

Green Dots

# Solutions to problems-1

- Monitoring (remote sensing, GPS)
  - Reducing labor needs associated with monitoring
  - need for cross-walking of new approaches (e.g., high resolution aerial, satellite imagery) to long-term ground-collected data (legacy information from many ARS research stations)
  - innovative uses of GPS technology
  - statistically rigorous monitoring for adaptive management
- Restoration of invasive species-dominated (including poisonous plants) lands
  - Disruption of fire cycles
  - Emphasis is currently on post-fire restoration , but seeding success is inherently low
  - Need for lower cost forb and shrub seed/establishment techniques for restoration of cheatgrass-infested lands
  - Need for staged research plan (decadal) on seedling emergence/establishment information and enhanced success rate to increase restoration efforts following burning of cheatgrass-dominated lands

# Solutions to problems-2

- Ecological Site Descriptions (restoration pathways, ecosystem states/transitions/thresholds, riparian areas)
  - Northern Rockies area is a need for Forest Service
  - Restoration pathways research in concert with changing climate
  - ARS role focus transitions and thresholds between/among states (“tipping points”)
    - Across scales – plots to landscapes (cumulative impacts)
- Grazing as a management tool
  - Length of time animals on a unit of land vs. stocking rate
  - Landscape approaches
  - Outcome-driven management
- Multi-species grazing
  - Using livestock to reduce invasive weeds and for fuel load reduction
  - Economic aspects of this need to be determined

# Solutions to problems-3

- Economic aspects (quantifying/estimating ecosystem services, cost:benefits of management/conservation practices)
  - Pull ERS down to practical farm/ranch level applications?
  - targeting limited resources on landscapes
- Climate variability and production systems
  - Drought management responses, adaptive management, enterprise flexibility
  - Invasive species concerns
  - Possibly convert rangelands from a sink for GHGs to source
  - Development of new forage species
  - Matching livestock to the environment
- Water quality/quantity issues
  - Coordinate with NP211

# Solutions to problems-4

- Grass fed beef/pasture-based systems for lambs and goats
  - Handout from Sheep industry
  - economic considerations of finishing livestock on grass
  - needs interactions with NP101 (animal scientists)
  - wildlife concerns can be international (e.g., grassland birds)
- Coordination with customers
  - Science distribution to land managers
  - Use of ARS Information Staff to help distribute information
    - Have them write the accomplishment reports, assessment report
  - “Cliff Notes” of research for public
  - Synthesis of accomplishments – key findings and interpretations for public
  - Coordination of dissemination with Extension