One Thing That Should be Done: Natural Resource Management—Fire

Teaching

- Prepare people in public/private sector to reduce risks of catastrophic fires and as well as other benefits such as health watershed

Overall NRM Teaching One Thing to do

- Rather than creating new courses to address these issues – take existing material and better integrate across disciplines
- Teaching and integrating the globalization of the critical issues into multiple disciplines
- Develop and offer cross-institution courses. Regional course-sharing to increase workforce development in mission-critical areas.
- Better teach and integrate soft skills:
    - Leadership
    - Conflict management
    - Policy analysis
    - Problem-solving
    - Teamwork
    - Communication
- Integrate the critical issues into K-12 programs (e.g., Ag in the classroom, summer Ag. institute)
- Develop internship consortium with extension and experiment stations across the western region
- Two-way communication with local, state, and federal agencies and other organizations/employers in developing workforce guidelines
- Enhance critical-thinking and problem-solving of regional issues by supporting students' participation in international experiences.

- Comments:
    - Online degrees, noncredit, badging
    - Extension offers local venues for practical instruction/internships
    - Extension faculty can instruct (when not in conflict with federal constraints)
    - Add "community development" to the soft skills list
    - Remember audience at the system; remind decision makers of region/institutions

Research

- Educate clientele in pre- and post-fire land usage management (e.g., forage koche)
- Research economics of fire management choices (e.g., subsidies to encourage product development that makes landscapes more fire resilient
- Long-term and large-scale studies on grazing intensity, plant communities, and fuel load—also include environmental management
- Research on biological methods for fire retardant management and control (e.g., grazing, kochia, etc.; timing of grazing; on public lands policy)
- Research: is human intervention needed after a wildland fire?
- Evaluate importance of public/private interface on fire management
- Develop better models of fire movement, intensity, etc. (i.e., fire dynamics); general models not accurate at local level
- Research how to make "fire wise" a more generally applied choice
- Research fuel loads and forest health management (connected to issues like use & capacity to support human activity like grazing)
- Research utilization choices and fire risk management

- Research how to mitigate water runoff and quality after fires (e.g., research how to increase awareness)
- Research how to get consumers to make better choices about using high-risk landscapes
- Continue to improve funding for fire coordination and research, including assessing new innovations currently being tried
- Continue fire-safe education efforts
- Research on the psychology of risk
- Research use of logging and fire management choice

Research: Overarching policies that affect more effective management approaches

- Economic analysis
- Endangered Species Act
- Water use-it-or-lose-it laws
- Full life-cycle accounting
- Water laws can be disincentives
- Public lands management—is it consistent? Effective?
- Farm Bill Policy does not allow some good management choices
- For invasive species—quarantine policies

Research Room Idea Board from Walk-About

- Develop internships and/or youth development (young scholars) with academic programs, AES, and CES through county offices
- Graduate fellowships at experiment stations and county extension offices
- Coordinate cross-institutional course offerings
- Recruit K-12 outreach programs at experiments stations and CES through 4H programs
- Coordinate with community colleges at experiment stations and cooperative extension

Extension

- Better market and use of E-extension, "E-WIN"
- Create neighborhood watch approaches to reduce hazards in residential areas and respond
- Resarch on natural fire recovery and other management approaches
- Education of fire protection for ex-urban areas
- Better connections between research and extension education
- New technologies for fire detection, monitoring, risk assessment
- Education for land managers about recovery from fire and reduce catastrophic fires
- Develop management information for tropical areas
- Develop master gardener module for fire-resistant landscaping (some states have this, i.e., CA has several)
- Develop economic opportunities for post-fire areas (e.g., morel mushroom hunting post-fire in AK)
- Develop watershed management plans **

** Denotes highest priority actions to be taken, based on dot-voting by group.

Breakout #2 — **RESEARCH** NM

FIRE — Natural Resources Management

Critical Issues	**What *is* being done?**	**What *should* be done?**
Critical Issue *a:* LAND MANAGEMENT TOOLS	1. RECENTLY HIRED 3 NEW FACULTY TO ADDRESS THIS. 2. 3. 4. 5.	1. SHOULD ~~[illegible]~~ EVALUATE THE ~~[illegible]~~ IMPORTANCE OF PUBLIC / PRIVATE INTERFACES ON FIRE MANAGEMENT. 2. 3. 4. 5.
Critical Issue *b:* RECOVERY & RESTORATION	1. ONE OF OUR AGRICULTURAL SCIENCE CENTERS IS DEDICATED TO RESTORATION / FIRE MANAGEMENT. 2. 3. 4. 5.	1. SHOULD INCREASE EFFORTS IN RECOVERY & RESTORATION. 2. ECONOMIC RESEARCH. 3. HOW MUCH INTERVENTION IS NEEDED. 4. 5.
Critical Issue *c:* BUILT ENVIRONMENT	1. 2. 3. 4. 5.	1. RESEARCH ON URBAN / FACTORS THAT INCR. FIRES. 2. SYSTEMS APPROACH TO FOREST HEALTH. 3. 4. 5.

Breakout #2 — **RESEARCH**

FIRE — Natural Resources Management

Wyoming

Critical Issues	What *is* being done?	What *should* be done?
Critical Issue *a:* Land Mgmt tools Pre-fire landmgmt	1. Fire-retardent plants 2. Targeted grazing 3. 4. 5.	1. Continue research on biological methods to reduce wildland fire 2. 3. 4. 5.
Critical Issue *b:* Recovery + Restoration Ecology of Recovery Human Intervention	1. Reclamation and restoration of forest post-fire 2. Reduction of invasive weeds after fire. 3. 4. Native species that are appropriately resilient after fire. 5. Nutrient cycling post-fire	1. Is ~~prevention~~ human intervention required after a wildland fire? 2. 3. Research to guide BLM + US FS on post-fire management decisions 4. 5. Erosion control. + Watershed-level + life-cycle analyses.
Critical Issue *c:* Built environments To create defensable space	1. Evaluation of multiple approaches to create defensable spaces 2. - a post-fire analysis to determine what approach was most effective 3. 4. 5.	1. Use of fire as a management tool. 2. 3. 4. 5.

Breakout #2 — **RESEARCH** Montana **FIRE** — Natural Resources Management

Critical Issues	What *is* being done?	What *should* be done?
Critical Issue *a:* Land mgmt tools	1. Impacts of fire on plant 2. diversity 3. Grazing management 4. 5.	1. Use of livestock on decreasing 2. fuel loads particularly in 3. wet years when fuel load 4. is greater 5.
Critical Issue *b:* Recovery + Restoration	1. Impacts of fire on Invasive 2. plant species 3. 4. 5.	1. Effects on water quality and 2. ~~potentially~~ ~~[illegible]~~ 3. ~~species~~. 4. Landscape 5. may improve → Rangeland quality Air quality - negative
Critical Issue *c:* Built Environment	1. 2. 3. 4. 5.	1. Human factor - how to 2. prevent. 3. 4. 5.

Alaska

Breakout #2 — **RESEARCH**

FIRE — Natural Resources Management

Critical Issues	What *is* being done?	What *should* be done?
Critical Issue *a*: Land management	1. Research on fire behavior based on fuel loads, weather 2. 3. ~~Need~~ to 4. 5.	1. Better models to forecast wildland fire behavior + intensity for scenarios planning 2. 3. Need to convince people that fire is natural part of landscape 4. in most ~~of~~ of the west. 5. Research on smoke abatement
Critical Issue *b*: Recovery & restoration	1. Impacts of fire intensity on ecosystem recovery (i.e. do more intense fires necessarily inhibit recovery, etc.) 2. 3. 4. 5.	1. More funding to better understand ~~recovery~~ ecosystem response to fire 2. Impacts of fire on invasive species 3. 4. 5.
Critical Issue *c*: Built environments	1. 2. 3. 4. 5.	1. More on defensible space. 2. 3. 4. 5.

Utah

Breakout #2 — **RESEARCH**

FIRE — Natural Resources Management

Critical Issues	**What *is* being done?**	**What *should* be done?**
Critical Issue *a:*	1. 2. 3. 4. 5.	1. Collect info available – many states have developed good science, but not widely dispersed. 2. 3. 4. Educate ~~[illegible]~~ clientele – federal, state, public on fire ~~[illegible]~~ – pre and pro-fire landscape, e.g., forage [illegible]! 5.
Critical Issue *b:*	1. 2. 3. 4. 5.	1. 2. 3. 4. 5.
Critical Issue *c:*	1. 2. 3. 4. 5.	1. 2. 3. 4. 5.

Breakout #2 — **RESEARCH**

FIRE — Natural Resources Management

Afltavvt

Critical Issues	What *is* being done?	What *should* be done?
Critical Issue *a:* Land management	1. Fire hx 2. Impacts of land management. 3. 4. 5.	1. 2. 3. 4. 5.
Critical Issue *b:* Recovery & Restoration	1. Restoration ecology 2. Remote imaging 3. 4. 5.	1. 2. 3. 4. 5.
Critical Issue *c:* Built environments	1. 2. 3. 4. 5.	1. 2. 3. 4. 5.

Hawaii

Breakout #2 — **RESEARCH**

FIRE — Natural Resources Management

Critical Issues	What *is* being done?	What *should* be done?
Critical Issue *a:* Land Management for Prevention	1. Developing models of fuel load and combustion in the American Tropics (differs from temperate models) 2. Developed Pacific Fire Exchange to bring research to public and fire fighters 3. 4. 5.	1. Need local models of fuel load/combustion and wild fire behavior, because general models not accurate. 2. 3. 4. 5.
Critical Issue *b:* Recovery & Restoration	1. studying regeneration of both native plants and invasive grasses. 2. 3. 4. 5.	1. Need to create restoration plans to avoid guinea grass and other invasives. 2. 3. 4. 5.
Critical Issue *c:* Protecting Built Environments (cities)	1. Developing local models of wildfire behavior. 2. 3. 4. 5.	1. 2. 3. 4. 5.

CA

Breakout #2 — **RESEARCH**

FIRE — Natural Resources Management

Critical Issues	What *is* being done? (across all issues)	What *should* be done? (across all issues)
Critical Issue *a*: land mgmt & tools pre-fire fire prevention public educ	1. CALFIRE 2. 1 Fire Safe Councils in CA 3. 2 CE educ programs 4. 3 interagency coord in CA 5. 4 strong multi-disciplinary	1. 2. 1 Continue increase funding 3. for fire research (like #6 in other column) 4. 5. 2 continue & increase funding
Critical Issue *b*: recovery & restoration ecol of recovery human intervent	1. interagency fire research 2. programs 3. 5 CE programs on structure 4. fires & defensible space 5. 6 ecol research on mgmt	1. for fire coordination 2. efforts (interagency) 3. 4. 3 continue fire safe education efforts 5.
Critical Issue *c*: Creation of defensible space 10 Fire adapt well listed w/ lots of science-based info	1. strategies to incr fire resistance 2. spec in forests 3. 7 prescribed burning 4. 8 use of fire to manage vegetation 5. (invasive species mgmt, promote veg) 9 use of grazing to reduce fuels	1. 4 $ for researchers to stay 2. engage w/ agencies in fire 3. recovery work 4. 5. 5 continued research on ecol methods to reduce fire

OREGON

Breakout #2 — **RESEARCH**

FIRE — Natural Resources Management

Critical Issues	**What *is* being done?**	**What *should* be done?**
Critical Issue *a:*	1. Some work on forest 2. thinning debris for use 3. in biofuel. 4. 5.	1. Long-term, large-scale 2. studies on grazing 3. intensity, plant 4. communities, fuel 5. load.
Critical Issue *b:*	1. Large scale field 2. studies near 3. completion 4. 5.	1. 2. 3. 4. 5.
Critical Issue *c:*	1. 2. 3. 4. 5.	1. 2. 3. 4. 5.

Breakout #2 — **RESEARCH**

Livestock grazing Nevada

FIRE — Natural Resources Management

Critical Issues	What *is* being done?	What *should* be done?
Critical Issue *a:* Land management Tools	1. Landscape level late season of 2. Cheatgrass to restore 3. rangeland to previous species, 4. and decrease fire ~~protection~~ risk, i.e. pre suppression grazing 5.	1. Assess ~~[illegible]~~ western LGC's 2. capacity to monitoring fire 3. potential including use of unmanned aircraft. 4. Develop models to predict * Expand research on use of livestock 5. to manage fuel load in rangeland
Critical Issue *b:* Recovery & Restoration	1. 2. Studies evaluating re-entry of livestock (grazing) following 3. major fire on ~~[illegible]~~ public 4. rangelands (BLM) 5.	1. Impact BLM 2. 3. 4. 5. Economic studies to assess (total) ~~cost~~ of fires in west including
Critical Issue *c:* Build Defensible Space	1. Target late season grazing 2. to high risk ~~[illegible]~~ areas, decrease 3. intensity of fire, 4. 5.	1. recovery, damage to property, human injury, 2. 3. 4. 5.

USU

Breakout #3 — **EXTENSION**

FIRE — Natural Resources Management

Critical Issues	**What *is* being done?**	**What *should* be done?**
Critical Issue *a:*	1. EWIN extension fire education program (E-Wildfire Information Network) 2. 3. 4. 5.	1. Ensure the public knows of the resource. 2. 3. 4. 5.
Critical Issue *b:*	1. ? 2. utilization of remaining wood products for bio-fuel production 3. 4. 5.	1. There is a Utah/NY coalition on bio-fuels 2. 3. 4. 5.
Critical Issue *c:*	1. EWIN 2. 3. 4. 5.	1. As above! 2. 3. 4. 5.

Breakout #3 — **EXTENSION**

Wyoming

FIRE — Natural Resources Management

Critical Issues	What *is* being done?	What *should* be done?
Critical Issue *a:* management	1.- Living w fire bulletin 2.- Education on fire as a ~~[illegible]~~ mgmt tool 3.- Research on the impact of fire on soil other aspects 4. - 5.	1. Education on fire as mgmt tool. 2. 3. 4. 5.
Critical Issue *b:* recovery and restoration after fire	1. Living w/ fire bulletin 2. education on recovery after fire. 3. - education on water quality concerns for fire impacted run-off. 4. Workshops for NR professionals D. of Ag, NRCS, Consv. dist. etc 5.	1. Research & education on restoration strategies after fire 2. fire and water quality concerns. 3. 4. 5.
Critical Issue *c:* Built Environments exurban development w/ fire	1. - Education on defensible landscapes. 2. - Education on fire protection systems for exurban homes 3. workshops on landscaping 4.- fire protection modules in master gardner curriculum - 5. -	1. Education on fire protection for exurban home owners 2. landscaping to protect property 3. 4. 5.

UNIV OF CALIFORNIA

Breakout #3 — **EXTENSION**

FIRE — Natural Resources Management

Critical Issues	**What *is* being done?**	**What *should* be done?**
Critical Issue *a:*	1. Applied research on forest and range management to manipulate vegetation to create fire resilient landscapes. 2. Development of recommendations for fuel management for large and small 3. landowners. 4. Applied research on the suitability of forest woody biomass for a variety 5. of products beyond energy generation.	1. Applied research investigating "natural" fire recovery and an 2. array of management approaches across a variety of ecosystems. 3. 4. All in "what is being done." 5.
Critical Issue *b:*	1. Applied research on post fire recovery of forest system, with and 2. without "human intervention" 3. Assessment of effects of land management agency approaches to 4. post fire recovery 5. Assessment tools for determining mortality of woody plants following fire	1. 2. 3. 4. 5.
Critical Issue *c:*	1. Development of fire resistant landscaping guidelines. 2. Research on flammability of common landscaping plants. 3. Coordination of, and participation in, 4. local Fire Safe Councils - developing and guiding fuel reduction efforts 5. at all scales.	1. 2. 3. 4. 5.

Emergency response for residents during and after a fire

Education programs for homeowners / landowners on fire preparedness [illegible]

Breakout #3 — **EXTENSION**

FIRE — Natural Resources Management

University of Nevada

Critical Issues	What *is* being done?	What *should* be done?
Critical Issue *a:* More better land management tools. Funding for prevention v. control. Public Ed.	1. Living w/ Fire program 2. Joint Fire Science Program 3. 4. 5.	1. * Better connection between research & education programs 2. ~~Pre~~ Demonstrate efficacy of preventive/ risk management programs- 3. 4. 5. Expand current programs to beyond urban/ wildland interface
Critical Issue *b:* Recovery & restoration after fire. Ecology, w/ & w/out humans. What opportunities to accelerate recovery	1. Invasive species 2. 3. 4. 5.	1. Evaluate efficacy of restoration efforts 2. 3. New technologies for fire monitoring and awareness 4. 5. "Let it burn" approaches to fuels management
Critical Issue *c:* Built environments. Better collaboration between public service agencies	1. Living w/ Fire Program 2. 3. 4. 5.	1. Remote sensing for fuel & risk management and assessment 2. 3. Citizen science/ monitoring for fuel/risk assessment 4. 5.

Breakout #3 — **EXTENSION** Montana State **FIRE** — Natural Resources Management

Critical Issues	What *is* being done?	What *should* be done?
Critical Issue *a*:	1. Research and education 2. 3. 4. 5.	1. 2. 3. 4. 5.
Critical Issue *b*:	1. Research on 2. ecology of recovery 3. 4. 5.	1. 2. 3. 4. 5.
Critical Issue *c*:	1. -Montana Fire Services 2. Training School 3. Extension forestry providing 4. training for communities 5.	1. 2. Expand Extension involvement in high growth areas which 3. tend to be in high risk areas 4. 5.

Univ. Hawaii - Manoa

Breakout #3 — **EXTENSION**

FIRE — Natural Resources Management

Critical Issues	**What *is* being done?**	**What *should* be done?**
Critical Issue *a:* Land Mgt. Tools	1. Pacific Fire Exchange 2. 3. 4. 5.	1. Disseminating management information for tropical 2. forests & pasture lands, ... 3. 4. Workshops for various clientelle groups. 5.
Critical Issue *b:* Recovery & Restoration	1. 2. 3. 4. 5.	1. Forming enhanced partnerships 2. with state and federal agencies. 3. 4. 5.
Critical Issue *c:* Built Environments	1. 2. 3. 4. 5.	1. Pure extension information 2. Crisis management 3. 4. 5.

Breakout #3 — **EXTENSION**

FIRE — Natural Resources Management

Critical Issues	What *is* being done?	What *should* be done?
Critical Issue *a:* Land Mgmt Tools	1. 2. 3. 4. 5.	1. educ for policy makers on 2. reducing fuel load + reducing 3. plant species that burn hot 4. 5.
Critical Issue *b:* Recovery + Restoration after fire	1. 2. 3. 4. 5.	1. 2. 3. 4. 5.
Critical Issue *c:* Built Environments	1. 2. 3. 4. 5.	1. crisis teams to move people 2. + animals 3. Defensible space landscape education 4. 5. Neighborhood watch approach for reducing hazards + fighting fire in remote areas.

Breakout #3 — **EXTENSION**

Oregon

FIRE — Natural Resources Management

Critical Issues	**What *is* being done?**	**What *should* be done?**
Critical Issue *a:* MGT TOOLS	1. 2. 3. 4. 5.	1. TEACH FUEL MGT TO FOREST LANDOWNERS 2. 3. 4. 5.
Critical Issue *b:* RECOVERY & RESTORATION	1. 2. 3. 4. 5.	1. DEVELOP web cam DEMONSTRATION RECOVERY 2. ZONES i.e., 3. TIME-LAPSE PHOTO SERIES 4. 5.
Critical Issue *c:* BUILT ENVIRONMENTS	1. 2. 3. 4. 5.	1. DEVELOP FIRE-RESISTANT LANDSCAPE 2. MG MODULE 3. DEVELOP MG MODULE ON 4. FIRE-RESILIENT LANDSCAPES 5.

Breakout #3 — **EXTENSION**

New Mexico

FIRE — Natural Resources Management

Critical Issues	What *is* being done?	What *should* be done?
Critical Issue *a:* Land Mngt Tools public Education Pre fire mngt	1. Silviculture Studies / Education 2. to USFS and other land mngt Agencies 3. Hired wildland Fire Mngt Specialist 4. 5.	1. Education to public land mngt Agencies 2. & policy makers to reduce Catastrophic fires 3. 4. Issue navigating ESA/litigation to implement Silviculture & Grazing methods to reduce fuel Load 5.
Critical Issue *b:* Recovery & Restoration	1. Forest & Range Mngt Programs 2. Riparian Restoration Programs 3. 4. 5.	1. 2. 3. 4. 5.
Critical Issue *c:* Defensible Space Community Response to Fires	1. Deffensible space / Fire wise 2. program for youth, families & communities. 3. 4. 5.	1. Enhance Firewise program through 2. youth Development (4-H). 3. 4. 5.

Breakout #1 — **TEACHING**

FIRE — Natural Resources Management

WORKFORCE DEVELOPMENT

Critical Issues	What *is* being done?	What *should* be done?
Critical Issue *a:* LAND MGMT tools	1. 2. A HANDFUL OF COURSES IN 3. FIRE SCIENCE, ECOLOGY & 4. HABITAT MGMT 5.	1. 2. 3. 4. 5. the Big, Q&A
Critical Issue *b:* RECOVERY & RESTORATION	1. 2. 3. TREMENDOUS AMOUNTS OF 4. historical ANALYSIS IN the aftermath of the 'big' 5. yellowstone fire (LATE 80's)	1. 2. 3. 4. 5. WHERE ARE the opportunities for collaboration?
Critical Issue *c:* BUILT ENVIRONMENTS	1. 2. 3. CURRICULA IN 4. LANDSCAPE DESIGN & 5. ENVIRO · ARCHITECTURE	1. 2. 3. 4. 5. (focus here)

Breakout #1 — **TEACHING**

Guam

FIRE — Natural Resources Management

Critical Issues	**What *is* being done?**	**What *should* be done?**
Critical Issue *a:* Cmd Mgmt tools pre funding public educatn	1. 2. min fire in agr courses 3. 4. 5.	1. 2. 3. ↑ AWARENESS 4. Integrate fire topics 5. into a variety of courses in agr.
Critical Issue *b:* Recovery and restoration ecology human into urban	1. 2. min 3. 4. 5.	1. 2. 3. " 4. 5.
Critical Issue *c:* Build environments to create a defensive able space	1. 2. min 3. 4. 5.	1. 2. " 3. 4. 5.

Breakout #1 — **TEACHING** Freshman Read – The Big Thirst

FIRE — Natural Resources Management IDAHO

Critical Issues	What *is* being done?	What *should* be done?
Critical Issue *a:* ~~Pre Fire~~ ~~Land Mngt~~ Land Mngt Tools	1. 2. 3. 4. 5.	1. 2. Defensible space 3. 4. Lanscaping 5.
Critical Issue *b:* fire-load Recovery & Restoration	1. 2. 3. 4. 5.	1. 2. understanding incentives 3. to protect high-valued 4. losses 5.
Critical Issue *c:* Built environment to create defensible space Tools	1. 2. 3. 4. 5.	1. 2. ~~MS in Ag~~ – ~~ESGt~~ 3. 4. 5.

NEVADA

Breakout #1 — **TEACHING**

FIRE — Natural Resources Management

Critical Issues	**What *is* being done?**	**What *should* be done?**
Critical Issue *a:* Fire land management	1. 2. 3. 4. 5.	1. Integrate livestock & rangeland 2. management courses. 3. 4. 5.
Critical Issue *b:* Recovery & restoration	1. 2. 3. 4. 5.	1. 2. 3. 4. 5.
Critical Issue *c:* Built environment	1. 2. 3. 4. 5.	1. Landscape architecture & 2. defensible space 3. 4. 5.

Breakout #1 — **TEACHING**

FIRE — Natural Resources Management

CA

Critical Issues	What *is* being done?	What *should* be done?
Critical Issue *a:* Land Management Tools	1. 2. 3. 'Regional collaboration of range management courses / degrees 4. 5.	1. 2. 3. Done in Invasive species 4. 5.
Critical Issue *b:* Recovery & Restoration	1. 2. 3. 4. 5.	1. 2. *Are we ~~t~~ training ecologists in biology? 2, & Ag or NR or Environmental Sciences] 3. Is the focus on molecular? 4. 5.
Critical Issue *c:* Built Environments to create a defensible space	1. 2. 3. 4. 5.	1. How do we → balance disciplinary focus with breadth of training? 2. specialists vs generalist 3. 4. 5.

HAWAII

Breakout #1 — **TEACHING**

FIRE — Natural Resources Management

Critical Issues	**What *is* being done?**	**What *should* be done?**
Critical Issue *a:* Land-management tools - pre-fire mgt. - Funding for prevention - Public Education	1. 2. 3. 4. 5.	1. 2. 3. 4. 5.
Critical Issue *b:* Recovery and restoration - Ecology - Human intervention	1. 2. 3. 4. 5.	1. 2. 3. 4. 5.
Critical Issue *c:* Built environments - Define defensible space - Tools needed	1. 2. 3. 4. 5.	1. 2. 3. 4. 5.

Oregon

Breakout #1 — **TEACHING**

FIRE — Natural Resources Management

Critical Issues	What *is* being done?	What *should* be done?
Critical Issue *a:* Pre-fire mgmt Funding Education Land mgmt tools	1. None to little - left to College of FOR or Other institutions in the state that offer technical/voc training 2. 3. 4. 5.	1. Integrate curriculum across college particularly Range Forestry Landscaping & some Structural Engineering 2. 3. 4. 5.
Critical Issue *b:* Recovery & Restoration ecology human intervention	1. 2. 3. 4. 5.	1. 2. 3. 4. 5.
Critical Issue *c:* Built Env to create defendable space - landscaping - maintenance	1. 2. 3. 4. 5.	1. Landscaping could emphasize this - offer a certificate in Fire Prevention Landscapes 2. 3. 4. 5.

COLORADO

Breakout #1 — **TEACHING**

FIRE — Natural Resources Management

Land Mngmt

Critical Issues	What *is* being done?	What *should* be done?
Critical Issue *a:* Pre Fire Mngmt Tending for Fire Prevention Public Education	1. 2. 3. 4. 5.	1. Landscaping of Forests 2. Forest Management 3. 4. Include in all discipline 5. - Landscape Arch.
Critical Issue *b:* + Recovery/Restoration Ecology of Recovery = Human Intervention for Recovery - Ecology of System - Physical - biological ~~Geographic Scope~~	1. 2. 3. 4. 5. perhaps a part of a lecture in a forage management class	1. - Business of Fire 2. - Soil Restoration 3. 4. - Plant Regrowth 5. - Animal management
Critical Issue *c:* Built Environments - define defensible space landscaping distance veg education of maint. Req. needed collaboration public serving agency neighbor/community	1. 2. 3. 4. 5.	1. 2. 3. 4. 5.

WYOMING

Breakout #1 — **TEACHING**

FIRE — Natural Resources Management

No fire Science Prgms.

Critical Issues	**What *is* being done?**	**What *should* be done?**
Critical Issue *a:* Land Mgt Tools Pre-fire land Mgt (Fuel load red'n) Funding for fire prevention Public education	1. ? 2. 3. 4. 5.	1. See group sheets 2. 3. ? 4. 5.
Critical Issue *b:* Recovery & Restoration · Ecology of recovery - physical - biological · Human/intervention for recovery - ecology of system → physical → biological	1. Restoration/reclamation graduate certificate? 2. 3. 4. 5.	1. 2. 3. ? 4. 5.
Critical Issue *c:* ~~Built environments to create a defensible space we must:~~ · Define defensible space · Tools needed to create space	1. ? 2. 3. 4. 5.	1. 2. 3. ? 4. 5.