

Introduction: Human Migration to Protected Area Edges in Africa and Latin America: Questioning Large-scale Statistical Analysis

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Abstract

The introduction to this set of papers highlights four challenges to the large-scale analysis of population growth at protected area edges in Africa and Latin America undertaken by George Wittemyer and colleagues in their 2008 paper published in *Science*. First, it raises questions about their sampling procedures, given national-level variation in systems of protected area designation and protected area estates. Second, it challenges the largely economic model of migration decisions that underlies their analysis. Third, it highlights the neglected variable of land tenure systems as a factor facilitating or impeding migration. Fourth, it points to the problematic politics of reducing human communities and polities to ‘populations’ subject to management from afar.

Keywords: protected areas, population, migration, land tenure, political ecology

INTRODUCTION

For the last several decades, conservationists, policy makers, and social scientists have been examining interactions between protected areas (PAs) and neighboring human communities. Perspectives on the role of ‘local’ communities in biodiversity conservation have vacillated; people are characterised as a principal threat, essential for conservation success, or somewhere in between. Regardless of one’s position in this debate, there is wide recognition of the need to incorporate the human element in conservation policies and practices. Partially in response to this debate, conservation interventions in the developing world since the 1990s have largely taken the form of Integrated Conservation and Development Projects (ICDP) and similar efforts to link conservation with benefits to neighboring communities.

In the summer of 2008, *Science* published an article authored by George Wittemyer *et al.* (2008a) that speaks directly about debates surrounding people and PAs. In this article, they conclude that in Africa and Latin America there has been significantly higher population growth within a 10 km buffer area of PAs compared with similar rural areas without parks. The authors propose that this pattern reflects in-migration due to people’s perception of the economic, social, and infrastructural benefits of parks, often provided by international aid for ICDPs. Further, they suggest that this pattern shows that conservation does benefit ‘local’ communities, and argue that this population growth trend could pose a threat to biodiversity in and around PAs.

Wittemyer *et al.*’s (2008a) arguments speak about many conservationists’ concerns about population growth and change around PAs, as well as the threats such growth might present. At the same time, Wittemyer *et al.*’s (2008a) results contrast with much of our collective experience in Latin America and Africa, where more nuanced observations either contradict or complicate these simplistic explanations for buffer zone population growth. Further, their analysis seemed to contradict many social analyses of conservation, which point out the heavy costs and minimal benefits of PAs for ‘local’ people (West *et al.* 2006).

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These concerns about the scale, method and representativeness of the Wittemyer *et al.* (2008a) analysis led to a call for papers for the 2008 Society for Applied Anthropology's annual meetings in Santa Fe. The call sought contributors who could bring a fine-grained, anthropological analysis to contextualise the Wittemyer *et al.* (2008a) hypotheses. In this panel we attempted to answer questions such as: What patterns of human migration and re-settlement are we observing? Is in-migration really driving community population growth near PAs? Who are these migrants and what motivates people to migrate away from other rural (or urban) areas and towards parks?

In the end, the panel brought together four anthropologists whose papers follow, as well as the contribution of one of the authors (L. Joppa), who critiqued the statistical methodology and the conclusions of the Wittemyer paper (Joppa *et al.* 2009). This set of papers foregrounds some of the problematic aspects of Wittemyer *et al.*'s (2008a) analysis and conclusions, but also reaffirms the conservation policy importance of the contextualised data provided by ethnographic fieldwork. Furthermore, these papers directly respond to Wittemyer *et al.*'s (2008a) call for such accounts to more effectively frame conservation policy and practice. These papers thus illuminate existing critiques and debates of Wittemyer *et al.*'s (2008a) arguments.

EXISTING CRITIQUES AND DEBATE

Wittemyer *et al.* (2008a) had immediate impacts in both scholarly and conservation advocacy / policy circles. The interdisciplinary scholarly community working at the intersection between conservation and people was especially quick to engage with their findings. Almost immediately, Wittemyer *et al.*'s (2008a) findings were confronted with several important critiques, which fall into two categories: 1) methodological concerns about the suitability of their datasets for their analysis, and 2) skepticism regarding Wittemyer *et al.*'s (2008a) hypotheses regarding processes that drive accelerated human population growth at PA edges.

Joppa *et al.* (2009) immediately challenged the conclusions of Wittemyer *et al.* (2008a) with a critique of their methodology. In one test, Joppa *et al.* (2009) compared the growth within a 10 km buffer area to the growth in concentric rings of 20 and 40 km zones. They found no evidence for population growth in areas immediately surrounding the majority of PAs to be higher than areas further away, contrary to expectations if one assumes that growth in PA buffer areas is driven by perceived opportunities created by the PA. Joppa *et al.* (2009) go on to question the compatibility of two data sets used by Wittemyer *et al.* (see also Nelson *et al.* 2009), calling into question Wittemyer *et al.*'s (2008a) conclusion that 80% of global PAs show higher growth rates than comparable rural areas. Instead, their alternative statistical analysis demonstrates that 'there are no more parks with higher growth rates near them than parks with lower growth rates' (Joppa *et al.* 2009: 4).

Other criticisms arose in online responses to Wittemyer *et al.*'s (2008a) original paper in *Science*. Shoo (2008) questioned

the proposed causal sequence, arguing that there is a need to understand rates of population growth and deforestation (key variables used by Wittemyer *et al.* 2008a) prior to PA establishment as a baseline for statistical comparison. In this manner, we can better see the cause and effect relationship between PA establishment and population growth, and at the same time control for the trend of establishing PAs in areas where human population growth motivated the creation of the PA.

The authors of the following papers recognise the importance of these critiques, but the analyses in this collection more closely follow the arguments of Jim Igoe (Igoe *et al.* 2008; Igoe 2009) in his commentaries on both the Wittemyer *et al.* (2008a) and the Joppa *et al.* (2009) pieces. Igoe critiques Wittemyer *et al.*'s (2008a) claim that population growth indicates that 'local' populations are benefiting from PAs. As Igoe (2009) explains, echoing longstanding critiques of population-based analyses, 'their data can tell us nothing about how the costs and benefits of protected areas are distributed in any context'. Igoe argues that global statistics do not provide enough fine-grained detail to make accurate policy decisions for individual PAs, and calls for 'better understandings of the dynamics of human communities living on the boundaries of protected areas' (Igoe 2009).

Each of the papers in this special issue answer this call, with contextualised accounts of various parks in Africa and Latin America, discussing some of the dynamics of human communities that drive (or in some cases prevent) in-migration into PA buffer zones and peoples' perceptions of conservation and the ways in which this frames migration opportunities.

CONTRIBUTIONS OF THIS COLLECTION

Wittemyer *et al.* (2008a) have shown what seems to be a global trend, yet the papers provide direct evidence that contradicts the growth they observed, call into question the ways in which their methodologies may mask trends that can be observed on the ground, and point to potentially significant factors ignored or occluded in their analysis. Individually and collectively, these papers point to conceptual problems which cast doubt on the causal relationships claimed by Wittemyer *et al.* (2008a). In their paper's discussion, Wittemyer *et al.* (2008a) recognised the need and importance of contextual data to prove or disprove their analyses and hypotheses. We offer such data here, collectively raising questions about the sampling, assumptions, and conclusions that were reached. We also draw on additional examples to develop our critiques and to highlight questions for further research on the topic.

National Protected Area Designations

One critical issue raised in this collection of papers, and in our collective experience of other areas, is how the sampling methods used by Wittemyer *et al.* (2008a) could misrepresent overall trends and fail to capture local complexities. As Hoffman (this issue) points out, the Wittemyer *et al.* (2008a) analysis is problematic in its selection and treatment of PAs,

in part because of their inclusion of World Heritage sites along with International Union for the Conservation of Nature (IUCN) Category I and II PAs. At least one of their selected PAs for Costa Rica does not conform to the notion of a single, bounded PA. The Guanacaste Conservation Area, a World Heritage site, is made up of both protected and unprotected lands, and within the unprotected lands there are areas of significant population growth. Yet, Wittemyer *et al.* (2008a) do not account for the local bureaucratic nomenclature—‘conservation area’—which does not entail a PA.

While other papers do not take up these issues, our knowledge of other cases makes it clear that Wittemyer *et al.*'s (2008a) approach is inconsistent: in South Africa, they instead choose to separately analyse five PAs that together comprise the Cape Floral Kingdom World Heritage Site, without a clear justification for this choice. Perhaps the most extreme case of problematic sampling is that of Botswana, where they only sample one of the country's 79 PAs, limited in part by their restriction to IUCN Category I and II areas, of which there are only four in Botswana. They base their sample on a single PA, comprising 1.7% of the total PA area in Botswana and 10.5% of the IUCN Category I and II PA area in Botswana (World Database on Protected Areas 2007). This results in a case that fits their overall argument—and which prominently places a bright red outline in their map of Africa—but which can hardly be said to decisively represent relations between population and PAs across an entire country.

In short, if future research is actually going to claim to draw conclusions about relations between PAs and populations at a national—not to mention a continental—level, we need more attention to local PA policies and configurations, and to the relation between the sampled areas and a nation's overall PA estate.

Migration and Social Action

Igoe & Brockington (2007) have made it clear that social analysis of conservation must attend to the largely neglected connections between conservation and neoliberal policies aimed at expanding free markets and restraining the state. They have highlighted the growing prevalence of linkages between private and for-profit ventures, and conservation agencies and activities (Igoe & Brockington 2007). Indeed, neoliberal conservation has contributed to the growth of ICDPs and other efforts that may create or enable conditions likely to draw economically-motivated migrants to parks.

Neoliberalism has another dimension that we see manifested in the Wittemyer *et al.* (2008a) article: the reduction of human motivations to narrowly economic concerns. As Farmer (2003: 5) puts it, within neoliberal thinking, ‘individual[s] in a society are viewed, if viewed at all, as autonomous, rational producers and consumers whose decisions are motivated primarily by economic or material concerns’. Wittemyer *et al.* characterise migration in terms of ‘potential attractants and deterrents of PAs as settlement sites’ (Wittemyer *et al.* 2008a: 123), all concerned with the material well-being of prospective

migrants. Wittemyer *et al.*'s (2008b) assumptions were more clearly stated in their response to Igoe *et al.* (2008) when they drew an analogy between migration to PAs and rural-urban migration, motivated by economic opportunity.

The papers here present three points of objection: 1) this notion of migration relies upon an under-socialised and apolitical model of human action (Luciano this issue), 2) it neglects the social dynamics that shape decisions about—and the very possibility of—migration (Hoffman this issue), 3) it portrays a very simplistic model of migration in relation to PAs that emphasises the ways in which PAs draw migrants due to the opportunities and services they provide.

Given neoliberal ‘pro-growth’ conservation interventions, one might expect to see migrants flocking to areas where they perceive economic opportunities. That we do not, in part reflects the fact that human motivation and social action cannot be totally reduced to narrow economic and resource calculations as is suggested by the hypotheses of Wittemyer *et al.* (2008a). Migration, while often influenced by individual and collective economic factors, is both enabled and constrained by social and political circumstances, as is demonstrated throughout the ensuing collection of papers.

Of necessity, Wittemyer *et al.*'s (2008a) focus on the areas surrounding PAs means that they are concerned with only one half of the migration equation, the ‘pull’ factors that might draw migrants to a particular location (Hoffman this issue). As Hoffman, Davis, and Fay point out, however, movement towards PAs may be shaped by a diverse array of ‘push’ factors, situated in a local spatial political economy, that are missing from the Wittemyer *et al.* (2008a) models.

As Cross *et al.* (1998) observed for South Africa, rural-rural migration, of which movement towards PAs is often a subset, has scarcely been studied in developing countries. Perhaps the best known cases involve the colonisation of tropical forests in Latin America (Hoffman this issue), but even these apparently straight-forward cases of economic migration require attention to macroeconomic and policy factors driving migration and land use change that are not evident in the destination landscape itself (Hecht 1985).

Rural-rural migration is less well-understood in sub-Saharan Africa, but Cross's studies of rural-rural migrants in KwaZulu-Natal, South Africa (Cross *et al.* 1998; Cross 2006) found that rural-rural migrant streams differed considerably from rural-urban migrants; they were exceptionally *uninterested* in the economic attractions of their destination (Fay this issue).

Cross's work also raises attention to another shortcoming of the Wittemyer *et al.* (2008a) approach: given that migration streams are socially formed, one must examine their demographic composition. The motives of migrants and the factors shaping migration can be expected to vary not only cross-culturally but also along lines of class, age, and gender. Population movement consisting primarily of elderly or retired persons, for example, is likely to have very different implications for pressure on park resources than population movement consisting primarily of economically active persons with expanding families.

The ensuing papers also challenge the simplistic models put forth by Wittemyer *et al.* (2008a), and others, to explain human migration to park edges. Wittemyer *et al.* (2008a) explain the phenomena using an 'attraction model', suggesting that people move to buffer zones for employment in the park or in tourist facilities outside the park, or for access to PA environmental services (Scholte & De Groot 2010). Scholte & De Groot (2010) build on the push and pull factor analysis of Ogelthorpe *et al.* (2007), by suggesting that there are at least two other models that may describe migration toward PAs, the 'frontier engulfment' and 'incidental mechanisms' models. In the former, the buffer zones of PAs established in remote areas are engulfed by an extraction frontier (e.g., logging) and subsequently by an agricultural frontier because they offer resource conditions unavailable in migrants' home communities (Scholte & De Groot 2010). As they point out, this model has little to do with the attraction and direct opportunities produced by the PA. In the latter, the 'incidental mechanism' model, factors outside of direct PA opportunities ('pull') and resource conditions outside of PAs ('push') can drive human migration to park buffer zones. Scholte & De Groot (2010) point out that conflict and natural disaster may have depopulated buffer zones in the past, that the areas may become zones of refuge from other conflicts, and/or that people may have been evicted from parks to their edges. Most importantly, it is likely that these conditions, which are not neatly characterised as 'push' or 'pull', contribute to changes in the populations surrounding PAs (Scholte & De Groot 2010).

Scholte and De Groot (2010) are to be commended for pointing out the weakness in Wittemyer *et al.*'s (2008a) focus on the 'pull' factors in explaining human population growth on park edges. This set of papers reiterates Scholte and De Groot's point that population growth on PA edges is often the product of incidental factors that do not fit within the neat push-and-pull factors. Collectively, this set of papers indicate that further attention to the demographics and the motivations of particular migrant streams to the boundaries of PAs will allow us to assess the validity of models which presume that migrants are primarily attracted to PA edges due to the economic, education, and infrastructure 'pull' related to PA development.

The Social Embeddedness of Resources

Another critical issue raised by these papers is that migrants who want to move to the borders of a PA may not necessarily be able to do so. Wittemyer *et al.*'s 'deterrents' (2008a: 123) recognise this point to a degree. We would argue, however, that their formulation omits the factor of social capital: membership in social networks, groups and categories that may enable or constrain action.

The possibility of migration is contingent upon locally-specific forms of social capital that mediate movement, the possibilities for movement, and even awareness of opportunities to potentially move. In particular, land tenure institutions shape the possibility of migration. We draw here from our papers and the broader literature on land tenure

to highlight its importance and suggest avenues for further research. At the risk of gross oversimplification, one can identify four different scenarios around rural land tenure with very different implications for the possibility of migration.

The first is a functioning market in rural property. Wittemyer *et al.* point to an 'increased cost of living associated with tourism' as a possible deterrent of migration (Wittemyer *et al.* 2008a: 123), and evidence from Latin America (Stonich 1998; Kull *et al.* 2007; Hoffman this issue) and the Caribbean (Fortwangler 2007) bears this out. Markets may create conditions where the value of land surrounding PAs makes it unaffordable for many prospective migrants, particularly where tourism or residential use is a more profitable land use than extraction or cultivation.

The second scenario is a situation in which access to land is 'embedded' in social relationships. Research on land tenure in sub-Saharan Africa has for decades emphasised the ways in which access to land is contingent upon membership in social groups (Cousins 2007). These have variable consequences, depending on the particular would-be migrants. The accessibility of land to outsiders in a locally-controlled system of land tenure may depend upon particular demographic relationships of kin groups to territory, and the social linkages prospective immigrants may or may not be able to form with existing residents. Davis and Fay (this issue) both show the problems associated with not 'belonging' to an area, according to local social conceptions, which both discourage immigration by outsiders and encourage out-migration by those subjected to forced resettlement. As Davis puts it, Iraqw who tried to migrate into the predominantly Maasai communities of Simanjiro 'would more likely be met with crossed arms (disdain) than open arms'.

The third land tenure scenario is a frontier situation, where local tenure systems are ineffective or defunct, and in which migrants can move in relatively freely, often with the expectation of later securing state-sanctioned titles. Such a situation existed in many European settler colonies in prior centuries (Weaver 2003); it has seldom existed in sub-Saharan Africa but remains relevant in the tropical forest regions of Latin America. Indeed, the effects of prior policies that deliberately encouraged migration and forest clearance have come to stimulate many efforts at PA conservation across Latin America including Costa Rica (Brandon & O'Herron 2004).

The fourth scenario is what we might call a 'neoliberalising' system of tenure, in which efforts are underway to turn land into a commodity and convert customary tenure and frontier situations into land markets. As Igoe & Brockington (2007) have suggested, such systems seem to have negative conservation outcomes (Dorondel 2009), though much more research is necessary to identify the conditions under which privatisation may lead to environmentally-adverse outcomes (Acheson 2000). As studies in Brazil (Hecht 1985) and Zambia (Brown 2005) have shown, such policies may lead to speculative claims, clearance and settlement based upon the possible future market value of land rather than its immediate productive value. Likewise, migration towards PAs may be

facilitated when customary land tenure systems, which often function to exclude outsiders, are replaced by state-based free exchange of land titles. We see the relationships highlighted here, between land tenure and population movement, as an important avenue for future research.

We have considered factors affecting both whether migrants would (i.e., motivation factors) move, and whether they could (i.e., land tenure). A further complication of whether migrants could relocate has to do with the costs and benefits of relocation. Much of our skepticism about the Wittemyer *et al.* (2008a) thesis has to do with this issue. Often, rural-urban migrants are poor, lacking significant resources or wealth of their own. In-migration to urban environments is often possible for these individuals as a result of pre-existing infrastructure and other amenities of urban settings. Rural park boundaries, on the other hand, rarely offer these features. Further, rural parks are often located far from main roads and other transportation options, in sharp contrast to urban areas, making access difficult. Thus, any comparison of in-migration to rural park boundaries with rural-urban migration is a questionable one, and ignores many of the factors that dictate whether or not rural inhabitants can migrate.

Political Implications

In his studies of transformations of forms of power in early modern and modern Europe, Michel Foucault (2007) chronicles the emergence of the concept of population in tandem with a shift away from strategies of rule grounded in threats of punishment and surveillance. The notion of population as ‘...a multiplicity of individuals who are and fundamentally and essentially only exist biologically bound to the materiality within which they live’ (Foucault 2007: 21) emerged together with notions of the individual economic actor in free markets (Foucault 2007), and the strategies of rule he labels as ‘governmental’, aimed at shaping people’s conduct and subjectivity while preserving their sense of freedom and autonomy. Foucault’s account holds intriguing parallels with developments in conservation policy: prior ‘fines and fences’ approaches, based upon enforcement of regulations and surveillance of borders, have been replaced with an attention to populations, who may be managed not by restricting or monitoring their activities, but by reshaping the conditions under which they act in order to meet policy goals.

Foucault’s analysis of power leads us to reflect upon the Wittemyer *et al.* (2008a) paper as a technique of power, aimed at shaping conservation policy to control the population movements they describe. Indeed, the paper seems to exemplify the practices that Li’s Foucauldian analysis refers to as ‘rendering technical’ (Li 2007): it treats PAs and their populations as objects to be managed by experts, occluding political conflicts over resources and autonomy and replacing them with seemingly neutral, technical analyses that can then be employed to justify policy interventions with real human consequences.

Returning to the example of Botswana discussed briefly

above, Wittemyer *et al.*’s (2008a) approach represents Botswana as a country in which populations are rising on the borders of PAs. It is not clear if this is true, but whether it is or not, any analysis of population change in Botswana must take into account the forced resettlement of thousands of San from the country’s PAs (Hitchcock 2002). This type of political dynamic—in which powerful outsiders decide on the fate of PA-dependent communities—could be justified by employing the decontextualised and managerial analysis of Wittemyer *et al.* (2008a).

Luciano’s paper (this issue) takes this critique the furthest in the collection. He writes, ‘Specific language matters, and the Wittemyer *et al.* (2008a) terms are not value neutral. Wittemyer *et al.* (2008a) speak of ‘settlements’, not communities, ‘populations’, not jurisdictions or terms that reflect social and political life’. His analysis astutely demonstrates that global analyses reinforce and reify borders of parks and PAs that do not necessarily match local people’s traditional understandings of jurisdiction, or polity as he calls it. In fact, he deftly points out the ways in which the global conservation project has slowly replaced local institutions of governance over Machu Picchu. The complexity of overlapping power relations found within the Machu Picchu national park are ignored and undercut by studies like that of Wittemyer *et al.* (2008a) that assume park boundaries also match a bounded polity. According to Luciano, the danger inherent in global statistical analyses based on externally defined park borders is that they further erode local historical claims to access, governance, and even profit from cultural and natural resources found within parks and PAs, transforming an area’s inhabitants into ‘populations’ to be managed from afar.

We do not propose that Wittemyer *et al.* (2008a) had political ends or specific policy interventions in mind, and then gathered data to prove that these interventions are necessary. What this set of papers do suggest is that their conclusions have inevitable political implications, and that—as they circulate in condensed form—they may be used to promote top-down, context-independent policies around PAs and human migration. For example, reviews and summaries of Wittemyer *et al.*’s (2008a) paper—many of which were based on a media relations piece produced by the University of California at Berkeley (Yang 2008) where the researchers were based—immediately circulated through online blogs and newswires devoted to conservation biology, conservation and development, and conservation policy and advocacy.¹ Likewise, scholarly papers, especially in those fields aligned with conservation biology, quickly ‘black-boxed’ Wittemyer *et al.*’s claims and hypotheses about the causes of population change—which were presented as “context-specific, and [requiring] data collection at local scales” (2008a: 124)—and treated them as decisively proven facts.² Finally, there is evidence that their claims are being incorporated into conservation policy and practice.³ Our perspective here aligns with Jim Igoe’s (2009) concern about the ways in which statements in the abstract of Wittemyer *et al.* (2008a) are reproduced in academic and political circles, which may then be uncritically incorporated into decisions at the local level.

In fairness, Wittemyer *et al.* (2008a) do suggest that further research is necessary, and their analysis did open a space for dialogue on this issue. But, it is important to recognise that their claims may take on a life and a power of their own. As Luciano suggests, expert knowledge is privileged, despite many counter-examples, and becomes a discourse that can be utilised to delegitimise claims that stand in the way of or run counter to global-level interpretations of the relationship between PAs and human migrants.

CONCLUSION

The collection of papers that follows demonstrates that conservation policy makers and practitioners must maintain awareness of the local conditions driving (or preventing) migration to the edges of parks. The case studies utilise locally-based contextual data to illuminate serious shortcomings of relying on global data sets. It is only at this finer scale that we can begin: 1) taking into account local and national PA designations and national PA estates, 2) capturing the complex economic and social relations that may impede or facilitate migration to PA margins, and 3) formulating analyses that do not serve to disempower local populations, communities and polities.

Further, while Wittemyer *et al.* (2008a) have raised important questions regarding migration to the margins of PAs, we are skeptical of attempts to manage human relationships with parks and PAs based on global level data. To their credit, with their call to recognise the need for more contextualised research on the ways in which PAs interact with flows of human migration, they give credence to this fact as well.

We hope that the critiques of global level data and the insights provided by on-the-ground anthropological studies found in this collection are only the first step. We concur with Sutherland *et al.*'s (2009: 565) conclusion that analyses of the relationships between migration, PAs, and biodiversity are currently lacking, and that it is a critically important area of inquiry for biodiversity conservation. Systematic local-level analyses paired with more methodologically-sound global analyses (Joppa *et al.* 2009) are needed on these issues, and suggest that social scientists working in this area work together towards this end.

Only when we have these data in hand can we make more general conclusions about the roles that PAs may play in the population changes that Wittemyer *et al.* (2008a) hypothesise. We are aware that local-level, ethnographic data collection is likely to take considerable time, that national or regional statistics on population may be grossly inaccurate in some contexts, and that there may be significant opportunity costs involved in delaying conservation decisions (Grantham *et al.* 2009). We do not propose that the designation of conservation areas be necessarily delayed. We are arguing that conservation policy makers and PA managers should not rely on global data that may or may not apply to the local context; they should instead work more closely with social scientists to understand human population dynamics around PAs.

Notes

1. Many online blogs and conservation biology news sites uncritically replicated the hypotheses proposed by Wittemyer *et al.* (2008a). The discourse surrounding the Wittemyer *et al.* (2008a) paper on these sites typically asserts that PAs necessarily attract human migrants, often reflecting a perspective that humans are an inherent threat to biodiversity conservation (see Chagas 2008; Mongabay.com 2008; Wildbiology.com 2008; Wildlifeextra.com 2008).
2. Academic articles have also included the hypotheses stated in the paper's abstract uncritically. Urbina-Cardona & Loyola write that 'human population growth is much higher around protected area edges than in other rural areas' (2008: 429), offering Wittemyer *et al.* (2008a) as their sole citation. Balme *et al.* (2010: 7) employ the Wittemyer *et al.* (2008a) paper to make the blanket statement that 'human populations continue to increase around protected areas'. Another example is Winsheimer *et al.*'s (2010) statement about habitat for endangered amphibians in Ethiopia, saying '...these areas contain very few suitable habitats based on our findings. This is especially critical, as most of these remaining habitats lie at the edge of the protected zones where human population growth is higher than in other rural areas'. This is a particularly disingenuous example, as Ethiopia appears in Wittemyer *et al.*'s (2008a) analysis as one of the few cases in Africa where population was actually decreasing on the borders of PAs.
3. Impacts of the Wittemyer *et al.* (2008a) hypotheses can be seen in the realm of policy. Further, Wittemyer *et al.*'s (2008a) work was the subject of a public event in October 2008 at the Woodrow Wilson International Center for Scholars' Environmental Change and Security Program. Finally, Torquebiau & Taylor's (2009) report states, 'It was also found recently that protected areas can attract, rather than repel (as initially thought), human settlement at their edges, a fact which shows that such areas have a value for local people, but also highlights a real biodiversity threat, particularly if such biodiversity is contained within strictly protected areas (Wittemyer *et al.* 2008a)'. This report is a summary of a community-based natural resource management workshop in Niger, which clearly demonstrates that the ideas presented by Wittemyer *et al.* (2008a) are circulating back to the field.

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