

Tortoise Occupancy on the BCCE

Project: 2023-BIO-2325D

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August 18, 2025



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Funding & Agency Partners:

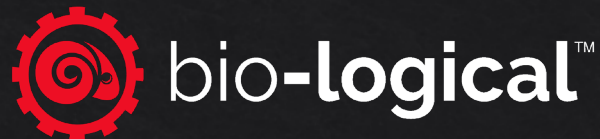
- Southern Nevada Public Land Management Act (SNPLMA)
- Agreement #L08AC13225 (Clark County & BLM)
- Land Sales Through SNPLMA Fund Multiple Species Habitat Conservation Plan (MSHCP)



desert conservation
PROGRAM



togetherforbetter



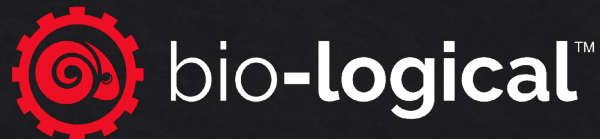
Objectives & Assumptions

- Demographics
 - Size & sex
- Occupancy
 - Analyze status & change
- Change
 - Variations in observations due to weather, etc.
- Habitat
 - Correlations with patterns
 - Overlapping data from other projects in BCCE



Purpose

The data from this project can be used to develop a statistical model to understand and predict the occurrence of desert tortoises in similar landscapes and supports conservation of the species as required by the MSHCP.



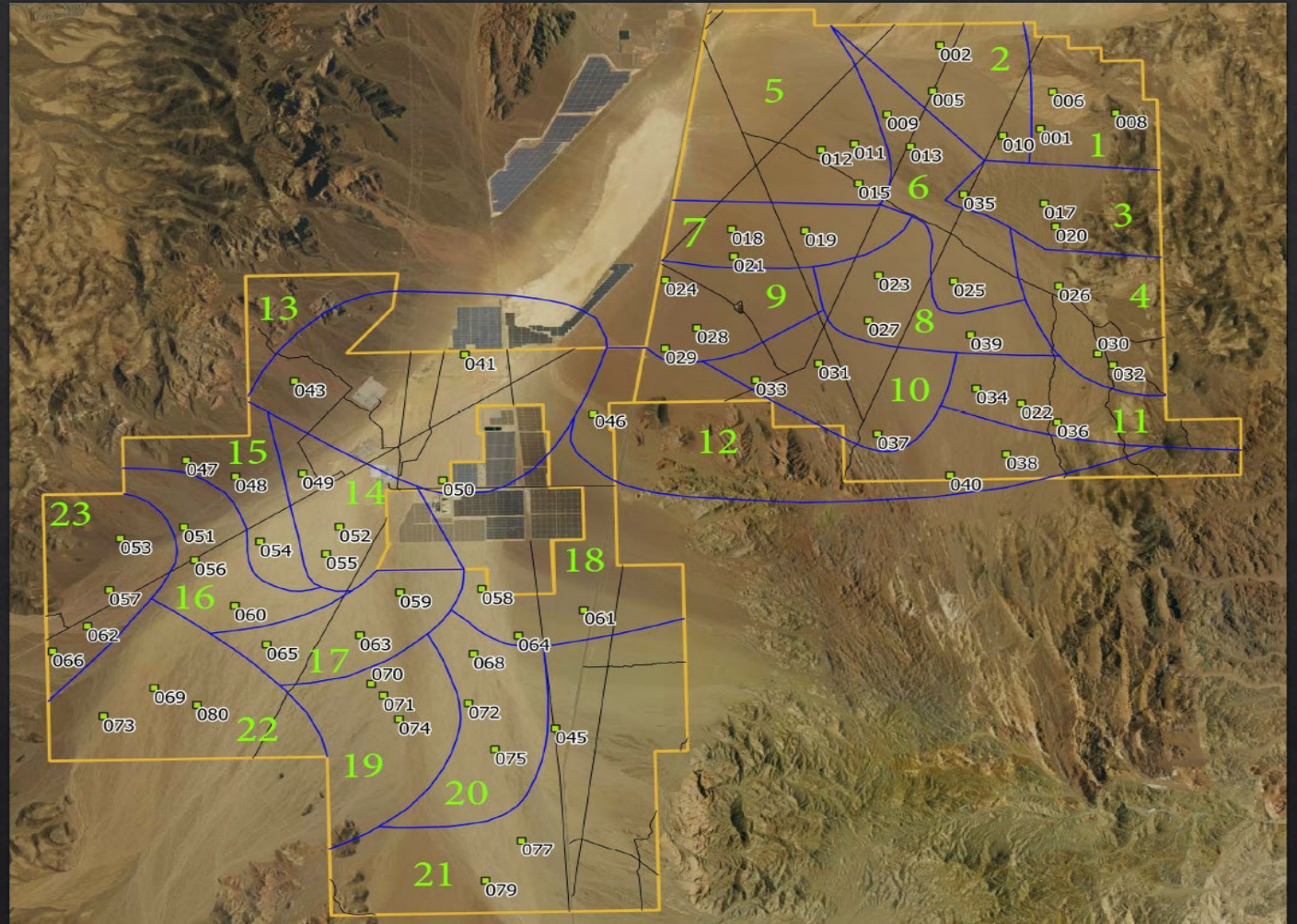
Methodology

- Work Plan
 - 3 plots (1 group) per team per day. Two teams per day.
 - Occasional 1 team day or 3 team days due to schedule.
- Fieldwork Timeline
 - Started April 8, 2025
 - Completed June 2, 2025
- Issues
 - Terrain and access
 - Minimal staff issues this year, until May 21.



Methods - Site

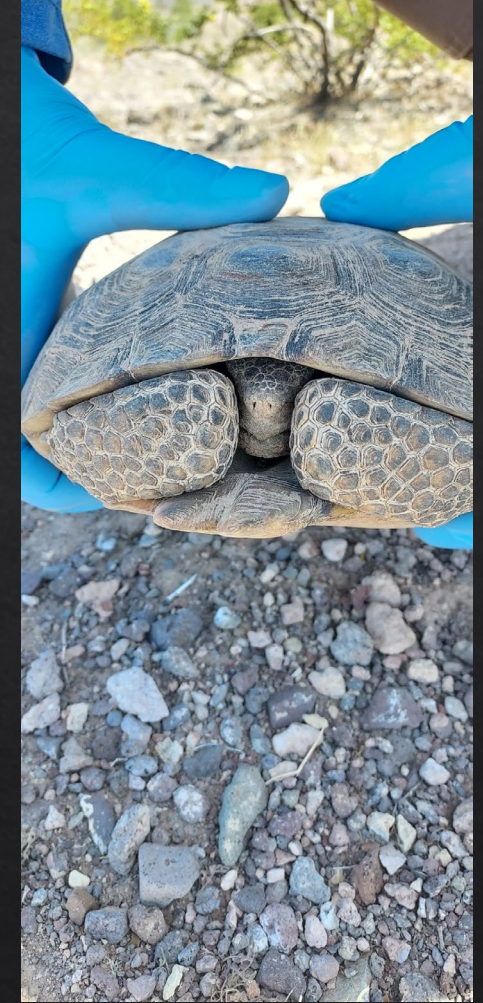
- 70 200M x 200M plots
- Full coverage transects
- 23 plot groups
- 3 plots per day per team
- 3 rounds
 - N - S, E - W, N - S
 - Start at NW corner
- 210 plot surveys total
- Incidental observations between plots captured.



Methods - Crew



- Survey Crew
 - One Authorized Desert Tortoise Biologist
 - One Occupancy Assistant
- Aerial Crew
 - One Drone Operator
- Duplicate Data Collection
 - Digital data collected via Wildnote
 - Paper data collected by hand
 - Survey tracks via Garmin
 - Aerial photo data by Resi Solutions



Methods – Data

- Live Tortoise
 - Measured, tagged, hydrated if needed



- Active Burrow
 - Measured, must have tortoise sign



Methods – Data

- Reptiles
 - Only recording a subset of snakes, lizards
- Tagged Carcass
 - Must be intact to measure



Methods – Samples

- Methods & Checks
 - Data sheets, data software & export, QA / QC, error tracking are all crucial to data quality

Wildnote



Data sheet

Excel export

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
1	Survey ID	Unique ID:	Date:	Round#:	Team#:	Plot###:	Time Begin:	Time End:	Digital Data	Paper Data:	Air Temp Start (°C):	Air Temp End (°C):	Wind Speed (kph):	Cloud Cover:	Live Tortoise#:	Tagged Carcass#:	Untagged Carcass#:	Active Burrow#:	Inactive Burrow#:	Comments:
2	331945	PL0773230417	4/17/2023	1	3	077	08:30 AM	09:20 AM	ZAW	KMC	25.4	27.3	7.5	Sunny	0	0	0	0	0	2 N/A
3	332049	PL0793230417	4/17/2023	1	3	079	10:29 AM	11:30 AM	ZAW	KMC	30.6	34.3	5.6	Sunny	0	0	0	0	0	2 N/A
4	332093	PL0453230417	4/17/2023	1	3	045	12:39 PM	01:42 PM	ZAW	KMC	34.7	34.5	7.5	Sunny	1	0	0	0	0	0 N/A

Scanned data sheet

Data Protocol

- Field Data
 - Redundant data collection
- End of Day Summary
 - Field check that plot descriptions are summed correctly
- QA / QC
 - Check of all data points manually

Data Summary

Data Collection 2025

	Total Observations	In Plot	Incidental
Active Burrow / Den	51	34	17
Live Tortoise	35	20	15
Reptile Observation	48	16	32
Tagged Carcass	3	1	2

Data Summary

Active Burrow Data Comparison 2020 - 2025

	Total	Occupied	Unoccupied	Avg Height	Avg Width	In Plot	Incidental
2020	9	6	3	N/A	N/A	5	4
2021	25	22	3	N/A	N/A	13	12
2022	41	22	19	13	40	20	21
2023	25	19	6	13	27	12	13
2024	22	13	9	14.5	28	10	12
2025	47	30	17	12.2	26.9	30	17

Data Summary

Live Tortoise Data 2025

	Live Torts	Max MCL	Min MCL	Avg MCL	Has Tag	New Tag	No / Unk Tag
Male	4	292	180	244	2	1	1
Female	11	240	185	212.8	8	3	0
Unknown	20	175	43	127.3	4	8	8
Totals	35	292	43	183.5	14	12	9
New Tags	12	240	43	153.2	N/A	N/A	N/A

Data Summary

Live Tortoise Data Comparison 2020 - 2025

	Live Torts	Male	Female	Unk	Max MCL	Min MCL	Avg MCL	Has Tag	New Tag	No Tag
2020	44	10	16	18	270	65	193	10	22	12
2021	30	11	10	9	294	115	197	10	17	3
2022	29	7	5	17	238	119	189	2	13	14
2023	38	8	13	17	300	106	211	14	15	9
2024	41	8	20	13	293	114	208	13	21	7
2025	47	4	11	20	292	43	185.7	14	12	6

Data Summary

Reptile Data 2025

	In Plot	Incidental	Totals
Coachwhip	0	0	0
Mojave Rattlesnake	2	1	3
Sidewinder	1	0	1
Western Patch-nosed snake	0	0	0
Desert Collared Lizard	4	0	4
Desert Horned Lizard	20	9	29
Desert Iguana	3	5	8
Long-Nosed Leopard Lizard	2	1	3
Totals	32	16	48

Data Summary

Reptile Data 2020 - 2025

	2020	2021	2022	2023	2024	2025
Coachwhip	2	1	0	1	2	0
Mojave Rattlesnake	1	0	1	1	0	3
Sidewinder	4	3	0	5	15	1
Western Patch-nosed snake	2	1	0	1	1	0
Desert Collared Lizard	0	0	0	1	0	4
Desert Horned Lizard	6	1	2	3	31	29
Desert Iguana	2	3	1	8	11	8
Long-Nosed Leopard Lizard	10	2	3	6	19	3
Totals	27	11	7	26	79	48

Data Summary

Tagged Tortoise Carcass Data Comparison 2020 – 2025

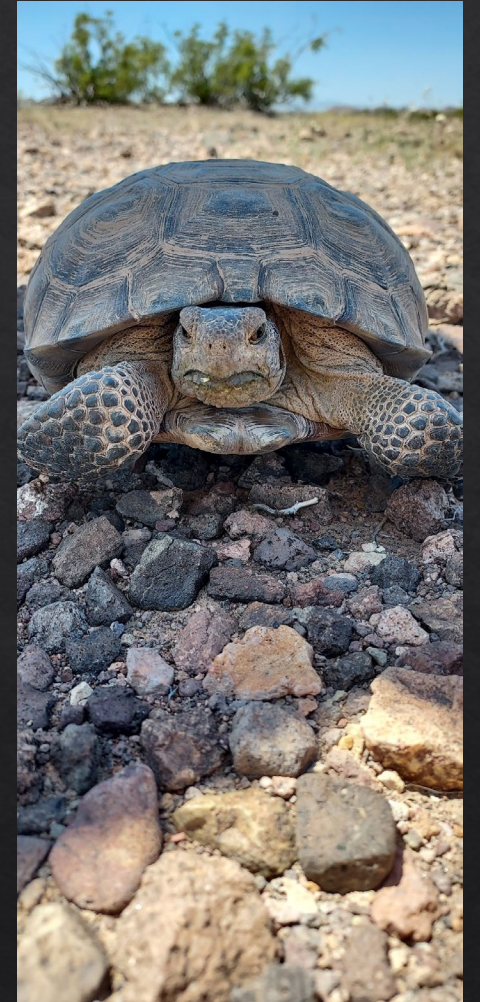
	Male	Female	Unk	MCL	Tag(s)
2020	0	0	0	0	N/A
2021	0	0	1	50	N/A*
2022	1	0	0	N/A	CC0808
2023-1	1	0	0	257	CC0125
2023-2	1	0	0	216	EV3963
2024	1	0	0	226	C
2025	3	0	0	1 – 264 2 – 244 3 – 197	1 – CC0339 2 – CC0143 3 – CC0103



*untagged but noted due to fresh condition

Summary & Year Review

- Work Plan
 - 3 plots (1 group) per team per day. Two teams per day.
 - 2 teams for the two weeks, then 3 teams for the next two weeks would be the most ideal approach based on when we are seeing tortoises.
- Data Plan
 - Unique ID algorithm
 - Simplify Wildnote survey data entry further
 - Error tracking cut from 126 in 2022 down to 46 in 2024, reduced further in 2025 to less than 20. Encouraged team to review data at end of day and QA / QC thoroughly before leaving the field.



Conclusion

Thank you for joining!



Acknowledgements

- Clark County Logo. Digital image. N.p., n.d.Web. Aug 2023.
<https://en.wikipedia.org/wiki/File:Seal_of_Clark_County,_Nevada.svg>.
- Desert Conservation Program Logo. Digital image. N.p., n.d.Web. Aug 2022.
<https://mojavemax.com/wp-content/uploads/2016/12/DCP_Logo_Small.jpg>.
- Desert Tortoise Occupancy Sampling at the Boulder City Conservation Easement; D25 Year 3, Annual Project Report. June 15, 2022. PN 2021-BIO-2020D , Bio Logical.
- MSHCP
https://www.clarkcountynv.gov/government/departments/environment_and_sustainability/desert_conservation_program/current_mshcp.php. Web, Aug 2022

This work was supported by the Clark County Desert Conservation Program
and funded by Southern Nevada Public Land Management Act as
project #2023-BIO-2325D, to further implement or develop the
Clark County Multiple Species Habitat Conservation Plan

