged the need to re–think human–nature relationships, among them also human geographers.

4.1.1. The cultural turn within human geography and beyond

From the 1980s onwards there was what is now generally acknowledged as a 'cultural turn' within geography, and the social sciences more generally. Different notions of a cultural turn have been widely discussed and studied (see for example Chaney 1994; Grossberg et al. 1994; Barnett 1998 for overviews). As the intention in this thesis does not involve addressing the cultural turn per se, I do not attempt to examine in–depth in this short section the broad literature addressing this notion. Rather, my concern here is to focus on the significance of the cultural turn for the present study and in particular the selection of the theoretical approach. It should be noted that academics associated with the cultural turn, and post–structural and post–modern strands of thought, began to question universal notions of culture and normative values implicit in 'objective science' in the 1970s (for example Foucault 1972; Derrida 1979; Spivak 1988). Increased focus was beginning to be placed on reflexivity towards the roles of language, meaning, and representations (Foucault 1972; Derrida 1979; Spivak 1988) and on the constructions of science and knowledge in general. Academics associated with the cultural turn in geography, such as Peter Jackson, James Duncan and Denis Cosgrove, criticised in

particular Carl Sauer and the Berkeley School's 'universal' focus on material cultures and physical forms of landscapes (Valentine 2001). However, in their criticisms, they themselves upheld, perhaps unwittingly, the divide between nature and culture by portraying the natural world as 'an exclusively human achievement' (Whatmore 2003, 165). Thus, within such a perspective 'knowing nature' became an issue considered to be '*internal* to culture' in a profound way so that there would be 'simply *no way* to access nature's materiality outside the materiality of signification' (Castree 2003, 167). Such constructivist positions have similarly faced criticism from 'realists', such as environmental scientists Soulé & Lease (1995), who feared that constructivist arguments would lead to real world environmental problems being drowned in a drain of relativism. One response to such rather unfruitful debates was to 're–materialise' human geography (see for example Bakker & Bridge 2006) and increasingly focus on embodied practices or 'doing', and to a lesser degree social constructions and representations.

4.1.2. A 'doing nature' perspective in human geography

A 'doing' nature perspective, or what has been termed a 're–materialisation' within British human geography (Bakker & Bridge 2006, 5), implies the perception of material and social aspects of the world as constantly interacting. This entails a shift in scientific focus from representation to practice (Whatmore 2006). Essentially, the focus within such a perspective discards attempts at discovering 'hidden' structures and meanings *behind* the phenomena under study, and directs the focus towards how human–nature relationships are the result of practices: a 'shift of concern from what things mean to what they do', in Whatmore's terms (Whatmore 2006, 604). This implies paying attention to 'what affects and effects us' (ibid.) and moreover a renewed categorisation of agency as a capacity belonging to both humans and non–humans.

The focus on practices and doing in human geography has taken many directions, such as studies of how humans interact with commodities and artefacts[12], work on embodiment and

[12] The body of work that Bakker & Bridge (2006: 12) terms 'commodity stories' includes studies of how commodities and artifacts are used in everyday lives (for example Appadurai 1986; Miller 1987; 1998; Graves-Brown 2000).

bodies[13], and work on hybridity and sociotechnical relationships[14] (see Bakker & Bridge 2006 for an overview). A now established body of work termed 'non–representational theory' (see Anderson 2009 for an outline) focuses on how practices of everyday life are performed in embodied and processual ways that link humans and non–humans together (Nash 2000, 655). An important premise is that, as many interactions and human capacities are spontaneous, non–intentional, and non–discursive, the world cannot be perceived only through the lenses of discourse and representations. Thrift (2000, 220), generally seen as the founder of non-representational theory, argues that 'thought is bound up with things' and such 'things' (commodities, bodies, and biophysical processes) influence social relations and practices. He links this perception of practical knowing to the metaphor of performance, which implies

> a way of understanding meaning as not residing in something but as generated through processes … which does not therefore assume a realm of representation and a realm of the real (Thrift 2000, 225).

However, this does not mean abolishing the notions of, for example, discourse or representation altogether, but rather focusing on discourses and representations as specific kinds of practices (Whatmore 2006). Moreover, the're–materialisation' of human geography involves taking into account the active agencies of non–humans, which are being explored within 'more–than–human' geography.

4.2. More–than–human geography: perceiving agency as a relational achievement

The active roles of non–humans in for example shaping natural and social environments, are easily overlooked both because there has been a long philosophical tradition of rendering them invisible (Latour 1993) and because their agencies are not easily translated or articulated through human language (Jones & Cloke 2002, 62). Conversations within more–than–human geography provide a theoretical framework to study the reciprocal relationships between humans, non–humans, and discursive contexts (in line with Whatmore 1999). Specific non–

[13] Influential work on embodiment and bodies includes for example Butler (1993), Rose (1993), Harvey (1998) and Harrison (2000) just to mention some.
[14] Work on hybridity and sociotechnical relationships are inspired by Latour's (1993) work on hybridity and quasi-objects and Haraway's (1991) cyborg metaphor. Examples are Whatmore's (2002) study of 'the wild'(for example jaguars and elephants) and 'wilderness' as products of sociotechnical relations (Bakker & Bridge 2006). Another example is Swyngedouw' s (1996) approach to urbanization as a process of hybridization.

humans have become the main actors in studies of 'animal geographies' (see for example Wolch & Emel 1998; Matless 2000; Philo & Wilbert 2000; Matless et al. 2005) and 'plant geographies' (see for example Jones & Cloke 2002; Cloke & Jones 2004; Robbins 2004; Head & Atchison 2009). Rather than being portrayed as passive objects to the human rational will, non–humans in the cited studies are perceived as active subjects that engage with their surroundings. More–than–human geographies thus emphasises 'the co–constitution of subject and object, self and environment' (Jones 2009, 311), and while drawing on conversations from various theoretical fields such as science and technology studies (Haraway 1997; Latour 1999), anthropology's interests in material culture (for example Appadurai 1986; Ingold 2000), and environmental history (Brid 1987; Cronon 1995), several scholars researching relational agencies utilise network approaches, particularly inspired by actor–network theory (ANT). Whatmore (2002) follows an ANT–inspired approach when tracing the networks involved in, for example, wild animal trade, genetically modified soybeans and the governance of plant genetic resources, while for example Robbins (2004) traces the specific power–laden networks of human and non–human actors involved in enabling species invasions. While acknowledging the importance of insights from network theories, I have found it even more relevant to pursue Ingold's notion of dwelling when investigating relations between rather abstract categorisations and human perceptions of plants.

4.3. Language as an embodied skill in dwelt–in worlds

In this thesis I view the uses of concepts, in both written and oral forms, as embodied skills integral to dwelling in the world. By implication, conceptual practice has material consequences. Ingold's notion of dwelling as a mode of being–in–the world concerns the continuous and intimate engagements between species, including humans and the surroundings (Ingold 2000). Ingold contrasts this approach to a conventional 'building perspective' where the perceiver is imagined as being situated 'outside' the world and consequently has to make a representation of it inside the mind before meaningful engagement can take place (Ingold 1995, 66). Such a building perspective has largely framed conventional Western philosophies in which an external environment given independently of the senses is perceived as being separate from the internal environment organised by acquired cognitive schemata, and, consequently, 'worlds are made before they are lived in' (Ingold 1995, 66). As an alternative to the conventional building perspective, Ingold formulated a 'dwelling perspective' inspired by Heidegger's essay 'Building, dwelling, thinking'

(Heidegger 1971). In this essay, Heidegger sets out to explore the connections between what it means to dwell and to build. Essentially, 'we do not dwell because we have built, but we build and have built because we dwell, that is, because we are *dwellers*' (Heidegger 1971, 2-3). Ingold interprets Heidegger's argument to mean that the forms people build, either mentally or physically, are results of their engagement with their surroundings. Thus, dwelling in the world is a premise for thinking and reflecting. Importantly, embodied encounters come *prior* to us reflecting about them (Merleau-Ponty 2002). In the embodied and reciprocal encounters between the body subject and the physical and social surroundings meaning and reflections are shaped. Through such relational encounters plants affect and effect us, and vice versa. In this sense embodied experiences with and categorisations of plants are interconnected (Ibid.).

4.3.1. Concepts as products of dwelling

Following Ingold, categorisations of alienness and nativeness are products of human dwelling in the world. The scientific categorisation of species is a practice that involves taking the position of a detached observer describing the world instead of being in the midst of it, in line with scientific criteria of objectivity and methodological credibility. Ingold (2000, 217) asks: What are we doing when stepping outside the current of sensuous impressions and attachments? He answers that this kind of activity is called imagining. Imagining is, however, an activity that people *do*, yet what distinguishes imagining from, for example, nurturing plants is that it is turned inwards on the self, to a world populated by other products of imagining. Ingold (2000, 418) goes on to argue that 'whatever we call these products - whether plans, strategies or representations - their forms are generated and held in place only within the current of imaginative activity'. Consequently, even imagining is an activity that takes place *within* the world. Consequently

> [t]he scientist may indeed think himself to be an isolated, rational subject confronting the world as a spectacle, yet were he in reality so removed from worldly existence he could not think the thoughts he does. (Ingold 2000, 418)

When imagining, scientists are sensitive to real world persons, objects, and realisations and so too are their uses of concepts. In this sense, scientific argumentation is not that different from, for example, garden dwelling, as both scientists and gardeners ascribe values to plants and are engaged in social, cultural, and historical practices. Consequently, all practices are nurtured

by dwelling in the world. Ingold (2000, 409) pinpoints that conventions and meanings associated with words are forever being built over time through use in 'activities and relations in which they are used and to which they contribute'. Concepts are products of collectively defined and historically situated practices (in line with Skinner 2002), that have the capacity to influence individual perceptions and experiences. The categorisations of alien species as an environmental problem by natural science, environmental management, and the media are gradually starting to influence the practices of for example garden owners, planners, and landscape architects, as demonstrated in this thesis. In the following, I explain how language and concepts can be perceived as speech acts or rhetorical tools that do work within the context of species categorisations.

4.4. Language, concepts and speech acts

The understanding of language adopted in this thesis implies perceiving concepts as terms constantly negotiated and held in place through *use* rather than merely being an abstracted system of signs (in line with both Ingold 2000 and Skinner 2002). When exploring concepts as tools in papers 2 and 3, I am inspired by the political philosopher Quentin Skinner (Tully & Skinner 1988; Skinner 2002) who is often termed a 'linguistic contextualist' and associated with the academic canon of the Cambridge school. Inspired by Austin's speech act theory (Austin 1962) Skinner's (2002) perspective on language implies seeing utterances as speech acts, and consequently to say something is also to do something (for example warn, support, convince, or criticise) within specific contexts. Skinner is not only interested in what has been said by a particular author in a particular context, but also how and why something is said or how concepts are used to conventionally or unconventionally *do* things. His approach thus provides;

> a historically grounded framework that accounts for the relationship between human agency and the structural language–context, which make actions meaningful. This allows for a conception of historical change that is neither narrowly structuralist nor exclusively focused on the individual agent (Edling & Mörkenstam 1995, 120).[15]

[15] Edling and Mörkenstam (1995) argue that there are several similarities between Skinner's contextualist approach and the writings of Michel Foucault (1972; 1973; 1980): 'both Skinner and Foucault are concerned with language as a structural determinant of action and with the analysis of discourses. However, unlike

Skinner is primarily concerned with the intentions of writers and speakers in their production of utterances. Interpreting utterances through a Skinnerian approach thus involves exploring the relationships between writers or speakers and the relevant contexts in which they are situated. Moreover, spoken or written utterances are not merely *representing* real–world phenomena, but are themselves the forms of action under study. Skinner's analytical strategy implies tracing particular contexts in order to explain what an utterance is an answer to (Skinner 2002), rather than, for example, trying to reveal the hidden world *behind* an action. Skinner's approach is thus

> not contextualising in the sense that it reduces utterances to their contexts (for example social classes, interests, anxieties or sensibilities). On the contrary, Skinner explicitly seeks to avoid such reductions and problematises such forms of reasoning. He … wishes to avoid the trap of looking for something behind utterances or expressions of an external context and instead tries to take the utterance literally. (Asdal 2012, 386)

What does it mean to take an utterance literary? According to Skinner the answer may be found by looking at an author's intention when uttering something, such as 'Was the utterance … meant as a warning, a criticism, a reproach, perhaps only a joke, or what?' (Tully & Skinner 1988, 271-272). Intentions do not refer to an author's 'plans to act' but rather their *intentions in acting* (for example whether they wished to legitimise or reject a particular moral position). Intentions exist only as a feature of the work itself, expressed at a particular point, and will therefore adhere to the existing conventional social and linguistic rules. It is therefore necessary to trace the contexts that utterances spring from. Taking an utterance literally thus means not to try to go 'behind' an utterance and read something else into it, but rather to focus on what is being *done* with the specific utterance as well as what is being *said* (Tully & Skinner 1988, 279–280). Edling & Mörkenstam (1995, 121) argue that

> the concept of discourse points to a social setting characterised by an element of reflexivity, i.e. the concepts and ideas proposed by the professionals involved in the

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Foucault's work, Skinner's theory and method open up a possibility to go beyond the mere study of 'the regularity of discursive practice' (Foucault 1972: 145) and identify potential instigators of change in practices. Thereby, the analyst can hypothesise and examine how changes have been brought about, not just point to obvious breaks in discursive practices' (Edling and Mörkenstam 1995: 123–124).

> discourse draw upon notions in society but may also deeply affect and feed into day–to–day interaction in society.

Hence, a Skinnerian discourse analysis implies studying speech or written utterances as acts produced through the interaction between statements of individual speakers and the structural properties inherent in language, as language structures thoughts and contributes to rendering the world meaningful (Edling & Mörkenstam 1995). Importantly, 'linguistic structures do not preclude or prohibit other ways of thinking or speaking about a topic' (Edling & Mörkenstam 1995, 122), as language and language–users are situated in social, cultural, and historical contexts. Thus, while speakers and writers need to draw on linguistic conventions to be understood as intended within the relevant context, there is always the possibility of *transforming* language (Tully & Skinner 1988). This leads on to how the conventional uses of concepts may change when applied to contexts that they do not normally refer to (Skinner 2002).

4.4.1. Conceptual changes

Conceptual changes can be studied through rhetorical 'moves in argument' or 'rhetorical redescription' where the concepts are seen as tools in past and present debates and contexts. A rhetorical redescription takes place when authors succeed in framing concepts in a specific moral light, and thereby impose a particular moral vision upon the world. Skinner (2002, 186) comments that

> [a] number of practices previously regarded as acceptable and perhaps even taken for granted will come to seem morally intolerable. This is not of course to say that the process is one of coming to see things as they really are. … It is merely a matter of substituting one social philosophy for another, both of which may have seemed rationally defensible at different times.

The outcome of such linguistic and discursive struggles will sometimes be conceptual change. An author or a group of authors need to succeed in persuading their audience that a concept applies to circumstances where it would not normally be used, for example, that the action of planting alien species has changed from being a perfectly accepted practice in landscape architecture into an act of crime against the environment. Thus, the same concept is used by

two opponents that place the term in different moral light, i.e. alien species are natural elements in gardening versus alien species represent a threat to native species.

As Skinner is firmly placed within a hermeneutic tradition, he focuses primarily on *linguistic* and ideological contexts, and Asdal (2012) pinpoints that he does not specifically refer to material or non–human aspects. However, his approach does not exclude the possibility of non–human presence in shaping perceptions and categorisations of species. While Skinner's approach engages with linguistic uses of concepts in specific historical contexts, it simultaneously embraces wider political, social, and material processes. Consequently, concepts are not purely linguistic acts, as they are nurtured and engaged in embodied world encounters.

In sum, because I draw on different theoretical perspectives in the three papers, i.e. dwelling, more–than–human geography, and the 'doing' of concepts I am able to demonstrate the relevance and importance of a dialogue between them in order to throw critical light on species debates. As illustrated above, Skinner's approach can be fruitfully combined with the 'doing perspective' in human geography (for example Bakker & Bridge 2006; Whatmore 2006), as he is concerned with what concepts *do* rather than merely what they mean or represent. Further, Skinner (2002) and Ingold (2000) share the perspective of concepts as being materially embedded terms held in place through use. The different conversations outlined above constitute a theoretical framework for the thesis as a whole, one that enables the exploration of how individual and professional perceptions and categorisations of plants relate to the categorisations of alienness and nativeness as defined in environmental policies and management. In the next chapter, I outline and reflect on the methodological approaches and fieldwork, which constitute the empirical foundation of this thesis.

5. Methodologies

In addition to my childhood memory of the garden lupin as a beautiful summer plant, which later has been turned into an invasive alien, there are also work–related reasons why I decided to focus on invasive alien species as a research topic for this thesis. One of my first assignments as an employee at the Norwegian Institute for Nature Research (NINA) involved writing a report together with three biologists on how different ministries in Norway had monitored and responded to the spread of alien species. Prior to being a NINA employee, I had worked at the Nordic Council of Ministers, on policies for genetic resources in the Nordic countries. I was therefore concerned with plants as valuable resources for food and agriculture, as well as how seeds best could be preserved for the well–being of future generations. At NINA, my focus suddenly changed. The primary concern was no longer agricultural diversity, but rather nature's diversity and how this *biodiversity* was threatened by, for example, horticultural and agricultural *invasive alien plants*. Initially, I felt quite uncomfortable about having to accept the definition of alien species given by Norwegian and international environmental authorities. I was not supposed to argue about the concept of alien species *itself*, but rather to take it as my point of departure when finding out what types of monitoring activities were going on. I became increasingly interested in why the categorisation of alien species was taken for granted and not discussed at my own research institution. In this thesis, one of my objectives has been to move past what was taken for granted and instead investigate how perceptions, categorisations, plants, practices, and texts are constantly interacting.

In the following sections, I reflect upon the selection of methodological approaches and then move on to describe the methods used for producing the empirical material. Thereafter, I explain why the two specific studies were chosen and reflect upon the sampling and interview process. Finally, I describe the chosen strategies for analysing the research material.

5.1. Selection of methodological approaches

Designing a theoretical and methodological framework for this thesis was much like a wayfaring process (Ingold 2009) and one of the first steps in the research process involved selecting methodological approaches that would enable the production of data suitable to address the research questions of the thesis. There is no one 'correct' way of producing

empirical data, as different methodological approaches enable different perspectives and insights into the topic under research. Due to the contingent and flexible nature of concepts, I was interested in rich context–dependent knowledge about how people perceived and categorised plants rather than more context–independent knowledge such as a questionnaire survey would have provided (in line with Flyvbjerg 2006). Flyvbjerg (2006, 229) argues that '[w]hen the objective is to achieve the greatest possible amount of information on a given phenomenon, a representative case or random sample may not be the most appropriate strategy.' Rather, the qualitative research approach enables elaborative insights into how people relate to and describe their natural surroundings, namely the domestic garden and the landscape development at Fornebu, which are difficult to access through a quantitative approach.

A goal has been to gain insight into individual (i.e. domestic gardeners) and professional (i.e. planners, landscape architects, and environmentalists) perceptions, categorisations and interactions with plants through interviewees' accounts. In contrast to written material, qualitative research dialogues are not just accounts of specific incidents, as the dialogue in itself is an incident situated in cultural and historical settings (in line with Skår 2009). A research dialogue situates the researcher in a position of double hermeneutics when having to interpret their interviewees' interpretations of phenomena (Skår 2009). This may be challenging, as researchers always will interpret their dialogue partners according to their own preconceptions. Gadamer (1975) argues that any form of understanding involves some form of self–understanding. In some cases, our preconceptions may lead to misinterpretation. According to Gadamer, researchers need not strive towards abandoning their preconceptions but rather be aware of how they influence their understanding or misunderstandings during the research process. Consequently, as a researcher, I have had my own preconceptions during the whole research process, and have constantly had to negotiate my own preconceptions against the interpretation of the material. Throughout the research process it has been important to move between interpretations of individual accounts and the relevant social, cultural and historical contexts, which have been accessed through the interpretation and analysis of documents. Next, I describe and reflect upon the selected qualitative methods for data collection.

5.2. Research design

The fieldwork of this thesis was undertaken in different stages; the domestic garden study was carried out in early autumn 2008, while the Fornebu study was carried out in the period 2009-2010. As the two study areas are rather different, the methods and analytical strategies needed to reflect this, as shown in Table 4.

Table 4: Methods and analytical strategies

Study area	Methods	Analytical strategy
Domestic gardening in Oppland	Talking–whilst–walking interviews Semi–structured interviews	'Coalescence of meaning'
The Fornebu study	Talking–whilst–walking interviews with key interviewees	Intention analysis of interviews
	Document studies	Intention analysis of documents

I followed the instructions of the Norwegian Data Protection Official for Research (NSD) by filling in a notification form on the research that was to be undertaken. For both studies, the interviews were recorded and transcribed in full with the permission of the interviewees. The interview material was then made anonymous in manners that are explained in the following sections related to the respective studies. As I wanted to investigate how the interviewees' perceptions of and experiences with plants related to categorisations of alienness and nativeness, I found qualitative talking–whilst–walking interviews in the field to be a fruitful approach for both studies.

5.2.1. Talking-whilst–walking interviews

Both the domestic garden study and the Fornebu study involved paying attention to the relational encounters between the interviewees and their surroundings, and consequently, I found that moving around in the field or the physical surroundings helped in terms of stimulating dialogue and finding the words to describe experiences and perceptions. Whatmore (2004, 90) describes the process of generating materials as an intervention in the

world where the researcher enters into a co–fabrication of data together with 'all those (humans and non–humans) enjoined in it'. Such a *co–fabrication* of data between researcher and researched can be achieved through talking–whilst–walking interviews. Walking or talking–whilst–walking interviews are in many ways different to typical semi–structured interviews conducted while seated. Whereas the latter make *talking* the centre of attention, talking–whilst–walking interviews allows for a more flexible process where more informal and spontaneous talking is easier as the physical surroundings can trigger emotions, reactions, and memories (Kusenbach 2003; Anderson 2004). The act of walking in itself allows for pauses, silence, and reflection in the course of an interview. According to Hitchings & Jones (2004) it is difficult to talk about, for example, a garden when one is not in it, but walking triggers conversations and, not least, attention to the plants in question. Further, talking–whilst–walking interviews take place in the environment under discussion, where the researched is the one who is 'at home' and takes the researcher on a 'guided' tour. The interrogative character of an interview conducted while seated is thus weakened which allows for more spontaneous dialogue between the researcher and the researched. Thus, meaning is obtained through a reciprocal dialogue where the researcher and researched respond to each other's utterances (Skår 2009). I will now describe why domestic gardens of Oppland were selected as study area before moving on to describe the process of sampling and production of empirical data.

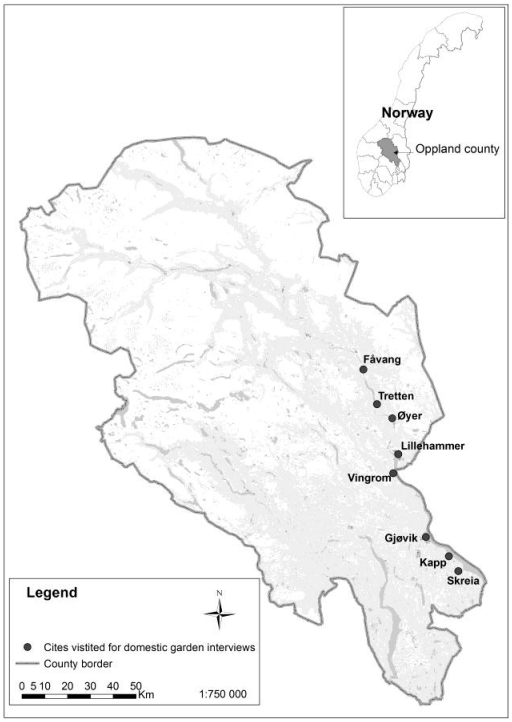

Fig. 2: Map of Oppland with sites visited for domestic garden interviews. (Illustration: Stein I. Johnsen)

5.2.2. Domestic gardening in Oppland

The study of domestic gardeners in Oppland was selected because I was interested in investigating how people in their everyday lives perceive and related to plants and categorisations of alienness, nativeness and invasiveness. Alien horticultural plants are examples of species that may be perceived as both ill–makers because of their invasive attributes and as resources because of their aesthetic qualities. As domestic gardens represent a semi–private sphere they are not subject to the same regulations and legal enforcements as public spaces (Longhurst 2006). Currently, the Nature Diversity Act (2009, § 31) states that it is allowed to plant alien species in domestic gardens as long as spreads beyond the garden are not likely to occur. Oppland, in south–east of Norway, is a county with a relatively cold climate, which affects the possibility of species spreads as the period with snow cover normally lasts from November till March and consequently the reproductive season is

relatively short.[16] This allowed me to investigate an area where garden owners are only beginning to be aware of invasive alien species as problematic. Figure 3 below shows one of the gardens visited during field work.

Fig. 3: A domestic garden in Oppland. (Photo: Helen Fredholm, 2010).

[16] From November 2010 to March 2011 the temperatures in the part of Oppland focused on fluctuated between c-12 °C to −23 °C. Between April and September 2011 the temperatures fluctuated between 26 °C to c.1 °C (see http://www.yr.no/place/Norway/Oppland/Lillehammer/Lillehammer/statistics.html)

The sample: domestic gardeners

Early on, I made a decision to focus on domestic gardeners who had a strong interest in gardening and consequently had chosen to become active members of local garden associations under The National Garden Association (Hageselskapet). Some of the interviewees pinpointed that the local garden associations have many passive members that receive information and the periodical *Norsk Hagetidend* without actively participating in organised activities. I was interested in getting in touch with people who arranged and joined in activities such as meetings, garden visits, lectures, and small–scale plant sales. Clearly, contacting less interested gardeners could have provided other types of information. An assumption that guided my sampling was, however, that active and committed gardeners are also those who most keenly participate in networks where plants are frequently exchanged and spread.

I interviewed 22 gardeners in total. The interviewees lived in the local communities of Skreia, Kapp, Gjøvik, Vingrom, Lillehammer, Øyer, Tretten, and Fåvang (see Fig. 2). I made contact with the interviewees through the membership lists of local garden associations in Oppland, through internet advertisements for 'open visitor gardens', and through snowball sampling (in line with Rubin & Babbie 2010). The approach led me to many like–minded people and to many women. To obtain a broader sample, I visited different local communities (mentioned above) where six different local garden associations were represented. Other criteria used for sample selection were age and residency in both towns and countryside, in order to ensure an as broad as possible sample. I interviewed 3 gardeners with terraced house gardens in towns or close to towns, 10 gardeners with larger gardens of detached residences situated in towns or close to towns, and 9 gardeners with larger gardens of detached residences in the countryside. The interviewees had in common that their properties were close to green areas such as farmland, forests, or smaller unmanaged public green areas. The age structure of the sample was as follows: 7 gardeners were in the 40-50 years age group, 6 gardeners in the 50-60 years age group, and 9 gardeners in the 60-75 years age group.

In line with Bertaux (cited in Krange & Skogen 2007), I aimed to include an as broad as possible sample of interviewees involved in domestic gardening in order to be able to identify social meaning structures on a higher level than individual experiences. According to Bertaux it is of key importance that the interviewees participate in a well–defined practice area, i.e. a common activity such as domestic gardening. I included new interviewees until I

reached a saturation point in the material, identified when the interviewees started to repeat issues already addressed by others and provided few new insights. The saturation enabled identification of common topics across the material.

A potential weakness of my sample is the fact that relatively few men were interviewed (5 out of 22). In several households the division of labour in the garden was clearly segregated according to gender. The gendered division of labour was most clear–cut in households where the woman was the main gardener and the man helped her with heavy digging, composting, and mowing. The gendered division of labour appeared to be less apparent amongst the interviewees who shared an enthusiasm for plants and gardening. Thus, men and women with strong interests in gardening told quite similar stories about their experiences with plants and garden work. Although a greater gender balance would have been desirable, findings from other countries (Czech et al. 1998; Schlegel & Rupf 2010; Fischer et al. 2011; Selge & Fischer 2011; Selge et al. 2011) have revealed that people are more concerned with plants' attributes, such as their aesthetic qualities, rather than their status as native or alien, and this corresponds with my findings across gender. I therefore believe that the findings presented in paper 1 can provide insight into a rapidly growing field of similar studies internationally.

The research dialogue

When approaching the interviewees, I introduced myself as a PhD student interested in people's interactions with and perceptions of their plants, how they had acquired their plants, why they planted what they did, and what types of plants they disliked or had problems with. I asked each of them for their permission to record the interview and ensured that their answers would be made anonymous through the use of code names. All of the interviewees accepted these conditions.

Although I had prepared a semi–structured interview guide I rarely used it directly, as I wanted the dialogue to flow freely. I let the interviewees lead the garden walks and conversations while I prompted some questions related to my list of issues whenever it seemed necessary. Since it was early autumn, many of the interviewees told me about how their garden had looked at its most beautiful during summer. We consequently jumped back and forth in time, triggered by different plants in the garden, for example, when an

interviewee commented that ‘this plant had [such and such] flowers in June’ or ‘over here I had a beautiful flowery meadow in May’.

At first, I did not want to tell the interviewees that I was particularly interested in alien species, not only because I was concerned that they might become reluctant to participate but also because I did not want to influence their answers. During the interviews I asked specific questions about the plants I knew were listed as invasive alien species in the 2007 Norwegian Black List (Gederaas et al. 2007). However, I did not mention the issue of alienness and nativeness until the end of the interviews, when I asked the interviewees to define the concepts ‘alien’ and ‘native’. At this point, we had normally gone inside to drink coffee. Some were slightly unwilling to define the concepts as they rather wanted to show me pictures of what their gardens had looked like in summer. This may indicate that they found it easier to talk about the plants when moving amongst them or looking at images of them, than to define more abstract concepts (in line with for example Hitchings & Jones 2004). These insights were important when writing paper 1.

My own experiences of gardening are largely limited to planting wild pansies in the spring and mowing a lawn during summer. Thus, my own insights concerning gardening did not place me on equal footing with the interviewees during the interviews. Shortly after entering their gardens, the various interviewees adopted the role of skilled expert when showing me around. Somehow, the role often shifted from me being a novice to whom they were telling stories to becoming the researcher who knew the ‘correct’ answer when I asked them to define the concepts native and alien. As soon as I became the acknowledged expert, several interviewees started asking whether their answers were correct. I tried to resolve this situation by assuring them that I was not interested in the accuracy of any definitions, but merely their perceptions, experiences with plants, and their gardening.

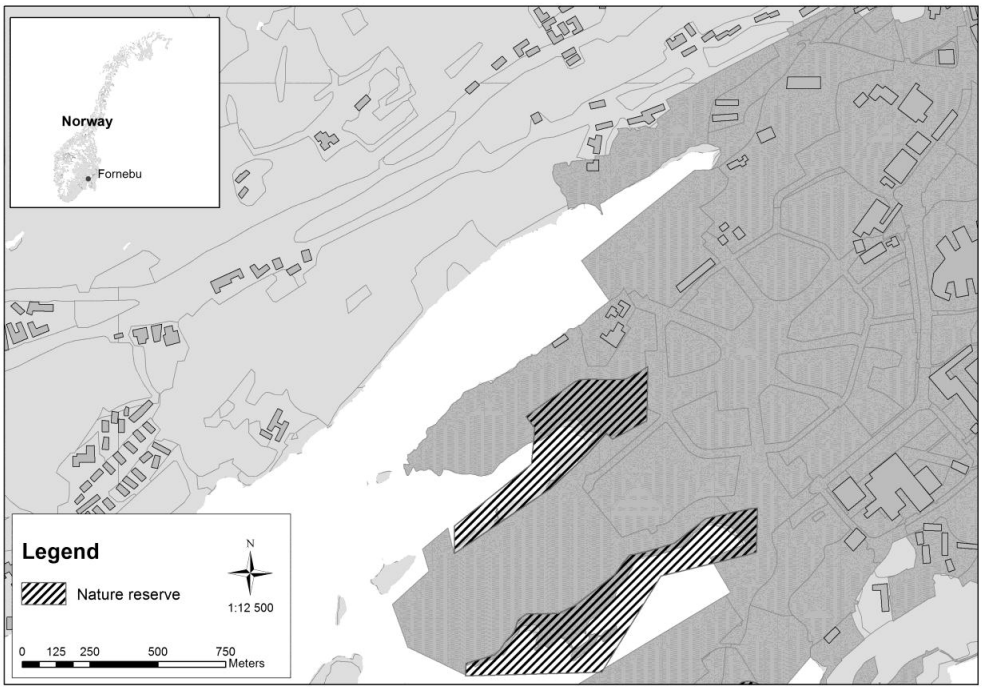

Fig. 4: Map of Fornebu. The two nature reserves are visible on each side of the former landing strip. (Illustration: Stein I. Johnsen)

5.2.3. The Fornebu study

The reconstruction of pre-airport Fornebu is unique in a Norwegian context as it involved a large scale refurbishment of a former national airport. The land furthermore represents a highly prized and attractive estate for property and business development close to Oslo. Importantly, the site includes two nature reserves of national value (see Fig. 4). I discovered the potential of the site of the closed–down airport as a relevant case study in 2009 when attending a conference on alien plants organised by FAGUS[17]. One of the involved planners presented the development of Fornebu as a green site for housing, recreation and business development as a success story and his presentation was followed by a very heated debate in the auditorium. Flyvbjerg (2006, 229) claims that the 'extreme case can be well suited for getting a point across in an especially dramatic way'. Fornebu is in many ways an extreme

[17] FAGUS (Faglig utviklingssenter for grøntanleggssektoren) is an umbrella body representing the Norwegian greenery sector, landscape architects, landscape gardeners and landscape entrepreneurs.

case as it involved a conflict which received substantial attention from the national media and has set a national example noticed by landscape architects and planners in general as well as the environmental management sector. The conflict at Fornebu illustrates well the wider on-going national debates over alienness associated with, for example, the 2007 Norwegian Black List (Gederaas et al. 2007), and the implementation of a regulation for the introduction of alien species under the fairly recent Nature Diversity Act 2009 (see papers 2 and 3). Fornebu was thus a good case for studying perceptions and categorisations of plants, and how that leads to choosing certain plants in the development process, before and after alien species were nationally 'launched' as an environmental problem. Figure 5 below shows an excursion arranged by Statsbygg where they wanted to explain their plantings to the environmental NGO called SABIMA[18], while figure 6 shows the disputed plantings in the buffer zone towards the border of one of the nature reserves.

Fig. 5: Excursion with Statsbygg and environmentalists 2007. (Photo: Morten Bergan 2007)

[18] SABIMA (Samarbeidsrådet for biologisk mangfold) is a national umbrella organization working to preserve biological diversity in Norway. Se www.sabima.no.

Fig. 6: Alien plantings in the buffer zone, 2006. (Photo: Morten Bergan, 2006)

The sample: professionals at Fornebu

Throughout 2009 and 2010 I undertook 18 interviews with key people involved at Fornebu: landscape architects (2); planners at the Norwegian Directorate of Public Construction and Property (Statsbygg) (1), Bærum Local authority district (4), and Oslo Local authority district (1); the County Governor of Oslo and Akershus (1); the Norwegian Directorate for Nature Management (2); and 3 scientific consultants (1 soil scientist, 1 biologist/ornithologist, 1 botanist), and finally 4 environmentalists from SABIMA. I contacted the interviewees by either phone or email and explained the background to why I wanted to conduct the research. I started by contacting Statsbygg and received a list of key people. In addition, I asked each of the interviewees whether they knew about other relevant people who should be contacted. All those that I contacted agreed to participate in the study, although some of the landscape architects needed slightly more convincing due to the number of negative media reports. Consequently, I had to assure them that I aimed to provide a balanced discussion of the conflict. I continued the sampling process until I had included the key people involved in the planning and the subsequent conflict. Access to documents from the planning process and the conflict (i.e. internal reports, correspondence, and media reports) enabled a strategy of

triangulation (in line with Bryman 2001) and hence the possibility to cross–check the interview material and my own interpretations.

The research dialogue

I explained to the planners and landscape architects that the aim of the thesis was to investigate how human interactions with plants are categorised and perceived. In addition, I told them that I wanted to look at the debate over native and alien plants at Fornebu, as the study would illuminate the extent to which the concepts are contested. I further explained that I was interested in knowing more about different opinions concerning the pre–airport landscape as well as opinions on the landscape development. When I first approached the environmentalists, I explained them that I was interested in their reasons for reporting Statsbygg to the police, in addition to their perspectives on alien species as an environmental problem. I also wanted to understand their perceptions of what Fornebu should ideally look like.

I invited all interviewees to meet me at Fornebu, and 12 out of 18 interviews were conducted as talking–whilst–walking interviews. The remaining interviews were held in offices as the interviewees did not have sufficient time in their schedules to travel to Fornebu. During the indoors interviews we used different maps to 'mentally' move around in the study area. I asked all of the interviewees for permission for our conversations to be recorded. Further, I informed them that their answers would be anonymously presented. However, as some of them had been very visible in the media I was allowed to use their real name when quoting from media articles.

All of the people I interviewed represented either a profession or interest group and were thereby involved at Fornebu due to their professional positions. All of those interviewed at Fornebu showed me aspects of the landscape related to their specific competences and interests. For example, the ornithologist showed me different birds through his binoculars, while the soil scientist carried a shovel, which he used to dig into heaps of woodchips to see whether they had started to crumble into soil. The planners showed me the places where, from their perspective, the environmentalists had 'vandalised' the landscape by removing plants, while the environmentalists showed me places with particularly rare flowers that they repeatedly had tried to save by removing the thick layers of soil and woodchips. One landscape architect met me at the opening of a kiosk and public toilet on the beach at Fornebu

and emphasised that a high number of people were using and appreciating the area as a recreational site. The storied nature of their knowledge gave valuable insights for later comparison with the documents that I analysed. Further, as the interviews were held a few years after the peak of the conflict, the interviewees could reflect back on what had happened in a retrospective light.

In addition, I conducted extensive searches to obtain relevant documents related to the planning of post-airport Fornebu (plans, background documents, reports, leaflets, personal letters, emails, and media coverage). I was allowed to access the archives of Statsbygg, which included both public reports and internal notes. I was also given access to the archives of the landscape architects, including vegetation maps and plans from the whole development process. Moreover, one of the key environmentalists that had been actively involved at Fornebu since the close–down of the airport gave me his personal letters and emails addressed to Statsbygg, as well as all of the reports and plans he had collected. Further, I have selected documentation of how Fornebu appeared prior to the construction of the airport, such as old maps, textual descriptions in books, old newspaper clippings, and photographs held in the archives of Bærum Library and at Bærum Local Authority Distinct.

Being a researcher employed at the Norwegian Institute for Nature Research (NINA) provided certain challenges at Fornebu, as NINA is commonly associated with natural science research. The environmentalists hence seemed to assume that I was taking their side in the conflict. I tried to be as open as possible and explain that I was interested in gaining a thorough understanding of what had happened throughout the planning process. The heated nature of the conflict made it challenging for me not to take sides. My strategy during fieldwork was to present myself as a social scientist interested in perceptions of and experiences with alien species.

5.3. Analysis of research material

Validity in qualitative studies is associated with a reflexive writing style where the researcher makes his or her position and choices explicit (see for example Woolgar 1988; Ashmore 1989; Hay 2000). A crucial aspect is making the voices of the interviewees visible (Opie 1992) through, for example, the use of quotes as well as an explicit account of the criteria that the researchers have used in their analysis and throughout their fieldwork (Hay 2000). At the core of validity debates rests the assumption of objectivity, which have been challenged by

several social scientists (see for example Latour 1993; Gordon 1997; Haraway 1997; Law 2004), who discard the extraction of objective truths corresponding to external reality. Rather, interpretations will always depend on the researcher's preconceptions, the theoretical framework, the research design, and the relationship between the researcher and the researched (in line with for example Denzin 1994). Thus, transparency in research is important concerning the position and agenda of the researcher, and the research design and choices made through the analysis and presentation of the material (Hay 2000; Bingham 2003). In the next two sections, I will outline the process of analysing the material from the two study areas.

5.3.1. Analysis: domestic gardeners in Oppland

Coalescence of meaning

I analysed the garden interviews in line with Giorgi (2009), where the purpose is to convey what the phenomena are essentially about, in my case how garden owners perceive and relate to plants as well as the categories of alienness and nativeness in their gardens. This is an analytical strategy inspired by phenomenology which, through different steps, coalesces the meaning of the phenomenon or phenomena in question. The aim of such analysis is to acquire an essential description of the phenomenon or phenomena drawn from the experiences of the interviewees, or an 'interstructural meaning' (Giorgi 2009, 200) where similar types of experiences can be abstracted from the individual interviews into a common structure of essential meaning. If the experiences vary greatly between the interviewees, several structures of essential meaning can be described. This method of analysis involves the following steps (Giorgi 2009):

1. Transcribing interviews in full.
2. Read transcriptions for the sense of the whole, which means reading whole interviews to gain a sense of their entire description
3. Identification of meaning units, which involves breaking the individual interviews down into parts or meaning units
4. Describing carefully the features of the experienced phenomenon or phenomena. Importantly, the researcher should neither add nor subtract elements, but describe the experience precisely as expressed by the interviewee

5. Describing the essential structure of each interview in relation to the phenomenon or phenomena investigated
6. Provide a general description of the inter–structural meaning across the interviews, with the aim of ensuring that the general patterns of the phenomenon or phenomena are understood.

Table 5 gives examples of steps 3 and 4. The transcribed talking-whilst-walking interviews were divided into meaning units, as shown in Table 5. This gave further insights into how the gardeners related to their plants, such as which plants they were fond of and which of them they had problems with. The results of this analysis are presented in paper 1, Part 2.

Table 5: Example of determination of meaning units and transformation of the participants' expressions

Meaning Units	Transformation of participant's expressions
Coded name: Lisa	
I like simple roses. This is a *robusta*, one of those *Rugosa* roses. A hybrid that doesn't spread much.	She likes simple plants that do not spread much**.**
And here are my mints. They smell so lovely and are nice to use in teas.	She likes herbs that smell nice and can be used in tea.

5.3.2. Analysis: the Fornebu Study

Intention analysis

In his interpretation of utterances, Skinner (2002) focuses on identifying the intentions of utterances as expressed in, for example, documents, and in my case also interviews. One challenge concerned finding out what the notion of identifying intentions really involves. Skinner (Tully & Skinner 1988, 274) states that 'to argue is always to argue for or against a certain assumption or point of view or course of action. It follows that, if we wish to understand such utterances, we shall have to identify the precise nature of the intervention constituted by the act of uttering them.' Skinner (Tully & Skinner 1988) identifies the following steps to do this:

1. Identify the meaning and subject matter of utterances we are interested in
2. Focus on the context and occasions of utterance by asking questions such as
    - Why has this utterance been made?
    - Why did it seem worth making that precise move?
    - What presuppositions and purposes went into making it?
    - To what questions was the proposition regarded as an answer?
    - What pre–existing arguments or conversations are relevant?
    - What exact position has been taken up?
3. Look at the context surrounding the performance of the utterances in question.

I used these steps as a guide when analysing the oral interview material and the relevant utterances in documents, as I show in the following two sections.

Intention analysis of interviews

My first step was to note down observations I had made through the talking–whilst–walking interviews, such as where the different interviewees had decided to take me at Fornebu and what they had pointed out to me. Next, I transcribed the interviews in full. Steps 1 and 2 (as outlined above) were undertaken by selecting statements from the transcribed interviews which concerned nativeness and alienness of plants, and also expressions related to original nature. Further, I looked for explanations given for different actions, plans, and moves that had been undertaken during the planning process, during the conflict, and after the conflict. I paid particular attention to utterances explaining what the interviewees had intended to do at different stages in the planning process, and during the conflict and after, and compared these utterance with the observations I had made during the talking–whilst–walking interviews. For example, the soil scientist explained why there had been a decision to put woodchips on top of the soil, while he simultaneously dug into the woodchips with his spade to show me how they had started to turn into soil. Thus, it was of key importance to identify the interviewees' own intentions for their actions before, during, and after the Fornebu conflict, and in addition their intentions in telling and showing me what they did during the interview situation. Step 3 involved contextualising their utterances. This was done in several ways, initially by comparing and contrasting what the different interviewees had said, and then by comparing and contrasting their utterances with an analysis of documents of relevance to the Fornebu process. Further, literature on the history leading up to the formulation of the CBD and to

Norwegian biodiversity politics (presented in chapter 2) served as an important back–drop to contextualise the Fornebu study.

Intention analysis of documents

I analysed planning documents (from Statsbygg, Bærum Local Authority District, Oslo Local Authority District, The County Governor of Oslo and Akershus, and The Directorate for Nature Management), scientific impact assessments (produced by research consultants), internal notes, letters, emails, and media coverage. In this regard, it was not the content of each document as a whole that was of key importance, but rather the utterances related to alienness and nativeness and how these concepts were defined and applied (in line with step 1 above). The author's intentions in texts were traced by paying attention to how they positioned their arguments in line with on-going debates (step 2). I paid particular attention to the genre of the different documents, which made their intentions clearer. A genre can be defined as a rhetorical 'point of connection between intention and effect, an aspect of social action' (Miller 1984, 153). Thus, an author may express intentions in an informal e–mail differently than in a formal planning document or in a media story. Most of my material consisted of planning documents from the project's initiation until its finalisation. The planning documents from Fornebu can be classified within a 'bureaucratic genre' which follows pre–defined standards for how planning and construction processes are expected to be undertaken in accordance with Norwegian judicial conventions (for example specified in Norway's Planning and Building Act 1985; 2005[19]). Such documents are constructed by collective authors, such as a local authority district or a planning agency. They are written in an impersonal 'objective' language meant for decision–making in order to give a trust–worthy, balanced impression. Summa (1990, 185) argues that while one should not expect rhetoricity to be a quality of administrative texts, persuasive intentions are nonetheless inevitable components of such texts. By analysing bureaucratic texts as *genres*, such as planning documents, political strategies, or White Papers, the rhetorical strategies at play in these supposedly 'objective' documents are displayed (Miller 1984, 155). In planning texts, typically the language and messages are condensed and seemingly stripped of rhetorical argumentation. Rather than arguing for particular statements, planning texts tend to refer to decisions given in higher ranked documents such as judicial texts or White Papers, or a pre–

[19] http://www.regjeringen.no/en/doc/Laws/Acts/Planning-and-Building-Act.html?id=173817

given ‘political will’ according to Summa (1990, 195). By contrast, the environmentalists utilised personal letters and the media to get their messages across. I used the framework of Hannigan (2000), as described in paper 2, to investigate how the environmentalists framed the Fornebu plantings as an environmental problem.

Step 3 involved considering the importance of environmental policies related to alien species, including black listing and red listing of species, which were measures that influenced the conflict between the stakeholders at Fornebu. To understand the utterances at Fornebu as part of a wider societal debate, I also undertook a literature review of secondary sources to investigate how alienness and nativeness have been categorised historically and to trace the roots of the current alien–native dichotomy in environmental management and politics? (Outlined in chapter 2).

5.3.3. Literature review of historical and political contexts

Quentin Skinner’s work has been concerned with illustrating the different ways that concepts have been used in the past and how current usages have been influenced by past actions (Tully & Skinner 1988). In order to investigate the roots of the current categorisations of alien and native species I read extensively literature explaining categorisations of alienness and nativeness published by early biologists at the time of Charles Darwin as a contrast to recent literature on invasion biology and environmental policy, as demonstrated in chapter 2. Authors such as Cadotte (2006), Chew (2006), Davis (2006; 2009), and Chew & Hamilton (2011) have provided excellent accounts of how the thinking around alien species has evolved historically within the field of biology specifically and the natural sciences more generally. In this regard, Chew has documented the ideas and writings of many early botanists and bio geographers on alienness and nativeness through his PhD thesis *Ending with Elton: Preludes to Invasion Biology* (2006), and later through an exploration of the concept of ‘nativeness’ (Chew & Hamilton 2011). Davis has contributed through his extensive book *Invasion Biology* (published in 2009), as well as an article on invasion ecology in the period 1958-2005 (David 2006). Cadotte’s (2006) contribution is an exploration of how natural scientists early on began to document the phenomenon of human–assisted species spread without being particularly interested in the geographical origin of ecological invasions. I have expanded on the work of the above–mentioned authors and investigated how ideas from invasion biology (for example

Elton 2000 [1958]) have influenced the fields of environmental policymaking (as outlined in chapter 2 of this thesis).

In sum, the selected methodological approaches described in this chapter have enabled insights into individual and professional perceptions and categorisations of plants in semi–private and public settings, as well as into how individuals and professionals perceive the categorisation of invasive alien species as applied by the environmental management sector. The different perceptions, categorisations and interactions with plants at individual, private level and professional, public level serve to elaborate and critically discuss the official definitions of these concepts as given in environmental management and politics. Next, I present Part 2 of the thesis, where the findings of both studies are presented in papers 1, 2, and 3.

6. Concluding discussion

As demonstrated throughout this thesis, a plant is much more than just a plant, and can be perceived as both ill–maker *and* resource, and further be categorised as native *and* alien at the same place and moment in time. This thesis has demonstrated the contingent and shifting nature of species status as wanted or unwanted in society through addressing the following research questions:

How are alienness, nativeness and invasiveness perceived and expressed at individual, professional, and political levels?

How is the categorisation of invasive alien species, as applied by the environmental management sector, perceived at individual and professional levels?

The research questions are founded on an understanding of concepts as spatially, temporally, and socially constituted, gathering their meanings from encounters between those who use them and the world. Skinner (2002, 178) states that

> Not only is our moral and social world held in place by the manner in which we choose to apply our inherited normative vocabularies, but one of the ways in which we are capable of reappraising and changing our world is by changing the ways in which these vocabularies are applied.

As a whole, the thesis demonstrates that plants are perceived, experienced and categorised by gardeners in semi–private settings and by professionals (i.e. planners, landscape architects and environmentalists) engaged in the plantings of the public Fornebu landscape in ways that do not always correspond to the categorisations of alien and native in natural science and environmental management. This illustrates the importance of taking into account the experiences, contexts, and qualities related to the species themselves when discussing nativeness and alienness. The main findings, as presented in papers 1–3, are summarised in Table 6 below.

Table 6: Summary of findings

Findings
Alienness and nativeness are practised differently in the semi–private garden and in the public Fornebu landscape
Alienness does not necessarily equate something negative
'Invasiveness' is a concept that corresponds to how domestic garden owners experience their plants attributes as willing and dispersive
Alienness and nativeness are rhetorical tools in environmental conflicts
The black–listing and red–listing of species serve as rhetorical tools in environmental conflicts and have retrospective effects

In the following part of this concluding chapter I discuss the main findings of the three papers in more detail and relate the discussion to the theoretical framework presented in chapter 4, and to relevant research on alien species outlined in chapter 3.

6.1. Discussion of main findings

Social science research on alienness and nativeness tends to *either* focus on human–plant relationships *or* on the wider political and scientific framings of alienness and nativeness. This thesis has contributed with research on the interrelationships between the level of human–plant interactions (in semi–private individual and public professional settings) *and* the wider political landscape of environmental policy–making and management framings of alienness and nativeness. By drawing on a combination of insights from Skinner (2000), Ingold (2000), and more–than–human geography (for example Whatmore 2006), the thesis demonstrates how concepts in use can be studied as part of a 'doing nature' perspective, i.e. what can be done with the concepts alien and native, rather than what alien and native *are*.

A key finding of the thesis is that alienness and nativeness are spatiotemporally contingent concepts (for example Warren 2007), that are practised differently in private (for example domestic gardens) and public (for example Fornebu) settings. Plants categorised as alien are more contested when planted close to areas of national interests, as illustrated at Fornebu, than in semi–private settings. Although it may be acceptable to plant alien species in private gardens, their presence becomes increasingly problematic the closer they spread towards 'wild' nature, such as the nature reserves at Fornebu. In the following I outline these findings in detail.

6.2. The domestic garden study

This thesis demonstrates that domestic gardeners influence the composition of biodiversity in various ways and in particular through the spread of alien and potentially invasive species. The thesis further shows that the current categorisations of alienness and nativeness in natural science, environmental politics and management do not take into account the various ways that plants interact with humans. Theoretically, Ingold's (2000) notion of dwelling proved useful for demonstrating how sensuous human–plant encounters in selected domestic gardens in Oppland were important for how the gardeners perceived their plants. Approaches within more–than–human geography investigate the active agencies of plants (or species in general) and their roles in human–plant encounters (see for example Jones & Cloke 2002; Cloke & Jones 2004; Robbins 2004; Kull 2008; Head & Atchison 2009) and, importantly, that non–humans influence human practices in unexpected ways (Bakker & Bridge 2006). The thesis shows how human–plant relationships in domestic gardens are practised in relational embodied ways, such as when domestic gardeners experiment with climatically unsuited plants that survive against all odds, or when struggling to control unruly plants. This demonstrates a broadened scope of Skinner's conceptual approach, as concepts are not only linguistic and political tools but also negotiated in relation to sensuous encounters with plants.

The majority of the domestic gardeners appreciated a mixture of wild plants and alien plants in their gardens, a finding which implies that alienness and nativeness were not particularly important to them in their selection and cultivation of garden plants. Rather than focusing on the alien or native status of plants, the gardeners tended to talk about their plants in terms of their attributes as being 'dispersive', 'willing', or 'quiet'. This finding is in line with international studies indicating that species' attributes are more important for people's

attitudes towards them than their geographical origin (see for example Czech et al. 1998; Montgomery 2002; Schlegel & Rupf 2010; Binggeli 2011; Fischer et al. 2011; Schüttler et al. 2011; Selge & Fischer 2011;). Moreover, many current public perception studies have been undertaken in 'artificial' interview settings (for example García–Lorente et al. 2008; 2011; Selge & Fischer 2011; Selge et al. 2011; Sharp et al. 2011) and I therefore argue for the importance of engaging with interviewees in the field, to allow the species in question to influence the conversation (in line with for example Hitchings & Jones 2004). By moving around in the gardens it was possible to identify alien plants growing there, and to discover that the gardeners had planted them despite being aware of them having been black–listed and thus acquired a controversial status. A key finding was that alienness did not necessarily equate with something negative in the eyes of the domestic gardeners. On the contrary, several gardeners described alienness as something positive and exciting. Surviving climatically unsuited plants were described with pride and included both wild–growing native plants and alien plants from abroad.

Another finding of the study is that whereas alienness and nativeness do not necessarily resonate with plants attributes, *invasiveness* does. The challenge that many plants posed through being either invasive or fragile and climatically unsuited was largely appreciated by the gardeners, as it stimulated them to develop their skills and succeed in cultivating such plants against all odds. Hence, the garden was largely seen as a space where they could experiment and develop their gardening skills in close relationships with plants and microclimates. The study also demonstrates that people change their perceptions and start taking precautions when they experience that plants become particularly invasive and hence problematic to keep under control. Many gardeners in Oppland had become more careful with plants they had acquired from small–scale sales or through informal exchanges. Consequently, they kept the plants in 'quarantine' or removed the soil to avoid unwanted weeds as well as the Spanish slug (*Arion vulgaris*). Fears of attracting 'the slug' made people more aware and careful, a finding in line with other research (for example Selge et al. 2011) demonstrating that animals, and in this case invertebrates, are perceived as more difficult to control than plants. Losing control over unwanted plants and other pests was largely perceived as a worst–case scenario. Invasiveness in plants can thus be perceived as both a positive challenge and a threat when it results in such loss of control.

6.3. The Fornebu study

Whereas several international studies focus on species' attributes as important for people's attitudes (as argued by for example Czech et al. 1998; Schlegel & Rupf 2010; Fischer et al. 2011; Selge & Fischer 2011; Selge et al. 2011), the Fornebu study demonstrates alternative insights into human–plant relationships by exploring how alienness and nativeness are used rhetorically in environmental debates for reasons that do not necessarily correspond to problematic species attributes. At Fornebu, the rhetorical use of alienness and nativeness was a strategy to realise certain ideal natures while discarding other natures. This is in line with for example Chew's (2009) account of how tamarisk (*Tamarix spp.*) went from being promoted as a useful species in erosion control to being framed as an environmental problem causing water shortages. Similarly, Eskridge & Alderman (2010) outline how the kudzu (*Pueraria lobata*) has been framed within a particularly negative light to justify the need for legislation and control. During the conflict at Fornebu, the Japanese rose changed status from being considered as part of cultural heritage to becoming black–listed as an invasive alien in 2007. A focus on *intentions*, as suggested by Skinner (Tully & Skinner 1988; Skinner 2002), has enabled insights into less apparent issues at stake during the Fornebu conflict than merely a discussion over plant origin. Part of the reason for the environmentalists' negative reactions to alien plantings was their envisioning of Fornebu as an opportunity to reverse negative trends of habitat destruction within the wider Oslo fjord region and simultaneously a wish to restore nature to a former state of dry meadows with drought–tolerant species in need of mowing and maintenance. Such a landscape was associated with the pre–airport landscape, i.e. before 1939. Fornebu was thus used as a demonstrative example by the environmentalists, and their discontent with the development of Fornebu was linked to the missed opportunity of landscape restoration to a pre–1930s state. It is worth noting that had the Fornebu project been initiated ten years later it would probably have been subject to ecological restoration. This has recently become a more common practice in Norway as ecological restoration is emphasised in the 2009 Nature Diversity Act. Determining what state Fornebu should have been restored back to would however be no straight forward task even with established standards for ecological restoration, and would probably have spurred debates over what temporal reference point the landscape should be restored back to.

While the value–based and contingent nature of alienness and nativeness has been widely debated in research, less attention has been directed towards the associated concepts of

'black–listed' and 'red–listed' species (although see Jørstad & Skogen 2010). The thesis raises concern over the rhetorical uses not only of alienness and nativeness but also of red lists and black lists in environmental conflicts used to strengthen the legitimacy of interest groups, as demonstrated at Fornebu. When used to strengthen environmental 'claims to the truth', the red–listing or black–listing of species may serve as value–based measuring sticks for wrong–doing and right–doing that may gloss over more complex aspects such as scientific uncertainties associated with species listing. Species lists are currently portrayed as objective, scientifically based tools that aid environmental management in their measures to reduce biodiversity loss. Although such lists may be useful and necessary management tools to prioritise conservation efforts and document changes in biodiversity composition, implicit value judgements and temporal ambiguities make black–listing and red–listing problematic. The selection of the year 1800 to separate black–listed from red–listed species in the 2010 Norwegian Red List (Kålås et al. 2010) and the 2012 Black List (Gederaas et al. 2012) appears rather random. No explanation was given in the 2010 Red List for why the year 1800 was selected (see Kålås et al. 2010), and the Norwegian Biodiversity Information Centre confirmed that a different year may have worked equally well (NBIC representative, personal communication 2012). Hence, the date is primarily a temporal threshold selected to make management easier. What may complicate matters are the conceptual ambiguities; not all alien species are termed alien (for example food crops), while to be red–listed does not equate being native. Consequently, the red–listed cultural heritage of today may become the black–listed alien of tomorrow. Moreover, the Fornebu case demonstrates that black lists and red lists have retrospective effects, as inclusions of new species on the lists frame past actions in a dubious light. This means that the future of various economic production sectors, such as agriculture, horticulture, landscape planning, and forestry, are likely to be environmentally controversial.

6.4. Wanted and unwanted nature

Current debates over alienness and nativeness, as well as the black listing and red listing of species raise questions about the ambiguous roles that humans play in creating environmental problems such as alien species spreads (as argued by for example Head 2012). Through the construction of black and red lists scientists and environmental policy–makers become protectors of species and biodiversity and seek to reverse negative impacts undertaken by 'ill–makers', for example people who through trade, travel, and informal exchanges spread

invasive alien species. The question, then, is how much human influence is considered appropriate, and further, what kinds of human influence are appropriate? Head & Muir (2006a, 87) argue for a slightly more radical approach to this dilemma, namely that 'humans will need to be re–thought and co–opted as active co–constructors of this nature rather than solely as threats to it.' In environmental management, humans are clearly part of the solution as well as part of the problem. I agree with Head & Muir (2006a, 98), that '[p]ublic environmental programs that seek simply to educate the public about scientific truths, for example in relation to appropriate plantings, need to develop a more sophisticated understanding of how local environmental knowledge is developed.' This thesis is not a study of environmental management or policy–making per se but hopefully it will contribute to broadening the knowledge about a field that has been little researched in Norway. The study has triggered some issues of interest for further research;

- The domestic garden study demonstrates a currently unexplored potential in researching how invasiveness affects gardeners' perceptions and categorisations of plants, in positive and negative ways, and particularly in how an increased focus on invasiveness in environmental management strategies and initiatives may contribute to greater awareness of alien species spreads by gardeners.
- During fieldwork at Fornebu I observed that the green areas are frequently used for walks and recreation more generally. People have started moving into the area and more housing is developed. Further research on how the users and residents at Fornebu appreciate the area would be interesting, and would probably give additional insights into what makes nature attractive to people as well as how the users relate to alienness and nativeness.
- The Fornebu study further shows that there is a need for more research on the effects of using black lists and red lists to promote certain idealised nature conditions and related species. How do black listing and red listing affect biodiversity and landscapes more concretely? Could rhetorical uses of black lists and red lists lead to the preservation of a higher number of iconic landscapes and associated red–listed species in need of human assistance to survive?
- A further issue of interest is to study the political and practical developments related to alien, horticultural plants in Norway. How will the greenery and landscape architect sectors relate to the upcoming regulation on introductions of alien species? And what

will be the connections between the 2012 Norwegian Black List and the upcoming legal regulation?

There is currently an on-going debate in Norway between different sectors such as the forestry, agriculture and greenery sectors on the one side, and the environmental authorities and associated organisations on the other side concerning the delayed entering into force of an alien species regulation under the 2009 Nature Diversity Act. While different institutions representing environmental interests, such as SABIMA and the Norwegian Botanical Society, call for stricter regulations of alien species introductions, the greenery sector emphasises the challenges that the new regulation may present for their businesses (Faglig utviklingssenter for grøntanleggssektoren 2010).[20] FAGUS (Faglig utviklingssenter for grøntanleggssektoren), which represents the greenery sector, the Norwegian Landscape Architects Society (NLA), the Norwegian landscape gardeners (NAML), and landscape entrepreneurs, sent a joint consultation response to the new regulation pointing out the potentially grave economic and administrative consequences. They express concerns over using the Norwegian Black List as a 'prohibited list' since the categorisation of species are too general. They mentioned the example of the Japanese rose (*Rosa rugosa*) which is invasive on the coast, but not to the same extent inland. While the 2007 and 2012 versions of the Black List categorise plants as problematic on a national scale, the greenery sector claims that geography matters and that a plant which is problematic in one location may be harmless under different conditions. Furthermore, whereas the Black List is specified to species level, the greenery sector argues that several cultivars of the same species can be bred to be less invasive and hence not environmentally problematic. They hold that for many hundreds of years it has been part of cultural history to try out new plants in gardens and parks. The greenery plants represent a cultural heritage, previous standards for beauty and fashion, and garden art. They therefore propose that the use of species such as the Japanese rose should be allowed in inland areas and at plant nurseries (Faglig utviklingssenter for grøntanleggssektoren 2010).

The outcome and consequences of the proposed regulation remains to be seen. Currently, the 'user pays principle' (Nature Diversity Act, § 28) is emphasised by environmental authorities who require both private individuals as well as professionals to act

[20] Available at http://www.regjeringen.no/nb/dep/md/dok/regpubl/otprp/2008-2009/otprp-nr-52-2008-2009-/10/6.html?id=552340 (accessed 10 November 2011).

responsibly by avoiding and hindering unwanted spreads of alien species. To act responsibly further implies obtaining relevant knowledge about how plants behave and may behave in the future. A question of concern is how this responsibility should be interpreted. Will the importer for example be held responsible for the introduction of alien species 'hitchhiking' in soils or leafs of other plants? And how far into the future should for example the responsible garden owner or landscape architect be able to guarantee that the introduced plant will stay in place? Some further unresolved questions are for example; what is the link between the 2012 Norwegian Black List and the delayed regulation on alien species? Does black listing equate judicial banning of plants? Moreover, what are the criteria for native and safe plants? Such questions illustrate that there is currently insecurity within the greenery sector that needs resolving.

In sum, this thesis can contribute towards a broader understanding of how different groups in everyday and professional settings perceive, relate to and categorise plants in relation to spatial and temporal contexts, and in relation to their social, cultural, and historically situated positions. This leaves a challenge for environmental policymakers and managers to increase their focus on the ways in which vocabularies are applied. In particular, it involves being explicit about why certain species are unwanted in specific locations whereas others are not, why seemingly random temporal thresholds for species introduction are selected to demarcate alien from native species, and why the management focus rests on invasive alien species while native species with invasive behaviour largely escape attention.

7. References

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Paper 1

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Politicising plants: dwelling and invasive alien species in domestic gardens

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Abstract

This paper investigates how domestic gardeners in Oppland County, Norway, engage with plants and with 'invasive alien species' as defined by the national environmental authorities. Invasive alien plants spreading from domestic gardens may represent a threat to native biodiversity, and environmental authorities currently face a challenge in communicating this message to domestic gardeners operating within their relatively autonomous garden spaces. This article demonstrates how biodiversity politics and human-plant relationships meet, or fail to meet, in the domestic garden. Empirically, we draw on talking-whilst-walking interviews with selected domestic gardeners. Analytically, we are inspired by Ingold's notion of dwelling in combination with more-than-human geography. This has enabled an analysis of how domestic gardeners, through embodied practices relate to plants as well as to the terms developed within natural science (i.e. alienness, nativeness and invasiveness). A main finding is that these

gardeners are not concerned about the geographical origin of garden plants, but rather focus on the plant's attributes, such as invasiveness and adaptability to a harsh climate. Insights on how the terminology used by environmental authorities corresponds to domestic gardeners' interaction with garden plants may provide input to improved communication strategies directed towards domestic gardeners on invasive alien species issues.

Keywords: native and alien species, invasiveness, domestic gardens, more-than-human geography, biodiversity politics.

Introduction

> Anna: 'Many people say garden lupines shouldn't be here [in Norwegian nature]. I think that is nonsense, as many of our garden plants have been here long but have come from other places' (Interview 3.10.2008)

> Per: 'They [garden lupines] may repress other Norwegian plants. But it hasn't been a disaster yet, has it?' (Interview 3.10.2008)

This paper examines domestic gardens as key spaces where human-nature, or more specifically, human-plant relations are engaged, debated and understood. There is a growing interest within cultural geography for gardens as spaces for learning about nature (e.g. Hitchings 2003; Head & Muir 2007; Shillington 2008; Bhatti et al. 2009; Head & Atchison 2009), and work is moving from seeing the garden solely as 'the

triumph of human action over an inert and docile landscape' (Power 2005, 39) to acknowledging the paradoxical (Longhurst 2006) and political (Bhatti 1999; Bhatti & Church 2000) nature of gardens. What this move more specifically means is that domestic gardens, i.e. 'an area of enclosed ground cultivated or not, within the boundaries of the owned or rented dwelling, where plants are grown and other materials [are] arranged spatially' (Bhatti & Church 2000, 183), are increasingly acknowledged as a lens on broader social, cultural, political and economic processes. Of particular relevance to this paper is the (un)controlled spread of what has become known as invasive alien species (Elton 1958; Mooney et al. 2005; Davis 2009) as an example of human-nature interactions. Importantly, despite the fact that invasive alien plants spreading from domestic gardens have proven to pose a substantial threat to native biodiversity and ecosystems worldwide (e.g. Zagorski et al. 2004; Dehnen-Schmutz et al. 2007), the domestic garden has to a surprisingly large degree escaped attention from both natural and social science research on alien – and consequently native – species (although see Fremstad & Elven 1997a; Zagorski et al. 2004; Head & Muir 2006; Head & Atchison 2009; Lundberg 2010). While human-plant interactions in domestic gardens largely have escaped scientific attention in alien-native species research, garden plants which have spread to natural habitats attract substantial scientific interest as threats to native biodiversity (see e.g. Dehnen-Schmutz et al. 2007; Zagorski et al. 2004). What make garden plants particularly problematic is that they have been tested and cultivated to fit climatic conditions in gardens and parks, and thereby are well adapted to survive in nature as well (Gederaas et al. 2012, 28). Potential ecological effects of alien garden plants on native biodiversity can be e.g. displacement of native species or spread of parasites and pathogens, disturbance of adaptation of native species in addition to altering the structure or compositions of entire ecosystems (Weidema

2000). Plant spreads from domestic gardens mainly happen through vegetative dispersal or through the dispersal of seeds, fruits or spores by wind, animals or birds (Gederaas et al 2012). Moreover, a challenge that environmental authorities face is the well-established practice amongst gardeners of dumping garden waste along e.g. road sides, forest edges or water's edges. Several species of *Spiraea* and *Symphyotrichum* as well as *Reynoutria japonica* and *R. sachalinensis* have established in Norwegian nature as a result of such garden throw-away (Fremstad & Elven 1997b). The map below (Fig. 1.) illustrates how such practices can cause large-scale spread of invasive, alien species into Norwegian nature.

Fig. 1. Map over the dispersal of *Reynoutria japonica* as a result of thrown away garden waste. (Norwegian Biodiversity Information Centre and GBIF-Norge © 2007-2012)

Against this backdrop this paper deals with how domestic gardeners living in Oppland County, Norway, engage with (or rather not engage with) what is now frequently being categorised as 'invasive alien' plants, in their gardens (see Fig. 2.). An increasing number of common garden plants are falling under the Norwegian definition of alien species; 'a species, subspecies, or lower taxon occurring outside of its natural

range (past or present) and dispersal potential (i.e. outside the range it occupies naturally or could not occupy without direct or indirect introduction or care by humans) and includes any part, gametes or propagule of such species that might survive and subsequently reproduce' (Gederaas et al. 2007, 9).The International Union for Conservation of Nature (IUCN) has defined native species as 'a species, subspecies, or lower taxon, occurring within its natural range (past or present) and dispersal potential (i.e. within the range it occupies naturally or could occupy without direct or indirect introduction or care by humans.)'(IUCN Council 2000, n.p.). What is essentially the political message sent by these definitions is that natives are referred to as the victims of 'invasive' alien species, defined as alien species threatening biodiversity (IUCN Council 2000, n. p.).This is a main point in this paper: when plants are categorised within environmental politics as invasive alien or native respectively they are simultaneously cast as wanted or unwanted nature.

Our concern is how invasive alien species and consequently native species as defined within environmental politics, and heavily influenced by natural science, frame gardeners' practices within the semi-private and relatively autonomous spaces of domestic gardens. More concretely, we focus on the terminology used by environmental authorities (i.e. alien, native and invasive) and how these terms correspond to domestic gardeners' relationships with garden plants. The findings will provide input to how environmental authorities may improve their communication with domestic gardeners on invasive alien species.

Analytically we draw on the notion of 'garden dwelling' which refers to the 'complex performative achievement of different human and nonhuman actors,

interrelated in time and space' (Cloke & Jones 2004, 314). Encounters between humans and non-humans are mediated through language and socially situated practices. Practices are hence context-bound and specific, 'consisting of both human actors and histories of ideas, in addition to non-humans and objects and materialities of politics' (Asdal 2012, 382). In this paper, the relevant context of concern is the categorisations of species within environmental management and biodiversity politics. We combine Ingold's (1995; 2000) notion of dwelling with 'more-than-human' geographies by emphasising the relational and entangled agencies of non-humans and the concrete, lived experiences of humans (cf. Whatmore 1999: 2006). This is a radically different approach to agency than conventional western philosophies offer when portraying humans as active subjects in a world of passive non-humans. Moreover, a more-than-human geography opens up for considering language not as an arbitrary system of signs (e.g. Saussure 1983) but as a skill of dwelling in the world. Categorisations such as alien or native, then, can be perceived and used as 'weapons and tools' (Skinner 2002, 177) in earthly encounters between humans and non-humans in given contexts. A key here is that the written vocabularies used by many natural scientists and environmental management bodies, as well as domestic gardeners everyday engagements with plants, are socially situated practices that involve ascribing particular values to plants. Consequently plants reside in a policy arena as much as in a garden. A main point is that alienness and nativeness as defined in environmental politics do not refer to actual attributes in plants, but are scientifically defined and context-dependent characteristics (Warren 2007; Preston 2009). What this means is that the alien and native status of plants is determined by the spatiotemporal belonging to a specific location, and moreover, depend on whether humans have been involved in introducing the species. The temporal belonging of species is often arbitrarily defined and it is largely up to

policy-makers or scientists to determine how long a species must have been present and reproduced in an area to be categorised as native or alien (see e.g. Ellis 1993; Preston 2009; Smout 2011; Head 2012). In Norway, the year 1800 is somewhat randomly selected to distinguish alien from native species (NBIC representative, personal communication 2012; Gederaas et al. 2012: 12) which illustrates our point that alienness and nativeness are scientifically determined categories rather than actual attributes observable in plants. Moreover, the manner of spread (i.e. by humans or naturally) is of vital importance to the native or alien status of plants. More concretely, plants introduced to Norway prior to 1800 may be considered alien if they were introduced intentionally or unintentionally by humans and in addition have established reproducing populations after year 1800 (Gederaas et al. 2012). Currently, research on how concepts such as alien, native and invasive are perceived and practiced in everyday settings, is largely lacking as issues related to biodiversity have tended to be studied by natural scientists (although see Head & Muir 2004; Head et al. 2004; Zagorski et al. 2004; Graham & Connell 2006). This paper aims to contribute to this larger research complex with a qualitative analysis of how a human-plant interaction in the semi-private setting of the domestic garden influences invasive plant spreads.

Based in the above we raise the following main questions: In what ways do domestic gardeners engage with plants in their gardens? And are the categories of 'alien', 'native' and 'invasive' as defined by environmental authorities settling in the garden? In order to answer these questions we find it analytically meaningful to situate the paper within more-than-human geographies combined with anthropologist Tim Ingold's notion of dwelling. After outlining our analytical position more thoroughly, we present key concerns within current debates about biodiversity generally, and alien

species more specifically, as expressed by environmental policy-makers in Norway as well as internationally. After a short presentation of the empirical context and methodology, we move into a selection of domestic gardens in order to confront the categorisations of plants together with the interviewed gardeners. The paper is drawn to a close by discussing the importance of identifying the domestic garden as an increasingly relevant space to biodiversity politics well beyond the garden itself.

More-than-human geographies

Our concerns in this paper are broadly situated within the age-old nature-culture schism, a schism perceived as increasingly unsustainable by scholars from a number of social sciences. Many natural scientists, policy makers and environmental planners are however still caught up in this dualist mind-set (c.f. Latour 1993; Ingold 1995; 2000). Ingold (1995) demonstrates how conventional Western philosophies distinguish between an external environment given independently of the senses, and an internal, perceived environment organised by acquired, cognitive schemata. The conventional mind-sets Ingold (2000) points at, do, in short, portray nature as a singular realm that can be studied and perceived objectively through scientific methods which downgrade sensuous encounters and portray non-humans as passive objects (see e.g. Abram 1996). A radically different approach is pursued by Ingold's 'dwelling perspective' as a mode of being-in-the world (Ingold 2000). Inspired by Heidegger (1971) Ingold describes how we are dwellers who intimately engage with our surroundings in both conceptual and 'pre-conceptual' manners. Relational encounters with the world come prior to conscious reflection and condition how we come to make sense of the world (Ingold 2000). However, as we are socially situated and our language and concepts are

conditioned by collectively defined practices, these practices may influence individual perceptions and experiences (cf. Abram 1996). Moreover, plants' active agencies influence human-plant interactions as demonstrated within more-than-human geography (see e.g. Whatmore 1999; 2002; 2003; 2006). More-than-human geographies emphasise 'the co-constitution of subject and object, self and environment' (Jones 2009, 311), and draw analytical inspiration from e.g. Actor-Network Theory (ANT) and Science and Technology Studies. Crucially, Ingold's (2000) notion of dwelling also represents a source of inspiration to more-than-human geographies as human experiences and knowledge are perceived as always already embedded within dwelt-in worlds of continuous encounters between all living things, and consequently not *given* by humans alone. These relational insights have influenced a broad range of geographical works, and of particular relevance to this paper are works which consider the lives of non-human animals (Wolch & Emel 1998; Philo & Wilbert 2000; Matless 2000; Matless et al. 2005) and the agency of vegetative species such as trees (Jones & Cloke 2002; Cloke & Jones 2004).

Under the umbrella of more-than-human geographies there is also an increasing literature investigating various aspects of 'human-plant geographies' (see e.g. Head & Atchison 2009 for an overview). The focus on plants is rather recent compared to geographical works on the lives of animals. Head and Atchison (2009, 236) speculate that this may be due to an ethical distance which appears greater between plants and humans than between humans and animals. Moreover, as a number of human geographers have been concerned with studying cultural processes in landscapes and landscape representations, plants have tended to be reduced to 'aggregate visual experiences' (Hitchings & Jones 2004, 6). Plants can thus easily be taken for granted as

they are subtle creatures and appear easier to keep in place than animals. We may thus forget that plants too have agency and interact with humans in multiple ways (Hitchings and Jones 2004). In their work on trees as cultural agents, Jones & Cloke (2002, 8) demonstrate that '(…) trees can, and should, be understood as non-human agents, with a potential to act, to bend space around themselves, to facilitate dependence and even to translate the will of others into their own articulation'. To exemplify, trees and plants alike can force themselves onto places and grow or reproduce in ways which escape human control. Plants may grow quietly for relatively long periods of time before they take on a status as being 'out-of-place', either because they use their own agency, or they are assisted by humans. Before exploring such human-plant relationships in the domestic gardens of Oppland, we will demonstrate how plants and gardens are increasingly becoming subject to politicised ideas about wanted and unwanted nature.

Politicising plants – politicising gardens

The introduction and movement of plants and animals have been a historical trait of any human culture. For example, plant introductions to Norway, such as potatoes, cabbage and a variety of grains, have been seen as favourable and necessary, with hardly any negative consequences for nature. However, with the dramatic increase in species introductions, mostly due to 'the growth and development of trade, transport, and travel' (Dehnen-Schmutz et al. 2007, 527) we now see increasing numbers of introduced species as problematic 'invaders' (e.g. Head & Muir 2004), hence casting such species as unwanted nature. The main political and legal framework for this shift in outlook on biodiversity is the 1992 Convention on Biological Diversity (CBD). Article 8h of the Convention requires its contracting parties to prevent, control and eradicate 'those alien

species which threaten ecosystems, habitats or species' (Article 8h, CBD). The CBD is the only legally binding international convention dealing with alien species in a coherent way, i.e. problematic and 'geographically displaced' species from the smallest of insects to the largest of mammals are bundled together within the singular notion of 'alien species' representing a threat to native species and ecosystems.

Prior to the 1992 CBD definition of alien species as a collective term, financially or ecologically harmful species were treated separately within relevant economic sectors (e.g. fisheries, agriculture and forestry) in Norway, as well as in most other countries (Shine et al. 2005). With the implementation of the CBD, coherent legal and political instruments were needed on alien species resulting in a national Strategy on Invasive Alien Species (Norwegian Ministry of the Environment 2007) and a Norwegian Black List of Alien Species originally published in 2007 (Gederaas et al. 2007), extended and updated in the 2012 list titled *Alien species in Norway – with Norwegian Black List* (Gederaas et al. 2012). The methodological framework for ecological risk assessments have been developed since the 2007 edition which was based on qualitative assessments of the ecological effects caused by alien species. The species were categorised as high risk, low risk or unknown risk according to the probability of introduction, spread and ecological effect on native species (Gederaas et al. 2012). The 2012 edition rests on an improved methodology based on quantitative assessments of ecological risk as a combined function of spread and ecological effect, where species have been grouped into the following categories; no risk, low risk, potentially high risk, high risk and very high risk. Only the species placed in the two latter categories (i.e. high risk and very high risk) have been included on the 2012 Norwegian Black List (Gederaas et al. 2012) which constitutes 217 species.

Furthermore, alien species are subject to attention in the recent Norwegian Nature Diversity Act (2009). However, while the legislation and policies on alien species are relatively new in Norway, the underlying nature-culture schism (i.e. alien species portrayed as humanly spread 'impact' and native species as 'ecological victims') is not. Environmental approaches to protecting 'untouched' nature (e.g. nature reserves) from harmful human impacts and disturbances originate in similar lines of thoughts. In Norway this is much due to a strong focus on seemingly untouched nature rather than paying attention to human practices in nature, as can be illustrated by the Norwegian 'hands-off' strategy of protecting native species and habitats from human influences as far as possible (Aasetre 2000). Conservation initiatives have mainly been centred on publicly owned landscapes considered of national value, e.g. national parks and nature reserves, while nature that has been highly influenced, and in fact conditioned, by human practices and situated within the semi-private domain (e.g. domestic gardens), has largely been overlooked within environmental management. A shift in focus is occurring as there is a growing recognition that the spread of invasive alien garden plants represent a large-scale environmental threat (Gederaas et al. 2012) Consequently, domestic gardens are becoming too important to overlook, not least due to their semi-private and autonomous status where people are largely free to 'do as they please'.

According to Bhatti and Church (2000, 368) relations between everyday life and nature are different in public spaces compared to semi-private domestic gardens due to 'their [garden's] increasing ubiquity, legislative forms of ownership and the real and imagined connections to home.' While public spaces such as parks or nature reserves are subjects to environmental decision-making concerning alien species, domestic

gardens largely escape the environmental authorities' gaze as they are spaces in-between nature and culture, the public and the private (Longhurst 2006). Still, the private autonomy of domestic gardens, not least in Norway, is imbued with public responsibility and social expectations towards what is considered to be proper behaviour in relation to selecting plants. Currently, domestic gardeners in Norway are relatively free to buy and swap plant material regardless of them being seen as problematic by the environmental authorities. The Norwegian Directorate for Nature Management has suggested to legally prohibiting sales of popular garden plants such as the garden lupine which may indicate that stricter regulations may be exercised in the years to come. Bringing in plants from abroad is however still mostly controlled according to phytosanitary trade regulations and not so much according to geographical origin per se. Thus, as long as plants carry Plant Health Certificates and the soil has been removed most plants can still be imported largely unhindered.

Currently, environmental authorities face challenges in communicating their scientifically based measures and terminology to the wider public, and not least to domestic gardeners who actually spread invasive alien species. Environmental management in Norway as well as in other courtiers strive towards being 'knowledge based' and as a result natural science from the field of e.g. invasion biology largely develop terminology as well as policy measures towards alien species (e.g. Davis 2009). Domestic gardeners may however commonly acquire their knowledge about plants and gardening from other sources than invasion biology, such as landscape architecture and the greenery sector where the focus largely has been centred on aesthetical and hardy attributes in plants rather than biogeography (Jørgensen & Stabel 2010). Domestic gardeners are also often part of informal networks where plants, seeds and seedlings are

exchanged, brought along from travels or given away to other enthusiasts with green fingers. Negatively or positively, willingly or unwillingly, garden dwelling thus affects the composition of biodiversity. Before demonstrating this in detail, some notes on empirical context and methodology are provided.

Notes on empirical context and methodology

Oppland County, in the south-east of Norway, is characterised by a relatively cold climate, where the period with snow-cover normally lasts from November till March[i]. Oppland was selected as a research area because of these climatic conditions and as a result, few problematic invasive alien species have until recently managed to establish. This allows us to study a field 'in the making' where domestic gardeners are only beginning to be aware of the invasive alien species problematic.

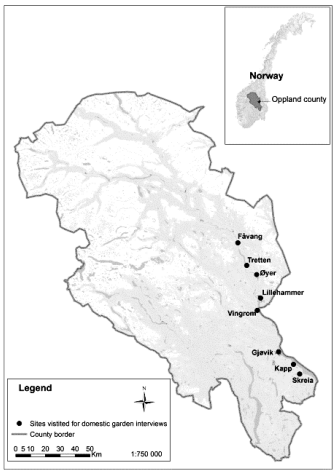

Fig. 2. Map of Oppland with sites visited for domestic garden interviews.

22 gardens and domestic gardeners in the local communities of Skreia, Kapp, Gjøvik, Vingrom, Lillehammer, Øyer, Tretten and Fåvang were visited for interviews (see Fig. 2). [ii] The interviews were undertaken in October 2008, and while October is not the high season for garden blooming in Oppland, there were still many autumn blooming flowers and green plants at the period of time when the interviews were undertaken. October-interviews further enabled reflections over the garden season that was about to come to an end.

To get in touch with the domestic gardeners contact was established with the National Garden Association (*Hageselskapet*), which is a national membership based interest organisation for garden enthusiasts. The National Garden Association has 25 000 members organised in approximately 360 local branches, of which 24 are based in Oppland. Being a member of a garden association meant that all of the interviewees had a strong interest in plants and garden design, and several of them arranged open days in their gardens, inviting anyone interested to visit and have a garden chat. Less committed gardeners could have given other types of insights to the research. We assumed however that active and committed domestic gardeners were those who most actively participated in networks where plants are exchanged and spread.

Using snowball sampling as a method leads researchers to people who know each other well (Rubin & Babbie 2010), and in this case, often women of a certain age group who had close social connections and frequently swapped plants. To get a broader sample, gardeners from different districts were visited, through contact with 6 different local garden associations. Criteria used for sample selection were age, gender and residency in both towns and countryside. Consequently, we wanted to cover

different types of gardens; small row-housing gardens in towns or close to towns, larger gardens of single-unit residences situated close to towns, in addition to single-unit residences in the countryside surrounded by forests or fields. The interviewees had in common that their properties were close to green areas such as farmland, forests or smaller unmanaged public green areas. Even though interviewees were recruited among a few younger couples in their early 40s with young children, the majority of the sample is made up of women between 50-70 years of age. 17 women and 5 men were interviewed, and in addition several of the husbands of the 17 women wanted to participate in parts of the interviews as they shared an interest in gardening with their spouses. The quotes from the empirical material used in this paper are translated from Norwegian, and the interviewees are given fictive names.

When approaching the 22 domestic gardeners in Oppland in 2009, 'talking whilst walking' interviews were undertaken (Hitchings & Jones 2004, 9). These are interviews which offer an opportunity to allow plants more 'power to visibly contest or prompt what was to be said about them' (Hitchings & Jones 2004). Talking whilst walking interviews thus allow for a co-fabrication of data between researcher and researched, with a reference to the plants. As has been demonstrated by e.g. Waitt et al. (2009) the act of walking is itself a way of 'doing' nature. Researching a topic which involves relational encounters between humans and the material surroundings, 'being in it' and moving around in the actual surroundings under scrutiny, helps to stimulate communication and finding the words to describe experiences.

The interviews were transcribed and analysed in line with the method described by Giorgi (2009) where the purpose is to depict what the phenomena in question is

essentially about, in our case how domestic gardeners perceive alien and native plants in their gardens and how that leads to certain practices. A phenomenon may be described as 'any object whatsoever considered insofar as it is viewed from the perspective of consciousness' (Giorgi 2009, 93). By first coalescing essences of meaning the individual interviews, and secondly, looking for similar types of experiences across the interviews (interstructural meaning), a structure of the phenomenon can be abstracted from the individual experiences. The interviewees gave quite similar accounts of the phenomena discussed, which allowed us to highlight the relationship between their experiences in an interstructural way. This is conveyed in the following.

Domestic garden dwelling in Oppland, Norway

Setting the scene

> Anna: 'I quite enjoy sitting on a rock up here where I have an overview of the whole garden. I think this is the nicest place on earth.' (Interview 3.10.2008)

This quote represents a feeling of the domestic garden as an autonomous space for rest and recreation where creativity can unfold (see also Bhatti 1999), very much in line with how Merleau-Ponty (1945) describes the reciprocity and resonance that silently takes place between the human body and sensory entities. The interviewed gardeners all emphasised sensory encounters with their plants as an important motivation for working in the garden, e.g. 'I like a variety of smells coming from different plants. In the evening there is the Jasmine and you can sit there and just feel the smell drifting, and then the lilies are flowering, and I love sticking my nose into the roses' (Tor, interview

20.10.2008). Most of them further appreciated the garden as an autonomous space where they could experiment and develop their garden skills in close relationships with plants and microclimates;

> Lina: 'I like to experiment with roses. Some do not make it, but that varies according to the micro-climate in my garden. I have tried moving them around. (Interview 14.10.2008)

> Ole: I want it to be a bit exciting and fun and plant things that are at the edge of their climatic range (…). I have learnt a lot from trial and errors in my garden'. (Interview 14.10.2008)

Several interviewees accounted for the joy involved in helping fragile or 'climatically unfit' plants survive against all odds. Such survivors were described as a garden pride and could both be wild-growing native plants as well as alien plants from abroad. In order to keep them under control, weeding of invasive plants was described as a natural part of gardening. A main impression from the interviews was that gardens with a 'natural' look were much preferred to 'sterile' gardens with a perfect lawn, a point nicely illustrated by Anita: 'A garden is not supposed to be perfectly tidy but rather more natural. Of course straight edges and weedless lawns look nice, but somehow it looks a bit artificial. I like to let it grow' (interview, 3.10.2008. See Fig. 3.). This did however not mean that the gardeners let plants disperse unrestrained. In fact, all of the gardeners had quite tidy gardens and another interviewee, Hanna, said that she 'prefers a certain system rather than tangled wilderness' (interview, 9.10.2008).

Fig. 3. ‘I like to let it grow’ (Anita). (Photo: Helen Fredholm 2008).

These introductory reflections thus demonstrate that also for these gardeners, the garden is a somewhat secluded, aesthetic space where keeping a ‘certain system’ and staying in control is important while simultaneously allowing plants to grow and disperse. In the next section, we focus explicitly on how gardeners exchange plants and thereby potentially participate in the spreading of invasive alien species between gardens as well as to natural environments.

Controlling invasiveness

Garden dwelling in Oppland is, and has traditionally been, conditioned by a rather harsh climate with long, cold winters and often quite chilly summers. Consequently, and according to several of the interviewees, many of the most common garden plants sold through commercial chains simply do not thrive or they die during winter. Local domestic gardeners who managed to breed locally adapted varieties for sale or exchange

were thus highly esteemed by the interviewees. While locally adapted varieties may thrive in domestic gardens they are also potentially those which will succeed in spreading and establish themselves beyond garden fences. To engage in informal plant swaps in order to get hold of locally adapted plants was nevertheless considered an important activity and few of the gardeners were concerned with plants spreading outside their garden fences. In fact, the informal plant exchanges between domestic gardeners have long historical roots in Norway: 'In the past many plants were given from one household to the next and people shared what they had' (Johanna, interview 16.10.2008). Johanna underlined the importance of taking care of traditional plants, such as loosestrife (*Lysimachia punctata*). However, while being a plant with historic and cultural roots in Norway loosestrife is now also listed in the Norwegian Biodiversity Information Centre's Database of Alien Species because of its invasive attributes in nature. Johanna commented that 'people are angry with plants that spread (…), but many of these plants are nice too. And I have got room for them' (Johanna, interview 16.10.2008). This quote clearly illustrates that Johanna primarily was thinking of spreading garden plants inside the controllable environment of her own garden. She did not reflect upon the risk of the plants spreading beyond her control and into surrounding areas, and what this could potentially lead to. Having room for plants in the gardens was generally linked to being able to control the more willing and invasive plants by most of the gardeners. While feeling in control and being able to handle the invasive plants inside the garden was considered of main importance, invasiveness in plants was simultaneously largely appreciated as an attribute that made these plants easy to succeed with and therefore often referred to as 'willing plants'. Willing plants further demanded skilled, conscious gardeners who knew what types of plants should be best avoided, as exemplified by Karina;

> Karina:' I want to be generous and I don't listen to people who warn me about dispersive plants which I should not bring into my garden. I want to try for myself and I like dispersive plants. That is why my garden looks a bit messy. I am however afraid of plants sprouting from the roots.' (Interview 7.10.2008)

In sum, invasiveness could be an appreciated attribute in plants as long as the gardeners stayed in control and the plants stayed inside of a defined garden space. A general impression from the interviews was that uncontrolled plant spread was considered a worst case scenario, both inside and outside of the garden. Lisa described the feeling of losing control;

> Lisa: 'There is an unruly plant in my garden which climbs and crawls and is all over the place. I don't like it in my flowerbed. It is a bit wild and choking. Now it has entangled that bush over there. We could have done a lot more. We have jobs, a cabin and two small children so the garden is neglected.' (Interview 13.10.2008)

Problematic plants mentioned by the gardeners were both long-established plants assumed to have been grown in Norway since the medieval ages, such as chickweed (*Stallaria media*) and goutweed (*Aegopodium podagraria*), but also alien knotweed (*Fallopia japonica*), snap weed (*Impatiens glandulifera*) and Japanese roses (*Rosa rugosa*) were mentioned. While most garden plants are 'tame' in the sense that they are cultivated and designed in ways fitting the likings of humans, the plants' own creative agency sometimes represented a challenge to the domestic gardeners, especially when they spread beyond the domestic garden fence. This was repeatedly, and strikingly, illustrated by the garden lupine (*Lupinus polyphyllus*), which appeared to be a

controversial plant as some domestic gardeners expressed a strong appreciation for it while others hated it (See Fig. 4.).

Fig. 4. Garden lupine (*Lupinus polyphyllus*) – a loved and hated plant. (Photo: Anders Often).

The garden lupine is an herbaceous tuft-forming perennial with blue, pink or white flowers which can become up to 150 cm tall and spread by seeds or 'by means of creeping rhizomes below ground' that may suppress other species (Fremstad 2010, 6). In Norway, the Directorate of Public Roads has actively used garden lupine as a nitrogen-fixing species to stabilise soils after construction works (Norwegian Biodiversity Information Centre 2007). As a result lupines are currently spreading rather uncontrolled along roadsides around the country while local meadow flowers are disappearing (Norwegian Biodiversity Information Centre 2007). This is probably one of the reasons why the garden lupine ended up on both the 2007 and 2012 editions of the Black List because it was found to represent a *high ecological risk* to the well-being of Norwegian ecosystems (Gederaas et al 2007; 2012)**.** The Directorate of Public Roads has recently started a long term project of removing garden lupine populations and

several of the interviewees also expressed negative feelings towards the uncontrolled spread of the plant in natural settings, e.g.;

> Kristian:' It has become a pest. And the Directorate of Public Roads is responsible. It is too late now'. (Interview 9.10.2008)

> Johanna: 'Lupines ruin the conditions for our common flowers growing on roadsides'. (Interview 16.10. 2008)

A tendency among the interviewees was to principally categorise the lupine as an invasive alien species which 'should not be here [in Norwegian nature]', yet on a practical level many of them assured that the lupines in *their* gardens were neither problematic nor invasive. This point is bluntly illustrated in the introductory quotes. A few mentioned, in fact, that they would like to try sowing some in their gardens;

> Lina: 'Lupines have got a bad reputation. They become a bit too much. But I have a yellow variety that I would like to try. I don't think that one spreads much. And it's possible to reduce the population by removing the seeds'. (Interview 14.10.2008)

> Frank: 'Those lupines don't spread that much. We help them a bit and sow some extra seeds…'
> Marta: 'In some places they spread a lot…'
> Frank: 'Yes, but not here [in our garden]. I think they are very pretty. A lot of strange things grow on this little plot.' (Interview 13.10.2008)

The interviewees who had planted the garden lupine mentioned the diverse colours and the invasive attributes making it a 'willing' plant as their main reasons for having it in the garden. Its invasive behaviour was also the most common reason mentioned for disliking garden lupines. For example Lina explained that she used to have garden lupines, but that she got rid of them when she noticed that they started to spread. Another interviewee presented an illustrative story of the lupine's invasive attributes and its potential for spreading beyond the garden and into a nearby forest:

> Hanna: 'It's not difficult if you watch out and remove the seeds. But that doesn't help if the neighbour let them spread freely. The old lady over there had lupines as ornamentals but then they started to spread and form a dense blanket all the way into the forest. The poor old lady, she is not able to deal with it. So they keep on spreading.' (Interview 9.10.2008)

An overall impression was that most of the domestic gardeners approved of planting lupines as long as they were able to keep the plants under control, i.e. to control their spread within the defined space of the garden. While the uncontrolled spreads of lupines both within and outside the garden fence were considered threatening, lupines kept under control were largely quite accepted.

Defining 'alien' and 'native' plants in the garden

The interviewees' experiences with the garden lupine, nicely illustrate a crucial point in this paper, namely that human-plant relationships in domestic gardens are not necessarily influenced by scientifically defined and politicised concepts such as alien and native. To find out exactly how the gardeners related to these concepts (i.e. the

scientific terminology) the domestic gardeners were asked to define 'alien' and 'native' during the interviews. Even though a few of the interviewees had not heard of the concepts and had difficulties in imagining what types of plants could be considered alien in their gardens, most knew about the 2007 Norwegian Black List, and about blacklisted species more generally. One of the interviewees defined *alien species* in the following way, which was in line with the views of several others;

> Lars: 'Alien species are species which have arrived with the help of humans. They have not dispersed naturally. It can happen with the help of birds as well. I have found red currant in the forest over there.' (Interview 29.09.2008)

Based on a systematic analysis of the empirical material (as described by Giorgi 2009), three main understandings of the concept 'alien' can be identified; something 'spread by humans', 'species that do not belong in our nature' and 'species causing environmental harm'. All three categories are in line with the definition of alien species as given in the 2007 Norwegian Blacklist (Gederaas et al. 2007), the later updated 2012 Norwegian Blacklist (Gederaas et al. 2012) and the Norwegian Strategy on Invasive Alien Species (Norwegian Ministry of the Environment 2007). A further overall finding was that while many of the gardeners knew how the concepts were defined by environmental policy-makers they did not apply these concepts to their own gardens and garden plants. Thus, there appeared to be a gap between their knowledge of the terminology used by the environmental authorities, and their own relational encounters with their plants. To illustrate this point, one couple defined alien species as 'something that is not welcome here [in Norwegian nature]' but they quickly added that;

> Sofia: 'A lot of the aliens have found their place here [in Norwegian gardens].'

Tor: ‘I don’t actually mind moving plants around. Many of the plants [in Norwegian gardens] come from China and Himalaya…’

Sofia: ‘Yeah, many of the plants we really love are brought from over there.’

(Interview 20.10.2008)

Another interviewee suggested that as everything had wandered into Norway at some point, it was perhaps when plants became very dominant in natural environments that they suddenly were termed ‘alien’ by policymakers. Thus, while most of the gardeners could define what it meant to be alien they did not necessarily agree that alien meant something negative within the setting of the domestic garden. In fact, a main impression from analysing the material is that ‘alien’ in the garden also could mean ‘exotic’, referring to fragile species in need of human protection in order to survive in the cold Nordic climate. Both wild growing native plants and plants from southern latitudes were mentioned as examples of exotic garden plants. The gardeners were thus asked to define what they thought of as a native species. The following quotes illustrate views that were commonly given by the gardeners;

Linda: ‘Native is something that has been here [in Norwegian nature] as long as we can remember. It can be both wild and cultural plants.’ (Interview 7.10.2008)

Anna: ‘I am thinking of Norway spruce, birch, common hepatica…’

Per: ‘Yes…the common hepatica is original.’

Anna: ‘It has been growing at all times in the forests of Romedal.’

(Interview 3.10.2008)

Tor: 'I am thinking of native as the state of plants before they were improved or hybridized.'

(Interview 20.10.2008)

These views can be summarised into the following categories; 'something that has always been here [in Norwegian nature]'; 'wild, non-domesticated plants' and 'traditional, cultural plants which have not been hybridized'. While the first category is rather vague, the second category of native species as 'wild' and 'non-domesticated' is in line with the IUCN definition and the 2010 Norwegian Red List (Kålås et al. 2010). The third category of native is more in line with horticultural literature on plant breeding and cultivation. A main finding was that regardless of how close the gardener's definitions were to the definitions provided by the environmental authorities, the concepts of alien and native were not applied in embodied human-plant encounters within the garden. A majority of the gardeners explained that they appreciated a mixture of wild flowers like meadow flowers, and cultivated alien flowers like the garden lupine, a finding which supports the impression that categories such as alien and native were not particularly important to them in their selection and cultivation of garden plants. In fact, rather than focusing on the geographical origin of plants, a tendency among the gardeners was to talk about their plants as 'dispersive' (i.e. invasive) or 'quiet', as illustrated above. This may reflect the fact that alien species policies are still in the making in Norway.

Interestingly, an invasive alien species that *did* provoke the gardeners' collective fear was the Spanish slug (*Arion vulgaris*). The Spanish slug has through extensive media coverage become a well-known garden invader, and perhaps more so than any

particular plant. The Spanish slug is not common in Oppland yet and none of the domestic gardeners had actually discovered the slug in their gardens. Despite of this, the gardeners feared an invasion from the slug and other 'garden dangers'. As one couple explained;

> Dag: 'I guess there are small chances that the slugs will come all the way up here [to Oppland County].'
>
> Susanne: 'Yes, but we have a black slug, and the authorities are afraid they may interbreed and get more resistant.'
>
> Dag: 'yes and there are some giant ladybirds too…'
>
> Susanne: 'Are they really that big?'
>
> Dag: 'Well, maybe not, but I am sure they are bigger than ours.'
>
> Susanne: 'Yeah, there are so many dangers…' (Interview 3.10.2008)

The fact that most interviewees mentioned the Spanish slug as their initial example of an alien species may perhaps indicate that they did not consider plants equally threatening and invasive as they expressed an ability to influence and control plant spreads. The slug appeared somewhat 'sneakier' and thereby caused stronger reactions among the interviewees. The fear of 'getting the slug' had made several interviewees take precautions when swapping plants informally or when buying from commercial chain stores as they had heard of stories where slugs had been found in soils from such stores. As a result several had started to keep newly acquired plants in 'quarantine' for a few days before they allowed them into the garden. With reference to the slug, several interviewees also pointed out that plant flee-markets should be held locally to stop vermin and slugs to spread across the country.

Are categorisations of alien, native and invasive plants settling in the garden?

Aside from the precautions taken by the gardeners who feared being invaded by snails and certain invasive plants, a remaining question is to what extent the categorisations of plants as defined by environmental authorities are likely to become part of garden dwelling. Currently, the environmental authorities and the greenery sector disagree over a proposed Norwegian Alien Species Regulation which has not yet entered into force.[iii] The Regulation, which is currently out on a public hearing, recommends a 'prohibited species list' based on the 2007 Norwegian Black List (Directorate for Nature Management 2010) and the updated 2012 Norwegian Black List (Gederaas et al. 2012). Many of the interviewees did not find that legally banning plants was a good idea, a message illustrated by Ole;

> Ole: 'I don't know if those plants should be prevented. All [plants] have the right to live. It should be up to each individual domestic gardener what he or she wants in the garden. But plants sprouting at the roots… you have to really work with those. And if you do, it is not a big problem. You can handle it.'
>
> (Interview 14.10.2008)

Another interviewee explained:

> Jon: 'I think it is important to grasp people's general sense of justice and that the authorities manage to communicate with people. If not, I think they risk that a lot of alien species are spread illegally. I think the environmental authorities are perhaps a bit puritan and pietistic and they are doing things in ways that seem completely removed from people's realities. So people are unable to relate to that communication. Many people like lupines. My mother however saw that

> when she planted lupines all her beloved bellflowers died. So from that experience she knows what lupines can cause. And this is exactly the type of logic the authorities should apply.'
>
> (Interview 8.10.2008)

These quotes point to a wider trend that was common among the interviewees; while they did not categorise their garden plants as alien or native, they took precautions when they experienced invasive plants. Recently, environmental policies focusing on alien species have to a certain extent started to influence which plants are locally recommended in domestic gardens through a local Plant Variety Lists for Hedmark and Oppland Counties (Hedmark og Oppland Gartnerforening 2010; 2004).[iv] Many of the domestic gardeners mentioned that they used this list as a basis for choosing their garden plants. As the 2004 edition of the list recommended several species which later has become blacklisted, a member of the List's editorial board was asked whether they would remove e.g. Garden lupine and Japanese roses in the forthcoming 2010 edition as these have been blacklisted. She responded in the following way;

> 'We cannot take these plants out. No, that is out of the question. You know, I don't think it makes sense, especially with the Japanese rose. It is a useful plant and it is very pretty. (…) But still, when I planted giant hogweed in my garden that was something I had to take care of. So there are cases like that.' (Member Editorial Board, interview 22.10.2008)

In the 2010 edition the editorial board had nonetheless agreed to take the species out of the list even though they still did not think of garden lupines and Japanese roses as problematic. Consequently, while these were acceptable plants some years ago they had

become more problematic in 2010 as a result of environmental policies and their by then, gained status as black listed.

Politicising plants: Invasive alien species in domestic gardens

Throughout this paper we have sought to explore how invasiveness, alienness and nativeness are perceived and expressed in domestic gardens through garden dwelling and embodied engagements with plants. Our empirical material based on talking-whilst-walking interviews with domestic gardeners in Oppland, Norway, has demonstrated that human-plant encounters are dynamic and relational, and based in embodied and everyday dwelling. The research also crucially demonstrates that gardeners do not to any degree practice the alien-native dichotomy constructed by scientists and environmental policymakers. Their relations to plants are rather focused on plant attributes, such as invasiveness. We have investigated domestic gardens as both relatively autonomous spaces involved in biodiversity politics as invasive alien plants spread in to and out of gardens, and sometimes they spread beyond human control. Despite the increasing numbers of garden plants that are currently blacklisted with high ecological risk this paper has demonstrated how plants are ascribed alternative values by the domestic gardeners of Oppland. However scientific and objective in outlook the CBD and the consequent debate about alien species is portrayed to be, human-plant relations in the domestic garden emerge from embodied and socially situated practices. A key point here is furthermore that human perceptions are not caused solely by humans but through reciprocal encounters between body-subjects and their surroundings. Attractive plant attributes, such as smells, colours, shapes, invasiveness and growth, invite domestic gardeners to apply practical skills to control plants and in

shaping eye-catching flowering spaces, while invasive plants out of control - or slug-threats - force them to take precautions. The paper further illustrates the challenges of communication between domestic gardeners and environmental policy-makers in Norway at the moment. Environmental policy-makers based at the various County Governors Offices, the Norwegian Directorate for Nature Management and the Ministry of the Environment largely base their policies on natural science and scientific terminology (i.e. alien and native) which do not necessarily correspond to how domestic gardeners relate to their plants. In short, it has proven a bit of a challenge for environmental authorities in Norway to make their categorisations of alien and native species relevant to domestic gardeners in their everyday dwelling. Only when words are felt, with their embodied presence can we understand how our concepts and language can influence, change and transform our sensual world. Even so, concepts have the capacity of 'working their way back' and influence human perceptions if they resonate with embodied experiences or are socially and culturally established. Thus, while changes in the 2010 Local Plant Variety List for Hedmark and Oppland illustrate that alienness as defined by environmental authorities may eventually influence individual domestic gardener's selection of plants, this will probably only happen when people start recognising alien species as problematic in their gardens through their practical engagement with them. By demonstrating the perspectives and concerns of domestic gardeners, the paper should be relevant for the designing of environmental measures such as information campaigns. In particular such campaigns could focus on invasiveness rather than alienness, as invasive behaviour in plants, both inside and outside the garden are observed, experienced and understood by gardeners. With enhanced knowledge on invasiveness and ecological risk of garden plants there is a potential for getting domestic gardeners on board in halting the spread of invasive alien

species as they become concerned and take precautions when plants try to escape their control.

Notes

[i] From November 2010 to March 2011 the temperatures in the part of Oppland we focused on fluctuated between around 12 °C to minus 23 °C. Between April and September 2011 the temperatures fluctuated between 26 °C to around 1 °C (see http://www.yr.no/place/Norway/Oppland/Lillehammer/Lillehammer/statistics.html)

[ii] All interviews were undertaken by NN

[iii] Regulation to the Norwegian Nature Diversity Act (2009) named *Forslag til forskrift innførsel og utsetting av fremmede organismer.* When the Regulation on alien species of the Act finally enters into force, new standards will be enforced for plantings and uses of alien material.

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Chapter 12

Native Nature and Alien Invasions: Battling with Concepts and Plants at Fornebu, Norway

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> After the airport [at Fornebu] was closed down in 1998, 50 mills NOK have been spent to create an unwanted botanical garden […]. (Environmentalist)

> I personally think of Fornebu as a symbolic case used to draw attention to the general problem of invasive alien species. (Planner)

Following the closedown of the airport at Fornebu, Oslo, 'alien' plant species were used by the Norwegian Directorate of Public Construction and Property (Statsbygg) to reconstruct the former landing strip into a green area neighbouring two nature reserves. During this process the environmental NGO, SABIMA,[1] reported Statsbygg to the police in 2007 for having committed an environmental crime by planting alien invaders. Even though Statsbygg argued to have acted according to agreed upon plans and disputed being labelled environmentally criminal, negative publicity was presented in the media and Statsbygg consequently had to remove several alien plants. A pending question remaining is whether this actually was an environmental crime. Defining environmental crimes are, as we have seen in other chapters of this book, no straightforward task. One of several definitions describes environmental crimes as 'those harms against humanity, against the environment and against non-human animals committed both by powerful institutions (e.g. governments, transnational corporations, military apparatuses) and also by ordinary people' (Beirne and South 2007: xiii). From these large-scale perspectives of harms against humanity and the environment, Fornebu might appear to be a local concern, a lawsuit to be solved and settled. Yet it is so much more. The conflict at Fornebu illustrates how the concepts 'alien' and 'native' species respectively are used by different scientific disciplines,

[1] SABIMA (Samarbeidsrådet for biologisk mangfold) is a national umbrella organization working to preserve biological diversity in Norway. Se www.sabima.no.

in this case landscape architecture and biology/ecology, in a battle to legitimize their vision of the ideal nature. Defining what is native, alien or even criminal can be seen as political activities that will have implications for people, other species and nature? Consequently, when we use such concepts in specific ways we simultaneously seek to 'impose a particular moral vision on the working of the social world' (Skinner 2002: 182). The battles over concepts and the moral visions related to their uses lay at the core of the global alien species debate, which will be exemplified through the conflict over planted material at Fornebu. The questions this chapter seeks to address, in essence, are the following; is the spread of alien species environmental criminality, and further, what are the consequences of labelling alien species as environmental outcasts?

To deliberately spread invasive, alien species may qualify as an act of environmental crime as such species currently are termed a global threat towards biodiversity (see for example Simberloff 2000a, CBD 2007, European Commission 2011). What complicates the labelling of environmental criminals is, however, the difficult task of distinguishing the aliens from the natives. Interestingly, these are scientifically constructed concepts which appear to emanate from ecological theory and 'desk work' rather than practical experience. Further, humanity depends on the uses of a diverse range of alien species as most agricultural food crops as well as horticultural plants used in gardening are by definition alien. In Norway an illustrative example of the sea is the Red King Crab that has spread from Russia and down along the Norwegian coastline since the 1970s onwards. The crab was considered a resource until around 1992 when large quantities of crabs were caught as by-catch in fishing nets and caused problems and economic losses for fishermen (FKD 2006–07). Today the crab is in fact treated as a commercial resource northeast of the cartographic boarder drawn at 26° east, while it is restricted as an alien species west of this same boarder. Thus, alien species are entangled in economic, cultural and historical practices, and often have a dual status of being simultaneously harmful and valuable resources.

While the damaging consequences of several alien invaders are real enough, defining what is alien and native is a politically loaded activity with real world consequences. Inspired by the British political philosopher Quentin Skinner, I will examine such encounters between linguistic actions and 'the real world' (for example Tully and Skinner 1988, Skinner 2002) exemplified by the Fornebu case. Skinner argues that conceptual changes do not necessarily result in changed *meanings* of a concept, but rather changes of the moral implications attached to the concepts (Skinner 2002: 179). Such moral implications influence how concepts can be rightfully used, and whether for example planting alien roses is considered an acceptable or unacceptable practice. Concepts can thus be seen as rhetorical 'tools' used in negotiating societal 'right-doings' and 'wrong-doings'. With this perspective in mind, I will investigate how the interest groups at Fornebu, representing different types of scientific knowledge, used the same concepts in very dissimilar ways, and with particular moral and material consequences.[2] I will, however, first provide some background explaining the current framing of alien species.

What make Species Invasive Aliens?

The Japanese Rose (*Rosa rugosa*) was one of the planted alien species the environmentalists reacted against at Fornebu. The Leader of SABIMA compared the rose to rabbits in Australia in a newsbreak on public television (NRK Lørdagsrevyen 2007). Before giving a thorough description of what happened at Fornebu, I will spend some time investigating what makes a Japanese Rose an example of invasive invaders.

[2] I conducted 17 semi-structured interviews during 2009 and 2010. I have categorized the interviewees into three groups; 'the Planners', referring to bureaucrats involved in planning, 'the Landscape Architects', involved at different stages in the Fornebu process and 'the Environmentalists' who constitute a diverse group of academically skilled and trained people as well as 'lay-experts'.

Who Are the Aliens?

The Japanese Rose is a sprouting shrub that forms dense thickets in habitats it thrives in. The flowers are big with varying colours from white to dark pink (Weidema 2006). Alien species such as the Japanese Rose are typically referred to as species occurring outside their natural dispersal ranges. They have been brought to locations they could not have reached on their own by the intentional or unintentional help of humans. When they manage to establish and reproduce in the new location for at least ten years, they become naturalized (Richardson and Pyšek 2006). Further, if the plants manage to reproduce in large numbers and spread over considerable geographical distances they become invasive. Naturalization thus does not imply that an alien has become native; it just means that the species managed to 'sustain populations over many life cycles' (ibid.). The Japanese Rose was introduced to Europe from Japan, and the first record is from 1796 (Weidema 2006). The rose was, and is, used as an ornamental plant in gardens and parks throughout Europe. In Norway it was first recorded in a naturalized condition in the 1940s, and it is currently spreading northwards and especially along the coast (ibid.).

Historically, diverse terms have been used to describe such species for example 'introduced', 'non-native', 'exotic', 'new', 'weed', 'pest', 'biological invasion' and 'adventives'. The Secretariat of the 1992 Convention on Biological Diversity (CBD) took on the task of standardizing the terminology in collaboration with other regional and international organizations (Shine et al. 2000). The CBD[3] defines alien species as those which manage to reproduce and survive outside their natural range, while alien invasive species are aliens threatening biodiversity (CBD 2010). Alien species are contrasted to native species which are species '(…) occurring within its natural range (past or present)' (IUCN Council 2000). A

[3] The CBD is currently the only international legally binding instrument addressing the prevention, control and eradication of all kinds of alien species (Article 8 (h)). The CBD obliges the member countries to implement Article 8 h and the associated guiding principles through national strategies and action plans to meet the threats posed by alien species.

problematic aspect that will be further exemplified in the Fornebu case is the lack of a temporal scale specifying how long period of time a species must spend in a location to be considered native. In fact, Woods (2001) argues that there is no clear-cut line distinguishing aliens from natives as both concepts have fuzzy boundaries.

The focus on alien species as a global threat against native biodiversity is actually quite recent. In fact, Cadotte claims that early biologists studying alien species in previous centuries were not so concerned with the outcomes of species invasions or their geographical origin, but rather with documenting the occurrence and role of alien species in ecological processes (Cadotte 2006: 22). In 1958 came Charles Elton's classic *The Ecology of Invasions by Animals and Plants*. Elton is often portrayed as the founding father of the field of studying ecological invasions (Ricciardi 2003, Chew 2006, Richardson and Pyšek 2006, Ricciardi and MacIsaac 2008), although there was quite a large interest in the topic among many scientists prior to his book. Elton was apparently the first to bring together three important ecological components; firstly, that plant and animal communities of different continents have become very distinct from one another over millions of years; secondly, that humans are rapidly altering these distinctions; and thirdly, the serious consequences this process have on the conservation of species diversity (Simberloff 2000b: viii). Elton used militaristic metaphors and normative language to describe and warn against what was happening. Since Elton's book, his language and way of framing alien invasions has become highly influential in biological literature, the media and in environmental policymaking such as the CBD framework (see for example Davis 2006, CBD 2010).

How Harmful are Invasive Aliens?

In the first chapter of this book Rob White comments that eco-global criminology pays special attention to ecological considerations of harm. Since I am to discuss whether the spread of alien,

invasive species can be considered a crime, it is worth spending some time discussing the harm-aspect of alien invasions. The Japanese Rose mainly invade sandy, gravely or stony seashores (Weidema 2006). If the conditions are favourable it forms dense, shrubby blankets that may cause reduced numbers of native spices as a result of the shading effect (Isermann 2008a, 2008b, Weidema 2006). The reduction of native species may further affect animals depending on these species, for example butterflies laying eggs on certain types of plants (Weidema 2006). Furthermore, as the rose forms such impenetrable, thorny covers it is problematic for landowners and visitors to beaches. Davis (2009) identifies the following ecological impacts of invasive alien species; impacts on populations or biodiversity caused by for example pathogens or predators; impacts on food webs and communities; impacts on biochemical processes or impacts altering the physical structure of the environment (Davis 2009). Another important harm element is of course the economic harm caused by many alien invaders, such as the Colorado beetle that hit potato crops from the 1850s onwards in for example Germany, France and Britain (Elton 1958). It is important to note that some sites are more open to invasions than others, and these are often locations that have been disturbed by human activities such as roadsides, dumps or railroads (McNeely 2005).

Globally, the threat posed by invasive aliens has been termed a homogenization of the world's biodiversity (Brown 1995, McKinney and Lockwood 1999). A central aspect in this 'homogenization' thesis is that alien invasions increase local species' richness while decreasing the world's species' diversity. Thus, the rare species are replaced by more common and widely spread species (Brown and Sax 2004). In addition to the spread of alien species, habitat fragmentation and climate change contribute to this process (Haber 2008). Rahel (2002), Davis (2003), and Sax and Gaines (2003), however, modify the homogenization thesis by showing that it is not very likely that the world will be stripped of its diversity and inhabited by only a few headline invaders. In fact, several international studies illustrate that there are surprisingly few incidents of resident species having been driven to extinction due to competition from alien

species (Mooney and Cleland 2001, Davis 2003, Davis 2009). Rodriguez (2006) argues that some alien species actually can have positive impacts on native species, for example pollination and restoration of habitats through the use of alien grass species.

Biorascism? Critique of Invasion Biology

The field of invasion biology is increasingly criticized for the criteria used to distinguish aliens and natives. Several scientists from the fields of for example geography and philosophy emphasize the cultural and political aspect entangled in the biological categorizations of species (see for example Kendle and Rose 2000, Alderman 2004, Head and Muir 2004, Robbins 2004, Foster and Sandberg 2004). Further, biological scientists have been termed 'biological nativists' with xenophobic attitudes towards aliens (Hettinger 2001). Hettinger (2001) writes that in human affairs, nativists are characterized by morally troubling attitudes as they favour native inhabitants over foreigners. In a similar troubling manner, biological nativists are perceived to favour native plants and work against introduction and spread of aliens. Hettinger mentions the American journalist Michael Pollan who in a *New York Times* article compares biological nativism to Nazi ideology (ibid.). In a similar manner, the philosopher Jonah Peretti has argued that conservation biology suffers from nativist trends that reproduce racist and xenophobic attitudes (Peretti 1998). Against these accusations, the biologist Daniel Simberloff (2003) argues that such critics fail to see that invasion biologists are merely concerned with preventing ecological and environmental harm. Moreover, the critics ignore the serious economic and ecological impacts of many invasive species. Following along similar lines of thought, Hettinger (2001) argues that biological nativism in fact can be praiseworthy. As we value the preservation of indigenous peoples and cultures, he finds it admirable to strive towards the preservation of valuable biological diversity that is threatened by being homogenized due to the spread of alien species. While there may be some parallels in the rhetoric used by nationalistic racists and invasion biology, I find this comparison a bit farfetched. One of the simple reasons is

that most invasion biologists know perfectly well that many alien species are not harmful at all (as underlined by for example Simberloff 2003), but necessary resources in for example agricultural production. While these debates have received broad attention, less has been written on the issues investigated in this article; whether the spread of alien invasive species can be defined as a crime.

Alien Species and Environmental Crimes

Many invasive alien species cause some type of harm to nature or human societies. *Harm*[4] is, as described in the Beirne and South 2007 definition, an important element related to environmental crimes. In this volume White identifies three notions of harm related to eco-global criminology; legal conceptions (for example laws, rules and international conventions), ecological wellbeing (of for example species and ecosystems) and justice conceptions (related to the intrinsic value of species and ecosystems). Larsen (this volume) notes that transgressions against nature or activities she defines as eco-crime includes legal environmentally harming activities undertaken by, for example, states or businesses. She distinguishes between 'illegal harm, harm in the grey area between legal and illegal harm, and legal harm' (Larsen, this volume) and argues that harms can be criminal not only in the judicial sense but also in a moral sense. A further element related to harm is the notion of *risk* which relates to predictions or expectations of harm. According to White (2008), environmental problems are constructed and negotiated in relation to competing perceptions of risk and harm. Environmental crime is thus a socially contingent concept. Labelling the spread of alien species an environmental crime will imply what Skinner calls rhetorical redescription (2002), where a concept is increasingly being applied to circumstances where it normally would not be used, for example that the planting of alien species has transformed from being a perfectly accepted practice in gardening and

[4] White (this volume) defines harm as 'an actual danger or adverse effect, stemming from direct and indirect social processes that negatively impinge upon the health and wellbeing and ecological integrity of humans, specific biospheres and non-human animals'.

landscape architecture into an act of crime. The processes of rhetorical redescription can be exemplified with the proceedings in a court room where the prosecutor and the defines attorney will redescribe the same course of events in ways that best suit their goals. The result is often two quite different descriptions of the same case. The outcome of such linguistic struggles will sometimes result in conceptual change if social consensus about the new uses of the concept is reached (see for example Bjørkdahl this volume). To address whether the spread of alien species is an environmental crime it is necessary to scale down to a physical location in a particular geographical context which in this case is Fornebu, Norway.

Introducing Fornebu: the Reconstruction of a Former Airport

Since the airport at Fornebu closed down in 1998 the area has been developed into a commercial site for housing, business and recreation. Simultaneously, Fornebu is a location very rich in biological diversity including red listed bird, insect and plant species. Before the 1930s, when the airport was constructed, the landscape at Fornebu was characterized by forests, dry meadows and agricultural fields (Bendiksen 1994), hence a substantial part of both cultural and natural landscapes were cleared and blasted away due to the airport construction. Some wetland areas were, however, preserved and these are currently considered some of the most important biotopes for migrant birds in the country with over 264 different species registered. The areas were protected as nature reserves by royal proclamation in 1992 (Kongelig resolusjon 1992).[5] The landscape architect company which was engaged by Statsbygg to manage the process of reconstructing the green areas at Fornebu were instructed to preserve both natural and cultural fragments of the former landscape (Statsbygg and Oslo Kommune 2000). The landscape plan

[5] The two landowners at Fornebu, which were the municipality of Oslo and the Norwegian State respectively, together with the Municipal Planning Authority of Bærum, shared the wish to conserve the rich natural diversity at Fornebu, however the end-result was highly disputed.

(2001)[6] provided guidelines for the new Fornebu forest which would consist of native vegetation registered by the botanist Egil Bendiksen in 1994 (Østengen and Bergo 2001). The plan emphasized the construction of a new landscape where elements from Fornebu's historical nature and cultural landscape would be preserved (ibid.).

A rapid establishment of green buffer zones was given high priority in the planning process in order to protect the nature reserves and bird life from the large amount of people who would move into the area. As a result, the buffer zones were intended to consist of fast-growing and impenetrable local species with thorns. The landscape architects found it very challenging to meet the requirement of using native species as these were difficult to get hold of in the commercial market (Statsbygg and Oslo Kommune 2000). As a result of time pressure and lack of experience in the greeneries of producing native non-commercial material, several native species were substituted with similar non-native commercial species (ibid.). In collaboration with soil scientists, a layer of wood chips was distributed on top of the soil to prevent weeds from surfacing and to secure the moisture content of the soil.

When the conflict over the alien planted material and the thick layers of wood chips escalated in 2007, Statsbygg had arranged a guided tour around the planted areas to try to resolve the conflict with the environmentalists. One of the environmentalists told me about an incident which took place during this guided tour:

> I saw a Salix which had come up on its own in the middle of the wood chips. 'Imagine a forest of Salix here instead of your alien species', I told the chief gardener from Stasbygg. Then he grabbed the Salix and pulled it out. 'This is not supposed to be here', he said. It was not on his list. And I was completely paralyzed and lost my speech. He fixed nature in his own way, even though it was Nature itself which had placed the Salix there. That was the only thing we wanted here. (Environmentalist)

[6] The landscape plan is a superior plan for long-term landscape development at Fornebu. It was developed by a Landscape Architect agency and commissioned by Oslo municipality in collaboration with Statsbygg and Bærum municipality. The plan is, however, not a formally binding planning document like the Local Development Plan, yet it laid out the premises for the further regulation and planning activity.

The type of nature that the environmentalists wanted was a mosaic of natural and cultural elements with, for example, calcareous pine forests, pastures and dry meadows with drought-tolerant, rare species where many red listed insects thrive. This had been a typical element of the original landscape at Fornebu prior to the airport (Bendiksen 1994). However, other typical elements of the historical landscape were farms, parks and greeneries (Bærum kommune 1994). One of the landscape architects explained that 'From older maps and pictures we can see that this was a very cultivated area. The soil must have been quite nutrient-rich to suit agriculture' (Landscape Architect). Thus, both natural and cultural elements were part of the past landscape at Fornebu. On the 16 October 2007 SABIMA reported Statsbygg to the police for having acted against the § 3 of the Local Development Plan that specify the use of native vegetation. The environmentalists termed the alien plantings a crime against nature. The case was, however, closed down as a result of lacking capacity by the police to investigate it (Asker og Bærum politidistrikt 2007).

'Wrong Plants at Fornebu'

During the airport period, Fornebu had been actively used as a location for bird watching. One of the local bird watchers told me that 'People thought this was just an airport and did not realize its natural qualities. But we knew about it. We, the bird watchers, knew' (Environmentalist). The bird watchers' involvement and views of the processes around the 'new Fornebu' were deeply emotional as several of them had grown up in the area and were using it on a regular basis. They had strong interests in preserving the natural qualities of the area, which had been largely shielded from human activity during the airport period. When the airport closed down, they established a joint committee called KEF[7] consisting of local ornithologists, environmentalists and local welfare organizations to lobby in the planning process to secure a green alternative at Fornebu. In the summer of 2004 they became aware of what they later

[7] Komite for Etterbruk av Fornebu [Committee for the Re Use of Fornebu].

termed a catastrophe which was taking place at Fornebu (Environmentalist). The area, which in their opinion should consist of native nature with buffer zones of native species around the nature reserves, was described by one of the environmentalists in Friends of the Earth Norway's membership magazine as 'a sterile park landscape – a gigantic garden of mould with wood chips on top' (Bergan 2009: 5). They discovered that a substantial part of the plants were alien and did not belong in Norwegian flora. The KEF committee realized, however, that they had to liaise with others in order to get heard: 'How were we supposed to get our arguments through? Nobody but bird watchers had been using these areas since 1939, so how were we to make people realize that we had to take care of this area? We needed the national organization SABIMA to take the lead' (Environmentalist). SABIMA realized that the case had a symbolic value which could be transferred to similar cases at a national level (Leader of SABIMA). In 2007 they sent out a number of letters to planners, policymakers and the media.[8] The letters stressed the national value of Fornebu as a unique location for red-listed plants and insect species in addition to the rich bird life. The environmentalists held that:

> Fornebu is the country's most expensive environmental project. From a natural scientific point of view the project is a disaster. Enormous sums have been spent on plantings which do not meet the intentions of restoring the unique nature of the area. At a time where the international attention has been turned towards the control and eradication of alien species through the Rio convention, thousands of non-native species have been planted at Fornebu. (NOF AO 2007)

To save the nature at Fornebu they found that more public attention was needed and the leader of SABIMA proved to be an excellent communicator. On the 26 May 2007 a newsbreak called 'Wrong plants at Fornebu' was broadcasted as prime time news. The voiceover reported that 'an environmental disaster is unfolding at Fornebu. A green site costing 35 mill NOK intended to protect the nature reserves in the area has become a zone of plants which can eradicate the natural vegetation in the area […]' (NRK Lørdagsrevyen 2007). Preceding this introduction, the

[8] Those who received the letters were Statsbygg, Bærum municipality, The County Governor of Oslo and Akershus, the Directorate for Nature Management and the Norwegian Broadcasting Corporation (NRK).

leader of SABIMA was interviewed together with a biologist from the University of Oslo. The biologist stated that: 'The soil is totally lifeless and unfertile. And with all these alien species very little will make it here.' The next clip showed the director of Statsbygg in his office pointing at a map. According to him Fornebu had become a really great area with a varied terrain, nice recreational areas 'where beautiful vegetation will grow.' Back in the park areas, the leader of SABIMA repeated his disappointment: 'Based on the planned intentions, this is a disaster. Nothing of what we wanted can grow here at all'. Returning to the office again, the director of Statsbygg explained that they did not manage to get hold of native plants in the commercial markets, and he found it a correct decision to use alien plants in order to protect the nature reserves. Against this claim some of the environmentalists countered that: 'This is a crime against the environment', and they required the immediate removal of the alien plants and the thick layer of wood chips (ibid.).

Two more newsbreaks were broadcasted as prime-time news the same year. In addition there were several stories in national and local newspapers emphasizing the threat of the planted alien species and the lifeless and dead landscape of mould and wood chips where nothing would grow except garden plants (Myhr 2007a, Myhr 2007b). Further, accusations of the incompetence of the people involved in constructing the green site at Fornebu is exemplified in quotes such as: 'They have not understood what native plants are, and have used the wrong type of expertise.' (Sæther and Hansen 2007) and: 'This is the worst case I have ever seen. They have done everything wrong.' (ibid.).

The Construction of Environmental Claims

Statsbygg and the landscape architects felt that the case had been blown out of proportion and that important nuances disappeared in the one-sided media coverage of Fornebu (Landscape Architect). They felt that they did not manage to get their perspective through to the media

(Planner). The way Fornebu was framed in the media may fit with what Hannigan characterizes as the processes of socially constructing environmental problems, which consist of the following three tasks; assembling, presenting and contesting (Hannigan 2000: 69). Assembling environmental claims means discovering the problem and supporting it with scientific evidence. This includes naming and defining the problem in a manner which overcomes ambiguities and contradictory scientific evidence (White 2008: 36). Next, presenting environmental claims involves catching public attention and legitimating the claim through, for example, the use of mass media. This often requires a skilled communicator, such as the leader of SABIMA, who expresses clear moral messages such as: 'the introduction of alien species is an environmental crime'. The streamlining and simplification of facts becomes particularly visible through the use of verbal metaphors together with visual illustrations. Some examples are metaphors associated with the spread of diseases, for example 'contamination of the nature reserves' (Aakre and Kirkholm 2008) or 'pest species which will destroy the nature reserves' (NRK Lørdagsrevyen 2007). Further, the planted vegetation at Fornebu was described as 'ecological deserts' (Austad and Rydgren 2007) and 'litter' (Budstikka 2007). Militaristic metaphors were also used, for example, 'aggressive, ornamental shrubs', and 'invading species' (Auestad 2008).

Metaphors play a key role in attaching social and moral values to concepts such as alien or native species. As Skinner (2002) argues, the social values associated with a concept may change while the meaning of the concept remains fairly constant over time. Alderman (2004) illustrates how the introduced Kudzu in the USA changed from being perceived as a 'miracle vine' used as, for example, animal fodder to being a 'pest' and 'menace'. This is an interesting example in parallel to Fornebu as it shows how a famous radio personality, Channing Cope, played an important role in legitimizing the spread of Kudzu through environmental claims. He gave the Kudzu legitimacy as a resource through the use of metaphors such as 'miracle vine' (Alderman 2004: 160). In a similar manner, SABIMA spread environmental claims by using negatively loaded metaphors to describe the alien plants at Fornebu. Alien species was at the

time a relatively new topic to the Norwegian public and SABIMA contributed towards portraying Fornebu as an environmental disaster.

Further, SABIMA was trying to move the Fornebu issue onto the political agenda with the aim of influencing legal and political decision-making, a process that Hannigan (2000) calls contesting environmental claims. Rob White comments that networking with like-minded people, getting scientists on board and initiating public rallies is part of this process (White 2008: 36), as was also done by SABIMA. According to Hannigan (2000: 69), the simplification of complex phenomena into understandable terms increases the probability that the environmental problem will stick in the public arena.

The Blacklisting of Aliens

In 2007, the same year as the conflict at Fornebu reached its peak, a Norwegian Black List[9] of alien species was launched and boosted media attention towards alien species previously barely discussed publicly. Such lists of both invasive aliens (black lists) and threatened, vulnerable species (red lists) have become internationally recognized scientific tools applied in decision-making processes within the field of biodiversity conservation (Jørstad and Skogen 2010). Jørstad and Skogen (2010) discuss how planners, scientists and NGOs use such lists rhetorically and strategically in manners that simplify scientific knowledge. In this way a red list or a black list may be used in a public debate to strengthen and legitimate environmental claims related to harm and risk.

Even though the planning stages of the Fornebu project were finished and the reconstruction process started in 2004, the 2007 Norwegian Blacklist was used as a tool with

[9] In May 2007 the Norwegian Biodiversity Information Centre presented a Norwegian Black List which consisted of ecological risk assessments of alien species. Part of the aim with the Black List was to help the authorities make priorities in their measures against the most invasive of the alien species.

retroactive effect by SABIMA to strengthen their accusations of environmental criminality against Statsbygg. SABIMA managed to create a successful strategy and attract public attention through national and local media, although they did not manage to fulfil Hannigan's third task of contesting their claims to affect the legal or political decision-making. After the police decided to close the case, it was reopened politically by the Bærum city manager. The city manager went through the legal foundation of the charges and concluded in a report that Statsbygg had acted in accordance with the agreed upon plans and had done nothing wrong (Rådmannen Bærum kommune 2008). The environmentalists, that is SABIMA, did not agree and one of the involved environmentalists stated in an article in the Friends of the Earth Norway's membership magazine that 'in a time where there is an international focus on the eradication of alien species […] thousands of non-indigenous plants have been spread all over Fornebu. Red listed species; native plants and insect species, are thereby threatened with extinction […]' (Bergan 2009).

Was the Spread of Alien Species at Fornebu an Environmental Crime?

Conceptions of what counts as environmental crimes depends not only on judicial or moral definitions of the criminal or legal, but also on the perceived harms and risks attached to the relevant action. I will use White's three notions of harm to evaluate the status of the Fornebu plantings. In terms of *legal conceptions of harm*, jurisdiction and policies to tackle alien invasions are currently implemented internationally as well as on the national and local scales (IUCN 2000, McNeely 2001, Gederaas et al. 2007). Both nationally and internationally, the legal framework related to alien species has been fragmented and mostly focused around economic production sectors such as, for example, agriculture, forestry, fisheries and wildlife management (Shine et al. 2005). As a result, international rules and regulations have been developed in separate, sector-wise areas (Shine et al. 2000: 14). The 1992 Convention on Biological Diversity (CBD) is, in fact, the only legally binding international instrument

addressing alien species' introductions and requiring the contracting parties to as far as possible 'prevent the introduction of, control or eradicate those alien species which threaten ecosystems, habitats or species' (Article 8 (h). For the CBD to become operational, however, the individual member countries to the Convention must implement Article 8 h and the associated guiding principles in their national legal frameworks and strategies.

In Norway alien species as a national problem was placed higher on the political agenda as a result of the entering into force of the CBD. As had been the case in other countries, harmful species within a Norwegian context had been treated fragmentarily, both scientifically and legally, according to economic sector or species group. It took over ten years for different ministries to agree on a National Strategy on Invasive Alien Species[10] which was launched in May 2007, the very same year as the Norwegian Black List and the 'peak' of the Fornebu conflict. The most recent legal tool, the Norwegian Nature Diversity Act, entered into force in 2009. It provides a coherent set of rules governing introductions of all types of alien species (Sørensen 2010). Imports and introduction of alien species require a special permit and the applicant carries the burden of proof that the species are not harmful or invasive (ibid.). A separate regulation to the act is being prepared on the introduction of alien species but has not yet entered into force.[11] To return to Fornebu, the plantings initiated in 2004 were in line with contemporary rules and regulations, but had the same process taken place in 2009 after the launching of the Nature Diversity Act, it would probably have been a different matter. Ecological restoration is currently a methodology which is receiving increased attention as an important measure preceding nature interventions (Hagen and Skrindo 2010). At the time of the Fornebu project, ecological restoration was not systematically integrated in planning and

[10] A number of ministries have cooperated in drawing up Norway's strategy: the Ministry of Fisheries and Coastal Affairs, the Ministry of Finance, the Ministry of Defence, the Ministry of Health and Care Services, the Ministry of Justice and the Police, the Ministry of Education and Research, the Ministry of Agriculture and Food, the Ministry of Petroleum and Energy, the Ministry of the Environment, the Ministry of Trade and Industry and the Ministry of Transport and Communications (Norwegian Ministry of the Environment 2007: 4).

[11] The Regulation is sent out on a public hearing and suggests that a list of prohibited species will be based on the 2007 Norwegian Black List (Direktoratet for naturforvaltning 2010). When the regulation on alien species of the act finally enters into force, new standards will be enforced for plantings and uses of alien material.

management statutory frameworks. Fornebu was never intended as an ecological restoration project, but had it been initiated today, it would probably have been framed as one.

Space makes a difference when it comes to legal practice (Blomley 2008) and the moral conflict fought at Fornebu illustrates that while it may be acceptable to plant alien species in private gardens, their presence becomes increasingly problematic the closer they move towards wild and native nature, such as the nature reserve at Fornebu. The fact that the charges against Statsbygg were dropped without any investigation illustrates the deficient experiences with such cases in the legal system. In addition, there was no coherent national legal framework at the time. The battle over plants at Fornebu thus became an example of what Larson (this volume) terms crime as a moral category rather than crime as a judicial category.

Returning to White's second notion of harm; *ecological wellbeing* is closely related to how the different groupings at Fornebu perceived the risk of the alien plants and the potential future damage related to them. As the environmentalists were people with a natural science background and the landscape architects had perspectives rooted in horticulture and gardening, their perceptions of the ecological harms and risks associated with the plantings were quite dissimilar. At Fornebu a rhetorical battle was fought out between scientific disciplines on how to define species and their potential ecological harm. A central aspect of designating harm and risk was associated with defining the species status as alien or native.

The Japanese Rose: an Invasive Alien or Harmless Native?

The use of native plants was a specified goal in the reconstruction process of Fornebu, (Bærum kommune Rådmannen 2001, Bærum kommunestyre 2002) and the central planning documents defined native vegetation as vegetation growing in the inner-Oslo fjord. This vague definition left the issue open for discussion and the landscape architects thought that native plants such as

for example the Japanese Rose was a good choice at Fornebu as it had been growing in the inner-Oslo Fjord for decades (Bjørbekk and Lindheim 2005). According to one of the Planners at Statsbygg, the landscape architects defined native species as 'Species which today grow at Fornebu and which includes both original, natural species diversity and cultural plants which have become naturalized or are part of the cultural landscape' (Lundetræ 2007). In line with this definition, the Japanese Rose could be considered a native. However, the criterion of *time* was not something the planners and landscape architects had considered when determining what was native early in the Fornebu project. A botanist stated that: 'the Landscape Architects do not care about biogeography. (…) All that has been here before 1750 or 1820 when they really started to introduce plants and animals through agriculture can be called native'. He did, however, admit that even among botanists 'there is no 100% definition' of the native status (Botanist). Another criterion for applying the term native was that of genetic origin. After the debates between Statsbygg and the environmentalists, a plant scientist approached Statsbygg claiming that 'A plant can be characterized as native to an area if it belongs to the wild-growing flora and genetically belongs to the area by originating or having developed there for a long period of time' (Lundetræ 2007).

We see that there were knowledge-debates about the criteria for applying the concept native and thus distinguishing harmless natives from harmful aliens. Skinner refers to such disagreements as rhetorical debates over the criteria for applying a concept (Skinner 2002: 163). This type of debate is typically a part of struggles to redescribe the conventions for how concepts can be used. These disagreements are also linked to Skinner's second level of disagreement concerning which situations the concept can be applied to (Skinner 2002: 165). In the debates between the landscape architects, the planners and the environmentalists there were quite different opinions concerning in which circumstances species should be termed alien or native. One of the environmentalists stated that even though Japanese Roses were found on nearby islands, defining them as native was out of the question: 'Would you say that the

Spanish slug is native because it can be found in nearby gardens? Species do not become native for having been planted in gardens a few decades' (Environmentalist). One of the landscape architects on the other hand was not convinced that the Japanese Rose deserved its status as a harmful and ecologically risky plant to use:

> The Japanese Rose was perfectly ok. We have experienced it along the coast as a natural element. It is fast-growing, thorny, and good for the bird life so we used it with the best intentions. (…) I am still not sure if the Japanese Rose really is that invasive. I think it is a more quiet plant. I know the Oslo-fjord pretty well and have not observed any spots where the Japanese Rose has been expansive (Landscape Architect).

Thus the environmentalist and the landscape architects disagreed over the definition of native species, as well as over which species fitted the criteria of being alien. Further, the criteria related to the Japanese Rose's invasiveness and thereby its ecological harm potential constituted a particularly heated topic. Not surprisingly, the environmentalists of SABIMA expressed stronger fears of future threats than the planners and landscape architects did. One of the involved planners explained that:

> One of our main arguments of defence has been that all these plants can be found in the nearby gardens. They are already here. Does it make a difference whether some are planted here in addition to all that material surrounding us? Most plants are spread from private gardens (Planner).

Contrary to this, the environmentalists emphasized in interviews that the fear of future environmental harm and the alien species invasiveness was one of the main arguments for acting like they did. While the perceived risk and harm led the environmentalists to take actions to save future nature in general and species at Fornebu in particular, none of my interviewees were able to document that spread of alien plants from the buffer zones actually had taken place 4–5 years after the plantings. As the Japanese Rose has a fringy reputation of being invasive and harmful (Weidema 2006), most of the roses were actually removed by Statsbygg. The environmentalists, however, were still not assured that the roses had been removed in a sufficient way, and were anxious that they would return (Leader of SABIMA). Another aspect

is the issue of geography and the fact that the rose may not be invasive in all types of locations, for example while the Japanese Rose may be invasive in coastal areas, it may not be in the inland (Faglig utviklingssenter for grøntanleggssektoren 2010).

While the actual ecological harms of the alien plantings at Fornebu remain an unclear issue, there may have been other concerns at stake in the Fornebu debate. White identifies the *justice conception* of harm as his third notion. For the environmentalists the justice conception can be related to their disappointment and crushed expectation concerning what the Fornebu was going to be like. In their opinion, Fornebu could have been a unique place where rare species and endangered habitats would thrive. Instead the area was developed into a manmade, artificial nature park, and Statsbygg was reported to the police as a last attempt by the environmentalists to try to realize their visions for Fornebu. The landscape architects and planners never intended to recreate the 'original' nature at Fornebu. Rather, their intention from the very beginning was to construct a clearly manmade landscape combined with some elements from the past (Østengen & Bergo 2001).

Labelling Alien Species as Environmental Outcasts

After having discussed White's three notions of harm in relation to the Fornebu case, the alien plantings at the time could not judicially be considered criminal. This does not mean, however, that the spread of invasive alien species elsewhere or even within today's legal framework may not be termed criminal and ecologically harmful. Interestingly, several other issues were at stake in the Fornebu conflict, particularly a rhetorical battle over concepts with material and moral implications. I will now address the second main question I set out to answer; what were the consequences of casting alien species as environmental outcasts in the Fornebu case?

As we have seen throughout this chapter, SABIMA won the 'media-war' and thereby the right to define the 'truth' about the Fornebu case. While Statsbygg was not legally convicted, a moral sentence was passed on them due to the negative media coverage. This sentence has been difficult to shake off, and the leader of SABIMA held that:

> This case has had its effects. Landscape Architects have started to call me because they are scared of getting reported to the police. Many have woken up due to this case and have started to think about what they are actually doing. And I don't think that would have happened without a reporting the case to the police. (Leader of SABIMA)

The very different knowledge and perceptions of landscape architects and environmentalists illustrate that the concepts 'alien' and 'native' have not sprung out of practical experiences with nature but have rather been constructed scientifically as political and rhetorical tools. They are, hence, complicated to utilize and grasp. Landscape architecture has long traditions of shaping landscapes for human uses with plants as their tools, while, for example, biologists, botanists and ecologists generally are concerned with the conservation of wild and 'untouched' nature. The planners, on their part, were in need of advice from scientific consultants within different fields in order to lay out their strategies. The tendency of using science as foundation for decision-making is common in all sectors of society and science is used to give political decisions legitimacy (Jasanoff 1995, Jørstad and Skogen 2010). The environmentalist lobby secured a strong focus on the protection of the rich birdlife in the planning process. Several studies were commissioned by Statsbygg to investigate how the birds best could be protected and the diversity of birds be maintained in the face of residential developments (Bærum kommune 1994, Reitan 1996, Statsbygg and Oslo kommune 1996). The wellbeing of the birds was also the main reason why the buffer zones needed to be fast-growing and dense, and there was no time to let nature do the job. The planners and landscape architects thus did their very best to protect the birdlife. A side-effect of the rapid establishment of vegetation consisting of alien plants was the potential harm and spread to the nature reserves.

Importantly, and rather surprisingly, botany was a field largely ignored by both the environmental lobbyists, the planners and the landscape architects although the botanical qualities of the area had been documented by skilled botanists (Bendiksen 1994, Often and Røseng 1998). As we know, the concept native had a much wider interpretation among landscape architects than biologists, ecologists and botanists. What the landscape architects called 'cultural plants' (Statbygg and Oslo kommune 2008) the environmentalists labelled 'alien'. The focus changed from birds during the early planning and construction processes towards botany after the finalization of the project at Fornebu. The botanical interest increased as alien and native species became hot topics on the public agenda in 2007 with the launching of the 2007 Black List. Fornebu thus became a useful national case to define the spread of alien, invasive species as environmental criminality.

The spread of alien, invasive plants as environmental criminality touches upon our perception of the dual role of humans as ill-makers as well as protectors of nature and species. As we have seen, the alien plantings were ill-makings in the eyes of the environmentalists. They wanted natural succession with just a little bit of human help, such as mowing to keep weeds down. An unanswered question is how much human interference would be acceptable and, of equal importance, which types of human action are acceptable in such processes. Bendiksen (1994) claims that most of the dry meadows the environmentalists cherished are in fact cultural landscapes which depend on mowing to not turn into forest. He further notes that these cultural landscapes are probably the most botanically valuable in the whole area and they are in need of human protection and management in order to be maintained (Bendiksen 1994: 22). Thus, while the environmentalists criticized human interventions at Fornebu, they wanted a type of nature and species which are totally dependent on human maintenance. One of the planners from Statsbygg argued that 'The pendulum has swung far out on the alien species side of the scale. Hopefully it will move more towards the centre again. We are hoping for a compromise' (Planner). This illustrates some of the insecurities of how such a case should be best handled

and dealt with today and in the future. The conceptual debates over aliens are still going strong between scientific sectors such as biology and horticulture, however both nationally and internationally biological knowledge seem to be the stronger part in paving the way for future management (see for example the Norwegian Nature Diversity Act 2009, CBD 2007). As underlined by White (this volume) a lot depends on who define harm when it comes to measures against environmental crimes and to alien species. The debates at Fornebu turn out to be precisely about different knowledge camps struggling for legitimate positions in decision-making and definitions of the 'right' types of nature and practices.

Conclusion

This chapter has discussed the environmental lawsuit at Fornebu as an example of how legal and moral standards are negotiated with the native-alien dichotomy as a measuring-stick for belonging. As demonstrated, linguistic disputes between rival theories and knowledge are also social disputes (Skinner 2002: 178) with real-world consequences. Interestingly, Fornebu raises questions of what type of environmental problem the introductions of invasive, alien plant species represents and how such actions should be categorized judicially and morally. While the alien plantings at Fornebu did not classify as an environmental crime according to White's three notions of harm at the time, the spread of invasive, alien species remains a judicial and environmental challenge. We may see law suits in the future dealing with the spread of alien animals or plants, but what complicates this matter are at least two aspects. The first is related to the dual roles of many alien species as being harmful threats towards native species and simultaneously ecological, economic or social resources. The second is related to the dual role of human beings as ill-makers and protectors. The ambiguity created by these aspects leave room for rhetorical battles over concepts, and consequently 'alien', 'native' and 'environmental crime' are used as conceptual tools and weapons in ideological debates over environmental

problems. Struggles to define and fix concepts in specific moral lights are constantly going on, and as Skinner argues our social world is held in place by the normative vocabularies we use.

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Paper 3

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Wanted and unwanted nature: Landscape development at Fornebu, Norway

Journal of Environmental Policy & Planning

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Abstract

Black listing and red listing of species are two of few available tools in dealing with alien species spread and biodiversity loss. This paper sets out to address the categorisations of plants as alien and often black listed, or alternatively, native and often red listed and argues that these categories are portrayed as 'scientifically neutral' within environmental management and conservation efforts while being founded on value-laden and constructed temporal thresholds. The paper explores how categorisations of plants are perceived and 'practiced' among actors in a landscape development process, based on a qualitative case-study of the redevelopment of the former main Norwegian airport, Fornebu in Oslo, into a green site for housing, business and recreation. Here, environmentalists clashed with the planners and landscape architects over the planting of alien species. The Fornebu conflict illustrates how black listing and red listing are founded on a sense of time which largely implies idealising and preserving certain 'natural' conditions, processes or landscapes in a 'frozen' state serving as a measuring-stick for the future. The paper demonstrates the need for making implicit values in environmental management and planning more explicit in order to meet environmental challenges related to alien, invasive species spread and biodiversity loss

Key words: Alien and native plants, black listing and red listing of species, landscape architecture and planning, environmental management.

Introduction

Black listing and red listing of species are two of few available tools to prioritise conservation measures against biodiversity loss (Possingham *et al*., 2002). Black lists work to identify alien and potentially ecologically harmful species (e.g. Gederaas *et al*., 2012; Gederaas *et al*., 2007), while red lists highlight the species considered to be threatened with the risk of extinction (IUCN, 2003). Portrayed as scientifically objective tools (Jørstad & Skogen, 2010), the implicit value-laden and temporally ambiguous aspects involved in species listing are surprisingly little discussed in environmental management, planning and conservation given the broad focus on alien, invasive species spread as a global problem[i] (see e.g. Hassan *et al*., 2005; IUCN, 2009). One explanation may be the tendency to base environmental policy measures upon seemingly disinterested and neutral scientific advice (e.g. Wynne, 1995; Rientjes, 2002) while the profoundly value-based nature of science is disregarded (see e.g. Charr, 2001; Bay-Larsen, 2012). Consequently, 'ambiguities inherent in biodiversity value assessments (such as complexity and uncertainty) and administrative judgements' are largely ignored (Bay-Larsen, 2012, p. 942) or glossed over (Wibeck, 2009). In fact, drawing and reproducing boundaries between 'value-neutral' science and instrumental policies are crucial in order to sustain both political and scientific credibility and legitimacy (Gieryn, 1983; Sundqvist, 2003; Koetz *et al*., 2011).

The current paper raises critical questions related to the categorisations of plants as alien and black listed, or alternatively native and red listed. Red lists and black lists can be described as 'boundary-objects' (Jørstad & Skogen, 2010) which means that these are flexible

enough to communicate knowledge between fields such as science and policy (Star, 1983). As demonstrated by e.g. Jørstad and Skogen (2010), the scientific knowledge that goes into species listings works as a tool for regulators and policy-makers to make informed decisions over which species to conserve and which to prevent and eradicate. Consequently, placing species on red or black lists will affect their wanted or unwanted status in the wider society. Moreover, as alienness and nativeness do not refer to specific qualities in species per se, distinguishing aliens from natives involves demarcating their *spatial* belonging to a particular area at a particular moment in *time* (Warren, 2007; Preston, 2009). While the spatial aspects of alienness and nativeness are well established through internationally recognised definitions of 'alien' and 'native' through the 1992 Convention on Biological Diversity (CBD) and International Union for Conservation of Nature (IUCN), these definitions are lacking explicit temporal designations of species origin which largely leaves it up to policy-makers and scientists to demarcate a temporal reference point or 'threshold of nativeness' (Head & Muir 2004, p. 202)[ii]. Examples of such thresholds are the Neolithic period (Preston, 2009), after closure of the English Channel 7000 years ago (Ellis, 1993), or after the Mesolithic period (Smout, 2011). In the Australian case, 1788 is the chosen threshold, marking the start of the European colonisation (Head, 2012). Of primary concern for this paper is the year 1800, which is used as a temporal reference point both in the 2010 Norwegian Red List (Kålås *et al*., 2010) and in the 2012 edition of the Norwegian Black List (Gederaas *et al*., 2012). Also in the 2012 Norwegian Black List the same temporal reference of the year 1800 is used to distinguish natives from aliens (Gederaas *et al*., 2012). No explanation is given for why the year 1800 is given as a point of reference, but a representative from The Norwegian Biodiversity Information Centre (NBIC), the institution responsible for developing species lists, explains that 'it could equally well have been a different year. One of the reasons why we chose the year 1800 was to avoid species ending up on both lists.' (NBIC representative,

personal communication 2012). Thus, the year 1800 is primarily chosen for regulatory purposes and for providing the authorities with a possibility to distinguish what is assumed to belong in Norwegian nature from that which is not. In this way, the year 1800 becomes a year zero (in line with Head 2012) – marking which species movements and human practices are deemed acceptable or not. Based on this or other temporal thresholds, the rhetoric of red lists and black lists draw boundaries between what can be seen as wanted and unwanted nature.

A Norwegian case study of the redevelopment of the closed-down airport landscape at Fornebu, Oslo, into a green site for recreation, housing and business, illustrates some critical issues related to categorisations of plants as alien and black listed, or alternatively native and red listed. The paper will explicitly analyse 1) How the environmental management sector's categorisation of plants were perceived and put into practice by the involved planners, landscape architects and environmentalists at Fornebu, and, 2) How ambiguous and constructed temporal thresholds implicit in species categorisations affected the redevelopment of Fornebu. The Fornebu case is a unique case in a Norwegian context as the former national airport is situated close to the capital of Oslo, and the publicly owned estate is an attractive location for up-market housing and business near the Oslo fjord. Simultaneously, the area is one of Norway's biodiversity hotspots, including many red listed species of birds, insects and plants. The time-span of concern will be from when Fornebu closed down as an airport in 1998 until the redevelopment was finalised in 2008.

Analytically, this paper pursues the application of concepts as *acts* rather than as steered by an abstracted system of signs constructed within the human mind (as argued by e.g. Saussure, 1983). This perspective draws on theoretical insights from the British political philosopher Quentin Skinner, who aims to situate concepts in intellectual contexts by recognising what relevant writers and speakers are doing in uttering them. Importantly, concepts are not static containers of meaning but tools used rhetorically in social disputes

(Skinner, 2002, p. 178). And crucially, as this paper illustrates, concepts are materially embedded, i.e. they do material work.

The paper contributes to the growing body of research on alien species as studies investigating the *rhetoric* of alienness and nativeness are largely lacking (although see Alderman, 2004; Chew, 2009; Eskridge & Alderman, 2010) and in particular in relation to how black lists and red lists may be used to idealise certain types of nature. Although this is a study of one specific case, the findings may be of relevance to similar cases as the tendency of hiding or ignoring values in the environmental management sector (see e.g. Bay-Larsen, 2012) may actually work counter to the aim of halting the spread of alien, invasive species.

Red lists and black lists as key conservation tools

The global responsibility of saving the diverse life on the planet has been manifested in various international conventions and treaties. Of particular relevance to this paper is the 1992 Convention on Biological Diversity (CBD) which is the only legally binding international convention requiring its Parties to take action against the spread of alien species through its article 8 h. Scientific risk assessments of alien species compiled in black lists and in alien species databases such as the Global Invasive Species Database, 100 of the Worst Alien Species and the European Network on Invasive Species (NOBANIS), along with red lists of endangered species, are some of the concrete tools to inform national governments in their priority measures against biodiversity loss (e.g. IUCN, 2003;Gederaas *et al*., 2007; Kålås *et al*., 2010; Gederaas *et al*., 2012).

The national focus on red listing and black listing species came relatively late to Norway, given that the CBD entered into force in 1992. In 2007 the Norwegian Black List was launched, to be extended and revised in 2012. Species which have been included in the

ecological risk assessments are divided into the following categories; no risk, low risk, potentially high risk, high risk and very high risk. Only species placed in the two latter categories end up on the 2012 Norwegian Black List (Gederaas *et al*., 2012) which constitutes 217 species. In terms of red listing of species, the first IUCN-based Norwegian Red List was launched in 2006, and later updated in 2010 (Kålås *et al*., 2010). The list is designed as a tool for coping with species extinction. Critics, however, argue that there are problematic aspects related to both red lists and black lists. Vié *et al*. (2008) points out that there is a general challenge related to a lack of knowledge about the true status of the earth's biodiversity. To account for the lacking knowledge, the 2010 Norwegian Red list has followed the IUCN recommendation of a precautionary attitude which implies listing a species as threatened when it is impossible to say with certainty that it is *not* threatened (Kålås *et al*., 2010, p. 30). Consequently, more species are listed as threatened than what is probably the case. The black listing of species raises related challenges. For example, the limited knowledge about the number of species in Norway over time makes it difficult to decide whether they are alien or alternatively native (Gederaas *et al*., 2012). Furthermore, whether species have been introduced by humans to Norway or have arrived on their own is also not always known (Gederaas *et al*., 2012). Despite such important weaknesses in the knowledge base, black lists and red lists are generally portrayed as scientific and value neutral documents and practical tools which currently legitimise important political decisions (Jørstad & Skogen, 2010).

Rhetorical uses of red lists and black lists

To analyse rhetorical uses of the concepts alien and black listed, and native and red listed the paper draws on theoretical insights from the British political philosopher Quentin Skinner's performative take on language. Inspired by Austin's speech act theory (1962) Skinner (2002)

understands utterances as acts, and thus spoken or written utterances are not merely *representing* real world phenomena, but are themselves the forms of action under study. When investigating how concepts are applied within specific contexts (e.g. by disagreeing or supporting ongoing debates) Skinner pays attention to the *intentions* of authors in uttering something, e.g. whether the utterance was meant as a criticism or as a strategic move to strengthen one's position[iii] (Tully & Skinner, 1988). The tracing of how concepts are used and with what intentions, illuminates their contextually contingent nature as well as how they rhetorically are put to work in discursive struggles. Sometimes such struggles lead to changed conventions for how concepts 'legitimately' are used, with their related material effects. To exemplify, a plant that by definition is alien and black listed becomes problematic to use in e.g. landscape development. Alternatively, if the same alien plant is listed as cultural heritage its' use will most likely be encouraged. As this paper will demonstrate, the application of concepts such as alien, native, black listed and red listed may alter the social status of plants, and moreover, set standards for acceptable and unacceptable human practices. Thus, 'the co-production of knowledge and social order (...) takes place at the same time' (Bay-Larsen, 2012, p. 944) as the social and ideological status of concepts influences what is commonly considered 'good' or 'bad' societal conduct (Skinner, 2002). Consequently, what is regarded as worthy or unworthy of preservation, i.e. seen as wanted and unwanted nature, changes over time and from one context to another.

Temporal thresholds in red listing and black listing of species

When studying how the uses of concepts change, time is a crucial component. Time is further, as already noted, an important, but often only implicit ingredient in species conservation. The above mentioned year 1800 as a temporal threshold between alienness and nativeness in

Norwegian species lists illustrates a 'before-and after' mentality in environmental management and conservation, which implies an intention to freeze and idealise certain valued conditions in nature. This sense of time is rooted in a wider trend within environmental policies in the 19th and 20th centuries to consider planet Earth as increasingly vulnerable and humans as largely responsible for protecting life on Earth in an intergenerational and evolutionary perspective (Macnaghten & Urry, 1998). Consequently, restoring or saving what has been degraded or destructed by human activity is emphasised together with a wish to compensate for these destructions by recreating past conditions when nature was largely untouched or at least undamaged (Setten, 2004). Within environmental management remnants from the past are often conserved in isolation from the processes that originally produced them. In this sense, remnants become static fragments taken to represent a coherent past. Howitt and Suchet-Pearson (2006, p.332) term this a 'linear narrative' or 'a unidirectional, progressive, controlled movement towards a coherent strategic target presumed desirable' – which largely guides nature conservation and environmental management, including the black listing and red listing of species. In line with such arguments, the past works as a measuring-stick for legitimating, or alternatively for de-legitimating, present choices (Setten, 2004). Consequently, certain past states of both cultural and natural landscapes are selected as being ideal and become objects of conservation measures.

This 'before and after mentality' steering nature conservation and environmental management has been criticised as 'unecological' attempts to arrest time since processes in nature are constantly and per definition changing (see e.g. Katz, 1998). Moreover, initiatives to preserve the past simultaneously involve changing it as some remnants will always be singled out as more central while others will be ignored (Setten, 2004). Along such lines of reasoning permanence in nature conservation may become an illusion, as '[t]he more we save,

the more aware we become that such remains are continually altered and reinterpreted' (Lowenthal, 1993, p. 410).

Study area, methods and data analysis

Introducing Fornebu

Most of the bedrock at Fornebu had been blasted away and flattended when the airport was constructed in 1939. Some wetland areas were, however, considered important biotopes for migrant birds in Norway. These were fenced in during the airport period and the birdlife thrived (Often & Røseng, 1998). The areas were further protected as nature reserves by Royal proclamation in 1992 (See Fig. 1).

On October 8th, 1998, Fornebu was closed down as the main airport of Norway. The responsible authority for restoring Fornebu, Norwegian Directorate of Public Construction and Property (Statsbygg) was acting on behalf of the Norwegian State and put prestige into developing a green 'Sustainable Fornebu'[iv] (Statsbygg, 2002, p. 3). A local group consisting of local environmentalists had been using Fornebu for bird watching during the airport era. The group lobbied at the initial stages of the planning process to make sure that the rich bird life and natural qualities of the area were maintained, and to prevent that the whole site was turned into upmarket housing and business establishments. As the planning authority, sitting at Bærum local authority district, included a large green area and two buffer zones that were to consist of native plants in the planning documents, the environmentalist lobby group felt they had succeeded with their aims (Environmentalist). In 2004 they realised that the areas that they had envisioned to consist of native species, dry meadows and calcareous pine forest

had become a park-like landscape with fast growing alien species (Bergan, 2009). In their opinion, the steering principles of planting native species had been compromised. They therefore liaised with the national environmental nongovernmental organisation SABIMA[v]. On the 16th of October 2007 the environmentalists reported the responsible planning agency, Statsbygg, to the police for having conducted an environmental crime by using alien invasive species at Fornebu rather than native vegetation as specified in § 3 of the Local Development Plan. Thus, the environmentalists and the planners/ landscape architects had agreed on what Fornebu was going to look like on paper, but strongly disagreed over the result.

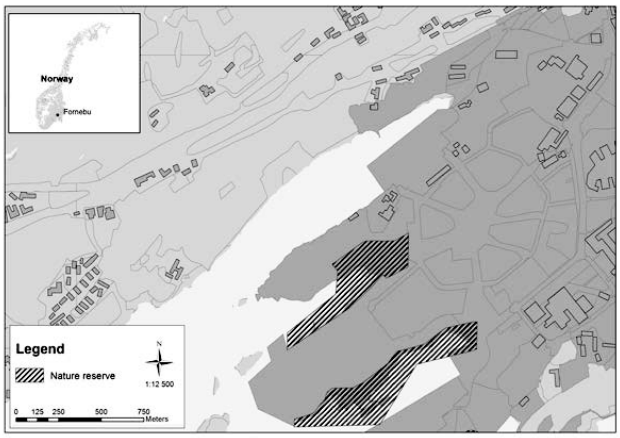

Fig 1, Map of Fornebu. The two nature reserves are visible on each side of the former landing strip.

Methods and data analysis

The qualitative data for this study was collected through semi-structured interviews conducted throughout 2009 and 2010. The interviewees were categorised into two groups that represent the conflicting parties at Fornebu. The first group, landscape architects and planners, comprises landscape architects (2), a planner at Statsbygg (1), planners at Bærum Local Authority District (4) and Oslo Local Authority District (1), the County Governor of Oslo and

Akershus (1), the Norwegian Directorate for Nature Management (2), and scientific consultants engaged by Statsbygg in matters such as soil science and ornithology during the planning process (3). The second group, the environmentalists, constitute representatives from a local environmental group at Fornebu (3) and SABIMA (1). The 4 interviewed environmentalists represent the key figures and initiators during the conflict at Fornebu. In total, 18 semi-structured interviews have been undertaken. While the landscape architects and planners constitute a heterogeneous group in terms of involvement in the reconstruction and administrative levels, the environmentalist comprises a more homogenous group working for a common cause. The 'planners group and landscape architects group' is a lot larger than the 'environmentalist group' as it was necessary to capture the different administrative levels and positions involved in the development of Fornebu at different stages of the project. In the project

The majority of the interviews were undertaken while walking on site at Fornebu, which allowed paying attention to elements of the physical landscape we were walking in. In addition, extensive analysis of documents have been undertaken (plans, background documents, reports, leaflets, personal letters, e-mail correspondence and media coverage published over a period of 14 years, between 1994 and 2008).

To analyse how the interviewees at Fornebu related to the concepts alien, native, black listed and red listed, the steps suggested by Skinner (2002) were followed. These involve identifying the meaning of an utterance, exploring why and how the utterance was made, what positions the utterances related to (e.g. to support or contradict a position), and an investigation of the relevant context. Consequently, the fully transcribed interviews were scrutinised for statements concerning the nativeness and alieness of plants, as well as descriptions of black listed and red listed species. The next step involved focusing on the interviewees' explanations of their own roles and actions during the conflict at Fonebu. These

statements were compared to observations during the on-site walks. Further, their utterances and actions were contextualised by comparing and contrasting between interviews and with relevant documents concerning Fornebu.

The Fornebu conflict: Wanted and unwanted nature at a former airport

At Fornebu, the planners, landscape architects and environmentalists related to the environmental authorities' categorisation of species as alien or native in very different ways. This section will explore why plants regarded as acceptable and useful by the planners and landscape architects were considered unwanted and harmful by the environmentalists.

The landscape architects and planners: Protecting the birds with hardy, robust plants

A decision was made that Fornebu would be developed as a recreational and residential site where green areas would connect the nature reserves and the shore line in order to secure biodiversity values and recreational opportunities (Bærum kommune Rådmannen, 2001). The planting of dense buffer zones was prioritised with tight deadlines for their finalisation, because as they would be impenetrable, they would protect the birds in the nature reserves from the people moving into the area (Bjørbekk & Lindheim, 2005). Thus, protecting the bird life became the main priority in terms of taking responsibility for biological diversity in the planning process (Landscape architect). Another important premise was that fragments of the pre-airport landscape were to be conserved in the development process (Statsbygg & Oslo kommune, 2000), because the new green areas were going to 'secure the continuity of the landscape history and relationship with the surrounding landscape' (Statsbygg & Oslo kommune, 2000, p. 19). Thus, elements of the past Fornebu landscape were important as

measuring-sticks when planning the development of the future site. A question of key concern was however which parts of the past were considered important and which were not.

An important past source of inspiration for the planners and landscape architects was in particular the pre-airport 'diverse and beautiful cultural landscape with a variation between vegetated hills and open cultivated land' (Statsbygg & Oslo kommune, 2008). Farming at Fornebu has long historical roots stretching back to the Iron Age (Bærum kommune, 1994). One of the landscape architects argued that 'as I have shown you on these old maps, the landscape out here was cultivated with deep nutrient rich mould where various species were grown'. Similarly, one of the planners held that; 'this has not really been a wild landscape. Cultivated areas have been here all the time'. They used the indications of previous agricultural activity to legitimise the decision of covering much of the area with thick layers of soil with wood chips on top to avoid weeds. This was considered a necessary measure to ensure the rapid establishment of the buffer zone (Statsbygg & Oslo kommune, 2008).

This decision collided, however, with another important premise specified in the planning documents, namely the requirement in the steering Landscape Plan (2001) of using native 'vegetation existing at nearby islands in the Oslo fjord' in the construction process (Bærum kommunestyre, 2002). The planners and landscape architects wanted to collect native seeds of e.g. Blackthorn, hazel and hawthorn for propagation. This, however, turned out to be complicated as they were being unsuccessful in getting hold of sufficient seeds and nuts due to poor natural production. Moreover, the engaged greeneries were inexperienced with how to propagate local seeds. Unpredictability of the progeny, and little time for trial and error made the planners and landscape architects drop their original plans (Statsbygg & Oslo kommune, 2008, p. 18). Further, the production of native bushes and trees was considered quite time consuming as several years of nursing was necessary before planting (Enzensberger, 2007). As a result several alien plants with similar qualities were selected, e.g. Blackthorn of Danish

origin. The landscape architects hence decided to use plants similar to what they *considered* native in addition to some plants that *were* native to the area. In accordance with the legal framework at the time this was an acceptable practice. On a general level, the focus on using native plants in landscape architecture which has been common in countries such as France, Germany, Britain and the USA (Gröning & Wolschke-Bulmahn, 2003) has largely been lacking in Norway. Rather, finding hardy plants which survive in the cold Nordic environment has traditionally been one of the major challenges (Jørgensen & Stabel, 2010, p. 9). Robustness has consequently been considered more important than geographical origin. The plants at Fornebu were thus chosen in accordance with their favoured attributes and abilities in meeting the agreed upon deadlines. They needed to be fast-growing, robust, hardy, disease-resistant, easily maintained, and serve as impenetrable buffer zones towards the bird reserves (Statsbygg & Oslo kommune, 2008).

The environmentalists: "This does not look like nature at all"

As noted, the environmentalists were strongly disappointed with how Fornebu turned out and ended up reporting the responsible planning agency Statsbygg to the police. The environmentalists were primarily concerned with preserving the rich species diversity of Fornebu with some 260 species of birds and around 700 species of plants registered in the nature reserves (Often & Røseng, 1998). Their disappointment was consequently huge when they discovered that the landscape turned out to be quite different than expected:

> I remember that autumn because there were so many birds and insects. I cannot recall other autumns with so many of them. (…) But along came the lifeless desert of woodchips we have here now. (Environmentalist)

> They have made impossible the reestablishment of dragonhead [*Dracocephalum ruyschiana*] in places looking like this; woodchips, pretty deep! You will never ever get bellflowers [*Campanula rotundifolia*], dragonheads, dropwort [*Filipendula vulgaris*] and the special species. They will never grow here. (Environmentalist)

Part of the reason for their disappointment was that they had seen the Fornebu development as a chance to reverse the negative trend of habitat destruction within the wider Oslo fjord region. Many similar habitats had been developed and destroyed, and the unique calcareous landscapes with drought tolerant, red listed species were disappearing. The leader of SABIMA held that; 'Fornebu represented such a good point of departure for reversing that trend; a giant area that was going to be made into nature. That was why our people worked so hard throughout the planning process.' Moreover, the environmentalists feared that the new landscape and associated vegetation posed a direct threat to endangered, red listed insects and plants in the nature reserves. One of the involved environmentalists expressed that;

> This does not look like nature at all. And this will definitely not help the situation of all the endangered species of the inner Oslo fjord. It is sad that they have spent so much money to make it look like this. To do it right would have cost next to nothing. They could have just let it grow. (Environmentalist)

This quote illustrates how different temporal considerations created tensions between the environmentalists who wanted to let nature do the job and the landscape architects and planners who were restricted by project deadlines. The different temporal perspectives further influenced how the two groups related to plants; the landscape architects and planners emphasised plant attributes such as robustness and rapid growth which could help them meet the project deadlines while the environmentalists considered Fornebu as a missed opportunity of a long term restoration of something about to get lost, i.e. endangered habitats of calcareous species.

Categorising nature: 'nature-like', 'native' or 'alien'?

As a consequence of the above, the two conflicting groups at Fornebu had radically different opinions concerning which human interventions were acceptable. In fact, the landscape architects and planners did not really consider the construction site as 'nature' at all. Rather, Fornebu was intended as a 'nature-like' park serving as a recreational area and working as a buffer zone to the 'real' nature; namely the two nature reserves with the associated bird life (Statsbygg & Oslo kommune, 2000; Bjørbekk & Lindheim, 2005). As explained by one of the planners who was trained as a landscape architect;

> Fornebu was meant to be a 'nature-like' landscape. Landscape architects frequently use the concept 'nature-like' and this illustrates that we are constantly navigating between nature and culture. As landscape architects we think that it is right to shape nature and influence it through management in certain areas, especially in areas that are developed near human settlements. In such cases we find that plants with certain qualities can be used even though they do not necessarily belong naturally. (Planner)

Consequently, the planners and landscape architects decided on a strategy where they combined the preservation of elements of the past Fornebu, such as remaining vegetation and parts of the former landing strip, while simultaneously creating a new (and man-made) landscape which met the requirements in the steering plans;

> We had three options; one was a nostalgic approach of trying to recreate the way it used to be; the second was to keep the flat airport structure without vegetation; and the third option was to create a new, exciting and vigorous landscape that was clearly man-made. And we chose the latter option. (Landscape architect)

In contrast, the environmentalists would have preferred an alternative strategy with as little human influence as possible;

> The buffer zone was clearly important, but there would have been enough time to let the vegetation establish on its own (…). If they had let nature do the job and helped a little bit by planting some native species and adding just a little bit of soil, we could have gotten species like those thriving on neighbouring islands. (Environmentalist)

Another environmentalist expressed a similar concern, yet in an alternative way:

> I remember running in between tall, yellow flowers playing hide and seek when growing up here. That was very exciting. I was an adult before I understood that these were Canadian Golden rod [*Solidago canadensis*], an alien, invasive plant which was not supposed to be here. Some of the plants which are registered here are feral garden plants which are now growing wild because birds have spread them from traditional gardening. But those restoring the landscape should have been able to look a bit further back in time. (…) To be honest, I am not particularly concerned with alien species spread, but react against the principle of planting garden plants when you are supposed to restore nature. (…). (Environmentalist)

What should count as 'nature' was however far from straight forward. Taking a closer look at the argumentation of the environmentalists reveals that the dry meadows and several of the plants that they cherished as natural – and by implication native - are in fact associated with the former cultural landscape at Fornebu. Thus, what they termed 'natural' actually meant 'cultural vegetation' dependent on human maintenance. Several of the botanists who had mapped the botanical qualities emphasised the old cultural landscape as the most species rich and valuable areas for biodiversity conservation (Bendiksen, 1994; Often & Rørseng, 1998). This type of vegetation is in need of continued mowing to be kept open and for the Red listed species to thrive. This illustrates some of the complexities implicit in species categorisations

and triggers the question of how ambiguous and value-laden temporal thresholds affected the landscape development at Fornebu.

'Freezing the situation': rhetorical uses of red lists and black lists at Fornebu

According to e.g. Howitt and Suchet-Pearson (2006), a linear understanding of time where the past serves as a measuring-stick for the future, largely steers environmental decision-making and consequently which species and nature conditions should count as 'natural' and worthy of preservation. A consequence of this, what we might call 'nostalgia', is a bias towards freezing certain conditions with a related preference for certain species. This sense of time permeated the arguments presented by the environmentalists at Fornebu. In a letter to the responsible environmental authorities and planners, SABIMA argued for the necessity of 'freezing the situation, while there is something still left to conserve' (SABIMA, 2007a). Just before the development of Fornebu started in 1999, one of the environmentalists wrote a letter to Bærum Local Authority District where they explained their ideas about the ideal nature at Fornebu that preferably should be 'frozen' in time;

> We find the ideas of changing the terrain quite good. We wish that the hill tops are left as bare rock (…) to facilitate dry-meadow vegetation. (…) When considering the wellbeing of birdlife, the flora and the old fjord landscape we envision a calcareous pine forest and an open bushy landscape of briars, blackthorn [*Prunus spinosa*], barberry [*Berberis vulgaris*], common buckthorn [*Rhamnus carthartica*], linden and oak (Bergan, 1999, no pagination).

One of the consequences of the clashing visions of the future Fornebu, and of the environmentalists' disappointments with the final result being nowhere near what they had imagined, was their uses of the newly launched 2007 Norwegian Black List and the 2006 Red

List to rhetorically strengthen their arguments of ideal nature at Fornebu. In an article in the Friend's of the Earth Norway's membership magazine one of the environmentalists argued that there were more than 100 red listed species at Fornebu and that the recent plantings had resulted in 'many beautiful roses, but no colourful flower meadows with red listed insect species and a rich bird life' (Bergan, 2009, p. 8). In another environmentalist magazine, an insect specialist complained that the developments threatened the red listed species at Fornebu (Christensen, 2006). The concepts red listed and black listed were used on several occasions in both media reports (e.g. NRK Lørdagsrevyen, 2007) and in open letters to environmental authorities and the involved planners; e.g. 'red listed plants and insect species are threatened with extinction through this project, not only locally but on a national scale' (SABIMA, 2007 b). Further, in the local newspaper for the Fornebu area, it was argued that the native vegetation was threatened by 'thousands of species which are unwanted in Norwegian nature and included in the national Black List' (Myhr, 2007, n.p.). A plant of particular concern was the red listed dragonhead categorised as vulnerable in both the 2006 and 2010 Norwegian Red Lists. The environmentalists argued that due to the planting of black listed pest species like the Japanese rose (*Rosa rugosa*), such red listed species were 'increasingly threatened for each day that passes' (SABIMA, 2007 c). In addition to creating a dramatic picture of nature in peril at Fornebu, the environmentalists framed the plantings undertaken by the landscape architects and planners prior to the 2007 Norwegian Black List in a dubious light, which illustrates how species lists may work.

Species lists with retrospective effects

Several of the plants that the environmentalists wanted removed from Fornebu were plants that in the 1990s were listed as important elements of cultural landscapes of national value,

such as blackberry (*Rubus fruticosus*), Japanese roses, willow, alpine currant (*Ribes alpinum*) and dog rose (*Rosa spp*) (see e.g. Norderhaug *et al*., 1999). As emphasised by Skinner (2002), the status of concepts influences what is commonly considered 'good' or 'bad' societal conduct. Consequently, many species which have previously been considered part of valuable cultural landscapes and consequently cultural heritage may become black listed as alien and invasive[vi]. When species are included in black lists or red lists their present and past status are modified in accordance with their currently ascribed status as wanted or unwanted. The implicit linear understanding of time in such lists further sets past actions in a dubious light, such as the planting of species that later become labelled as alien. At Fornebu, the planners and landscape architects were unprepared for the environmentalists' arguments concerning red listed and black listed plants, as this initially had been a topic of little significance to the project in general. The apparent neglect of red listed and black listed plants can perhaps be explained by the fact that the planning of the post-airport Fornebu landscape was initiated at the end of the 1990s, i.e. several years before the black listing and red listing of species became a hot topic on the Norwegian environmental policy agenda. In 2008, one year after the environmentalists' police report, the launching of the 2007 Norwegian Black List and the negative media coverage of the plantings at Fornebu, Statsbygg and the landscape architects published a Green Structure Plan with the intent to legitimise and explain their previous plantings at Fornebu. This illustrates how the Black list had retrospective effects; while the plants at Fornebu were considered relatively unproblematic in 2004, their alien, black listed status gained by 2008 made the plants controversial. When studying conceptual use, an interesting point is to pay attention to how intentions of authors not only materialise in the practical world, but also in texts (Skinner, 2002). The Green Structure Plan was clearly intended as an attempt to disprove the environmentalists' accusations of Statsbygg as an environmental criminal. Legally speaking, this was not strictly necessary as the case was

closed by the police in 2007 due to a lack of capacity to investigate it. Statsbygg nonetheless felt a need to legitimise their past decisions and actions at Fornebu. This is clearly visible when comparing the intensions of the Green Structure Plan produced in 2008 with the vegetation plans produced in 2004, when the alien plants were considered to be acceptable. In the period between 2004 and 2008 the wider context influencing the valuation of nativeness and alienness had changed significantly due to political documents such as the 2006 Norwegian Red List and the 2007 Norwegian Black List.

Future challenges at Fornebu

The alien status of several of the plants at Fornebu has both resulted in removal of several species such as blackberry and Japanese roses, and a future management plan for the finalised site which is intended as a 'living' document to be updated in accordance with revisions of the Norwegian Black List. Consequently, species black listed in the future will have to be removed from the area (Statsbygg, 2007). As a result, the management of Fornebu may turn out to be a costly and time consuming procedure for many years to come.

Currently, horticultural plants are considered the greatest single source of alien species introductions to Norway (Gederaas *et al*., 2012). This places considerable responsibility on the greenery sector (including landscape architects and landscape gardeners) which in 2012 developed a Trade standard for invasive alien plants where they give advices about safe uses and treatment of plants, as well as which plants to best avoid[vii]. Surprisingly then, the Fornebu project is today promoted among landscape architects as an 'innovative project' which 'meets future environmental challenges' (Norsk Form, 2010). In a recent book on contemporary landscape architecture in Norway (Jørgensen & Stabel, 2010) some of 'the best projects designed and built by Norwegian landscape architects over the 20 year period from 1989-

2009' (ibid., back cover) are presented, and Fornebu is among these. Maybe not so surprisingly, then, the issue of alien plants is omitted in this book.

In sum, the Fornebu case illustrates that it is challenging, even impossible, for landscape planners to know which plants will be 'safe' to use in projects as the labelling of 'aliens' is likely to cover increasing numbers of species in the future.. Still, landscape architects and planners carry a responsibility for shaping environmentally sustainable landscapes that will enhance future biological diversity. This requires awareness of the need to clarify value judgements concerning wanted and unwanted nature across scientific disciplines like ecology and landscape architecture

Towards a conclusion

This paper has explored how the environmental management sector's categorisation of plants as alien and black listed or native and red listed were perceived and put into practice by the involved planners, landscape architects and environmentalists at Fornebu. Moreover , the paper shows how the ambiguous and value-laden temporal thresholds implicit in these categorisations affected the redevelopment of the Fornebu site. The conflict at Fornebu has provided insights into how labels such as alienness, nativeness, black listed and red listed contribute to ascribe both species and related practices a particular status as wanted or unwanted. Consequently species categories and species lists are far from value-neutral regulatory tools. As demonstrated, the environmentalists at Fornebu were largely representing the perspectives of the environmental management sector as they valued certain static nature conditions and past human practices, and used the categories alien, native, black listed and red listed as measuring sticks for wanted and unwanted nature. In contrast, the planners and landscape architects focused on alternative qualities in species like robustness

and hardiness. The different opinions of what counts as wanted and unwanted nature across scientific disciplines such as ecology and landscape architecture is a serious challenge if environmental authorities wish to succeed in halting the spread of alien, invasive species. In the face of climate change, fragmentation of habitats and biodiversity loss, the restoration of landscapes like Fornebu are increasingly important. To meet future environmental challenges skilled ecologists, landscape architects and planners need to find arenas for collaboration, communication and sharing of expertise. This involves being explicit about values and about constructed temporal thresholds for valuation. Importantly, landscape architects, planners, environmentalists and environmental managers all make value judgements about nature. Such value-based judgements become troubling when they cease being portrayed as such, and instead go unquestioned as matter of facts.

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Notes

[i] See e.g. the Convention on Biological Diversity website:
http://www.cbd.int/invasive/WhatareIAS.shtml and
http://www.cbd.int/invasive/problem.shtml

[ii] *Alien species* are defined as those species managing to survive and reproduce outside their natural distribution and importantly, have reached these locations by the help of humans.

(Retrieved March 3, 2011, from the Convention on Biological Diversity website: http://www.cbd.int/invasive/WhatareIAS.shtml).

Native species are defined by the International Union for Conservation of Nature (IUCN) as species '(…) occurring within its natural range (past or present)' (The IUCN Council, 2000)

[iii] Intentions should, however, not be mixed up with personal motivations and inner thoughts of authors, but rather as possible to trace as features of a text or utterance.

[iv] The Norwegian State is a landowner at Fornebu, previously together with Oslo Municipality

[v] SABIMA (Samarbeidsrådet for biologisk mangfold) is a national non-governmental umbrella organization working to preserve biological diversity in Norway, www.sabima.no

[vi] In Norway there is no clear temporal demarcation of what constitutes a valuable cultural landscape other than a reference to 1950 when agricultural production in Norway significantly changed character or simply to a landscape with sufficient 'time depth', meaning that there are visible traces of historical use (Norwegian Directorate for Nature Conservation *et al*. 2009). Thus, a problematic aspect for both culture and nature conservation measures is the ambiguous foundation for deciding what counts as worthy of preservation.

[vii] Available at http://fagus.no/publikasjoner/2012/bransjestandard-om-invaderende-fremmede-planter

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