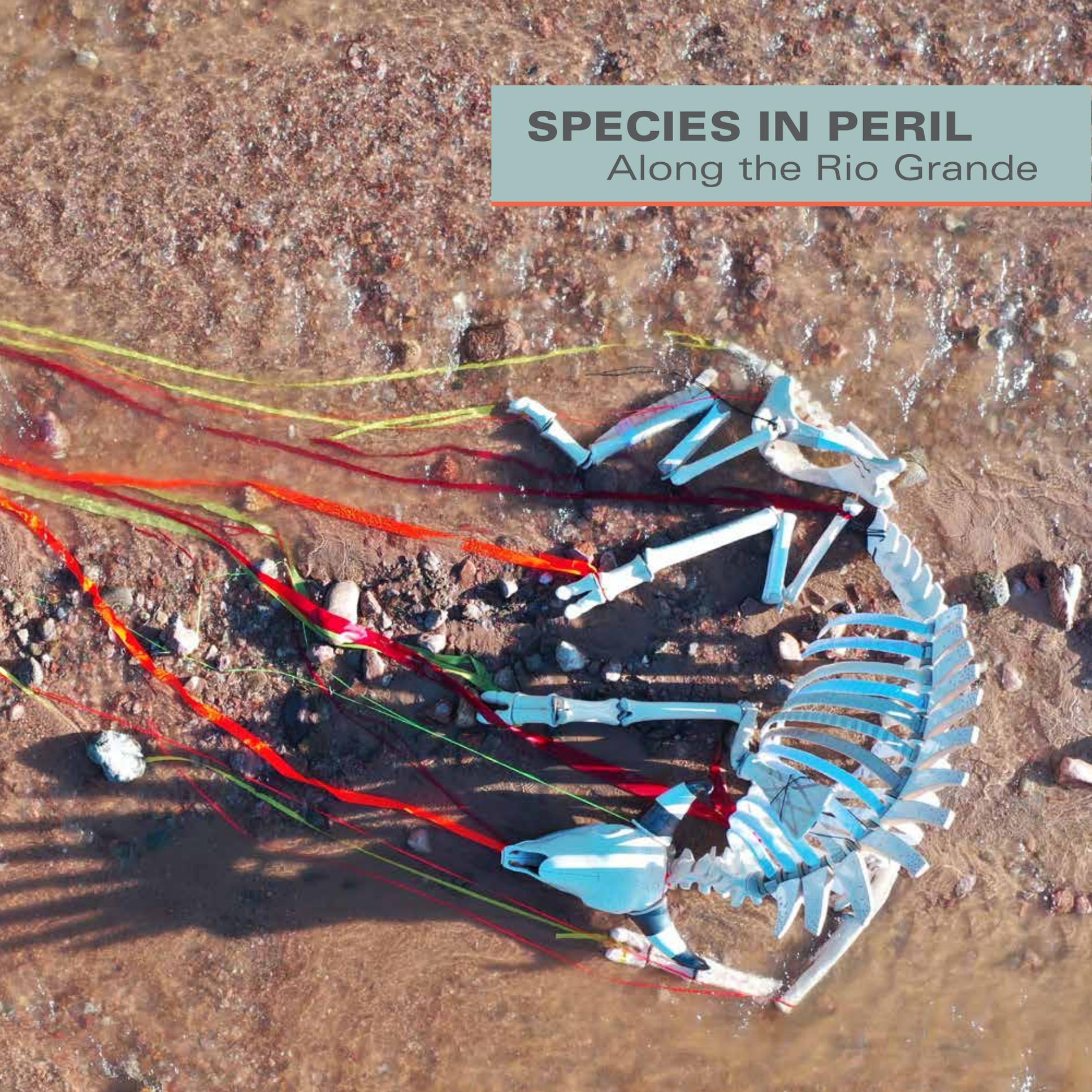


SPECIES IN PERIL

Along the Rio Grande



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EXHIBITION CATALOG

SPECIES IN PERIL

Along the Rio Grande

Curated by Josie Lopez, PhD & Subhankar Banerjee

September 28 – December 28, 2019

516 ARTS Contemporary Museum | Albuquerque, New Mexico

Regional collaboration | Fall 2019

Colorado, New Mexico, Texas, Mexico



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Land Acknowledgement of the Rio Grande/Río Bravo del Norte

Rosie Thunderchief, Roger Fragua & Brophy Toledo

We begin this exhibition, *Species in Peril Along the Rio Grande*, by opening space for meaningful discussion about the current environmental crisis and immediate need for human action. As we take this necessary step toward global and inner climate change, we acknowledge, along with the rooted, winged, finned, and four-legged beings, that we as “earth peoples” cohabitate the lands of the Southwest and share natural resources in a gentle and loving manner. We acknowledge that we can always do more and better. In this regional arts collaboration, we respectfully acknowledge that all lands (including the Rio Grande/Río Bravo del Norte watershed) are ancestral lands of countless but not nameless Indigenous nations, pueblos, communities, families, and individuals. We acknowledge that Mother Earth knows no borders. We recognize that our destiny as earthlings is shared. May this exhibit be a voice for those whose nonhuman voices should be heard. We offer our respects and acknowledgments to the Pueblo nations currently surrounding Albuquerque, New Mexico, as stewards of these lands since time immemorial: the Pueblo of Isleta, the Pueblo of Sandia, the Pueblo of Santa Ana, the Pueblo of Laguna, the Pueblo of Acoma “Sky City,” the Pueblo of Zia, and those who made the ultimate sacrifice. We offer our respects and acknowledgments to all past and present Native nations, pueblos, villages, and communities along the Rio Grande/Río Bravo del Norte watershed and the Indigenous ancestors of the artists, collaborators, and supporters who hold lineage to:

Ancestral Puebloan; Clovis; Folsom; Pecos; Oshara; Cochise; Mogollon; Mimbres; Anasazi; Chacoan; Pecos; Piru (Piro); Tompiro; Jumano; Tiwa (Tigua); Tewa; Towa; Keresan; Zuni; Hopi; including but not limited to villages at Mesa Verde, Chaco Canyon, Taos, Picuris, Ohkay Owingeh (San Juan), Santa Clara, San Ildefonso, Nambé, Pojoaque, Tesuque, Walatowa (Jemez), Bandelier, Cochiti, Kewa (Santo Domingo), San Felipe, Zia, Tamaya (Santa Ana), Zuni, H’aaku (Acoma Sky City), Laguna, Sandia, Arenal, Tijeras, San Antonio, Carnué, Isleta, Gran Quivera, Ysleta del Sur, La Junta, and more; Arapaho; Cheyenne; Pawnee; Paiute; Ute; Southern Ute; Ute Mountain; Diné; Navajo Nation; Ramah; To’Hajiilee (Canoncito); Ndee (Apache); Jicarilla; Nit’ahe (Mescalero); Chiricahua (Fort Sill); Bidánku; Lipan; Jocomes; Comanche; Kiowa; Tanoan; Aztecas; Norteños; Conchos; Abriaches; Otomoacas; Nahuatl; Hokan; Coahuiltecan (Tejano); Alazapas; Cuanales; Gualaguas; Comecrudo; Carrizo; Tamaulipas; Tonkawa; Tarahumara (Raramuri); Tepehuanes; Varohío (Guarojío); Tobosos; Janos; Juanos; Sumanos; Pescados; Mansos; Chinarras; Huauchichiles; Irritilas; Rayados; Tlaxaltec; Mazahua, Mixteco, Zapoteco, Pima, Chinanteco, Otomí; Yaquí; Colhua (Culhuacan); Toltec; Olmec; Mexica; Genizaro; Mestiza; Chicanx; Mandan; Hidatsa; Arikara; Lakota; Ho-Chunk; and all descendants of Indigenous peoples of the Americas. *Please note: this list is designed to be inclusive; any mistake or omission is entirely the fault of the authors.*

Rosie Thunderchief works as the Ancestral Lands Tribal VISTA at Valle de Oro National Wildlife Refuge. She is Navajo (Diné, Pawnee, Arapaho & Cheyenne, Ho-Chunk, and Lakota). **Roger Fragua**, from Jemez Pueblo, is a farmer, Director of Flower Hill Institute, and principal of Cota Holdings. **Brophy Toledo** is a cultural leader from Jemez Pueblo. Fragua and Toledo are both principals of Bear Paw Tourism.

“Science needs to stay objective, yet to bring our full selves into the scary future that is being revealed by climate science, we need emotions, connections, community, and creativity. If we don’t carve out spaces for diverse spiritual and aesthetic values, we lose sight of why we need to be environmental stewards. The Earth is home and we are the ancestors of the future.”

—Nina Elder, Artist

Preface

Suzanne Sbarge

Executive Director, 516 ARTS

Species in Peril Along the Rio Grande: Contemporary Artists Respond, cocurated by Josie Lopez, PhD, and Subhankar Banerjee, features commissioned and existing artworks by 23 artists based in our region, highlighting perspectives on species undergoing die-offs, disruptions, and population declines within the Rio Grande watershed. Through the eyes of contemporary artists, the show raises ethical and cultural questions about human impact on the natural world. It is accompanied by a series of programs with 42 partners throughout the interstate, cross-border region of the Rio Grande, including art exhibitions, murals, speakers, workshops, performances, and outdoor activities, all designed to engage participants in a process of learning, dialogue, and creative thinking about the environmental issues that affect us all.

When we approach new projects at 516 ARTS, we ask, “Why here, why now?” We are always listening to find out what feels most pressing to people in the community and what among those themes can serve as connective tissue for bringing people together around art. During my 13 years of directing 516 ARTS in its current incarnation, the top recurring themes have been our environment and the nearby international border. We look at where we are on this planet, in this particular place and time, and that brings us to the river—the lifeblood of our place in the desert.

Throughout the process of organizing *Species in Peril Along the Rio Grande*, my mantra has been “How does the river connect us?” This simple question has helped to guide the process of exploring how the water, microbes, plants, animals, and the river itself all connect us to the vast issue of the global biological crisis. It is our hope that our approach of bringing together artists, scientists, historians, and environmentalists will serve as a model for regional collaborations around the global environmental issues that can seem overwhelming. Focusing on the life, death, and struggles taking place before our very eyes is the place to start.

In this time when our governments are clearly not bringing us together across borders, the role of cultural and educational organizations and institutions is essential in making this work happen. Through an open process of invitations, calls, meetings around the region, networking, and collaboration, we have forged an intercity, cross-border partnership with four cities at its core: Albuquerque, Las Cruces, El Paso, and Ciudad Juárez. 516 ARTS, as an independent organization, also has the freedom and agility to bring state university programs together to make a bigger impact. The Art & Ecology Program at the University of New Mexico (UNM), the University Art Museum at New Mexico State University (NMSU), the Rubin Center for the Visual Arts at the University of Texas at El Paso (UTEP), Universidad Autónoma de Ciudad Juárez (UACJ), and Museo de Arte de Ciudad Juárez are now connected in a new way, and we look forward to continuing to strengthen cross-border arts programming and activism in the years to come.

My last mantra of this preface is “We’re all in this together.” As we look to the future of life on Earth, and in our region, I believe we need to focus our energies on creative problem-solving for all beings and the planet as a living organism. Human exceptionalism has brought us to this moment on the brink, and now it is essential that we think about our collective survival across borders and across species, both human and nonhuman.

EXHIBITION





Connecting Culture, History, Art and Species Along the Rio Grande

Josie Lopez, PhD

The Rio Grande is a border between two countries, a series of ecosystems, and a lifeline. The river's headwaters are located in the San Juan Mountains of Colorado. It is the fourth-longest river in the United States and flows for 1,885 miles until it runs into the Gulf of Mexico.

The Rio Grande is a primary water source for humans as well as birds, mammals, reptiles, amphibians, and about 40 native fish species. Many of these species can only be found in this region, including the silvery minnow and the Rio Grande blue catfish. There are many native plant species and an entire biome of invisible life-forms sustained by the river. *Species in Peril Along the Rio Grande* is a collaboration across disciplines, organizations, and state and national borders. This exhibition is the impetus for exploring how artists can ultimately engage with one of the most pressing crises of our time—loss of species. The artists and their works are diverse, and they employ a vast array of approaches, techniques, and forms of creativity as they look to the often-overlooked plants and animals of our region.

A key thread that runs through the exhibition is a larger sense of interconnectedness. Species, habitats, and human behavior are now thought of as inextricably linked. As many of the works in this exhibition demonstrate, species loss has a profound impact on cultural, political, and historical developments over time. Paying attention to the biological and cultural connections between the living worlds of plants, animals, and humans is imperative to the survival of species in our region.

Several artists in the exhibition chose to explore the topic of the river and species living in the region through a broad, larger-scale lens. **Cannupa Hanska Luger's** *(Be)Longing* is a ceramic and steel sculpture of a buffalo, a species that was nearly killed off by the beginning of the 1900s. A series of videos shows the large sculpture submerged in the waters of the Rio Grande to metaphorically expose that the river's waters were and are tainted. Ancestral lands, plants, and peoples were decimated as the buffalo were ruthlessly slaughtered. Luger raises an important question: "How does losing one species a hundred years ago have lasting effects in the 21st century?" The constructed skeletal remains are an imposing physical artifact that is historically and culturally specific. It represents an acknowledgment of the past as well as a warning for the future. According to Luger, "through installation, sculpture and performative video, the piece implores audiences not to wait another hundred years to protect the next species in peril."

Ruben Olguin's *Evaporation* is a mud mural representation of endangered and threatened species along the Rio Grande. The artist uses clay and earth pigments collected in the Rio Grande Valley to depict the expanse of the river and the silhouettes of over 150 endangered species, including crustaceans, mollusks, fish, amphibians, reptiles, birds, mammals, and plants. As the harvested clay dries on the wall, the work echoes the cracking dry earth the river cuts through. Olguin's work invites viewers to reflect on the fragility of the river's inhabitants as well as the scarcity of water, climate change, and pollution.

Opposite:
Michael Berman
Binary Codex - The Habitat
2019
Carbon Pigment on Kozo Washi

Armed with his camera, **Michael P. Berman** explored and photographed the river from South Padre Island, Texas, to the headwaters in Colorado. Berman writes, "I drove the entire river. Top to bottom. Ain't no river left in the river. The peril of these species is all about lost habitat. I did not find a single place where the ecosystem along the river had not been radically shifted by people." In his photographs, Berman captures the beauty of the river but also the devastating traces of human impact on the natural world.

Marisa Demarco, Dylan McLaughlin, and Jessica Zeglin also consider the river itself as the subject for their collaboration *There Must Be Other Names for the River*, which includes six singers who reflect on historical river flow data through song. Their performance takes into account that the river became dry for miles in 2018. The singers physically and spatially convey the history of the flow of water while also projecting the future of the river.

Other artists focus their work more specifically on plant and animal species that are endangered. **laura c carlson**'s installation includes a cement memorial honoring freshwater mussels, drawings of five species of mussels, and a zine telling the stories of mussels threatened by oil extraction. carlson explored the Pecos River from its deposit into the Rio Grande through the Permian Basin and up to its headwaters. carlson states, "As far as my research has taken me, there are no mussels left in the Pecos River. This river is being actively destroyed due to new and intense oil extraction in the Permian Basin. The Pecos is polluted, saline, dammed, and lacks a strong riparian zone—all issues that mussels are extremely sensitive to." Together, these works expose how one of North America's most endangered animals will disappear without direct action toward reversing how the Pecos River is currently used.

c marquez's installation reflects on both flora and fauna as they use seedpods and stems of the tall tumbled mustard plant to re-create the nests of the New Mexico meadow jumping mouse. marquez's nests employ tension and gravity as the only forms of attachment. There are 29 circles, representing the 29 surviving populations of the New Mexico meadow jumping mouse. In June 2014, the species was listed as endangered, and it was forecast that it would reach extinction in 10 years (521 weeks). According to marquez, "521 embodies this extinction timeline. It opens with all the nests on the wall, then releases over half of the nests during the runtime of the exhibition, reflecting the experience of steady loss." The



Nicasio Romero
Bolas y Nido
2019
Willow, straw, wire, clay

installation grapples with the painful process of witnessing a species die off over time, but it also invites reflection through light, ephemeral materials that remind us of both the fragility and beauty of the natural world around us.

Nicasio Romero also engages with the form of the nest in his installation, which looks to endangered bird species in and around Ribera, New Mexico. According to Romero, "the installation is a metaphor of a nest—a 'nido,' or sanctuary, for both migrating and resident birds." The nests represent the strength and resilience of birds but also point to recent die-offs that signal an urgent need to raise awareness.

Suzi Davidoff considers the relationship between birds, flora, and their habitat as she geographically contextualizes the northern aplomado falcon, which depends on native Texas grasses. She also depicts the Sacramento Mountains thistle found in Otero County, New Mexico, and the shootingstar geranium. The plant and animal species appear as shadow images cast over maps, demonstrating how the living world does not conform to human boundaries. These works also reveal that human behavior is the primary cause of species loss due to overgrazing, water usage, and habitat loss.

Since the early 1800s, invasive species have been present in and around the Rio Grande. **Jessica Gross** turns her attention to rats, which are an invasive species that live in the region. She draws parallels between humans and rats, connecting the history of invasion and colonization with current threats to natural habitats. According to Gross, "we are remarkably similar—they share our ability to adapt to and thrive in widely varying environments and, like us, have competed with indigenous species for resources, driving out those that are highly specialized to their environments. Someday, humans and rats may be the only animals here."

Artist **Mary Tsiongas** and Valle de Oro National Wildlife Manager **Jennifer Owen-White** tell the story of the silvery minnow through poetry and research. Collaborating with local experts on the ecology of the silvery minnow, they gathered data and used it to inform the video and digital still imagery that conveys the fight for survival that the minnow has faced in recent decades. The minnow points to the long history of contentious relationships forged by water management. Farmers, municipalities, pueblos, states, and even countries have fought over water rights for centuries, and the protection of a small fish has shed light on the need to take species and habitat into account.

Nina Elder's *Interrupted Ecosystems* examines the near extinction of the beaver and the catastrophic loss of 80% of the two-needle piñon in New Mexico. According to Elder, "solastalgia is a premonition of longing for the present moment from an anticipated future. It is cherishing the places we live as we know them now. Solastalgia uniquely describes a triangle between place, time, and emotion. These drawings explore a solastalgic response to ecosystem collapse by translating information about ecosystem disruption into visual voids and inversions. These drawings ask: What is being erased? What is being turned upside down? What will remain? As dominant human culture is expressed through extraction, consumption, and waste, what are we going to remember? What will haunt us?"

Kaitlin Bryson and Hollis Moore's work directly incorporates the natural materials produced by the cottonwood tree, using cottonwood paper embedded with native seeds. *Its Vitality Comes Through Fluctuation* examines the importance of cottonwood trees in the Middle Rio Grande Bosque. Cottonwoods grow when flooding occurs along the river, allowing for the successful germination of seeds. This process has become increasingly rare since 1941, resulting in fewer cottonwoods along the Rio Grande. Human

interventions and decreased levels of water have changed the natural flooding cycles of the river and will ultimately change the entire ecosystem, resulting in species migration and loss. Similar to c marquez’s installation, the cottonwood paper will change throughout the duration of the exhibition, revealing concepts of loss over time.

Agnes Chavez’s interactive installation, *BIOTA*, invites viewers to explore microbial species of the region through various technologies, from satellite remote sensing data to DNA sequencing. By making the invisible world of microbes visible, *BIOTA* raises an awareness of a world that is often unknown because it is not seen. Chavez collected and investigated data and imagery utilizing these new methods of scientific exploration in collaboration with local environmental organizations and scientists. According to Chavez, they “identified and collected DNA strands of a water sample from the Rio Fernando at the Taos Land Trust, revealing thousands of species that form the microbiome of the river. This bio-data was used to simulate an algorithmic ‘life-form’ growing in real time in response to changing environmental factors to visualize the delicate symbiotic relationship of this species in peril.”

This art installation reveals the complex scientific approach necessary to study microscopic life-forms, but it also makes visible a whole world of activity and beauty that is as integral to the ecosystem as the mammals, birds, mollusks, and plants represented in the exhibition. In some ways, the smallest life-forms reveal most emphatically that there is much work to be done to understand how interconnected the seen and unseen living world is.

Several artists in *Species in Peril Along the Rio Grande* grapple with the impact of the barriers built between Mexico and the United States. The barriers are not only the manufactured physical structures supposedly built to keep people out of the United States, they are also the historical, cultural, and racial barriers that promote the current environment of hate that allows a nation to ignore and imprison the weakest among us. The living world, both human and nonhuman, along the border continues to be devastated by systems and individuals that choose to ignore the interdependence of land, culture, the environment, and people.

Zeke Peña’s *The River* and *All Against the Wall* depict the river as a habitat and also bring attention to specific species and human interactions. *The River* illustrates a historical timeline, taking into account colonization and the development of an international border between Mexico and the United States. It is a chronicle of the people who have survived on the river for thousands of years. *All Against the Wall* features several species that are impacted by the continued development of border infrastructure, including the tortoise. The overall narrative of Peña’s work provides a glimpse into what the international river community once was and the urgency for humans to come together and fight to preserve the region’s biodiversity as well as its culture.

Catalina Delgado-Trunk incorporates the sacred and the profane as she connects the history and the mythology of Mexico through the jaguar, which is an endangered species today. According to Delgado-Trunk, “jaguars are at the center of many ecological and mythological Mexican narratives and are believed to possess a powerful and generative force in the traditional spiritual realm. Tezcatlipoca is one of the central deities in the Mexican pantheon, along with his three brothers. His sacred spirit animal is the jaguar (ocelotl), and he is brother and arch-rival to Quetzalcoatl, whose sacred spirit animal is the eagle (cuauhtli). Tezcatlipoca and Quetzalcoatl, the jaguar and the eagle, are opposite forces involved in the

creation of our current world and the sun. While the eagle is connected with the bright sun and the day, the jaguar becomes the lord of the night and the ruler of the moon; the spots on the fur represent the stars.”

Jaque Fragua depicts the Mexican gray wolf, the jaguar, and the ocelot in official-looking signs that speak for the voiceless. Official signs serve the purpose of directing people’s behavior, conveying the rules of society, and demanding attention. Fragua’s signs demand that we pay attention to the animals that are being impacted by the cordoning off of the border region. Fragua states, “Our natural environment is at odds with modernization, industrialization, globalism, and colonization. Our lifestyles do not respect the life of the land, water, or air. Our endangered relatives, the plants and animals that share this home with us, need our attention and care more than ever.”

Marcia I. Santos’s *Affective Cartography* is an illustrated map of the borderlands surrounding Ciudad Juárez and El Paso. The map was produced in conjunction with a collaboration that arose from a class seminar, Desert.Art.Archive. The maplike diagram was devised to represent the collective imagination—historical, social, and aesthetic—that exists across the landscape, in contact with the topography and surrounding plains, hills, flora, and fauna. The map also brings attention to the impacts of resource management, environmental policies, and the limits of both countries.

Janette Terrazas is a fiber artist who has realized many projects addressing issues such as the oppression of women and social injustices as they relate specifically to the border region. She often looks to the impacts of capitalism and industrialization as well as the responses to these conditions as they influence border identity. The tendency to reuse materials, for example, is common along the border. Terrazas’s use of electronic components references the 669 factories in the area. Using circuits and interactive maps, she brings attention to the ocelot, cacti, and birds of the region. She also explores botanical colors. Terrazas notes, “In this practice, I have found more than one hundred color ranges, so I realize that the colors of the plants are a gift of our mother’s sacred technology; those techniques were used by pre-Hispanic cultures, by our ancestors.”

Daisy Quezada’s project embraces concepts of land and community as a way to connect with the natural world. Participating communities include Tewa Women United, Cochiti Pueblo, and Museo Regional del Valle de Juárez. The process of collaboration included engaging community members in conversations about flora and fauna. As part of the interview process, contributors each shared an article of clothing representing their regional understanding. Using an alternative firing process, Quezada transformed the articles into sculptural seeds, shaping the material into almond forms. According to Quezada, “this process is a way to share awareness of the interwoven aspects of place, history, physiology, and people; how relational characteristics of a place are all a part of this natural fabric.” The transcribed conversations, as well as images of the seed sculptures, are included in a small printed publication that will be distributed back to the communities along with the sculptures.

Each of the participating artists in *Species in Peril Along the Rio Grande* directly addresses a specific region and the species that live in that region. While bringing awareness to the dire challenges that the living world faces, the artists also reveal the intense interconnectivity that spans geography, time, and sociopolitical systems. Understanding these connections is an important step that has compelled these artists to speak up, act against, and challenge current structures that if left unchecked will continue to result in unprecedented loss of species.

Josie Lopez is Curator of Art at the Albuquerque Museum and formerly served as Curator at 516 ARTS. She received her BA in history and MA in teaching from Brown University. She also holds an MA in art history from the University of New Mexico and a PhD in art history from the University of California, Berkeley. Her 2013 publication “Picasso and the Forgotten War” appears in *Picasso and the Politics of Visual Representation: War and Peace in the Era of the Cold War and Since*, edited by Jonathon Harris, Liverpool University Press. She wrote *The Carved Line: Block Printmaking in New Mexico* and curated the accompanying exhibition at the Albuquerque Museum. Her research interests include examining art as a discursive agent in the political arena, modern and contemporary Latin American art, 19th-century France and Mexico, and the history of New Mexican art.

MICHAEL P. BERMAN
Silver City, New Mexico

"I drove the entire river. Top to bottom. Ain't no river left in the river. The peril of these species is all about lost habitat. We have remade the river; if we cannot get at it, farm it, ranch it, we take the water and set it channels, dams, and pipes. I did not find a single place where the ecosystem along the river had not been radically shifted by people."



The Rio Grande is the fourth-longest river in the United States and the main artery in the region, carrying water and life through the seasons, and constant flow toward the ocean. If the Rio Grande suffers, so will all those for whom it represents an ecological, cultural, and economic (re)source. The Rio Grande is under a lot of pressure. An average 95% of its annual flow is claimed for municipal and agricultural uses. Only five out of every hundred drops of water are left in the river to flow downstream. All of this missing water affects the ecosystem of the river itself as well as its surroundings and the species that depends on them. In addition, the Rio Grande is the spine of an ecological and geographical area that is highly sensitive to climate change. The U.S. Bureau of Reclamation estimates that the Upper Rio Grande watershed will collect 30% less water by the end of the century, as annual snowpacks shrink and evaporation rates increase.

Above: *Habitat/Binary Codex/Detail*
2019
Carbon pigment on kozo washi

Right: *Donna/Rio Bravo International Bridge*
2019
Carbon pigment on kozo washi



**KAITLIN BRYSON
& HOLLIS MOORE**

Albuquerque, New Mexico

“Our work asks, How is loss felt? What will be left in this wake? Through interspecies collaboration, we address these questions on handmade cottonwood paper embedded with native seeds. Each embroidered stitch is a step, creating a labyrinth of native animal tracks; their literal impacts pressed into the soil. As the cottonwood paper decays and grows, the marks of these animals will be left on the soil and consumed by future flora. This work will change throughout the duration of the exhibition, imagining what might become of this loss.”



Cottonwood trees make the early summers along the Rio Grande—when their fluffy, soft seeds are dispersed—look as if an out-of-season storm left an inch of white snow on the ground; yet almost none of those seeds will generate new trees. A cottonwood tree has a life expectancy of 80 to 100 years. The trees that constitute the Rio Grande Bosque were seeded many decades ago, before dams were built to avoid flooding and to support the expanding town of Albuquerque after the flood of 1941. The cottonwoods need flooding to allow seedlings to grow into mature trees. Now they are nearing the end of their lives, and due to the controlled flow, the river has not created new habitats for them. There is not a new generation to take their place.

Its Vitality Comes Through Fluctuation
(details)

2019

Handmade cottonwood paper, native seeds, naturally dyed fibers, natural ink, grow lights, and pine

laura c carlson
Albuquerque, New Mexico

“Together, these works create an installation devoted to the past and future of North America’s most endangered family of animal, the freshwater mussel. Today, only one of New Mexico’s eight native species remains, the Texas hornshell (*Popenaias popeii*). This ecosystem engineer filters 10–15 gallons of water a day and lives over 20 years. In a bed of 1,000 Texas hornshells, that’s 109,500,000 gallons of water filtered. If a mussel can’t survive in your river, you can’t live off that river.”



Freshwater mussels live on the bottom of rivers, often unseen and underappreciated by humans. Yet North America has the highest diversity of freshwater mussels in the world, with a huge variety of shell shapes and adornments. They are among the longest-living invertebrates, some surviving as long as 100 years. They rarely move, getting their nourishment by filtering water for microscopic food particles. Freshwater mussels represent North America’s most endangered family of animals. 70% of mussels in North America are extinct or imperiled, compared to 16.5% of mammalian species and 14.6% of bird species. Water pollution has heavily affected these clean-water-loving animals, and dams have deteriorated water quality and separated mussels from the host fish on which their reproduction depends. Thirty-five species have already been declared extinct, and more are disappearing. Mussels serve a key function in the world of cleaning the water.

Lotic Possibilities I-V (Popenaias popeii, Fusconaia mitchelli, Truncilla cognata, Quadrula couchiana, Potamilus metnecktayi)

(detail)

2019

Glass

Popenaias popeii Stratigraphy: looking forward to see back

(detail)

2019

Concrete, travertine, water from the Black River



AGNES CHAVEZ

Taos, New Mexico

"*BIOTA* is a data visualization installation that explores biodiversity loss through the micro/macro lens of new sensing technologies. From DNA sequencing to satellite remote sensing to microalgae production, I investigate data and imagery from these new methods of scientific exploration. Through *BIOTA*, I hope to instill empathy for the invisible world of microbial species while raising awareness of the fascinating new science and technology that allow us to finally 'see' microbial species and understand the important role they play—and how they too are in peril."

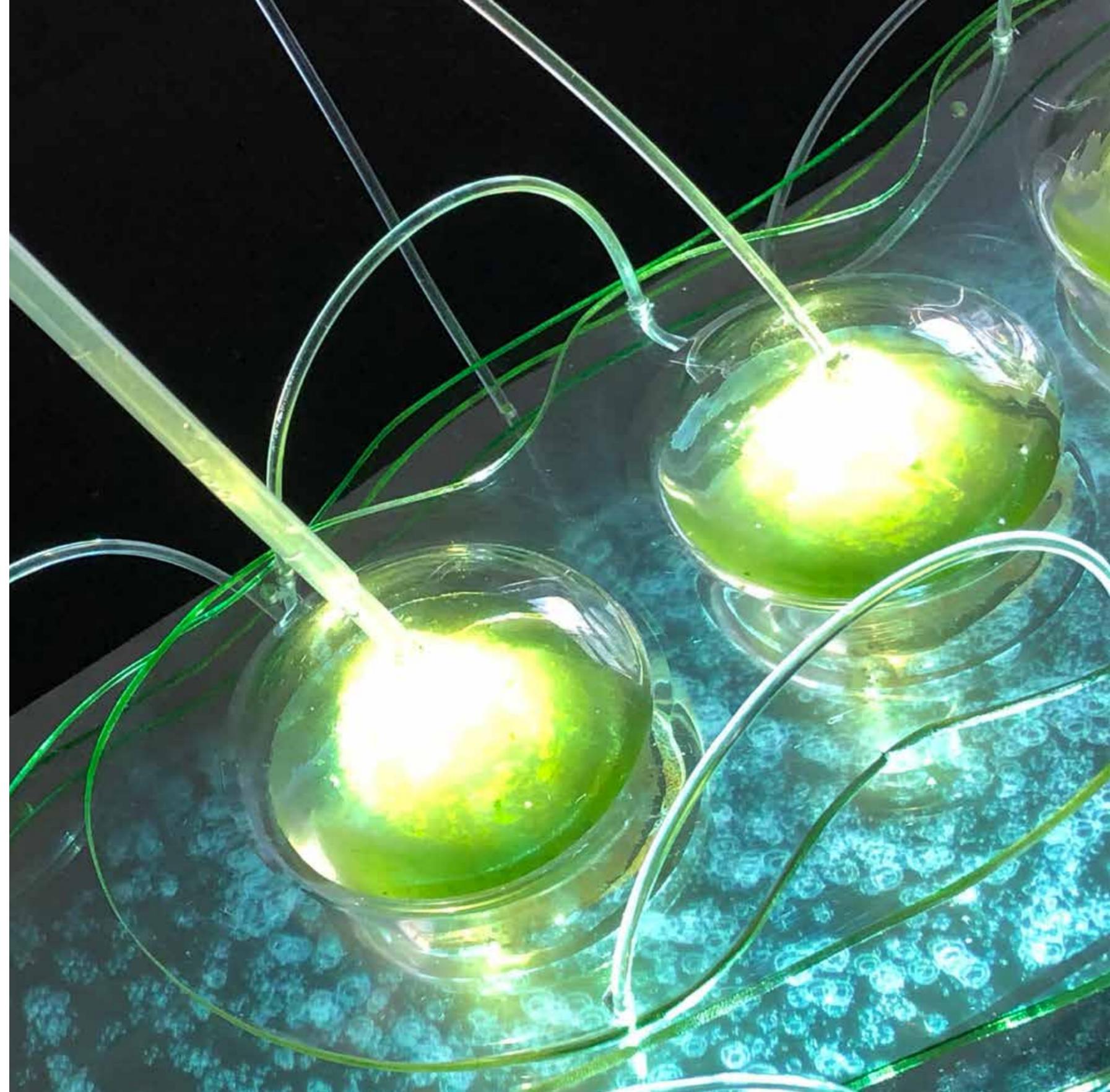
Microorganisms are present everywhere in water ecosystems, extremely abundant and diverse. Invisible to the human eye, they play a major role in regulating aquatic environments—in particular, changing the chemical balance of elements—and serve as a source of food at the base of ecosystem chains. Human activities impact heavily on aquatic ecosystems: especially damaging are household and industrial wastes and changes to the chemical balance as a consequence of agricultural practices. Due to their small size and rapid proliferation rates, microbes respond readily to anthropogenic pollution, resulting in changes in microbial diversity. These species embody ways to understand the effect of human activities in an aquatic ecosystem.



BIOTA
(details)
2019
Projection, copolyester, fiber optics, galvanized metal, microalgae

Collaborators:

Marcel Schwittlick, artist/coder
Cristina Vesbach, Museum of Southwestern Biology,
DNA sequencing
Mr. DNA, DNA sequencing
Luke Spangenburg, Santa Fe Community College Trade and
Technology Center, algae samples
Shannon Romeling/Amigos Bravos, advisor
Rich Schrader/River Source, advisor
Katie Bryant, Upward Bound Math & Science, advisor
Taos Land Trust staff, advisors
Screen Solutions International, sponsor/advisor
Cisneros Sheet Metal, sponsor/advisor
Viola Arduini, Advisor
CERN Data Center, copolyester fiber optic form development,
Fluidic Data



SUZI DAVIDOFF

El Paso, Texas

4. SIMPLIFIED WORLD/APLOMADA FALCON and GRASSES 2017

The Simplified World map is a "clear presentation of a limited number of concepts and a unified view of the world" (Smith). The main image, the Northern Aplomada Falcon, is endangered in Texas and Northern Mexico (US Fish and Wildlife Service Endangered Species -- 1986-present). Severe overgrazing by domestic livestock and resultant brush encroachment in the Southwest, including Texas, has been most frequently implicated as the principal cause for the species' decline, according to the Texas Parks and Wildlife Department (TPWD). The shadow images are native Texas grasses, which provide habitat for the falcons and other birds and mammals.

Right: *Simplified World/Aplomada Falcon and Grasses*

2017

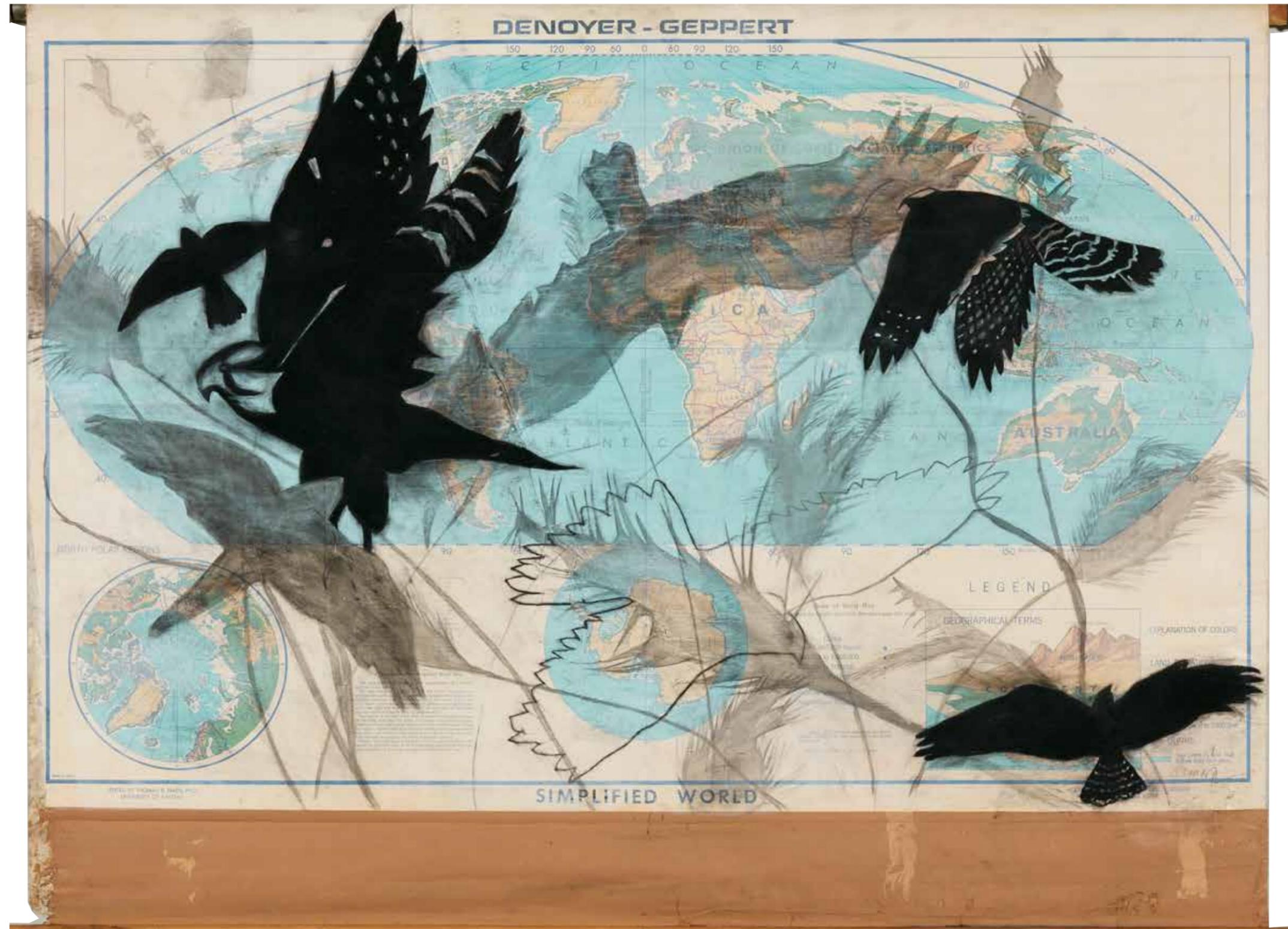
Charcoal, gesso, map

Above: *Simplified World/Aplomada Falcon and Grasses*

2017

Excerpt from *Field Notes*

Northern Aplomado falcons hunt together as pairs or in family groups, working collectively to pursue their prey. It was once common to see pairs flying in big circles over dry grasslands in New Mexico and southeastern Texas, but the last known wild breeding pair of aplomado falcons in the United States was seen in New Mexico in 1952. Despite their rarity in the U.S., this bird's global range extends all the way south to Tierra del Fuego, Argentina. The aplomado falcon was placed on the endangered species list in 1986 and is the last falcon in the U.S. currently on the list. Today, there are only 33 pairs of aplomado falcons in the U.S., reintroduced in Texas through an extensive breeding program. Many elements contributed to the decline of the northern aplomado falcon, including fire suppression efforts, intense overgrazing, agricultural development, and pesticide use, particularly DDT.



CATALINA DELGADO-TRUNK
Albuquerque, New Mexico

"And now we pass this commission on to our sons and daughters. Never forget to teach your children how magnificent the rise of our new sun will be."

—*"Last Mandate of Cuauhtemotzin" by Eagle That Descends*

"The point of departure for my designs are the mythical, spiritual, and religious images and symbols, as well as the social archetypes and aesthetics, of my homeland, Mexico. I blend pre-Columbian with European, contemporary, ethnic, and popular folk manifestations in my artwork. Through my art, I return to my ancestors' belief that humans are a point of contact between the material and spiritual, between life and death, between light and darkness, as well as between the divine, the sublime, and the profane."



Above: *Axis Mundi*
2014
Cutout on archival Japanese Leathac grain paper



Right: *Fauna Mesoamericana*
(detail)
2017
Cutout on archival Japanese Leathac grain paper with collage

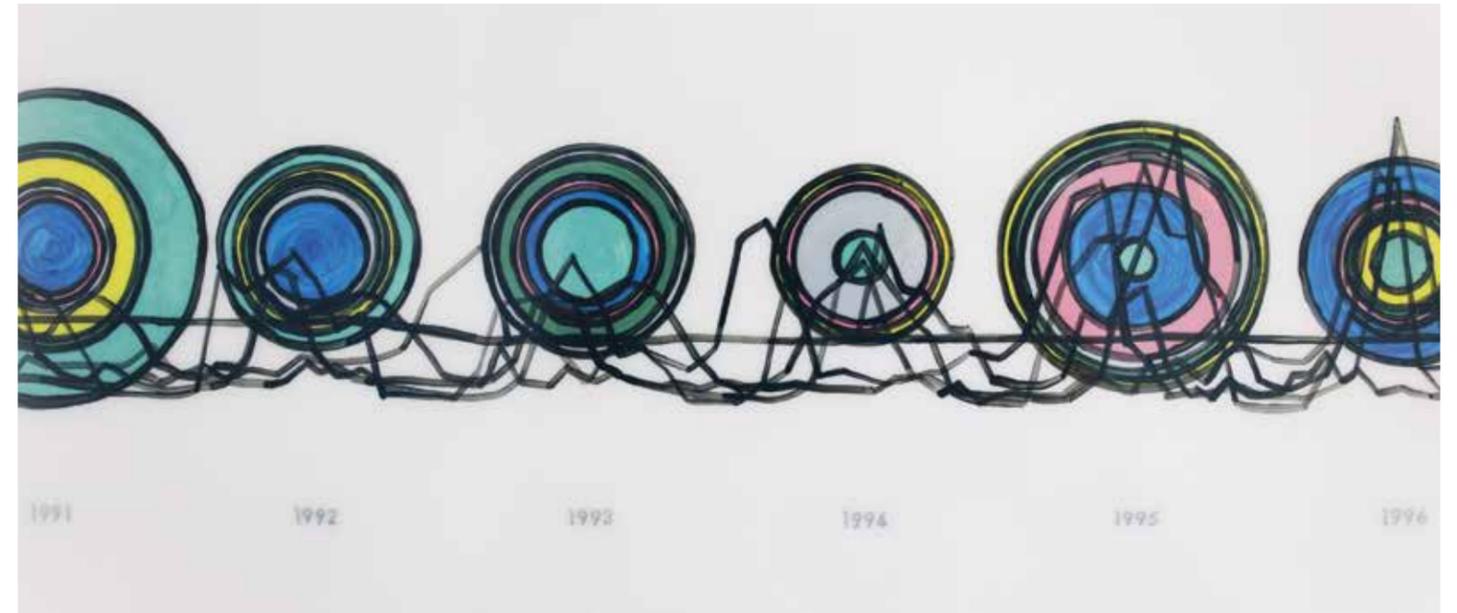
The jaguar is the largest cat in the Americas and a top-level carnivore, helping to stabilize ecosystems and regulate prey populations. Once free to roam in much wider ranges than today, the jaguar became an important figure in human cultures throughout the American continent, playing a central role in stories, songs, and prayers for Indigenous people. Today, jaguars have been almost eliminated from the United States. Populations in Central and South America are declining because of habitat destruction, trophy hunting, and poaching over perceived conflicts with livestock. The total population of jaguars in the continent is approximately 64,000. There are 34 jaguar subpopulations, 25 of which are threatened and eight of which are in danger of extinction.

MARISA DEMARCO, DYLAN MCLAUGHLIN
& JESSICA ZEGLIN

Albuquerque, New Mexico

“As the snow melts in the mountains and runs to the rivers, water and climate change experts look to the Rio Grande, which for the first time in memory became dry for miles in 2018. In *There Must Be Other Names for the River*, six singers embody the Rio Grande physically and spatially, singing a score based on historic river flow data through the present day, and then projecting possible futures. Scrutinizing human decisions and their impact on the flows, they communicate directly our trajectory with this lifeline of water in the desert.”

The Rio Grande has become a fragmented river. From its headwaters in the San Juan Range of the Colorado Rockies to the Gulf of Mexico, the Rio Grande draws from 11% of the continental U.S., with much of that being drought-prone land. That vulnerability is aggravated by scores of dams and irrigation diversions, which have left significant portions of the river dry. There are 15 dams on the Rio Grande, many of them in New Mexico. Flows are significant until Elephant Butte Reservoir in New Mexico. Most of the water for the city of El Paso comes from this reservoir. Downstream, at the American Dam, much of the flow in the Rio Grande is diverted for irrigation and municipal uses in both Texas and Mexico. From here, the Rio Grande has little or no flow until joined by the Río Conchos and the Pecos River. Further downriver, additional withdrawals for agricultural and municipal use, coupled with the relatively low influx of water from tributaries, reduce the flow. In some years, the Rio Grande flow does not even make it to the sea.



There Must Be Other Names for the River, performance
2019

Performance featuring singers, Ken Cornell, Monica Demarco, Ryan Dennison, Marya Errin Jones, Antonia Montoya, and Mauro Woody
Saturday, November 16, at the National Hispanic Cultural Center, Albuquerque, New Mexico

There Must Be Other Names for the River, score
2019

Acrylic, mylar, paper, river water, wood

NINA ELDER
Albuquerque, New Mexico

“Solastalgia is a premonition of longing for the present moment from an anticipated future. It is cherishing the places we live as we know them now, and at the same time feeling anxiety about what is happening to those places and what is to come. These drawings explore a solastalgic response to ecosystem collapse, and the ghosts and memories that will remain. By translating information about ecosystem disruption into visual voids and inversions, these drawings ask, What is being erased? What is being turned upside down? What will remain? Facing unprecedented change and loss, what are we going to remember? What will haunt us?”



Interrupted Ecosystem: Rocky Mountain Piñon (detail)
2019
Charcoal, graphite, ash, dirt on paper

Interrupted Ecosystem: Beaver and Rivers
2019
Charcoal, graphite, ash, and dirt on paper

The piñon grows slowly, often taking decades to reach just six feet in height, but is able to burst from the southwestern United States’ dry, steep, and rocky soils, which are inhospitable to many other species. Piñons can be extremely long-lived, taking 75 to 200 years to reach maturity and at times living to be 1,000 years old. Climate change, increasing heat, drought, wildfire, and insects are a great threat to this tree and to the species and ecosystems that depend on it. As a consequence of the prolonged drought that began in the 1990s, some 350 million piñons were dead by the early 2000s, with some areas in New Mexico reporting nearly 100% mortality. Hotter and drier climate also appears to be linked with Ips bark beetle breakouts. Typically, Ips only attacks trees that are weak or under stress, but when conditions such as drought occur, the beetle’s population builds to such a level that it can cause massive destruction. Overall, between 1984 and 2008, nearly 20% of southwestern forests were lost to wildfire and bark beetles, according to a study from Columbia University.

Beaver are considered ecosystem engineers because their dams and lodges can increase wetland areas, diversity, and water quality. Freshwater fish, migratory birds, amphibians, turtles, and other wetland species all benefit from beaver ponds. In the American West, characterized by dry climates, wetlands cover just 2% of the total land area but support about 80% of the biodiversity. Any creature capable of creating wetlands is immensely important. In North America, when the first European traders and trappers arrived, there were as many as 400 million beaver. By 1900, there were perhaps 100,000. For three centuries, they were trapped for their pelts. Despite reintroductions and natural expansion, beaver are still threatened by habitat loss and conflict with humans. They have yet to return to many places where they used to live, and many of these areas need more beaver to restore crucial wetland habitat.

JAQUE FRAGUA

Albuquerque, New Mexico

"As artists, we have a responsibility to express our vision. We also speak for the voiceless. Personally, my role as a human being is to be a steward of Mother Earth. As such, I feel the need to show the imbalance of our reality. Our natural environment is at odds with modernization, industrialization, globalism, and colonization. Our lifestyles do not respect the life of the land, water, or air. Our endangered relatives, the plants and animals that share this home with us, need our attention and care more than ever. These species are a reflection of the state of our species."

WOLF XING
2019
Oil enamel and vinyl on aluminum

JAGUAR XING
2019
Oil enamel and vinyl on aluminum

OCELOT XING
2019
Oil enamel and vinyl on aluminum



The jaguar is the largest cat in the Americas and a top-level carnivore, helping to stabilize ecosystems and regulate prey populations. Once free to roam in much wider ranges than today, the jaguar became an important figure in human cultures in the American continent, playing a central role in stories, songs, and prayers for Indigenous people. Today, jaguars have been almost eliminated from the United States. Populations in Central and South America are declining because of habitat destruction, trophy hunting, and poaching over perceived conflicts with livestock. The total population of jaguars in the continent is approximately 64,000. There are 34 jaguar subpopulations, 25 of which are threatened and eight of which are in danger of extinction.

The Mexican gray wolf is a subspecies of the gray wolf, smaller in size and adapted to the climate of the U.S. Southwest and northern Mexico. Though once numbering in the thousands, it is now the most endangered gray wolf in North America, having been extirpated in the wild during the mid-1900s through a combination of hunting, trapping, poisoning, and digging pups from dens. Last year, the whole wild population was composed of 131 individual wolves and 32 packs of two or more animals in Arizona and New Mexico. All are descendants of seven wild founders of the captive breeding program started in the 1970s. These wolves are still threatened by illegal killings, legal removals due to conflicts with livestock, and a lack of genetic diversity.

Ocelots are small wild cats with spotted fur and tufted ears. They once ranged in large numbers from Arizona to Arkansas and Louisiana, but the fur and pet trades decimated the population. Fewer than 60 ocelots remain in the U.S. today, in two small populations 20 miles apart in south Texas near the Mexican border. An overall population of 40,000 is present in the whole American continent. The biggest threat for the species is habitat loss due to agriculture and fragmentation, vehicle strikes, and hunting for fur and the pet trade. The new wall at the U.S.–Mexico border is also a major threat to the survival of the ocelot. If completed, the barrier would forever block U.S. ocelots from breeding with those in Mexico.

JESSICA GROSS

Albuquerque, New Mexico

"We are the most destructive invasive species to inhabit the Rio Grande Valley. Rats followed us here, invading with us. We are remarkably similar—they share our ability to adapt to and thrive in widely varying environments and, like us, have competed with indigenous species for resources, driving out those that are highly specialized to their environments. In this work, I use rats as both themselves and stand-ins for us—two resilient and inextricably linked invasive species that have colonized and led to the endangerment and extinction of native flora and fauna. Someday humans and rats may be the only animals here."

The Creation

2017

Intaglio and serigraphy on paper

The Norway rat is one of many invasive species that threaten habitats along the Rio Grande. These rats came to North America aboard ships from Europe in the 18th century. Humans also provide rats with food and shelter, allowing them to thrive. Our large-scale cities enable the rat population to grow, and the habitat loss due to city expansion combines with the rats' ability to outcompete other organisms to produce a perilous situation for native species.



CANNUPA HANSKA LUGER

Glorieta, New Mexico

"I live because my ancestors survived a war of attrition. Carried out by settlers in order to subjugate Plains Tribes, this war of attrition decimated the North American buffalo population. Historic images of this era documented massive pyramids of buffalo skulls as monuments of conquest scattered throughout my ancestral lands of the Great Plains. This loss of species not only affected my ancestors but also the land. Running down the center of North America, the Great Plains are one of the most endangered environments; many indigenous grasses are dependent on the buffalo to thrive and have therefore also degenerated. In fact, there can be no true restoration without roaming herds of buffalo. *(Be)longing* explores the cascading effects of a decimated species on our precious and interconnected environment."



The Bison

It is estimated that 30 million to 100 million bison roamed the Great Plains before 1800. But by the 1880s, fewer than 1,000 remained. Many were slaughtered by the U.S. government in an organized effort to destroy the livelihood of the Indigenous people of the Great Plains. The bison, a keystone species, helped create habitat on the Great Plains for many different species, including grassland birds and plants. As bison forage, they aerate the soil with their hooves, which aids in plant growth and disperses native seeds, helping to maintain a healthy and balanced ecosystem. Because there are no longer millions of animals migrating across the plains, the bison is considered ecologically extinct, but conservation herds have been established. Though the American bison population has partially recovered, the species is still considered near threatened, and these animals depend heavily on conservation efforts for survival.

(Be)longing
2019

Mixed media, life-size buffalo skeleton, sculptural installation, ceramic, steel, ribbon, fiber, video

Right:

Photo by Kate Russell Photography, courtesy of the artist.



c marquez

Taos, New Mexico

"521 embodies the predicted 521-week extinction timeline for the New Mexico meadow jumping mouse. It opens with all the mouse nests on the wall, then releases over half of the nests during the runtime of the exhibition, reflecting an experience of steady loss. This project speaks to painful truths about imperiled species along the Rio Grande, while offering space for reflection through these light, fragile, ephemeral beings. Perhaps we may slow down, take a closer look, and fall in love with small parts of nature that are right around us on the land where we live, inspiring stewardship and preservation."

The New Mexico meadow jumping mouse is a water-loving rodent, often found less than a few feet away from running water. These mice live only in New Mexico, Arizona, and a small area of southern Colorado. Only 29 remaining populations (two in Colorado, 15 in New Mexico, and 12 in Arizona) have been documented since 2005, spread across eight geographic management areas. Nearly all of these areas are isolated, widely separated, and too small to support resilient populations. In addition, most of these populations contain few individuals, and the reduced numbers will likely affect the species' chances for survival in the future. The New Mexico meadow jumping mouse needs specific habitat characteristics to thrive: dense grass vegetation along flowing streams to support feeding and sheltering close by. Human intervention and land use have largely reduced the places that accommodate these animals.

521
(detail)
2019
Seedpods and stems of *Sisymbrium altissimum* on wall



RUBEN OLGUIN

Bernalillo, New Mexico

"*Evaporation* is a mud mural that graphically represents all endangered and threatened species along the Rio Grande. Using sharp graphic stencils, I painted clay and earth pigments, collected in the Rio Grande Valley, onto the wall, depicting the expanse of the river and silhouettes of over 150 endangered species, including crustaceans, mollusks, fish, amphibians, reptiles, birds, mammals, and plants. With the harvested clay, the work evokes the cracking, dry habitat the wet river cuts through and the fragility of its inhabitants to water shortage, climate change, and pollution."



Species in peril in the Rio Grande watershed

A species is categorized as endangered if it is at risk of extinction and disappearing from its habitat. It is labeled threatened if it is likely to become endangered within the foreseeable future. Extinction occurs at a natural "background rate" of a few species per year as part of evolution. Scientists estimate that we are now losing species at a speed that is many times faster than the background rate (the precise number varies in different studies). It is widely recognized that extinction is happening much faster than its natural occurrence, signaling that a large percentage of all species will possibly be affected within a few decades. It is a scary future. Unlike past mass extinctions, caused by natural events, the current crisis is almost entirely caused by humans. In fact, almost all currently threatened species are at risk due to human activities, primarily those driving habitat loss, introduction of exotic species, and global warming.

Evaporation
(details)
2019

Hand-foraged clay and soil on wall

ZEKE PEÑA
El Paso, Texas

"*The River* is a narrative illustration of the historical timeline of the river, showing the changes the river has gone through due to colonization and development of the international border. The river is a timeline of its own, a chronicle of the people who have survived on it for thousands of years. Using symbols and iconography, I highlight certain histories."

The River
2017
10-color serigraph, printed at Self Help Graphics & Art

Species in peril on the U.S./Mexico Borderlands

The proposed wall for the U.S.–Mexico border will have heavy ecological consequences for the species living in the region. The wall will sever ecological connections in a region that is considered one of the most biologically diverse in the Western Hemisphere due to its large variety of habitats, with mixed mountain ecosystems—known as “sky islands”—surrounded by vast desert communities. Because the borderlands are located within the gentle transition zone between tropical and temperate climates, species that do not coexist anywhere else in the world live side by side here. The borderlands are home to more than 180 threatened and endangered species. A viable future for these and many other wild creatures depends on open migration pathways between the United States and Mexico.



DAISY QUEZADA

Santa Fe, New Mexico

“Considering place as a space that can be felt as an extension of the body, I aim to bring into conversation, with fluidity, the relationships created by the intersection of audio, digital mapping, and ceramic in the public space. The work situated within communities near and around the Rio Grande asks to be explored and understood beyond the immediate.”



brotante
2019
Right: Porcelain seed
Above: Healing Food Oasis amaranth plant, 2019
Left: Cochiti Dam, 2019



NICASIO ROMERO

El Ancon, New Mexico

"My installation can be seen as a metaphor of a nest—a "nido," or sanctuary, for both migrating and resident birds. I focused on the frail nature of birds and how their existence is threatened. This nido also shows the strength and resilience of nature, in spite of all the efforts, both intentional and unintentional, to disrupt and destroy. There is, however, a point of no return. I am afraid that we have already reached it. We must become hyper-concerned and get actively involved in responding to this threat. We do not have time to waste."

Birds in the Upper Pecos, New Mexico

Due to its wide diversity of habitats, New Mexico has the second-highest number of bird species of any noncoastal state in the United States. More than 280 species of birds breed in New Mexico, and its extensive grasslands are important for birds that spend the winter here. The Rio Grande serves as an important flyway for migrant birds, connecting the whole American continent. Numerous bird populations are declining, both along the Rio Grande and globally. The reasons are varied but are mostly related to human impact on their habitats. Degradation, alteration, fragmentation, and loss of breeding grounds, wintering areas, and migratory stopover locations now jeopardize the long-term survival of many species. In some cases, these threats are intensified by pollution, pesticide poisoning, and global climate change. Endangered birds in the Upper Pecos drainage include the white-tailed ptarmigan, brown-capped rosy-finch, boreal owl, American three-toed woodpecker, dusky grouse, peregrine falcon, and gray vireo. Other common species in New Mexico that are thought to be vulnerable to climate change include the flammulated owl, pinyon jay, Virginia's warbler, Lewis's woodpecker, and Woodhouse's scrub-jay.

Bolas y Nido
(detail)
2019

Willow, straw, wire, clay



MARCIA I. SANTOS

Ciudad Juárez, Chihuahua, Mexico

“My work is developed from the idea of ‘border thought,’ or the notion of urban space as a meeting place for the public and private, and the exploration of the lived experience where it is as permeable as its borders.”

—Marcia I. Santos

Affective Cartography
2019

Paint on wall – a collective schematic from the project *Desierto.Arte.Archivo* at Universidad de Ciudad Juárez

Desierto.Arte.Archivo Project Coordinators
Art Department, Universidad de Ciudad Juárez:

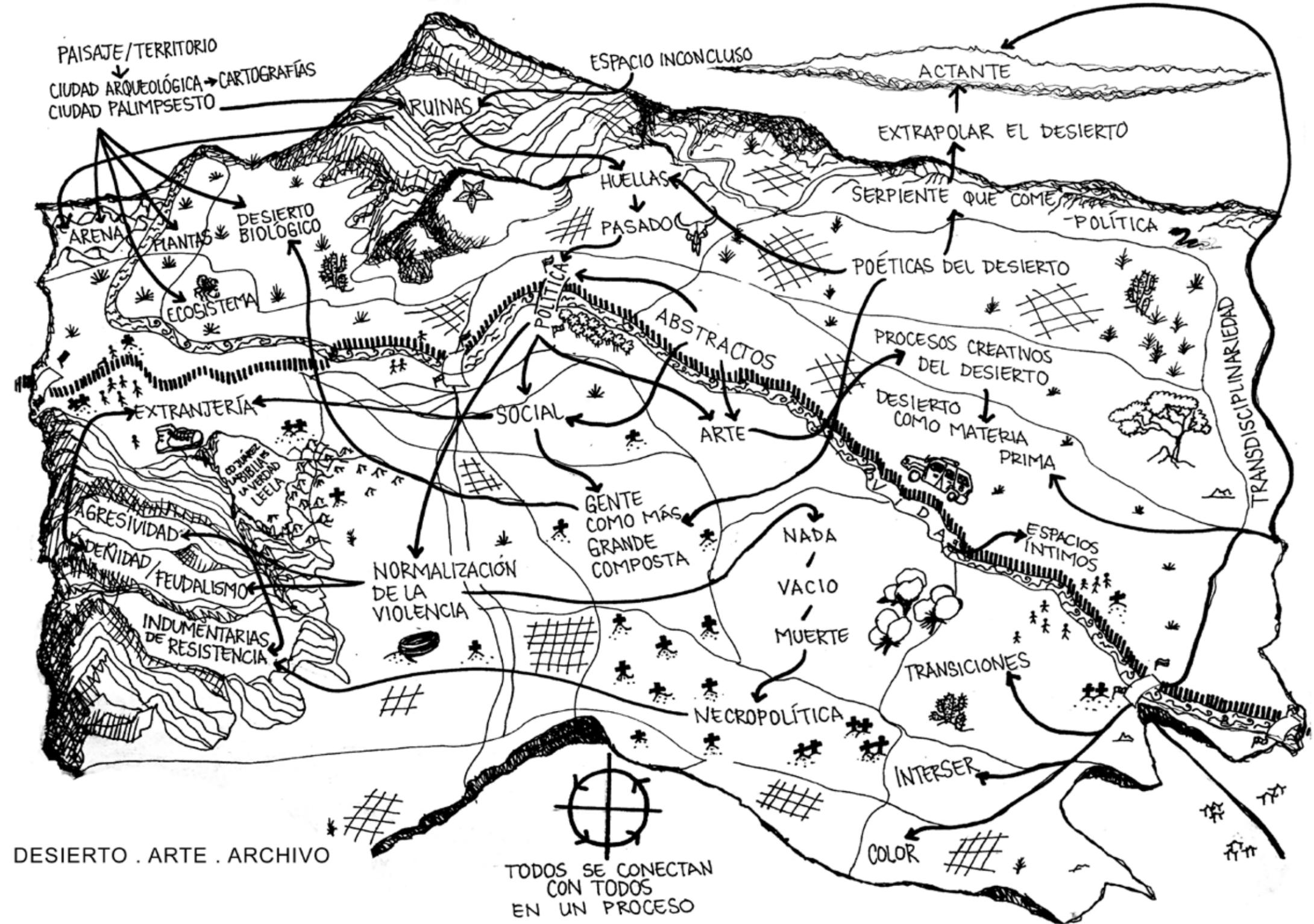
Gracia Chavez-Ortiz
Dr. León De la Rosa-Carrillo
Dr. Ma. Eugenia Hernández-Sánchez

Participants:

Cassandra Adame
Alejandra Aragón
Alba Naiky Arreola-Cepeda
Alejandra Carrillo-Estrada
Octavio Castrejón
Enrique Casaña-Díaz
Paloma Galaviz,
Pilar García
René López,
Martín Luna
Andréa Magallanes
Laura Meneses
Paola Nayely Mendoza
Abril Meléndez
América Pérez
César Ponce
Ángel Rangel
Juancarlos Reyes
Alexandra Rodríguez
Marcia I. Santos
Julian West

Guest Lecturers:

Janette Terrazas Islas, independent artist
Dr. Pablo Levin, Biochemistry Sciences, UACJ
Dr. Cynthia Bejarano, NMSU



“In the desert, on the border, we are all in peril. Our terrain is flat and so is our ontology; flora, fauna, human beings, minerals, and even dreams are all precariously tethered to a river that seldom carries water and mostly serves as a stark reminder that there is no such thing as a free ride when the first and the third worlds collide. Our land is cheap, and so we sprawl across the sand like garter snakes digging up refuge, belly flat on the ground like a family of four that just heard gunshots across the street. Our relationship with our landscape is suspect at best, we know it is not meant to sustain us for long, yet we keep devising methods to extract capital from shifting dunes. We even dare extract poetry and pigments and aesthetic bemusement and acute contemplation; all to once again claim this desert as our own; all to once again claim ourselves as the desert’s own.”

—León De la Rosa-Carrillo

JANETTE TERRAZAS

Ciudad Juárez, Chihuahua, Mexico

"In the process of researching materials, I found some that are part of the border identity; those are related to reusing everything. The electric components have particular meaning to me because Juarez has around 669 factories that manufacture accessories, electrical appliances, and electric power generation equipment. Five years ago, I also started exploring botanical colors, as a journey into the heart of the earth. I have found more than one hundred color ranges, and I realize that the colors of the plants are a gift of our mother's sacred technology and that those techniques were used by pre-Hispanic cultures, by our ancestors.

The Chihuahuan desert extends from the southern United States to northern Mexico. This desert is unique, as it has been isolated from the influence of surrounding arid regions by the large mountain ranges of the Sierra Madre. This isolation has allowed the evolution of many species that live only here. Most notable is the high number of endemic plants and cacti. The Chihuahuan Desert hosts one-fifth of all the world's cacti—as many as 350 of the 1,500 known species—and contains the largest number of endangered cacti in the Americas.

Leopardus pardalis
2019

Electronic textile, flowers, and *Larrea tridentata* over cotton
Interactive mapping of species' distribution and conservation status
along the border between Mexico and the United States.



**MARY TSIONGAS
& JENNIFER OWEN-WHITE**

Albuquerque, New Mexico

“Working with local experts on the ecology of the Rio Grande silvery minnow, we gathered up-to-date information. Then, using video and digital still imagery, we attempted to convey the arduous fight for survival that the minnow has faced over the last few decades.”

“My work has attempted to explore my (and our) changing relationship to the natural world. I use ‘natural world’ to refer to the naturally occurring landscape, and to its apotheosis in wilderness, and as a term of opposition to the increasingly harmful human-built environments we find ourselves in. My choice of subject hinges on my deep (and deepening) concern about how we as humans are impacting the natural world, and on my interest in how these impacts are affecting me (and us) personally and globally, in return.”

—Mary Tsiongas

The Rio Grande silvery minnow is a small fish once found for hundreds of miles in the Rio Grande, from Española, New Mexico, to the Gulf of Mexico in Texas. Today, these fish exist in less than 5% of their native range and can only be seen between Cochiti Dam and Elephant Butte Reservoir. The silvery minnow was listed as an endangered species in 1994, yet today it is still one of the most endangered fish in North America. The decrease in silvery minnow populations is directly correlated with human alterations to the Rio Grande over the past century. These alterations include water diversions for municipal and agricultural uses, modifications of the natural hydrological cycle of the river, habitat degradation, and the construction of dams.



Silvery Minnows, past
2019
Etched Cast Acrylic

Special Thanks:

Carlos Gabaldon, Technical Assistant
Joel D. Lusk, Senior Fish and Wildlife Biologist
Kimberly E. Ward, Head Aquarist ABQ BioPark

REGIONAL & GLOBAL CONTEXT





Acceptance and Redemption on the Rio Grande

Laura Paskus

Zipped into my sweaty sleeping bag, I'm trying to listen over the whine of mosquitoes to the headwaters of the Rio Grande gurgling and cooing in the night.

Beneath the summer sky, I marvel that here begins a river that pours from Colorado's mountains, carves gorges and canyons, spreads silt across farmlands, nourishes cities, and historically, made its way to the Gulf of Mexico near Brownsville, Texas.

This river rarely reaches the sea nowadays—we take too much of its waters—and I learned only recently that it didn't start flowing into the Gulf of Mexico until sometime between 1.6 million and 600,000 years ago. For much of its 28-million-year lifespan, it stoppered up in inland basins.

I try to peek at the stars, pull the sleeping-bag cord tighter, and eventually fall asleep. Meanwhile, hydrogen and oxygen molecules migrate downstream. They carve out history, ignite imaginations.

Almost 20 years later, I'm standing in the river channel more than 300 miles downstream from the headwaters, and I'm trying not to cry. The channel in San Antonio, New Mexico, should be full, running bank to bank with reddish brown waters. Instead it's sandy and dry. Dead fish fill divots against the banks. They're piled atop one another, where the last hot puddles settled before the sun scorched off the water completely. Desiccated monuments to a winter that had nothing to give.

Since the late 1990s, the Middle Rio Grande has often dried south of Albuquerque during the summer, when the river's flows are diverted into irrigation canals and ditches for the growing season. The summer drying can spread for 30, 50, 70 miles through central New Mexico.

But in early April 2018, the river should have been building toward peak flows for the year, not slowing to a halt. From Bosque del Apache National Wildlife Refuge, the drying spread upstream 20 miles by May.

Throughout the summer of 2018, federal water managers scrambled to keep the drying from moving north all the way to Albuquerque, 120 miles upstream. The U.S. Bureau of Reclamation worked with the local irrigation district, pueblos, and nonprofits to keep at least some water in the river. And in August, the state's largest water utility in Albuquerque sold the bureau 20,000 acre-feet of water stored in an upstream reservoir—water piped into a tributary of the Rio Grande through a series of diversions from the Upper Colorado River Basin. That kept people in Albuquerque from having to see dead fish, from having to watch the birds fly off. From having to see mud transform to sand.

In southern New Mexico, the sandy channel has been a commonplace sight for decades. We barely pause to notice. Snowmelt feeds the Upper Rio Grande, but below Elephant Butte and Caballo reservoirs—through places like Hatch, Las Cruces, and Mesilla—the Rio Grande's channel is completely dry for most of the year. Except when there are flash floods or treated wastewater, more than 100 miles of

In early April 2018, the Rio Grande north of Albuquerque is barely ankle deep to a Canada goose.

the Rio Grande flow only when water is released from reservoirs for downstream users, who immediately divert it onto pecan orchards, alfalfa fields, and rows of chile, onions, cotton, and other crops.

In his 1954 book *Great River*, Paul Horgan wrote, “The river commonly does not carry a great deal of water, and in some places, year after year, it barely flows, and in one or two it is sometimes dry.” But the morphology of the Rio Grande—what the Spanish in the 1540s called *Nuestra Señora*—is different from what it once was. Until very recently, the riverbed wasn’t broken up by dams, diversions, and reservoirs. There were backwaters, oxbows, and dryland lakes that stored water and helped species survive; these were places where fish could hold out during hot, dry times.

Thanks to our thirst, thanks to legal compacts and feats of human engineering, those places are mostly gone now.

And so are many species.

As late as the 1830s, wolves were noted as abundant in northern New Mexico, writes Dan Scurlock in his 1998 environmental history of the Middle Rio Grande Basin, *From the Rio to the Sierra*. Bears and mountain lions moved through the basin. Scurlock’s centuries-long time line also notes that in 1630, Fray Benavides listed the presence in the Middle Rio Grande of fish like bagre (blue catfish), trucha (trout), yellow bullhead, anguila (eel), boqueinete (sucker), sardina (chub), aguja (shovel-nosed sturgeon), and cazon (longnose gar).

Sturgeon, gar, and eel are all extinct from the Middle Rio Grande today, explains Thomas Archdeacon, a biologist with the U.S. Fish and Wildlife Service. Other fish species extinct from the river include roundnose minnow, speckled chub, Rio Grande shiner, Rio Grande bluntnose shiner, blue sucker, and gray redbreast. Phantom shiners used to swim in the Rio Grande, too. But they’re extinct everywhere now.

Today, no species tells the story of the Rio Grande as succinctly as the silvery minnow, a three-inch-long fish that still struggles to survive in New Mexico’s largest river.

Historically, the silvery minnow lived throughout the Rio Grande and its tributary, the Pecos River, occupying more than 2,000 miles of habitat. By the time it was protected under the Endangered Species Act in 1994, the minnow had been extinct in the Pecos for 30 years, and survived only in a 174-mile stretch of the Rio Grande.



In September 2018, the state’s largest reservoir, Elephant Butte, is at just 3.7 percent capacity.

The Rio Grande near Hatch is dry for most of the year, except when it’s used to move irrigation water downstream.

Under the federal Endangered Species Act, water managers, the local irrigation district, and the state needed to take into account how their actions affect the minnow’s survival. For decades, plans for the minnow have been argued over, litigated, altered, and compromised. But the act’s basic premise is this: the most vulnerable species deserve our attention and best efforts. It also acknowledges that collaterally, protecting individual species can benefit entire ecosystems. Keeping water in the river to benefit fish, for example, better connects groundwater and surface water, which helps native cottonwood trees, wildlife, and of course, humans. For years, agencies complied with the Endangered Species Act, sometimes begrudgingly. And over time, even as the Fish and Wildlife Service backed off its original flow requirements for the river, people who’d learned to work together started figuring out ways to keep water in the river.

As the climate changes, that’s going to be harder and harder.

New Mexico has already warmed two degrees Fahrenheit since the 1970s. By the end of the century, it will be four to six degrees warmer than it is today.

Already, climate change affects the amount of snowmelt in the Rio Grande, says Shaleene Chavarria, who in 2018 published a study based on her graduate work at the University of New Mexico’s Earth and Planetary Sciences Department with Dr. David Gutzler. She looked at annual and monthly changes in climate variables and streamflow volume in southern Colorado from 1958 to 2015 and found that big changes are already occurring—changes in winter temperatures, increases in spring temperatures, and decreases in streamflows.

Right now, we know that warming will keep pushing the Rio Grande lower, reducing flows by 4% to 14% by the 2030s and 8% to 29% by the 2080s. Scientists have predicted that the Colorado River—which New Mexico also relies upon—will see a 20% to 30% decrease in flows by 2050. And a 35% to 55% decrease by the end of the century. Even on the Gila River in southwestern New Mexico, warming will decrease flows by about 5% to 10% due to decreasing snowmelt runoff.

These aren’t isolated studies.

Another shows that at the same time the Earth continues warming, multiyear precipitation-driven droughts will continue to occur in the 21st century in the Southwest. In other words, there will still be cycles of wet years and dry years. But recovery from the dry years will be much more difficult in the warmer climate.



Spring flows in 2017 nourished the Bosque near Albuquerque.

The drying riverbed near San Antonio, New Mexico, in 2016.



Continued warming-induced dryness, growing demands for water, and climate change-induced decreases in streamflows may force even large dryland river systems—in particular, the Rio Grande—into “permanent hydrological drought,” according to a 2015 study. Another examination of 421 river basins in the Northern Hemisphere found that 97 river basins—supplying water to almost 2 billion people—have at least a 67% chance of decreased snow supply. Of the 32 basins most sensitive to changes in snowmelt, the authors named the Colorado River and the Rio Grande.

Another peer-reviewed study forecasts that as winters and springs continue to warm, the Upper Rio Grande in Colorado will see lower-than-historic flows in the late winter and early spring. And new reconstructions of runoff ratios for the Upper Rio Grande Basin, stretching back to 1571 CE, show that the declining trend in runoff that has been observed in the basin since the 1980s is “unprecedented” in the last 445 years. The authors write that greater temperature sensitivity over the past few decades implies that “future management vulnerability” will persist.

If any of this seems esoteric, just remember: in arid places, warming means drying.

It’s also useful to remember that fish need water. So do humans.

“In our attempt to save the bigger cogs and wheels, we are still pretty naïve,” wrote conservationist Aldo Leopold a century ago. “A little repentance just before a species goes over the brink is enough to make us feel virtuous. When the species is gone we have a good cry and repeat the performance.”

Indeed, that’s long been the case, even as Americans say they support environmental laws like the Endangered Species Act, which right now is under a particularly cruel and crass assault by the Trump administration.

Spring flows in 2019 were higher than they had been in years. Yet the rivers still dried south of Albuquerque at the end of the summer.

But there’s no time for a good cry. And we can’t keep repeating our performances, eradicating species after species after species from our planet.

While reporting on the Rio Grande for nearly 20 years, I’ve seen the river dry. In good years, I’ve whooped to watch it ripple over its banks, flooding cottonwood saplings and willow seedlings. Farmers have shown me their fields and irrigation ditches; scientists, their data. I’ve been growled at by some sources, shed tears with others. Navigated a kayak through the river; lugged my boat through sandbars, blinked back at coyotes staring from the bank, and watched turkey vultures luxuriate on the bank, spreading their wings in the early spring sun.

Along the Rio Grande, I’ve fallen in love, had my heart broken; also, fallen into the river and had mud suck off my shoes. Held my breath while my daughter climbed too high into gnarly old cottonwoods. I’ve spied coyotes slinking through dry brush the same color as their fur; tripped over roots and stones while keeping my eyes peeled for porcupines feeding or napping within the overstory. I’ve birdwatched with friends at dawn and gone owl-searching after dark; watched tens of thousands of sandhill cranes and snow geese fly overhead at sunset. I’ve sat through countless public meetings, court proceedings, and interviews about everything from reservoir operations to endangered species compliance.

Of all I’ve learned, the most valuable thing is this: ours is a river worth loving for its own beautiful sake.

But don’t take my word for it. Go listen to what the river has to say. Give into the desire for a better world, fall into love with the Rio Grande. Imagine a future where species thrive, rather than barely survive or barrel over the brink. Imagine a future in which we encourage our rivers to run back to the sea.

Laura Paskus has been writing about environmental issues in New Mexico for 17 years, reporting for magazines, newspapers, and public radio, focusing in particular on climate change, water, energy, and southwestern rivers. A former archaeologist and tribal consultant, she currently hosts a monthly show on New Mexico PBS, *Our Land: New Mexico’s Environmental Past, Present and Future*. Her book, *At the Precipice: New Mexico’s Changing Climate*, is forthcoming from UNM Press.



One Region Across Two Nations Issues a Clarion Call to Mitigate Biological Annihilation

Subhankar Banerjee

“My conviction is that environmentally engaged art bears the potential to both rethink politics and politicize art’s relation to ecology, and its thoughtful consideration proves nature’s inextricable binds to economics, technology, culture, and law at every turn.”

—T. J. Demos, from *Decolonizing Nature: Contemporary Art and the Politics of Ecology*¹

In 2000, a short text with the title “RESOURCES: Species in Peril” was published in the journal *Science*, which warned that more than 1,200 animals and plants in the United States were in peril and had been added to the endangered species list.²

The same year proved a turning point in my life. I left a well-paid job in science and headed north. In late October, I came upon an unusual scene in subarctic Canada: one polar bear eating another. That scene of violence was an antithesis of Canadian Inuk artist Pauta Saila’s 1973 exuberant stone sculpture, *Dancing Bear*. One polar bear eating another was my first encounter with the biological crisis. As the sea ice continues to disappear in a rapidly warming Arctic, polar bears are finding it difficult to hunt for food.³

At the turn of this century, the polar bear was not on the U.S. endangered species list. But by 2006, this charismatic Arctic animal had become a poster child of climate change communication, appearing in the Academy Award–winning documentary *An Inconvenient Truth* and on the cover of *Time* magazine. Two years later, the polar bear was recognized as a threatened species under the Endangered Species Act.

Troubling news arrived as I was writing this essay.

On August 12, the Trump administration announced its intention to gut the Endangered Species Act. “The new rules would make it easier to remove a species from the endangered list and weaken protections for threatened species,” the *New York Times* reported.⁴

But *why*?

The *Times* writer opines that the updated rules “appear very likely to clear the way for new mining, oil and gas drilling, and development in areas where protected species live.”

According to the latest data from the IUCN (International Union for Conservation of Nature) Red List of Threatened Species, the United States ranks #3 and Mexico ranks #6, with Ecuador and Madagascar taking the top two spots.⁵ At a time when the number of imperiled species in the U.S. is considered to be the third highest globally, the Trump administration’s attempt to gut the Endangered Species Act is unconscionable and must be challenged.

A new battle is brewing.

Ruben Olguin
Evaporation
2019
Hand-foraged clay and soil on wall

Senator Tom Udall of New Mexico and his cohorts are “considering invoking the Congressional Review Act, a 1996 law that gives Congress broad authority to invalidate rules established by federal agencies, to block the changes,” according to the *New York Times*.

From Extinction to Biological Annihilation

Until recently, public debates and discussions on environmental crisis were largely focused on human-caused global warming. Incorporating lucid narrative and impeccable science journalism, Elizabeth Kolbert urged us to also consider the biological crisis in her path-breaking book *The Sixth Extinction: An Unnatural History*, first published in 2014.⁶ It was a watershed moment for public communication on species extinction.

The biological crisis is getting worse by the day.

Earlier this year, the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), which was established in 2012 following a directive from the United Nations General Assembly, offered the most comprehensive assessment of the escalating crisis to date and issued the grimdest warning in human history: “around 1 million animal and plant species are now threatened with extinction, many within decades.” This epic tragedy is a direct result of human activities.⁷

Species in Peril Along the Rio Grande was conceived with an eye toward making the biological crisis—which so far has eluded much public engagement—into a common crisis. By that I mean a crisis that we all can see and experience and participate in to mitigate.

For that to happen, we will need to think beyond the extinction narrative and engage with a more expanded term—biological annihilation, which includes human-caused species extinctions, die-offs, and massacres. Two years ago, the term was introduced in a seminal scientific paper by Gerardo Ceballos, Paul Ehrlich, and Rodolfo Dirzo.⁸

If we keep focusing exclusively on extinction, which happens relatively rarely and gradually and often in remote places out of most of our sight, we will fail, or slow down the process, to turn biological annihilation into a common crisis. Our first task will be to frame the tragedy with stories of die-offs and massacres coming from where we live and with events that we can experience right now.

If I ask you: Have you witnessed an actual species extinction? By that I mean watch the last member of a species die in front of you or see its carcass. The answer will likely be “no.” But if I ask: Have you witnessed a species die-off or massacre? The answer will likely be “yes.” Varieties of die-offs and massacres surround us right now. All we have to do is pay attention.

Over the past two decades, I have witnessed and engaged with three mass species die-offs in the United States:

- The piñon die-off in northern New Mexico—about 90% of mature piñons died between 2001 and 2005.
- The sea stars die-off along the Pacific Coast—more than 20 species of sea stars from Mexico to Alaska suffered mass die-offs between 2013 and 2017, with about 99% population decline in many sites.

- The die-off of the southern Beaufort Sea polar bear population in the Arctic National Wildlife Refuge—40% loss between 2006 and 2010.

These experiences have helped me to appreciate the scale of the biological crisis firsthand and make a commitment to help the public understand what is happening to the nonhuman relatives with whom we share this Earth.⁹

According to the 2018 *Living Planet Report*, issued by WWF and the Zoological Society of London, since 1970 the monitored populations of vertebrate species—birds, mammals, fish, reptiles, and amphibians—have declined on average by 60% globally. In Latin and Central America, the decline is the worst, a tragic 89%. The Indo-Pacific ranks second, with 64% decline, while freshwater populations have declined globally by a staggering 83%. At the same time, we are beginning to learn that the news is equally grim for insects and plants.¹⁰

The story of biological annihilation since the dawn of the early modern age is deeply entangled with colonialism, capitalism, and imperial ambitions.¹¹ Today, all aspects of modern living, and its products, infrastructures, and institutions, are contributing to the biological crisis.

It isn’t only pesticides, as highlighted in Rachel Carson’s 1962 classic, *Silent Spring*, or plastics, as highlighted in Chris Jordan’s recent film *Albatross*.¹² Myriad other industrial chemicals that have become part of our daily life contribute to the loss of nonhuman life, and products like window glass—through which we see the outside—are massacring life at a great scale.

In March 2006, a couple of days after moving into a rented house in northern New Mexico, I found a dead male house finch, a small songbird, on the porch. The bird had smashed into one of the building’s large glass windows and died. After mourning that humble and private human-nonhuman moment,



Subhankar Banerjee,
Dead Bird: Tribute to Ryder, New Mexico,
2006
Photograph



I started what became a five-year journey to understand where I live. I made an ethical commitment to engage the biological crisis.¹³

As many as 988 million birds die each year in the United States by crashing into glass windows, which puts windows as the second-largest driver (after cats) of avian mortality.¹⁴

Biological annihilation is arguably the most expansive crisis of our time, if you count casualties; and the most challenging, if you consider mitigation. Yet, so far it has gotten very little public attention.

Why a Regional Model?

The name of the organization responsible for bringing the global community together to address the biological crisis—Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services—is limiting and problematic.

Should global public policy on mitigating biological annihilation be guided only by science, and by economics via ecosystem services? Should we also not consider the arts? The humanities?

The crisis is as much cultural and political as it is scientific. We also need an ethical lens to apprehend the tragedy. For that we need arts and humanities.

Species in Peril Along the Rio Grande was conceived with an expansive interdisciplinary frame, which includes visual arts and culture, music, performances, stories, law, and public policy, informed by science and Indigenous ecological knowledge. The main exhibition at 516 ARTS in Albuquerque is accompanied by extensive public programming hosted by 516 ARTS and partner organizations from both sides of the U.S.–Mexico border.¹⁵ This collaboration among unlikely allies is an example of building bridges (not walls) across nations, peoples, disciplines, and creative practices.¹⁶

This may be the first time that communities across a large region spanning two nations have engaged the biological crisis in such an expansive and distributed manner with a shared concern and generosity.

In April 2017, I had convened a public forum in Albuquerque, *Decolonizing Nature: Resistance, Resilience, Revitalization*, which included a four-day conference at the National Hispanic Cultural Center and a

laura c carlson
Study for Lotic Possibilities 2, Potamilus metnecktayii
Study for Lotic Possibilities 3, Quadrula couchiana
 2019
 Pencil on paper

two-week exhibition at 516 ARTS. At the time, Suzanne Sbarge and I first discussed the possibility of organizing an exhibition focusing on the biological crisis. The following year, Josie Lopez (then curator at 516 ARTS) and I discussed how we might proceed curating the exhibition. In short order, the three of us put our heads together—and the planning for *Species in Peril Along the Rio Grande* started in earnest.

The few questions that animated our early planning were:

At what scale do we engage—local, regional, global?
 How do we select the artists and from where?
 What stories do we tell?

After carefully considering several recent environmentally themed art exhibitions for guidance, we opted for a different approach—a regional model, but one that is binational. We also decided to include only artists who live in the selected region. I now offer some rationale for these choices.

When a planetary crisis like the climate crisis or the biological crisis is presented at a global scale, we begin to lose local complexity and politics. On the other hand, if we present it at a hyper-local scale, we lose the big picture. It’s worthwhile to search for a sweet spot where we retain much of the local complexity while at the same time don’t lose sight of the larger story.

The fabled and endangered Rio Grande, or Río Bravo as it is known in Mexico, its basin, and the associated U.S.–Mexico borderlands offered an appropriate scale and complexity.

We are honoring the extraordinary yet overlooked ecological vitality of our region. Take, for example, New Mexico.

- Did you know that New Mexico ranks third nationally (after California and Arizona) in diversity of wild birds?¹⁷
- A “desert wasteland” to some, New Mexico harbors 546 wild bird species, which is nearly half of the national avian diversity. How does New Mexico’s diversity of wild birds compare to some of the most biologically diverse places around the world—say, the Western Ghats in India or Yasuni National Park in Ecuador? The Western Ghats and Yasuni provide a home for 508 and 596 wild bird species, respectively.
- Did you know that New Mexico ranks third nationally in diversity of native mammals? With 179 native mammal species, New Mexico trails behind California and Texas, while the Western Ghats and Yasuni provide a home to 139 and 173 wild mammal species, respectively.¹⁸
- Did you know that New Mexico is home to more than a quarter of the native bee species in the U.S.? Of the 4,000 species of native bees that live in the U.S., New Mexico is home to about 1,100, which is more than 5% of the global diversity of bees.¹⁹
- Did you know that New Mexico ranks fourth nationally (after California, Texas, and Arizona) in overall diversity of wild species?²⁰

We are yet to publicly acknowledge and celebrate such profusion of life. What we do speak about, however, reads like a litany of social tragedies. New Mexico ranks among the worst nationally—in environmental injustice, education, child welfare, poverty, opioid crisis—a consequence of the long history of colonial violence and capitalist exploitation. I also did not raise questions about the ecological vitality of my home state until two years ago, when I began to think seriously about *Species in Peril Along the Rio Grande*.

The ecological vitality of New Mexico and the interspecies connectedness is in peril. Take, for example, the recent piñon die-off, which was the most widespread loss of biological life in New Mexico since the turn of this century. Over a four-year period, from 2006 through 2010, I had made photographs of the piñon die-off and had wondered about the larger ecological impacts—who else might die following the die-off of New Mexico’s state tree?²¹

We are finally beginning to find out something about the scale and significance of that larger loss. Last year, Los Alamos National Laboratory ornithologist Jeanne Fair and her colleagues released the results of a 10-year bird study on the Pajarito Plateau of New Mexico’s Jemez Mountains, where some of the worst piñon die-offs had occurred. The study shows that between 2003 and 2013, the diversity of birds declined by 45% and bird populations, on average, decreased by a staggering 73%.²² Consider the irony of that on a plateau whose Spanish name, Pajarito, means “little bird.”²³ Two of my students, Leia Barnett and Dylan McLaughlin, are working on addressing the tragedy.²⁴

But why did we only select artists who reside in the region?

Our aim is not merely to raise awareness through arts and visual culture but also to build a community that will make a long-term commitment to engage the crisis.

We are also honoring the cultural diversity of the Rio Grande Basin. Again, take New Mexico. The extraordinary diversity of lifeways in New Mexico—with 19 Pueblo communities, the Navajo Nation, three Apache tribes, Hispano and Latinx Americans, and Anglo and other communities—anchors a variety of human relationships with nonhuman species.

To honor Native land, peoples, plants, and animals along the Rio Grande, the exhibition’s public programming includes an evening event, *Honoring Traditional Ecological Knowledge of the Rio Grande*, held at the Valle de Oro National Wildlife Refuge in Albuquerque on Indigenous Peoples’ Day.

After we finalized the geographic scope and how we would select artists, we then discussed various broad themes to frame the exhibition. Three terms emerged: acknowledgment, awareness, and action, and a bit later I added accommodation. Below I discuss briefly acknowledgment and accommodation.

Acknowledgment—Past & Present

The exhibition and the associated public programs are taking place in the traditional homelands of Indigenous peoples. We begin this exhibition catalog with a Land Acknowledgment by Rosie Thunderchief (Diné, Pawnee, Arapaho & Cheyenne, Ho-Chunk, Lakota), Roger Fragua (Jemez Pueblo), and Brophy Toledo (Jemez Pueblo).

I also offer a few examples of how the exhibition artists are engaging the tragedy and developing their work.

In late June 2019, we received a list, “Species in Peril in the Rio Grande Watershed,” from the Center for Biological Diversity, one of our two national partners. The list includes 46 animals and 25 plant species. Created with mud and pigments collected from the Rio Grande Valley, *Evaporation* by artist Ruben Olguin is a mud mural that acknowledges the endangered and threatened species along the Rio Grande.

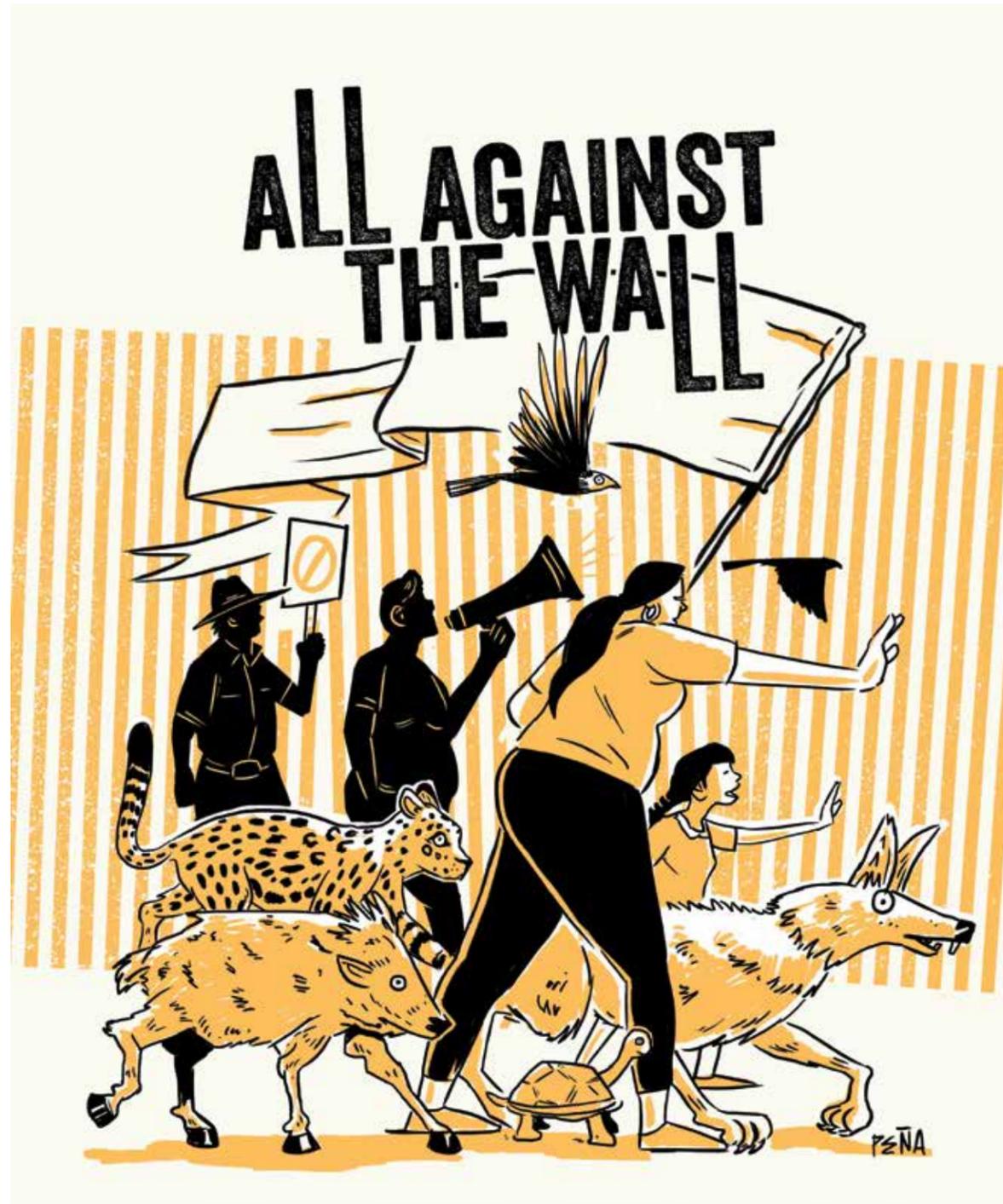
Below is another example of how artists using different creative media are acknowledging the Rio Grande in peril and the creatures who live in and/or depend on the river for survival.

On May 7, 2018, NM Political Report published an article, “A Dry Rio Grande in Springtime Isn’t Normal. But It Will Be,” by New Mexico environmental journalist Laura Paskus.²⁵ The article opens with “I smell the mounds of dead fish before seeing them,” placed underneath a picture of dead fish and tree branches on the dry riverbed, taken by Paskus herself (see her essay “Repentance and Redemption on the Rio Grande” earlier in this catalog). At the time, Paskus was a student in my spring course, *Integrative Ecology & Social Transformation*. A year later, three graduate students at the University of New Mexico, Marisa Demarco from Experimental Art + Technology, and Dylan McLaughlin and Jessica Zeglin from Art & Ecology, inspired by Paskus’s article from the previous year, created a musical score based on the Rio Grande streamflow data. The score, titled *There Must Be Other Names for the River*, was performed by six Albuquerque-based singers on April 19, 2019, at the UNM Art Museum and the following day on the bank of the Rio Grande. Paskus was in attendance at the museum and was deeply moved. So was I by the heartrending performance. The *Species in Peril Along the Rio Grande* public programming also includes a performance of *There Must Be Other Names for the River* at the National Hispanic Cultural Center.

We also acknowledge past injustices. The large-scale massacre and near extinction of the buffalo in the 19th century paved the way for white settler colonial expansion into the American West, while destroying Native American food security and a way of life. For the exhibition, Indigenous artist Cannupa



Marisa Demarco, Dylan McLaughlin
& Jessica Zeglin
There Must Be Other Names for the River
2019
Performance featuring singers Jessica Chao,
Monica Demarco, Ryan Dennison, Ken Cornell,
Antonia Montoya, and Mauro Woody



Hanska Luger created *Be(Longing)*, a life-sized ceramic and steel sculpture of a buffalo skeleton, with accompanying video, as an acknowledgment of past biological annihilation and colonial violence as well as a call to action to avert similar future massacres.

Accommodation in the Borderlands

Did you know that the U.S.–Mexico borderlands are some of the most biologically diverse places in North America?

Bookended by the Pacific Ocean and the Gulf of Mexico, the borderlands traverse six eco-regions—through California, Arizona, New Mexico, and Texas in the U.S.; and Baja California, Sonora, Chihuahua, Coahuila, Nuevo León, and Tamaulipas in northern Mexico—and are home to 1,506 native terrestrial and freshwater animal and plant species, according to a study by Defenders of Wildlife, our other national partner.

Last year, Defenders of Wildlife organized a letter, “Nature Divided, Scientists United: US–Mexico Border Wall Threatens Biodiversity and Binational Conservation,” which was endorsed by more than 2,500 scientists.²⁶ The letter highlights that the Trump administration’s efforts “to complete a continuous border ‘wall’ threaten some of the continent’s most biologically diverse regions.”

To bring attention to the letter among our community members, I coauthored an op-ed with two colleagues at the University of New Mexico, biologist Joseph Cook and historian Samuel Truett, in which we point out that the science letter is the latest “in a series of acts of resistance from scientists, scholars, environmental justice advocates and Indigenous peoples living in the U.S.-Mexico borderland.”²⁷

Artist Zeke Peña’s *All Against the Wall* is participating in this broader culture of resistance.

All Against the Wall is intergenerational and interspecies and makes a plea for accommodation (or living with wild animals), not extermination. It is an exemplary illustration of multispecies justice. Multispecies justice brings concerns and conservation of biotic life and habitats into alignment with environmental justice and Indigenous rights.²⁸ With a spare color palette (yellow, black, white, and gray), the lively illustration packs political ecology with humor and a hard punch.

Peña’s use of “All” also brings to mind Indigenous multispecies cosmology—All Our Relations.

But it isn’t only the charismatic, cartoonish, and cute mammals and birds in peril that deserve our attention. Equally important are the overlooked invertebrate creatures, like freshwater mussels, that also are caught up in the politics of ecology in the borderlands.

Last year, the U.S. Fish and Wildlife Service added the Texas hornshell mussel to the U.S. endangered species list. Celebrating the designation as the latest result of a “landmark agreement” between the Center for Biological Diversity and the federal agency, the center also highlighted the threats in a press release: “The last surviving native freshwater mussel in New Mexico, the hornshell is threatened by plans for a new dam, pollution and diminishing water in rivers due to global warming and agricultural and municipal use.”²⁹

Zeke Peña
All Against the Wall
 2018
 Digital illustration, created for Southwest Environmental Center (Las Cruces, New Mexico) to call attention to the harm that the border wall causes wildlife and our communities. For more information: wildmesquite.org

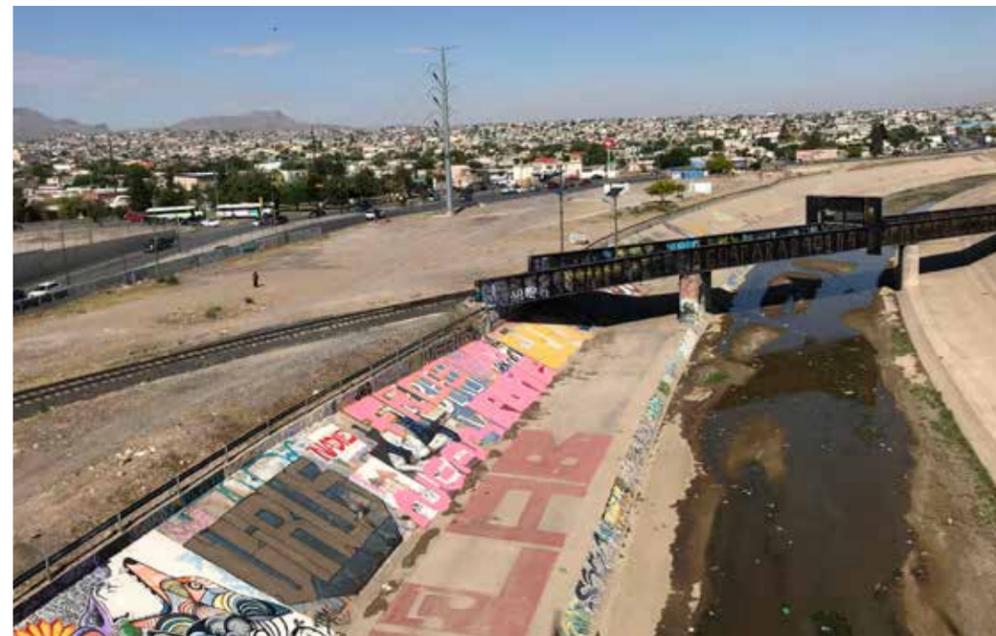
There is also the threat of oil and gas development.

Not everyone was thrilled with the listing. The *Albuquerque Journal* reported that then congressman Steve Pearce, who represented southern New Mexico, was “concerned that the listing may harm business in that corner of the state and the state as a whole as a result of decreased energy production.”³⁰

There is fear that the listing would endanger oil and gas development in southeastern New Mexico. As it happens, oil and gas production has already caused trouble for the hornshell. The Center for Biological Diversity press release also pointed out that one of the reintroduced populations in the Delaware River in New Mexico likely was wiped out two years ago following an oil and wastewater spill from a ruptured pipeline.

If you take this hyper-local story of an overlooked species and connect it to the Trump administration’s current attempt to gut the U.S. Endangered Species Act, you will realize how the public policy of a nation endangers imperiled species.

Artist laura c carlson first brought to my attention that the freshwater mussels are among the most endangered families of animals in North America. carlson’s passion to amplify the plight of mussels through art and education is infectious. With five dremel-etched drawings on glass panels, a concrete sculpture, and a zine, carlson’s work in the exhibition honors the freshwater mussels of the Rio Grande and its tributaries in the Mexico-U.S. borderlands—and urges accommodation, not extermination. Invoking each mussel’s capacity to filter enormous amounts of water, the artist offers a provocation: “If a mussel can’t survive in your river, you can’t live off of that river.”



View of the Rio Grande walking over the Santa Fe Bridge between El Paso and Ciudad Juárez. Photograph by Suzanne Sbarge

What’s Next?

Species in Peril Along the Rio Grande was developed by 516 ARTS in partnership with the Art & Ecology program at the University of New Mexico. Over the past two years, the Art & Ecology program convened two environmental justice conferences—*Decolonizing Nature: Resistance, Resilience, Revitalization* in April 2017 and *the last oil: a multispecies justice symposium on Arctic Alaska and beyond* in February 2018—and several speaker series lectures, including the *Global Futures Initiative* series in spring 2019.³¹

Species in Peril Along the Rio Grande is a continuation of these community-engaged scholarly efforts, and the most expansive and significant to date.

The Art & Ecology program is now making a long-term commitment to address biological annihilation. We are in the process of developing a global research, creative practices, and public outreach initiative: Biological Annihilation Omnibus. We plan to launch the initiative website in December 2019 (biologicalannihilation.unm.edu).

There is more. Last year, Albuquerque’s BioPark became the first facility in the United States to become a hub for the IUCN. In attendance at the partners’ meeting at 516 ARTS was Clayton Meredith, the IUCN Red List Officer for Plants at the BioPark. His colleague Tim Lyon is assessing freshwater fish. “With the recent addition of two Red List assessors, the ABQ BioPark is now at the leading edge of conservation research worldwide,” the *Albuquerque Journal* reported.

With the expansive kickoff of *Species in Peril Along the Rio Grande* at 516 ARTS—and the upcoming efforts of the Art & Ecology program at the University of New Mexico and the IUCN initiative housed at the BioPark—cultural, academic, and conservation institutions in the Rio Grande Basin are making a commitment to foster creative production, public scholarship, and outreach on biological annihilation.

We hope that our collective efforts will prove informative, inspiring, and generative for our region and beyond.

I close with what my Gwich’in relatives of Arctic North America taught me.

Mahsi choo shalak nai (thank you all my relations)!

Subhankar Banerjee is Lannan Chair and Professor of Art & Ecology at the University of New Mexico. His creative, scholarly and activist work over the past two decades have focused on biological annihilation and climate breakdown, and on defending critical nurseries and Indigenous rights in Alaska’s Arctic, including the Arctic National Wildlife Refuge. His photographs have been shown in more than fifty exhibitions around the world; an exhibition of his work will open at the Harwood Museum of Art in December 2019. Subhankar is editor of the anthology *Arctic Voices: Resistance at the Tipping Point*, and coeditor with TJ Demos and Emily Eliza Scott of the forthcoming book *Routledge Companion to Contemporary Art, Visual Culture and Climate Change*. Subhankar received a Greenleaf Artist Award from the United Nations Environment Programme and a Cultural Freedom Award from Lannan Foundation.

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12. Watch Chris Jordan’s film *Albatross* online at no cost. <https://www.albatrossthefilm.com>

13. Watch my short interview “From Aesthetic Shock to Ethical Awakening: How an Environmental Artist and Activist Found Purpose,” Humanities Moments, National Humanities Center, 2019. <http://humanitiesmoments.org/moment/subhankar-banerjee-aesthetics-ethics>

14. Susan Milius and Science News, “Stop Blaming Cats: As Many as 988 Million Birds Die Annually in Window Collisions,” *Washington Post*, February 3, 2014.

15. See the Program Guide for *Species in Peril Along the Rio Grande* (516 ARTS, August 2019). https://www.516arts.org/assets/documents/Species_in_Peril_Guide_FINAL_web_spreads.pdf

16. See a discussion of “unlikely allies” in my essay “Long Environmentalism: After the Listening Session,” in *Ecocriticism and Indigenous Studies: Conversations from Earth to Cosmos*, eds. Salma Monani and Joni Adamson (*Routledge Interdisciplinary Perspectives on*

Literature, 2017). For a discussion of “building bridges,” watch online the keynote lecture “Building Bridges and Connecting Dots: Apprehending Multispecies Futures” I gave at the National Humanities Center conference *Beyond Despair: Theory and Practice in Environmental Humanities*, April 3-5, 2019. <https://nationalhumanitiescenter.org/beyond-despair-next-steps-environmental-humanities/>

17. See “List of Birds of the United States,” which is compiled largely from the information in “Check-list of North American Birds” (<http://checklist.aou.org>) published by the American Ornithological Society. https://en.wikipedia.org/wiki/List_of_birds_of_the_United_States#cite_note-AOS-7

18. See “Maps of Mammal Diversity in the USA.” <https://biodiversitymapping.org/wordpress/index.php/usa-mammals/>

19. Elayne Lowe, “Busy As Bees Identifying Species,” *Santa Fe New Mexican*, June 19, 2018.

20. Bruce Stein, “States of the Union: Ranking America’s Biodiversity,” *NatureServe*, 2002.

21. See the exhibition catalog *Where I Live I Hope to Know* of my desert series photographs (Amon Carter Museum of American Art, 2011) and my essay “Ought We Not to Establish ‘Access to Food’ As a Species Right?” in *Third Text* special issue “Contemporary Art and the Politics of Ecology,” ed. T. J. Demos (Routledge, Number 120, Volume 27, Issue 1, January 2013).

22. April Reese, “Bird Population Plumets in Piñon Forests Pummeled by Climate Change,” Audubon, 2018. <https://www.audubon.org/news/bird-population-plummets-pinon-forests-pummeled-climate-change>

23. Andy Stiny, “New Mexico Plateau Named for Birds Seeing Them Die Off,” *Santa Fe New Mexican*, August 19, 2018.

24. See Leia Barnett’s story map “The Loss of a Namesake,” December 7, 2018. <https://www.arcgis.com/apps/Cascade/index.html?appid=dbf680efebb74d9ea3d950749eee57c1>

25. Laura Paskus, “A Dry Rio Grande in Springtime Isn’t Normal. But It Will Be,” NM Political Report, May 7, 2018. <https://nmpoliticalreport.com/834338/a-dry-rio-grande-in-springtime-isnt-normal-but-it-will-be-en/>

26. Robert Peters, et al., “Nature Divided, Scientists United: US–Mexico Border Wall Threatens Biodiversity and Binational Conservation,” *BioScience*, Volume 68, Issue 10, October 2018, pages 740–743. <https://academic.oup.com/bioscience/article/68/10/740/5057517>

27. Subhankar Banerjee, Joseph Cook, and Samuel Truett, “The Border Wall Endangers the Future of Humanity and Nature,” *Albuquerque Journal*, August 19, 2018.

28. Subhankar Banerjee, “Resisting the War on Alaska’s Arctic with Multispecies Justice,” in *Social Text* Periscope dossier “Beyond the Extractive View,” ed. Macarena Gómez-Barris, May 2018. https://socialtextjournal.org/periscope_article/resisting-the-war-on-alaskas-arctic-with-multispecies-justice/

29. See the press release “Vanishing Rio Grande Mussel Added to ‘Endangered’ List: Texas Hornshell Barely Hangs on in New Mexico, Texas” from the Center for Biological Diversity, February 8, 2018. https://www.biologicaldiversity.org/news/press_releases/2018/texas-hornshell-02-08-2018.php

30. Maddy Hayden, “Mussel in Southeast New Mexico Listed As Endangered,” *Albuquerque Journal*, February 10, 2018.

31. See the websites for the *Decolonizing Nature* (<http://decolonizingnature.unm.edu>) and *the last oil* (<https://thelastoil.unm.edu>) conferences and the *Global Futures Initiative* speaker series (<https://thelastoil.unm.edu/global-futures-speaker-series/>).

32. Rick Nathanson, “ABQ BioPark Has Lead Role in Species Conservation,” *Albuquerque Journal*, August 6, 2018.

Species in Peril in the Rio Grande Watershed

ANIMALS:

Diminutive amphipod
 Noel's amphipod
 Pecos amphipod
 Mexican long-nosed bat
 Mexican blindcat
 Uncompahgre fritillary butterfly
 Western yellow-billed cuckoo
 Bald eagle (delisted)
 Northern aplomado falcon
 Peregrine falcon (delisted)
 Black-footed ferret
 Southwestern willow flycatcher
 Big Bend gambusia
 Pecos gambusia
 Texas hornshell
 Socorro isopod
 (or Socorro sowbug)
 Jaguar
 Gulf Coast jaguarundi
 Red knot
 Canada lynx
 Devils River minnow
 Rio Grande silvery minnow
 New Mexico meadow jumping mouse

Preble's meadow jumping mouse
 Ocelot
 Mexican spotted owl
 Piping plover
 Comanche Springs pupfish
 Leon Springs pupfish
 Jemez Mountains salamander
 Pecos bluntnose shiner
 Pecos assiminea snail
 Alamosa springsnail
 Chupadera springsnail
 Koster's springsnail
 Phantom springsnail
 Roswell springsnail
 Socorro springsnail
 Least tern
 Greenback cutthroat trout
 Diamond tryonia
 Gonzales tryonia
 Phantom tryonia
 (or Cheatum's snail)
 Golden-cheeked warbler
 Gray wolf
 Mexican gray wolf

PLANTS:

Texas ayenia
 Zapata bladderpod
 Kuenzler hedgehog cactus
 Lee pincushion cactus
 Lloyd's mariposa cactus
 Bunched cory cactus
 Nellie cory cactus
 Sneed pincushion cactus
 Star cactus
 Tobusch fishhook cactus
 Terlingua Creek cat's-eye
 Ashy dogweed
 Guadalupe fescue
 Zuni fleabane
 Holy Ghost ipomopsis
 Walker's manioc
 Hinckley oak
 Todsens' pennyroyal
 Davis' green pitaya
 Little Aguja pondweed
 Sacramento prickly poppy
 Texas snowbells
 Pecos sunflower
 Sacramento Mountains thistle
 Gypsum wild-buckwheat

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Ballroom Marfa
 El Paso Museum of Art
 Rubin Center for the Visual Arts at UTEP

MEXICO

El Museo de Arte Ciudad Juárez
 Visual Arts Program, Universidad Autónoma de Ciudad Juárez

NATIONAL

Center for Biological Diversity
 Defenders of Wildlife

Featured Public Programs

NEW MEXICO

ALBUQUERQUE

September 21, 2:30pm
 Public Forum: *Encuentro de Semillas // Gathering of Seeds*
 at Albuquerque Museum

September 28
 Opening Reception:
Species in Peril Along the Rio Grande: Contemporary Artists Respond
 at 516 ARTS

September 29, 2pm
 Opening Address with *Kierán Suckling, Cannupa Hanksa Luger, Josie Lopez, PhD, Subhankar Banerjee*
 at Albuquerque Museum

October 3, 7pm
 Conversation & Booksigning:
Elizabeth Kolbert & Laura Paskus
 at KiMo Theatre & 516 ARTS

October 14, 5-7pm
 Indigenous Peoples Day: *Honoring Traditional Ecological Knowledge of the Rio Grande with Eddie Paul Torres, Brophy Toledo, Roger Fragua, Stephanie Oyenqu, & Rosie Thunderchief*
 at Valle de Oro National Wildlife Refuge

October 19, 2-4pm
 Field Murals & Poetry at the Refuge with *with Francesca Searer, Nani Chacon, Erin De Rosa, Jessica Chao, & Haley Greenfeather English, Michelle Otero & Amaris Ketcham*
 at Valle de Oro National Wildlife Refuge

November 15, 6pm
 Public Forum: *Species in Peril on the Borderlands: Michael P. Berman; León De la Rosa, PhD; Ma. Eugenia Hernández, PhD; Robert Peters, PhD; Sam Truett, PhD*
 at 516 ARTS

November 16, 7pm

Performance: *There Must Be Other Names for the River* by *Marisa Demarco, Dylan McLaughlin, & Jessica Zeglin*
 at National Hispanic Cultural Center

November 20, 7pm
 Panel Discussion: *Restoration & Resilience: Reclaiming Cultural Ecosystems*
 at Indian Pueblo Cultural Center

December 5, 6pm
 Public Forum & Booksigning: *Global Perspectives with Bathsheba Demuth & Joe Cook*
 at 516 ARTS

December 12, 5pm
 Talk: *Bird Conservation in New Mexico with Jon Hayes*
 at 516 ARTS

JEMEZ PUEBLO

October 12 & 26, 10am-1pm
Indigenous Knowledge Walk with Brophy Toledo
 at Red Rocks

LAS CRUCES

November 20, 7pm
 Lecture: *Subhankar Banerjee on Multispecies Justice in the Age of Biological Annihilation & Climate Breakdown*
 at Rio Grande Theater

ROSWELL

November 8, 5:30pm
 Opening Reception:
A Line in the Sand: Wildlife of the Borderlands
 at Roswell Museum & Art Center

TAOS

September 22, 5-8pm
 Public Art Launch: *Pollinator Concentrator: Focusing the Unseen*
 at Rio Fernando Park

COLORADO

Tuesday, December 3, 5:30pm
 Talk: *Regan Rosburg on Art and Grief: The Rio Grande Watershed*
 at RedLine Contemporary Art Center

TEXAS

September 27 & November 2
 Exhibition & Events:
Alebrijes by Colectivo Última Hora
 at El Paso Museum of Art

September 26, 5-7:30pm
 Mural Launch: *Both Sides of the River: Endangered Species in the Borderlands* by *U.S. artists Jaque Fragua, Dose, Waka and Laura Meness*
 at Rubin Center for the Visual Arts, University of Texas, El Paso

Through October 27
 Exhibition: *Candelilla, Coatlicue, and the Breathing Machine*
 at Ballroom Marfa

November 15, 6-9pm
 Opening Reception: *Solange Pessoa*
 at Ballroom Marfa

MEXICO

November 8, 2pm
 Mural Launch: *Both Sides of the River: Endangered Species in the Borderlands*
 at Universidad Autónoma de Ciudad Juárez

November 9, 7pm
 Opening Reception: *Desierto.Arte.Archivo*
 at Centro Cultural de las Fronteras,
 Universidad Autónoma de Ciudad Juárez

Exhibition List

MICHAEL P. BERMAN

Binary Codex - The Habitat
2019
Carbon Pigment on Kozo Washi

KAITLYN BRYSON & HOLLIS MOORE

Its Vitality Comes Through Fluctuation
2019
Handmade cottonwood paper, native seeds, naturally dyed fibers, natural ink, grow lights, and pine

laura c carlson

Lotic Possibilities I-V
(*Popenaias Popeii*, *Fusconaia mitchelli*, *Truncilla cognata*, *Quadrula couchiana*, *Potamilus metnecktayi*)
2019
Glass

Popenaias popeii Stratigraphy: looking forward to see back
2019
Concrete, travertine, water from the Black River

Passages: Notes on the Pecos River
2019
Zine, in collaboration with nicholas b jacobsen

Concrete cast Texas hornshell shells
Glass etching (shells provided by Texas A&M University)
Publication in collaboration with nicholas b jacobsen

AGNES CHAVEZ

BIOTA
2019
Projection, copolyester, fiber optics, galvanized metal, microalgae
Collaborators listed on page 24

SUZI DAVIDOFF

Simplified World/Aplomado Falcon and Grasses
2017
Charcoal, gesso, map

New Mexico Geology/Sacramento Mountains Thistle
2018
Chine collé etching on archival inkjet map, edition of 24

New Mexico Geology/Shootingstar Geranium
2018
Chine collé etching on archival inkjet map, edition of 24

CATALINA DELGADO-TRUNK

Fauna Mesoamericana
2017
Cutout on archival Japanese Leathac grain paper with collage

Axis Mundi
2014
Cutout on archival Japanese Leathac grain paper

MARISA DEMARCO, DYLAN MCLAUGHLIN & JESSICA ZEGLIN

There Must Be Other Names for the River
2019
Performance: Saturday, November 16, 7pm, 2019 at the National Hispanic Cultural Center featuring singers Ken Cornell, Monica Demarco, Ryan Dennison, Marya Errin Jones, Antonia Montoya, and Mauro Woody
Drawing: Acrylic, mylar, paper, river water, wood

NINA ELDER

Interrupted Ecosystem: Rocky Mountain Piñon
2019
Charcoal, graphite, ash, and dirt on paper

Interrupted Ecosystem: Beaver and Rivers
2019
Charcoal, graphite, ash, and dirt on paper

JAQUE FRAGUA

WOLF XING
2019
Oil enamel and vinyl on aluminum

JAGUAR XING
2019
Oil enamel and vinyl on aluminum

OCELOT XING
2019
Oil enamel and vinyl on aluminum

JESSICA GROSS

In clusters; they among fresh dews and flowers
2019
Serigraphy on paper

The Creation
2017
Intaglio and serigraphy on paper

CANNUPA HANSKA LUGER

(Be)Longing
2019
Ceramic, fiber, ribbon, steel, video

c marquez

521
2019
Installation and seedpods and stems of *Sisymbrium altissimum*

RUBEN OLGUIN

Evaporation
2019
Hand-foraged clay and soil on wall

ZEKE PEÑA

The River
2017
10-color serigraph, printed at Self Help Graphics & Art

All Against the Wall
2018
Digital illustration, created for Southwest Environmental Center (Las Cruces, New Mexico) to call attention to the harm that the border wall cause wildlife and our communities. For more information: www.wildmesquite.org

DAISY QUEZADA

brotante
2019
Porcelain ceramic seeds

NICASIO ROMERO

Bolas y Nido
2019
Willow, straw, wire, clay

MARCIA I. SANTOS

Affective Cartography
2019
Paint on wall

JANETTE TERRAZAS

Leopardus Pardalis
2019
Electronic textile, flowers, and *Larrea tridentata* over cotton
Interactive mapping of species' distribution and conservation status along the border between Mexico and the United States

Endangered Vegetal Species in the Chihuahuan Desert
2019
Electronic textile and piñon over mixed fabrics
Interactive mapping of species' distribution and conservation status along the border between Mexico and the United States

Chaute
2019
Electronic textile, *Larrea tridentata*, and flowers over mixed fabrics
Interactive mapping of species' distribution and conservation status along the border between Mexico and the United States

MARY TSIONGAS & JENNIFER OWEN-WHITE

Silvery Minnows, past
2019
Acrylic mounted digital print

Silvery Minnows, now
2019
Acrylic mounted digital print

Rio Grande Silvery Minnows
2019
HD video looped, framed LED monitor

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