Fruits of Our Labor: Exploring The Impacts of A Nonprofit Seed Bank on indigenous Communities in The Southwestern United States

Rachel Mary Davis
raemarsh33@gmail.com

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FRUITS OF OUR LABOR:
EXPLORING THE IMPACTS OF A NONPROFIT SEED BANK ON INDIGENOUS COMMUNITIES IN THE SOUTHWESTERN UNITED STATES

Rachel Davis, MA
Department of Anthropology
Northern Illinois University, 2022
Mark Schuller, Thesis Director

This thesis explores the ways that the nonprofit Native Seeds/SEARCH, of Tucson, Arizona interfaces with Indigenous communities and the local seed and food systems in the Southwest United States. The thesis argues that Native seed and food sovereignty have different meanings for different Indigenous people, and that nonprofits working with Indigenous communities need to consider input from them when deciding how to catalogue, regenerate and sustain healthy grow outs for the future, especially in the light of climate change and drought.
FRUITS OF OUR LABOR:
EXPLORING THE IMPACTS OF A NONPROFIT SEED BANK IN INDIGENOUS COMMUNITIES IN THE SOUTHWESTERN UNITED STATES

BY

RACHEL DAVIS
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A THESIS SUBMITTED TO THE GRADUATE SCHOOL
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE
MASTER OF ARTS

DEPARTMENT OF ANTHROPOLOGY

Thesis Director:
Mark Schuller
ACKNOWLEDGEMENTS

I respectfully acknowledge that Tucson, Arizona and Native Seeds/SEARCH is on the land and territories of Indigenous peoples. Today, Arizona is home to 22 federally recognized tribes, with Tucson being home to the O’odham and the Yaqui. I would like to thank my thesis advisor, Professor Mark Schuller for his support and guidance in this process, as well as Professor Kristen Borre and Professor Dana Bardolph, who also served on my thesis committee. I would also like to thank the Department of Anthropology at Northern Illinois University, and my colleagues in Arizona, California and New Mexico for making this research possible. Above all, I thank my family. Mom, Dad, Dawn, Will, and Joe – I love you. To my husband Brett, “What do you say? Wanna go around again?”
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"Can you see me? Can you hear me?" I said those words about five times every Zoom or Teams meeting. I had a specific plan in February of 2020 for how I was going to do my field research, and none of that involved COVID-19 and the challenges it would bring. I had a mixed-methods approach planned, including a survey for people living on Indian reservations about their food security and semi-structured interview questions for in-field observations of agricultural practices for Indigenous farmers. COVID-19 had other plans. I moved my field research from June 2020 to November 2020. I did not use a survey or semi-structured interview questions in the field on Indian reservations. The people I met with in person, I did so outside, with masks, disinfecting wipes, and hand sanitizer within reach. I was able to do semi-structured interviews with people in the Native Seeds/SEARCH courtyard or over Zoom. I did all of my ethnographic work in Tucson and Patagonia, Arizona, not all over the state, and into New Mexico and California as planned.

The scope of my research changed because of COVID-19; I spoke with more employees and fewer Indigenous stakeholders than I had planned initially. How could I contribute to decolonizing anthropological research and empower the cultures being studied if I could not speak to more than one person of each culture? Each Indigenous tribe is unique, and I got one or maybe two viewpoints from each Indigenous community. Faye Harrison wrote that Westerners could play a role in decolonizing anthropology whereby “cross-cultural sharing of perceptions, experiences, and knowledge is essential for constructing valid comparative theory and devising effective strategies for social transformation” (Harrison, 1991b, p.89). I was not sure if there
would be enough sharing of these experiences with what was now a smaller study and was often not even in person because of COVID-19. So, I offer this thesis to future parties interested in its use to work with Native seeds and with seed sovereignty.

Harrison also suggested that ethnographic material that could be widely understood and distributed to the population under study was vital for decolonization. So here is where I decided to move forward with my research. I would make this thesis accessible for all, starting with the participants that I interviewed. I only asked questions that participants felt comfortable with, never prying if they wanted to refrain from specific topics. I gave copies of my thesis, interview quotes, and findings to all participants, starting with those most vulnerable. I am also sharing all the data I have with each community or tribe, allowing them to do what they want with the findings I collected. I also offered up this research for data analysis and interpretation from my Indigenous counterparts. My perspective and interpretations may not always be the same as another person's, and I want this research and my use of their interviews and quotes to reflect their understanding of that interaction.

According to Otakuye Conroy-Ben of the Oglala Lakota tribe, Indigenous communities have data sovereignty, “meaning that any data generated on our land belongs to the tribe” (Conroy-Ben, in Gerwin, 2021). I was never collecting data on tribal land, but several tribal members asked me to let them review what I wrote up before publishing it so that they may let the tribal council approve it. Oral history, stories, and traditional knowledge are all part of a tribe's sovereignty, and I try here to credit and maintain respect and good standing with each person I interviewed, whether or not I was physically on their sovereign land. Western knowledge and Indigenous knowledge should work together as an exchange, not as extraction of
Indigenous knowledge for the sake of Western uses. My goal is to be transparent in all of my work so that people can see and hear me and I can do the same for them.
INTRODUCTION
ARID ADAPTATIONS ABOUND

This thesis examines the nonprofit Native Seeds/SEARCH collaborations with Indigenous groups in the Southwestern United States, specifically focusing on Arizona, California, and New Mexico. In March of 2020, before the COVID-19 pandemic shut down vast swaths of businesses and services in the United States, I traveled to Tucson to learn about and volunteer with the nonprofit Native Seeds/SEARCH. Native Seeds/SEARCH works on conserving arid-adapted seeds in order to promote food security in the Southwest. I learned about this organization through Professor Kristen Borre in my first year of graduate school at Northern Illinois University. I am not Indigenous, and so I knew very little about Indigenous farming and gardening practices or what seeds were native to the areas I would be visiting until I started reading about it. I wanted to learn more about Native seed, farming and horticulture practices, and Indigenous food sovereignty. One of the hottest, driest deserts on the planet seemed like a fascinating place to start. How could this arid place host life, produce shelters and medicines, and feed populations?

Stepping off the plane and into the Arizona Basin and Range Province was not what I expected; I anticipated a primarily dead, flat land of tans, dusty browns, and rolling tumbleweeds under a blazing sun. Instead, I was met with a cacophony of bird song, jagged rock formations with wildflowers bursting through the crevices, thirty-foot tall verdant saguaro cacti blooming towards the pink and orange skies, and signs of bountiful plant and animal life. Steep mountain ranges alternate with desert and creates islands of cooler climate zones for varying plants and
animals, and copper, gold, and silver are hidden in those same hills. However, I did see some tumbleweeds rolling along the sides of the roads, so my perceptions were not entirely off.

If water is life, then life should be scarce in the Sonoran Desert. Imagine standing alone in a gravelly, dry riverbed of the Sonoran under a clear turquoise sky. Flash floods that do not absorb into alluvial desert sands have carved out zigzagging grooves between the creosote, bur sage, mesquite, and cacti. In the Colorado Plateau and the Transition Zone of Arizona above Phoenix, the Gila River is free-flowing. It trickles lazily in the state's southern half if the riverbeds are not bone dry due to irrigation up north. Of the total area of Arizona, less than 0.35 percent consists of water, much of it north on the Colorado Plateau. Despite the meager water supply and unabating sun, life thrives here. Flora has adapted to the bi-seasonal rainfall patterns in the Sonoran, allowing for the most diverse variety of plant species of any desert. Succulence, drought tolerance, and drought resistance are all evolutionary adaptations to life here. More than two hundred and fifty edible plants grow in the Sonoran, but some scholars argue that the number goes up to one thousand or more (Hodgson, 2016). Thousands of mammals, birds, amphibians, reptiles, fish, and insects inhabit the desert landscape and have adapted to and thrive in the desert landscape. Over 1000 species of bees pollinate the plants in this desert, which feed humans and the likes of tortoises, javelinas, woodpeckers, and jaguars.

Arid adaptability in seeds is often crucial to surviving in the Southwest. According to the University of Nevada, Las Vegas Geoscience Department, there are many environmental stresses put on seeds in the Southwest, including low and unpredictable precipitation, low relative humidity, desiccating winds, high summer temperatures, and low nutrient availability. There are four main strategies for adaptation to desert life for plants, including drought-escaping plants,
drought-evading plants, drought-enduring plants, and drought-resisting plants (Solbrig & Orians, 1977). People in the Southwest may practice dry farming or irrigation farming, depending on the type of plants, soil, and access to water. Some agricultural techniques for arid land include capturing existing water, relying on monsoon rains, furrows, ditches and pits, alley cropping, rock or clay-lined basins, cisterns and dams, wells, solar stills, and finally by conserving existing water (Martin, 2021).

I never really thought about where I bought my seeds from. I never saved seeds from plants I had grown until the last few years. I’ve lived in the comfort of being able to easily afford and access seeds as needed for my hobby and I never particularly thought about the companies I was buying them from. I live in the Midwest, and have access to adequate water supplies for gardening, there have never been restrictions on the amount of water I can use or afford in Indiana or Illinois. I have never needed to use an arid-adapted seed, and I had heard the word heirloom, but couldn’t have defined it until I started this research. When the average person buys their seeds, they may go to a big box store, hardware store, online retailer, or a greenhouse. They may not know that companies like Bayer/Monsanto, Seminis, Dow, Syngenta, Corteva (formerly Dupont), and Limagrain own and control about 50% of the global seed market (Kelloway, 2021). The first plant patent in the United States was issued in 1931 (Stim, 2018). Plants that can be created by breeding or grafting can be patented. Landraces and heirloom seeds cannot be patented, as they have been initially discovered in the wild or an uncultivated state.

With the emergence of patents and limitations placed on seed, seed banks have formed, selling unpatented, open-pollinated, and heirloom varieties. These seedbanks and varieties allow small farmers to grow seeds and crops without paying high prices for patented or genetically
engineered items. Affordable seed varieties and the ability to save seeds allow many people to control their foods and nutrition. A seed bank is “the reservoir of viable seeds present in a plant community” or can also be defined “as a place where seeds are stored in order to preserve genetic diversity” (Encyclopedia.com, 2020, and SourceTrace, 2019).

Many nonprofit seed bank organizations are committed to distributing organic, non-GMO, and open-pollinated varieties of seeds. Seed Savers Exchange, one of the largest seed banks in the country, outlines their community ventures’ goals to preserve the diversity of seed and expand the "diversity of people involved in seed stewardship." (SeedSavers Exchange, 2019). This vital work is influencing food security sovereignty across the country. The Lexicon of Food defines seed sovereignty as "the farmer's right to breed and exchange diverse open source seeds which can be saved and not patented, genetically modified, owned or controlled by emerging seed giants" (Sustainable Food Trust, 2015). Food sovereignty also encompasses ideologies and sets of practices around production, distribution, and consumption "at the level of local ecologies and communities" (p. 228, MacRae; 2016). Sovereignty can lead to security, and I am food secure and do not need to grow food for nutrition purposes. I chose this research to learn more about what can be done to strengthen food sovereignty, and how that ties to food security in this country. I will touch on seed and food sovereignty in the chapter on Native Seeds/SEARCH and how it relates to the organization’s mission on food security.

The food sovereignty movement across the world has emerged as a reaction to the global restructuring of agri-food systems and modernist development agendas (Pimbert, 2009). Pimbert suggests ways to achieve food sovereignty include direct democracy and participation in framing agro-food policies, democratized research and strong networks of local innovators, reformed and
equitable access and resource use rights, and re-localized and resilient food systems, among others (p. 2, 2009).

Indigenous farmers have used traditional ecological knowledge (TEK) to breed seeds, alter genes, and develop crops over many generations. These seed types are often co-opted in the public sphere or altered and patented by large corporations. Many of these plants are favored for their genetic capabilities to prevent waterlogging, resist drought or pests. Some of these plant breeds are used for food, and others for their medicinal purposes.

Few Indigenous people see compensation for the work done by their agricultural communities over generations. Indigenous Peoples' rights to seeds have not consistently been recognized, and as a result, some varieties established by Indigenous people have been patented by agricultural companies (McCune, 2018). As more people become interested in traditional Native seeds for their unique properties like the taste or medicinal uses, or because of their ecological resistance or adaptation to climate change, Indigenous people look to policy options for protecting their intellectual property (Guest, 1995/1996). Additionally, with some Native seed varieties, there is a national shortage, and the National Seed Strategy for Restoration and Rehabilitation (NSSRR) was launched in 2015 to counteract these shortages (Oldfield, 2016). Some seed banks, including Native Seeds/SEARCH, are working with Indigenous groups to find solutions for intellectual property claims on seeds and seed variety ownership.

Rowen White discusses tracing regional seed systems and Indigenous trade routes and their impact on healing Indigenous people's intergenerational trauma (White, 2019). Previous studies on seed banks have focused on creating and executing their seed programs and the food sovereignty they help create. In the same book, Pat Gwin explored the history behind the
Cherokee Nation SeedBank and worked on a collaboration that spent much time searching for Cherokee heirloom seeds to preserve and distribute. They consider the project a great success within the community. (Gwin, 2019).

"Rematriation" or "to restore a living culture to its rightful place on Mother Earth" is a term that is used frequently by Indigenous groups to discuss the return of and use of Native seeds and Native seed sovereignty (Newcomb, 1995). The term rematriation can also be used in other contexts, as discussed in the second chapter. Since the 1980s, US seed banks have been created to focus on returning seed to Indigenous groups to grow Native foods, combat food insecurity, and achieve food sovereignty lost with colonization. Today some seed banks are protecting and distributing Native seeds across the United States, such as Native Seeds/SEARCH, the Traditional Native American Farmers' Association, the Cherokee Nation Seed Bank, and the Indigenous SeedKeepers Network. The Zuni, Hopi, and Iroquois Six Nations also create and maintain tribal seed banks (Rogers, 2011). The Indigenous Seed Keepers Network is a thriving program from the Native American Food Sovereignty Alliance (NAFSA).

There is plentiful research on the causes of food insecurity in Indigenous communities in the United States. However, less research has been done on programs returning Native seeds and foods to Indigenous people. The seed bank Native Seeds/SEARCH is unique. It works with Native seed but is not owned by an Indigenous Nation. It also highlights food security in its mission statement, but their community programs and stakeholders are intertwined with food and seed sovereignty. Therefore, members of the organization and Indigenous communities may conceptualize their mission and the programs' benefits and costs differently. Additionally, it is unknown how the COVID-19 pandemic has affected these Native seed programs in the short and
long term. When I arrived at Native Seeds/SEARCH in March of 2020, I was able to see firsthand the work that Native Seeds/SEARCH was doing before the pandemic. While doing my independent research from November 2020 through January 2021, I was able to see how the pandemic has affected the organization over the past ten months and how it will continue to impact it into the future. This project is about how non-Indigenous organizations can work with Indigenous communities to protect seeds, strengthen food security, and contribute to seed sovereignty in the Southwest. In this thesis, I will draw upon works that focus on Indigenous seed sovereignty to help build an understanding of the impacts and influences that Native Seed/SEARCH has on the Indigenous people they serve.

Overview of the Thesis

The first chapter of this thesis reviews the history of the Indigenous peoples of the Southwest. Colonization took an enormous toll on Indigenous people. There are many examples from the 1500s through the 1800s of various European colonizer policies and conflicts that impacted and violated Indigenous peoples' rights and health. I will focus on several significant events in the 1800s to the present day to give more concise examples of the United States of America's federal and state intervention into Indigenous ways of life surrounding food, infrastructure, and the contemporary issues facing native seed and Indigenous foodways. Colonialism, health issues, seed patent rights, and land use are all issues that I will address regarding seed and food sovereignty. The effects of colonialism on Indigenous livelihoods and
foodways will also be examined. Issues like irrigation and climate change have also significantly impacted the biodiversity and ecology of the Basin and Range Province.

The second chapter of the thesis is the history and analysis of the nonprofit Native Seeds/SEARCH. This chapter will cover Native Seeds/SEARCH history and past and current work. I cover the funding that Native Seeds/SEARCH receives, and the expenses associated with their nonprofit programs. I explain what the community programs they have in place are doing for Indigenous people. I will compare the mission statement of Native Seeds/SEARCH on what the organization is doing in regard to food security, and how that is closely connected to food sovereignty. It will also include the findings from the field research at Native Seeds/SEARCH in Tucson and the surrounding area. Here I will also include interview excerpts from those affiliated with Native Seeds/SEARCH and detailed ethnographic information from my time working with it.

The third chapter of this thesis is on Indigenous Perspectives. I explore the concept of Indigeneity as theory for Indigenous peoples. I also look into the connections between Native Seeds/SEARCH’s mission of food security, and how it related to seed sovereignty. I will answer the research questions that I have set out below and detail agricultural work of Southwestern Indigenous communities in the present, thoughts and reactions to seed loss, Indigenous opinions on food and seed sovereignty, Indigenous perspectives on COVID-19 and agriculture, and Indigenous perspectives, both positive and negative of Native Seeds/SEARCH. I will end on what Indigenous people would like to see Native Seeds/SEARCH do for the future of their organization and future tribal people.
Methodology and Research Questions

Scope of the Study

The findings presented in this thesis come from my independent research project on the scope of impact of the nonprofit Native Seeds/SEARCH on Indigenous communities in the Southwest. The dataset for my project was gathered through a mixed-methods approach to research that relied on qualitative methods.

Guided by my thesis committee, I conducted ethnographic research to investigate the question, can a nonprofit not run exclusively by Indigenous people or on tribal sovereign land contribute to seed and food sovereignty for Native Americans? The research project was conducted between November of 2020 and January of 2021 in Tucson, Arizona, and the surrounding areas. Some of the remote interviewing were also done from Chicago, Illinois. The field site of Native Seeds/SEARCH was chosen because Indigenous people did not start it, nor is it on tribal sovereign land, but because it has some Indigenous representation and works with culturally significant Native seeds. As I will outline in this thesis, there is no one Indigenous viewpoint on who owns, controls, and can grow Native seed – each individual, community, and tribe contributes to a complex narrative around sovereignty.

Methods and Research Tools

Before entering the field, I collected information and history about the Indigenous Southwest. I spent many hours doing archival research in preparation for my fieldwork. I
researched humanities publications and anthropological works that have been done on the Southwest and explored Indigenous print and digital news sources. Utilizing Native Seeds/SEARCH’s online platform, including its website, blog, and various articles that have already been written about the organization, I was able to go into the field more prepared.

While in the field I used participant observation and semi-structured interviews. I worked at the Conservation Center in the seed lab and the demonstration garden. I worked alongside staff and volunteers and was able to tour the facility and shadow staff. I was able to interview interlocutors at the center, and travel to the Patagonia farm and get to know workers that way. I also did interviews over Zoom, both while in Arizona and once back in Chicago.

While working with Indigenous interlocutors, I tried to use a decolonizing methodology. A decolonizing methodology balances Indigenous and Western frameworks and methods (Simonds and Christopher, 2013). By allowing for data decolonization, the community will determine what information is gathered and how it is interpreted (Secaira, 2019). “Decolonizing research means centering concerns and world views of non-Western individuals, and respectfully knowing and understanding theory and research from previously “Other(ed)” perspectives” (Thambinathan and Kinsella, 2021).

I researched ways to decolonize my methods before entering the field, including familiarizing myself with Indigenous ways of knowing and trying to incorporate reciprocity. I worked to tailor my questions to each participant’s experience within their own cultural identity and community. The gaze I use as a researcher is shaped by colonial ideologies of western research, and so I tried to understand and integrate theory from the Indigenous stakeholders I worked with, including by respecting cultural protocols of those I interviewed. One such cultural
protocol is the importance of oral history and lessons being taught through storytelling. I encouraged each interviewee to use these methods as they saw fit and spent many hours listening and trying to let the person drive the direction of the interview. I wanted to be able to offer each stakeholder the ability to use this research and my thesis in any way that would be beneficial for themselves or their community in regard to seed sovereignty and Native Seeds/SEARCH.

Self determination is another practice that has been encouraged to decolonize research. Kinsella and Thambinathan argue that self determination is an ‘iterative cyclical process’ and not a one-time opportunity for consent and decision making. I offered everyone the ability to review the information before publishing it, so that they may offer critique, ask me to remove certain things, or to reframe things that they might interpret from a different perspective. Linda Tuhawi-Smith argues in the book Decolonizing Methodologies that sharing research findings or “reporting back” to communities is simply not enough. Listening affectively is essential and allows for open dialogue between the researcher and participant because affectively implies accountability and commitment to growth. In doing this, I am not the only owner of this research, it belongs to all that have participated.

**Limitations of Research**

The research I am presenting, like all research, has inherent limitations. The research project was limited by time, the COVID-19 pandemic, and my linguistic and cultural fluency. My research was pushed back by six months due to travel restrictions during the COVID-19 pandemic, and thus I was unable to spend more than eight weeks in Arizona. The in-person research was geographically limited to the town of Tucson, Arizona, and the Patagonia farm
sixty miles south of Tucson. Additional research and interviews were done remotely to protect the health and safety of Indigenous consultants and their reservation communities. As a result of COVID-19, I missed the summer planting season at the Native Seeds/SEARCH conservation center and interacted in person with fewer employees and volunteers as social distancing restrictions were in place. I did not speak with as many urban Indigenous people as I did of those living on tribally sovereign lands. During the time allotted, I only did semi-structured and open-ended interviewing; I did not use a survey written on food security for reservation community members as some reservations' internet capabilities are limited, and I could not meet community members in person. I am not Indigenous and therefore an outsider, and I do not speak any Indigenous languages, so I spoke to all of my interlocuters in English. Bragdon argues in Indigenous Theory that “recent reappraisals suggest that languages do indeed “influence” experience, and thus Indigenous theories of knowledge” (p. 4, Bragdon, 2018). As I do not speak any Indigenous language and most of my Indigenous interlocutors were bilingual, I may have missed or misinterpreted some of the knowledge that they provided to me, which is another limitation. I do try to mitigate this limitation by allowing my consultants to review the thesis before I publish it.

The research project also relied on information from the Native Seeds/SEARCH nonprofit website, including its tax forms and Annual Report. Considering the context of the thesis's limitations, this work represents a foundation for future research both at Native Seeds/SEARCH and with the communities they serve.
Research Questions

Before traveling to Tucson in November 2020, I created a series of research questions to guide my independent research. The three questions I came up with focus on Native Seeds/SEARCH and their Indigenous stakeholders. In each specific question lies the subtext for an overarching question: Are Indigenous people's contributions being respected and used to enhance the seed and food sovereignty movements? When writing these questions, I wondered if Native Seeds/SEARCH non-Indigenous employees and board members would have different views on the sharing of seed and how and if to use seeds of cultural and religious significance.

1. How has Native Seeds/SEARCH learned from and respected the contributions of Indigenous People, and how consistently has the organization brought those contributions into the projects with Native seeds?
   
   How do board members, employees, and volunteers of Native Seeds/SEARCH describe the relationship between the nonprofit and Indigenous communities they work with? How do Indigenous stakeholders feel in return? What contributions from Indigenous people have been incorporated into NS/S projects, and which have not?

2. How does Indigenous participation in Native Seeds/SEARCH programs work toward building seed and food sovereignty for Indigenous communities?
What is seed sovereignty? What is food sovereignty? How do these questions get answered at NS/S, and what happens when NS/S and Indigenous people disagree? Are there tangible results from NS/S relationships with Indigenous participants in securing and regenerating Native seed?

3. What are the measurable outcomes of Native Seeds/SEARCH's action plans surrounding Native seeds as viewed by the organization and the Indigenous participants?

What is NS/S's mission regarding Native seed? How has that mission changed, and why? What seed programs are working, and why? What are the additional action plans that Indigenous people would like to see be supported by NS/S?

Naming Terms

Before discussing the foods and groups of people discussed in the thesis, it is imperative to explain the naming designations. The word native with a small n has several meanings as an adjective or noun. Native with a capital N used to describe foods or plant seeds means originating with medicines, cuisines, and food practices from the Americas' Indigenous peoples. These plants and foods were grown, used, and have origins of pre-European colonization. A Native American is a member of any Indigenous peoples of the western hemisphere (Native American, Merriam-Webster, 2020). An American Indian is a member of any Indigenous peoples of the western hemisphere, generally excluding Arctic Indigenous peoples (American Indian, Merriam-Webster, 2020). This definition or name is especially standard in the United
States' history, given to Indigenous people by European colonizers (Blackhorse, 2015). American Indian/Alaska Native is a term used by some and is explicitly used by the United States Census Bureau on Intergovernmental Tribal Affairs (US Census Bureau, 2020).

The word indigenous with a small i can mean innate or refer to "produced, growing, living, or occurring natively or naturally in a particular region or environment (Merriam-Webster, 2020). Additionally, the word Indigenous with a capital I encompasses a variety of Aboriginal groups. Aboriginal is "of or relating to the people who have been in a region from the earliest time" (Merriam-Webster, 2020). Indigenous across the world can refer to Native Americans, First Nations, and Aboriginal peoples (Sapiens, 2020). When capitalizing Indigenous, I do so because, "...in the UN, "Indigenous" is used to refer broadly to peoples of long settlement and connection to specific lands which have been adversely affected by incursions by industrial economies, displacement, and settlement of their traditional territories by others” (Indigenous Foundations, 2020).

In an Indian Country Today media network interview, Amanda Blackhorse interviewed several Indigenous people and asked their preferred terminology. Depending on whom one speaks to, the preferred name can vary (Blackhorse, 2015). Many Indigenous scholars, professionals, and writers seem to use the term Indigenous when writing or to publish, preferably. I will use the terms American Indian, Indigenous, and Native American in this proposal. I will use the term American Indian when citing historical sources on the United States colonization of the Indigenous people in the present-day United States. I will use Native American when quoting or referring to Native Seeds/SEARCH rather than "Native" because Native is a general term and does not denote specific ethnicity. Native Seeds/SEARCH uses the
term Native Americans when discussing the groups of Indigenous peoples their organization works with and with whom they are affiliated. However, while the organization uses the broad term Native Americans to describe Indigenous peoples, it must be noted that they will give the names of the tribes and peoples they work with when describing individuals or specific groups or projects.

Pseudonyms and gender-neutral pronouns will be used in this thesis to protect the identity of the research participants. Anonymity is essential to help protect the privacy of the respondents so they can feel comfortable speaking about their workplaces and communities. Anonymity also protects the message of what the interlocutors are trying to get across in their interviews.

In conclusion of this introductory chapter, this thesis examines the nonprofit Native Seeds/SEARCH collaborations with Indigenous groups in the Southwestern United States. While in Tucson, AZ I was able to use participant observation and semi-structured interviewing to focus on how Native Seeds/SEARCH partners with Indigenous groups to focus on seed sovereignty, and how that is linked to food sovereignty and security. I have covered what a seed bank is, what kinds of seeds can be patented, what some of the definitions of sovereignty are, and definitions of rematriation.

My introduction overview of the thesis identifies three chapters and a conclusion, and what my research questions that I worked to answer are. I identify the scope of the study, the methodology, the research tools, and the limitations of research. I also discuss naming terms for Indigenous peoples, and the use of gender-neutral pronouns and pseudonyms to protect my interlocuters.
CHAPTER 1: COLONIALISM IN THE SOUTHWEST UNITED STATES

People have adapted and thrived in this area of North America for thousands of years, long before European colonialism. This chapter focuses on the Indigenous peoples of Arizona, prehistoric and today. I give a summarized history of how European colonialism has affected Indigenous people in the area that is now known as the United States.

Prehistoric people took advantage of seasonal climate and food sources. Today there are over twenty contemporary Indigenous tribes in Arizona, each with life histories shaped by the desert ecology (Arizona State Museum, 2020). Indigenous peoples began as nomads, following game and collecting wild-crafted foods. Over time, native farming practices were created internally or adopted from others. Traditional foodways that have been developed by Indigenous people and persisted over time include the entire chain of cultural practices surrounding seeds, plants, and other native foods. These practices can include praying for and sowing seeds, casting nets, clearing, storing, preparing, serving, and storytelling about food (Nabhan, 2008).

Over sixty percent of the food the entire world eats today originated from and was developed by Indigenous people of the Americas (Rogers, 2011). Seed-sharing customs in North America can be traced from Indigenous societies. When Indigenous communities moved from one place to another, the seed savers cared for and moved the seeds. Indigenous people shared cultural heritage and food independence through seeds because seeds were believed to be owned by the tribe, not just by one person (Breen, 2015). Foods and seeds are prominent in Indigenous cosmologies, creation stories, and cultural stories (Karp, 2019). Crops native to the Southwest United States and Northern Mexico that have been stewarded by Indigenous peoples include
amaranth, barley, maize, millet, tepary beans, chiltepins, and many more. When European settlers came to the Southwest, they brought some crops with them and took full advantage of Native crops that could grow in these arid regions.

Prehistoric Cultures of the American Southwest

To understand how colonization has affected Indigenous tribes of the Southwest, we must look at the region's prehistory. Pre-colonization, Indigenous tribes had various modes of food collection and livelihood strategies. There are four known prehistoric culture groups of sedentary farmers in the American Southwest, the Ancestral Puebloans, the Mogollon, the Patayan, and the Hohokam (McGuire et al., 1993). The Ancestral Puebloans spanned the present-day four corners region of Utah, Arizona, New Mexico, and Colorado and are the ancestors of the contemporary Pueblo peoples. It is estimated that the Ancestral Puebloans settled in this area around 550 AD (National Park Service, 2017). The Ancestral Puebloans' geography and floral and faunal resources varied greatly across their region, and populations lived in pit houses, larger structures, pueblos, and cliff dwellings. Archaeologists have shown that Ancestral Puebloan areas experienced severe droughts, thunderstorms, and snowfall, but that snowmelt allowed many of their wild and cultivated seeds to germinate. The Ancestral Puebloans may have overhunted the deer population by 900 CE but cultivated corn, beans, and squash varieties on mesa tops and used dry farming techniques to water their crops. Production of maize likely declined around 1270 CE due to climate changes like droughts and cooler summers, which led to them leaving the area (Bawaya, 2010).
The Mogollon culture thrived in Southern New Mexico, Arizona, Western Texas, and Northern Mexico. They appear to have arrived around 200 AD and remained in the region until around 1500 AD. They initially were foragers, and archaeological sites show evidence of discarded deer bones, but increased farming is evidenced by water control features that have been discovered (Wheat, 1955). The Mogollon people grew corn, squash, beans, and amaranth in addition to cotton. They foraged on pinon nuts, walnuts, acorns, prickly pear, wild tomato, and sunflower seeds (Arizona State Museum, 2020). This culture also used pit houses and cliff dwellings and had extensive pottery usage. It is very likely that the Mogollon peoples traded with the Hohokam and got the idea for cliff dwellings from the Ancestral Puebloans (Wheat, 1955).

The Patayan lived across modern-day Arizona, California, and parts of Nevada. Archaeologists have determined that this unique culture was active between 700 and 1550 AD. The Patayan used hunting and gathering as well as practicing floodplain agriculture (Fagan, 2019). Patayan peoples often lived in permanent settlements along major waterways like the Gila and Colorado Rivers to do their floodplain agriculture, though it is likely that some villages were lost to flooding (Wright, 2020). The site of Tinajas Atlas, a major water hole at the time, shows evidence of plant processing, hunting, and pictograph creation, likely used by both the Patayan and Hohokam cultures (Hartman and Thurtle, 2020). Other evidence of close association with the Hohokam, including linguistic and archaeological data, such as evidence of Yuman-Piman bilingualism and similar burial practices (Shaul and Andresen, 1989).

The Hohokam people are prehistoric farmers of the Arizona Sonoran Desert who lived in the area from around 300 AD to 1500 AD (Fagan, 2019). The Hohokam would likely travel to collect marine shells along the northern Gulf of California for shell ornaments and jewelry.
There were also likely trade networks with the Patayan during the Ceramic period with the people living along the northern end of the Gulf of California due to large amounts of marine shells found at Hohokam sites in the Phoenix and Tucson Basins (Foster et al. 2012). The Hohokam populations were situated in the regional trade routes suggesting trade beyond the greater Southwest (Fagan, 2019). The Hohokam used hunting, gathering, and complex irrigation networks for their food systems. The most extensive archaeological sites are located in the lower Salt River Valley, which shows irrigation systems as integral parts of Hohokam livelihood. The Hohokam lived along rivers, and their irrigation system supported the largest population in the Southwest by 1300 CE. (Arizona Museum of Natural History, 2012). The Hohokam grew maize, cotton, tobacco, beans, and squash and harvested wild plants. They also used dry farming methods to grow agave for both food and fibers for weaving. "Archaeological data and Native oral tradition both point to environmental degradation, health decline and social conflict in the 14th century, well before the arrival of Europeans" (p. 610, Hill et al. 2015). Fundamental traditional ecological knowledge in the Southwest grew from the Hohokam tradition and included understanding watershed and irrigation management, growing desert and arid-land adapted seeds, and amending sandy, gravelly, and clay soils (DesertUSA, 2001).

A tribal member research participant, Emery Soqui, living in the Salt River Pima-Maricopa Indian Community, discussed the ancient Hohokam farming traditions, including their relationship with corn and beans. These stories have been passed down for many generations.

Corn has been with us for about, 8000 years maybe longer only reason I say 8000 years is they found a corn variety named Chapalote in Marana (Arizona) that was about 8000 years old. It was one of our ancestor sites, and so we say that it has been here for at least 8000 years. However, corn is not Indigenous to this area, and I think the thing that is the most Indigenous and representative of the people that were not necessarily the staple crop
is the tepary beans. Tepary beans helped create the stars in the sky when the world was first created.

Emery also talked about the last thousands of miles of canals that irrigated over 100,000 acres of land in the Salt River Valley. Emery touched on how little of what was previously farmed by their ancestors is now farmed today at all, and even less of that by Indigenous people. They said, "If we want to talk about pride and cultural retention around food sovereignty, what is more cultural for an agricultural society than farming?" Emery would later tell me about their plans for revitalizing farming practices with the native seeds they are accumulating in the Salt River Valley, partially through collaboration with organizations like Native Seeds/SEARCH.

I went into a detailed discussion with a member of the Zuni tribe, Ellis Wyaco, who had stories to tell about their prehistoric ancestors, the ancestral Puebloans, and the archaeological findings that have been uncovered near their Pueblo. There are both appreciations for some of the archaeological work done in the Southwest and frustration and uncertainty. In some ways, the findings, like ancient seeds, have been exciting and helpful to the current Indigenous communities. Near a Zuni village, polychrome pottery and jars containing ancient seeds dated to around 1100 AD were found. Handfuls of this seed were shared with Zuni tribe members to use as offerings, and the Zuni also began to try to grow them out. What is remarkable is that many of the elders in the Zuni tribe recognized the seed without needing genetic testing, a book, or an archaeologist to tell them what it is. Archaeologists will give information on the seeds, and the elders will already know about them through history from the tribe. This is commonplace with many archaeological sites, says Ellis Wyaco. They could go directly to religious leaders to answer many of the questions that they (archaeologists) are digging for, says Ellis, referring to a
specific instance where archaeologists wanted to know about burial traditions. A burial of bodies centered around a matriarch was found. According to Ellis,

> There are all these magazines and news articles saying they found this and they found that and I'm like yeah, you could have come straight to the village, and one of the leaders would have told you that. So we take (those articles) with a grain of salt, because well, we could have told you that." Ellis laughed good-naturedly at "scientists spending thousands and thousands of dollars on fancy machines when all they had to do was ask.

Stories like Ellis show how strong Indigenous people's cultural and oral traditions are and give glimpses into the past.

Ellis Wyaco went on to say that they have not worked with archaeologists directly but spoke about how some archaeologists have begun to hire some of the religious and cultural leaders of different tribes, offering a new mindset on the archaeological process. Some tribe members have also worked with archaeologists in the Southwest on prehistoric projects regarding their ancestors. They think that making a working relationship like this is better for both parties, that it gives the people a piece of their history back while also giving the archaeologists an insight into what the seeds are and where they came from.

> They (the archaeologists) have gone from the mindset of things like, "Tell us what this is for, give us the answers," to "If you want to share anything with us, please let us know and if we can be of any help, if we can give it back to you somehow"…and they have kind of I guess, I don’t want to say redeemed themselves, but they've kind of put themselves in a new category now as far as respecting that part of it, and giving back to the tribes and saying here are your seeds, these seeds actually belong with you guys, and you should have them.

Ellis elaborates that rather than letting the seeds "just sit inside a facility," they will take them to find out what they are and start trying to grow them out, which is at least one instance with the Zuni Yellow Bean successful.
Another exciting thing about finding the ancient seeds is the discussion on not only where the seeds came from but who they "belong to." Seed trading was and still is common among Indigenous groups, and if what is thought to be a Hopi seed initially is found at a Zuni site, the conversation opens to whom that seed belongs. According to Ellis Wyaco's perspective, the seeds belong to everyone. If the Hopi or another group does not have access to those seeds anymore, it is an opportunity and an obligation to share seeds that are part of their history and could be grown out. Research participant Emery Soqui spoke about the history of seeds as well,

So, if you look at our stories, you can tell what Indigenous is and what came in through time. Corn wasn't something the people grew; it's some with which we've created a relationship and a deep connection with, so deep that we've created a strain that is indicative and belongs to our people (60-day corn), but that came from somebody else's corn. So, when it leaves our community, it is no longer that 60-day corn; it has the same makeup, but when it starts to be grown and regrown and it will change. So, my relationship with the seed, to me, doesn't mean that I can limit it if somebody else can grow it.

These conversations got ever more complex as I spoke with more and more people, especially when discussing seedbanks preservation or distribution of native seeds. Just like working with archaeologists, the sharing of knowledge is something that seems like it would be simple, but that isn’t always the case.

Though some interactions with archaeologists have been positive, there are still barriers to overcome. The process of archaeological reconciliation is ongoing and didn't happen overnight, and sometimes things are dug up that was meant to stay in the ground. It is generally thought by Indigenous tribes that taboo and burial items should stay where they were found and can even open up a can of worms by simply being dug up in the first place. Taking things away from prehistoric sites or from sites that are from what was Indigenous land before it was taken by
Europeans and putting them in museums or drawers somewhere can be an area of contention.

Ellis Wyaco says,

They should be given back to the proper societies...it's not that these items were lost or forgotten about. It's just that the items should have stayed at those sites and remained there, and if they were pulled up, the right thing to do is to give them back to the society that knows how to take care of them, and that knows how to honor those items. There is not always a ceremony or a certain protocol in place for putting items back in the ground. It becomes a gray area and a touchy topic for Indigenous people when things that shouldn't have been removed come back to them because it's not always known what is to be done next and can bring bad luck on an individual.

Ellis elaborated,

A particular society put them there for a reason...it's hard for religious leaders to say what to do next because there is no protocol. Everyone goes into panic mode because "what do we do?" and they say we can't just make something up because there is no action for that, and we never in a million years would have thought that we would have to put it back.

Additionally, the tribes want to know who gave the archaeologists permission to dig in certain places, which is another frustration of colonization.

To outsiders, these sites look like they are abandoned, and they have been left there to "discover." In actuality, these sites are still visited by certain groups, Zuni still visit many sites and they still have them in their prayers even when they do not physically go see them.

Zuni is still spiritually connected to these sites, and people visit them for specific reasons, and archaeologists do not necessarily know or try to find that information before beginning their work. Zuni tribal member Ellis Wyaco took the middle ground, saying that they appreciated that some of the sites were visible and able to "breathe again" and to be shown to their people, and to be able to leave offerings there. They spoke in length about the sacred sites they take their family and children to visit ancestors, reconnect with their heritage and leave offerings. They spoke of visiting the site of where a 21st grandmother had lived and the feeling of home they experience when being present in these areas. "I keep telling my children, this is part of your identity, being
Zuni isn't just on a piece of paper, it's all of this, it's everything from agriculture to water to where we've come from." Such instances like this show that the prehistoric cultures of the Southwest are still very relevant and essential to tribes today.

Spanish Conquest and Colonialism and the Mexican-American War

This section covers the arrival of Spanish explorers and colonizers that came to Northern Mexico and the Southwestern United States. Introduction of these new colonizers resulted in conquest and war for the Indigenous peoples. The Puebloans are Native Americans of the Southwestern United States who shared common agricultural, material and religious practices when they first came into contact with the Spanish, the first colonizers of the Southwest. Pueblo means village in Spanish, the term originating with Colonial Spanish because of the limestone or adobe brick residences and multifamily buildings that the people lived in. Puebloan peoples first began having contact with the Spanish in the 16th century when the Spanish began sending in soldiers, missionaries, and settlers from the viceroyalty of New Spain, covering much of present-day Mexico and the Caribbean. In 1598 Spain claimed the area centered on the upper valley of the Rio Grande river, with borders varying into present-day western Texas, Colorado, Kansas, and Oklahoma and through most of New Mexico as Santa Fe de Nuevo Mexico, a kingdom of the Spanish Empire and New Spain (Weber, 2009). The Spanish slowly colonized this area, with much resistance to missionary and pacification efforts from the Indigenous peoples against the Spanish.

In the 17th century, many Spanish missions were built in Nuevo, Mexico, near pueblos, to convert Indigenous peoples to Christianity and collect tribute from them. This influx of soldiers,
settlers, and missionaries received mixed reactions from the Pueblo peoples over time. Indigenous people fought many battles and were subjected to massacres, struggling against Spanish warfare technology, and being particularly vulnerable to European diseases.

In 1680 the Pueblo Revolt occurred, an uprising of many Indigenous Pueblo people against Spanish colonizers. Leading up to the revolt were severe droughts in the 1670s and increased Apache raids, and in 1675 many Pueblo medicine men were arrested for sorcery and were hanged or whipped and imprisoned. One of the Pueblo men later released was Popé, who, with other leaders, planned the revolt. Four hundred Spanish were killed, and two thousand were driven out of the province, but the Spanish could recapture the region twelve years later in 1692 and came back in force (Knaut, 1997).

The Spanish brought forcible colonization with them and new seeds, plants, and animals with them to the Americas that people across the Southwest and the United States as a whole still use today. Examples of plants and seeds include fruit trees, chile peppers, sugarcane, rice, wheat, spices, olives, and almonds. Examples of animals brought by the Spanish include domesticated horses, cattle, pigs, goats, sheep, chickens, cats, donkeys, and new bee and dog species. While some of these introductions have been beneficial, with colonization also came the introduction of Old-World weeds and new animals' overgrazing of native plants (Mastnak et al., 2014 and Anderson, 2011). One Hopi interviewee, Morgan Kaya, told me

> Although we had to overthrow the Spanish with the rebel revolt (of 1680), there is a saying out there that goes, you know, did we ever really get rid of the Spanish because we still have a lot of their peach and apricot trees and many their seeds that they had brought with them.

In 1810 Miguel Hidalgo initiated the quest for independence in New Spain against the Spanish. In 1821 the independent empire of Mexico was declared and ended three centuries of
Spanish dominion. In 1824 the area once held by Spain was declared the Territory of New Mexico. Trade along the Santa Fe Trail was opened to many more people, and many citizens of the United States came to be a part of it and receive land grants, once again to the detriment of Native American territories (Archer, 2003).

Between 1835 and 1836, the Texas Revolution raged. Texas revolted against Mexico partially in order to keep their system of slavery, as Mexico had abolished slavery in 1829 (Valdez, 1987). 1836 The Republic of Texas declared itself freed from Mexico and existed for ten years. In 1845 the United States annexed the Republic of Texas under President James K. Polk, which increased tensions with Mexico. The two countries have been in contention as the United States took more and more land near the Mexican border. It was made worse that Mexico did not recognize the Velasco Treaty and saw all of the Territory of New Mexico as their own (Brack, 1970). In 1846 the Mexican-American War began. This war lasted two years between the Republic of Mexico and the United States, ending in 1848 with the Treaty of Guadalupe Hidalgo. With this treaty, the border between Texas and Mexico became the Rio Grande river, the cession of the Territory of New Mexico, and ownership of Alta California which included most of Arizona, Nevada, Utah, and Colorado (Rives, 1970). The Gadsden Purchase of 1853 added lands south of the Gila River and west of the Rio Grande River to the United States ownership. This includes the present-day areas of Southwest New Mexico and Southern Arizona to the current California border (US Department of State, Foreign Service Institute, 2021).
United States Colonization Moves West

Eventually this area of North America was controlled by the United States and its government. The U.S. policies enacted over time had severe consequences for Indigenous peoples. Colonization effects on Native Americans did not end with the Spanish. There are many examples from the 1500s through the 1800s of various European colonizer policies and conflicts that impacted and violated Indigenous peoples' rights and health. I will highlight several significant events from the 1800s to the 1970s to give more concise examples of the United States of America's federal and state intervention into Indigenous ways of life surrounding food. Some of the examples I will briefly discuss did not impact tribes of the Southwest until much later after their enactments, such as the 1824 creation of the Bureau of Indian Affairs, the 1830 Indian Removal Act, and the 1851 Indian Appropriations Act.

In 1824 the Bureau of Indian Affairs (BIA) was created to handle Native American relationships (Lambert, 2016). In 1830 with the United States Indian Removal Act passage, many Indigenous people east of the Mississippi River were forcibly relocated west away from European-populated areas. This removal continued through the BIA until 1850 (Bowes, 2014). In 1851 the United States Congress passed the first Indian Appropriations Act, creating farming reservations in Oklahoma and other areas of the Midwest, and moving eastern tribes to them (Estes, 2017). These reservations were often far from the Indigenous people's original homes in unfamiliar areas of the country. Much smaller land areas were given to farm than were previously utilized for food procurement and Indigenous livelihoods. Many of the foods that the Indigenous communities traditionally grew were unsuitable for their new farmland tracts.
At each of these established reservations, the United States Government initially allowed
missionaries of various groups to manage the affairs of the residents, much to the detriment of
their societies. Various religious groups managed many reservations, and the Dutch Reformed
Church was in charge of San Carlos Apache Indian Reservation, and Presbyterian missionaries
were in charge of several of the O'odham reservations. (Kappler, 1904, electronically published
2021).

In 1862 the first Homestead Act was enacted. Public land in the United States, nearly ten
percent of the total area of the United States, was given away for free to nearly 1.6 million
homesteaders, mostly west of the Mississippi River. There was much abuse of this new act,
including homesteaders taking Native American land and gaining control of many water and
other natural resources and much of the arable land in the Southwest to the detriment of Native

There were many clashes over land and natural resources in the Southwest, often with
devastating results for the Indigenous peoples whose lands were being taken from under them. In
1864 there was a blatant attempt at ethnic cleansing of spread-out populations of Navajo peoples
in Eastern Arizona by the United States government, with what is now called The Long Walk of
the Navajos. Major General James H. Carleton began to displace Navajo people forcibly, many
of them small children and elderly, by forcing groups of captured Navajos to walk over three
hundred miles from Arizona to Fort Sumner in New Mexico, where they lived in internment
camps and terrible conditions alongside Mescalero Apaches (Davies and Iverson, 1995). In 1868
with the Treaty of Bosque Redondo, Navajos were allowed to return to their home territories and
given/returned specific Navajo lands, now known as the Navajo Nation (Iverson and Roessel,
While giving Dine people a reservation and some supplies like seeds, agricultural equipment, and some compensation, this treaty also forced Navajo children to compulsory education required to send children to school for ten years for US education with white teachers (Mitchell, 1973).

In 1879 Native American boarding schools or Indian Residential Schools began being established in the United States. These schools were used for "civilizing" or assimilating Native American youth into Euro-American culture. While some reservations had already seen compulsory attendance at schools before, in 1891, it began across all residential schools in the United States (Office of Indian Affairs, 1891). What was overlooked or ignored was that Native Americans already had education systems and colleges in place before these forced boarding schools (Yeboah, 2005). Children were taken from their families to get a European-American education, and were often forced to cut their hair, had their names changed to European names, and were forced to get a Christian education. School workers were often strict and abusive, and students who did not conform were often punished (Yeboah, 2005). Many Native American youths subsequently lost much of their cultural identity, Indigenous languages, and Indigenous religions. Arizona and New Mexico were two of the states with the highest numbers of boarding schools, numbering up to as many as seventy-seven schools. The last compulsory Indian Residential Schools in the United States did not close until 1973; however, there are still over three hundred schools open across the country, either as day schools or as boarding schools (Beck, 2021). Today many tribal nations have their own tribal or community-based schools, and many tribal colleges and universities have been established, but attendance at which school children go to is determined by parents and communities and not on forcible relocation at the
hands of the government. Since the 1960's demands for government involvement and aid for
Native American schooling have been made; however, more funding and attention has been
given to public schools off the reservations and for BIA schools (Schaefer, 2004). Many tribal
schools now have a western curriculum and a tribal curriculum, allowing students to revitalize
language, culture, and identity. Native American community colleges allow for history and
culture to be incorporated into courses in Native American-controlled educational institutions.
However, though changes have been made to many tribal school programs, assimilationist
approaches have left their scars on Native Americans. Many Native American students live off-
reservation or do not attend reservation schools, and public schools inadequately cover,
downright ignore, or rewrite topics covering Native American history, language, spirituality, and
contributions (Feagin and Feagin, 2003).

I was told some personal and painful stories that I cannot share, as they would violate the
trust I have established with my interviewees. Three of the reservation residents I talked with
spoke about elders in their communities and the trauma they dealt with being forced to attend
Indian Residential Schools. They spoke of their elders being underfed, dealt brutal punishments
for misbehavior, and losing much of their cultural identity as children. One interlocutor from the
Navajo Nation, Willie Todachine, told me that the elder was forced to no longer speak their
indigenous language, with physical punishment being given out if they were caught. I was also
told that many elders still had trouble speaking about their time in residential schools and that
there were long-lasting side effects and trauma of the treatment and forcible removal from their
homes and families.
The 1887 United States Dawes Act broke up and subdivided communal tribal land holdings into individually owned allotments, hoping to assimilate Indigenous people to settler culture of owning property. “Surplus” land was frequently sold to non-Native people, and “Allotments were conveyed to members of affected tribes and held in trust by the federal government. As allotments were taken out of trust, they became subject to state and local taxation, which resulted in thousands of acres passing out of Indian hands” (US Dept of Interior, 2021).

Many mixed-blood Native peoples were forced to accept US citizenship, and some tribes were detribalized and lost their status. Between 1887 and 1934, Native Americans lost over 100 million acres of land because of the Dawes Act. This new law and the unsuitable land that many Indigenous people were moved to make it harder for Indigenous people to farm, and many Native foods were also discouraged from being grown to "civilize" them.

Colonization in the 1900s and Beyond

This section focuses on Indigenous peoples and their recent history in the 1900’s to the present. In 1908 the Supreme Court of the United States ruled in Winters vs. United States that Native American tribes were entitled to sufficient water supplies for their reservations. While there was hope for positive change with this act, still years later, many water rights remain unquantified, and water settlements that could provide infrastructure drag on for years in the court systems (James, 2020).

In the United States in 1934, the Indian Reorganization Act replaced the Dawes Act, noting that the Dawes Act was severely detrimental to Indigenous people and tribes. The new
law allowed for the return of surplus lands to tribes and encouraged tribes to self-govern (Estes, 2019). This "Indian New Deal" allowed for the return to joint holdings of some lands, but not all. Land that was already patented to individuals stayed with that individual. Today you may look at a map and see a checkerboarding of reservation or tribal lands mixed with individual trust and fee land (ILTF, 2021). The Indian Reorganization Act encouraged tribal sovereignty, eliminating or reversing some of the assimilation policies. Land and mineral rights were given back to some tribes, but while some changes were positive, others were not. Some tribes were terminated (legally dismantled) or lost their federal recognition and were no longer eligible for government programs that assisted Native Americans. Some of the unrecognized tribes of Arizona include the American Cherokee Confederacy, Arizona Cherokee Pioneers, Barrio Pascua (Yaqui), Chiricahua Apache Ndeh Nation, and The United Cherokee Nation (UCN) – Western National Office. Unrecognized tribes of New Mexico include Canoncito Band of Navajos, the Genizaros, or Genizaro communities such as the Pueblo de Abiquiu, Cañon de Carnue, and San Miguel del Vado, the Piro/Manso/Tiwa Indian Tribe of the Pueblo of San Juan de Guadalupe, the Piro/Manso/Tiwa Tribe of Guadalupe Pueblo (a.k.a. Tiwa Indian Tribe), and the Mazewalli Nation. Additionally, the Indian Reorganization Act changed food procurement strategies on Native American lands all over the country, the Southwest included.

After the Indian Reorganization Act of 1934, the Indigenous residents gained back much of their tribal sovereignty. During the 1940s and into World War II, the BIA budget was cut, and Native American issues took a backseat to other governmental matters. Non-native business people and conservative politicians critiqued Collier's Indian New Deal policies and criticized Native American lifestyles as un-American and communistic (Encyclopedia.com, 2021). As a
result, many gains made for Native American rights were reversed in the late 1940s and early 1950s.

The 1960s saw the American Indian Movement (AIM) begin. The movement focused on policymaking that would create programs and organizations to serve Indian people in various communities. "AIM has repeatedly brought successful suit against the federal government for the protection of the rights of Native Nations guaranteed in treaties, sovereignty, the United States Constitution and laws" (Waterman-Wittstock and Salinas, 2021). Long-term objectives of AIM include unification within Native American people, information to Native Americans of community affairs, encouragement of Native Americans to become involved in community affairs and to bring the economic status of Native Americans up to the status of the general community in the United States.

In 1968 Congress passed the Indian Civil Rights Act, recognizing policies of Indian termination as a failure. The government finally agreed that the goal of assimilation was wrong and detrimental to Native Americans. This bill guaranteed a Bill of Rights for Native American peoples. Self-determination was not an official federal government policy until 1970, under President Richard M. Nixon. Other policies enacted in the 1970s include the Indian Financing Act of 1974, the Indian Self-Determination and Education Assistance Act of 1975, the Indian Child Welfare Act of 1978, and the American Indian Religious Freedom Act of 1978.

Today the BIA regards tribal sovereignty as a way to "ensure that any decisions about the tribes with regard to their property and citizens are made with the participation and consent" (US Dept of Interior, 2021). There are several types of relationships that Native Americans have with the US Government, including territorial sovereignty, plenary power doctrine, and trust
relationships. Most Native American land is held in trust by the US Government, so federal law governs the economic rights of tribal governments. In 1994 the US Department of Housing and Urban Development changed and supported Native American housing programs, leading to the Native American Housing Assistance and Self-Determination Act of 1996.

Tribes of the American Southwest Today

There are many tribes in the Southwest today, over twenty in Arizona alone. The borders of what is considered the Southwest region of the United States are disputed and not standardized. For this study, I have focused mainly on tribes inhabiting Arizona and New Mexico and a few that have land in Southeastern California that overlap into Arizona – as this is where many of the seeds that Native Seeds/SEARCH conserves, protects, propagates, and distributes are originally from, and adapted to. There are currently twenty-two federally recognized tribes in Arizona and twenty reservations (Arizona State Museum, 2020). There are 23 federally recognized tribes located in New Mexico, with 19 pueblos and three reservations (New Mexico Tourism Department, 2020). Some tribal land overlap state borders, the Colorado River Indian Reservation, the Fort Mojave Reservation, the Fort Yuma Reservation all overlap the Arizona/California border, and the Navajo Nation and the Zuni Reservation overlap the Arizona and New Mexico border.

In the Arizona Basin and Range Province area, there are many tribes, including many Apache groups, Akimel O'odham, Tohono O'odham, Mohave, Maricopa, Quechan, Cocopah, Hopi, and Yaqui. I have had communications with people from some of these tribes or
reservations, though not all. I will briefly discuss the history of some of the communities with which Native Seeds/SEARCH has served.

The Salt-River Pima-Maricopa Indian Community was created in 1879 and is home to both Akimel O'odham (Pima), whose name means the River People, and the Piipaash (Maricopa), many of whom originally came from the Halchidhoma (named People who live toward the water) tribe from the lower Colorado River at the Arizona and California border (SPRMIC, 2020). The O'odham and Maricopa have had a long-standing positive relationship, forming a confederation in the 19th century.

The Gila River Indian Reservation was created in 1859, and the United States Congress formally established the Gila River Indian Community in 1939. Akimel O'odham and Piipaash people live here. Some Yuman groups also moved east to live amongst the O'odham, and much of the livelihood of the Indigenous people of this area pre-and-post colonization has revolved around irrigation and agriculture. (Gila River Indian Community, 2021).

The United States federal government established the Ak-Chin Indian Community (known previously as the Maricopa Reservation) in 1912 in the Sonora Desert. Akimel O'odham, Tohono O'odham, and Hia-Ced O'odham peoples live here today. The reservation currently sits on 22,000 acres. The community gained federal recognition in 1961 and started large agricultural operations, which were supplemented by gained water rights to the Colorado River in 1984. Ak-Chin is an O'odham word that means "mouth of the arroyo" or wash (Johnson et al., 2008).

The Pascua Yaqui people are currently based in Tucson, AZ, but there are communities spread across the Southwest. Yaqui people have lived all over the Sonora and Sinaloa in Mexico, especially along the Yaqui River (Advameg Inc., 2021). Yaqui people traditionally farmed crops
like beans, maize and squash, using flooding from the rivers as a water source. Yaqui people also cultivated cotton and made cotton products. The Yaqui also fished the rivers for food sources. As a result of wars between Spanish conquistadors, the nation of Mexico and the Yaqui people, many fled north to the United States. Most Yaqui settled in urban areas. In 1964 leader Anselmo Valencia Tori helped to convince the U.S. government to grant the Pascua Yaqui people trust land southwest of Tucson, AZ (Innes, 1998). The Yaqui did not become a federally recognized tribe until 1978, and the trust land was given reservation status. As of 2008 the Pascua Yaqui tribe counted over 11,000 voting members (Volante, 2008). Yaqui religion is very important to Yaqui culture and is with interwoven aspects of Catholicism and Jesuit Christianity.

The Tohono O'odham Nation is the second-largest Indigenous landholding in the United States after the Navajo Nation and is located in south-central Arizona in the Sonoran Desert. It is comprised primarily of Tohono O'odham and some Hia C-ed O'odham Indigenous people. The current Tohono O'odham Nation is made up of several previously distinct reservations that were combined, including the San Xavier Indian Reservation and the Gila Bend Indian reservation, as well as other designated and purchased lands. Formerly called the Papago, this name was replaced, and the name Tohono O'odham means "People of the Desert" (Nabhan, 1987). There are some conflicts at the United States and Mexico border over the range of the Tohono O'odham lands (74 miles of border) because there are Tohono O'odham in Mexico, but they do not have an established reservation there. The Tohono O'odham have clashed with the United States government over the border wall being built between the US and Mexico (Tohono O'odham Nation, 2016). A Tohono O'odham research participant, Terry Anghill, discussed the frustration of the O'odham people regarding the border wall. "The border wall does nothing to benefit the
O'odham people and everything to hurt them. These lands across the US and Mexico were all O'odham lands originally, and the borders have cut off people who are related to one another and have the same traditions."

The San Carlos Apache Reservation was established in 1872 for the Chiricahua Apache. In 1875 the Yavapai and other culturally related Apache bands were forcibly removed and marched over 180 miles away from their lands. In 1886 the Chiricahua Apache were forcibly removed again to Florida, and other relocated Apachean speaking groups such as the Pinal Coyotero, the Aravaipa, and Pinalen, Apache Peaks, San Carlos, and the Cibecue Apache stayed on the reservation. After the Indian Reorganization Act of 1934, the various Apache groups formed a government and became federally recognized as the San Carlos Nation (Native Languages of the Americas, 2021).

Directly north of the San Carlos Apache Reservation in northeastern Arizona is the White Mountain Apache Reservation, formerly known as the Fort Apache Indian Reservation. It is home to the federally recognized White Mountain Apache Tribe, a Western Apache tribe. This reservation was established in 1891 and separated from the San Carlos Apache Reservation in 1897 (ITCA, 2011).

Modern-day Pueblo peoples are descended from the Ancestral Pueblos. There are an estimated 35,000 Pueblo who live in New Mexico and Arizona today. Pueblo peoples speak languages from four different language families, Keresan, Kiowa-Tanoan, Uto-Aztecan, and Zuni, some of which are further divided into sub-branches and dialects. The Pueblo peoples have been contrasted as Eastern and Western Pueblos, the Western being Desert Pueblos of the Zuni and Hopi. In 1877 the US Government created the Zuni Reservation in New Mexico and
expanded it in 1883 (Bonvillian, 2011). In 1882 the Hopi Reservation was created, and Hopi and Arizona Tewa people live there, surrounded by the Navajo Nation (Dockstader, 1979).

North of the Basin and Range Province on the Colorado Plateau of Arizona and New Mexico, there are many tribes, including the Navajo, Apache, the Southern Paiute, the Southern Ute, Havasupai, and Hualapai. The Navajo Nation is the second-largest federally recognized tribe in the United States. It is estimated that there are around 330,000 Navajo people in the United States, with over 300,000 enrolled tribal members. As of the 2010 census, around 173,000 Navajo people live in the Navajo Nation (US Census Bureau, 2010). Outside of the Navajo Nation, some small groups of Navajos are members of the federally recognized Colorado River Indian Tribes, with around 4,200 enrolled members from the Chemehuevi, the Mohave, the Hopi, and the Navajo (US Census Bureau, 2017).

Colonization and Commodity Foods

By changing the diets of Indigenous peoples, the United States brought new health issues to the tribes. By the end of the 19th century, many Indigenous people found it impossible to feed themselves and were on the brink of starvation. The US Government stepped in to prevent starvation, providing surplus agricultural commodity foods, using high fat and high-calorie canned foods. This program was meant to be temporary while Indigenous people learned to become successful at farming, but the Dawes Act failed to produce self-sufficient farmers. Additionally, traditional Native foods were not given among the surplus goods; they were instead discouraged. Migratory patterns and Native foodways were disrupted by Europeans and their food systems, hoping that forcing Indigenous peoples to eat colonizer foods would assimilate
them more quickly (Keen, 2013). In the early twentieth century, the US government created the Food Distribution Program on Indian Reservations (FDPIR), a program similar to food stamps, to give commodity foods free of charge to over two hundred and fifty reservations (Vantrease, 2013). "Available foods today include canned meats, canned beans, canned vegetables, canned soups, canned fruits, bottled juices, cereals, rice, dried pasta, flours, processed cheese food, powdered egg mix, shelf-stable milk, buttery spread, and vegetable oil" (USDA 2012a in Vantrease, 2013).

The Indian Reorganization Act did not allow many Indigenous people to return to their original lands, and many reservations are in the middle of food deserts. Many tribes were, and are today, still very reliant on commodity foods and food programs provided by the US government. Commodity foods have taken a negative toll on Indigenous peoples' health. Indigenous traditional diets that included around fifteen percent fat increased to forty percent fat with Anglo-foods' introduction. As the government provided commodity foods, they became the primary source of diet for Indigenous people, and heart disease rates, kidney disease, obesity, and diabetes mellitus skyrocketed. Obesity issues from the diet are associated with trans-fats, high-fat foods, and sugar intake.

Additionally, there is usually a lack of high-fiber foods in the commodity diet. Indigenous adults are 1.7 times more likely to be obese than Caucasians, according to the Department of Health and Human Services' Office of Minority Health (OMH, 2018). “Almost thirty-three percent of all American Indians and Alaskan Natives, including both children and adults, are obese, and over half of AI/AN women are overweight” (Goetz, 2012). Sugar intake is very high in Indigenous communities in the United States, coming mainly from sweetened
beverages, processed foods, and sweets. Previous dietary studies report that Indigenous youths' diets are high in sugar and saturated fats and low in fruits and vegetables (Gachupin, 2019).

Diabetes began to be seen in Indigenous communities in the 1940s, although there are indicators that the disease began to spread earlier than that (Mihesuah, 2019). Type two diabetes is frequently associated with diet and obesity, contributing to high blood pressure and cardiovascular diseases. Between 1994 and 2009, the prevalence rates of diagnosed diabetes skyrocketed across Indian Country, increasing by 110% in teens 15-19 years old, and by 161% in young adults between the ages of 25-34 years old” (CDC Factsheet, 2020). American Indians have the highest prevalence of Type 2 Diabetes Mellitus (T2DM), with T2DM treatment accounting for over a third of all Indian Health Services' medical costs (Schure et al., 2019).

To combat health problems that have been exacerbated by commodity and Anglo-foods, there have been many interventions for obesity and diabetes by the US government and the Indian Health Service in the United States. While many programs are considered "successful," the rates of diabetes mellitus are not going down in Indigenous peoples.

Ethnobotanist Gary Paul Nabhan identifies four factors that contribute to the vulnerability of Indigenous peoples to metabolic disease – the abandonment of wild foods, changes in agrobiodiversity, the introduction of refined carbohydrates, and the addition of food additives to Native diet (Nabhan, 2013). In the last twenty-five years, Dr. Nabhan has studied the value of native desert foods for controlling diabetes among Indigenous peoples in the Southwest (Brody, 1991). Commodity foods, as I spoke of previously, are not the only barriers to health in Indigenous communities; infrastructure shortcomings, climate change, and Covid-19 have all hit many Indigenous communities especially hard.
Colonization Impacts on Water and Infrastructure

As is evident from several of the Indigenous names and traditions for various peoples - water, rivers, and washes were and continue to be essential to their ways of life. When it came to water for farming and irrigation, much of the rights for these were gained later in the 20th century through treaties or lawsuits (JRank Articles, 2021). These water rights are still being affected by climate change and infrastructure projects.

In 1924 the San Carlos Irrigation Project was started; it was created to provide irrigation water to the project landowners. In 1928 the hydro-electric Coolidge Dam was built southeast of Globe, Arizona on the Gila River to "generate power, incidental to releases of stored irrigation water, for irrigation pumping in Utility lands and the sale of excess power" (US Dept of Interior, 2021). The Coolidge Dam construction formed the San Carlos Lake, located in the San Carlos Apache Indian Reservation, which was established in 1872. This irrigation project and dam have had lasting effects on water rights and allotment issues for Native Americans in the Southwest.

Due to the irrigation needs of the surrounding areas, the lake is often shallow, having been nearly empty over twenty times and only completely full around three times (Leisure and Sport Review, 2021).

In 1979 the Church Rock Uranium Mill Spill in New Mexico poisoned Navajo water in the Puercos River. The disposal pond at the uranium mill breached its dam, spilling into land and water to the north and Southwest, where it is bordered by Navajo Nation Tribal Trust lands. New Mexico Governor Bruce King refused the Navajo Nation's request to declare the site a federal disaster area, which limited aid to residents. Arizona and New Mexico did not adequately explain
or prepare populations for the dangers of radiation, and it was several days after the spill that the IHS and Environmental Improvement Division of New Mexico finally warned residents not to use the Puercos River. Many Navajo people in the area only speak Dine, and the signs and radio coverage were only done in English. Uranium-contaminated water hit the Puercos River and seeped into wells, people were injured, and required amputations, herbs gathered near the river were contaminated, and many livestock died after drinking the water. United Nuclear denied claims that the spill caused livestock deaths, but the Navajo economy in mutton was harmed. Clean water access was lost to 1,700 people, and the water brought in by the government was stopped in 1981 (Brugge, DeLemos, and Bui, 2007). The Navajo Nation spent around 100,000 dollars on clean water for the people of this area. It is the most significant release of radioactive material in US history and got very little media coverage, likely due to its lightly populated and rural area. In 2003 the Churchrock Chapter of the Navajo Nation began the Church Rock Uranium Monitoring Project to assess the impacts of abandoned uranium mines (Shuey and Ronca-Battista, 2007). Navajo tribal member Willie Todachine told me that significantly higher radiation than what is recommended is emitted from natural and mining sources in the area, and that is an ongoing concern on the Nation.

Additionally, though Indigenous lands were colonized, the infrastructure and quality of life are not the same for reservations and trust lands across the board. Sometimes infrastructure on different reservations is compared to the developing world, with some places lacking enough running water, electricity, telecom and internet services, health services, grocery stores, and more. Sarah Oven reported in April 2021, “Tribes face a digital divide “as big as the Grand Canyon” and a “not even quantifiable” lack of utility access, just two of the problems outlined at
a House hearing April 21 on infrastructure needs in Indian Country” (Oven, 2021). Her article detailed bleak statistics on infrastructure on reservations having to do with water systems, electricity, roadways, transit, and other issues.

The American Jobs plan presented by President Joe Biden includes 10 billion for improvements for rural and tribal water systems and goals to reach 100% high-speed broadband coverage across the US but is still seeing resistance for the deal in Congress (Oven, 2021). My Navajo contact Willie Todachine relayed some information on the homes and infrastructure problems that they and their extended family members deal with outside of Leupp on the Navajo Nation lands within northern Arizona, including how high rates of COVID-19 have seen their borders shut to protect the tribes, and how hospitals and clinics are struggling with the influx of patients.

Diseases, infectious, respiratory, skin infections, and obesity are all affected but the lack of reliable and safe water service in communities. In Monument Valley, Utah, Navajo people line up as early as dawn to collect water from a spigot where the only clean drinking water comes from for that area. An estimated 30% of people in the Navajo Nation live in homes without running water. Additionally, people need clean and safe water for their farm animals, meaning that with long commutes and long lines at water sources, precious hours of the day are eaten up doing these basic tasks and keeping people in poverty or out of school. Lack of basic phone services keeps families from communicating in times of emergency, especially with COVID-19 ravaging tribal lands, where water access is limited.
Hopi consultant Morgan Kaya and I used Zoom to do our interview, and they had to go into their car and drive around their reservation to find a good WIFI signal for the meeting. The signal was still spotty enough that we had to turn our cameras off after a few minutes. They told me that WIFI has been made available on several reservations during COVID-19 so that reservation children can do e-learning, but that once COVID is resolved and students are going back into public schools, the WIFI services they have temporarily had will be removed. Morgan also gave me information on the grocery options in their area of the Hopi reservation, discussing how since COVID-19, there have been some relief efforts, and while fresh produce is sometimes available, the majority of products being delivered are canned goods.

Colonization and Climate Change

Not only are infrastructure projects like the rivers being diverted north of the reservations for farming irrigation for non-Indigenous peoples, but the weather is changing too. Colonization and booming population lead to new industries, including fossil fuels, mining, industry like cement and aluminum production, manufacturing and construction, heavily meat-focused food systems, and deforestation, all of which contribute to climate change (Sutter, 2015).

I spoke to Salt River resident Emery Soqui who discussed how the Gila River is dry near where they live now and that the "wet periods" that used to happen in past years are very infrequent now. This is a common theme among many of the people I spoke to in the Southwest, how they are experiencing hot, dry weather and shorter monsoon seasons. Agriculture is dependent on water, and people who depend on extensive irrigation or dry farming are suffering because of it. Dry farming is where you do not irrigate plants but instead rely on rain and on rain...
catchment methods. Another Indigenous consultant, August Scott, who works for Native Seeds/SEARCH, told me this about dry farming,

(Dry farming) which is traditionally how many farmers did it; even oxygen is just basically the ultimate way of capturing water off the alluvial fans that come off the hills and growing your crops within these fans that are filled up with water and you can concentrate them on your crops.

Multiple people from Native Seeds/SEARCH and local residents in the Sonoran Desert told me that they had over 100 days of 100-degree weather during the summer of 2020 and only two good monsoon showers of rain between June and September for the crops that rely on water. Generally, the average amount of rainfall during the monsoon season is 2.78 inches (La Fontaine, 2020). According to Arizona reports, this was the second summer of the "non-soon" with only 1.51 inches average falling across Arizona (Ackley, 2020). Regular volunteers at Native Seeds/SEARCH, Jessie Martin, and Dallas Washington, talked about how much more watering they have been doing in the demonstration gardens due to lack of rain. Lennon Jones, an employee of Native Seeds/SEARCH, told me that climate change is impacting grow outs and seed health.

We just had the absolute driest and second hottest monsoon in two seasons recorded history and corn that we would prefer not to hand pollinate per guidance from communities on how to steward that seed cannot be grown without hand pollination. We found that out this summer when it's this hot in this dry for this long.

They also discussed how shifts in water access and salinity of the soil because of extreme weather events affect seed health. Lennon went on to elaborate, saying

Like we're seeing right now with what's out there that some of those beans aren't going to make it. Because we had such a gap between triple digits and freeze. It was so short between those two events, so that's definitely going to be an ongoing struggle.

August Scott had more to say on climate and the management of the NSS seed stocks.
But you need some rain to happen for dry farming, and I haven't heard of anyone who's had any success growing something with this monsoon season. Up at Hopi even, like there's a lot of people that try to farm there - that's really like what Hopi corn is best at, is being dry farmed. I don't know anyone who did particularly well with it. So, let's see, the people I saw that did better we're in New Mexico, Colorado and California who are living in slightly better, less arid sections that managed to grow some of the some of the seeds, but overall it was bad. You know, corn can't pollinate in that heat. If it's over 95 degrees, corn stops really pollinating, and it literally like never stopped for, like, five or six months. It was like six months of just over 100-degree weather certainly, six months of over 90, for sure, and a solid four months of over 100, because we had 110 days of it. You can't grow things in that really, I mean we managed with some but that's what so much of this stuff is late, like our beans are just flowering now because they just suffered. It's been like the hottest November and if this becomes more normal when you have more and more years without real monsoons just like what's been happening for the last several years and you have more exceedingly hot heat waves. So many things are not going to grow, not actively grow. I really worry that it won't be viable to grow during the monsoon season anymore. I think we'll always have a spring growing season, at least for now. But I don't know what we're gonna do. I mean I think summer is an issue, you can't grow anything from end of May to end of August at the earliest. Even if you irrigate. If you irrigate you can do some things, but none of that dry farming can be done, and even with irrigation people fail a lot. My home garden, even cacti, it's too hot for them. They just wait till it cools off, and then they start growing again. Or they die, it was really bad. I know that we did not have a good corn grow out here and actually the corn was looking much better than I expected it to. But the pollination failed because the heat killed the pollen. So you get empty years, despite having reasonably nice stocks.

One of the Native Seeds/SEARCH founders, Gary Nabhan, had a lot of interesting insights on climate change, some of which I will detail further in the chapter on Native Seeds/SEARCH and agriculture.

I've published major paper with 12 Mexican and American colleagues, who've worked on these climate issues for 20 years, and we had a paper out in Plants, People, and Planet in the September. It was about climate friendly solutions to food production in arid lands because arid lands are the laboratory of the future for a hotter drier world. … We focus on land health, meaning that we don't want to further extract or deplete the soil, see salmon supplies or see water supplies diminish by over irrigating things. Climate change also diminishes human health, and we need to deal with the pressing issues like diabetes and diseases of oxidative stress that are being aggravated by heat and dehydration, so that there's a spike in a whole bunch of new diseases. Since a climate change many things have been exacerbated. …We are going to continue to have those cross-cultural tensions at country and reservation borders, because there's haves and have nots. So, we need to redesign agriculture to meet all of those three needs: land health, human health, and
community well-being. Whether we use wild foods in agroforestry systems or tribes used to use or choose to use their heritage varieties that they've grown for hundreds or 1000s of years. I think we're setting our sights too low; we really need to redesign agriculture in the face of climate change to be more equitable not just more climate friendly. If we do one without the other, we'll still lose.

Indigenous consultant Morgan Kaya of the Hopi tribe talking to me about climate change that they have seen, noting

…For about maybe five years or so, you know the monsoons still come, the rain still comes, but you know I like to watch it. It normally comes from the Southwest. And so you know the clouds build up and then we all we all get excited because we know that it's moving our way. Then it gets real close to the points, maybe less than a mile half a mile or so from the village. And it never comes in and they (the clouds) part, and then goes around so we never get anything from it anymore.

Morgan talked to me about how they viewed the climate change as part of their religious beliefs as well, saying that it is better to not acknowledge that the rain is coming because it is ancestors coming to visit, and if you acknowledge it, they may not come. They also discussed the spiritual beliefs that the people of the villages that need rain need to care for their land, the neighbors, and their communities because if they don't, the ancestors may not bring them rain.

Ellis Wyaco from the Zuni reservation gave me this insight into climate change where they live,

Oh gosh we used to get tons of rain here, I mean growing up as a kid we used to swim in the Zuni river, and we used to play in it. We see a lot of change. I think our hydrologist said it best. His name is Kirk and he is Zuni. He was doing a presentation somewhere and something that always stuck in my head was that he said at the beginning of that presentation is that climate change is nothing new for us, we've been dealing with it for 1000s of years. And when I always think about that I think about like it's true. He said it's not a new concept for Zuni so we've been dealing with it for 1000s of years and that has always stuck with me. I always hear people talking about climate change and go to different conferences in the US, the first thing they throw it seems like it's the new thing you know, people are just saying, putting climate change and slapping that label on everything and all this and data they're getting funding for it and whatnot but you know what sets it apart. From then to now we (Zuni) we would migrate, we will adapt to your surroundings, we would go seek where the water was where the water was, we've kind of
migrate towards it. We can't do that now, what we're doing to adapt to it isn't trust anything drastic I think we're still doing the same thing. Because people talk about how much rainwater we used to get long time ago how much water flow we used to get. They talk about all of that, you could throw your seed in the ground and you never have to water you just wait for the rain. And obviously it is affecting us. And it is showing itself that it is here. We've had one of our main lakes on the south side dry up, and an aquifer fed that.

Another Zuni consultant, Rowen Panteah, confirmed the changes in weather on their part of the Zuni reservation as well, saying, "We’re doing our best to deal with the drought we're in, which mainly you know comes through conserving water and trying to adapt to that, and how our environment is changing."

A Ft. Quechuan tribe interlocuter, Alexis Chino, lives on the California/Arizona border, just north of the Mexican border and at a different elevation than Tucson or in some other tribal lands.

So I was born in 1975, so I remember when I was maybe five to 10 years old, we would get heavy monsoons. And I've noticed it dry out even here, just from my personal observations you know I remember we used to get heavy rains. We used to get frost we would, you know, like some of the puddles during the winter and freeze over now it's you know we, I think we've got a couple of sprinkles this year you know so I've seen patterns change just in my lifetime.

**Colonization Land Grabs**

Even though many Southwestern Indigenous groups now have tribally sovereign lands, colonization and US economic interests continue to threaten livelihoods and sacred lands. The Coolidge Dam was met with opposition from the San Carlos Apache tribe, who feared treaty rights violations and because the lake would flood over a tribal burial ground and Geronimo's camp. Those burial grounds have been covered with a concrete slab to protect them, but they are now underwater and inaccessible to the people. Additionally, in 2003 the San Carlos Apache Tribe took the Secretary of the United States Department and the BIA to court for draining the
reservoir below 75,000 acre-feet, saying that draining the reservoir will cause a fish kill and also threaten endangered birds such as the peregrine falcon and the bald eagle (Justia Law, 2021).

Near Phoenix, the Pima-Maricopa people of the Gila River Indian Community (GRIC) also struggle with colonization tactics that threaten their water and farming rights. At the turn of the 20th century, the Pima-Maricopa peoples were starving because of a lack of water and not being able to irrigate their farm fields. They fought for water rights for many decades until, in the 1990s, they reached a water settlement called the Pima-Maricopa Irrigation Project. Still, only slightly over half (201,000 of 372,000) of the Gila River Indian Community's lands are considered irrigable farmland, meaning they should have a claim for 1.5 million acre-feet of water. The community settled for 653,000 acre-feet of water (Water Strategies, 2019). Another Arizona infrastructure issue that the Gila River Indian Community faced was with the building of the South Mountain Freeway that went through their lands and affected South Mountain, which is sacred and holds several historical, archaeological, and religious sites for the GRIC people (Coppola, 2015).

In the early 2000s the Zuni went to court with an Arizona utility company that wanted to build a large coal strip mine in Western New Mexico. The plans for this mine were in the works for about two decades and finally abandoned in 2003 as a result of pressure and lawsuits from the Zuni Pueblo and environmental groups. The mine would have been close to the Zuni Salt Lake and involved construction between the lake and the Zuni. The mine would have extracted water from the aquifer below the lake, a site that is sacred to the Zuni. The Zuni and other Native American pueblos make pilgrimages to the lake to harvest salt for culinary and ceremonial purposes (Neary, 2003). Zuni Interviewee Ellis Wyaco talked about using salt from the Zuni Salt
Lake for ceremony and food at home on their Pueblo and as something they have traded with other tribes, such as the Hopi, in return for seeds.

(The Zuni) are so proud of their seeds, and they're really strict with seeds, their seeds are really sacred and they're really well protected. They take pride in that, and that's the reason I approached them to get seed for our (Zuni) seed bank. The last exchange I did was in 2019; we try to keep it traditional, we've given them the Zuni salt in exchange for the Hopi seed and if we're fortunate enough, it'll produce an ear of corn that gives us kernels, so we count our blessings and make sure we are careful with that seed.

Another Zuni member, Rowen Panteah, told me about village and family expeditions to the Salt Lake for cultural and ceremonial purposes.

In December 2014, President Barack Obama signed the 2015 National Defense Authorization Act, which would give land sacred to the Apache in Arizona to Resolution Copper Mine (RCM), owned by Rio Tinto and BHP Billiton (Barletta, 2014). This act cleared the way for a land swap between Resolution Copper and the federal government, and RCM would be allowed to develop and operate an underground copper mine in Tonto National Forest. In this area of land, there are more than 2400 acres of the Oak Flat Campground, which has many petroglyphs, prehistoric and historic sites. The San Carlos Apache Tribe and the National Congress of American Indians, and several environmental groups have opposed and begun a legal fight against RCM. As of 2016, the Oak Flat Campground was listed on the National Register of Historic Places, which will not stop the RCM but will force a federal agency to evaluate the project's effects on a property before taking action. Bills have been introduced by several democratic senators and representatives but are yet to have hearings in Congress (Welch, 2017). A San Carlos Apache tribal member who declined to be named spoke to me about how so much land has been encroached upon for environmentally detrimental purposes, which also destroy historical and
spiritual landmarks. "Oak Flat is just one of many sacred places on our lands, and mining companies won't stop coming and litigating over areas they deem valuable," they said.

Significance

The overall significance of this chapter is that since the beginning of colonization, it has affected Indigenous people in many detrimental ways, from the lack of being allowed decision making, tribal land lost or decimated, infrastructure issues, poverty issues, destruction of food systems, health issues including the outbreak of COVID-19, climate change, federal status, and treaty recognition.

In the next chapter, I will focus on how livelihood strategies have changed, therefore affecting food procurement and health issues for Indigenous people. All of these issues all tie into why it is essential to recuperate the seeds and native foods. In the same chapter, I will overview the nonprofit Native Seeds/SEARCH, focusing on an organization working in the Southwest with Indigenous people on preserving the genetic diversity of and returning native seeds to their agriculture production and gardens. I will cover many topics with the interviewees I spoke with, from what seed sovereignty means to them, what Native Seeds/SEARCH is hoping to accomplish over the next several years, how seeds are being grown out and preserved, what COVID-19 will mean for those projects and the employees and volunteers, and how Native Seeds/SEARCH relationships with Indigenous people are perceived, and what their hopes for the future of these collaborations to be.
A nonprofit that is not tribally run but that works with Indigenous groups on food security, seed, and food sovereignty efforts is Native Seeds/SEARCH. I chose to focus on Native Seeds/SEARCH because there has been some published research on tribally run or Indigenous nation seed banks, such as the Cherokee Seed Bank, but less about seed banks that work with both the general public and Indigenous people of a specific geographic region.

Native Seeds/SEARCH was founded by Gary Paul Nabhan, Karen Reichhardt, Barney Burns, and Mahina Drees after spinning off a successful Meals for Millions garden project. Meals for Millions is a nonprofit organization that focuses on feeding the poor, with a specific interest in rural areas, using multi-purpose food, a high protein food supplement (Meals for Millions, 2019). The Meals project that Nabhan et al. worked on was with the Tohono O'odham Nation of the Sonoran Desert. The MFM project health promoter wanted to expand into gardening because reservations did not choose what foods they got from trading posts. Indigenous people had been experiencing outsider programs (such as the Gila River Indian Community diabetes project) which were not treating their communities with respect but rather as guinea pigs. So Indigenous people asked for knowledge on how to change their diet and fitness programs. Meals for Millions went in to do a combined program with the community health representatives, going around to homes and community centers and talking about gardening and bringing in seeds donated by national and international seed companies. One issue
with this, however, was that not all of the seeds donated were something that the Indigenous
people may know how to grow or want to eat. Dr. Nabhan was comfortable going on record and
not using a pseudonym for his quotes in this thesis. Dr. Nabhan told me,

People would look at like, you know, what did the hell is a rutabaga? Do you grow it in
the summer or winter? What we want to eat are the things that our grandparents grew, but
we don't know where to find all those seeds.

Nabhan and the others dealt with issues getting seeds for SW Arizona from Mexican markets
where they were still being grown because MFM already had a Latin America program. With the
blessing of the Meals for Millions project, the idea for Native Seeds/SEARCH took shape. The
founders went to see and meet other seed organizations and met the precursors of Seed Savers
Exchange. The Land Institute was collecting crop and wild seeds, and within a year had the first
national conference forum called Seed Banks Serving People to discuss the best ways to
conserve seeds. Nabhan remembers,

Why do we think that the best way to conserve seeds, which we know is not just a natural
resource but a cultural resource, is to be divorcing the seeds from people? Can't we have
in-situ or in place conservation as the primary goal, and the seed banks as a backup. They
were willing to help, so that's when we got incorporated, as the seedbank serving the
people.

From this project emerged the new nonprofit. Native Seeds/SEARCH (Southwestern
Endangered Aridlands Resource Clearinghouse) was founded in 1983 in Tucson, Arizona. Dr.
Nabhan had this to saying about the founding of NSS,

I should say, I never I think we've sort of said that there were four Native Seed/SEARCH
founders. In fact, we had been trying to seek out seeds from Native American farmers for
three or four years before that. And so, I always felt that we were trying to be in service
to a larger part of people who are seeding ideas on to us and I've always felt
uncomfortable as describing it, that there were four co-founders of the organization, we
had to do something to sign the papers to get to get incorporated. But even back then
other people were putting in volunteer time or other kinds of support.
The original mission statement was:

Native Seeds/SEARCH is a new, nonprofit organization, the first devoted to the conservation and promotion of native, agriculturally valuable plants of the US Southwest and northwest Mexico. By distributing seeds, we increase to the public and permanent seed banks, and by documenting their cultural, nutritive, ecological, and culinary value, we hope to ensure that this agricultural heritage persists for years to come. We will be exploring fresh approaches to assisting Native American farmers and gardeners recover seeds that their peoples formerly tended and to the in-situ conservation of wild perennial relatives of crops (Seedhead News, Issue 1).

Over the years, the operation has grown and does work with Indigenous people and people all over the Southwestern United States and northwestern Mexico. The mission statement given in 2019, thirty-six years later, was shortened: "The nonprofit mission of Native Seeds/SEARCH is to conserve and promote arid-adapted crop diversity to nourish a changing world. We work within the southwestern United States and northwestern Mexico to strengthen regional food security" (Seedhead News Issue 124). While the mission statement has been shortened, the nonprofit’s work with Indigenous groups has continued into the present through many programs.

Native Seeds/SEARCH Today

Native Seeds/SEARCH has grown over the last thirty years, and today offers many programs. Native Seeds/SEARCH (NS/S) provides seed preservation, propagation, and distribution, and stewardship. NS/S sells seeds and plants, and other goods to partially fund its community programs that benefit Indigenous people and seed protection throughout the Southwest. NS/S has an online store and previously held a retail store where consumers can purchase seeds, books, Indigenous art and handicrafts, body products, foodstuffs, and more.

As of February 2021, the executive director of NS/S is Alexandra Zamecnik. NS/S employs around fourteen staff, and as of 2021, has a board of ten people. Ms. Zamecnik was
hired after the end of my fieldwork; therefore, I have not met her. There is a mixture of full-time and part-time staff at Native Seeds/SEARCH, and board members are unpaid volunteers that serve the organization's mission. There are quarterly board meetings, with the board member chair elected at the September board meeting. There are several subcommittees for board members that meet beyond the quarterly meetings, including the executive committee, the seed policy committee, and the search committee.

The organization runs community programs, including the Seed Backup Program, Native Access, Native American Seed Request, Community Seed Grants, and Partner Farmer Program. Added in 2021 after the end of my fieldwork was the Partner Gardener Program. Each of these programs can offer supplemental workshops and education. The nonprofit also holds community events and teaching workshops on growing seeds and crops. The seed bank organization has worked with over fifty Indigenous communities and tribes. The seed bank has also focused on collecting and passing on oral traditions about the seeds, such as recipes, cultivation practices, and stories.

To allow the nonprofit and the programs to function, much careful attention is paid to the health of the seed collection. Employees supervise the germination testing, which is monitoring the health of the collection. By law, NS/S must make sure that the seeds being sold are good and have good viability. Every seed variety or crop type has different regulations regarding how high the germination percentage has to be. Every seed lot in distribution gets tested at least once a year to keep up with those standards. One employee, Cameron, told me that seeds are often tested at least twice a year, if not multiple times. They do a "ragdoll" test, which is just wrapping up the seeds in a damp germination testing towel. They then put those labeled with all the
information they have (which lot it is, for example) and the information they need to collect, and then they are put into the germination test chamber, which is climate controlled. It has a humidifier, temperature control, and light control so that it is light and warm during the day and it is cooler and darker at night. Seeds stay in the germination tester for up to three weeks, depending on crop tags and the employees have to record the percentages of how many developed and whether the seeds are viable or not. The federal standards are 75% for corn, beans, wheat, and squash to name a few. The seeds must meet the standard, and if not, they will have a second test, and then they are possible moved to a different part of the seed bank.

There is the active collection - the seeds in distribution that are being either sold or sent out through the Native American seed exchange or community seed grants. A second collection is the increased seed, which can be things that were set aside on purpose because they plan to expand on what they have. These seeds could be here because they are popular or want to have bigger grow outs or make more seeds available to people. There is also the collection of seeds that are not viable enough to sell but still have decent germination, and these are moved into that increase so that they be grown out again and try to refresh the seed. All of that is separate from our base collection, which is the original seed that came to Native Seeds/SEARCH. The regeneration samples are small samples that are a seed that's grown, either from the original seed or from other region samples, so that the staff knows it is as close as possible genetically to the original seed. With regeneration samples, the goal is to have a number of those for every single accession in the collection. Cameron told me,

So that's the heart of the seed bank in terms of the that regeneration that making sure that genetics are protected. The other part of Native Seed/SEARCH’s role is the ex-situ, getting things out into the community so that they're grown and used as opposed to keep it keeping them like museum pieces in the seed bank.
Native Seed/SEARCH Funding

To understand how this nonprofit works, I reviewed their funding strategies. As of 2021, nine board members run operations for Native Seeds/SEARCH. According to the 2019 tax return prepared by the finance and operations manager, there are ten voting members of the governing body of the nonprofit organization, and none of the board members received direct compensation from Native Seeds/SEARCH profits. Each board member contributed between a half-hour and an hour a week towards NS/S work.

Staff members at Native Seeds/Search do earn a salary or hourly wages. Both the executive director and the finance and operations manager earn yearly salaries from NS/S. It is currently unclear through online resources who controls the budget, distributes the benefits, and decides how much money goes into each program. It is likely a collaboration between the board, the executive director, and financial operations management.

Native Seeds/SEARCH receives funding through five sources: product sales, donations, membership, tuition, and other revenue, and grants. According to the 2019-2020 Annual Report data, at 45.95 percent of their base, their most significant revenue area is from product sales through their retail store, online website, and the location at the nonprofit headquarters and community events around the Southwest. Their next most significant income source, at 40.87 percent, comes from donations from foundations, individuals, and corporate donors. Membership fees make up 7.86 percent of income, tuition and other revenue make up .60 percent, and grants make up 4.71 percent.
As of 2020, Native Seeds/SEARCH expenses include distribution, conservation, membership and fundraising, administration, and education. They use 44.37 percent of their funding for seed access programs, the Partner Farmer Program, and costs of goods. 21.65 percent of their income goes into the seed bank and garden, and 19.92 percent goes into membership and fundraising through methods such as newsletters and advertising. 10.56 percent of NS/S income goes into administration, including building and operational maintenance. The last category of expenses is education, where 3.50 percent of the income goes towards workshops, outreach events, print, and online resources. See the appendix below for Native Seeds/SEARCH's 2019-2020 funding information.

One board member told me about the loyalty and commitment many of their members have to Native Seeds/SEARCH. They said,

One of the reasons we do so well with donations is because members have this vested interest, they get seeds, and they support the cause because they have these stories and memories with these seeds. They have this connection to a living thing, and they're endeared to the cause. So, a lot of people donate through their wills, and they support every year.

Below is a figure showing the 2020 Annual Report for Native Seeds/SEARCH, which breaks down where all of the donations and funding comes from for the organization that year.

Brief Background Native Seeds/SEARCH Community Programs
Native Seeds/SEARCH is a nonprofit that works within the larger Southwestern community. There are currently six community programs that interested parties can use or be a part of. Native Seeds/SEARCH’s website explains that the Seed Backup program is promoted through ex-situ and in situ approaches, a combination of keeping seeds in cold storage conditions where they are
viable to germinate later. Secondly, their stewardship of this program works through an ongoing relationship between people and plants in the present. The Seed Backup program is a "black box" initiative that allows the seed bank to be a security backup repository for regional seed collections. This program also is tied to the rematriation of seeds to their original owners. Rematriation has several meanings including, "to restore a living culture to its rightful place on Mother Earth," (Newcomb, 1995) and "The act or process of returning the sacred to the mother." (Rematriation Home, 2021). As the director and founder of Sierra Seeds, Rowen White is a well-known Seedkeeper from the Mohawk community of Akwesasne and an Indigenous seed sovereignty advocate. White had this to say on rematriation,

> We call this movement "seed rematriation," because these seeds are alive when they're coming back home. They're living relatives, having come home after a long stint away, back to their motherland, back to their mother community. So, the rematriation is harkening to that maternal connection. In many of our communities, there's a matrilineal connection to Earth. In many of our communities, the bundles of seed are carried by the women, and how these seed songs and ceremonies are kept alive is in the hands and hearts of women. So, we're rematriating these seed bundles from institutions back to tribal communities (White, Emergence Magazine, 2020).

The Native Access Program takes religiously or culturally significant Native seeds out of general rotation, making them only available to tribal members and people of Indigenous heritage. Some of the seeds currently exclusive to Indigenous people are Hopi blue corn, certain ceremonial tobaccos, certain tomatillos, sunflowers, and chilies. Some Native seeds that are low in stock have also temporarily been placed in Native Access. This move aims to allow Indigenous people to have the first opportunities to get culturally and religiously significant seeds, while the conservation center and their partners grow out healthy stock to replenish what
# 2020 Annual Report Data

Financials for the period of October 1, 2019 - September 30, 2020. Detailed financial information is available upon request.

## REVENUE

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<td>Retail Sales</td>
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<tr>
<td>Donations</td>
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<td>Includes donations from foundations, individuals &amp; corporate donors</td>
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<td>Membership</td>
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<td>Grants</td>
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## INCOME BEFORE COST OF GOODS

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<td></td>
<td>$1,634,033</td>
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<tr>
<td>Cost Of Goods</td>
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## GROSS INCOME

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## EXPENSES

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<td>Seed access programs, bulk seed exchange &amp; cost of goods</td>
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<td>Conservation</td>
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<tr>
<td>Seed bank &amp; garden</td>
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<tr>
<td>Membership &amp; Fundraising</td>
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<td>19.92%</td>
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<tr>
<td>Newsletters &amp; advertising</td>
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<tr>
<td>Administration</td>
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<tr>
<td>Building &amp; operational maintenance</td>
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<td></td>
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<tr>
<td>Education</td>
<td>$39,402</td>
<td>3.50%</td>
</tr>
<tr>
<td>Workshops, outreach events, print &amp; online resources</td>
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## TOTAL EXPENSES

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## NET INCOME

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<td></td>
<td>$314,467</td>
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</table>
the seed bank has. The goal is to return some of the seeds (but not all) back to the active
collection once there is a healthy surplus, and then non-Indigenous people will be able to access
some of these varieties again.

The Native American Seed Request Program is a way for Indigenous individuals or
families to get free or half-price seed packets of any type of seed offered through the program.
According to the 2017-2018 Annual Report, 5368 seed packets were distributed through this
program to Indigenous peoples (Annual Report, 2018, 13). Native Seeds/SEARCH encourages
Indigenous people within the Southwest to request up to ten free seed packets and up to an
additional twenty seed packets at the discounted rate of two dollars per packet. Indigenous
people outside the Southwest Native Seeds/SEARCH can purchase up to thirty seed packets for
only two dollars per packet. The organization offered, at one point, thirty-three types of Native
seeds exclusively to Indigenous peoples that are not for sale to the general public. That number
has tripled since the start of the COVID-19 pandemic. The organization will prioritize certain
groups depending on the number of seeds available (Native Seeds/SEARCH, 2019).

The Community Seed Grants Program allows organizations working on educational, food
security, or community development projects to request up to thirty standard seed packets of
various foods and wildflowers. Organizations that are eligible for the program are operating in
the southwestern US and northwestern Mexico. Seed grants are only available to organizations,
not individuals, and prioritize projects that will benefit underprivileged groups. Examples of
successful past seed grants include "school gardens or other educational gardens, therapy and
rehabilitation gardens, and community-operated food security gardens" (Native Seeds/SEARCH,
A NS/S employee, River Williams that works closely with the seed grants program, told me that they "put them (applications for community seed grants) into four broad categories, schools, community organizations, seed libraries, and then health and rehabilitation organizations." When asked for elaboration on the types of seed library programs, they talked about communities wanting to start seed libraries in their community, whether they be a public library, a tribal organization, or other US government organization that wants to start. The idea with those seed libraries is that they can apply for up to two seed grants a year, but that these organizations would be getting the seeds out into the community, having them grown, and then the growers are returning them to the seed library that the organization is building. With a three to five-year grant relationship, having those organizations find they have got their library built up for their communities. River has worked creating flyers in English and Spanish for Community Seed Grant, Partner Farmer, and Native American Seed Request programs. They are creating them for handouts and posters for gas station boards on reservations and places where people are not necessarily just consuming digital media.

The Partner Farmer Program "… relies on partnering with a network of southwestern farmers to grow out and increase the seed varieties we steward, with a focus on working with Indigenous farmers growing in or near the areas these seeds are originally from" (Native Seeds/SEARCH, 2021). The program gives seeds to farmers and has some returned to Native Seeds/SEARCH's collection to replenish seeds for both parties. Seeds only last so long, which is why they must be grown out, because even in the ideal temperatures of zero degrees in the deep freeze, where the long-term storage of the base collection is, seeds will not last forever. There are
two options for farmers in the Partner Farmer Program, bulk seed exchange and contract growing.

In the bulk seed exchange, the agreement involves farmers receiving seeds, and at the end of the growing season, returning 5x (five times) the original number of seeds, or 3x (three times) the amount for Indigenous farmers. The seed returned to NS/S should only be a fraction of the seed harvested and collected so that the farmer participants can harvest a large amount of food and save seeds for future planting. If there is not a successful harvest, or if there is a crop failure, there is no financial penalty.

For contract growing, any experienced southwestern farmers that can grow a quarter acre or more of a seed variety can be paid to grow seeds as part of the contract agreement. Native Seeds/SEARCH will pay growers to grow out select varieties and focus on seeds that need to be replenished. Farmers can contact NS/S to discuss varieties they are interested in growing and discuss logistics and the amount of land they plan to cultivate.

In 2021 thus far, there have been forty partner farmer program participants, at least fourteen of which were Indigenous growers from at least twelve different tribes. Native Seeds/SEARCH specifies that the seed (or their progeny) that Partner Farmers are given are not used for commercial breeding purposes. Growers are provided with the regeneration priority list and select seeds based on crop interest, experience, and climate. Native Seeds/SEARCH team members "…work with growers to assess potential issues of cross-pollination and communicate seed-saving guidelines to include isolation distance and minimum population size for genetic preservation" (No. 127, The Seedhead News, 2021).
The Partner Gardener Program is new as of 2021, and while similar to the Partner Farmer Program, it is on a much smaller scale. By creating seed growing teams, Native Seeds/SEARCH allows for conserving seeds through small gardens in the Southwest. In this first 2021 summer growing season, NS/S invited people to apply to participate in June and begin growing with their team at the beginning of July. This program is open to anyone with gardening experience who can pick up and return seeds to the NS/S conservation center. Each member of a seed team grows between five and fifteen plants of the same variety, returning fifty percent of their harvested seeds to Native Seeds/SEARCH at the end of the growing season. Partners Gardeners can help increase seed stocks of rare seeds while also keeping seeds for themselves. Partner Gardeners receive training on how to grow the particular crop they will be working with. The rare seeds being grown out in the summer 2021 growing season are Havasupai striped sunflower, Colorado River devil's claw, Texas chiltepin, and Sacaton white tepary bean (Native Seeds/SEARCH, 2021).

Native Seeds/SEARCH's website lists preserving nearly 2,000 varieties of seeds in its seed bank, with at least ninety varieties reserved explicitly for Indigenous people. The nonprofit leads educational workshops with various topics, including saving and growing seeds, and offers on-site internships for Indigenous youth. The organization offers many opportunities for future research on food sovereignty that could look into developing Indigenous-owned and managed businesses, Indigenous-run youth education programs, and more.
Food Security and Seed Sovereignty

The mission of Native Seeds/SEARCH involves regional food security. Food security is closely linked to food and seed sovereignty. According to USAID food security is “having, at all times, both physical and economic access to sufficient food to meet dietary needs for a productive and healthy life” (USAID, 2021). Food sovereignty is “The right of peoples to healthy and culturally appropriate food produced from ecologically sound and sustainable methods, and their right to define their own food and agriculture systems” (Patel, 2009). I defined seed sovereignty is in the introduction of this thesis as “the farmer's right to breed and exchange diverse open-source seeds which can be saved and not patented, genetically modified, owned or controlled by emerging seed giants” (Sustainable Food Trust, 2015). Seeds are the foundation of food systems, we cannot feed animals in meat-heavy food production systems, nor humans without seeds. If seeds become inaccessible to people because of poor quality, affordability, or patenting and genetic modification that otherwise make seeds unavailable to the average consumer, farmers and gardeners cannot attain sovereignty.

Many landrace and heirloom seeds are being lost over time, and with them the knowledge and historical breeding practices which molded them. Challenges to seed diversity include hybrid seed types, patents and global trade agreements (Sustainable Food Trust, 2015). In the early 1980’s Pat Mooney and Cary Fowler coined the term ‘farmers’ rights’ as a counter to plant breeders rights (Esquinas, Frison, Lopez & Mooney, 2012). The 2000’s saw the emergence of concepts like peasant seeds, which are parts of a plant organ that are from plant populations managed by farmers, “selected sorted and preserved before being sown” (Dubrulle, Pimoguet & Hazard, 2019). Also introduced at this time were definitions for open-source seeds and the term
seed sovereignty. These are all concepts that revolve around seed activism. Seed activism fights against the processes of seed enclosures and loss of agrobiodiversity. Common detriments to seed sovereignty include seed and intellectual property laws, biopiracy, new genome editing technologies and corporate concentration (Esquinas, Frison, Lopez & Mooney, 2012).

Seed sovereignty and the protection of peasant, landrace and heirloom seeds allows for farmers to have control over what they plant. In being able to plant as they choose, farmers gain access to food sovereignty to be able to grow that healthy and culturally relevant food. If safe and ecologically sustainable food growing systems are not in place because of restrictions from large companies, farmers do not have choices over their own agriculture systems. Without having control over agricultural production and seeds that are allowed to be used, many people cannot reach food secure status, because they may not be able to physically or economically attain seed or food sources.

Native Seeds/SEARCH emphasizes regional Southwest food security in their mission. Without seed diversity, specifically for arid-adapted crops in Southwestern environmental conditions, and as the climate continues to change and become hotter and drier, seed sovereignty, food sovereignty and food security are all at risk. Native Seeds/SEARCH has a collection of over 2000 different seed types that can be grown in the Southwest. If these seeds are taken away by large companies or left to die because they cannot be grown out and regenerated, diversity will be lost.

Who is Using the Seeds from Native Seeds/SEARCH?

Native Seeds/SEARCH has over 2000 varieties of seeds in its collections. Some seeds are accessible to everyone who wants to purchase them, and some are Native Access, strictly for
those with Indigenous heritage. Native Seeds/SEARCH sells the non-Native Access seeds to anyone who wants to purchase them and donates them as well with the Community Seed Grants.

Native Seeds/SEARCH does not sell seeds in bulk, only doing bulk seed orders when working with Partner Farmers. Many people all over the Southwest purchase seeds from Native Seeds/SEARCH. The seeds in their collection are mostly arid-adapted and meant for the Southwest United States and Northern Mexico, meaning that they may not grow well in other areas of the country. The areas these seeds will grow well in are explained in the seed listing. Many people from Tucson and the surrounding areas come to NS/S to purchase seeds and plants and grow them in home gardens.

I asked some of the volunteers that work at NS/S what seeds they typically buy and grow. Skyler Moore likes to grow greens and enjoys going to the plant sales. Skyler mainly volunteers in the Seed Lab and enjoys learning about the seeds as they clean and pack them. Dallas Washington grows okra both as a food source and a textile.

I've taken a couple of stalks, and I meticulously stripped them, and I've come out with long strands of fiber. Then I held them up over the steam kettle in the kitchen a couple of times and got them pliable and braided them. They came out as hard as you can imagine that they would, they could hold upwards of 10 or 15 pounds.

Jessie Martin, another volunteer, loves growing arugula from NS/S. "It's really quite hardy and I just scatter some seed out in the in the backyard and it came up and just every now and then add a little water and they grew perfectly.” Jessie has also grown tepary beans, Sonoran white wheat, and corn.

Employees of Native Seeds/SEARCH also love growing seeds from the collection. Not all the favorite seeds being grown are necessarily Native or even indigenous to the Southwest. One favorite of Bodhi Johnson's is orach, a cool-season plant similar to spinach, which is from

...
Europe. The seeds can be mixed with flour for making bread, and the seeds can also be used to make a blue dye. River Williams loves growing peas and kale. They also enjoy growing corn and squash but reiterated something that many others I have interviewed have said, that corn has been difficult to grow because it has been so hot, and it has needed hand pollination. Another employee loves growing sorghum, which can reach eight feet or higher, and loves adding big sunflowers for color. A board member loves squash and melons and discussed seed saving and seeing interesting combinations come out because of cross-pollination. The squash works wonderfully in Southwestern Arizona soils, they said, and they love tepary beans, but those plants are very labor-intensive to get beans from.

Board, Employee, and Volunteer Reasons for Working for Native Seeds/SEARCH

I spoke at length to several board members about why they chose to volunteer their time and efforts to Native Seeds/SEARCH. Dr. Nabhan, an ethnobiologist, while in school, was learning about seed viability, seed germination, and seed contamination. He was interested in seed genetics and their cultural history. He was also concerned about the politics of only a few multinational corporations controlling most of the seeds in the world. Another founder told me that founding took a cue from Seed Savers Exchange's ideals – finding people to grow heirloom seeds so that their seed would be more secure and that there would be more places growing it so if one crop failed, someone else would still have a crop so that seeds didn't go extinct. Dr. Nabhan retired from the NS/S board in the early 2000’s.
Another board member Riley Thomas told me that the mission is what drew them to NS/S. They were a financial contributor for years before one of the previous chairs of the board called him and asked them to join the board. This interviewee had worked on previous nonprofit boards and felt they had skills that would be important and valuable to the mission. This board member, whom is not of Indigenous descent, was also integral in getting more Indigenous representation on the board. One of the Indigenous board members told me that Riley asked for the direction and the focus of NS/S to be from an Indigenous perspective, giving an opportunity to create an impact with tribal communities.

A board member with Indigenous ties, Emery, told me their story, saying,

I think what they do is vital; I think having this outside resource that's dedicated just to the retention and then safety and of the seeds is vital to their existence." They also discussed an issue that I will delve further into later in this chapter, which is the state of flux between Native Seeds/SEARCH and some Indigenous communities. When they were asked to be on the board, they went to some of the people that they knew that had the biggest issues with NS/S and asked what those concerns were. One of the biggest opponents was able to say to this board member though, that if this person were to join the board that they would be more accepting and trusting of NS/S because adding more Indigenous voices added credibility and more people at the organization to represent their communities and shape the direction that NS/S was going in.

Emery continued,

And he said you know we need more people that represent our communities to help shape the direction of where they're going to go. He said, because right now there's no representation and they don't even talk to us. And previously I also was one of the people that was complaining about some of the same things, so if I let that opportunity to go away then I would feel like I didn't have the right to make those complaints when I had the chance to make a change.

Another Indigenous interviewee, Alexis Chino, who works on the board told me that a colleague and friend told them about board member opportunities, and this as well,
Mainly I think it's my passion for the mission of what Native Seed/Search has done so. One thing that really stood out to me and that was really important was that they were carrying a couple of varieties of corn sweet corn and some tepary beans that were originally from my area. So, they had some seedstock of some of our traditional crops that I didn't have access to even here on the community so that's really what blew me away I was like well these guys are keeping this, making it accessible to us.

Jamie Smith, an employee of NS/S, is Indigenous and gave me some background into why they wanted to work for NS/S. Their tribe lost its land base early on, and they were never exposed to traditional agriculture through ancestry or relations. At university, they got involved with the American Indian program there, and there they were exposed to the food sovereignty movements. Working under Dr. Jane Mt. Pleasant, Jamie learned to compare European agriculture to traditional Indigenous agriculture, and from there, went on to find out information on Gary Nabhan when they moved to Tucson to do Ph.D. work on native small grains. With these contacts, they were able to visit the Hopi reservation, participate in a seed saving workshop, and keep in touch, applying for their position when it opened at NS/S.

Another employee, August Scott, with ties to the Indigenous community, spoke about being familiar with NS/S since high school, saying it is one of the major nonprofit organizations focused on the conservation of Native American crops, and discussed their impressive collection of seeds. “My passion is about trying to uplift Indigenous knowledge in conservation institutions.” They have worked in different forums doing conservation adjacent and Indigenous knowledge work, and also gardening and food sovereignty work and felt this position would be a good fit. They elaborated that a lot of their food and seed knowledge was passed down from their ancestors and relatives and felt like the position would give them the opportunity to speak for Indigenous concerns and expand their knowledge base.
Other employees gave answers about why they wanted to work for NS/S, a love of agriculture and farming, to be able to support Native food sovereignty, former members, gardeners, or retail shoppers that found out more about the organization and wanted to get involved, the importance of eating local, and arid-adapted foods in the desert and employees wanting to use their skills to help nonprofit organizations. Volunteers I interviewed who work in the seed lab or the gardens talked to me about their loves of the outdoors, gardening, using their retirement to do something fulfilling and fun, and how the seed sovereignty mission was appealing to them. One volunteer told a fun story about winning a prize from the Native Seeds/SEARCH store and going to the conservation center to pick up their prize. Jessie Martin said,

So I was picking up the basket, and they said, "Well have you ever been here before?" and they gave me a little tour because I hadn't been. And then they said, we do accept volunteers and being recently retired, I thought well gosh, this would be fun! I love to garden anyway.

Why Native Seeds/SEARCH Matters

Native Seeds/SEARCH has made an impact on thousands of people across the Southwest. I asked interlocuters why they feel that the work of Native Seeds/SEARCH matters. Gary Nabhan told me,

In the 1980’s many other people were concerned about that (seed patenting) because 180 US seed companies were bought by about five major corporations and consolidated and most of their seeds dropped. So our perception at the time, right or wrong was that the big issue was that what were called landraces, or standard varieties, or none, hybrid varieties or open pollinated varieties, data of Hispanic, African American, Anglo Swedish, Mennonite, Quaker, whatever, were being lost from access by the people who were their original caretakers because those networks had broken down in communities. And if like some of the Dakota tribal seeds, they had ever been in a seed catalog, they were disappearing from those seed catalogs because there had been this consolidation or the
beginning of the global globalization of seed supplies. And even though seeds were ruled by the Supreme Court, thanks to Luther Burbank asking the Supreme Court through his political buddies to allow him to patent the seeds in 1928 or 31, somewhere around there. We knew of no native seeds, by that I mean the Indigenous cultural property, that was being patented at that time, but we heard that it was happening in other countries. And ironically, there was not much commercial interest in or plant breeder interest in the heirloom varieties at that time. The plant breeders were much more interested that Native Seeds/SEARCH and other organizations had wild relatives of crops.

A botanist and early supporter of Native Seeds/SEARCH, Karter Wilson was able to tell me about another remarkable thing that this group was able to accomplish. There was a seed breeder that was hoping to patent mayakoba beans and a specific kind of tepary bean and Native Seeds/SEARCH was able to prove that those beans had been and continue to be grown by Indigenous communities. Because of the documentation that these scientists had of where they had obtained the seed from the Indigenous people, it was enough proof that the seed breeder did not make any changes to the seed. In order to patent, a person or company must have to show that they have made some kind of a change to the seed to make it their own. And the documentation Native Seeds/SEARCH had was helpful in showing that the seeds hadn't been changed and therefore were kept open.

Speaking with those working around the Community Seed Grants I was able to find out more about that program. Between October 1, 2019, and September 30, 2020, the organization was able to fund 137 seed grants. The total amount of seed packets sent out for this program was at 4093 for the fiscal year. I was able to ask someone working with community seed grants about which seeds are requested most often to gauge what community organizations are interested in growing that NS/S can provide. Heavily requested are root veggies, carrots, radishes, beets, and many greens like kales, lettuces, and mustards. Part of the reason for these requests is that many of these organizations are schools, so they are growing in the cool weather growing season.
I asked NS/S employee Jamie Smith about why arid-adapted crops matter, and they said,

Most of the collection is what I would say is low-input at least. So, crops that don't need a lot of water. They (the seeds) are not bred and grown with a lot of water. These are often rain adapted and rain-fed adapted crops. So, if the seed is not bred as water-conserving, then it was bred using low input as in, it's not used to a lot of fertilizer. A lot of conventional crops were bred and grown under high water conditions and high fertilizer conditions, but as the future is changing where we don't have that water and also don't have that amount of nitrogen fertilizer because it's getting more expensive. What's cool about this collection is not only are they often drought tolerant but they're also low input, so they don't need a lot of fertilizers to grow. So, I think there's a lot of resiliency within the collection, which is going to be exciting to work with and I think going to be really valuable in the future.

Another thing Native Seeds/SEARCH has been able to do is store seeds for the varying elevations of the Southwest. One Indigenous participant Alexis Chino told me how their farmland is at sea level, so even lower than Tucson’s 1200 - 2000 feet. As a result, some of the crops that grow in Tucson or at Patagonia don’t work for their land, and they’ve had to use other seeds from the collection. They have been ordering seeds from NS/S for around eight to ten years and was able to use the online platform to see which seeds would grow best in their elevation area. Other people tied to NS/S feel strongly about the organization. Keegan Miller told me,

I've definitely become more aware of injustices with food in communities. I've learned a lot about more about what grows here in the desert, and about arid adapted crops. I mean I've learned a tremendous amount; I feel like every time I come in; I'm learning something new.

Jamie Smith told me they feel NS/S has,

An appreciation for the value of the seeds and an appreciation for the cultures from where they came. I think that the employees have that they are aware of it's a beautiful collection. The seeds themselves are just physically beautiful, looking at them and then the plants that they that they produce – there’s value of what's here, and the organization really wanting to do right by it.
Internal Criticisms of Native Seeds/SEARCH

There are some internal criticisms of some of Native Seeds/SEARCH’s programs or inner workings. A person I interviewed with close ties to Native Seeds/SEARCH had things to say about how NS/S has changed over time and the organization's problems.

When Native Seeds/SEARCH started, significantly more Native people were actually involved in the program. There was a point when they were; over half the staff was Native and there was a big Native presence on the board to my understanding. I don't understand all that happened, but somewhere in the late 90s early 2000s all the Native people kind of started falling out, and you got to a point in the mid to late 2000s where there was like a Native outreach person and that was it, there were no other Native people in the staff.

This person felt like that at this time, in the 2000’s that the bigger emphasis of NS/S was to become a seed company, rather than a seed conservancy. It became more and more focused on the Patagonia farm, specifically to grow out large numbers of seeds for distribution and bring the whole process in house.

I think that was one of the biggest mistakes, I'm not necessarily fully opposed to the Patagonia farm having been bought, but we were working on a network, it used to be that you had a huge network of people growing these things and relationships that were built, then it all became about Native Seeds/SEARCH, doing everything in house and at Patagonia, and you lose the real value of that diversity there.

This person was concerned about certain Native seeds being grown at the Patagonia farm, which has a unique Southwest environment, because for example, Hopi seeds were originally grown on higher elevation Hopi mesas (5700 feet and up), and they were now being adapted to the 4000-foot elevation south of Tucson. They feel that the seeds became no longer Hopi in anything but name. This individual said they had heard that as time went on more Native people were pushed out of the organization because they had more reservations about how, where and by whom the seeds should be sown.
A universalist vision of agriculture for the whole Southwest sounds really great, but when you start to interrogate who is actually included in that whole Southwest, it becomes very clear that they're talking about the white Southwest, or in practice, if not an intent, it becomes the white Southwest, because there are no efforts to engage black or Asian or Latinx farmers in any meaningful way. And then the Native folks really are kind of a secondary objective. It becomes much more about the focus on selling seeds to an urban gardener, or a suburban home gardener elite in the Southwest who want to be have these cool Native varieties to sell to grow in their backyard.

Emery Soqui had this to say on the internal differences of opinion between the Indigenous People at Native Seeds/SEARCH:

I keep telling them that this has to be a group understanding, when we entered into this we all agreed that we probably aren't going to come out of this 100% agreeing with everything that happens, or that we come to a consensus on. There's some things that we just aren't going to agree on, but we have to decide to disagree to get the best possible outcome for the organization. I have my own feelings, but I'm not representing myself, I'm representing Native Seeds/SEARCH and so I asked them to kind of look at the mission statements and really what we're here to do, but in the end it is what is coming from their tribal background, which is appropriate for their tribal background. But there's hundreds and, you know, hundreds of tribes that are all distinct and different and we all have our own belief systems and even on repatriation. This shows like how different each culture is and each tribe has to be talked to on an individual basis because we're not all the same.

Bodhi, who is working with Conservation was frustrated with the lack of space and time to grow out accessions. “Accessions need to be grown out every ten years, and with 2000 accessions we can't do it. We can't do it and I think that's been a huge frustration to the Conservation Department.” I asked why Patagonia Farm was not being used for some of the grow outs and this employee discussed how it was expensive to operate and also at a different elevation than the Conservation garden in Tucson. There is a difference of about 2000 feet, and they told me that if you begin to grow crops out of their usual zone they can lose their desert edge, and NS/S wants to keep the integrity of the genetics and evolution. Additionally, Bodhi discussed how the weather had been and how difficult it had been to get the corn pollinated in
2020. They expressed the need for more pollinators and water, because hand-pollination is difficult and takes a lot of time.

However, one positive point on this note is that at the time of my fieldwork, additional land around the existing garden was being amended to make more garden area. While doing my fieldwork, I spent time with employees and volunteers that tilled the land, irrigated it, and amended it for planting. A considerable part of this was also trying to conquer invasive species like Bermuda grass and Sahara mustard. In December, while I was there, I was able to help construct six long beds, adding 1500 square feet into growing production that uses drip irrigation. Seven additional smaller beds were also added, including two pollinator tents. NS/S has invested a great deal of time into growing pollinator beds and pollinator-attracting plants to deal with the heat issues.

Another employee I cannot name discussed the frustration with the Seed Backup program.

As far as the purpose for why the seeds are there, my understanding is that really it's so that Native Seeds has a backup. So, it's not so much about saving the seeds for the Native Americans. Although we have offered that (the program) and it's very likely that some Native communities have taken us up on some of that. But that would be a fraction of the stuff that we've saved and sent out. But, so, again it's sort of like that spin. You know we tell people that we're holding these seeds for the Native Americans. And if there's funding for programs, kind of like that. But Native Americans so mistrust a lot of white run organizations. Of course, the idea of saving a backup can and will ultimately serve people who need those seeds. But then you get into what the program is and what kind of funding you have and what kind of outreach you can offer. You know, it seems to always get back to money.

Here I asked this person about how I had seen donation emails from NS/S asking for $33 "to get seeds to Native American farmers" and asked how they felt about this.

At this point I think that's more spin, and it's frustrating to see that. Because it's not like we're hiring a couple extra people to go out and make sure that that all the (Indigenous)
communities that we have seeds from have all the seed they need. That's not happening. And so, it seems, at best, disingenuous to say it's only going to go to the native farmers. They elaborated that while seeds may be going to Indigenous people, that there is a difference between farmers and gardeners. Small scale farmers may be able to use some of the free seed packets, but large-scale farmers would need pounds or more of seed to actually farm.

Contestation Over Native Access Seeds

There is some derision within Native Seeds/SEARCH as to which seeds should be put into Native Access and how long they should stay there. One person with a vested interest in the collection wants many Native seeds in Native Access, only for use by Indigenous people. Seeds included in this program include some ceremonial tobaccos, corn, beans, chiles, and gourds. When I was at NS/S in November 2020 through January of 2021 there were at least one hundred varieties in Native Access. As of October 2021, most of these varieties are still in Native Access. When COVID-19 began, NS/S saw a massive increase in requests for seeds, and NS/S made the decision to move some of the seeds of which they had lower volumes to Native Access to ensure that they would not deplete all of their stores, and so Indigenous people would get first access to seeds that were culturally and religiously significant to them.

One person said of Native Access that the goal of keeping seeds there is not about the fact that they are too rare or precious. They want NS/S to be on the right side of Indigenous people before they do build up the seed populations again. This person wants to make sure that NS/S is in the right with the tribes and that tribes are okay with what that process of giving out Native seed looks like.
It's not about exclusivity, it's about autonomy. Giving tribes the right to say yes or no. And for some reason, giving them the option is just immediately determined as a threat as a threat by some of the white board members, that's a problem to be accountable to tribes. A counterpoint to some seeds staying permanently in Native Access is regarding the legality of keeping seeds from some ethnicities of people. This person said the board was discussing whether or not keeping seeds in Native Access was discriminatory.

I think for tobacco, no question, right, this is ceremonial and we're getting into religious and culture. For other crops like a gourd or a squash it's a little trickier, especially if we're going to start not even navigating into spaces of a tribe that unless you're from this tribe you can’t have them. What if you're Mexican American and you're not Native Access but really you're like Chicano from Arizona, or New Mexico, who may have really long family ties here. So, can we say, “Well, no, you can't get them.”?

One person does not care for the Native Access Program. They believe that NS/S should not be restricting who gets the seeds, and personally does not like the program. They would prefer to keep the seeds as part of the larger collection and only remove them if a tribe comes to the organization with an issue. They understood the concern during COVID because of the demand draining quantities of seeds, but overall wants access for all people. They believe enacting the program long ago went along with the right intentions, but dreams of seeds are used by all people, not just restricted to particular places where the seed originated. Their personal goal is to provide seed for all unless a tribe really wants to restrict it because they are not a seed company; they are a conservation company and need people to help grow out healthy seed stocks.

Native Seeds/SEARCH and COVID-19

COVID-19 affected everyone the world over, including the people involved at Native Seeds/SEARCH. On March 20, 2020, Native Seeds/SEARCH had to shut down in-person retail
sales because of the COVID-19 pandemic. Native Seeds/SEARCH announced in 2021 that the retail store would be permanently closed. Purchases and seed requests are now made through the website and then either picked up through a drive-through area at the Distribution Center or shipped to the purchaser's address. As a result of the closure, there were some layoffs at Native Seeds/SEARCH. The topic of layoffs seemed to be very sensitive at the time for the employees still working for Native Seeds/SEARCH, so I chose not to bring up the topic with any employees I spoke with.

Additionally, workshops, on-site gardens, plant sales, volunteering opportunities, and other revenue collection ventures were shut down to prevent the virus's spread. Some employees working within the Native Seeds/SEARCH office were forced to work from home, and volunteers, who make up a significant amount of the workforce in the seed lab and gardens, could not fulfill their duties. As a result, there was not enough labor to quickly fill the many more orders that were now coming in online. Some of the employees I spoke to talked about really enjoying their positions but being very worn out from the work increase. With fewer people testing, planting, harvesting, drying, collecting and packing, all while more and more orders were coming in, the staff have run into some feelings of burnout.

COVID-19 has had adverse effects on the nonprofit, just like everyone else in the world. One of the most significant issues for NS/S was the lack of volunteers. The staff became overworked but had to continue despite the difficulties. They did not have enough people to pack seeds to meet the demand for the volume that needed to go out. August Scott told me,

So there were things like that, because it's all volunteer based so it's been hard without having the volunteer support that we had previously, we have a lot less that can get done and a lot more gets put on the shoulders of the staff, and you're already pretty over overworked. I mean, everyone kind of had to go full steam ahead and take on extra tasks
and extra work to get through that period and make sure that we are able to, especially in my opinion, I really want to emphasize that we are going to make sure we can always fulfill native required Native American Seed Requests, even when we were closed for sale for almost a month and a half, I still was making sure that we could fulfill Native requests received.

When the pandemic first hit there was a big wave of seed buying and the nonprofit was nearly overwhelmed. A NS/S employee told me,

A lot of people were fear-buying seeds, not unlike toilet paper was being fear-bought. And so we kind of had to first put holds on seed, because we've kind of fulfill all the orders and had to think about how we were going to do it sustainably, especially by reducing the number of seeds really available because it was just so, so much of it was just going out the door.

Several NS/S employees were also worried that they would run out of the Native seeds and that they wanted and needed those seeds to be put into Native Access because they worried they would deplete the stocks and Indigenous people would not be able to gain access to them.

NS/S workers have found some ways to cope with the pandemic and even some positive outcomes. One example of a positive outcome was that as more people stayed at home, they also began to garden more. Native Seeds/SEARCH saw a considerable demand for seeds, and their products came in during the pandemic. One employee told me,

For the longest time we’ve done an online sale and then an in-person sale at the store or the conservation center. We went 100% online and made more than double the amount of money that NS/S ever made, just all virtually.

Viewing the public tax documents for Native Seeds/SEARCH for 2019-2020, there does show to be an increase in revenue from product sales during this time.

One thing NS/S was able to do to cope with the pandemic was utilize social media and the internet. Articles, newsletters, and educational videos go a long way to inform and educate
people on what teaching opportunities and practices the organization offers. One board member told me they hope to continue to grow their platforms for the future.

I think for us as an organization, we know exactly where we are and why we do things, but I don't think the general public has the intimate understanding as we would, so I think more openness to sharing is something that we should focus on now during COVID-19.

The nonprofit also sent out emails and advertised on their online platform asking for assistance, news sharing, and donations to get seeds to their Indigenous farmers and partners. Some associates mused that people are starved for connection, education, and new projects, and therefore began connecting virtually. One board member argued that some of the challenges COVID-19 may be vital to keeping them on the cusp of innovation and keeping Native Seeds relevant by utilizing the platforms available today to create better and more sound practices in communities in the future.

An Indigenous staff member was able to tell me more about the educational workshops that used to be done in person.

In person events aren't going to happen but we can do them virtually and it's easier on staff and we can get more staff involvement by doing it of the Conservation Center. We can work with these tribes without having to make anyone travel to Tucson, or we want to have this many slots and open it up to tribal reps first, and then let them all sign up and then we can have a field day or as a workshop, virtually.

They went on to elaborate about their reservation saying,

That's one of the things that we've learned here, some of our posts are getting 3000 hits and traditionally, we would only be working with like a group of like 20. And then we'd be doing hands on activities with a group of 20 and they would get their impact and like we would feel like we're doing good, but even in our own community there's almost 11,000 tribal members and there's 6000 of them that live here and 20 people don't really reflect the community.

NS/S implemented mask and social distancing mandates for workers and volunteers once people could slowly come back to work. Garden volunteers stay masked while working together
outside and try to work in different areas of the gardens. There is a maximum limit of two people for the seed lab, and another seed packing has also been done outside and in the break room to spread out volunteers. After vaccinations began to be distributed, NS/S allowed small groups back to the outdoor areas of the conservation center for plant and art sales. According to regular email and social media updates that I have received since beginning my work with NS/S, it is apparent that they are continuing to see high volumes and have been requesting volunteers to come into the Seed Lab for cleaning, packing, and distribution.

Significance

This chapter on the nonprofit Native Seeds/SEARCH focuses on how the organization operates. I cover the origins of the organization, what the organization is doing today, how it is funded and what programs they are funding, including a look at the Annual Report. I explain what the NS/S community programs are, how NS/S’s mission on food security is linked to food and seed sovereignty, and who is using the NS/S programs and seeds. I use excerpts from board. Staff and volunteers on why they chose to work for this organization, and about how and why they think the organization matters. I also briefly touch on internal strife or criticisms for NS/S programs, including about the Native Access program. I finally touch on how COVID-19 has impacted the organization.

The significance of this chapter is that, like the seed collection, the organization is full of living, growing beings that work together, sometimes in conjunction and sometimes at odds, to create a unique ecosystem in the desert. There are acknowledgments of the accomplishments of the organization and differences of opinion on how to move forward. Not everyone has the same
opinion of how the organization has changed over the last 30+ years; some see mistakes being made and a need for more Indigenous input and programs specifically for Indigenous people. Others feel specific programs like Native Access restrict their ability to grow seeds all over the Southwest.
CHAPTER 3: INDIGENOUS PERSPECTIVES

Southwestern Indigenous Communities in the Present

Today, many Indigenous reservations rely on agriculture, livestock, timber, and tourism for their livelihoods. Across the Southwest, varying climate areas, topography, and geographical differences determine what can be used for their economies. Elevation, landscape features, monsoon seasons, seasonal temperatures, and soil types all determine what grows across a region. As a result, farming and gardening areas may grow different varieties of seeds more or less successfully than others. Newer farming practices like using fertilizer or excess water on seeds that were grown and adapted a specific way over a long period can also change the makeup of the seeds. Many Indigenous communities and Native Seeds/SEARCH have tried to commit themselves to growing native seeds in the conditions they were initially meant for. There are several examples I will give more context to later in this chapter on why it is important to Indigenous people and Native Seeds/SEARCH to grow seeds in specific conditions.

Southwestern Indigenous Farmers Today

According to the Guide to Arizona Agriculture released by the governor of Arizona Douglas Ducey and Director of the Arizona Department of Agriculture Mark Killian, the main crop industries today in Arizona are citrus and cotton (AZDA, 2020). According to the 2012 USDA National Agriculture Statistics Service's census, Indigenous farmers and ranchers make up about 57% of the agricultural operations in the state. In 2012 there were 18,475 Indigenous farmers and ranchers, operating on over 20.6 million acres and producing $86.7 million in direct
agricultural sales. Ranching lands are used for beef cattle, sheep, goats, fish, and other animal products. While citrus and cotton are the main agricultural crops, alfalfa, hay, corn, wheat, potatoes, and olives are also grown by large-scale farmers. Smaller-scale farms have an even more diverse variety of crops, including those I listed as Southwestern crops.

Irrigation has always been essential for farming in the Gila River Indian and Salt River Pima-Maricopa Indian communities. Much of the livelihood of the Indigenous people of this area pre-and-post colonization has revolved around irrigation and agriculture. (Gila River Indian Community, 2021). Gila River Farms is a well-known Indigenous farm project run on the Gila River Pima-Maricopa Indian Community. People changed their traditional garden plots into Gila River Farms, which operates on at least 10,000 acres just Southwest of Arizona's Phoenix/Scottsdale area. The farm grows alfalfa, cotton, wheat, orchards, and olive trees. Most acreage is devoted to alfalfa, which is used nationally for grazing animals. The farm has also produced barley, sorghum, and citrus (Gila River Farms Sales, 2019).

Tohono O'odham Nation peoples have traditionally focused on dry farming, cultivating crops without irrigation. Members of the Tohono O'odham Nation run San Xavier Food Co-op. Its goal is to nurture traditional desert cultivars. The mission stated by San Xavier Co-Op Farms is "committed to healthy farming practices and growing traditional crops to support the cultural and environmental values, as well as support economic development within the (Tohono O'odham) community" (San Xavier Co-Op Farm, 2021). The farm follows the Tohono O'odham Himdag, or Way of Life, to follow farm rehabilitation programs consistent with their Indigenous culture. Mission objectives include respecting the land, the sacredness of water, respecting elders, respecting animals, and respecting plants. Crops grown by San Xavier Co-Op include
alfalfa, watergrass, hay, white Sonoran wheat, mesquite, O'odham peas, white tepary beans, and cholla buds.

The Navajo Nation is located in several states, including Arizona and New Mexico. Navajo farmers traditionally grew corn, beans, and squash, and these food are still culturally and agriculturally significant to them today. Many Navajo have practiced dry farming techniques, but irrigation was also used along Chaco, Cottonwood, and the Pinabete Washes. Dry farming and irrigation farming techniques are both used today. The Navajo Nation runs the Navajo Agricultural Products Industry (NAPI), which was established in 1970. This organization operated the Navajo Indian Irrigation Project and 72,000 acres of irrigated farmland. “NAPI grows alfalfa, some grains, corn, potatoes and beans, all packaged under the Navajo Pride brand” (Caruthers, 2016).

In New Mexico, some organizations focus on Native American farming. The 2017 Ag Census by the USDA shows that Native Americans make up 24 percent of New Mexico's farms and ranches. Commonly grown crops include native corn and chile peppers (Bustillos, 2021). The Traditional Native American Farmers Association is located in Santa Fe, NM, and seeks to reverse the decline in Indigenous farming and increase economic opportunities for Native farmers (Lannan Foundation, 2021). In addition to Navajo Agricultural Products Industry, the New Mexico Department of Agriculture (NMDA) has also worked to find new markets for products from the Santa Ana Pueblo and the Ute Mountain Reservation. The NMDA works with other Indigenous people in New Mexico, but I did not interview people from these communities regarding Native Seeds/SEARCH.
Zuni and Hopi farmers also tend to specialize in dry farming. Eastern Pueblo farmers tend to use irrigation methods for their farming practices. According to a recent census, there are around 350 Hopi farms on the Hopi reservation, the average number of small farms being between one and nine acres. Michael Kotutwa, who was interviewed for Tribal Business Journal is quoted as saying,

If the fallowed fields continue to increase, what’s going to happen is we’ll run out of seeds to plant. Hopi farmers had 21 different corn varieties less than a century ago. It’s been a slow cultural erosion, but we’ve now dwindled down to three seed lots because we’re not farming that much anymore. (Allen, 2020).

Arizona agriculture employs over 138,000 people in Arizona, yet there are still communities that deal with issues of food access. Many of these communities are on reservation lands. The Arizona Department of Agriculture (AZDA) has been working to reduce food insecurity, obesity and diabetes while working in conjunction with the Arizona Department of Health Services (DHS) and the Arizona Department of Economic Security (DES). According to the results of a 2017 Action Plan, 1 in 6 Arizonans are affected by food insecurity and 500,000 Arizonans are likely to deal with a diet-related illness by 2030 (AZ Gov, 2021).

According to the Arizona Department of Health, there are many areas in the state that are food deserts. Below is a map of the reservations of Arizona, and underneath that is a Geographic Information System (GIS) Application of susceptible food desert areas. The interactive version of this map can be found at https://azdhs.gov/gis/az-food-deserts/index.php. Reservations areas that have large swaths in red, or as Low Income (LI) and Low Access (LA) at 1 and 10 miles include the Tohono O’odham Nation Reservation, the Pascua Pueblo Yaqui Reservation, the San Carlos Reservation, the Fort Apache Reservation, the Colorado River Indian Reservation, the Fort Quechuan Reservation, the Fort Mohave Reservation, the Hualapai Indian Reservation, the
Havasupai Indian Reservation, the Navajo Nation Reservation, parts of the Hopi Reservation, the Kabib Paiute Indian Reservation, and likely more. Below are Figures 2 and 3, which show a map of the Native Peoples of Arizona: A Comprehensive Map of Arizona Indian Reservations and also a map of grocery stores, farmers markets and food access points in Arizona.

Seed Loss

Seed loss is at the heart of the mission for Native Seeds/SEARCH and many Indigenous farming communities. Returning seeds to their original places of origin and to the people that traditionally cultivated them is the most common theme among all those that I interviewed. Seed loss can come from forced assimilation, forced relocation, armed conflict, the death of elders and traditional seed keepers and knowledge holders, and land loss. Jamie Smith, affiliated with NS/S, told me about how their tribe lost its land base early on, so they were never exposed to traditional agriculture. Land loss can occur in a variety of ways, including the loss of federal recognition. Jamie Smith began learning about traditional Indigenous agriculture once they moved into higher education and did not get the chance to grow traditional foods until they started that work.
Figure 2: Native Peoples of Arizona.
Emery Soqui told me about how much they lost from the 1930s on, saying their reservation had maybe 10 or 20 percent of the foods they once grew in their Arizona fields.

It’s a great loss of the foods we once grew. If you look at any culture that’s focused on agriculture, it is the whole reason that we were allowed to exist in one place for all those years. It (agriculture) is the bedrock of who we are. So, if you look at 80 percent of our seeds being lost, we’ve lost 80 percent of those cultural practices.

Many ceremonial and spiritual practices that their communities use came from practices in agricultural fields, so when those agricultural practices cease, the cultural practices cease and can be lost permanently. Multiple Indigenous participants spoke similarly on seed loss, saying that each seed has a story, and if those stories are lost, the culture can be lost.
Emery Soqui told me that there are sixteen varieties of tepary beans indigenous to Arizona and that growing up, they only knew about two of the varieties. They have been able to help growers on their reservation grow out up to thirteen varieties at one time, which they consider exciting and a huge success. However, there has also been conflict when bringing back seeds that were once lost to their culture. Emery told me the following story about an exchange over a pure black strain of tepary beans.

We were able to be gifted a pure black strain of tepary beans from our neighboring sister tribe that had grown them out and every year, and through those successive grows, they got a pure black strain from a white tepary bean being grown out. So originally they had a white grow out and every once in a while you'll see a little black bean in there and so they isolated those beans and they grew them out. So what they did is they isolated them and they got a pure strain. We're really excited we grew a bunch of them out, and one of the things that we would always do is we would give them to the elders and we have a little dinner for them, and then we would give them produce and stuff like that from our first yields. I was so excited to see like to just show off these black tepary beans that we brought back, and this elder she stopped me and she said “what are these?” So I told her. She said, “well why are you growing them?” I said, “Well, because they were once here in the community, and there was a whole bunch of other tepary beans that once grew here and so we were able to bring these back.” And then I walked off and they were talking at their little table there and I noticed they weren't eating them. So, I asked “well, what's going on?” and I said “did you did you not like the taste because they do taste a little different.” She said, “No, but I really wanted to tell you that you should be ashamed of yourself.” And I was like, “Whoa, why?” And she said “I'm 87 years old and I've never seen these beans or have eaten them. So you're changing our culture, and you're lying to the people.” And so after that now the elders wouldn’t eat them. She was one of the older ladies that was there, and it was a really sad moment for me because it shows that you can be so far removed for something that always belonged to you and we always had a relationship with the people, that even when you bring it back we're no longer willing to accept it. Well, they went out of our food systems, either as an early child or right before she was born, and so she would have never remembered any of those. And all it took was that one person's voice to say that they didn't belong here. And then none of the elders would support it into that and so it was, it was kind of a really big eye-opening thing.

Indigeneity means many things and can’t necessarily be separated from colonizer assimilation or the erasure of Indigenous history and culture. Here is an example of that erasure, where the black tepary bean was not used by these elders but had history within the overall culture and across
Southwestern Indigenous peoples. The bean is now both local and foreign, depending on what information people are able to access. According to Linger, “people are also conscious agents who are continually reworking personal meanings, and sometimes culture itself” (1994). The meanings behind the pure black strain of tepary beans arise from communicative events between the people that discuss them and use them in this particular Indigenous culture.

Morgan Kaya of Hopi spoke to me also about how the embracing of Western culture in the community has put many Hopi traditions on the back burner. Some are no longer doing things that the ancestors would do, like picking wild greens and growing corn, so those processes and teachings are slowly being lost. Kaya believes that if the people don’t get back to farming Native seeds and revitalizing the language, that the community won’t last into the future. Kaya says,

Farming is also, a way of maintaining our connection to our mother. We began to get away from that, we haven't been maintaining our connection. And so now as a result you know our mother is telling us, you know, you need to take care of me, you need to continue to put your seed, you need to continue to put to grow to, to put your seed into the ground to nourish me so I can nourish you and sustain you.

Ellis Wyaco talked about one of the losses of traditional practices and knowledge at the Zuni Pueblo. When a researcher from the east coast came to work at the Zuni pueblo, they wanted to learn about Zuni agriculture. Wyaco traveled with the researcher to elders' homes, translating Zuni to English, as they asked questions about traditional seeds and farming practices. It took a while for the researcher to gain the trust of the elders, but when they did, they were able to get recordings from them about agriculture and traditional methods.

These were all recorded, and at the end of the three years we had interviewed maybe 12 individuals. And before that, the guys that that had been running the program, they had already done a ton of interviews and there was a box with I don't know how many tapes, I want to say over 50 to 60 tape recordings, and at the end before the researcher left Zuni
that box went missing. So, I don't know where that box is to this date. And those interviews that I did, were part of that box and so I can only try to recall what exactly was said. I did take notes and so I have some highlighted notes of some of those elders and what they had said. But I want to say, 90 plus percent of those elders have since passed and so I don't think we're ever going to get back those tapes and the researcher left, maybe around 2009 or 2010, So it's been since then that we have no idea where those tapes are.

Another Zuni story about seed loss came not from losing traditional knowledge but from human miscommunication. Wyaco told me about a rare chili seed grown at Zuni and how the seeds were taken.

Usually my office is open. I don't know what happened but somebody had gone in and taken the whole jar pickle jar of the chili seeds that we had that we had in there. We haven't been able to get that chili back at all. We have zero seeds and that was kind of our, our bread winner, we were gonna send that off to Native Seed/SEARCH and ask them to grow that out and put that in their catalog as a heirloom variety because it's been identified by several elders, and not just any elders, these are kind of the top notch last master gardeners and they've all identified it and they've described the chili before we even got a chance to grow it fully. Just by the color and the leaves and the flower. That was a big disappointment.

Indigenous Understandings of Rematriation

I asked several Indigenous interviewees what the idea of rematriation meant to them. The responses were varied, showing that there is no one exact Indigenous perspective of rematriation. Alexis Chino told me that rematriation focuses on reconnecting tribal communities with seeds that were once lost.

Emery Soqui also used the word repatriation to discuss the movement and said,

I would like to have a looser form of repatriation if we could, because I think we could serve more people. I think by having these really stringent guidelines of a tribe that wants that collection back, I think that seeds can be at risk. That connection, the connection that maybe 50 other tribes may have gained through, receiving services from Native Seeds/SEARCH will be lost before it even will have the opportunity to ever be experienced.
They also said, “As a board member of Native Seeds/SEARCH, for repatriation and how we fit in, it is as an organization dedicated to the preservation of these seeds, and how we can better facilitate tribes’ needs.” They continued that facilitating tribal needs was the original intent of the founding of Native Seeds/SEARCH and they hoped that the organization would always going to be in the best interest of the seeds and in the best interests of future generations of farmers.

Morgan Kaya told me that they had friends who believed that rematriation meant strictly the seeds going back into the hands of the original farmers. Kaya was conflicted about rematriation believing that seeds should come home to Hopi. Nevertheless, Kaya also said, "We ourselves can have this conversation about repatriation but we have to make that commitment to grow the seeds out full time. Then not have them sit in a seed bank." They went on to say that they can't get the seeds back from various seed banks and not grow them out and let the seeds sit and die.

What is Seed Sovereignty?

I tried to ask everyone I spoke to what they believed is seed sovereignty. I also asked Indigenous people how they feel about the non-Indigenous people using Native seeds. Emery Soqui, told me that they were conflicted.

I'm trying to chair the committee that's creating our seed policy right now and what food sovereignty looks like. For me, if you are growing our crops, wherever you’re from, doesn't diminish my ability and my connection and my cultural connection to the seeds that I'm growing here. Soqui acknowledged that not everyone would agree with him on his perspective, even those affiliated with Native Seeds/SEARCH.

To me, that doesn't mean that everybody else has to be without those seeds, like it doesn't do us any good to say “Oh this is only mine. A lot of people that are big
advocates for like returning seeds wholeheartedly are highly educated and that's cool. But I also see this kind of coming together of a traditional knowledge that's been changed as traditional understanding or viewpoints that are being changed and aren't really traditional at all. Their viewpoints that are based on their higher education and their understanding of the historical events that have occurred in the past to get us (Indigenous people) to where we're at. A lot of them are based on hurt and pain and things that have happened to us and our people.

Soqui told me that traditionally Indigenous people were known as a giving people, that helped others. They gave me the example of the creation of corn. Corn has a story of when it came to the people in the form of a man on the road. Corn existed in this community and spent time in this community and then gifted itself to the people. After this, the corn man went on, and the corn remained here on earth. Corn was a gift to the people and did not specify which people it specifically belonged to. Corn was not something that people grew, but that they have created a relationship with. Emery Soqui discussed how many tribes had similar seeds or descriptions of seeds that were similar to theirs. They say that if they give all seeds back to one tribe, the others suffer, even though they have the same vested value and interest in growing them. An example Soqui gives is of Navajo Blue Corn, and Navajo wheat. Trying to talk to the Navajo to decide if they should be the only ones to have these seeds is difficult because there are over a million Navajo in the tribe, so who makes the decisions for the entirety of the people? Only a fraction of the Navajo can be represented; not all Navajo people will have the same opinion on rematriation or sovereignty. Soqui was quick to say that though they believed that seeds were to be shared with all people, they are wary of seed manipulation and profit grow-outs like with large GMO companies.

Another Indigenous tribal member that is not on the board of Native Seeds/SEARCH told me that they have been to several food sovereignty conferences, and there are things that tribes
can do to protect food sovereignty. Willie Toadachine told me that there were many things that tribes could do to protect their sovereignty and traditional foodways, though some of them included having to go to court to protect their hunting, fishing, and gathering rights.

Indigenous NS/S Participants

Emery Soqui uses seeds from NS/S in their community. They focus on working with other entities and creating gardens, doing projects and presentations with the youth. Several services such as the Youth Services building, the recreation center, the Juvenile Detention Center, and the local high schools all have gardens.

We basically planted those seeds and then gave the staff there the knowledge and the ability to do it themselves and then we let them just kind of flourish and we provide the assistance when they have troubles. And because of that, because they took the ownership, their leadership, actually created funding for those programs and positions and so they're sustainable now. And so it's something that we don't have to really monitor on a daily but we check in with them. And so now for the past 16 years there have been kids that have had these garden components in their education. And now these kids are old enough where they're going to counsel and they're asking why can't we grow these foods here? Why don't we have access to stuff? There's all these teachers and lessons talking about these traditional foods that are returned and what they will do for obesity, diabetes, and heart disease – better than any kind of workout program, but we can’t buy them anywhere. And now, almost every component that works with youth has some kind of gardening curriculum within it here in the community.

Soqui says that they sometimes think they forget the impact they actually are having on individual tribal members and the community, and that these interactions are special and push the work forward. Soqui also says that chiltipens (a spicy chile indigenous to the desert) are grown in every garden and that everyone who comes to the garden has to eat one before starting.

Emery Soqui told me about the seeds being grown on their reservation. Many Native seeds like tepary beans, 60-day corn, and squash varieties can handle alkali soil and the lack of high amounts of nutrients in the soil. Also, they can handle the heat of Arizona, and so they
encourage people on the reservation to grow things that grew there for hundreds if not thousands of years. These crops will grow better, and the people will not have to struggle to keep them going. Some varieties of tepary beans can grow in two months, so the people can plant multiple crops within the same amount of time they may have planted something like the common bean. With the 60-day corn, people can have multiple crops in the same season. They can start growing on March 15 and grow multiple crops until the middle of August. Another important crop that is not Indigenous but brought by the Spanish is wheat. Soqui says, “They gave us a winter crop that we never had in the past, I think that it became a predominant food source because you can grow such a large volume of it at one time.”

After hearing about them from someone else on the reservation, Hopi consultant Morgan Kaya told me how they got introduced to Native Seeds/SEARCH.

I finally went to their website and went through and saw the listing of all the seeds they had and I figured that you know what I want to stick to growing our traditional our native seeds, from here (NS/S). I finally decided to sign up for the free membership and get the free seed packets, and then just go from there and just continue to just grow out, and you know if anybody here in the village wants some I would have a lot of seed readily available. So in that sense it was really just, thinking about how do we here in the village, when we create our own seed bank you know because a lot of the folks here want to, you know, grow a lot of the traditional seeds, but just don't have access to them. And so they're bringing other you know, similar varieties in and growing them out but, which I see no problem with doing it but you know I would kind of wish that they would go and have it separate from their own native seed types that they're growing now. A lot of our own traditional seeds are back in the hands of the farmers, and we try to weed out a lot of the non-Hopi variety seeds that some of the farmers are growing. We treat the seed in the same manner as a traditional variety, but we don’t have the same connection. We need to reconnect ourselves with our traditional seeds so that our bond and our strength when we go through our ceremonial obligations with our seeds are much more connected to our original seed, rather than an outside seed that we don't really know where it came from. It's just a matter of trying to teach the farmers here about keeping those non-native seeds away from the traditional varieties and keeping them pure.
Indigenous Perspectives on COVID-19 and Agriculture

As of December 2020, when I spoke to my interlocutors, COVID-19 numbers were still rising. COVID-19 hit Indigenous reservations and communities very hard. The people that have had COVID-19 and survived have often had reoccurring health issues, and many that did not survive were elders and traditional knowledge holders in the community.

Infrastructure issues have led to many problems facing the current Covid-19 pandemic. Covid-19 has also detrimentally affected Indigenous culture and ways of life. Hopi consultant Morgan Kaya told me,

It's impacting our ceremony and our social life...I've heard that COVID-19 mutated from an animal somewhere; it's really a dire warning from our mother to heed all the warnings, and to go back to that simple way of life of taking care of our mother, growing your own food, etc...We get our nourishment from her, and if we continue to care for her she'll continue to take care of us and provide us with the nourishment and medicine that is needed to combat disease.

Morgan later went on to say,

The other thing COVID-19 is really doing is testing our mental health, we need the will to live and to fight the best we can. I've heard in stories in oral history that were passed down that there is this thing that is going to come and test us as a people, and I believe that is what this is.

A Zuni tribal member Ellis Wyaco later said,

We’ve lost a lot of community members and a lot of them were religious leaders that were our elders and had a lot of the traditional knowledge, with that taken that is a big chunk of knowledge we will never get back.

Salt River member Emery Soqui told me,

Our numbers went from 40 people with COVID-19 to 120 right now. We’ve had over 30 deaths, I believe, it’s a scary time.” He went on to say, “A lot of people here have pre-existing conditions, like obesity, heart disease, and diabetes, but I know healthier people that have gotten really sick too.

Zuni research participant Rowen Panteah gave me this information on COVID,
With COVID, we didn’t really know how distribute seeds and promote healthy living, people couldn’t just come in anymore and ask. It’s also slowed down our religious events, the first was our Summer Solstice which sparked an outbreak, that’s when our first wave happened, these events include a lot of people and religious deities. We couldn’t have our Winter Solstice the way we usually do, and that sparked another one, though not as bad. It’s hard in some of our villages because everything is so tight (close together), whereas other villages are more spread out.

As I wrote this section of my thesis, Spring Equinox was occurring, and I’ve emailed some of my consultants about their plans for it. The consensus is while COVID is slowing, everyone remains vigilant, and many events have been put on hold or are being done online. This effects the people that do not have reliable internet access or have to search for hotspots. The people I spoke to over Zoom frequently had issues with lag time, freezing and cutting out during the calls. One of the people I spoke to even needed to go to their car away from home in order to do the internet interview. Additionally, some services may not be available after the pandemic ends. The WIFI access and at home learning tools such as I Pads may not continue once the pandemic is over. Morgan Kaya told me, ‘Whenever this situation dies down or disappears, a lot of household are going to lose access to those things…the only problem is just accessibility, after COVID when people no longer have WIFI devices.’

Another service that might disappear is relief efforts for food, water, and other virus preventing measures. I asked Morgan Kaya about what healthy food and grocery options they currently have at Hopi Pueblo, and they have told me that there have been many relief services, including bringing in more fresh produce. Morgan said,

We still get a lot of canned goods sent in, not as much produce as we would like, so people have really started to talk about food security, getting healthy foods that are nutritious and good for the immune system, which is why we’re seeing a spike in gardening.
Morgan went on to say that they believe that in order to prevent viruses and negative health effects in the future, the Hopi people need to get back to reestablishing their connection to their mother (Earth), for if they care for her, she will care for them.

**Positives of COVID-19**

Ellis Wyaco told me that they believed that COVID-19 forced people to do something else, like plant a garden.

It gave people a chance to say okay, we're no longer working, we're stuck at home, we're stuck on the reservation because they had closed it down. They shut down the reservation and we were given curfew. So, people were kind of forced to do agriculture, because they had time.

Wyaco told me how people on the reservation began sharing posts on social media like Facebook, talking about what they were planting and asking for feedback and advice. They said it gave people the opportunity to get back to their roots and tap into gardening as families.

And I was able to go outside and work on our garden and find the passion for it again. Because I love it, but when like I said when I do it for a living, it's not as fun and I'm not as passionate. So, I lost that passion for it and I think during this times by staying home my whole family got involved and that was the neat part. It brought out our traditional roots in a lot of people and that was a good thing to see. I think that's what I'm taking away as far as agriculture, agriculture part of COVID-19 and all the stuff that's happening here is that the good part is that we were able to tap back into our through who we were.

Morgan Kaya told me that COVID-19 has impacted their ceremony and social life and gotten people to think about food security. The Hopi are known for being good farmers but now have been heavily reliant on grocery stores. Ceremony requires corn that has been grown by the Hopi, so it's been a conversation for many years that they need to get back to that.

We can't have anything ceremonial or even social, a lot of our social obligations require corn. And so I think now finally, you know unfortunately had to take something like this for people to finally realize we can no longer neglect farming.
Kaya told me that the ceremonies do not make sense if the people are not putting the corn seed into the ground. The people need to perpetuate prayers and the complex cycles that relate to ceremonies and food. Kaya hopes this (COVID-19) was the wake-up call for their village. "I want to see us going back to the fields, going back to the gardens. Reestablishing our connection here, back to our farming cycle. What it comes down to is honoring that covenant between a deity and people.”

August Scott talked about being Indigenous and affiliated professionally with NS/S. COVID-19 emphasized the need to be accountable to Indigenous people, they said.

When a structure is strained and recognize that one of the biggest problems here to these seeds is that we have broken these relationships (with Indigenous tribes), and here we have the opportunity to slow down. We can try and rebuild those relationships and get us back on a better track, rather than the status quo. So COVID sort of opened that opportunity. In that moment, though it was something I already wanted us to work towards, but it maybe sped that up. And so that we can have those conversations with more folks again.

Indigenous Perspectives on Native Seeds/SEARCH, and its Programs

Emery Soqui thinks Native Access is essential to keep enough seed in stock for Indigenous peoples but does not believe that some of the seeds need to remain in Native Access once there is enough to be distributed to the larger community of the Southwest. They also do not think that public domain seeds need to be given back to specific tribes for only their use.

I would hate where we make this change because it sounds good and it looks good but it's actually a great disservice. In the future, like giving up all these seeds can ultimately be like a big problem and I'll say this about giving back seeds too: The whole reason I like Native Seeds is just because they're an entity, or an organization that is dedicated to the protection of the seeds and to the wellbeing of the seeds and the perpetuation of the seeds well into the future. And they've never denied tribal entities from getting the seed back and growing them, but I look at it as a safeguard in our community. I found out that there were three or four other programs just like mine that happened since the 30s to now (on my reservation). At one time in the 70s apparently they grew 10 acres of tepary beans
they had thousands of pounds of beans. But no one knows what happened to those, there's no there was no tribal seedbank. And our (tribal) leadership is similar to all these other (tribal) nations, we have elections and so people come and go. And so, the direction of one office might be different than the next. They may pull funding from these projects and there's been a whole bunch of projects that have just ended, because of lack of funding and interest in the leadership. And then they'll see it (the seeds) get stored somewhere then they get lost or they get taken and then that's the end of them. That's how we've lost a bunch of the seeds. So to give them back to just one community is scary.

Soqui also says that even though NS/S could give seeds to all tribal governments, it doesn’t mean that future generations will run the seed programs the same way. They mention that their children are not interested in the same career path that they have taken, and that it’s possible to lose many seeds even in one generation. Soqui advocates for creating seed banks within tribal communities and having backups at NS/S, and for allowing NS/S to do more outreach and education within those communities.

Morgan Kaya is conflicted about NS/S holding Hopi seeds and about the Partner Farmer program.

I believe that once the seed returns into the hands of the people who it belongs to it should stay there. I kind of felt a little awkward (about the Partner Farmer Program) knowing that I'm going to have to give some back. I wanted it to stay here I didn't want it to go back.

Kaya went on to say that though they felt this way, they understood the need to continue to grow out seeds during this time. Kaya says that the seeds need to be grown, and that as long as people are dedicated to preserving and growing them, that they are willing to work with them.

We (Hopi people) need to reestablish and make that commitment to continue to grow those seeds in order for us to reclaim. A lot of these seeds that are sitting in seed banks, we have to make that commitment to weed out a lot of these non-indigenous seeds (on our lands) and make room and to bring these (Hopi) seeds back, and rapidly inherit it back into our hands and into our homes, I think that's the only way that we really can truly commit to that.
Indigenous Criticisms of Native Seeds/SEARCH

Emery Soqui told me that they had some Indigenous friends, colleagues and community members that were doubtful of Native Seeds/SEARCH. Some Indigenous people feel like there is not enough Indigenous representation at NS/S or have not always listened to tribes' concerns. Soqui told me that some of these people will no longer use NS/S or have used NS/S for Native seeds and will not participate in NS/S programs like the Partner Farmer or Partner Gardener Programs. Soqui themselves was uncertain if they wanted to work on the board of Native Seeds/SEARCH because of some of their friends' concerns, but that the friends told Emery that they may trust the organization more if Emery was there working for Indigenous rights and representation. Soqui says that NS/S needs more outreach for tribal communities and that is something that it had in the past and hadn't been focused on in the last decade or so.

Much of the curriculum and outreach has been happening at the Conservation Center or in the Tucson area, but they (NS/S) never really addressed tribal communities for about 20 years. I saw their outreach and informational booths when I was young, but not as I got older. They didn’t do a lot of hands on work, or like this is how we can help you with your seed saving practices. This is how we can help you set up a sound seed bank, this is what you need.

One Indigenous person that I chose not to name to protect them had strong opinions on how NS/S handles its relationships with Indigenous people. They believe that the seeds belong to the individual tribes, and that NS/S is selling some seeds without consent.

You can't come to the table and try and heal broken relationships if you're still, you know, doing something that people find harmful. Some people on the NS/S board would argue that they got agreements from Indigenous folks but there's no paperwork, there's no real formal documentation of most of this. Some of its it's pretty formally documented that it was not consensually taken, it was like at a market and someone bought seeds, but they never asked if like hey can I grow this? There's a difference between just buying seed in a market and getting permission to commodify an Indigenous variety of seed.
This individual took issue with how the seeds were marketed as well, saying that NS/S uses tribal titles for the names of seeds. One example was using the name Hopi on seeds that had not been grown on the Hopi lands for decades and with very little input from Hopi people. They argue that the seed has become something else at that point, that the corn may have changed a lot.

If they (NS/S) really want to be preserving Hopi corn it needs to be done there at Hopi, or primarily there not down in Tucson.” The worry that many Native seeds are being bought by curious white “backyard gardeners in the foothills of Tucson” who are not really committed to growing and saving seeds or trying to build a relationship with the tribes. “They (some non-Indigenous people) want the Indian jewelry or something like that, they want the esteem, the aesthetic of the jewelry and the name of the tribe on it, but they don't really want to hang out with tribal people and follow or be accountable to them.

Indigenous Opinions on Improvements Native Seeds/SEARCH Can Make

A common theme with the Indigenous people I spoke to about improvements that Native Seeds/SEARCH can make is to have more indigenous representation on the board and in positions where decisions are being made. Indigenous interviewees have told me that they want more connection with NS/S and that their communities used to have relationships with the organization, but this is not as common anymore. Terry Anghill said to me, "The organization is called Native Seed/Search and sometimes there were only one or two Native Americans on that board. And there was very limited people of color on staff.”

Emery Soqui wants better consultation and better interactions with tribes for the future. Soqui went on to say that consultation did not necessarily mean determination, but that consultation guides determinations or decisions. One tribal entity may have different opinions that another, even in the same community. Soqui wants to use those conversations to make a
well-balanced, well-rounded determination on what the future of the seeds in the collection is going to look like. Soqui says,

One of the things that I've heard all the time (from Indigenous people) is, “well it's a bunch of white people that are from the east coast, making millions of dollars off of our seeds”. In actuality, we don't make any money on the seeds, I even wonder if we make enough money to cover the shipping and the processing and the packaging of those seeds. Most farms make their money on cash crops, and we don't depend on the sale of our seeds to operate and a lot of our funding comes from donors and things like small grants. I think that's one of the things that I'm trying to change is not to say this is an only Native-owned or run business, but to have that inclusion so there's a well-rounded reflection of all vested parties on tribes and tribal partnerships so that we can make better determinations on what we're trying to do and we have a say at the table.

Soqui wants to rebuild relationships so that there is less misinformation, and more transparency. When I interviewed Soqui they hoped for a well-qualified Executive Director that also hit the ground running. There was a search in progress for an Executive Director, which has since been filled as of 2021.

Morgan Kaya told me that there can't just be implicit trust, that all people, including Native Seeds/SEARCH, need to be kept accountable for their actions regarding tribes. Kaya wants to see Native Seeds/SEARCH go into tribal relationships with good intentions and to stick to making those relationships lasting and meaningful. Kaya also said they wanted to see Native Seeds/SEARCH come out more to show the farmers the Native seeds they can use.

It would be nice for them (NS/S) to come out and show a lot of the farmers different growing techniques, because we're just so used to the farm and tractor. To offer other different kinds of methods that farmers can use to help grow more crops, to retain water, or mulching methods and so forth. That could be very beneficial to us, especially living in an environment that is very dry and doesn't get too much rain. I think they have a lot of experience growing in the Sonoran Desert down there so I would think that’s something that they could consider offering some of the farmers who are who are wanting to get some of these seeds. Just provide them or show them that there's a different alternative other than the traditional growing method to produce healthier, more nutritious seed.
Rowen Panteah of the Zuni Pueblo talked about how other Zuni community members introduced them to the lasagna beds for their youth program and how that had been beneficial. They also want to see NS/S come out to the pueblo more once COVID-19 allows for it.

"Learning new methods for putting nutrients into the soil, and other creative solutions. As there is less and less rain, we need options for dealing with drought." Panteah wants outreach to the youth to see whom they can get interested in growing seeds.

Should Non-Native Nonprofits Work with Native Seeds?

Emery Soqui works with NS/S and has thoughts on the direction the nonprofit could head in the future.

One of the things that I think is much more vital right now is to empower tribes, with the ability to do these things (like seed save) on their own, not necessarily get rid of one basket for another, but create a whole other basket, multiple baskets, so that if any one of those are faltering we can all support each other. This one (NS/S) is this fall back that's outside of any kind of government, politics, and that's a lot of what controls tribes ability to do things is the politics and in the interests at the time. If you were to give seeds back to a family or a group of families then they control that, although that seed has a relationship with thousands of tribal members of that community. It's not an easy dilemma to address but I've seen firsthand our community’s experience the loss of seed because it wasn't given back or it wasn't shared. And right now, that's what we're trying to do is bring some of those seeds back without emptying Native Seeds/SEARCH. We're going to lose seed inevitably if we rematriate it all.

Morgan Kaya also feels conflicted about non-Indigenous nonprofits working with Native seed.

Last year when I got these seeds (from NS/S) I was happy that they were back. But at the same time I was kind of a little bit leery about who handled these seeds. How are they taken care of and were they treated the way that we would treat our seeds when they're brought home? There's a certain way that these seeds are kept, they're cared for, the women only take care of the seeds and so forth and so that was kind of the thing in the back of my mind, are some of these things considered (by NS/S), On top of that the other aspect is the ceremonial part. The ceremonial and all this other stuff that goes into it, not
just putting the seed in the ground. How are they cared for in that specific way that we care for those kind of plants like the saying is, you're just planting a seed in the ground but you're actually growing a child or taking care of them. Were they being sung to, are they being talked to?

Kaya says there are concerns, but they are happy to have the seeds back. Kaya says it is great that they now have some of these seeds available for ceremony when they are needed. Kaya thinks that the seeds are happy to be back in the hands of the Hopi, where they belong. They think that the seeds know they have come home and that they’re going into the hands of the women to be cared for.

Ellis Wyaco from Zuni thinks that the relationship with NS/S has been beneficial and wants to continue to work with them in the future for bigger projects. They told me that they didn’t have anything negative to say about the organization.

We wouldn't have had that success if it wasn't for places like Native Seeds, so we owe them a lot. I’d like to go visit there (the Conservation Center in Tucson) one of these days and I know we've talked about it, they came and visited with us and I showed them around at our project sites and areas that we do our parks, gardens at our offices, and everything and they were super impressed and they're like, man, we'd like to come out here and maybe even partner with you guys one, one of these years just to do a little grow out garden for us.

Wyaco discussed the need for secured garden areas to make this happen in the future, as one issue they deal with is pests like porcupines and raccoons that get into planting areas. They also wondered if this is something that NS/S could help them figure out how to do affordably.

How NS/S Helps Indigenous People from the Organization’s Perspective

Native Seeds/SEARCH was started to protect seed varieties and make seeds accessible to those who had traditionally grown them. One example of how members of the organization did that was before the organization was even formed. In the late 70s, Gary Nabhan testified in Washington DC against the Plant Variety Protection Act. There is a great threat to raising seed,
growing seed, saving seeds, and planting your own seed by large corporations. That was a huge threat at the time of the founding of Native Seed/Search, and he testified against a law that would have required that all seed planted in gardens had to be from companies. Karter Wilson also told me how all the seeds that NS/S are in the public domain, as landraces or heirloom seeds. Landraces are populations of domesticated plants that were selected over many generations by farmers in a particular region. Unless a seed is patented, it is in the public domain.

Emery Soqui said to me,

The future is not known. Right now, we have all these people that come from all these different backgrounds, but our unifying value is the seeds and the production of the seeds and so I think that's an awesome thing that to be unified in.

Soqui was very proud that the organization had learned to grow and adapt during the pandemic. Though they were sad the retail store had to close, they told me how their online sales had doubled during the pandemic when they could not do in-person plant sales. Virtual events and sales can be easier and safer for everyone with that access, and more staff can get involved by doing work directly from the Conservation Center. Soqui wants to expand the online workshops, saying that they can do field days or workshops virtually and that more posts are being viewed on their social media.

Riley Thomas is proud of the work they do on the board at NS/S.

The real strength of the organization maintaining the seed stocks, literally in perpetuity. While either climate change or tribal politics or fashions or so forth go in and out. If these seeds are not maintained in the tribal communities, NS/S will have them, and when they're ready. That's the most important thing that Native Seeds can do.

Riley went on to talk about the Seed Backup program and it’s to have the seed stocks there “forever” (black boxing) and have them in a state of constant regeneration so that healthy seeds can be distributed. Riley thinks that they can continue to maintain and strengthen tribal
relationships because solid cultural values are tied to the seeds belonging to the soils where they came from. They say it has to be a conservation goal to further that objective. Riley wants to assist in groups of tribal seed banks as well. "It's not sufficient for us just to maintain it and distribute from our own collections it's really getting those seeds back up on the Apache Reservation and up into Hopi tribal areas.” This point is strengthened by the story that Ellis Wyaco told me about the chili seeds that went missing from their office. Having a safe seed bank with regular staff and accountability could keep seeds from being lost in the future.

Jamie Smith sees lots of possibilities for NS/S within their Conservation Center and at the Patagonia Farm. “We are expanding our gardens, so that is a huge plus, we can grow out a lot more seeds this way and keep the collection healthy.” I asked what they wanted to do with Patagonia farm, and they had lots of thoughts on possibilities for the future.

I think there's opportunities for grazing down there, whether that could be leasing the land, and also maybe doing some research of our own of native grasses that could be good for feeding sheep. What are good grass mixes, and also what are good rotational schedules. Maybe the Patagonia farm is a research extension on farming practices or ranching practices that would be good for family farming, but for growers. There's a deficit of information for small-scale, low-input, growers in the Southwest. We could be a source if we tried it (at Patagonia). We graze the sheep, and this is what happened, or this was a good seed mix that the sheep liked to be able to be researched and information source would be useful.

Keeping Seeds

Over thousands of years, Indigenous people have selected and adapted seeds to fit their needs depending on their environment. Seeds can be selected from plants with desired traits, such a drought and disease resistance, flavor, size, and abundance. Seeds across the Southwest have been adapted for the arid conditions, elevations, amounts of moisture they will receive, and how quickly they grow.
Emery Soqui told me this about the 60-day corn that their tribe has been growing for many generations.

We grow it all the time but when we first started we were giving it everything that they would need like they were babies, we gave it all the good fertilizer, we gave it plenty of water, and they were little, a three- or four-inch crop. Those little, tiny, tiny years of corn, but because the way we're growing them we're getting them to be like six to eight inches long and they're really clean they look really nice. But they were taking 70 to 80 days to grow. And we started wondering like their reacting to the input that we're giving them, for babying them. If we were to have to farm and rely on like a more traditional way of farming in the future, say there was some type of water loss or some impact to our resources - would they still produce? Are we actually creating a weaker strain and weakening something that took 1000s of years to develop here in the community?

Soqui went on to say that they have adjusted the way they grow the 60-day corn, and that it’s slowly growing faster, and the ears are smaller, more like what the crop once was. Soqui wants to think about the success of not just today, but for the future of their children and community. Soqui wants to ensure that the integrity of the seeds that they produce remains. The problem with growing smaller amounts of 60-day corn is getting mutations because there is not enough genetic diversity within the crop. Soqui hopes to grow larger quantities to get it back to that 60-day mark.

Morgan Kaya, from Hopi, wants more Hopi seeds in the NS/S seed bank to be conditioned to their original environments.

I think, you know, and they have a lot of experience growing in the in the Sonoran Desert down there. Our climate isn’t the same. And you know, in this case, the method they were grown in as well. That which we were introduced to originally was the lasagna beds.

Kaya hopes to continue to grow Hopi seeds traditionally in their soil.
Inclusiveness

Emery Soqui talked about education and inclusiveness in their tribe. I asked them what happened with the black tepary beans that the elders were hesitant of, and they remarked that they are still grown, and conversations are going on about what to do when people don't know the history of something that came from the tribe. "They don't know that we've lost a lot of these things and so after that incident we had to do more outreach and we share this information.”

The tribe also has a day laborer program where people who are out of work can work a day or two out of the week to get some supplemental income and work in some gardening programs. Soqui says their tribe has found this useful and relies on it greatly for the garden programs.

One of the things that I encourage my staff to do is to always tell them (the laborers) why you're doing it. Don't just tell them to pull these weeds over here, or mow this landscape or trim those trees but explain to them why they're doing what they are and why that has value as in the community, how is that related to us what can you use it for. And so, it's funny, a lot of the laborers come back and then a lot of them have gardens themselves now, and then they teach their kids that, or they may have worked with us on a Wednesday and then on a Friday they're bringing their kids out and showing them around the area and so through those kind of interactions we've really shared a lot.

Inclusiveness also means respecting and learning from elders. Elders in many tribes help decide what to plant and when. Emery Soqui told me that it took them a while to learn traditional knowledge about agriculture from the elders in their village.

They wanted to see if I was serious before they invested any time in me, there may be value in the information that they're sharing with me all that much more because I had to work for it and I had to show that I was serious about retaining it.

I also experienced Indigenous people using traditional ways of knowing to inform me during my interviews. All of my interviews with Indigenous interlocutors took longer than the planned hour. I spent as much as up to 4 hours at a time recording interviews and listening to
stories that related to agriculture and community. I did not try to rush my consultants and tried to put in the time and work and respect they deserved as a cultural broker while collecting the data. Emery Soqui told me that they have learned from their elders to give information to those that earn it and are serious about the process of learning it and retaining it. I did not try to change the subject or go back to what may have been the initial questions with any of my consultants, as their way of teaching may be different than the colonial ideology I have learned.

Willie Todachine told me that the elders taught them that “the seeds remember its relatives.” Morgan Kaya told me what elders had taught them about farming and their cultural livelihood.

Farming teaches you how to raise a family. You take care of your own children as you would your corn or your crops. Then the other saying is that you have to learn how to build a house because you're building a nest for your family. If you don't know how to do either of those things then they say you shouldn't be out there looking for our girlfriend because you're not able to raise a family. And you don't have a home or a nest, to provide for your partner to start a family and so these are some of those teachings that go along with that farming.

Kaya believes this lesson from the elders is also critical to keeping the farming traditions alive.

Is Native Seeds/SEARCH Helping to Build Indigenous Seed Banks?

Native Seed/SEARCH employees and board members have told me that they hope to contribute to growing seed banks and seed collections in Indigenous communities. Being an organization focusing on seed saving, they hope that more and more people will collect seeds from the plants they grow that they acquired from NS/S and save them for the future. Bodhi Johnson told me,

Some people come back and buy seed packets or plants from us every year. That is great, but also we want people to save their seeds from plants they’ve previously gotten, that is part of the mission of the organization.
I asked several Indigenous people that have worked with NS/S if they have tribal seed banks or seed banks on their reservations. Emery Soqui works in agricultural practices in their community and started saving seeds before working with NS/S. They began accumulating and growing seeds in their backyard and then began to focus on Native seeds. They learned seed-saving techniques as a teenager, and then began improving on those techniques over time. Some of their seeds came from the community and other tribal communities, and then they also got some from Native Seeds/SEARCH.

One of the reasons we have such large volumes of some of the seed was in hopes that the tribe would take over some of this land again and start farming it with a focus on some of these traditional foods. Every other farm that we've talked to that grows traditional foods they supplement their income by growing cash crops, but it allows them to grow their traditional foods. I hope to get children involved, we have 15,000 acres dedicated to agriculture and we don't farm, a single acre of that. And that's a very sad thing for community that's build these canals, we built 1000s of miles of canals. They've said there were over 1000 miles of canals here along the Salt River Valley and the original people irrigated over 100,000 acres of land and today we don't farm any of that. And so that's one of the reasons we try to accumulate large volumes so that if the child wanted to get into farming they'd have the resources ready to go.

The seed bank has seen high volume and low volume times, and Soqui is working to expand the amounts and the varieties.

We do have a seed bank and we do have more varieties than what we had when we started, there was just a little less volume, but it's still healthy seedbank and we practice the standards of labeling, listing, dating, where we got them from, what grow-out, what year they are. We give community members the seeds that we have in our collection. And then hopefully we're still building like a stockpile.

Soqui says that the venture doesn’t need to be making money, but as a return to cultural practices, and to give pride and reinforce the bedrock of who they are as a tribe.

Currently, there is not a Hopi seed bank. According to Morgan Kaya, a few individuals in several villages have created a Hopi Co-op. The co-op's biggest problem is that they live in
different villages, some of which are very rural or not close to one another. Kaya liked the idea of starting a seed bank, and so applied for the Community Seed Grant from NS/S last year. Kaya intended to give some of the seeds out to some of the farmers that they know in their village.

As long as we get some seed back from it and then we're able to give it out to other farmers so that we're continuing to plant our original seed, our heritage seed. I know growing up, my uncles and a lot of individuals here in the village, they would go to the store and buy those hybrid seeds and they were planted too. And so that's what I kind of grew up growing in the beginning, some hybrid varieties because, the fact that they were resistant to draw more resistant apparently to drought to rodents, and other everyday factors that could affect the growth of it. However, it just wasn't what the people here were used to and so they eventually weeded the hybrid seeds out, but I know for a fact, some varieties down here still have some of those hybrid traits, because you get the real glassy seed almost to the point where it looks like it's just chicken feed corn.

Kaya wants to continue gathering and growing Native seeds that the Hopi have used for generations and help add to an eventual seed bank.

There is not an official Zuni seed bank at this time. I spoke to two members of Zuni, and both expressed a desire for one. Rowen Panteah works with youth programs and wanted to make seeds more accessible to children and teens that are interested in learning about Zuni growing. Ellis Wyaco told me about a Zuni Agriculture Committee that is focusing on getting more seed stock and about the Zuni seed house. They also told me the heartbreaking story about the chile seeds that were taken. They want to continue to get seeds from NS/S and build up the collection again.
CONCLUSION: THERE IS MORE THAN ONE INDIGENOUS VIEWPOINT

This thesis concludes by touching upon Indigeneity theories and revisiting the three research questions I set out to investigate at the beginning. Indigeneity theory since the 1990’s has tended to move in two directions, one towards analyzing it as a political movement, and the other working towards collaborative research and theorizing (Bragdon, 2018). Indigeneity has multiple meanings, and Indigenous people and communities weave the concept of Indigeneity through space and time to “…revive identities and cultural practices and to regain or retain land, human rights, heritage, and political standing” (p. 1, Steeves, 2018). Timperley asserts that lack of attention to definitions of Indigeneity is problematic and has consequences including affecting how has access to resources for Indigenous peoples, and by shaping the kinds of privileges and resources that Indigenous people can attain (2020). Harris and Wasilewski write, “Indigeneity assumes a spiritual interconnectedness between all aspects of creation and affirms that everything created not only has the right to exist, but also has the right to be able to make a positive contribution to the larger whole” (p. 590, Harris & Wasilewski, 2004). Merlan discusses the presupposition of Indigeneity to include a sphere of commonality among “Indigenous peoples” in contrast to their “others” (2009). Indigeneity implies first-order connections between groups and their locality, and connotes belonging, attachment and identification. Over time Indigeneity has expanded in meaning to include peoples who have moral claims on nation-states and international society. This has occurred because of often inhumane, unequal, and exclusionary treatment of said peoples (Merlan, 2009).
After speaking to everyone about Native Seeds/SEARCH, what is glaringly clear to me is that there is not just one Indigenous viewpoint of the organization. All too often, all tribes and Indigenous peoples are lumped together under one umbrella term or idea of culture, however, there are 574 separate recognized tribes in the US, and even more that are not recognized. There is no “one size fits all” for indigenous viewpoints. Each person is unique, every tribe is unique, and those differences are shown in the interviewing I have done. There is no one authority on all things Indigenous.

Harris and Wasilewski do however argue that there are common core cultural values shared by most Indigenous peoples, including Relationship, Responsibility, Reciprocity and Redistribution. Relationship is a kinship obligation, the sense that human beings are related to all things, not just other humans, but everything on earth and in the universe. Responsibility is a community obligation, which is the understanding that people have a responsibility to care for all of their relatives. Reciprocity is the cyclical obligation that points to the fact that in nature things are circular, (not unlike seed cycles). Redistribution is a sharing obligation, primarily there to balance and rebalance relationships between people and all other things.

Regarding the question "How has Native Seeds/SEARCH learned from and respected the contributions of Indigenous People, and how consistently has the organization brought those contributions into the projects with Native seed?", well, it varies. Most of my interviewees agree that Indigenous representation was waning at Native Seeds/SEARCH for a time. Opinions on why that varies from person to person. Most would also agree that there is a resurgence in the pursuit of Native representation for the board and staff and the Partner Farmers and that this is a positive thing. Each person affiliated with NS/S had their own opinion on the organization's
relationships with Indigenous communities. Some have argued that some aspects of the relationship are performative and that Indigenous opinions do not matter as much as keeping local white gardeners happy. Some argue that the relationships with the Indigenous communities will change over time, as people in charge of those communities and tribal governments do. Some argue that there should be no difference in how any ethnic communities are treated and that the seeds should be grown by anyone who wants and can.

Indigenous stakeholders who work with Native Seeds/SEARCH have a variety of opinions on the relationship as well. Some Indigenous interviewees were happy with NS/S and wanted to see more community programs and education become part of their work. Others want the seeds to be returned to their communities and see NS/S as a bastion for education and funding while allowing the Indigenous people control of the seedbanks and planting. Some Indigenous people feel that everyone should have access to the seeds and that open access does not diminish their relationships with the seed. Several members that I spoke to discussed their happiness at being able to get and revive seed with the help of NS/S, but also worried about if the seeds could be adequately cared for if they are not at home with their people.

Regarding the question, "How does Indigenous participation in Native Seeds/SEARCH programs work toward building seed and food sovereignty for Indigenous communities?" I would point to programs like Partner Farmer and the Indigenous seed banks being added to because of seed from Native American Seed Request and the Community Garden Grants. Each seed request or community grant allows Indigenous people to grow seeds, foster plants, and save seeds in tribal seed banks for subsequent use. Each Partner Farmer growing season allows for two-thirds of the seeds grown to stay with the farmer, who can then grow them individually or
share them with their community. Seed banks are being added to at Salt River and Navajo, and there are hopes to add to collections and build up seed banks among members of Hopi and Zuni. At the time of writing, I do not have specifics on the number of Indigenous Partner Gardeners that were growing out low seed stocks but based on previous information from NS/S employees, it can be assumed that they are reaching out to Indigenous people for that program as well. The definitions of seed and food sovereignty vary for each Indigenous person, and NS/S will have seeds in storage as their communities decide what initiatives to take on in their names.

The final research question I started this project with is “What are the measurable outcomes of Native Seeds/SEARCH’s action plans surrounding Native seed as viewed by the organization and the Indigenous participants?” The mission statement of Native Seeds/SEARCH is “To conserve and promote arid-adapted crop diversity to nourish a changing world. We work within the southwestern United States and northwestern Mexico to strengthen regional food security.” The mission statement has changed from the original from 1983, which specifically names Indigenous issues as a priority, having said, “We will be exploring fresh approaches to assisting Native American farmers, and gardeners recover seeds that their peoples formerly tended.” While discussing the change of the mission statement, employees and board members (past and present) had different opinions on why this change took place. Some are concerned that Indigenous people are not as much of a priority, and others feel that moving towards a regional approach has been better for reaching more diverse groups of people.

Concerning if the NS/S community programs are working, the overall consensus was yes from both Indigenous and non-Indigenous stakeholders. The programs provide valuable services and resources specifically for Indigenous people, including Seed Backup, Native Access, and
Native American Seed Request. Partner Farmer, Partner Gardener, and Community Seed Grants are open to everyone who meets the program's requirements and are also utilized by Indigenous growers. The Conservation Center was able to regenerate 23 varieties and plant 44 accessions in 2020. Seven thousand three hundred seed packets were donated to Native American Seed Request, and an additional 1730 were donated for additional assistance to Covid-relief in Native communities. 45.7 pounds of additional seed was given to Native communities to supplement community seed stocks in 2020. 137 Community Seed Grants were awarded, with 4093 seed packets being sent out for this program in 2020, although the Annual Report does not iterate how many of those grants were awarded to enrichment programs in Indigenous communities.

When I asked Indigenous stakeholders what they wanted to see in the future from the community programs and Native Seeds/SEARCH, they gave me some ideas to share. Having NS/S come out to do more education projects, including showing communities new growing techniques, was encouraged. Each person spoke about the importance of water retaining plants and mulching techniques to conserve water as the climate changes and the droughts become more frequent. Another told me that they would like to get bigger orders of seeds from NS/S for their community members, that the small number of seeds was something that people took issue with. They also spoke about the importance of conditioning the seed to the elevations and climates that they originally came from and accessioned them out on tribal lands. Some Indigenous stakeholders wanted NS/S to increase their online presence and do "How To" videos and other media they can access over email or the internet. However, another point that was brought up is that some of the internet services on reservations are not always reliable and maybe less so after COVID-19, so another person from that same community wanted NS/S to continue
to do hard copy pamphlets, training, and education, and come to the communities in person to do some of these workshops.

I had to grapple with the thoughts about “white saviorism” when exploring Native Seeds/SEARCH, and if it applied to this NGO. White saviors often think they helpers or providers for BIPOC communities. White saviorism can cause people to help for the wrong reasons, or by allowing for them to push their belief systems and culture on others. Was Native Seeds/SEARCH created out of a sense of white saviorism? It’s tough to say, and I think it could be a mixture of a few things. The founders of NS/S started the NGO as ecologists and biologists, but specifically mention providing Indigenous farmers with access to seeds in their original 1983 mission statement. This mission statement has since changed, and now does not specifically include words about Indigenous peoples. One of the founders that I spoke to talked about how the project spun off from a larger food and farming Meals for Millions project, which was working to provide food security for the Tohono O’odham people. Because of detrimental aspects of colonization, Indigenous people and their communities are often food insecure. Was this project righting a wrong, or was it swooping in to “save” farmers that supposedly couldn’t save themselves without the resources provided? It’s likely a combination of both. I was only able to speak to two people about the Meals for Millions project, and both were white. I did not have any connections to speak to O’odham people that participated in this project and if they had agency over the “help” they were receiving.

Several Indigenous people that I spoke to about NS/S in the presence said that they felt the organization was “arrogant”. Some felt it was implied in the past that Indigenous people could not collect, save, and grow out seeds without the resources or education given to them by
NS/S. Other Indigenous interlocuters felt gratitude and commitment to the partnerships with NS/S. What every Indigenous person had in common when talking about commitment from NS/S was that these relationships can’t be allowed to die and have to be continually nourished and inclusive of Indigenous peoples perspectives and ideas for how to manage the seeds.

In my analysis of this research, Native Seeds/SEARCH and the interviews I have done, the biggest take away I have come across is that there is not just one Indigenous viewpoint. The more Indigenous voices that collaborate on Native Seeds/SEARCH projects, the better, because it allows for a well-rounded and inclusive discussion on what next steps for the organization should be. Beyond that, I also was very aware of the fact that there were more white board members, employees and volunteers than Indigenous people. As of October 2021, the board is about half and half in terms of white and Indigenous members, but I have not seen any new members added in the year since my field research. A year ago interlocuters told me they hoped to gain more Native representation on the board, and that has yet to officially be announced online if that has been the case. Additionally, an Indigenous person has left employment with NS/S, while at least one other way added, perhaps possibly more. Incorporating new board members and staff can take time and can be limited by nonprofit funding, availability, and COVID-19 among many other factors.

My recommendations for Native Seeds/SEARCH are as follows: I believe that NS/S should revisit their original mission statement about assisting Indigenous farmers in the Southwest with recovery of seeds. Growing seeds out with Indigenous farmers has been a priority, and by continuing to document and preserve the cultural, nutrition, ecological and culinary value of the seeds will strengthen food sovereignty. Food security across the Southwest,
which is one of the present mission statements of the nonprofit, can only be enhanced by encouraging food and seed sovereignty within Indigenous communities. In order for Indigenous communities to be food secure, they need to be in control of their food systems, access to seeds that are important to them, soil health, their nutrition and education, and water access. Food sovereignty and food security are also tied to health equity, which is something that many Indigenous people still lack on reservations, as I previously mentioned in the first chapter on colonization. Food sovereignty can also promote gender equity and help address structural racism that Indigenous peoples of the Southwest may experience from non-Indigenous peoples (Weiler, et al. 2014). Native Seeds/SEARCH is making excellent strides in working to make the board and staff and partner farmers more diverse, and by encouraging Indigenous voices to be part of the larger conversation about the seeds in the collection.

In conclusion, Native Seeds/SEARCH has connected to many Indigenous communities, farmers, and gardeners in the Southwest over their 38 years of work. Essentially what is being asked for in the future is continuing to improve relationships that may have waned over the years and continued support for Indigenous programs on tribal lands. Sovereignty means different things to different people, and each contribution to the conversation has merit and should be acknowledged. Each of these issues will be an ongoing conversation so long as NS/S is involved with Native seeds and Indigenous peoples. Increased engagement increased Indigenous presence at the decision-making table, and respect for the seeds as relatives to the people of these communities is vital to maintaining healthy growth for the seeds of partnership to bloom. A Pima consultant told me that their elders taught them that, “the seeds remember its relatives.” Seeds live in a circular lifecycle (reciprocity) that nourish and are shared (redistributed) across
communities. If we look at seeds as relations that we have responsibility to, we will have more in depth and collaborative findings and practices on sovereignty.

Figure 4: Free Seed Access Brochure
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APPENDIX A

Native Seed Search Employee/Volunteer Questions

1. Do you grow? What is your favorite thing to grow?
2. When did you begin working with/at Native Seeds/Search?
3. What made you decide to work/volunteer for this organization?
4. What are/were some of your jobs/duties/or roles when working/volunteering?
5. Typically, how many staff/volunteers do you work with? Does this number shift according to the service/program?
6. How has COVID-19 impacted Native Seeds/Search? How has it affected you?
7. What do you think will be the long-term effects of COVID-19 on NSS?
8. What personal benefits or positive outcomes have you gained from working/volunteering for NSS?
9. Have you worked with other Native food farming/gardening/seed bank/ or sovereignty organizations? Which ones?
10. If yes, how are your experiences with them compared to Native Seeds/Search?
11. What are the Native (Indigenous) seeds that Native Seeds/SEARCH offers that are hard to find elsewhere?
12. Can you tell me about the Native seeds that are reserved for tribal members?
13. What kinds of traditional ecological knowledge (TEK) from Indigenous communities are being used to grow seed crops at Native Seed/SEARCH?
14. How does the organization tailor seed collections to meet the needs of different peoples?
15. How does the organization tailor grants and community work to meet the needs of different beneficiary groups?
16. What are some of the interactions you have had with the people that Native Seeds/Search provides services?
17. What cultural values or beliefs do you feel are included in the work and services that the NSS provides?
18. How has the organization maintained its mission and standards throughout the time you have been working/volunteering there?
19. What do you feel are the strengths of this organization?
20. What do you consider your successes in saving and cultivating native seeds?
21. What are some challenges you personally or the association as a whole currently face?
22. Do you have any specific memories or experiences while working/volunteering with this organization that you would like to share?
23. What are your hopes for the next year, and on for NSS?
APPENDIX B

Native Seeds/SEARCH Board Member Interview Questions

24. I know NS/S spun off from a Meals for Millions project, but can you tell me more about its founding and the early years of your work here?
25. How have you been able to prevent large seed companies from patenting some of the seeds you conserve?
26. What inspired NS/S to open its retail sales platforms?
27. What are some of your duties or roles when working on the board?
28. How often does the board work together on Native Seeds/SEARCH efforts?
29. How has COVID-19 impacted Native Seeds/SEARCH?
30. What do you think will be the long-term effects of COVID-19 on NS/S?
31. What personal benefits or positive outcomes have you gained from creating/working with NS/S?
32. Have you worked with other Native food farming/gardening/seed bank/ or sovereignty organizations? Which ones?
33. If yes, how are your experiences with them compared to Native Seeds/Search?
34. How does the organization tailor seed collections to meet the needs of different Native peoples?
35. How has NS/S worked to build and maintain strong partnerships with Indigenous communities?
36. What are some of the strengths and successes that Indigenous communities have found that NS/S provides?
37. What are the conservation goals you hope to achieve with current Native Access seeds?
38. How does the organization tailor grants and community work to meet the needs of different beneficiary groups?
39. What cultural values or beliefs do you feel are included in the work and services that the NS/S provides?
40. How has the organization maintained its mission and standards throughout the time you have been working here?
41. What do you feel are the strengths of this organization?
42. What are some challenges the association currently faces? (Climate change, Covid, etc)
43. Do you have any specific memories or experiences while working with this organization that you would like to share?
44. What are your hope for the next year, and onwards for NS/S?
APPENDIX C

Indigenous Stakeholder Interview Questions

45. Do you grow? What is your favorite thing to grow?
46. How has COVID-19 you/your community?
47. What do you think will be the long-term effects of COVID-19 on your community?
48. What personal benefits or positive outcomes have you gained from working with NS/S?
49. Have you worked with other Native food farming/gardening/seed bank/ or sovereignty organizations? Which ones?
50. What are the Native (Indigenous) seeds that Native Seeds/SEARCH offers that are hard for you to find elsewhere?
51. What kinds of traditional ecological knowledge (TEK) do you/ your community use?
52. What are some of the interactions you have had with the people at Native Seeds/Search?
53. What do you consider your successes in saving and cultivating native seeds?
54. What are some challenges you personally or your community as a whole currently face?
55. What are some of the strengths and the weaknesses of the programs that NS/S offers?
56. What are your hopes for the next year, and on for your community and for NS/S?
57. Do you have any specific memories or experiences while working with this organization that you would like to share?
Form 990
Public Disclosure Copy
Return of Organization Exempt From Income Tax
2019

A. For the 2019 calendar year, or tax year beginning OCT 1, 2018 and ending SEP 30, 2020

B. Description of organization

Name of organization: NATIVE SEEDS/SOUTHWESTERN ENDANGERED ARIDLAND RESOURCE CLEARINGHOUSE, INC.

Employer identification number: 54-2899356

C. Business activities:

Doing business as: NATIVE SEEDS/SEARCH

Number and street (or P.O. box if not delivered to street address): 3584 EAST RIVER ROAD

City or town, state or province, country, and ZIP or foreign postal code: TUCSON, AZ 85716

F. Name and address of principal officer:

LINDA PECK
SAME AS C ABOVE

J. Website: WWW.NATIVESEEDS.ORG

K. Form of organization:

Corporation

L. Year of formation: 1983

State or foreign country: AZ

Part II Summary

1. Write the organization's mission or most significant activity:

NATIVE SEEDS/S.E.A.R.C.H. (NES) WORKS TO SUPPORT SUSTAINABLE FOOD SECURITY IN THE SOUTHWEST

2. Check this box: If the organization discontinued its operations or disposed of more than 26% of its net assets:

3. Number of volunteers:

a. Total number of individuals employed in calendar year 2019: 10

b. Total number of volunteers (estimate if necessary):

4. Total unrelated business revenue from Form 990T, line 12:

5. Net unrelated business taxable income from Form 990T, line 39:

6. Revenue:

- Contributions and grants (Part VIII, line 11)
- Program service revenue (Part VIII, line 2a)
- Investment income (Part VIII, column A, lines 3, 4, and 7a)
- Other revenue (Part VIII, column A, lines 1, 5, 6, 8, 11, and 12)
- Total revenue: $458,955

7. Expenses:

- Salaries, other compensation, employee benefits (Part IX, column A, lines 6-10)
- Professional fundraising fees (Part IX, column A, line 13)
- Total fundraising expenses (Part IX, column D, line 12): $187,084

8. Net assets or fund balances:

- Beginning of current year: $312,467
- End of year: $1,708,608

Part III Signature Block

Signature of officer:

GLENN WAGNER, FINANCE & OPERATIONS MANAGER

Preparer's signature:

MONICA A. VERA, CPA

Preparer's address:

1985 E. RIVER ROAD, SUITE 201
TUCSON, AZ 85718

Phone no.: 520-321-4600

Preparer's signature:

MONICA A. VERA, CPA

Preparer's address:

1985 E. RIVER ROAD, SUITE 201
TUCSON, AZ 85718

Phone no.: 520-321-4600

Part III Signature Block

Sign Here

[Signature of officer]

2/1/2021

Preparer's signature:

[Signature]

Preparer's address:

1985 E. RIVER ROAD, SUITE 201
TUCSON, AZ 85718

Phone no.: 520-321-4600

[Signature]