

Desert Tortoise Monitoring in the Red Cliffs National Conservation Area and surrounding areas



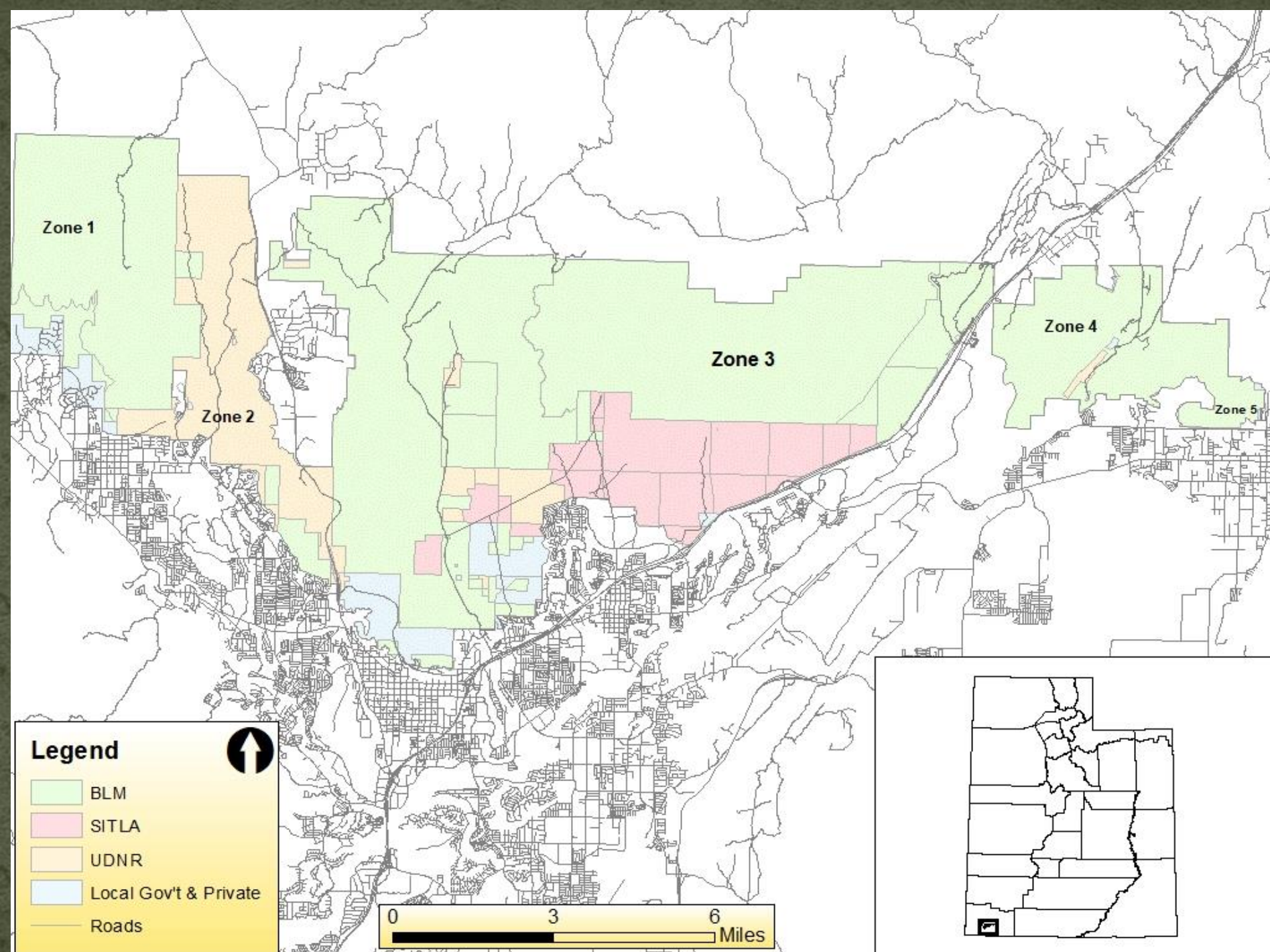
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Overview

- Design:
 - UDWR's long-term monitoring program
- Methods
 - 1998-2023
- Results
 - Spring 2023
 - Compare to prior years
- Summary





Long Term Monitoring Goals/Objectives:

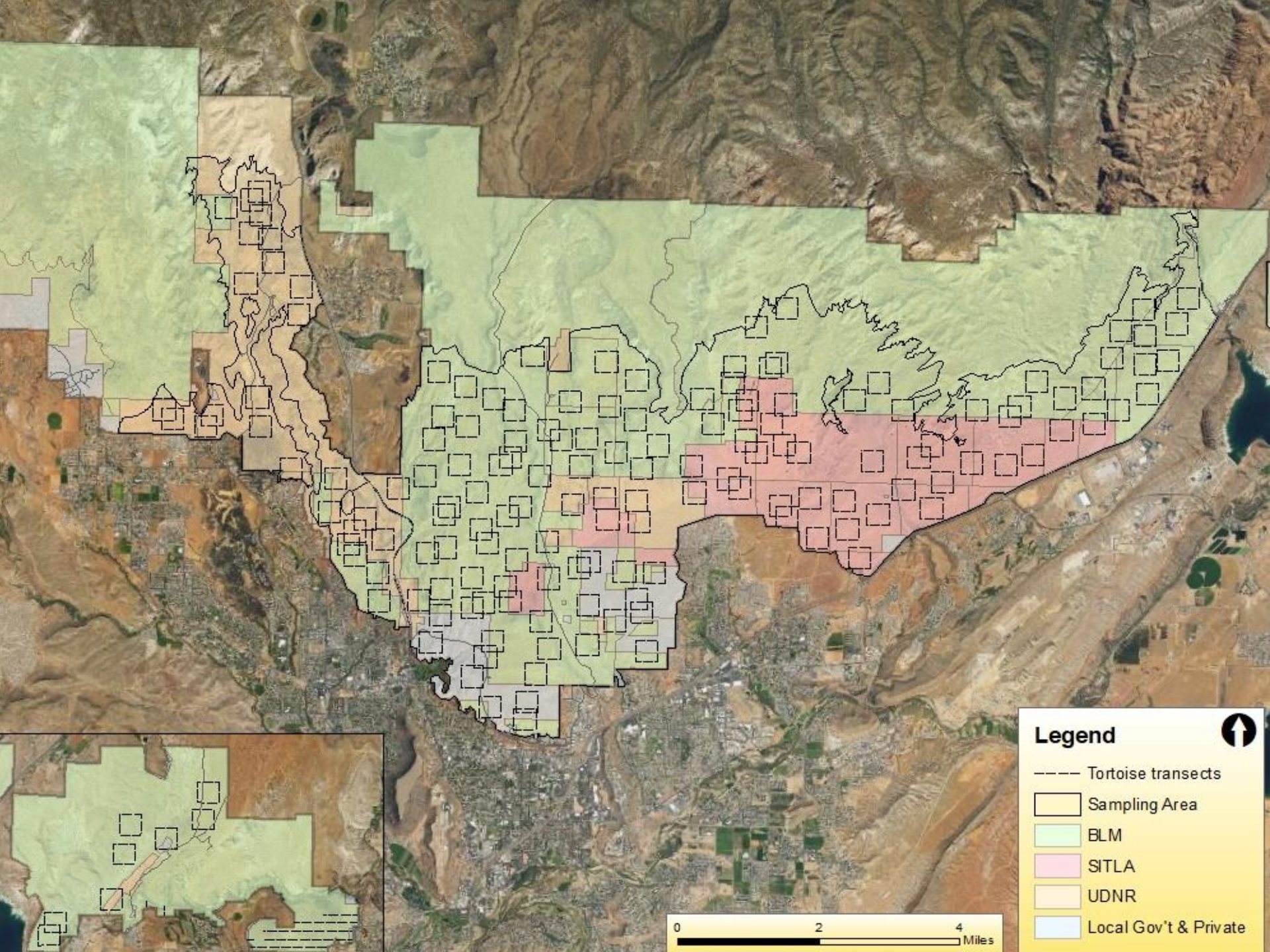
- Estimate regional density and abundance
 - Zone 3
 - Assess trends
 - Across the Reserve/NCA
 - Zones 2, 3, 5
 - Assess trends
- Tortoise Demographics
 - Age class
 - Sex ratios - adults
 - Overall health condition
 - URTD – clinical signs
 - Shell Disease
 - General body condition
 - Recaptures
 - History
 - Movements
 - Long term survival
 - Growth

Long Term Monitoring Effort

Year	Zones Surveyed				Line Length (km)
	2	3	4	5	
1998		✓			193.4
1999	✓	✓		✓	296.0
2000	✓	✓		✓	289.0
2001	✓	✓		✓	302.0
2003	✓	✓	Separate monitoring effort to determine efficacy of translocation program	✓	298.8
2005	✓	✓		✓	293.7
2007	✓	✓		✓	296.4
2009	✓	✓		✓	298.5
2011	✓	✓		✓	298.9
2013	✓	✓		✓	302.6
2015	✓	✓		✓	300.2
2017	✓	✓		✓	266.2
2019	✓	✓		✓	262.0
2021		<50%			88.3
2023	✓	✓	✓	✓	314.6

Methods





Legend



----- Tortoise transects

□ Sampling Area

■ BLM

■ SITLA

■ UDNR

■ Local Gov't & Private

0 2 4 Miles







Results





Results:

- We surveyed 161 transects from April 3 to June 13, 2023.
- 178 tortoises observed
 - 69 males and 70 females
- 163 found on transects
 - 15% were juveniles
- Majority of tortoises appeared healthy
 - 15 (9%) with URTD clinical signs
 - 6 live tortoises with burn injuries
- Telemetry (13 tortoises)
 - 71% tortoises visible and above ground



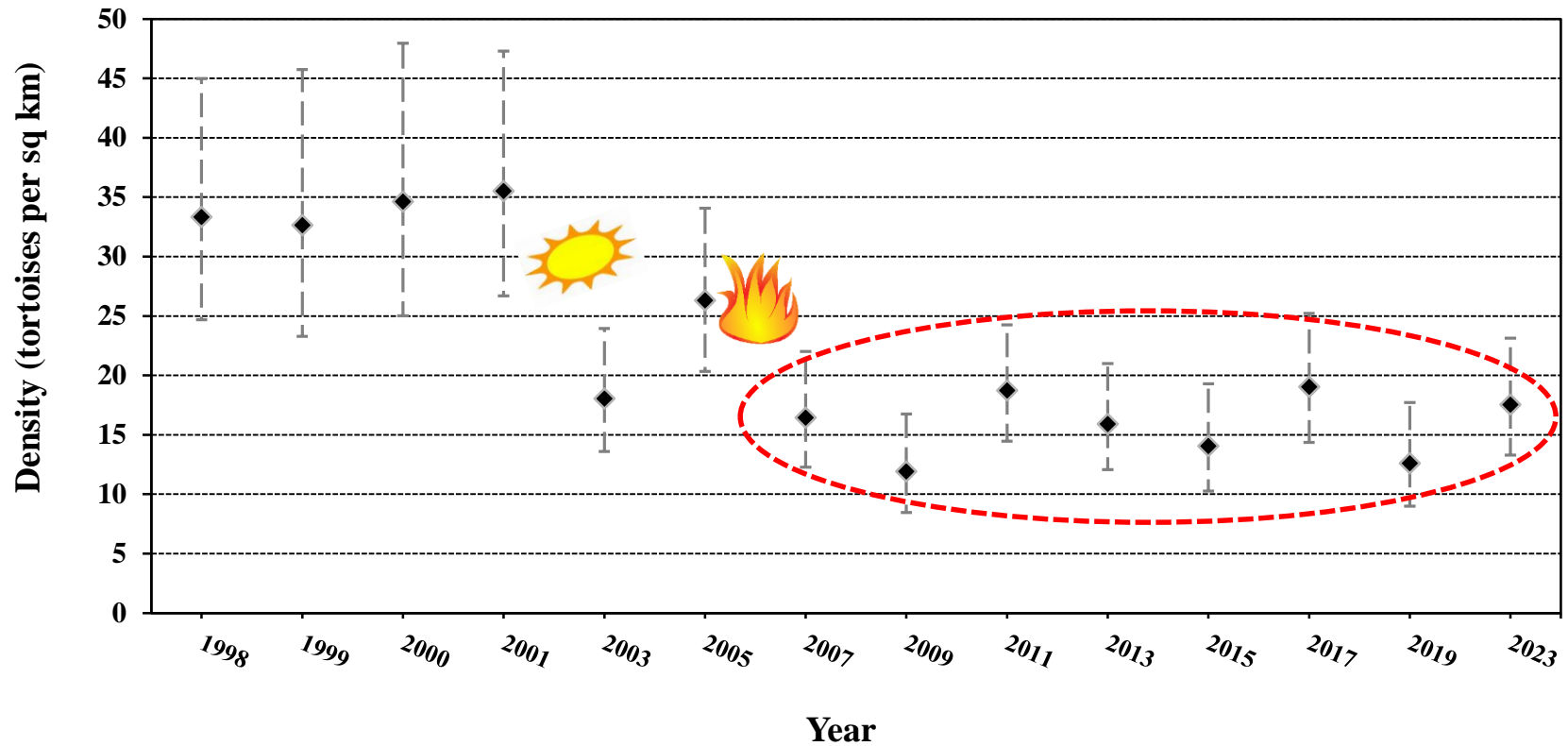
Recaptures



- 30% (50 tortoises) were previously marked
- Avg time since original capture was 14 years (< 1 yr to 51 yrs)
- Four marked with drill holes
 - Used prior to 1985 to mark animals
- Over 50% of tortoises were found on the same transect as a previous capture

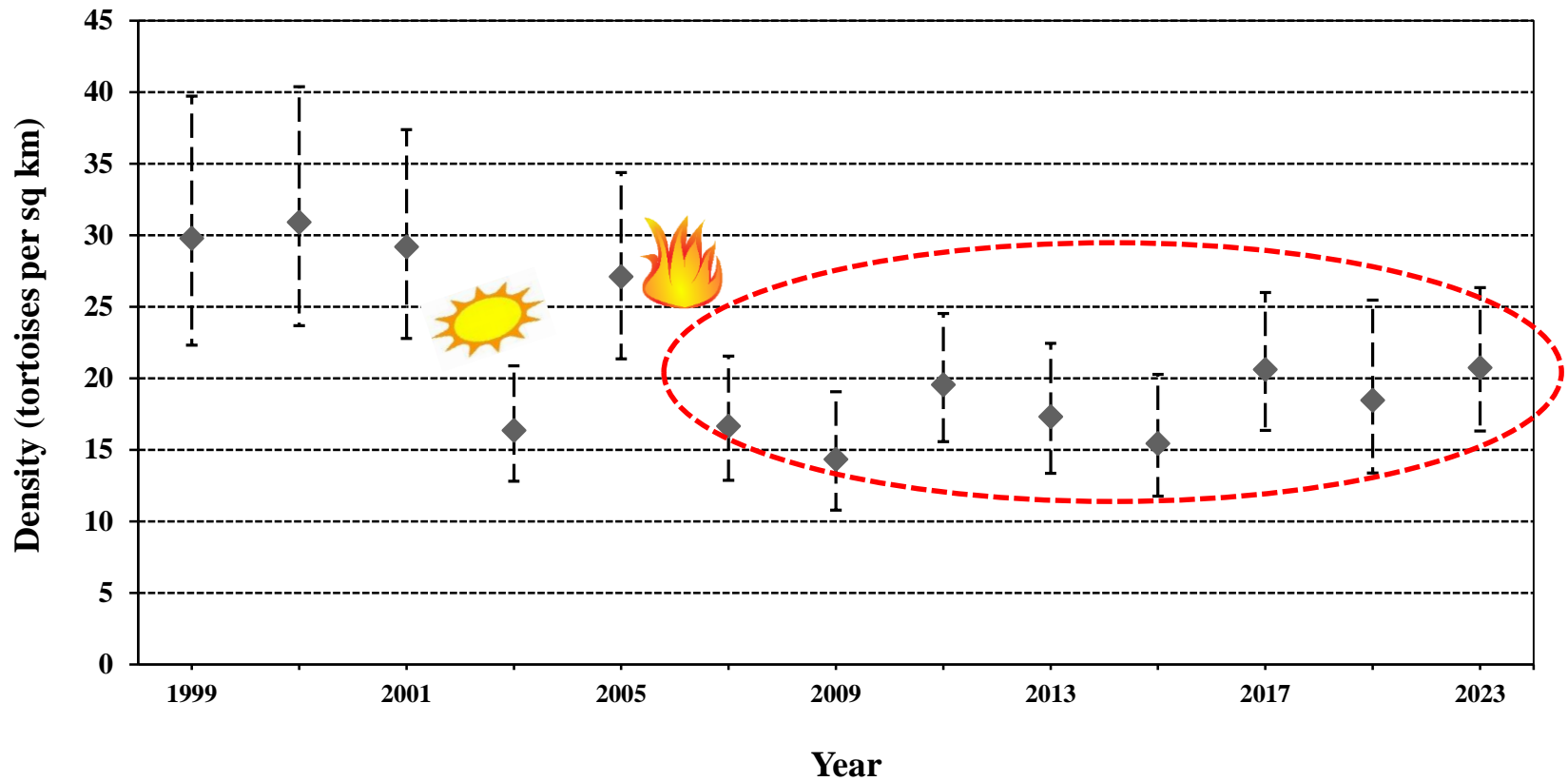
Population Density (adults): 1998-2023

Management Zone 3

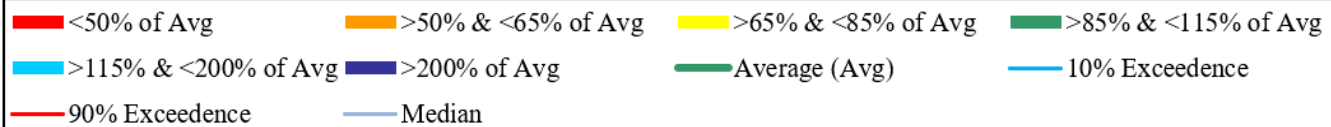
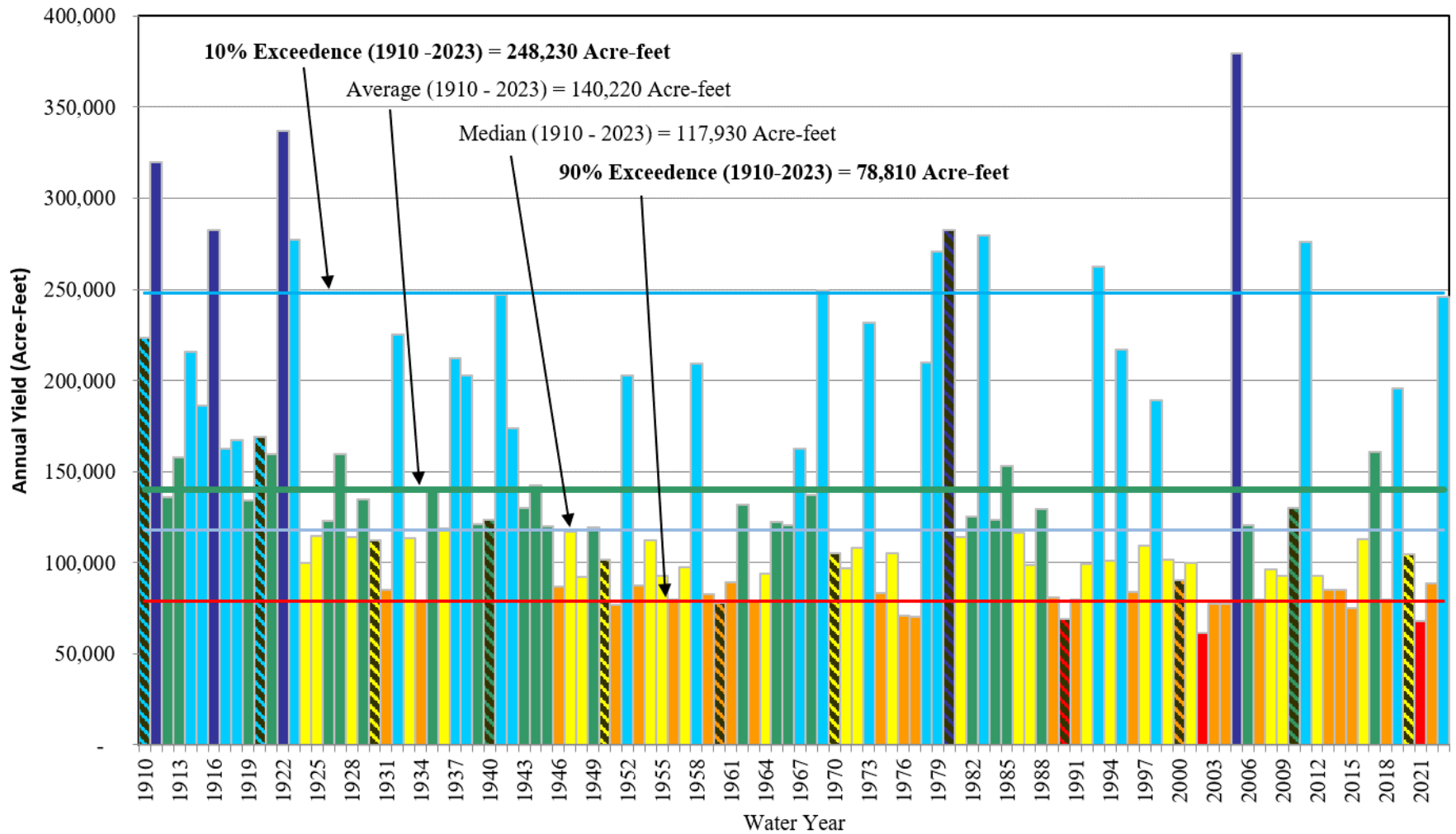


Population Density (adults): 1999-2023

Management Zones 2, 3 & 5



09406000 Virgin River near Virgin Annual Yield (Acre-Feet)



Annual Mortality (adults)

UDWR Population Monitoring

Year	Shells Remains TSD < 1 yr	Line Length (km)	Live Adult Encounters	Annual Mortality (%)
1998	5	193.4	138	3.5
1999	9	296.0	192	4.5
2000	13	289.0	191	6.4
2001	9	302.0	181	4.7
2003	52	298.8	100	34.2
2005	25	293.7	167	13.0
2007	14	296.4	106	11.7
2009	16	298.5	88	15.4
2011	18	298.9	124	12.7
2013	9	302.6	108	7.7
2015	4	300.2	94	4.1
2017	3	266.2	112	2.6
2019	7	262.0	100	6.5
2021	4	88.3	33	10.8
2023	2	314.6	139	1.4

Summary: 2023

- This is the 14th year of long-term desert tortoise monitoring over a 26 year time span (since 1998) within the Reserve/NCA
- We estimated density and abundance for desert tortoises
 - 17.5 tortoises per sq km in Zone 3
 - 20.7 tortoises per sq km across the Reserve (Zones 2, 3 & 5)
 - 34.2 tortoises per sq km in Zone 2
 - Since 2009, populations are stable
- Majority of processed tortoises appeared healthy
- Low annual mortality of adults
 - 1.4% adult annual mortality
 - Lowest recorded mortality since monitoring was initiated in 1998



Acknowledgments:

