Quercus hirtifolia habitat. Photo by Maricela Rodríguez-Acosta.

Global Conservation Consortium for Oak

2024 Annual Report

Prepared by

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Global Conservation Consortium
Oak
LED BY
The Morton Arboretum

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Quercus tomentella leaves and acorn. Photo by Karina Orozco.

OVERVIEW

Quercus peduncularis in El Salvador. Photo by Roderick Cameron.

The Global Conservation Consortium for Oak (GCCO) brings together the world's oak experts, conservationists, and the botanic garden community to ensure that no wild species of oak becomes extinct.

No one garden or arboretum can or should conserve all of the world's threatened oak species, so a coordinated, global effort is needed. Led by the Morton Arboretum, in collaboration with Botanic Gardens Conservation International (BGCI) and dozens of other partners, the Global Conservation Consortium for Oak was launched to prevent extinctions and ensure healthy oak species and populations for the future.

The goal of the Global Conservation Consortium for Oak is to mobilize a coordinated network of institutions and experts who work collaboratively to develop and implement a comprehensive conservation strategy to prevent the extinction of the world's oak species.

To officially join the GCCO and receive all communications, news releases, and other important updates, members are encouraged to become Affiliates via the BGCI website. Click here to join.

GCCO LEADERSHIP OVERVIEW

Murphy Westwood, PhD
The Morton Arboretum
Global Lead

Silvia Alvarez-Clare, PhD
The Morton Arboretum
Global Lead

Amy Byrne
The Morton Arboretum
Global Coordinator

Maricela Rodríguez Acosta, PhD
BUAP Botanic Garden
Mexico & Central America Coordinator

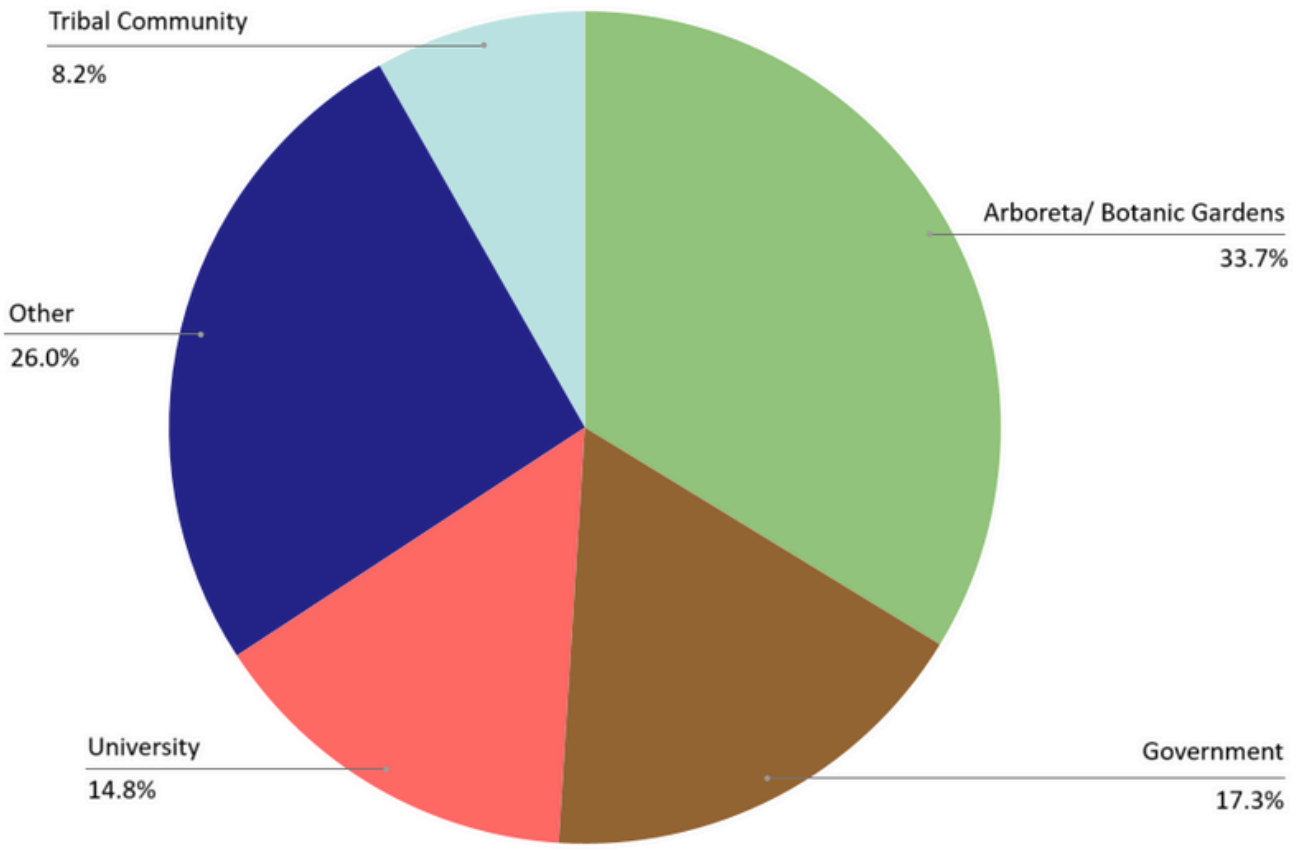
Karina Orozco
The Morton Arboretum
US Coordinator

GLOBAL ACHIEVEMENTS

Communications & engagement

In 2024, 18 new readers subscribed to receive the GCCO quarterly newsletter, totaling 728 recipients by the end of the year. The newsletter is one of the main ways for GCCO leadership and members to share updates about oak conservation, upcoming events, funding opportunities, and more. View past GCCO newsletters on The Morton Arboretum website.

Compared to 2023 data, representation of arboreta/botanic garden members and Indigenous groups on the GCCO mailing list grew in 2024. While the



GCCO mailing list by sector

mailing list is largely composed of NGOs, arboreta, and botanic gardens, the increase in participation from other sectors reflects our intent to unify a diverse network of people interested in the conservation and research of oaks.

The GCCO network involves hundreds of members who participate in regional meetings, technical working groups, and more. Among these participants, the GCCO recognizes Affiliates, those who have officially applied to be part of the consortium on the GCCO website, for a variety of reports and other engagement metrics. In 2024, GCCO membership grew from 145 Affiliates at the start of the year to over 165. Additionally, members from more than 60 institutions have now taken on the role of Species Stewards, covering all 29 out of 29 priority oak species of conservation concern in the US region!

In an effort to share oak conservation research and further engage network members, GCCO leadership also helped to organize and participate in a number of virtual and in-person events:

- The International Oak Society (IOS) and GCCO **collaborated to co-host three virtual webinars in 2024**, sharing oak-related research, conservation work, and other tools from around the world. The GCCO and IOS will continue to co-host these virtual meetings into the future to facilitate interaction and engagement between the two networks. The webinar titles and links to recordings are listed below:
    - IOS Webinar #3: “GCCO Metacollections and Gap Analysis; the Oaks of San Antonio Botanical Garden” on February 22. A recording of the webinar can be found here.
    - IOS Webinar #4: “*Quercus marlipoensis* Conservation Project and the Oaks of Chevithorne Barton” on May 14. A recording can be viewed here.
    - IOS Webinar #5, “Regional Endemic Oaks in Turkey and the Oaks of Royal Botanic Gardens, Kew” on August 21. A recording of the webinar can be found here.

- GCCO Global Coordinator **Amy Byrne engaged youth STEM volunteers at The Morton Arboretum** on oak conservation in June. This event included a presentation from Amy on the importance of oaks, threats to oaks, and oak conservation efforts as part of the GCCO. She also conducted a data collection activity with Kim Shearer, Curator of Collections and Manager of New Plant Development at the Arboretum, with the volunteers to take tree height and Diameter at Breast Height (DBH) at the arboretum's paperbark maple metacollection planting.
- Representing the GCCO and plant conservation professionals, **Amy Byrne attended the IUCN Conservation Planning Specialist Group (CPSG) Annual Meeting** at Taronga Zoo in Sydney, Australia in October. Amy hosted a workshop titled "Conservation Planning for Plants" to discuss current and future plant conservation planning conducted by the Center for Species Survival: Trees and the GCCO. Workshop participants took part in a discussion to identify ways in which those conducting plant conservation action plans and animal conservation action plans can collaborate. There were some great ideas shared for future cross-sector collaboration.
- GCCO Global Lead **Silvia Alvarez-Clare represented the GCCO and Center for Species Survival: Trees at the 5th IUCN Species Survival Commission (SSC) Leaders' Meeting** in Abu Dhabi, UAE. This landmark gathering brought together more than 300 conservation leaders to address the urgently needed interconnected solutions to protect biodiversity, stabilize climate, and support human well-being. The meeting culminated with the release of a powerful declaration affirming that "Saving Species Sustains Life." Silvia presented a poster, participated in a panel focused on Conservation Planning, and met with more than 10 specialist group leaders from around the world.

Fieldwork

- Colleagues at Holden Arboretum, Polly Hill Arboretum, the Bartlett Tree Research Arboretum, and the US Forest Service **completed conservation work for** *Quercus austrina* (bluff oak, native to the Southeastern United States) for a third year! Botanical expeditions in several southeastern states (AL, MS, GA, SC, and FL) were conducted to collect acorns and study *in situ* seedling disbursement. A seed orchard for *Q. austrina* germplasm conservation was also established at the Francis Marion National Forest in SC, working in collaboration with the USFS. Read this article by Alex Faidiga to learn more.


Left: *Q. austrina* on a creek bank in Alabama, USA. Right: *Q. austrina* acorns in Georgia, USA.

- While conducting field work on Otay Mountain (California, US), the **San Diego Zoo Wildlife Alliance (SDZWA) horticulture team found a** *Quercus cedrosensis* **(Cedros Island oak) individual** that had slid off a cliff and was

slowly dying on the side of the road. This species is one of the focal species of SDZWA's efforts to conserve California native oaks. With permission from the Bureau of Land Management, the team and partners from San Diego Botanic Garden retrieved the tree and planted it at the San Diego Zoo. This individual is only the second Cedros Island oak planted at the zoo, and there are only seven other botanic gardens in the world that have this tree in their collections. The SDZWA horticulture team will continue to study this individual, which is decades if not hundred of years old.

- In Baja California, Mexico, during the first week of September, Dr. Luciano Sabás and Dr. Hiram Rivera conducted a collaborative field trip with partners from the San Diego Zoo Wildlife Alliance, San Diego State University and the BUAP Botanical Garden. This dynamic partnership was successful in leading a **field trip to survey for priority, threatened oaks: *Q. cedrosensis* and *Q. ajoensis* in Mexico**. The team was successful in finding both species and collecting some acorns for *ex situ* conservation. They also engaged with local farmers and Tribal groups to work together in the future on monitoring and collecting acorns from these species in the future.

Dr. Luciano Sabás and Dr. Hiram Rivera photographed during the botanical expedition in Baja California, México.

- Following field sampling, herbarium revision, and a leaf shape analysis, **a new species of oak, *Quercus purhepecha* De Luna-Bonilla, S. Valencia & Coombes, was described in November!** This species is native to the Cuitzeo basin in the Trans-Mexican Volcanic Belt of Michoacán, México. *Q. purhepecha* is described as a shrubby white oak, distinguished by its rhizomatous habit and having both toothed and untoothed leaves. Read more about this incredible discovery in the official publication, authored by several members of the GCCO.

Figure 5.A from Luna-Bonilla et al., 2024: “Multiple stems emerging from the rhizome from a burned individual.”

Funding opportunities

In 2024, several members of the GCCO collaborated on or independently submitted grant proposals to support their oak conservation and research activities, many of which received awards. Below is a list of reported funding received by members of the network:

- An **APGA-USFS Tree Gene Conservation Partnership** grant was awarded to San Diego Zoo Wildlife Alliance and partners at San Diego Botanic Garden, The Huntington, Santa Barbara Botanic Garden, Treehugger Care & Consulting, Botanic Gardens Conservation International-US, and The Morton Arboretum. This award will support several scouting and collecting trips targeting *Quercus dumosa*, an endangered oak species native to California, USA, and Baja California, Mexico. The project will also entail potential cryopreservation, embryo rescue, and pollen banking, if available.
- Another **APGA-USFS Tree Gene Conservation Partnership** grant was awarded to Atlanta Botanical Garden (ABG) along with partners at South Carolina Botanical Garden - Clemson University (SCBG) and the GCCO. This grant will focus on increasing wild provenance representation *ex situ* for the endangered Oglethorpe oak, *Quercus oglethorpensis*, which is native to five states in the southeast US. In 2024, several trees from known populations were destroyed by Hurricane Helene. Proposed activities include surveying for trees, seed collection, and germplasm distribution to other gardens.
- GCCO members in Southeast Asia, including the Alliance for Conservation Tree Genomics, Institute of Research for Sustainable Development (IRD) - Centre International de Recherche Environnementale de Nakaï (CIREN), Dalat University, Vietnam National University of Forestry, Vu Quang National Park, Pu Mat National Park, and Nakai-Nam Theun National Park, were successfully awarded a **Fondation Franklinia grant** to support their project, "The conservation and range restoration of ten threatened Fagaceae species in Laos and Vietnam." The Morton Arboretum's Center for Species Survival: Trees/GCCO will co-lead this project with these partners and Botanic Gardens Conservation International.

- Christy Powell and her team at San Diego Zoo Wildlife Alliance were awarded an **Association of Zoological Horticulture grant** to support the project: "Cultivating cross-border collaborations towards conserving threatened oaks". They will collaborate with numerous partners from southern California, USA and Baja California, MX to survey for priority, threatened oaks in the region and to also host a collaborative workshop to discuss progress made and areas to focus on in the future for oak conservation and research.

Resource development

- In March 2024, Botanic Gardens Conservation International (BGCI) and the GCCO collaborated to release a **free virtual module in Spanish, titled "Programa de capacitación para los guardianes de los encinos"** (Training program for oak stewards). This course provides basic knowledge on the ecology, morphology, and diversity of oaks in Mexico and Central America to provide students with a greater understanding of the importance of conserving oaks around the world. We invite you to register and take the course to be trained as a Species Steward!
- Following the launch of the course described above, BGCI and the GCCO developed an identical, **virtual training course in English, "A Training Program for Oak Stewards."** Read more and register for the course on the BGCI website.
- **The Conservation Gap Analysis of Native Mesoamerican Oaks** (Good et al., 2024) was published and officially launched on The Morton Arboretum website in September. This conservation gap analysis is meant to help coordinate and prioritize conservation action to protect Mesoamerican oaks for both *in situ* and *ex situ* populations. Researchers surveyed oak populations in the region, consulted experts and local partners, and assessed available information for 59 native species of oaks listed as threatened or Data Deficient by the International Union for Conservation of Nature (IUCN). The analysis estimates the geographic distribution and ecological representation of Mesoamerican oak species in *ex situ* collections; identifies

major threats and local conservation efforts for at-risk species; and provides recommendations for the most urgently needed conservation activities. It is an incredibly useful tool for informing oak conservation and management as it pertains to Mexican and Central American species.

- A **free virtual workshop titled "Conducting *Ex Situ* Gap Analysis for Conservation Metacollections Management"** was led by The Atlanta Botanical Garden, The Morton Arboretum, Montgomery Botanical Center, San Diego Botanic Garden, and BGCI-US in May. The workshop was a part of an Institute of Museum and Library Services (IMLS) project, led by Atlanta Botanical Garden (MG-252894-OMS-23), that includes the development of a gap analysis tool designed for those managing conservation collections. The workshop consisted of three half-day sessions including hands-on training with the gap analysis tool and guidance on managing conservation collections from numerous presenters.
- The GCCO held a **webinar in August titled "Channel Islands Restoration Projects; Sharing Case-studies,"** featuring presentations from Luciana Luna (Grupo de Ecología y Conservación de Islas), Kathryn McEachern (US Geological Survey), and John Knapp (The Nature Conservancy). The presenters highlighted oak conservation and restoration projects on Guadalupe, Santa Rosa, and Santa Cruz Islands, respectively. It was a great opportunity to learn more about the restoration being done on these islands, especially as they pertain to oak species. If you are interested in viewing the recording from this webinar, use this link.
- To support the education and outreach component of the *Quercus austrina* action plan, GCCO US Coordinator Karina Orozco worked with Ron Lance at Donald E. David Arboretum to create a **species identification guide**. This double-sided sheet includes information on the species' biology, ecology, conservation status, and taxonomy, intended to be used by students, researchers, or anyone interested in identifying the species *in situ*. The finished PDF version of the guide can be viewed and downloaded here.

Metacollection development

The GCCO employs several strategies to promote collaboration between its members to prevent the extinction of oak species. One such tool is a metacollection, or the sum of all collections in the world for a given species (Griffith et al., 2019). When taking into account the total number of collections of an oak species, its pool of genetic resources, individuals, and stewards is greatly increased, making it easier to conserve. The GCCO's Metacollection Partnership Program pairs host site organizations with botanic garden partners that will collect and propagate the wild germplasm and work with the host site to design and plan a conservation grove where the trees can grow to maturity. The botanic garden partners will also help plant, monitor, and maintain the grove long-term. Below is a summary of the advancements made in 2024 towards developing various oak metacollections:

- GCCO Global Coordinator Amy Byrne visited the **USDA Forest Service (USFS) Beech Creek Genetic Resource Management Area and Francis Marion National Forest** to collect survivorship and growth data for *Quercus boyntonii, Q. georgiana* and *Q. austrina* in May. Amy worked with USFS staff and garden partners to weed and collect data to populate the GCCO ArcGIS metacollection dashboard.
- A metacollection partnership planting of *Quercus sadleriana* was established at the **Happy Camp USFS site in northern California**. This planting was done in collaboration with USFS Region 6 and 5 staff, and the Hoyt Arboretum. Seedlings that were collected from northern California and Oregon populations were planted. There are plans to have more seedlings and acorns established at this site in the future.
- GCCO leadership worked to develop an **ArcGIS dashboard for the metacollection partnership program**, which launched on The Morton Arboretum website in June. This interactive map displays locations for nearly all of the GCCO's current metacollection sites, as well as specific geographic points for individual trees and data on their survival and growth

over the years. The dashboard is continuously being updated, and is a great tool that can be used by partners as well as the public to visualize the large range of this project across the US. We are currently discussing the possibility of displaying the additional *ex situ*, "near" *situ*, and *in situ* sites where our priority oak species are also being managed.

- A *Quercus engelmannii* planting was established in collaboration with **San Diego County Parks & Recreation and the San Diego Botanic Garden (SDBG)** in November. Twenty-two Engelmann oak seedlings provided by SDBG were transplanted into a county preserve that is closed to the public. Seedlings were planted beneath the canopy and dripline of mature Engelmann oaks that occur naturally on the preserve, and will be periodically monitored and measured by SDBG staff.
- Another *Q. engelmannii* planting was conducted over two days at the **Viejas Band of Kumeyaay Indians Reservation** in November. Staff from the San Diego Zoo Wildlife Alliance, San Diego Botanic Garden, and The Morton Arboretum volunteered to plant over 50 Engelmann oak seedlings at the Viejas Tribal Hall and campground areas. These seedlings were originally collected as acorns from the reservation, then propagated and grown at Devil Mountain Nursery in Oceanside, CA; the return of this culturally significant species to the Viejas reservation acts to restore the oak ecosystem there, as well as maintain the use of Engelmann oaks as a cultural resource by the Tribal members who live there.
- GCCO US Coordinator Karina Orozco visited **The Wildlands Conservancy's Oak Glen Preserve** to collect survivorship and growth data for a conservation grove of 126 *Quercus engelmannii, Q. gambelii*, and *Q. hypoleucoides* trees. This metacollection planting has high survivorship overall (> 70%) despite predation from gophers and overwinter freezing. A handful of trees, mostly Gambel oaks, produced acorns for the first time this fall! There was even a sign of reproductive success as the data collection team spotted a Gambel oak seedling popping out of the ground, indicating that trees at this site are thriving.
- USFS Region 8 staff, Bartlett Tree Research Laboratories and Arboretum, North American Land Trust, and The Morton Arboretum staff came togeth-

-er to conduct a **second planting at the Francis Marion National Forest** in November. This planting included > 90 *Quercus austrina* seedlings collected across the species native range in the southeast US. The seedlings were labeled, had a tree tube placed around for protection and watered. Kate Good of The Morton Arboretum participated in the planting and collected survival and growth data on all seedlings at the site while visiting partners there in South Carolina.

Species action plans

The GCCO's lead institution, The Morton Arboretum, is working closely with the IUCN SSC Conservation Planning Specialist Group to lead workshops and facilitate the development of conservation action plans for priority oak species. Groups of stakeholders from various sectors and fields of expertise participate in an inclusive discussion and collaboratively develop a long-term strategy for the conservation of a given species. These plans provide a comprehensive view of the species' ecology, threats, as well as outline conservation strategies to prevent extinction over a extended period of time, usually 5-10 years. Below is a summary of the advancements made by GCCO members as part of conservation action plans in 2024:

- GCCO Global Coordinator Amy Byrne hosted an **in-person** ***Quercus austrina*** **conservation action planning meeting** at Bartlett Tree Research Laboratories and Arboretum in Charlotte, North Carolina. 15 participants from Bartlett, North American Land Trust, Georgia Department of Natural Resources, the USFS Region 8 office, NatureServe, Alabama Natural Heritage Program, Donald E. Davis Arboretum, Polly Hill Arboretum, Mississippi State University, and Holden Forests Gardens and Arboretum attended. The group contributed additional information to be included in the final conservation action plan; the action plan will include activities to implement over the next 5-10 years for the species.

- The first **conservation action planning workshop for** *Quercus hirtifolia* was held in April at Las Truchas Ejecayan in Zacapoaxtla, Puebla. GCCO Coordinator for Mexico and Central America, Dr. Maricela Rodríguez-Acosta, designed and led the workshop in collaboration with several partners comprising the organizing team. A diverse group of stakeholders from three municipalities of Puebla participated: Teziutlán, Zacapoaxtla, and Honey. This workshop marked the first step towards planning the conservation of this incredible species of Mexican oak, which lives in one of the most beautiful humid forests in Mexico. Drafting of the species conservation action plan will follow.

Q. hirtifolia habitat in Puebla, Mexico. Photo by Maricela Rodríguez Acosta.

- Partners at The Morton Arboretum, in collaboration with members of the GCCO, such as the Donald E. Davis Arboretum, US National Arboretum, Huntsville Botanical Garden and the US Forest Service **published a conservation action plan for** *Quercus boyntonii* in July. This report is the culmination of three years of work with multiple partners, including local communities in Alabama, and more than 20 representatives from gardens, NGOs, the USFS and other government agencies, private landowners and others. Access the plan here.
- Patrick Thompson (Donald E. Davis Arboretum) **hosted a** *Q. boyntonii* **event** in Hoover County, Alabama. This effort follows the tradition of hosting an annual meeting for the species since the creation of the species' action plan. Patrick continued this event in 2024 and hosted the event in Hoover, Alabama. The meeting included a morning focused on invasive species removal from a native *Q. boyntonii* habitat, followed by a series of presentations about the species. Members from the community participated in this event. The organization of this activity supports several objectives in the action plan, including to raise awareness of the species within the local community, and remove invasive species from the native habitat.

Community participants visiting a native *Q. boyntonii* population to remove invasive species.

Quercus virginiana, or Angel oak, in South Carolina. Photo by Amy Byrne.

REGIONAL ACHIEVEMENTS

United States

The GCCO-US focuses on 29 species of conservation concern, 28 of which are highlighted in the Conservation Gap Analysis of Native US Oaks (Beckman et al., 2019). *Quercus cornelius-mulleri* was added to the list of priority species following the publication of the gap analysis.

The GCCO-US is split into three sub-regions based on where the species of concern are distributed geographically:

- Western US
- Texas/Southwest US
- Eastern US

Communications & engagement

- The Morton Arboretum's Youth and Family Program has been engaging the next generation of conservationists with an Oak Regeneration Project that comes to a close this year. Since fall of 2022, youth volunteers have participated by collecting acorns, planting them, and caring for the germinated seedlings of six oak species growing on arboretum grounds. The resulting 150 seedlings were given away in the spring to local NGOs and used in plantings organized by the Chicago Region Trees Initiative. Read more here.
- Several GCCO members were invited to attend the 2024 Crop Wild Relative Symposium, convened by US Botanic Garden and Botanic Gardens Conservation International-US and hosted at Denver Botanic Garden. Amy Byrne presented on the oak metacollection partnership program conducted by the GCCO network, and how other groups could reach out to Amy to learn more about the program to see how it may be implemented in their own projects. In addition, one day before the official symposium started, the organizers held a Wildland Gathering to celebrate Indigenous wild plant foraging, convened by the Flower Hill Institute.
- A "Species Spotlight" article featuring Coastal sage scrub oak, *Quercus dumosa*, was published over the summer by The Relevator. The piece was written by Dr. Joe Ree, formerly a postdoctoral researcher for the San Diego Zoo Wildlife Alliance's plant conservation team. The article provides a profile for the species, including its native habitat, threats, and conservation efforts, which highlight work done by the GCCO and Joe's own research on *Q. dumosa* micropropagation. Read the article here.
- M. Kat Anderson, an ethnoecologist, has officially launched her website, "Tending the Wild." Kat's website compiles books, articles, and essays that she has authored throughout her career of trying to bridge Native knowledge and Indigenous practices with western science, hoping to heal our cultural divides. There are several resources that center Indigenous wis-

-dom and traditional ecological knowledge with regards to stewarding the land. Visit the site here.

- Tarin Toledo, an ecologist and professor at Institute of Ecology, A.C. in Veracruz, Mexico, visited The Morton Arboretum to present on her research and restoration of cloud forest species in Mexico during Hispanic Heritage Month. Attendees of Tarin's talk also watched a video about the restoration of *Quercus brandegeei* in Mexico via a conservation research project led by The Morton Arboretum, and learned more about Mexican oak species from Morton's Herbarium staff. Finally, participants were brought to a monarch migration station to explore the connection between monarch butterflies and oaks, which is the central focus of another conservation project in Mexico led by Morton with the support of USFS.
- The Tribal EPA and US EPA Region 9 conference was held in October 2024 and was hosted in San Jose, CA by US EPA Region 9 and Viejas Band of Kumeyaay Indians, a GCCO collaborator. The event conveyed a powerful message on Traditional Ecological Knowledge (TEK) as not just a tool for conservation but more so of a way for social, cultural, and ecological empowerment and acknowledgement for Indigenous peoples. There were many tribal nations represented, including the La Jolla Band of Luiseño Indians, Sherwood Valley Band of Pomo Indians, Iipay Nation of Santa Ysabel, Pechanga Band of Indians, Colorado River Indian Tribes, and more. Supporting organizations and academics included the Hybrid Indigenous Stewardship, Center for Community Energy and Environmental Justice , Center for Creative Land Recycling, University of California Agriculture and Natural Resources, Oregon State University College of Agricultural Sci-

-ences, and many others that seek to actively support the vital efforts happening in Indigenous communities.

Fieldwork

- In March, Zach Kantor-Anaya of The Wildlands Conservancy worked with a volunteer group to plant 16 Engelmann oak seedlings at Santa Margarita River Trail Preserve in southern California. The planting will serve as a pilot project to inform a larger-scale restoration project at the preserve in the future based on how well the oaks establish.

View of an Engelmann oak seedling at the Santa Margarita River Trail Preserve in California.

- Staff at the Campo Indian Reservation native plant nursery in San Diego, California germinated and planted locally sourced *Quercus agrifolia* and *Quercus engelmannii* in spring 2024. Acorns were collected between October 2023 and January 2024 from a designated burn area on the reservation. A total of 370 seeds of the two species were planted in germination trays in March and May this year with either store bought or native Campo soil to test the effects on seedling growth. Tragically, about 100 acorns were eaten in June, presumably by rodents. Nursery staff will continue overseeing care of the remaining seedlings and monitoring their progress.

Resource development

- In April 2024, the GCCO collaborated with California Oaks to launch a new working group for Blue and Valley Oak! These two species (*Q. lobata* and *Q. douglasii*) are ecologically and culturally important California endemics that have demonstrated recruitment challenges exacerbated by development pressures, groundwater depletion, and climate stressors. The working group aims to plan and execute collaborative conservation actions to prevent the species' extinction by spreading awareness and restoring their respective populations. If you are interested in joining this group, contact the GCCO US Coordinator.

Metacollection development

- The Wildlands Conservancy announced the first-year success of their Experimental Oak Woodland project at the Oak Glen Preserve in southern California. The native black oak (*Q. kelloggii*) woodlands are being ravaged by non-native golden-spotted oak borer beetles. The "experiment" is to introduce beetle-resistant oak species of the White Oak tribe (the subgenus

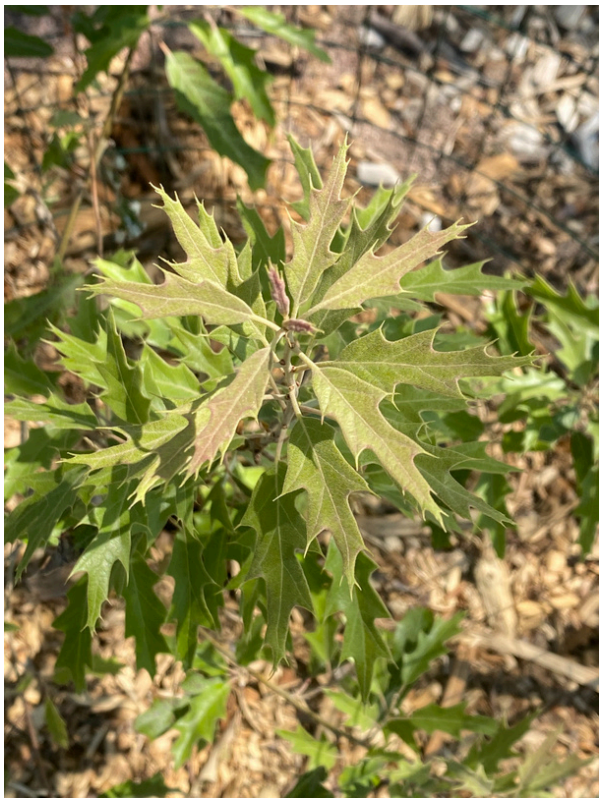
Quercus)—focusing on the rare southern California Engelmann oak (*Q. engelmannii*). Thanks to funding from the Edison Foundation, the San Manuel Indian Tribe, and a private donor, 130 15-gallon oaks of three white oak species—*Q. gambelii, Q. hypoleucoides,* and *Q. engelmannii*—were planted on a two-acre plot in the Preserve. The northeastern most populations of Engelmann oaks are situated just below the Oak Glen Preserve at about 3,000 feet elevation. The Preserve is situated at 4,800 feet, so part of the experiment is to see how the trees will tolerate some snow.

Snow at the experimental oak woodland at Oak Glen Preserve, CA.

- As a part of Houston Botanic Garden's (HBG) ongoing commitment to oak conservation, members of their institution signed on to be Species Stewards for *Quercus austrina* and *Quercus chapmanii*, both native to Florida and of conservation concern. Given the similarity to Houston's climate, they expect these oaks to perform well in their garden. HBG

will also serve as a back-up for *Q. arkansana*, native to Texas and other southeastern states. HBG is currently growing *Q. arkansana* from several populations from Louisiana and Mississippi that were received from Missouri Botanical Garden.

- Ryan Russell of Stephen's Lake Park Arboretum grafted white and red oaks from southwest Texas as part of a larger ongoing conservation project in collaboration with US Botanic Garden and many other garden partners. The project is focused on surveying to better understand the distribution of the threatened red and white oaks in southwest Texas. This work entails collecting material for genetic analyses and acorn or scion material for *ex situ* conservation purposes to ensure these rare species are conserved long-term. Ryan shared some photos of the recently grafted trees, which are included below. Species of grafted plants include: *Quercus graciliformis*, *Q. carmenensis*, and *Q. tardifolia*.



Left: *Q. tardifolia* grafting. Right: *Q. graciliformis* grafting.

Quercus costaricensis. Photo by Francisco Garin.

REGIONAL ACHIEVEMENTS

Mexico & Central America

The GCCO-Mexico and Central America is focusing on the conservation and research for 59 threatened and data deficient species, which are highlighted in the Conservation Gap Analysis of Native Mesoamerican Oaks (Good et al., 2024).

Communications & engagement

- As part of a conservation strategy for priority oaks in Honduras, the Cyril Hardy Nelson Sutherland Herbarium (TEFH) of the National Autonomous University of Honduras (a GCCO Central America partner) established a collaboration agreement with the NGO Eden Reforestation Projects. This organization is dedicated to reforestation projects and works in two protected areas: the Uyuca Biological Reserve and La Tigra National Park. This alliance focuses on conserving *Quercus gulielmi-treleasei* C.H. Mull., a species listed as Vulnerable (VU) by the IUCN. The collaboration includes a series of actions focused on ensuring the survival and growth of *Q. gulielmi-treleasei* in its natural habitat. Among the agreed actions, population studies will be carried out to better understand the distribution and threat status of the species in these protected areas. In addition, phenological periods will be reviewed to determine the flowering and fruiting times. To ensure the long-term viability of these seeds, propagation nurseries will also be established.

A *Q. gulielmi-treleasei* individual photographed in El Parque Nacional La Tigra in Honduras, courtesy of Dr. Olvin Oyuela-Andino.

- During the Universidad Autónoma Agraria Antonio Narro (UAAAN) EXPO 2024 in September, the GCCO Species Steward Coahuila team led by Dr. Aida Leal and Dr. Juan Encina hosted an oak conservation workshop titled “Getting to know the oaks.” Its objective was to share information about the biological characteristics of the Quercus genus, specifically their ecological and cultural importance, emphasizing the diversity of species and their endemism, particularly for oaks in Coahuila. The workshop consisted of three parts including a theoretical lecture, observation of distinctive oak structures using herbarium specimens, and memory games.
- Several members of the GCCO, including Dr. Maricela Rodríguez-Acosta, attended and participated in the annual meeting of the Mexican Association of Botanical Gardens (AMJB) in October. The Meeting was sponsored by the Haraveri Botanical Garden, A.C. At the meeting, Maricela presented on the progress that has been made by GCCO Species Stewards within the region. Also, the metacollection of oaks in Mexico was discussed. At the same meeting, a workshop was given to the member gardens of the AMJB interested in learning about the propagation of oaks.

Participants during the UAAAN EXPO oak workshop in Coahuila, Mexico.

Lina Ramirez and Maricela Rodríguez-Acosta photographed at AMJB 2024.

Fieldwork

- Under the direction of Dr. Arturo Mora Olivo, accredited as a Species Steward, the project "*Quercus miquihuanensis*, a shrubby oak endemic to northeastern Mexico," advanced in 2024. *Q. miquihuanensis* is an oak endemic to northeastern Mexico whose populations are threatened by forest fires, land use change, and climate change. The objective is to evaluate the populations of *Q. miquihuanensis* to learn more about its distribution and propose strategies to ensure its conservation. The natural populations of the species in question were visited, where it was found that the type of vegetation corresponds to a pine-oak forest, associated with other species such as Agave montana, Arctotaphylos pungens, and Pinus pseudostrobus. The inhabitants of La Peña and Valle Hermoso have been informed of the project.

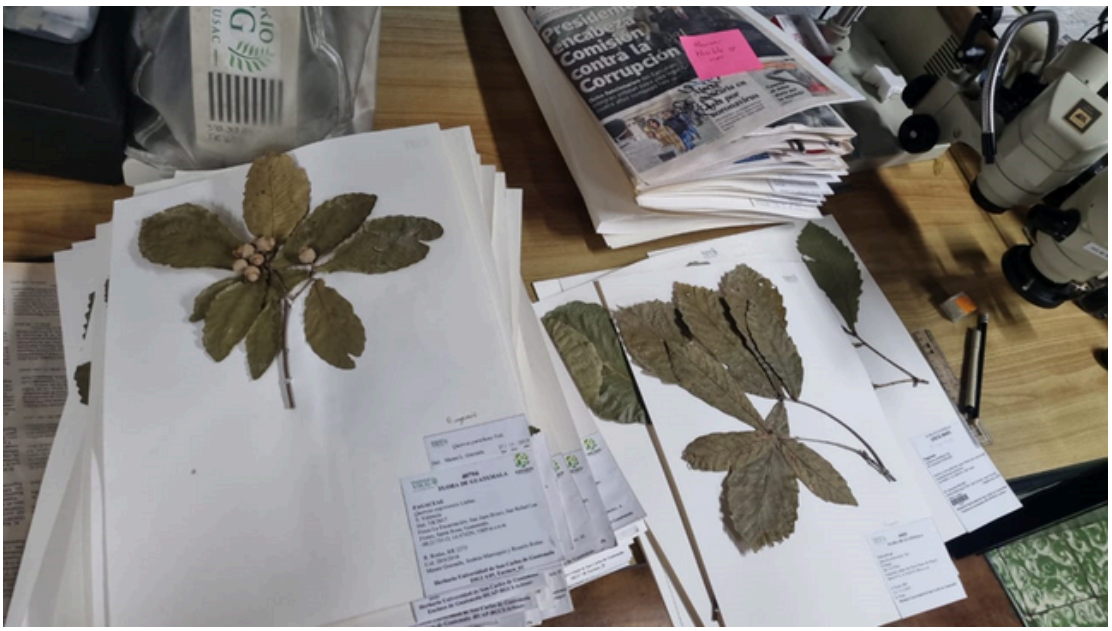

Left: Dr. Arturo Mora collecting *Q. miquihuanensis* acorns in the field. Right: *Q. hintoniorum.*

- In May of 2024, a team of GCCO Species Stewards from the Universidad Autónoma Agraria Antonio Narro (UAAAN) and PROFAUNA in Mexico conducted a scouting trip to the Ejido la Moneda, in Arteaga, Coahuila, to assess the phenology of *Q. hintoniorum* and collect plant material for its propagation.
- During the 2024 UAAAN EXPO, GCCO Species Steward Aaron Sandoval

and the PROFAUNA team collected acorns of Quercus hintoniorum, Q. gregii, Q. saltillensis and Q. striatula in the Arteaga mountain range of Coahuila. The team shared acorns with the UAAAN researchers to germinate and cultivate.

Resource development

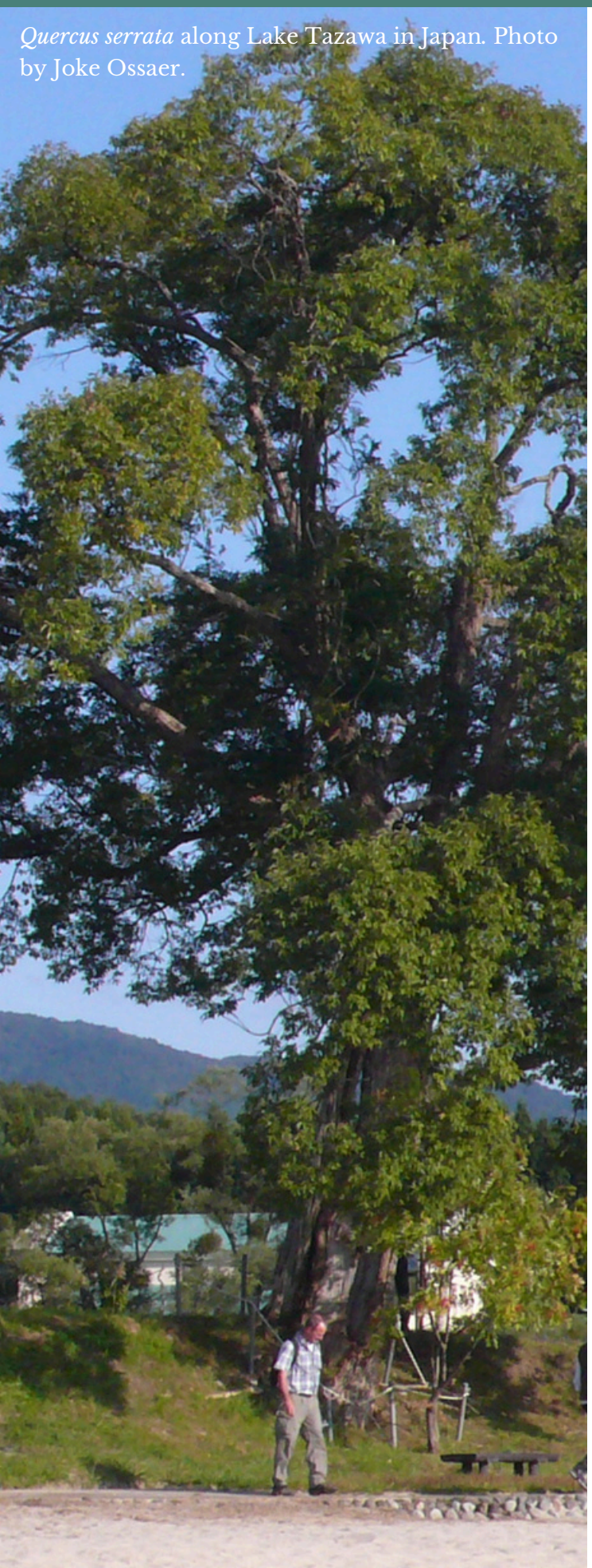
- Dr. Susana Valencia Avalos visited the USCG Herbarium/Botanical Garden of the University of San Carlos of Guatemala's Center for Conservation Studies in November. Trip objectives included reviewing the *Quercus* collection from Guatemala, as well as specimens collected for the project "Supporting sustainable livelihoods and tree conservation in the Trifinio Biosphere Reserve, Guatemala-Walder Foundation 2023-2026." Dr. Valencia was received by Dr. Maura Quezada (Curator of the USCG Herbarium) and together they reviewed the collection. The presence of several common species for the area was confirmed, such as *Q. gulielmi-treleasei, Q. insignis, Q. peduncularis*, *Q. skinneri* and *Q. sapotifolia*, as well as rare species such as *Q. flagellifera, Q. seemannii* and *Q. xalapensis*.



Examples of Quercus species identified in the University of San Carlos in Guatemala's herbarium.

- In 2024, a collection of oaks from Baja California was established at the University of Baja California Botanic Garden in Ensenada. This project focused on understanding the distribution and conservation status of *Q. tomentella* and *Q. dumosa populations*. Dr. Hiram Rivera of the Universidad Autónoma de Baja California, Ensenada, delimited populations of *Q. tomentella* on Guadalupe Island, and others of *Q. dumosa* near Ensenada, Baja California.

Quercus tomentella. Photo by Hiram Rivera.



Quercus serrata along Lake Tazawa in Japan. Photo by Joke Ossaer.

REGIONAL ACHIEVEMENTS

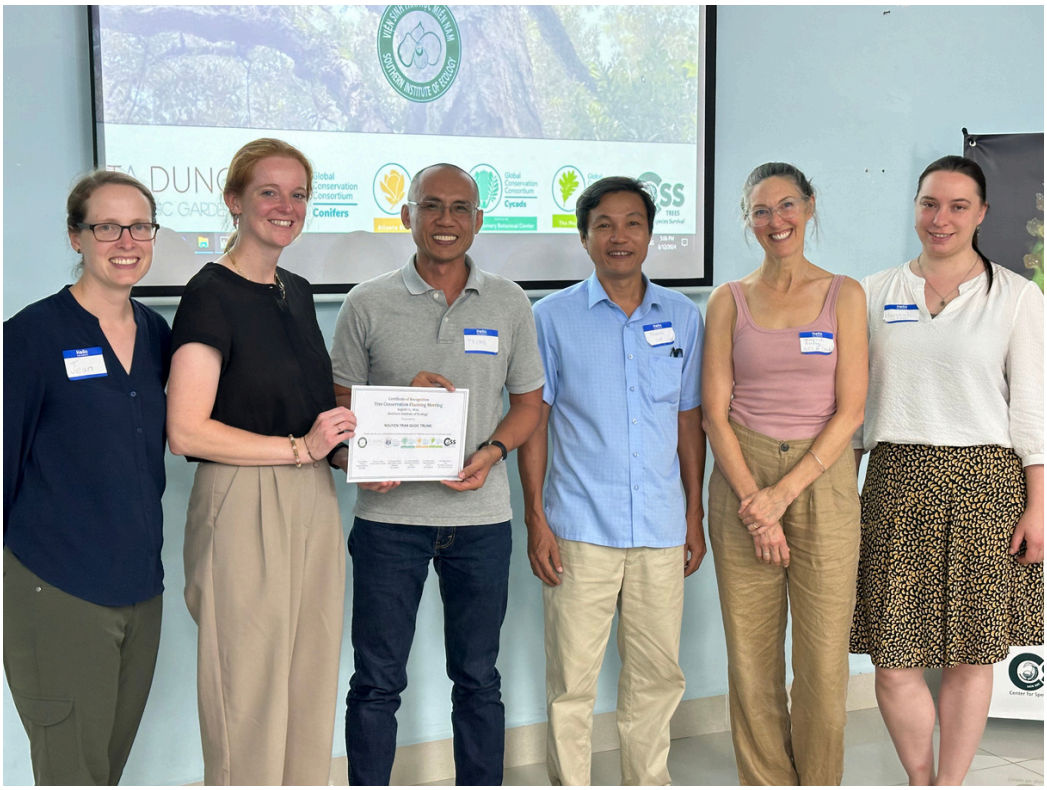
Southeast Asia

GCCO Southeast Asia, thus far, has been coordinated by numerous partners in Vietnam, Laos, Thailand, Malaysia, and Indonesia. This region focuses on 53 oaks of conservation concern including threatened and data deficient species (Good *et al.*, in prep).

Communications & engagement

- Dr. Ngoc Nguyen and his work with Vietnamese oaks was highlighted in an International Oak Society article written by GCCO Global Coordinator Amy Byrne. Read the full story here.
- In early August, GCCO Global Coordinator Amy Byrne, along with the GCC for Magnolia, Cycad and Conifer, and BGCI-US led two workshops focused on Global Conservation Consortia (GCC) establishment and coordination as well as GCC data sharing at BGCI's Global Botanic Garden Congress in Singapore, where approximately 80-100 attendees participated. Attendees heard a number of speakers involved in the establishment and coordination of five different GCCs, and were able to ask questions about the functioning and leading of a GCC. Attendees also received instructional training on data sharing and using BGCI's online data tools for gap analysis and collections prioritization.
- Amy Byrne (GCCO Global Coordinator) and Silvia Alvarez-Clare (GCCO Global Lead), along with collaborators from the GCC Magnolia, GCC Cycad,

Amy Byrne, Dr. Bình Hoàng Thị, and Dr. Ngọc Nguyễn Văn posing with the *Quercus baolamensis* (CR) and *Quercus bidoupensis* (CR) seedlings.



Left to right: Jean Linsky, Amy Byrne, Mr. Trung, Dr. Luu Hong Truong, Vanessa Handley, and Hannah Wilson at the Tree Conservation Planning meeting at SIE, August 2024.

and GCC Conifer, coordinated a tree conservation planning meeting in Vietnam. This meeting was co-hosted and supported by the Southern Institute of Ecology (SIE), Ho Chi Minh, Vietnam. Over 20 participants from NGOs, government agencies, arboreta, botanic gardens, and university sectors attended. This meeting was the first step in initiating future conservation action planning for trees in the region. Following the meeting, Amy, Silvia, GCC and SIE colleagues went on a four day trip visiting national parks and botanic gardens in southern Vietnam to meet with partners there to discuss how to work together to support their tree conservation and restoration efforts. The group saw Dr. Ngọc Nguyễn Văn and Dr. Bình Hoàng Thị's seedlings of threatened oak (*Quercus baolamensis, Quercus bidoupensis*) and Magnolia (*Magnolia tiepii, Magnolia bidoupensis, Magnolia brainensis*) species at Bidoup Nui Ba Botanic Garden/National Park nursery facilities. These seedlings will be planted next year at the national park as part of the *in situ* restoration objectives of their Fondation Franklinia funded projects.

- The **2024 International Seminar on Fagaceae Conservation and Evolution** took place in late October at the Chenshan Botanical Garden in Shanghai, China. This seminar brought together leading experts to discuss the conservation and evolutionary dynamics of the Fagaceae family. Dr. Chai-Shian Kua, Senior Officer of Center for Species Survival: Trees (CSS: Trees) and Conservation Specialist at The Morton Arboretum was invited as a plenary speaker. Her talk, entitled "Quantifying and characterizing sympatry networks in oak species to understand potential interspecific gene flow and its implications for conservation," introduced research by fellow colleagues at the Morton Arboretum. The presentation explored the complex interactions among oak species and their relevance to conservation efforts. Dr. Kua also served as a member of the scientific committee of this conference.

Fieldwork

- Dr. Ngọc Nguyễn Văn and his team at Dalat University, Vietnam made great achievements in their Fondation Franklinia funded project, the "Conservation of two threatened endemic Quercus species in Lam Dong Province, Vietnam." They successfully collected and propagated over 500 seedlings of two Critically Endangered oak species, *Quercus baolamensis* and *Quercus bidoupensis*. They are planning to restore these seedlings in Bidoup Nui Ba National Park.

Quercus bambusifolia acorns. Photo by Joeri Strijk.

REGIONAL ACHIEVEMENTS

China

Dr. Yi-Gang Song from Shanghai Chenshan Botanical Garden and Dr. Min Deng of Yunnan University have coordinated oak conservation and research efforts for the GCCO in China. This region focuses on 36 threatened oak species for conservation (Carrero *et al.*, 2020).

Communications & engagement

- A research study led by Yunnan University in China resulted in new discoveries about the germination of the Critically Endangered oak species *Quercus marlipoensis*. This evergreen oak is endemic to the tropical montane cloud forests of China's Yunnan province, making these findings extremely important for its conservation. Read more about the study here.
- Dr. Min Deng and Luting Liu (Yunnan University, School of Ecology and Environmental Science) presented on their seed germination, pollen grain conservation and phylogenetic studies of *Quercus marlipoensis* at the International Oak Society Webinar in May. Read more in the Global highlights: Communications & engagement section.

Metacollection development

Oak seedlings from five new species growing in the greenhouse at Shanghai Chenshan Botanical Garden. Photos courtesy of Yi-Gang Song (宋以刚) of the Plant Systematics and Evolutionary Biology lab.

- Shanghai Chenshan Botanical Garden expanded its *ex situ* conservation efforts by adding five new oak species to its collections in 2024. In the first half of the year, the garden introduced individuals of *Quercus arbutifolia, Q. cocciferoides, Q. fleuryi, Q. hui*, and *Q. sichourensis* to the nursery, photographed above. The garden now holds more than 45 oak species in the Fagaceae family.

NEW: Europe, West Asia, & North Africa

The GGCO Europe, West Asia and North Africa group launched in 2024 and with coordination support from the International Oak Society, the group has been meeting on a quarterly basis. The group consists of many partners across the regions representing universities, NGOs, botanic gardens/arboreta, research organizations, government entities and more. So far, the group has worked together to define the priority species list; which species to focus on now and for the foreseeable future for further conservation and research. The group also recently began developing a regional work plan.

Quercus magnosquamata acorn. Photo by Parisa Panahi.

ACKNOWLEDGMENTS

Quercus brandegeei habitat at Cañón de la Zorra in Baja California Sur, Mexico. Photo by Kate Good.

Thank you to the GCCO members who contributed to this report by providing content for our quarterly newsletters and shared stories of success with GCCO leadership and other network members. Additionally, thank you to all GCCO members for another year of support. Your dedication to protecting and studying oaks is essential for their survival now and into the future. Finally, thank you to our funders who made several of these projects possible: