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COMMENTARY

Prospects and challenges coexist in China's new protected area system

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Abstract

Acting as a cornerstone in conserving biodiversity, protected areas (PAs) have played important roles in protecting the unique flora and fauna in China, yet a variety of issues have arisen, such as fragmented management, dispersed spatial pattern, and conflicts with socioeconomic development. To grapple with the problems associated with the current PA system, China is implementing nationwide institutional reforms by proposing a new coherent PA system with national parks as the main body. The reforms provide unprecedented opportunities to integrate the existing disjointed PAs into a unified and efficient system, and to meet international commitments. However, no previous experience is available for how to construct China's new national park system. We decipher how the institutional reforms would change China's PA system, and what the reforms can provide for China's PAs and biodiversity, as well as potential challenges. Importantly, China's PAs are stepping into a new era for nature conservation, with a strong hope to provide a quality environmental space for the rich and unique biodiversity.

Keywords Post-2020 global biodiversity targets · Biodiversity conservation · National park system · Nature reserve · Protected area

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Introduction

In light of the ongoing mass extinction of species, protected areas (PAs) act as a cornerstone in conserving global biodiversity (Liu et al. 2003; Watson et al. 2014). China is among the world's 12 megadiverse countries, harboring exceptionally rich and unique biodiversity, including nearly 3000 terrestrial vertebrates, of which > 640 species are endemic, and > 30,000 vascular plant species, about half of which are endemic (Jiang 2016; Liu et al. 2003). More than 20% of these vertebrate species are classified as threatened or endangered (Jiang 2016). Since establishment of the first Chinese nature reserve in 1956, > 18% of the land in China has been protected by > 12,000 PAs of 11 types, with nature reserves as the backbone of the PA system (Wu et al. 2020; Xu et al. 2019; You et al. 2018; Zhang et al. 2017). These PAs have played important roles in protecting the unique flora and fauna of China.

Problems in China's existing PAs

Although Chinese government agencies have accumulated rich experience in PA management over the last six decades, a variety of issues have arisen (Zhang et al. 2017). Among these issues, the fragmented management of different PAs has emerged as a core problem, with each PA being managed by one or more departments or agencies within the corresponding administrative area (Xu et al. 2019). Other major problems mainly arose from dispersed spatial pattern. Large geographic gaps and overlaps exist among different types of PAs due to an inappropriate spatial arrangement of the PA network. Many PAs have no explicit boundaries, and many have had ambiguous management objectives since their establishment. Conservation actions are difficult to implement due to administrative conflicts among multiple management agencies. Conflicts between biodiversity conservation and socioeconomic development are increasing (Wu et al. 2020; Xu et al. 2019). These problems are mainly attributed to the lack of both "top-level design" and "bottom-up participatory planning", disjointed categories, fragmented management, and insufficient regulations for PAs (Zhang et al. 2017).

Prospects for PA system reforms

After 60 years of rapid growth of Chinese PAs, especially between 1990 and 2000, the expansion has slowed down and China's central government has been initiating comprehensive reforms in its PA system (Xu et al. 2019). To grapple with the problems of overlapping designations and fragmented management, recent relevant institutional reforms (March 2018) have transferred administration of all Chinese PAs to the newly established National Forestry and Grassland Administration (NFGA, based on the previous State Forestry Administration). The Ministry of Ecology and Environment (previously the Ministry of Environmental Protection) no longer manages PAs, but has the authority of overseeing the management performance of all PAs (Xu et al. 2019). Meanwhile, the Ministry of Natural Resources was established to take charge of state-owned natural resources and assets, coordinating development and conservation while establishing PAs (Xu et al. 2019).

Along with the institutional reforms, a new coherent "PA system with national parks as the main body" has been proposed by the State Council, which announced the "Overall Plan for the Development of China's National Park System" in 2017 (http://www.gov.cn/zhengce/2017-09/26/content_5227713.htm). A national park is defined by IUCN as "Category II: Large natural or near natural areas set aside to protect large-scale ecological processes, along with the complement of species and ecosystems characteristic of the area, which also provide a foundation for environmentally and culturally compatible spiritual, scientific, educational, recreational and visitor opportunities" (IUCN 2020). National parks are a new type of PAs in China and are proposed to initiate institutional changes of the conservation management through nation-wide reforms of the governance system and management mechanism (He et al. 2018). This new PA system aims to integrate and optimize the current PAs of more than ten types under fuzzy classifications and fragmented management (Xu et al. 2019). Management of the national park system belongs to the NFGA, which also functions as the National Park Administration. Ten national parks have been designated as system pilots in China since 2015, and the construction of a new PA system is expected to be fully completed by 2035 (http://www.gov.cn/xinwen/2015-06/08/content_2875563.htm).

This moment can be one of unprecedented opportunities to integrate the existing PAs with fuzzy classifications and fragmented management into a unified, normative, and efficient management system (Xu et al. 2019). The PA reforms also present an opportunity for creating an integrated legal framework to regulate management performance of all PAs. Therefore, the new PA system would facilitate China's ability to meet international commitments, particularly the post-2020 Global Biodiversity Targets expected to be adopted in 2022 according to the 15th Conference of Parties (COP-15) held in Kunming in October, 2021 (https://www.cbd.int/conferences/post2020).

Challenges in establishing the national park system

Along with these positive prospects, constructing China's national park system presents unprecedented challenges (Xu et al. 2019). As national park is a new PA type in China, no previous experience is available. Jiang (2018) proposed two phases of establishment, i.e., firstly constructing large-area parks to integrate and optimize existing PAs, and then checking and filling gaps to focus on important species, and elements of cultural and natural heritage (Zhang et al. 2017). As PA management is an administrative issue, impactful, top-level design and legislation are needed for China's new PA system to perform smoothly. The new national park system would provide an opportunity for a new legislative framework to improve PA's management efficiency. Because PAs are subject to many continuously changing pressures (Naughton-Treves and Holland 2019), dynamic management should be obligatory for established parks (Jiang, 2018).

China's new national park system would be established on the basis of thousands existing PAs. These PAs have already seen considerable investment and development, playing indispensable roles in saving key species, ecosystems, elements of natural and cultural heritage, important geological relics, forest parks, and scenic spots (Jiang 2018; Zhang et al. 2017). The existing PAs need to be optimized and integrated into the new system with national parks as the main body, rather than to be replaced (Jiang 2018; Wu et al. 2020). Specifically, existing PAs inside new national parks should be repealed and integrated into

the newly established parks, whereas those outside parks should be maintained and can be reclassified as nature reserves or nature parks.

As an important step of constructing the new national park system, beginning in early 2020, China has been initiating a nationwide adjustment and optimization project regarding current PAs, to solve existing problems (http://www.china-npa.org/info/2835.jspx). The project aims to facilitate biodiversity conservation through adjusting spatial coverage, optimizing functional divisions of current PAs, and alleviating conflicts between conservation and socioeconomic development. Great enthusiasm has been expressed by local governments and management agencies for this project, and most provinces initiated the project immediately upon receiving official documents from corresponding ministries (http://lyj.ah.gov.cn/public/9913203/39646016.html). However, some local authorities misunderstood this project and were motivated by their wish that they would get more economic benefits after adjusting or even revoking PAs to reduce restrictions on economic development generated by nature conservation. Ironically, they had also shown great enthusiasm to establish the PAs during the initial stage because there would be financial supports from governments and possible economic benefits attracted by the reputation of PAs (Zhang et al. 2017). Many non-national and even some national level PAs were thus established in haste with ambiguous conservation objectives and no consideration of possible conflicts between nature conservation and local communities. As management of PAs is strengthened, local economic development is increasingly impeded by nature conservation, particularly since 2015 (Li et al. 2020). In this context, the present wishes of local management agencies to accomplish the adjustment and optimization project as soon as possible might go against the objectives of protection. Importantly, comprehensive scientific assessments are now required when adjusting and optimizing PAs, to avoid repeating problems.

Conflicts between nature conservation and local economic development are prevalent not only in existing PAs, but also in newly established national parks (Xu et al. 2019; Zhang et al. 2017). To resolve these conflicts, PAs should seek to provide opportunities for local livelihoods and promote the post-2020 Global Biodiversity Targets related to "Living in Harmony with Nature" (Jiang 2018). Most current PAs in China overlap spatially with populated areas, and local development sometimes has outmatched the public interest (Zhang et al. 2017); at times, the balance between nature conservation and local resource demands may be locked in unavoidable trade-offs (Andrade and Rhodes 2012). According to the IUCN definition, national parks not only protect "wilderness," but also support "spiritual, scientific, educational, recreational and visitor activities," providing an opportunity for compatibility between environment and culture (IUCN 2020). However, effective channels for indigenous people to express their interest claims and third-party supervision mechanisms are often lacking. Therefore, to avoid the barrier between PAs and local communities, the rights and interests of local residents should not be ignored when formulating and implementing conservation plans (Andrade and Rhodes 2012).

Conclusion

Taken together, China's PAs are stepping into a new era for nature conservation. To safeguard biodiversity and ecosystem benefits better with the new national park system, we suggest to, (1) clarify current fuzzy classifications and fragmented management of PAs; (2) create an integrated framework to regulate management of PAs using an "top-level design" and "bottom-up" approach; (3) optimize the spatial pattern of the PA network to reduce geographic overlaps and conservation gaps; (4) set an unambiguous management objective for each PA

based on scientific assessments; (5) consider benefits of local communities in conservation plans. Given that limited space is available for establishing new parks, and that biodiversity loss is irreversible, the new national park system should guarantee long-term security of natural ecosystem rather than only be a short-term project.

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