

action”, because “science-based learning opportunities based solely on providing information do not come with a moral vision or ethical position”.

Transforming science into practice and action requires participation – communication and active discussion can be the first step in this direction. The effects can be particularly powerful if the dialogues are accurate but optimistic, empowering young people to turn their anxiety into action that makes a difference.

CONNECTION TO NATURE

While it may sound obvious to anyone with an interest in the natural world, such a feeling is subjective, multi-faceted and influenced by many factors, so scientific credit to this idea is welcome. Indeed, recent evidence cited in the study suggests that a person’s connection to nature is a stronger predictor of their environmental behaviour than their knowledge of the subject. Hence the need for this third strategy to premeditate such behaviours.

Knowledge alone cannot make a person feel close to nature, nor can it inspire them to act in its best interest. Instead, five pathways – emotion, beauty, contact, meaning and compassion – are thought to manifest a relationship with the environment, requiring repeated exposure and positive experiences in the natural world. If these occur in a young person’s life, they are central to developing and maintaining caring attitudes and actions towards the natural world. Internalising a connection to nature therefore has the potential to inspire long-lasting pro-environmental behaviour and stewardship.

Experiences in the ‘outside world’ are also linked to aiding people’s mental health – so a connection to nature helps build internal resilience to face the climate crisis. This effect could be exponential if the same connection inspires nature-positive action to preserve the environment for others.

“ONE OF THE DIFFICULTIES YOUNG PEOPLE FACE IS COMMUNICATING ABOUT THE CLIMATE CRISIS AND THEIR FEELINGS TOWARDS IT”



Ugandan climate activist Vanessa Nakate embodying youth and diversity in action at Cop26, held in Glasgow in 2021 © COP26/Flickr

CRITICAL THINKING SKILLS

Any sort of discussion, action or decision also requires critical thinking – the fourth strategy. The best actions for nature and the environment require the identification of accurate, meaningful facts, but these can be difficult for anyone to separate from misinformation and disinformation. These latter two issues are significant obstacles to positive dialogue and action for climate and nature.

Young people are especially vulnerable to the effects of false information – as the research states, through increased screen time and as a result “concomitant exposure to excess information”, but also due to ever-increasing fake news creators and techniques. Several “game-based initiatives” have been identified to ‘inoculate’ young people against misinformation and disinformation by increasing their understanding of science and ability to spot false data.

Critical thinking skills are essential for anyone in decision-making processes, especially those surrounding the complexities of nature and the climate. Equipping young people with such abilities is an important step in enabling them to separate crucial fact from fiction and then use this information to make the best choices for nature.

CO-CREATED VISIONS OF A SUSTAINABLE FUTURE

Essentially, this final strategy means a unified, agreed vision of the actions and changes required in the best interests of the planet. It is crucial that the solutions agreed to help the biodiversity and climate

crises move in the same direction. Otherwise, focus and emphasis are lost to the point that projects work at cross-purposes. Similarly, there is no point doing one action only to undo it in the next phase of activity.

Bearing in mind that young people are having to deal with a problem that wasn’t of their making, their views and voices are vital as they will be the people that enact future change. From a legal perspective, a growing number of decisions are emphasising a moral obligation to protect future generations from the problems of climate change caused by their forebears. Empowering young people to influence the direction that society will take, including their voices and celebrating their involvement will help to strengthen the feeling that they are at the forefront of climate action, resilient and making a stand. This ensures a sense of self-efficacy, that young people have a voice and agency to solve the problems.

Crucially, this strategy relies on the preceding four strategies being implemented successfully – if so, it has the potential to pull together all five and empower young people to use these newfound skills to actively influence the direction of change. They will play their part in setting the world’s course for a sustainable future that considers nature and the environment. ■

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FROM MOUNTAINS TO MANGROVES

Though it’s the shortest flyway on Earth, the Central Asian Flyway – which is also the least known – still carries billions of migratory birds over the world’s highest mountains, on a twice-yearly journey fraught with ever-increasing dangers.

A story is told of the ancient Mongol khagan (emperor) and falconer Genghis Khan that he once took his favourite falcon hunting and needed to find water. The falcon repeatedly knocked the cup from his hand before he could drink, so in anger, Khan killed it with his sword. Only then did it become apparent that a poisonous snake was lying dead in the stream and the falcon was trying to prevent Khan from drinking its venom. The falcon’s repeated warnings were disregarded almost to the point where Khan put his own life at risk.

David Callahan

The relevance of this allegory to today’s planetary state couldn’t be more resonant, and modern-day birds sound universally fatal warnings. The radical declines of thousands of species tell us we are overexploiting, poisoning and depleting the natural world to the point of putting our species at severe risk. Decreases in migrating bird numbers indicate degraded habitats and human-made dangers on their breeding grounds, at their wintering sites and over every mile in transit.

The transglobal, twice-yearly phenomenon of bird migration affects every continent, with flyways interconnecting huge land masses traversed by billions of birds undergoing immense exertion and danger. Most of the major routes cross both



hemispheres, but one – the Central Asian Flyway (CAF) – is unique in being restricted to the northern hemisphere, making it the shortest. In addition, it is the only great flyway where, instead of oceans and deserts, the main geographical barrier migratory birds have to overcome is high mountains. It's also the least known, although it covers a substantial area, funneling birds from the northernmost Siberian tundra to Sri Lanka and back. Many are staring extinction in the face.

THE GREAT BARRIER

The relatively short distance between the Arctic and Indian Oceans incorporates substantial hurdles. The largest is the Himalayan mountain chain, which diverts many species west onto the Black Sea-Mediterranean Flyway and into Africa to avoid the crossing. However, many northern Asian species use the deep Himalayan valleys to reach the Indian subcontinent, fly above the clouds or take the coastal routes.

Among the 'high flyers' is Bar-headed Goose, one of the world's most altitudinous migrants, which has been reported flying clear above the Himalayas at 8,481m. Another high-flyer is Brown-headed Gull, which moves from Sri Lanka in spring to breed on the Tibetan Plateau at up to 6,000m. A keynote high-flying species is Demoiselle Crane. Its population of 250,000 birds migrates to India directly across the Himalayas from the Central Asian steppes.

The huge Inner Mongolian and Tibetan Plateau breeding populations of Ferruginous Duck – classified as Near Threatened after rapid declines –



use both the Central Asian and Black Sea-Mediterranean Flyways to reach wintering areas in India and Africa. Its decline seems to be due to serious degradation and loss of wetlands, overhunting, lead poisoning and physical disturbance by humans, as well as drought.

Tundra-breeding waders are major users of the CAF, including Great Knot, which travels from easternmost Siberia, along with Curlew Sandpiper, Little Stint and Central Asian populations of Asian Dowitcher, as well as more widespread species such as Pied Avocet, Bar-tailed Godwit and Eurasian Curlew.

Songbirds are funnelled to either end of the Tibetan massif, with commoner species from the Eastern Palearctic including Dusky Warbler, which can be found 'tacking' in winter in almost any patch of scrub in South-East Asia. From more western

ABOVE
Although currently classified as Near Threatened, the shy Ferruginous Duck is undergoing an overall decline across its range in Asia and Europe
© Gergosz/Shutterstock

BELOW
Bar-headed Geese are high-altitude migrants, breeding in Central Asia and flying over the Himalayas to winter in South Asia
© Zzvet/Shutterstock



LEFT
Doyang Reservoir in Nagaland, India, is an important stopover site for Amur Falcons on their way from East Asia to southern Africa
© Balajisrinivasan/Shutterstock

RIGHT
Migrating Amur Falcons were trapped and sold for food in unsustainable numbers until 2013
© Mike Prince/Flickr

reaches come Paddyfield Warblers, Blyth's Reed-warblers and Citrine Wagtails, while Red-breasted Flycatcher travels to India from as far north-west as southern Sweden.

REVERSAL OF FORTUNES

Smaller raptors also 'take the low road'. Amur Falcons leave their breeding grounds in East Asia, some passing to the east of the Himalayas and others moving through India, flying directly across the Indian Ocean and wintering in southern Africa.

Nagaland in north-east India is a nexus for the species, and its importance as a stopover location was emphasised by a recent count of almost one



million roosting at Doyang Reservoir – double the official population estimate of 500,000. However, until 2012, roughly 100,000 were being trapped annually and sold as food by locals using huge mist nets draped across forest roost sites. This massacre caused a severe decline and prompted the Bombay Natural History Society (BNHS; BirdLife partner), other NGOs and the state government into action, destroying nets and employing local Nagas to patrol roost sites and monitor the falcons.

Some locals were taken on as natural history schoolteachers, initiating Amur Falcon dance festivals in celebration of the birds. Local government resolutions were passed to ensure protection and wild bird hunting was banned in Pangti, the largest village. Human behaviour changed almost overnight with not one falcon taken in 2013. This rapid *volte-face* shows just what can be achieved with concerted effort and innovative thinking.

A more short-distance migrant is White-throated Bushchat, which breeds in central and western Mongolia and winters in the moist *phanta* grasslands of the foothills in Nepal and northern India. There are fewer than 10,000 individuals left, remaining stable in the species' largely uninhabited breeding sites. Its wintering zones in the eastern Himalayas tell another story: while its overall numbers don't yet seem to have been significantly impacted, a seesaw of drainage, flooding, overgrazing and harvesting for thatched roofs has done untold damage to its habitat. The grasslands fall outside existing protected Important Bird and Biodiversity Areas (IBAs), though extensions and regeneration schemes are proposed.

As with other major flyways, intra-continental movements are also present, including some south of the Himalayas. Indian Pitta, the limited-range Pied Thrush and Kashmir Flycatcher (classified as Vulnerable) all leave breeding grounds low in the mountains for southern India and Sri Lanka.

Just 730 Critically Endangered Lesser Floricans are left, and they migrate almost completely within India from the north-west to central western regions. Tagging has shown these small bustards to have high breeding-site fidelity, spending seven months at potential risk outside their protected areas. Yet this may only be true of males, as no

IMPORTANT STAGING POSTS

Kurtan Lake, Russia: breeding grounds for up to 5,000 Gadwall, 7,000 Garganey and 1,500 Marsh Sandpipers

Sukla Phanta Wildlife Reserve, Nepal: the largest *phanta* grassland in Nepal provides a winter home for numerous White-throated Bushchats

Keoladeo National Park and Ajan Bande, India: a huge wetland, important for Dalmatian and Spot-billed Pelicans and Sociable Lapwings

Rann of Kutch Wildlife Sanctuary, Pakistan: another large wetland with globally important numbers of Ruddy

Shelduck, Northern Pintail, Northern Shoveler, Common Crane, Ruff and Little Stint

Chilika Lake, Odisha, India: this large, brackish water Ramsar lagoonal site hosts more than a million wintering waterbirds of about 150 species, nine of which are considered Threatened; the mudflats alone can support 300,000 waders

Great Vedaranyam Swamp and Point Calimere Wildlife Sanctuary, India: this southern wetland hosts hundreds of thousands of waterbirds each winter, including more than 150,000 migratory waders such as Curlew Sandpiper and Black-winged Stilt



The Rann of Kutch is a globally important wetland
© Ninara/Flickr



females have been tracked, leaving many questions about this fragile species unanswered.

DAUNTING JOURNEY

Wetland habitats are the most degraded along the flyway. Rivers are diverted, dammed and polluted, and groundwater depleted for irrigation and urban water supplies. Russia's inland Aral Sea has been shrinking rapidly: diminished to 10% of its original area, with the water level reduced by 16m in depth, its once huge waterbird colonies have been lost.

Coastal India – essential for Asian Dowitcher – has seen its brackish and freshwater wetlands inundated with seawater and the huge expansion of salt pans, further exacerbated by illegal hunting. The important overwintering site of Point Calimere in Tamil Nadu has suffered worrying declines in wader numbers, with decreases of more than 70% in Curlew Sandpiper and Little Stint, and formerly common Pied Avocet and Black-winged Stilt reduced to scarcities.

Large soaring birds are extremely vulnerable to human-made structures through collision and electrocution. The latter is the major cause of death in Saker Falcon and the other 45 raptor species that migrate across the Himalayas. A single 100km stretch of power line in Kazakhstan electrocuted 311 birds of prey in one year.

Black-necked Crane has a tiny population of 6,000 individuals, mostly restricted to Tibet and India's Ladakh region. It's an altitudinal migrant adversely affected by the proliferation of greenhouses, winter wheat and ploughed fields, industrial development, power lines and human demands for water in its native wetlands – topped by climate change. Its dwindling population is concentrated into three wintering areas on the

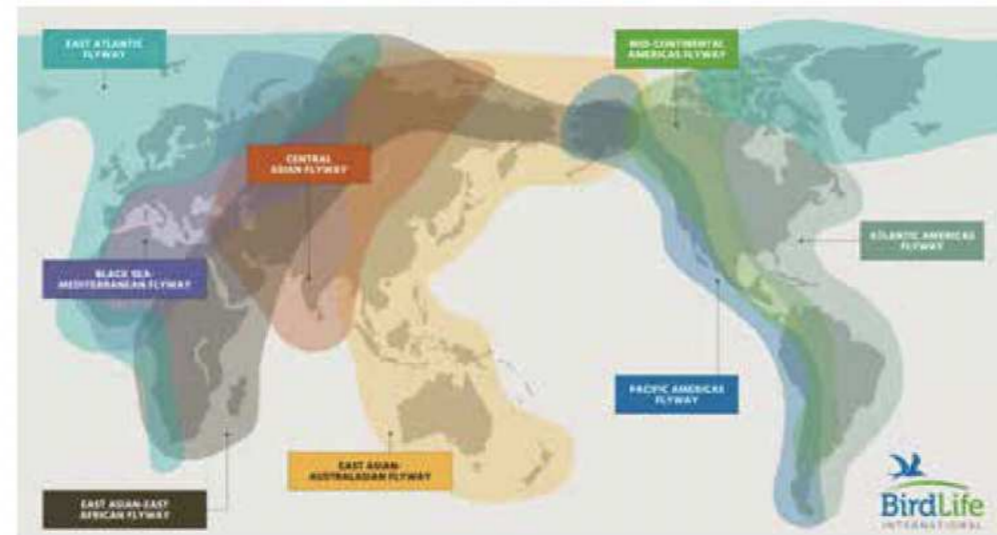
Qinghai-Tibet and Yunnan-Guizhou plateaus.

International co-operation has seen India, China and Bhutan firm up its protection, while in Bhutan, the Black-necked Crane Festival takes place each November, garnering support for the protection of wintering sites. A Species Action Plan running from 2021-25 aims to combine habitat protection with improving local livelihoods. Things are already looking up: in 2023, a record 2,342 individuals were counted in China's Yunnan province, after plateau marshland was conserved for the species at Dashanbao Nature Reserve, one of its highland wintering areas.

White-bellied Heron is one of the world's most Critically Endangered species. Its localised population of fewer than 140 adults is spread disconnectedly across adjacent areas of Bhutan, India, Bangladesh and Myanmar. It's a short-distance migrant to a tiny area of Bangladesh's Brahmaputra wetlands, and it has very specific requirements, eating only larger fish in forested

ABOVE

Asian Dowitcher, with a global population of just 23,000 individuals, is under threat from the destruction of wetlands in its wintering grounds across coastal India © Agami Photo Agency/ Shutterstock



FLYWAYS



ABOVE

The annual Black-necked Crane Festival is celebrated in the Gangteng-Phobji valley in central Bhutan, which is home to a wintering population of roughly 300 cranes each year © Doug Knuth/Flickr

RIGHT

The Chambal River in India is an important site for nesting colonies of the Endangered Indian Skimmer © Hari K Patibanda/Flickr

areas with fast-flowing rivers. The species' decline is due to widespread overexploitation, drainage, pollution and eutrophication of wetlands, hydroelectric dam building, loss and disturbance of neighbouring forest areas and the increasing numbers of power lines stretched across core river basins.

HANDS ACROSS THE HIMALAYAS

To deal with the litany of fatal hurdles facing many declining species, further national and international co-operation is needed, zeroing in on which species and sites require the most urgent assessments and monitoring to target conservation efforts.

The Asian Waterbird Census – an annual Wetlands International-organised, pan-Asian project covering 6,100 sites in 27 countries – provides large-scale umbrella monitoring of resident and migratory species in the region.

The Field Ornithology Group of Sri Lanka (BirdLife partner) is ratcheting up its research and monitoring programmes, including via its Waterbird Tracking Project that is mapping the movements of

Great Knot, Bar-tailed Godwit, Eurasian Curlew and Spot-billed Pelican with GPS tags as they pass through the region.

Indian Skimmer is currently classified as Endangered, having lost 41% of its already small population over three generations, leaving no more than 2,900 breeding-age individuals. BNHS has collaborated with the Madhya Pradesh Forest Department, engaging local people to guard nest sites and creating a marine reserve at the main wintering site.

Using sites and species identified by the Wildlife Institute of India and BNHS, India has a National Action Plan focusing on reversing bird declines, managing landscape-scale habitats and increasing international co-operation. This plan, proposed in 2021, prioritises the conservation of 20 species, 48 wetlands and 31 landbird sites in 17 states, including many of the species already mentioned as well as some subcontinent residents, including Black-bellied Tern, and some rapidly disappearing species that use more than one flyway, such as Yellow-breasted Bunting.

A major challenge, however, is the paucity of knowledge about the population trends, status, precise routes and stopover sites of species that use the flyway, as well as a lack of resources. The proposed actions therefore include the stepping-up of monitoring, building on the combined efforts for shorebirds of the Species Action Plans timed to finish this year.

Most of the countries of the CAF are Parties to the Convention on Migratory Species (CMS). This

“A MAJOR CHALLENGE IS THE PAUCITY OF KNOWLEDGE ABOUT POPULATION TRENDS, STATUS, PRECISE ROUTES AND STOPOVER SITES OF SPECIES THAT USE THE FLYWAY”



SPECIES AT RISK ON THE CENTRAL ASIAN FLYWAY

Baer's Pochard	CR
Siberian Crane	CR
Lesser Florican	CR
Masked Finfoot	CR
White-bellied Heron	CR
Sociable Lapwing	CR
Yellow-breasted Bunting	CR
White-headed Duck	EN
Egyptian Vulture	EN
Steppe Eagle	EN
Great Knot	EN
Indian Skimmer	EN
Black-bellied Tern	EN
Saker Falcon	EN
Lesser White-fronted Goose	VN
Asian Houbara	VN
Greater Spotted Eagle	VN
Wood Snipe	VN
Relict Gull	VN
White-throated Bushchat	VN
Kashmir Flycatcher	VN
Greater Adjutant	NT
Lesser Adjutant	NT
Ferruginous Duck	NT
Marbled Teal	NT
Lesser Flamingo	NT
Black-necked Crane	NT
Dalmatian Pelican	NT
Spot-billed Pelican	NT
Black-headed Ibis	NT
Bearded Vulture	NT
Black-winged Pratincole	NT
Curlew Sandpiper	NT
Asian Dowitcher	NT
Black-tailed Godwit	NT
Bar-tailed Godwit	NT
Eurasian Curlew	NT

means they must assess their migratory species and their habitats, designate well-connected networks of protected areas, restore degraded ecosystems, protect declining species and create appropriate legislation to ensure these actions. India has taken a leading role in facilitating the international co-operation mandated by the Convention in the CAF, taking steps to ensure ecological connectivity along the flyway.

Accordingly, at the Conference of Parties of CMS in Samarkand, Uzbekistan, in February 2024, a Central Asian Flyway Initiative was launched, co-ordinated out of an office hosted by India, to support enhanced conservation of migratory birds among all 30 countries of the flyway. You can read more about this on the BirdLife website.

BirdLife has been instrumental in supporting the development of this CAF Initiative, including by undertaking a situation analysis of the whole flyway, which underpins the work of the Initiative.

BIRDS IN THE HAND

Much CAF conservation work is supported by surveying and monitoring.

Ringing schemes in India help gather data on biometrics, site fidelity, physiological conditions and population dynamics of every species trapped. The BNHS has ringed more than 700,000 individual birds since 1927, and recoveries have helped refine the flyway's borders.

However, perhaps only one in every 100 ringed birds is recovered, making ringing schemes the focus of intense effort to make the information

gathered scientifically robust. Leg tags, neck collars or GPS transmitters can have more success in some circumstances, but all methods are pursued to gather meaningful information. Results from such studies have been brought together in BNHS's *Indian Migration Atlas*, which details information on the origins, migration routes, and stopover and wintering sites of birds migrating within and outside the subcontinent.

Surveys of White-bellied Heron have taken place via an IUCN 'Save Our Species' project on the Assam/Bhutan border since 1973, engaging with local communities and appointing 'heron guardians'. The Royal Society for the Protection of Nature (RSPN; BirdLife in Bhutan) works tirelessly to ensure new power lines aren't erected in the heron's remaining breeding areas and that its home rivers remain undammed.

Since 2017, the RSPN has maintained a White-bellied Heron captive breeding centre in collaboration with the government, national energy company and Synchronicity Nature, hoping to reintroduce 'headstarted' fledglings of this shy species into the wild. Similar speculative censuses are also planned for other parts of India, Myanmar and Tibet to assess appropriate habitat in areas in which the species is currently absent. Its breeding areas in Namdapha Tiger Reserve may be shored up with buffer zones, while a tagging scheme has been mooted.

Several more declining species have been the focus of International Species Action Plans: Siberian and Black-necked Cranes, Saker Falcon, Eurasian

FLYWAYS



ABOVE
With fewer than 140 adults globally, White-bellied Heron is one of the most Critically Endangered species
© Rich Lindie/Shutterstock

Spoonbill, Lesser Flamingo, Asian Houbara, White-headed and Ferruginous Ducks, and Sociable Lapwing.

Unfortunately, Siberian Crane has disappeared from the flyway, with the remaining 3,500 confined to the East Asian-Australasian Flyway. Lesser Flamingo has a small, locally migratory population in Gujarat and Rajasthan (most of its population is in sub-Saharan Africa). Asian Houbara is less peripheral to the CAF, with its population moving between Central Asia and some regions of India.

Tagging of Common Cuckoos breeding in China has revealed that India is also used as a staging post in the species' migration to Africa in a similar way to Amur Falcon, further indicating that these birds aren't entirely restricted by the geography of the main flyways, but can 'mix it up' with other flyways.

CENTRAL ASIAN FLYWAY NUMBER CRUNCHING

41,868,517 km²

307 migratory species

30 countries

1,178 Important Bird and Biodiversity Areas

5 sites with more than one million birds

CONSERVATION ACTION

Conservation of Biodiversity of Kazakhstan (ACBK) is BirdLife's partner in a country holding up to 85% of the world's Steppe Eagle breeding population. Satellite tracking of the birds has revealed their wintering quarters and also the threats they face en route: mostly collisions with energy infrastructure and diclofenac poisoning.

ACBK and the Uzbekistan Society for the Protection of Birds (UzSPB; BirdLife partner) both work towards protecting Sociable Lapwing. As well as studying the species' migration ecology and monitoring its known breeding grounds, UzSPB has overseen the introduction of AVISTEP in the country – the Avian Sensitivity Tool for Energy Planning, a planning spatial assessment tool developed by BirdLife that helps mitigate the impacts on birds and habitats while enabling the growth of renewable energy sources (see page 49).

A vertiginous collapse in vulture numbers in the Indian subcontinent was caused by the veterinary use of diclofenac between the 1990s and early

2000s. This led to a 96.8% decline in vulture numbers, reducing populations of White-rumped, Long-billed and Slender-billed Vultures from 40 million to a paltry 19,000, while Red-headed Vulture also became Critically Endangered. Diclofenac and similar drugs are now banned in India, while captive breeding via the Saving Asian Vultures from Extinction (SAVE) initiative saw the first birds being reintroduced into the wild in 2021, after almost 20 years of concentrated efforts.

Added to this, wild populations are being helped by several 'vulture restaurants' opening over the last eight years, with the birds being fed beef and mutton guaranteed free from diclofenac and other non-steroidal anti-inflammatory drugs that cause fatal harm. BNHS has selected several regions of about 30,000km² in area as Vulture Safe Zones, where monitoring efforts are focused.

SAVE partners in Bangladesh and Myanmar are also surveying and protecting their remnant populations of White-rumped and other vultures. Nepal has banned the manufacture and use of veterinary diclofenac since 2006, seeing a gradual increase in vulture numbers subsequently. Nepal has also begun to monitor its population of wintering Yellow-breasted Bunting (which has declined globally by as much as 96.7%); the species' numbers have diminished so rapidly through high demand as food, with a craze for *begadi* meat being responsible for tens of thousands being trapped and killed for the restaurant trade.

Hopefully, Nepal will soon become a Party to the CMS, which already adopted a Multi-species Action Plan for African-Eurasian Vultures in 2017 and is to adopt an International Single Species Action Plan for Yellow-breasted Bunting. ■

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