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Value Spillovers from Ecological Conservation Activities: A Case Study of Qinghai Lake Naked Carp Restocking

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Abstract

Ecological product value realization constitutes the practical pathway for transforming “lucid waters and lush mountains” into “mountains of gold and silver.” Current research predominantly concentrates on the “monetization” of immediate, concrete, and limited ecological products, rendering the exploration of how to achieve unlimited production of ecological products and value spillover a subject of considerable significance. Historically, ecological protection initiatives were exclusively undertaken by government and public welfare organizations; however, burgeoning public enthusiasm for participation in recent years has made it feasible to promote ecological protection activities themselves as ecological products capable of unlimited production and value spillover. The stocking of Qinghai Lake naked carp (*Gymnocypris przewalskii*) represents a critical measure for restoring its population, having demonstrated remarkable effectiveness over the past two decades. With the advancement of ecological civilization construction in the new era, transformations in the broader development paradigm, and improved resource conditions, facilitating value spillover from Qinghai Lake naked carp stocking has become viable: in terms of ecological value, it suppresses opportunities for alien species release and safeguards water ecological security red lines; in terms of social value, it satisfies the release demands of diverse ethnic groups and enhances public awareness of ecological protection; in terms of economic value, it creates eco-tourism landscapes for Qinghai Lake, bolsters tourism economic development, and effectively communicates the narrative of ecological civilization; and in terms of political construction, it contributes to demonstrating the integration of ecological civilization construction into everyday life.

Full Text

Preamble

Value Spillover from Ecological Conservation Activities: A Case Study of *Gymnocypris przewalskii* Stocking in Qinghai Lake

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Abstract: The value realization of ecological products represents the practical pathway for transforming “clear waters and green mountains” into “gold and silver mountains.” Current research predominantly focuses on monetizing specific and limited ecological products, yet how to achieve unlimited production of ecological products and spillover of their values warrants deeper exploration. Historically, ecological conservation actions were undertaken solely by governments and public institutions, but growing public enthusiasm for participation in recent years has made unlimited production and value spillover of these activities feasible. *Gymnocypris przewalskii* stocking in Qinghai Lake has served as a crucial measure for restoring the species’ population, demonstrating remarkable effectiveness over the past two decades. With the advancement of ecological civilization construction in the new era, shifts in development priorities, and improved resource conditions, creating value spillover from *Gymnocypris przewalskii* stocking has become possible: ecologically, it can suppress space for invasive species release and safeguard aquatic ecological security; socially, it can satisfy public demand for releasing activities while enhancing ecological awareness; economically, it can create ecotourism attractions that boost tourism development and tell the story of ecological civilization; and politically, it can demonstrate the integration of ecological civilization into daily life.

Keywords: *Gymnocypris przewalskii*; artificial breeding and releasing; development approach; ecological civilization construction

1. History and Effectiveness of In-Situ Conservation and Stocking of *Gymnocypris przewalskii*

The protection and restoration of *Gymnocypris przewalskii* natural resources have relied on two primary measures: in-situ conservation of wild populations and artificial breeding and releasing programs.

In-situ conservation has centered on lake closure policies and protection of migratory populations. The first fishing ban was implemented in 1982, limiting

catches to 4,000 tons for two years. Subsequent bans became increasingly stringent: 1986 limited catches to 2,000 tons for three years; 1994 reduced the limit to 700 tons for seven years; and 2001 initiated a complete ten-year fishing ban. The fifth ban in 2011 and sixth ban in 2021 each extended the complete prohibition for another decade. To protect migratory populations, local authorities began constructing fish passages in 2008, completing seven passages by 2015 that fully restored upstream migration routes. These measures, combined with water management prioritizing fish conservation, resolved conflicts between agricultural and ecological water needs.

Large-scale artificial breeding and releasing began in 2002. Due to natural constraints, the fertilization rate, hatching rate, and survival rate of naturally migrating and spawning populations remained low. The Qinghai Lake Naked Carp Rescue Center addressed this by artificially collecting eggs from migrating broodstock, conducting artificial fertilization and hatching, and raising the fish before release. This approach dramatically improved reproductive success rates. Over the past two decades, the center has released 220 million one-year-old *Gymnocypris przewalskii* into Qinghai Lake.

These combined efforts have yielded significant results. According to surveys using underwater sonar systems conducted by the Rescue Center and the Yangtze River Fisheries Research Institute since 2002, the resource volume of *Gymnocypris przewalskii* in Qinghai Lake has recovered from 2,592 tons in 2002 to 120,300 tons in 2023—representing 37.5% of the original 320,000-ton resource base. Population modeling indicates that stocking has contributed approximately 26% to this recovery, demonstrating the substantial achievements of sustained conservation efforts by Qinghai’s governments and the Rescue Center.

On June 8, 2021, during his inspection of Qinghai Lake, General Secretary Xi Jinping emphasized that “the achievements in ecological protection and environmental governance at Qinghai Lake have not come easily and must be cherished and continuously consolidated and expanded.” The protection and restoration of *Gymnocypris przewalskii* resources not only benefits the species itself but also supports the entire aquatic ecosystem health of Qinghai Lake and its “fish-bird symbiosis” system. While ensuring the recovery of *Gymnocypris przewalskii* resources, stocking activities also suppress space for invasive species release and maintain the red line of aquatic ecological security.

2.1 Sustained Importance and Rising Necessity of Stocking

As natural resources gradually recover, the importance of *Gymnocypris przewalskii* stocking for species rescue and population enhancement remains undiminished. Following large-scale exploitation beginning in 1958, overfishing and spawning ground degradation caused a sharp population decline. The species was listed as a second-level priority species in China’s Biodiversity Conservation Action Plan in 1994 and as endangered in the China Species Red List in 2004.

However, due to effective in-situ conservation and stocking efforts, the 2015 China Biodiversity Red List downgraded its status from endangered to vulnerable. With continued success, the 26% contribution rate of stocking to resource recovery is evident, making it inadvisable to reduce its importance before wild populations reach natural equilibrium.

Nevertheless, natural reproduction still faces risks, maintaining the necessity of stocking programs. Accelerated melting of alpine snow due to global warming has reduced river inflow during the critical June-August migration and spawning period since 2018, severely impacting migration, reproduction, and survival rates of both adults and larvae. Warning signs have emerged: migrating populations in the Shaliu River have declined significantly since 2019, and those in the Heima River began decreasing markedly in 2022. While the causes and long-term implications require further study, this trend cannot be ignored. Qinghai Lake's high-altitude, fragile ecosystem demands persistent conservation as the paramount responsibility.

2.2 Suppressing Invasive Species Release and Safeguarding Aquatic Ecological Security

From an ecological protection perspective, *Gymnocypris przewalskii* stocking restores natural resources; from a public participation perspective, it satisfies demand for releasing activities. Unregulated release of organisms has introduced invasive species to some water bodies, threatening ecological security. Influenced by cultural practices, some citizens have strong demand for releasing aquatic animals, but limited ecological knowledge often leads to indiscriminate purchase and release of non-native species. This results in either mortality of released organisms or, more concerning, establishment of invasive populations that compete for habitat and food, potentially causing ecological disasters.

Gymnocypris przewalskii stocking can accommodate and mobilize broad public participation, satisfying release demands while promoting regulated, scientific, and civilized practices. As a routine annual task implemented by the Rescue Center, incorporating public participation and providing free fish for release—combined with ecological education—can effectively guide citizens and significantly reduce unregulated invasive species releases, thereby contributing to native ecosystem protection.

3. Value Spillover of *Gymnocypris przewalskii* Stocking in the New Era

Entering a new development stage, Qinghai Province is exploring a high-quality development path with local characteristics, striving to build an international ecotourism destination and a national and international ecological civilization highland. As Qinghai leverages its natural resources to advance ecological civilization and transform “clear waters and green mountains” into “gold and silver mountains,” *Gymnocypris przewalskii* stocking can leverage its capacity for eco-

logical product generation and value spillover. By expanding its social activity attributes, enriching its value connotation, and exploring new forms based on local advantages, it can provide ecological services, satisfy public release demands, create social value, and drive economic development.

In 2018, General Secretary Xi Jinping stated at the National Ecological and Environmental Protection Conference that “we must actively respond to what the people think, hope for, and urgently need, vigorously promote ecological civilization construction, provide more quality ecological products, and continuously meet the people’s growing needs for a beautiful ecological environment.” Influenced by local culture, diverse ethnic groups around Qinghai Lake have strong demand and willingness to participate in release activities. Providing opportunities for public participation in *Gymnocypris przewalskii* stocking can satisfy these demands, promote ethnic harmony, and through educational components during stocking events, enhance public recognition and support for conservation efforts while raising ecological awareness—realizing social value spillover.

During a stocking event on July 1, 2022, at the Buha River in Tianjun County, local residents enthusiastically participated. After the release, when the transport truck became stuck in mud due to water spilled during fish transfer, participants spontaneously rolled up their trousers and worked together to push the vehicle out, then helped staff load equipment onto pickup trucks. This demonstrates how participation fosters support for conservation work.

Similarly, during a July 27, 2022 event at the Jirmeng River in Haibei, participants attentively listened to educational presentations and carefully viewed exhibition boards. Afterward, they spontaneously collected and removed garbage from the site (not generated by the event itself), applying their enhanced ecological awareness to practical action.

3.2 Creating Ecotourism Attractions and Telling Qinghai’s Ecological Civilization Story

“Qinghai’s greatest value, responsibility, and potential all lie in ecology.” Ecotourism has become a key component of Qinghai’s high-quality, green, low-carbon development path. The 14th Qinghai Provincial Party Congress report noted that “our unique resource endowment gives us prominent ecological status and advantages... cultural tourism has unlimited prospects.” As an ecological product generator, *Gymnocypris przewalskii* stocking can leverage its unique advantages to expand Qinghai Lake tourism from “lake viewing and bird watching” to “lake viewing, bird watching, fish appreciating, and fish releasing.” This integration of ecological conservation and cultural tourism creates multiplier effects, enhancing Qinghai Lake’s “ecological 名片” and enabling economic value spillover.

The Rescue Center annually releases 20 million *Gymnocypris przewalskii* under the provincial agriculture and rural affairs department’s mandate. While fulfilling this task, the center can transform stocking activities into free, partic-

ipatory ecotourism attractions that visitors spontaneously promote. Since its initiation in Gangcha County in 2006, this landscape-style stocking event has been held for 17 consecutive years, becoming a tourism 名片 for “Gangcha, the Highland Lakeside Tibetan Town.” With dedicated funding and systematic research on *Gymnocypris przewalskii* and Qinghai Lake, future efforts can leverage Gangcha’s geographic, environmental, ethnic, cultural, and tourism advantages to create an open, normalized, institutionalized, scientific, and standardized free participation program. This will attract and sustain public enthusiasm, gradually forming a 环湖 ecotourism landscape that further integrates geography, culture, tourism, and ecology, strengthening Qinghai’s international ecotourism destination appeal.

As participation mechanisms mature and scientific guidance improves, *Gymnocypris przewalskii* stocking could become a deep entry point and promotional 名片 for ecological civilization construction in Qinghai and even China. Modern tourists seek to learn new knowledge, gain new experiences, and share their journeys. Participation in stocking activities allows visitors to internalize ecological knowledge, spontaneously disseminate conservation awareness, and share meaningful, free ecotourism experiences. In China’s “everything is media” era, leveraging visitors’ self-media dissemination can effectively drive value realization and spillover.

3.3 Serving and Relying on the People to Demonstrate Ecological Civilization in Daily Life

Ecological civilization construction is not just the responsibility of specific departments but a common cause for all people. By serving and relying on the people, this cause can flourish. General Secretary Xi Jinping’s important speeches have clarified the requirement to build the Qinghai-Tibet Plateau into an ecological civilization highland. As a model conservation action and pioneer in Qinghai’s ecological civilization construction, *Gymnocypris przewalskii* stocking should adhere to the Party’s mass line, achieving political value spillover by demonstrating how ecological civilization can be integrated into daily life.

In the new era, facing new situations and tasks, Qinghai seeks innovation and transformation to build a national and international ecological civilization highland. *Gymnocypris przewalskii* stocking should also emancipate minds, seek innovation, and serve the broader development agenda by understanding its political value realization. It must recognize its role as a medium for ecological civilization concepts and a promotional identifier, accept its function as social life and sharing activity for the people, reposition itself from a government task to a public social activity, and envision its future as a conservation achievement, life element for local communities, annual ecological event, ecotourism 名片, and demonstration of ecological civilization in daily life.

Gymnocypris przewalskii stocking must be ambitious yet meticulous. Following new era requirements, the Rescue Center should: (1) fulfill government man-

dates by providing adequate fish for release; (2) assume primary responsibility while organizing co-hosting by local governments, departments, organizations, and social groups; (3) support free participation by residents and tourists while guiding environmental organizations and volunteers; (4) scientifically guide and encourage promotion by civil society, volunteer groups, tourism departments, residents, and tourists to spread positive energy and tell good stories; and (5) gradually achieve institutionalization (regular timing, locations, and quantities), standardization (clear procedures and content), ritualization (creating memorable experiences), openness (allowing all willing participants), and integration into daily life (making participation a regular habit), while effectively blending scientific, life, and entertainment elements.

Conclusion

The practice of the “clear waters and green mountains are gold and silver mountains” concept is key to the ecological civilization development paradigm, with ecological product value realization as its critical pathway. However, focusing on limited ecological products for value realization often feels constrained, with problems and obstacles everywhere. Viewing this from the higher perspective of unlimited ecological product production and value spillover may reveal a different landscape. Based on growing public recognition of conservation values and increasing desire for participation, this paper proposes that value spillover from ecological protection activities is an inevitable future trend, enabling incremental value realization.

The case analysis of *Gymnocypris przewalskii* stocking demonstrates significant ecological success in population recovery, broad public demand within the Qinghai Lake basin, and support for Qinghai’s international ecotourism destination goals. Promoting the socialization, openness, institutionalization, standardization, ritualization, and integration into daily life of *Gymnocypris przewalskii* stocking activities can enable value spillover across ecological security, social, economic, and political domains, achieving wins for ecological protection, social harmony, economic development, and political construction while driving regional high-quality sustainable development. These exploratory practices and experiences can provide valuable references for value spillover initiatives in other conservation actions and regions.

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