Think before you plan: Introducing preplanning considerations in conservation

Erik Meijaard[1,2,3], Craig Leisher[4], Edward T. Game[2, 5] and **Craig Groves[6]**

[1]People and Nature Consulting International, Ciputat, Jakarta, 15412, Indonesia.
[2]School of Biological Sciences, University of Queensland, Brisbane, QLD 4072, Australia
[3]Center for International Forestry Research, PO Box 0113 BOCBD, Bogor 16000, Indonesia
[4]Central Science, The Nature Conservancy, Monson, ME, USA.
[5]Conservation Methods Team, The Nature Conservancy, South Brisbane 4101, Australia.
[6]Conservation Methods Team, The Nature Conservancy, Bozeman, MT, USA.

Corresponding author: Erik Meijaard, email: *emeijaard@gmail.com*

Abstrak

Selama dekade terakhir, konservasi mengalami transisi dari yang semula fokus utamanya pada tujuan yang terkait erat dengan ekologi atau keanekaragaman hayati kepada tujuan-tujuan yang lebih mempertimbangkan kepentingan masyarakat (misalnya: sosial, ekonomi dan politik). Meskipun masih banyak tantangan secara teknis dan logistic, perencanaan multi-sasaran dapat mendukung analisa konteks konservasi baru ini, karena masalah konservasi merupakan satu kompleksitas yang saling bertautan. Didalam proses perencanaan konservasi multi-sasaran, elemen yang seringkali diperhatikan secara berlebihan adalah tahap pra-perencanaan. Tahap dimana kebutuhan akan perencanaan dikaji, metode/alat perencanaan yang tepat dipilih, tingkat investasi perencanaan ditentukan, kajian menyeluruh atas potensi kondisi penghambat dilakukan untuk memastikan dukungan masyarakat. Kajian pra-perencanaan secara menyeluruh sebelum mengambil keputusan perlu tidaknya perencanaan dilanjutkan akan lebih baik untuk mengaitkan berbagai resiko kegiatan dengan pendekatan yang diambil, tingkat investasi, dan keberhasilan upaya konservasi. Penyelarasan ini juga kemungkinan akan menghasilkan lebih sedikit rencana konservasi yang diabaikan dan hanya disimpan sebagai dokumen saja.

Abstract

Over the past decades, conservation has transitioned from focusing primarily on ecological or biodiversity-oriented goals to increasing consideration of goals related to human well-being (e.g., social, economic, political). Multi-objective planning can support analysis of these new conservation contexts but remains logistically and technically challenging because of the inherent complexity of conservation problems. Within a multi-objective conservation planning process, an often-overlooked element is the pre-planning stage. This is where the need for planning is assessed, appropriate planning tools are selected, the level of planning investment determined, and a horizon scan of potential 'disabling conditions' is undertaken to ensure the societal context is supportive. Explicit pre-planning prior to making a decision about whether or not a planning effort should go ahead would better align project risks with approach, level of investment, and potential conservation rewards. It might also result in fewer shelved conservation plans.

Keywords: biodiversity, disabling conditions, multi-objective planning, opportunity costs, pre-planning, trade-offs

Introduction

What is conservation planning? For something that most conservation organizations talk about, the term has a surprising range of interpretations (Pressey & Bottrill, 2009). Since the 1990s, it is most commonly associated with systematic conservation planning (Margules & Pressey, 2000), which involves a sequence of steps in a planning process that includes the establishment of quantitative goals for representing a set of biodiversity features in a suite of conservation areas. Any particular definition of conservation planning aligns it with the context and scale in which conservation is going to take place. A narrow definition, for example, could fit a relative simple conservation plan, such as one

Received 3 April 2013; revision accepted 25 May 2013

that aims to diversify micro-habitats in a temperate woodland swamp with the goal of increasing diversity and population size of rare dragonfly species. In this case, conservation interventions focus on local ecological processes and are unlikely to have broader societal implications. More often, however, conservation challenges are more complex. In those cases, there is a need for a broader definition of conservation planning that takes into consideration that conservation interventions could impact a range of social, economic and ecological processes. In the context of the present paper, we define conservation planning as a logical process at varying spatial scales for: 1) determining the need, purpose, and costs of planning; 2) identifying the ecological and societal context or situation in which a conservation program or project will take place; 3) establishing multiple objectives and trade-offs among them; 4) evaluating alternative strategies for achieving these objectives (including their costs and benefits); and 5) selecting preferred strategies (actions designed to achieve a specific goal). Prior to the actual development of a plan, there need to be particular pre-planning considerations.

In the past decade, conservation planning has evolved into a distinct sub-discipline of conservation biology, with well-developed theories and methods. The discourse around conservation planning has included frequent calls for planning approaches that integrate the perceptions and aspirations of the people who are likely to be impacted by conservation intervention (Cowling & Pressey, 2003; Knight et al., 2006; Pierce et al., 2005; Theobald et al., 2000). Consideration of the potential trade-offs between conservation and human development has a long history in conservation planning. Some of the conservation planning conducted during the 1970s and 1980s actively promoted the integration of conservation goals with those of economic development and natural resource extraction (Margules & Usher, 1981). The scope and context of conservation planning expanded further in the 1990s with the attempted integration of conservation and economic development goals within projects—i.e., Integrated Conservation and Development Programs (ICDPs)—and an increase in the sophistication of planning approaches for doing so (Wells & Brandon, 1993). Evaluations, however, suggest that the purported win-win approach of this integration often fell short of the rhetoric (Chan et al., 2007; McShane et al., 2011; McShane & Newby, 2004; Spiteri & Nepal, 2006; Tallis et al., 2008; Weber et al., 2011). This suggests that reconciling conservation and development objectives requires better planning that includes, inter alia, improving understanding of the societal context of conservation (Knight et al., 2006; Perhans et al., 2008).

Recently, a group of conservation practitioners from a range of conservation organizations and academic institutions, including the authors of this paper, evaluated conservation planning practice within The Nature Conservancy (TNC)—the world's largest conservation NGO—and made a number of recommendations for improvement (Planning Evolution Team, 2011). Two important recommendations that are relevant to general conservation planning were to: 1) improve plan implementation by paying greater attention to the planning context before a plan is initiated; and 2) aim for greater rigor without greater investment in planning. Improving planning does not mean increasing the volume of planning; it means planning more efficiently and ensuring that it is appropriate to the particular circumstances.

In this paper, we build on these recommendations and outline several inherent challenges facing conservation organizations undertaking multi-objective planning, emphasize the need for a pre-planning phase, highlight several considerations in the pre-planning phase, and provide specific recommendations on pre-planning methods.

Challenges inherent in multi-objective conservation planning

The conservation community is increasingly working with other sectors of society, such as natural-resource industries (e.g., mining, timber, and fisheries) or people living in areas of environmental concern. Therefore, conservation initiatives often involve planning for a wide range of objectives, in addition to the specific

biodiversity or other conservation-oriented objectives. Yet predicting the influence of a conservation action on a biodiversity objective is a complex task. Conservation involves multiple interacting elements such as species, the physical environment, people, policies and regulations. Interactions between these elements are often non-linear, and small changes in one element can induce disproportionately major impacts in others (Snowden & Boone, 2007). Thus, multi-objective conservation planning needs a multiple criteria approach (Moffett & Sarkar, 2006), as well as consideration of non-linear relationships between components of a social-ecological system in which most conservation initiatives take place.

The inherent complexity also means that conservationists often fail to identify the potential conflicts among multiple objectives (Salafsky, 2011). One reason for this failure might be that it is not always clear under which circumstances objectives are conflicting. Oil palm plantations, for example, often impact local biodiversity negatively (Sheil et al., 2009), but whether or not biodiversity conservation and oil palm production have conflicting objectives depends on the ecological sensitivity of the area, the specific biodiversity elements involved, the size of the plantation, the alternatives to oil palm for producing vegetable oil, and the geographic scale at which the issue is assessed (Feintrenie et al., 2010; Meijaard & Sheil, 2013). In other words, local context frequently determines which objectives are in conflict and how trade-offs can vary across different temporal and spatial scales (ACSC, 2012). Solutions that are "win-win" will not always be possible (Sayer & Campbell, 2004).

Another challenge of multi-objective planning that includes socio-economic and ecological goals is that these goals increase the number of potential constraints. Understanding societal enabling and disabling conditions, such as market constraints, positive and negative economic incentives, and community resource management rights, becomes more important and challenging in multi-objective planning. Often programs are based on hopeful assumptions of political will, capacity, the ability to change behavior, and the eventual positive impact of the program, but "hope is not a planning tool" (Downes, 2012). Conservationists do not generally recognize the existence of situations in which positive outcomes are not possible unless key constraints are addressed—with a few exceptions (see Knight et al., 2010; Knight et al., 2011; McClanahan et al., 2008). In marine fisheries in the South China Sea, for example, resolving livelihood issues appears to be a prerequisite to solving fish conservation problems (Cheung & Sumaila, 2008). In Ghana, reducing the bush meat trade is constrained by a lack of sustainable fish supplies (Brashares et al., 2004). The mechanisms of failed conservation interventions are rarely reported (Knight, 2006; Redford & Taber, 2000), but in those cases in which they are, societal constraints are often important causes (Gibson & Marks, 1995; Knight et al., 2010; McClanahan et al., 2009; Webber et al., 2007; Wunder et al., 2008). In some cases, project failure and loss of conservation investment might have been avoided through rigorous assessments of disabling conditions.

Identifying disabling conditions requires reviews of societal and ecological conditions and trends (Cowling et al., 2008; Knight et al., 2006). Situation analyses or development of conceptual models (Conservation Measures Partnerships, 2007) involve such screening, however, these are generally only introduced after it has already been decided that a conservation plan is needed and conservation action will take place. Identifying and evaluating disabling conditions must be conducted before a conservation plan and strategies are developed.

The overlooked pre-planning phase

Prior to planning, a team should determine the best approach to planning and whether it is even needed. We consider such pre-planning to be different from the initial phase of conservation planning or "scoping" (Cowling & Wilhelm-Rechmann, 2007; Knight et al., 2006; Margoluis and Salafsky, 1998; Pressey & Bottrill, 2008, 2009). Such scoping is among others an obligatory component of the

Strategic Environmental Assessments that form the principal environmental planning framework in the OECD and many other countries (e.g., Australia, New Zealand, the U.S.A., and Canada). Scoping occurs when it has already been decided that planning will take place. Pre-planning, on the other hand, assesses explicitly whether a plan is needed and, if so, what type of plan will be best.

For consistency, planning efficiency, and a common language, conservation organizations like to standardize their conservation planning approaches. Standardized approaches can lead to overlooking specific local contexts in which planning and implementation may occur. Our review of conservation planning indicates that many conservation plans are unused because the planning and project contexts were poorly understood. Pre-planning requires that an open mind is maintained regarding the need for a plan, its scale (from simple to complex), potential audience, and the most suitable (rather than standard) method for developing the plan.

To illustrate our case for the need of a distinct pre-planning phase, we give an example from our own direct experience of the impact of insufficient consideration of planning and project contexts. Ecoregional Assessment is one of the standard methods that TNC and other conservation groups use to establish priorities for their conservation actions. This planning process assesses relatively large geographic areas delineated by large-scale patterns of climate, geology, biodiversity, and other ecological and environmental patterns. Several such assessments have been conducted in Indonesia, including, for East Kalimantan (Moore et al., 2003). Even though the resulting conservation prioritization patterns were insightful, the plans were not used to inform the choice of project areas, adapt land use plans or designate new protected areas. The reasons for the lack of take up of the plans vary, but one major factor is likely to be that decisions on land use and forest protection in Indonesia are more likely to be influenced by government regulations and socio-economic cost and benefits (McCarthy & Cramb, 2009), rather than ecological considerations. Such studies have consequently been put in place in Kalimantan, but a pre-planning phase might have identified the constraints of ecology-based planning up-front, and could have recommended incorporating the economic consequences of different land use options (for example, by looking at land use opportunity costs), and analyzing regional decision-making frameworks (how and by whom are decisions made?). The resulting plan could thus have had much more political relevance and might indeed have been used more effectively.

We reiterate that in a pre-planning phase two contexts should be evaluated:

Context of the plan. The first step of pre-planning is to consider the purpose of the plan, what decisions will come from it, and who will use the plan to make those decisions? Many conservation planners fail to ask the question of what they are planning for, and who will be accountable for and use the results. If such questions cannot be answered, a planning process ought to be terminated.

Context of the project. A second step in pre-planning focuses on the planning capacity of conservation staff and external stakeholders, the institutional complexity, the degree of stability in socio-ecological systems, the spatial context of the plan, the time and funding available for planning, and the particular requirements to include local, non-conservation objectives.

These pre-planning considerations should help determine whether actual planning should start, influence the choice of planning methods and tools, and guide the overall investment of time and resources into planning (Fig. 1). Discarding inappropriate and unsuitable standard planning approaches is difficult, because of the organizational tendencies to adhere to standard practices. Consequently, pre-planning should be done by people who are familiar with local contexts and are in positions to decide whether a project should be developed and which planning approaches should be used.

One constraint of implementing pre-planning is

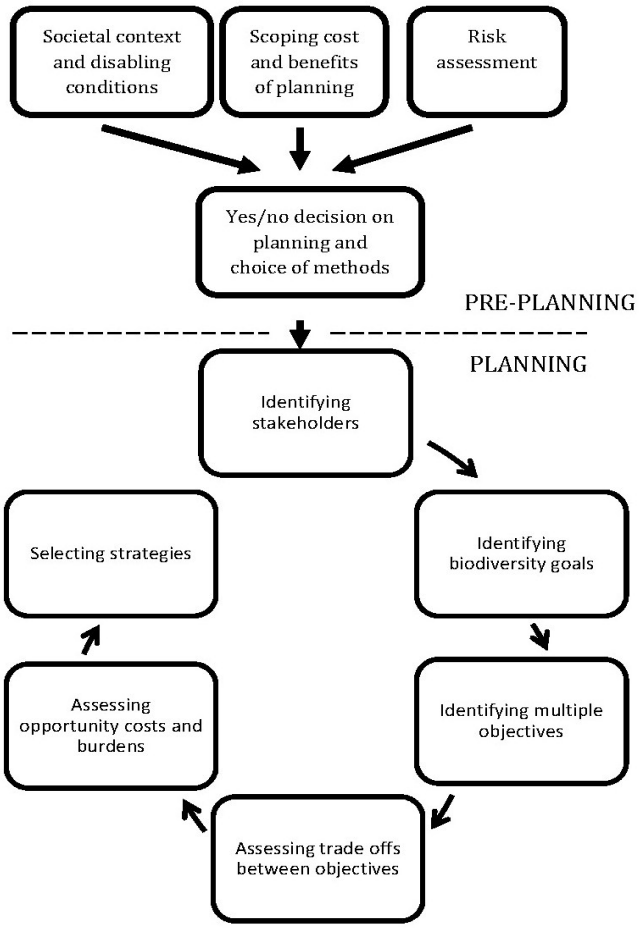

Figure 1. Schematic design of the conservation pre-planning and planning processes.

that project planning forms part of overall project management and is included in the project funding. Because pre-planning happens before commencing a project, it usually falls outside the normal donor funding cycles. Consequently, to save costs pre-planning should be undertaken quickly, for example using a simple checklist (Tab. 1) or other means of assessing planning and project feasibility as well as potential risks and rewards.

Pre-planning not only determines the context in which conservation planning will take place, it also indicates how much flexibility will be needed in planning. The idea of adaptive planning is reflected by Patton's (2011) suggestion that the heavy planning mode of "ready, aim, fire" might be less suitable than the "ready, fire, aim" approach. In some contexts it may be sufficient to propose a theory of change, and "avoid the tyranny of the project and logframe" (Keystone, 2012). Pre-planning is also designed to anticipate the likelihood of unforeseen events impacting the project negatively (i.e., a risk assessment) and suggest the type of planning approaches that allow for a suitable level of adaptability.

Considerations in the pre-planning phase

Here we highlight three contexts—biodiversity extents, opportunity costs, and conservation knowledge—which ought to be assessed in the pre-planning phase to determine the subsequent approach to planning. While there are other important contexts that could be considered in pre-planning too, we select these three because project planners often make assumptions (as part of standardized methodologies) about them. We use these three elements to illustrate how consideration of context may change the type of planning that should occur.

Biodiversity extent

Some landscapes are characterized by large and abundant areas of high conservation value (e.g., the Amazon Basin). Other areas have geographically localized regions of high conservation value in a broader landscape of low conservation value (e.g., the remaining forest patches on the Philippine islands). In between are a few fragmented landscapes of high conservation value (e.g., South Africa's Cape Floristic Region). Each requires different approaches to conservation planning. The initial conservation goal in areas of widespread conservation value is frequently to reduce the decline of biodiversity. Conservation gains can be made in one area or another with near equal benefits. In areas of widespread high conservation value, conservation planning might emphasize objectives relating to community support, political expedience, and maximizing broader conservation outcomes. Such situations are common in tropical countries where most of the world's biodiversity is concentrated (Hoffmann et al., 2010; Leadley et al., 2010). In areas where high conservation value sections are scarce or fragmented due to high human

population densities and high rates of habitat loss, the immediate goal is to secure as many fragments as possible and maximize their ecological integrity and connectivity at minimal cost. Strategic choices between different conservation fragments require trade-off analyses, especially as modified landscapes are correlated with high costs for effective conservation. Spatial prioritization tools are primarily focused on navigating the latter situation. The context in countries with widespread high conservation value should not preclude the use of sophisticated prioritization software (see Game et al., 2011; Meir et al., 2004), but the pre-planning phase should ensure that the objectives relevant to the decisions at hand, merit its use. If local political decision makers are not willing to integrate information from land-use optimization or ecoregional planning exercises into decision making, such planning exercises are futile and merely incur unnecessary expenditures.

Opportunity costs and burdens

Conservation may preclude land-use alternatives and thus create opportunity costs, i.e., the value of the most lucrative alternative not chosen. In poorer countries, conservation works partly on credit by foregoing current revenues from natural resource use for potential future gains, whereas in wealthier countries, capital is often provided up front, for example, for buying land or conservation easements. In both cases it is reasonable for conservation organizations to strive to minimize opportunity costs. However, in wealthier countries, an acceptable opportunity cost constitutes a broader societal decision and one that should be presented clearly in terms of what can be gained for a given level of incremental cost outlay (e.g., Game et al., 2008). In poorer countries, an acceptable opportunity cost is usually decided locally in a context that is heavily dependent on fine-scale variation in social adaptive capacity and environmental conditions (McClanahan et al., 2008). Pre-planning needs to anticipate that implementing conservation programs under variable opportunity costs may influence the support of people and institutions directly or indirectly associated with the project. To what degree are the people affected by the conservation interventions willing to forego earnings from the natural resources that conservation seeks to protect, and is the international conservation community willing to adequately compensate the affected people?

Conservation knowledge

Education levels are important predictors of conservation success (Jacobson, 2010; Launio et al., 2010; Waylen et al., 2010), and different levels of technical knowledge and scientific thinking need to be considered before choosing a conservation planning approach. If conservation organizations have to work with unfamiliar or complex planning tools and datasets that they do not fully understand, they will find it difficult to convince project stakeholders of the usefulness of the planning outcomes. One of us (CRG) experienced difficulties in getting program directors to accept "high-priority conservation areas" results generated with the help of decision support software, because the directors viewed it as a "black-box." The planning approach, therefore, needs to adapt to the local planning capacity, and how the results of planning are most effectively articulated (e.g., oral or written; top down or bottom up). Capacity assessment at the pre-planning stage stand a much better change of producing better planning outcomes.

Conclusions

Even in conservation projects that primarily focus on the singular objective of biodiversity conservation there is a well-known gap between planning and implementation (Knight et al., 2008). Conservation projects that are explicitly addressing multiple objectives, including those related to human well-being, are inherently more complex. While we believe that considering multiple objectives is a precondition for implementation, the increasing complexity also risks that planning becomes more abstract. We recommend that pre-planning processes

are introduced to understand how complexity and particular contexts affect planning and project implementation.

We recognize that pre-planning to some extent exists in conservation organizations and other organizations engaged in biodiversity conservation. Organizations make strategic assessments of the risks and potential rewards of investing in certain countries, regions, strategies, or new markets. Also at national and sub-national level, there are strategic organizational processes that assess these risks and rewards. We believe our pre-planning recommendations will add most value in the context analysis at project level, when it is possible to determine whether a project is going to fail or succeed. Subsequently, a pre-planning team can provide recommendations to accept or reject the project, the type of planning that should be considered, duration over which a project should be attempted before deciding to discontinue it, and the funding for the project. Whereas pre-planning may add to organizational bureaucracy, it will ultimately increase conservation performance by effectively aligning project risks, approaches, investments, and rewards. The key to successful incorporation of pre-planning is to keep it simple.

Acknowledgements

We thank J. Hämäläinen for his thoughts on multi-objective optimization in conservation, Carl Traeholt, Andrew Knight, Douglas Sheil, Sangeeta Mangubhai, and several anonymous reviewers for their comments on earlier versions of this paper, and Darmawan Liswanto for providing the abstract translation into Indonesian. The Schooner Foundation, Seth Neiman, and Harry and Shirley Hagey of the HRH Foundation provided the funding to make this paper possible.

References

ACSC (2012). Advancing Conservation in a Social Context. Working in a World of Trade-Offs. Conceptual Overview. http://www.tradeoffs.org/static/conceptualFramework.php. Accessed 3 October 2012.

Brashares, J.S., Arcese, P., Sam, M.K., Coppolillo, P.B., Sinclair, A.R.E. and A. Balmford (2004). Bushmeat Hunting, Wildlife Declines, and Fish Supply in West Africa. *Science* **306**:1180-1183.

Cannon, Summers, C.H.M., Harting, J.R. and P. J.A. Kessler (2007). Developing Conservation Priorities Based on Forest Type, Condition, and Threats in a Poorly Known Ecoregion: Sulawesi, Indonesia. *Biotropica* **39**:747-759.

Chan, K. M. A., Pringle, R.M., Ranganatran, J., Boggs, C.L., Chan, Y.L., Ehrlich, P.R., Haff, P.K., Heller, N.E., Al-Krafaji, K. and D.P. Macmynowski (2007). When agendas collide: Human welfare and biological conservation. *Conservation Biology* **21**:59-68.

Cheung, W.W.L., and U.R. Sumaila (2008). Trade-offs between conservation and socio-economic objectives in managing a tropical marine ecosystem. *Ecological Economics* **66**:193-210.

Conservation Measures Partnerships (2007). Open Standards for the Practice of Conservation, Version 2.0.

Cowling, R.M., Egoh, B., Knight, A.T., Reyers, B., Rouget, M., Roux, D. and A.S. Welz (2008). An operational model for mainstreaming ecosystem services for implementation. *Proceedings of the National Academy of Sciences* **105**:9483-9488.

Cowling, R.M. and R.L. Pressey (2003). Introduction to systematic conservation planning in the Cape Floristic Region. *Biological Conservation* **112**:1-14.

Cowling, R.M., and A. Wilhelm-Rechmann (2007). Social assessment as a key to conservation success. *Oryx* **41**:135-136.

Downes, M. (2012). 'Hope is not a planning tool' —it is time to instil and accept a sense of realism in SSR programming. The Geneva Centre for the Democratic Control of Armed Forces. The International Security Sector Advisory Team Geneva, Switzerland.

Feintrenie, L., Chong, W.K. and P. Levang (2010). Why do Farmers Prefer Oil Palm? Lessons Learnt from Bungo District, Indonesia. *Small Scale Forestry* **9**:379-396.

Game, E.T., Lipsett-Moore, G., Hamilton, R., Peterson, N., Kereseka, J., Atu, W., Watts, M. and H.P. Possingham (2011). Informed opportunism for conservation planning in the Solomon Islands. *Conservation Letters* **4**:38-46.

Game, E. T., Watts, M.E., Wooldridge, S. and H.P. Possingham (2008). Planning for persistence in marine reserves: A question of catastrophic importance. *Ecological Applications* **18**:670-680.

Gibson, C.C. and S.A. Marks (1995). Transforming rural hunters into conservationists - an assessment of community-based wildlife management programs in Africa. *World Development* **23**:941-957.

Hoffmann, M., Hilton-Taylor, C., Angulo, A., Bohm, M., Brooks, T.M., Butchart, S.H.M., Carpenter, K. E., Chanson, J., Collen, B., Cox, N.A., Darwall, W.R.T., Dulvy, N.K., Harrison, L.R., Katariya,V., Pollock, C., Quader, M.S., Richman, N.I., Rodrigues, A.S.L., Tognelli, M.F., Vie, J.C., Aguiar, J.M., Allen, D.J., Allen, G.R., Amori, G., Ananjeva, N.B. and et al. (2010). The impact of conservation on the status of the world's vertebrates. *Science* **330**:1503-1509.

Jacobson, S.K. (2010). Effective Primate Conservation Education: Gaps and Opportunities. *American Journal of Primatology* **72**:414-419.

Keystone (2012). Developing a Theory of Change. A Framework for Accountability and Learning for Social Change. A Keystone Guide. Keystone, London, UK.

Knight, A.T. (2006). Failing but learning: writing the wrongs after Redford and Taber. *Conservation Biology* **20**:1312-1314.

Knight, A.T., Cowling, R.M. and B.M. Campbell (2006). An operational model for implementing conservation action. *Conservation Biology* **20**:408-419.

Knight, A.T., Cowling, R.M., Difford, M. and B. M. Campbell (2010). Mapping human and social dimensions of conservation opportunity for the scheduling of conservation action on private land. *Conservation Biology* **24**:1348-1358.

Knight, A.T., Cowling, R.M., Rouget, M., Balmford, A., Lombard, A.T. and B. Campbell (2008). Knowing but not doing: Selecting priority conservation areas and the research-implementation gap. *Conservation Biology* **22**:610-617.

Knight, A.T., Grantham, H., Smith, R.J., McGregor, G.K., Possingham, H.P. and R.M. Cowling (2011). Land manager willingness-to-sell defines conservation opportunity for protected area expansion. *Biological Conservation* **144**:2623-2630.

Launio, C.C., Morooka, Y., Aizaki, H. and Y. Iiguni (2010). Perceptions of small-scale fishermen on the value of marine resources and protected areas: case of Claveria, Northern Philippines. International *Journal of Sustainable Development and World Ecology* **17**:401-409.

Leadley, P., Pereira, H.M., Alkemade, R., Fernandez-Manjarrés, J.F., Proença, V., Scharlemann, J.P.W. and M.J. Walpole (2010). Biodiversity Scenarios: Projections of 21st century change in biodiversity and associated ecosystem services. CBD Technical Series no. 50. Page 132 Secretariat of the Convention on Biological Diversity, Montreal, Canada.

Margoluis, R. and N. Salafsky (1998). Measures of Success: Designing, Managing and Monitoring Conservation and Development Projects. Island Press, Washington, D.C., U.S.A.

Margules, C. and M.B. Usher (1981). Criteria used in assessing wildlife conservation value: A review. *Biological Conservation* **21**:79-109.

Margules, C.R. and R.L. Pressey (2000). Systematic conservation planning. *Nature* **405**:243-253.

McCarthy, J.F. and R.A. Cramb (2009). Policy narratives, landholder engagement, and oil palm expansion on the Malaysian and Indonesian frontiers. *Geographical Journal* **175**:112-123.

McClanahan, T.R., Cinner, J.E., Graham, N.A.J., Daw, T.M., Maina, J., Stead, S.M., Wamukota, A., Brown, K., Venus, V. and N.V.C. Polunin (2009). Identifying reefs of hope and hopeful actions: Contextualizing environmental, ecological, and social parameters to respond effectively to climate change. *Conservation Biology* **23**:662-671.

McClanahan, T.R., Cinner, J.E., Maina, J., Graham, N.A.J., Daw, T.M., Stead, S.M., Wamukotav, A., Brown, K., Ateweberhan, M., Venus, V. and N.V.C. Polunin (2008). Conservation action in a changing climate. *Conservation Letters* **1**:53-59.

McShane, T.O., Hirsch, P.D., Trung, T.C., Songorwa, A.N., Kinzig, A., Monteferri, B., Mutekanga, D., Thang, H.V., Dammert, J.L., Pulgar-Vidal, M., Welch-Devine, M., Brosius, J. P., Coppolillo, P. and S. O'Connor (2011). Hard choices: Making trade-offs between biodiversity conservation and human well-being. *Biological Conservation* **144**:966-972.

McShane, T.O. and S.A. Newby (2004). Expecting the unattainable: the assumptions behind ICDPs. Pages 49-74 in T. O. McShane, and M. P. Wells, editors. Getting biodiversity projects to work: towards more effective conservation and development. Columbia University Press, New York.

Meijaard, E. and D. Sheil (2013). Oil palm and biodiversity. *Encyclopedia of Biodiversity* **5**:600-612.

Meir, E., Andelman, S. and H.P. Possingham (2004). Does conservation planning matter in a dynamic and uncertain world? *Ecology Letters* **7**:615-622.

Moffett, A., and S. Sarkar (2006). Incorporating multiple criteria into the design of conservation area networks: a minireview with recommendations. *Diversity and Distributions* **12**:125-137.

Moore, J.C., Kitchener, D.J., Salim, A., Pollard, E.H.B. and S.A. Stanley (2003). Ecoregional assessment of biological diversity conservation in East Kalimantan, Indonesia. The Nature Conservancy Indonesia Programme, Samarinda, Indonesia.

Patton, M.Q. (2011). Developmental Evaluation. Applying Complexity Concepts to Enhance Innovation and Use The Guilford Press, New York and London.

Perhans, K., Kindstrand, C., Boman, M., Djupstrom, L. B., Gustafsson, L., Mattsson, L., Schroeder, L.M., Weslien, J. and S. Wikberg (2008). Conservation goals and the relative importance of costs and benefits in reserve selection. *Conservation Biology* **22**:1331-1339.

Pierce, S.M., Cowling, R.M., Knight, A.T., Lombard, A.T., Rouget, M. and T. Wolf (2005). Systematic conservation planning products for land-use planning: interpretation for implementation. *Biological Conservation* **125**:441-458.

Planning Evolution Team (2011). Planning for Tomorrow's Challenges: Recommendations of the Planning Evolution Team. The Nature Conservancy, Arlington, VA, U.S.A.

Pressey, R.L. and M.C. Bottrill (2008). Opportunism, Threats, and the Evolution of Systematic Conservation Planning. *Conservation Biology* **22**:1340-1345.

Pressey, R. L. and M. C. Bottrill (2009). Approaches to landscape- and seascape-scale conservation planning: convergence, contrasts and challenges. *Oryx* **43**:464-475.

Redford, K.H. and A. Taber (2000). Writing the wrongs: Developing a safe-fail culture in conservation. *Conservation Biology* **14**:1567-1568.

Salafsky, N. (2011). Integrating development with conservation A means to a conservation end, or a mean end to conservation? *Biological Conservation* **144**:973-978.

Sayer, J., and B. Campbell (2004). The science of sustainable development. Cambridge University Press, Cambridge, United Kingdom.

Sheil, D., Casson, A., Meijaard, E., van Noordwijk, M., Gaskell, J., Sunderland-Groves, J., Wertz, K. and M. Kanninen (2009). The impacts and opportunities of oil palm in Southeast Asia. What do we know and what do we need to know? *CIFOR Occasional Paper* **no. 51**.

Snowden, D.J. and M.E. Boone (2007). A leaders framework for decision making - Wise executives tailor their approach to fit the complexity of the circumstances they face. *Harvard Business Review* **85**:68-+.

Spiteri, A. and S.K. Nepal (2006). Incentive-based conservation programs in developing countries: A review of some key issues and suggestions for improvements. *Environmental Management* **37**:1-14.

Tallis, H., Kareiva, P., Marvier, M. and A. Chang (2008). An ecosystem services framework to support both practical conservation and economic development. *Proceedings of the National Academy of Sciences* **105**:9457-9464.

Theobald, D.M., Hobbs, N.T., Bearly, T., Zack, J. A., Shenk, T. and W.E. Riebsame (2000). Incorporating biological information in local land-use decision making: Designing a system for conservation planning. *Landscape Ecology* **15**:35-45.

Waylen, K.A., Fischer, A., McGowan, P. J. K., Thirgood, S.J. and E.J. Milner-Gulland (2010). Effect of Local Cultural Context on the Success of Community-Based Conservation Interventions. *Conservation Biology* **24**:1119-1129.

Webber, A.D., Hill, C.M. and V. Reynolds (2007). Assessing the failure of a community-based human-wildlife conflict mitigation project in Budongo Forest Reserve, Uganda. *Oryx* **41**:177-184.

Weber, J.G., Sills, E.O., Bauch, S. and S.K. Pattanayak (2011). Do ICDPs Work? An Empirical Evaluation of Forest-Based Microenterprises in the Brazilian Amazon. *Land Economics* **87**:661-681.

Wells, M. and K. Brandon (1993). The principles and practice of buffer zones and localparticipation in biodiversity conservation. *Ambio Special Report* **22**:157-162.

Wunder, S., Campbell, B., Frost, P.G.H., Sayer, J.A., Iwan, R. and L. Wollenberg (2008). When Donors Get Cold Feet: the Community Conservation Concession in Setulang (Kalimantan, Indonesia) that Never Happened - art. no. 12. *Ecology and Society* **13**:12.

Table 1. A checklist of relevant questions that could be asked during the pre-planning phase and their possible answers and conclusions. This list is not meant to be exhaustive, but provides guidance as to what could be considered during pre-planning.

Relevant questions	Possible answers	Possible conclusions
Why is the plan needed?	Because we have no idea what to do.	You need a plan, or a review of the rationale of your work.
	We know what to do, but everyone else tells us that a plan is needed.	You might only need a simple plan that formalizes what you already know.
	Because we need to develop a coherent approach to solving the problems identified.	A detailed planning process with stakeholders may be warranted.
Who will be accountable for and use the results of the plan?	Ourselves	The plan is primarily for internal communication and guidance.
	Government	Link to existing government plans, and assess trade-offs with conservation. Keep it simple.
	Local communities	Ask them whether they want a plan; what should be planned for and over what timescales.
Does it make a difference where investments are made in terms of conservation value?	No, any site we choose would have high conservation value, or conservation values do not feature in local land use decisions.	Spatial prioritization planning might not be the most useful planning tool.
	Yes, some sites have much higher conservation values than others and are locally appreciated.	Spatial prioritization planning might be useful.
How are decisions about conservation values made in the area of interest?	Top-down, power-based	Plan for conservation trade-offs most relevant to decision makers.
	Bottom-up, democracy-based	Plan for conservation trade-offs most relevant to a local public that ultimately drives decisions.
	Informed by science and rational thinking	Use one of the many scientific conservation planning tools.
Are there any obvious enabling or disabling conditions?	There are certain factors that make it unlikely that conservation will work.	Focus planning on addressing disabling conditions rather than trying to achieve impossible conservation goals.
	Local factors such as public support make it likely that conservation will work.	Focus on bottom up planning that involves local stakeholders.
Are there any obvious risks to our project's success?	Yes, but the potential gains outweigh the risks.	Proceed with standard planning approaches.
	Yes, the risks of failure are very high.	Reconsider whether a plan is useful, or focus plan on minimizing risks or maximizing leverage from success.
	No, there are minimal risks.	Recheck the risk assumptions.
Do existing plans (including by other organizations) fully or partly fulfill planning needs?	Yes, existing plans are useful.	Consider how existing plans can be incorporated and assess what the take up of those plans has been.
	No, there are no other useful plans	Consider why there are no other plans (lack of data) and how these reasons could affect present planning processes.
How does data availability relate to data needs for planning?	There are sufficient data for present planning needs.	Choose planning method that is in line with data availability.
	Planning may be data-limited	Consider whether an investment in data gathering is worthwhile investment, or choose a planning tool that uses data that are easily obtained, reliable and readily available.