

14. Achieving Fuel Reduction Goals and Restoring Riparian Zones to Healthy Conditions

Riparian ecosystem dynamics in relation to fire in the Rocky Mountains

With fire exclusion and the consequent absence of fire-associated floods, many river and stream ecosystems throughout the Rocky Mountains have undergone hydrologic and vegetation changes.

analysis of charcoal deposits in sediments and peat bogs—to estimate the frequency, intensity, and spatial extent of fires in riparian zones and adjacent uplands in past centuries and millennia.

While evidence of riparian and watershed deterioration varies by site and region, this phenomenon can include:

- Increased woody biomass,
- Uncharacteristic fire frequency and severity,
- Drying of channels,
- Reduced water yield,
- Loss of native plant and animal species,
- Invasions of exotic plants and fish, and
- Increasing pressure on threatened and endangered species populations.

“Legal challenges and public pressure demand that we apply management practices based on sound research—not on casual observations and opinions. This study is providing us with basic knowledge developed from robustly designed, peer-reviewed science for direction and support.”

Catherine Stewart, Assistant Fuels Planner/Fire Ecologist
Northern Region, Fire, Air, and Aviation Management

Scientists are evaluating the relationship of fire to climate—with a focus on past and recent relationships between fire and drought events.

Scientists Eye Fire and Drought Events

Both rapid assessments and long-term research were needed for understanding:

- The ecological costs and benefits of wildfires as well as fire use and prescribed fires, and
- Fuel removal in and adjacent to sensitive riparian ecosystems.

Under this research project, in New Mexico and Montana, scientists used research tools—such as tree-ring analysis of fire scar and tree age patterns, and “carbon-14”

To better understand how these systems respond to fire—and, perhaps, even flooding—these scientists are also comparing current conditions in streams and riparian zones that burned at different times.

Researchers have also projected the ecological future of post-fire ecosystems by evaluating successional patterns of different-aged wildfires. In addition, research compared ecological responses to varied methods of fuel removal in a wide range of forest and shrub communities.



Figure 17. Workers remove exotic tamarisk and other fuels at RMRS study site near San Antonio, New Mexico.

Applying This Study's Results

Under this study, two 10-day workshops provided students, academics, and natural resource professionals an intensive, hands-on learning experience in tree-ring and fire scar analysis.

Scientists and partners also hosted three workshops and two training sessions that resulted in riparian restoration manuals now in use by city, State, and Federal agencies.

Managers frequently request and use this research's products, including:

- Slides and photos for preparing restoration plans,
- Information for educating partners and internal employees, and
- Plans and techniques that can be relayed to supervisors, staff, constituencies, and partners.

Contacts

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