

Integrating Desert Tortoise Recovery Actions for Current and Future Landscapes

Kristina Drake

U.S. Fish & Wildlife Service, Desert Tortoise Recovery Office



Management Oversight Group
October 12, 2023

Bolson Tortoise (*Gopherus flavomarginatus*)

Release on Private Land in New Mexico, USA
USFWS Safe Harbor Agreement



- 25 yr head-start & conservation initiative
- Largest & rarest land reptile in North America
- One of six species of *Gopherus* tortoise
- *Endangered* (ESA 1979) without critical habitat
- USFWS drafting Recovery Plan; Lessons learned from Desert & Gopher tortoise recovery efforts

September 2023





Would Management & Recovery Strategies Be Different?

1994 Recovery Plan

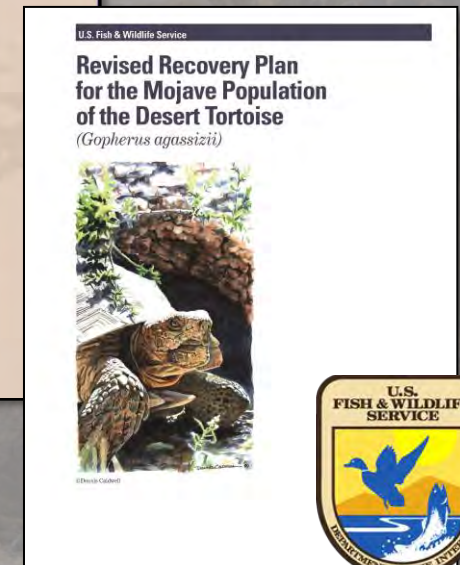
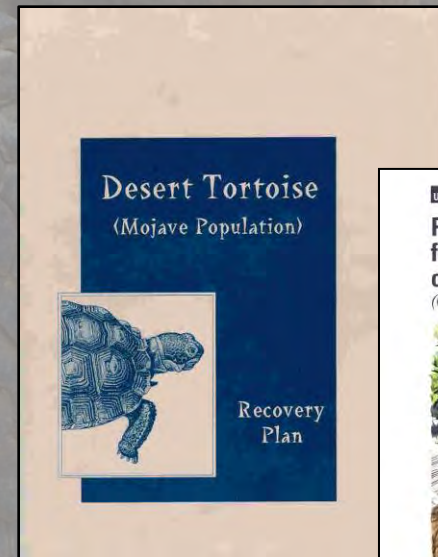
- Establish reserves (critical habitat)
- Monitor trends
- Suite of land management prescriptions

2011 Revised Recovery Plan

- Identify threats
- Protect existing populations & habitat

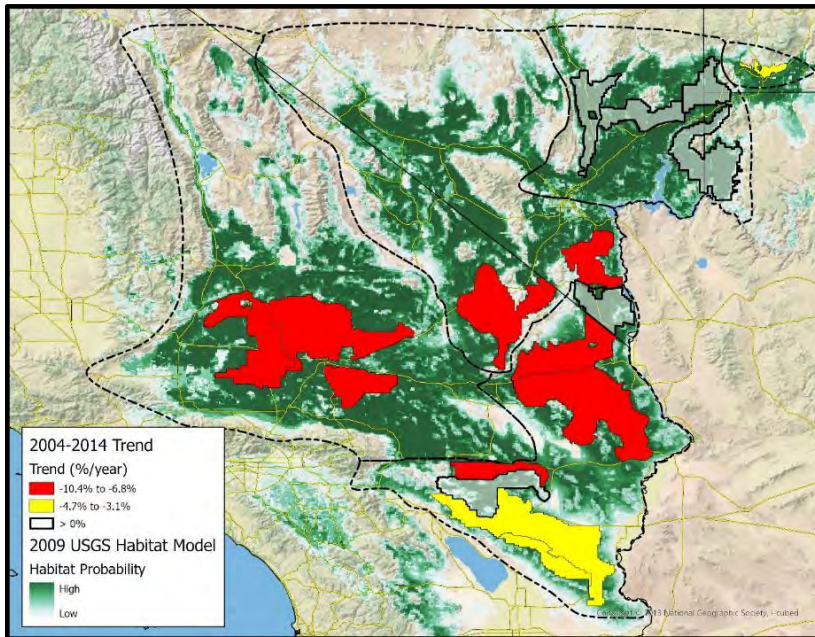
Underestimated Cumulative Impacts

- Human subsidies & predators
- Multi-use land practices
- Climate change & wildfire
- Renewable energy & land develop/degradation



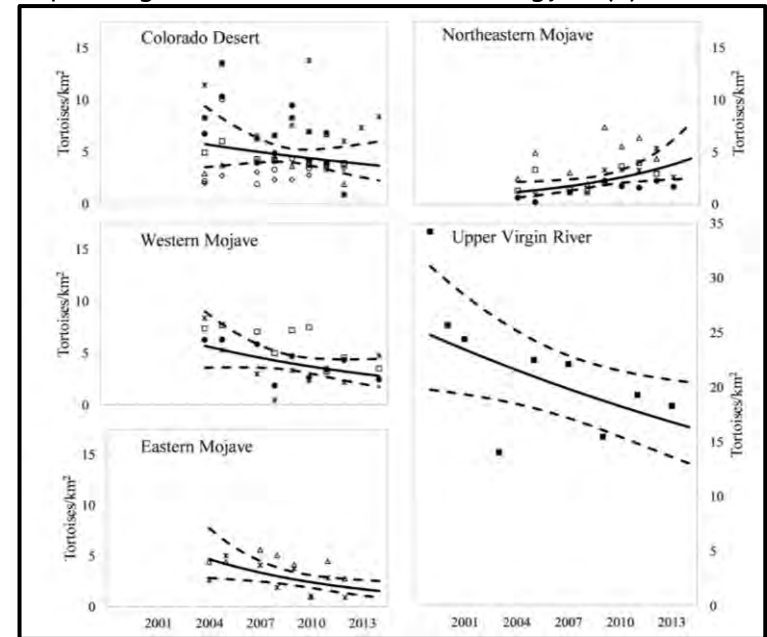
Tortoise Population Trends

2004 – 2014 Trend



Allison and McLuckie 2018

Herpetological Conservation and Biology 13(2):433-452.



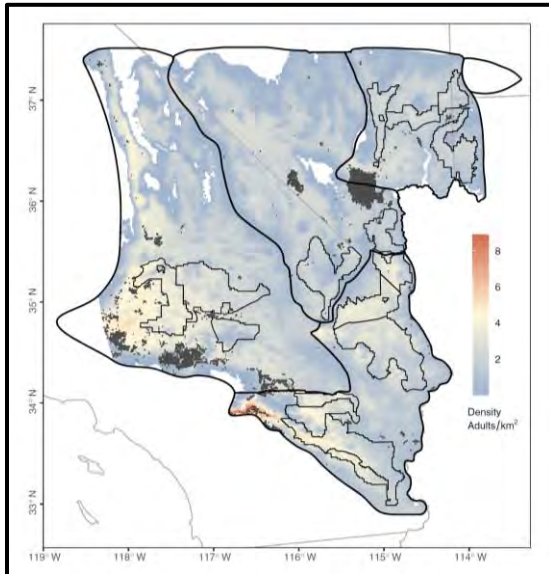
Negative population trends in most TCAs (11/17) for Mojave Desert Tortoises indicate that adaptive management is required to support recovery and continuance of the species.

Spatial Variation in Tortoise Density

2001 – 2020 Trend

Zylstra et al. 2023

Ecosphere 14:e4448



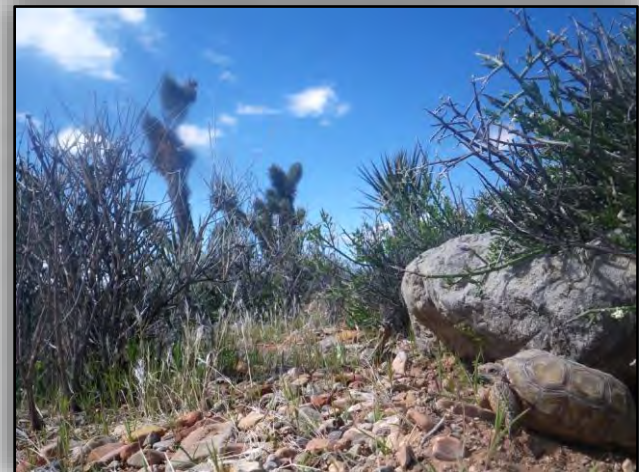
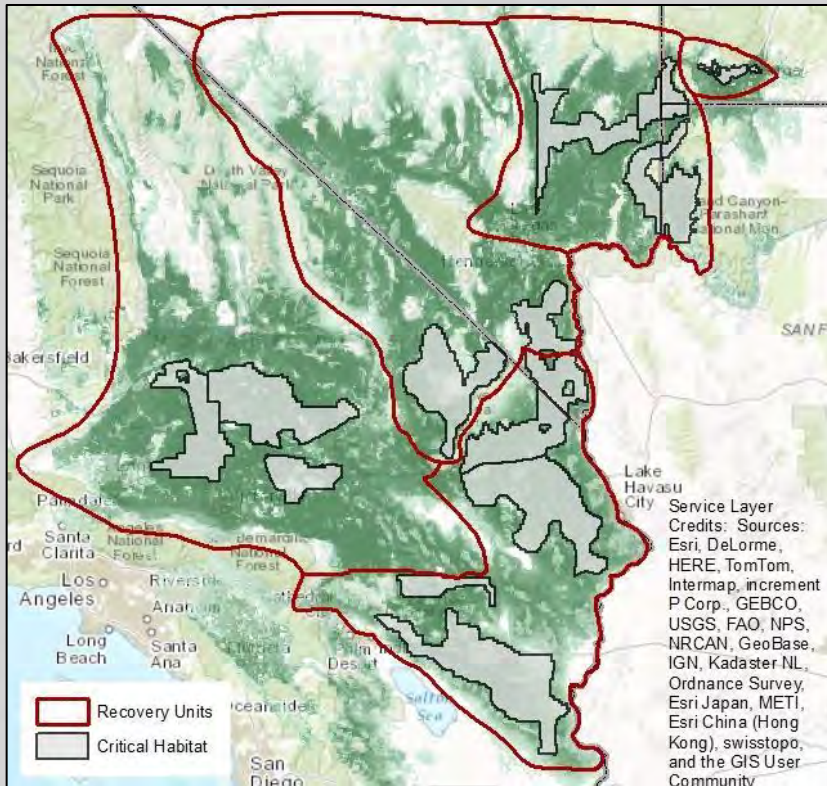
- Density varied geographically
- Adult density declined ~1.8% per year with **steepest declines in West Mojave**, losing an estimated **129,000 adults (36%)** across range between 2001 and 2020.

TABLE 5 Predicted abundance (with associated standard error in parentheses) of adult Mojave desert tortoises in 2001 and 2020, and the difference between the two years, in modeled areas of four recovery units.

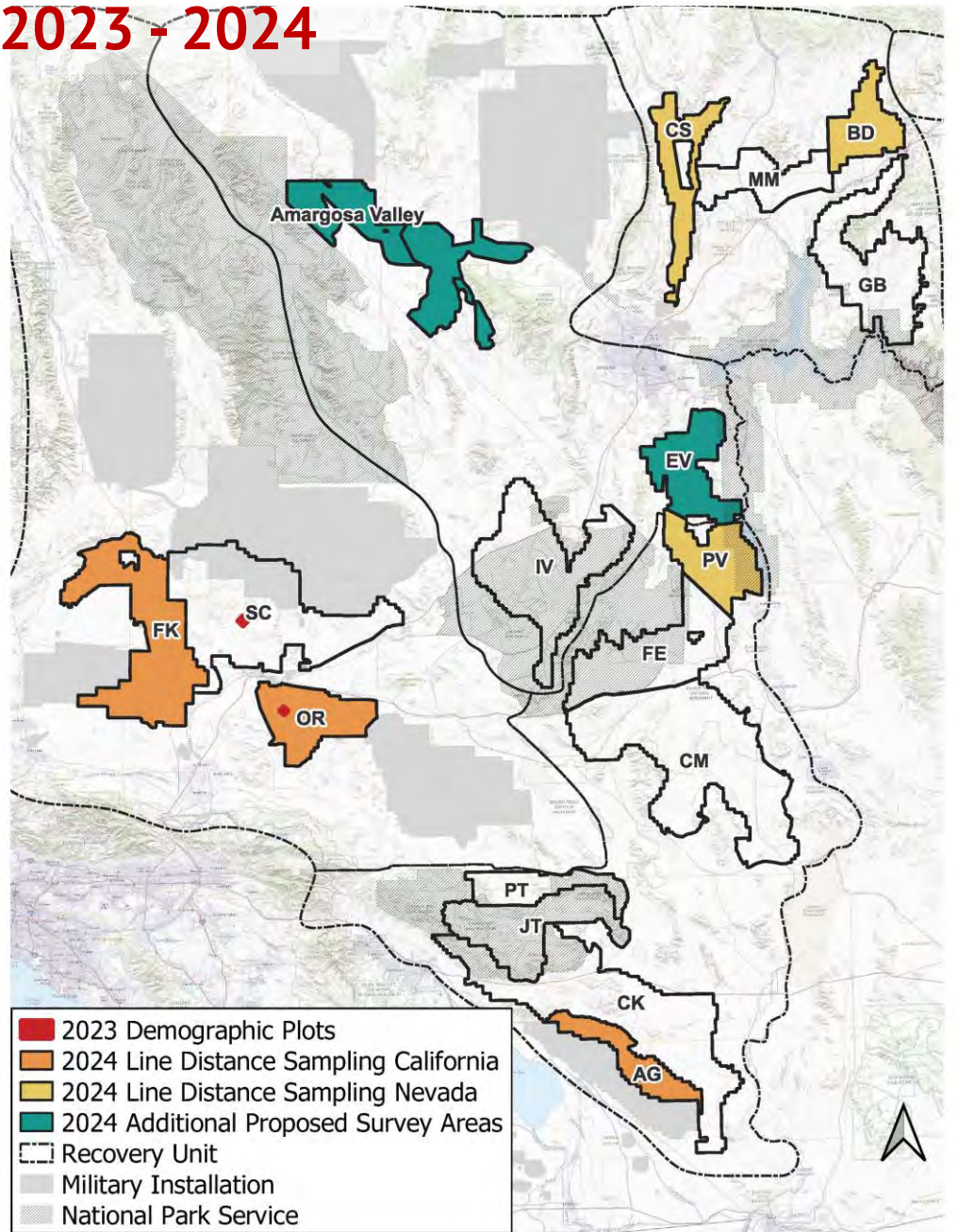
| Recovery unit | 2001 | | 2020 | | Difference in abundance |
|---------------------|-------------------------|------------------|-------------------------|------------------|-------------------------|
| | Area (km ²) | Abundance | Area (km ²) | Abundance | |
| Colorado Desert | 30,815 | 75,918 (12,458) | 30,723 | 62,820 (9862) | -12,782 (17,774) |
| Eastern Mojave | 39,778 | 53,564 (10,784) | 39,567 | 48,692 (9886) | -5081 (16,925) |
| Northeastern Mojave | 19,537 | 24,322 (4991) | 19,437 | 25,255 (5593) | 1124 (8508) |
| Western Mojave | 50,623 | 206,540 (35,443) | 50,444 | 94,433 (16,737) | -112,020 (42,490) |
| Total | 140,753 | 362,290 (41,513) | 140,171 | 234,197 (25,106) | -129,380 (50,692) |

What's Missing With Our Range-Wide Sampling?

- **Status of under-studied areas?**
- **Aging populations**
- **Limited recruitment** in some areas (lack of vital rates data)



2023 - 2024



Range-Wide Monitoring

- **Density Estimates (LDS)**
 - Fremont Kramer, CA
 - Ord Rodman, CA
 - Chocolate Mtn AGR, CA
 - Piute Valley, NV
 - Coyote Springs, NV
 - Beaver Dam, NV
- **Additional Surveys**
 - Amargosa Valley, NV
 - Eldorado Valley, NV
- **Vital Rates (Demographic Plots)**
 - Superior-Cronese, CA (1)
 - Ord Rodman, CA (1)
 - Others
(CA & NV -BLM, UNR, USGS)

Monitoring Coordinator
Corey_Mitchell@fws.gov



Achieving Recovery

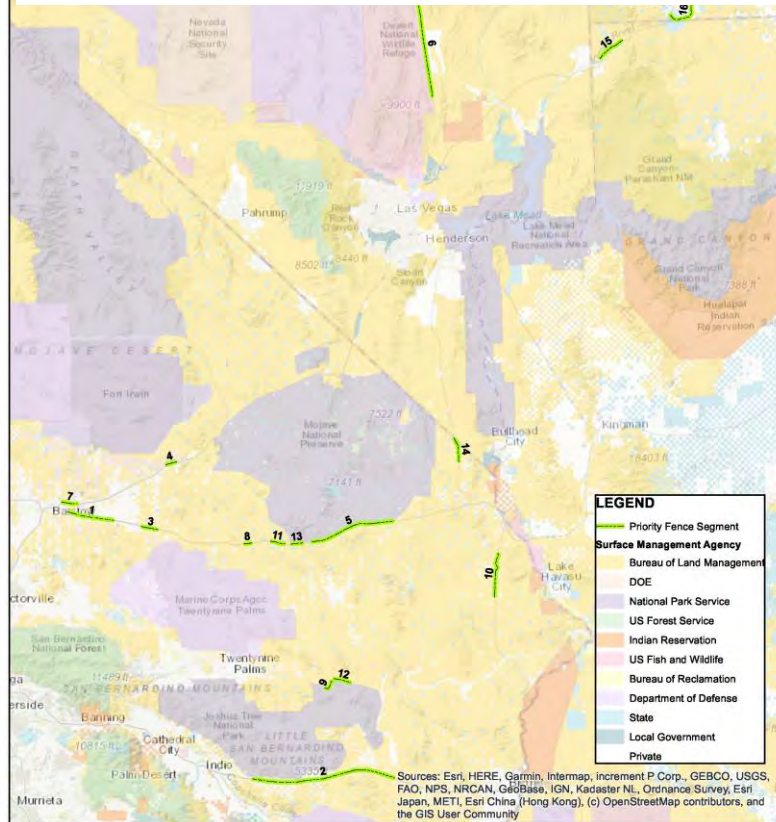


1. Limit future population decline (direct threats)
2. Incorporate recovery actions (alternative/novel approaches)
3. Integrate actions to promote recovery
4. Plan for environments & landscapes in 2050+



Desert Tortoise Fencing Initiatives

Priority Road Fencing Segments



- Funding opportunities available for fence installation;
- **Limited to no funding opportunities for fencing maintenance**
- Document fence status & road-related mortality events

Integrated Raven Management in Tortoise Habitat



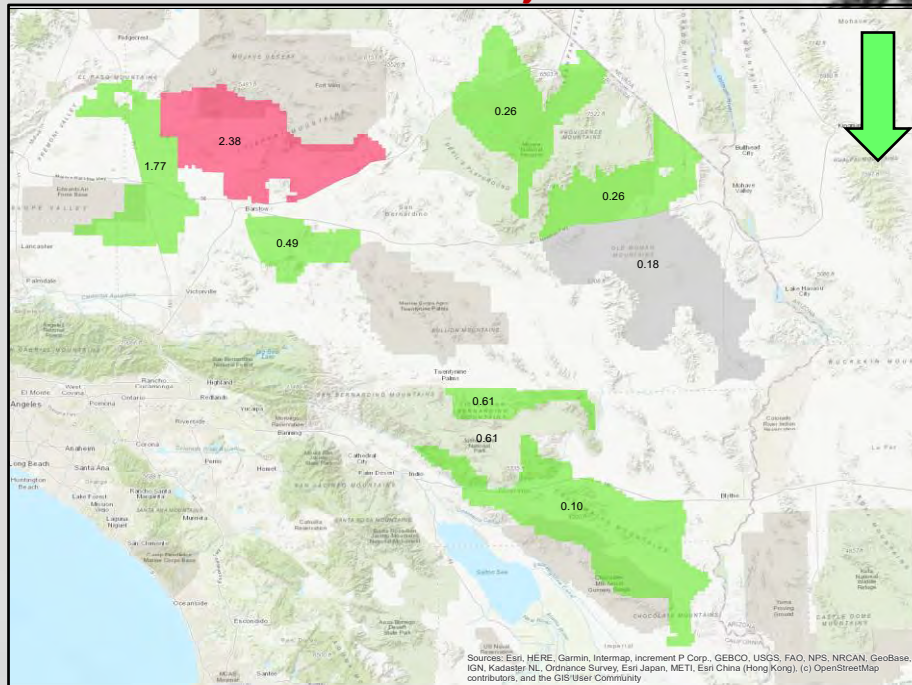
- Ecology & management
- Reduce food subsidies
- Anti-nest devices
- Egg addling (drones)
- Laser hazing
- Weaponized techno-tort
- 3D tort models



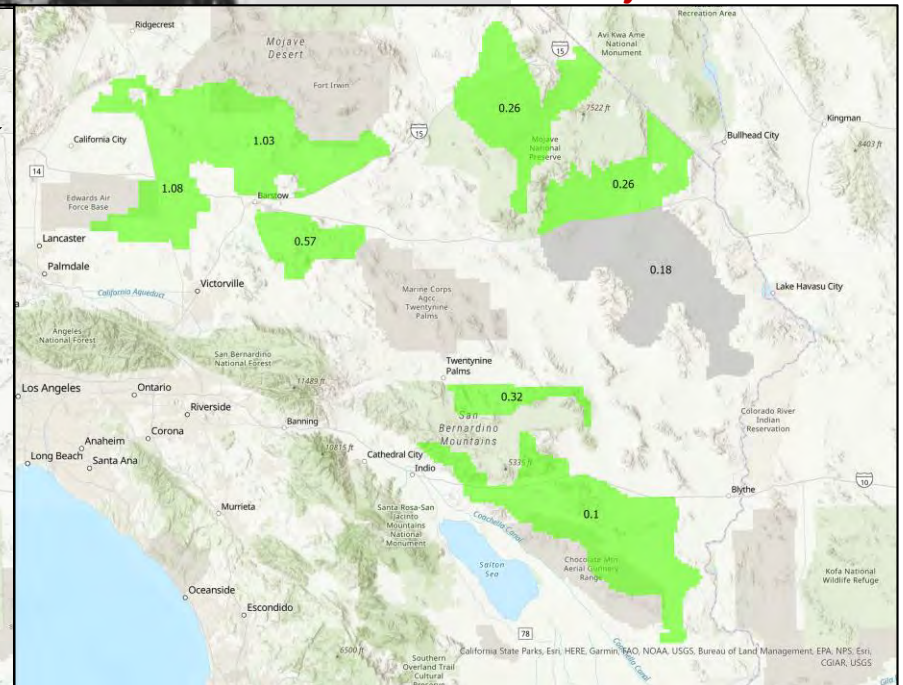
Is This Integrated Management Approach Working?



2022 Raven Density Estimates



2023 Raven Density Estimates



Holcomb et al. In Prep.

Reducing Raven Densities in Western Mojave & Colorado Desert Tortoise Habitat

Other Recovery & Management Efforts To Strengthen Tortoise Populations & Habitats



- Invasive species control
- Road/route density management
- Land acquisition (quality habitat)
- Native seed collection & preservation
- Education & Community Support ("Friends Of" Groups)



Integrated Approaches

Avoid singular projects that may not address cumulative impacts

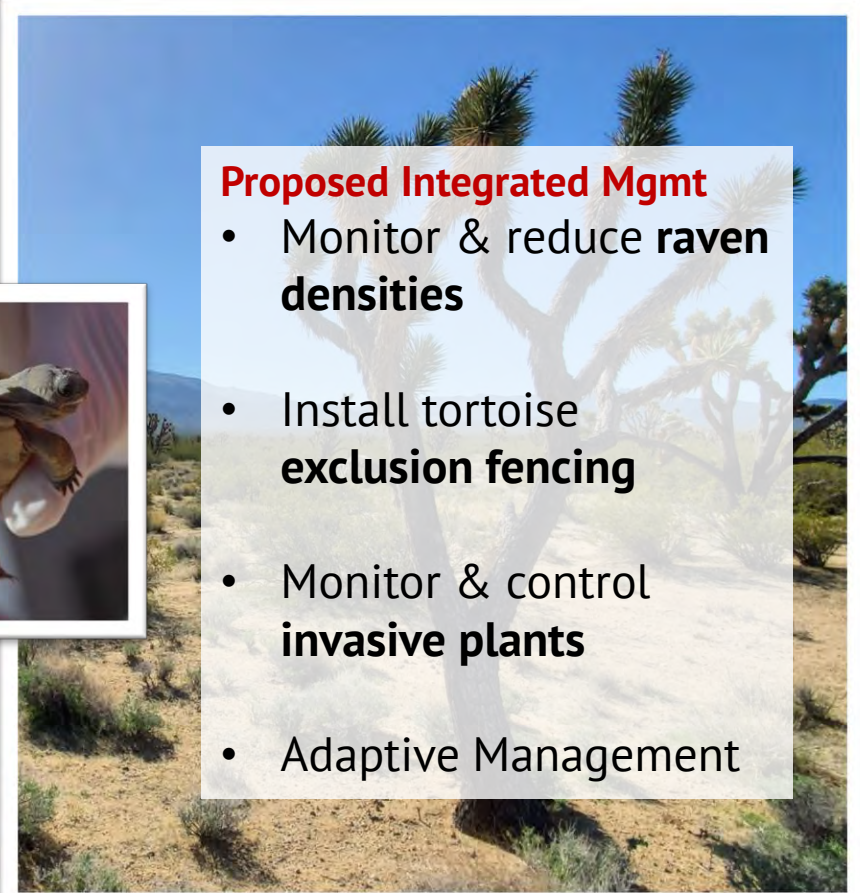
Project Example

Mojave National Preserve
Ivanpah Headstart Research Facility



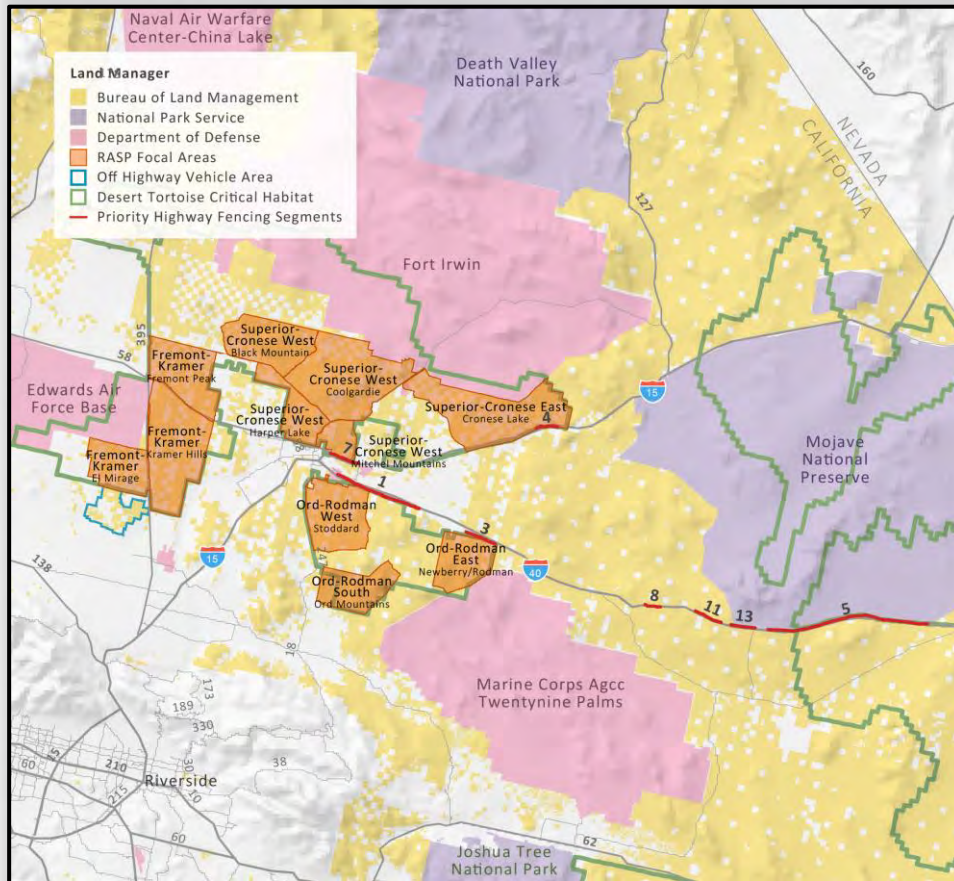
Proposed Integrated Mgmt

- Monitor & reduce **raven densities**
- Install tortoise **exclusion fencing**
- Monitor & control **invasive plants**
- Adaptive Management

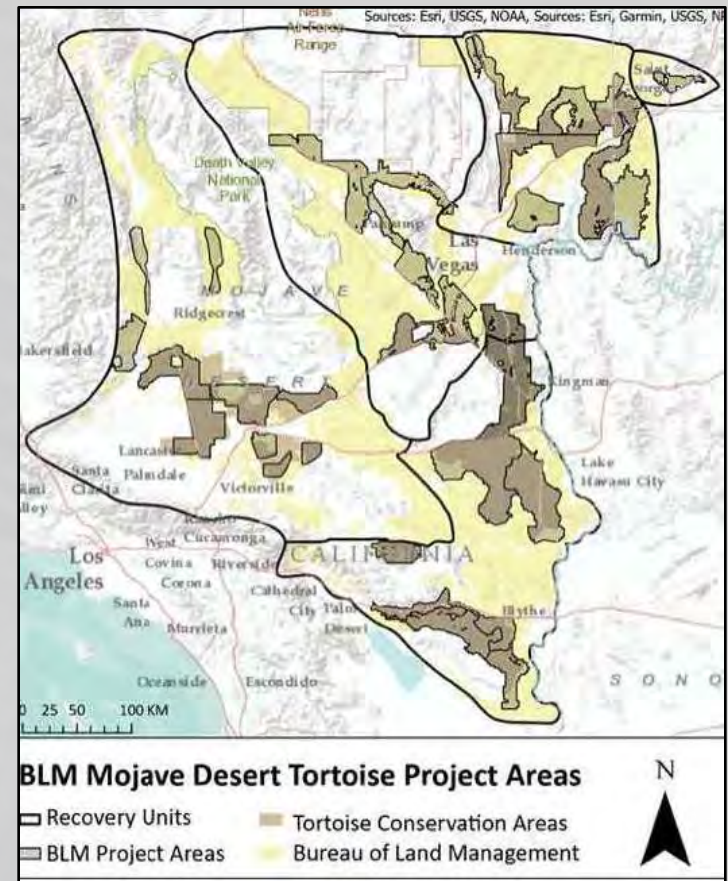


Integrated Programs

Recovery and Sustainment Partnership (RASP) Department of Defense, USFWS, Partners



BLM Mojave Desert Tortoise Project Areas Bureau of Land Management



Draft Appendix 1.

Conservation Science Partners. 2023. Bureau of Land Management
Rangewide Mojave Desert Tortoise Action Plan Final Report, Truckee, CA.

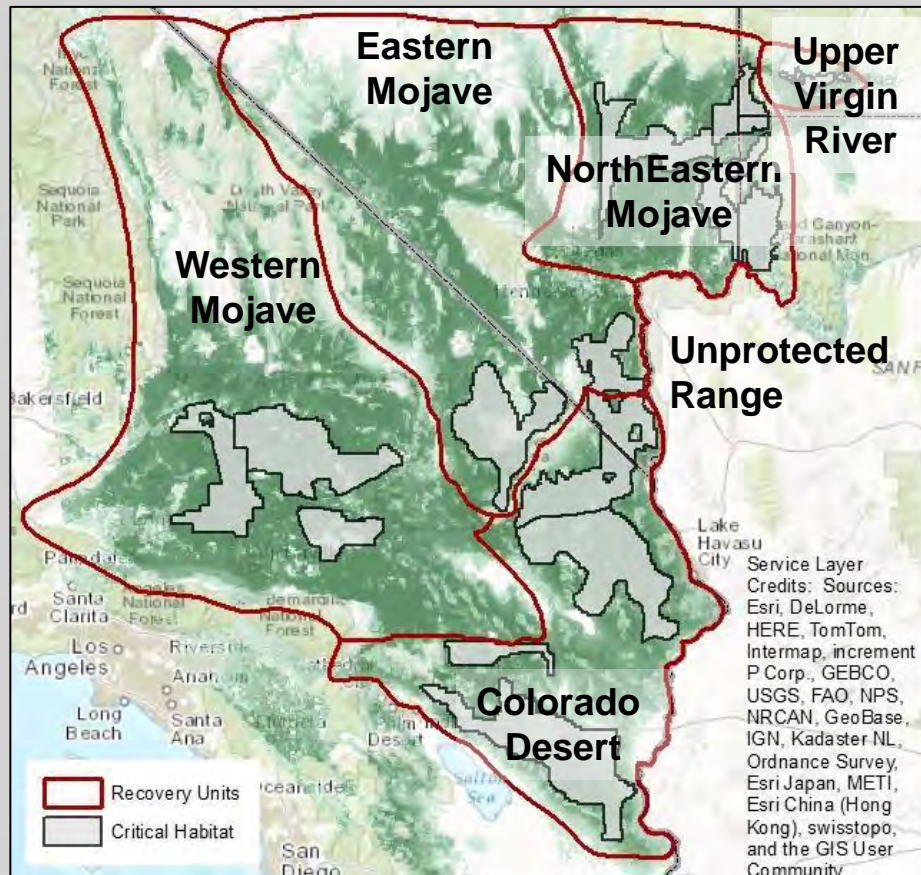
How do we apply integrated management range-wide?



Recovery Implementation Teams (RITs)

“Regional, inter-organizational teams to **prioritize and coordinate implementation of recovery actions throughout tortoise’s range**. Actions will involve **step-down plans and maintain focus on implementing recovery actions, encourage cross jurisdictional, landscape-level action** that will be tracked, monitored, and evaluated.”

- Revised Recovery Plan, USFWS 2011



Future RIT Configuration Alternatives

- **2 RITs**
 - Western, Eastern, NE
 - Colorado Desert, UVR
- **2 RITs**
 - CA (Western, ½ Eastern, Colorado)
 - NV, UT, AZ (½ Eastern, NE, UVR)
- **3 RITs**
 - Western
 - Eastern, NE, UVR,
 - Colorado Desert
- **4 RITs**
 - Western
 - Eastern,
 - NE, UVR
 - Colorado Desert

- Adding unprotected range in Arizona; Maintaining RITs for at least first year.



Recovery Implementation Teams (RITs)

Goals for RITs (Year 1)

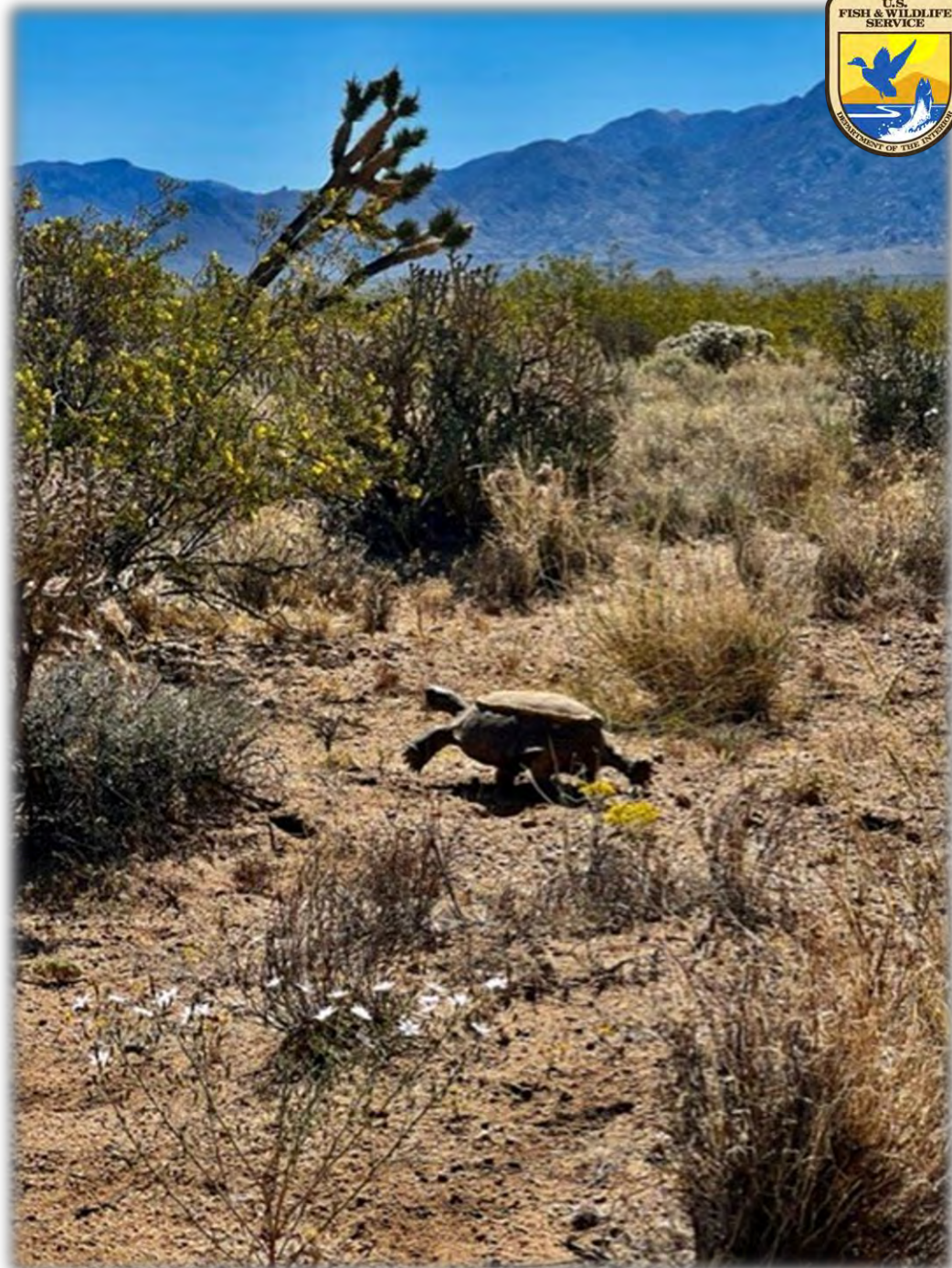
1. **Develop integrated strategy for threats**
2. **Incorporate robust datasets & adaptive management triggers to prioritize strategies for threats** (published literature, models, population trends, demographic & clearance data, climate projections, other land history & environmental data)
3. **Identify if threats can be addressed with internal/development funds**
4. **Identify if threats require additional grant funding**
5. **Promote & include novel technology & methods**

How can RITs best support BLM's Strategic & Action Plans, RASP, Other Recovery Programs?



Call to Action

- Ensure long-term protections for intact habitats
- Maintain habitat connectivity
- Allow updated science & climate models to inform recovery & adaptive management efforts
- Act now, think outside the box



Thank You To Our MOG Partners!



Desert Tortoise Recovery Office

- Kristina_Drake@fws.gov
- Kimberleigh_Field@fws.gov
- Kerry_Holcomb@fws.gov
- Corey_Mitchell@fws.gov

