

SMITHSONIAN'S USE OF CUTTING-EDGE TECHNOLOGY TO SAFEGUARD BIODIVERSITY

The Smithsonian is at the forefront of employing cutting-edge technology to assess and protect biodiversity, helping scientists understand the complexities of ecosystems and develop strategies globally. By integrating satellite tracking, artificial intelligence, and innovative monitoring techniques, the Smithsonian is leading the way in biodiversity conservation.

Programs like [ForestGEO](#), [MarineGEO](#), and [GEO-TREES](#) track long-term changes in ecosystems worldwide. ForestGEO monitors over 7 million trees across 29 countries, providing essential forest ecology data training local scientists. MarineGEO collaborates with NOAA on a national strategy for marine biodiversity conservation strategy, while GEO-TREES offers an open-access forest biomass reference system for accurate satellite-based forest carbon assessments.

The [Movement of Life](#) program uses satellite and aircraft technology to track long-distance animal migrations, such as wildebeest and whales, providing crucial data on migration patterns and conservation needs. The Migratory Bird Center uses radio tracking to monitor birds like songbirds and Arctic seabirds, helping scientists protect habitats along migratory routes.

In the American Midwest, the [Great Plains Science Program](#) is using a new technology to track endangered black-footed ferrets and prairie dogs—key species in the region—assessing prairie ecosystem health and guiding conservation actions.

Artificial intelligence is transforming biodiversity research. The [Panama Amphibian Rescue and Conservation Project](#) uses AI to search for frog species once thought to be extinct. By analyzing environmental data, AI helps locate elusive species, advancing recovery efforts.

The Smithsonian also leads in environmental DNA ([eDNA](#)) technology, detecting rare species like salamanders from trace genetic material in water or soil, revolutionizing biodiversity monitoring in hard-to-reach areas.

Additionally, programs like [Wildlife Insights](#) and [eMammal](#) use camera traps to monitor global biodiversity, and [satellite tracking of Asian elephants](#) capture crucial data on species behavior, abundance, and distribution.

Through these innovative technologies, the Smithsonian is not only advancing biodiversity research but also creating practical solutions for the conservation of species and ecosystems worldwide. This multidisciplinary approach, which combines cutting-edge science with global partnerships, is a beacon of hope for the future of our planet's natural resources and biodiversity.

Life on a Sustainable Planet (LSP) is a vital initiative from the Smithsonian designed to advance and inspire global engagement in environmental stewardship. This comprehensive program applies the Smithsonian's expertise in science, outreach, and education to foster holistic approaches to preserving ecosystems, building resilience, and educating the world about sustainable climate solutions. Smithsonian scientists partner with communities and organizations around the world, conducting research and educational programs to shape the future. LSP programs save and protect biodiversity, champion sustainable practices, and offer innovative solutions to the challenges posed by our changing climate.