Article

"Charismatic Species and Beyond: How Cultural Schemas and Organisational Routines shape Conservation"

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Abstract
It has long been suggested that charismatic species attract a disproportionate amount of attention and resources in international conservation. This paper follows up on this observation to investigate how cultural schemas and organisational routines shape resource allocation in conservation more broadly. Based on 44 in-depth interviews with programme managers in international conservation NGOs and in zoos with conservation programmes, we argue that the way units of intervention are institutionalised in conservation work shapes the allocation of resources in ways that are not directly based on conservation science. In addition to the role of species, and charismatic species in particular, we examine the role of focus countries – political boundaries shape the conditions under which NGOs can do their work and they shape NGOs' work via the priorities of institutional donors. We also discuss the role of landscape types, and competition among landscape types, and of solution-based programming.

Keywords: charismatic species, NGOs, triage, priority-setting, schemas, organisational routines, conservation

1. INTRODUCTION

It has long been suggested that charismatic species attract a disproportionate amount of attention and resources in international conservation efforts. The focus on species – as opposed to ecosystems – and on particular species is sometimes based on scientific arguments about the broader benefits of such an approach: Protecting a specific species might be justified by the protective effects these efforts have for other species and for whole landscapes (umbrella species) (Andelman and Fagan 2000). It may make sense to focus on particular species, for example because they serve as an indicator of broader environmental issues in the context of incomplete data (indicator species) (Landres et al. 1988). But it is also acknowledged that there are psychological and cultural reasons behind these choices (Caro and O´Doherty 1999; Leader-Williams and Dublin 2000; Feldhamer et al. 2002; Kontoleon and Swanson 2003; Lorimer 2007; Tisdell and Nantha 2007).

This paper follows up on this discussion to investigate how cultural schema and organisational routines shape the allocation of resources in conservation more broadly. The paper draws on 44 in-depth interviews with programme managers in international NGOs and in zoos active in international conservation. These organisations pursue ambitious global aims. The research asked: How do they decide where to go, and what to do there? How do they frame and categorise targets of intervention? How do they compare different sites and objects of interventions? We ask respondents about their own practices and experiences and about the processes they are involved in in their organisations. These professionals were targeted because they occupy a key position between the top of the organisational hierarchy and implementation of projects on the ground and because they are involved in preparing, making and implementing decisions about conservation priorities.

The fact that some animals are more readily seen as worthy of care and attention might have a basis in broadly shared culture or even in biology (Sunquist 1992, see the discussion in Lorimer 2007); this still begs the question as to how exactly they come to matter in the organisational response to environmental degradation. We suggest that species are institutionalised in conservation work as a prominent unit of intervention, which shapes organisational identities and programme design and is a precondition for charismatic species to be favoured among species. Organisational routines to do with other units of interventions also shape the allocation of resources in conservation in ways that are not directly based on conservation science. We discuss the role of focus countries, landscapes, and charismatic solutions.

1.1 Priorities in Conservation Science

There is an extended published discussion on prioritisation in conservation science that addresses how it "should" be practiced (Myers et al. 2000; Olson and Dinerstein 2002; Brooks et al. 2006; Murdoch et al. 2007; Wilson et al. 2007; McCarthy et al. 2008; Leader-Williams et al. 2010). Different approaches are championed, each of which with its own demand data requirements. Some of the discussion focuses on the different properties of species that might be taken into account: Joseph et al. provide a useful

overview 'of frameworks […] for ranking species based on criteria such as the level of endangerment (Master 1991; Carter et al. 2000), evolutionary distinctiveness (Faith 1994; Vane-Wright et al. 1994 […]), a combination of these and socio-political significance (Rodriguez et al. 2004), ecological importance, and potential for recovery (Marsh et al. 2007)' (Joseph et al. 2009: 329). Others emphasise properties not of different species but of different "areas" or "ecosystems", such as the level of biodiversity, the level of distinctiveness and threat, and the value of ecosystem services (Brooks et al. 2006; Tallis et al. 2008).

There is an explicit discussion in conservation about "triage", a term initially used in emergency medicine to describe the sorting of patients according to severity of injuries and chances of survival (Kennedy et al. 1996; Moskop and Iserson 2007; Ellebrecht 2009). In conservation the discussion about triage on the one hand introduces the costs and chances of success of different courses of action into the discussion, marking a shift from discussions that only considered the where and what to save (Possingham et al. 2001; Bottrill et al. 2008). The discussion about triage is also about whether it is ever appropriate to declare certain species or certain areas as "too sick to treat". As in medicine (Molitor 2013), some voices in this debate question whether it is ever appropriate to give up on a patient, a species or an ecosystem. For some opponents of triage in this sense, this is a question of ethics or principles, but consequentialist arguments are also put forward. Stuart L. Pimm, for example, argues that 'triage inhibits science. Saving the very rarest pushes the technical frontier of conservation biology, for nothing concentrates the mind like impending extinction, nor so openly tests whether our knowledge of ecology, genetics, and behaviour is up to the task' (2000: 2289) (see also Noss 1996; Watts and Wilson 2004).

In contrast to these claims, Bottrill et al. state that '[t]riage in a conservation context is the process of prioritising the allocation of limited resources to maximise conservation returns, relative to the conservation goals, under a constrained budget' (Bottrill et al. 2008: 649). Accordingly, they argue that far from being defeatist, '…if applied explicitly, triage is simply a process of wise resource allocation' (Bottrill et al. 2008: 650). Proponents of the approach argue that processes of triage, or resource allocation, serve to make transparent the unconscious and unrationalised processes of triage which *already* shape projects and commitments into what they argue are inefficient choices (Bottrill et al. 2008: 650, see also Possingham et al. 2001).

The debate on species, ecosystems and different ways to assign value to them, and the debate about triage is largely about how prioritisation should or might be practiced. We build on the smaller body of work that brings data to bear on the question how conservation NGOs actually set priorities (see James et al. 1999; Castro and Locker 2000; Halpern et al. 2006; Mansourian and Dudley 2008; Fishburn et al. 2009; Brockington and Scholfield 2010a,b). This existing work has focused largely on quantitative measures of how expenditure is distributed across countries. This paper complements this research by looking at relevant practices and routines inside NGOs. Our research design directly targets a key site of resource allocation in conservation, the programme management

offices of international NGOs.

1.2 Organisational Routines and Schemas
Previous research on decision-making has highlighted that actors do not always respond directly to the outside world, but rather that their response is mediated by tacitly held assumptions, and by taken-for-granted routines. Researchers in cognitive psychology have established the role of schemas or prototypes (Rosch 1975) as one of a number of cognitive shortcuts (Kahneman 2011). Most research in this area has focused on individual cognition and on the cognition of everyday objects. But sociologist point out that these types of conventions might also shape the perception of technical categories and play a role in organisations and professional communities (diMaggio 1997; Zerubavel 1999; Hodginson and Healey 2008; Beer and Coffman 2014).

Social scientists have drawn attention to the internal rules and informal routines within organisations that mediate between an organisation's explicit goals, and the situation in the world on the one hand and on what the organisation does or does not do on the other hand (Molotch and Lester 1974; Fishman 1978; ; Becker 1982; Krause 2014, see Weber 1978). In a classic contribution Cohen and co-authors have argued that solutions circulate relatively independently of problems in organisations (Cohen et al. 1972).

Some work has focused on how dynamics internal to one individual organisation shape outcomes. But some mediating practices are shared across organisations, who can form a cluster or field. Because of considerable uncertainty in terms of knowing and predicting their environment, organisations often look to other organisations, which they consider relevant or peers (Fligstein 2001) to develop a response (Meyer and Rowan 1977; diMaggio and Powell 1983). This mutual adjusting of organisations who see themselves as peers has been called "institutional iso-morphism" (diMaggio and Powell 1983).

We suggest that organisational practices are shaped profoundly by the ways in which "units of intervention" are constructed; in organisational practice, the unit of intervention – the equivalent of "categories" of linguistic research – is the product of contingent yet enduring forms of institutionalisation, shaping how subdivisions are structured, how jobs are defined and how efforts are measured and assessed. The construction of units of intervention is a precondition for schemas to play a role in decision making by shaping which among the concrete instantiation of the unit (or category) is selected; we can then expect the impact of schemas to be mediated or refracted by the practical infrastructure surrounding these units.

2. MATERIALS AND METHODS
The paper draws on a study that examined how priorities are set in international conservation programming. We interviewed 44 managers in international conservation NGOs and in zoos with international conservation programmes. Programming staff in conservation NGOs work alongside colleagues in advocacy, research, finance, human relations, and fundraising departments. Zoos distinguish between field conservation and research on the one hand, and work with the "living collection", the animals on site. Our

respondents are in charge of either a specific region or a specific theme or programme.

We interviewed programme staff because the most detailed knowledge of practical work is located here, and not at the highest level in the organisational hierarchy. With this, we stand in a specific tradition of expert-interviewing (Bogner et al. 2009). The expert, in this tradition is not interviewed to give information about a subject area that she is knowledgeable about as an observer, rather her practical knowledge of organizational processes she herself is involved in is the target of the investigation. Her knowledge is not targeted because it is "better" but because it is especially practically relevant and full of consequences as she has decision-making power.

Interviews lasted about an hour and were conducted in person when possible (n=25) or on Skype (n=19). We asked our respondents about their everyday work. We asked what a typical day in the office looked like, about how priorities are set and changed and about debates they had with colleagues about priorities. Respondents almost all have training in biology, though some came into the field as activists, or have a professional background in public policy.

Respondents worked for organisations including Antwerp Zoo, Bronx Zoo, Birdlife International, Chester Zoo, Conservation International, Jane Goodall Institute, Zoological Society London, Ocean Conservancy, National Audubon Society, Nature Conservancy, Queens Zoo, RSPB, Stiftung Artenschutz, Vienna Zoo, the Wildlife Conservation Society and WWF. In total, interviews with respondents from 20 conservation organisations were carried out.

Five additional interviews were carried out with researchers at universities and research institutes. We complement the evidence produced in these interviews with other sources of evidence about what it is that organisations do and do not do, such as annual reports, project reports, other academic work, and published reflections by professionals and debates among them. Data collection included observing a five-day training on conservation planning.

3. RESULTS
3.1 Charismatic Species in Organisational Context
Single species have long played an important role in conservation, with a lot of attention focused on large mammals and – because of the importance of bird-watching as a past-time (Bargheer 2016) – birds. This focus has been criticised in the name of a focus on ecosystems or ecosystem services as targets of intervention (Tallis et al. 2008) and much focus of formal discussion today is about the relative importance of areas for intervention (Myers et al. 2000; Olson and Dinerstein 2002; Brooks et al. 2006). Several large international conservation organisations focus mainly on places and have produced lists of what they considered to be the priority areas in which to focus their work, organised by landscape type. WWF's list comprises of 238 'global ecoregions'; areas made up of 26 major habitat types.[1] Conservation International has been working with a smaller range of 35 identified 'global hotspots'.[2]

But the category of species continues to structure conservation work. Data continues to be collected and aggregated with regard to the unit species (Braverman 2015b). A number of organisations are focused specifically on single species, such as the Save the Tiger Fund, as well as organisations focused on polar bears, sharks, and rhinos. Even the large international conservation NGOs still focus some of their work on single species. Alongside their focus on places, WWF, for example, also works prominently on species. On their website, they provide a directory of their focus species, a list of 100 species on which they focus their conservation efforts.[3] These can be based on formal criteria for the selection of species, and/or they can be based on species whose protection promises broader benefits.

But these are sometimes overridden with regard to personal preferences or perceived public impact. One respondent, for example, told us how the wolf became a focus of work for her organisation:

> We were not really working [on the wolf] […], wolves have been back in [Europe] for 10, 15 years, and in my view this has been dealt with quite well by other organisations, and suddenly there is a new CEO and he says "I want to do something on the wolf", and then we suddenly have a wolf project on our hands, such things also happen.

When we asked about the scientific assessment, the respondent confirmed her view that, 'the wolf is not really a priority; the wolf is generally not endangered'.

Conservation projects in zoos are almost exclusively focused on single species. When discussing which species to select for support "in the wild", zoos usually select among species that they themselves keep in situ. As one respondent put it:

> We always try to consider that we also hold the species in the zoo, to make that link …. this is a restriction that we want to make because we also talk about conservation education. We want to show the animal in order to tell people more about it... we know that most people don't come in order to learn more about conservation projects, rather they come to see animals, and we want to meet them where they are at.

Linking conservation programmes to living collections, and with that to species, allows zoos to present their conservation work as a logical extension of zoos' expertise. One respondent explained that it was an important factor in her organisation's selection of projects that the zoo can offer expertise as well as money:

> Zoos are the only ones who have experience in the husbandry of wild animals, of rare animals. Projects in the wild often don't have that. They know a lot about the biology or the ecology of the animal but when it comes to, for example, I have an injured animal, how do I make it survive, what do I feed it, how do I handle it?

> Here zoos are the only ones who have this kind of expertise and this can be made available, also to projects in the wild.

Veterinarians who have experience with captive animals regularly lend expertise to projects in the wild (e.g. Walzer 2007); this is one example of the many ways in which the in situ and ex situ side of conservation are linked in zoos (Braverman 2015a) – with effects also on how resources are distributed.

This pressure to focus conservation on species kept in the zoo as part of the living collection can be seen even if it is counteracted, as the quote below illustrates:

> So, for example, we wanted to develop our own tiger conservation programme in the field and this was my area, so we have Sumatran tigers in the zoo. So we at first, for many years said, "It has got to be Sumatran tigers." I tried to make that happen but it just didn't make sense to do that, because everybody works in Sumatra and the topic that we are very good at, which is conflict with people, isn't the most pressing issue there. There just wasn't such a great need for that and it was too crowded. So [...] quite reluctantly we then decided to work in Nepal, which is a different sub-species of tiger.

The organisation went ahead to follow an opportunity to have a bigger impact working on the Bengali tiger; but internally the issue had to be discussed repeatedly: 'People who haven't followed how this evolved are asking why are we working on the Bengal tiger, when we have Sumatran tigers, that doesn't make sense? So you have to explain it all. Just the context of the whole global situation comes into that. It just didn't make sense to do the absolutely irrational thing.'

The link to animals kept at the zoo poses some restrictions on what zoos can do – one respondent quipped it was unlikely a zoo would ever work on whales given the kind of enclosure they would need. But it is important to note that zoos do not just hold furry animals and that threat status is part of what informs which species are included in a zoo in the first place. In an interesting twist on the focus on charismatic species, the Zoological Society London (ZSL), for example, is focusing a programme on "EDGE" ("Evolutionary Distinctive, Globally Endangered") species, which are defined by their lack of close genetic relatives and often look unusual rather than cute.[4]

3.2 Focus Countries as a Unit of Distribution and Strategic Reflection
Ecosystems and habitats rarely conform to shifting political borders. We would thus not expect there to be biological reasons for countries to become a unit of decision-making in conservation. The international NGOs we studied work across national boundaries, but national boundaries do play a role when resources are allocated in their work.

NGO structure their programmes according to countries of operation and some have more or less informal priority countries in addition to formal approaches of determining where to work based on data about threat level or biodiversity. Countries then become a unit of

strategic reflection within NGOs. International NGOs review their own engagements with a view to, on the one hand, seeking to work in a range of contexts, and on the other hand, seeking to avoid "spreading themselves too thin." This regional manager explained:

> In the past year I made the decision, informed by a lot of my colleagues and some analysis, essentially to get out of a number of countries in Latin America where we had been operating and to focus our efforts on other countries, so essentially to reduce by about four, five, or six the number of countries we're going to be operating in. Some of the countries that we chose to leave are very important from a biodiversity standpoint – so Venezuela, Bolivia, most of Central America; however, there were financial feasibility questions around those.

The respondent explained that he was expected to raise a considerable portion of the funds for their programme in the countries where they are operating:

> So, if you're working in countries that are poor that don't have particular… They don't have wealthy donors or there are other restrictions on getting philanthropic donations, those countries are going to drop off because you can't afford them. It hurts, in a sense, to leave some of these places and I hope we don't have to stay out for long, but the realities of the funding were such that we had to make some priorities against what the biodiversity information, or even opportunities, might have dictated.

National boundaries matter for NGOs as they shape the costs of conservation work and as they affect the political conditions for work in a country (see Eklund et al. 2011). Some countries are closed to the activities of foreign NGOs, and some are deemed unsafe to work in. In one example, a respondent explained:

> I think there was some trepidation from our board, just because of the insecurity and risk associated with Africa. Some of the early places we worked tended to be the safer, more secure places that the board felt more comfortable with, but that also had lots of grasslands.

Other countries present new opportunities: Myanmar, for example, has recently become open to NGOs and has received a significant influx of resources.

National boundaries also shape NGO work via the preferences of institutional donors. Conservation NGOs have been accessing funds from institutional donors, such as USAID (see Chapin 2004); these donors structure their work in terms of focus countries. As one respondent, a regional manager in a large international NGO put it:

> In reality, it's often quite different, we're actually often very donor driven [...]. If we just look at [donor x], they have focus countries. They … [do] not support America, do not support Australia, do not support Thailand anymore, because Thailand is no longer a developing country in the strict sense; and gradually

> funding for India is stopping, and China stopped a while ago. So you see, …
> [they have their] priorities, and if we stay with Thailand, Thailand is definitely no
> longer a developing country in the classical sense, rather it's a transition country;
> but in Thailand, we have the largest tiger population in South East Asia. This
> means getting public funds for the Thai tiger is really almost impossible.

This respondent went on to say:

> We look a little bit where is the [donor] going, where do they put money in, so
> we swim a little bit with the current. There was an example, […] until a few
> years ago, southern Africa, Namibia, Botswana, Zimbabwe was no issue for us
> […] Suddenly the [donor] […] wanted to really get engaged in southern Africa
> and that was also noticed with us, and well, great, suddenly we were in southern
> Africa. Though it is not a priority area, it did not get defined as such, but
> suddenly we find ourselves there.

There is some evidence that national boundaries also matter with regard to how threat
itself is measured and acted upon. Consider the efforts to protect bears and wolves in
Germany, Switzerland and Austria – animals who are not threatened overall but rare in
these countries and a focus for environmentalists there.

For the case of bird conservation, Stefan Bargheer has shown that national threat lists
have played an important role in bird conservation in the UK and in Germany.

> Many bird species that are target species under national conservation programs
> initially attained this status because they were represented by populations living at
> the edge of their species range – they are rare and endangered on a national level,
> yet abundant on a European or global level. The other way around, many species
> that are abundant and common on a national level have to be considered rare from
> a European or global point of view,

if they are species whose world population is confined to a single area or only a couple of
areas (Bargheer 2016: 333). This has meant for example that much effort was spent to
protect the crane in Western Germany, which was rare in Western Germany but for
whom Western Germany was not an important area. The status of the crane and a number
of other birds changed when data began to be collated on a European level in the early
2000s.

This highlights the importance of the reference frame for interpreting data on threat levels
and biodiversity. International NGOs usually adopt the global reference frame in their
priority-setting exercises, but this can be challenged from a national perspective. One
respondent, for example, felt that Australia, where efforts had focused on the Great
Barrier Reef because of its global importance, had been shortchanged by an international
priority-setting exercise in her organisation:

So my view was "but Australia is a biodiversity hotspot" – all divisions of mammal are in Australia – nowhere else in the world except for New Guinea is that the case, so Australia is like a special case, it should be a whole country that is granted priority and that was my view and I've stuck to that and I still believe that it's foolish to allow ourselves to be chipped down to basically one land area in Australia, that's considered a global priority area.

3.3 Landscapes as a Unit of Distribution

NGOs have programmes focused on specific animals or threats, programmes that address specific countries or regions and programmes that target specific types of ecosystems and landscapes. The structuring of work by landscape types mirrors the differentiation in biological training, where students can focus on marine biology, or freshwater systems, for example; and it mirrors the differentiation within biological research. Some specialised journals, such as *Fish and Fisheries*, *Coral Reefs*, *Forest Ecology and Management*, and *Fresh Water Biology* are among the very top-ranked conservation journals.

Formal approaches for determining priority areas vary in how much importance they give to different criteria, which in turn has different implications for different types of ecosystems (Brooks et al. 2006). Approaches that privilege biodiversity tend to value rainforests most highly. But alongside diversity, endemism, threat, and biological function is also sometimes considered. Others have argued, that we should construct priority sets, which help maximise a range of these values (Mace et al. 2000).

Some approaches value representativeness across distinct landscape types (see Olson and Dinerstein 2002). This logic of representativeness is reflected in the following account by one of our respondents:

> The organisation back in 2000 worked on what we call the "2015 goal". ... That goal was really focused on conserving 10% of every habitat type on earth, so grasslands, forests, tundra, deserts. We mapped all those habitat types, we mapped the percentage that was under protection at the time, and tried to focus our new investments on habitat types that were under-protected.

There is some evidence that some types of landscapes attract more attention than others. It has been explained to us that coral reefs and coastlines photograph well; they also have a general constituency among tourists and a specialised constituency among divers. It is clear that much attention has focused on forests, and rainforests in particular. Forest conservation can be linked to carbon emission targets, which are on the broader policy agenda (see also Ehrenstein and Muniesa 2013). The destruction of forests can be rendered visible relatively easily, with a clear line separating "forest" and "destruction" in both regular and aerial photography.

Grasslands are a relatively neglected area: As one respondent working on the protection of birds suggested: 'For example, one of the major habitat types that's been totally

hammered are grasslands. They're not maybe as charismatic as coral reefs. It's not as easy to tell if a grassland has been decimated. If you look at a forest that's been converted to agriculture, it's pretty clear what happened.'

It has been suggested that grasslands might be actively damaged by conservation efforts themselves. Global numerical targets encourage extensive reforestation to offset CO_2 emissions by 2020. Some conservation programmes engaged in reforestation activities might plant trees in areas that have historically been grasslands (Bond 2016; DeVitt 2016).

3.4 Solutions and Charismatic Solutions
There is some evidence that some actions in conservation do not start directly from the "problems" which NGOs are supposed to be responding to, whether they are framed as a threat to biodiversity, a threat to wilderness, the extinction of species, or a loss of ecosystem services – but rather from an established repertoire of solutions. Entire organisations are devoted to specific courses of action, such as reforestation. Large NGOs develop expertise around particular types of projects or programmes.

 If we call some of these solutions "charismatic" solutions, this does not necessarily mean that they are not appropriate either in general or in any particular case. It does mean to raise the possibility that they may sometimes be employed without careful investigation of the alternatives and without careful investigation of the results.

Historically, the charismatic solution in conservation has perhaps been acquiring and fencing off land – a strategy that dates back to the first creation of US national parks in the nineteenth century (MacKenzie 1988; Beinart and Coates 1999; Nash 2001; Kupper 2009; Gissibl et al. 2012). This has been criticised, for its impact on local populations, and for some of the conservation drawbacks that follow from the impact on local populations (Carruthers 1995; Cronon 1996; Brockington 2002; Brockington and Igoe 2006; West and Brockington 2006; West et al. 2006; Dowie 2009; West 2009; Duffy 2010).

The proportion of land that is protected continues to rise dramatically (Brockington and Duffy 2010). One of our respondents explained:

> We acquire properties for two main purposes. One is to conserve the species that are already there; so, a lot of Australia is still in a relatively intact situation and you can acquire properties and, basically, if you manage it correctly, you'll conserve those species. […] We also buy properties that don't actually have very many mammals at the moment but used to, because we have an idea of former distributions, and then we actively reintroduce those animals to that area. […] We've got a number of other fenced areas and an island, and we are actively pursuing projects that would involve building other fenced areas in Southern Australia.

Other activities can be assigned to problems more by default than because of a process of selection among alternatives: It has been suggested that monitoring of species is over-employed in conservation (Lindenmayer et al. 2013). Critics claim conservationists are "monitoring the environment to death"; the "wildlife conservation society" is sometimes jokingly referred to as the "wildlife counting society". In the terms of this paper, we would suggest that monitoring is another charismatic solution.

One respondent reflected on this issue at length:

> it's partly because scientists love data and they'll just go and monitor things. For pure science that's fine but when you're trying to save the planet I don't think you can afford to just do that because that money could have been used to do something else. So, I think we've got to be much smarter about what we're monitoring and why we monitor.

Hopes associated with new technologies and big data are reinforcing monitoring and data collection as default solutions (Benson 2010; Braverman 2015a). One of our respondents for example explained:

> Each of the villages have identified a forest monitor, who has been provided with either a tablet or an android phone, and they go into the forest and they monitor to make sure that sudden threats are identified, at least if there are people cutting down forests, if there are people hunting, if there are people grazing, they have animals in there that they shouldn't have. […] It's pretty exciting, actually. The next step now, we really want to see how the village government and the district government can really have an easy way to access this information to make quick decisions on resource allocation [...] If they need to send patrols to a specific area. We're looking at how we can use that information.

We can see here how technologies are adopted before it is clear what they are useful for. Conservation projects embrace activities that technologies enable, relatively independently of the substantive purpose of such activities.

4. CONCLUSION

International NGOs and zoos are key to the delivery of conservation action on the ground. This paper has asked how they set and implement priorities in practice. Many of these organisations engage in formal scientific priority-setting exercises; based on interviews with managers in international conservation NGOs, we have argued that schemas and routines shared across the community of conservation professionals and organisational routines also shape the allocation of resources.

We find that despite critiques of species-based approaches, species still structure the work of international NGOs, and of zoos in particular. Species are institutionalised in conservation work as an important unit of intervention. Among species, charismatic species, that can symbolise conservation efforts, attract considerable resources. Zoos

almost exclusively structure work according to species and they focus efforts on the conservation of species "in the wild", on species that they actually hold as part of their living collection.

Conservation work has other units of distribution that shape the allocation of resources. Countries are an important unit of intervention. Political boundaries shape the conditions under which NGOs can do their work and they shape NGOs' work via donor priorities. Programmes can be structured according to landscape type or a type of approach or solution. Some types of landscapes, which we call "charismatic landscapes", such as forests, attract more attention in conservation than others, such as grasslands. It can be argued that some courses of action, which we call "charismatic solutions", such as fencing off land and monitoring, are chosen over others due to routines and taken-for-granted assumptions.

Our research design directly targets a key site of resource allocation in conservation, the programme management offices of international NGOs; this allows us to conceptualise mechanisms that affect the distribution of resources based on close examination of practices in this site. Our data does not allow us to quantify the size of the effects of the mechanisms we identified, however. This research could usefully be complemented with data about the patterns of distribution that result from the practices we examine. Building on our research and on previous research on broad country-level distributions, scholars can collect and examine data on patterns of distribution within countries, across different types of activities and across different types of landscapes.

Empirical insight into how prioritisation is practiced can be used to reconsider the existing normative discussions of priority-setting. It has already been suggested that the discussion needs to go beyond scientific evidence about the "problem" side of conservation – information about threat levels, for example, or biodiversity – and needs to factor in evidence about aspects of the "response", such as the costs of different courses of action (Possingham et al. 2001; Bottrill et al. 2008).

Other aspects of the empirical reality of the response to conservation issues could also be factored into the normative discussion. The normative discussion might, for example, need to take into account the constraints zoos face when considering conservation projects ex situ. It might also benefit from reflecting on the realities of fundraising for large NGOs. Factoring in costs of different courses of action has already been suggested, but this discussion is still based on assumptions about a fixed pot of money, which can be distributed in more or less efficient ways. This does not acknowledge how closely linked planning and fundraising are in practice, that is how dependent the availability of a budget is on one course of action or another, in one specific area or another.

5. ACKNOWLEDGEMENTS

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Endnotes

[1] http://wwf.panda.org/about_our_earth/ecoregions/ecoregion_list/ [accessed 10.09.2015]

[2] 2 http://www.conservation.org/how/pages/hotspots.aspx

[3] http://www.worldwildlife.org/species/directory

[4] http://edgeofexistence.org/about/default.php [accessed 10.09.15]