# A Critical Discussion of Existing Approaches for Deciding Local to Global Biodiversity Conservation Priorities

According to various studies, it is evident that the biodiversity threats are unevenly distributed. Owing to this effect, there have to be ways to minimize its loss, thus leading to the need for prioritization in conservation. The priorities are based on the existing vulnerability of biodiversity, including the proactive and reactive regions. Further, there has been a growing recognition of the deepening biodiversity extinction crisis that has necessitated the World Wildlife Fund and other relevant authorities to devise a prioritization mechanism of conservation that includes pinpointing priority regions and biodiversity hotspots that need urgent action (Gustafsson & Perhans 2010). Large water bodies have been outlined as biodiversity conservation hotspots. Further, a science-based and practical approach has been required for the decision and implementation of the biodiversity conservation priorities.

First, the identification of the conservation target needs to be done to help in devising prioritization strategies (Tingley et al. 2014). Therefore, biodiversity has been defined as the various living organisms that thrive in different ecological conditions as well as how they interact with each other while in their physical environments. Consequently, biodiversity is deemed to have three various components. The first one is composition, which is the structure and the function of the living organisms within it. Each of these elements is important for the determination and identification of conservation targets. The conservation targets and features of a conservation plan are used in the representation of the biodiversity of a region. As such, a target refers to particular goals that encompass conservation of specific objectives, including the preservation of precise percentages in various ecosystems (Squires et al. 2014). Due to the difficulty in the establishment of conservation strategies of every living organism in an area, scientists sought to identify a set of conservation strategies that best represent the biodiversity of a region. Although most places were not rich in information on various existing species, conservation targets had to be identified. Besides, there was the identification of ecosystems, abiotic goals, and other species that were likely not covered under the two categories.

Moreover, the communities and ecosystems of a species are better determinants of the strategies that are geared towards deciding conservation priority targets. Communities are defined as an assembly of classes that interact and contain a degree of consistency as well as predictability. Therefore, an ecosystem puts into consideration the interactions that occur within the species that exist in a community (Mantyka-Pringle et al. 2016). Ecosystems can serve the primary purpose of identifying the more exquisite details that are found in the biological organizations of a population. As such, it is easy to identify the priorities of conservation within a locality. Further, the remote sensing imagery approach could be employed to help in the collection of relevant information pertaining communities and ecosystems that are based on existing dominant vegetation. Precisely, the establishment of the communities that need urgent conservation is done and implemented, thus leading to the prioritization of conservation strategies in the local and global regions. A hierarchical classification system that takes into account the physiognomic criteria for the upper levels of living organisms and floristic criteria at lower standards can be implemented. This approach implies that the more exceptional classification levels that are difficult to detect using remote sensing technology are less useful in the local and global conservancy (Snäll et al. 2016). The classification structure may undergo modification so that it can become suitable for all geographic areas and be detectable by remote sensing technology as well.

Abiotic targets are other approaches that can be used in the identification of areas that may need to be prioritized in the implementation of conservation strategies. Notably, there has been a notable increase in the availability of regional, global, and national data sets on various environmental variables, which have made the variables excellent targets for conservation planning (Whitehead et al. 2014). The approach applies to global and local areas that contain a scarcity of biological information. A classification system that targeted landscapes was formed to be used in many countries that had been derived from abiotic factors. As such, the system became adopted as a surrogate for biodiversity in the assessment of the extent to which areas in New South Wales acted as a representative of the biodiversity of the state. Further, the combination of biotic and abiotic factors resulted in a conservation system that was more representative of the various regional biodiversity. A classification that was developed by TNC for freshwater ecosystems also proved to be useful in the determination of establishment of conservation priorities (Sutton & Armsworth 2014). Furthermore, most classification systems in the marine environment have been based on combining both biotic and abiotic factors. With that connection, communities in need of urgent conservation strategies are identified. In most aquatic situations, there is a lack of readily available biological information. However, both the biotic and abiotic units are collectively referred to as habitats. Therefore, the selection of areas that need to be prioritized in the marine environment is the use of habitats as well as the various ecological processes that are deemed useful in sustaining the habitats.

Species is another consideration used to determine areas that need conservation priorities to be implemented. Although several species are useful in the management and conservation, this effect may be attributed to their scarcity and habitat specificity. Additionally, if the approach of focus on community is used, it is less likely to become beneficial to such species as they will be faced with the possibilities of becoming distinct (Larson et al. 2014). As such, there has been the rise of the need to give such species more attention in the scientific literature, which has also been faced with criticism as well. The emphasis of this approach of using species to determine the local and global conservation priorities focuses on the need to ensure that some species that need special conditions to survive do not become extinct. The approach seeks to establish species friendly habitats with excellent conditions to thrive, thus prolonging the lives of the biotic life that could otherwise be faced with extinction challenges. This approach emphasizes jeopardized and endangered species as conservation targets that need to be given priorities in any conservation mechanisms so that it can enable them to thrive and continue surviving. Further, the available rampant and essential species of living organisms are also covered in this category by being classified as conservation targets. Additionally, there are bedrock species that also form a part of the biotic life in an environment. Such living organisms including the starfish are bound to thrive only in specific habitats and otherwise face distinction with the destruction of their ecosystems, thus leading to the need for efforts to prioritize them in the implementation of conservation strategies (Bunting et al. 2015). Moreover, keystone species are essential to the functioning of ecosystems that cannot be disregarded.

The collection of information and identifying further any available information gaps is another approach in the determination of biodiversity conservation areas. Conservation plans for both local and global regions need a variety of data and information that may include human population trends as well as land ownership patterns that help in the identification of vulnerable conservation targets. Further, there is also the need for identification of environmental and biological information regarding the availability and targeted conservation areas. Most of the useful information is readily available on the internet as well as in the open digital sources. It is crucial that in laying out of conservation, priorities take into account the information from all available sources since one may be lacking critical information that could be necessary for a conservation strategy to be developed. Moreover, some techniques have taken up the implementation of remote image sensing that it provides critical information that could be lacking any available sources (Tuanmu & Jetz 2015). Furthermore, the consultations that occur in workplaces between experts of conservation strategies have also proved to be essential tools in the filling of information gaps for both local and global establishment of conservation priorities. In the quest of gathering enough information on conservation plans, biological inventions that are cost-effective have been considered and deemed to provide accurate information as compared to other sources about conservation planning. However, there have been evident shortcomings in the assumptions and additional speculated information that is hardly implemented. Owing to this reason, there is a need for the planners to anticipate such challenges and devise ways of dealing with them accordingly.

The establishment of conservation goals is yet another approach that can be used to provide a guide towards setting conservation priorities. Therefore, planners need to find out how much of the various targets should be conserved as well as the distribution of the targets within the conservation region (Panfil & Harvey 2015). The effectiveness of a proposed conservation system can be evaluated using the attainable goals by finding out whether the proposed areas cover the targets under consideration. Moreover, conservation goals will act to offer the much-needed guidance to planners and implementers of strategy who will establish a balance between the demands for land and water resources that need conservation priorities. Additionally, having realistic goals will ensure that the number of conservation areas that contain the targets is well covered and prioritized. Even though there are no outlined steps that should be followed in the setting up of conservation targets, it is quite challenging to choose the populations that should be considered for conservation strategy prioritization. It is vital that conservation goals cover a representation component that shows the percentage of the target that needs to be prioritized and covered by a conservation strategy. At the same time, there is also a need for conservation goals to ensure that all environmental gradients are included in the quest to establish regions of conservation strategy prioritization (Bunting et al. 2015). However, the process of setting up conservation goals is faced with numerous challenges, and there is the need for biologists and planners to consider setting numeric goals for various targets as numerals tend to provide reasonable estimates of targets for prioritization during planning.

Furthermore, the existing environmental conservation areas should be assessed, and their biodiversity values recorded as well. This approach will in the end help in determining the available biological features in various environments that may need the implementation of conservation strategies. It is a common misconception that resource areas including parks and marine regions are protected; and therefore, may not need the execution of any conservation strategy (Panfil & Harvey 2015). However, there has been the need to put more efforts to the conservation of the biodiversity by prioritizing their conservation management and strategy implementation. Due to the limitation of resources that are devoted to the preservation of biodiversity, it is vital that priority is given to the targets within the areas. Further, the assessment of the extent to which the already existing conservation areas have taken into consideration the achievable goals is mandatory. It has also been observed that the conservation areas that do not represent the target population would require an upgrade in totality to cover the endangered species of animals and vegetation types that are threatened with extinction (Pimm et al. 2014). As such, the assessment will provide detailed analyses of the areas that are permanently protected from conversion to status to those that have no implementation strategy that seeks to conserve the available targets. If there are lands that fall under the former, they are considered to have an adequate conservation management strategy in place. Therefore, it is anticipated that the assessment process will provide details of areas that are well conserved to those that contain target species but are in need of a conservation strategy implementation. Furthermore, planners will be well equipped with the areas where prioritization of available conservation strategy should be exercised.

Another approach is the evaluation of the ability of conservation targets to persist, which involves establishing whether there is a possibility of the target populations to continue in the long term. If the biotic life under consideration is a particular species, then population viability analyses are useful in the determination of whether they will remain reproductive over prolonged periods. However, it is vital to note that this approach may only be fruitful when a smaller group of species is under consideration. In cases of larger populations or entire ecosystems, the factors that cause disturbances are put into an account and in the determination of survival of the available species. Further, research on the size of the habitats of the species and their sufficiency in the provision of suitable survivability conditions should be conducted. A recommended approach to the determination of the ability of a species to persist in the use of a qualitative ranking system that takes into consideration the size, condition and the area that is inhabited by the species under consideration (Sutton & Armsworth 2014). Further, it should be noted that the size takes into account the region that is occupied by a species as well as the number of individuals belonging to a particular species that inhabit the area. At the same time, the condition encompasses the structure and biotic relationships of the species that exist within a region. The state of a population can also take into account the reproductive structure as well as predation and disease vulnerabilities. Therefore, the formation of a landscape involves the dominance of biological structures that help in the maintenance of a balance between a particular species’ survival and the surroundings, which provides a conducive environment for dispersal, migration, and movement of species to adjacent habitats to meet their survival needs.

The assembly of a portfolio of conservation areas serves in helping to determine areas that need conservation strategy prioritization as well. This approach follows the assessment results of persistence and the data collected on conservation targets. In this case, computerized algorithms using Geographical Information Systems are useful (Metcalfe et al. 2015). With algorithms, the problem in prioritizing conservation strategy is broken down into straightforward issues that will help in the challenging process of choosing a conservation area that meets the general target-based goals. To overcome the challenge, many algorithms have been developed that aid in the process while allowing planners to provide the characteristic rules for the chosen conservation areas. Hence, portfolios on various conservation areas can be easily identified, and each team presents their findings. The conservation planners will have an easy time as they will only need to identify the features of the conservation areas that they seek in an algorithm, which will then present them with areas that need to have priority in the implementation of conservation strategies. Moreover, there is an increasing need to consider the design of a particular conservation strategy since such decisions must balance the desire to establish new conservation areas while maintaining and managing the already existing ones.

Additionally, the approaches listed above are all aimed at identification of areas that need to be prioritized in the implementation of conservation strategies. Some of the identified regions are in need of urgent conservation action due to the fear of extinction of its creatures while others are not. Therefore, the degree of current protection and threat and feasibility are among the factors in the criteria that will be used in setting up conservation priorities. A degree of stability shows how well the conserved regions are spread within the area. Areas that are not well represented will receive higher priorities while their conservation values are also calculated. The value represents the number of targets available for conservation as well as their diversity and ability to exist for extended periods. Areas that are deemed to have some conservation targets with a higher persistence probability over time are also given priority for conservation strategies over others. Further, the degree of threat to the biotic life in areas that need conservation is assessed and the higher the risks realized, the more top the priority of implementing conservation strategies in the regions (Gustafsson & Perhans 2010). Moreover, the feasibility is an important consideration that encompasses the ability of an organization to gain protections for an area and provide adequate funding for the staff who will be tasked to work to implement the strategies aimed at lessening dangerous threats that the biotic life faces.

Therefore, the representation is outlined as the most important approach to deciding the biodiversity conservation approaches as it uses the analogy of saving some resources for every available biotic life that needs conservation. As such, each population that is ranked as needing a priority over the others for conservation strategies are necessary to have portrayed resilience and showed their ability to persist over long periods of time (Patterson & Grundel 2014). Furthermore, conservation goals have been seen to be crucial in the determination of the areas that need conservation priority while assessment of the conditions is deemed necessary as well. The effective management of conservation areas cannot be disregarded as it plays a vital role in maintaining the already existing conservation areas while working towards the creation of new conservation areas regarding existing guidelines.

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