

## **Natural Resources Management Water Issues**

### **Critical Issue #1: Competing uses of water (region-wide)**

- Multiple demands on limited water resources—ag, urban, recreational, fish & wildlife
- Urban vs agricultural use of water
- Urban areas buying up ag water
- Water security
- What are beneficial vs nonbeneficial uses of water?
- Water rights
- Prior appropriation doctrine sometimes encourages wasteful use of water
- Instream use of water for recreation, wildlife
- Ecological use of water
- ESA protection results in competing uses/storage/delivery of water
- Ag water as a public benefit: connecting consumers with food, fiber & ag uses & what it means to them
- Water distribution/competition (e.g., Las Vegas vs. agriculture, ESA vs agriculture)
- Biological decisions' impacts on water distribution
  - o Entrenched beliefs which may or may not be science-based
  - o When to decide to re-evaluate former biological work when species don't recover?

### **Critical Issue #2: Water quantity & strategies for increasing water availability (region-wide)**

- Inadequate water quantity to meet demands for ag and urban growth
- Sufficient and fair water allocation for people, agriculture & the environment
- Drought, inadequate water storage, changing seasonal availability of water due to climate change
- Above ground/below ground storage
- Catchments, best mechanisms to collect and use water
- Storage and delivery systems
- Landscape management effects on hydrology
- Floods, too much water at once—typhoons, tsunamis (Pacific issue)

### **Critical Issue #3: Water conservation (region-wide)**

- Need more efficient utilization of water, including development of crops that are more drought-tolerant
- Conservation for multiple purposes (e.g., recreation, wildlife habitat, instream flow)
- Irrigation water management technology
  - o Remote and/or proximal sensors
  - o Computational specialists to develop interpretive algorithms
  - o Marry above with proposals for engineering solutions to promote variable rate water application
  - o Management on a municipal or district level vs. watershed level
  - o Some water policies actually discourage conservation techniques for water

## **Other Issues Related to Water**

- **Water quality**
  - Salinity
  - Salinity intrusion into aquifers
  - Pollution
  - Nitrates
  - Naturally occurring water quality issues—e.g., arsenic, radon
  - Need for potable water
- **Water law/policies/regulations**
  - Perception that ag uses 80% of water
  - Discrepancies in federal, state, local water laws
  - Need for education on the needs of ag producers to use water to grow food crops
  - Groundwater rights
  - Rights—landowner, management areas, Native American tribes
  - Interstate historical demand—legal battles over availability
- **Economics of water/markets**
  - Affordability vs. pricing to promote conservation (conservation groups buying water rights & inflating prices for water)
  - Water pricing for ag is quite variable & extreme
  - Consumer behavior
- **Dramatic effects of climate change**
  - Climate change affecting western snow packs
  - Seasonal patterns of snow/rain changing & affecting ability to capture and store water
  - Climate change and sea-level rise will have major effects on lowlands & atolls

# Natural Resources Management

## Fire

### Critical Issue #1 – Land Management Tools

- Land management practices for prevention
- Land management to prevent large wildfires
- Range management problems that degrade plant communities and create excess fuel
- Fire as a component of resource/lands management
- Diminishing tools to manage (i.e., reduce) fuel load on public lands
- High fuel load due to fire exclusion
- Elimination of management tools like timber harvest, etc. on federal lands
- Pre and post-fire resource usage
- Fire management
- Destruction of rangeland for livestock production
- Degraded ecological function due to fire suppression
- Knowledge of effective fire prevention/management strategies and communication of these strategies
- Fire ecology
- Beetle management for forest health

#### *Comments:*

- *Connection between fire and water amount and quality in all 3 areas*

### Critical issue #2 – Recovery and restoration following fire

- Inadequate understanding of recovery rate/robustness of lands after accidental fires
- Fire recovery
- Effects of fire on watersheds
- Post-fire water quality
- Restoration and management of rangelands/forests/wildlands
- Recovery – land, housing, plant & animal species
- Ineffective approaches to vegetation management after fire

#### *Comments:*

- *Fire intensity is so severe that site is devastated – lost. Recovery/restoration requires different approaches. Use of non-natives and GMOs may be necessary.*

### Critical issue #3 – Built environments

- Creating defensible space
- Private property/homes in forested habitats
- Urban-wildland interface
- Planning and options for fire resistant landscapes on rural properties (ranchettes)
- Landscaping for fire management/control in exurban environments

#### *Comments:*

- *Fire threat is a community issue not just individual. Need community action and fire adapted communities.*
- *Use of zoning to prevent/limit expansion into high fire susceptible areas*

- Evaluate current approach to firefighting allowing “inclusion” of community – especially funding for “status” of fire. Related to availability of federal resources.
- Economics of bearing the cost of building into fire areas.

### **Endangered species**

- Habitat loss for endangered species
- T&E species regulations have resulted in reduction of timber harvesting/grazing

### **Policy**

- NEPA and EPA is used to restrict grazing and timber harvesting

### **Arson**

- Many wildfires on agricultural lands are result of arson

### **Air quality**

- Air quality effects on environment and quality of life
- Health issues associated with fire and air quality

### **Climate change**

- Increased frequency due to climate variability
- Drought is increasing fire risks, decreased fuel moisture and increased mortality due to insects
- Climate change is degrading plant communities

### **Invasive species**

- Invasive plant species impact fire behavior and management
- Invasive species encroachment
- Many invasive weeds burn hotter than native plants

### **Public education**

- Public understanding of “natural” systems; recognition that forest conditions today are the result of 100 years of active fire suppression
- Public understanding of fire as a part of the ecosystem (use of control burns)

### **Economy of suppression versus prevention**

- Funding going to fire control rather than fuel load prevention
- Inefficient resources to focus on fire prevention
- Economical uses of excess fuel load when reduced
- Cost of fighting fires
- Lack of personnel for fighting fires
- Adequate funding resources for fire prevention/elimination
- Collection of fuel loads for bioenergy

## **Natural Resources Management Endangered Species Issues**

### **Critical Issue #1: Endangered species listing does not account for basic understanding of ecosystem science. Go from species-based (arbitrary) to a rational, ecosystem approach (region-wide)**

- Disconnect between natural evolutionary extinction and anthropogenic extinction
- Research priorities? Agencies
- Research to better understand ecological resiliency of endangered species (e.g., how will management +/- change in environment effect?)
- Developing habitat management strategies to mitigate declines in endangered populations
- Dangers to species
- Critical habitat
- Identification of species
- Reacting to endangered species one by one rather than recognizing the broader issue of environmental changes
- Overall lack of science succeeding over special interest group advocacy
- Trends population
- Evaluating the relative effects of different stressors on endangered species populations
- Endangered species listing is result of habitat destruction
- Disconnect between genetic value and consequences of actions to protect it
- Misunderstanding of the connection between GMOs and endangered species

#### Walkabout Comments:

- Re-evaluation of prior decisions? Is the still valid?
- Who decides what's rational?
- Cultural implications
- Sustainable economics (benefit/cost)
- Rational ecosystem "science-based" (MB note: this is in reference to the "arbitrary" and "rational" as written in the issue statement).

### **Critical Issue #2: Adequately quantifying and communicating the trade-offs of listing an endangered species and determining recovery (region-wide)**

- Establish "value" for endangered species as opposed to zero or infinite
- Economics of endangered species is not done
- Can we save everything? Can we determine consequences if we don't? Who chooses which species lives or dies? How much do \$ get to play?
- Competing land use?
- Failure to establish and communicate trade-offs associated with endangered species solutions

#### Walkabout Comments:

- Economics of society
- Where species live

**Critical Issue #3: 1) Our current approach to listing endangered species does not consider the social, economic, and environmental consequences well; 2) Our land grant system has the unique capacity to bring clarity to these sorts of issues (region-wide)**

- Include faculty from Land Grant Universities on recovery teams
- Science input west-wide versus value system input
- EPA overreach – Rules interpretation by agency; lack of science-based decisions
- Lack of sufficient economic impact analysis
- Impacts of listing are not considered in a comprehensive way
- Public land use is most impacted by ESA issues
- Lack of science in the listing and recovery plan process
- Consumers/taxpayers often do not realize they pay the costs in one form or another
- Benefits of listing are not articulated
- Endangered species listing impacts – economic development; energy development; agricultural production
- Finding ways to involve those who might be affected by Endangered Species listing in the proposed solutions
- Develop stronger partnership with USFWS to allow more science input into listing and management of endangered species – they are so inflexible!
- How to “quantify” effect of listing of any endangered species on: local economies; state economies; national economies; custom and culture of state residents

**Walkabout Comments:**

- What to do when strategies aren't producing results? When is enough enough? How to decide?
- Importance of basic economic knowledge (env.econ / NR econ) of benefits and costs for UG education

**Other Issues Related to Endangered Species**

- **Politicization (RW)**
  - o How ESA is applied depends on the current administration, creating variability and inconsistency
  - o There seems to be constant conflict among states' issues and federal issues
  - o Control of endangered species? State control; federal control
- **Species-specific listings that have impacts (RW)**
  - o Listing sage grouse – grazing, farming, energy production, energy reclamation, recreation (MS)
  - o Bighorn Sheep habitat: federal lands grazing, rural economy, food and fiber supply (MS)
  - o Delta smelt may affect: all of CA Ag production and associated industry (MS; CA, NV, and AZ)
  - o Listing aquatic species: grazing, farming, nutrient management, recreation (MS)
  - o Listing of sage grouse: effect on federal land, private land. How to frame discussion for public and policy-makers. How can LGU help? (RW)
  - o Listing jumping meadow mouse: effect on federal and private land. How to frame discussion for public and policy-makers? How can LGU help? (MS)

- Mexican wolf: effect on federal land and private land. How to frame discussion for public and policy-makers. How can LGU help?
- Sage grouse management and impact of listing is elephant in this room. Need more education on (note: the note just ended there) (MS)
- Single species management plans: federal lands leases for livestock; logging; oil & gas; economy (RW)
- Delisting grizzly bear and wolves: impact on relisting; livestock production; recreation (MS)
- Sage grouse: 1) loss of private property rights; 2) loss of income; 3) historic use of region; 4) unintended consequences habitat development and maintenance; and 5) driven by emotion not sound science
- **Measuring the efficacy of (regulatory) actions (RW)**
  - Having capacity and will to check to see if our regulatory action actually resulted in increasing a listed species #'s (e.g., stopping grazing actually resulted in increase **YOTO?** (w. wide)
  - Need for multiple-use management during recovery process

## **Natural Resources Management Invasive Species Issues**

### **Critical Issue #1: Money and People (region-wide)**

- For prevention (preparation), detection, rapid response, treatment, long-term management
  - Inadequate funding for research (federal, state, communities)
  - Inadequate funding for programming (research, education, outreach) (federal, state, local, private)
  - Inadequate funding for faculty/staff (federal, state, local)
- Requires collaborative responses and planning at all levels
- Leadership to encourage collaborations
- Walk-About Suggestions
  - Inadequate or unavailable controls
  - Impacts on production should be documented
  - Issue: Detection, rapid response... prevention → solutions: funding to increase capacity

### **Critical Issue #2: Range, Pasture, Grasslands (region-wide)**

- Overwhelm desirable species/habitat
- Significant economic impact/sustainability issues
- Complex management issues – land ownership/regulatory responsibility
- Proacting vs. reacting
- Gaps in science of management (diagnosis, treatment, speed or response, uniformity of response); Both R & E
- Gap in resources to manage weeds
- Relates to fire and water issues (e.g., cheatgrass, salt cedar, Russian olive)
- Ease and speed of entry of exotic, aggressive species of plants/weeds
- Walk-About Suggestions
  - Applying the approach to range, pasture, grassland is far too narrow
  - Why just range, pasture, grassland? What about production schemes or urban environments?
  - What about invasive animals
  - Why do we want to manage invasive species in range, pasture, grasslands, etc.?
  - Typically a species worse than you have presently will follow unless addressed timely
  - 80% of biota in the California Delta is invasive – some (e.g., bass) are eating threatened species

### **Critical Issue #3: Policy and Regulation (region-wide)**

- Control – biological, mechanical, and chemical
- Education- public
- State /Region/National/International point of contact
- Current and future climate conditions



## **Other Issues Related to Invasive Species (Snow Cards that did not make it into the three critical issues)**

- **Miscellaneous Species**
  - o Brown Tree Snake
  - o Koki frog (invaders (via Hawaii) from Puerto Rico; damages plants, potentially affect tourism)
  - o Cocofsci (sp?) frog (could not read handwriting)
  - o Wild pigs
- **Insects**
  - o Forest insects and Beetle Pine Disease. Others: Green Ash Bore; black walnut)
  - o Rhino beetle: destroying coconut trees on Guam. If it spreads to other Pacific Islands could destroy important food source
  - o Bark beetle infestation to western forests
  - o Pine bark beetle: how to help neighbors most effectively
  - o Tiny fire ant...invades (via Hawaii) from South America
- **Crop Land**
  - o Local crop weeds
  - o Conflict between potential economic introduced biomass crops and their 'invasive' nature
- **Introduced Animal and Plant Diseases**
- **Economic Impact**
- **Water Ecosystem**
  - o Aquatic contamination – zebra mollusks, weeds, insects, algae
  - o Invasive fish species impact on ocean fisheries industry; economic well-being of coastal rural communities
  - o Bird-water-Land Contamination carry pests between water sources and facilities (starlings, Canada geese, spotted doves, pigeons)
- **Crossover Issue – Diseases in wild and domestic animals**