

Recent Trends: Linking Research to Management – CFER and Beyond Synthesis

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Long-term Collaborations on Forest Management Issues in the Pacific Northwest

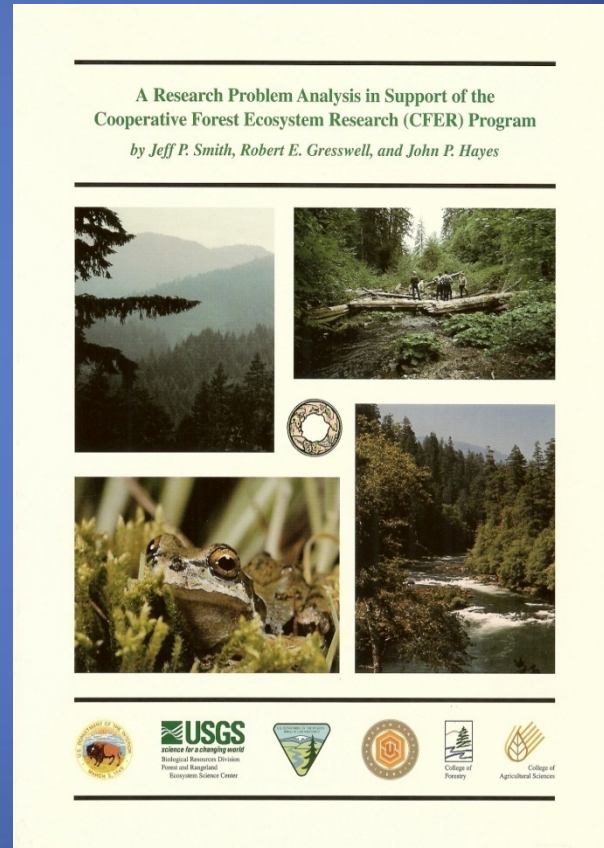
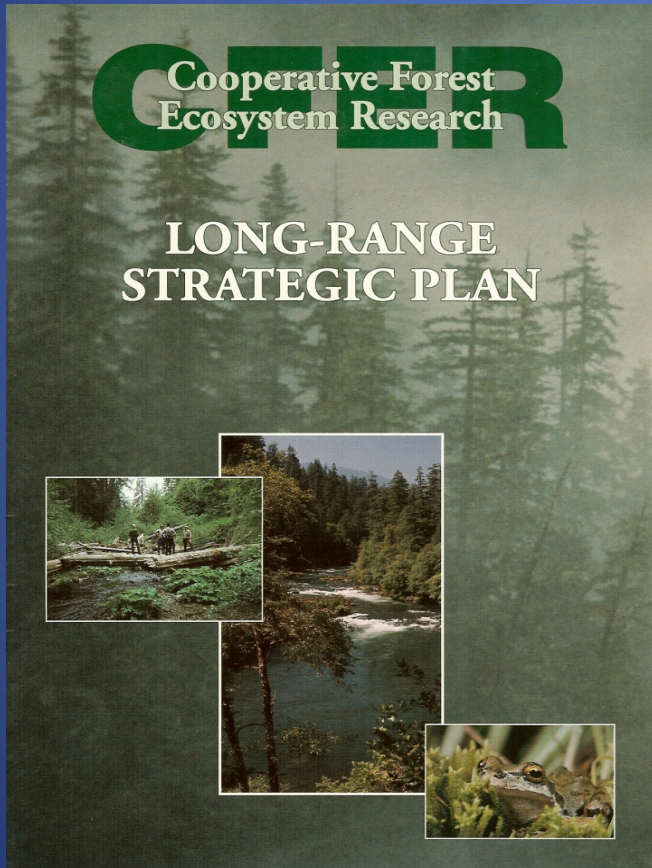
OSU, BLM, FRESC, ODF:

- **FIR** - Forestry Intensive Research (1978-1991)
- **COPE** - Coastal Oregon Productivity Enhancement (1987-1999)
- **CFER** - Cooperative Forest Ecosystem Research (1997-present)

Why Establish CFER?

- Northwest Forest Plan recently adopted
- BLM-funded COPE program completed
- BLM needed research support for implementation of NFP
- Multi-organizational approach needed to assemble required capacity
- Focus on helping resource managers address difficult management issues

CFER Planning Documents



CFER Goals

- To provide forest managers with new information to evaluate current and proposed strategies and practices associated with management of forest ecosystems.
- To facilitate development of sustainable forest practices through team-oriented, integrated research.

CFER Objectives

- To further the understanding of ecological relationships in forest ecosystems with special emphasis on biodiversity and its management in young forest stands and riparian zones.
- To deliver information to cooperators, forest managers, and the general public in a timely and responsive manner.

Research Themes

- *Stand Structure* and Biotic Responses to Changes in Structure of Young Forests of Western Oregon
- *Large Woody Debris* in the Terrestrial and Aquatic Riparian Zone: Production, Recruitment, Retention, and Function
- Influence of *Landscape* Pattern and Composition on Species in Forested Ecosystems of Western Oregon
- Influence of *Riparian* Vegetative Community Composition on Animal Community Response

Managing at the Stand Scale

- Thinning and Stand Development (J. Tappeiner)
 - Big old growth trees grow fast at young ages (lower densities)
 - Large old trees respond to thinning
 - Shrubs can limit understory tree establishment and growth



Managing at the Stand Scale

- Soils (S. Perakis)
 - Tree species affect soil characteristics
 - More diverse stands will have more diverse soils
 - Effects are site-dependent, but predictable
 - Large and small gaps show similar responses
 - Increased soil nutrient availability favors early seral over forest understory species
 - Management choices will shape long-term soil properties



Managing at the Stand Scale

- Wildlife Habitat (J. Hayes)
 - Keystone structures studied: snags, shrubs, down wood
 - Importance of retaining snags away from riparian buffers and patterns of use of snags in post-fire forests
 - Influences of down wood on the behavioral ecology of species and individual survival
 - Forests subjected to active management for complex conditions can likely maintain or support habitat for many species of wildlife the short- and long-term



Managing at the Landscape Scale

- Wildlife (J. Hayes)
 - Species-specific responses to spatial scale
 - Amphibians respond differently to habitat structure at different scales
 - Bats studied responded differently to landscape characteristics
 - Subtle differences in life history characteristics can result in very different responses to landscape characteristics



Managing at the Landscape Scale

- Riparian Areas as Networks (B. Gresswell)
 - Continuous samples of cutthroat trout throughout each watershed allowed analysis of spatial structure of fish distribution and abundance
 - Demonstrated the importance of movement within watershed to short-term survival and long-term persistence
 - Developed a sampling frame to obtain a statistically representative sample of watersheds supporting coastal cutthroat trout



Managing at the Landscape Scale

- Landscape Scenario Analysis Project (Christian Torgersen)
 - Used complex modeling approaches to develop different management scenarios of interest to managers, so they could evaluate alternative outcomes
 - Can now begin to incorporate wildlife and fisheries data into modeling efforts



Post-Fire Environment

- Vegetation (D. Hibbs)
 - Vegetation recovers quickly in riparian and uplands
 - Abundant tree regeneration
 - Regeneration occurs over extended period
 - Small effect of seed source distance
 - Shrub composition different in managed and unmanaged stands
 - More larger trees with management



Post-Fire Environment

- Wildlife (Michelle Cannon)
 - Biological legacies influence the distribution of bird species in severely burned forest
 - Salvage logging influences nesting species differently:
 - ↓ primary cavity nesters/bark foragers
 - – secondary cavity nesters/ground gleaners
 - ↑ shrub/ground nesters
 - Patterns after salvage similar to after logging green forests



Post-Fire Environment

- Aquatics (B. Gresswell)
 - Negative effects of fire greatest on least mobile species
 - Abundance and distribution returns to pre-fire levels w/in 2 years, even in areas where extirpation occurred
 - Connectivity may be the most important factor determining negative consequences of fire
 - Lakes less affected than streams
 - When water temperatures are not lethal, growth of fish increases



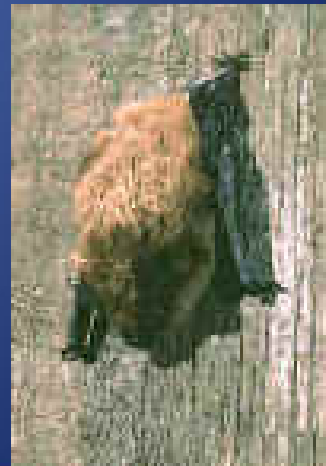
Riparian Management

- Insects to Aquatic Vertebrate Links (J. Li)
 - Documented seasonal dietary patterns among four vertebrate predators in conifer and hardwood dominated canopies
 - Used Bayesian Belief Network Model to examine relationship between several predators and their prey
 - Great example of integrating several simultaneously conducted studies to develop food web model



Riparian Management

- Terrestrial Vertebrates (Holly Ober)
 - Contribution of conifers and hardwoods to wildlife in riparian areas
 - Synthesized work of 10 CFER grad students
 - Looked at
 - Influence of vegetation composition on vertebrates
 - Diets of insectivorous vertebrates
 - Influence of vegetation composition on invertebrates
 - Influence of vegetation structure on vertebrates



Riparian Management

- Vegetation Processes (S. Perakis)
 - Alder leaves are an important energy base for terrestrial (and aquatic) food webs
 - Alder habitats likely host unique and more productive soil food webs
 - Alder N legacies may fuel Douglas-fir growth, but this legacy N is of limited nutritional value



CFER Products

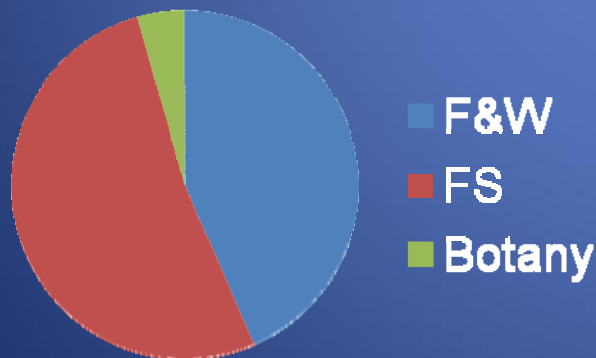
- Program Documents (Strategic Plan; Problem Analysis)
- Annual Reports (since 1999)
- Newsletters (19 issues since summer 2001)
- Theses and Dissertations (30)
- Scientist Publications (33)
- Fact Sheets (6)
- Topical Reports (5)
- Digital Products (3)
- Media Productions (4)
- Website
- Dozens of workshops, presentations, and lectures
- More to come as current projects are completed

Training Future Scientists

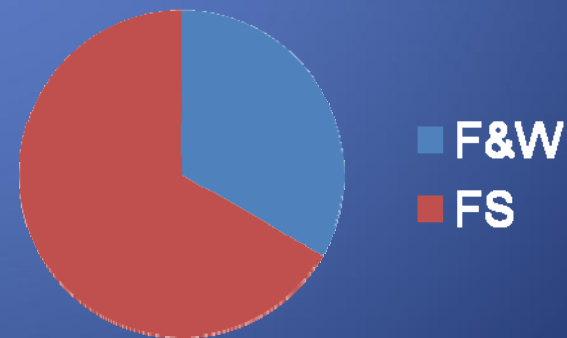
32 CFER Graduate Students:

- Forest Science (6 Ph.D., 12 M.S.)
- Fisheries and Wildlife (3 Ph.D., 10 M.S.)
- Botany and Plant Pathology (1 M.S.)

M.S. Degrees



Ph.D. Degrees



Placement of Graduates

- USFS, Gifford Pinchot National Forest
- USFS, PNW
- USGS, FRESC
- BLM (Oregon)
- National Park Service
- NOAA
- Oregon State University
- University of Florida
- UC Berkeley
- Conservation International
- Ph.D. Programs (UF, Univ. of ID, Michigan State Univ., Cornell Univ.)

Summary Observation

- “Research cooperatives are excellent mechanisms for integrating research and management” (Ross Holoway, ODF)
- For the past 30 years there has been a series of very successful forest management research collaborations – *an unprecedented accomplishment*
- USGS, OSU and ODF should take pride in the accomplishments of CFER, continue to support research that addresses management needs, and work hard to continue the levels of cooperation and collaboration that have been a hallmark of research in the PNW

CFER  Cooperative Forest
Ecosystem Research

