



2022

CA DOT Biology Intern

Madison Zambo

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COLLEGE OF THE ENVIRONMENT



Internship Title: California Department of Transportation, District 5, Environmental, Biology Department, Student Assistant

Student Name: Madison (Maddie) Zambo

Internship Dates: June 24, 2022 - August 31, 2022

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Student Signature: _____

A handwritten signature in black ink, appearing to be "MZ", is written over a horizontal line.

Date: _____

08/07/2022

COLLEGE OF THE ENVIRONMENT



California Department of Transportation, District 5, Environmental, Biology Department, Student Assistant



Madison (Maddie) Zambo

June 2022 – August 2022



Acknowledgements

Jennifer Moonjian, Senior Environmental Scientist Supervisor, Caltrans, District 5

I cannot express my thanks enough to Jennifer Moonjian, my supervisor. She dedicated so much of her time and energy to take me on as a student assistant over summer. She has been a kind and caring mentor who not only sparked my interest in bats, but also provided me with all the tools to be a successful professional in the field of Biology. She showed me valuable qualities in a supervisor as she demonstrated her expertise in biology, endless enthusiasm for the work she does, and a genuine care for her employee's interests and well-being on the job. I will forever be grateful for the support, knowledge, and advice I've absorbed from her these past few months as her student assistant.

Ed Schefter, Senior GIS Specialist, Caltrans, District 5

I would also like to thank Ed Schefter for giving me the tools and the one-on-one trainings to develop my role in GIS this summer. I wish him the most fulfilling upcoming retirement and feel so privileged to have studied GIS under him.

Caltrans, District 5, Environmental, Biology Department

My role as a student assistant could not have been accomplished without the support of the biologists at Caltrans, District 5, who offered their time, guidance, and career advice to help me find success in this role. I felt like a sponge all summer, trying to absorb all the knowledge that I was exposed to from working with such an intelligent group of individuals who have a deep passion for the environment.

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Executive Summary

I participated in a summer internship with the State of California, Department of Transportation from June 2022 to August 2022. My student assistant position was under Jennifer Moonjian, Senior Environmental Scientist Supervisor, with the District 5, Biology department in San Luis Obispo, California. During this time, I conducted field work such as habitat surveys, bat emergence surveys, and pre-construction activity surveys. Additionally, my role consisted of training several departments within the Environmental division in ArcGIS Pro. To do so, I created PowerPoint trainings, how-to guides, and permit layout templates. Additionally, I often met one-on-one with biologists to address specific project mapping needs. This internship allowed me to meet my goal of applying what I've learned throughout my academic career at Western Washington University to a hands-on professional work experience. I learned proper field techniques for field data collection and sensitive species surveys, while also developing my skills in training staff in GIS applications, public speaking during meetings and trainings, and receiving real-time feedback on my work. As a result of this internship with Caltrans, I've developed my career interests in fish and wildlife biology and built long-lasting professional connections within the field.

Introduction

The State of California, Department of Transportation (Caltrans) is responsible for managing “more than 50,000 miles of California's highway and freeway lanes, provides inter-city rail services, permits more than 400 public-use airports and special-use hospital heliports, and works with local agencies. Caltrans carries out its mission with six primary programs: Aeronautics, Highway Transportation, Mass Transportation, Transportation Planning, Administration, and the Equipment Service Center” (Caltrans, n.d., para.1). Caltrans is a state agency whose mission is to “provide a safe and reliable transportation network that serves all people and respects the environment.” (Caltrans, n.d., para.3). My internship is with the Environmental division in District 5, covering Monterey, Santa Cruz, San Benito, San Luis Obispo, and Santa Barbara counties. Here, I will be working closely with the Biology and GIS departments, while also collaborating with the Aquatic Resources team and the Cultural Resources division at times.

During my time at Caltrans as a student assistant, I hope to conduct field work and practice GIS in a professional setting. This internship allows the opportunity to apply my educational background in Environmental Science and Geographic Information Systems to a hands-on experience. I aim to practice a variety of techniques by assisting biologists in the field, conducting the following surveys: habitat mapping, habitat assessments, bat emergence surveys, construction pre-activity surveys, and construction inspections. When not in the field, my goals are to assist several departments within the Environmental branch of District 5 in transitioning between ArcMap and ArcGIS Pro via one-on-one trainings and group presentations with walkthroughs and tutorials. Additionally, I plan to create mapping templates for real time field data collection, how-to guides for troubleshooting technology, and help with navigating maps in ArcGIS Online, ESRI Collector, and ESRI Field Maps.

Upon completion of my summer internship with Caltrans, I will be graduating from Western Washington University with a Bachelor of Science in Environmental Science and a minor in Geographic Information Systems. This internship allows me to meet my program's graduation requirements, thus playing an essential role in meeting my academic goals.

Internship Activities and Achievements

GIS and Office Work

As a student intern for Caltrans, District 5, I assisted biologists one-on-one with specific project mapping needs. For example, I created a map of proposed conservation easement limits for a creek restoration project (*Figure 1.*). Additionally, as seen in (*Figure 2.*) I mapped a lane extension project to show where the project intersects with California Natural Diversity Database observations. In addition to producing final maps, I often helped biologists transfer data from the handheld GNSS receivers (.ssf file) using MicroStation. This data was then converted as a shapefile (.shp) that could be imported into ArcGIS Pro or ArcMap with the correct projection system. Not only did I work on static map projects, I also drafted web maps to be used on the iPad with the ESRI collector app, Survey 123, and the Field Maps App. In *Figure 3.*, I mapped a segment of an ongoing project that is providing internet access to rural communities by installing broadband conduit and fiber in trenches along the highway. As you can see in *Figure 3.*, I was able to map where the project intersects with California Natural Diversity Database (CNDDDB) animal and plant observations such as the San Joaquin Kit Fox, the California Jewel flower, and the Blunt-Nosed Leopard Lizard. This map was particularly challenging as it is a federal emergency broadband project that was prioritized over all other projects and needed to be completed within a short time frame. In addition to being a high priority project, the postmiles for the project area were often changing and great attention to detail was required to make sure my data was up to date. When not participating in GIS work or field work, I combed through images taken off wildlife cameras, identified the species captured, and sorted the results into a datasheet. I also worked on updating site specific bat databases and monthly updates of the California Department of Fish and Wildlife, CNDDDB database. By completing a variety of projects, I was able to provide direct support for 10+ biologists and expand my knowledge outside of GIS and into database management.

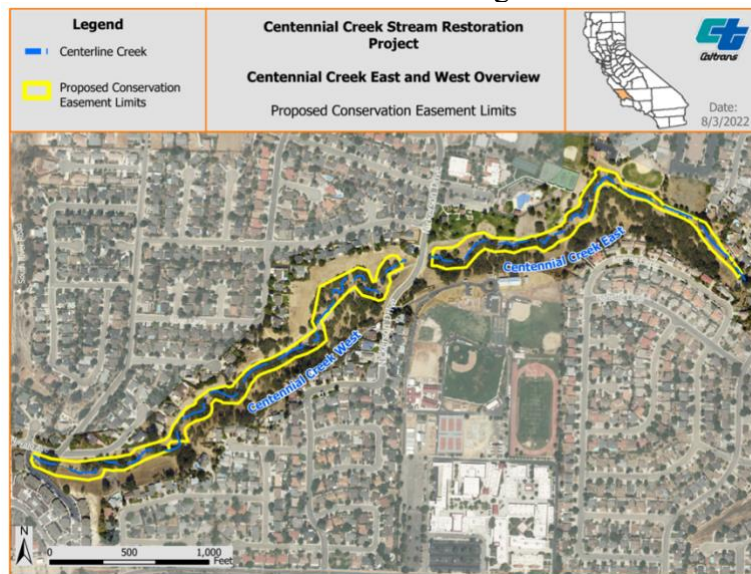


Figure 1: Map of the Centennial Creek restoration project showing the proposed conservation easement limits. Created in ArcGIS Pro on August 3, 2022.

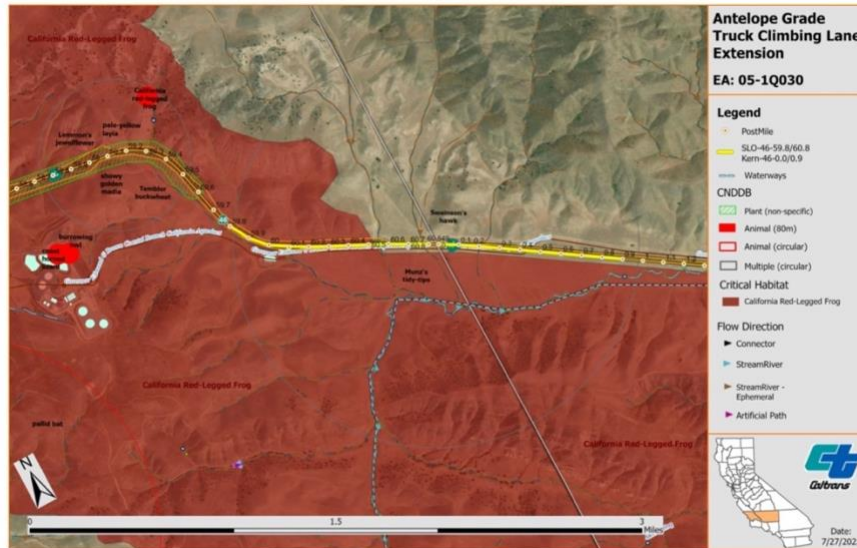


Figure 2: Map of the Antelope Grade Truck Climbing Lane Extension showing where the California Natural Diversity Database Observations and Critical Habitat for the California Red Legged Frog overlaps with the project limits by postmile. Created in ArcGIS Pro on July 27, 2022.

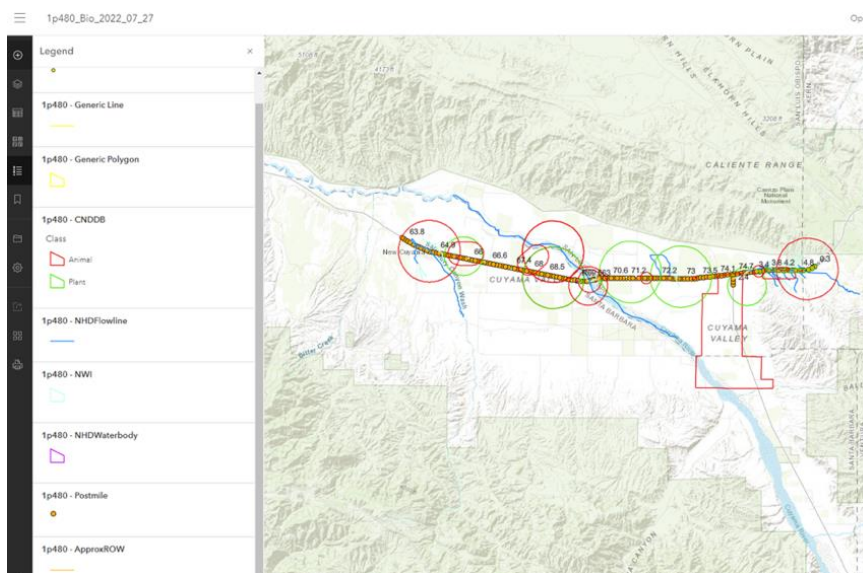


Figure 3: Screen capture of the interactive web map in ArcGIS Online showing where the California Natural Diversity Database Observations overlaps with the broadband conduit and fiber project by postmile. Created in ArcGIS Pro and ArcGIS Online on July 27, 2022.

GIS Training

An important aspect of my role with Caltrans was to help with the Division's transition between ArcMap and ArcGIS Pro. To do so, I created an introductory slideshow training in PowerPoint. The purpose of this initial training was to provide an introduction to the user interface and a general understanding of basic tasks in ArcGIS Pro, such as creating a project, making a layout, navigating the symbology pane, etc. The training consisted of 12 tutorials, each

ranging from 5-45 minutes in length with ESRI guided walkthroughs and corresponding YouTube videos. I then provided a survey at the end of the PowerPoint, to gauge the varying degree of proficiency in GIS among the staff and to get a better understanding of Caltrans specific GIS needs moving forward. Using the feedback from this survey, I created an additional training to target specific requests such as importing an .mxd (ArcMap file) into ArcGIS Pro, creating map templates for NES (Natural Environment Study) documents, and running geoprocessing tools (buffer, clip, intersect, etc.). This training was offered live to address questions as they came up and recorded for those who were unable to attend at the time.

In addition to the PowerPoint ArcGIS Pro trainings, I also created several “How to Guides”. These documents outlined step by step instructions, often with screen snippets, for completing a specific process in ArcGIS Pro or providing troubleshooting tips. For example, I drafted a guide for how to sign into ArcGIS Pro using ArcGIS Enterprise, how to obtain field data collection and troubleshoot using the iPad and GNSS Receivers, how to create points, lines, and polygons in ArcGIS Pro, how to export map layers/feature classes as shapefiles, etc. Creating these how to guides allows for more training resources, or cheat sheets while staff learn the workflow in ArcGIS Pro and provides an additional form of learning for those whose preferred learning style is by doing rather than watching examples.

Further, to provide GIS support to the district’s biologists, I created map layout templates for permit and scoping documents. Several templates were created (aerial map, soils map, USGS quadrangle map, general biology map, watershed, and weather station map), each containing four layout options (8.5x11 portrait and landscape, 11x17 portrait and landscape). The purpose of these templates is to provide a quick and easy way for users to create a final map for their Natural Environment Study (NES) scoping documents with very little time or proficiency with GIS required. The layout templates were designed with a designated layout containing the map frame, legend, title placement, and a dynamic north arrow, scale bar, and date. Each type of layout has a different purpose and comes with preloaded data layers associated with the layout. For example, the biology map templates (*Figure 4.*) include all data layers the biologists most commonly work with such as the California Department of Fish and Wildlife, California Natural Diversity Database, a critical habitat data layer, and the EPA National Watershed Index. Conversely, the aerial map templates (*Figure 5.*) include only the Caltrans aerial base maps by county. For this template, the biologists will need to input their shapefile of the study area that was mapped in the field or by the design engineers. I also created a how to guide for importing a layout template into a new project and navigating the layout template (*Figure 6.*). The creation of these templates and the corresponding user guides played an essential role in helping me gear GIS resources towards the specific needs and experience levels of the department biologists.

To ensure that the training slideshows, how to guides, and map templates for permit and scoping documents are easily accessible, I created a wiki page in the district 5 Environmental Division’s Microsoft Teams group. Here, I compiled active links to each resource with brief background text to describe the purpose of each resource. In doing so, I was able to provide a convenient and organized way of presenting all the work I’ve completed to 25+ staff members.

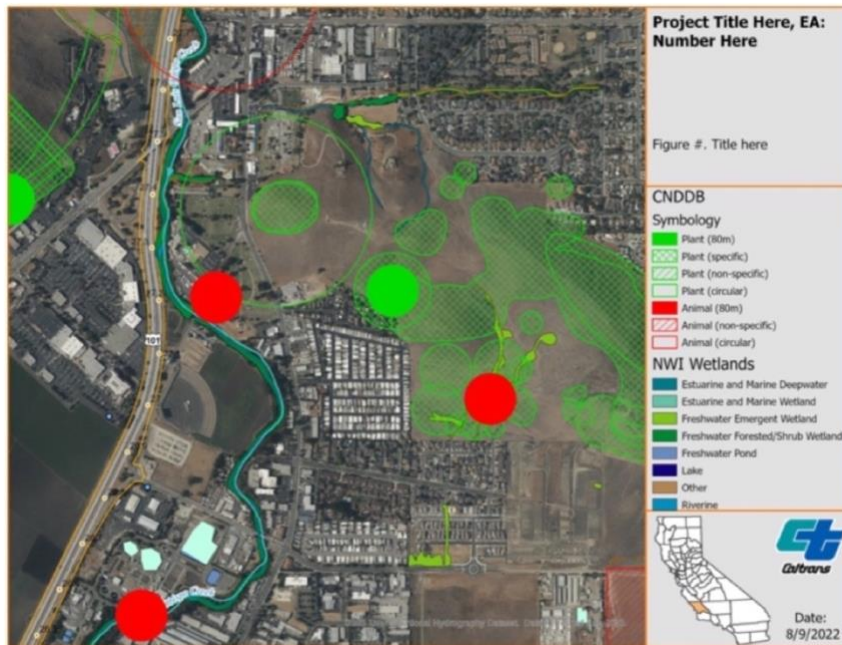


Figure 4: Map of the biology layout template in 8.5x11 landscape to be used for permit and scoping documents, containing the California Natural Diversity Database layers and the NWI Wetlands, given the map extent. Created in ArcGIS Pro on August 9, 2022.

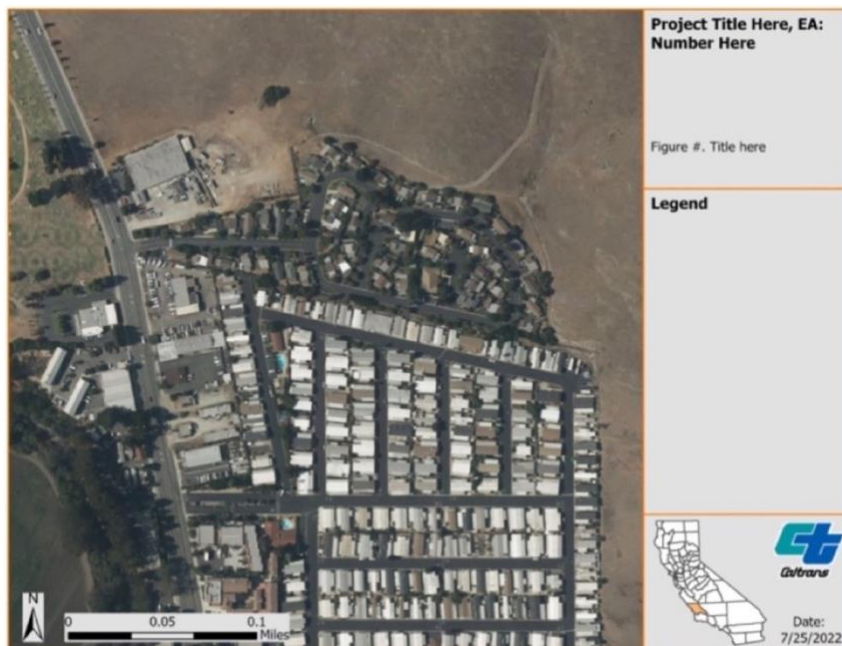


Figure 5: Map of the aerial layout template in 8.5x11 landscape to be used for permit and scoping documents. Created in ArcGIS Pro on July 25, 2022.

How to Navigate Permit Layout Templates

Before proceeding: Please see the "How to Import Permit Layout Templates to a New Project" help guide to ensure the template was properly imported.
 ("P:\LIB\GIS\Tools_Info_Misc\HowToGuide_ImportPermitLayoutTemplates")

About: By now you should have created a new project file (.aprx) using the existing layout files (.pagx). To use the layout with the desired size/orientation refer to the numbered image and follow the corresponding steps below.

The red numbers (1-4) must be edited each time.

The green numbers (5-8) are optional, only need to be edited if you followed the Trouble Shooting Step in the "How to Import Permit Layout Templates to a New Project" help guide, or do not need to be edited.

Template Layouts (Portrait and Landscape):



Figure 6: Screenshot of the cover page for the how to guide created for navigating the map of the aerial layout template in 8.5x11 landscape to be used for permit and scoping documents, containing the California Natural Diversity Database layers and the NWI Wetlands, given the map extent. Created in ArcGIS Pro on July 25, 2022.

Field Work

For the field work aspect of this position, I participated in several bat emergence surveys and bat habitat field reviews. One emergence survey took place at the Estrella River Bridge in San Luis Obispo County (*Figure 7.*). At this site, bat boxes were installed in the newly constructed bridge as a mitigation measure to provide roosts for birds and bats. Since summer is maternity season, the purpose of this study was to observe if the bats were utilizing the bat boxes as maternity roosts. To begin, biologists counted the number of bats in each box (*Figure 8.*) and identified the species present. Identifications were made based on visual cues like body color and size of ears. Later, around sunset, a bat emergence survey was conducted. The biologists and I used handheld clicker counters (*Figure 9.*) to count bats as they left each box. As seen in *Table 1.*, the most common species at this project location were the Mexican free-tailed bats (*Tadarida brasiliensis*) with about a total of 791 individual observations.



Figure 7: Photo of the Estrella River Bridge in San Luis Obispo County, taken by biologist Audrey Weichert on June 28, 2022.



Figure 8: Photo of Maddie Zambo counting bats in a pile of guano under the Estrella River Bridge in San Luis Obispo County, taken by biologist AnnMarie Blackburn on June 28, 2022.



Figure 9: Image of the handheld clicker counters used to count bats during the emergence surveys, taken by Maddie Zambo on June 28, 2022.

Table 1: Table showing the data recorded at Estrella River Bridge in San Luis Obispo County on June 28, 2022 for the six bat boxes. The table includes the visual count along with the emergence survey results.

Date	Box #	Survey Method	# Bats: Mexican Free-Tailed	# Bats: Pallid	# Bats: Myotis	# Bats: Big Brown	# Bats: Townsend's Big-Eared	# Bats: Other Species (Species / No ID)	Total # Bats	Evidence of Maternity (Y/N)	# Pups	Observers	Comments
6/28/2022	1		99	27	0	0	0	0	126	N	0	Jennifer Moonjian, Audrey Weichert, Amy Millan, Annmarie Blackburn, Maddie Zambo	
6/28/2022	2		155	0	0	0	0	0	155	Y	6	Jennifer Moonjian, Audrey Weichert, Amy Millan, Annmarie Blackburn, Maddie Zambo	
6/28/2022	3		137	1	0	0	0	0	138	Y	50	Jennifer Moonjian, Audrey Weichert, Amy Millan, Annmarie Blackburn, Maddie Zambo	Pups observed
6/28/2022	4		130	2	3	0	0	1	136	N	0	Jennifer Moonjian, Audrey Weichert, Amy Millan, Annmarie Blackburn, Maddie Zambo	
6/28/2022	5		121	1	0	0	0	0	122	N	0	Jennifer Moonjian, Audrey Weichert, Amy Millan, Annmarie Blackburn, Maddie Zambo	
6/28/2022	6		149	0	0	0	0	0	149	Y	1	Jennifer Moonjian, Audrey Weichert, Amy Millan, Annmarie Blackburn, Maddie Zambo	Jerusalem Cricket legs and heads present
Total:			791	31	3	0	0	1	826		57		Total # of bats observed on 6/28/2022: 817
6/28/2022	1	Dusk/Emergence	N/A	N/A	N/A	N/A	N/A	N/A	N/A			Jennifer Moonjian, Audrey Weichert, Amy Millan, Annmarie Blackburn, Maddie Zambo	5 biologists: 6 boxes
6/28/2022	2	Dusk/Emergence							181			Jennifer Moonjian, Audrey Weichert, Amy Millan, Annmarie Blackburn, Maddie Zambo	
6/28/2022	3	Dusk/Emergence							173			Jennifer Moonjian, Audrey Weichert, Amy Millan, Annmarie Blackburn, Maddie Zambo	
6/28/2022	4	Dusk/Emergence							125			Jennifer Moonjian, Audrey Weichert, Amy Millan, Annmarie Blackburn, Maddie Zambo	
6/28/2022	5	Dusk/Emergence							386			Jennifer Moonjian, Audrey Weichert, Amy Millan, Annmarie Blackburn, Maddie Zambo	
6/28/2022	6	Dusk/Emergence							319			Jennifer Moonjian, Audrey Weichert, Amy Millan, Annmarie Blackburn, Maddie Zambo	
Total:									1,184				Total # of bats observed on 06/28/2022 (emergence): 1,184

By participating in bat emergence surveys and bat habitat surveys, I learned how to identify bat species based on visual cues. For example, I learned that Mexican free-tailed bats (*Tadarida brasiliensis*), in Figure 11., tend to be darker in a color closer to a gray, whereas seen in Figure 10., Pallid bats (*Antrozous pallidus*) are a light brown and have bigger ears. As you can see in (Figure 11.), pups can be identified at this time of year by the hairless pink patches on their head. When bats are unable to be directly observed, an indicator of the presence of Pallid bats (*Antrozous pallidus*) are insect remains under the roost near guano piles. As seen in Figure 12., Jerusalem cricket heads (*Stenopelmatus fuscus*) were found underneath bat box #6 at the at the Estrella River Bridge site indicating Pallid bat presence. Additionally, while learning to identify bat species, close up inspection of guano often occurred (Figure 13.) to determine the species based on the size and shape of present guano.



*Figure 10: Photo of Pallid bats (*Antrozous pallidus*) at Cholame Creek Bridge, taken by biologist Audrey Weichert on July 27, 2022.*



*Figure 10: Photo of Mexican free-tailed bats (*Tadarida brasiliensis*) in a maternity roost (box 3) at the Estrella River Bridge in San Luis Obispo County. Image taken by biologist Audrey Weichert on June 28, 2022.*



*Figure 12: Jerusalem cricket heads (*Stenopelmatus fuscus*) found underneath bat box #6 at the Estrella River Bridge site indicating presence of Pallid bats (*Antrozous pallidus*). Image taken by Maddie Zambo on June 28, 2022.*



Figure 13: Image of biologist Jennifer Moonjian examining guano during a habitat survey inside a culvert, taken by Maddie Zambo on July 15, 2022.

I also participated in a bat emergence survey at a project location where bats were not expected to be present as the site contained bat exclusion material. This project took place under a Northbound bridge off Highway 101 at Nojoqui Creek in Santa Barbara County. The purpose of this bat emergence survey was to ensure that no bats were present before the construction phase of the project could begin. As seen in *Figure 14.*, instead of bat boxes, exclusion material was put in place to keep birds from nesting and bats from roosting in the trusses in the bridge. However, as the project was delayed several years for biological and engineering alterations, the exclusion material was no longer fully intact. To conduct the survey, biologists watched the gaps in the exclusion material to observe if any bats were emerging around sunset. There was only one gap where bats were observed (*Figure 15.*) with about 80 individuals counted. Here, most of the species seen in this project area were Big Brown bats (*Eptesicus fuscus*). As a result, the construction phase of this project will likely be delayed as the project's environmental impacts will need to be assessed further. From this experience, I gained a better understanding of how essential the analysis of environmental impacts are to the development of a transportation project.



Figure 14: Image of the Northbound bridge off Highway 101 at Nojoqui Creek in Santa Barbara County showing the bat exclusion material. Image taken by Maddie Zambo on July 13, 2022.



Figure 15: Image of the crevice where bats were emerging from after sunset at the Northbound bridge off Highway 101 at Nojoqui Creek in Santa Barbara County. Image taken by biologist Audrey Weichert on July 13, 2022.

In addition to the bat habitat assessments and emergence surveys, I also participated in pre-construction surveys. One survey took place off Highway 41, East of Morro Bay in San Luis Obispo County at a slope failure off the road into the creek bed. Before the soldier pile wall could be constructed, a biological survey needed to take place as the site was in Red-Legged Frog (*Rana draytonii*) habitat and Legless Lizard (*Anniella pulchra*). The purpose of this field study was to ensure no individuals belonging to these vulnerable species were at the site 48 hours prior to the start of construction. Additionally, a nesting bird survey was conducted to ensure no birds were nested in trees that will be removed. To observe for Red-Legged Frogs and nesting birds, a visual survey was conducted using binoculars and PPE gear. To observe the site for Legless Lizards, a soil raking was conducted as these lizards burrow underground. As a result, I gained a better understanding of the full scope of work behind transportation projects and where permit compliance fits in that process.

Discussion and Evaluation

My main goal at Caltrans was to gain experience conducting field work and practice applied GIS in a professional context. I was able to expand my knowledge of field work by practicing bat emergence surveys, habitat assessments, and construction pre-activity surveys. Regarding the GIS aspect of my role, my goals were to provide support to the district 5 Environmental division in transitioning between ArcMap and ArcGIS Pro. I was able to accomplish this by creating slideshow trainings, individual and group lead walkthroughs, drafting how to guides, and providing layout templates. The work I produced during my time as a student assistant was effective as I provided direct support for biologists when learning GIS and an extra hand when conducting field surveys.

As a summer intern for the biology department, I was exposed to numerous biologists with vast niches of expertise in ecology. Going into this position, I never expected to conduct bat surveys or to love doing so. Not only did I learn proper field techniques for conducting surveys and compiling field data, but I also learned a great deal about identifying bat species. From my exposure to bat surveys, I learned that my degree in Environmental Science encompasses a broad range of career paths. To continue to improve on bat specific work, as a potential focus in my career path as an Environmental Scientist, I would need to continue to study species identification characteristics and participate in various habitat surveys.

With Caltrans I was able to apply what I've learned in a classroom setting as an undergraduate student to a professional setting with hands-on field opportunities. From this work experience, I've clarified my interests in the field and aim to pursue a career in fish and wildlife biology. I've also strengthened my public speaking skills by presenting my work during meetings and live trainings. In doing so, I was able to receive real-time feedback for my work and learn to adapt my work to the needs of my team members. This student assistant position also allowed me to thrive when given the flexibility to work both with a team and independently in an office setting. During my time at Caltrans, I was able to meet the goals of my Western Washington University internship agreement and gain valuable work experience that directly relates to my career interests and academic goals.

Works Cited

“About Caltrans.” *About Caltrans | Caltrans*, <https://dot.ca.gov/about-caltrans>. Accessed on August 9, 2022.

Caltrans Time Sheet / Internship Log

Date	Time In	Time Out	Duration, hh:mm	Total / 150, hh:mm:ss	Name	Any Notes (time record issues / projects worked on)	Time Sheet Pay Period	Paid on the 7th and 22nd of each month
Thurs 6/23	9:15 AM	11:00 AM	01:45	01:45	UEI Orientation	Student pay organization	6/16-6/30	
Mon 6/27	12:30 PM	1:30 PM	01:00	2:45:00	Caltrans Orientation	Security, Introductions, Tour, Orientation (with Jennifer Moonjian)	6/16-6/30	
Tues 6/28	10:00 AM	11:30 AM	01:30	4:15:00	Meeting with ED	Going over ipads, trimble/handheld GPS, data, network access, collector with Ed (head of GIS department)	6/16-6/30	
Tues 6/28	10:00	1:00 PM	03:00	7:15:00	Meeting with Meg	Going over templates for permits and scoping with Meg (field biologist/environmental planner)	6/16-6/30	
Tues 6/28	4:00 PM	10:30 PM	06:30	13:45:00	Field Work: Bat Emergence Survey	Day Count, Bat emergence count 1,184 bats and ~ 50 pups (Freetail, Pallid, Myotis) (team of 5 biologists: Jenn, Anne Marie, Amy, Audrey), at old estrella bridge (2 lane) (SR 46, Paso Robles, CA) where caltrans project built new 4 lane bridge \ time sheet notes: split between today and 6/27 @ Paso Robles	6/16-6/30	
Weds 6/29	8:30 AM	12:45 PM	04:15	18:00:00	Office Work from home (remote)	Drafted powerpoint presentation for training staff in ArcPro, compiled tutorials and walkthroughs to bridge the gap between ArcMap and ArcPro) start ppt. and how to on offline collector app maps	6/16-6/30	
Thurs 6/30	10:00 AM	11:00 AM	01:00	19:00:00	Jenn's Staff Meeting	Weekly Staff Meeting with Jenn	6/16-6/30	
Thurs 6/30	11:00 AM	4:00 PM	05:00	24:00:00	Office Work	cubicle assigned, set up with ArcGIS Pro, Cisco, VPN, Outlook, Independent work on How To Guides, set up server, submitted SNOW tickets for server access, meeting with Ed, checked out ipad and trimble) completed iPad and GNS5 how to guides,	6/16-6/30	
Fri 7/1	7:56 AM	12:00 PM	04:04	28:04:00	Office Work	submitted portal account request form, completed introductory training of arcpro basics and interface and sent out a survey for feedback/gauge proficiency of GIS	7/1 - 7/15	week 1/10
Tues 7/5	7:59 AM	11:33	03:34	31:38:00	Office Work and Jenn's Staff meeting	Scheduled site visit with Ed Weber, introduced introductory training during weekly staff meeting, pear/pair tool, downloading SQL server, IT help desk	7/1 - 7/15	
Tues 7/5	12:25	16:51	04:26	36:04:00	Office Work and Jenn's Staff meeting	Met with Biologist Audrey 1 on 1 to discuss her issues in GIS Portal, Work with ed on troubleshooting Audrey's errors loading layers in "1F1810.2022.07_05". Feature layers must be "hosted" to load on iPad collector and in portal on desktop (settings ed needs to ensure when publishing from pro), sent update email on which tutorials to prioritize and the requirements of a SNOW ticket	7/1 - 7/15	
Weds 7/6	7:59 AM	12:40 PM	04:41	40:45:00	Office Work	Compiled How To help binder for after I leave, created how to sign into pro, worked on pear tool, set up microsoft teams training folder	7/1 - 7/15	
Weds 7/6	13:13	16:33	03:20	44:05:00	Office Work	Compiled How To help binder for after I leave, started permitting templates in pro) 4 for each template, started location/general reference area of study templates and USGS topo quadrangle templates	7/1 - 7/15	
Thurs 7/7	8:00 AM	12:40 PM	04:40	48:45:00	Office Work	Worked on GIS permit and scoping map templates. Need to make a total of 6 types, 4 each (-24 total). Working on 4 aerial layouts with 2 inset locator maps and help text boxes (need 2 copies of project file at end, 1 with help boxes, 1 without), sent out first draft to Meg,Ed,Jen of aerial 8.5x11 portrait for feedback (1 screenshot without help boxes, 1 screenshot with)	7/1 - 7/15	
Thurs 7/7	1:10 PM	16:30	03:20	52:05:00	Office Work	Finishing all 8.5s and 11s for aerial layouts, 1:1 training with Ed on how to send background maps to trimble from a shapefile using GPS pathfinder	7/1 - 7/15	
Fri 7/8	7:40 AM	13:40	06:00	58:05:00	Office Work	Finishing touch ups and editing on Final Layouts for Aerial permit template. Breaking up template into four different files due to size. Created how to guide for switching between maps and layouts that are not on ribbon. Created how to guide for creating a project from a project template	7/1 - 7/15	week 2/10
Mon 7/11	8:01	12:30	04:29	62:34:00	Office Work	Finalizing permit templates (aerial) using feedback from Supervisor Jenn, Biologist Meg, exporting help boxes in screenshots) instead of using project template (which copies data and is not exporting), I am re-saving all layouts as layout files (.pagx) and writing a how to for using layout files to create a new template, and re-doing "help" boxes. The how to and help boxes will be more uniform with all templates moving forward	7/1 - 7/15	
Mon 7/11	1:30 PM	5:00 PM	03:30	66:04:00	Office Work from home (remote)	Finished the 2 How To's for aerials: How to guide: Navigate Permit Layouts, How to guide: Import Permit Layouts	7/1 - 7/15	
Tues 7/12	8:04 AM	12:30	04:26	70:30:00	Office Work	Review aerial map layouts to make sure they are functional, review how to guides for permits (2), re-order/condense how to navigate permit layouts to make more sense, send email to Jen/Meg/Ed detailing my process & for review	7/1 - 7/15	
Tues 7/12	1:00	4:30	03:30	74:00:00	Office Work	reviewed responses from intro arcgis slideshow training, began Soil map template layouts (4/4) with 3 corresponding maps: will need to make specified soil How To	7/1 - 7/15	
Weds 7/13	12:27 PM	2:15 PM	01:48	75:48:00	Office Work and Virtual Site Visit with Ed	finished 4 soil map layout templates and exported (.pagx), virtual site visit with academic advisor and Jenn: Notes: 1 page to 1.5 pages per credit, add a bullet point about bio field work to description of duties (wildlife surveys in the field), sahra resume with Jen and academic Ed	7/1 - 7/15	
Weds 7/13	6:30 PM	10:15 PM	03:45	79:33:00	Field Work: Bat Survey	Bat survey with biologists: Larissa, Audrey, Amy (EA: 05-1F7904) @ Nojoqui Creek	7/1 - 7/15	
Thurs 7/14	8:04 AM	11:30 AM	03:26	82:59:00	Office Work and Jenn's Staff meeting	worked on soils maps, took notes during meeting, discussed scoping maps as a priority for biologists and NES map documents, awaiting examples from audrey and connor	7/1 - 7/15	
Thurs 7/14	12:00 PM	4:30 PM	04:30	87:29:00	Office Work from home (remote)	worked on soils maps, how to for soils maps, how to map series for layouts	7/1 - 7/15	
Friday 7/15	12:30 PM	5:00 PM	04:30	91:59:00	Field Work: Bat habitat field review	Field review of all project locations for bat habitat suitability: determine which sites may need follow-up with sound recording per CDFW recommendation. With supervisor Jen and Biologist Mindy (EA: 05-1K510)	7/1 - 7/15	week 3/10
Mon 7/18	7:55 AM	8:59 AM	01:04	93:03:00	Office work	finish soil map templates	7/16 - 7/31	
Mon 7/18	9:31 AM	4:24 PM	06:53	99:56:00	Office Work from home (remote)	covid exposure, working from home this week \ met with ed to go over design file -> mxd -> aprx/gdb -> web layer	7/16 - 7/31	
Tues 7/19	8:03 AM	12:08 PM	04:05	104:01:00	Office Work from home (remote)	covid exposure, working from home this week \ bat observations excel sheet	7/16 - 7/31	
Tues 7/19	12:38 PM	4:30 PM	03:52	107:53:00	Office Work from home (remote)	covid exposure, working from home this week \ collected laptop and set it up for home use, bat observations excel sheet	7/16 - 7/31	
Weds 7/20	8:02	11:55 AM	03:53	111:46:00	Office Work from home (remote)	covid exposure, working from home this week \ wrote soils how to guide for navigating the permit map template	7/16 - 7/31	
Weds 7/20	12:26 PM	3:19 PM	02:53	114:39:00	Office Work from home (remote)	covid exposure, working from home this week \ entire biology department staff meeting from 1-3 pm	7/16 - 7/31	
Thurs 7/21	8:04 AM	12:14 PM	04:10	118:49:00	Office Work from home (remote)	covid exposure, working from home this week \ Jen staff meeting from 10-11 am, presented templates and got feedback AND Jen and Audrey Bat meeting for compiling data	7/16 - 7/31	
Thurs 7/21	12:44 PM	4:34 PM	03:50	122:39:00	Office Work from home (remote)	covid exposure, working from home this week \ Worked on wiki on teams, Meeting with Ed at 2, finished adding images into wiki, and started 10 year old bat database, explored pear tool	7/16 - 7/31	
Fri 7/22	8:01 AM	11:00 AM	02:59	125:38:00	Office Work from home (remote)	covid exposure, working from home this week \ met with biologist audrey to go over permits, pear tool, and biologist mapping needs	7/16 - 7/31	week 4/10
Mon 7/25	8:02 AM	10:22 AM	02:20	127:58:00	Office Work from home (remote)	Soils Map Template	7/16 - 7/31	
Mon 7/25	11:09 AM	4:30 AM	17:21	145:19:00	Office Work from home (remote)	Soils Map Template	7/16 - 7/31	
Tues 7/26	8:40 AM	12:00 PM	03:20	148:39:00	Office Work	Wiki Teams	7/16 - 7/31	
Tues 7/26	12:30 PM	5:07 PM	04:37	153:16:00	Office Work	Permit Map template	7/16 - 7/31	
Weds 7/27	7:59 AM	11:41 AM	03:42	156:58:00	Office Work	Broadband Interactive Map mapping 1P480	7/16 - 7/31	
Weds 7/27	12:39 PM	4:51 PM	04:12	161:10:00	Office Work	Broadband Interactive Map mapping 1P480	7/16 - 7/31	
Weds 7/27	6:45 PM	10:15 PM	03:30	164:40:00	Field Work	Bat emergence survey, counter ~800+ bats	7/16 - 7/31	Week 5/10
Mon 8/1	4:30 PM	5:30 PM	01:00	165:40:00	Office Work from home (remote)	centennial creek mapping in arcMap	8/1-8/15	
Tues 8/2	8:04 AM	1:57 PM	05:53	171:33:00	Office Work from home (remote)	broadband static mapping, overview map done, started map series for the first segment (half mile increments)	8/1-8/15	
Weds 8/3	7:00 AM	11:33 AM	04:33	176:06:00	Office Work	centennial creek mapping, presentation of ArcGIS Pro material and HOW TOS to Cultural team, met with biologist Larissa one on one to teach ArcGIS Pro	8/1-8/15	
Weds 8/3	12:30	16:34	04:04	180:10:00	Office Work	napped 26 sites for broadband,met one on one with biologist shelby to teach ArcGIS Pro	8/1-8/15	
Thurs 8/4	7:57 AM	12:05 PM	04:08	184:18:00	Office Work	how to points/lines/polygons	8/1-8/15	
Fri 8/5	8:00 AM	12:04 PM	04:04	188:22:00	Office Work	Sent mass email to biologists and cultural sharing wiki (adding pro, request account, slideshow trainings, how to guides, templates) and upcoming training. Also finished how to export layers to shapefiles	8/1-8/15	
Fri 8/5	12:34 PM	4:23 PM	03:49	192:11:00	Office Work	Teams wiki, how to guides, mapping templates	8/1-8/15	Week 6/10