

LOSS THROUGH REFORESTATION

A HIKE THROUGH THE TERMS
SURROUNDING REFORESTATION

DEN -
SITY
GN +



POLITECNICO
MILANO 1863

SCHOOL OF DESIGN

FINAL SYNTHESIS DESIGN STUDIO
LM in Communication Design
Sez. C3 — 2022/2023

GROUP 03

*Lost in the woods: a hike through the terms
surrounding reforestation*

AUTHORS

Giulio Alessandrini
Alexandra Chiojdeanu
Andrea Corsini
Greta Cozza
Miguel Gashi
Alessia Mattesini
Ana Muço

FACULTY

Michele Mauri
Ángeles Briones
Gabriele Colombo
Simone Vantini
Salvatore Zingale

TEACHING ASSISTANTS

Elena Aversa
Andrea Benedetti
Tommaso Elli
Beatrice Gobbo
Arianna Bellantuono

D E N -
S I T Y
G N +



POLITECNICO
MILANO 1863

SCHOOL OF DESIGN

FINAL SYNTHESIS DESIGN STUDIO
LM in Communication Design
Sez. C3 — 2022/2023

INTRO

With the threat of climate change growing day by day, our responsibility to care for our planet is more important than ever. This is where reforestation comes into play. The topic is connected to a range of practices adapted to solving environmental problems, from restoring habitats to replanting acres of damaged woodland. However, due to these varying methods, a branching canopy of terms emerges.

The aim of this investigation is to determine how these practices are connected, their growth overtime, and which factors affect our associations to them. To conduct this analysis, three platforms were mainly used, Wikipedia, Google Trends and Google Images, to collect data and build findings.

The following research expands on reforestation terms to find related topics using Wikipedia, allowing for the creation of network graphs which highlight connections and clusters between the data gathered. Google Trends was used to reveal the search trends of terms over time. Their popularity and how it fluctuates is shown, along with events and patterns that cause these changes. By analysing Google Image results, the way terms are visually portrayed is investigated. This reveals usage of common tropes they share, or imagery unique to them.

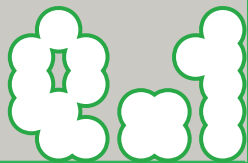
INDEX

pag.01

TERMS

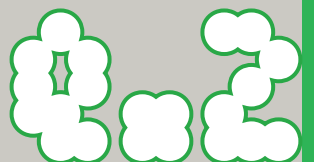
pag.06

Which are the Wikipedia pages related to the concept of reforestation?



pag.21

How have the terms associated to reforestation evolved over time according to Google Trends?



pag.45

How are the terms associated to reforestation represented on Google Images?



TERMS

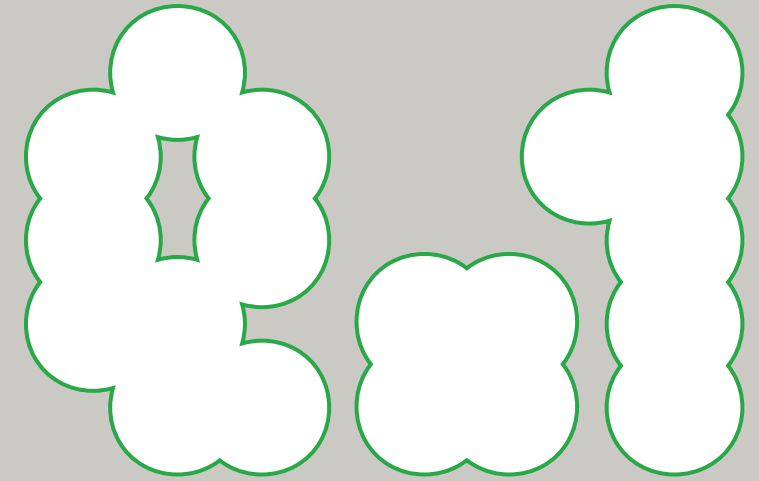
THE *TERMS* OF REFORESTATION

Before we began our analysis, a list of terms related to reforestation was researched and compiled. This involved collecting words and synonyms from research articles on the topic, that we then reduced to those most associated with reforestation. The list used for each research question differs slightly due to terms not providing useful data on some platforms.

INCLUDED
 NOT INCLUDED

Term	Which are the Wikipedia pages related to the concept of reforestation?	How have the terms associated to reforestation evolved over time according to Google Trends?	How are the terms associated to reforestation represented on Google Images?
AFFORESTATION	Not Included	Not Included	Not Included
AGROFORESTRY	Not Included	Not Included	Not Included
ARTIFICIAL REGENERATION	Not Included	Not Included	Not Included
CARBON SEQUESTRATION	Not Included	Not Included	Not Included
ECOLOGICAL RESTORATION	Not Included	Not Included	Not Included
ECOLOGICAL REVITALIZATION	Not Included	Not Included	Not Included
ECOSYSTEM REPAIR	Not Included	Not Included	Not Included
ECOSYSTEM RESTORATION	Not Included	Not Included	Not Included
ENVIRONMENTAL REMEDIATION	Not Included	Not Included	Not Included
FORESTATION	Not Included	Not Included	Not Included
FOREST EXPANSION	Not Included	Not Included	Not Included
FOREST MANAGEMENT	Not Included	Not Included	Not Included
FOREST RESTORATION	Not Included	Not Included	Not Included
FORESTRY	Not Included	Not Included	Not Included
FUNCTIONAL RESTORATION	Not Included	Not Included	Not Included
HABITAT RECONSTRUCTION	Not Included	Not Included	Not Included
HABITAT RESTORATION	Not Included	Not Included	Not Included
LAND RECLAMATION	Not Included	Not Included	Not Included
LAND REHABILITATION	Not Included	Not Included	Not Included
LAND RESTORATION	Not Included	Not Included	Not Included
LANDSCAPE RESTORATION	Not Included	Not Included	Not Included
NATIVE VEGETATION RESTORATION	Not Included	Not Included	Not Included
NATURAL FOREST REGROWTH	Not Included	Not Included	Not Included
NATURAL REGENERATION	Not Included	Not Included	Not Included
NATURE RECOVERY	Not Included	Not Included	Not Included
NEW PLANTING	Not Included	Not Included	Not Included
PRODUCTIVE LAND ABANDONMENT	Not Included	Not Included	Not Included
RAINFORESTATION	Not Included	Not Included	Not Included
REAFFORESTATION	Not Included	Not Included	Not Included
RECONCILIATION ECOLOGY	Not Included	Not Included	Not Included
REFORESTATION	Not Included	Not Included	Not Included
REVEGETATION	Not Included	Not Included	Not Included
REWILDING	Not Included	Not Included	Not Included
SILVICULTURE	Not Included	Not Included	Not Included
SPECIES REINTRODUCTION	Not Included	Not Included	Not Included
SPECIES REPLACEMENT	Not Included	Not Included	Not Included
SUSTAINABLE FOREST MANAGEMENT	Not Included	Not Included	Not Included
TREE COVER INCREASE	Not Included	Not Included	Not Included
TREE PLANTING	Not Included	Not Included	Not Included
WILDLIFE REHABILITATION	Not Included	Not Included	Not Included

focus: **TERMINOLOGY**

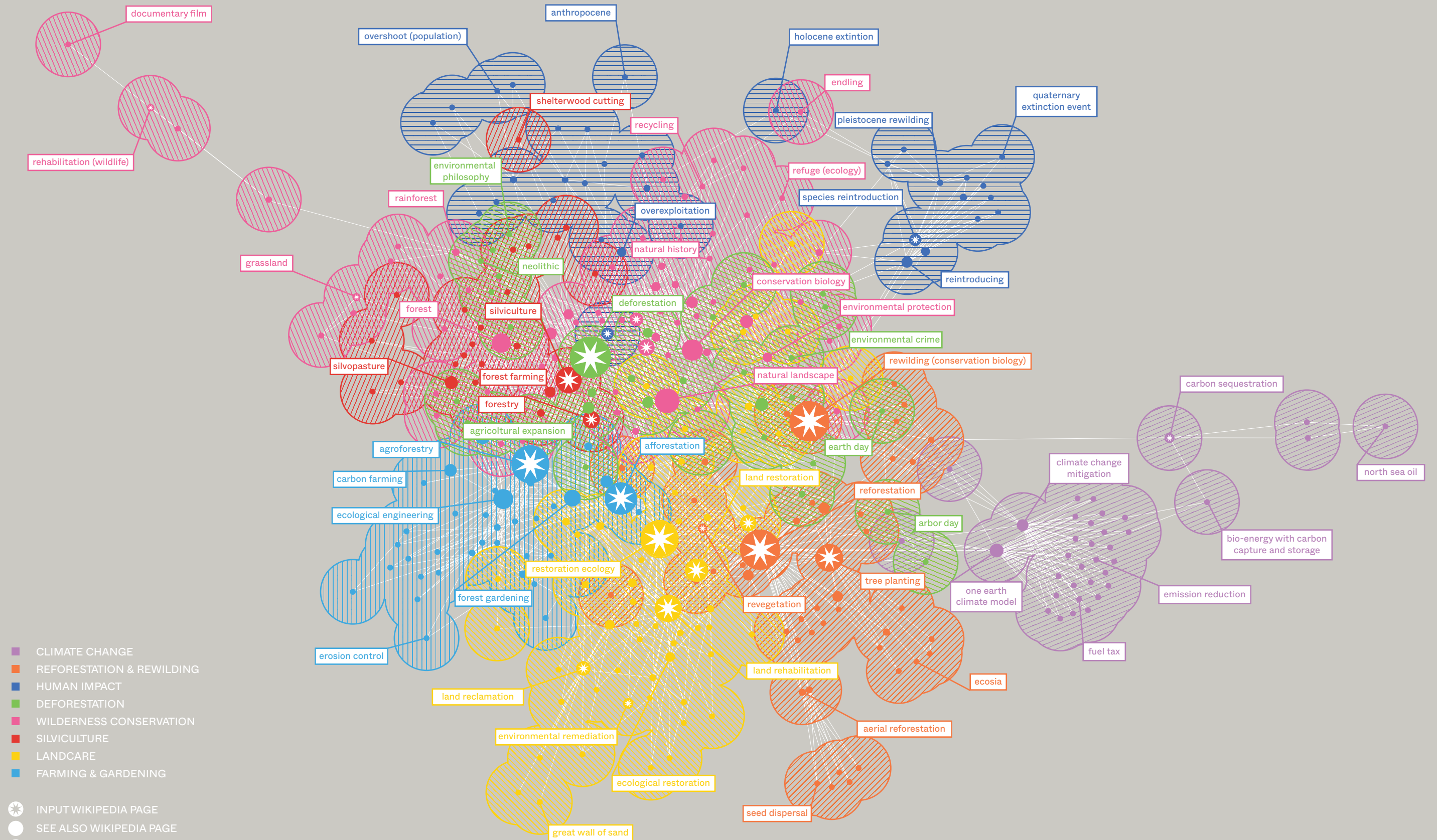


WHICH ARE THE WIKIPEDIA PAGES RELATED TO THE CONCEPT OF REFORESTATION?

We began our research by investigating the broader web of topics surrounding reforestation. We used Seealso to find pages that are off-shoots and logical links between our terms on Wikipedia. This allowed for the creation of a network of interconnected concepts, which is explored through this first research question.

CLUSTERS & GEOGRAPHY

There are 346 pages related to reforestation that we divided into 8 interconnected clusters. The climate change cluster is further from the core and only connected by two pages, the cluster regarding negative human impact is isolated, and pages associated with documentaries and animal shelters stretch out to the top left.

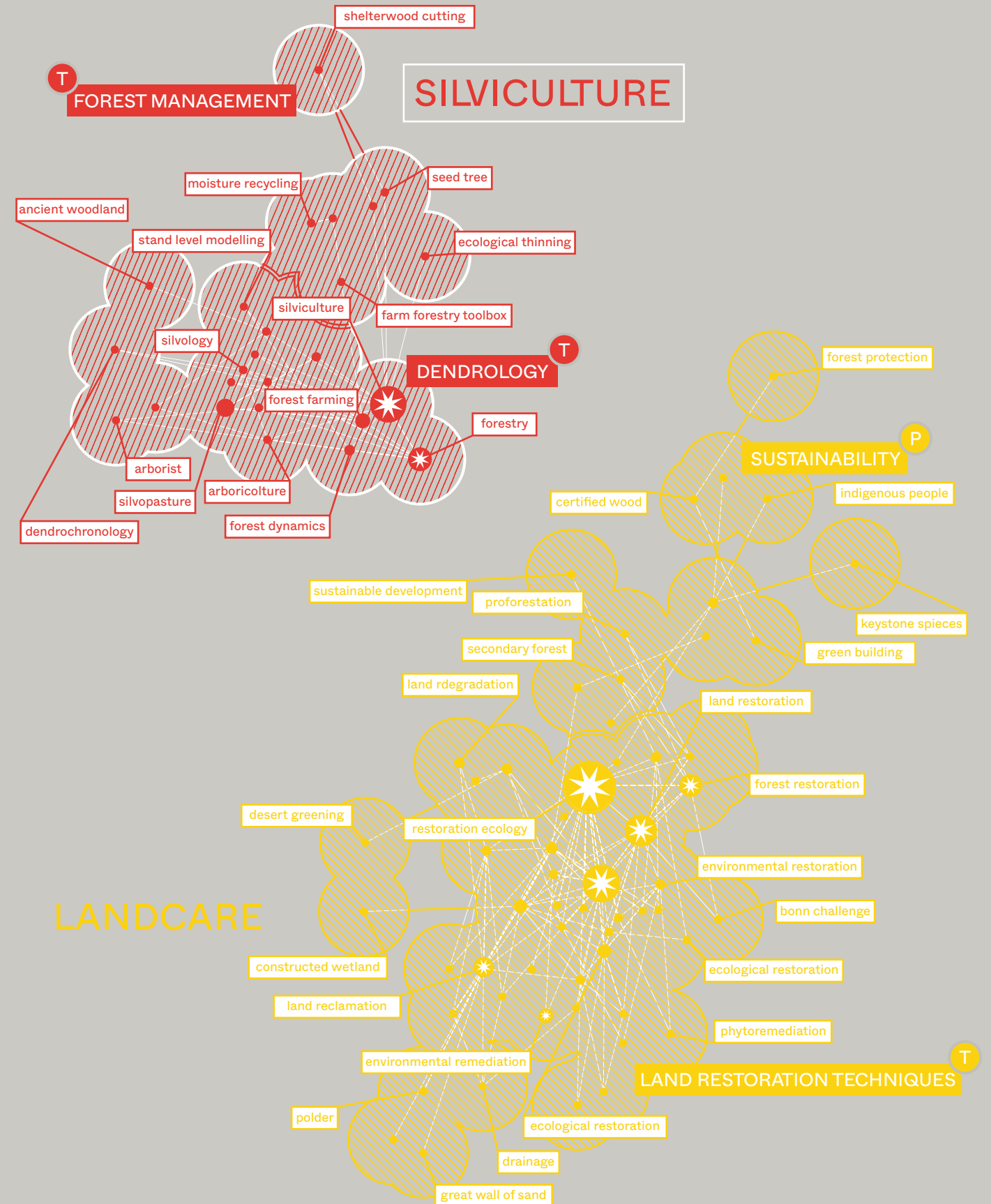
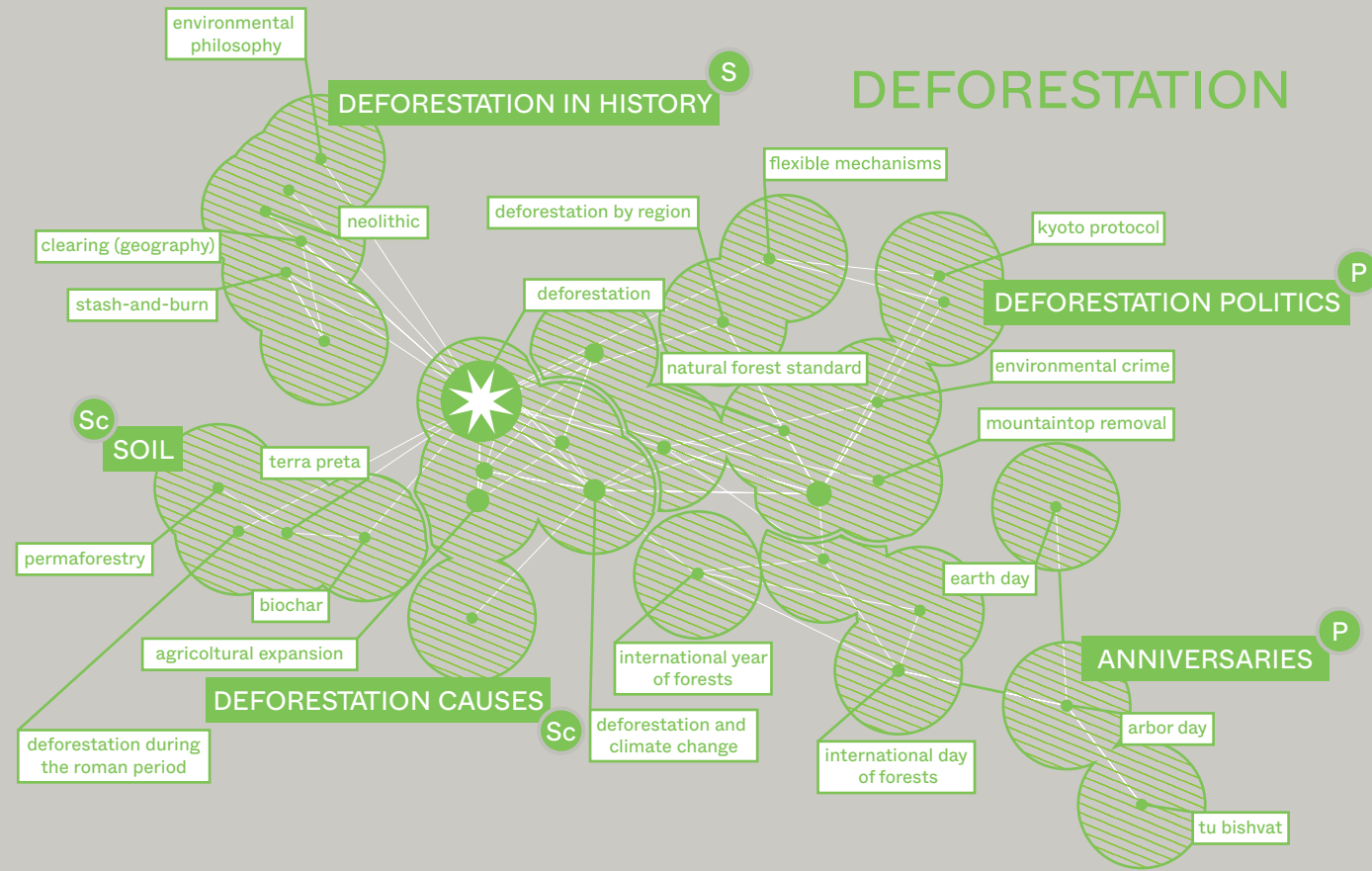


CLUSTERS' TOPICS

RECURRENCE

Analysis of the pages show they refer to four general categories: politics, science, technology, and social issues. These categories can be used to subcluster the main clusters. "Silviculture" and "Farming & Gardening" clusters only contain technology related pages.

- S SOCIAL ISSUES
- T TECHNOLOGIES
- Sc SCIENCE
- P POLITICS



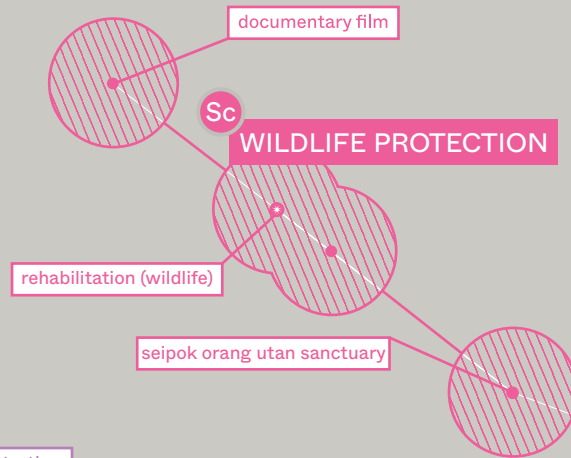
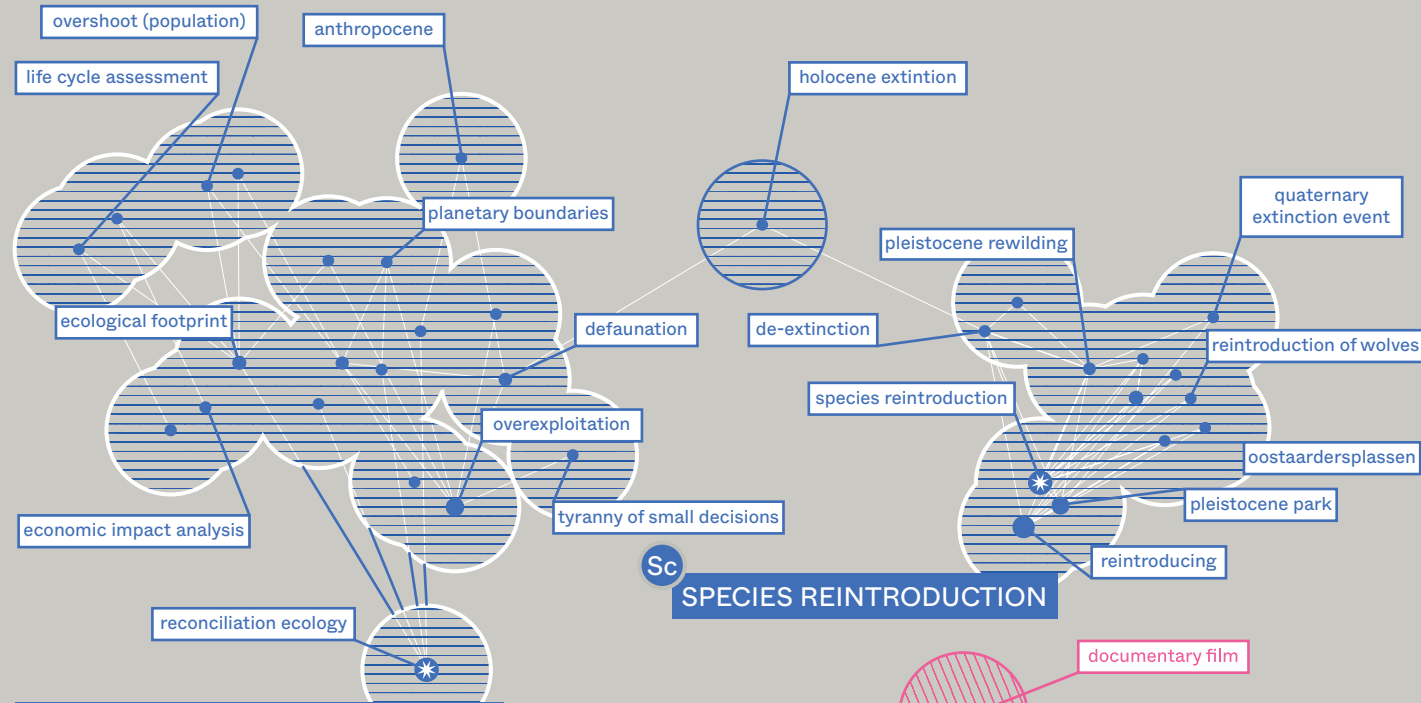
FARMING & GARDENING

ECOLOGICAL ENGINEERING

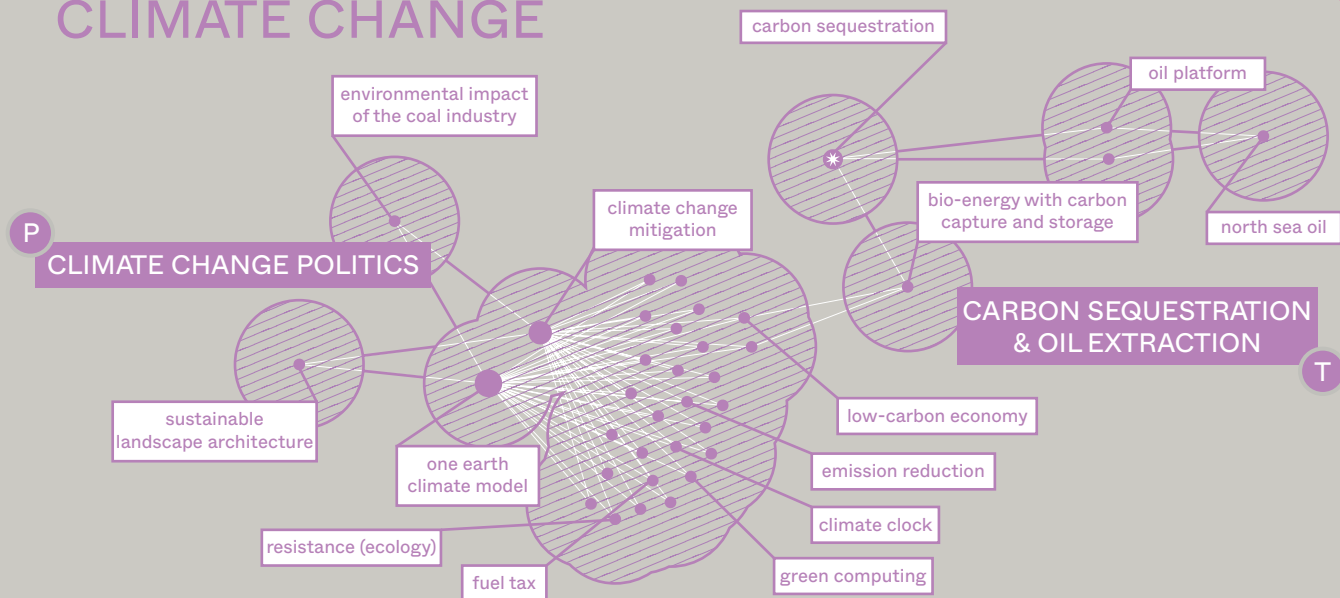
CLUSTERS' TOPICS

UNIQUENESS

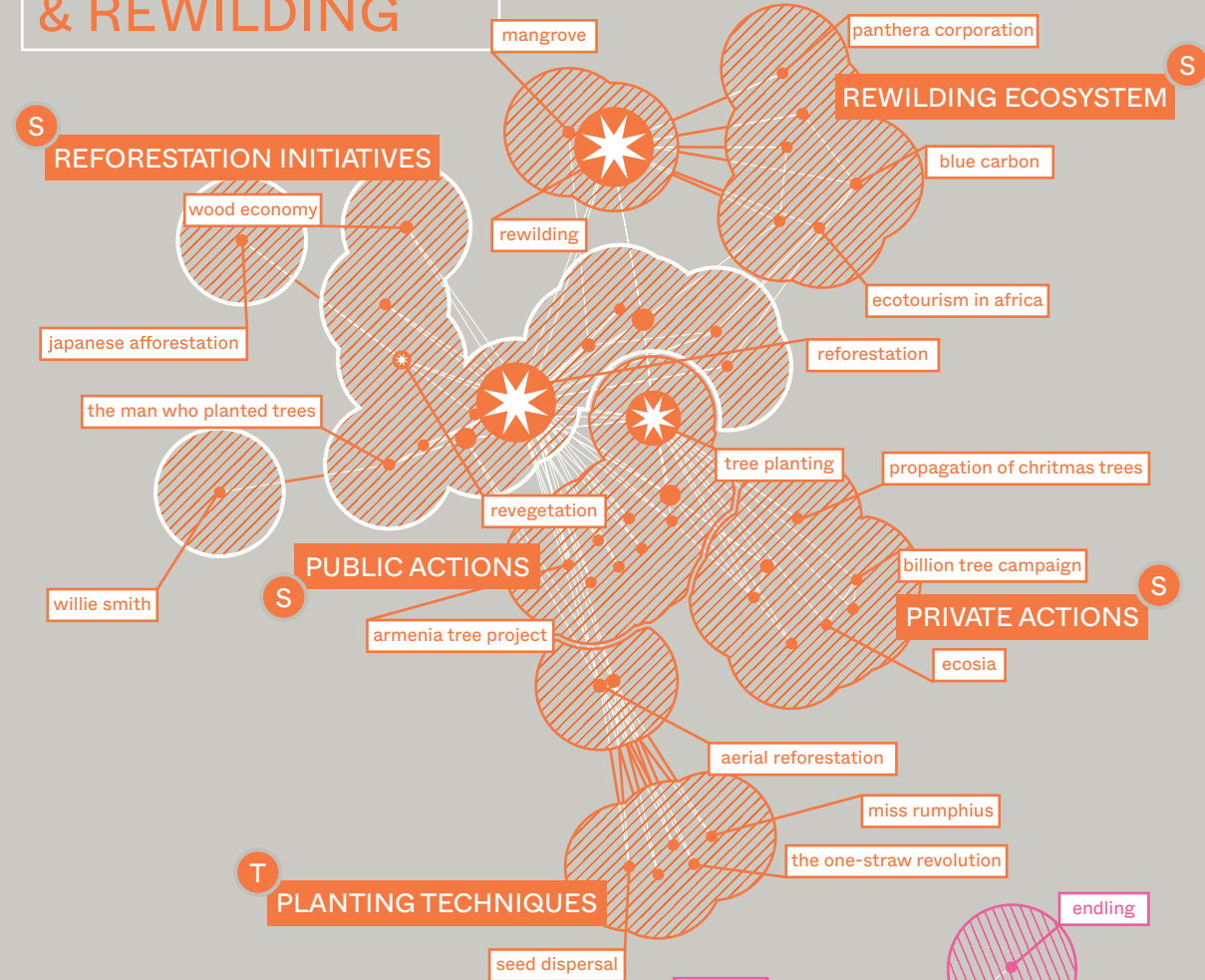
The "Human Impact" cluster is divided into two subclusters, one for positive impacts and the other for negative. Reforestation and rewilding is the only cluster containing famous figures, projects and books related to the field.



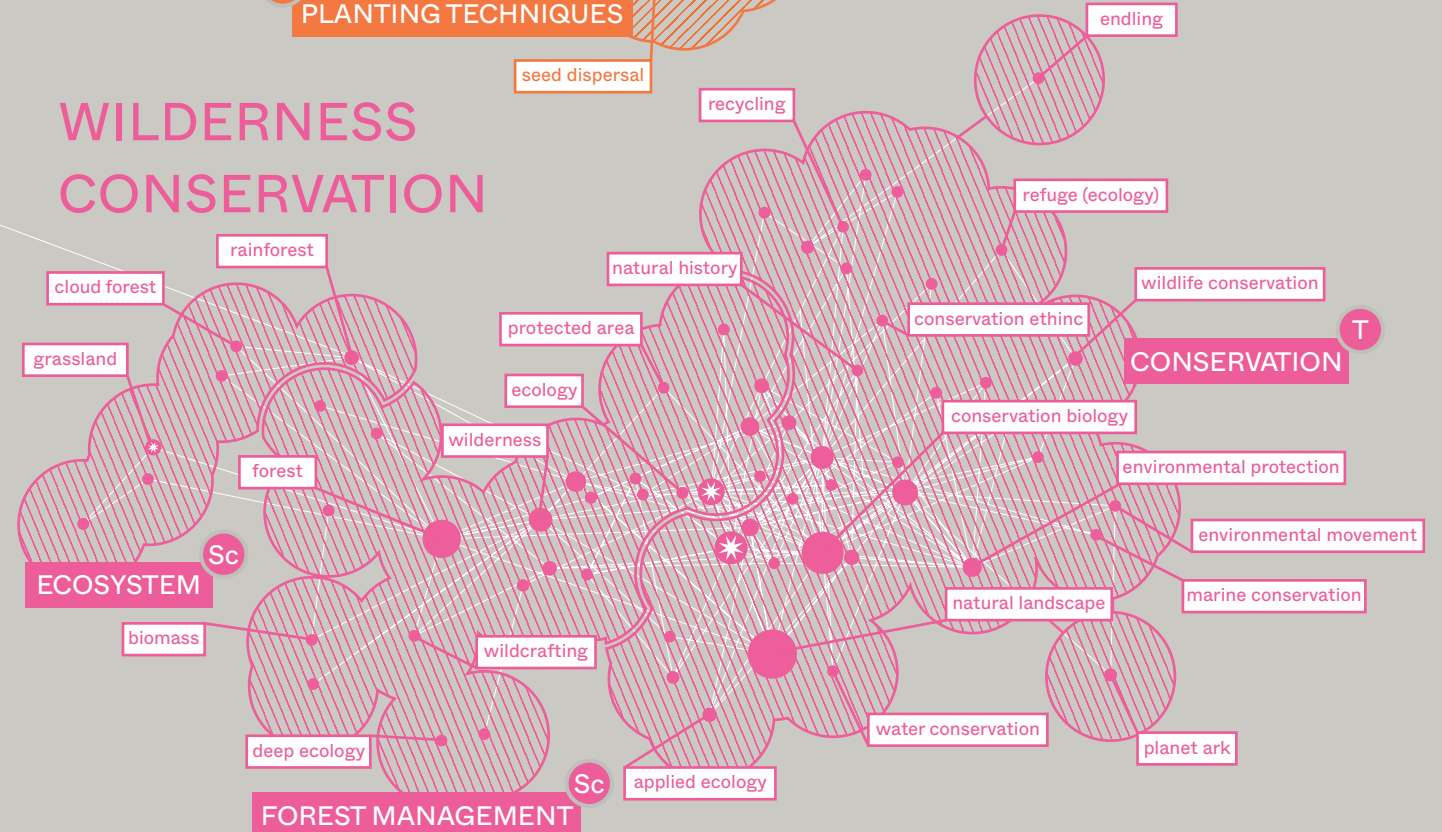
CLIMATE CHANGE



REFORESTATION & REWILDING

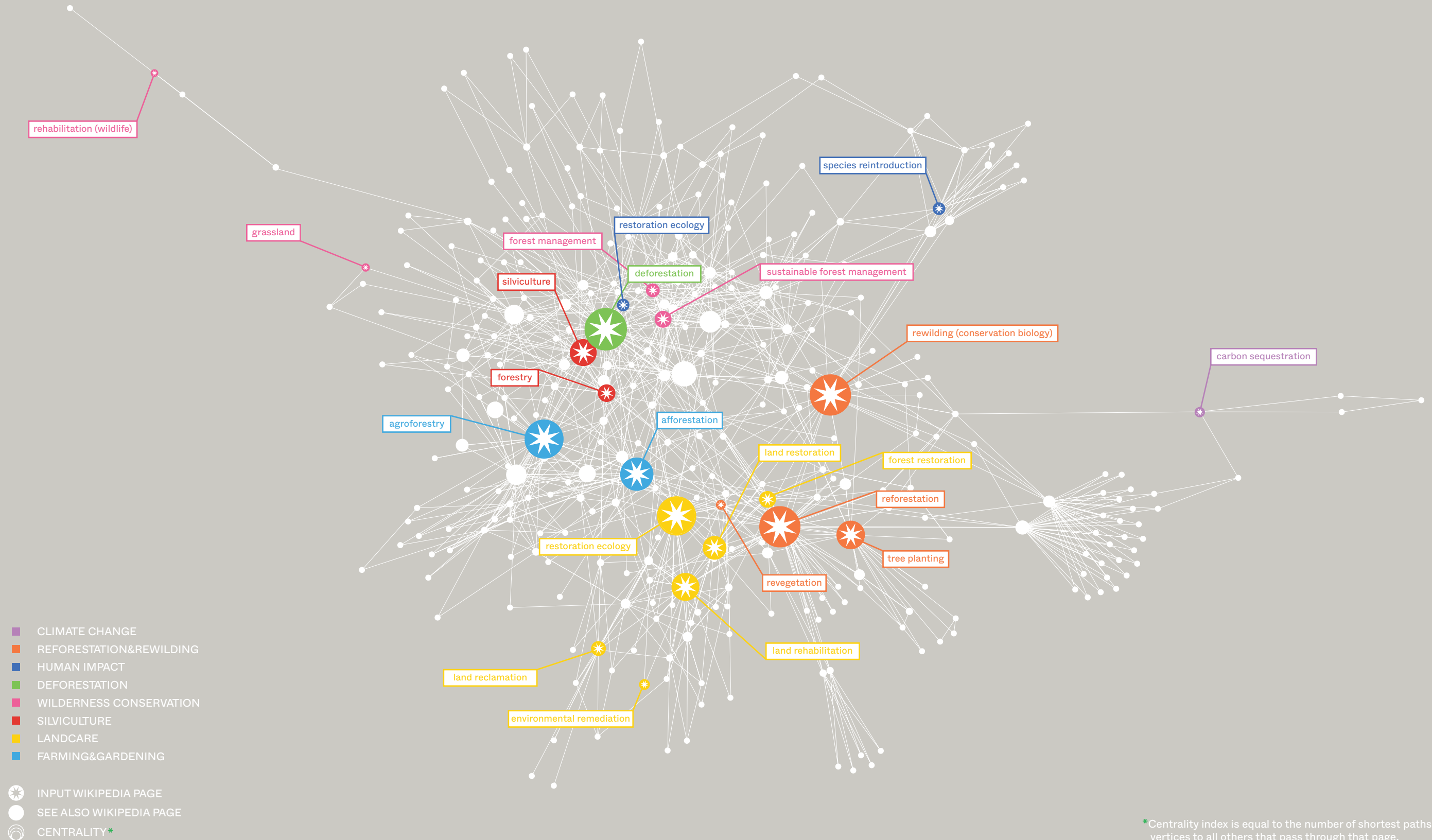


WILDERNESS CONSERVATION



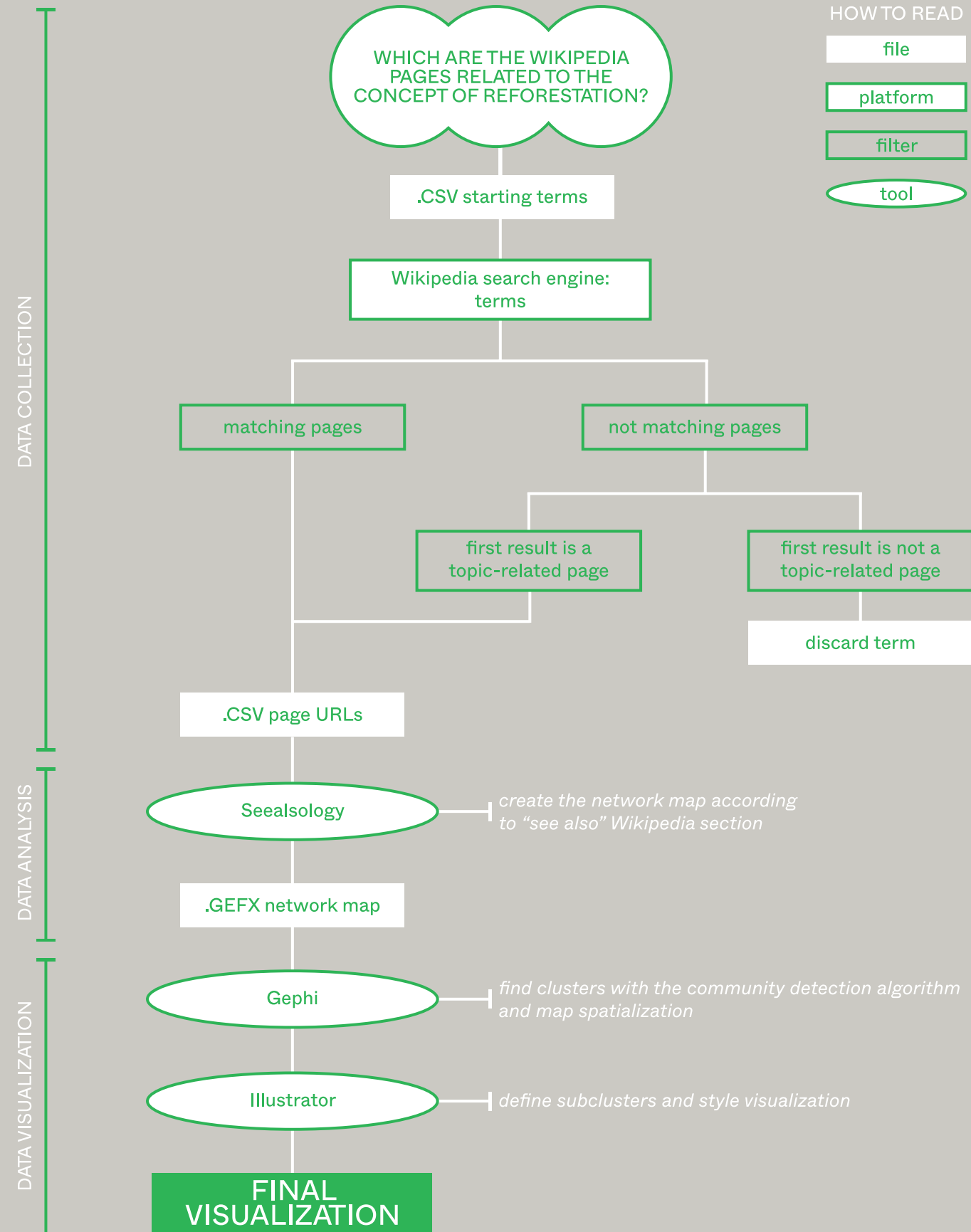
INPUT PAGES CENTRALITY

Here we see the centrality between pages, which is an indicator of their position in the network. The pages with higher centrality, and therefore closer to the network core, are mainly our input terms. However, there are input pages further from the core which may indicate they are more niche, due to them having less links to central pages whose topics seem to be more mainstream.



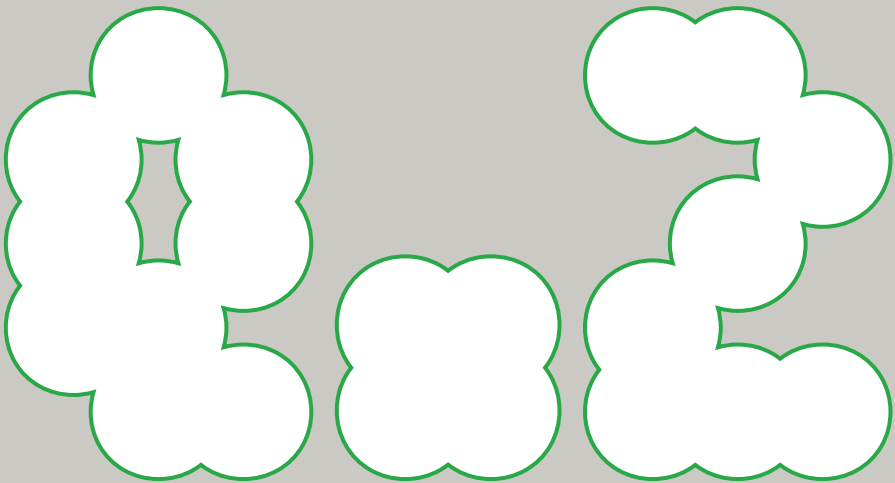
*Centrality index is equal to the number of shortest paths from all vertices to all others that pass through that page.

RESEARCH PROTOCOL



RESOURCES

focus: **TIME**



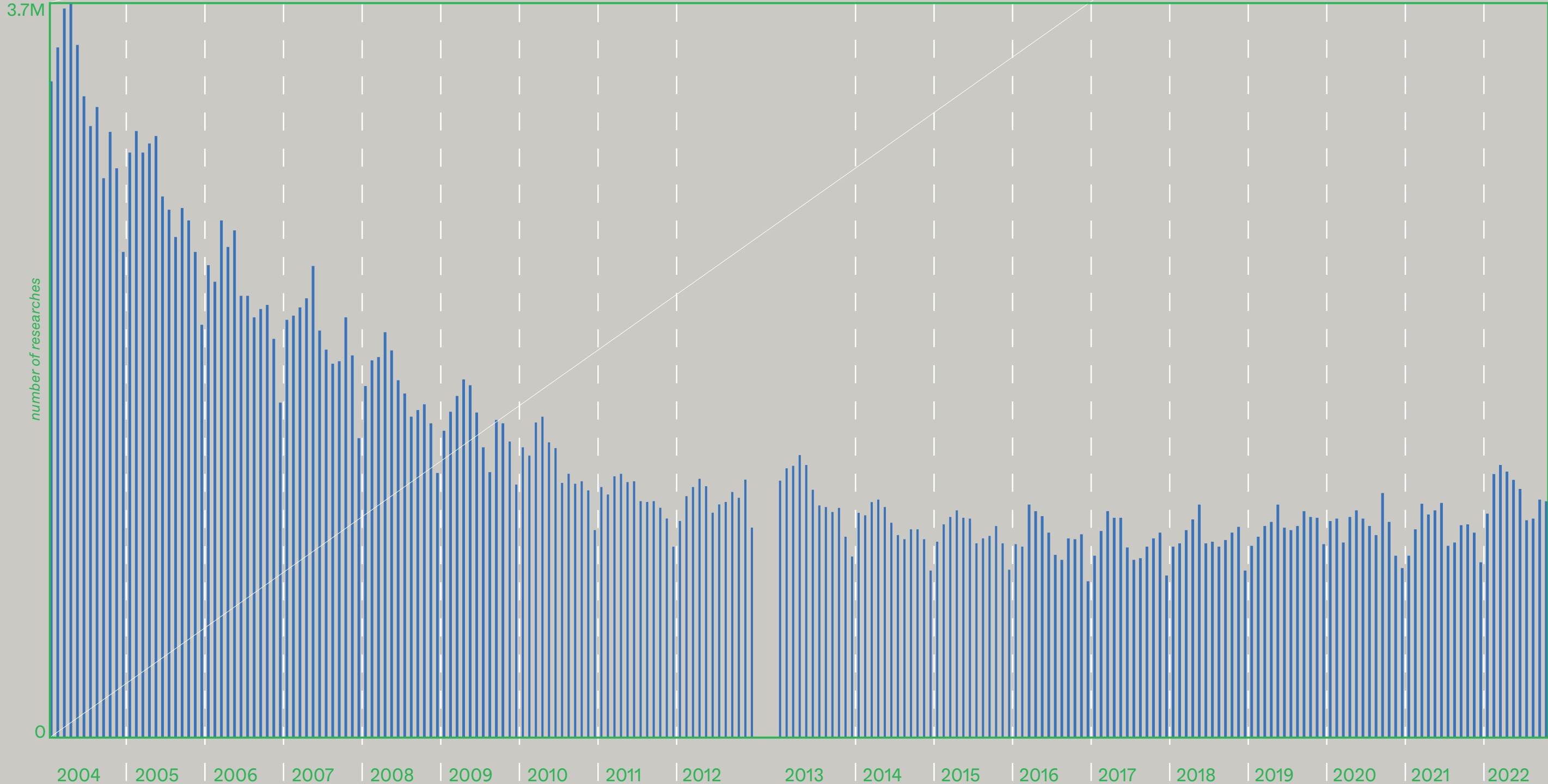
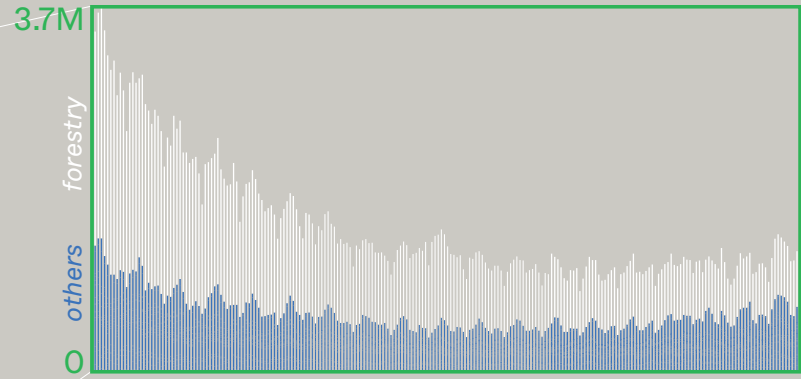
HOW HAVE THE TERMS ASSOCIATED TO REFORESTATION EVOLVED OVER TIME ACCORDING TO GOOGLE TRENDS?

Question two uses Google Trends data to analyze search volumes for the chosen terms, and show how interest in them changes over time. By doing this we were able to visualize how the trends have evolved from 2004 to 2022 and see whether there are changes in interest between the different reforestation terms.

SEARCH VOLUME TREND

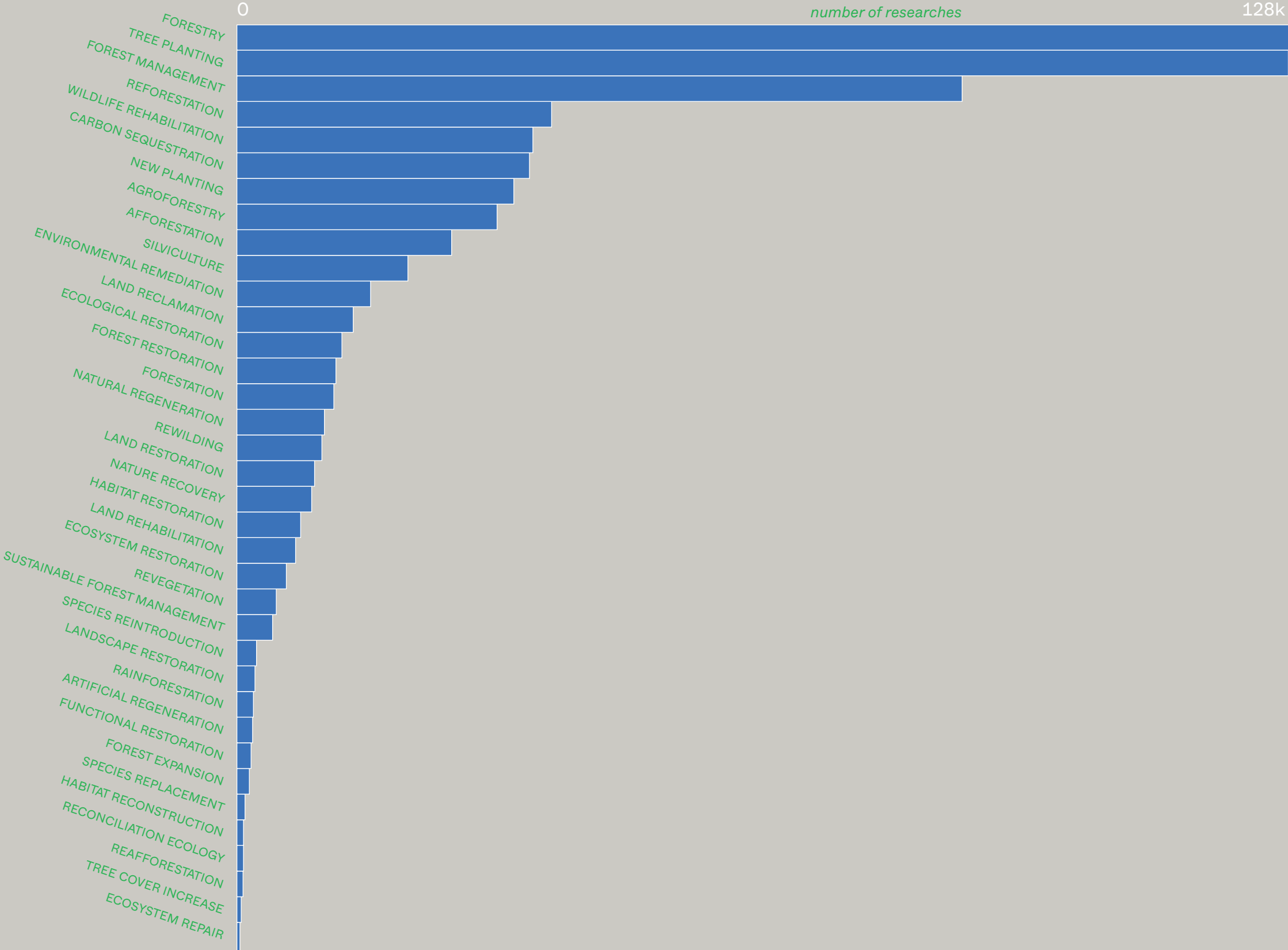
This visualization represents the overall search volumes for the combined terms. Data was collected from Google Trends on the search volume of each term for every month in the time frame 2004-2022. These volumes are summed up to show how interest in the general topic changes over time.

The month with the highest search volume is April 2004 with 3.7 million searches.



AVERAGE SEARCH VOLUME RANKING

The analysis of the average search volumes for terms for the entire time frame 2004-2022 highlights how the searches for “Forestry” greatly exceed the searches for the other terms combined. Indeed, on average there are a total of 1.5 million searches per month, while it lowers to 599k excluding “Forestry”.



200k

300k

400k

500k

600k

700k

800k

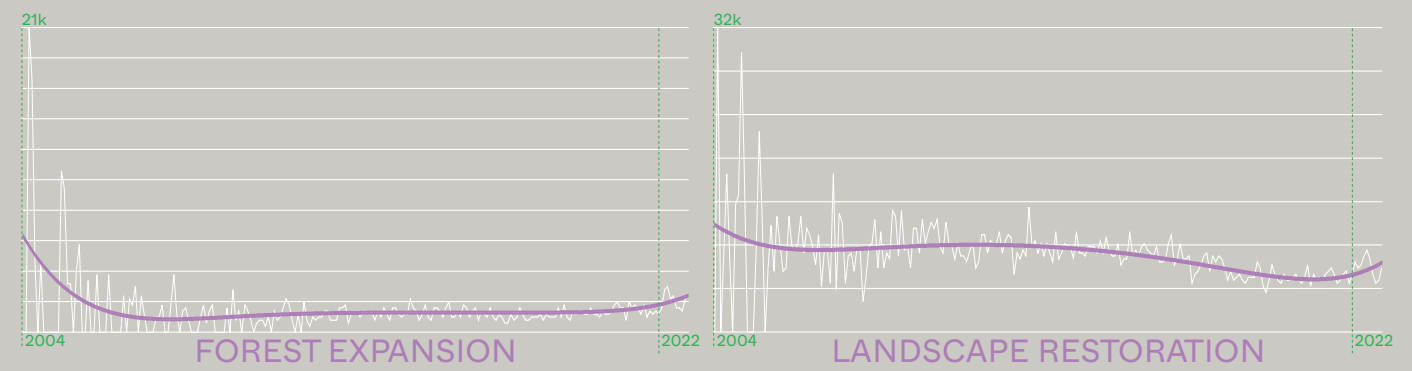
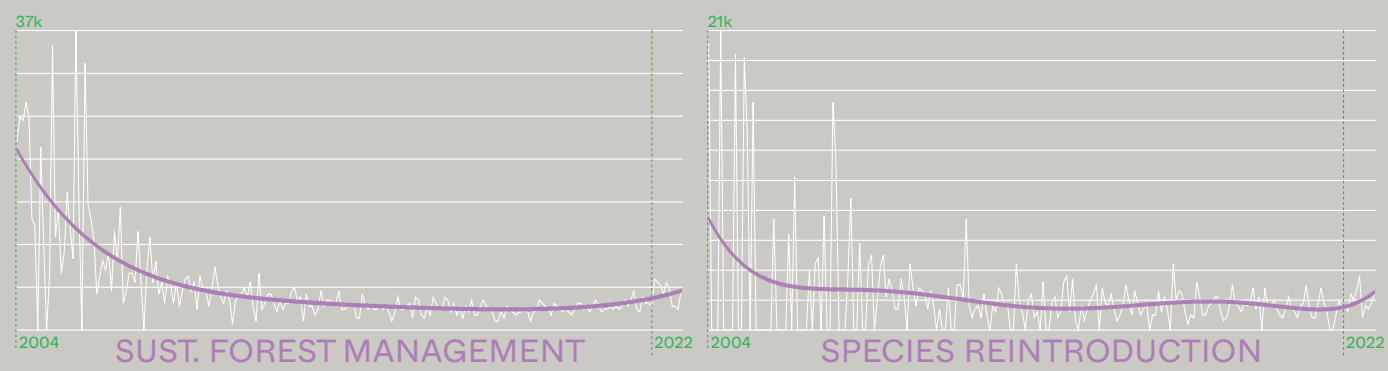
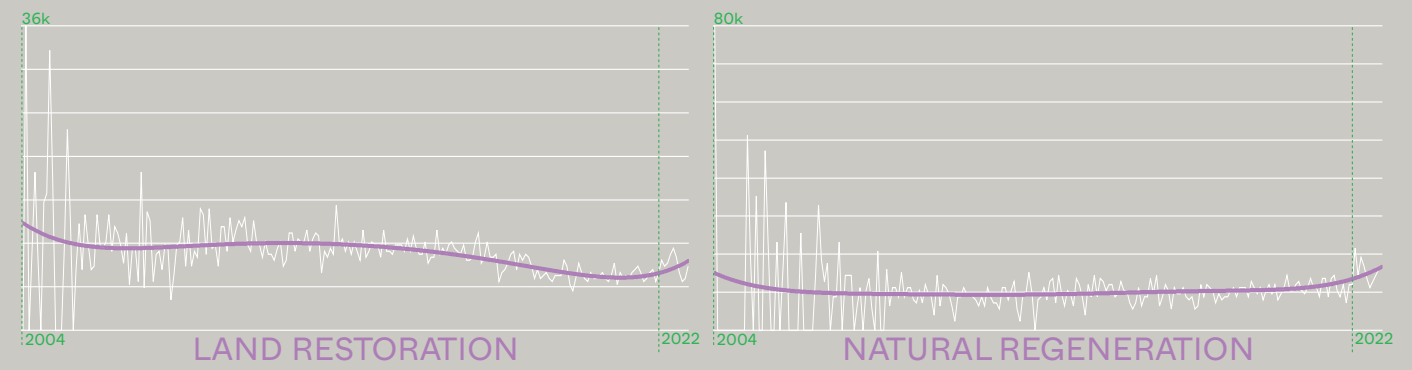
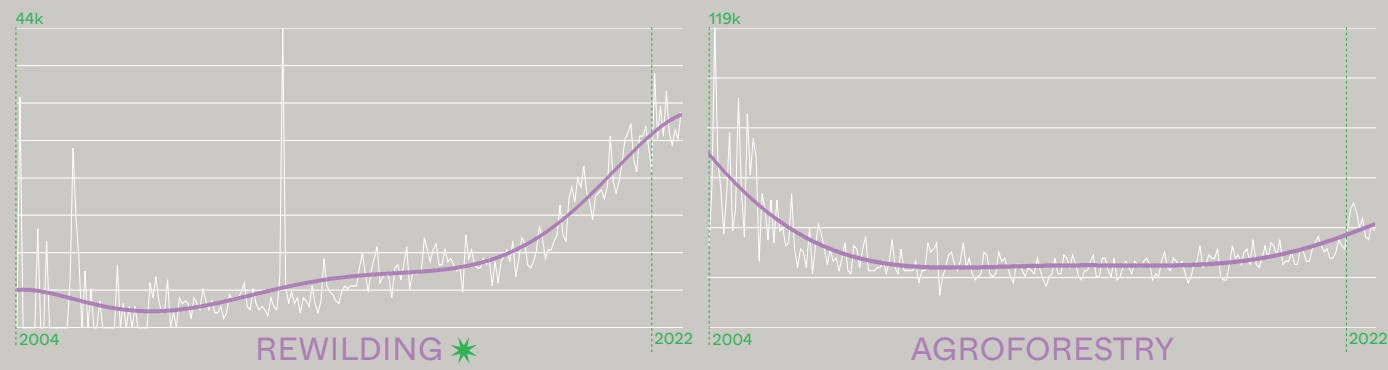
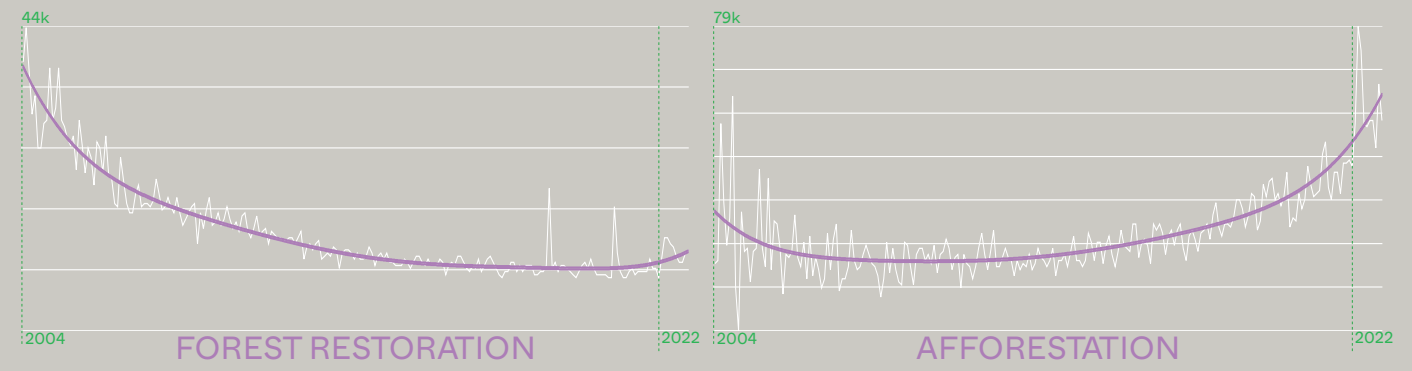
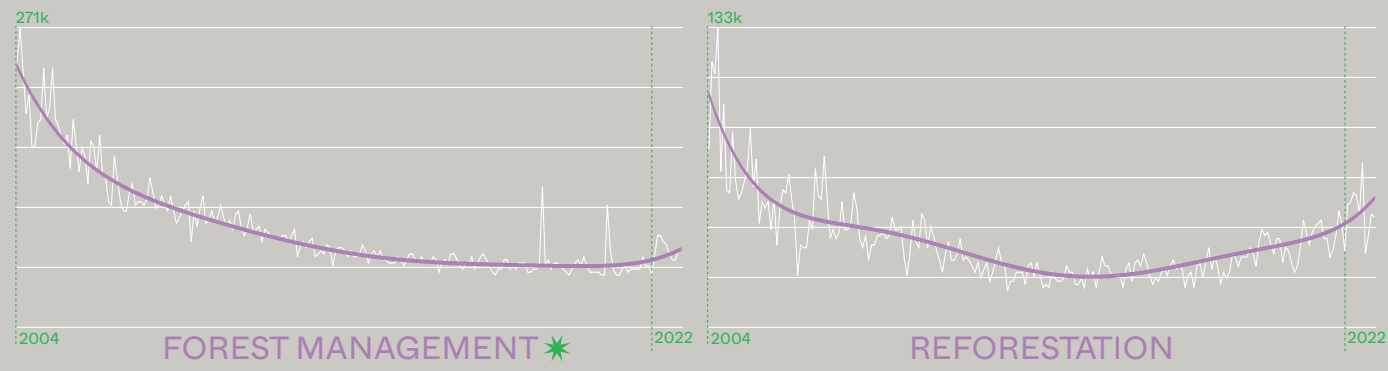
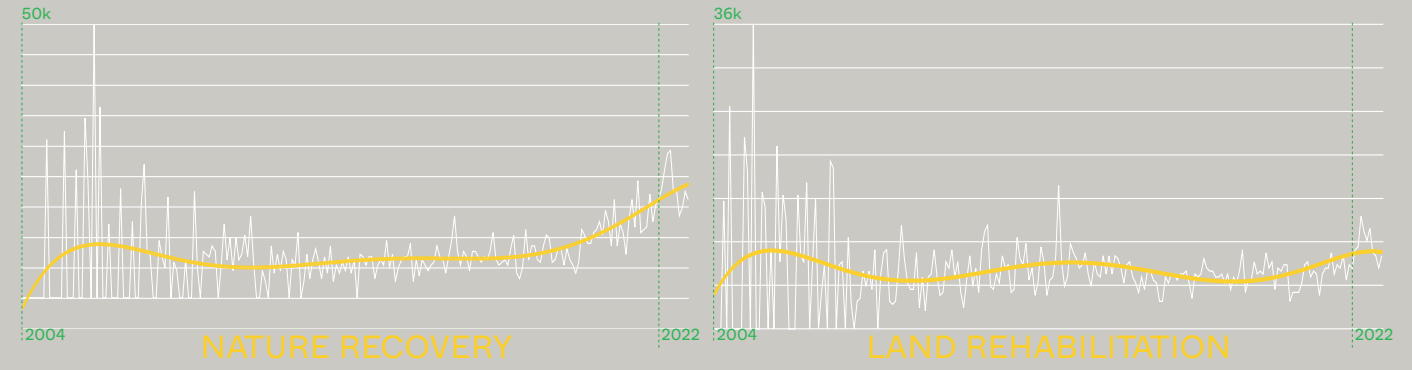
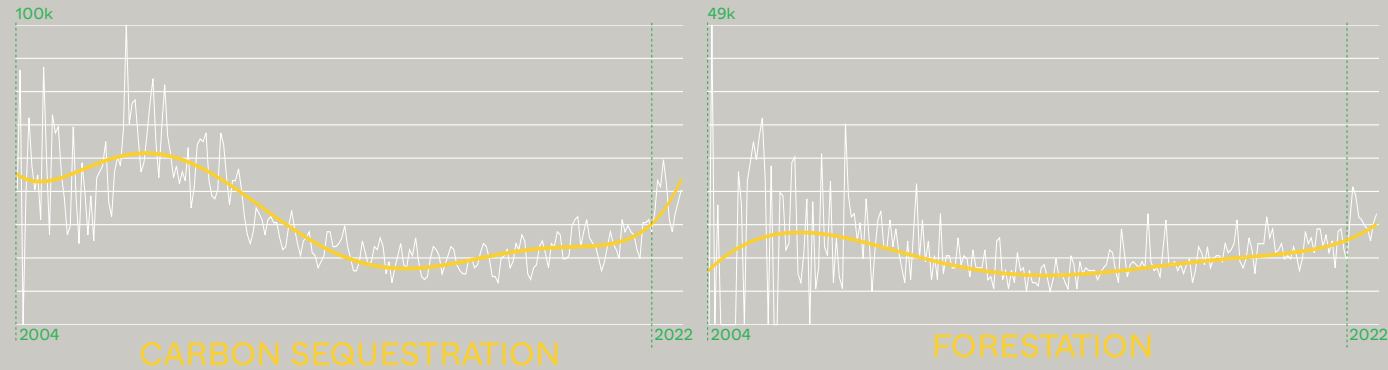
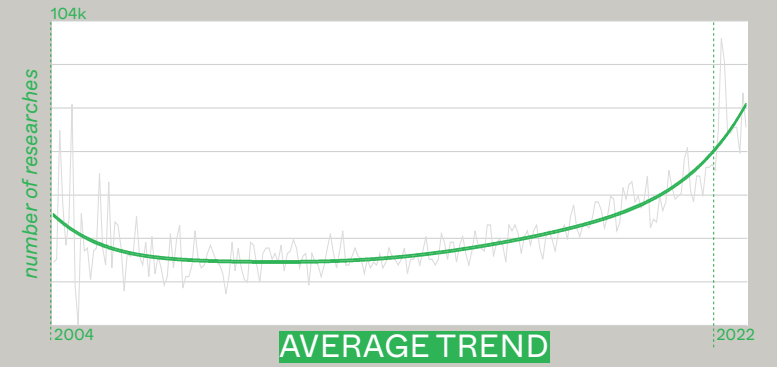
913k

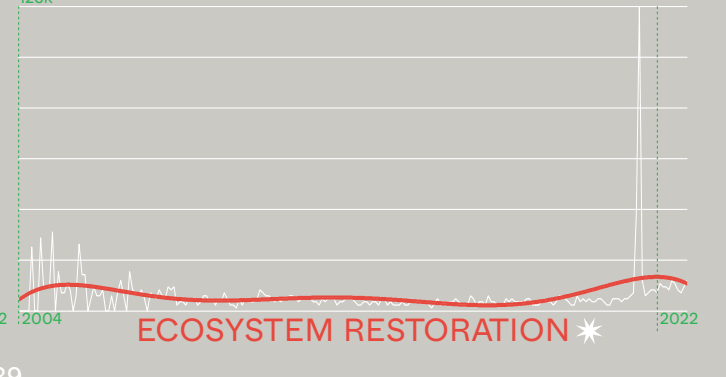
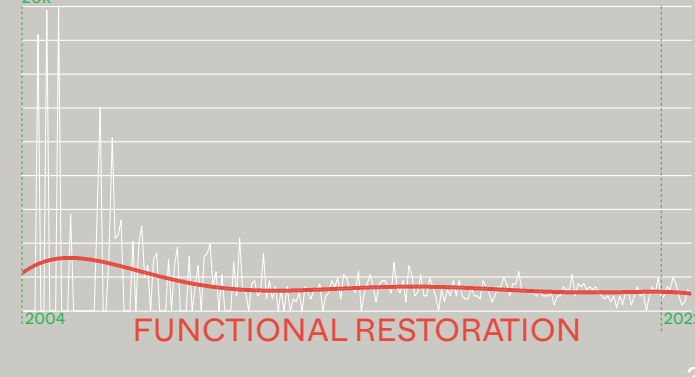
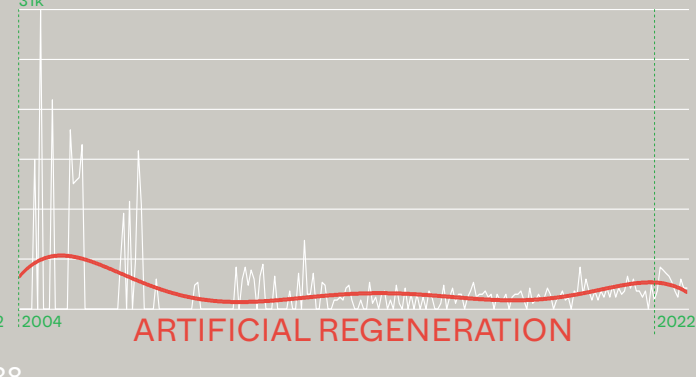
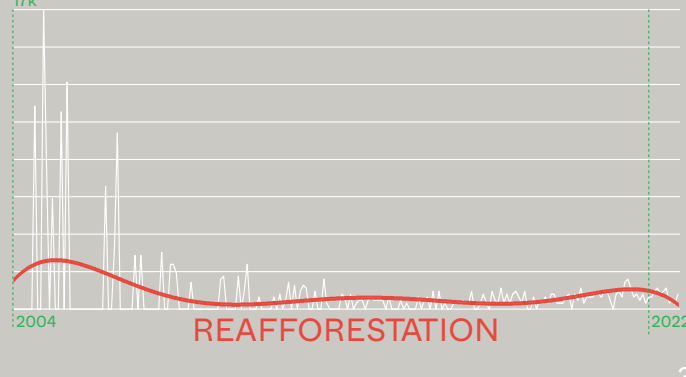
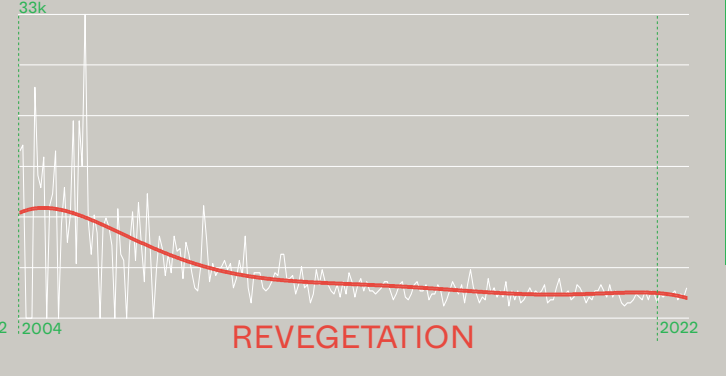
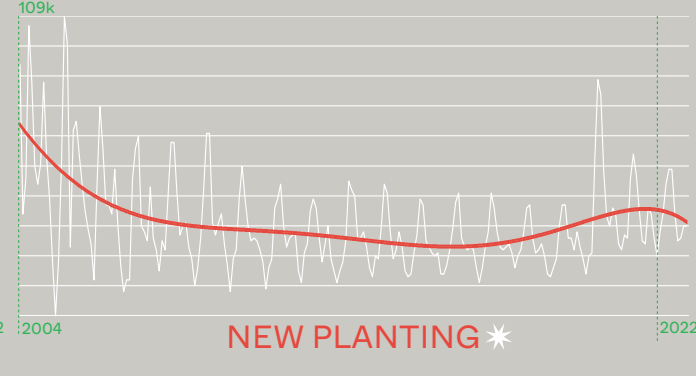
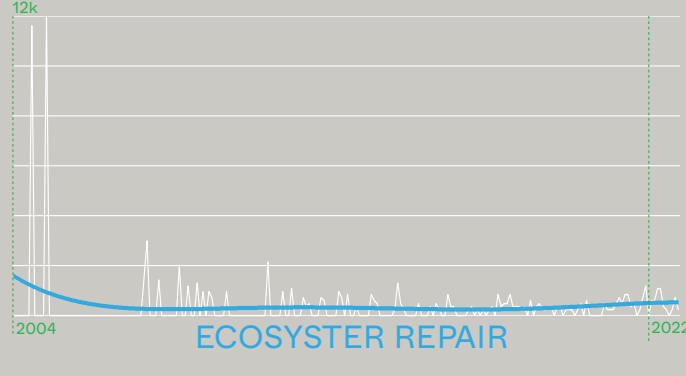
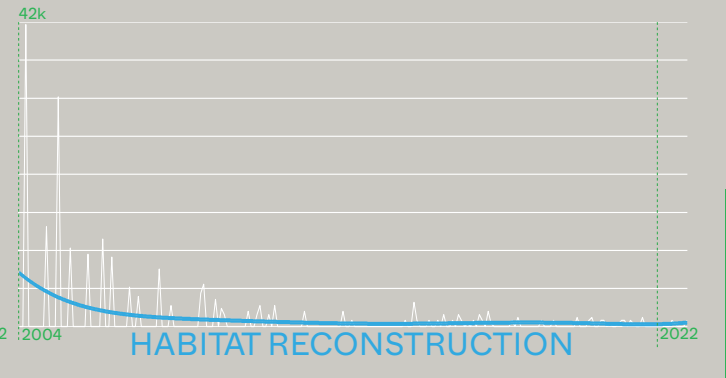
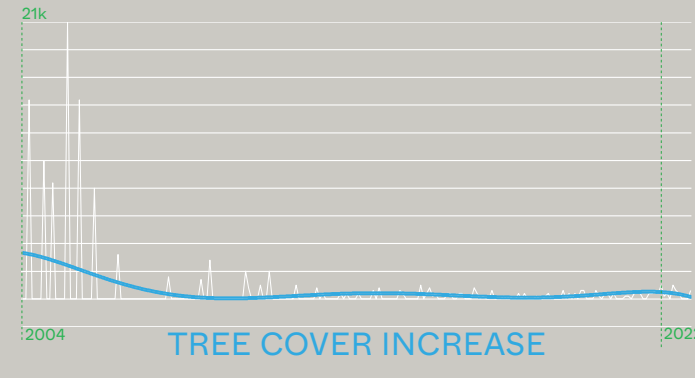
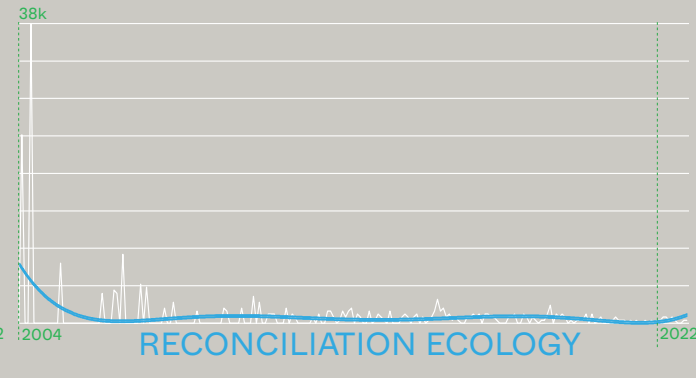
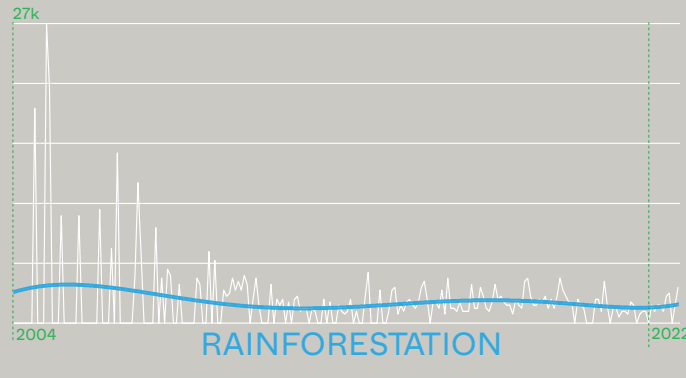
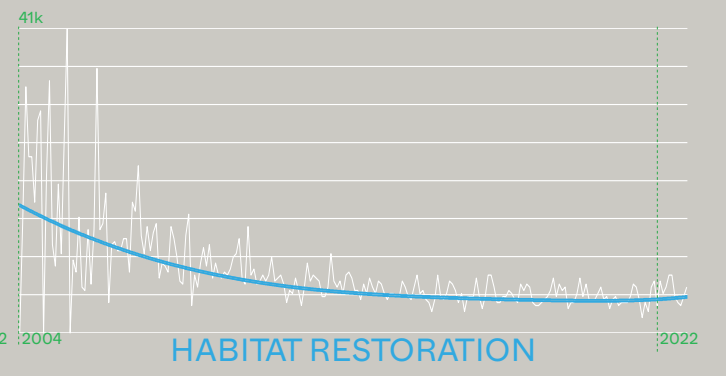
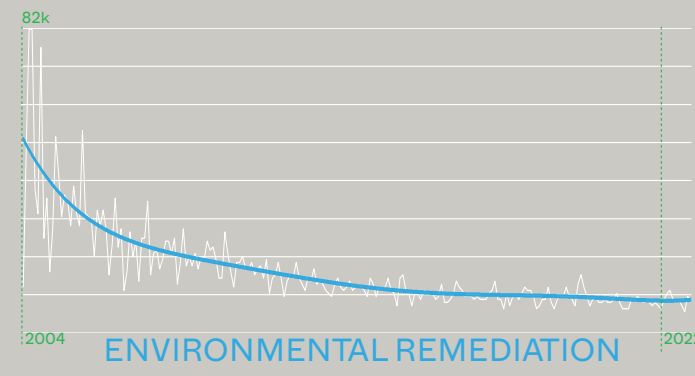
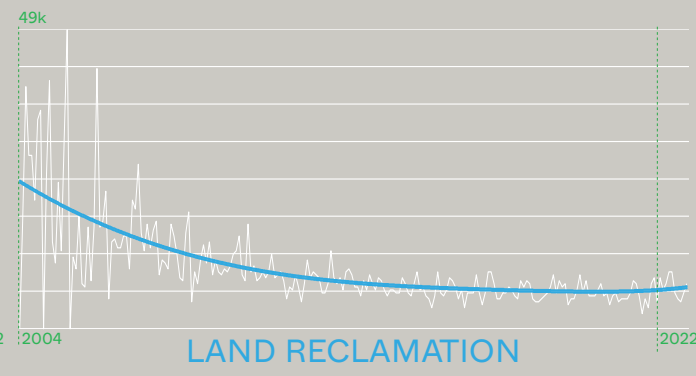
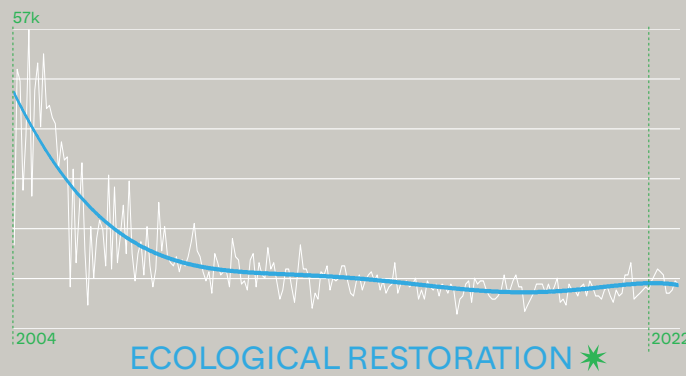
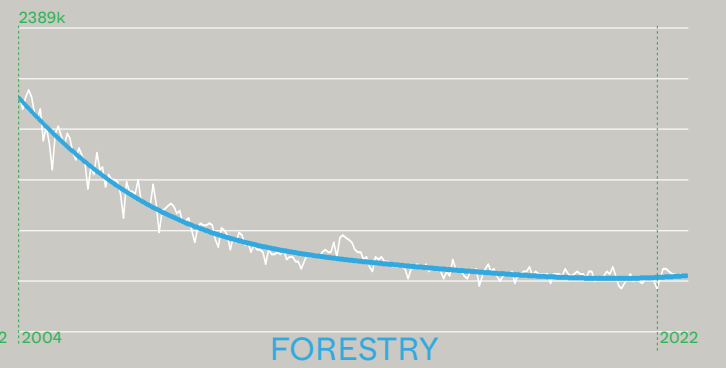
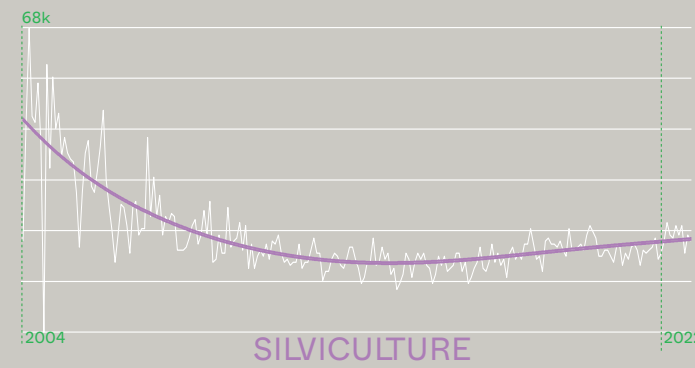


SEARCH TREND AVERAGES

In this visualization terms are categorized into four groups based on similarities in their trend lines. The comparison shows that the interest was higher before the late 2000s but there are no common spikes between them. The average trendline (top right) presents a dip midway that then rises.

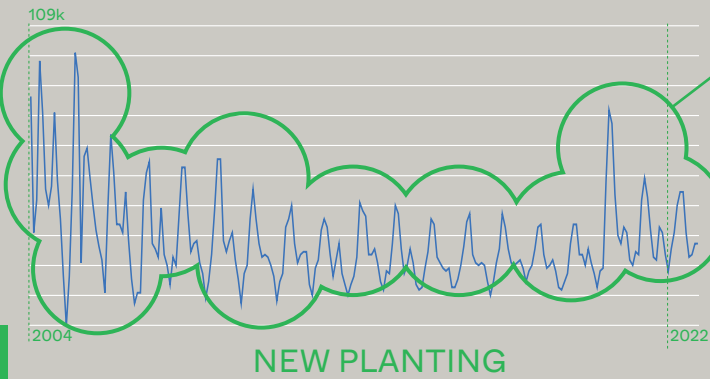
- ↑↓↑
- ↓→↑
- ↓→→
- ↓→↓
- * RECURRING PATTERNS
- * UNUSUAL SPIKES





★ RECURRING PATTERNS

The observation of spikes in trend timelines unveiled that several terms have patterns of regular spikes that appear at yearly intervals.



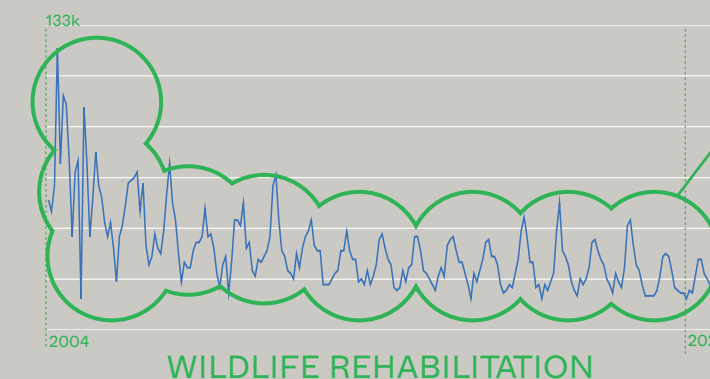
EVERY APRIL/MAY

People tend to plant vegetation and grow crops in Spring. [Worldwide]



EVERY 22 APRIL

World Earth Day and several initiatives promote buying trees and gifting plants. [Worldwide]



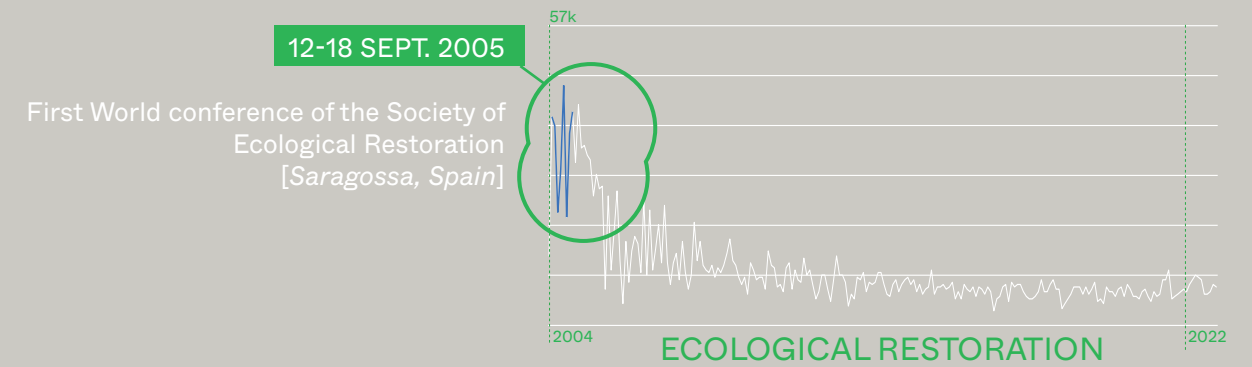
EVERY JUNE

Peak month for animal births and migrations creates a need for wildlife rehabilitators. [Worldwide]

WILDLIFE REHABILITATION

In contrast, there are terms that show sharp, irregular spikes due to a surge in news coverage or term popularity.

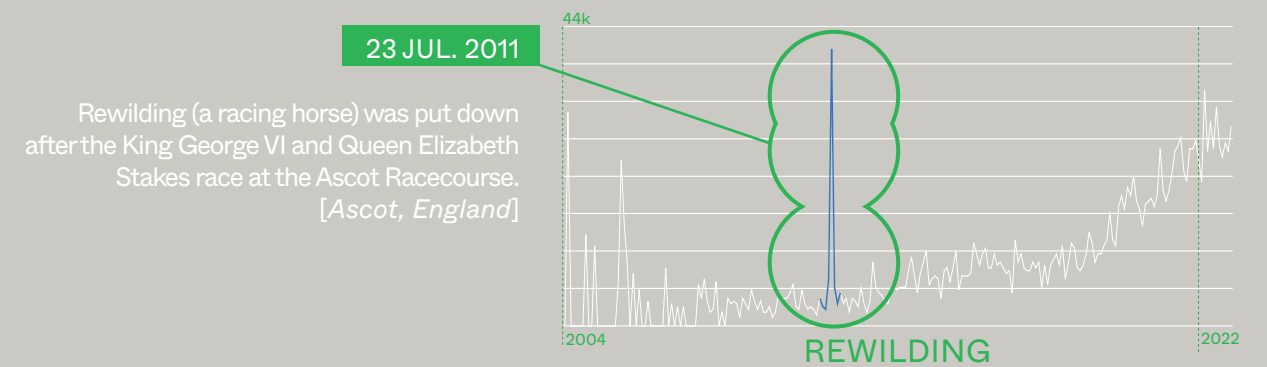
UNUSUAL ★ SPIKES



12-18 SEPT. 2005

First World conference of the Society of Ecological Restoration [Saragossa, Spain]

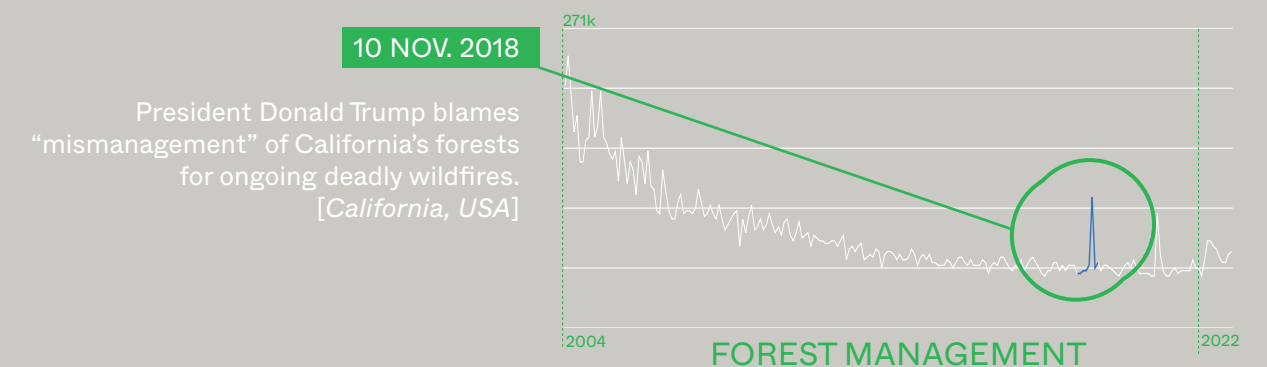
ECOLOGICAL RESTORATION



23 JUL. 2011

Rewilding (a racing horse) was put down after the King George VI and Queen Elizabeth Stakes race at the Ascot Racecourse. [Ascot, England]

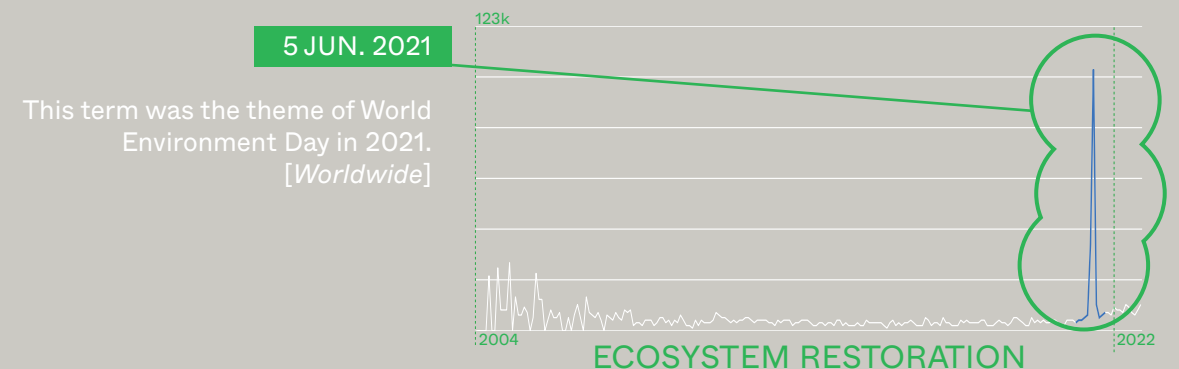
REWILDING



10 NOV. 2018

President Donald Trump blames "mismanagement" of California's forests for ongoing deadly wildfires. [California, USA]

FOREST MANAGEMENT

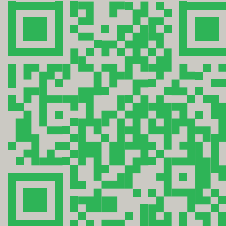
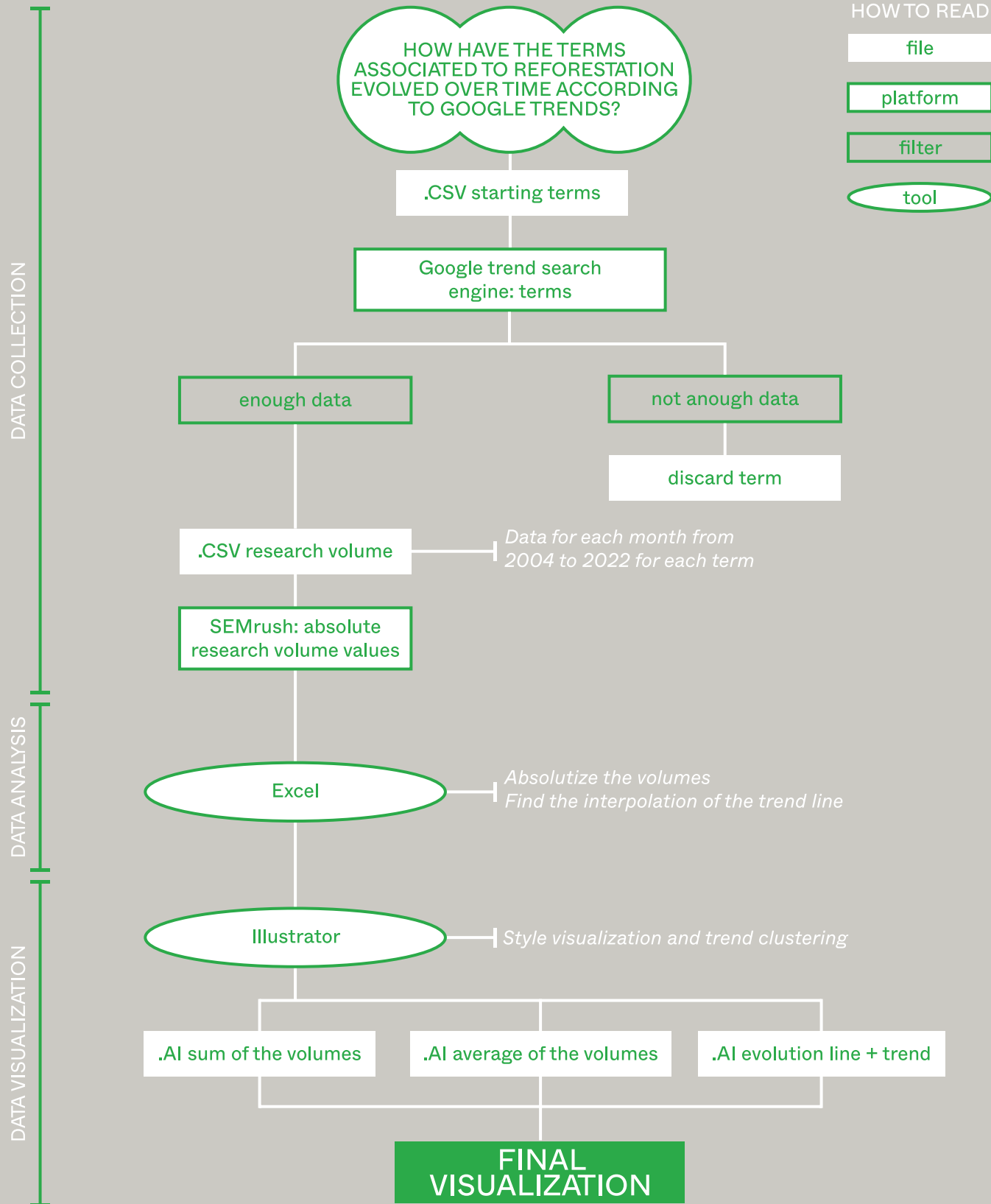


5 JUN. 2021

This term was the theme of World Environment Day in 2021. [Worldwide]

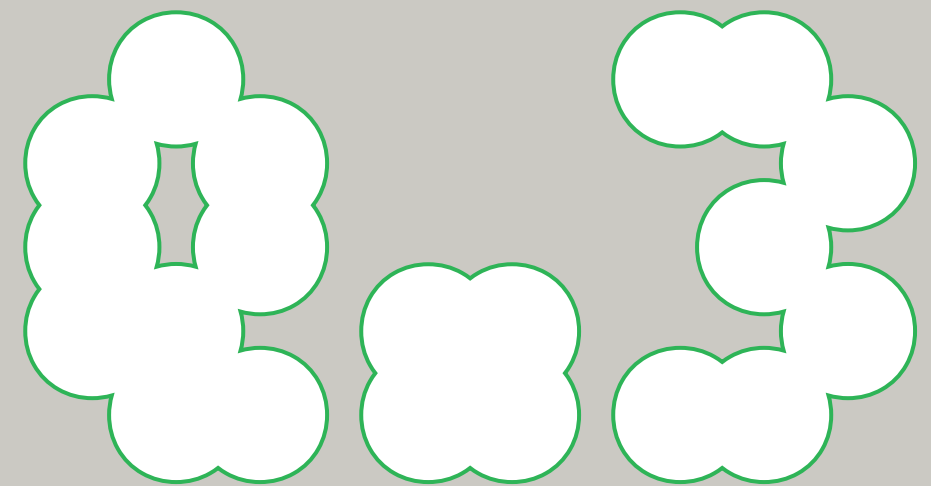
ECOSYSTEM RESTORATION

RESEARCH PROTOCOL



RESOURCES

focus: **IMAGES**



HOW ARE THE TERMS ASSOCIATED TO REFORESTATION REPRESENTED ON GOOGLE IMAGES?

The final question focuses on how the chosen terms are represented visually. For each term we downloaded the first ten results of Google Images and displayed them as they were ranked by the platform. The process allowed to make comparisons regarding different media involved, recurring tropes in the content, and image sources.

DIAGRAMMATIC VS FIGURATIVE

IMAGE CATEGORIZATION

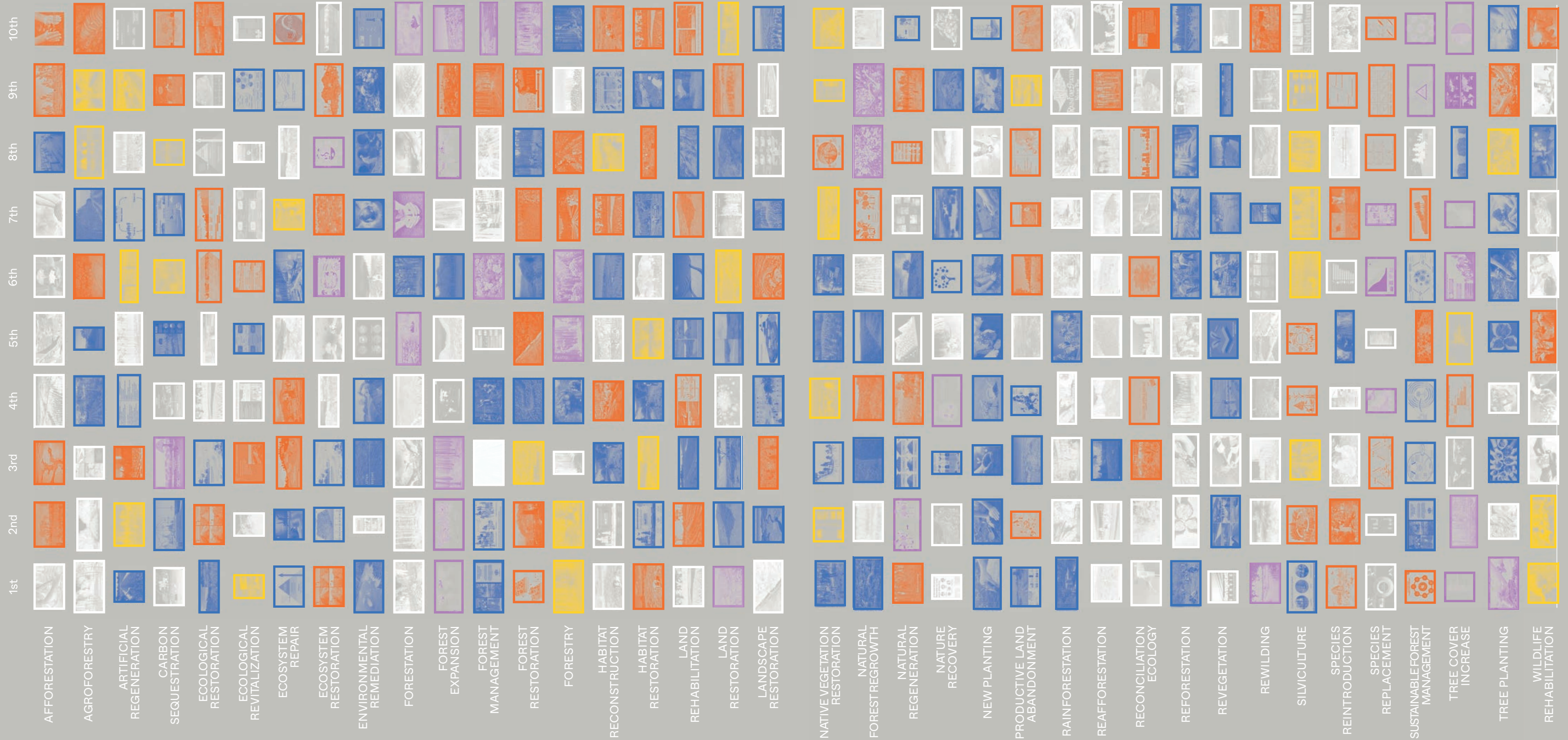
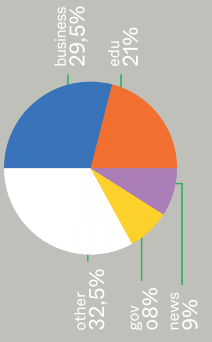


ANALYSIS OF THE SOURCES

URL CATEGORIZATION

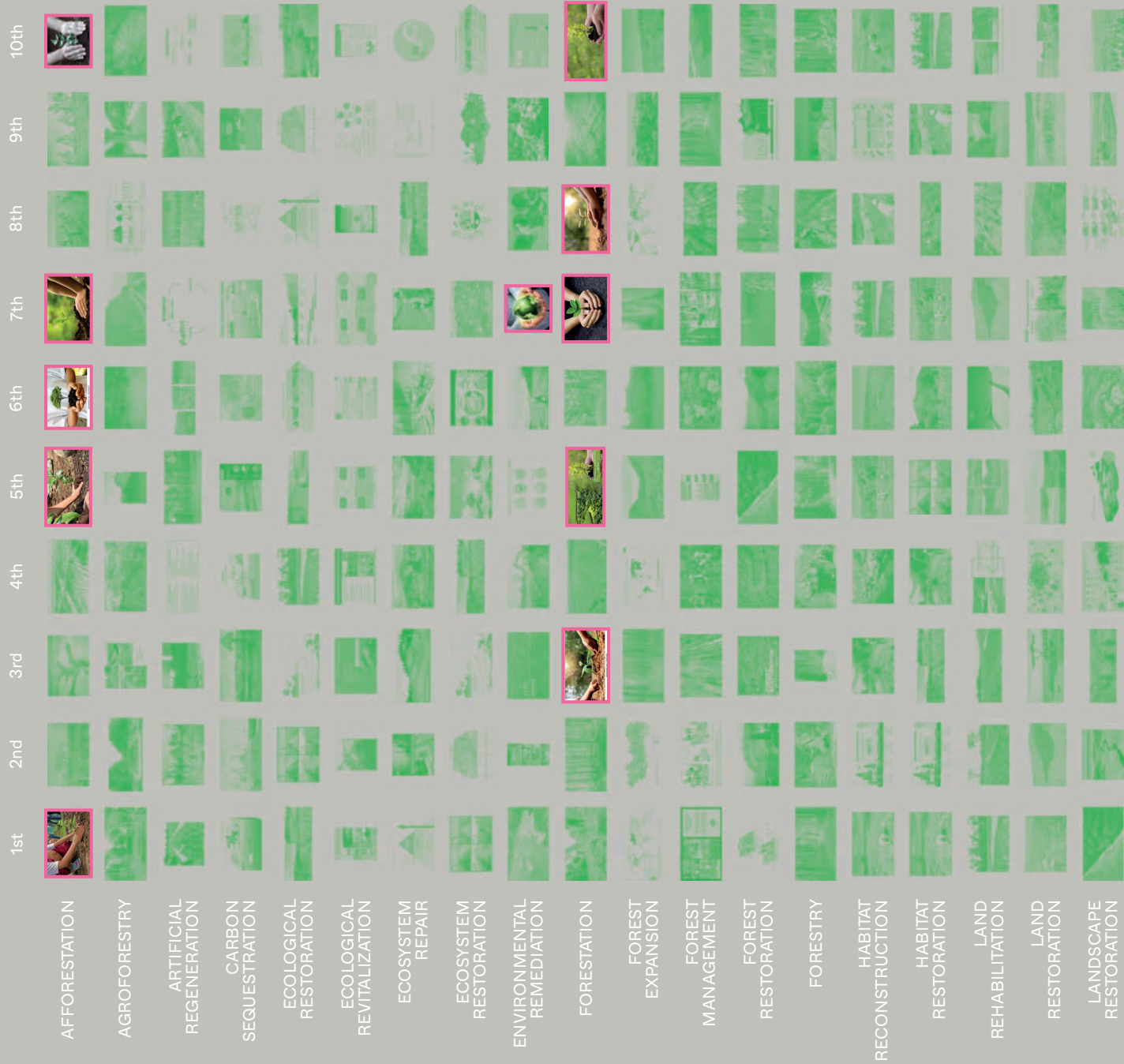


Analysis of the sources of each image reveals that their host websites are heterogeneous. However, this has little influence on image content as there are no significant differences based on image origin.



HANDS PLANTING/ HOLDING SPROUTS

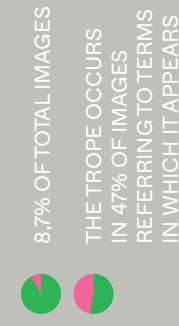
RECURRING TROPES



The most recurring trope is imagery of hands planting or holding seeds, usually staged in appearance. These images are generally associated with terms that refer to action, where the trope occurs multiple times in different versions, while in other terms it is completely missing.



Stack of all the images depicting the trope of hand holding or planting sprouts.



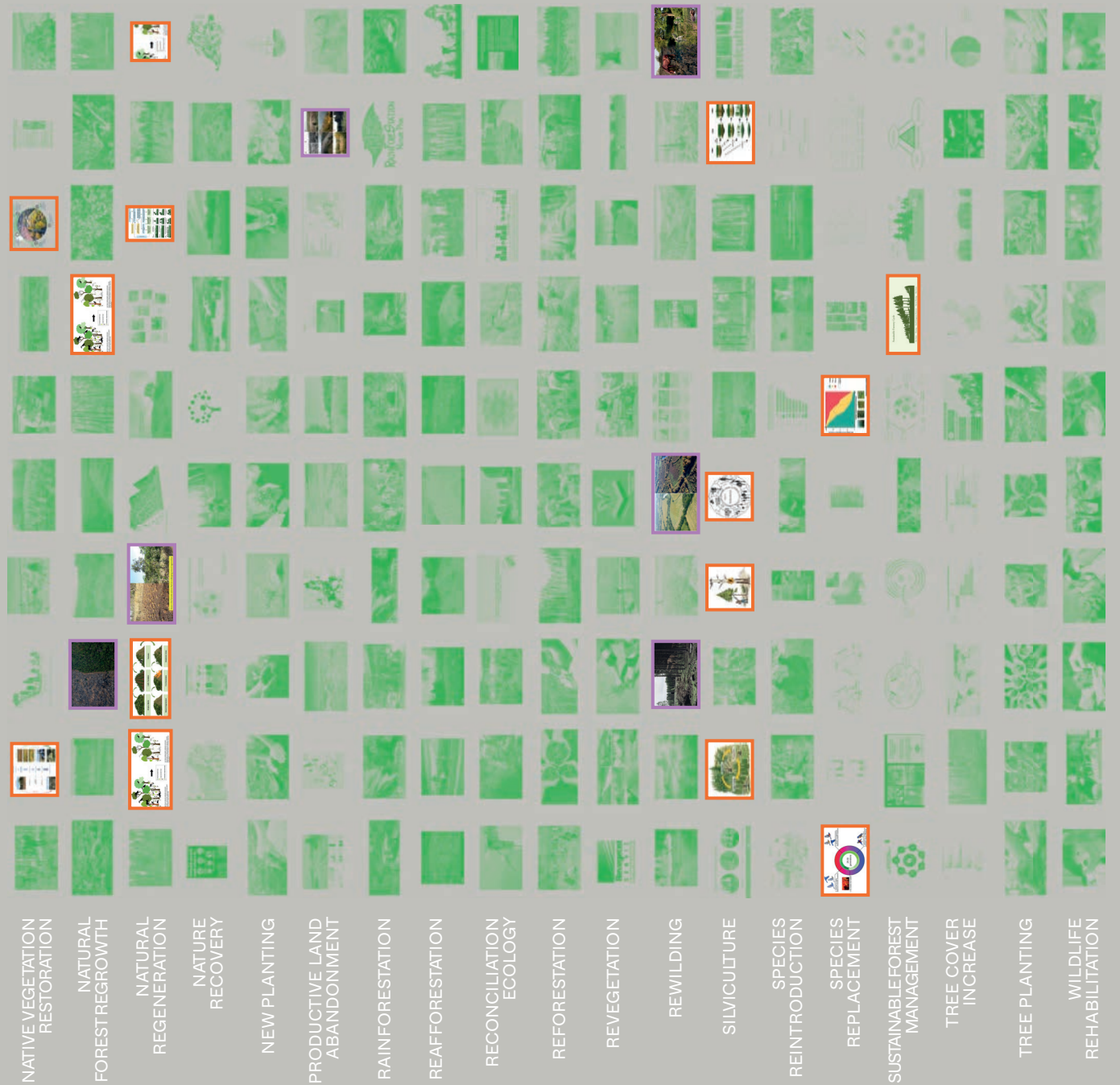
BEFORE AND AFTER

RECURRING TROPES



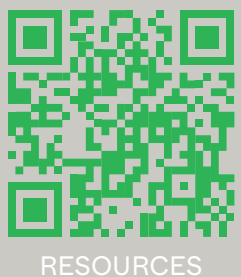
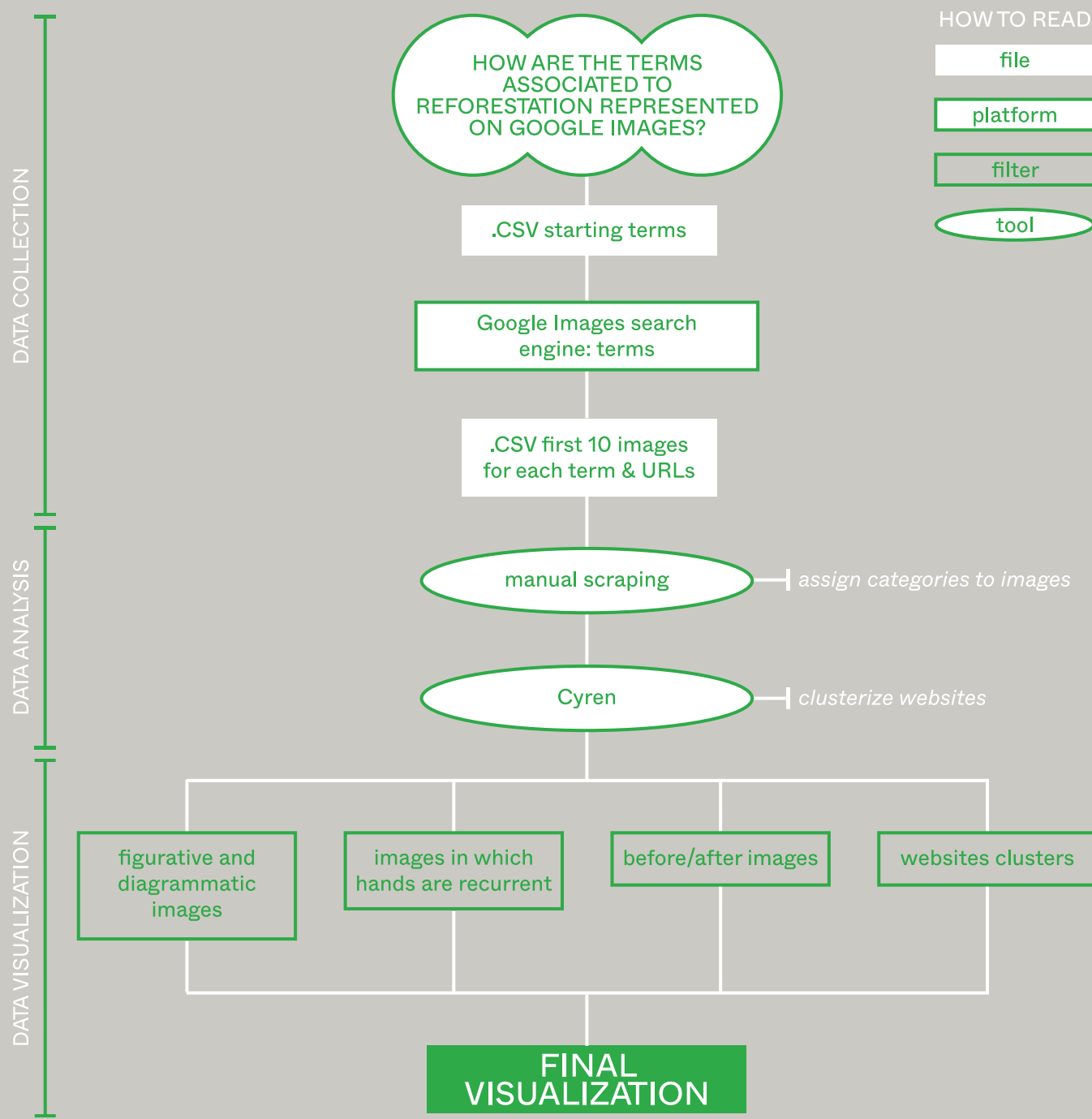
PROGRAM RESULTS
"HOW TO" TIMELINE

Images representing reforestation often show a comparison of before and after. This trope is used for two purposes. The first, to represent the results of reforestation programs, the second, mainly composed of diagrams, represent timelines on how to fully recover a deforested area.



Images of program results arranged to highlight their chromatic differences.

RESEARCH PROTOCOL



RESOURCES



