

## **Research/management priorities for aspen ecosystems**

Based on workshops at *Restoring the West – Frontiers in aspen restoration*

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A three day conference was devoted to contemporary research and management taking place on aspen landscapes around western North America (<http://www.restoringthewest.org/>). The final ½-day of the conference was devoted to workshops addressing aspen genetics and phytochemistry, recommendations from the field, wildlife interactions, and monitoring issues. Though discussions were productive and wide-ranging, we requested that workshop facilitators boil down their notes to a small set of priority items. Complete presentations from each workshop can be found at the website link above (click **2008 RTW Conference Website**). The following lists provide a starting point for Western Aspen Alliance research prioritization.

### **Aspen genetics and phytochemistry**

- Genetics:
  - Genetic diversity and genome structure/architecture
  - Life History Strategies (i.e., reproduction, growth & longevity, resistance/resilience, etc.)
  - Intraspecific and interspecific (genetic) community composition
- Phytochemistry:
  - Mediation of organismal interactions (i.e. between aspen, understory, pathogens, soils, insects, mammals)
  - Effects on ecosystem function (N cycle, C sequestration, etc.)
- Both:
  - Education and Outreach – show how these topics affect management; encourage feedback from the field
  - Establish common garden demonstrations addressing environmental gradients
  - Extensive / intensive field surveys of aspen genetics
  - Utilize above information for developing an aspen classification system

### **Experiences and recommendations from the field (Silviculture & Management)**

- **Management Recommendations:**
  - Think the entire process (i.e., treatment & regeneration) through before taking action
  - Where feasible, fence to keep out browsing wildlife
  - All clones cannot be treated alike; coordination with genetics research may be crucial.
  - Specifically recommend Mueggler's (1989) "*Age distribution and reproduction of Intermountain aspen stands*" (Western J. Applied Forestry, 4(2):41-45) as a guidebook in this process
  - Focus should be directed toward the system (or habitat), not toward a single species.
  - Need to facilitate cross-disciplinary coordination of management needs: notably between vegetation and wildlife and livestock concerns.
- **Research Questions:**
  - Need more research on options where fencing is not practical (i.e., large landscapes).
  - Same coordination needed with wildfire managers. What are pros & cons of this? If seen as mostly beneficial, how can we put this into practice (i.e., mechanisms)?
  - Are different management techniques required for seral vs. pure aspen stands (e.g., burning is very difficult in pure stands)?
  - How can agencies share funds and resources to create good habitat, biodiversity, or "health" in aspen landscapes?

- What are the relationships between level of aspen stand deterioration and health of regeneration? Or, how bad can the condition get, or the number of aspen stems be reduced, before regeneration is unsuccessful?

### **Wildlife Interactions**

- **Management Recommendations:**
  - Need to bring users, wildlife biologists, various agencies together to plan.
  - Management plans may differ by location: those in the urban interface may be more management intensive, while those further afield may be more flexible with tools/options.
  - Need objective driven guidelines – for herbivory, aspen regeneration, specific habitat needs, etc. - for management actions pertaining to wildlife.
  - There is a need for education models, preferably field-oriented, at both the professional and lay levels.
- **Research Questions:**
  - What are reasonable, cost-effective, options for fencing or otherwise reducing wildlife browsing? For example, can “hinging” be used on a landscape scale to reduce browsing? Wildlife managers have a need for a set of practical guidelines from forest managers and scientists in the field.
  - Do wildfires need to be larger, or wildlife numbers smaller, for aspen regeneration to succeed? Management plans at a large-scale must be coordinated in order to pull this off.
  - Research on beaver impacts on aspen at the landscape-level is sparse. A literature review and/or increased research would help bring this information to managers. Perhaps a special workshop could be organized at future aspen conferences to address beaver.
  - Further research is needed to investigate behavioral changes needed in wildlife to promote avoidance of aspen regeneration (e.g., see genetics/phytochemistry topics).

### **Merging monitoring at varying scales**

- Itemization of current monitoring efforts and the scales they primarily operate on:
  - State scale:
    - Forest Health Monitoring/Forest Inventory & Analysis (FHM/FIA): permanent systematic ground surveys
    - Forest Health Protection: aerial detection and select ground surveys
  - Regional scale:
    - Aspen Delineation Project (primarily Sierra Nevada): ground survey quick plots to assess trends
  - Landscape:
    - Local wildlife habitat surveys: non-permanent, various agencies
    - Agency vegetation monitoring: stand exams by various agencies
  - Remote Sensing: RS Application Center (USFS), various scales on demand
- How do current monitoring efforts complement each other, or not? There is a strong need to establish defensible connections between ground surveys and aerial/remote sensing efforts.
- Can current FHM/FIA data be used to establish agreed upon status at state and regional scales of aspen cover in various categories (i.e., seral and pure stands)?
- Why do FHM/FIA find different results than aerial detection methods regarding Sudden Aspen Decline?
- Can monitoring efforts, in cooperation with wildlife biologists, establish standards and assessments for status and trends in habitat for important game species, threatened species, or other aspen users (e.g., avian communities)?

- Can we establish a data, photo, bibliographic, and information clearinghouse of aspen conditions around the region?