

# YOSEMITE CONSERVANCY

*Spring Summer 2022*

VOLUME 13 ISSUE 01





# Shaping Yosemite's Future



**TECHNOLOGY** may not be the first thing that comes to mind when describing the wonders of Yosemite, but it can be exciting in its own way. Just to prove the point, we gathered some insights about the latest tools park staff are using to monitor the vital signs of Yosemite's natural systems, to share historical artifacts and images from the park museum, and to up the sustainability quotient in the park.

Thanks to recent donor funding, Yosemite Conservancy was able to fund lidar ("light detection and ranging") overflights of the park. Lidar uses lasers that create precise 3D imagery to measure the topography of the bare earth. It can penetrate tree cover, as well as track disappearing glaciers by measuring the thickness of the ice.

GPS (global positioning system) has evolved to let park biologists easily track the movement of bears, fishers, and mountain lions in the park. Conservancy-funded GPS collars on animals can also drop off when signaled, then be retrieved by park staff to use again.

Conservancy grants have enabled the park museum and library to digitize historical photographs to make them available online — opening a view into Yosemite's past to the public without fear of degradation of the images.

In a great marriage between technology and sustainability, a new partnership with electric vehicle (EV) manufacturer Rivian will put up to 100 EV charging stations in Yosemite. Use of the stations will be at no cost to the public, and we look forward to seeing an increase in the number of EV owners visiting the park in a more eco-friendly way.

All these projects contribute both to reducing the human impact on Yosemite and to the park's growing electronic database. Through the increased use of modern technology, we'll know more about Yosemite than ever before. In turn, this knowledge will help the park make even better data-driven decisions about projects big and small — whether it's a restoration project, or assessing if a tent cabin is safely outside a rockfall zone.

As the challenges of climate change bring more complexity to our world, we will need the most innovative technology to guide us in preserving Yosemite for the years ahead. Now, that's exciting.

Frank Dean  
PRESIDENT & CEO

**COVER** A yellow warbler sits on a branch. Once called the "summer yellow bird," this songbird makes its home in Yosemite from May onward. Learn more about the use of lidar in songbird studies on pg. 4.

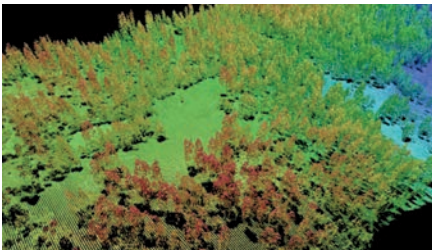
PHOTOS: (COVER) © ANN & ROB SIMPSON. (LEFT) © CAROLYN BOTELL. (OPPOSITE PAGE, TOP TO BOTTOM) © CAROLYN BOTELL. © SIERRA NEVADA ADAPTIVE MANAGEMENT PROJECT/MAREK JAKUBOWSKI. © GRACE WANG.



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YOSEMITE  
CONSERVANCY

**OUR MISSION** *Yosemite Conservancy inspires people to support projects and programs that preserve Yosemite and enrich the visitor experience for all.*



# MAPPING TECHNOLOGIES

HOW LIDAR SUPPORTS RESEARCH IN YOSEMITE

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BY MEGAN ORPWOOD-RUSSELL





**FOR DECADES**, research scientists in Yosemite have had a huge problem to solve: how to study the sheer scale of the park. While it is possible to study small areas and collect and aggregate mean data to predict results, it proves difficult to fully understand the delicate and myriad ecosystems within the 1,187 square miles of the park. Thanks to technological advances, however, scientists are able to map not only the topography of the land, but also the habitats and flora and fauna to which Yosemite is home.





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You may have heard lidar mentioned in some of our project updates. Developed in the 1960s, lidar, which is short for “light detection and ranging,” is closely related to radar and sonar technology. It is, fundamentally, a remote sensing tool.

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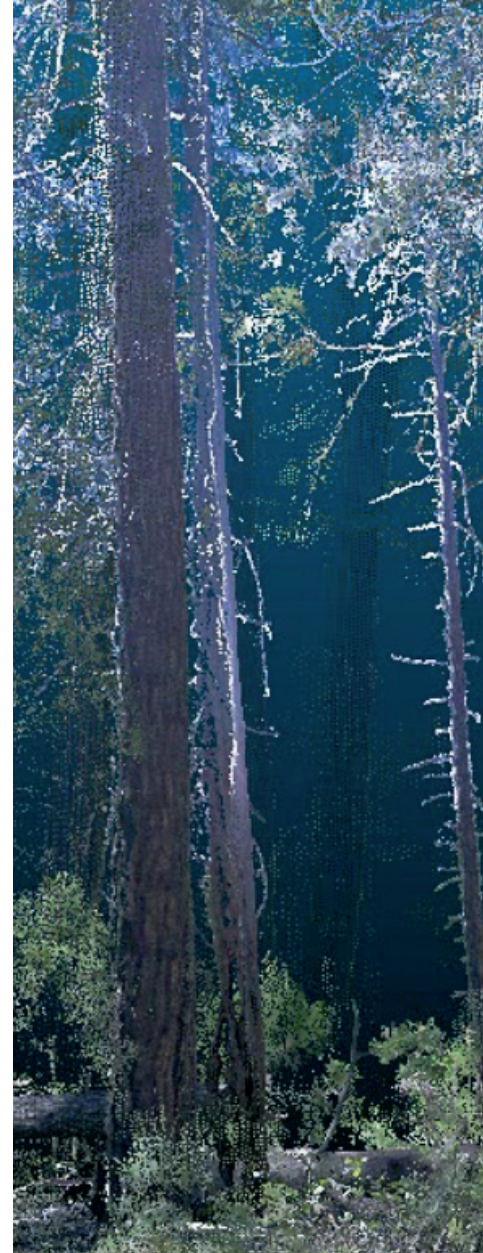
Lidar works by using a laser beam to determine the distance to an object. The beam of light hits an object, then travels back to the sensor. A microcomputer inside the lidar sensor measures the time it takes for this light to return to the sensor. Since the sensor also knows the speed of light is fixed, the sensor can then calculate the distance to that object.

Due to the accuracy of the technology, it is frequently used in aircrafts to ascertain distance to the ground. It is also used in a number of Conservancy-funded projects in Yosemite. From mapping the habits of songbirds, to assessing forest vulnerability, lidar is a core tool for understanding both the land and the environment.

Greg Stock, a Yosemite National Park geologist, is studying disappearing snow in the high country. His goal is to understand declines in the perennial snowfields in Yosemite, as well as in the Lyell and Maclure glaciers (work that started with John Muir in 1872). The

oldest snowfield records, from the early 1900s, are historical photographs and topographical maps (courtesy of U.S. Geological Survey records). In the mid-1990s, satellite imagery was used to map the park, and lidar was used beginning in the Tuolumne watershed in 2012 and in the Merced watershed in 2014. It is likely that more water is stored in perennial snowfields than in glaciers and that storage is being lost to warming temperatures and drought. The goal of Stock's research is to learn more about the impact climate change has on the snowfields and to make the first major effort to track trends in snow patches. This will let scientists estimate when remaining snowfields might disappear and determine what the loss of that snow will mean to streams that drain from them.

Unlike many of our other tools, lidar is 3D. By comparing year to year, it is possible to track shrinking ice patches, which lets us measure the volume of snow lost from one year to the next.



#### **THIS STILL TAKEN**

from a 3D model animation shows the fine-grain detail terrestrial lidar can pick up. Researchers are able to completely map the forest from ground to canopy using lidar, which enables them to recreate the forest in its entirety, and establish which habitats are more vulnerable to fire — and how they can best be protected.

PHOTOS: (PREVIOUS PAGE) © ATHENA DEMETRY.  
(ABOVE) © COURTESY OF NPS/CHAD ANDERSON.





“We’re used to seeing snowfields in the High Sierra, and so we tend to take them for granted,” Stock says. “Even in the late summer, they are a big part of how we experience the high country. But recently, we’ve begun to realize that may not be the Sierra of the future: High country snowfields may soon be entirely absent from the high country in the late summer. This has impacts in terms of how we experience and navigate the landscape, as well as in what it could mean for the streams fed by snow melt.”

When the park first started using aerial lidar technology in the early 2010s, it was a big event and an important opportunity. Lidar precision has changed significantly since then. Not only has 3-meter resolution been fine-tuned to a resolution of centimeters, but airplanes can gather data five to six times per year, rather than the annual flyover that was initially possible. Using

terrestrial lidar, multiple research teams can collect as many as 50 million points of lidar data in a single week.

A combination of both aerial and terrestrial lidar is essential for forest mapping. Chad Anderson, one of Yosemite’s landscape ecologists, is working on a Conservancy-funded project to assess forest vulnerability to drought and fire, and to study tree mortality. The lack of road networks in the park makes remote sensing a necessary tool to measure changes on the ground, with a goal toward making a working model that can evaluate trees on an annual basis. Subsequently, researchers will be able to rapidly assess outcomes of fires and determine where the best locations may be for prescribed burns to improve wildlife habitat and reduce the chances of high-severity fire.

“We have never been able to capture the state of the entire forest at once,” Anderson says. “In a good year, with



a well-funded crew, we could visit a couple of hundred plots. In a 900,000-acre park, we could assess only a few hectares. We want to understand the structure and the health of the forest on a park scale. Lidar gives us the ability to assess the park's health over vast scales."

For the first time in Yosemite's history, we will be able to get a boundary-to-boundary 3D view of the entire park in full color, thanks to the combination of increased computer-processing speeds with advanced lidar and other satellite technology.

Lidar also plays well with other technology, such as GPS (global positioning system; read more about how GPS has evolved on page 10). This year, park researchers will unite lidar forest structure data with songbird location data to evaluate desired conditions for a suite of songbird species that breed in Yosemite. Together, these rich data sets will help park managers develop restoration plans to maximize habitat for bird species and communities. Prolonged droughts and fires are changing forests and

meadows, making it increasingly vital to have tools, such as lidar, to look forward at the effects of climate change and act accordingly to make Yosemite's habitats more resilient for songbirds and other wildlife.

"We want to protect and maintain as much of the birds' natural habitat as we can," says Dr. Sherill Ladwig, who along with her wife, helps to financially support this vital songbird research.

Sarah Stock, a Yosemite's wildlife ecologist, is also using a number of technologies, ranging from ground-based terrestrial lidar to GPS tracking, to assist her research into Pacific fishers and great gray owls.

"Both aerial and ground-based remote imaging are useful," Stock says. "Lidar gives us different values and lets us see habitat in slightly different ways. It's a tool that enables us to zoom in and zoom out on the landscape. We might have a point on the map where we know there's an animal, based on their GPS collar as a data point, or visual observation. Using lidar, we can zoom in on what individual animals are using on the landscape. Is their presence associated with canopy cover, big trees, open areas, etc.? We are then able to map those attributes and learn more about the habits of different animals. By integrating aerial and ground-based lidar technology, we hope to leverage both top-down and ground-up perspectives."

Integrating both aerial and terrestrial lidar data is essential to the success of multiple projects, as they work to create a holistic 3D map of Yosemite, including everything from bare earth to animal behavior patterns. Lidar is a perfect complement to fieldwork, and it offers a more granular view of habitats.

"Animals have evolved to live in Yosemite for thousands and thousands of years," Stock says. "They can adjust, but only if they have the habitat left."

She works closely with Anderson to figure out how to manage fires on the landscape.

"We have a lot of capacity to protect what we have," she adds. "It's more challenging to try to improve what's already been changed. When a high-severity fire comes through and burns hot enough to remove the canopy cover or the big trees, you can't bring those back, so we have to protect what we have, and we have to identify what we have first. That's where technology comes in."

"We've never had this much data before," Anderson says. "Our partnership with Yosemite Conservancy allows us to see the park in new ways." ■



#### THE YELLOW-RUMPED WARBLER

are one of the many species of songbird that are being studied in Yosemite. This vital research, which has been ongoing since the 1990s, continues this year.

PHOTOS: (ABOVE) © ANN & ROB SIMPSON.  
(OPPOSITE PAGE) © CHAD ANDERSON.



**NPS TECHNICIAN**  
Melissa Booher surveys  
plants along transects  
associated with terrestrial  
lidar plots.



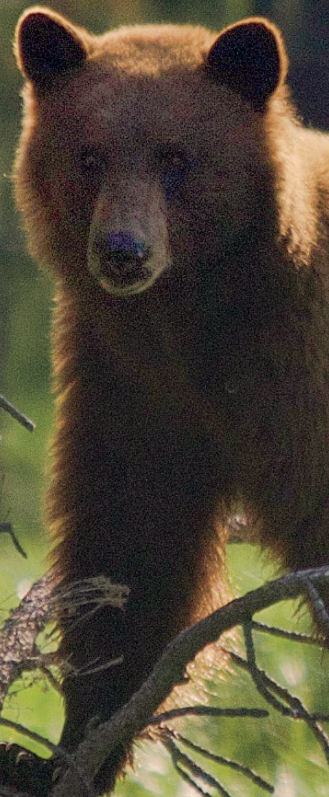


# *Saving Species*


## THROUGH GPS TRACKING

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BY ELIZABETH SHERER





A black bear is seen from the side, climbing a large, fallen tree trunk in a lush green forest. The bear's thick brown fur is visible, and its paws are gripping the bark. The background is filled with tall, thin trees and dense green foliage, creating a sense of a wild, natural habitat.

“We want to shift bears back  
to their natural behaviors:  
avoiding people and  
eating natural foods.”

**Caitlin Lee-Roney**  
YOSEMITE'S HUMAN-BEAR  
MANAGEMENT PROGRAM

**A BLACK BEAR**  
climbs a fallen tree.  
Conservancy donors have  
contributed nearly \$279,000  
to bear-specific GPS projects  
in the past decade, and more  
than \$2M to other bear-related  
projects. Your support is  
working to protect this iconic  
Yosemite species

PHOTO: © COURTESY OF NPS/MICHELLE DESROSIER



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These days, we take GPS (global positioning system) for granted. It's in our phones, in our cars, in our computers — and many of us rely on it for day-to-day navigation, sharing our travels, and more.

But the technology has a different use within Yosemite; it is invaluable for scientists studying wildlife in the park. From bears to birds to bighorn sheep, GPS is a critical tool for researchers and their work to study and protect both ubiquitous and rare species.



## BEARS

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**Since the 1990s**, wildlife biologists have used radio telemetry to monitor black bears' activities in Yosemite. This precursor to GPS technology allowed resource managers to find collared bears of interest via a radio signal — but it only worked within a small range of about a mile or two.

Now, real-time GPS tracking allows researchers to continually and consistently observe bear movement across the park, identifying patterns that allow responsive management decisions, such as temporary speed restrictions on Tioga Road when bears are actively foraging nearby. Longer term, this wealth of data offers ample research potential into bear habitat, food sources and availability, movement patterns, and more.

There is a common misconception that tagged and collared bears in the park are “in trouble,” or that those tags and collars amount to unnecessary human interference.

Actually, it's humans who are encroaching on black bear habitat. And the tags and collars — which are harmless to the bears — help keep them safe.

“While they might not look natural, the goal [of the GPS collars] is to encourage bears to remain wild by staying away from humans,” says Caitlin Lee-Roney of Yosemite's Human-Bear Management Program.

The simple presence of people often tempts bears to forgo their instinctual food sources, such as acorns, in favor of the calorie-rich food humans bring and eat daily at the campgrounds and picnic tables.

Lee-Roney knows exactly how dangerous a single incident of a bear successfully finding human food can be. She and her team rely on donor-supported GPS tracking technology to help prevent those incidents, allowing bears to coexist with humans in healthy and sustainable ways.

“We want to shift bears back to their natural behaviors: avoiding people and eating natural foods,” Lee-Roney says.

And it's working. The combination of monitoring devices and bear-proof food storage has led to a massive reduction in annual bear-related incidents in the park — from a high of 1,584 in 1998 to just 55 in 2021.

Lee-Roney and her team only target and tag or collar bears after visually observing that they are interacting with developed areas, which amounts to fewer than 25 of the 300 to 500 bears in Yosemite.

Despite the advanced technology that helps track habituated bears (those that have become desensitized to the presence of humans) in Yosemite Valley, the actual method of deterring the bear is as analog as ever. When rangers receive an alert that a collared bear is in or approaching a campground or parking lot, they grab their equipment and get ready to yell.

“We do whatever we can to convince them that being around humans is a bad idea,” Lee-Roney says.

In this way, GPS tracking and in-person ranger interventions protects both wildlife and people.





## BIGHORNS

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**Sierra Nevada bighorn sheep** are a unique, genetically distinct subspecies of bighorns, and they only live in their namesake mountain range. After decades on the edge of extinction, they are slowly reclaiming a foothold in their Yosemite high country habitat.

Conservancy donors have played an invaluable role in that recovery since the species' initial reintroductions in 1986 and 1988, as has GPS tracking.

When Sierra Nevada bighorn sheep were listed as endangered in 2007, GPS tracking was identified in the recovery plan as an important tool for monitoring the population. With help from Conservancy donors in 2011, 30 individuals were fitted with collars.

Prior to the 20th century, Sierra Nevada bighorn sheep populations likely numbered in the thousands. But the arrival of Western settlers brought unregulated hunting and exposure to foreign diseases carried by domesticated sheep.

Today, GPS data helps resource managers and researchers from the National Park Service, U.S. Forest Service, and California Department of Fish and Wildlife to monitor bighorns' survival, habitat use, and movements — and to intervene, when necessary, to ensure they avoid contact with domestic sheep. Domestic sheep are still grazed near park boundaries on Forest Service land, and they could potentially hinder bighorn recovery efforts without effective monitoring.

Modern GPS technology is also helping biologists learn how the species is faring in a changing climate. As the Sierra Nevada experiences climate whiplash — extremely wet winters juxtaposed with extremely dry winters — researchers are studying the bighorns' GPS tracks to understand how they navigate these new climate challenges.

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**BEARS:** A GPS tracking map that shows the behaviors and habits of wild bears. This bear map is one of many resources that can be found at [keepbearswild.org](http://keepbearswild.org), a project made possible by donor support. PHOTO: © COURTESY OF NPS/KEEP BEARS WILD.

**BIGHORNS:** Bighorn sheep are tracked using GPS collars, which helps researchers monitor the species' recovery in the park. PHOTO: © STEVE YEAGER.



## OWLS

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**Previous issues** of this magazine have highlighted our donor-supported effort to restore Ackerson Meadow to its natural hydrology and reinstate its former glory as a mid-elevation habitat haven.

This year and next, GPS tracking of Yosemite's great gray owls will reveal where the species are foraging, roosting, and nesting. Biologists will use this information to help inform active restoration activities that further optimize the habitat characteristics on which the owls rely.

With your support, in 2022, wildlife biologists will tag up to seven individual great gray owls with GPS tracking devices, which will record their locations at regular intervals and help map their travel patterns. Biologists can use this location data in conjunction with noninvasive methods, including lidar data, DNA analysis, and field observations, to monitor their movements and document favorable conditions at the owls' nesting and hunting sites.

"Combining technology allows us to zoom in and zoom out at all spatial scales with precision to examine how animals are interacting with the landscape," says Sarah Stock, a wildlife ecologist in Yosemite.

Stock and her team hope to make roadsides less attractive to these rare and threatened owls, which are regularly lost to vehicle collisions, and to create the ideal water levels and vegetation structures for them to forage in Ackerson and other nearby meadows. If resource managers can replicate the owls' preferred conditions during rehabilitation, they'll make serious strides toward ensuring the species' survival.

This project is made possible by donor support and through collaboration with the Institute for Bird Populations, which relied on similar tracking technology to study raptors in the northern Sierra Nevada in recent years, and which has contributed to several successful Conservancy-funded bird projects.

## PACIFIC FISHERS

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**The Pacific fisher** — a relative of the mink and the otter — is a medium-size, forest-dwelling mammal. The isolated population of fishers in the southern Sierra Nevada, which scientists estimate at fewer than 300 adults, faces rapid habitat loss driven by wildfire, tree mortality, and climate change. The species was designated as federally endangered in May 2020.

There's reason for hope, however.





“Combining technology allows us to zoom in and zoom out at all spatial scales with precision to examine how animals are interacting with the landscape.”

**Sarah Stock**  
YOSEMITE WILDLIFE ECOLOGIST

With your support, park biologists have been surveying and monitoring fishers with advanced tracking technology since October 2021 with great success. Using a combination of advanced GPS collars and conventional telemetry methods, Stock and her team have captured and collared 10 male and five female fishers. Their goal is to determine fisher travel paths in and around recent wildfire footprints, but their tracking efforts have already revealed fishers in unexpected places, including Yosemite Valley!

In late March, when the fisher breeding season began, the project team transitioned to tracking pregnant females to identify the den trees where they will have their young offspring.

“This is an exciting time to discover a new generation of fishers in the park,” Stock says. “We hope our results will tell us more about the number of fishers living here and, more importantly, the habitat they need to survive in a constantly changing landscape.”

While tracking collars for smaller animals, such as fishers, are not as versatile as larger models (such as for bears and sheep), and have limited battery life, they can still provide critical, detailed data on habitat use and suitability, as well as inform successful management strategies that balance the species’ immediate and prolonged needs.

If biologists such as Stock can identify where a female fisher has chosen to den, for example, that area can be temporarily protected from interference while fire crews perform prescribed burning elsewhere, hopefully preventing high-severity fire and protecting fisher habitat into the future.

In this way, technological advances in GPS monitoring — and the generosity of you and other donors who make such tools accessible to Stock and her colleagues — are helping protect the Pacific fisher population from near extinction. ■

PHOTOS: (TOP) © VISHAL SUBRAMANYAN. (BOTTOM LEFT) © U.S. FISH AND WILDLIFE SERVICE PACIFIC SOUTHWEST REGION.



## Yosemite ICONS

Yosemite Conservancy is excited to launch the Yosemite Icon series! Each title gathers stunning photos and insider information to tell the story of one of the park’s celebrated landscape elements.

**Purchase both and receive a 30% discount at [shop.yosemite.org](https://shop.yosemite.org).**



# PROJECT UPDATE

# WELCOME CENTER

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With exhibits, eateries, and stores, Yosemite Village draws millions of people each year and is often visitors' first stop in the park. As the village nears its 100th anniversary, outdated facilities — especially the often-crowded visitor center — offer a less-than-ideal welcome.

*But that's about to change.*



This winter, construction crews broke ground for the re-envisioned village plaza and Yosemite Valley Welcome Center, which will dramatically upgrade visitors' arrival experience and provide an accessible, self-service orientation to Yosemite National Park and its many wonders.

The \$10.4 million project is supported, in large part, by Yosemite Conservancy donors. It will transform the 3,000-square-foot former "sport shop" at the south end of the village

into a state-of-the-art space where visitors can learn about safety and stewardship, talk to rangers and Conservancy volunteers to get oriented and plan their itineraries, shop for guides and maps, and more. Outside, a 20,000-square-foot plaza will provide ample seating; a new restroom facility; and educational signs, displays, and maps with information available 24 hours a day — all with quick access to nearby parking.

The current Valley Visitor Center, which opened in 1967 when park

visitation was a fraction of what it is today, is currently about a half-mile from the hub of visitor parking. The trail connecting the two is sometimes confusing to visitors, especially first-timers, and difficult for those with mobility challenges.

"I remember what it was like going up there," says Pam Starr, whose family made a significant gift to the project. "I knew how much this was needed."

Starr worked five summers in the park in her early 20s — as a





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## The \$10.4 million project is supported, in large part, by Yosemite Conservancy donors.

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**AN ARTIST'S RENDERING** of the Welcome Center in Yosemite Valley, which will be located adjacent to the Village Store. The 3,000-square-foot building was formerly the Yosemite Sports Store and is situated closer to the main parking lot.

housekeeper, cafeteria worker in Camp Curry, and server in the restaurant at Wawona Hotel. She met her late husband, Jim — who grew up in Yosemite Valley as the son of the park's resident dentist — during her summer at Wawona Hotel, and they were married in the Yosemite Valley chapel.

"Dad's love for the park went on forever," Jon Starr says. "Mom knew she wanted to make a gift to the park and recognize him."

"Yosemite has been a very special place for our family. We went backpacking in the High Sierra for years! The love for the park was something Mom and Dad both shared with our family."

Overall, the project represents an unparalleled opportunity to transform the visitor experience in the heart of the park.





**TOP:** The new center will provide an information hub for all visitors in Yosemite, offering information on how to access the park safely and sustainably. **BOTTOM:** Construction is under way, with work due to be completed by spring 2023.

RENDERINGS: (PREVIOUS PAGE & TOP)  
© RHAA LANDSCAPE ARCHITECTS.  
PHOTO: (ABOVE) © YOSEMITE CONSERVANCY.

The new Welcome Center will ensure that Yosemite's millions of annual visitors enjoy a best-in-class welcome when they arrive in the Valley and that they will have access to the information they need to experience the park safely and sustainably. The current Valley Visitor Center lobby will also be updated and transformed into an educational and learning hub in the next several years.

The following demolition and construction are currently in progress or slated to be complete by summer:

#### OUTDOORS:

- The site has been cleared, including demolition of the patio on the south side of the building and removal of select trees, to make way for the restroom and plaza.
- Trenching for utilities for the updated Welcome Center and the nearby restroom has begun, with Tribal representatives monitoring the site for buried artifacts.

#### INDOORS:

- The interior of the building has been demolished and hazardous materials abated.
- Exhibits are being written and reviewed.
- The tech team is assessing needed IT and AV systems.
- A firewall is being constructed between the new Welcome Center space and the grill/market next door.

The majority of construction is expected to be complete by fall 2022, with the outdoor plaza, exhibits, and restroom finished and open to the public in spring 2023. ■





## DATA & STORYTELLING

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# Digitizing Yosemite's Archives

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BY MEGAN ORPWOOD-RUSSELL

In this data-driven age, we know the information gathered about our digital lives tells a story. Every website we visit is correlated with apps we use on our phones, and our behaviors and habits become aggregated data points that build a profile on what we might be interested in — whether that is booking a hotel for a trip to Yosemite or buying a new phone.

At Yosemite Conservancy, our dedicated data team manages a database of more than 330,000 constituents and has processed more than 1 million gifts. Gone are the days of vast file cabinets containing all this information. We now have streamlined processes that help us understand our supporters better, and that helps us tell better stories.

“This data makes it possible for us to see and understand where different aspects of our organization overlap: where we have donors who are also volunteers or if wilderness permit applicants are also

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**NATIVE AMERICAN BASKETS** stored on shelves in the Yosemite Museum. The museum has more than 1.2 million objects, and they are carefully archived and accounted for. This work is undertaken predominantly by volunteers and interns, providing invaluable support to Yosemite.

PHOTO: © YOSEMITE CONSERVANCY/KEITH WALKLET.





**“THE YOSEMITE ARCHIVES** preserve more than 7,000 maps, plans, and drawings, an amazing collection of trail maps, fire maps, vintage advertisements, design plans (both completed and theoretical), and more! Each one is a unique artifact which cannot be seen anywhere else.” — Paul Rogers

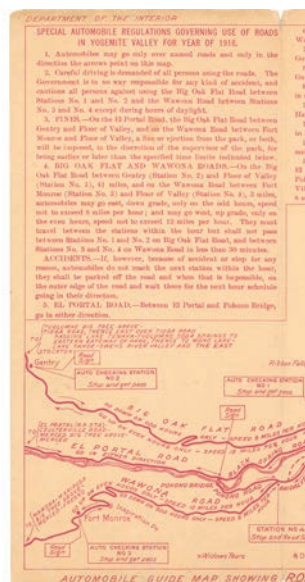
program participants,” says Eryn Ligon, the Conservancy’s data services director. “Seeing ways that people interact with us shows us who has stories or connections.”

Both the Yosemite Museum and the archives have been undertaking the task of digitizing their records for years. The pandemic provided an unexpected benefit to museum staff, when the empty exhibit gallery transformed into a workspace and photo backdrop. Staff took thousands of images of objects, and they are working to add these to the NPS Web Catalog, a task that was launched and supported by a past Conservancy grant.

According to Greg Cox, the curator of collections at Yosemite, the staff photographed most of the basketry and other ethnographic

material, and a large portion of the 2D art, in the collection during 2021, enabling greater access to the museum’s artifacts. Creating an easily accessible, non-physical space for researchers and enthusiasts to search for information is also a powerful tool of democratization, as it lifts many barriers to access.

Donor-supported work has allowed the archive to preserve and digitize thousands of images, which, in turn, are uploaded to NP Gallery, the National Park Service’s digital asset-management database. Where researchers previously would have had to travel to the park to visit the archives in person, they are now able to explore huge swathes of the archives online, thanks to this digitization project. This work also offers the public a wonderful







opportunity to browse and download archival images and learn more about the history of the park. Extensive data on both cultural and historical resources can be found in the Yosemite archives.

“Many retired NPS/contract staff view digitized photos and maps and provide additional information about the materials — background stories, which are vital for connecting people to the resource. We call this ‘folksonomy,’” Park Archivist Paul Rogers says. “In the era of increased teleworking for college and work, digitizing primary sources makes that process more seamless and brings these resources to people’s fingertips.”

Thanks to the support of Yosemite Conservancy donors, the archives have partnered with the Student Conservation Association (SCA) to digitize maps, plans, and drawings. They will make around 3,000 archival maps available for use in an online public gallery. The SCA is America’s conservation corps, which focuses on protecting and preserving national parks, heritage sites, and cultural landmarks. The goal is to cultivate lifelong stewardship and develop conservation leaders in their communities by engaging young people. Four SCA interns make up the Yosemite Archives map digitization project.

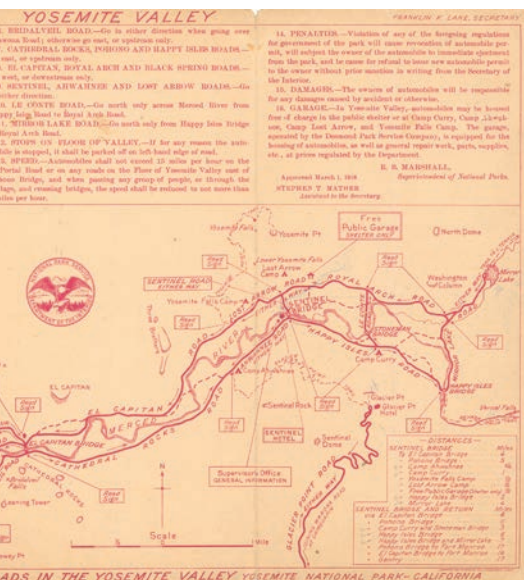
What is extraordinary about the map project is how detailed it is and how many potentially different stories of Yosemite it holds. What would the park have looked like had it hosted the Winter Olympics in 1932? How would different developments have shaped the Valley?

The files consist of everything from fire maps to old advertisements, and each one must be scanned by hand. The conservation process is laborious. Maps are carefully humidified to flatten out creases, and handlers must ensure their hands are clean and free of oil, food, and chemicals, so as not to damage the paper. A thorough system of filing metadata is undertaken to ensure files are as accessible as possible once they are in the system. Once scanned, the original document is rehoused in its original location.

These maps are not only fantastic resources for researchers; they are also used by park management. The historical maps, once uploaded, can be studied by Yosemite’s Geographic Information System (GIS) experts to observe how fire has moved through the landscape, and they can help guide and map modern natural and cultural resources.

The scope of the project is limited to Yosemite and routes to the park. However, occasionally there are archival maps of other federal lands — usually adjacent to the park or from fires the park staff participated in fighting. Each map helps inform the archive’s mission: to tell the story of the park.

Storytelling is at the heart of many digitization projects. Yosemite’s archives contain more than 4 million resources, and the museum has an additional 1.2 million items. Because Yosemite was one of the first national parks, these archives also tell the story of the National Park Service. They are an essential tool for understanding the history of the park and for planning its future. By ensuring the archives are accessible, we are able to understand the diverse history of the park and the land, and provide opportunities for untold stories to be uncovered. ■



#### A 1916 ROAD MAP

of Yosemite Valley. Thousands of maps are stored in Yosemite’s archives and are in the process of being digitized — democratizing access to them as resources.

PHOTOS: (TOP) © COURTESY OF NPS, RL# 01566.  
(BOTTOM) © COURTESY OF YOSEMITE MUSEUM,  
YOSE AR0010811.





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# EV

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## CHARGING STATIONS

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### IN YOSEMITE

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BY RYAN KELLY



In the 1800s, visitors traveled to Yosemite Valley on horseback. By 1907, they journeyed by train to El Portal, then by stagecoach to the Valley. Private automobiles were formally allowed into the park by 1913, and a \$5 permit was required for each car. Vehicles were only allowed to enter and exit from 10 am to 1 pm and 4 pm to 5:30 pm. Once in Yosemite Valley, cars were required to be parked until departure. Visitors explored the valley floor by foot and on horseback. It wasn't until 1926 that the first gas station was built.

Fast forward to 2015 when the first electric vehicle (EV) charging station was installed at The Ahwahnee hotel. In 2021, a grant from the California Energy Commission and a private donor allowed the park to install Level 2 EV charging stations at the Yosemite

Valley Lodge, Tuolumne Meadows, and El Portal. Now, thanks to our partnership with Yosemite Hospitality, EV manufacturer Rivian, and Adopt a Charger (a national nonprofit that works to bring EV charging stations to scenic, cultural, and civic locations), visitors can plug into any of the 15 free EV charging stations in the park.

Through the collaboration between Rivian and Adopt a Charger, Rivian is providing financial support, design, installation, and maintenance for the stations.

This year, the project is expanding to new locations, including Curry Village and Wawona, which will increase the plug count to 64. These Level 2 chargers use J1772 plugs, which are compatible with all EV manufacturers, but visitors are encouraged to travel with their adapter kits to ensure compatibility.





“Sustainable practices are essential to Yosemite’s future,” says Yosemite Conservancy President & CEO Frank Dean. “Programs such as this, along with Yosemite Bike Share and our expanded composting and landfill-waste reduction efforts, will help reduce environmental impacts and are an important part of the support we provide to help preserve and protect the park. The charging stations also will be visual reminders to tread lightly while visiting Yosemite.”

As visitors to the park, we join a long tradition of people who have traveled many miles over winding roads to Yosemite. This project continues the park tradition of evolving to meet the changing needs of visitors. With donor support, we are making environmentally friendly travel a reality for Yosemite. ■

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**THESE RIVIAN**-installed chargers are compatible with all electric vehicles and are available at numerous locations throughout the park. By providing increased accessibility to EV chargers in Yosemite, the park is able to expand its environmentally friendly transit options. PHOTOS: © YOSEMITE CONSERVANCY/RYAN KELLY.

“The charging stations also will be visual reminders to tread lightly while visiting Yosemite.”

**Frank Dean**  
YOSEMITE CONSERVANCY  
PRESIDENT & CEO



# TREASURES FROM THE YOSEMITE MUSEUM

BY YOSEMITE MUSEUM STAFF

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**Receiving a letter or a package by mail** is a unique thrill, especially when it is unexpected. These days, handwritten notes and gifts are far less likely to arrive in the mail than they once were, so a joyful image arises when thinking of the wonder and excitement invoked by the original arrival of the U.S. Postal Service in Yosemite.



## STEREOGRAPH

Tom Hutchings with a string of fish for the hotel guests, by Thomas Roche, published by Anthony and Company.

PHOTO: © COURTESY OF YOSEMITE MUSEUM, YOSE 230205.

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“A grand event has occurred in our remote snowbound Valley,” John Muir wrote in a March 1870 letter to his sister. Mail carrier Tom Hutchings trekked through the snow “from the open lower world with the mail...” Tom, an Indigenous man who belonged to the Mono Paiute Indian Tribe, did much to bring the comforts of the “lower world” to Yosemite while working for James M. Hutchings, a hotel operator and early promoter of Yosemite.

James was appointed as the first postmaster for Yosemite on August 9, 1869, and he received an annual salary

## MAIL-CARRIER SKIS

Skis were used for early mail delivery, possibly even by Tom Hutchings. The skis were collected from the lower end of the Valley, where a small cabin was built for the winter mail carrier.

PHOTO: © COURTESY OF YOSEMITE MUSEUM, YOSE 5430 & YOSE 6288.







of \$12. Tom got a better deal: James paid Tom \$10, plus room, board, and other goods, to make the trip in winter when normal service was unavailable. Tom delivered the winter mail on skis, and he worked for James for many years, transporting goods and mail, as well as catching fish for the hotel at 25 cents per pound.

More than a bit has changed since Tom made his once-a-month deliveries 150 years ago. In 1925, the Yosemite Village Post Office was built, and it still serves both residents and visitors. Today, the postal service delivers up to 4,000 pieces of first-class mail each week. Snow chains for the mail truck's tires have replaced skis and snowshoes. The monthly deliveries of the 1870s can now be accomplished in days, and technology allows us to share information and greetings in real time, often relegating "old-fashioned mail" to a backburner. Yet even with these myriad ways of communicating, there is still something special about the presence of the postal service within the Valley. ■

#### SOUVENIR POSTCARDS

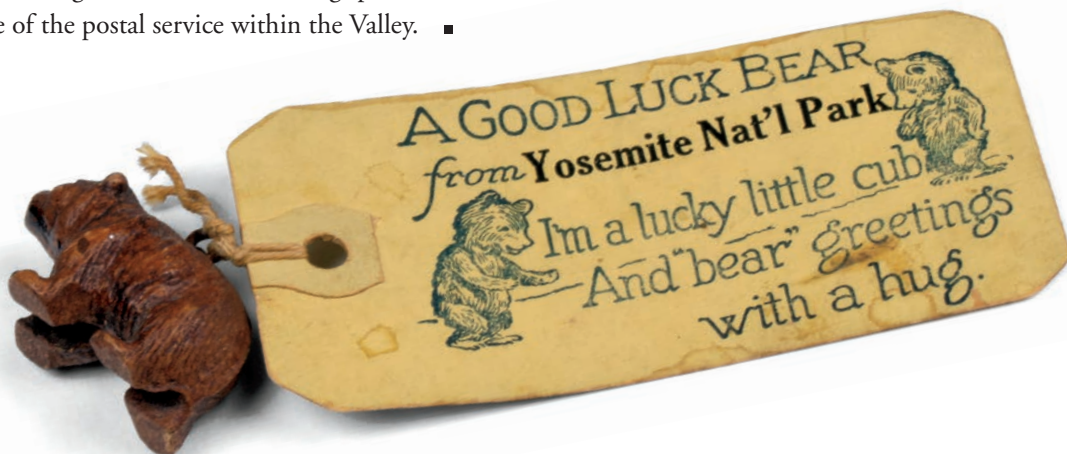
Souvenir postcard set, circa 1930. The miniature U.S. Mail bag from Glacier Point contains eight images of Yosemite. These were purchased and mailed by park visitors of the time.

PHOTO: © COURTESY OF YOSEMITE MUSEUM, YOSE 102684.

#### "GOOD LUCK BEAR"

Souvenir figurine of small "Good Luck Bear" with shipping tag, circa 1950.

PHOTO: © COURTESY OF YOSEMITE MUSEUM, YOSE 242782.







## MEET THE TEAM:

# CASSIE MAY

**ABOVE:** Cassie holds son, Remy, at Tunnel View. Cassie has lived and worked in the park since 2009.

**RIGHT:** Cassie and wife Alison pause at Clouds Rest, Tenaya Lake behind them.

PHOTOS: © COURTESY OF CASSIE MAY.

**AS YOSEMITE CONSERVANCY GROWS**, our technology needs are growing, as well. From data and gift processing on the development team, to digital ads in marketing, to online reservations for our art classes and adventures, the organization has continually invested in programs and people to stay modern and maximize our effectiveness.

Our Grants, Data, and Technology Coordinator Cassie May (who uses she/they pronouns) has worn many hats in their six years at the Conservancy. Cassie now liaises with our IT consultants, is the go-to technical lead, and is building capacity for our grants and programs teams based in the park.

In this interview, we asked what inspires Cassie and how they see technology evolving at the Conservancy.



**If I had to explain my job to a stranger, I'd say:**

I aid in the success of our programs by ensuring our IT platforms are in place and running smoothly. I also manage our cloud-based data and help address our organization's IT needs.

**Internally, colleagues come to me for:**

IT troubleshooting, funny GIFs, virtual hugs, creative ideas, workflow solutions.

**My favorite part about my job is:**

Working across all our departments and programs. I enjoy being creative, problem-solving, and tackling new challenges. Every day is different, and there is continuous learning.

**I'm excited about how the Conservancy is evolving its use of technology in these ways:**

It feels like we are leaning into technology in a new way. Looking at innovative and efficient ways to solve complex problems, streamline our workflows, and boost our organization's impact.

**Something people are surprised to learn about me:**

I enjoy blacksmithing, playing mandolin, listening to finance podcasts, and helping women across the nation win their fantasy football leagues.

**My connection to Yosemite comes from:**

In college, I worked as a sound and light technician for a live music production company that brought me to Yosemite for the first time. I fell in love with Yosemite and counted down the days until I could return. After finishing school, I packed up my car with all my belongings and drove back for a seasonal winter job. That seasonal job has stretched to 13 incredible years.

Yosemite is my home. I am constantly growing, inspired, and humbled by this place. It's gifted me with knowledge, community, marriage, lifelong friends, and endless adventures. Now I am thrilled to be sharing this place with my two beautiful children.



“Yosemite is my home.  
I am constantly growing,  
inspired, and humbled  
by this place.”

**Where I spend my days:**

I enjoy all the area has to offer with my family and friends. We swim in the Merced River canyon and camp in the Eastern Sierra in the summer. When crowds thin out in the off-season months, we hike, bike, and ski. Thankfully, our little town of Mariposa is starting to gain quite the music scene, too!

**What inspires me?**

Terry Tempest Williams' words are so powerful to me. She spoke at the Mariposa Grove after the restoration project, and I'll never forget it. One of the things she said was, “I return to the wilderness to remember what I have forgotten, that the world can be wholesome and beautiful, that the harmony and integrity of ecosystems at peace is a mirror to what we have lost.” ■





# Science Begins With Making Observations

*Each issue of the magazine will include Junior Ranger pages, with special content intended for school-age kids.*

**Curiosity and observation** are two very important qualities for being a Junior Ranger. Observation is a key component to science and to understanding the natural world. Making observations and tracking these observations with location, date, and time can be helpful to science by helping recognize patterns: where a species can be found, where it moves, and what are the trends. Observations in the natural world can happen anywhere, not just in our national parks.

## Scientific understanding begins with curiosity and making good observations.

Go outside, and find a tree! Trees play an important role in the natural world. They can support many different organisms: birds, bugs, squirrels, fungi, and so much more! What species can you observe in your tree? Draw what you discover.

California scrub jay

ladybug

western fence lizard

Draw here

Draw here

mushrooms

caterpillar

white layia

California towhee

bentgrass



western gray squirrel

spider

lichen

ants



butterfly

Anna's hummingbird

bottlebrush squirreltail

## Feed Your Curiosity

Find the official  
Yosemite Junior  
Ranger products at  
**[shop.yosemite.org](http://shop.yosemite.org)**



Draw here



### Stay Curious!

Scientists now have a powerful new tool: YOU! When you make an observation, take a photo and upload it to **iNaturalist.org**. iNaturalist is a database of observations made by people such as you. This tool can help scientists understand where species are located and discover even more! If you cannot identify a species on your own, have no fear! iNaturalist has a community dedicated to helping with identification. Just upload your photo (with metadata attached), and the community of curious observers will help identify what you have observed. You can also become a citizen scientist by participating in studies.



# YOSEMITE THROUGH YOUR LENS

Park fans share their  
photos of Yosemite.



**A** Drappled Light Before  
a Storm

© KENAN CHAN

**B** Early Morning in  
Tuolumne Meadows

© ILO GASSOWAY

**C** Reflections of a Spring  
Day in Yosemite Valley

© CYNTHIA IBIS

**D** Spring Flowers  
Framing Liberty Cap

© JACKSON ABHAU

Thanks for sharing  
your shots, Yosemite  
fans! To see more  
photos of the park, and  
share your own, follow  
us on social media:



@yosemiteconservancy



@yoseconservancy



flickr.com/groups/  
yosemiteconservancy



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There are many ways you and your organization can support the meaningful work of Yosemite Conservancy. We look forward to exploring these philanthropic opportunities with you.

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WE'VE MOVED!

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Magazine of Yosemite Conservancy,  
published twice a year.

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### JUNIOR RANGER ILLUSTRATOR

Stefi Lacy

Spring Summer 2022  
Volume 13 Issue 01 ©2022  
Federal Tax Identification No. 94-3058041

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For a full list of our 2022 grants, visit  
[yosemite.org/our-impact](https://yosemite.org/our-impact).







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**WE'VE MOVED!**

Follow the Conservancy on social media to stay in touch on the go:



PHOTO: © NANCY ROBBINS.

# Your Legacy *makes a difference for Yosemite*

**YOU CAN MAKE** an investment that will protect Yosemite and support its visitors, its wildlife, and its natural beauty for generations by creating a legacy gift.

When you include Yosemite Conservancy as a beneficiary in your will, trust, or retirement account, you ensure the park remains well-preserved and accessible. Your gift provides for Yosemite's future, and in the meantime, it entitles you to membership in our Legacy Society.

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To learn more about how to create your legacy for Yosemite, contact Catelyn Spencer at [cspencer@yosemite.org](mailto:cspencer@yosemite.org) or **415.891.1039**.

[yosemite.org/legacy](http://yosemite.org/legacy)

