



**Permits/Certs**

USFWS  
AGFD  
Navajo Nation  
EMT, CPR  
MSHA  
others as required

**Trainings**

Southwestern willow flycatcher  
Yellow-billed cuckoo  
Desert tortoise  
Burrowing owl  
Mexican spotted owl  
Marsh Birds  
Chiricahua leopard frog  
Flat-tailed horned lizard  
Wildlife Tracking Workshop  
Biological Assessment  
404 Workshop  
NEPA Leadership  
Project Management  
Wildland Fire

**Species Experience**

Southwestern willow flycatcher (E)  
Yellow-billed cuckoo (T)  
Mexican spotted owl (T)  
Burrowing owl  
Northern goshawk  
Golden eagle  
Bendire's / Le Conte's thrasher  
California gnatcatcher  
Avian point/count  
MBTA nest  
Bats  
Kit fox  
Pygmy rabbit  
Dark/pale kangaroo rat  
Navajo mountain vole  
Mojave (T) and Sonoran desert tortoise  
Gila monster  
Tucson shovel-nosed snake  
Rattlesnake removal  
Chiricahua leopard frog (T)  
Quino checkerspot butterfly  
Mojave shoulderband snail  
Arizona hedgehog cactus (E)

**ERIC HERMAN | OWNER AND BIOLOGIST**

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**EDUCATION**

**Arizona State University** 2003  
Tempe, Arizona  
MASTER OF ENVIRONMENTAL PLANNING, HONORS  
Final Studio: Sustainable Redevelopment in Tempe, AZ

**Ripon College** 2001  
Ripon, WI  
BACHELOR OF ARTS IN ENVIRONMENTAL STUDIES WITH EMPHASIS ON BIOLOGY, HONORS  
Thesis: Winter Weather Effects on Raptors in Central Wisconsin

**PROFESSIONAL EXPERIENCE**

**AtoZ Environmental Consulting, LLC (AtoZec)** 04/14 – present  
73 Casas Arroyo Road, Sonoita, AZ 85637

**POSITION: Owner, Biologist**

Eric established AtoZec from the ground up in 2014 focusing on wildlife biological services, as well as NEPA services. As Owner, Eric is involved in every aspect of running a small business, from client development to administration to final products. As a seasoned and permitted (federal, state, tribal) Biologist with 17 years of experience, Eric leads a multitude of surveys, writes biological reports, conducts Section 7 Consultations, presents environmental training programs, acts as a biological monitor, and carries out other biological tasks that arise. Surveys include southwestern willow flycatcher, yellow-billed cuckoo, Mexican spotted owl, burrowing owl, northern goshawk, raptor nests, MBTA nest, desert tortoise, and a variety of plants...among other species. Eric has conducted these on federal, state, city, county, tribal, and private projects. Eric runs on passion and continually trains biologists in proper survey techniques to gather better data on species.

**HDR Engineering, Inc.** 04/06 – 10/13  
3200 E. Camelback Rd., Phoenix, Arizona 85018

**POSITION: Biologist and NEPA Project Manager**

As NEPA Project Manager Eric performed a multitude of duties; gaining valuable industry experience. His focus was managing an average of 20 CEs at a time, while assisting on EAs and EISs. He was consistently solving challenges in an ever-changing regulatory environment. He managed all facets of projects from cost development to comment resolution to delivering the final product.

As Biologist Eric prepared Biological Assessments and Evaluations in support of EISs, EAs, CEs, and other environmental documents. He led surveys for threatened/ endangered/ sensitive species, migratory birds, bats, and native plants, and conducted the Section 7 Consultations when required. Eric also developed biological monitoring plans and performed the ensuing monitoring. He managed office permits for the USFWS, AGFD, and Navajo Nation, and mentored junior staff. His work experience spread across public and private sectors in the transportation, renewable energy, oil, and utility industries; and more. Eric paid close attention to budgets, schedules, quality, and maintaining a healthy relationship with clients.

Pima pineapple cactus (E)  
Paperspine cactus  
Pima Indian mallow  
Peebles Navajo cactus (E)  
Botanical/Native plants

### **Biological Monitoring**

Southwestern willow flycatcher (E)  
Yellow-billed cuckoo (T)  
Yuma clapper rail (E)  
Burrowing owl  
Cliff swallow  
Raven  
Bats  
Sonoran/Mojave (T) desert tortoise  
Gila monster  
Razorback sucker (E)  
Bonytail chub(E)  
Pima pineapple cactus (E)  
Dwarf bear poppy (T)  
Siler pincushion cactus (T)  
Fischeisen plains cactus  
International Borderwall

### **Volunteer**

Patagonia Volunteer Fire and Rescue: EMT, Fire  
Sky Island Alliance: wildlife cameras, spring surveys  
Borderlands: habitat development  
Wild at Heart: raptor rescues, burrowing owl habitat construction, and raptor food monitoring  
AGFD: bat and tortoise surveys  
CDC: tick collection  
Hassayampa River Preserve: bird banding  
Biology education for students in Patagonia

### **Wildlife Research**

Wildlife camera trap monitoring, Sky Islands AZ, 2015-2020  
Winter weather effects on migration patterns to raptors in central Wisconsin, 2001  
Observation of eaglet behavior in Boundary Waters, MN, 2000  
Boat proximity to orcas at San Juan Island, WA, 1999

## **SELECTED RECENT SPECIES EXPERIENCE**

### **Yellow-billed Cuckoo (permitted in AZ, CA, NM, TX, UT)**

*San Simon River and Gila River, Safford, AZ, 2022. Protocol surveys along San Simon River and across the Gila River.*

*Patagonia Mountains, Coronado National Forest, Pima County, AZ, 2018-2021. Yearly surveys where AtoZec leads six biologists in the Patagonia Mountains in southern Arizona. Surveys cover over 30 miles of rugged, off-trail transects within pine-oak woodland canyons. Eric has recorded hundreds of cuckoo detections both aurally and visually, cuckoo behaviors, breeding pairs, and nests. Surveys are significant in detecting cuckoos in previously undescribed habitat that has recently been added to the USFWS Proposed Critical Habitat. Eric continually briefs his teams and trains new biologists in proper survey techniques, navigation in remote areas, and safety protocols in the International Border region. Additionally, over 100 avian species were identified in the mountains during spring and summer.*

*King Ranch, Maricopa County, AZ, 2017-2019. AtoZec conducts yearly surveys at this site, consisting of tamarisk/mesquite/agricultural habitat along the Gila River. Surveys covered over 5 miles and recorded cuckoos; presumed ranging beyond known territories in proximity to the survey site. Survey reports are written each season to document results and trends. AtoZec also trains client biologists on proper cuckoo survey methods.*

*Fresnal Wash and others, Buenos Aires National Wildlife Refuge and Coronado National Forest, Pima County, AZ, 2018. Managed surveys over 6 miles of various washes in the Buenos Aires National Wildlife Refuge and Coronado National Forest along the International Border. Discovered cuckoos in previously undetected habitat. Discovered 15 individuals and 7 nesting pairs of cuckoos with over 50 detections.*

*Coon Creek/Sycamore Canyon, Tonto National Forest, AZ, 2017. Conducted cuckoo surveys within two remote drainages of the Salt River. Several cuckoo detections and breeding cuckoos were documented. Additionally, recorded all breeding birds and wildlife observed, and maintained four wildlife camera traps. Wrote a Survey Report and Biological Assessment analyzing survey results, vegetation layers, and wildlife observed for use in the Tonto National Forest Management Plan.*

*Dragoon Mountains, Coronado National Forest, AZ, 2017. Conducted cuckoo surveys in several drainages in the Dragoon Mountains. Pine-oak habitat was similar to other Sky Islands where cuckoos have been found; however, only one was located on these surveys.*

*Gila River, Kearny, AZ, 2016. Performed cuckoo surveys along a 6 mile stretch of the Gila River. Numerous detections were recorded.*

*Mineral Creek, Tonto National Forest, AZ, 2016. Single cuckoo survey in a rugged portion of the Pinal Mountains requiring wading and off trail skills.*

*Multiple drainages, Tonto National Forest, AZ, 2016. Eric performed cuckoo surveys along 10 miles of drainages in 6 canyons in Sonoran desertscrub habitat. Eric trained junior biologists in proper cuckoo survey techniques.*

*Vamori Wash, Tohono O'Odham Nation, Pima County, AZ, 2015.* AtoZec conducted cuckoo surveys in Vamori Wash where it crosses the International Border with Mexico. Two resident cuckoos were detected and classified as probable nesting south of the border, where the majority of detections occurred. Eric also trained two of the client's staff in cuckoo survey methods and identification.

### **Southwestern Willow Flycatcher (permitted in AZ, CA, CO, NM, TX, UT)**

*San Simon River and Gila River, Safford, AZ, 2022.* Protocol surveys along San Simon River and across the Gila River.

*Alamo and Canoncito, Navajo Nation, NM, 2022.* AtoZec conducted SWFL surveys within 8 different drainages prior to a noxious weed removal project. 25 migrating willow flycatchers were recorded. A Biological Assessment was written.

*King Ranch, Maricopa County, AZ, 2017-2019.* AtoZec conducts yearly surveys at this site, consisting of tamarisk/mesquite/agricultural habitat along the Gila River. Surveys covered over 5 miles and yielded migrating flycatchers. Survey reports are written each season to document results and trends. AtoZec also trained client biologists on proper flycatcher survey methods.

*Roosevelt Lake, Tonto National Forest, AZ, 2018.* Conducted flycatcher surveys at the northern and southern ends of Roosevelt Lake. Habitat consisted of tamarisk, mesquite, and cottonwood/willow. Surveys were conducted by both kayak and transects, and yielded 58 detections.

*Dripping Springs, Gila River, Tonto National Forest, AZ, 2018.* Surveys and monitoring focused on relocating previously known territories. 22 detections were made and 8 nests monitored while wading through a tamarisk-dominated portion of the Gila River.

*Coon Creek/Sycamore Canyon, Tonto National Forest, AZ, 2017.* Conducted flycatcher surveys within two remote drainages of the Salt River. Breeding flycatchers were observed. Additionally, recorded all breeding birds and wildlife observed, and maintained four wildlife camera traps. Wrote a Survey Report and Biological Assessment analyzing survey results, vegetation layers, and wildlife observed for use in the Tonto National Forest Management Plan.

*Gila River, Kearny, AZ, 2016.* Performed flycatcher surveys along a 6-mile stretch of the Gila River. Numerous detections were recorded and breeding birds identified. Eric trained junior biologists in proper flycatcher survey techniques.

*Queen Creek, Boyce Thompson Arboretum and Tonto National Forest, AZ, 2016.* Performed flycatcher surveys along a stretch of Queen Creek. Migrant flycatchers were identified. Eric trained junior biologists in proper flycatcher survey techniques.

*Dripping Springs to San Pedro to A Diamond Ranch, Gila River, AZ 2015.* Performed flycatcher surveys and nest monitoring along 25 miles of the Gila River on Bureau of Reclamation land in the Kearny area. Habitat on this stretch of the river is dominated by a dense tamarisk thicket, interspersed with cottonwood, willow, and mesquite. The density of the thicket requires an extreme physical effort to maneuver through. Eric's portion yielded 73 territories and 39 pairs. Following surveys he conducted 70 hours of nest monitoring and assisted in the training of one staff member in nest monitoring.

*Alamosa National Wildlife Refuge, CO, 2015.* Performed flycatcher surveys in the Alamosa Wildlife Refuge and Alamosa County parcels in southern Colorado. The survey consisted of 5 separate locations dominated by varying densities of willow, with cottonwood and cattails. This survey at the northern edges of the flycatcher's range yielded 13 migrants and 1 nesting pair. Additionally, AtoZec was hired to train the client's staff in flycatcher survey methods and identification.

*Little Colorado River, Cameron, Navajo Nation, AZ, 2011-2013.* Eric conducted 3 years of flycatcher surveys while coordinating Section 7 Consultation for the replacement of historic Cameron Bridge. Surveys yielded migrating flycatchers in tamarisk/mesquite habitat.

### **Mexican Spotted Owl (permitted in AZ, NM, UT; Spotted Owl in CA, OR)**

*Gila National Forest, Mogollon, NM, 2022.* Surveys were in multiple drainages at night, with follow-up surveys conducted during the day. Two new breeding pairs of owls were located, each with 2 successful fledglings.

*Patagonia Mountains, Coronado National Forest, AZ, 2017-2021.* Led surveys to over 50 call points each year in the Patagonia Mountains. Previously unknown owls and offspring were identified. Multiple pairs of owls were monitored. Surveys were conducted off-trail through rugged mountain and canyon conditions adjacent to the International Border, making safety a key component.

### **Northern Goshawk**

*Patagonia Mountains, Coronado National Forest, AZ 2018-2021.* Yearly surveys following the USFS survey protocol. Eric led a team of 4 biologists surveying over 30 miles of rugged, off-trail transects within woodland canyons in an area with few goshawk sightings over the years. One pair was located and the nest monitored from egg to fledgling. Two goshawks fledged from a clutch of three in 2019. The nest was relocated in 2020 and fledged 3 goshawks.

### **Burrowing Owl**

*I-10 and Marana Road, Marana, AZ, 2021.* 35-acre survey across disturbed desertscrub habitat. Numerous inactive burrows were located and a survey memo written.

*Bella Vista, San Tan Valley, AZ 2020.* Surveys covered a 2-mile proposed waterline and access roads through agricultural fields. 21 owls, 20 active burrows, 8 potentially active burrows, and 6 inactive burrows were identified.

*SRP Site, San Tan Valley, AZ, 2020.* Surveys extended across a 90-acre site. Twelve inactive burrows were identified, and mitigation created for future work on the site.

*I-10, Gila River Indian Community, AZ, 2020.* Twenty miles of owl surveys were conducted prior to installation of guardrail and repaving of I-10. Numerous inactive burrows were located in the I-10 right-of-way.

*Wenden Railroad Spur, Wenden, AZ, 2019.* Performed burrowing owl surveys prior to construction of a railroad spur. Catalogued all burrows in the project area and whether they were active or potentially active so they could be monitored during construction.

*San Carlos Irrigation District, Pinal County, AZ, 2018.* Performed a burrowing owl survey within a mixed desertscrub/agricultural area along 4 miles of the Gila River. The survey was conducted following the AGFD guidelines; pedestrian transects were conducted at 30 ft apart and throughout topographic features. All burrows (active/inactive), owls, spoor, and behavior were recorded.

*SR 87, Pinal County, AZ, 2017.* Performed a burrowing owl survey along SR 87 and Randolph Road in an agricultural setting. The survey was conducted following the AGFD guidelines; pedestrian transects were conducted at 30 ft apart and throughout topographic features. All burrows (active/inactive), owls, spoor, and behavior were recorded.

*Florence, Pinal County, AZ, 2015.* Surveyed for burrowing owls within agricultural land outside of Florence, AZ. Owls and burrows were observed.

*Dove Valley Road, Maricopa County, AZ, 2015.* Performed a burrowing owl survey along 2 miles of Dove Valley Road through Sonoran desertscrub habitat. The survey was conducted following the AGFD guidelines; pedestrian

transects were conducted at 30 ft apart and throughout topographic features. All burrows (active/inactive), owls, spoor, and behavior were recorded.

*San Carlos Irrigation District, Pinal County, AZ, 2015.* Performed a burrowing owl survey within a mixed desertscrub/agricultural area along the Gila River on 31 acres. The survey was conducted following the AGFD guidelines; pedestrian transects were conducted at 30 ft apart and throughout topographic features. All burrows (active/inactive), owls, spoor, and behavior was recorded.

*White Sands Missile Range, Sierra East, NM, 2014.* Performed burrowing owl surveys on over 6,000 acres of the White Sands Missile Range using a combination of transects, tape playback, and road survey. Surveys estimated the relative abundance and spatial distribution of burrowing owls. In addition, all wildlife species observed were recorded.

*Cell Tower, Tucson, AZ, 2014.* Surveyed a small parcel for burrowing owls, burrows, and owl sign. No owls were observed.

*Solar Site, Arlington, AZ, 2012.* Surveyed for burrowing owls on a 300-acre solar development site in desertscrub habitat. Recorded all tortoise, burrows, and sign observed.

*Solar site, Arlington, AZ, 2010.* Led 3-person crew in protocol surveys for burrowing owls on a 500-acre solar development site in desertscrub habitat. Recorded all tortoise, burrows, and sign observed.

### **Other Bird**

*Migratory Bird Nest Searches, Southwestern US, 2005-2022.* Multitude of nest surveys for swallows, raptors, and all nesting birds over hundreds of miles from Texas to Arizona for a variety of clients. Surveys have been located in pristine habitats, transportation corridors, bridges, solar/wind sites, communications towers, International Border, and more. Hundreds of nests, eggs, and nestlings have been recorded over the years.

*Golden Eagle and Migratory Bird Surveys, Dilkon, Navajo Nation, AZ, 2022.* Surveys covered 12 miles of transmission line and observation points covering surrounding mesa. One golden eagle was identified and numerous potential burrowing owl burrows.

*Golden Eagle, Burrowing Owl, Raptor, and Migratory Bird Nest Surveys, Pinyon, Navajo Nation, AZ, 2022.* Surveys covered 24 miles of current transmission lines and followed Navajo Nation protocols. Inactive burrows were identified, and numerous raven nests identified.

*California gnatcatcher, Otay Mountains, CA, 2021.* Assessed California gnatcatcher habitat and performed a protocol survey in the Otay Wildlife Preserve. Habitat was suitable and several California gnatcatchers observed.

*Golden Eagle, Burrowing Owl, Raptor, and Migratory Bird Nest Surveys, Navajo Nation, AZ, 2021*  
Surveys covered 15 miles of future transmission lines and followed Navajo Nation protocols. Inactive burrows were identified, but no active nests of any species were observed; surveys were late in the season.

*Golden Eagle and Raptor Surveys, Cargo Muchacho Mountains, Imperial County, CA, 2021.* Surveys followed the USFWS Golden Eagle Monitoring Protocol. Thirty observation points were established around and within the mountain range to monitor for golden eagle presence. Additionally, hiking observations were conducted in technical terrain. No golden eagles were nesting the mountains. A prairie falcon aerie was located and a red-tailed hawk nest.

*Le Conte's thrasher, Gila River Indian Community, AZ, 2020.* Surveys were conducted following a modified version of the Desert Thrasher Working Group protocol. Twenty miles of the Interstate 10 right-of-way were surveyed.

*Golden Eagle, Dugway Mountains, UT, 2019.* Searches for golden eagles, other raptors, and nests were conducted using a spotting scope for thirty minutes from numerous high points throughout the project area. Observation points were chosen during site reconnaissance identifying areas that offered views of prime golden eagle habitat. Two golden eagles were recorded.

*Bendire's thrasher, Statewide, NV, 2018.* Surveys were conducted for the Great Basin Bird Observatory following the Desert Thrasher Working Group protocol. Thirty survey plots were located throughout central and southern NV in desertscrub and pinyon-juniper habitats. Surveys also included detailed vegetation mapping at each plot.

*Avian point-counts, Gila River Indian Community, AZ, 2017.* Point-count surveys were performed six times throughout the breeding season in desertscrub habitat. Five minutes were spent at each of 40 points during each visit, recording all birds observed visually and aurally.

*Avian point-counts and nest search, White Sands Missile Range, Sierra East, NM, 2014.* Point-count surveys and migratory bird nest searches on over 6,000 acres of the White Sands Missile Range. The project area contained 26 plots where 220 birds were observed. Surveys measured the relative abundance of birds and estimated the abundance and species composition of nesting birds. In addition, all wildlife species observed were recorded.

### **Desert Tortoise**

*Ogilby, Imperial County, CA.* Surveys across approximately 2000 acres for the Mohave desert tortoise. A low density of tortoises were observed. Scat, carcasses, and numerous burrows were also located.

*I-10, Gila River Indian Community, AZ, 2020.* Twenty miles of tortoise surveys were conducted prior to installation of guardrail and repaving of I-10. Numerous burrows were located in the adjacent I-10 right-of-way.

*SRP Site, San Tan Valley, AZ, 2020.* Surveys extended across a 90-acre site. Numerous potential burrows were identified, and mitigation created for future work on the site.

*Lake Pleasant Regional Park, AZ, 2019.* Large sections of Sonoran Desert were surveyed using a modified protocol. Eric surveyed 30 miles of meandering transects in rugged desert mountain terrain. Seven tortoises and numerous burrows, scat, and carcasses were observed.

*Wenden Railroad Spur, Wenden, AZ, 2019.* Performed Sonoran desert tortoise surveys prior to construction of a railroad spur. Catalogued all burrows in the project area and whether they were active or potentially active so they could be monitored during construction.

*BLM, North Las Vegas, NV, 2016.* Performed Mojave desert tortoise surveys over thousands of acres on BLM land as part of a land swap. Numerous tortoises were found at all life stages, as well as scat, carcasses, and burrows.

*Solar Site, Arlington, AZ, 2012.* Surveyed for Sonoran desert tortoise on a 300 acre solar development site in desertscrub habitat. Recorded all tortoise, burrows, and sign observed.

*Flat Top Mesa, Mesquite, NV, 2010.* Surveyed for Mojave desert tortoise in an 8-mile long solar power facility. Duties included locating tortoise burrows, track and sign, and individuals; and recording observations, GPS points, and photos.

*Solar site, Arlington, AZ, 2010.* Led 3-person crew in protocol surveys for Sonoran desert tortoise on a 500 acre solar development site in desertscrub habitat. Recorded all tortoise, burrows, and sign observed.

*Mormon Mesa Carp Elgin, Mesquite, NV, 2010.* Surveyed for Mojave desert tortoise in a small areas for wind power met towers. Duties included locating tortoise burrows, track and sign, individuals; and recording observations, GPS points, and photos.

## **Bats**

*SR77/Oracle Road, Tucson, AZ, 2021.* Preconstruction survey of the Rillito Creek Bridge. Surveys consisted of visual and audible inspections of these locations for day-roosting and night-roosting bat species. All expansion joints, crevices, girders, I-beams, and rough surfaces were inspected by listening for bats, watching at various times of day/night for flying bats, inspecting crevices and joints, and using an endoscope to inspect hard-to-reach areas.

*I-10 Benson Overpass, Benson, AZ, 2020.* Preconstruction surveys of the San Pedro River Bridge and seven culverts where different species of bats roost during the day and night. Surveys consisted of visual and audible inspections of these locations for day-roosting and night-roosting bat species. All expansion joints, crevices, girders, I-beams, and rough surfaces were inspected by listening for bats, watching at various times of day/night for flying bats, inspecting crevices and joints, and using an endoscope to inspect hard-to-reach areas. The bridge and culverts were also inspected for urine/oil staining and guano. Day roosting bats used the culverts and night roosting bats used the bridge.

*I-10, Vail and Mountainview Overpasses, Pima County, AZ 2019.* Surveys at the Vail and Mountainview Bridges prior to bridge demolition. Both bridges were visually inspected to observe bats flying in and out during the day and night. Audible observations were made beneath the bridge decks. I-beams, girders, expansion joints, and all crevices and rough surfaces were examined for bat presence with high powered lights. An endoscope was used for inspection of hard-to-reach areas. Bats were not present at the time of the winter survey, but urine/oil staining and guano beneath the bridges was observed. Bridge expansion joints were sealed with expanding foam to keep bats from re-entering prior to inspection. Follow-up inspections were made to confirm the foam was intact. Surveys lasted 2 days and nights. Free-tailed bats are expected to be using these structures.

*Laguna Creek Bridge, Kayenta, Navajo Nation, AZ. 2019.* The project focused on migratory bird nest surveys; however, an impromptu bat survey was conducted during the day. The ground beneath the bridge deck, I-beams, expansion joints, and all crevices and rough surfaces were visually inspected for bat sign. Staining and guano were both preset and reported to the construction crew. This project was on Navajo Nation and a Biological Investigation permit from the Navajo Nation Department of Fish and Wildlife was issued. Surveys lasted one day.

*Wenden Railroad Spur, Wenden, AZ. 2018.* An old manganese ore pit was surveyed for the presence/absence of bats using visual and audible observations. A light and endoscope were used where required. Large amounts of guano was observed on the ground and California leaf-nosed bats were observed hanging from the ceiling.

*London Bridge, Lake Havasu City, AZ 2010.* A one-day presence/absence survey was conducted inside the London Bridge. California leaf-nosed bats were observed throughout the structure; concentrated at either end.

*Statewide, Arizona, 2005-2014.* Numerous surveys focused on bridges and culverts throughout the Arizona highway system for ADOT. Surveys were completed during the day and night. All bats, roost types, and sign observed were recorded.

*Bridges and Culverts, Maricopa County, AZ 2005* Eric volunteered with AGFD to inspect numerous bridges and culverts throughout Maricopa County for presence/absence of bats. Surveys included visual inspection using lights, binoculars, and unassisted, as well as audible surveys. Structures were inspected for guano and urine/oil staining. Bats and their sign were found on structures throughout Maricopa County.

## Other Wildlife Species/Surveys

*Dark and Pale Kangaroo Mice and Pygmy Rabbit Surveys, Goldrush, Eureka, NV, 2021.* Small mammal trapping for 5 days at 5 sites with 60 traps, totaling 300 trap nights for target species dark and pale kangaroo mice (BLM sensitive). Data was collected on all species trapped, including kangaroo mice, deer mice, chipmunks, and others. Two pale kangaroo mice were successfully identified through trapping. Pygmy rabbit surveys consisted of meandering transects through suitable habitat with searches centered around the densest/tallest patches of sagebrush. Pygmy rabbit scat and burrows were identified.

*Quino checkerspot butterfly, Otay Mountains, CA, 2021.* Assessed Quino checkerspot butterfly habitat and relocated host plants in the Otay Wildlife Preserve. Habitat was suitable, host plants located, and Quino checkerspot butterflies observed.

*Flat-tailed horned lizard and Colorado Desert fringe-toed lizard surveys, Ogilby, Imperial County, CA, 2021.* Surveys were conducted across approximately 2000 acres for the FTHL following protocols established in the FTHL Rangewide Management Strategy. No protocol exists for the fringe-toed, so a survey method was established based off previous lizard and reptile surveying experience. Six species of lizard were observed; however, no target species were located.

*Jurisdictional delineation, Atterbury, Tucson, AZ, 2021.*

Performed the fieldwork for a jurisdictional delineation on ASLD land in the Tucson area. Dozens of desert washes were measured and data entered into a project specific app immediately uploaded to the project server.

*Flat-tailed horned lizard and Colorado Desert fringe-toed lizard Habitat Assessment, Cargo Muchacho Mountains, Imperial County, CA, 2021.* Conducted habitat assessment for lizards in the flat lands surrounding the Cargo Muchacho Mountains to determine locations of future surveys.

*Flat-tailed horned lizard, San Luis, AZ, 2020.* FTHL surveys over a 90-acre area along the International Border. Surveys followed the protocol found in the FTHL Rangewide Management Strategy, with alternating scat and lizard transects.

*Tucson shovel-nosed snake, I-10, Gila River Indian Community, AZ, 2020.* Surveys focused within suitable habitat along twenty miles of I-10 prior to installation of guardrail and repaving.

*Kit Fox, Dugway Mountains, UT, 2019.* Surveys consisted of walking transects searching for sign and reviewing GIS files to locate the most suitable habitat. The survey protocol used at BYU was followed and included placing scent sticks in habitat and using camera traps to identify kit foxes.

*Pygmy Rabbit, Dugway Mountains, UT, 2019.* Surveys followed a BLM protocol. Optimal habitat was located through site reconnaissance and GIS file review. Meandering transects were walked through suitable habitat with searches centered around the densest/tallest patches of sagebrush.

*Aquatics, Patagonia Mountains, AZ, 2019.* Aquatic surveys within creeks and stock tanks scattered throughout the Patagonia Mountains. Surveys were conducted visually and with nets to collect both vertebrate and invertebrate species. Water quality data was also recorded.

*Mohave shoulderband snail, Mohave Desert, 2017.* Surveys were focused on a particular mountain in the Mojave Desert where a snail petitioned for the USFWS T/E List is found. Surveys consisted of walking all areas of the mountain slopes looking for snails on the ground; particular focus was on searching underneath rocks and within crevices.

*Chiricahua leopard frog, Floyd Pocket, Douglas, Cochise County, AZ, 2013.* Performed a Chiricahua leopard frog survey at a 7.5 acre site centered around a stock tank for US Border and Customs FOB.



*General wildlife, Keystone XL Pipeline, NE, 2012.* Monitored multiple field crews for compliance with industry-standard data collection. Field crews included biology/wetland delineation, construction reclamation, and cultural resources.

*Fish Passage Barrier Inventory, Central Coast, CA, 2006-2007.* Conducted fish passage surveys for 6 months to determine culvert and bridge locations on the California state highway system that do not meet the CDFG and NOAA fisheries requirements for passage of resident and anadromous salmonids. A prioritized list of culverts and bridges in need of repair or replacement to facilitate fish passage was developed for all coastal drainages crossing state highways in San Luis Obispo, Monterey, and Santa Cruz counties. Following completion, trained new biologists to continue surveys for Humboldt County.

### **Biological Construction Monitoring**

*Multiple species, Hurricane Mesa, UT, 2022.* Daily biological monitoring during UXO removal an old military installation. Species were surveyed for ahead of ground disturbance and monitored throughout. Species included desert tortoise, raptors, nesting migratory birds, dwarf bear-poppy, Fickeisen plains cactus, and Siler pincushion cactus.

*General biology, International Borderwall, Sasabe, AZ 2020-2021.* Biological monitoring during construction of the borderwall. Duties included removing wildlife in harm's way, assessing wildlife corridors, verifying cactus relocation, inspecting BMPs, and overall monitoring of construction activities.

*Pima pineapple cactus, I-19 Tubac – West Arivaca Rd and Duval Mine Rd – Pima Mine Rd., AZ, 2020-2021.* Installed fencing around all Pima pineapple cacti in the project area, performed construction environmental awareness training for all personnel entering the project site, and periodically checked cacti fencing.

*Bat and Pima pineapple cactus, Mountainview and Vail TIs, Pima County, AZ, 2019-2020.* Surveyed for bat presence and installed bat exclusion measures to prevent bats from roosting in the project area. Installed fencing around all Pima pineapple cacti in the project area and performed construction environmental awareness training for all personnel entering the project site.

*Raven, Kayenta, Navajo Nation, AZ, 2019.* AtoZec surveyed and monitored ravens using a bridge for roosting during construction. The ravens were monitored towards the end of their nesting cycle to ensure fledglings left the nest successfully. Daily notes were recorded for the client.

*Yellow-billed cuckoo and southwestern willow flycatcher, Kearny, AZ, 2019.* Daily monitoring at the site of culvert repairs in tamarisk dominated critical habitat. Construction was observed to ensure it stayed within the construction footprint and did not remove any vegetation previously not approved.

*Burrowing owl and desert tortoise, Wenden, AZ 2019.* Weekly monitoring during railroad spur construction to ensure no tortoises were in the construction footprint and no burrows contained tortoises or owls; burrows collapsed when necessary. Continually briefed client on operations and wrote a monitoring report. Remained on-call to remove any owls or tortoises observed in the project area.

*Pima pineapple cactus, Duval Road, Pima County, AZ, 2018.* Installed fencing around all Pima pineapple cacti in the project area and performed construction environmental awareness training for all personnel entering the project site and wrote a final report.

*Pima pineapple cactus, SR 86, Pima County, AZ, 2017.* Installed fencing around 19 Pima Pineapple cacti for avoidance. Performed construction environmental awareness for all personnel entering the project site and wrote a final report.

*Desert tortoise and Gila monster, Tonto National Forest, AZ, 2016.* Eric led a crew of six biologists performing surveys and construction monitoring during road building and drilling operations across large parts of the

Sonoran Desert. Any tortoise or Gila monster in danger was removed to safety. All activities were documented and a monitoring report summarizing the project written.

*Desert tortoise and Pima pineapple cactus, SR 86, Pima County, AZ, 2016.* Performed a desert tortoise awareness program for all personnel entering the project site. Remained on-call to remove any tortoises observed in the project area. Three Pima pineapple cacti were fenced for construction avoidance.

General wildlife, South Mountain Corridor, Maricopa County, AZ, 2016. Daily monitoring during demolition activities of structures in a future transportation corridor. Surveyed structures for wildlife prior to demolition and removed wildlife found. Observed during demolition activities for any sign of wildlife.

*Cliff swallow, Yuma clapper rail, razorback sucker, and bonytail chub, Bill Williams National Wildlife Refuge, AZ, 2010-2011.* Developed a CE, incidental take plan, and biological monitoring plan. Daily construction monitoring for bridge repairs over a wildlife refuge, home to three endangered species. Enforced conservation measures from the USFWS Biological Opinion throughout construction. Project received Arizona Transportation Partnering Excellence Award.

## **Plants**

*Pima pineapple cactus, I-19 Helmet Peak Rd, Santa Cruz County, AZ, 2021.* Surveyed for endangered Pima pineapple cactus along Interstate 19 and installed fencing around all cacti found.

*Pima pineapple cactus, I-19 Tubac – West Arivaca Rd, Santa Cruz County, AZ, 2020-2021.* Surveyed for endangered Pima pineapple cactus along Interstate 19 and installed fencing around all cacti found.

*Native Plant Survey, San Tan Valley, AZ, 2020.* Performed surveys over a 90-acre site for native plants to develop a database used in extrapolating costs for an ASLD stumpage assessment. The stumpage assessment was written to comply with guidelines set forth by ASLD.

*Arizona hedgehog cactus, Oak Flat, Tonto National Forest, AZ, 2020.* Surveyed for the endangered Arizona hedgehog cactus in steep canyon habitat. Thirty-six new cacti were located.

*Pima pineapple cactus, Mountainview and Vail I-10 TIs, Pima County, AZ, 2019-2020.* Surveyed for endangered Pima pineapple cactus in a small area adjacent to Interstate 10 and installed fencing around all cacti found.

*Native plants, San Tan Valley, AZ 2018.* Protected native plants surveyed within a roadway right-of-way to determine a stumpage assessment for the ASLD. The name of each plant observed, UTM coordinates of native trees, photographs, the size classification of each plant in caliper inches, and the total number of plants within each size classification were recorded.

*Pima pineapple cactus, Duval Road, Pima County, AZ, 2018.* Surveyed for endangered Pima pineapple cactus in a small area adjacent to Interstate 19 and installed fencing around all cacti found.

*Vegetation assessment, Bagdad, AZ, 2018.* Using the line intercept method, 17,000 acres were surveyed for vegetative cover, habitat types, protected native plants, and a complete plant list.

*Pima pineapple cactus, SR 86, Pima County, AZ, 2017.* AtoZec surveyed along 16 miles of a linear transportation corridor, surveyed previously by another company. Nineteen endangered cacti were located, 11 of which were previously unidentified.

*Arizona hedgehog cactus, Oak Flat, Tonto National Forest, AZ, 2017.* Surveyed within rugged cliff and canyon habitat for endangered Arizona hedgehog cactus, finding several.

*Native plant and Pima pineapple cactus, SR 86, Pima County AZ, 2016.* Performed a native plant and endangered Pima pineapple cactus survey along 14 miles of a heavily disturbed linear corridor, surveyed previously by another company. Three Pima pineapple cacti and numerous native plants were located. Rechecked three Pima pineapple cacti from previous survey and determined the marked locations were not Pima pineapple cactus; removed avoidance constraints at these locations.

*Huachuca water umbel, San Pedro River, AZ, 2012.* Surveyed for the endangered Huachuca water umbel, finding a few specimens, and coordinated Section 7 consultation with the USFWS.

*California rare plants, I-15 Corridor, Riverside County, CA, 2011.* Botanical field surveys of the project corridor identifying rare plant species and compiling a complete flora list.

*Peebles Navajo cactus, paperspine cactus, native plants, Dry Lake Wind Farm, Snowflake, AZ, 2009-2010.* Led 4-person crew for Arizona's first wind farm in a native plant inventory covering over 1000 acres; including the assessment of transplantability of individual plant specimens in compliance with the ANPA, stumpage assessment for the ASLD, and a sensitive species inventory for the BLM.

## **Documents**

*Biological Assessment, Alamo and Canoncito Noxious Weed Removal, Navajo Nation, NM.* Biological Assessment and SWFL surveys for an EA of noxious weed removal. The Biological Assessment examined the willow flycatcher and yellow-billed cuckoo in detail, as well as assessing Navajo Nation species such as the golden eagle.

*Biological Assessment and EA Section, Meadview, AZ, 2021.* A Biological Assessment for a 20-mile transmission line to BLM and USFWS standards. Species examined in detail included the California condor, Sonoran desert tortoise, burrowing owl, and the Joshua tree. Information from the Biological Assessment was used for the Environmental Assessment.

*Biological Review, San Tan Valley, AZ, 2021.* A Biological Review was written for a 200-acre sand and gravel operation. USFWS T/E species were examined, as well as AGFD sensitive species. Habitat assessments were conducted for the burrowing owl, desert tortoise, and migratory birds.

*Sunset View Wildlife Area Biological Evaluation, Yuma Crossing National Heritage Area, Yuma, AZ, 2020.* Section 7 consultation and a Biological Evaluation examining the yellow-billed cuckoo, southwestern willow flycatcher, Yuma Ridgway's rail, and northern Mexican gartersnake. Determinations included "may affect, not likely to adversely affect" and "no effect."

*Stumpage Assessment and Native Plant Inventory, San Tan Valley, AZ, 2020.* Performed surveys over a 90-acre site for native plants to develop a database used in extrapolating costs for an ASLD stumpage assessment. The stumpage assessment was written to comply with guidelines set forth by ASLD.

*Biological Review, San Tan Valley, AZ, 2020.* A Biological Review was written for a 90-acre desertscrub site. USFWS T/E species were examined, as well as AGFD sensitive species. Surveys were conducted for the burrowing owl and desert tortoise.

A variety of other documents have been written for federal, county, state, and city agencies, tribal nations, and private industry. These include:

- Biological Assessments/Evaluations
- Biological Monitoring Plans
- Survey Reports
- Habitat Assessment
- Species Lists
- Environmental Overviews
- Categorical Exclusions
- Environmental Assessments
- Environmental Awareness Trainings
- Comment Evaluation Report
- Company Safety Plans

### **Volunteer**

*Patagonia Volunteer Fire and Rescue. Patagonia, AZ. 2021-2022.* Certified EMT, Wildland Fire, and Firefighter for the Town of Patagonia's volunteer department.

*Santa Cruz County Search and Rescue, AZ, 2022.* Leads backcountry and EMT elements of rescues and body recoveries in the border region of the southern Arizona mountains and deserts.

*Borderland Restoration Network. Patagonia, AZ. 2021-2022.* Assists with restoration projects in southern Arizona.

*Biology Field Trips. Patagonia, AZ. 2021-2022.* Takes students from the Montessori school and homeschooled children on field trips. Lessons include wildlife, plants, usage of wildlife cameras, monitoring raptor nests, art projects, and more.

*Sky Island Alliance, Southern Arizona, 2020-2022.* Monitor independent wildlife cameras across the mountains in southern Arizona and share data with Sky Island Alliance. Assist in ID'ing species caught on Sky Island Alliance's cameras. Conduct surveys of springs and collect data using Survey123.

*Wild at Heart Raptor Rescue Volunteer, Statewide, 2014-2022.* Volunteer handling and safely transporting raptors from injury locations to Wild at Heart. When volunteering at the facility, duties include monitoring food intake by entering aviaries and collecting uneaten meals. Species interaction includes burrowing owl, northern goshawk, Mexican spotted owl, red-tailed hawk, Cooper's hawk, and a multitude of other raptors.

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