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Bill of Rights MyImpact Challenge

Project Report

Project Name: Re:Imagine Inc. – Transforming Food Waste Into S.A.F.E. Ecological Impact

<https://www.reimagineboom.org/>

Project Inspiration:

Our non-profit organization, Re:Imagine Inc., sprang to life from a simple yet profound question: *how might we give back to our local communities by restoring our parks, forests, and green spaces in a way that is both practical and ecologically sound?* In the rolling woodlands of Englewood Cliffs' Flat Rock Brook Nature Center and the gentle slopes of Leonia's Highwood Hills, we witnessed invasive species—Japanese stiltgrass and Asiatic tearthumb—rapidly overrunning the understory, outcompeting native wildflowers and saplings, and undermining the very foundation of our region's biodiversity. At the same time, our community's cafés and restaurants were discarding hundreds of pounds of compostable food waste each week—potato peels, coffee grounds, apple cores—bound for landfills to emit methane rather than nourish local soils. We saw these twin crises not as separate problems, but as opportunities for innovation.

Determined to forge a holistic solution, we began by listening. We spoke with residents who longed to volunteer but lacked direction; with land managers struggling to balance effective invasive control against the risks of soil-damaging herbicides; and with business owners eager to reduce waste but uncertain how. Each conversation highlighted the same need: a scalable, low-cost approach that could transform food scraps into a resource for ecological restoration. Inspired by research on allelopathy—the natural chemical defenses plants use against competitors—we conceived S.A.F.E. (Sustainable Allelopathic Field Eradication), a natural herbicide derived from those very food-waste allelochemicals. By repurposing everyday organic waste, we could suppress invasives without harming soil or water health, all while engaging the community in hands-on science.

Faced with these problems, we saw an opportunity to unite people, organizations, and businesses in Englewood Cliffs, Leonia, and New Jersey to tackle these problems as a unified effort. Rather than wait for larger systems to change, we focused on what could be done locally to protect the environment while making the most of available resources. With the support of

nature centers, local businesses, and volunteers, we began laying the groundwork for a hands-on, community-led approach that could restore damaged ecosystems and reduce unnecessary waste.

Project Plan:

We developed our organization by identifying where the needs of Englewood Cliffs, Leonia, and the broader New Jersey public and natural resources overlapped. Our project was built around three interconnected steps that needed to work together: (1) creating a sustainable, natural herbicide using food waste; (2) restoring native biodiversity through keystone plantings; and (3) organizing community trail cleanups to keep local nature spaces healthy and accessible.

The S.A.F.E. (Sustainable Allelopathic Field Eradication) system was the foundation. We chose this approach because we saw how much high-allelochemical waste, like potato peels, coffee grounds, and apple cores, was discarded by local cafes and restaurants. Scientific research showed these materials could suppress invasive plants, so we designed a low-cost, natural herbicide using simple extraction techniques. But implementing the herbicide alone wasn't enough. After removing invasives, we needed to restore native species. We chose white oak trees and pollinator-supporting perennials because they are critical to Bergen County's local ecosystems. However, even with these two steps, our organization could only truly fulfill our mission if we actively contributed to habitat cleanup and restoration. Therefore, we implemented monthly trail cleanups to reduce litter and erosion.

We built our model on three mutually reinforcing components—food-waste collection, natural herbicide development, and habitat restoration—by forging partnerships with Flat Rock Brook Nature Center, Marty's Burgers, and a diverse volunteer network. First, we gather and process compostable scraps; next, we refine and apply our S.A.F.E. formulation; then we replant native keystone species and organize community cleanups to sustain the restoration.

Community-led trail projects are especially crucial: by removing over two tons of litter through monthly volunteer events, repairing erosion, and maintaining pathways alongside Flat Rock Brook staff and the Hiking Heroes of NJ Club, we ensure that our scientific innovations translate into healthier, more resilient green spaces. Our long-term vision is to directly engage local youth and residents in these efforts—teaching sustainable land-management techniques as they help transform their own parks—because we believe combining rigorous research with grassroots action is the most powerful way to rebuild ecosystems and strengthen community stewardship.

Project Execution:

We started by contacting local businesses such as Marty's Burgers to collect food waste and built a compost-based supply chain that engages local cafes and restaurants. We innovated a simple processing setup using Soxhlet extraction and chromatography to isolate the necessary allelochemicals. With guidance from scientific literature, we prepared small test batches of S.A.F.E., which are currently being applied to designated plots in Englewood Cliffs and Leonia. We are also experimenting with different flow rates, drip irrigation, and *in vitro* setups to determine optimal concentrations for maximum invasive suppression.

At the same time, our keystone species planting program is being implemented with local land managers and community volunteers to select planting sites and identify native species that could thrive. We began planting white oaks and native perennials in these areas and invited local volunteers and students from New Jersey to join workshops on planting and native ecology. Furthermore, we hosted trail cleanups throughout all four seasons of the year to allow volunteers from Bergen County Academies, Leonia High School, and local environmental groups to come together to remove litter, repair erosion damage, and make nature center paths safer and more welcoming. This aspect of the project includes public workshops on planting techniques and native ecology, focusing on engaging students and families from underserved communities in Northern New Jersey, which helps directly link environmental action to educational opportunity.

By enhancing Flat Rock Brook and Highwood Hills, and scaling this work to other parks across Bergen County, we are preserving New Jersey's ecosystems while strengthening public appreciation and participation in environmental care. In this way, our organization evolved from a hypothetical question into a real collaboration between science and our community.

Demonstrated Impact:

Over the course of our project, we processed more than 500 pounds of food waste collected from local businesses, converting potato peels, coffee grounds, and other compostable scraps into our S.A.F.E. natural herbicide. In controlled *in vitro* assays, this formulation was shown to suppress growth in a dose-dependent manner, with 490 mg/L concentrations inhibiting invasive plant germination by 50%—an encouraging result that we hope to validate in upcoming field trials. Building on these laboratory successes, we plan to deploy varying concentrations and

encapsulation systems on 15 acres of invasive-dominated plots in Englewood Cliffs and Leonia, guided by our optimized extraction protocols and mushroom-enzyme assay for chlorogenic acid quantification.

On the restoration front, we planted over 100 keystone native species—including white oak saplings, milkweed, and pollinator-supporting perennials—across those treated areas to rebuild habitat structure and floral diversity. Twelve cleanup events brought together more than 60 volunteers from Bergen County Academies, Leonia High School, community groups, and municipal staff, who together removed 605 pounds of litter and cleared 1.5 tons of invasive plant material. Our work garnered direct praise from a diverse array of stakeholders—including Leonia’s Environmental Commission, the land manager and executive director of Flat Rock Brook Nature Center, the staff at Marty’s (voted the best burger spot in New Jersey), and the many students who earned community service hours with our organization—for our innovative, community-driven approach.

Future Project Goals:

Building on our successes, we envision scaling and deepening Re:Imagine Inc.’s impact through four key initiatives. First, we will expand the S.A.F.E. herbicide model to additional parks across Bergen County, forging partnerships with ten more municipalities and nature centers by the end of next calendar year. This will involve streamlining our extraction units into portable “lab-in-a-box” kits that community groups can deploy independently. Second, we plan to develop a digital monitoring platform—leveraging smartphone photography and computer vision—to track invasive regrowth and native sapling survival rates. Third, we aim to formalize an educational curriculum in collaboration with Leonia High School and Bergen County Academies, embedding our Re:Search, Re:Store, Re:Design framework into STEM classes and service-learning credits. Finally, we will spearhead a community seed bank and nursery program to propagate regionally appropriate native species, ensuring a long-term supply of seedlings and reinforcing genetic diversity in restoration plantings.

Reflection on Founding Principles, Civic Virtues, and Community:

From its inception, Re:Imagine Inc. was anchored in principles of innovation, inclusivity, and environmental justice. We refused to view food waste only as refuse or invasive plants solely

as problems; instead, we reimagined both as resources and opportunities. Our approach embodied democratic ideals by empowering volunteers to co-design restoration strategies, ensuring that local voices shaped project priorities. Civic virtue emerged through shared sacrifice: community members gave time, local businesses donated materials, and municipal leaders provided logistical support without demanding traditional hierarchies of expertise. By reflecting on the community, we recognize that restoration is as much about people as it is about plants. Conversations during cleanups revealed disparities in access to green space—underserved neighborhoods experienced more pollution and less maintenance—galvanizing our commitment to equitable site selection and outreach. Leading Re:Imagine Inc. taught us humility and adaptability; when our first extraction yields fell short, we iterated protocols rather than abandon the science. When volunteer turnout lagged, we partnered with faith-based organizations and youth centers to broaden engagement. Ultimately, our journey transformed us from curious students into community architects, proving that meaningful change is achieved not by waiting for permission but by forging partnerships, repurposing resources, and cultivating a shared vision of ecological stewardship for all.