



A regulation-based classification system for marine protected areas: A response to Dudley et al. [9]



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ABSTRACT

Dudley et al. [9] commented on our paper [11], arguing that the current IUCN objective-based categorization of protected areas, which is also used in marine protected areas (MPAs), should not be abandoned and replaced by the new regulation-based classification system [11]. Here we clarify that we do not advocate replacing the current IUCN categories, but highlight the benefits of using both the objective-based IUCN categories and the new regulation-based classification when applied to MPAs. With an increasing number of MPA types being implemented, most of them multiple-use areas zoned for various purposes, assessing ecological and socio-economic benefits is key for advancing conservation targets and policy objectives. Although the IUCN categories can be used both in terrestrial and marine systems, they were not designed to follow a gradient of impacts and there is often a mismatch between stated objectives and implemented regulations. The new regulation-based classification system addresses these problems by linking impacts of activities in marine systems with MPA and zone classes in a simple and globally applicable way. Applying both the IUCN categories and the regulation-based classes will increase transparency when assessing marine conservation goals.

Dudley et al. [9] commented on our new regulation-based classification system for marine protected areas [11], arguing that there are strong reasons to stick with the current IUCN categorization system which followed a wide participation process that was backed by a motion at the IUCN congress and should, therefore, not be casually abandoned. Dudley et al. [9] raised the following concerns: 1. a classification system for protected areas should encompass both terrestrial and marine habitats and therefore a common classification is preferable; 2. the regulation-based classification will bring further complexity due to the requirements of additional data gathering; 3. this new classification is mainly focused on fishing, failing to incorporate tourism, ecosystem services or conservation of particular species or features.

In Horta e Costa et al. [11], a regulation-based classification system for marine protected areas (MPAs) was developed, with the underlying assumption that implemented regulations are good proxies of impacts of activities on marine ecosystems. We understand that IUCN categories based on management objectives were developed, and further revised [6,8], through a wide participatory process by IUCN, and we

have not questioned the importance of identifying primary objectives of MPAs. Ideally, MPA objectives should dictate their design and management scheme and rules. However, with the rapid increase in MPA designations globally [3,7], there is often a disconnect between stated objectives and implemented regulations inside MPA boundaries [2,10] and a real danger of giving society a false sense of protection [1].

Dudley et al. [9] criticism of the regulation-based classification system does not challenge two critical facts: 1. IUCN categories were not designed to capture the variety of regulations within protected areas and therefore show a poor match to levels of impacts by activities in marine systems; 2. Most MPAs are multiple-use with different levels of protection inside their borders and the current IUCN categorization system shows difficulties when applying the 75% rule to MPAs containing multiple zones.

This calls for the need of having a simple and widely applicable classification system that is sensitive to both the levels of impacts of activities and the complexity of multi-use management in marine systems. Our new proposal aims to fill these gaps [11]. Having said that, nothing prevents the two types of classification from co-existing.

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In fact, we believe there are merits in having both the current IUCN objective-based categorization and the new regulation-based classification being used together to bring increased transparency to marine conservation goals.

The complementary nature of the objective-based categorization and the regulation-based classification needs therefore to be highlighted here. The objective-based categories are translating the aspirations behind the designation of a protected area with the primary objective driving the category ascribed to an area. They do not necessarily represent, however, an increased scale of naturalness [8]. Regulation-based classes represent the way objectives are translated into rules in the real world inside MPAs (and in each zone of those MPAs). Indeed, they reflect how the objectives that drove the MPA designation are expected to be achieved, and how they are supposed to scale-up in the case of multiple-use MPAs. Importantly, they represent an increased level of disturbance and incorporate cumulative levels of impacts in marine systems, both at the MPA level and also at the zone level inside multiple-use MPAs. Therefore, these two systems are complementary and measure different things.

We will now address the three main points raised by Dudley et al. [9] which are listed above, with a view to reinforce our argument that there are strong merits in the regulation-based classification when applied to MPAs and that both the IUCN categories and the regulation-based classes could be used in a complementary way.

1. A common classification for terrestrial and marine systems

Dudley et al. [9] defend the importance of using the same categories for marine and terrestrial protected areas. We understand the political arguments involved and the feasibility of using an objective-based system common to both marine and terrestrial protected areas, but it is widely recognised that ecological, genetic and evolutionary processes, as well as the nature and scale of human-induced impacts, are considerably different between terrestrial and marine systems [4,12]. This is also reflected in the fact that coastal MPAs adjacent to terrestrial areas have specific rules of management. Therefore, both the activities impacting marine systems and the regulations applied to those activities need a distinct approach [4] if one wants to measure effectiveness of conservation measures. So, we conclude that the existence of a global system based on protected areas' objectives would benefit from the regulation-based classification for MPAs and that this would not create confusion in the global policy arena, particularly if integrated or used in combination with the existing IUCN approach.

2. The challenge of generating accurate data

In this point Dudley et al. [9] recognize that IUCN categories can be misunderstood and deliberately or accidentally misassigned by countries and parties. They also state that introducing a new system that requires additional data gathering and calculation on a site by site basis will hinder progress.

In Horta e Costa et al. [11], we show that misclassification happens in many of the case-studies analysed. However, when we reassigned the categories ourselves following the IUCN guidelines to MPAs this improved the categorization. Nevertheless, a large variability persisted in each class when confronted with the levels of impacts of uses inside the MPAs (as expressed in MPA and zone scores). This confirmed that IUCN categories are not good proxies for impacts in marine systems and that, although no-take MPAs could be distinguished from partial protection areas, the latter ones were not distinguishable among themselves. This is a key issue since most MPAs are multiple-use at a global scale [5]. We agree that the problem of misclassification of IUCN categories in some MPAs can be in part due to how jurisdictions have chosen to apply the system (i.e. deliberate misidentification) but we argue that the regulation-based system can help shed light on the more

obvious examples of deliberate misidentification and therefore is a useful complement to the IUCN categories. Moreover, even if the misclassification problem persists in the global databases, due to difficulties of collaboration by countries and institutions, the regulation-based classification can be applied independently to each MPA in an objective way and allow meta-analysis of the global data to be performed by the global MPA community, which undoubtedly will increase the likelihood that those misclassifications will decrease.

We also agree with Dudley et al. [9] that the regulation-based classification system does not account for levels of fishing (e.g. fishing effort by gear) since such data is hard to come by even in the more developed countries. But by scoring gear types and non-fishing activities by their impacts in marine systems, this classification brings a tool to assess levels of disturbance that can then be compared with biological and socioeconomic effects of protection. The issue of illegal fishing, in our view, is not a subject related to the classification system but solely to the implementation of MPA rules.

The regulation-based classification system of MPAs does not require additional data collection and reporting since any given MPA (even if it is integrated in a larger coastal protected area encompassing both land and sea) has its respective management plan published or transmitted in some form. Such required information can usually be found in the published MPA regulations and objectives. Therefore, we do not agree that this system will hinder progress but, on the contrary, when used in complement to the IUCN objective-based system, it will bring important additional metrics to the table such as the expected levels of protection a given MPA will provide.

3. Failure to incorporate other activities besides fishing

Dudley et al. [9] suggest that the regulation-based classification system does not take into account multiple objectives that MPAs have. They criticize the focus given to fishing activities, which they state would prevent the inclusion of other activities as well as information on ecosystem services or management effectiveness.

We do not agree that the regulation-based classification prevents the integration of other uses. In fact, the decision tree and accompanied tables published with the paper [11] show how uses such as aquaculture, mining, other bottom impacting activities, and boating (for recreational activities such as diving), are integrated in ascribing the respective zone class within each MPA. Moreover, mitigating factors were incorporated in the scoring of the impacts, which originated the decision tree, thereby taking into account ecological, social and economic benefits.

It is not surprising to find out that fishing activities are the most important explanatory variable since, for instance, Boonzaier & Pauly [3] concluded that 84% of the total area of proposed and existing MPAs are only partially protected from fishing. However, the incorporation of multiple-uses is part of the regulation-based classification and allows its application to the wide range of different types of partial protected areas that occur worldwide. In our study [11], we found several cases of a multiple-use MPA which included zone classes ranging from 2 to 7 or from 1 to 6, and also a variety of zone types within MPAs, suggesting that the regulation-based classification can account for a myriad of possible designs. Moreover, in another study we found that biological effects follow the degree of impacts as predicted by the classification system, although weakly regulated areas do not provide benefits (unpublished data).

Information on ecosystem services and management effectiveness are indeed absent from the regulation-based classification, but are also not part of the IUCN categories. We recognize that such information should complement the assessment of ecological and socioeconomic effectiveness of MPAs but currently the available data does not allow to incorporate these aspects in a classification system.

We have been presenting this new classification in a number of international fora and directly to a few MPA managers, and the

reception has been enthusiastic since it fills a much-needed gap of assessing impacts of uses within MPAs by scoring those MPAs in a way that shows a strong correlation to the conservation objectives. We encourage the wider MPA community to apply this system and we believe that, with time, the merits of having a classification which is easily applied and sensitive to impacts on marine ecosystems will emerge. We are currently developing a web-based tool to allow any manager, practitioner, stakeholder or scientist to apply the regulation-based classification to any MPA. The great advantage of this system is that it is capable of evolving as more and better information on the impacts of activities on marine systems becomes available. It is also easily integrated in any international effort, such as those pursued by IUCN.

The above arguments make us confident that the regulation-based system is a robust, simple and globally applicable tool to assess the policy goals when designing and implementing MPAs. When used together with the current IUCN categories it would allow advancing our common conservation targets in a meaningful way.

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References

- [1] T. Agardy, J. Claudet, J.C. Day, ‘Dangerous targets’ revisited: old dangers in new contexts plague marine protected areas, *Aquat. Conserv.: Mar. Freshw. Ecosyst.* 26 (Suppl. 2) (2016) 7–23.
- [2] D. Al-Abdulrazzak, S.C. Trombulak, Classifying levels of protection in marine protected areas, *Mar. Policy* 36 (3) (2012) 576–582.
- [3] L. Boonzaier, D. Pauly, Marine protection targets: an updated assessment of global progress, *Oryx* 50 (2016) 27–35.
- [4] M.H. Carr, J.E. Neigel, J.A. Estes, S. Andelman, R.R. Warner, J.L. Largier, Comparing marine and terrestrial ecosystems: implications for the design of coastal marine reserves, *Ecol. Appl.* 13 (1) (2003) S90–S107.
- [5] M.J. Costello, B. Ballantine, Biodiversity conservation should focus on no-take Marine Reserves, *Trends Ecol. Evol.* 30 (9) (2015) 507–509.
- [6] J. Day, N. Dudley, M. Hockings, G. Holmes, D. Laffoley, S. Stolton, S. Wells, Guidelines for Applying the IUCN Protected Area Management Categories to Marine Protected Areas, IUCN, Gland, Switzerland, 2012.
- [7] R. Devillers, R.L. Pressey, A. Grech, J.N. Kittinger, G.J. Edgar, T. Ward, R. Watson, Reinventing residual reserves in the sea: are we favouring ease of establishment over need for protection?, *Aquat. Conserv.: Mar. Freshw. Ecosyst.* 25 (4) (2015) 480–504.
- [8] N. Dudley (Ed.) Guidelines for Applying Protected Area Management Categories, IUCN, Gland, Switzerland, 2008.
- [9] N. Dudley, J. Day, D. Laffoley, M. Hockings, S. Stolton, Defining marine protected areas: a response to Horta e Costa et al, *Mar. Policy* (2016) (in press).
- [10] J.A. Fitzsimons, Mislabeling marine protected areas and why it matters - a case study of Australia, *Conserv. Lett.* 4 (5) (2011) 340–345.
- [11] B. Horta e Costa, J. Claudet, G. Franco, K. Erzini, A. Caro, E.J. Gonçalves, A regulation-based classification system for marine protected areas (MPAs), *Mar. Policy* 72 (2016) 192–198.
- [12] R. Kearney, G. Farebrother, C.D. Buxton, P. Goodsell, How terrestrial management concepts have led to unrealistic expectations of marine protected areas, *Mar. Policy* 38 (2013) 304–311.