



De-Extinction: Restoring Extinct Species



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TIMELINE: FROM EXTINCTION TO REVIVAL

~13,000 Years Ago

Extinction Event

Dire Wolf disappears from Americas due to climate change & competition.



2021

Genomic Breakthrough

DNA analysis confirms Dire Wolves are distinct from Gray Wolves.

April 2025

Successful Revival

Colossal Biosciences announces birth of edited Dire Wolf pups.



METHODOLOGY: CRISPR PROCESS

Using CRISPR to "Copy & Paste" ancient traits into modern relatives.



1. DNA Recovery

Extract fragments from ancient fossils



2. Sequencing

Map genome & identify gaps



3. CRISPR Editing

Edit Gray Wolf embryo with Dire traits



4. Birth (Hybrid)

Surrogate gives birth to edited pup



Ethical Issues

Moral hazard

Competition with existing species

If reintroduction into environment life fails, who will be responsible

Proxies of species

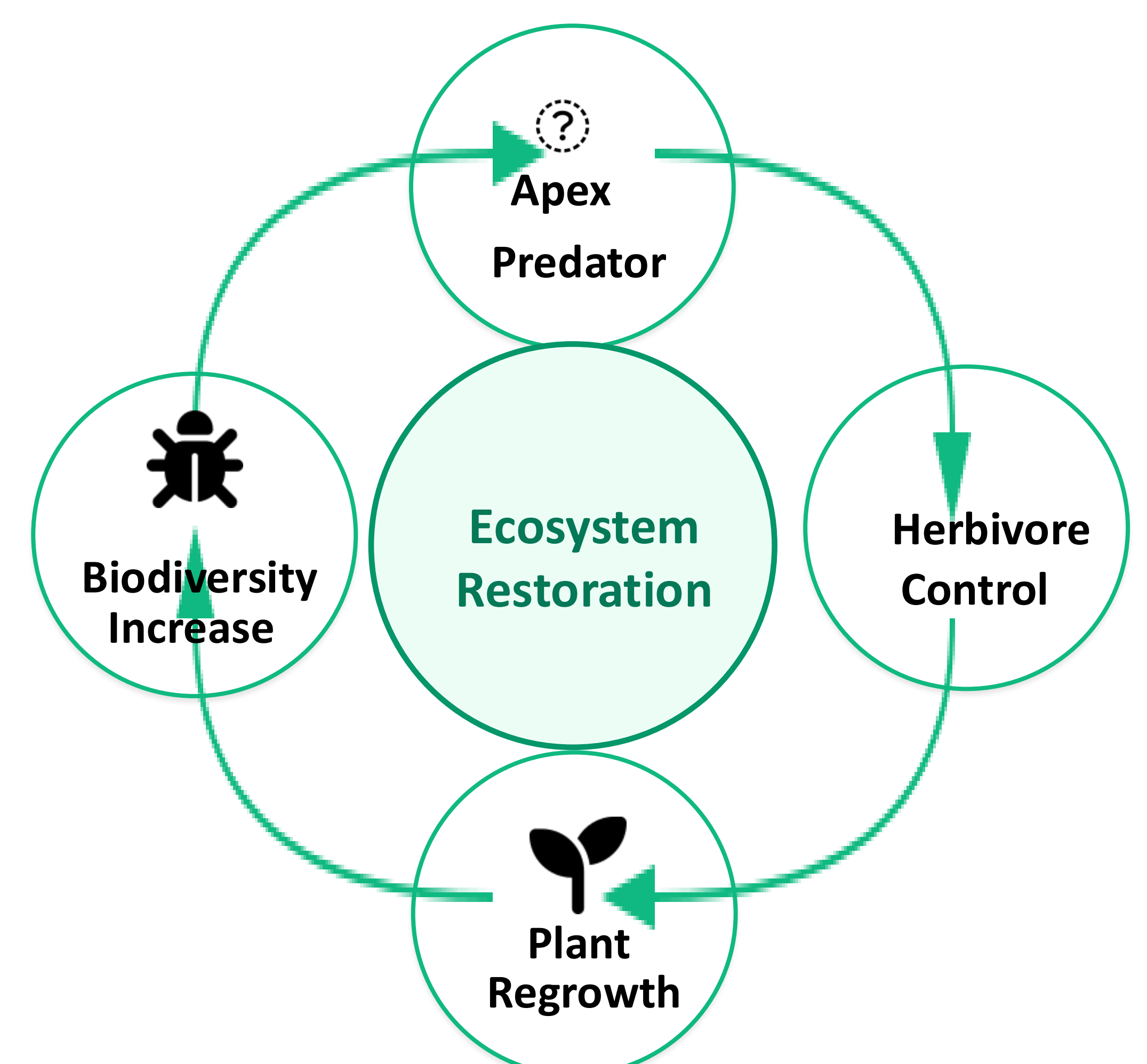
Introducing alternative species to restore ecological functions lost due to extinction



The true value of de-extinction lies not in the revival of species, but **in the revival of ecosystems.**



ECOSYSTEM IMPACT CYCLE



reference

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