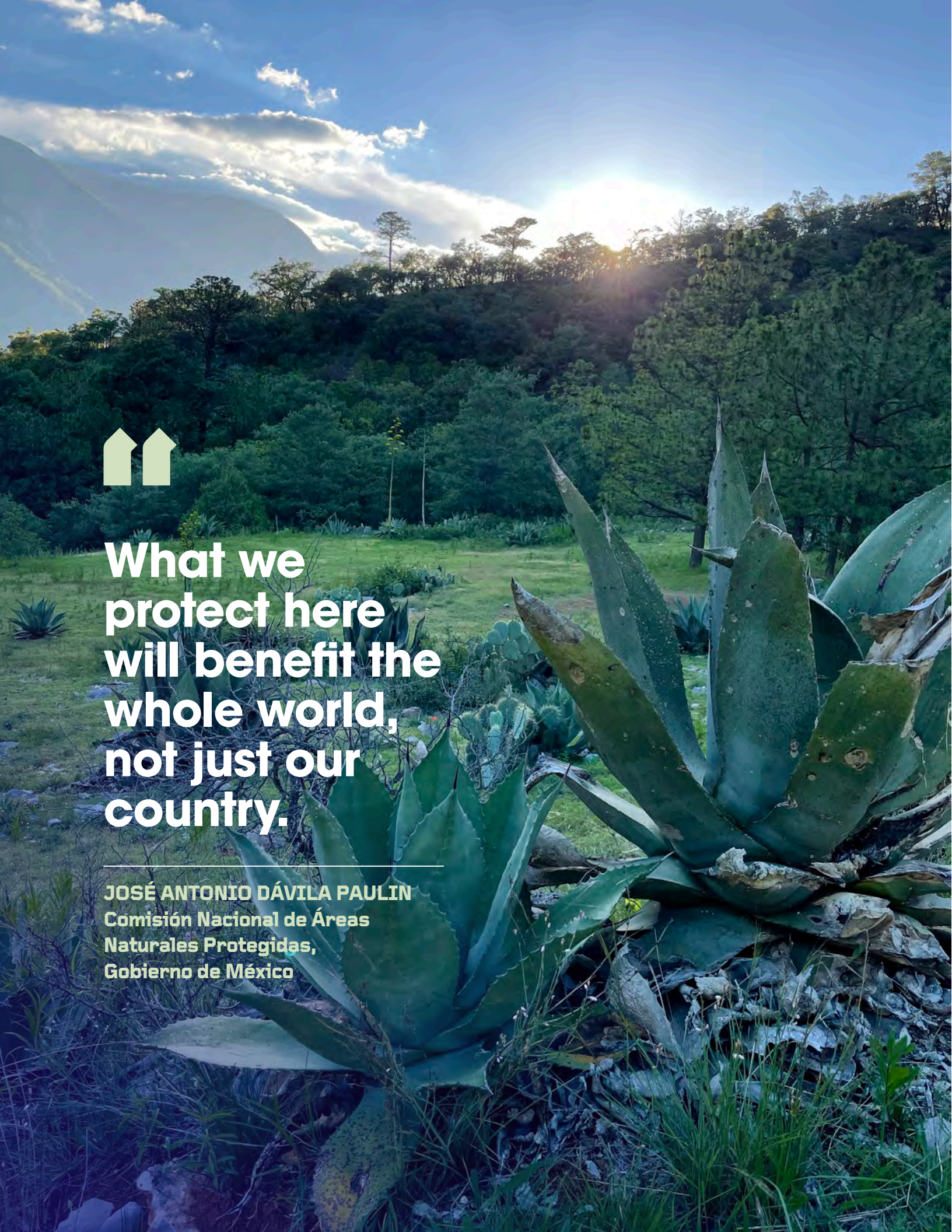
BAT CONSERVATION INTERNATIONAL

AGAVE RESTORATION FOR SUSTAINABLE DEVELOPMENT

CONTRIBUTION OF BI-NATIONAL HABITAT RESTORATION TO THE SUSTAINABLE DEVELOPMENT GOALS



What we protect here will benefit the whole world, not just our country.

JOSÉ ANTONIO DÁVILA PAULIN
Comisión Nacional de Áreas Naturales Protegidas, Gobierno de México

Advancing the Sustainable Development Goals

In 2015, 193 world leaders agreed to 17 goals to achieve a better and more sustainable future for all by 2030. Ecological restoration plays an essential role in achieving these ambitious global targets. Restoration initiatives at all scales can help to end poverty, conserve biodiversity, combat climate change, and improve livelihoods for everyone, everywhere.

Our Agave Restoration Initiative works across Mexico and the Southwest U.S. to protect and restore healthy, functioning ecosystems — simultaneously supporting rural livelihoods and preventing bat extinctions. We implement nature-based solutions at the intersection of wildlife conservation, regenerative agriculture and ranching, land restoration, and rural economic development. This work contributes to advancing 15 Sustainable Development Goals.

SUSTAINABLE DEVELOPMENT GOALS

COMMUNITY-BASED CONSERVATION &

LAND RESTORATION | SUSTAINABLE RURAL ECONOMIC DEVELOPMENT | ENHANCED LOCAL CAPACITY | SOCIALLY INCLUSIVE ORGANIZATION & GOVERNANCE | ROBUST PARTNERSHIPS | SUSTAINABLE FINANCING

1 NO POVERTY
2 ZERO HUNGER
3 GOOD HEALTH AND WELL-BEING
4 QUALITY EDUCATION
5 GENDER EQUALITY
6 CLEAN WATER AND SANITATION
7 AFFORDABLE AND CLEAN ENERGY
8 DECENT WORK AND ECONOMIC GROWTH
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
10 REDUCED INEQUALITIES
11 SUSTAINABLE CITIES AND COMMUNITIES
12 RESPONSIBLE CONSUMPTION AND PRODUCTION
13 CLIMATE ACTION
14 LIFE BELOW WATER
15 LIFE ON LAND
16 PEACE, JUSTICE AND STRONG INSTITUTIONS
17 PARTNERSHIPS FOR THE GOALS

SUSTAINABLE DEVELOPMENT GOALS

Building Social Capital and Resilience in Rural Communities

We're increasing the overall resilience of rural communities and their capacity to address climate change, environmental degradation, inaccessibility to financial services and markets, and other challenges that limit the potential of rural economies. Program objectives:

- Develop sustainable, community-based enterprises that are better integrated into value chains and markets,
- Provide local economic opportunities focused on sustainable use of agaves and other natural resources,
- Encourage agave liquor producers to adopt sustainable practices and integrate these practices into the official bacanora denomination of origin,
- Champion regenerative agriculture and ranching practices to strengthen the climate resilience of poor communities and achieve sustainable management of agaves, and
- Develop agave restoration supply chains to deliver restoration where needed most.

© HORIZONLINE PICTURES/BAT CONSERVATION INTERNATIONAL

SDGs IN ACTION: SIETE CORONADOS BACANORA | SONORA, MEXICO

Since 2019, we have been working alongside Colectivo Sonora Silvestre/Centro de Colaboración para la Ciencia y Cultura (CENKO) to encourage bacanora producers to adopt sustainable production practices that help maintain healthy populations of agaves and nectar-feeding bats. Bacanora is an ancestral agave spirit with a long history in Sonora. A 77-year ban on bacanora production, beginning in 1915, led to the overharvesting of wild agave and diminished food supplies for pollinators.

The Coronado family, owners of Siete Coronados Bacanora, actively champions both agaves and the bats that pollinate them. They leave roughly 1% of their agave fields to flower for bats and other pollinators. This brand has become a community-based model for other agave spirits producers to implement sustainable management practices.

Our work in Sonora and the American Southwest is helping to support the continued recovery of the once-endangered lesser long-nosed bat by ensuring it has abundant food resources long into the future. Thanks to the determined, cross-border efforts of scientists and conservationists, the species was recently removed from endangered species protections in both the U.S. and Mexico.

Our Partners:

CENKO CON-CIENCIA Y CULTURA

SIETE CORONADOS BACANORA

12
ENTERPRISES
SUPPORTED

255
TEMPORARY JOBS
CREATED THROUGH AGAVE RESTORATION ACTIVITIES

11
BACANORA PRODUCERS
EMPLOY PRACTICES THAT SUPPORT THREATENED BATS

400
COMMUNITY MEMBERS, RANCHERS, AND LAND MANAGERS
TRAINED IN REGENERATIVE AGRICULTURE AND GRAZING, SOIL AND WATER RESTORATION, ECOLOGICAL MONITORING, AND BUSINESS DEVELOPMENT

Today we are more than farmers, we are conervatioists.
- OSVALDO CORONADO

Improving Food Security and Promoting Sustainable Agriculture

By developing community and independent nurseries, we are scaling agave production while providing access to safe and nutritious food for local consumption and products for sale in local and regional markets.

© DIEGO OLIVO, CONANP

SDGs IN ACTION: EJIDO LA REFORMA | COAHUILA, MEXICO

Like other communal farming areas in the northeastern state of Coahuila, Mexico, Ejido La Reforma has been heavily grazed and degraded. The area's agaves are disappearing, and with them, a principal food source for nectar-dependent foraging bats.

The critically important El Rosillo Cave is just a few miles from La Reforma. The cave is one of only four known maternity roosts, where female endangered Mexican long-nosed bats raise their pups until they can fly. In this area, agaves are the bats' only food source.

Our local NGO partner, Especies, Sociedad y Hábitat, A.C. (ESHAC), works closely with partner ejidos to advance regenerative agricultural practices that safeguard livelihoods, restore agave habitats, and sustain bats.

In 2021, ESHAC helped La Reforma construct a community greenhouse capable of producing 5,000 native plants annually.

Today, community members are growing native Agave asperrima seedlings for restoration, as well as edible plants such as chard, jicama, carrot, radish, broccoli, sunflower, lettuce, cauliflower, beet, and, for the first time, chile pequín. Pequin peppers are highly valued in Mexico, often selling for more than ten times the price of other peppers.

The nursery reduces the ejido's environmental 'foodprint,' addresses food insecurity, and supports the health and well-being of these rural communities by creating new pathways for nutritious food.

Our Partners:

ESHAC Especies, Sociedad y Hábitat AC

CONANP Comisión Nacional de Áreas Naturales Protegidas

Área de Protección de Recursos Naturales Distrito de Riego 004 Cuenca Don Martin

2 ZERO HUNGER

3 GOOD HEALTH AND WELL-BEING

26

COMMUNITY & NGO NURSERIES

BUILT OR RENOVATED IN MEXICO AND THE U.S. TO PRODUCE AGAVES FOR RESTORATION, VEGETABLES FOR LOCAL CONSUMPTION, AND MEDICINAL PLANTS FOR BUSINESSES

27

EJIDOS & PRIVATE LANDOWNERS

PARTICIPATING IN SUSTAINABLE AGRICULTURE AND RANCHING PROGRAMS

10,200

COMMERCIAL & EDIBLE SPECIES

GROWING TO SUPPORT FOOD SECURITY AND LIVELIHOODS

4 QUALITY EDUCATION

Providing Education and Lifelong Learning Opportunities in Rural Communities

Education is a crucial enabler of sustainable development. By integrating education and skills development into all aspects of our landscape and regional restoration strategies, we're creating communities of shared learning where members align around a shared goal. Program objectives:

- Foster environmental and scientific literacy through focused environmental education materials and instruction for ejidos and the public at large,
- Strengthen local capacity through vocational training, knowledge-sharing workshops, and peer-to-peer learning opportunities,
- Increase the productivity of enterprises through relevant training, and
- Establish networking connections to lay the groundwork for future collaborations and partnerships.

30
LAND MANAGERS & EJIDATARIOS
TRAINED IN CITIZEN SCIENCE

12
EJIDO YOUTH
TRAINED IN CONSERVATION MANAGEMENT TECHNIQUES

1.5M+
CITIZENS
REACHED THROUGH VIRTUAL AND IN-PERSON EDUCATIONAL PROGRAMS

15
SCHOOL TEACHERS
TRAINED AS "ENVIRONMENTAL CHAMPIONS"

2
SPANISH CHILDREN'S BOOKS
CREATED HIGHLIGHTING BAT AND AGAVE CONSERVATION

© BATTUS

SDG IN ACTION: BAT FEST | NUEVO LEÓN, MÉXICO

For the past five years, local education NGO Battus has been organizing an annual Bat Fest in Monterrey, Nuevo León. This free public festival has served as a platform to expose and connect people of all backgrounds to the wonders of bats.

More than 500 people participate in on-site educational programming each year, from evening bat walks to bat-themed and community-centered talks and workshops, games, puppet shows, storytelling, musical events, and artistic and cultural activities. Information booths staffed by environmental NGOs, educational institutions, and private sector groups from around Nuevo León further educate and empower festival goers to protect bats and other local fauna and flora near their homes.

We have been proud partners of the festival since its inception, joining several dozen other environmental organizations each year to support Battus' efforts to promote care for the environment and a culture of sustainability.

Our Partners:

BATTUS

CHIPINQUE

Secretaría de Medio Ambiente
Gobierno de Nuevo León

UANL

Ensuring Equitable Participation and Empowering Women

Empowering women and girls has catalytic and multiplier effects and helps drive economic growth and sustainable development. Program objectives:

- Ensure equal access to training opportunities for women,
- Provide tools and training to accelerate innovation and technology for gender equality,
- Foster peer-to-peer learning opportunities for women involved in agricultural production and green enterprises, and
- Strengthen women-owned enterprises and collectives.

© CONANP

SDG IN ACTION: WOMEN'S EXCHANGE OF EXPERIENCE | SAN LUIS POTOSÍ & DURANGO, MEXICO

In 2023, a group of women from Aromas y Flores del Desierto in San Luis Potosí's La Mojonera Protected Area visited the women of Ejido La Flor in Durango's Mapimí Biosphere Reserve. The two ejido groups shared their knowledge and experiences in developing community-based businesses that sustainably use native medicinal plants.

These "exchange of experience" trips facilitate productive exchanges between individuals, communities, and other groups, allowing participants to adapt their knowledge, skills, and traditions by incorporating new ideas. By furthering equal access to information, they also remove one of the barriers to equitable and sustainable development.

We proudly partnered with the Mexican government's Comisión Nacional de Áreas Naturales Protegidas and the nonprofit Alterd Alternativas para el Desarrollo, A.C., who organized this trip.

Our Partners:

5 GENDER EQUALITY

3
WOMEN FROM LOCAL EJIDOS
TRAINED THROUGH PILOT PROGRAMS TO COLLECT DATA TO STANDARDIZE THE COMMUNITY DISTILLERY'S MEZCAL PRODUCTION

8
WOMEN-OWNED ENTERPRISES
AND PROJECTS SUPPORTED THAT ENHANCE AGAVE AND NATIVE HABITAT

26
WOMEN
PARTICIPATED IN TWO EXCHANGES OF EXPERIENCE FOR DEVELOPING COMMUNITY-BASED BUSINESSES FOR SUSTAINABLE USE OF NATIVE MEDICINAL PLANTS

6 CLEAN WATER AND SANITATION

Ensuring Sustainable Management of Agricultural Water Resources

We're training ejidos and private landowners to implement and use regenerative agricultural practices that increase water retention in soil and enhance water-use efficiency. Program objectives:

- Use conservation techniques to increase soil moisture retention, and
- Incorporate effective water filtration techniques to remove harmful contaminants and enable recycling and reuse of water.

97
HECTARES OF EJIDAL AGRICULTURAL FIELDS
SUBSOILED IN FOUR COMMUNITIES

4
COMMUNITIES
INSTALLED BORDER IRRIGATION ON 97 HECTARES OF EJIDAL AGRICULTURAL FIELDS

4
COMMUNITIES
INSTALLED FILTER DAMS IN EJIDAL AGRICULTURAL FIELDS

© ESPECIES, SOCIEDAD Y HÁBITAT, A.C.

SDG IN ACTION: WATER RETENTION PRACTICES | NUEVO LEÓN & COHUILA MÉXICO

Our local NGO partner, Especies, Sociedad y Hábitat, A.C. (ESHAC), is working with 11 ejidos and private landowners in Nuevo León and Coahuila to implement soil restoration and water retention practices. These regenerative and agroecological practices help achieve sustainable agriculture and improve the environment and farm and land economic viability. We're already seeing native vegetation grow back along the areas where ejidos have employed practices such as:

Subsoiling. Soil compaction is a common degradation process where stress reduces the pore space between soil particles. Compaction decreases water infiltration, drainage, and storage rates, increases soil erosion, reduces nitrogen uptake, and reduces yields. Subsoiling is used to loosen compacted soil layers and to break hardpan.

Border Irrigation. Border irrigation increases irrigation efficiency by enhancing water absorption and minimizing water wastage. The field is divided into strips separated by border ridges. As the water advances down these ridges, it soaks into the soil. Agaves and other agroforestry species can also be planted within these borders.

Filter Dams. Filter dams temporarily impound shallow water, allowing it to seep through rocks slowly, helping to maintain soil moisture and trap sediment.

Our Partners:

ESHAC Especies, Sociedad y Hábitat AC
CONANP Comisión Nacional de Áreas Naturales Protegidas
Área de Protección de Recursos Naturales Distrito de Riego 004 Cuenca Don Martín
Parque Nacional Cumbres de Monterrey
Amigos de la Sierra A.C.

Protecting, Restoring, and Promoting Sustainable Use of Landscapes and Halting Biodiversity Loss

By restoring agave habitats, we help safeguard threatened and endangered bat species that rely on the plant's nectar as a critical food source. Program objectives:

- Prevent the extinction and recover thriving populations of three nectar-feeding bat species,
- Ensure the conservation, restoration, and sustainable use of agaves and other natural resources,
- Reduce the degradation of natural habitats, and
- Implement sustainable management that combats desertification and restores degraded land and soils.

© KRISTEN LEAR, BAT CONSERVATION INTERNATIONAL

SDG IN ACTION: RESTORING AGAVES IN THE BORDERLANDS | ARIZONA, NEW MEXICO & TEXAS, USA

Degraded lands directly threaten biodiversity and ecosystem services, and are catastrophic for communities. They reduce food and water security, increase risks of wildfire, and undermine livelihoods.

We're restoring native agaves near key roosts and across the migratory corridors of the Mexican long-nosed bat (*Leptonycteris nivalis*), Lesser long-nosed bat (*Leptonycteris yerbabuenae*), and Mexican long-tongued bat (*Choeronycteris mexicana*) in Mexico and the southwestern U.S. By restoring degraded agave ecosystems, we're not only protecting these essential pollinators, but we're also improving ecosystem resilience, mitigating the effects of climate change, combating desertification, and improving human well-being.

In the U.S., we are working with Borderlands Restoration Network, Gila Watershed Partnership, and Sul Ross State University to develop regional supply chains of native agave seedlings for restoration. With these partners, we have been growing nearly 15,000 agaves; created a *Growing Agaves for Bats* best practices guide; and led trainings on propagation and seed collection with binational partners.

Over the past 100 years, much of the agave habitats in the U.S. have undergone significant degradation due to overgrazing, drought, and changes in fire regimes. In collaboration with BRN and other partners, we are establishing a Livestock and Agaves Working Group to explore opportunities for sustainable ranching around nectar-feeding bat habitat. We aim to work with ranchers and conservation groups to co-develop best management practices for the same.

Our Partners:

BORDERLANDS RESTORATION NETWORK

GILA WATERSHED PARTNERSHIP OF ARIZONA

SUL ROSS STATE UNIVERSITY

15 LIFE ON LAND

13 CLIMATE ACTION

185K

NATIVE AGAVES

PLANTED IN PRIORITY AREAS FOR THREATENED BATS

16,770

TONS OF CO2

DRAWN DOWN & STORED BY PLANTED AGAVES

4.4K+

HECTARES

EXCLUDED FROM LIVESTOCK AND UNSUSTAINABLE EXTRACTIVE ACTIVITIES

1.2K+

HECTARES

RESTORED WITH AGAVES & REGENERATIVE AGRICULTURE & RANCHING

1M+

NATIVE AGAVE SEEDS

COLLECTED FOR RESTORATION EFFORTS AND REGIONAL SEED BANKS

16 PEACE, JUSTICE AND STRONG INSTITUTIONS

Building Effective, Accountable and Inclusive Governance

Rural areas are characterized by governance gaps and informality. We are entrenching good governance by championing socially inclusive practices and strengthening local capacity. Program objectives:

- Host context-specific training to develop knowledge and skills in strategy, governance, consensus building, and conflict resolution, and
- Ensure training is locally relevant while building common practices and standards.

400

EJIDO PRODUCERS AND PROTECTED AREA STAFF

WILL BE TRAINED IN STRATEGY, GOVERNANCE, CONSENSUS BUILDING, AND CONFLICT RESOLUTION

OUR APPROACH

The United Nations Environment Programme has reported that natural resources have been linked to at least 40 percent of all intrastate conflicts in the past 60 years. These conflicts are twice as likely to relapse within the first five years. While rarely the sole cause of violent conflict, competition for scarce natural resources has become a significant driver of violence.

To achieve SDG 16, Peace, Justice and Strong Institutions, promoting more inclusive and participatory natural resources governance at all scales is critical. Our multi-stakeholder partnerships cultivate trust and strengthen democratic inclusion by encouraging diverse stakeholder groups – including vulnerable groups, women, and youth – to participate in decision-making. Transparent land-use planning also provides opportunities to actively involve local communities in sustainable natural resources management.

Our approaches foster transformative and durable landscape restoration and promote peaceful and inclusive societies for sustainable development.

© DIEGO OLIVO, CONANP

Building Regional and Bi-National Partnerships to Catalyze Collective Action at Scale

By catalyzing collective action, we deliver effective, locally relevant solutions and create long-term, scalable value for rural communities and bats. Program objectives:

- Co-design program goals and actions with partners,
- Build community conservation and restoration capacity by providing peer-to-peer learning opportunities that foster skill and knowledge exchange, and
- Cultivate multi-national and regional collaboration and innovation in sustainable agriculture and ranching.

© KRISTEN LEAR, BAT CONSERVATION INTERNATIONAL

Conserving and protecting species that migrate seasonally over significant distances, often across international borders, is a complex undertaking. It requires holistic strategies that prioritize inclusiveness and cooperation in conservation planning. Through our Agave Restoration Initiative, we are developing regional partner networks to catalyze collective, landscape-scale action.

SDG IN ACTION: NORTHEAST MEXICO AGAVE RESTORATION NETWORK

To improve collaboration and coordination of on-the-ground restoration activities, we launched the Northeast Mexico Agave Restoration Network. Northeastern Mexico is critically important to migrating Mexican long-nosed bats. In late spring, the females stop at one of the area's maternity roosts to give birth and raise their pups before heading into the Southwest U.S. Here, drought linked to climate change and overgrazing have destroyed much of the region's wild agave plants and the bats' primary food sources along with them.

We are working with dozens of the region's local organizations, ejidos, private landowners, and protected area managers to support a network to establish regional restoration supply chains and catalyze community-based agave restoration for bats and people. Ultimately, the network will help to facilitate partnerships, co-develop ambitious conservation and sustainable development goals, accelerate the pace of impact, and assist ejidos and local community members in gaining access to previously unattainable financial resources.

17 PARTNERSHIPS FOR THE GOALS

130

EJIDATARIOS, PRODUCERS, AND PROTECTED AREA MANAGERS

PARTICIPATED IN "EXCHANGES OF EXPERIENCE" FOCUSED ON SUSTAINABLE AGRICULTURE, REGENERATIVE AGRICULTURE, AND THE DEVELOPMENT OF COMMUNITY-BASED BUSINESSES

3

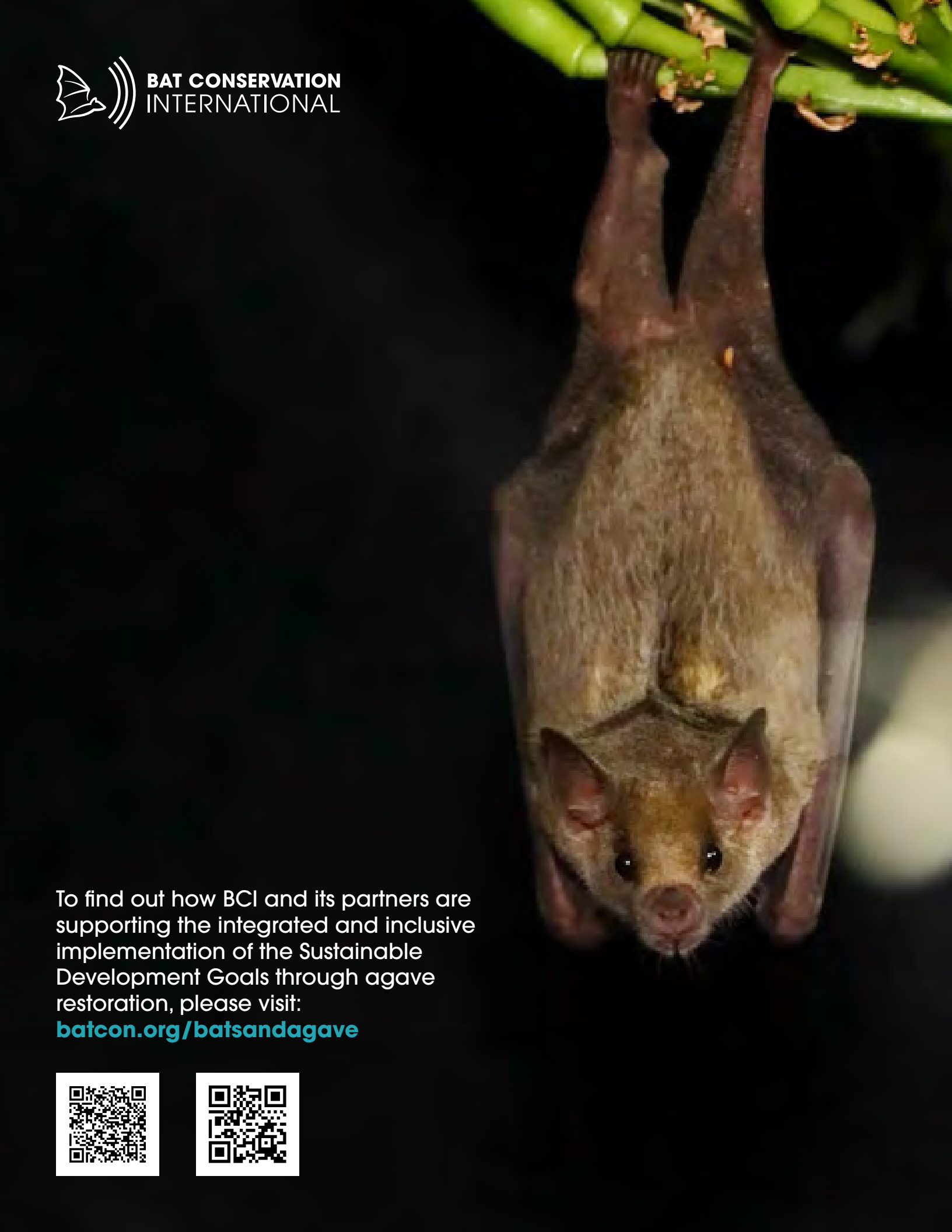
REGIONAL AGAVE RESTORATION NETWORKS

CREATED TO GUIDE RESTORATION AND CONSERVATION ACTIONS ACROSS THE U.S. & MEXICO

100+

NGO, GOVERNMENT, EJIDO, PRIVATE LANDOWNER, INDUSTRY, AND UNIVERSITY PARTNERS

ACROSS THE U.S. AND MEXICO



BAT CONSERVATION INTERNATIONAL

To find out how BCI and its partners are supporting the integrated and inclusive implementation of the Sustainable Development Goals through agave restoration, please visit:
batcon.org/batsandagave