SAN DIEGO NATURAL HISTORY MUSEUM

IMPACT REPORT

2020–2021

Dear Museum friends,

One of my favorite objects from my time at the Smithsonian's National Museum of American History is a specimen inspired by the old adage: "you can't make a silk purse out of a sow's ear," about taking something ugly or inferior and turning it into something of value. In 1921, a chemical engineer named Arthur D. Little attempted to prove that wrong (leave this type of hypothesis-testing up to a scientist). He created thread from protein in a sow's ear and wove it into a miniature purse. I know it doesn't really count as silk, but the optimist in me found it charming that someone took the time and effort to disprove a negative point of view.

Our version of a sow's ear was the COVID-19 pandemic and all the heartache and fear it wrought in our personal and professional lives. And what could possibly be our tiny redeeming purse?

While unimaginably horrifying, the pandemic taught us some valuable lessons and was not all bad for the San Diego Natural History Museum. The shutdowns and related societal crises forced a reassessment of museum values and activities, and was a time of rapid learning. Adversity made us stronger and more resilient, and it accelerated an organizational evolution that was already underway.

July 2021 marked the 5-year anniversary of President and CEO Judy Gradwohl. Visit sdnat.org/blog to read the interview about Judy's first five years—what she experienced, learned, rejoiced, and lamented at the helm of the San Diego Natural History Museum.

When I arrived five years ago the Museum was a well-known venue for major traveling exhibitions. Our new strategic plan, adopted in 2017, pointed us closer to our roots as a conservation and scientific organization that also runs a museum. With the loss of the iconic building as our identity, the pandemic helped us truly lead with our science, and celebrate and preserve nature in this amazing place we call home.

This report is testimony to our learning and accomplishments despite being dispersed over 100+ homes across the county. We made advances in science, conservation, education, energy conservation, reach and tenor of our digital communications. In fact, although we were permitted to reopen in fall 2020, we chose to stay closed until spring 2021 to focus on the activities that were showing promise during the shutdown.

The secret to our success is that, in a sense, we were ready for a major disruption. Plus, we had a lot of help. With our diversified financial model, practice in innovation, risk-tolerant atmosphere, and our strong ties with each other, our Board, and our community, we went in to the shutdown with valuable coping tools.

As a scientist in a nearly 150-year-old natural history museum, I can't help but make an evolutionary analogy. Unpredictable societal, political and environmental change will continue to be disruptive.

We can't anticipate every possibility, but we can try to build on the lessons we learned so far during the pandemic to be more sustainable, agile, and adaptive.

So, what's inside our proverbial silk purse?

- The knowledge that staff, Board, colleagues across the country, community of supporters, and government stepped up to pull us through the worst of the crisis.
- The sight of amazing feats of staff and volunteer agility, innovation, and rapid learning.
- The practice of questioning our assumptions and habits, and remaining open to experimentation.
- The shared vision that the only way we could truly fail would be to open the exact same museum we closed.

It wasn't an easy or comfortable year, but as we move toward our 150th anniversary in 2024, our culture, our skills, and our strength through adversity give me cause for optimism.

Sincerely,

Judy Gradwohl
President and CEO

Navigating Through Uncertainty

Our elation about reopening the Museum at the beginning of the fiscal year, and the months of preparation that went into creating a safe and welcoming experience for guests, was derailed by the curtailing of indoor activities due to of rising cases of COVID-19. In all, we were open to visitors for five days in July 2020 before shuttering our doors again. It was disappointing, but at least it provided a definitive guidepost in the pandemic swirl of uncertainty.

Our staff switched gears again and focused in earnest on reaching our audiences where they were: at home, online, and outdoors. With the success of our programming and the visible growth in new skills, plus extra time to re-group and address long-term planning, we quickly realized that being closed was not all bad.

In fact, in late July we decided we would stay closed voluntarily to shelter ourselves from being buffeted by constantly changing conditions, focus on work we knew we could accomplish, and use our resources most effectively by reopening when people were ready to come back.

We were closed for nine months of this fiscal year, a previously unimaginable length of time. But it gave leadership and staff the gift of time to re-envision the Museum's experiences for the pandemic era and beyond. We were already seeing how we could survive in a "new normal," and how people were receptive to our new ideas. We made the decision that when we did reopen, we would not be the same museum we closed on March 16, 2020. Our future would combine the best of our work before and during the pandemic in a hybrid model that connects people with the wonder of nature on-site, online, and out in nature.

The closure was anything but downtime. Our scientists kicked into overdrive, and although they were mostly unable to continue field work in the Baja Peninsula, they continued research and discoveries north of the border and in the collection itself. Our educators got creative digitally with a variety of live and pre-recorded content. Our social media team became our virtual front doors. Our valiant volunteers found ways to continue working at home and curate seasonal hiking suggestions. Our exhibition team completed a new show and planned for a new gallery.

We commissioned architectural studies for improving our collections and public spaces, continued our energy savings measures, reduced our dependence on paper, and tuned up our inclusion, diversity, equity and accessibility policies. We even designed a plan for new gardens that will surround our beloved building with living natural history.

Most of all, we learned new skills and learned important lessons about our museum and our capabilities. We adapted. That's something we know a lot about.

Al, our resident Allosaurus, masked up and ready for Covid compliance. The Nat—and Al—were featured in a New York Times *story about museums' responses to the pandemic.*

Prolific Paleontology

There's always something new to discover.

Paleontological discoveries come in all shapes and sizes, and sometimes at unexpected moments. The most familiar types of discoveries occur in the field, such as finding a fossil weathering out of a natural cliffside or exposed by a bulldozer in a freshly graded slope.

But discoveries also can occur far from the field—in the preparation lab where removal of sedimentary matrix exposes the true form of a long-buried fossil; in a museum collection storage room where long-archived fossils spark the imagination of a new generation of paleontologists; in a post-doc's office where new computational methods and big data reveal novel patterns begging for explanatory processes; or in the computer lab where CT imaging reveals a whole new source of anatomical information about an extinct species.

Here at The Nat, we had no shortage of exciting news and finds last year. And they illustrate the broad range of what we mean by "discovery"—from the excitement of being the first human to lay eyes on a long-buried skull or shell, to the intellectual spark that comes from discovering what a fossil has to tell us about the history of life.

In the field

In summer 2020, field paleontologists found and collected a treasure trove of land mammal fossils during construction of the new State Route 11 in Otay Mesa. Gino Calvano and Pat Sena, along with Preparation Lab Manager Chris Plouffe and other PaleoServices staff, uncovered these specimens from pond siltstones associated with ancient coastal sand dunes. They were collected en masse by encasing large blocks of the bone-bearing stratum in burlap-reinforced plaster jackets.

Back at the Museum, Curatorial Assistant Amanda Linn began opening the plaster jackets and making exciting discoveries of her own. As the enclosing silt and sand was removed to reveal skulls, jaws, and limb bones of ancient horses, camels, and oreodonts, it became clear that the fossils represented a curious assemblage of land mammals. This assemblage most closely matched assemblages long known from 15- to 14-million-year-old (middle Miocene) deposits exposed elsewhere in California, most notably near Barstow in the Mojave Desert. Because land mammal fossils of this age are unknown from San Diego County or northern Baja California, the Otay Mesa discoveries represent a new geological chapter for our region.

In the lab

One particularly large field jacket from the Otay Mesa site presented some puzzling patterns of fossil preservation as it was being prepared. The jacket yielded a number of camel and horse skulls, jaws, and limb bones, but no accompanying vertebrae or ribs. In addition, there were no femurs (thigh bone) or pelvic bones and all the humeri (upper arm bone) were missing their proximal ends where they would articulate with the shoulder blade.

Also, many of the preserved limb bones were sharply broken, with some showing spiral fractures indicative of breakage while the bones were still fresh. Still other bones preserved small, circular breaks that closely resemble puncture marks made by carnivore teeth. To top it off, there was also an age bias in the fossils of primarily young and old individuals.

Collectively, this taphonomic evidence suggests a complex history for the SR-11 fossil deposit; one that likely involved carnivores hunting young and elderly animals, selectively removing the tastiest parts, and hauling them "home" for dining.

Our PaleoServices team is responsible for spotting and salvaging fossil remains, including this one from the construction site of the new State Route 11 in Otay Mesa.

In the collections

Paleontology Postdoctoral Researcher Dr. Ashley Poust was involved in several interesting discoveries working with fossils that had been collected decades ago and stored in research collections at several different museums.

In one study published in the journal *Science*, Ashley and his co-authors used sophisticated mathematical methods and a series of museum specimens of *Tyrannosaurus rex* (32 post-juvenile and 12 juvenile specimens) to estimate the maximum body size and population density of this charismatic Cretaceous dinosaur—key measures critical to understanding an animal's life history. The team also came up with an estimate of the maximum number of *T. rex* individuals that had ever lived—about 2.5 billion over an estimated 127,000 generations. Although that seems like a big number, it suggests that there were only around 20,000 individuals of *T. rex* alive at any one point in time.

Ashley was also co-author of a study published in *Scientific Reports* that examined fragmentary skeletal remains of giant Eocene seabirds that were collected in 1983 from 50- to 40-million-year-old marine sedimentary rocks on Seymour Island in Antarctica. The partial fossil remains were identified as belonging to an early member of the extinct pelagornithids ("pseudo-toothed" birds), which represented the largest flying birds of their time with an estimated maximum wingspan of 5-6 meters. The Seymour Island fossils reveal the early evolution of extremely large body size in this group of open ocean-dwelling seabirds.

In the high-tech lab

Closer to home, Curator of Paleontology Dr. Tom Deméré and Research Associate Dr. Eric Ekdale used high-resolution computed tomography to reexamine a well-preserved skull of an early species of whale with both baleen and teeth, which was collected in 1972 from a rocky beach near Newport, Oregon.

The resulting CT scans revealed new information about the internal "plumbing" of the rostrum of the little whale (*Aetiocetus weltoni*), and showed that the paths of blood vessels and nerves leading to the teeth in *Aetiocetus* had branches that extended to tiny openings on the palate just inboard to the teeth. Earlier CT scanning of a modern gray whale calf by Eric, Tom, and others had found that the same rostral neurovascular pathways supplied the baleen racks in living baleen whales.

Together these results provide strong support for the hypothesis published by Tom and Eric in a recent issue of the *Zoological Journal of the Linnean Society* that unlike modern whales *Aetiocetus* had both teeth and baleen, and that the transition from tooth-assisted raptorial feeding on single prey to baleen-assisted batch filter feeding on schooling prey was accomplished by "repurposing" the dental plumbing to perform the new function of nourishing baleen—a totally novel keratinous structure.

Collections are critical to conservation. Scientific specimens and their associated data provide a snapshot of a species or community at a particular point in time. Shown here are paleontological whale specimens in our warehouse.

Collections Make Conservation Possible

From discovering new species to serving as expert advisors in land management decisions, our scientists play an important role in conserving biodiversity throughout our region. But the boots-on-the-ground discovery and restoration work sometimes overshadows one of the most critical parts of the conservation life cycle: our research collection.

A library of life in our region, our collection is invaluable and irreplaceable. The objects and specimens we study, collect, and care for represent the legacy of the past and the future of discovery. They provide benchmarks for our current knowledge and inspire new questions. Much of the research work we did over the past year underscores the importance of our collections.

Understanding What Lives Where

Field surveys and expeditions to gather data and understand what lives where, are essential to the conservation life cycle. Museum researchers along with Mexican colleagues and students restarted a pandemic-delayed survey of the coastal sand dunes of Peninsular California.

The peninsula of Baja California is home to some of the longest stretches of undisturbed coast in North America. But these areas are at risk of environmental degradation because they're seen as ideal spots for future development. Our goal to assess the biodiversity of the dunes resulted in discovering species that are new to science and yielded the authenticating specimens for our museum collection.

This research will help determine the uniqueness and ecological health of these remarkable and endangered dunes, and help local agencies establish conservation priorities.

Comparing Past and Present to Fill Data Gaps

Researchers are dependent upon our historic collections as well as new collections to help determine the conservation status of species today. Some extremely rare plant species have no official conservation status simply due to a lack of contemporary information. Curator of Botany Dr. Jon Rebman and Research Associate Dr. Sula Vanderplank collaborated with the San Diego Zoo Wildlife Alliance to solve this problem for at least a few rare plant species that straddle the border of California and Mexico.

Using a combination of collections data and on-the-ground fieldwork, the team gathered enough information to petition for the inclusion of five species on Mexico's federal listing of rare and endangered species. The fate of the species remains undetermined, but joining the list of rare and endangered species is a positive step in raising the profile of these plants.

*Conservation is made possible through historic collections, field notes, surveys, and expeditions. This page: Sand plants or purple pop-ups (*Pholisma arenarium*) in the coastal dunes of the Baja California Peninsula. Facing page: A team of scientists monitors the reproductive activity of California red-legged frogs as part of our project to re-establish populations in San Diego County.*

Supporting Habitat Restoration

Species don't magically become protected because they are added to a state or federal list. Collections play an important role in the contemporary management of rare species. For years, Curator of Herpetology Dr. Bradford Hollingsworth has been working with Anny Peralta from Ensenada-based Fauna del Noroeste to understand the current status of the California red-legged frog (*Rana draytonii*).

When they compared the frog's current range to historic data from collections and field notes, they were able to determine potential sites for expanding the population. This work helped identify habitat adjacent to healthy populations of the frog in Mexico. The team constructed new ponds to ensure a long-term safety net for this species. These same healthy populations were also used for reintroduction of the species into southern California for the second year in a row.

Informing the Future

In addition to thinking about the here and now, conservationists are always thinking about the future and how we can ensure resiliency of species across time. Our researchers had the future firmly in sight when working on a project to measure changes in species distributions over time in the Mojave Desert. It is only through using historic collections and research from over 100 years ago—and comparing it to data gathered in contemporary surveys—that the researchers were able to make that determination. Likewise, a century from now, scientists will use today's data to understand further how things are changing.

This year, the results of some of this work in the Mojave Desert were published in the journal *Science*. The project team found that while many species of birds shifted their distributions in response to climate change, the same is not true of most small burrowing mammals, as they can avoid extreme temperatures by staying underground. Practically speaking, the results of this work highlight that lifestyle matters, and that one size doesn't fit all for conservation approaches. Long-term conservation will require diverse measures to ensure species conservation in a rapidly changing world.

Together, collections, surveys, and expertise make our research staff a go-to resource for developing long-term management plans for our region's conserved lands. A team of museum scientists, led by Brenna Ogg and Kevin Clark in our BioServices Department, completed land management plans for five reserves managed by the California Department of Fish and Wildlife. This was made possible through a multidisciplinary approach, combining our collective institutional knowledge, biological studies throughout the region, and historic data and collections.

Whether it's using camera traps to understand wildlife corridor dynamics or studying diseased trees to aid in pest management, our team has been working to ensure the ecological health of some of the wildest places in our region. Our collections provide an unparalleled baseline for conservation efforts and grow more valuable every day.

Nature When We Needed It Most

Getting outside and into nature was one of the top activities of this pandemic year—right up there with reorganizing pantries, making sourdough bread, and experimenting with Zoom backgrounds.

The great outdoors beckoned both seasoned adventurers and nature newbies with the promise of fresh air and open spaces. San Diegans turned to trails, local parks, neighborhood canyons, city sidewalks, and their own backyards to escape boredom and socialize safely.

With our Museum's increased focus on outdoor programming and using nature as a classroom, we were uniquely poised to provide inspiration, expertise, and activities.

Canyoneers led the way online

At the beginning of the fiscal year, it became clear our Canyoneer naturalists would not be able to offer guided hikes. But with people battling cabin fever and clamoring for new activities, we leveraged the moment and shifted our focus. Instead, the Canyoneers curated quarterly "top 10" lists of their favorite trails to encourage people to hike on their own.

This new approach was a sleeper hit. The online-exclusive content was among the most frequently accessed by website visitors and our social media communities. People wanted to get outside and explore, and we were there to guide them (virtually). These results are already influencing our plans for the next Canyoneers season.

Resources and inspiration for people at home

With more people doing backyard gardening and getting outside, our scientists, educators, and community partners offered expertise and inspiration for those remaining close to home.

Dr. Michael Wall invited the San Diego Pollinator Alliance to write a blog about simple yet effective ways people can help monarch butterflies. Our Botany and Entomology departments launched social media campaigns explaining regional flora and fauna in fun and approachable ways. Dr. Jon Rebman's "Sidewalk Botany" series described weeds/plants one might see (and overlook) on city sidewalks. Entomology Collection Manager Pam Horsely and the LepNet team grew the #MothMonday campaign showcasing the incredible variety of Lepidoptera they have been digitizing since 2019.

Meanwhile, our Education team increased their production of at-home activities and resources for parents of school-age children (read more about those offerings on the next page).

Canyon-adjacent residents became backyard scientists

We publicly launched our Healthy Canyons initiative, which aims to improve the health of our urban and suburban coastal canyons and the people who live near them. In this pilot stage the project is working with two local communities to monitor and study the biodiversity of Ruffin Canyon as well as Chollas Creek and Radio Canyons.

More than 15 families and organizations that reside near these canyons became community scientists, agreeing to host our insect monitoring "malaise" traps and environmental monitoring equipment in their backyards. Participants were excited to be part of actual research at The Nat and quickly became adept at monitoring their local biodiversity.

If 2020 and 2021 proved anything, it's that we need nature as much as nature needs us. It strengthened our resolve to create a more sustainable future for wildlife and people across our region.

While the Museum was closed to the public, we were able to develop new ways to engage San Diegans in the nature that surrounds us, no matter where we live. And we will continue—no matter what the future brings.

Hikers enjoy the scenic terrain at Torrey Pines State Reserve. Hiking was a top pandemic-era activity, and our Canyoneers were there to guide the way (virtually) with online trail recommendations.

Learning in Our Living Rooms: Education for the Digital Age

A museum brings to mind a building, a place for the public to visit and learn. As the pandemic and shutdown marched on, we needed to adapt and answer the question: how could we continue to serve our audiences as the building remained closed?

The internet, of course.

Staff poured their efforts into virtual programming. Livestreams on social media opened our digital doors while Nat Talks moved to Zoom, becoming early indicators that The Nat could fulfill its mission virtually.

During the fiscal year, we hosted 21 virtual Nat Talks, including three programs held entirely in Spanish, collectively reaching more than 3,800 registrants. Virtual talks meant our reach went global, with attendees hailing from as far as Kenya and Argentina. No longer limited by travel needs, we hosted speakers from around the world, including colleagues from Baja California and researchers from as far away as Australia.

Attendance at The State of Biodiversity Symposium increased at least threefold (we virtually welcomed 678 attendees over four Thursdays in April 2021) as did the number of people registering from Mexico. In 2020, just 2 percent of attendees were from this part of our region, but with the move to Zoom, we saw that number increase to 26 percent in 2021.

To ensure greater accessibility, virtual programs were equipped with closed captioning and recorded for our YouTube channel, and several were offered in Spanish or with simultaneous Spanish interpretation.

To help meet the needs of educators, a survey went to teachers to learn what resources they needed most. We turned our most sought-after school field trips to the exhibitions *Fossil Mysteries*, *Coast to Cactus*, and *Living Lab* into virtual tours. We developed video versions of popular in-museum classes like Rockin' Out with Fossils and Amazing Arthropods, and paired them with activities and worksheets developed by volunteer Docents.

Teachers wanted help showing pathways to careers in science, and we answered the call with a series of Career Spotlights, videos that featured interviews with science professionals from our museum. Going virtual provided opportunities for students in the School in the Park program to go behind the scenes of The Nat and into field sites with paleontologists.

Live, interactive youth programs hosted on Zoom allowed staff to broadcast from places outside the Museum, such as tidepools at Cabrillo National Monument and a raptor caretaking site. Throughout the school year, live virtual programs served 3,674 participants from 59 schools. When the recordings were later shared on our growing YouTube page, they were viewed an additional 3,100 times. The newly-launched Distance Learning webpage served as a hub for all this content, registering nearly 12,000 page views since it was launched in November 2020.

Virtual programs reached thousands of students and at-home learners. Here, Paleo Prep Lab Manager Christopher Plouffe talks ammonites in the Fossil Mysteries *exhibition.*

This renewed focus on digital programs also allowed us to deepen ties with community partners. Adult and youth programming for climate literacy were developed in partnership with Climate Science Alliance. This included a talk with Rob Badger and Nita Winter, the photographers behind the exhibition *California Blooming*. The Barona Museum and Cultural Center was instrumental in the development of the virtual class Native Land, Native People.

The results of this past year's programming demonstrates that our impact goes well beyond the walls of the building. We plan to continue to integrate virtual programing for students and adults and to leverage resources such as captioning and translation to make programs more accessible.

We are excited to evolve our in-person, outdoor, and distance learning experiences in order to connect with all of our audiences, wherever they may be.

Building Ideas into Action

Behind closed doors, building improvements continued.

Our exhibits may have been dark for much of last year, but the Museum was a beehive of activity. The closure of our building provided an opportunity for improvement and upgrades that might not have been possible while hosting visitors. We took last year's facility master plan—which focused on reducing our carbon footprint, improving collections care, and enhancing the visitor experience—and turned ideas into action.

Ramping up access

A new ramp outside the east staff entrance may seem like a modest improvement, but it means a great deal when it comes to accessibility—for both people and specimens. It offers ease-of-use for the many staff, volunteers, and vendors who use it as their primary entrance to the building. And it helps us safely move large research specimens in and out of the building.

At the same time, we explored options for better use of our space to house our collections. We created plans to relocate offsite paleontology storage to our Museum's lower level, with the goal of creating a new fossil processing lab and collection area in the space formerly used for traveling exhibitions. If we are able to complete this project in future years, it will mean that our paleontology collection will be stored under one roof for the first time in decades, providing better access to specimens and allowing us to vacate offsite storage space.

Climate change starts at home —our home

Our fossils may be prehistoric, but our equipment shouldn't be. We're replacing aging building infrastructure with state-of-the-art solutions that are more energy efficient and financially sustainable.

Our team has replaced about 3,000 fluorescent light bulbs with LED retrofit lamps, and has removed more than 350 individual lights to reduce the number in operation. We also acquired environmental sensing devices to measure light, temperature, and humidity in our collections areas in real time. Alerts are automatically sent to staff if the indoor climate declines in sensitive areas.

These same devices are also being used to measure indoor climate conditions as we transition to passive modifications that reduce our dependence on energy and HVAC. A great example of passive techniques is the installation of high-performance window film throughout the Museum. This material prevents 70 percent of the thermal energy (heat) from entering—it's like a nice pair of sunglasses for the building!

New ways to delight and inspire visitors

Giving our guests more ways to experience the joy of discovery is a primary objective, and we made progress toward this goal in several key areas.

Because more staff will be telecommuting or using reconfigured, shared office spaces, six private offices on the fourth floor were demolished to make way for a new 2,000-square-foot gallery, which was completed in March 2021. In addition to creating better sightlines and access to our rooftop deck, this new gallery will house an exhibition about the biodiversity of the Baja California Peninsula, taking visitors on a journey through the area's unique habitats, and introducing them to its natural beauty, ecological conditions, and our museum research there.

We also completed a landscape master plan for the grounds immediately outside the Museum. Our vision is to build a new, interpretive nature garden surrounding our building that will be free and accessible to millions of Balboa Park visitors every year.

Additional improvements included re-envisioning our store into a mixed-use retail and café space to complement the new e-commerce site that was launched this year, deep cleaning and maintenance of all exhibits, converting the theater equipment from 3D to 2D, installing a new marquee identifying it as the Subaru Giant Screen Experience, and preparing for the reopening in April 2021.

We're creating more spaces to inspire and delight visitors, including a brand-new gallery on our fourth floor. This space was converted from a row of staff offices, and it will house an exhibition about the biodiversity of the Baja California Peninsula, opening in spring 2022.

Welcome Back

Visits to The Nat sparked joy.

April 2, 2021 was one for the record books. After a 13-month closure, our doors reopened to an awaiting group of elated guests eager to explore The Nat. The excitement was palpable—for both visitors and staff—and the building was abuzz with each person who walked through our doors. We welcomed more than 700 guests on that day alone, both longtime friends and first-timers.

The shared feeling was an overwhelming sense of a return to (relative) normalcy. The familiar din of chatter and enthusiasm slowly filled the dormant building, bringing our beloved Museum back to life. Guests explored fan-favorite exhibitions and new experiences like *California Blooming*, a gorgeous photography show about climate change and wildflowers.

While we were closed, we adapted and found other ways to connect with audiences. The success of our offsite and online offerings showed us that we are larger than our building, and that we can successfully reach our audiences online. As we bring our iconic building back into operation, we will continue to provide exciting experiences for both our online and onsite guests.

Our onsite visitors surprised us with their enthusiasm about the Museum. There's something really special about seeing a fossil or gemstone in person, watching the pendulum knock over a block, or coming face to face with a desert iguana.

Daily visitation rates remained high beyond opening week. Even with reduced operating hours, we fell just shy of 2019's admissions revenue during the same period. Of course, pent-up demand accounts for some of this, but the continued visitation rates underscore a genuine thirst for unique museum experiences and in-person connection, and reinforce our importance as a flagship attraction in San Diego.

Much of our work happens outside the museum walls, but our building in Balboa Park acts as a home base for everything we do. It holds 75 million years of history, millions of specimens, a team of researchers working to study and preserve biodiversity, and exhibits and programs that delight visitors.

And while we learned there are other ways to connect people to the wonders of the natural world, we also learned there's just no replacement for the real deal.

Visitors observe a Baja California ratsnake (Bogertophis rosaliae) *in* Living Lab. *The building sprang back to life on April 2, 2021 after more than a year of being closed.*

Continuing to Evolve: Diversity and Inclusion

Whether our work happens inside the Museum, out in the field, or online, it's implemented by the talented, hard-working, and passionate people on our team. Collectively, the voices, insights, experiences, and knowledge of our employees and volunteers power our mission and strengthen our public service.

During a difficult year in which we all practiced social distancing, it was more important than ever to make sure our staff also felt included, heard, and valued. An internal, cross-departmental working group of staff led this effort. Launched in 2019 and dedicated to removing barriers for inclusion, diversity, equity, and accessibility, the IDEA (Inclusion, Diversity, Equity, and Accessibility) Team truly shone this year.

It starts with listening. After seeking input from all staff, the team developed a statement on Diversity and Inclusion that served as a guiding principle to the data-gathering, training, and staff discussions that we hosted throughout the rest of the year. Currently on our website, this message will be a guidepost for our policies and practices.

Words are only the start. Training, learning, and active practice of inclusivity are paramount to having a team that feels confident, trusted, and empowered to work for our organization to the best of their ability.

With that in mind, we began hosting a series of virtual training opportunities for all staff. Together, we learned about: Unconscious Bias, LGBTQ+ Inclusivity, Race and Racism, and Diversity and Inclusion in Balboa Park. We paired some of these larger trainings with smaller group discussions to give everyone the opportunity to process and discuss information in a comfortable setting.

As a scientific institution, data-informed decision making is important to us. In collaboration with the Balboa Park Cultural Partnership, we participated in a multi-institution anonymous staff survey on diversity and inclusion. This survey provided the opportunity for staff to share their confidential opinions through a third party. We received actionable recommendations that would have the greatest impact on staff feelings of inclusion:

- Improve recruitment and hiring policies and processes to increase IDEA
- Improve communication, especially related to decision-making
- Help staff gain the skills they need to succeed in their jobs and careers

Both the Executive Management team and the IDEA Team are setting goals for the next fiscal year to address these recommendations. We will also participate in a follow-up survey to see how our focus on these barriers changes the work culture and experience for our staff.

We know we're not the only organization taking an active approach towards a more diverse and inclusive environment. The opportunity to transparently learn as we advance diversity and inclusion at The Nat is appreciated, and we welcome you to join us as we grow.

The Nat's Statement on Diversity and Inclusion:

We believe science and society are inextricably linked. Our Museum is committed to fostering attitudes and behaviors that promote and value diversity, equity, accessibility, and inclusion. We dedicate our work to regional biodiversity and we strongly support our vibrant community. Our hopes for a sustainable approach to the natural world rely on a society that consciously makes unbiased choices and values mutual respect, social justice, and cooperation in all aspects of life.

For more information, visit sdnat.org/about-us.

Biodiversity Research Center of the Californias Associates

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Mr. David K. Faulkner
Dr. Sohath Z. Yusseff-Vanegas
Dr. Natalia Rodriguez-Revelo

ENTOMOLOGY DEPARTMENTAL ASSOCIATE
Mr. Ron McPeak

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Dr. Todd Reeder
Dr. Patricia Galina Tessaro
Dr. Dean H. Leavitt

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Mr. Clark Mahrdt
Mr. Richard Schwenkmeyer
Mr. Jorge Valdez Villavicencio
Mr. Dustin Wood

LIBRARY EMERITUS
Ms. Carol Barsi

MARINE INVERTEBRATES RESEARCH ASSOCIATE
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MARINE INVERTEBRATES DEPARTMENTAL ASSOCIATES
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Dr. Hugh M. Wagner
Dr. Steven Holan
Mr. Robert Reynolds
Dr. Joseph El Aldi

PALEONTOLOGY DEPARTMENT ASSOCIATES
Ms. H. Patricia Don Vito
Ms. Carol Stadum
Ms. Kathleen M. Holen

*A sand wasp (*Bembix sp.*) in the coastal dunes of the Baja California Peninsula. Museum entomologists and scientists from Mexico are working on a comprehensive entomological survey to help decision makers conserve and manage this precious resource.*

Collections By the Numbers

TOTAL NUMBER OF SPECIMENS: ~8 MILLION

BIRDS
New specimens collected: 263
Total specimens: 51,798

MAMMALS
New specimens collected: 98
Total specimens: 25,498

HERPETOLOGY
New specimens collected: 80
Total specimens: 76,651

PALEONTOLOGY
New specimens collected: 16,697
Total specimens: 1,521,671

BOTANY
New specimens collected: 1603
Total specimens: 279,257

ENTOMOLOGY
New specimens collected: 54,932
Total specimens in the collections: 1,224,661

RESEARCH LIBRARY
56,000 volumes

MARINE INVERTEBRATES
5 million specimens

MINERALOGY
15,000 specimens

Volunteers Gift Their Time and Talent

The Nat has a dedicated and talented community of volunteers that is more than 700 strong. And they were eager to continue to support our mission from afar and, once restrictions began to ease, at the Museum. Throughout the past year, volunteers helped digitize butterfly and moth specimens, photograph fossils, transcribe herbarium labels, skin birds at outside work stations, and much more.

While Docents developed activities for at-home learners, Canyoneers planned for a new season of hikes (after blazing new trails developing digital content during the year-long hiatus), and Whalers returned to the seas as whale watching cruises resumed.

We are grateful to all of our volunteers for their patience and flexibility during this past year. Thank you, volunteers, for your valuable contributions.

A Mountain of Thanks

We would like to thank Director of Volunteers Janet Morris, who retired after 17 years of dedication to our mission. Janet has been an enthusiastic advocate for existing and new volunteer programs, always seeking novel ways to include volunteers in all aspects of our programming. Her leadership in recruitment of student interns in the science departments has greatly expanded the Museum's audience and helped foster closer relationships with local high schools and community colleges. Janet has touched the lives of hundreds of volunteers and helped extend the museum family. We are grateful she was part of ours for 17 years.

Janet Morris, pictured at Split Mountain in Anza Borrego Desert State Park, served as director of volunteers for 17 years.

Volunteer Milestones

JOIN US IN HONORING VOLUNTEERS WHO HAVE REACHED SIGNIFICANT MILESTONES.

40 YEARS+

Priscilla Dick, Canyoneer
Marian Lucas, The Covey
Geri Nicolson, The Covey
Joan Parker, Docent
Margaret Powell, The Covey
Sandra Rosenthal, Canyoneer
Ellen Smothers, The Covey

35 YEARS

Mary Lytle, The Covey
Carole Ziegler, The Covey

30 YEARS

Barbara Ellis, The Covey
Melissa Swann-Bloom, Canyoneer
Brian Swanson, Canyoneer

25 YEARS

Martha Jacobson, Science (Botany)
Barbara Kanzius, Docent
Enrique Medina, Canyoneer
Linda Pardy, Canyoneer
Sonya Sale, The Covey
Carol Wilson, Docent

20 YEARS

Betty Ball, Docent
Anne McCammon, Canyoneer
Eric Ross, Canyoneer
Gloria Sonnabaum, The Covey

15 YEARS

Janet Domnitz, Science (Botany & Paleontology)
Mary Emery, The Covey & Docent
Wendy Esterly, Canyoneer
Carrie Huckell, Docent
Rosemary Kelley, Docent & Whaler
Walter Konopka, Canyoneer
John La Grange, Science (Botany)
Janet Merritt, Science (Botany)
Judy Peacock, Whaler & Canyoneer
Merrilyn Pope, Canyoneer
Leslie Rapp, Whaler & Science (Birds & Mammals)
Carol Sebastian-Neely, Docent
Rosanne Stogner, Whaler
Thuy Ta, Canyoneer
Charles Wolfinger, Science (Parabotanist)

10 YEARS

Apolonia Akins, The Covey
Christine Baltuth, The Covey
Rochelle Gaudette, Canyoneer & Science (Entomology)
Patricia Gifford, Canyoneer
Marjorie Hale, The Covey
Pauline Jimenez, Canyoneer
Julie Johnson Lavelli, The Covey
Alan King, Canyoneer
M. Kimberly Lowe, The Covey
Glenda Maxwell, Whaler
Florence Sell, The Covey
Ann Sixtus, Whaler & Science (Botany)
Robert Wallace, The Covey
Penny Ward, Science (Research Library)
Lorena White, The Covey

5 YEARS

Carolyn Anderson, Canyoneer
Anna Arft, Canyoneer & Science (Botany)
Millie Basden Thomas, Science (Botany)
Nora Bodrian, Canyoneer & Science (Botany)
Mary Kay Borchard, Canyoneer
Richard Breisch, Science (Botany & Herpetology)
Marlin Burke, Canyoneer
Russell Carlson, Whaler
Dayle Cheever, Science (Paleontology & Zooarchaeology)
Jacqueline Corbeil, Canyoneer
Julia Deardorff, The Covey
Diane Elias, Canyoneer
Nico Goossens, Canyoneer
Sonia Hernandez, Canyoneer
Vryce Hough, Science (Birds & Mammals)
William Huntly, Docent & Science (Paleontology)
Meegan Jones, Canyoneer
Birgit Knorr, Science (Parabotany)
John Meitz, Science (Birds & Mammals and Entomology)
Janice Meliska, Docent
Christine Meza, Canyoneer
Veronica Morones, NATuralist
Marilyne Panzica, The Covey
Thomas Payne, Canyoneer
Emily Pittman, Canyoneer
Claudia Poquoc, Whaler
Erika Rodarte, Museum Ambassador
Vicky Rowley, Canyoneer
Louise Russell, Science (Botany)
Peter Sadori, Science (Entomology)
John Schuler, Science (Paleontology)
Jennifer Spearel, Whaler
Pamela Stahlak, Whaler
Robert Vinton, The Covey & Science (Botany)
William Zeigler, Canyoneer

By the Numbers

SCIENCE NEVER STOPPED

- Georeferenced 25,000 herbarium records (latitude/longitude assigned to a written locality description)
- Photographed 9,000 herbarium specimens and made available online
- Digitized 23,799 Lepidoptera specimens (moths and butterflies) for LepNet project
- Measured 22 fossil walrus skulls for research about fossil walrus diversity (The Nat has one of the most important fossil walrus collections in the world!)
- Number of T. Rex that ever lived: approximately 2.5 billion
(see story on page 4)

THE BUILDING WAS ABUZZ (EVEN WHEN CLOSED)

- Added 2,000 square feet of exhibit space for visitors (this gallery will house a new exhibition, opening in spring 2022)
- Fed 24,000 crickets to the animals in Living Lab, about 2,000 per month
- Saved 16,248 plastic water bottles from landfills through use of water refill stations
- Retrofit 335 lights with new LED drivers and replaced 46 exterior fixtures with new, energy efficient models
- Recycled 416 fluorescent tubes and 1,054 lbs. of e-waste

WE MET PEOPLE WHERE THEY WERE

- Public programs registrants came from 14 countries across the globe on ALL human habitable continents; within the U.S., they came from 38 states, plus D.C. and Puerto Rico, a 35.7% increase in geographic reach
- Hosted 21 virtual Nat Talks (almost twice the number the previous year), collectively yielding more than 3,800 registrations
- During City Nature Challenge, 765 community scientists in San Diego County submitted 14,955 observations representing 2,074 species
- Published 71 videos, from pre-recorded field trips to seasonal wildlife phenomena and research highlights
- Published 927 social media posts and 27 blogs; our most popular was “Great Hikes for Fall,” yielding 12,000 pageviews

YOU LIKED US. YOU REALLY LIKED US.

- 1,791 philanthropic donors gave more than $5.4 million to support research and education efforts in FY21
- The summer 2020 Challenge Grant garnered more than 459 gifts from 427 individuals. The number of individual gifts during this six-week period exceeds what we receive at the holiday season, which is typically our busiest fundraising time of year
- Members engaged with museum staff and got a peek behind-the-scenes during 20 virtual Member Meetups

Simply Extraordinary

Celebrating Margi Dykens.

Director of the Research Library Margi Dykens retired in January after 23 years of service to the Museum. She has been a tireless advocate for our special collection and an integral part of communicating our science to the public. Margi has always championed revealing the hidden collections and science of the Museum, from highlighting historic photographs for our Throwback Thursday series to helping make our library more accessible to the public.

Margi’s list of accomplishments is long, and her impact on the Museum will be long-lasting. Two wonderful examples of her work are *Extraordinary Ideas from Ordinary People*, a core exhibition that opened five years ago, and *Plant Portraits: the California Legacy of A.R. Valentien*, which earned the 2004 Western Museums Association Excellence in Exhibition Award and toured the U.S. for several years. Thank you, Margi, for your extraordinary contributions to The Nat.

Jerome and Eleanor Navarra, Margi Dykens, and Allison Henderson celebrate the 2016 opening of Extraordinary Ideas from Ordinary People *in the Eleanor and Jerome Navarra Special Collections Gallery.*

Financials

The Museum experienced strong financial and operational results for the fiscal year ended June 30, 2021. During a period marked by lockdowns, cancelled events and social distancing, we saw an organization shaped by new operating models, unanticipated federal funding and tax credits, and generous stewardship from both long-standing and new donors. Along with the rest of the world, we pivoted to address the challenges posed by COVID-19. We learned new ways to deploy working capital in an effort to maintain financial sustainability.

The Nat generated $11.8 million in total operating revenue during FY 2021 – an increase of $1.3 million (12.5%) over the prior fiscal year. Philanthropic support strengthened the Museum's ability to operate during nine months of closure to the public. Income from contributions of $6.5 million increased by $2.3 million (54%) from FY 2020. This was primarily driven by a $1 million challenge grant that increased individual giving, as well as one-time government funding for COVID-19 recovery of $1.2 million. In addition, the Museum's skilled and dedicated scientific staff delivered on our mission as Paleontological and Biological consulting services generated $2.9 million in revenue during our closure.
These factors allowed The Nat to retain a sizable portion of its full-time and part-time staff, as did the Employee Retention Tax Credit of $1.6 million.

The Museum's operating expenses totaled $10.1 million in FY 2021, compared to $11.4 million in FY 2020. To account for the uncertainty of our circumstances, we reduced spending by nearly $1.3 million (12.8%) through operational efficiencies, resource sharing, and limited use of furloughs.

Our energy conservation efforts (e.g., HVAC equipment and lighting upgrades) resulted in lower costs and we minimized paper consumption. We made necessary investments in our infrastructure, technology and people to keep pace with the changing environment. We learned that a remote workforce, while not ideal for everyone, was an economically feasible alternative to onsite operations during unsafe times. With our move to a digital workplace, which included the use of cloud-based applications and storage, we established better data security. Our move to digital education tools provided a learning platform to attract new audiences for our Nat Talk lectures. Digital content blossomed, with more material on a variety of platforms, more engagement, and an ability to truly lead with our science.

The Nat achieved a net operating surplus of $1.8 million in FY 2021, despite being closed for the first nine months of the fiscal year. The Museum's net assets grew by $7.7 million (15.9%), which was driven by growth in the endowment, unanticipated government funding, tax credits and donor contributions. Cash increased by $368,803, while the endowment rose to $24.8 million – an increase of $4.4 million from the prior fiscal year. In FY 2021, we also increased the use of restricted funds to support projects that could be completed during the closure. These funds covered salaries, supplies, and overhead in the science, education and engagement departments.

The Museum invested $538,327 to support critical infrastructure needs in FY 2021, including a new exterior ADA accessibility ramp, gallery space, and an e-commerce website.

As in the past, capital improvements were funded primarily from restricted donor contributions. Non-cash depreciation expense exceeded capital asset investments, which resulted in a net decrease in the value of the Museum's property, equipment and leasehold improvements of $1.1 million (from $18.6 million to $17.5 million). Additional details of The Nat's financial health at June 30, 2021, can be found in our audited financial statements, which are posted on our website.

A focus on sound financial management, disciplined investment, and thoughtful planning is the basis of all our past and future achievements. FY 2021 was a year of reimagining, tough choices, and hard work for the Museum. We reevaluated financial and operating policies and procedures; we strengthened our workforce; we shared knowledge in order to make better financial decisions; and we implemented best practices in an uncertain environment. The dedication of our staff, volunteers, board, and generous supporters helped us complete the year in a strong financial position. Looking to the future, we will succeed because of our bold vision, resilience, and connection to the region we serve. We continue to position ourselves to make transformational change as we approach our 150th anniversary in 2024.

MARK OROZCO
CFO/COO

Read the full FY 2021 financial report at sdnat.org/about-us

56%
CONTRIBUTIONS*
$6,758,514

58% Donations
$3,901,795

24% CRT Change in Value
$1,634,919

18% Paycheck Protection Program
$1,221,800

(*Includes a portion of net assets released from restrictions of $2.3 Million)

24%
CONTRACTS & GRANTS
$2,948,645

89% PaleoServices and Bioservices Contracts
$2,616,527

11% Grants
$332,118

14%
AUXILIARY ACTIVITIES
$1,658,128

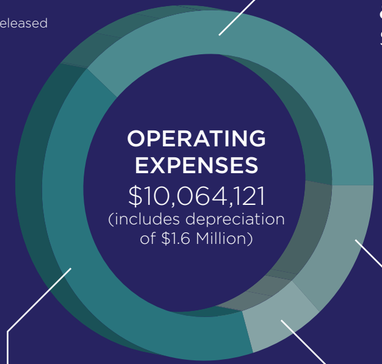
97% Employee Retention Credits
$1,603,740

3% Other
$54,388

6%
ADMISSIONS & MEMBERSHIP
$732,428

72% Admissions
$529, 934

28% Membership
$202,494



38%
SCIENCE & RESEARCH
$3,850,876

13%
MANAGEMENT & GENERAL
$1,311,385

41%
VISITOR EXPERIENCE
$4,152,241

8%
FUNDRAISING
$749,619

Publications

Research publications are the core of the scientific process. Through publication, research is open to the rigorous critique, testing, rejection, or verification necessary for knowledge to grow. In this way, our researchers continue a long tradtion of scientific inquiry at The Nat.

Bold indicates Museum research associates.

Bold Italics indicates Museum staff members.

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*Purple martin (*Progne subis*) on a cardón cactus (*Pachycereus pringlei*).*

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If we have omitted your name or made an error, please accept our apologies and help us correct our records by contacting us at 619.255.0359 or development@sdnhm.org.

In Memoriam

The following individuals represent members, donors, and volunteers who have passed away this fiscal year. We are thankful for their commitment to the Museum and wish to honor their memories.

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Love Nature. Love The Nat. Love Our Supporters.

Local philanthropists concerned about the loss of admissions and other revenue stepped forward last summer and offered a $500,000 challenge grant. It was an amazing act of generosity, one that was greatly appreciated during our shutdown.

We announced this matching gift opportunity, and the community responded with a resounding message of love and support. The challenge garnered more than 459 gifts from 427 individuals in a period of six weeks, allowing us to reach our goal of $1 million when combined with the match. As a point of reference, the number of individual gifts during this time period exceeds even what we receive at the holiday season, which is by far our busiest fundraising time of year.

We were delighted by the results of this campaign. Your generosity helped us through a difficult time. We are grateful for the incredible support of our community and people like you.

Staghorn Cholla Moth (Euscirrhopterus cosyra).

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The Live Oaks Society is comprised of supporters who have made gifts to the Museum through their estate plans.

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*Anthony's Liveforever (*Dudleya anthonyi*) is an endemic species restricted to the San Quintín volcanic fields.*

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The flat-tailed horned lizard (*Phrynosoma mcallii*) has the most limited distribution of any horned lizard in the United States. Its California range is mostly contained in the Imperial and Coachella Valleys, with some habitat in eastern San Diego County.

Development and off-road vehicle activity have affected the lizard's habitats. Our scientists use records of where the animal has been observed, coupled with data from the museum's historic collections, to understand the environmental factors that shape patterns of biodiversity and learn what the lizard needs to survive.

Preserving this amazing place we call home.

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