Pinus Longaeva: Exploring the Intersections of Art and Science Through Ancient Bristlecone Pine Trees

Delaney Burns

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PINUS LONGAEVA: EXPLORING THE INTERSECTIONS OF ART AND SCIENCE

THROUGH ANCIENT BRISTLECONE PINE TREES

by

Delaney Burns

A Thesis Submitted in Partial Fulfillment
of the Requirements for a Degree with Honors
(Studio Art, Marketing)

The Honors College
University of Maine
May 2022

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ABSTRACT

This creative thesis develops a series of 30” by 20” woodblock prints that explore the intersections of art and science through ancient bristlecone pine trees. These trees can live for over 5,000 years, making them extremely important to dendrochronology, the study of dating and analyzing tree rings. The growth patterns of these tree rings are used to study climate change over long periods of time. This thesis focuses on these trees due to their importance to climate change and personal significance to the author. By studying the history of ecological art movements, these prints are placed in the category of using modernist aesthetics to create a reverence for nature. The analysis of the prints becomes an exploration of how science and art are intertwined and can inform each other greatly.
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INTRODUCTION

My love for trees began as a kid. My dad, who studied forest engineering at the University of Maine, would take us for hikes in the woods behind our family camp and point out all of the different species. He would constantly quiz us: “What type of tree is this?” when we answered vaguely, he would push further and ask for specifics. His constant pestering about the trees annoyed me then, but now I am beyond grateful that he taught me to pay attention to the details of each tree. This attention to detail has allowed me to see the beauty in the tiniest things in nature, whether it is the patterns on tree leaves, moss, mushrooms, or lichen. This attention to patterns found in nature has directly impacted my art and my interests in environmental issues.

I first came across bristlecone pine trees on a family vacation in 2017. My mom had planned our great journey out west, and I fell in love with Utah and Arizona from the moment I stepped foot off the plane. Everything was so drastically different from New England, from the weather, to the landscape, to the colors. To me, the American Southwest was suddenly the most beautiful place on Earth and I never wanted to leave.

This was cemented when we made the trek through Bryce Canyon. Being in the canyon surrounded by hoodoos and bright orange rocks was like a religious experience for me. I felt extremely close to my family, myself, and nature. I felt like I was exactly where I was supposed to be. It is fitting that this is the moment that I first encountered a bristlecone pine tree, because now working with them makes me feel the exact same way; like I am doing exactly what I am supposed to be doing.

Before we even left on this trip, my dad was enthusiastically talking about seeing this ancient tree when we went to Bryce Canyon. It was his first time visiting the
Southwest, something he had always dreamed of. Once we were at the national park, my dad, sister and I hiked the short path to see it. When we finally found it, there was a weird rush of emotions. We found the coveted tree, and yet it appeared to be dead. After years and years of foot traffic from tourists, it seemed that the tree had been killed. While the tree was still beautiful, it made me angry that something so ancient and sturdy had been destroyed by needless human impact. These emotions really stuck with me, and I have since minimized my own impact on nature. From this moment on, I have been more careful about where I step, and monitor any actions that may harm the natural environment that I am enjoying. While this trip was monumental, I didn’t think much more about bristlecone pine trees until years later, when I was enrolled at the University of Maine, far from their native habitat.

Occasionally the Department of Art will leave boxes of free art-related books in Lord Hall for students to look through and take. During my third year, I found the book “Dark Forest: Night Photography from the Ancient Bristlecone Pine Forest,” by Steve Zigler in the lounge in Lord Hall. As soon as I saw the cover, I recognized the astounding bristlecone pine tree. It brought memories of Bryce Canyon rushing back, and I knew immediately that I needed to incorporate the bristlecone pine tree into my next printmaking project.

I chose to pursue this theme within woodcut printmaking because it is the medium that speaks to me the most. From the moment that I stepped foot into the printmaking studio on Accepted Students Day, I knew that I would be a printmaker. I enjoy the large-scale woodcut process because each print always offers a different set of challenges. I do
not get bored during the process and am fully engaged at all points. This process feels intuitive to me and I feel like I can truly express my creativity.

Unfortunately, this breakthrough occurred just before the COVID-19 pandemic interrupted the academic year. Having to work remotely led me to explore other themes in my artistic practice, and I waited to work with the bristlecone pine. Coming back to campus in the fall led me to reconsider working with this theme. Working with the bristlecone while having access to the studio and talking with Professor Susan Groce allowed me to push past representational imagery of the bristlecone and explore abstraction. After carving *Bristlecone 1*, I immediately knew that I had found something worth pursuing.
STATEMENT OF PURPOSE

Throughout my studies of the bristlecone pine tree, themes of biodiversity, climate change, dendrochronology, and the intersections of art and science have been at the forefront of my thoughts. The goal of this creative thesis is to explore the intersections of art and science through printmaking, specifically using the imagery of bristlecone pine trees. This project will expand my woodcut printing vocabulary and techniques, develop the thematic language I will use when talking about my visual and conceptual artistic practice, and allow me to explore the connections between art and science. This entire series is composed of three 30” by 20” prints, one 24” by 9” print, and one 90” by 40” print. They are titled: *Bristlecone 1, Bristlecone 2, Bristlecone 3, Bristlecone 4,* and *Pinus longaeva.*
SCIENTIFIC IMPORTANCE

To begin, it is important to understand the greater significance of bristlecone pine trees. Though I started my journey with these trees because of familial significance, I have come to admire them for their resiliency and their value to dendrochronology, the study of dating and analyzing tree rings. They are vital to both the ecosystems they grow in, but also to the study of climate change.

Great Basin bristlecone pine trees, *Pinus longaeva*, are known for their ability to persevere. They are found in California, Utah, and Nevada at montane, subalpine, and timberline elevations.\(^1\) This means that they tend to grow on exposed mountainsides and mountaintops, often growing in contorted shapes due to the weather conditions. Despite germinating in some of the harshest environments, bristlecones are the oldest living species in the world. The oldest bristlecone pine is over 5,000 years old.\(^2\) One of the reasons these trees are able to live this long is through strip barking. Strip barking is found in very old trees and occurs when the cambium begins to dieback.\(^3\) The cambium is the portion of the tree that creates growth in the wood and bark. As it dies, the tree keeps fewer and fewer branches alive. Thus, very few roots keep very few branches alive. Despite seeming contrary to survival, strip barking actually allows bristlecones to survive longer because they are less susceptible to die from limb damage caused by wildfires or extreme weather.\(^4\) If a branch is damaged, it is more likely to be one that has already died, protecting the remaining living portions of the tree.

Strip barking is what gives the bristlecones their gnarly, contorted, and barren look. It creates deep grooves and knots in the bark and limits the amount of pine needles that can grow. In fact, walking by you may even assume them to be dead. They don’t
grow very tall either, usually around 30 feet maximum, though they can be much smaller at timberline elevation. They don’t appear that impressive at first, until you learn of the history and age of these trees.

These trees have been around since the completion of the Great Pyramids of Giza, Egypt. It wasn’t until 1957 though that the true age of these trees was revealed. Edmund Schulman, a researcher from the Laboratory of Tree Ring Research at the University of Arizona, dated the famous bristlecone known as Methuselah to be 4,789 years old. At that time, it was the oldest known tree in the world. Shortly after, another researcher found an even older bristlecone—but only realized that it was 4,862 years old after it had been cut down. The current oldest bristlecone is 5,062 years old. However, its location remains a secret, except from a handful of forest ecologists, in order to protect it from being vandalized. The age of these trees has sparked a desire from many, including myself, to protect them. “The possibility that climate change will cause their extinction has inspired a spate of alarmed news stories,” says Alexander Ross, writing for the New Yorker. “Although tree scientists tend to discount the idea that the bristlecones are in immediate danger. They have survived any number of catastrophes in the past; they may survive humanity.” Due to their age and resiliency, people tend to see these trees as spiritual elders. They have been witness to far more than we can ever imagine, and we project a form of human wisdom onto them. They will continue to be resilient throughout future climate change, as they have in the past. They may well outlive the human species, remaining stark in their ability to persevere.

Since these trees can live for so long and experience some of the most extreme weather, they are often used in the study of dendrochronology. Dendrochronology is the
study of dating and analyzing tree rings. By studying tree ring growth patterns, dendrochronologists are able to identify the exact year a tree ring was formed. These patterns are then used to determine when major climate events occurred as well as climate patterns over long periods of time. This aids in the study of climate change, since these tree timelines cover thousands of years of changes in weather. The longest dendrochronology timeline ever goes back 11,000 years. It was created by crossdating both living and dead wood from German oak and pine trees.\(^8\) The longest bristlecone timeline is over 8,000 years,\(^9\) again by crossdating (see Figure 1).


This chronology of bristlecones from tree-rings is also used to calibrate and validate other dating methods, such as radiocarbon dating and paleoclimate records.\(^{10}\) One study using hydrogen isotopes in bristlecone pine trees found a “postglacial climate
optimum 6,800 years ago and a continuous cooling since then.”11 This study serves as a strong reference when comparing it to others that use ice cores, pollen, and fluctuation in treelines. With these cross references, a climate pattern of continuous cooling for 6,800 years has been established through the study of bristlecone pine trees.

In addition, bristlecones have aided in the study of historical events. For years it was assumed that a volcanic eruption ended the Minoan civilization.12 However, a radiocarbon dated olive tree put the time of the explosion years earlier, in the middle of the time when the Minoan civilization was doing very well. This did not make sense to a few dendrochronologists, who knew that radiocarbon dating is not always accurate to the exact year. Using bristlecone pine trees in comparison to other tree chronologies around the world, they were able to narrow down the likely year of the eruption to 1560 BCE.13 This is extremely important scientifically for understanding how the environment was impacted globally. However, it is also extremely important for historians who are now able to more correctly attribute the effects of a volcanic eruption to historic events.

Using bristlecones to identify major global events throughout history is also useful for our future. For example, from 774 to 775 CE a major solar event occurred, which was identified using tree rings.14 While no harm was done to the trees, scientists are very curious to identify when these events take place as a major solar event today could wipe out a majority of our electronic technology. Bristlecone pine trees may even be used to identify any patterns in solar flares, making them vital to our understanding of how these events could impact the natural and technological world.

Overall, Great Basin bristlecone pine trees have proven to be immensely important to dendrochronology, historical studies, and climate science. They have
allowed us to develop large timelines of climate patterns, calibrate timelines established through other methods, and even identify major historical events. Though these trees might not appear beautiful to everyone, they hold a sense of mystery, wonder, and wisdom that comes with their astounding age. These trees are vital to our understanding of the climate and will inform how the human population approaches the future in the face of a climate crisis. Though they will certainly outlive us, our lives will forever be intertwined with these amazingly resilient trees.
ART REVIEW

This next section of research focuses on artists throughout history who have worked with themes of climate change and sustainability. Early landscape artists in America were primarily focused on colonization and the domestication of the American wilderness. In the nineteenth-century artists painted majestic landscapes that visualized their reverence for the power and beauty of the American wilderness. Being in nature began to be perceived as an act of worship, and painters in the Hudson River School admired and glorified America’s land. In the 20th century however, environmental art took on many forms, and in our contemporary moment artists not only represent nature but also engage in creative ecologies. They practice art that studies ecological systems and imagines new futures that are ecologically and socially sound. In this section of the thesis I will discuss four major groups of environmental art and how I see my work relating to these categories.

Art as Reverence for Nature

The first category is art in which the artist uses modernist aesthetics and design to exaggerate perception to show reverence for nature. This type of environmental art orients the viewer to see the beauty, wonder, and elegance of natural forms. Artist’s working within this genre often felt a metaphysical, spiritual connection to nature. They created their artwork as a way to appreciate nature and encourage others to admire it as well.

Georgia O’Keeffe was one such pioneer of American modern art. Focusing on the organic and referencing contemporary research in biology, she created abstract paintings
of various plants and landscapes. About one of her paintings, Alan C. Braddock says, “The Lawrence Tree does not illustrate a scientific understanding of arboreal ecology in any strict sense, but it expresses artistic appreciation of the Southwest regional environment in a way that can be regarded as broadly consistent with contemporary research on plant geography.” Her paintings weren’t meant to be scientific, but reflect a greater understanding of the natural environment. It was reported that O’Keeffe had stated: “You know how you walk along a country road and notice a little tuft of grass and the next time you pass that way you stop to see how it is getting along and how much it has grown? ... I remember little things like that and put them in my pictures.” While O’Keeffe may have not looked at the plants she portrayed through a strictly scientific lens, she was clearly aware of the changes in the environment around her. She paid attention to the small details and gave each plant an individual identity and will of its own. Her intense attention to detail shows how enamored she was with the plants she encountered. Her paintings give a sense of awe and deep-rooted respect for the natural world. Though she wasn’t directly addressing issues of environmental degradation, she was able to capture a strong, “sense of wonder about ordinary environmental phenomena.” The Lawrence Tree, 1929 (see Figure 2), does this by highlighting the curvature of the tree and the way it expands upwards into the sky. Through her meditative painting, she pondered the way life flows through the tree and the intimate connection humans have with the natural environment.
Another artist who worked in a similar vein was Ansel Adams. Adams is well-known for his landscape photography of the American west, especially the National Parks. Adams’ images are natural spectacles, often with a sense of awe. His black and white photographs create a romanticized version of nature. Fueled by both mid-century aesthetics and conservation, his photographs create a new way of addressing environmental politics. Closely following the philosophies of naturalist John Muir, Adams used his images to push for the creation of more national parks by sharing the beauty of these places. *Eagle Peak and Middle Brother, Winter, Yosemite National Park,*
California, 1968 (see Figure 3), is one of Adams’ photographs that shows his reverence for the wild beauty of nature. Two towering peaks loom out of the fog, rising above the trees in the foreground. Compared to the trees, the mountains become giants, emphasizing the prominence and height of Eagle Peak and Middle Brother. This aestheticized portrayal of the mountainous scene creates a sense of formidable veneration for nature.

Yet another photographer that relied heavily on modernist aesthetics to romanticize nature was Eliot Porter. Porter began his career in chemical engineering and medicine. Finding an affinity for photography, he committed himself to capturing the
landscape. He experimented with composition and framing to produce abstract photographs. His art has been described as possessing “an ecological aesthetic”\(^\text{20}\) that brings the small details of natural settings into the spotlight. Rather than focusing on the fantastical, transcendental scenes like Ansel Adams, Porter zeroed in on the colors and patterns in nature. Through a midcentury lens, he captured the elegant undulating forms in photographs like *Dungeon Canyon, Glen Canyon, Utah, August 29th, 1961*, 1961 (see Figure 4). Glen Canyon was later flooded to construct a dam for hydro-electric power. The formal beauty and serenity of the photograph communicates the poignant loss that accompanies the destruction of nature at the hands of industrialism.

These three artists were central to the modernist approach to environmental art. They exemplify how artistic abstraction was shaped by natural forms and ecological systems. While this genre was extremely strong in revering nature and finding seemingly spiritual connections, it often erases the violence of colonialism aimed towards Indigenous peoples. The lands that Adams, O’Keeffe, and Porter admired were sites of cultural significance for Native peoples that had been taken away and repurposed for a white, European audience. The aestheticization of nature can deflect the harsh realities of environmental degradation and modern industrialization.

A contemporary artist who is addressing this issue of Indigenous erasure while building upon modernist aesthetics of nature is Nici Cumpston. Cumpston is a Burkandji-Australian artist who takes the aesthetics of the modernist movement and applies them to fragile ecosystems that are vital to Indigenous populations. She has developed a series of photographs about trees growing along the Barka, or Darling River, the third longest river in Australia. Cumpston’s goal is to humanize these trees “so they can be empowered to have the rights that protect them from harmful human intervention.” By glorifying these threatened trees in an aesthetically pleasing way, Cumpston draws us in. Once we observe the pieces more, we begin to question whether the situation is as serene as it appears. Cumpston tells us that it is not peaceful, but rather serves “to give them reverence and to provide an important platform to share stories of Aboriginal occupation and ongoing survival on our land...and to the hope that we can change this dire situation, before it is too late.” Through her pieces, such as Oh my Murray Darling, 2019, and Great Grandmother Barka, 2021 (see Figures 5 & 6), she captures the modernist reverence of nature, but asks us to dig deeper into the meaning. Yes, we are to appreciate
the beauty of these trees, but we are also asked to dig deeper into why these trees and why this river. Upon asking ourselves why, we come to realize that these landscapes are of great importance to the survival of Aboriginal peoples.

Figure 5. Nici Cumpston (Australian, b. 1963), *Oh my Murray Darling*, 2019. Archival pigment print, 75 x 175 cm.

Figure 6. Nici Cumpston (Australian, b. 1963), *Great Grandmother Barka*, 2021. Pigment inkjet print, 80 x 80 cm.
Despite its shortcomings, the modernist movement did have a massive impact on environmental art. It shifted the view on approaches to environmental themes, including how the same aesthetics are used for contemporary purposes. Rather than viewing eco-art solely as landscape paintings, modernist aesthetics expanded the lens through which nature was viewed. This movement leads to modern and contemporary artists building upon the beauty of nature to approach ecological problems in a variety of new ways.

**Dystopian Imagery in Art**

A second category of ecological art includes artists who employ dystopian imagery to call attention to natural and social crises. Instead of using a sense of reverence to draw in a crowd, they warn of a crisis that we are in the midst of creating. Pollution, climate change, and ecological injustice are not beautiful. They are horrifying and grotesque, and perhaps only dystopian imagery can create change.

Alexis Rockman is a painter who combines a pop art sensibility with dystopian imagery. In his painting *Manifest Destiny*, 2004, he envisions New York City after the glaciers have melted. In an interview with the New York Times, Rockman states that he consulted two climate change experts to create this work. After looking at their models of how melting glaciers will affect sea levels, he painted an urban world that has been reclaimed by nature. As an example, the Brooklyn Bridge, a feat of engineering, can still be easily taken over by natural forces. Instead of highlighting the beautiful aspects of nature, and begging us to save them, he offers a grim vision of the future. This is what will happen if humankind continues on the path we are on, and this scenario is backed up by scientific modeling. Rockman achieves a sense of surrealism with his work, as well as
irony. What at first appears to be a brightly colored aquarium scene quickly gives way to a frightening reality. This reality is all the more jarring because of the name of the painting. *Manifest Destiny* (see Figure 7) calls out the inevitable fate of the United States if we continue on as we are. It throws the words that encouraged colonialism and industrialism back into our faces, forcing us to contemplate our new destiny.

![Image of Manifest Destiny by Alexis Rockman](image)


Shock and fear are what dystopian art relies on: The artists want us to have a deeply emotional reaction. From their perspective, this is the only thing that will push their audience to care about the horrors of climate change and industrialization. This approach is effective in its straightforwardness and in how it asks us to imagine the future. A printmaker working in this genre is Sue Coe, who is famous for her graphic political commentaries on industrialism, fascism, and veganism. She uses an imagined future combined with metaphoric images to show us the horrors of the modern world.

The print *Toasting Our Destruction*, 2021 (see Figure 8), depicts world leaders sitting around a table with a smoking globe in the middle. Outside their opulent dining
hall is a multitude of tree trunks. Having been harvested, what was once a lush forest is now a desolate landscape. However, the rich and greedy seated at the table do not care that the world’s fate is in their hands. They only care about profits and power. Like Rockman, Coe warns of a very possible future. Though her audience tends to read her work as negative, Coe says, “To me, it's not negative to reveal reality.” She isn’t creating her work to scare us into thinking nothing can be done. Coe is relaying these realistic messages through art to remind us to be aware and continue to fight for change, otherwise these dark scenarios will become reality.

Another artist working in this way is Chris Jordan. As a photographer, Jordan captures moments that feel like they should be in the dystopian future but are actually happening now. He is most well-known for his series *Midway*, 2009 (see Figure 9),
which captures the tragic deaths of albatross chicks due to plastic waste. These birds live and breed on Midway Atoll, an island in the middle of the Pacific Ocean. Despite being about 2,000 miles away from any continent, these birds frequently die from plastic consumption and toxicity. Jordan’s series captures images of these dead birds in various states of decomposition. Their carcasses are filled with plastic that they mistook for food. These heart wrenching images seem like they are something from a dystopian horror film. Yet they aren’t. They depict a very current reality where human overconsumption and pollution have killed these birds, despite being thousands of miles away from the majority of human activity.

Figure 9. Chris Jordan (American, b. 1963), Midway, 2009.

Edward Burtynsky is another artist that highlights human impact on the environment. Rather than focusing on the impact on animals, he analyzes vast industrial wastelands through his photography. At first glance these images appear to be
dramatically beautiful landscapes. At second glance it becomes apparent that they actually depict the devastating impact of human involvement. Whereas Ansel Adams finds sublime beauty in an untouched natural world, Burtynsky finds the horrific beauty in industrial landscapes. They both invoke the same sense of awe, but in radically different ways.

Burtynsky’s photographs, such as Figure 10, strike terror in us when we realize that the iridescent colors are not natural but rather evidence of pollution. He calls his photographs “residual landscapes,” which is fitting given the physical residue from oil and pollution, but also for the feeling that resides within us long after viewing his images. We are left to puzzle over the images, awestruck by the intensity of environmental damage. Burtynsky’s work shows us this dystopian-escape landscape but forces us to realize that this is happening now and we cannot ignore it any longer.

By highlighting imagined catastrophes and our horrific reality that we have created, dystopian artists send us a warning. They warn us of crises that will impact the rest of human existence and beg their audience to do something about it. These artists want their audiences to take action and educate themselves on the prevalent issues of climate change, industrialization, and pollution. Their work is effective in its appeal to our fears. It lights the fire under us to do something.
Art and Better Futures

Some contemporary artists work in an opposite way. Instead of imagining a horrible dystopian future, they imagine better futures, where we have solved the problems of climate change. They imagine futuristic space, novel solutions, and architectural designs that are compatible with nature.

One artist envisioning sustainable futures is Canadian photographer Joan Sullivan. Most of Sullivan’s work revolves around climate change and renewable energy. By portraying fields of solar panels and mountain ranges with wind turbines, Sullivan shows us what steps are being taken toward greener energy and what more needs to be done, while also raising concerns. One of her photographs captures a tractor in the midst of a field of blue solar panels (see Figure 10). You can’t see any grass or natural elements, raising the question of whether or not this is truly sustainable energy. While solar energy
is harvesting naturally occurring UV light and transforming it into energy, a lot more energy is still needed to produce the solar panels in the first place. Sullivan’s photograph calls into question whether this is truly the best option, as farm fields have to be taken over in the name of solar energy. She sees this as leading us to a better future, but also asks what more we can do.

Figure 11. Joan Sullivan (Canadian), *Untitled*, 2020.

Another artist is architect Buckminster Fuller. Working in the early to mid 1900s, he drafted ecological designs for housing that maximized transmission of energy. Fuller saw the capitalist, industrial world as being extremely wasteful. He was aware of the limitations of the Earth’s resources and sought to maximize their potential. Fuller knew that there would be diminishing reserves and created housing that could be packed up and moved to a new location. He called this the Dymaxion house and saw that it would lessen the need to keep building houses, saving resources in the long run.
Fuller’s designs imagined a new and improved world, where humanity was aware of their impact on the environment. He promoted sustainable design as much as possible, and even drafted his own designs that integrated nature with cities. He created uses for everything, including pollution. His view was that, “Pollution is nothing but resources we're not harvesting. We allow them to disperse because we've been ignorant of their value.” Designing an imagined world that was more efficient and sustainable allowed Fuller to hope for a better future. He was able to show that it is possible to live more efficiently and sustainably, through both his fine art and practical architectural designs.

Both Sullivan and Buckminster envision sustainable futures for the world. They ask us to consider what developments can create eco-friendly solutions for a modern way of living. By highlighting the potential approaches to combat climate change, they give their audience hope that current environmental issues can be resolved.

The Art of Organic Materials

Next, there is the category of artists who work with organic processes or materials in their work. They create art from living things, use site-specific installations and scientific experimentation in order to raise awareness about ecological processes. Artists working in this vein call our attention to the connectedness of the environment. This genre of ecological art is addressing how every organism, no matter how small, is integrated into a whole ecosystem. Everything is intersectional, and in their work art, nature, and social systems work in tandem to create new possibilities.

Mark Dion is a well-known artist who often works with actual trees. His piece *The Life of a Dead Tree*, 2019 (see Figure 11), invites his audience to explore a white ash
tree and how it continues to be full of life, even after the tree itself has died. Dion transported the dead tree into the basement of the Museum of Contemporary Art, Toronto, where visitors were invited to take a closer look at the insects that made a home inside the tree. By closely examining the invasive emerald ash borers that have killed the tree, this piece opens up an “in-depth consideration of the effects of invasive species and extinction on a broader scope than what may be tackled by any individual.” It becomes a collaborative work, encouraging everyone to partake in learning about and caring for the environment. Placing an actual tree in an art museum shifts how we view science and art. Rather than existing in separate spheres, they work together to create integrated communities developing new ways of thinking about ecological crises.

Figure 12. Mark Dion (American, b. 1961), The Life of a Dead Tree, 2019.

Robert Rauschenberg’s Growing Painting, 1953 (see Figure 12), is an earlier example of art using living organic material to raise awareness for environmental processes. Growing Painting consisted of a frame containing dirt and living grass that he
watered to keep alive while it was on display. This piece was metaphorical and pragmatic, directly showing the need to take care of the natural environment. He described this work as being about “looking and caring,” reiterating the need to pay attention to environmental concerns. This piece sees humans as the caretakers and needing to protect and preserve our natural world. I believe it is successful in encouraging viewers to take deeper looks at their own relationship with how they care for the environment.

Figure 13. Robert Rauschenberg (American, 1925-2008), Growing Painting, 1953.
Kiyan Williams is a multidisciplinary artist who works directly with the soil, both for installation and performance pieces. They use soil in their work as a way to feel connected to nature and their ancestors. Williams’ piece *Reaching Towards Warmer Suns*, 2020 (see Figure 13), features hands extending from the bank of the Powhatan River (James River) in Virginia, one of the first places where enslaved Black people were brought in North America. The hands are eerily extended on long arm-like poles, reaching six feet into the air, and recall past trauma and appear to be begging the viewer to help them recover.

Williams’ views the process as a way to heal themself. They state, “the first time I touched the dirt I knew it was medicine… [it] also represent[s] the possibility for transformation, regeneration, to become something otherwise.”

Being connected to the Earth allows them to feel connected to themself and heal the generational trauma they have been subjected to. This act of using nature and ecological processes to heal reconnects the audience with the importance of place and being connected to the environment you live in. The land holds stories and using it to retell them holds a lot of power in discovering a deeply personal meaning.

The act of using organic materials serves a variety of purposes. Yet each piece in this section captures the intense connection between people and nature. Using natural materials satisfies the need for scientific knowledge, the urge to be caretakers of the environment, and the ability to connect with nature in order to heal. These artists bring together nature and social systems to foster a culture of learning and healing.

The artists I have discussed in this section illustrate just how far-reaching eco-art is. The techniques range from traditional paintings to conceptual installations. Each approach serves a different purpose, but all express a profound appreciation and concern for nature. This concern is what drives their art. They want us to empathize with these worries to encourage us to stop and appreciate nature, take action to protect the environment, and envision solutions to ensure the future of humanity. Aesthetics, dystopian themes, the desire for a better future, and organic mediums all come together to achieve this goal.
METHODOLOGY

The earliest form of printmaking traces back to between 206 BCE and 220 CE, during the Han Dynasty in China. These woodcut prints allowed images to be printed multiple times, both on paper and fabric, which is much faster than hand painting each image. Around 1440, the printing press was invented by Johannes Gutenberg in Germany. The invention of the press in conjunction with moveable type allowed for texts and images to be widely distributed. Printmaking has a long history of promoting scientific information. One example from the 1600s is Maria Sybilla Merian. She was one of the first women to utilize printing techniques to widely disseminate her scientific illustrations. By being diligent in her observation, she created highly detailed illustrations of plants and insects. Through her prints, she was able to teach her audience about the metamorphoses of caterpillars and the importance of the plants they consume.

Today, printmaking is used for a variety of commercial and fine art processes. Woodcuts are a type of relief printing that uses a reductive process. Images are carved onto sheets of various types of specialized plywood using various carving tools. My preference being shina plywood, a sustainably harvested Japanese wood. I carve my blocks using various V-gouge and U-gouge carving tools (see Figure 14). Areas that are carved out do not receive ink, which is rolled onto the block using a brayer. I use a printing press, rather than hand printing techniques, to pull my prints. I do this by laying the inked block on the press bed, placing a piece of paper on top of the block, and rolling the block through the press which transfers the image onto the paper. For this project, I used 30” by 20” shina plywood woodblocks, thai kozo paper, and oil-based ink. I carved and printed these in the Wyeth Family Studio Art Center.
Figure 15. Two V-gouge and four U-gouge carving tools. (Delaney Burns, 2022).
CRITICAL ANALYSIS

At the beginning of my bristlecone journey, I wanted to create images of these trees in a strictly representational way. I was drawn to the bark and the star patterns in the book *Dark Forests*, as mentioned in the introduction. I thought that I would be able to recreate these beautiful landscapes with a variety of mark-making techniques. However, this did not push me to the next step in my work. Professor Susan Groce very pointedly asked me what I was trying to accomplish with a landscape. What more could be said if these trees were viewed as strictly forms and patterns? Where would this take my work and how would it change the way I look at it?

I had experimented with abstraction before, but in a way where I was using natural images to explore patterns, not three-dimensional forms. However, as I was sketching and looking at the various forms of trees, I found it very freeing to not be held back by constructing a compelling landscape. Instead I was able to put all of my effort into creating space using only pattern to imply form. As I continued throughout the series, I used what I had learned from the previous print to make the next one stronger. I also continued to develop my linework, patterns, perspective, and sense of depth to keep the prints engaging throughout the series.

The first step in creating these prints began with compiling reference photographs. After finding the most spindly, ancient trees I could find, I would then place them into Photoshop. I began to play with reshaping the trees and melding the forms together. Once I had combined two or three images, I began to digitally trace the outline. Creating an outline allowed me to smooth out awkward transitions and to take artistic liberties. I could cut branches I didn’t like, or I could add them into places that were too empty. I
then printed out my sketches in nine sections to accommodate the large formatting. I would then transfer the image onto the block using graphite tracing paper. Once the image was transferred, I could begin carving. For me, carving is a healing, meditative process. Using only outlines of the form I hoped to achieve allowed me to get lost in the carving and follow my intuition.

My first print in this series is Bristlecone 1 (see Figure 15). This was my first time working with abstracted imagery, but it was also my first time working with such a large-scale format. Though intimidated by the size and how much carving I would need to do, I began to realize how freeing carving on a 30” by 20” woodblock was. I was able to make long, smooth strokes and extend over the block, rather than keeping a very intense control over my line-making. Carving at this scale with various sized tools was a defining shift in my art practice. For the first time I felt like I had found exactly what I needed to do. The moment I pulled my first print, I truly felt like an artist and I knew that I had to keep pursuing bristlecone pine trees.

While Bristlecone 1 was successful, I still needed to work on my sense of depth. While I did have layered branches, they did not extend into deep space. The tree appeared to be at surface level. My texture was strong, but there were areas that did not fall to the background because of the amount of line work that I had added. I had achieved a strong black ground by leaving large swaths of the block uncarved. However, I also needed to leave areas of black in the form itself to create more depth.
Figure 16. Delaney C. Burns (American, b.1999), *Bristlecone 1*, 2020, Woodcut.
This is exactly what I kept in mind when going into Bristlecone 2 (see Figure 16). For this print, I focused mainly on the sense of depth. I purposely chose a layout that included lots of branches to emphasize the sense of space. Wherever branches crossed each other, I amplified the depth by leaving stretches of black as shadows. I also made sure to create branches that extended back into the image through the use of foreshortening. This further pushed the sense of depth in this print. However, I don’t think this print is as strong on its own as Bristlecone 1 is. When it is shown with the entire series of bristlecone prints it works contextually but is lacking the same intensity as the others.
Figure 17. Delaney C. Burns (American, b.1999), *Bristlecone 2*, 2020, Woodcut.
With this in mind, I began carving *Bristlecone 3* (see Figure 17). I wanted this third print to stand strong on its own but continue to build upon what I had learned from carving *Bristlecone 1* and *Bristlecone 2*. I really pushed the branch that comes forward, again looking to create a sense of space through things that are close up compared to things in the distance, such as the skinny branch at the top middle. In addition to depth, I wanted to explore new mark making. While I still love carving the smooth, twisted lines, I realized that it was time to expand my vocabulary. I didn’t want to just create more of the same. So, I began to incorporate patterns resembling live bark into the trees as well. Whereas before I was focusing on the ancient, worn-down parts of the bristlecones, I began to look at the lively parts as well. This led to the active and textural qualities of *Bristlecone 3*. 
Figure 18. Delaney C. Burns (American, b. 1999), *Bristlecone 3*, 2021, Woodcut.
After carving *Bristlecone 3*, I broke my dominant wrist. This led to a temporary halt in the creation of bristlecone prints. However, after struggling through several uninspired monoprint series, I still found myself hung up on the ancient bristlecone pine trees. Determined not to let a small fracture hold me back, I began carving with my left hand. This led to a small-scale print, *Bristlecone 4* (see Figure 18), which was composed of two 8 inch by 10 inch woodblocks printed side by side. In addition to carving two blocks, I printed two layers—one red and one black—by flipping the orientation of the block. The red layer on top of the black creates a black-on-black pattern that subtly stands next to the red ink and white of the paper. While much smaller than my other prints, this print incorporated color to increase visual impact, rather than relying solely on size.

Figure 19. Delaney C. Burns (American, b.1999), *Bristlecone 4*, 2021, Woodcut.
The next semester I came back ready to create something that took yet another big jump forward. I decided to create a two-paneled print using large scale blocks. Overall, this became a 30 inch by 40 inch print. After carving these two panels and receiving very positive feedback, I thought, “Why stop here?” So, I decided to extend these two prints into a full tree, containing four more panels. This became *Pinus longaeva*.

*Pinus longaeva* (see Figure 19) stands 90 inches tall and 40 inches wide. This print considers pattern, depth, and linear perspective. In order to achieve the perspective I did, I spent hours sketching on newsprint in the hallways of Wyeth Studio. I drew my lines, would then step back and consider, then redraw the outline until it had the best perspective I could achieve. This was extremely important for this print because of the scale. If I did not achieve the correct perspective for the tree, then the print would not have held up. With this print I was also careful to consider a variety of patterns and how they would also change in perspective. I wanted the tree to appear as if it was leaning up and away from the viewer. I wanted viewers to be looking up into the tree canopy in awe. I believe that I was able to achieve this with the variety of mark making I used while carving in combination with the perspective of the tree. This print is what allowed me to fully develop my range of mark making abilities for this series, as I was able to create a variety of patterns. This allowed me to differentiate between areas with bark and areas without.
Figure 20. Delaney C. Burns (American, b.1999), *Pinus longaeva*, 2021, Woodcut.
*Pinus longaeva* has inspired another tree print of the same scale: A Northern white cedar tree, or *Thuja occidentalis*. This cedar print is a spinoff of my bristlecone series but focused on a tree that is native to Maine. Going forward, I have plans to continue to explore bristlecone pine trees in various new ways. Through the end of the semester, I will be creating a multi-color reduction print of a bristlecone pine, directly inspired by *The Lawrence Tree* by Georgia O’Keeffe. I connect to *The Lawrence Tree* because of O’Keeffe’s ability to use tree imagery to get her audience to consider their own relationship with nature, as discussed in the art review section.

When I think about my own art, I also find meaning in my deep appreciation and almost spiritual connection to nature. This in turn drives my concern for the state of the environment. I believe that our natural world needs to be protected and saved, and want to raise awareness through my art. However, I also want to be able to display my own reverence for nature. By exploring bristlecone pine trees, I am able to do both, through researching their scientific importance but also admiring their natural beauty. From this lens, I see my work aligning significantly with Georgia O’Keeffe, Eliot Porter, and Robert Rauschenberg.

I connect with Georgia O’Keeffe’s work because of the wonder she approaches nature with. This sense of wonder about seemingly ordinary things is what I hope to capture in my own work. Her painting *The Lawrence Tree*, calls to mind similarities to my own work. We both focus on the grandeur of the trees we are depicting and the sense of awe they often give. Instead of focusing on a strictly biological study of the bristlecone pine tree, I take artistic liberties to convey a deeper appreciation and meaning. Rather than depicting a tree in a way that is expected, I use a level of abstraction to draw in my
audience and encourage them to further evaluate the deeper meaning they can find within my prints.

I find similarities in Robert Rauschenberg’s *Growing Painting* because of how he asks his audience to care for the environment. This forces the owner of the “painting” to consider their role in taking care of the natural world. However, Rauschenberg fails to show that nature isn’t reliant on human caretaking. Whether or not humans are alive, other plant and animal species will persevere in some form. In my work I do want people to recognize their relationship to nature, but I also want them to realize that the environment will persevere even if humans do not. Bristlecone pine trees have been around for over 5,000 years. They very well may live on for more than another 5,000 years. Nature isn’t reliant on humanity, and though we should care for it, I want my work to express the resilience and strength of non-human species.

Like Eliot Porter, I want to bring attention to the details of nature. I focus on the colors and patterns and draw attention to the often-overlooked aspects of nature. I also use abstraction as a tool to aestheticize nature and ask the viewer to deeply consider the forms and shapes they are engaging with. However, artists who work with the American wilderness tradition have been critiqued for their lack of recognition of historical and political events and cultural biases. While Porter glorified nature, his work avoided directly addressing human impact on the landscape, the political ideologies around environmentalism, and the rising concern for the climate. Although he did directly support environmental causes, no crisis appears in his work. This raises questions about how effective such work can be in addressing these issues. This is something that I also
recognize in my own work. I portray the beautiful aspects of the environment to urge my audience to take action, but is that enough?

By looking at the categories of art that well-known professional artists operate within, I begin to find alignment with my own goals. I also ask how I will approach the topics in a way that effectively communicates something that I have to say. By analyzing the strengths and weaknesses of other artist’s in the context of their time, I begin to bolster my own work. With this insight, I will be exploring new themes and goals in my work going forward. I will be looking into how to directly communicate the pressing matter of climate change in my work.

Overall, my work aligns with the modernist aesthetic movement. I aestheticize bristlecone pine trees to express my connection to nature and appreciation for the environment. As discussed earlier, modernist aestheticized approaches to nature have their shortcomings. They often erase the experiences of people living through traumatic events that are related to nature or place. I want to address this in my own work. I can aestheticize my subjects, but I need to be intentional about how and why to avoid glossing over the true horrors of climate change. I am currently intentional with my desire to express the importance of bristlecone pine trees to the study of climate change but will consider new ways to demonstrate this more effectively.

One way I will do this is by continuing to exhibit my artwork. As of now, I have exhibited prints from this series in Lord Hall Gallery for the Annual Senior Capstone in 2020 and the Annual Student Shows in 2021 and 2022. I have also shown at the Bangor Arts Society Juried Show, as well as during Maine Impact week with the McGillicuddy’s Humanities Center. Having an audience to view my work creates an environment where
people can discuss my prints and the message they give. By hearing constant feedback from a diverse audience, I will be able to pinpoint how to effectively communicate the idea that art and science are intertwined, and that art is vital to helping us form an emotional connection to science.

This emotional connection to science is what I truly want to foster. Eveline Kolijn is a Dutch Canadian printmaker and sculptor who finds this same thread in her art. She states, “Science sets out to reveal and explain our reality, whereas art comments and makes connections that don’t need to be tested by rigorous protocols…Allowing room for both in the quest to understand our world will lead to an enriched experience.” This idea that art takes science and makes it accessible and more human is exactly what I want my work to convey. I want these trees to strike a sense of awe in the viewer and allow them to form a bond with nature. My goal is that this bond will drive them to consider the future of our environment in the face of a climate crisis. In this way I see art and science as completely intertwined. I don’t believe that you can ever separate the two and will continue to express this through my art.
BIBLIOGRAPHY


4. Trouet, Tree Story, 35.


6. Trouet, Tree Story, 35.


10. Trouet, Tree Story, 37.


AUTHOR’S BIOGRAPHY

Delaney Burns was born in Easton, Maryland in 1999. She relocated with her family to Gorham, Maine in 2004 where they have lived since. While pursuing a dual degree in Marketing and Studio Art (with a concentration in printmaking), Burns also took on minors in Art History and Graphic Design. She is a member of Phi Beta Kappa, Beta Gamma Sigma, and Phi Kappa Phi. Burns was also a recipient of a Maine Top Scholar Award, McGillicuddy’s Humanities Center Fellowship, a Center for Undergraduate Research (CUGR) Award, two Vincent A. Hartgen Travel Awards, an Elizabeth Graves Fine Arts Award, and a Charlie Slavin Research Grant.

While a student at the University of Maine, she also worked for the Maine Campus as the Production Manager and at Zillman Art Museum as the Curatorial Intern. After graduation Burns intends on spending the summer at her camp in Monson, Maine where she will hike, swim, and spend time with her family and dogs. In the fall, Burns intends on pursuing an MFA in Print Media and Photography at Boston University.