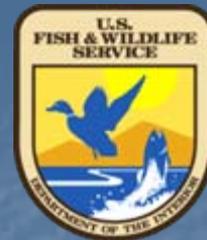




Desert Tortoise Recovery

Roy C. Averill-Murray
Desert Tortoise Recovery Office

November 30, 2010



2002

- Listing, CH, RP reasonable
- Recovery action effectiveness unknown
- Coordinated strategy to link mgmt with research

GAO

United States General Accounting Office
Report to Congressional Requesters

December 2002

ENDANGERED SPECIES

Research Strategy and
Long-Term Monitoring
Needed for the Mojave
Desert Tortoise
Recovery Program



GAO-03-23



2004

DTRPAC Report

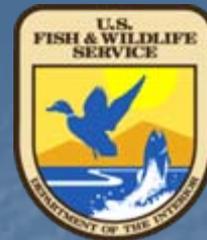
page i

Desert Tortoise Recovery Plan Assessment

Tracy, C.R., R. Averill-Murray, W. I. Boarman, D. Delehanty, J. Heaton, E. McCoy, D. Morafka, K. Nussear, B. Hagerty, P. Medica

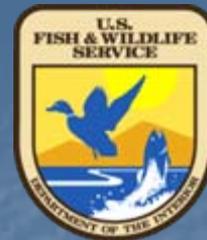


- 1994 RP strong
- Strategies for more cohesive, scientifically powerful recovery program
- Desert Tortoise Recovery Office



Recovery Plan Revision: 2005-06

- Feasibility of collaborative recovery planning
 - US Institute for Conflict Resolution
 - Center for Collaborative Policy
- Science Advisory Committee



Recovery Plan Revision: 2007

- Science Advisory Committee
- March, May – Recovery planning workshops
- 14 September MOG meeting – Admin draft
- 16 October – Stakeholder draft
- 6, 8 November – Open houses



Recovery Plan Revision: 2008

- 3 August – NOA in Federal Register
 - 90-day public comment
 - 4 November closed
- 44 unique letters + >6000 form letters
- 4 peer reviews



Recovery Plan Revision: 2009

- Revision/response to comments
-

Recovery Plan Revision: 2010

- 12 February – R8 meeting w/ Quadstate
- August – R2 and R6 concurrence

Recovery Plan Revision: Summary



- Science Advisory Committee
- 4 workshops + 2 open houses
- 2 iterations of informal review/comment
- Formal public review
- Peer review

Recovery Strategy

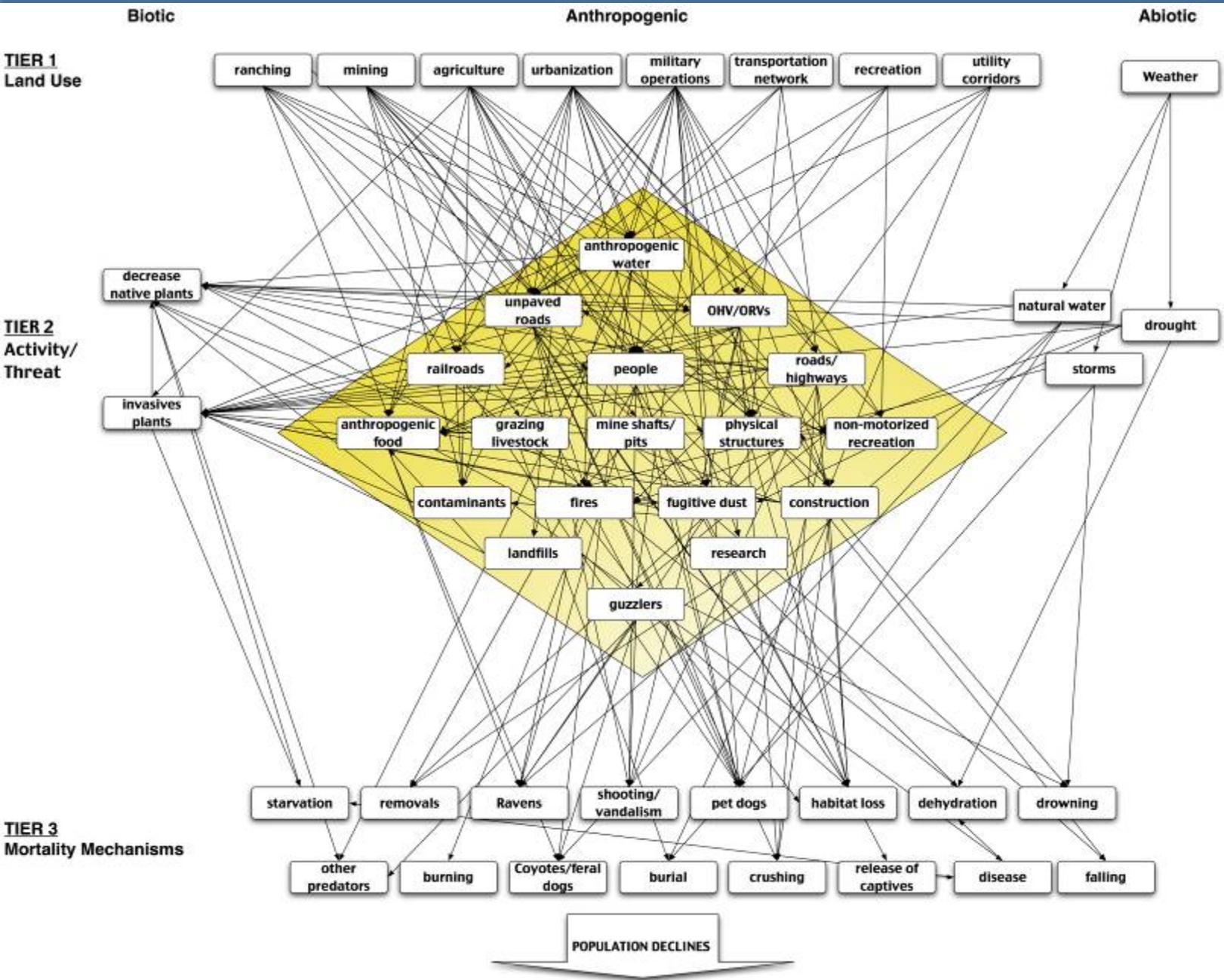
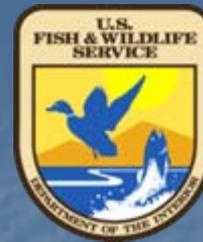


U.S. Fish & Wildlife Service

Draft Revised Recovery Plan
for the Mojave Population
of the Desert Tortoise
(*Gopherus agassizii*)



- **Develop partnerships**
- Protect populations & habitat
- Augment depleted populations
- Monitor progress
- Conduct applied research & modeling
- **Implement adaptive management program**



TIER 1
Land Use

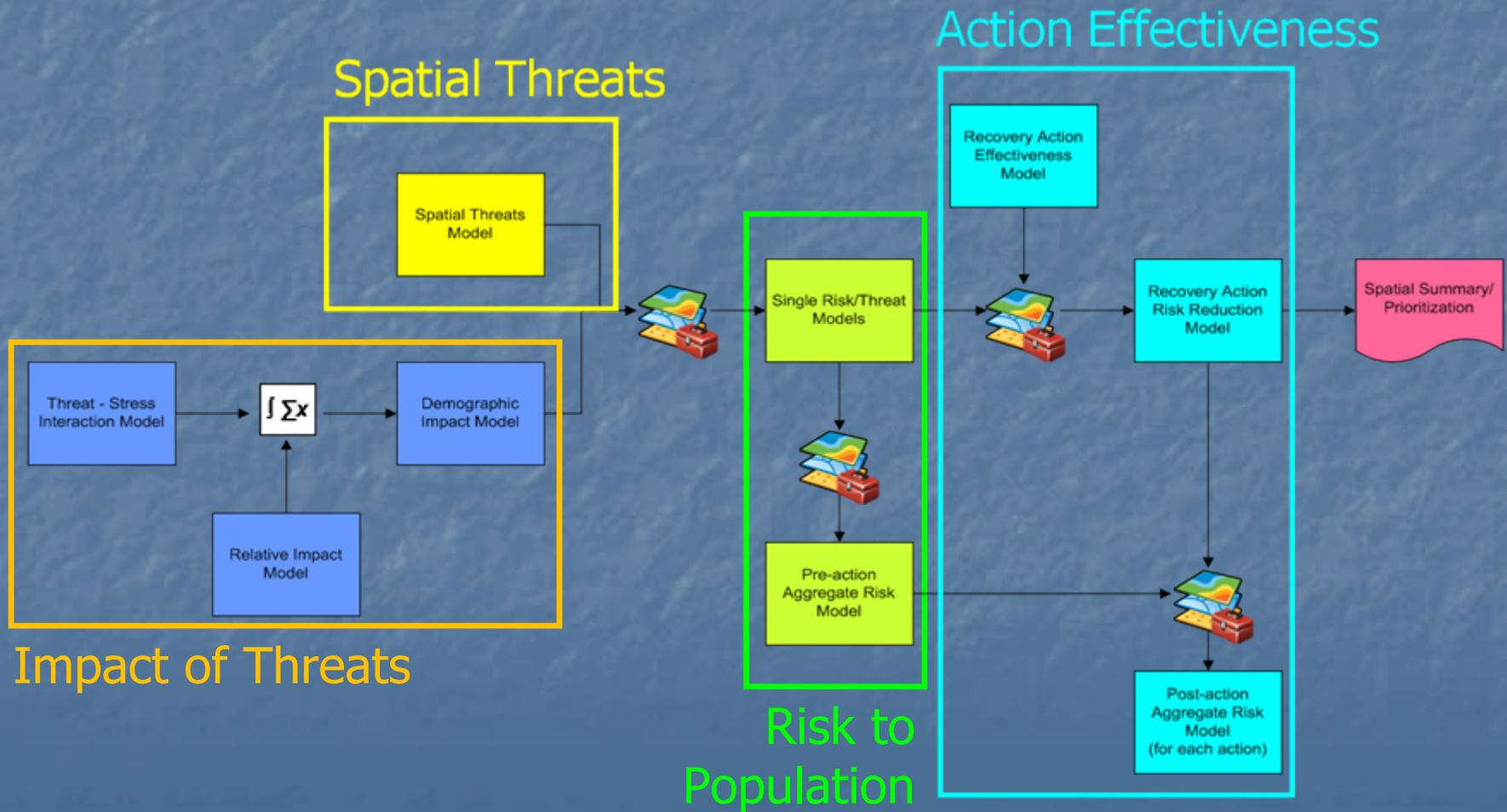
TIER 2
Activity/
Threat

TIER 3
Mortality Mechanisms

POPULATION DECLINES

Spatial Decision Support System

Evaluates effects of different management actions for desert tortoise recovery



Spatial Decision Support System

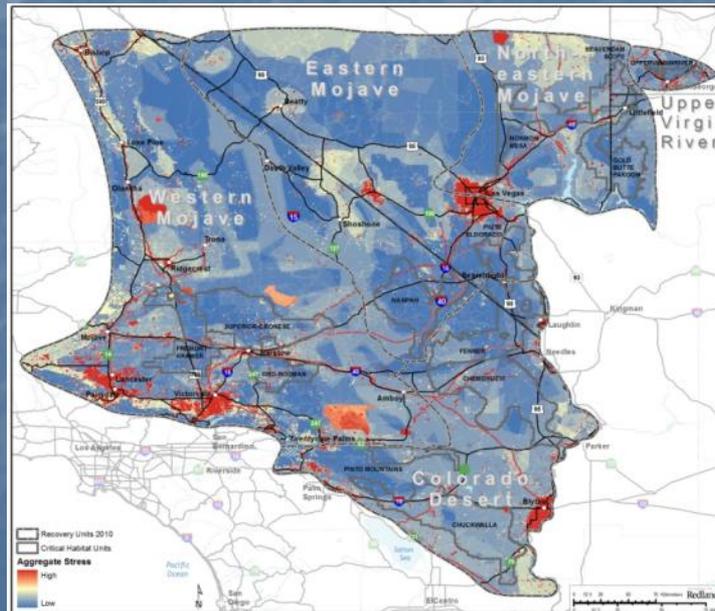


Spatial Summary/
Prioritization

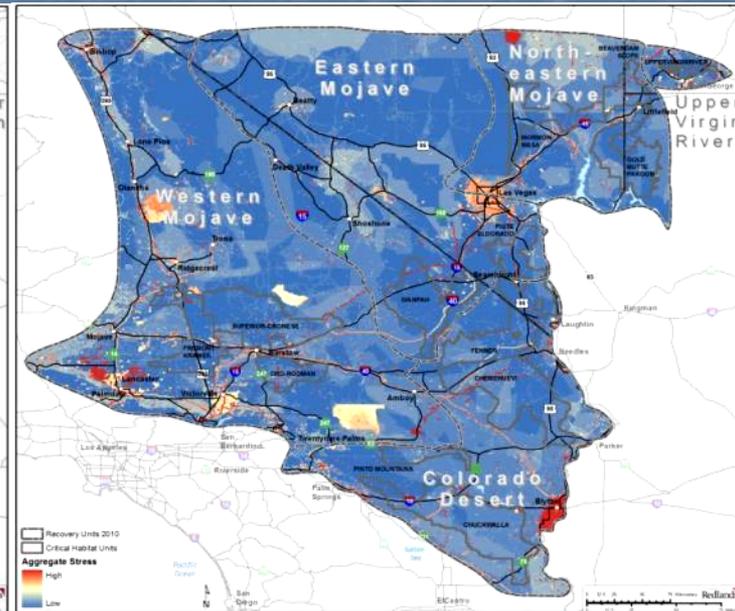
Compares remaining threat severity across
recovery actions

Extent of
threat after
actions

Aggregate Risk to the Tortoise



Remaining Risk after Actions



After actions, Δ risk to the tortoise = +464,000

Spatial Decision Support System



Spatial Summary/
Prioritization

Utilize prioritization to create
Recovery Action Plans

Extent of
threat after
actions

XXX Recovery Unit		
Action	Δ overall risk	Rank
Increase law enforcement	970	1
Close OHV routes	832	2
Decrease subsidies to predators	458	3
Restore habitat	183	4
Environmental education	154	5
Install culverts for connectivity	70	6

Change (decrease) in overall risk is calculated for all possible actions within a given area; actions can then be prioritized according to total risk reduction

Recovery Plan: Moving to Implementation



- Publish final plan
- Organize RITs/schedule initial meetings
- Develop 5-year Recovery Action Plans

ArcGIS RIT Application



Desert Tortoise SDS Data Explorer

File Zoom to... Make a Report

1:6,144,446

Layers

- Recovery Units
- RIT Areas
- Basemap

Study Area Report

West Mojave Planning Area

Total Area: 14,651,817 acres

Top Stresses

- Predation
- Habitat loss
- Disease
- Crushing
- Burning or smoke inhalation
- Loss of shelter and breeding sites
- Nutritional compromise
- Collection
- Deliberate maiming or killing

Contribution to Pop. Change

Predation	14
Habitat loss	13
Disease	8
Crushing	8
Burning or smoke inhalation	7
Loss of shelter and breeding sites	6
Nutritional compromise	5
Collection	5
Deliberate maiming or killing	5

Recommended Actions

- Protect intact desert tortoise habitat (2.1)
- Install and maintain tortoise barrier fencing (2.5 & 2.7)
- Land acquisition (2.9)
- Environmental Education (2.3)
- Restore Habitat (2.6)
- Increase law enforcement (2.4)
- Withdraw mining (2.12)
- Remove grazing (close allotments)
- Sign and fence protected areas (2.8)
- Install and maintain human barriers (wildland-urban interface)

Data Inventory

89 datasets

Add...	Threat Type	Dataset Title	Description	Data Source	Year	metadata
	Agriculture	National Land Cover Data 2001	Pasture/Hay and Cultivated Crops classifications from the raster file	U.S. Geological Survey	2001	
	Air Pollution	Air pollution measurements for ...	This dataset displays the air pollution measurements for Carbon	U.S. Environmental Protection Agency (E...	2008	
	Air Pollution	Air pollution measurements for ...	This dataset displays the air pollution measurements for Nitrogen	U.S. Environmental Protection Agency (E...	2009	
	Air Pollution	Air pollution measurements for ...	This dataset displays the air pollution measurements for Particulate	U.S. Environmental Protection Agency (E...	2011	
	Air Pollution	Total Nitrogen deposition for ...	Provides a geography of annual nitrogen deposition throughout most	University of California - Riverside	2002	
	Altered hydrology					
	Disease					
	Drought					
	Energy Development					

Source Threat Data Threat Intensity Stress Intensity Population Change

Add layer directly from inventory

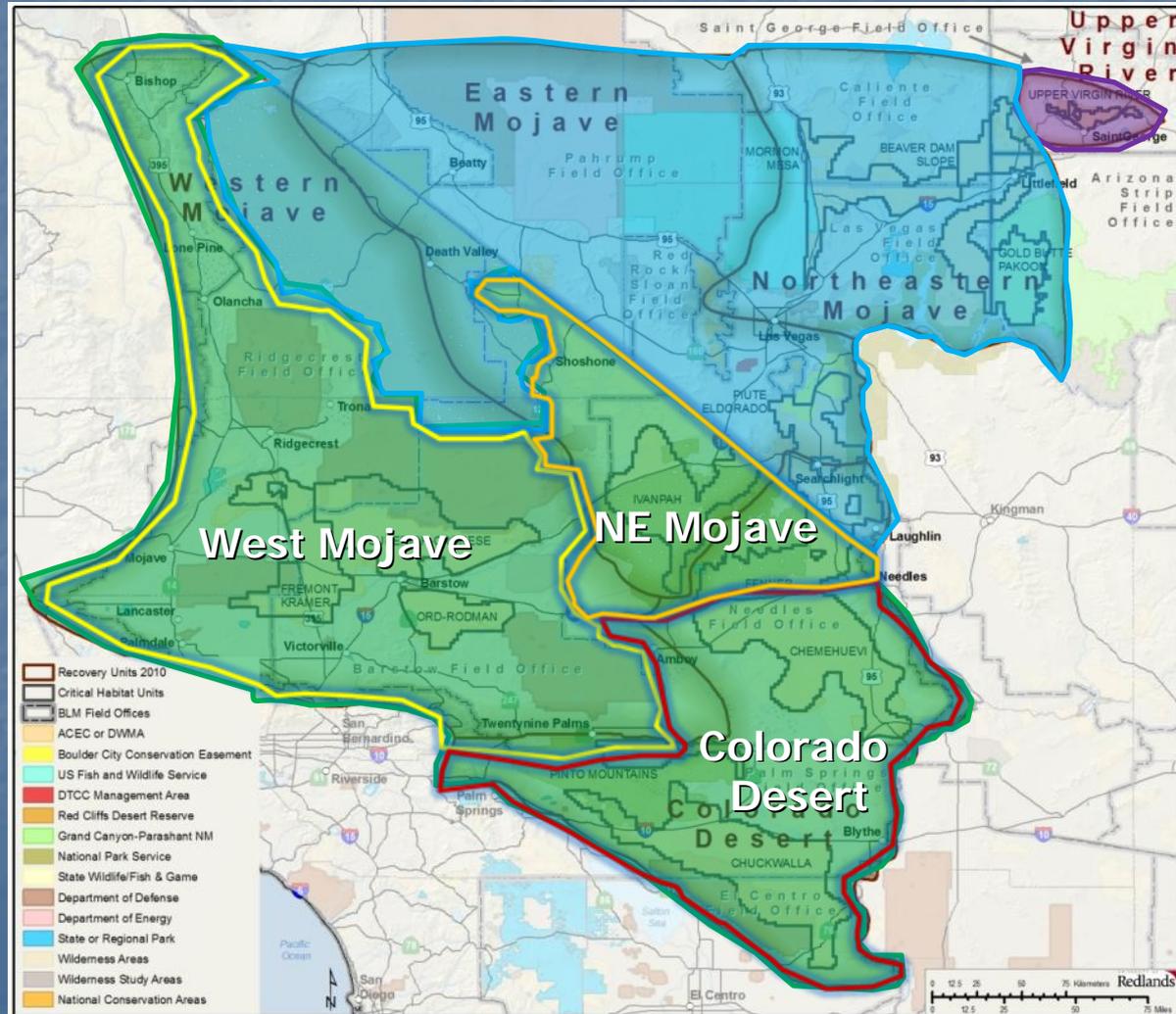
Create custom reports for any given extent (RIT area, DWMA, or user-drawn area)

Tabs for modeled layers

View full metadata record for each data layer

Partnerships

Regional Recovery Implementation Teams (RIT)





Desert Tortoise Information & Education



- Media field day at The Living Desert
- Classroom education with tortoise education "trunks"





Television and radio PSAs



DesertTortoise.gov :: Video PSAs

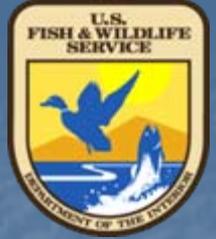


-  Military and the Desert Tortoise
-  Fragile Environments
-  Canines
-  Balloons



Mojave Max Contest

Partnership with The Living Desert





Brochures & Posters



YOU'RE IN DESERT TORTOISE COUNTRY

RESPECT - PROTECT - ENJOY



that
the
g to
and in
the
ly
id
near
sh
ght
ed.
thru-
publ-
y Ed-
contact
ow

• LEAVE THEM ALONE!

It is against the law to touch, harm, harass or collect a wild desert tortoise. When alarmed, tortoises void their bladders and waste particles stored inside—a reaction that can prove fatal for tortoises unable to replenish the supply. Stay at least 10 feet away from any tortoise you spot and keep dogs leashed at all times.

• STAY ON DESIGNATED ROADS AND TRAILS.

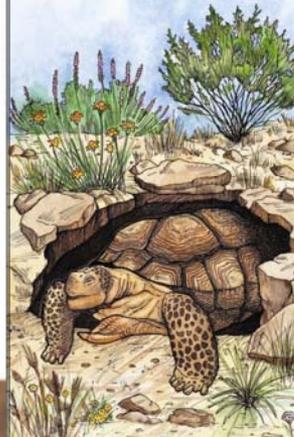
Don't drive, bike or walk off trails or roads except in designated "Open Areas." Cross-country travel through sandflats and other desert habitat can crush tortoise burrows, burying the occupants underground or stranding tortoises on the surface when they are vulnerable to predators and deadly temperatures extremes.

• WATCH FOR TORTOISES ON ROADS AND TRAILS.

Desert tortoises readily cross roads and trails, but the downy-necked species is no match for bikes, cars, trucks and off-highway vehicles. Be alert and proceed with caution.

BUILDERS GUIDE

*one desert
one tortoise
one chance*



Desert Tortoise *Gopherus agassizii*



The tortoise is a quiet, gentle creature who has walked the earth for millions of years.

What you can do

- Stay on established trails, keep dogs on leash, and keep OHV travel to designated routes.
- Don't pick up or disturb tortoises that you find in the wild.
- Never release a pet tortoise into the wild.
- To adopt or place a tortoise contact a local California Turtle and Tortoise Club or an animal rescue group.
- Pack out garbage and place into covered trash containers.

Learn

Tortoise Trunks are environmental education kits that provide teachers and students with an assortment of materials and classroom lessons. Trunks available for grades 3-4 and 5-6. Contact us to check out these kits.

For more information

www.deserttortoise.gov or www.livingdesert.org

Mojave Max Emergence Contest

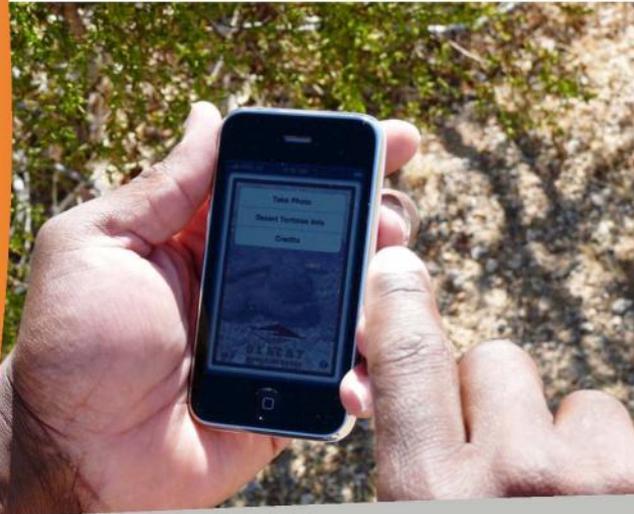
www.mojavemax.com



iPhone App



Supporting government agencies
through geospatial solutions



OVERVIEW:

Tortoise
Version 1.0
iPhone App



Mojave Desert
Ecosystem Program

www.mojavedata.gov

2701 Barstow Rd.
Barstow, CA
92308

760.252.6160

Goal:

To take key government environmental issues and present them in a mobile platform resulting in both education and data exchange through crowdsourcing.

Online Model and Data Explorers



http://www.spatial.redlands.edu/dtro/threat/7id=4

Google Reader (50) Personal Redlands Institute Finances ESRI Shopping News Tools Add to Wish List

Desert Tortoise Recovery Resource Site

home data explorer threat reports about contact

Quick threat selector

Navigate through

Threat: Mineral Development (A.8.)

Threat
Mineral Development (A.8.) Exploring for, developing, and producing minerals and rocks, and semi-metals, minerals, sand and gravel, coal etc.

Recovery Actions

Protect intact desert tortoise habitat (2.1)	Withdraw mining (2.12)	Restore Habitat (2.6)
--	------------------------	-----------------------

Corollary Threats

Surface disturbance (A.1.)	Toxicants (C.2.)	Unpaved Roads (A.2.)
----------------------------	------------------	----------------------

Stresses

Habitat Loss	Crushing	Population fragmentation
--------------	----------	--------------------------

http://www.spatial.redlands.edu/dtrde/Default.aspx

Welcome nathan_strout | logout | disclaimer | v0.968

Desert Tortoise Recovery Data Explorer

University of Redlands

Topo Satellite Go to Bookmark Select a layer to add

Critical Habitat and Recovery Units

- Desert Tortoise Critical Habitat Units
- Grazing Allotment Status
- Grazing Allotment Status

Legend

- Desert Tortoise Critical Habitat Units
- Grazing Allotment Status
 - Open and active
 - Open seasonally
 - Open and inactive

ESRI



New Direction for Education Program



- Expanded partnership with The Living Desert
- New partnership with San Diego Zoo

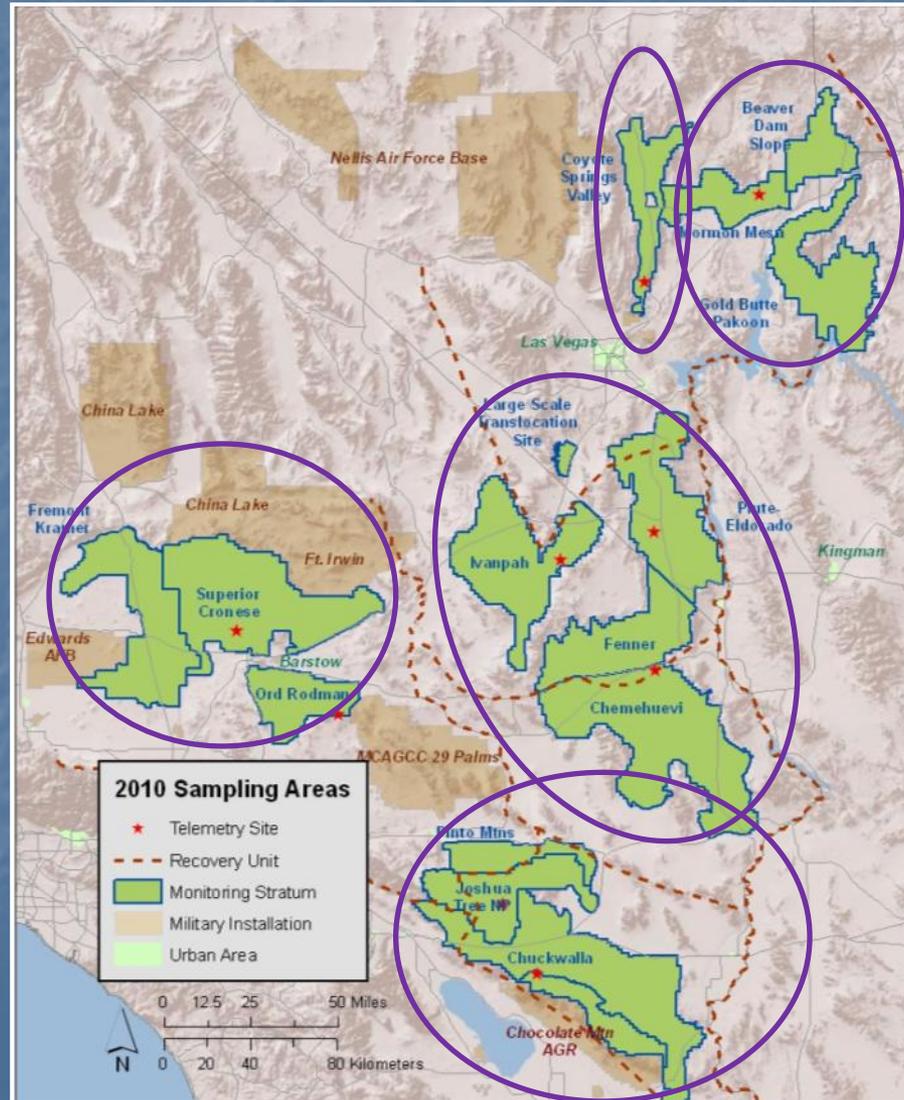




Range-wide Monitoring



- 2001-05 Report
- 2007 Report
- 2008-09 Report
- 2010 Report



Monitoring Funding

\$Thousands



	2007	2008	2009	2010	2011
DOD					
Ft. Irwin	208	208	208	250	300
Edwards AFB			45		
Choc Mtn AGR	42.3	?	?	39	
BLM					
Arizona Strip	2.5		16	40	20
CA Desert District	54.8			150	(75)
NPS					
Joshua Tree	10		32.4	20	
Grand Cyn Parashant				15	15
FWS/SNPLMA	645	618.4	611.4	687.4	614.3
Total	\$ 962.6	\$ 826.4+	\$ 912.8+	\$ 1,201.4	

SE 1: Develop, Support, & Build Partnerships to Facilitate Recovery



- Establish Recovery Implementation Teams w/in 6 months
 - Agencies and stakeholders
 - Recovery-action plans
 - Emphasize collation of up-to-date information on threats and recovery implementation into the DSS and range-wide recovery database

SE 2: Protect Existing Populations and Habitat



- 1994 recovery actions appropriate (GAO 2002)
- Guidelines to be implemented according to land-use plans
 - Coordinated/prioritized with RITs
- Effectiveness needs to be better evaluated
- Focus recovery on habitat within *tortoise conservation areas*



Strategic Elements 3-5

- SE 3: Augment depleted populations through a strategic program
- SE 4: Monitor progress toward recovery
- SE 5: Conduct applied research and modeling in support of recovery efforts within a strategic framework

SE 6: Implement an Adaptive Management Program



- Revise and continue development of DSS
 - 1st year: update data for at least 2 RUs (all RUs within 2nd year)
 - 2nd year: Evaluate models
- Recovery action plans (w/in 1st year)
 - Report progress to MOG annually
- Science Advisory Committee

Recovery Criteria



U.S. Fish & Wildlife Service

Draft Revised Recovery Plan
for the Mojave Population
of the Desert Tortoise
(*Gopherus agassizii*)



1. Increasing populations over 25 years
2. Increasing distribution over 25 years
3. No net loss of habitat