



WWF

REPORT

2015

EMBARGO
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FRAGILE CONNECTIONS

SNOW LEOPARDS, PEOPLE, WATER
AND THE GLOBAL CLIMATE

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Solitary, almost silent and majestically beautiful, the snow leopard is one of the most enigmatic big cats. It is also one of the most elusive and endangered.

Highly adapted to life on the cold, rocky slopes of Central Asia's high mountains, the snow leopard is a master of stealth and camouflage. Very rarely seen by humans, it has come to be known as the 'ghost of the mountains'. It has also become an icon for these breathtaking and critically important landscapes, which house a diverse array of unique high-altitude species and provide critical ecosystem services for hundreds of millions of people.

This short report reveals three illustrative statistics about the snow leopard and its importance:

- Over 330 million people live within 10km of rivers originating in snow leopard habitat and directly depend on the water flowing down from these mountains.
- More than a third of snow leopard territory might become unsuitable for the big cats if climate change is not checked.
- Less than 14 percent of snow leopard habitat has been covered by research or conservation activities.

Together these statistics demonstrate the importance of snow leopards and their habitats for the world we live in, the fragility of these habitats in the face of a warming climate, and how remote, wild and unknown those habitats still are, and thus the enormous challenges faced in conserving them.

THE VANISHING SNOW LEOPARD

Snow leopards roam across huge swathes of the region's mountainous terrain with individual home ranges stretching from 200 to 2000 km². This alone would make them hard to spot, but they also avoid human contact whenever possible and blend perfectly into their rocky background. However, they are also becoming ever harder to see because they are disappearing.

Snow leopards are in crisis. Listed as endangered on the International Union for Conservation of Nature (IUCN) Red List, which assesses species' risk of extinction, there could be as few as 4,000 remaining in the wild – and perhaps just 2,500 breeding adults. Their current range spans a huge area across 12 states – Afghanistan, Bhutan, China, India, Kazakhstan, Kyrgyz Republic, Mongolia, Nepal, Pakistan, Russia, Tajikistan and Uzbekistan. But many populations are small and fragmented. And the global snow leopard population is declining.

Habitat loss, degradation and fragmentation are threatening their future as human and livestock populations expand, and as new settlements, roads and mines encroach on their remaining range. Declining numbers of prey species, increasing conflict with communities and a rise in poaching are also thinning the big cats' ranks, leaving them clinging on in many areas.

Climate change will exacerbate most of these threats since it will have profound impacts on snow leopard habitat, the wild species living there, and the people dependent on it.

SNOW LEOPARD FACT FILE

Scientific name: *Panthera uncia*

Habitat: Cold, high mountains

Lives: In the highest regions of Afghanistan, Bhutan, China, India, Kazakhstan, Kyrgyz Republic, Mongolia, Nepal, Pakistan, Russia, Tajikistan and Uzbekistan

IUCN Red List status: Endangered

Population: Estimated between 3,920 and 6,390 individuals

Weight and height: Adult male, 45-55kg, up to 130cm

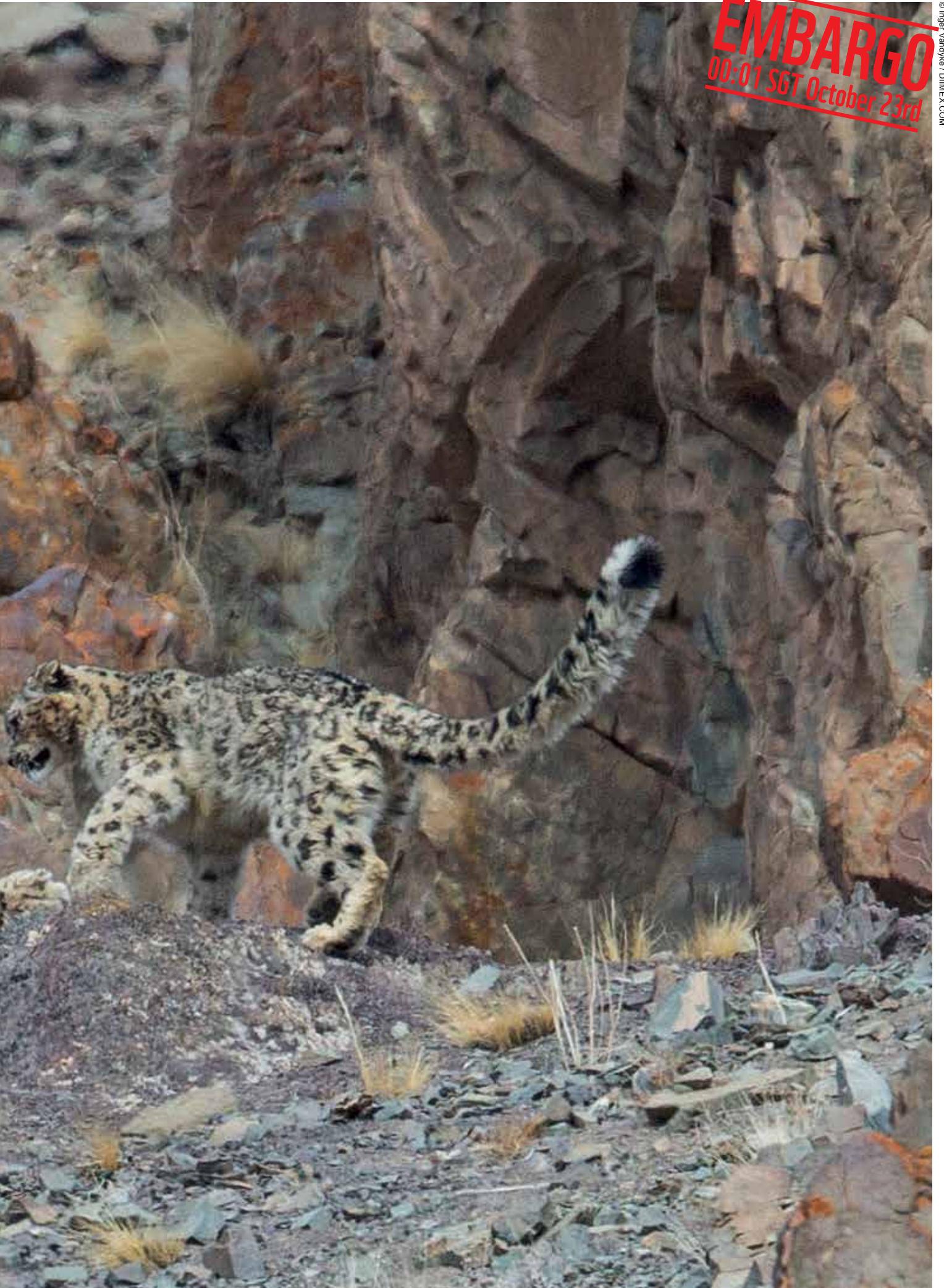


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CENTRAL ASIA'S HIGH MOUNTAINS: HOME TO THE SNOW LEOPARD, WATER SOURCE FOR BILLIONS OF PEOPLE

Snow leopards have evolved to live in some of the highest and harshest habitats in the world. While nomadic herders and more permanent communities are encroaching further and further into their remote world, the human population density within the big cat's range is still very low.

However, the snow leopard's high-alpine home is one of the planet's most important landscapes for people. More than two billion people pack the water basins downstream from snow leopard habitat – over 330 million of whom live within 10km of a river that originates in the mountains, according to WWF's detailed scientific report on the subject Water Provision Services of Snow Leopard Habitat and Vulnerability to Climate Change.

Snow leopards prowl rocky regions of Central Asia that are over 3,000 metres above sea level. The water cycle here is complex, mixing water supplies from a variety of sources, including monsoons, winter snows, summer rains, melting glaciers and vast areas of permanently frozen ground, known as permafrost. Together they form the headwaters of more than 20 major water basins, contributing to water supplies in 21 countries from Azerbaijan to China.

Water from snow leopard habitat feeds some of Asia's most critically important rivers such as the Ganges, Indus, Yangtze and Yellow, which flow through some of the most densely populated parts of the planet. Along with the more than 330 million people who directly depend each day on the quality and quantity of water flowing down from the high mountains, hundreds of millions of other people across Asia rely on the water indirectly for irrigation and industry.

The headwaters of the western basins, particularly the Indus, Amu Darya and Syr Darya, are the most important for downstream water provision and also harbour important core habitat for snow leopards. In other areas, snow leopard habitat contributes significantly to the overall water supply but is not the primary source. For example, a huge population exists in the Yangtze Basin downstream of the snow leopard range but the most important water flow originates in areas outside snow leopard territory.

However, the critical importance of snow leopard habitat to the future of countless communities across Asia is clear. And with human populations continuing to expand, protecting the region's precious water supplies will be even more essential.

But the snow leopard's mountainous habitat is under increasing threat from human encroachment and climate change. Already there are concerns that the rapidly warming world is starting to impact this fragile environment, threatening the survival of the snow leopard and water supplies for hundreds of millions of people.

Urgent action is needed to limit global warming and to mitigate any negative impacts on the mountains – to preserve sufficient suitable habitat for snow leopards and to ensure water security for the vast human populations downstream.

WARMING WATERSHEDS: CLIMATE CHANGE ENDANGERS SNOW LEOPARDS AND PEOPLE

CLIMATE
CHANGE WILL
POSE A SERIOUS
THREAT TO
BOTH THE
SNOW LEOPARD
AND REGIONAL
WATER
SUPPLIES

Snow leopards face a range of serious threats, including increased poaching, conflict with communities, and habitat loss. Tackling these challenges is possible, but climate change will exacerbate them – requiring even greater, global efforts to save the snow leopard and its priceless habitat.

While climate change will affect different areas in different ways, its overall impact will pose a serious threat to both the snow leopard and regional water supplies. Increasing temperatures are expected to shift the tree line higher up the mountains, foster the growth of plant species that are less palatable for the snow leopard's natural prey species

and livestock, expand the area suitable for crops, increase aridity, alter the timing of water availability, and melt the glaciers and permafrost.

These changes are going to severely degrade the habitat and could render more than a third of snow leopard territory unsuitable for the big cats. Eastern and northern parts of the snow leopard's range are likely to be the most affected, including critical habitat in China, which boasts by far the largest population of snow leopards.

Even a slightly warmer climate could have devastating impacts on snow leopards by encouraging people to encroach deeper into their territory. In some areas, farmers will be able to plant crops higher up the warming mountainsides, while in others herders could be forced to push their flocks further into the wilderness as unpalatable plants start to take over the montane grasslands. Increasing aridity and decreasing water availability lower down the mountains could also press communities to head for higher ground.

Combined with the ongoing expansion of settlements, mines, railways, and roads, these movements will degrade and fragment snow leopard habitat. They will also increase the potential for conflict with communities, which could lead to a rise in retaliatory killings, as well as increase the number of free-ranging dogs that compete with the big cats for prey.

Meanwhile, a warmer climate is expected to shift the tree line up the slopes. Since the snow leopard has evolved to hunt in the rocky terrain above the trees, this could drastically reduce the amount of suitable territory for this highly adapted hunter, particularly in the Himalayas and Tibet.

The snow leopard's natural prey – such as blue sheep, markhor and ibex – are already under pressure from habitat loss and hunting. Climate change could contribute to further reductions in these species due to the colonisation of grasslands by less nutritious grasses, climate-driven diseases and competition from new species – leaving the snow leopard at even greater risk.

But climate change threatens more than the snow leopard and other high mountain species. It will also impact on the region's critical watersheds, which could endanger the livelihoods of hundreds of millions of people downstream. The exact effects cannot be predicted but experts conclude that a warming world will lead to a reduction in the amount of water available to many of the people dependent either directly or indirectly on the high Asian headwaters.

For example, rising temperatures will melt the snow, glaciers and permafrost in snow leopard territory, which will affect the timing and flow of the water downstream. The warmer climate could also encourage more plant and tree growth in higher parts of the big cat's range, which would contribute to expected changes in patterns of evapotranspiration, since the plants would suck up more water, which would then evaporate into the atmosphere leaving less to run off into rivers and lakes.

Climate change is also expected to increase aridity in the mountains. Drier times in the high mountains will mean less water for the expanding human populations reliant on their water supplies for agriculture, industry and essential domestic consumption and use.

In the floodplains of the Ganges River, people are already struggling to cope with eight months of small flows coming down from the Himalayan slopes. Climate change could extend this dry period, affecting crop production and food security for millions. And millions of other people across the region, who also depend on the high Asian headwaters, face an uncertain future as well.

Figure 1:
Snow leopard
range (GSLEP
2013)



Range Country	Area Covered (km ²)	Total snow leopard habitat	% of habitat covered
Nepal	21,077	30,000	70.26
India	22,606	75,000	30.14
Uzbekistan	2,354	10,000	23.54
Russia	13,000	60,000	21.67
Mongolia	13,996	101,000	13.86
China	137,846	1,100,000	12.53
Pakistan	10,009	80,000	12.51
Bhutan	1,730	15,000	11.53
Afghanistan	5,000	50,000	10.00
Kyrgyz Republic	7,110	105,000	6.77
Kazakhstan	717	50,000	1.43
Tajikistan	875	100,000	0.88
Total	236,320	1,776,000	13.30

TIME TO FILL THE GAPS: HUGE AREA UNSTUDIED AND UNTOUCHED BY CONSERVATION

The snow leopard is remarkably hard to study. Serious efforts to research the species began in 1990s but the difficult terrain and some of the snow leopard's behavioural traits, such as its natural low population density, vast home ranges and elusive nature, have hampered efforts.

The truth is there is still a lot we do not know about the 'ghost of the mountains'. We only have rough estimates of the numbers surviving in the wild, and we still have much to learn about many aspects of its life cycle, including its mating and feeding behaviour.

But the gaps in our knowledge are not only due to the difficulties in studying snow leopards. Most of their vast range – possibly over 1.7 million km² of rugged mountain terrain – has never been researched or mapped, and is devoid of conservation efforts or protection.

A thorough recent review of scientific studies on snow leopard habitat revealed that just over 200,000 km² have been covered by either research or conservation activities – less than 14 percent of the territory snow leopards are believed to inhabit.

Only Nepal has seen a high level of coverage, with 70 percent of its snow leopard territory covered by research or conservation. The next highest is India with around 30 percent. However, a knowledge gap analysis showed that barely 3 percent of snow leopard habitat in the Indian Himalayas has actually been well studied.

It is critical that additional research is conducted to fill these gaps. We need to build a more accurate picture of the status of snow leopard populations, and establish baselines and indicators for both snow leopards and their traditional prey species so that range states can better assess future changes and evaluate the impact of conservation actions.

Effective snow leopard conservation is dependent on knowing more about this icon of the high mountains and of the mountain environments themselves. Research and monitoring must be expanded, and landscape level planning conducted to enable critical snow leopard habitats to be protected and to ensure connectivity through natural corridors. Successful conservation models and projects also need to be scaled up, ensuring benefits over much wider areas.

The Ukok Plateau in Russia is part of the UNESCO World Heritage Site 'Golden Mountains of Altai'. It provides critical habitat for the snow leopard and many other endangered species.



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WHAT IS WWF DOING?

SAVING THE SNOW LEOPARD

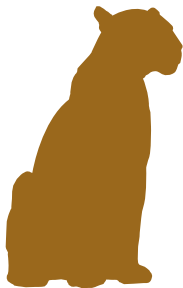
The snow leopard and its natural habitat are under severe threat. But the world is rallying to protect them, and WWF is at the heart of the expanding global response.

In 2013, the 12 snow leopard range states adopted the Global Snow Leopard and Ecosystem Protection Program (GSLEP), which is a joint initiative between governments, international

agencies, civil society, and the private sector to secure the long-term survival of the snow leopard in the wild. It is an ambitious plan. Now it needs to be implemented.

WWF has seized the opportunity provided by this increased momentum and political will to launch a more cohesive and comprehensive snow leopard strategy. Under our first Species Action Plan (SAP) for snow leopards, WWF will focus on critical areas and strategies where our work can contribute the most to global efforts to save the species – and protect the livelihoods of people across the region. And tackling the issues raised in this report is vital.

SNOW
LEOPARDS
SIMPLY CANNOT
SURVIVE
WITHOUT
URGENT HUMAN
ACTION



KEEPING CLIMATE CHANGE IN CHECK AND THE WATER FLOWING

WWF is campaigning tirelessly to raise the awareness of world leaders, politicians, businesses, and the public about the causes of climate change and the devastating effects that a warming world will have – and in some cases is already having – on people and nature. Highlighting the plight of the snow leopard and its fragile mountain home underlines the need for decisive action on a global scale to keep climate change in check.

WWF is also helping to mitigate the threats posed by climate change to snow leopard habitat through supporting effective landscape planning, using science-based and climate-smart management plans. For example, we are identifying regions of Central Asia that most urgently require good water management to minimise the negative effects of a warming world on water supplies.

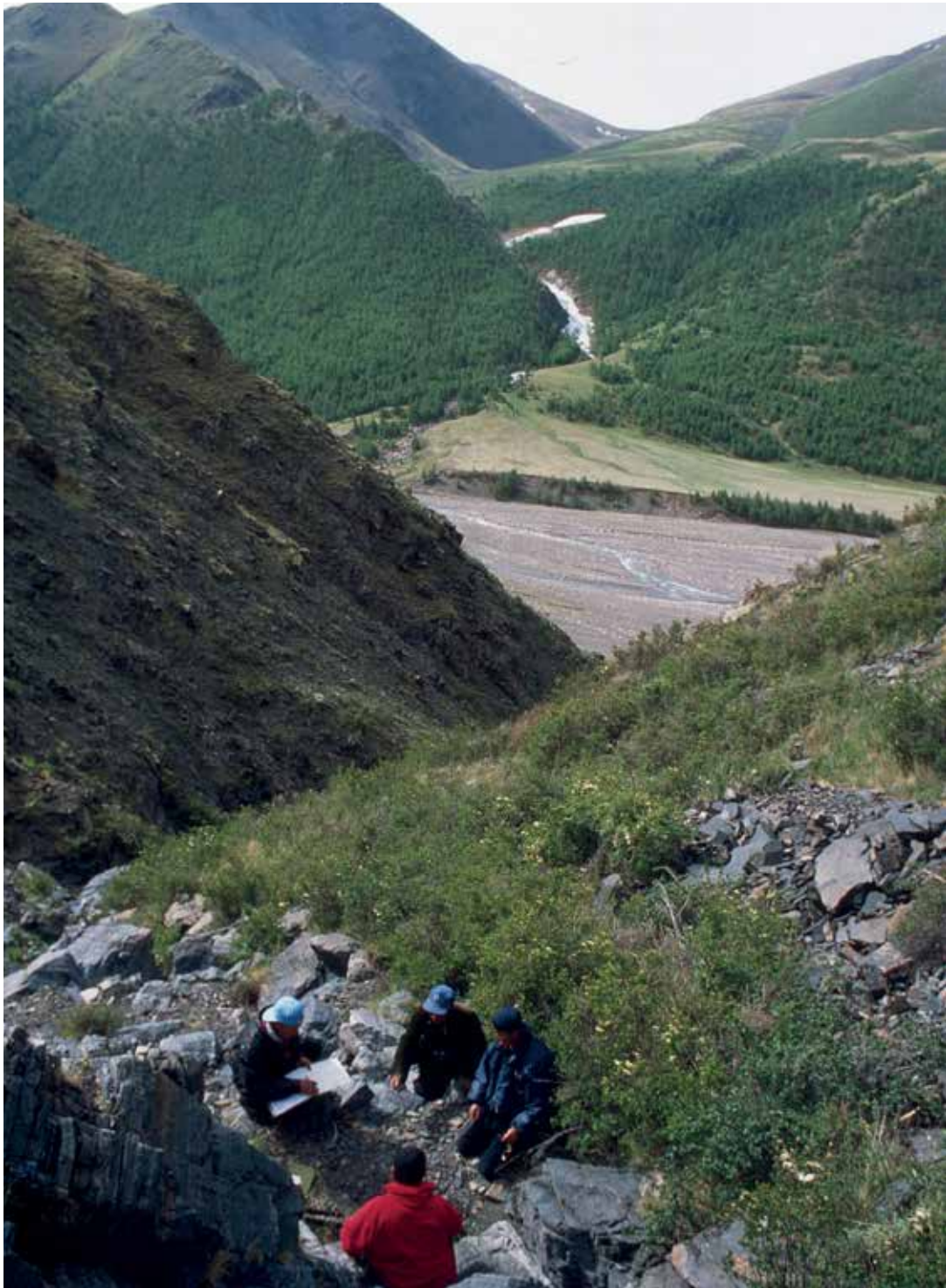
And we are working on the ground with communities, providing them with the knowledge and skills to better manage their livestock and land in the face of climate change so as to strengthen their livelihoods and reduce potential conflicts with snow leopards.

EXPANDING RESEARCH

WWF has supported groundbreaking studies and critical conservation projects in almost all of the snow leopard range states. We have funded camera traps and satellite collaring, which have transformed our knowledge of the species. But there is still an enormous amount we need to know. WWF will continue to support research into snow leopards and encourage countries and other organisations to extend their efforts. Since only 14 percent of snow leopard habitat has been studied or benefited from conservation, there are lots of gaps and blank spaces on the map to fill.

TACKLING THE OTHER THREATS

Climate change is going to make the situation worse in future. But snow leopards are facing grave threats right now – from habitat loss and degradation to poaching and conflict with communities.



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WWF team collecting data on Snow leopards (*Panthera uncia*) in the Turgan Mountain Strict Protected Area. Yamaatyn River Valley, Altai Mountains, Mongolia



**WWF IS
WORKING ON
THE GROUND
AMONG
COMMUNITIES
LIVING CLOSE
TO AND IN
THE SNOW
LEOPARD
RANGE**



WWF is working closely with governments, communities and other organisations to address these threats. Better research and landscape planning will help to identify and protect critical snow leopard habitats so they are not degraded or fragmented by unplanned human encroachment and unsustainable development. We will aim to ensure that natural wildlife corridors will be maintained to ensure that snow leopard populations do not become isolated.

WWF will aim to scale up initiatives that have successfully reduced retaliatory killing of snow leopards by herders, such as secure pens for livestock and livestock insurance schemes. We will work with communities and cooperate with law enforcement agencies to reduce poaching. Meanwhile, TRAFFIC – the wildlife trade monitoring network – will seek to stop the trafficking of snow leopards and reduce demand for their parts.

Critically, we will work with governments to ensure that the current momentum behind efforts to save the snow leopard and its habitat does not drain away. States have signed the GSLEP: we will advocate for them to fulfil their commitments under this ambitious plan. Politicians have pledged to take action: we will encourage them to follow through on their promises and support them when they do.

Reversing the downward trend in snow leopard numbers requires conservation efforts on an unparalleled scale. Achieving this will not be easy, but it is more feasible now than ever before thanks to the ongoing work of numerous excellent conservation organizations and the high level commitment of all range states to snow leopard conservation. But there is no time to waste. The ghost of the mountains is vanishing. Action is needed now.

KEY RECOMMENDATIONS FOR SNOW LEOPARD CONSERVATION

WWF recommends that:

1. Governments of snow leopard range states swiftly implement their commitments enshrined in the Global Snow Leopard and Ecosystem Protection Program.
2. Governments of snow leopard range states integrate snow leopard conservation needs into land use planning, ensuring science based and climate smart management plans.
3. Global governments and businesses take ambitious and urgent action to reduce greenhouse gas emissions and switch to cleaner forms of energy.
4. Global governments, NGOs and academic institutions increase efforts to build a range wide understanding of snow leopards and their habitats and scale up conservation efforts to additional habitat areas.
5. Global governments and major funding institutions acknowledge the importance of snow leopards and Asian high mountain ecosystems and contribute to their conservation.

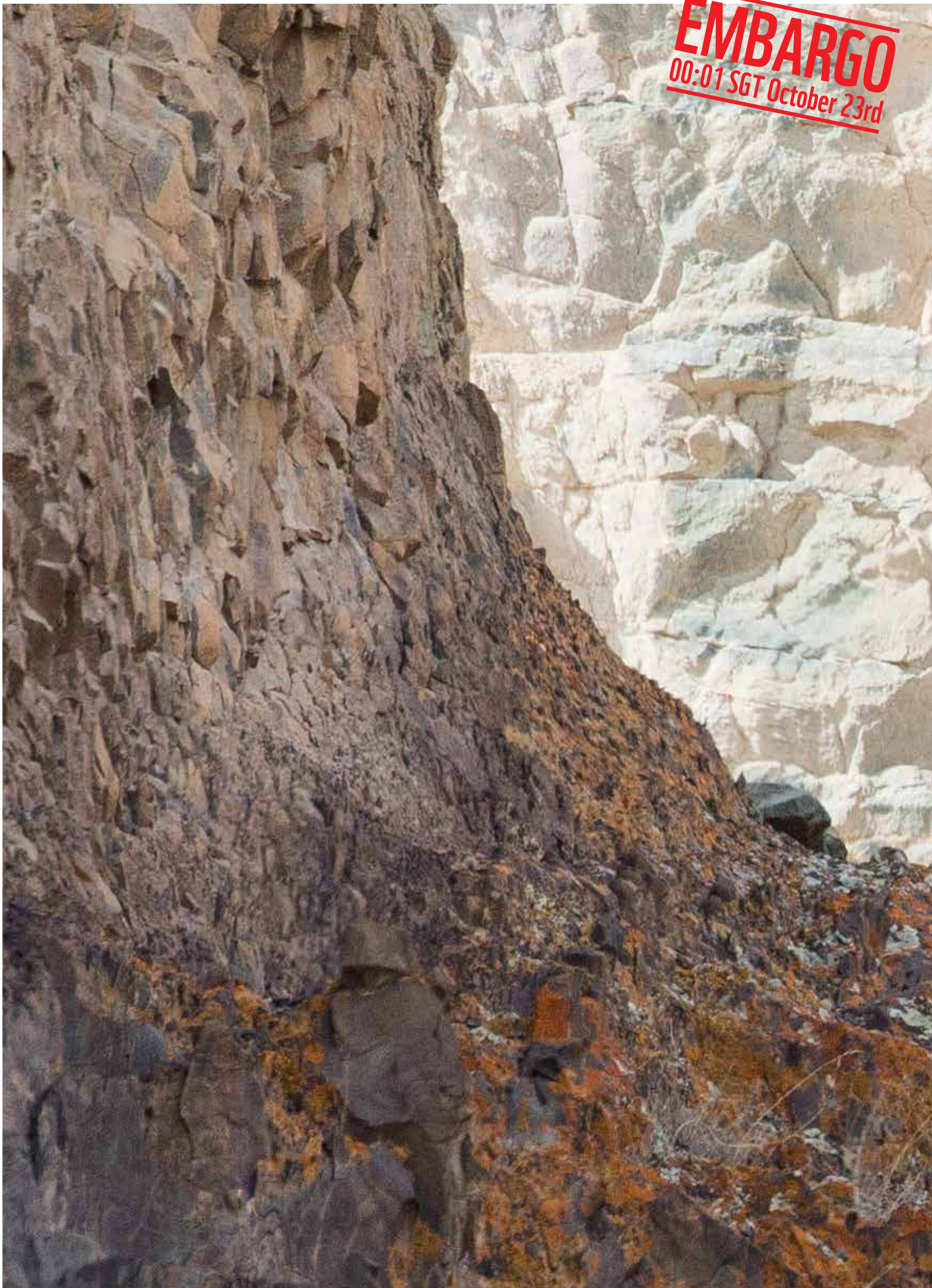
WWF also recommends that governments, institutions and organisations increase efforts to tackle other threats to snow leopards, such as conflict with human communities, poaching, trafficking and demand for snow leopard products.

WWF and our partner organisations stand ready to support such efforts.



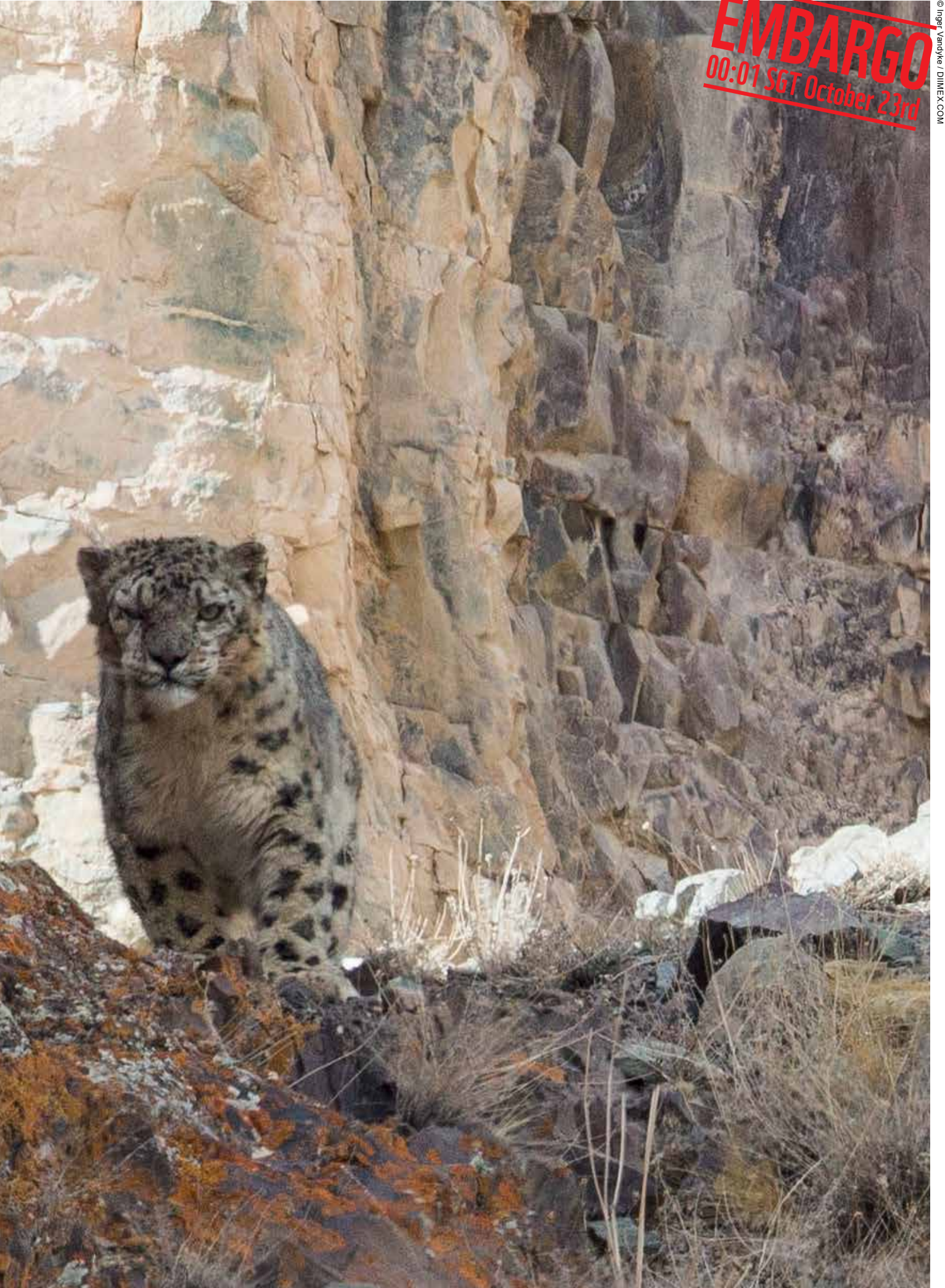
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Fragile connections: snow leopards, people, water and the global climate

100%
RECYCLED



14%

Less than 14% of the known global habitat of snow leopards has seen some form of conservation or research.

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330
MILLION

Over 330 million people depend daily on the water flowing down from the snow leopard habitat.



1/3

More than a third of the current snow leopard territory might be lost if climate change continues unchecked.

20%

Over the past 16 years, snow leopard numbers have declined by at least 20%.



Why we are here

To stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature.

panda.org

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