
Recommendation 1: Integration of ecological principles into land management

Bob Keane,

**Missoula Fire Sciences Laboratory, Rocky Mountain
Research Station, USDA Forest Service, Missoula MT**

Wendel Hann,

**University of Idaho, College of Natural Resources,
RMRS Wildland Fire Management RD&A, Gila, NM**

Recommendation 1:

Integrate ecology into management tools

Management tools including databases, maps, and models should be grounded in ecological research and principles.

An emphasis should be placed on landscape level tools that, where appropriate, incorporate biological, biochemical, climatological, ecological, geological, and morphological factors.



Fire Ecology

Answers to most fire management problems come from fire ecology

- Fire behavior tools are important
- Fire ecology provides the mechanisms, context and sideboards
- Addressing ecological components of fire behavior and effects provide the solutions to fire management issues



Recommendation #1

Integrate ecology into management tools

This lecture

- State-of-knowledge prior to 2000
- What has been done since 2000
- Challenges
- Future

Describe tools in three categories

- Assessments
- Technology development
- Technology transfer and implementation

Before 2000...

Assessments

- Northwest Forest Plan
- Eastside Forest Health Assessment
- Interior Columbia Basin Ecosystem Management Project
- Sierra Nevada Ecosystem Project
- Many other regional assessments, such as

Before 2000...

Technology Development

- Information technology
 - FEIS (Fire Effects Information System)
- Software tools
 - FOFEM, Consume, Behave, VDDT, FVS, CRBSUM ...
 - Limited GIS
- Ecological concepts
 - HRV, Fire Severity, Fire History, ...
- Wildland fuels
 - Photo guides, FOFEM classification, FCCSicrb

Before 2000....

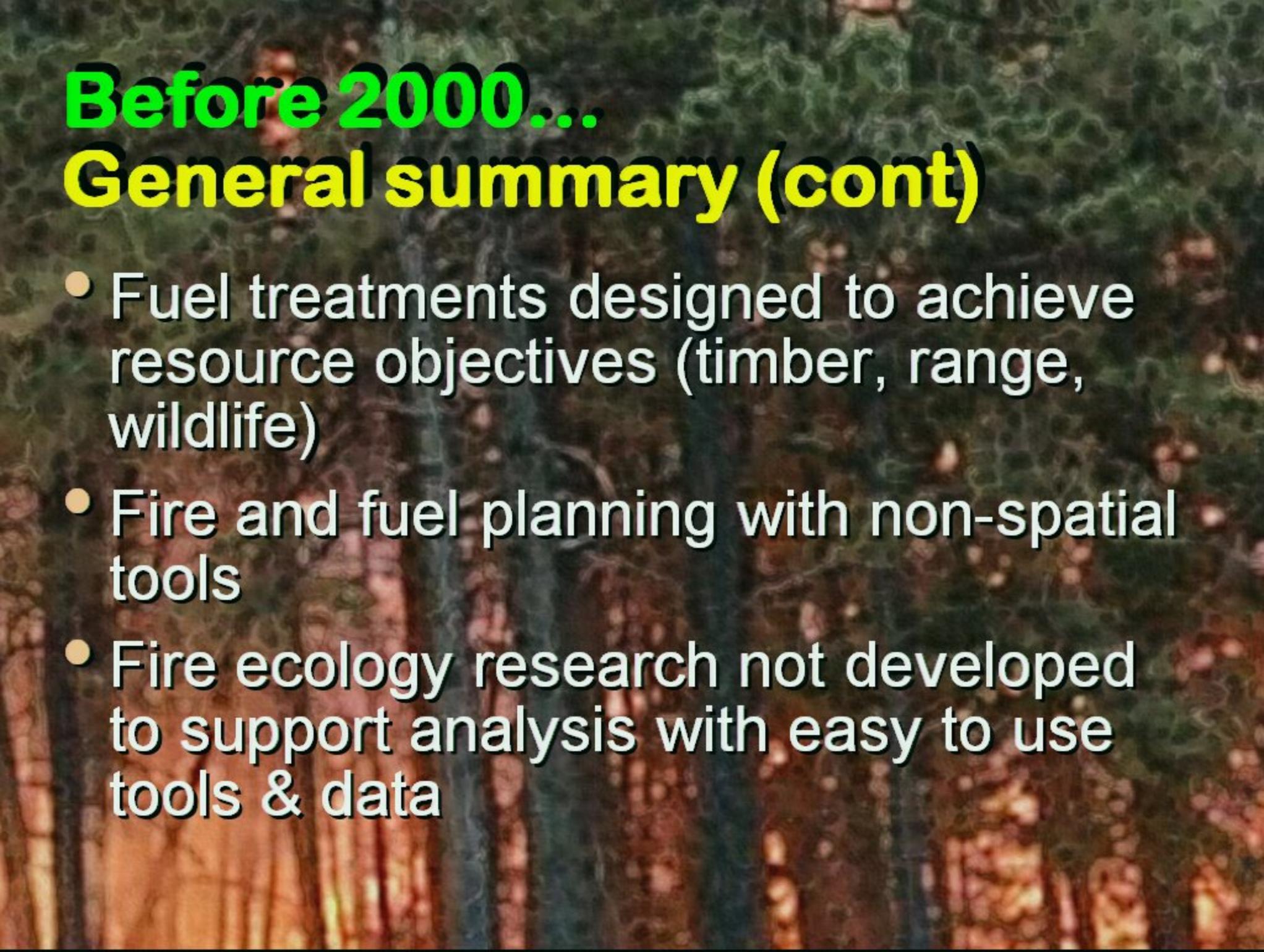
Technology Transfer & Implementation

- Training
 - Rx310-Introduction to fire effects
 - Rx 510-Advanced fire effects
 - M-580 – Fire In Ecosystem Management
- Workshops, conferences
 - Local symposia, special conferences
- Inventory, Monitoring
 - ECODATA, Limited Spatial Mapping
 - Stand Exam

Before 2000...

General summary

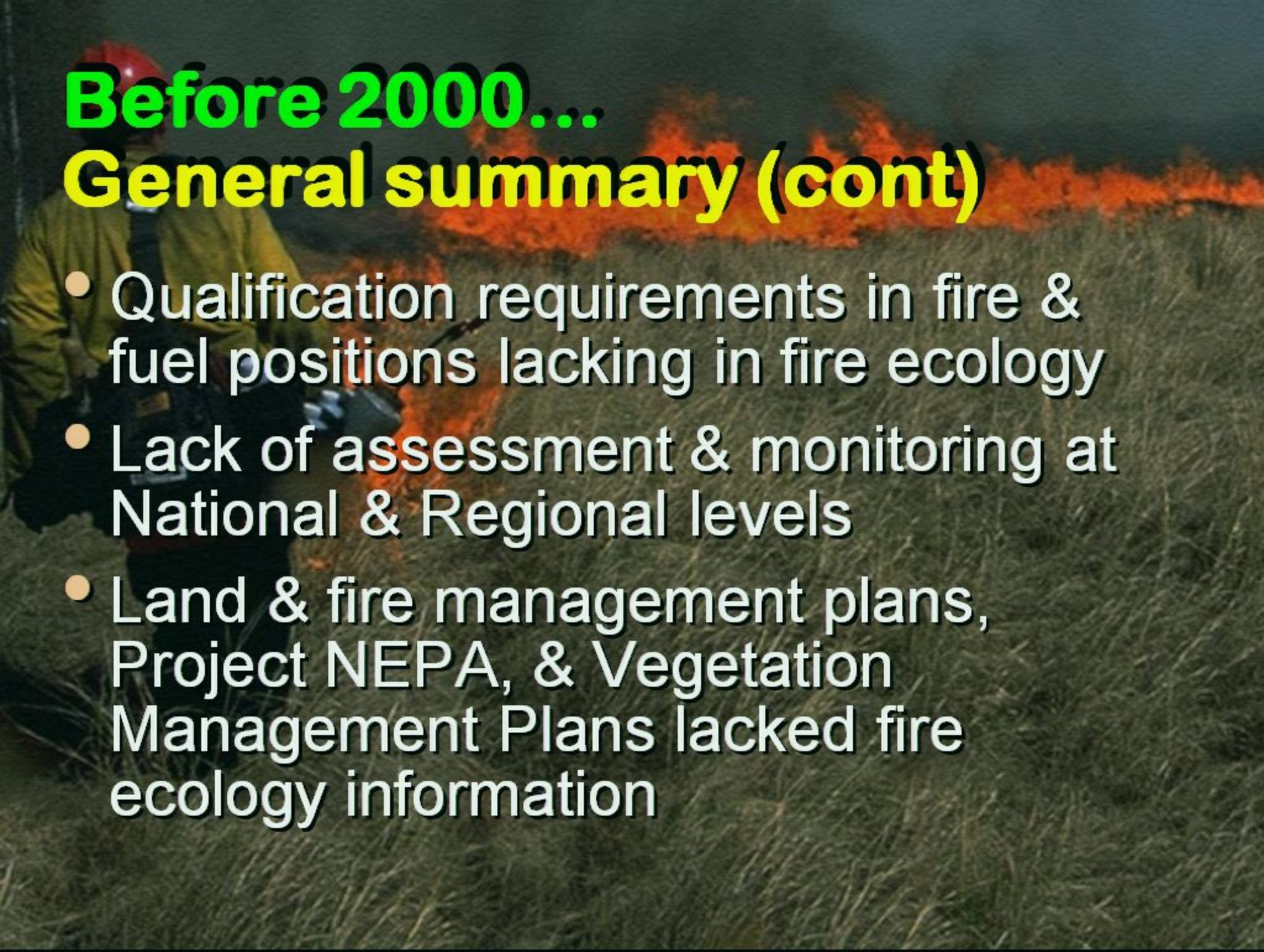
- Most analyses done at stand-level
 - Lack of spatial data & software
 - Lack of adequate computing resources
- Limited number of tools to integrate ecology into fire & fuel management
- Wildfire management based primarily on behavior not ecology



Before 2000...

General summary (cont)

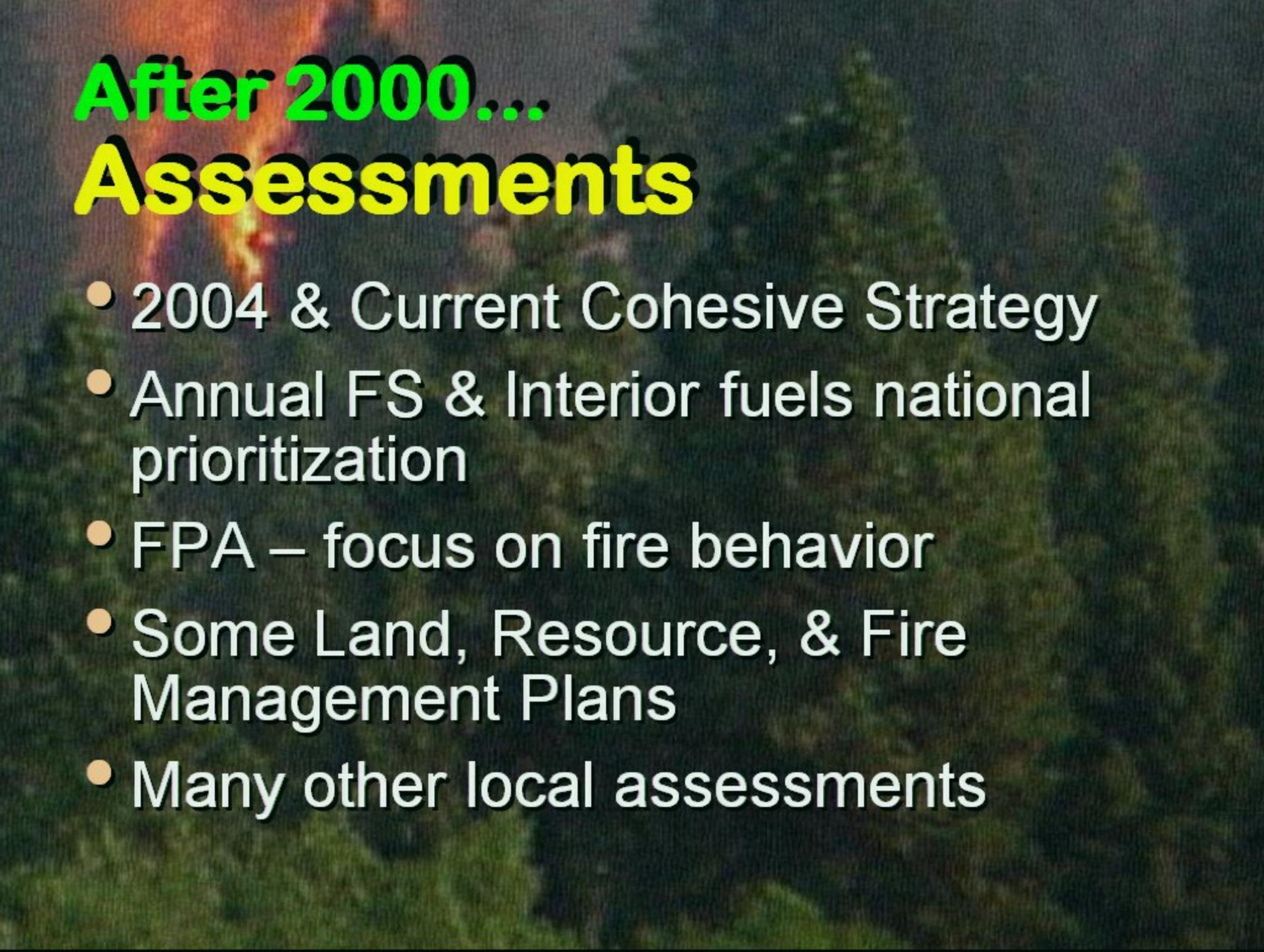
- Fuel treatments designed to achieve resource objectives (timber, range, wildlife)
- Fire and fuel planning with non-spatial tools
- Fire ecology research not developed to support analysis with easy to use tools & data



Before 2000...

General summary (cont)

- Qualification requirements in fire & fuel positions lacking in fire ecology
- Lack of assessment & monitoring at National & Regional levels
- Land & fire management plans, Project NEPA, & Vegetation Management Plans lacked fire ecology information



After 2000...

Assessments

- 2004 & Current Cohesive Strategy
- Annual FS & Interior fuels national prioritization
- FPA – focus on fire behavior
- Some Land, Resource, & Fire Management Plans
- Many other local assessments

After 2000...

Technology Development

- Information technology
 - Coarse Scale Analysis Data
 - LANDFIRE National & Refresh
 - BAER, MTBS, & MTLC
- Software tools
 - Decision support: EMDS
 - Spatial programs: WFAT, ARCFUELS, FRCCmt
 - Wildland Fire: WFDSS/RAVAR, FARSITE, FlamMap

After 2000....

Technology Development

- Software Tools (cont)
 - Futuring: FVS-FFE, SIMPPLLE, VDDT/PATH/TELSA
 - Point models: FUELCALC, NEXUS, FCCS
- Ecological concepts & information
 - FRCC, FRCC Guidebook
 - JFSP, NFP
 - Landscape fire ecology – pattern & process
- Wildland fuels
 - FCCS, FLM, Digital Photo Series

After 2000...

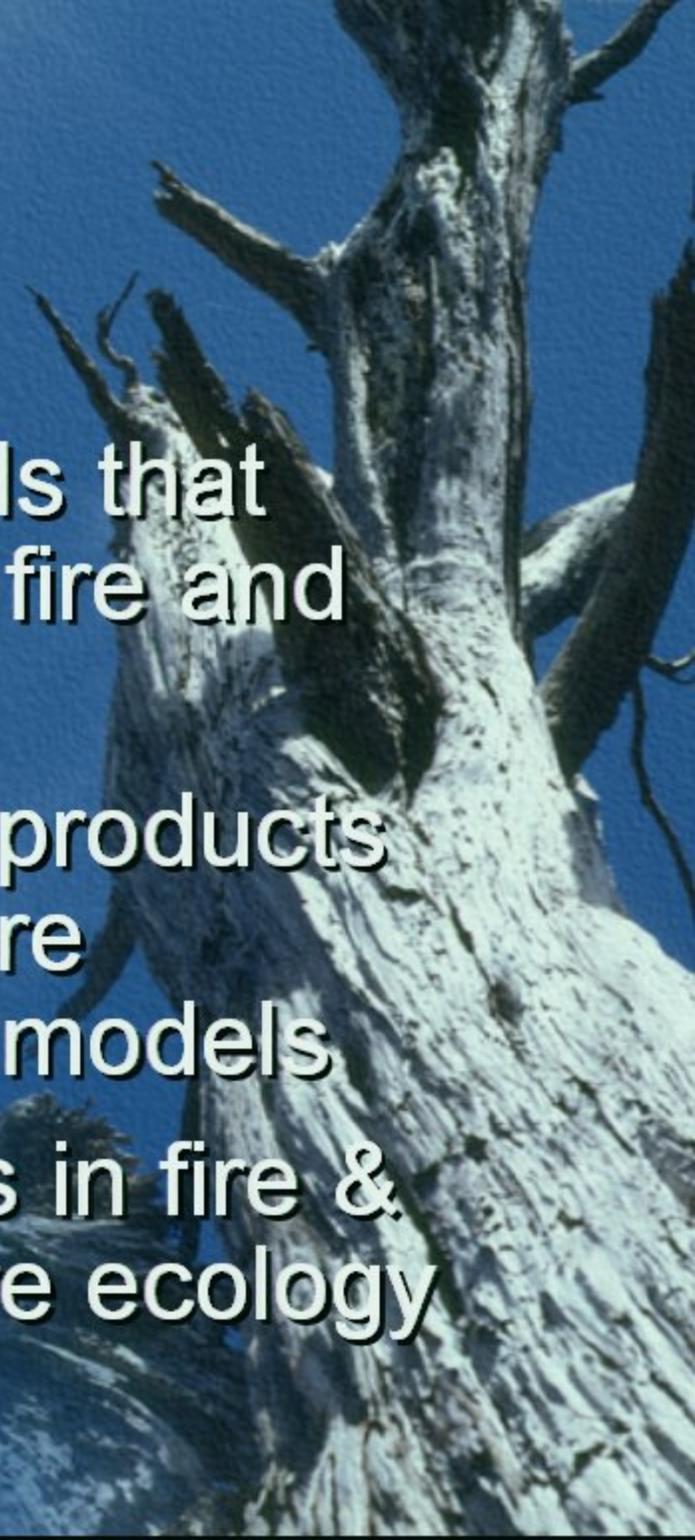
Technology Transfer & Implementation (Cont)

- Training
 - NIFFT – FRCC, fuels, fire effects & behavior
 - Upgrade of S-495, 491, 510, M-580 courses
 - University fire ecology courses
 - Limited or no upgrade in many other S & RX 200, 300 & 400 level courses
- Inventory, Monitoring
 - FIREMON, FEAT, FFI, FIA, FSVEG
- Workshops, Conferences
 - AFE/IAWF annual and special conferences

After 2000....

General summary

- Increase in number of tools that integrate fire ecology into fire and fuel management
- While spatial fire ecology products are now available, most are implementations of stand models
- Qualification requirements in fire & fuel positions lacking in fire ecology



After 2000....

General summary (cont)

- Fire & fuel management primarily based on behavior not ecology
- Assessments & monitoring of ecological issues occurring at National & Regional levels, but limited locally
- Land & fire management plans, Project NEPA, & Fuel Treatment Plans typically lacking in landscape fire ecology

Challenges

Assessments

- Providing the spatial and temporal data needed to make comprehensive assessments
- Resources to study, explore, and monitor the ecological effects and spatial and temporal effectiveness of fire and fuel treatments
- Ensuring that fire & fuel management assessments are based on sound fire and landscape ecology science

Challenges

Technology Development

- **Enhancing existing fire effects tools - incorporating current research into existing tools**
- **Funding basic and applied fire ecology research**
 - **Only 23% of JFSP tasks directly related to fire ecology**
 - **Only 33% related to fuels (overlaps w/ ecology)**
 - **50% related to fire behavior & smoke**
- **Integrating multiple disturbance interactions (e.g., reburns, MPB, budworm, grazing, fuel treatments)**



Challenges

Technology Development (cont)

- Integrating climate change projections with fire ecology tools
- Limit proliferation of tools while still providing managers the ability to perform needed analysis
- Combining spatially explicit fire behavior tools with fire effects tools
- Incorporating fire ecology & futuring into wildfire management decision support



Challenges

Technology Transfer & Implementation

- Integrating landscape fire, fuels, and vegetation dynamics into land and fire management plans, NEPA, fuel treatment design, & prescribed fire planning
- Incorporating landscape fire ecology into fire and fuel management position qualifications
- Training people in advanced analytical, geospatial, simulation, and fire prediction systems



Future

Technology Development

- **Integrated suite of up-to-date information and simulation tools**
 - **Life cycle plan for data & tools**
 - **Life cycle plan for transfer & implementation**
- **Process for addressing landscape fire ecology & futuring in wildfire decision-making**
- **Physically based 3-D fire behavior model that contains linkages to fire ecological responses**

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Future

Technology Transfer & Implementation

- Landscape fire ecology education for fire & fuel managers
- Communicate public, policy makers, & decision makers about ecological issues
- Free and easy access to analytical “Centers of Excellence” or “Analysis Centers”



Future Vision

- **What will future landscapes look like without the integration of fire ecology**