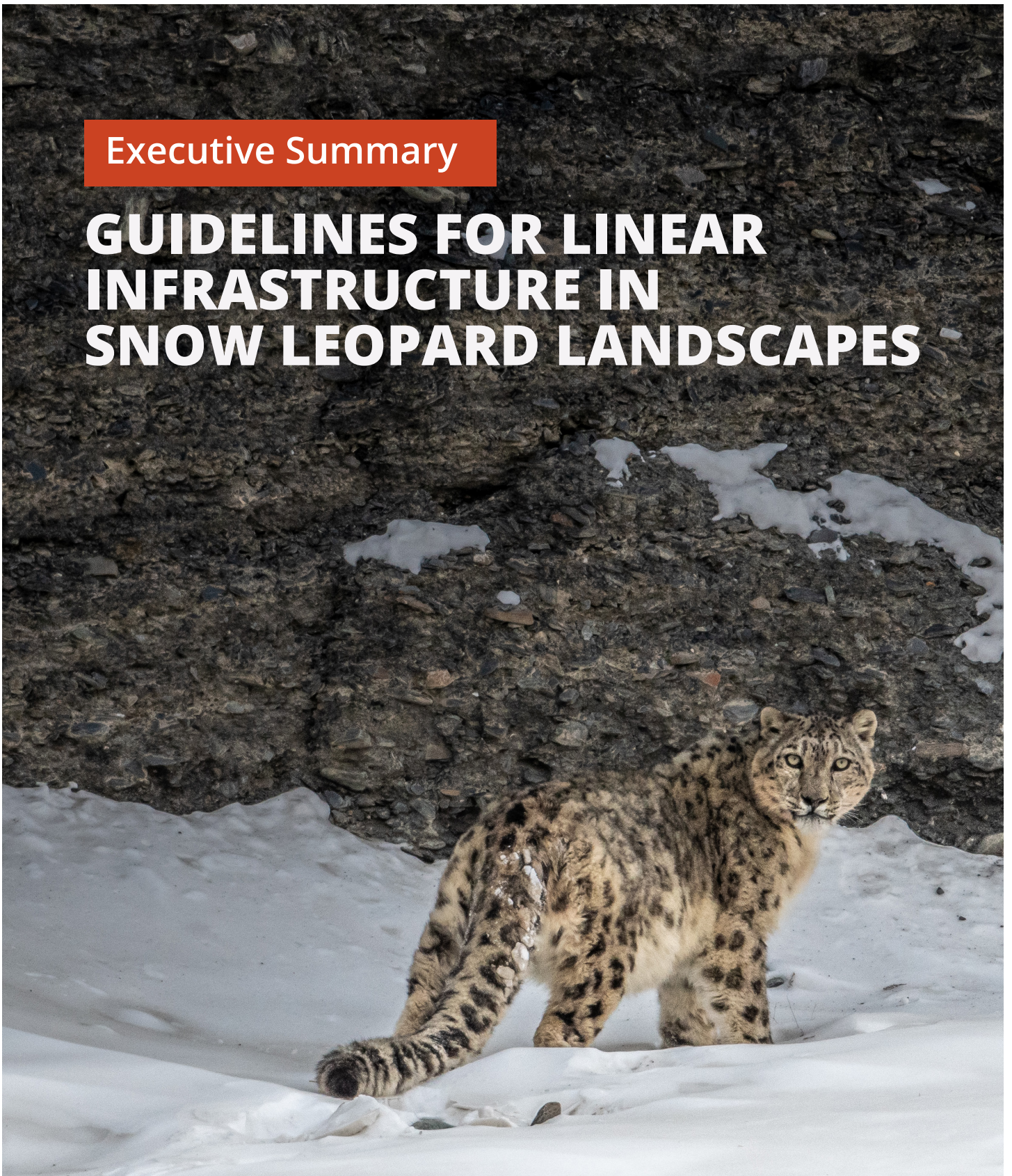


Executive Summary

GUIDELINES FOR LINEAR INFRASTRUCTURE IN SNOW LEOPARD LANDSCAPES



Introduction

While necessary for connecting people to goods and services, linear infrastructure—such as roads, railways, power lines, and fences—poses a multitude of threats to snow leopards and the high mountain ecosystems they inhabit. As top predators, snow leopards are essential to maintaining the health of their high-elevation ranges, which are home to the headwaters that supply water to one-third of the world's people.¹ In this way and more, snow leopard ecosystems are vital to us all.

Slicing through snow leopard habitats, linear infrastructure introduces harmful human activities into remote areas. Habitat fragmentation, illegal hunting and trade, wildlife-vehicle collisions, and other forms of human-wildlife conflict—along with the introduction of feral dogs, pathogens, and pollutants—are some of the ways in which roads and rail cause landscape-level changes that lead to major environmental disruptions. Climate change exacerbates these threats, putting linear infrastructure projects at high ecological and economic risk.

A growing body of information is guiding decision-makers on how site-specific, biodiversity-friendly safeguards can mitigate the negative effects of linear infrastructure, enabling both human and wildlife movement and ecosystems to continue to deliver the services on which we all depend.

Background

An alliance of all the snow leopard range countries, the Global Snow Leopard and Ecosystem Protection Program (GSLEP)—in its 2022 Bishkek Resolution and 2024 Samarkand Resolution—recognized the threat of linear infrastructure to snow leopard habitats and advised the creation of a “working group to develop policy guidelines and a strategy to help mitigate such threats.” Formed in 2023, the working group has brought together GSLEP representatives, scientists, and conservationists to create a set of guidelines for snow leopard landscapes to mitigate the

impacts of linear infrastructure. The US Agency for International Development (USAID) supported the development of these guidelines through the Asia's Linear Infrastructure safeGuarding Nature (ALIGN) Project, implemented by WWF in partnership with the Center for Large Landscape Conservation.

Along with highlighting the risks of infrastructure development to snow leopards, their prey, and the fragile ecosystems on which they depend, the guidelines provide recommendations for how snow leopard range country governments can use avoidance and mitigation techniques to address these threats. The guidelines follow the mitigation hierarchy, a four-step framework used to avoid, manage, and reduce negative environmental impacts and to identify solutions to protect biodiversity and ecosystem health across an infrastructure project's life cycle.



¹ This information was documented as part of the USAID-funded Adaptation in Asia's High Mountain Landscapes and Communities project. Learn more: worldwildlife.org/initiatives/asia-high-mountains.

Key Recommendations

The guidelines provide the following key recommendations:

1. Maintain **environmental sustainability** as the central underlying principle in all decision-making across the entire life cycle of all infrastructure projects—from planning and consultation to design and tender to construction and maintenance—in snow leopard habitats. In the long term, the benefits to ecosystems and local communities of allowing continuous flows of nature and water will outweigh costs incurred from project adjustments.
2. Develop a robust **stakeholder engagement plan** that emphasizes continuous consultation with local community members affected by the infrastructure project and that recognizes the value of and utilizes local knowledge.
3. **Avoid substantial project impacts** on critical ecosystems, conservation areas, and other sensitive habitats by completing strategic environmental assessments, environmental and social impact assessments, climate risk assessments, and natural capital and ecosystems services valuation. These should be accompanied by robust spatial planning, including scenario planning to identify the best project location to meet economic needs and maintain the integrity and function of nature.
4. Minimize the impacts of linear infrastructure on snow leopards, their prey—even when prey populations live far from high elevations—and their habitats by identifying **mitigation measures** that are appropriate for these high-mountain ecosystems and that account for the behavioral and ecological needs of snow leopards and their prey.
5. **Restore and rehabilitate** areas after infrastructure has been developed. This is especially important in fragile high-elevation landscapes to ensure that hydrology is well managed within the entire watershed, slopes are stable, verges are well maintained and vegetated with native plants, and safe passages for wildlife are sustained.
6. Establish a **monitoring and evaluation framework** to ensure the effectiveness of safeguarding and other mitigation measures in maintaining functional connectivity of snow leopard populations. Long-term monitoring is essential to prompt adaptive management actions if predefined biodiversity target levels are not met.

Conclusion

The forthcoming guidelines will engage decision-makers and practitioners from all sectors involved in infrastructure development across snow leopard range states. Their purpose is to establish practices in all stages of an infrastructure project's life cycle that avoid areas of high snow leopard use and value; to mitigate the impact of linear infrastructure where avoidance is not possible or existing structures impede the natural flows of ecosystems; and to restore habitats where development has caused disturbance. These measures will not only protect snow leopards and their prey, but also support the human communities living in snow leopard ranges and preserve ecosystem services essential to people across the globe.

Contact

Once finalized, the guidelines will be published on snowleopard.alignproject.org and globalsnowleopard.org. For more information, please contact the GSLEP Secretariat at secretariat@globalsnowleopard.org.