Resilience-Based Management

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USDA ARS Agricultural Research Service

NRCS

NATIONAL SYSTEM OF PUBLIC LANDS

Assumptions

- Development, amenity farms and ranches will increase loss and fragmentation
- Demand for food, fiber and energy will drive expansion and intensification of production on 'marginal' grazinglands

With high grain prices and global production shortages, U.S. farmers are expected to plant every available acre this spring. Here, harvesting corn in Marshall, Mo., in September.

Farmers Pressed to Plant

By Ian Berry

U.S. farmers are expected to plant every spare acre they can

Some analysts expect the strong prices will ease demand somewhat, yet ramping up

push farmers to convert pastures used for animal grazing to cropland and consider planting

"…grain prices are screaming for more acres which will push farmers to convert pasture used for grazing animals to cropland and consider planting in questionable weather conditions…" (I. Berry. Wall Street Journal. 1/18/11)

Resilient landscapes

- Resist and recover from degradation
- Are less likely to cross a threshold or ‘tipping point’
- Maintain their capacity to support current and future societal needs (ecosystem services)

Resilience-Based Management

Next Generation Resilience-Based Management

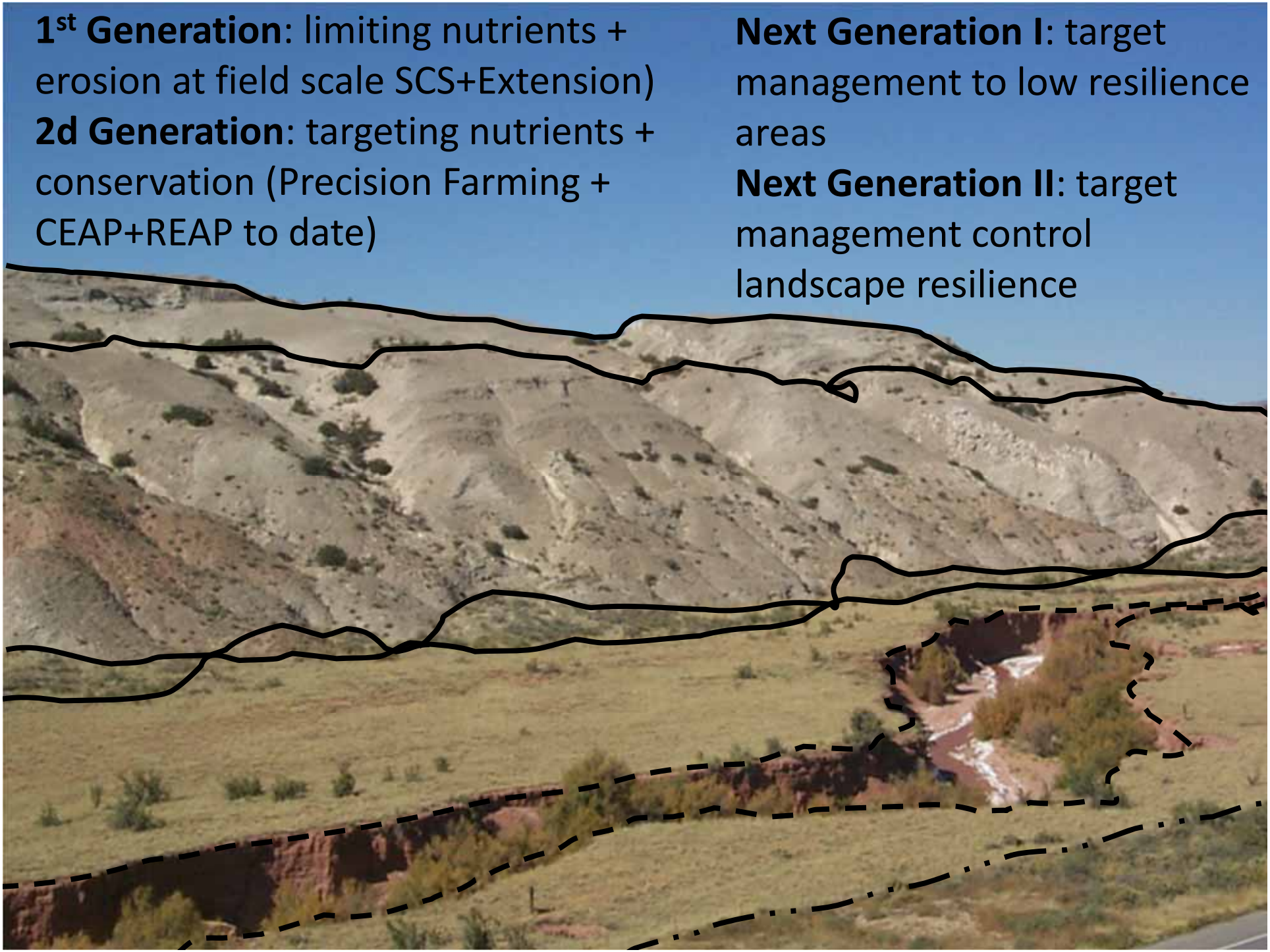
- Targets conservation actions to maximize return on conservation investments at all scales (CEAP)
- Favors sustainable production at landscape scale
- Integrates *relevant* scientific and local knowledge
- Often requires strong communication and cooperation among stakeholders
- Supported by Long-Term Adaptive Research networks

1st Generation: limiting nutrients + erosion at field scale SCS+Extension)

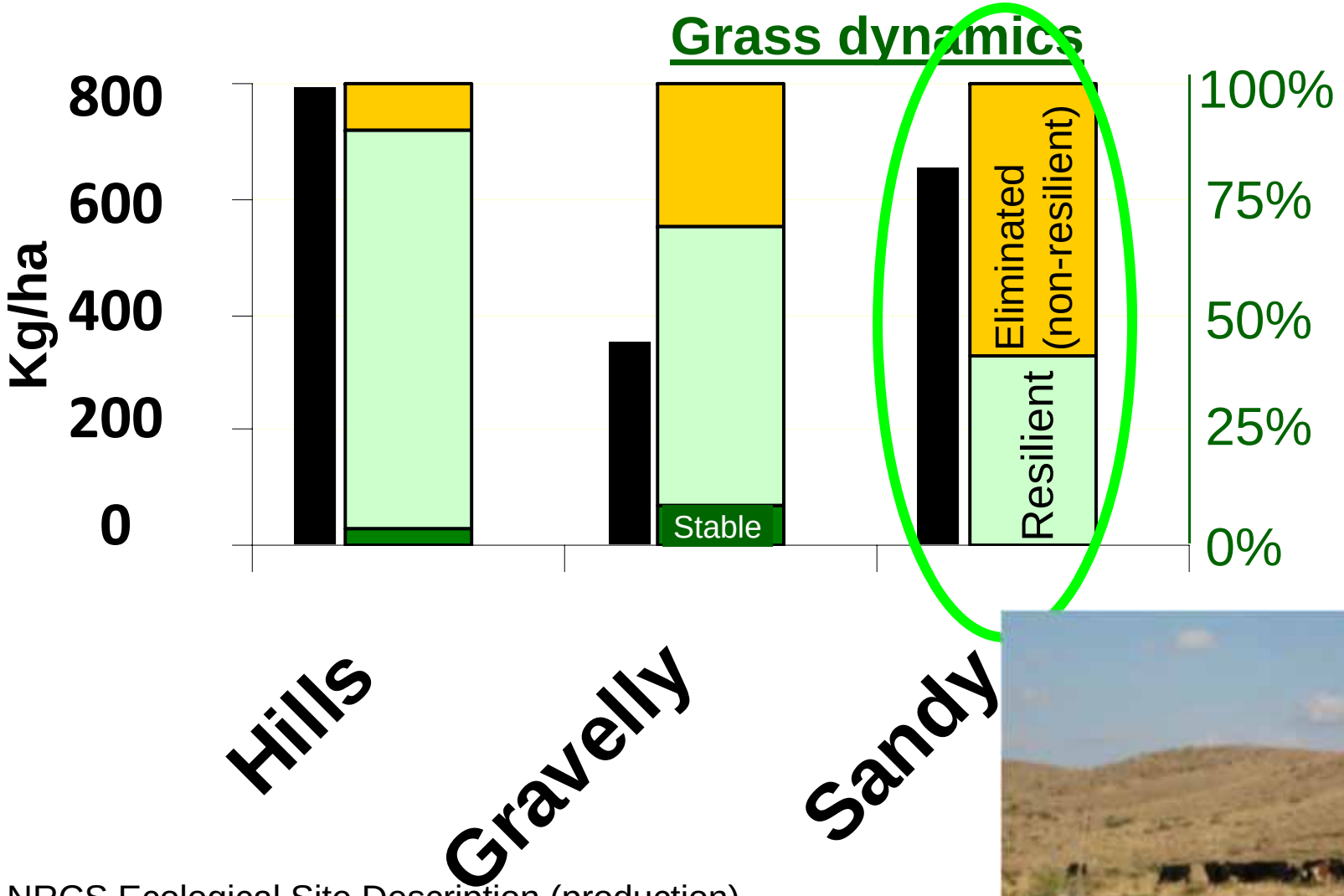
2d Generation: targeting nutrients + conservation (Precision Farming + CEAP+REAP to date)

Next Generation I: target management to low resilience areas

Next Generation II: target management control landscape resilience

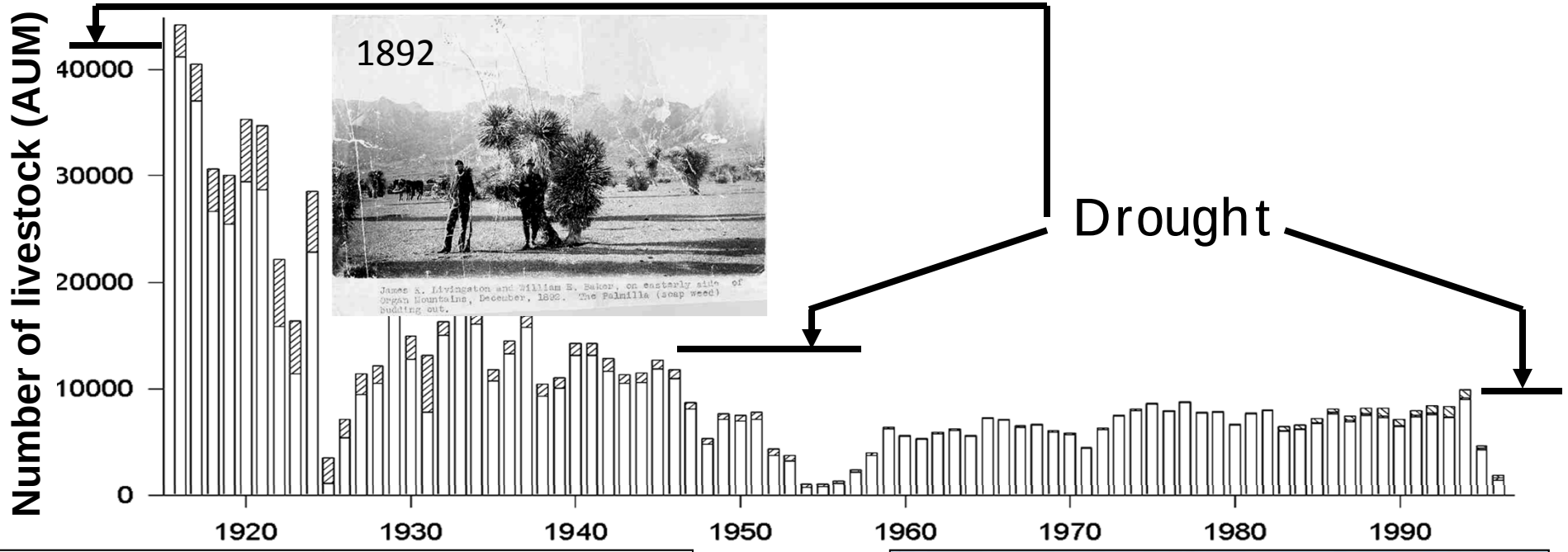


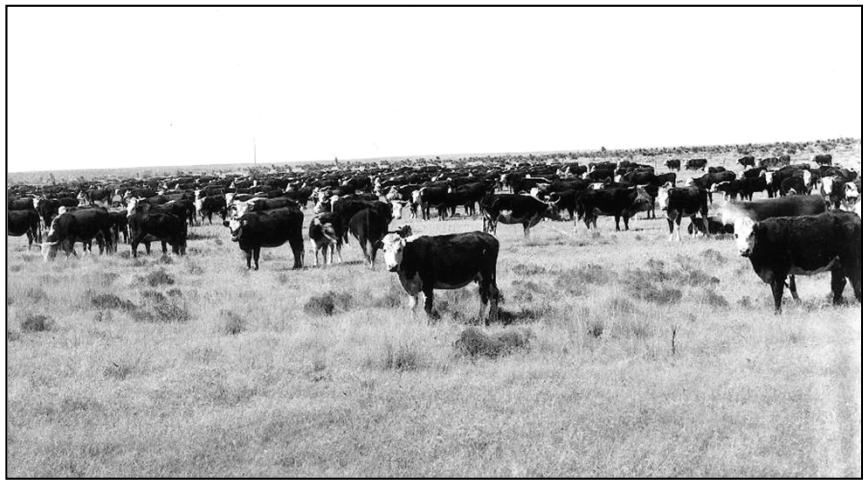
Soils control resilience



NRCS Ecological Site Description (production)
B. Bestelmeyer/BLM data, 123 plots (1970-2003)

Drought + landscape scale overgrazing on sandy soils → reduced grass production + increased soil erosion + native shrub invasion





Next Generation Examples

Next Generation I: target conservation inputs to areas of lowest resilience

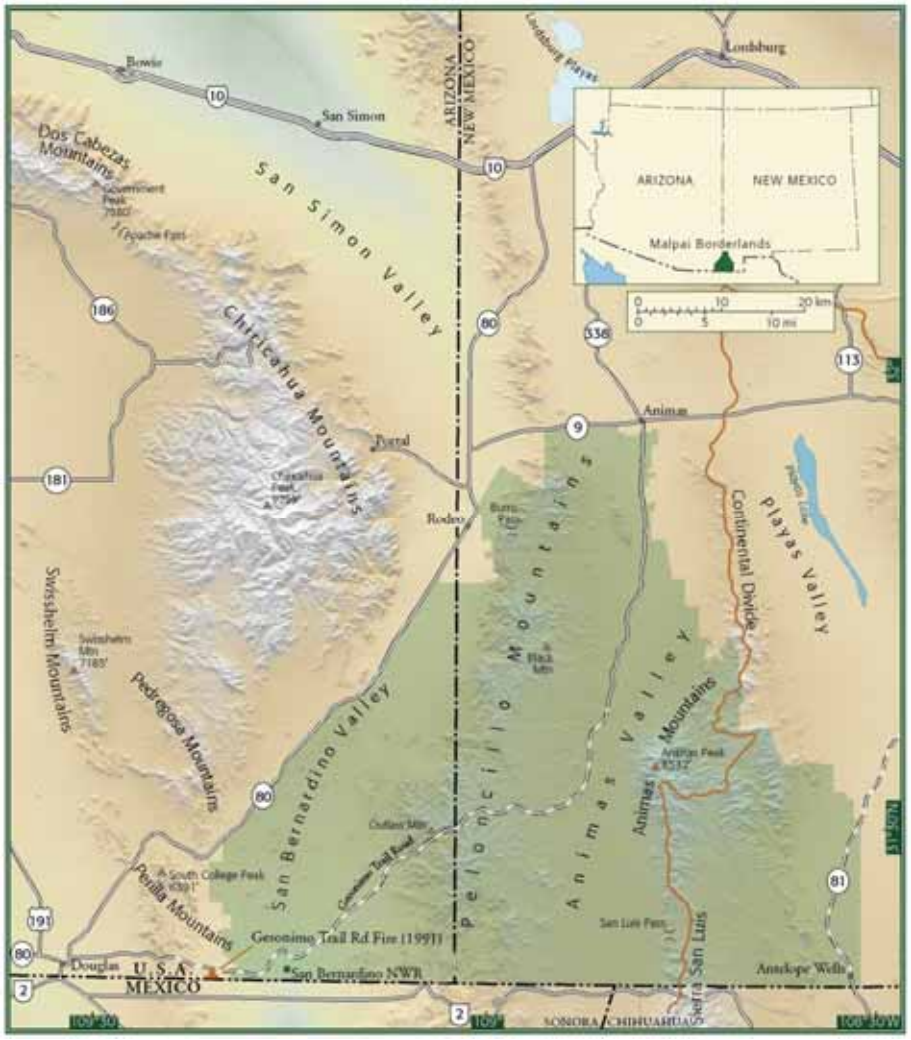
- *Hydrology/erosion*: shallow soils/convex slopes
- *Invasives*: favorable conditions for establishment + *persistence*

Next Generation II: target conservation inputs to areas that control landscape-scale resilience

- *Hydrology/erosion*: gully formation
- *Invasives*: dispersal nodes

Next Generation Resilience-Based Management: Malpais Borderlands Group

- *"… landowner-driven nonprofit working on one million acres…".*
- Partners: BLM, NRCS, USFS, ARS, others…
- CAMINO: Cooperative Assessment Monitoring and Interpretation NetwOrk recently established with ARS.



New Opportunities (2010-2011)

- **Management**: conservation programs extended to public lands
- **Sharing knowledge**: "ecological sites" adopted by USFS, NRCS, BLM with support of ARS; Partnership Management Team (ARS, NIFA, NRCS) re-established
- **Informing resilience-based management**:
  - NRCS and BLM have adopted common core rangeland assessment and monitoring protocols
  - Conservation program funding can be used for monitoring
  - Increased NRCS and ARS commitment to CEAP