



Chapitre de livre

2014

Accepted version

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How to cite

FALL, Juliet Jane. Biosecurity and ecology: beyond the nativist debate. In: Biosecurity : the socio-politics of invasive species and infectious diseases. Kezia Barker, Andrew Dobson, Sarah Taylor (Ed.). Abingdon : Earthscan/Routledge, 2014. p. 167–181.

This publication URL: <https://archive-ouverte.unige.ch/unige:46141>

Fall, J.J. 2013 *Biosecurity and ecology : beyond the nativist debate*. In : Kezia Barker, Andrew Dobson, Sarah Taylor, Eds. **Biosecurity : the socio-politics of invasive species and infectious diseases**. Earthscan (Publication pending).

Biosecurity and ecology: beyond the nativist debate.

Life's tendency to wander

Spotted Knapweed (*Centaurea maculosa*) is a little plant with pretty purple flowers, native to Eastern Europe, yet hugely successful beyond this original range, particularly in North America. Spotted Knapweed was accidentally introduced into North America in the 1890s, probably in alfalfa seed transported from Eastern Europe. It was first identified in Victoria, on the West coast of Canada, in 1893. It is assumed that soil carried on ships as ballast and unloaded in the port transported knapweed seed to this site (Mauer et al 2001). Like all plants, it has a particular biography. Its very name reflects a classification: the term 'weed' typically denoting the unloved plants, growing in the wrong place, a purely cultural term devoid of botanical meaning. Botanists recently attempted to model the spread and potential future expansion of Spotted Knapweed (Broennimann & Guisan 2008: 585).. They explored what evolutionary and ecological factors influence the invasion process, testing whether plants evolve traits likely to increase their success in the new range (testing whether invaders are "made") or whether functional determinants of communities or landscapes control invasiveness (invaders are "born") because, surprisingly, the ecological conditions in both of these differed. Somehow, once they had moved halfway across the globe, they appeared to prefer new ecological conditions. Simply assuming, as had been done up to then, that they would conserve ecological conditions similar to their native range was not enough (Broennimann & Guisan 2008: 585).

Any traveller could have told you that travel broadens the mind, but this common-sense explanation might understandably not satisfy botanists... Instead, they suggested that one explanation is that certain plants, including Spotted Knapweeds, occasionally display different ploidal levels, that is to say that certain individuals have multiple copies of all their genes. Unless a taxonomist did extensive genetic analysis, two plants of differing ploidal levels would look exactly the same, and they would classify them as belonging to the same species. But this ploidal diversity is one possible explanation for the differing preferences between these globalised, mobile Spotted Knapweeds and their original sedentary cousins, challenging what we understand to be a single, particular species. These plants have used the globalised infrastructures that we have spread across the world, hopping on and off container ships from Europe to North America and back again, catching rides on lorries and spreading along roads, into marginal urban spaces. They have shown themselves to be out-of-bounds, out-of-place and out-of-control. Farmers curse them halfway across the globe. Throughout these debates, the question of where such plants came from originally (native range), before they started travelling, is a recurrent concern. To where do they *really* belong, what right do they have to settle in new places and are the new 'invaders' returning to Europe really fundamentally the same as the 'natives' they left behind? And perhaps more importantly, to what extent are these ecological or political questions, and why might it matter?

In this chapter, and moving on from the example of the globally mobile and invasive Knapweed, I explore how the idea of nativism structures both conservation policy and the publics' sanctioned relationships with nature. This is a highly contested terrain, receiving critique and debate from a wide variety of natural scientists, social scientists, activists and

stakeholders. It continues to be a difficult dialogue, with tempers flaring on all sides. Debates about the definition of what is “natural”, and about the separation of humans and nature, take a specific and meaningful form in the biosecurity context. This chapter therefore considers the language and definitions used to structure nativist concerns, the suitability of classification criteria, the underpinning science, and the pragmatic justifications for nativist policies. Crucially, it discusses the discursive and political implications of the ‘nativist paradigm’, the ideological assumptions and cultural motivations for nativist policies, including the degree to which the ‘native good, aliens bad’ discourse might be a barrier to all citizens’ participation in environmental conservation, including ethnic minorities. Concrete examples draw from other research carried out in Switzerland where the issue of invasive species was specifically raised on the political agenda following the arrival of Ragweed (*Ambrosia artemisiifolia*), a North American plant with human health impacts. (2) It ends with a discussion of what happens when policies are put into practice, indicating that on the ground categories are much less fixed than current academic debates might suggest.

Putting nature into boxes

It is sometimes difficult to remember that our current Western way of thinking about nature as “biodiversity” is recent. It replaced previous valuations of nature as an example of the sublime creativity of a divine Creator for example, and is a markedly different idea of nature as that prevalent in many other non-Western cultural traditions (Descola 2005). The idea of biodiversity institutes a valuation of the degree of variation of life forms within a given species, an ecosystem or a biome. Crucially, it also involves awareness and lamenting of the decline of such diversity (Takacs 1996). But it is not just a straightforward question of quantity, for if it were simply about numbers then adding one more species to what is living in a given place would surely be celebrated? Yet this is crucially not the case for exotic invasive species.

Not so long ago however, adding chosen species to particular landscapes was specifically encouraged and institutionalized within acclimatization societies, particularly as part of state-sanctioned colonial projects. The first of these learned societies were founded in France and Britain in middle of the 19th Century, when moving species around the globe had fundamentally positive connotations. Both improving the supposedly defective colonial landscapes and rendering the metropolis exotic and cosmopolitan were noble aims embraced by many scientists (Crosby 1986; Osborne 2000; Smout 2003). Lamarckian transformism, or a malleability of form and function, underpinned the acclimatization theories of colonial times, something that the Spotted Knapweed, mentioned at the beginning of this chapter, could have been thought to be displaying if we hadn’t come up with other theories. (3) However, as Hall (2003: 8) writes “by 1900, exotic organisms were falling into disfavour, especially as ecological awareness began to expose mechanisms by which desirable native species succumbed to exotic competition. The cycles of fashion might also help to explain why exotic gloom began to eclipse exotic glory”. Yet as many gardeners can tell you, planting species from elsewhere continues to have great appeal, nurtured in back gardens specifically because they appear to bring a whiff of glamorous exoticism to the everyday. This love of exotic plants is not trivial: almost two thirds (62.8%) of the established plant species in Europe now listed as invasive were introduced intentionally for ornamental, horticultural, or agricultural purposes (Keller et al. 2011; see also McNeill 2003), often gaining strength by passing through the space of the garden where human selection and domestication, and a preference for exotic, colourful, vigorous, undemanding plants has led to the creation of super-plants that have become feral (Jeanmonod & Lambelet 2005 : 14; Mack 2001).

The idea of biodiversity nevertheless inexorably changed our relationship to these localised elsewhere, overturning not only how we think about place, nature and the environment,

but also specifically how we identify who is responsible for defining and solving specific problems. The crucial role of conservation biologists in coining the term biodiversity as a concept uniquely suited to advocating action in the face of catastrophic decline is well known and documented (Takacs 1996; Mauz & Granjou 2010). Biodiversity centres on an accounting paradigm that involves thinking of nature as individualised species and specific assemblages, paradoxically reflecting both a carefully-evolved order and a capacity for change. Yet despite this apparent focus on change, it is the question of the order and permanence of nature that appears to be particularly prevalent in the popular imagination, and that receives much attention as it is translated into governance policies. Representations of nature as the Garden of Eden, with Nature viewed as a single entity reflecting a divine and perfect order (Macnaghten and Urry 2000), may well be far from contemporary non-equilibrium biological models, but they still continue to influence many policy debates and mobilise for action.

Today, however, the ideal of improving nature and making it more harmonious, once the preserve of acclimatization societies, involves not the addition but the subtraction of selected species deemed unworthy. These invasive species seem to be rhetorically doubly perverse: not only are they spreading in new and unexpected ranges, they are also – like the Spotted Knapweed – crossing into spaces considered removed from nature: derelict train stations, industrial zones and other abandoned margins of human activities. Indeed, authors have argued that understanding what has been called the human preparation of landscape is a key factor in making sense of invasions (Robbins 2004), as this happens where and where the invasiveness of certain species uniquely combines with the invadability of certain landscapes.

Classification: an agonized debate

There has been fierce debate in both social science and natural science journals about the specific terms of the debate around invasive species (Head & Atchison 2008; Warren 2007 & 2008; Richardson et al. 2008; see Fall 2011 and Fall & Matthey 2011 for more details of these debates). This has been an agonised conversation, with tempers flaring and accusations of racism or xenophobia making interdisciplinary debate difficult (see Gröning & Wolschke-Bulmahn 2003 about suggested links between native plant enthusiasts and Nazi history; and the strong response by Uekötter 2007). These critiques of the terms and categories used have largely taken two paths, to some extent following disciplinary traditions: natural scientists worry that emotive categories (alien, invasive, native and so on) are scientifically inaccurate, counterproductive, and require refinement and streamlining in order to be more useful; while social scientists critique the fundamentally political nature and assumptions of such categories.

Many natural scientists accept that the rapid ascension in the public domain of the field of invasion biology owes a lot to the extensive use of adjectives such as “‘invasive’, ‘alien’, ‘noxious’ and ‘exotic’” (Colautti & MacIsaac 2004 : 135) that have immediate appeal. Broadly, and although not all authors agree, invasiveness generally refers to the behaviour of an organism, while alienness (and, conversely, nativeness) to its belonging in a certain place (Head & Muir 2004). In critiques of such terms made by natural scientists, it is mainly confusion over terminology that is seen to have impeded progress in scientific theory (Colautti & MacIsaac 2004: 135), since “science progresses best when hypothesis, theories, and concepts are concisely stated and universally understood” (Colautti & MacIsaac 2004 : 139). That terms such as ‘native’ and ‘exotic’ are deeply historic, and highly charged is well known (Hall 2003; Olwig 2003; Staszak 2008) and increasingly acknowledged by invasion biologists. Colautti and MacIsaac (2004) suggest that words like invasion and alien are in fact scientifically counterproductive, since subconscious associations with preconceived terms, particularly emotive ones, can lead to divergent interpretations and a confusion of concepts,

clouding conceptualization of the processes they are meant to describe. This leads to “widely divergent perceptions of the criteria for ‘invasive’ species” (Colautti & MacIsaac 2004 : 135), “lumping together of different phenomena, and the splitting of similar ones, which in turn makes generalization difficult or impossible” (Colautti & MacIsaac 2004 : 136). This, they argue, has led to deep divisions between invasion ecologists (Davis & Thompson 2001; Davis et al 2001). Suggestions have therefore been made to define terms unambiguously, based for instance on impact (Davis & Thompson 2001) or on successions of ecological stages, in other words following ecological processes dependent on spatial scale (Colautti & MacIsaac 2004). The latter posits that invasion is not the same as colonisation, as other authors have argued. Instead, in this position, invasive species are somehow uniquely Other: « we argue that the process of becoming nonindigenous is inherently different from the local spread characterized by native colonizers » (Colautti & MacIsaac 2004 : 137). Others, more simply, have noted that no species is inherently alien, but only with respect to a particular environment at a particular moment, and that such categories are of course not discrete, tightly defined and unambiguous terms, but cluster concepts with overlapping boundaries (Warren 2007; Willis & Birks 2006). As the example of Spotted Knapweed showed at the outset, not only is defining a native range not entirely straightforward, but neither is assuming that subsequently spreading plants will only adapt to conditions similar to it.

In response to what is viewed as problematic confusion over classification, others have argued that the problem isn’t only scientific accuracy, calling instead for encouraging “critical reflection on whether metaphors currently used to characterize these species may actually undermine conservation objectives” (Larson 2005 : 495), since “invasion biologists and conservation managers presumably (and perhaps unconsciously) rely on the rhetorical power of this language to generate action against these species, which are invisible to most people. Perhaps this approach has been successful, given the tremendous amount of attention this issue has received recently; nonetheless, these metaphors also pose a number of risks” (Larson 2005 : 495). Noting that these metaphors that invoke militaristic ways of thinking are not only inconsistent with sustainable relations between humans and the natural world, but also that framing the problem as a war requires recognizing two opposing sides, which is paradoxical when their spread is inextricably entangled with human consumptive activities and global movement patterns (Larson 2005 : 496). In response to such concerns, less emotive terms have been suggested, and the terms neophyte (“new plant”) and neozoaire (“new animal”) have been suggested in French-speaking Switzerland, for example, but don’t have the public visibility of previous terms (Klaus 2002). Other authors have recommended a return to past cultural categories cast aside by the success of new terms focussing on place of origin: pest / non-pest and vermin, although the latter is equally historically loaded as it enjoyed great success in the Nazi era (Smout 2003).

In practice, classifying plants as invasive on a national list is inevitably fraught, and more political than might be expected. In Switzerland, when this was carried out, the existing widely recognised definition suggested by The World Conservation Union (IUCN) only referred to threats to biodiversity. Yet, faced with a growing Ragweed invasion, the Swiss authorities were eager for economic and public health criteria to also be taken into account, something that an updated IUCN definition subsequently integrated. One of our interview partners recounts what happened:

“So, for certain species it was quite clear, for others it was a bit harder and especially when it came to the Watch List it was much harder to decide what we put on it and what we don’t want. Where we draw the line. And also, at the beginning, we were a bit ambitious; we tried to have a Black List, a Grey List and a Watch List. This Grey List disappeared over time and then the species on that list were split between the two others” (T2).

These negotiations were necessarily very place-specific as different species created different problems in different places, and questions and criteria emerged collectively during discussions within the group of botanists. This political exercise of categorization, in which experts collectively define criteria, framing the problem as they go and building on inevitably partial knowledge, goes some way to show that beyond the agonized debates about terms and categories, the actual practices of making invasive species into a coherent category depends on place-specific negotiated practices, rather than objective, aspatial rationality, as I discuss later on in the chapter.

Nativism: spatialising and ethnicizing the right to belong

Regardless of what terms are used, a clear nativist tendency runs through debates on invasive species: the idea of a discrepancy between the interests and rights of certain established inhabitants of an area or state as compared to claims of newcomers or immigrants. This might not be a problem in the natural sciences if, as is sometimes claimed, political and ecological domains were fundamentally different, with environmental concerns determined by value-free and science-led paradigms. Yet in the case of invasion ecology this assumption is revealed for the fallacy (or myth) that it is. Ecological policies are far from being a politics-free zone, since these reflect in multiple complex ways the underpinning social values of the societies that give rise to them (Robbins 2004; Barker 2010). Authors have argued that the continuing ambivalence toward the nature-society dichotomy and the “longing for lost community purity (...) guides nativism aimed at both humans and non-humans alike” (O’Brien 2006 : 65). It is particularly ironic that much of the writing about invasive species is taking place in former colonies in which issues of “indigenouness and belonging are discussed in contexts where settler human populations are still coming to terms with their own belonging” (Muir & Head 2003 : 203), by authors focussing largely on former European colonies (Barker 2010; Crosby 1986; Clark 2002; O’Brien 2006; Robbins 2001; 2005). I would tentatively go further and suggest that because many of these countries – Australia, Canada, the United States, New Zealand and South Africa in particular – are English-speaking and the studies produced by local researchers are widely read, these forms of postcolonial guilt and anxiety about identity end up orienting ecological debates in ways that still need fully examining in contexts with very different ecological and social histories.

The link between states, nativism and nature is further paradoxically strengthened by our current way of thinking about nature as biodiversity. The ratification of the Convention on Biological Diversity instituted states as the official guardians of biodiversity, rather than making it a common heritage of humankind. Although this came about because of a concern related to intellectual property rights, and was not in any way a reflection of any specific or underlying nationalism, this *de facto* nationalisation of biodiversity has a perverse consequence in the case of invasive species. Since state parties (i.e. each signatory country to the Convention) have to produce national lists of invasive species, this further entrenches decades-old ideas of direct link between the shape of the nation, nature and identity (Olwig 2003 : 72).

Thus what are presented as value-free tales, instead tell of swarming, invading, foreign, and out-of-control natures play on and to other fears, opportunistically rewriting the nation-state as the most pertinent scale of identity politics. In concrete terms, national Black Lists and Watch lists, select and make visible what are seen as the worst offenders. The question of scale, and the identification of pertinent scales at which to define these ecological threats and possible edit governance policies to regulate movement become a key focus since the simple addition of local or national scenarios into “Global Black Lists” of invasive species, as listed for instance by the Global Invasive Species Database (GISD 2005) is paradoxical since every species listed originally comes from somewhere (see Fall *in press*). Yet this apparent

inevitability of the nation as the scale of planning cannot make ecological sense: and the nation, as a socio-political construct, operates on a number of scales, leading some authors to suggest that “in the European context, nation may be too small; in the Australian context, it may be too large” (Head & Muir 2004 : 199).

Beliefs inevitably find their way into conservation discussions, and the role of language and categorisation in transporting values beyond the intent of any individual or group of speakers is well-known, such as in the well-rehearsed foreigner-as-threat terminology (O’Brien 2006 : 67; see also Gould 1997; Coates 2003). Olwig (2003: 61) summarises the problem clearly in writing that:

“the natural scientists who worry about the penetration of alien species often appear to be unaware of the parallels between their discourse and that of racists and national chauvinists. Few of these scientists would presumably wish to be classified as such. Yet racists and nationalists have been known to legitimate their arguments by drawing parallels between the arguments of scientists concerning ecological imperialism and the supposed threat of foreign species, on the one hand, and, on the other, the perceived threat of foreign races and cultures to the native populations of their countries”

Likewise, Coates notes that demeaning, defaming and othering specific groups of people through associations with creatures not only reinforces social and racial privileges by lending them the weight of natural authority, but “it also facilitates beastly behaviour toward the animalized and the naturalized” (Coates 2003 : 135).

This strand of critique therefore takes a different, more fundamental route. It builds on the concern about the prevalence of metaphors in the natural and ecological sciences (Larson 2005). While metaphors are ubiquitous in science, “simplicity and intuitive appeal are also the main reason why scientific language has never succeeded in ‘cleansing’ itself from metaphorical ‘impurities’, despite several attempts to do so” (Chew & Laubichler 2003 : 52). Interpreting natural phenomena in human terms is, however, “a two-edged sword, generating knowledge as well as opening the door to troubling misunderstandings” (Chew & Laubichler 2003 : 52). Metaphors thus introduce a fundamental trade off between the generation of novel insights in science and the possibility of dangerous or even deadly misappropriation (Chew & Laubichler 2003; see also Rémy & Beck 2008). This is what Cresswell warns about when he writes about biological morality, in which metaphors are not just theoretically inappropriate, but can also have “serious consequences on people’s lives” (Cresswell 1997 : 336).

Yet metaphors, though at times deadly, are useful in that they allow us to build on our experience when we extend familiar relationships to unfamiliar contexts, helping new ideas to spread. In the natural and ecological sciences, where much is inferred rather than directly observed, metaphors can make the difference between comprehension and confusion, helping to get a message across (Chew & Laubichler 2003 : 53). The frequent use of war-like ones such as invasive species or natural enemies nevertheless appear to imply that such categories exist in nature, assigning a normative dimension to the metaphors. While such categories can only be idealized abstractions, their existence is reinforced by the metaphorical language of scientists. They end up becoming concrete objects (Chew & Laubichler 2003 : 53). That environmental policies now rely on similar framings of perpetual war and permanent vigilance, with terms such as “sleeping species” mirroring those used to describe terrorist cells – and leading to subsequent networks of surveillance and control that mirror those watching stigmatized human populations (EEA 2010) – is further indication of how the framing of ecological concerns builds upon social and political contexts.

Challenging the permanence of states: anxieties about globalisation

While fears of invasion seem to feed off anxieties about globalisation and global change – suggested by the strategic coining of the term global swarming in reference to contemporary and established fears of climate change – they are nothing new. Anxiety and fear of future scenarios of rapid change has always been at the heart of invasion biology. Charles Elton, largely recognised as the founder of the field, was writing his key text in 1958 at a time of increased global anxiety: “Nowadays we live in a very explosive world, and while we may not know where or when the next outburst may be, we might hope to find ways of stopping it or at any rate of damping down its force. It is not just nuclear bombs or 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” (Elton 1958 : 15). At the height of the cold war, he did not shy away from using emotive vocabulary to make his case, and he explained that population explosions – plants, animals but also pathogens – included “those that occur because a foreign species successfully invades another country”... [bringing about] “terrific dislocations in nature” (Elton 1958 : 18). These formulations of the problem around states (“another country”) and on the idea that invasive species were somehow anti-natural (“dislocations”) were extremely influential, and largely continue to frame research and policies today. Equally important, the field of invasion biology – like, later on, the term ‘biodiversity’ – were coined specifically to combine scientific description and analysis with awareness-raising and calls to action in the face of urgent, and presumably catastrophic, changes.

The intimacy between social metaphors and claims about exotic nature means that discourses play on numerous feelings of insecurity and fear of difference. Clark (2002), for instance, further provides pathways for exploring the rich vein of symbolic association of social *diaspora* and cosmopolitanism with bad seeds, weeds and vermin, linking up with the literature on the risk society (Beck 1999). The right to belong indeed echoes many other contemporary fears, about human migration and threatening foreigners, making the question of a “war on invasives” all the more charged emotionally as it connects to the right to belong for various categories of persons in particular places. Yet for many of us, belonging to many places at once and quickly feeling at home in new places has become commonplace. Despite these incredible changes in our social and political worlds, it might therefore seem paradoxical that we continue to worry about what really belongs where when we think of plants and animals. Thus the effect of this framing of the problem must be acknowledged as problematic in many multicultural societies where authorities profess a desire to see all segments of society reap the benefits of environmental protection, and make use of existing green spaces.

Eager to test how ordinary citizens perceive official and lay discourses on invasion, including documents using what we identified as emotive or highly-charged language, we organised five focus groups of citizens in Geneva within which we discussed a wide variety of documents, from newspaper articles to official information leaflets on specific species. (4) To our surprise, repeated strategies of distancing emerged within the groups, constantly challenging the pertinence of the category itself of ‘invasive species’. Individuals made repeated connections with other harmful but native species to dispute the need to take action, such as stinging nettles (*Urtica dioica*), poisonous mushrooms, or native invasive plants. Many also suggested that there must be an underlying naturalness to such processes, or to the presence of particular species, and disputed how the documents presented specific species as somehow unnatural. These focus groups also highlighted how communicating with diverse publics on invasive species is in any case notoriously difficult since it involves a number of paradigmatic shifts. Where formally environmental and conservation groups tried to convince the public that less intervention and more pristine nature was better, and that all forms of life were intrinsically valuable, some of these same groups now call for special dispensations to use banned herbicides in nature reserves (Delabays 2010, *pers. comm.*),

and promote heavy-handed mechanical intervention with diggers in natural areas. It should however be noted that there are important variations in such practices (Kowarik 2003 & 2011; Lachmund 2004), and that more cosmopolitan approaches to welcoming invasive species are beginning to return.

Stepping out of boxes

This chapter has reviewed and commented on many of the debates surrounding questions of nativeness, debates that at times appear to be going round in circles. However, in our Swiss case study, one of the most interesting things to emerge from interviews with practitioners were the numerous negotiations and transgressions around what were presented as established expert categories and consequent environmental policies. Many of the individuals interviewed were employed in public bodies and were working either in city parks or in nature reserves. While many demonstrated clear loyalty to the cause of fighting invasive species, they also repeatedly justified not doing so in a number of cases. Some argued for instance that particular species were not actually on a Black list at all and that therefore no action was required (5); that others were not really a problem in their opinion and that this trumped official policy; that there wasn't sufficient time or interest to take action, or that it was too late to do anything; or even that aesthetic or external political reasons made removal impossible. A city park employee in Geneva for example mentioned a number of pragmatic exceptions, including the following:

"We make an exception in the case of the pawlonia (Paulownia tomentosa)(...) because this is clearly a tree with a certain decorative value, and we haven't noticed that there was an important spreading of pawlonias, unlike the ailanthus tree (Ailanthus altissima) that is all over the place. So we allowed trees that had been cut down to be replaced" (T6).

"Or else, for example, if we take the Route des Acacias, we have lines of acacia trees (Robinia pseudoacacia). An acacia dies, in that whole line, and well, we are not going to plant an oak tree (Quercus), or a chestnut (Aesculus hippocastanum) in the middle of a line of acacias, it's a question of how we view the landscape" (T6)

"After that, if we take out all the laurel (Kalmia latifolia) hedges in the green spaces [urban parks], I cannot tell you how much work that would be, it's quite simply enormous" (T6)

In a sense, the examination of such practices goes some way towards indicating that beyond the agonised and somewhat circular debates surrounding the definition of categories, the actual pertinence of the homogenous category of 'invasive species' is challenged when it comes to implementation and practical measures – or when it is relocalized, to use Miller's (2004) productive term – just as it was by the participants in our focus groups. The issue of invasive species in Switzerland was constituted as a singular problem and thereby achieved wide political recognition through the strategic alliance of natural scientists, environmental groups, and health professionals concerned about the public health impacts of increasing numbers of Ragweed. Yet this coherence of the category of 'invasive species' is challenged by the diminishing visibility of this flagship species: this specific problem appears under control, and the expected catastrophic rise in respiratory allergies did not take place. This is further strengthened by the increasing recognition that the individual biographies and behaviours of each species require extremely different measures to control them, or to accept them as new inhabitants while hoping for a return to some sort of equilibrium in the future. Focussing on practices, rather than on discourses, certainly offers further interesting paths to understand, and challenge, the categories we craft to make sense of the living world around us.

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Notes

(1) Apologies to Rudyard Kipling and his leopard!

(2) This draws from a research project at the University of Geneva funded by the Fondation Boninchi, carried out from January 2010 to June 2011. Some direct quotes from interviews are translated by me from the original French, while one interview was carried out in English. Laurent Matthey, Irène Hirt and Marion Ernwein were involved at various crucial stages, for which I am immensely grateful. Anonymity was granted to some interviewees when requested, and transcriptions were numbered T1 to T16.

(3) See Della Bernardina 2000 on myths of metamorphosis and invasive species.

(4) As this was an exploratory piece of research, groups were constituted of 6-9 people in a rather *ad hoc* manner, partially through targeted advertisements inviting participants « to discuss an environmental issue ». More by chance than by design, these reflected the diversity of the local population, in terms of nationality and place of origin. It must be noted however that the question of minority or ethnic groups' reception of discourses on invasive species was not a specific research topic.

(5) The coexistence of and confusion over the presence of multiple shifting Black lists with various differing legal statuses and territorial extent made such an argument all the more plausible in the case of Switzerland. In the Canton of Geneva, for instance, at least three different lists of species coexist and are referred to, with surprisingly large discrepancies between them.