2. Decline in Nilgiris Grassland - Environment

A 170-year study in the Nilgiris found that the conversion of native grasslands into plantations has decimated grassland bird populations, like the endemic Nilgiri Pipit. Conversely, forest bird species remained stable as the new wooded areas provided them with alternative habitats.

Overview of the Study

A comprehensive study published in the journal *Global Change Biology* has meticulously analyzed 170 years of land-use change within the Nilgiri mountains, a critical part of the Western Ghats. The research focused on understanding the long-term impact of these changes on bird diversity. In a unique methodological approach, researchers combined historical data from museum specimens with modern, on-ground field surveys to create a detailed timeline of biodiversity trends in the region.

Key Findings from the Study

Alarming Decline of Grassland Bird Species

The study revealed a severe negative impact on birds specializing in grassland habitats.

Widespread Drop - The relative abundance of approximately 90% of grassland bird species has declined over the study period.

Worst-Hit Species - The Nilgiri pipit and the Malabar lark, both grassland specialists, have suffered the steepest population declines.

Habitat Loss - This decline is directly linked to the massive reduction in their habitat. The extent of native grasslands in the Nilgiris shrank by a staggering 80%, from 993 sq. km in 1848 to just 201 sq. km in 2018.

Relative Stability of Forest Bird Species

In contrast to their grassland counterparts, forest-dwelling birds fared significantly better.

Stable Populations - The abundance of about 53% of forest bird species remained relatively stable over the last century.

Reason for Stability - The primary driver of grassland loss was the conversion of these areas into exotic tree plantations (like eucalyptus and wattle) or their takeover by woody invasive species. These new, wooded environments inadvertently created alternative or expanded habitats for forest-dependent birds, allowing their populations to remain stable or even thrive.

Main Conservation Concern

A critical insight from the study is the systemic neglect of grassland ecosystems. The conservation focus in policy and practice has overwhelmingly been on forests and promoting tree plantations, while native grasslands, which are unique and vital ecosystems, remain poorly recognized and protected.

Species in Focus

About the Nilgiri Pipit (Anthus nilghiriensis)

Distribution - This bird is endemic to the Western Ghats, meaning it is found nowhere else in the world. Its range is primarily within Kerala, Tamil Nadu, and Karnataka.

Habitat - It prefers high-altitude grassy upland slopes interspersed with scattered bushes and trees, mainly found above 1,500 meters and most abundant above 2,000 meters.

Conservation Status - It is listed as "Vulnerable" on the IUCN Red List due to its declining population and specific habitat needs.

Feeding Habits - It primarily forages on creeping grasses in valleys and also consumes the seeds of various grasses and herbs.

Breeding & Nesting - For breeding, it requires marshy grasslands with taller grasses and sedges, often building its nests near streams.

Major Threats - The primary threat is habitat loss due to the large-scale conversion of its native high-altitude grasslands into commercial plantations of tea, eucalyptus, and silver wattle (*Acacia dealbata*).

About the Malabar Lark

Appearance - A distinctive rusty-brown bird with heavily streaked upperparts, a short crest on its head, paler underparts, and strong dark streaks on its breast.
Habitat - It is found in more open landscapes, including grassy fields, rocky areas, and scrublands.
Behavior - It forages for food on the ground, often described as having a lazy gait. Outside the breeding season, it frequently forms flocks.
Vocalization - It is known for its pleasant call, which consists of a series of variable short whistles.
Breeding - It is a sedentary (non-migratory) breeder. It builds its nest on the ground and typically lays 2–3 eggs.
Diet - Its diet consists mainly of seeds, but during the breeding season, insects become a crucial food source for feeding its young.
Conservation Status - It is currently classified as "Least Concern" on the IUCN Red List, as its population is not yet considered to be under severe threat globally.

Ecosystems of the Nilgiris

The Shola-Grassland Ecosystem

Definition - A unique and fragile ecosystem described as a mosaic of montane evergreen forests (Sholas) and grasslands.
Location - This ecosystem is restricted to the tropical high-altitude regions (above 1500 m) of the southern Western Ghats.
Characteristics - The landscape is defined by vast rolling grasslands punctuated by patches of stunted evergreen forests found in the valleys and folds of the hills.
Biodiversity Hotspot - It serves as a habitat for numerous endemic and endangered species of both plants and animals.
Ecological Importance - Shola forests and grasslands are critical for the region's hydrology. They act like sponges, absorbing monsoon rainfall and releasing it slowly, thus playing a crucial role in sustaining water cycles and maintaining the flow of rivers.

The Nilgiri Mountains

Location - These mountains are situated at the trijunction of Tamil Nadu, Kerala, and Karnataka in the southern part of the Western Ghats.
Highest Peak - Doddabetta, at 2,637 meters, is the highest point in the Nilgiri range.
Geography - The landscape is characterized by rolling hills, deep valleys, and elevated plateaus, which support the unique Shola-grassland ecosystems.
Ecology - The Nilgiris are a globally recognized biodiversity hotspot, home to iconic endemic species such as the Nilgiri tahr, lion-tailed macaque, and the Nilgiri pipit.
Hydrological Role - The range acts as a vital watershed, forming the catchment area for several important rivers, including the Bhavani and Kabini.

Role of Natural History Museums in Conservation

Biodiversity Repositories - Museums are not just collections of old artifacts; they are vital stores of biodiversity data, especially crucial in species-rich tropical regions like India.
Invaluable Historical Records - Their collections provide a historical baseline, offering information on past species distributions, taxonomy, migration patterns, species' responses to climate change, and even biodiversity collapse.
Key Challenges - Despite their importance, these institutions face significant challenges, including a lack of digitization of records, limited funding, outdated infrastructure, bureaucratic hurdles, high travel costs for researchers, visa restrictions, and international disputes over specimen ownership and repatriation.

Insights and the Way Forward for Conservation

Integrate Historical Archives - Historical archives—including museum specimens, old journals, and

maps—are invaluable. They complement modern field studies by providing long-term biodiversity baselines against which current changes can be measured.

Prioritize Grassland Restoration - There is an urgent need to shift conservation focus to recognize, protect, and restore native grasslands as the critical and threatened ecosystems they are, rather than viewing them as wastelands to be afforested.

Adopt Nature-Based Solutions - Conservation strategies must include the proper valuation of non-forest habitats. Adopting holistic nature-based solutions that respect the integrity of all native ecosystems is essential to prevent further biodiversity loss.

Source - https - //www.thehindu.com/sci-tech/energy-and-environment/how-dead-birds-old-maps-are-helping-scientists-track-biodiversity-loss/article70003678.ece