

## **Sagebrush workshop flip chart notes (18 Oct 2011)**

### **Large group discussion: What changes are we observing?**

- Expansion of annual grasses
- Earlier drying
- Loss of native perennials
- Expansion of cactus
- Increase in homogeneity – loss of mosaic
- Juniper dying at top 1/3 (last five years in younger stands) (freezing?)
- Cheat grass and lots of new invasives
- Fragmentation
- Thistle -> pepperweed
- Loss of soil crust

### **Question 1: In highly variable environments, how can we tell the difference between “normal” variability and major, potentially irreversible, state changes?**

Uplands/sagebrush group:

- Changes in animal and plant species
- Changes in soil, hydrograph
- Invasive species
- Loss of functional groups

Wetlands group:

- Need state and transition models

### **Question 2: What are the other main factors (in addition to climate) in landscape change?**

Uplands/sagebrush group:

Depends on where, when, frequency, scope, intensity and duration of impacts

- Agriculture
- Energy
- Roads and transportation networks
- Irrigation
- Development

- Pollution
- Grazing
- Recreation
- Wildfires
- As vegetation changes, it can change soil properties and nutrient cycling and abiotic and biotic
- Flood regimes

Wetlands group:

- Invasives
- Fire
- Flood\*
- Development
- Wetland modification
- Groundwater depletion\*
- Water allocation conflicts\*

**Question 3: Which systems, functions, or species are most likely to be sensitive to the kinds of landscape changes we've discussed? Which are most likely to be buffered? What kinds of sites might increase or decrease in importance?**

Uplands/sagebrush group:

- Species that are specialist will be most impacted, generalist will be more adaptive
- Species on the edge of their range may be impacted more
- Amphibians are indicators of change
- Unique habitats would increase in importance
- North slope/aspects will become more important and will high elevation sites
- Definition of importance: "maintain basic functions, enough of the pieces and parts to keep the system functioning"
- Sites that have been irreversibly impacted might be beyond restoration
- Maintain movement corridors
- Facilitate genetic interchange
- Increased impacts on low mobility species

Wetlands group:

+ means buffered, - means sensitive

- - fish, amphibians

- - avian: swans, grebes, bobolink, other water fowl, breeding, fall migration
- + spring migrants
- Increase in wintering birds

**Question 4: Are there any changes to management practices or priorities that are suggested by current climate information?**

Uplands/sagebrush group:

- YES!!
- Shift in power supplies (“green” energy)
- Strategies in wildfire/prescribed fire (fire management) “SPOTS”
- From managing for specific species to functioning systems
- Adapt to new “states”
- Management priority for springs, wetlands, and riparian.
- Protect the best of the best
- Restore lost areas or degraded areas
- Create buffer zones that could restrict the spread of invasive species

Wetlands group:

- More efficient upstream water use/delivery
- Develop seasonal water management strategies (multi-species)
- Improve natural storage: riparian, floodplain, beaver, wolf(?))
- Improve agricultural practices
- Coordinate and/or build on public-private management at the landscape and regional level
- Take into consideration elevation and latitude for freshwater supply

**Question 5: What specific kinds of information are needed to inform management decisions? What critical uncertainties need to be resolved, and which variables should researchers be focusing on?**

Uplands/sagebrush group:

- Baseline data to define existing conditions
- Document changes already observed or created
- Research predicted climate changes to vegetation
- Figure out restoration of warmer drier systems
- Better understanding of systems functions

- What plant species would be used to restore habitats
- What do people want

Wetlands group:

- Invasive response to salinity gradients
- Avian response to salinity gradients
- Impacts of carp and other invasives
- Monitoring special status species