

Recovery Implementation

Recovery Implementation Teams & Spatial Decision Support



Catherine Darst
Desert Tortoise Recovery Office



Recovery Implementation Teams

Purpose

- Create prioritized, science-based 5-Year Recovery Action Plans
- Track regional implementation of plans and threat reduction
- Examine correlations between management actions and tortoise recovery



Recovery Implementation Teams

Why?

The desert tortoise has a huge range which includes four states & crosses many jurisdictions

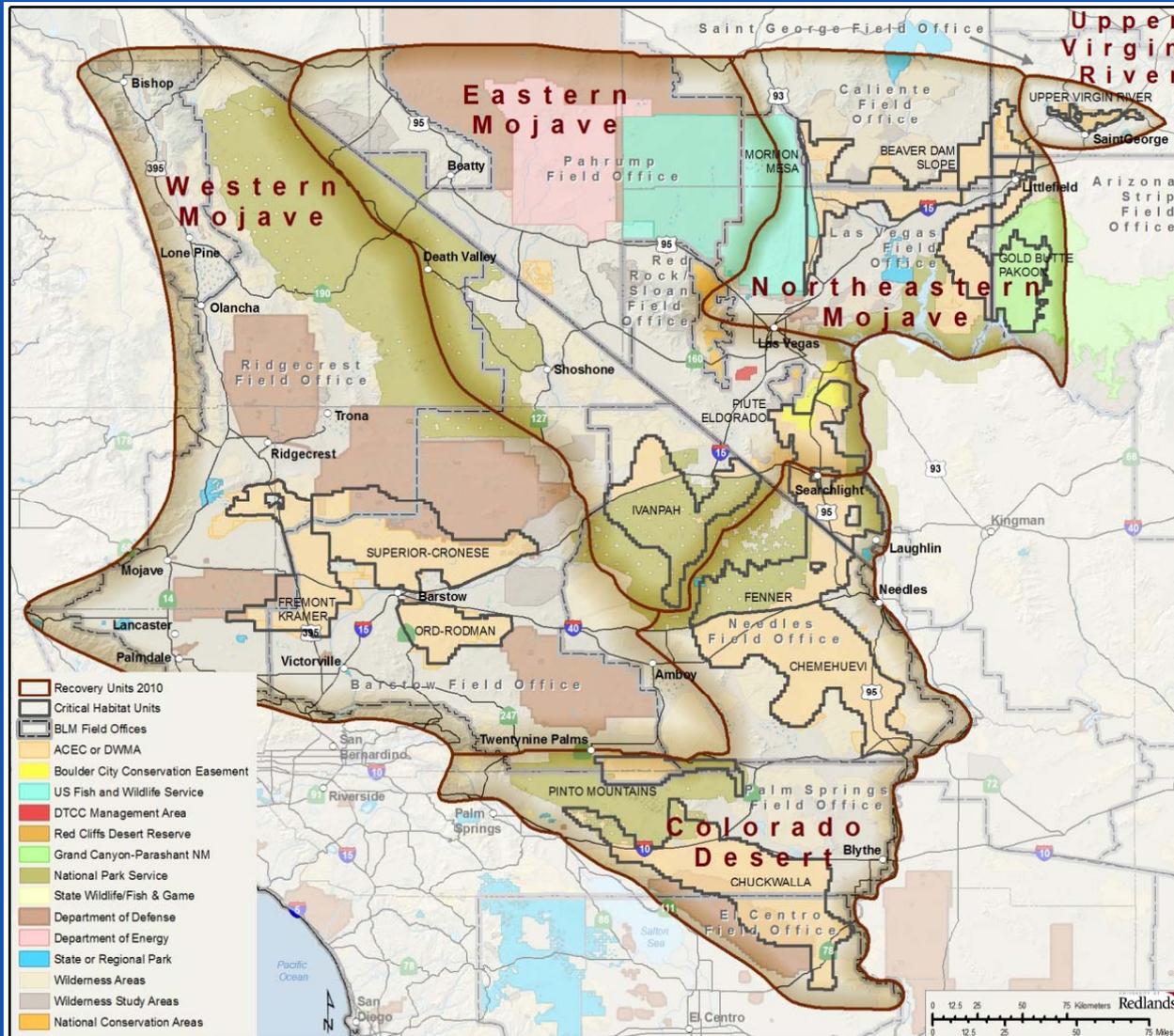
- We need a structure to coordinate this scale and diversity

DTRO is modeling and monitoring at the recovery unit scale

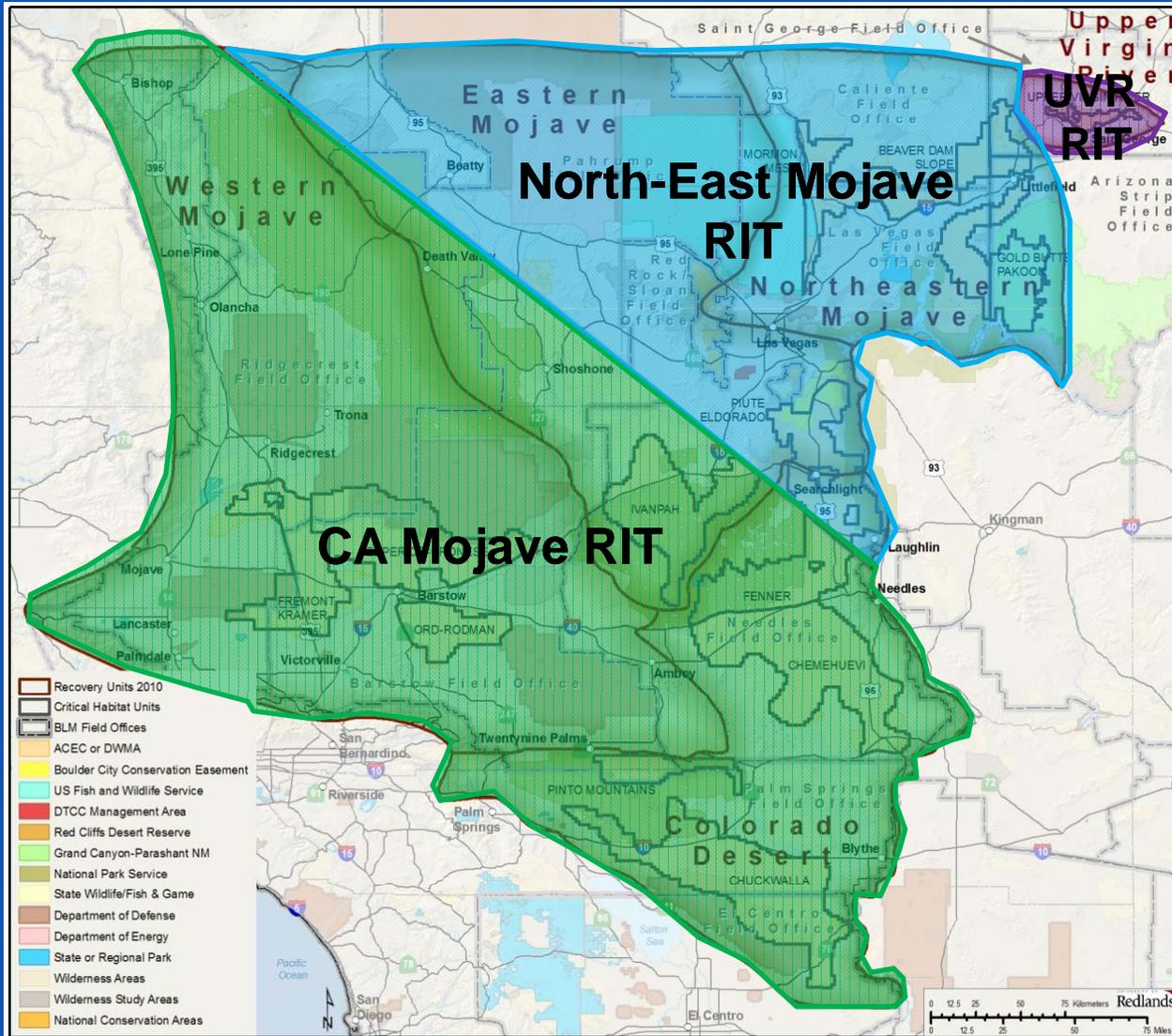
- We need your help with local-level information and implementation



Recovery Implementation Teams

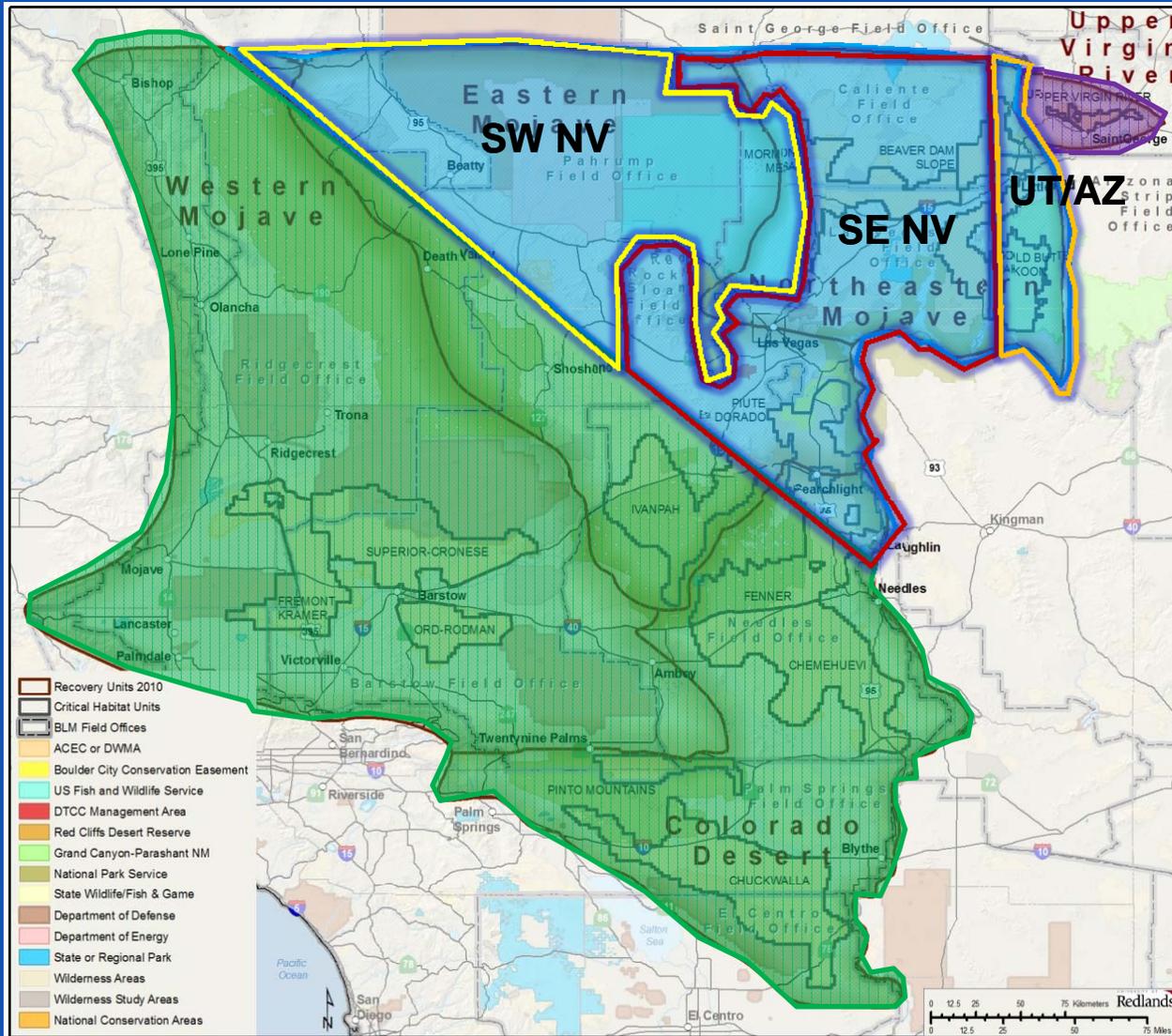


Recovery Implementation Teams



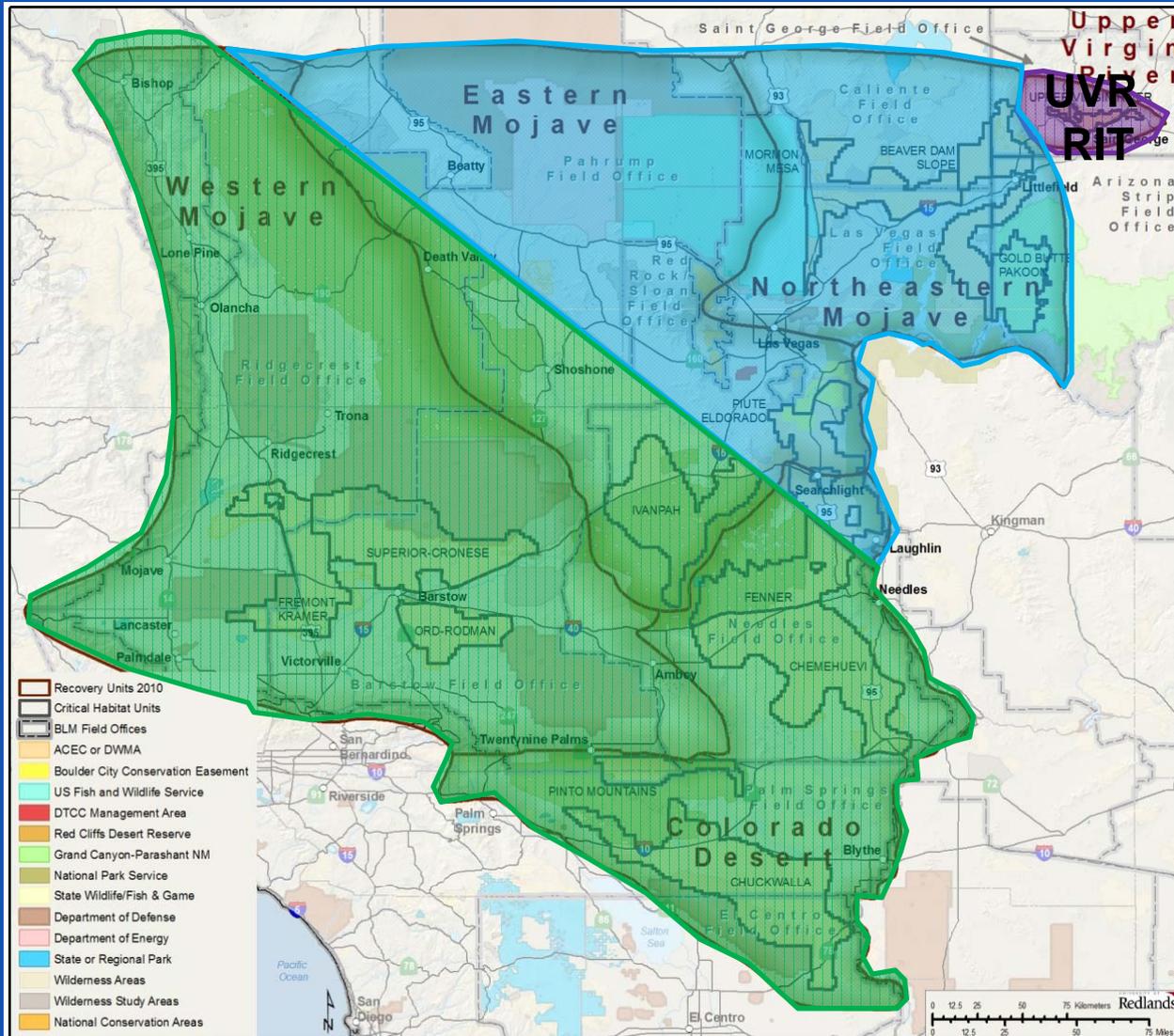
Recovery Implementation Teams

North-East Mojave RIT: Workgroups



Recovery Implementation Teams

Upper Virgin River RIT



Recovery Implementation Teams

Each workgroup will consist of ~8-15 individuals:

Agency representatives:

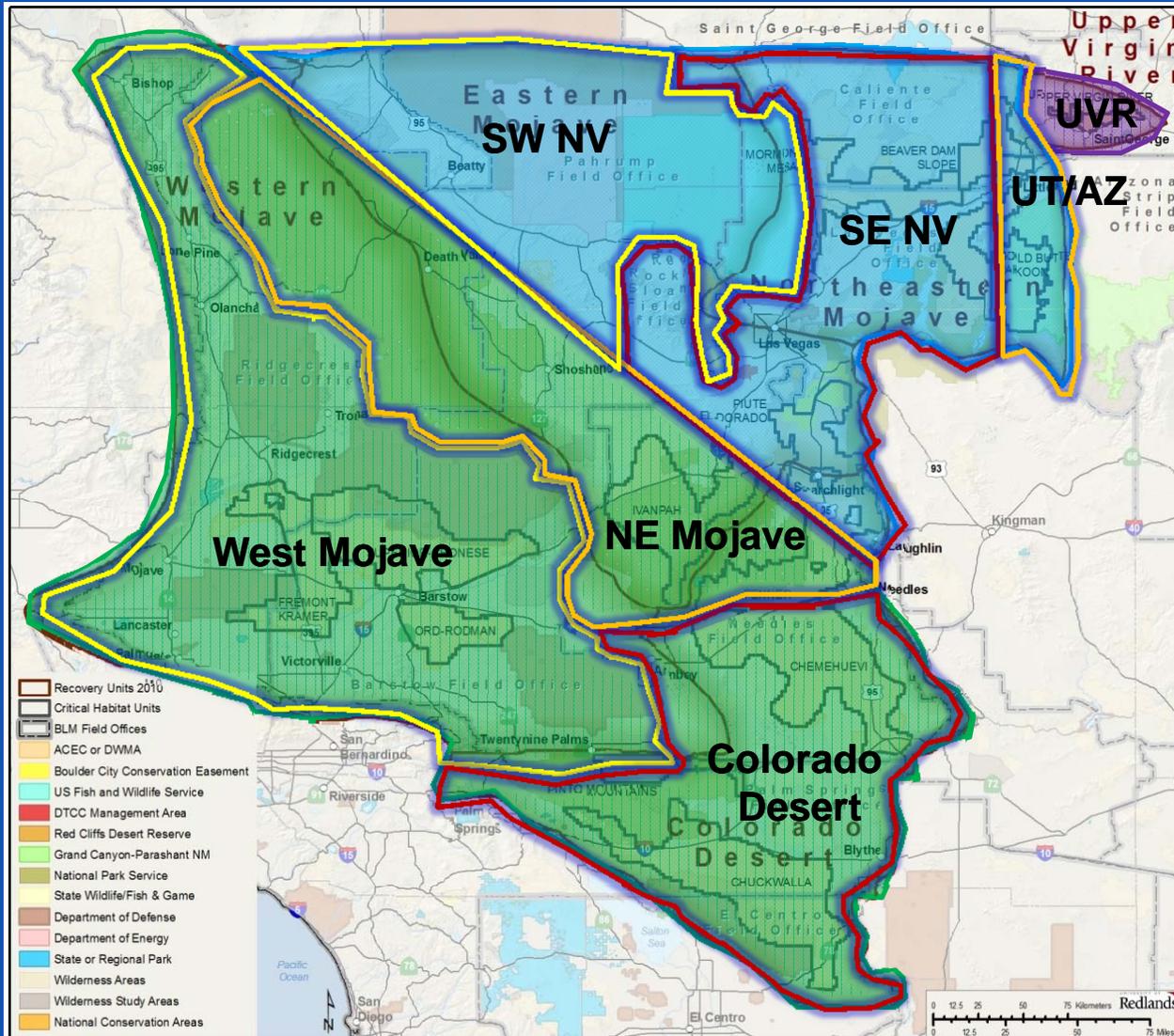
- land management
- wildlife management
- local government
- tribal resource agency

Stakeholder representatives:

- natural resources use group
- recreation group
- conservation organization
- scientific community

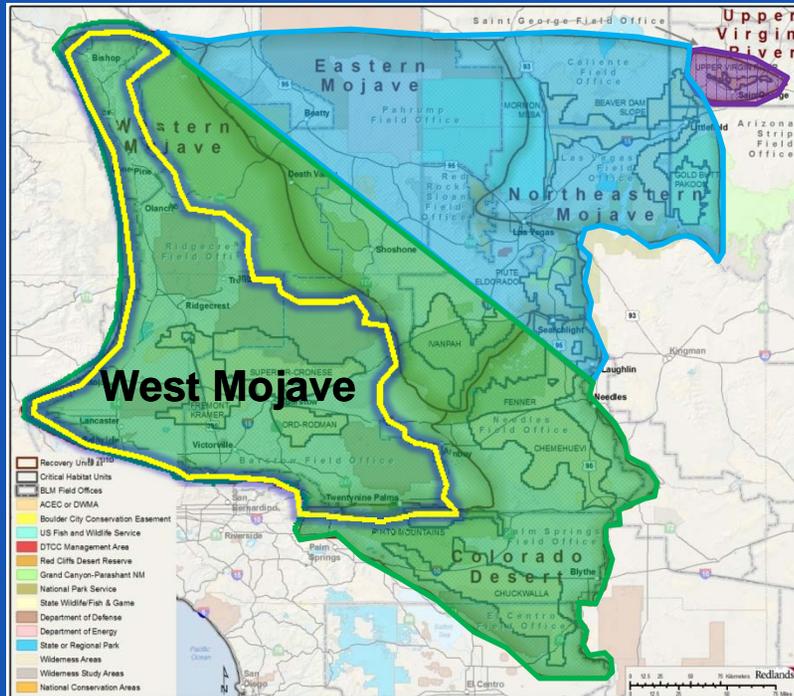


Recovery Implementation Teams



Recovery Implementation Teams

California Mojave RIT: Workgroups



West Mojave Workgroup

Agency Representatives

Land Management

- 1) BLM Barstow Field Office
- 2) BLM Ridgecrest Field Office
- 3) Edwards Air Force Base
- 4) Fort Irwin National Training Center
- 5) Twenty-Nine Palms MCAGCC
- 6) China Lake NAWS
- 7) Marine Corps Logistics Base Barstow

Wildlife Management

- 8) FWS Ventura Field Office
- 9) CDFG Inland Desert Region

County Government

- 10) San Bernardino County
- 11) Kern County
- 12) Inyo County

Tribes

- 13) Center for CA Native Nations

Stakeholder Representatives

Natural Resources

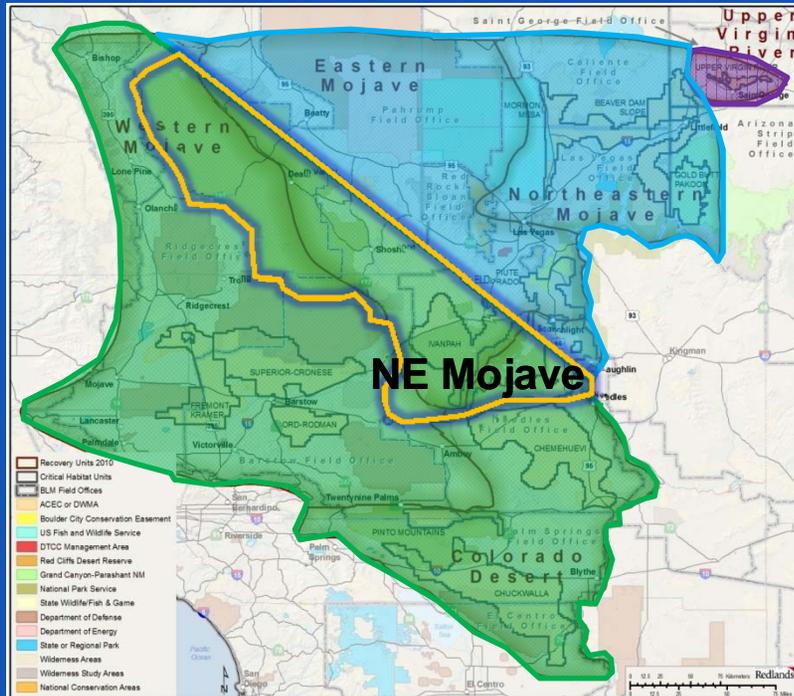
Recreation

Conservation Organization

Conservation Biology

Recovery Implementation Teams

California Mojave RIT: Workgroups



NE Mojave

Agency Representatives

Land Management

- 1) BLM Barstow Field Office
- 2) BLM Needles Field Office
- 3) NPS Mojave National Preserve
- 4) NPS Death Valley National Park

Wildlife Management

- 5) FWS Ventura Field Office
- 6) CDFG Inland Desert Region

County Government

- 7) San Bernardino County
- 8) Inyo County

Tribes

- 9) Timbisha Shoshone Tribe

Stakeholder Representatives

Natural Resources

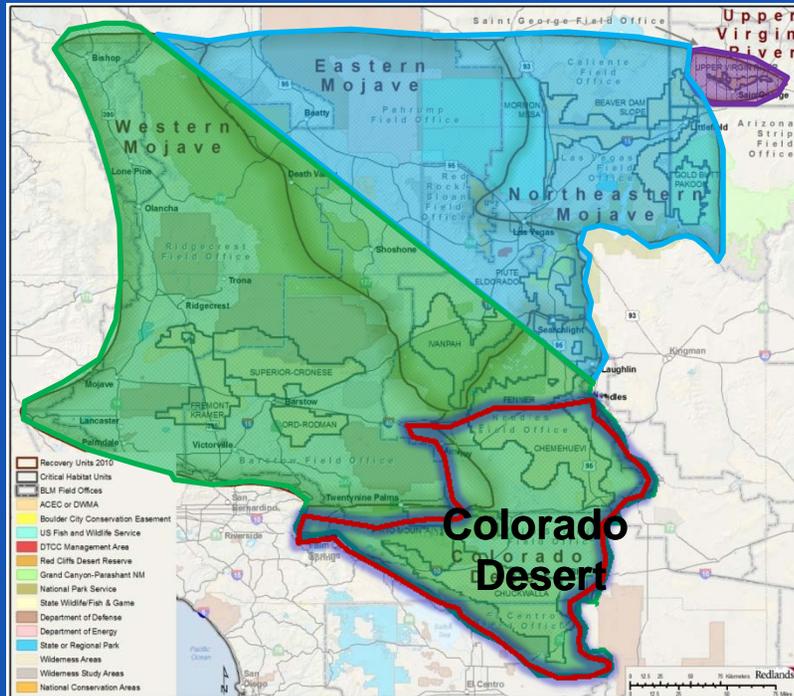
Recreation

Conservation Organization

Conservation Biology

Recovery Implementation Teams

California Mojave RIT: Workgroups



Colorado Desert

Agency Representatives

Land Management

- 1) BLM Palm Springs Field Office
- 2) BLM Needles Field Office
- 3) NPS Joshua Tree National Park
- 4) Chocolate Mountains AGR

Wildlife Management

- 5) FWS Carlsbad Field Office
- 6) CDFG, Inland Desert Region

County Government

- 7) Riverside County
- 8) Imperial County

Tribes

- 9) 29Palms Band of Mission Indians
- 10) Chemehuevi Indian Tribe

Stakeholder Representatives

Natural Resources

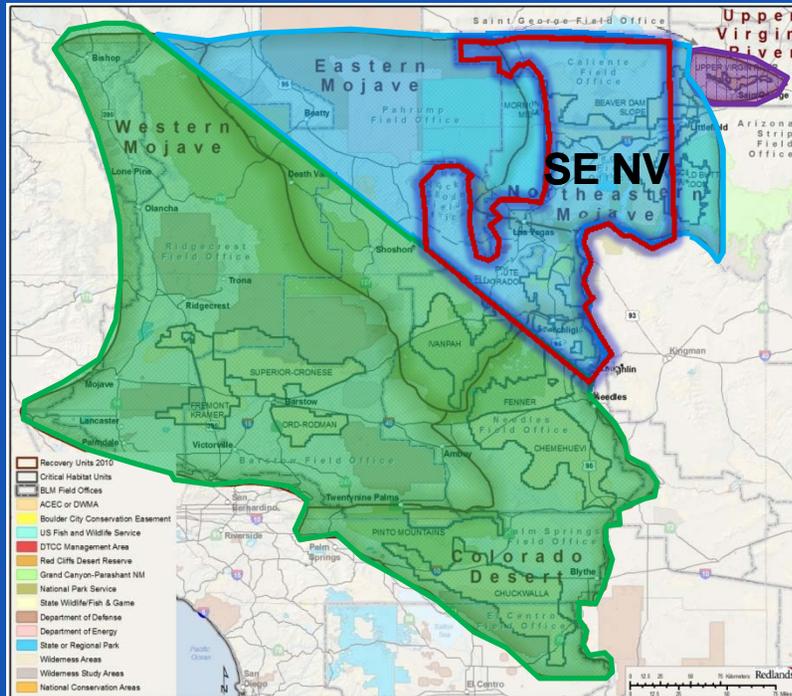
Recreation

Conservation Organization

Conservation Biology

Recovery Implementation Teams

North-East Mojave RIT: Workgroups



SE NV workgroup

Agency Representatives

Land Management

- 1) BLM Las Vegas Field Office
- 2) BLM Caliente Field Office
- 3) NPS Lake Mead NRA

Wildlife Management

- 4) FWS Las Vegas Field Office
- 5) Nevada Department of Wildlife

County/Local Government

- 6) Clark County
- 7) Lincoln County

Tribes

- 9) Las Vegas Piute
- 10) Moapa Piute

Stakeholder Representatives

Natural Resources

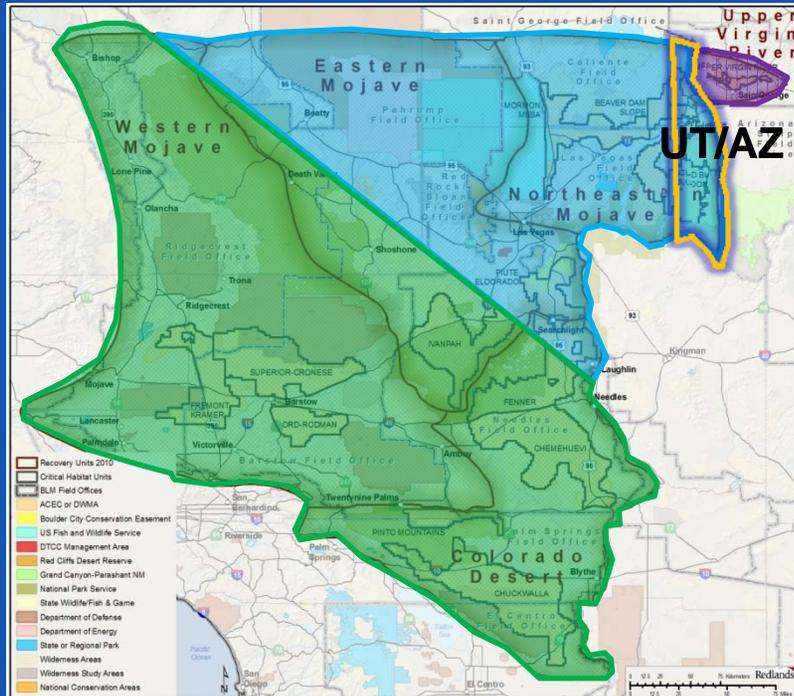
Recreation

Conservation Organization

Conservation Biology

Recovery Implementation Teams

North-East Mojave RIT: Workgroups



UT/AZ workgroup

Agency Representatives

Land Management

- 1) BLM AZ Strip/Grand Canyon Parashant
- 2) BLM Saint George

Wildlife Management

- 3) FWS Arizona Ecological Services
- 4) FWS Salt Lake City
- 5) Utah Division of Wildlife Resources
- 6) Arizona Game and Fish Department

County/Local Government

- 7) Washington County
- 8) Mohave County

Tribes

- 9) Kaibab Band of the Paiute
- 10) Shivwits Paiute

Stakeholder Representatives

Natural Resources

Recreation

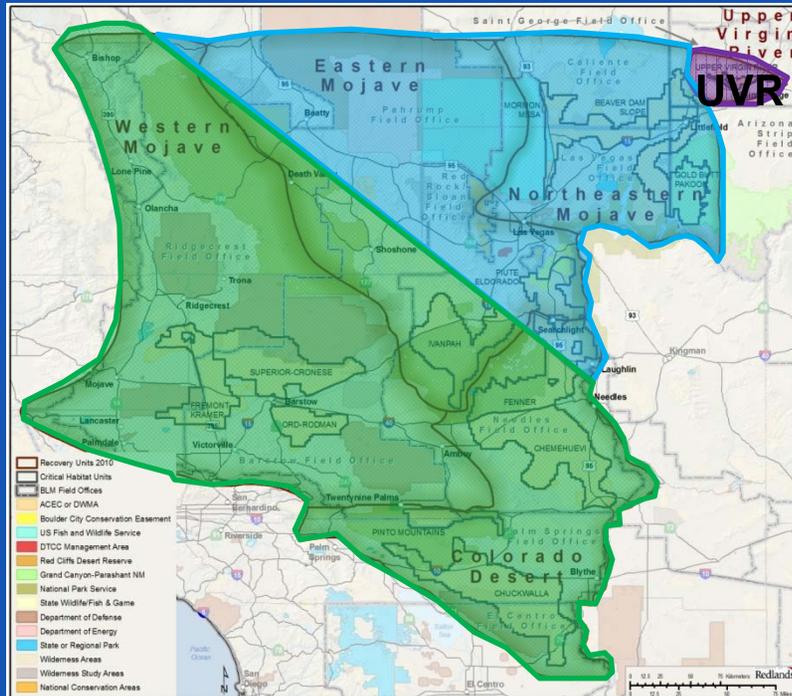
Conservation Organization

Conservation Biology

Recovery Implementation Teams

Upper Virgin River RIT

*Can function as part of existing HCP
Technical Team*



Upper Virgin River RIT

Agency Representatives

Land Management

- 1) BLM Dixie Resource Area
- 2) Snow Canyon State Park
- 3) Utah Department of Natural Resources

Wildlife Management

- 4) FWS Salt Lake City
- 5) Utah Division of Wildlife Resources

County/Local Government

- 6) Washington County
- 7) City of St. George

Stakeholder Representatives

Natural Resources/Local Development

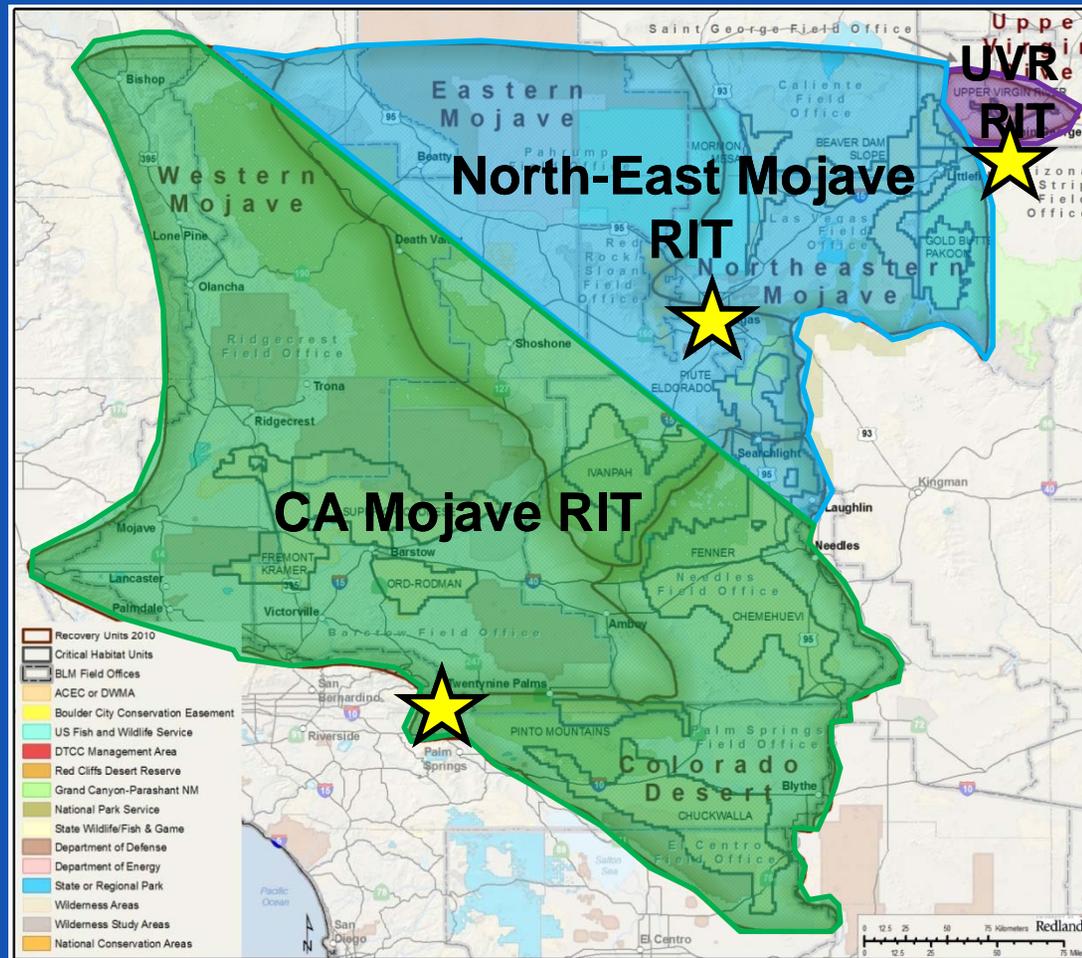
Recreation

Conservation Organization

Conservation Biology

Recovery Implementation Teams

Potential Meeting Locations



Recovery Implementation Teams

Expectations for RIT meeting outcomes

Prioritized 5-Year Recovery Action Plan to guide budget requests and implementation within RIT workgroup area

Expect ~1 to 1.5 years to get from planning to implementation



Recovery Implementation Teams

Expectations for RIT meeting outcomes

Prioritized 5-Year Recovery Action Plan to guide budget requests and implementation within RIT workgroup area

Meeting 1:

- Education about RIT process and decision-support system
- Practice using the system, create preliminary threats assessment for workgroup area
- Suggestions for model and data revision
- Plan to get better info/data and reconvene with revisions



Recovery Implementation Teams

Expectations for RIT meeting outcomes

Prioritized 5-Year Recovery Action Plan to guide budget requests and implementation within RIT workgroup area

Meeting 2: (3-4 months after 1st meeting)

- Presentation of model/data revision
- Better threats assessment using best available info
- Development of preliminary 5-year action plan for budget process
- Preliminary 5-Year Action Plan for manager and/or organization feedback



Recovery Implementation Teams

Expectations for RIT meeting outcomes

Prioritized 5-Year Recovery Action Plan to guide budget requests and implementation within RIT workgroup area

Meeting 3: (6 months later)

- Discussion of manager/organization feedback on preliminary plans
- Full threats assessment and development of 5-year action plan
- Begin to coordinate implementation of action plan through the development of annual work plans



Recovery Implementation Teams

Expectations for RIT meeting outcomes

Prioritized 5-Year Recovery Action Plan to guide budget requests and implementation within RIT workgroup area

Meeting 4: (6 more months later)

- Review utility of draft plan in implementation process
- Continue to coordinate implementation of annual work plans
- Begin to assess implementation and effectiveness
- Develop reporting of RIT's accomplishments to date

RITs now meet twice a year with goals to report, re-evaluate, and re-run; report, re-evaluate, and re-run...



Recovery Implementation Teams

Terms of Service

- Members will be appointed by the FWS RD based on demonstrated interest/participation in recovery planning process; others will be considered upon request. Stakeholder reps appointed by FWS are encouraged to coordinate among their interest groups.
- RIT members will be asked to commit to 5 years. Members may be reappointed to the team upon completion of their term.
- A RIT chair will be nominated by the RIT to serve one-year, will work with DTRO to ensure performance and reporting; each workgroup will also have a lead who reports to the RIT chair.



Recovery Implementation Teams

Role of DTRO in RITs

- Act as liaison between the RIT and the FWS RD, Desert Tortoise Management Oversight Group, Science Advisory Committee, and appropriate regional groups
- Provide guidance, coordination, and facilitation for completing RIT products
- Supply staff and technical support



Recovery Implementation Teams

On-line RIT Resources

For RIT members with interests in more than one workgroup and for non-members who would like to provide input to the RIT process

- Secure sharepoint for RIT members only at deserttortoise.gov. Will provide access to documents and a venue to provide feedback and make progress between RIT meetings
- Model and data explorer sites
- Publicly-available RIT information page at deserttortoise.gov for posting RIT products and soliciting feedback
- Announcements of when RITs will report out on progress



Recovery Implementation Teams

- Create prioritized 5-Year Recovery Action Plans
- Track implementation and threat reduction
- Examine correlations between management actions and tortoise recovery

TOOL: Spatial Decision Support System

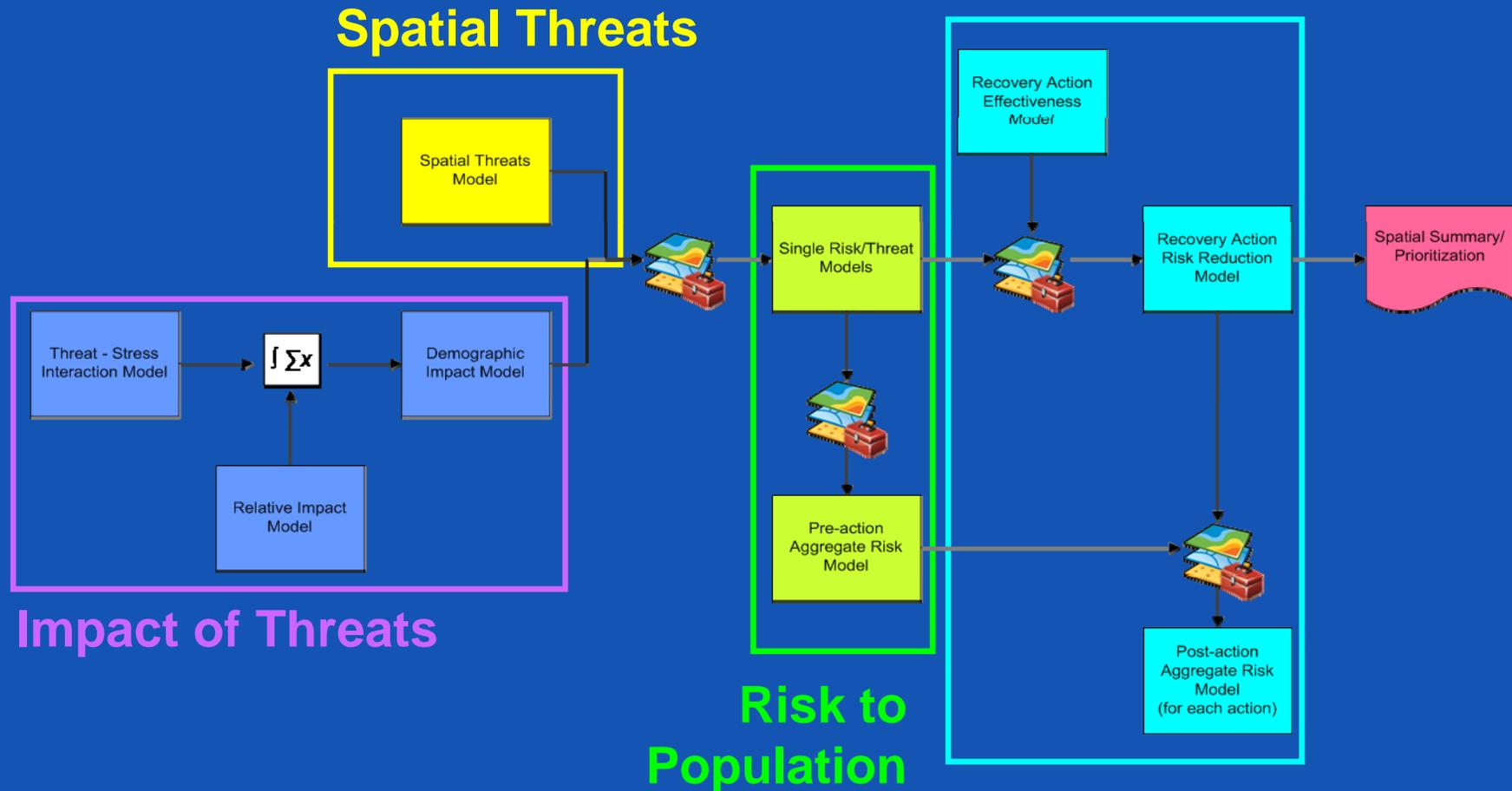
Model-based approach to characterize, assess, and prioritize recovery efforts

Range-wide tracking and reporting on recovery actions and progress

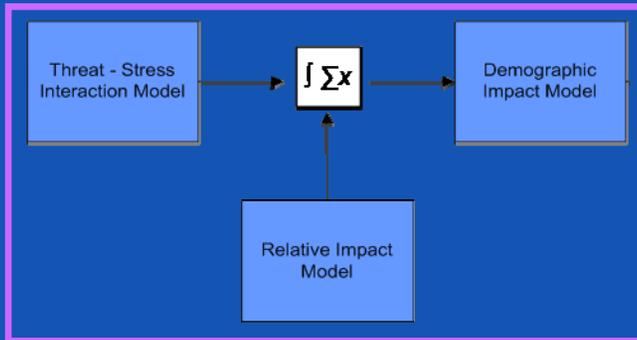
Spatial Decision Support System

Evaluates effects of different management actions for desert tortoise recovery

Action Effectiveness



Spatial Decision Support System

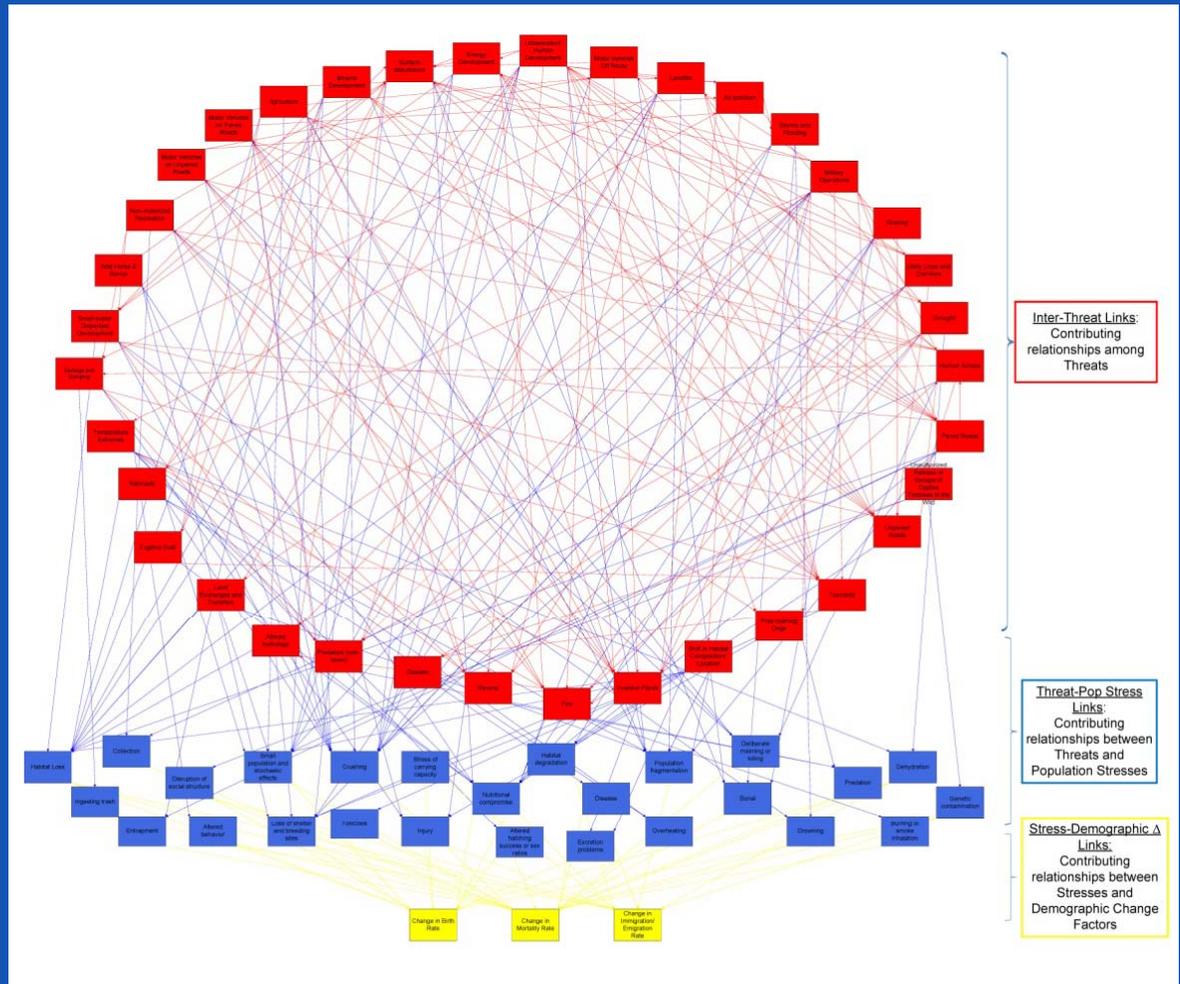


Impact of Threats

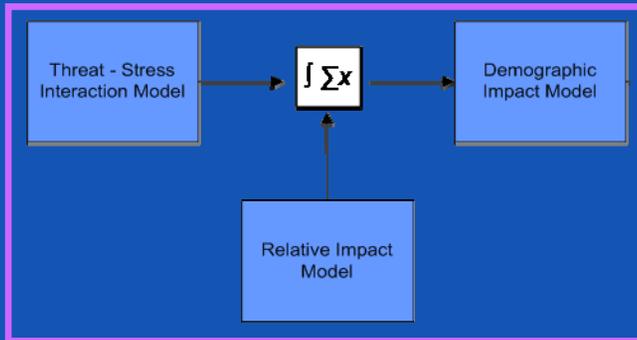
Utilizes Salafsky et al. 2008 lexicon for biodiversity conservation

Every link is defined with citations as available

Estimates the contribution of each individual threat to tortoise decline

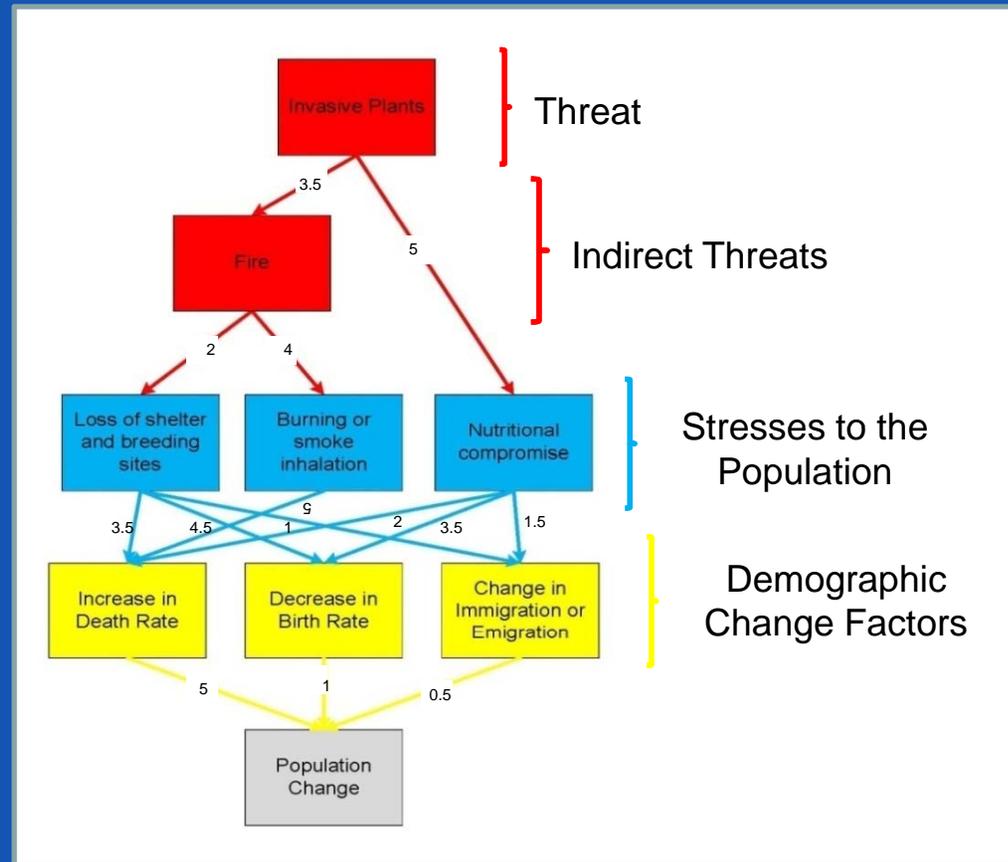


Spatial Decision Support System



Impact of Threats

Estimates the contribution of each individual threat to tortoise decline

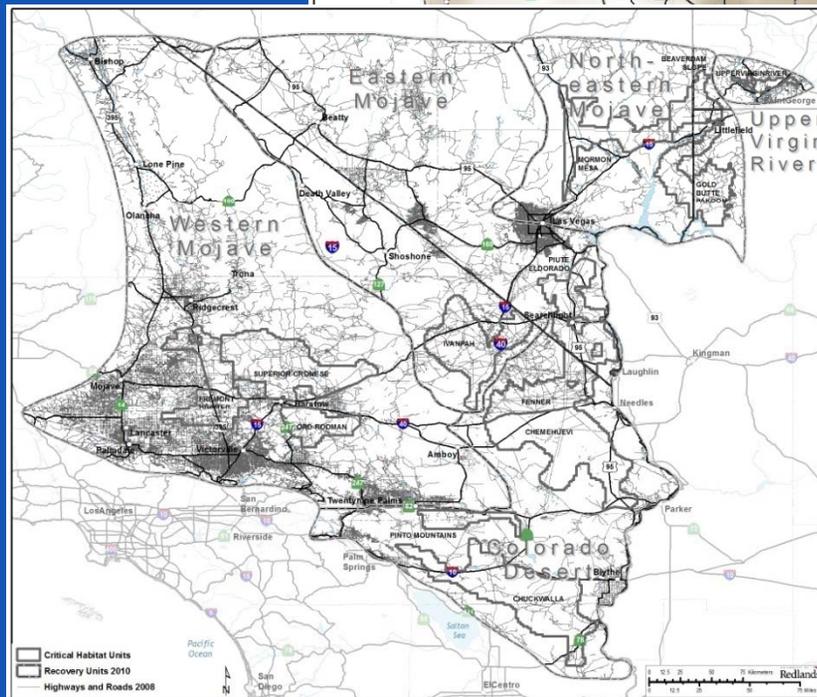


Utilizes expert assessments to quantify the relative strength of relationships between threats and population demographic change factors

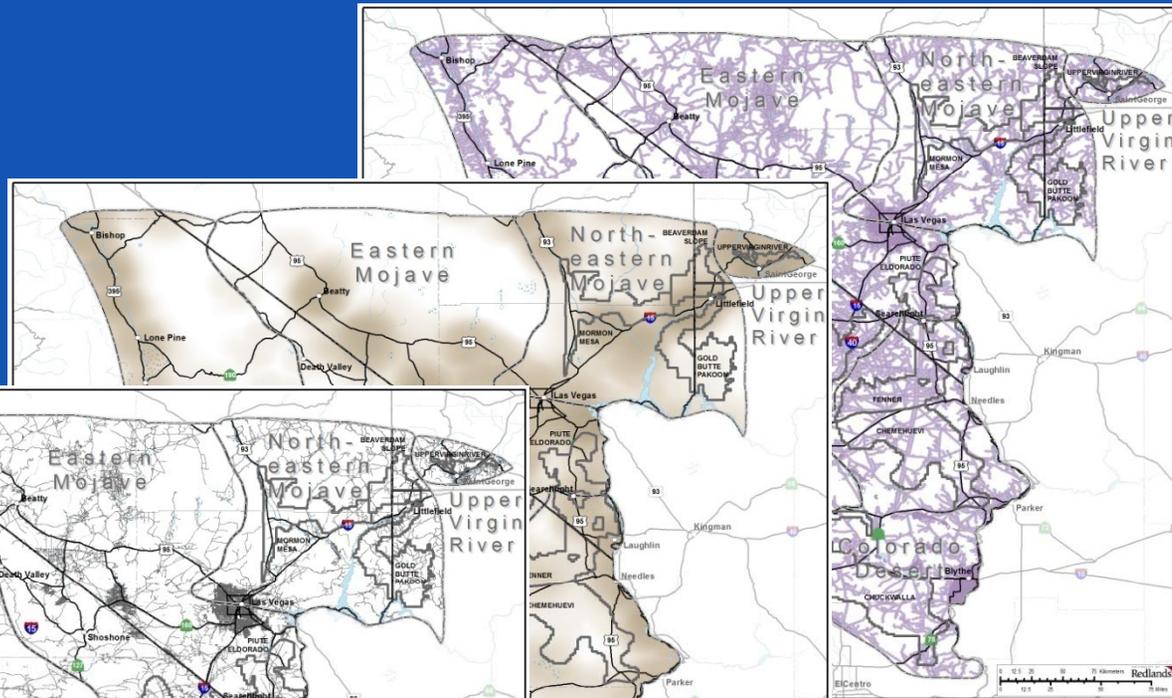
Spatial Decision Support System

Spatial Threats

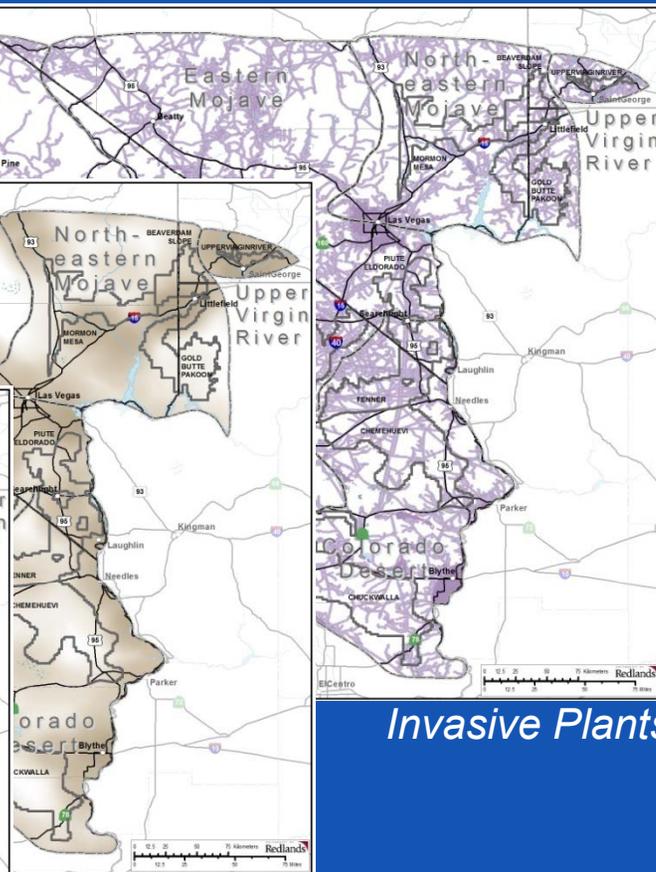
Spatial Threats Model



Roads



Invasive Plants



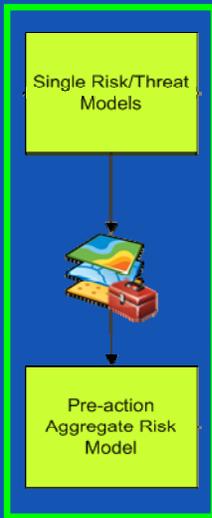
Ravens

Locations of threats to desert tortoise

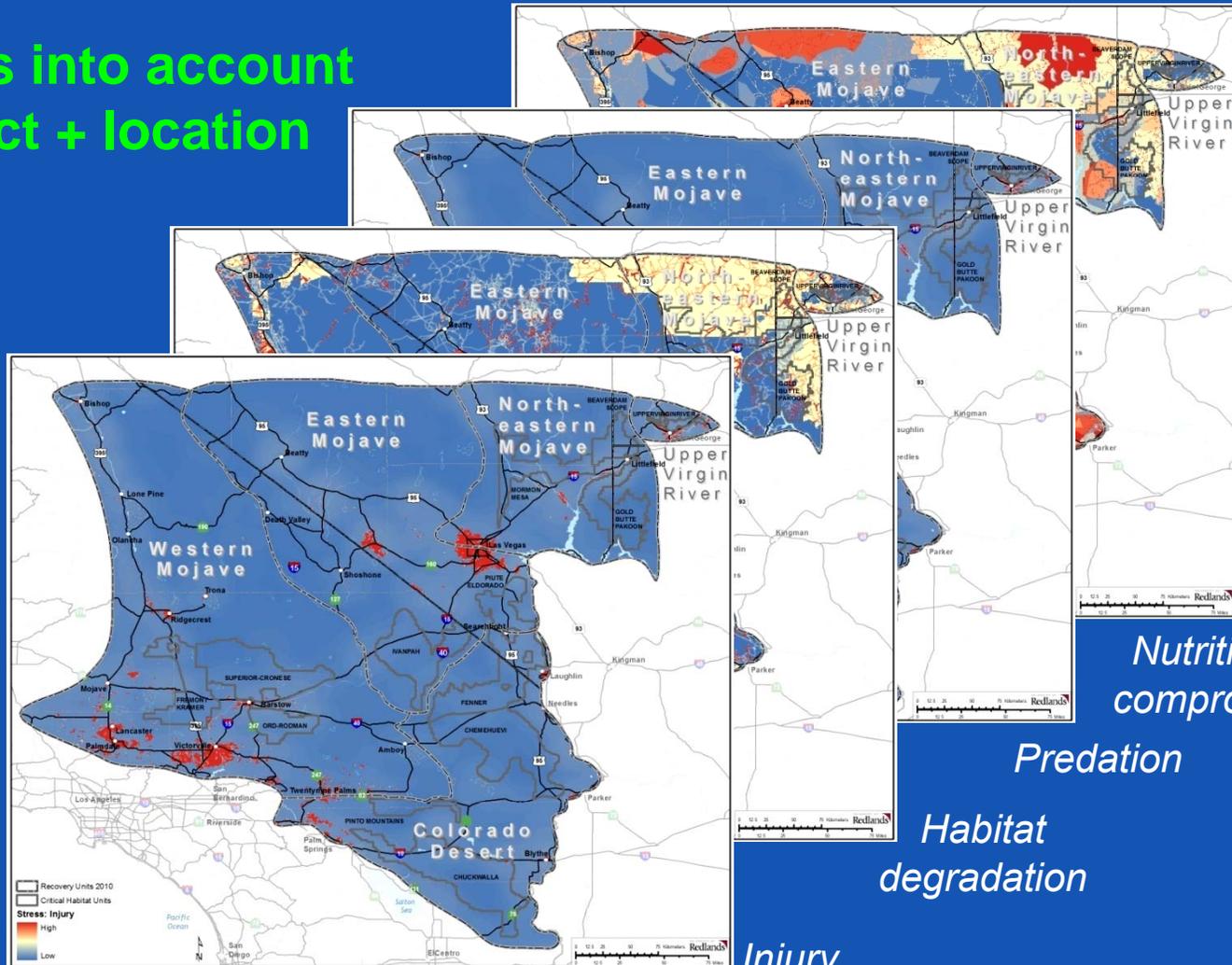


Spatial Decision Support System

Takes into account
impact + location



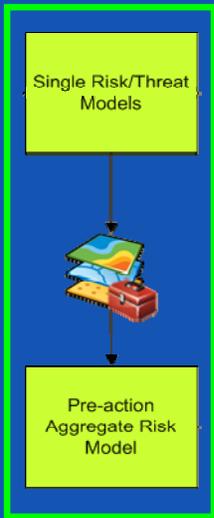
Risk to
Population



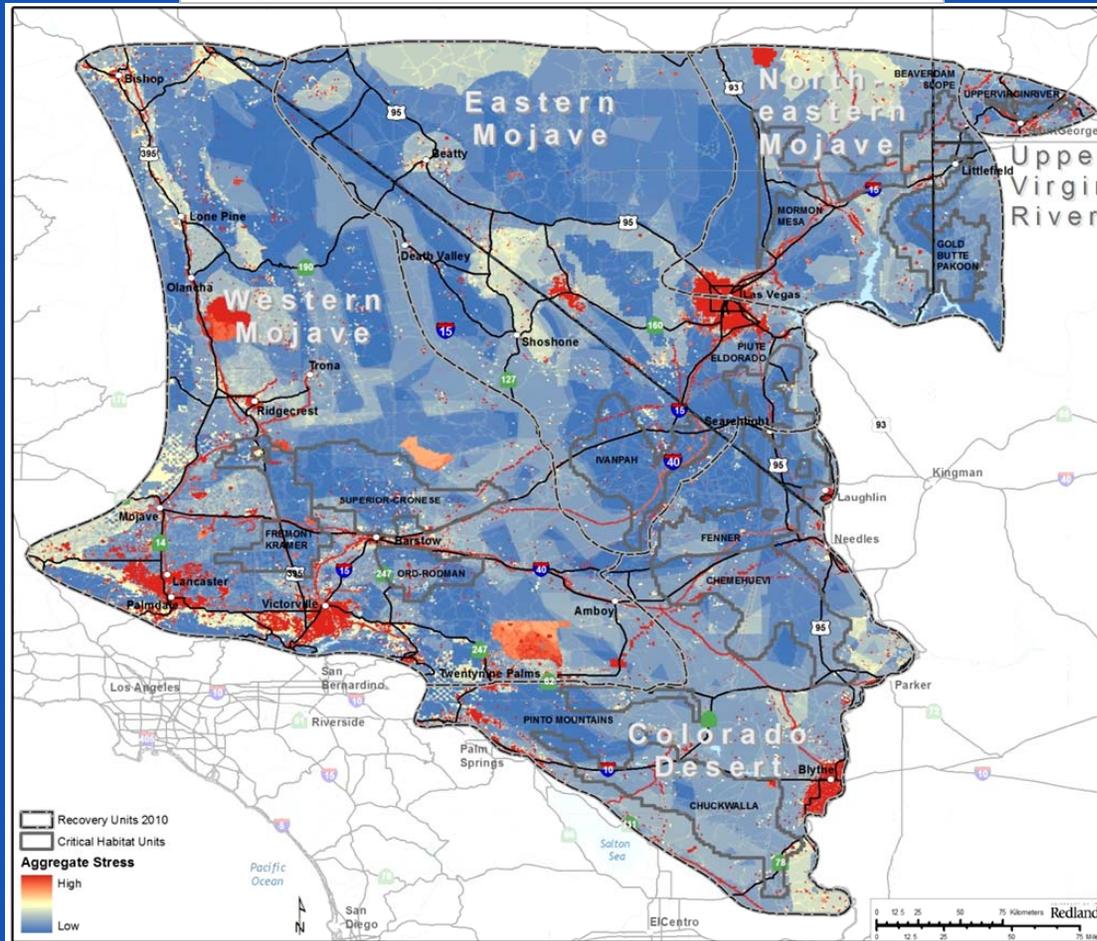
Spatial contribution of each stress to tortoise decline = risk to the tortoise

Spatial Decision Support System

Aggregate Risk to the Tortoise



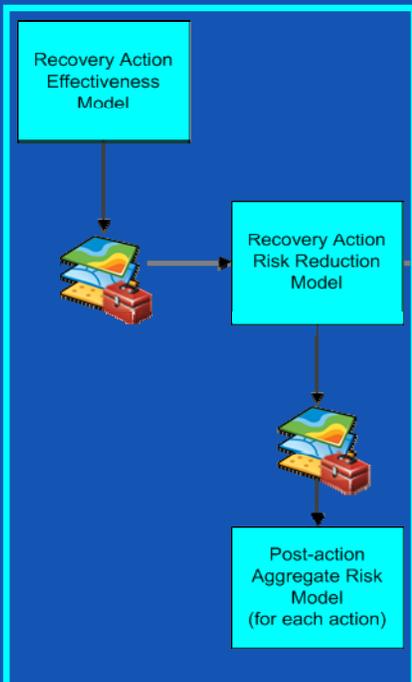
Risk to Population



Aggregate contribution from all threats and stresses to tortoise decline

Spatial Decision Support System

Action Effectiveness



Takes into account how individual recovery actions effect threat–stress links

Recovery Action/ Threat–Stress	Mortality– Disease	Habitat degrad–OHV	Collection– Human access	Nutritional comp–Grazing
Close Roads	1.1	4.6	3.25	0
Connect Habitat	1.7	0	0	0
Environmental Education	2.5	3.5	3.9	0
Control Ravens	0	0	0	0
Close allotments	0	0	0	4.8
Increase Law enforcement	0	4.9	3.3	0
Revegetation	0.8	3	0	0.5

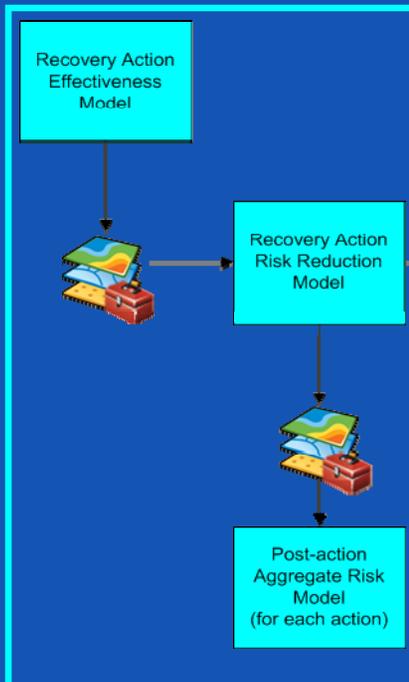
Utilizes expert assessments of threat–stress and action relationships on a scale of 0 (none) to 5 (high)



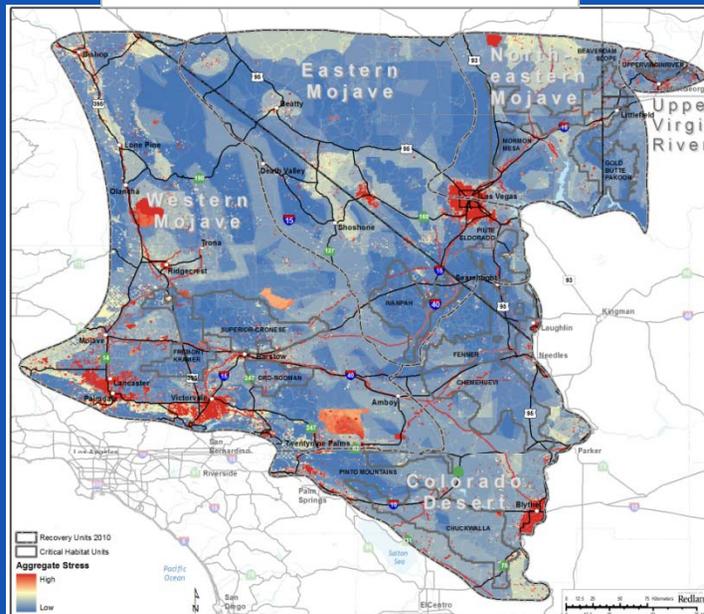
Spatial Decision Support System

Action Effectiveness

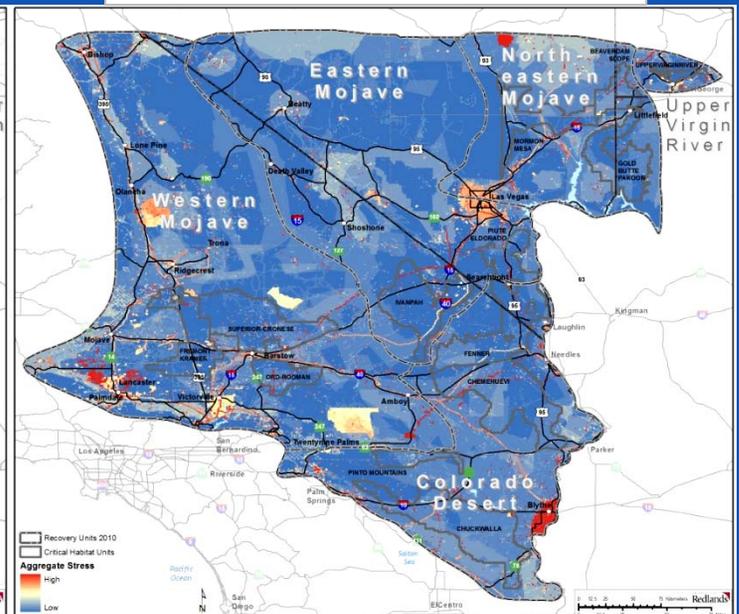
Takes into account how individual recovery actions effect threat–stress links



Aggregate Risk to the Tortoise



Remaining Risk after Remove-all-Predators Action



Post-action population stress severity (risk to the tortoise) as a result of the hypothetical action of removing all tortoise predators

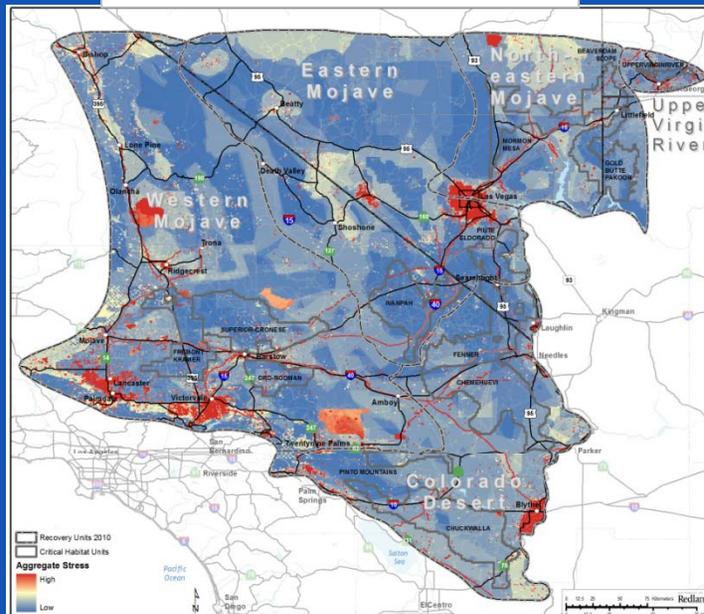
Spatial Decision Support System

Spatial Summary/
Prioritization

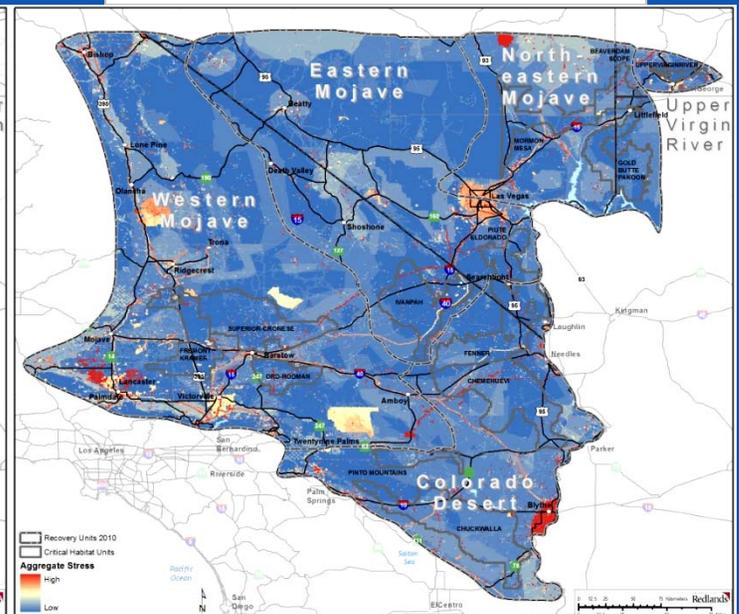
Compares remaining threat severity
across recovery actions

Extent of
threat after
actions

Aggregate Risk to the Tortoise



Remaining Risk after Remove-all-Predators Action



After remove-all-predators action, Δ risk to the tortoise = +464,000

Spatial Decision Support System

Spatial Summary/
Prioritization

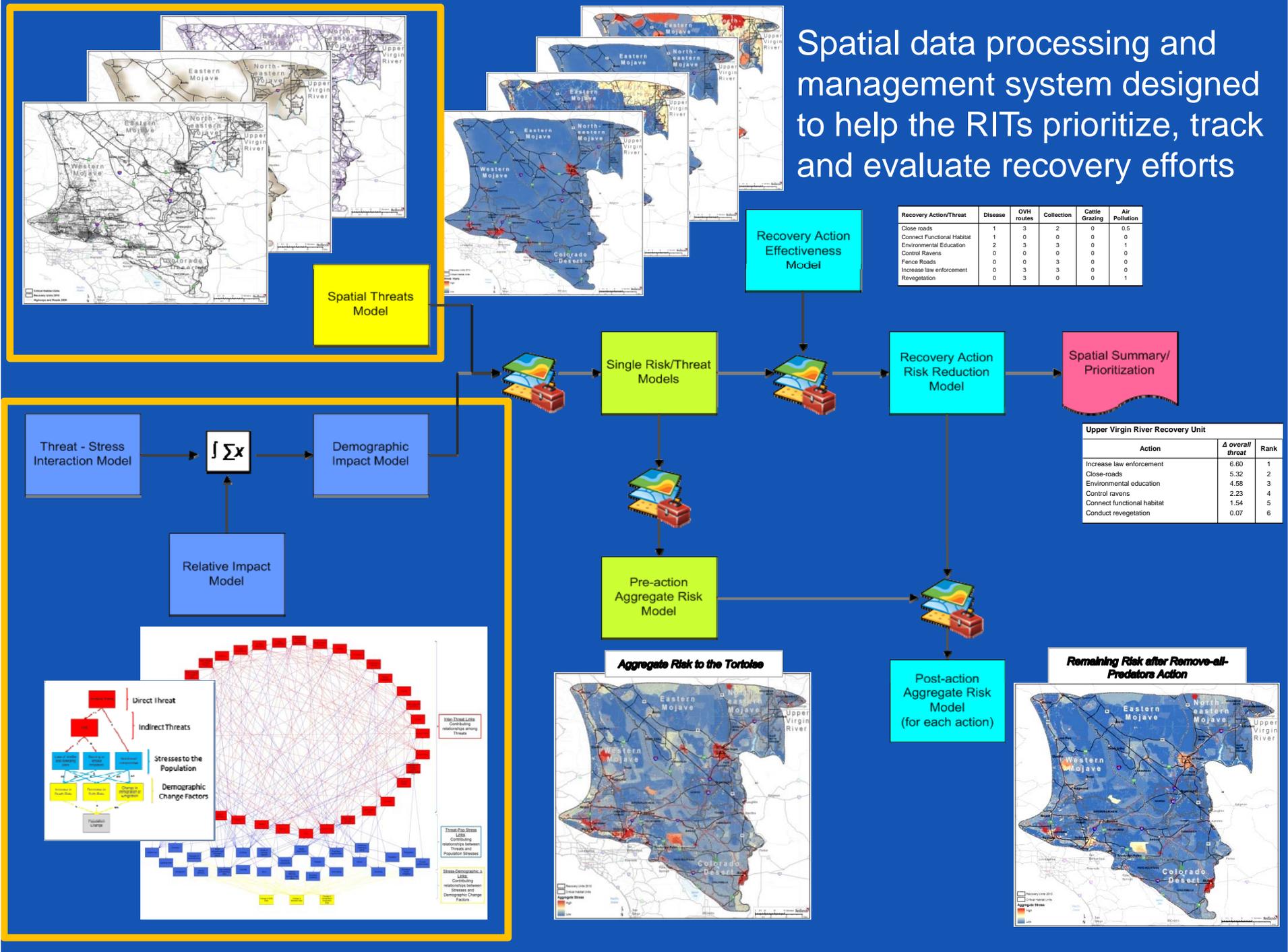
Extent of
threat after
actions

Utilize prioritization to create
Recovery Action Plans

Example Prioritized Actions for RIT Workgroup		
Action	Δ overall risk	Rank
Increase law enforcement	970	1
OHV route restoration	832	2
Decrease subsidies to predators	458	3
Restore habitat	183	4
Environmental education	154	5
Install culverts for connectivity	70	6

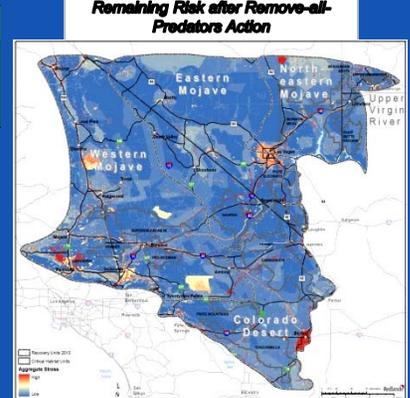
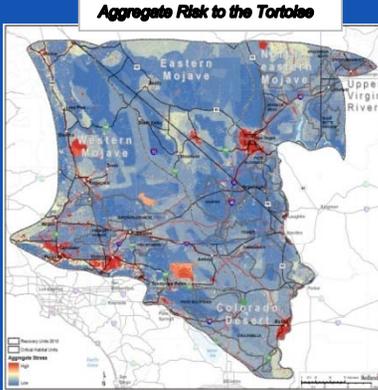
Change (decrease) in overall risk is calculated for all possible actions within a given area, actions can then be prioritized according to total risk reduction

Spatial data processing and management system designed to help the RITs prioritize, track and evaluate recovery efforts



Recovery Action/Threat	Disease	OVH routes	Collection	Cattle Grazing	Air Pollution
Close roads	1	3	2	0	0.5
Connect Functional Habitat	1	0	0	0	0
Environmental Education	2	3	3	0	1
Control Ravens	0	0	0	0	0
Fence Roads	0	0	3	0	0
Increase law enforcement	0	3	3	0	0
Revegetation	0	3	0	0	1

Action	Δ overall threat	Rank
Increase law enforcement	6.60	1
Close-roads	5.32	2
Environmental education	4.58	3
Control ravens	2.23	4
Connect functional habitat	1.54	5
Conduct revegetation	0.07	6



Online Model and Data Explorers

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

Home 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, including 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

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

Desert Tortoise Recovery Data Explorer

Welcome nathan_strodt | Logout | disclaimer | v0.968

Other bookmarks

UNIVERSITY OF Redlands

Topo Satellite Go to Bookmark comments off 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

- Open and active
- Open seasonally
- Open and inactive

POWERED BY ESRI

ArcGIS RIT Application

The screenshot displays the ArcGIS RIT Application interface. On the left, the 'Desert Tortoise SDS Data Explorer' window shows a map of California with various layers. A callout points to the 'Layers' panel, stating 'Add layer directly from inventory'. The 'Study Area Report' window is open, showing a report for the 'West Mojave Planning Area' with a total area of 14,651,817 acres. It includes a 'Top Stresses' list, a 'Contribution to Pop. Change' bar chart, and 'Recommended Actions'. The 'Data Inventory' window at the bottom shows a table of 89 datasets with columns for Threat Type, Dataset Title, Description, Data Source, Year, and metadata. A callout points to the 'Threat Type' column, stating 'Tabs for modeled layers'. Another callout points to the 'metadata' column, stating 'View full metadata record for each data layer'.

Add layer directly from inventory

Tabs for modeled layers

View full metadata record for each data layer

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

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

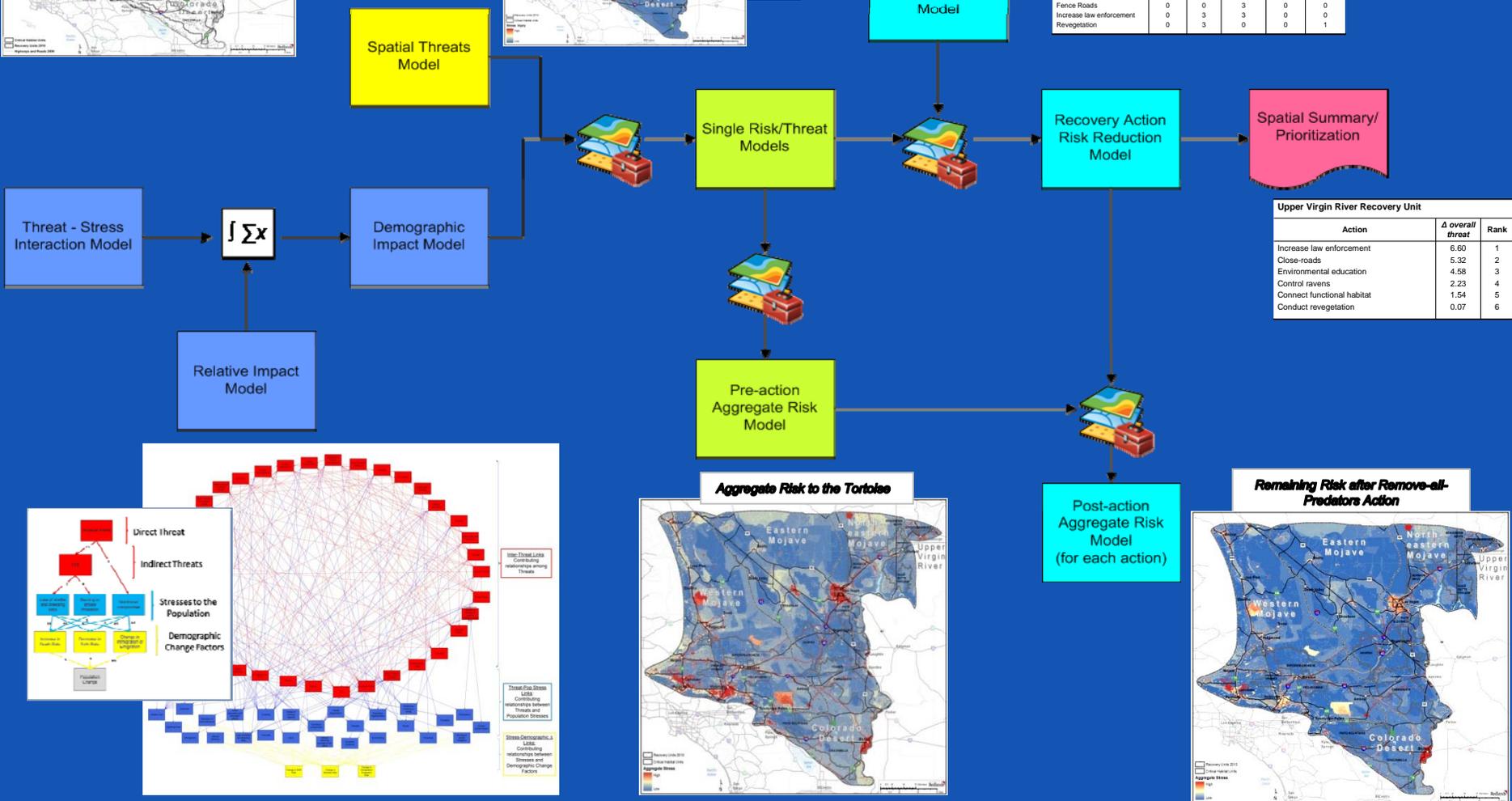
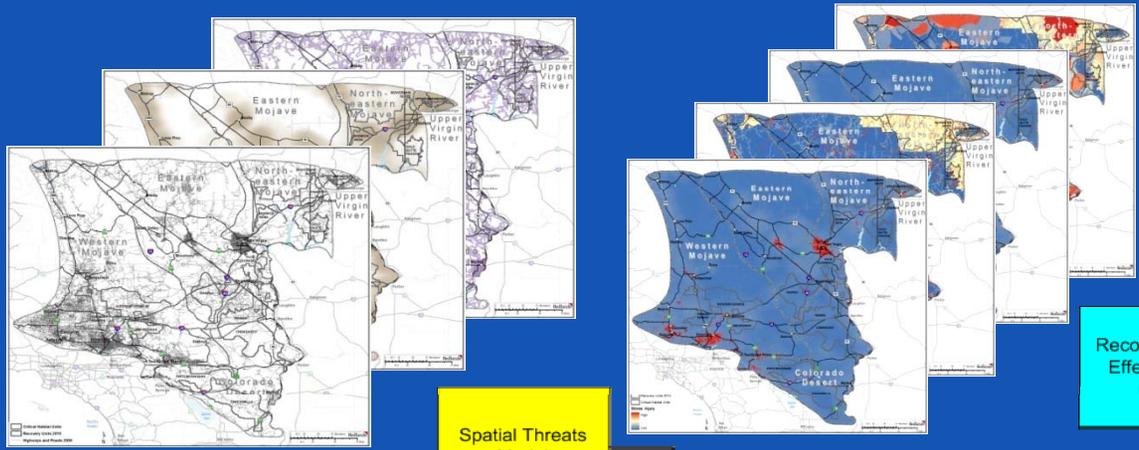
Contribution to Pop. Change

Stressor	Contribution
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

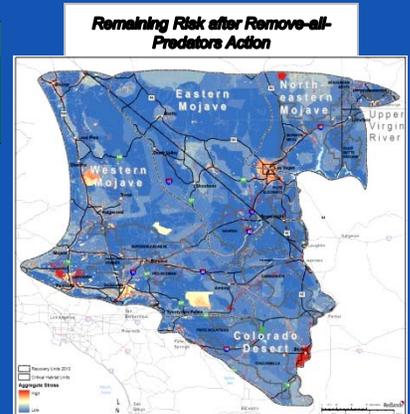
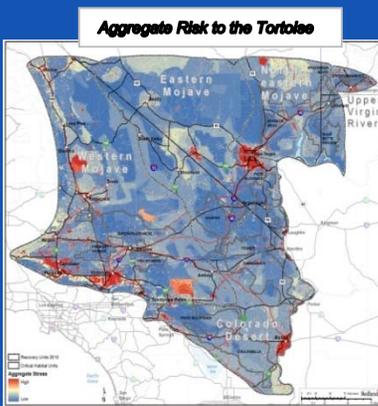
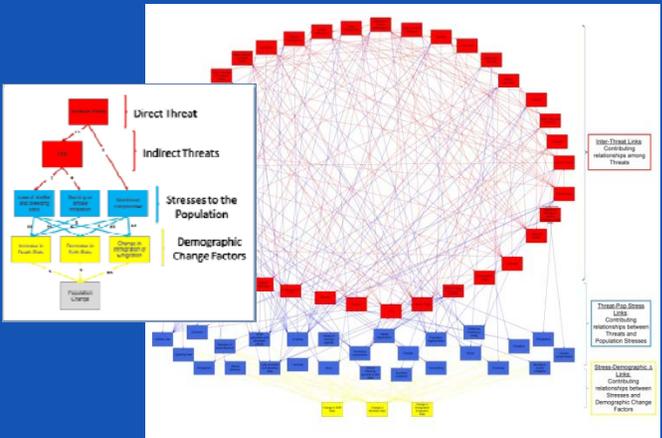
- Protect intact desert tortoise habitat (2.1)
- Install and maintain tortoise barrier fencing (2.5 & 2.7)
- Land acquisition (2.9)
- Environmental Education (2.3)
- Restore Habitat (2.6)
- Increase law enforcement (2.4)
- Withdraw mining (2.12)
- Remove grazing (close allotments)
- Sign and fence protected areas (7.8)
- Install and maintain human barriers (wildland-urban interface)

Spatial data processing and management system designed to help the RITs prioritize, track and evaluate recovery efforts



Recovery Action/Threat	Disease	OVH routes	Collection	Cattle Grazing	Air Pollution
Close roads	1	3	2	0	0.5
Connect Functional Habitat	1	0	0	0	0
Environmental Education	2	3	3	0	1
Control Ravens	0	0	0	0	0
Fence Roads	0	0	3	0	0
Increase law enforcement	0	3	3	0	0
Revegetation	0	3	0	0	1

Upper Virgin River Recovery Unit		
Action	Δ overall threat	Rank
Increase law enforcement	6.60	1
Close-roads	5.32	2
Environmental education	4.58	3
Control ravens	2.23	4
Connect functional habitat	1.54	5
Conduct revegetation	0.07	6



Topics for MOG Discussion

- Proposed RIT boundaries and structure
- Meeting locations
- Utilizing *deserttortoise.gov* as a mechanism for feedback/reporting
- Chair elected by each group to work with DTRO
- Meeting outcomes/expectations/timing
- Constraints to participation
- Role of the MOG in RIT process/products

