Collaboration as a Tool in Forest Restoration

May 2005
Ecological restoration seeks to heal degraded ecosystems by reestablishing native species, structural characteristics, and ecological processes. The Society for Ecological Restoration International defines restoration as “an intentional activity that initiates or accelerates the recovery of an ecosystem with respect to its health, integrity and sustainability. . . . Restoration attempts to return an ecosystem to its historic trajectory” (Society for Ecological Restoration International 2004).

In the southwestern United States, most ponderosa pine forests have been degraded during the last 150 years; many areas are now dominated by dense thickets of small trees and have lost their once diverse understory. Forests in this condition are highly susceptible to damaging, stand-replacing fires and increased insect and disease epidemics. Restoration of these forests centers on reintroducing frequent, low-intensity surface fires—often after first thinning dense stands—and reestablishing productive understory plant communities. The Ecological Restoration Institute at Northern Arizona University is a pioneer in researching, implementing, and monitoring ecological restoration of southwestern ponderosa pine forests. By allowing natural processes such as fire to resume self-sustaining patterns, we hope to reestablish healthy forests that provide ecosystem services, wildlife habitat, and recreational opportunities.

Every restoration project needs to be site specific, but the detailed experience of field practitioners may help guide practitioners elsewhere. The Working Papers series presents findings and management recommendations from research and observations by the ERI and its partner organizations.

This publication would not have been possible without significant funding from the USDA Forest Service. The views and conclusions contained in this document are those of the authors and should not be interpreted as representing the opinions or policies of the U.S. Government. Mention of trade names or commercial products does not constitute their endorsement by the U.S. Government.

1: Restoring the Uinkaret Mountains: Operational Lessons and Adaptive Management Practices
2: Understory Plant Community Restoration in the Uinkaret Mountains, Arizona
3: Protecting Old Trees from Prescribed Fire
4: Fuels Treatments and Forest Restoration: An Analysis of Benefits
5: Limiting Damage to Forest Soils During Restoration
6: Butterflies as Indicators of Restoration Progress
7: Establishing Reference Conditions for Southwestern Ponderosa Pine Forests
8: Controlling Invasive Species as Part of Restoration Treatments
9: Restoration of Ponderosa Pine Forests to Presettlement Conditions
10: The Stand Treatment Impacts on Forest Health (STIFH) Restoration Model

Further Readings


For More Information
For more information about forest restoration, contact the ERI at 928-523-7182 or www.eri.nau.edu.

Written by Kimberly Lowe and Ann Moote
Reviewed by Jesse Abrams, Dennis R. Becker, Sam Burns, Andrea Bedell Loucks, Dennis Lund, Vicky Sturtevant, and Diane Vesick
Series Editor Peter Friederici
Introduction

Many policy makers, stakeholders, and land management agencies have embraced collaborative approaches as a means of guiding forest management on public lands. A growing number of federal policies, such as the Healthy Forests Restoration Act of 2003 and the “Facilitation of Cooperative Conservation” Executive Order of 2004, call for “cooperative conservation” by encouraging federal agencies to work collaboratively with multiple stakeholders on natural resource management issues. These directives have created both optimism and uncertainty. This publication presents an overview of collaborative forest restoration, including both benefits and challenges.

The idea of working collaboratively on forest management projects became popular in the 1990s. It grew from a grassroots demand for increased public participation in natural resource decision-making and the application of alternative dispute resolution methods to environmental conflicts.

One of the oldest and best-known collaborative forest restoration groups is the Applegate Partnership in Oregon. This collection of environmentalists, loggers, mill owners, ranchers, and agency scientists and managers came together in 1992 to assess, manage, and restore a 500,000-acre watershed in southwestern Oregon. In the decade since its inception, the Applegate Partnership has completed assessments of social, economic, and ecological conditions in the watershed, implemented forest and riparian restoration projects, developed an extensive monitoring program, and completed one of the first Community Wildlife Protection Plans in the country.

Collaborative efforts have also promoted forest restoration efforts in many other locales, such as Flagstaff, Arizona; Montezuma County, Colorado; and Catron County, New Mexico. These models have advanced the concept of collaborative resource management around the country. Increasingly, people who have grown tired of conflict and gridlock are coming together to explore new, innovative, and more effective strategies for informing land management.

What Is Collaborative Forest Restoration?

Collaborative forest restoration is a process through which multiple stakeholders jointly explore diverse values and interests and attempt to come to some level of agreement about appropriate management. Typically, the goal is to develop new approaches to restoration that are both scientifically credible and socially acceptable. Collaboration implies stakeholder involvement that goes well beyond the usual processes of public comment on agency proposals, such as public meetings and comment periods. In a collaborative process, all stakeholders participate directly in identifying issues of concern, developing proposed actions, and reviewing alternatives.

Not all collaborative groups are the same. Groups vary considerably in their number of participants, scope of goals and activities, land ownership represented, interest groups involved, and the decision-making processes used. There are a variety of ways to collaborate (Figure 1), but what they all have in common is the active involvement of multiple stakeholders.

Using Collaboration to Meet Restoration Goals

Forest restoration projects present an ideal opportunity for using the collaborative process. Forest restoration usually requires the input of many experts, including wildlife biologists, fire managers, and planners. It also affects many people and groups, from people who live near the project area to those with a strong interest in resource protection. Often tradeoffs must be made that involve prioritizing differing values, such as protecting wildlife species and reducing fire risk. A project that includes multiple stakeholders in the restoration process from the beginning is likely to have more local involvement and support, resulting in improved results.

Introduction

Many policy makers, stakeholders, and land management agencies have embraced collaborative approaches as a means of guiding forest management on public lands. A growing number of federal policies, such as the Healthy Forests Restoration Act of 2003 and the “Facilitation of Cooperative Conservation” Executive Order of 2004, call for “cooperative conservation” by encouraging federal agencies to work collaboratively with multiple stakeholders on natural resource management issues. These directives have created both optimism and uncertainty. This publication presents an overview of collaborative forest restoration, including both benefits and challenges.

The idea of working collaboratively on forest management projects became popular in the 1990s. It grew from a grassroots demand for increased public participation in natural resource decision-making and the application of alternative dispute resolution methods to environmental conflicts.

One of the oldest and best-known collaborative forest restoration groups is the Applegate Partnership in Oregon. This collection of environmentalists, loggers, mill owners, ranchers, and agency scientists and managers came together in 1992 to assess, manage, and restore a 500,000-acre watershed in southwestern Oregon. In the decade since its inception, the Applegate Partnership has completed assessments of social, economic, and ecological conditions in the watershed, implemented forest and riparian restoration projects, developed an extensive monitoring program, and completed one of the first Community Wildlife Protection Plans in the country.

Collaborative efforts have also promoted forest restoration efforts in many other locales, such as Flagstaff, Arizona; Montezuma County, Colorado; and Catron County, New Mexico. These models have advanced the concept of collaborative resource management around the country. Increasingly, people who have grown tired of conflict and gridlock are coming together to explore new, innovative, and more effective strategies for informing land management.

What Is Collaborative Forest Restoration?

Collaborative forest restoration is a process through which multiple stakeholders jointly explore diverse values and interests and attempt to come to some level of agreement about appropriate management. Typically, the goal is to develop new approaches to restoration that are both scientifically credible and socially acceptable. Collaboration implies stakeholder involvement that goes well beyond the usual processes of public comment on agency proposals, such as public meetings and comment periods. In a collaborative process, all stakeholders participate directly in identifying issues of concern, developing proposed actions, and reviewing alternatives.

Not all collaborative groups are the same. Groups vary considerably in their number of participants, scope of goals and activities, land ownership represented, interest groups involved, and the decision-making processes used. There are a variety of ways to collaborate (Figure 1), but what they all have in common is the active involvement of multiple stakeholders.

Using Collaboration to Meet Restoration Goals

Forest restoration projects present an ideal opportunity for using the collaborative process. Forest restoration usually requires the input of many experts, including wildlife biologists, fire managers, and planners. It also affects many people and groups, from people who live near the project area to those with a strong interest in resource protection. Often tradeoffs must be made that involve prioritizing differing values, such as protecting wildlife species and reducing fire risk. A project that includes multiple stakeholders in the restoration process from the beginning is likely to have more local involvement and support, resulting in improved results.
Benefits and Challenges of Working Collaboratively

Collaboration is not easy. Although there are many benefits, there are also challenges. Collaboration is time-consuming and unpredictable, which can lead to frustration. Common challenges include competitiveness among group members, burnout, unbalanced representation, resistance to change, and lack of support from key community leaders and agency officials. Interpersonal relationships within any group can become complex, necessitating extra patience and diplomacy in order to resolve disputes. Collaboration does not guarantee consensus or elimination of controversy. It can be difficult to make the logic behind decisions clear to everyone in the process, as well as to outsiders. For that reason, it is critical to be as transparent as possible. Decisions made through collaboration are rarely binding and may or may not be upheld by participants or outsiders.

Despite these challenges, the potential benefits of collaboration are significant. Inviting multiple stakeholders to participate provides an opportunity to try new strategies, improve community relations, reduce existing tension, and share the responsibility among many people. Collaboration encourages communication and collective learning among all interested parties and can result in more innovative and comprehensive restoration plans and projects. By promoting open and transparent planning and decision-making, collaboration can build trust. Collaboration also brings to light issues early in the planning process, preventing unexpected resistance to a proposed restoration project or management plan later on. By working together, stakeholders can expand the human and financial resources required for restoration.

Potential Benefits
• Information sharing and mutual learning
• More innovative and informed decisions
• Increased trust among stakeholders and land management agencies
• Opportunity to work on landscape-level projects
• Long-term commitment
• Challenging projects get implemented

Potential Challenges
• Loss of autonomy
• Willingness to let go of personal positions
• Achieving transparent decision-making
• Complex interactions among several different interests
• Considerable time investment
• Unpredictable process and uncertain outcomes
• Focus on process may eclipse on-the-ground work

Natural Resource Agencies and Collaboration

Natural resource agency personnel face unique challenges in a collaborative process. They have specific legal responsibilities to uphold and operate under highly structured, bureaucratic management protocols. As professionals, they are trained to be technical experts, and may not be comfortable engaging in discussions of management tradeoffs, with people from different backgrounds. The time required for collaboration can be stressful if it is viewed as an additional job responsibility. Few agencies incorporate collaboration in job descriptions or as a performance goal or measure. Both agency and non-agency participants in collaborative efforts regularly cite agency organizational culture as the most significant obstacle to successful collaboration. Overcoming these challenges requires ongoing communication with upper management to ensure support for the collaborative effort, as well as ongoing communication with fellow participants in the collaborative process to ensure that they understand agency constraints.

Characteristics of Successful Collaborative Projects

Collaborative groups and the issues they address are too variable for any single set of criteria to apply in all cases. But there are several characteristics listed here that are common to many successful groups. They should not be viewed as requirements of collaboration, nor are they a recipe for success. However, they can serve as useful ideas for those involved in considering participating in a collaborative effort.

• Broad participation. All stakeholders, including anyone who could affect or be affected by their activities, are invited to participate in the process. Participants may include local community members; federal, state, and local government agencies; tribes; businesses; non-profit organizations; researchers; environmental groups; and others.

• Significant, shared need. A common, pressing need to work together on a specific issue provides an incentive to collaborate and can help maintain momentum. Often collaborative efforts are initiated in response to a resource management crisis, such as fire risk, a legal threat, or a legal requirement.

• Supportive political climate. The support of key decision-makers within the community – both elected officials and agency personnel, and including those with the legal authority to plan and implement restoration projects – facilitates project implementation.

• Adequate resources. Money, time, and staff are available to support the function of the collaborative group. Often participants are willing to engage on a volunteer basis; however, many collaborative groups have suggested that having at least one paid staff member is essential to keep the group moving forward. Sources of support may include private foundations, government grants, or direct Congressional appropriations.

• Clear, agreed-upon goals. Participants have discussed and come to agreement on the purpose and desired outcomes of the collaborative process. Communication, respect, and mutual learning are all important in identifying and addressing differing expectations about the collaborative process and its outcomes.

• Fair process. The group is not secretive about how information is obtained or decisions are made. Participation is open to all interested parties. Everyone can participate in planning and decision-making discussions. Participants understand their roles and responsibilities within the group and understand the reasoning behind decisions.

• Trust and accountability. Participants can openly and freely express their opinions without fearing ridicule or derision from other group members. Participants are willing to negotiate and compromise. The group has developed strategies for managing conflict, reducing individual vulnerability, and encouraging commitment to group decisions.

• Realistic expectations. Realistic timelines are set for achieving restoration goals. Patience is vital. It is not uncommon for collaborative groups to spend years engaged in planning before a project is implemented on the ground.

• Measures of success. Progress is monitored on an established timeline, and project advancements, successes, and failures are reviewed in order to improve the group’s productivity and maintain momentum. The group finds ways to recognize and celebrate its efforts, such as using the local media to provide recognition for its accomplishments.

Figure 1. Types of Collaborative Forest Restoration Groups

Planning committees and advisory councils
Main purpose is to provide advice and/or help develop guidelines and plans for others, such as government agencies. Group members are usually invited or appointed based on expertise. The group typically has no decision-making authority, but its suggestions are used by authorities to guide the details of restoration projects. These groups may last for months or years, or may dissolve once the task at hand has been accomplished.

Example: Arizona Forest Health Oversight and Advisory Councils

Dialogue groups and community forums
Single events or ongoing gatherings to share ideas and create a broad vision for future action. May propose goals or make recommendations, but make no attempt to reach agreement.

Example: Seventh American Forest Congress

Comanagement
This is a formal process with focus on shared power among government authorities or between an agency and one or more user groups. Participation is limited to people with legal authority and decision-making capacity. Comanagement groups may develop and analyze restoration proposals, develop and ratify legally binding agreements, and share the decision-making process among a handful of key stakeholders.

Comanagement can operate permanently or may be developed to work for a specified length of time.

Example: Valles Caldera Trust, New Mexico

Networks
Loosely defined groups of individuals with overlapping interests or responsibilities who engage in informal communication over extended periods of time. The goal is information exchange and resource sharing, not decision making or project implementation.

Example: National Network of Forest Practitioners

Partnerships
Generally long-standing and place-based, these groups are used to identify issues, gather information, generate management options, and develop recommendations for restoration projects within a specified geographic area. Participants usually represent an agency or special interest group, but non-aligned citizens may also participate. As with planning committees, partnerships usually do not have decision-making authority, but their suggestions are influential and are often adopted by agency personnel and government authorities.

Example: Applegate Partnership, Oregon

Example: National Network of Forest Practitioners

Example: Arizona Forest Health Oversight and Advisory Councils

Example: Seventh American Forest Congress

Example: Applegate Partnership, Oregon

Example: National Network of Forest Practitioners

Example: National Network of Forest Practitioners
Benefits and Challenges of Working Collaboratively

Collaboration is not easy. Although there are many benefits, there are also challenges. Collaboration is time-consuming and unpredictable, which can lead to frustration. Common challenges include competitiveness among group members, burnout, unbalanced representation, resistance to change, and lack of support from key community leaders and agency officials. Interpersonal relationships within any group can become complex, necessitating extra patience and diplomacy in order to resolve disputes. Collaboration does not guarantee consensus or elimination of controversy. It can be difficult to make the logic behind decisions clear to everyone in the process, as well as to outsiders. For that reason, it is critical to be as transparent as possible. Decisions made through collaboration are rarely binding and may or may not be upheld by participants or outsiders.

Despite these challenges, the potential benefits of collaboration are significant. Inviting multiple stakeholders to participate provides an opportunity to try new strategies, improve community relations, reduce existing tension, and share the responsibility among many people. Collaboration encourages communication and collective learning among all interested parties and can result in more innovative and comprehensive restoration plans and projects. By promoting open and transparent planning and decision-making, collaboration can build trust. Collaboration also brings to light issues early in the planning process, preventing unexpected resistance to a proposed restoration project or management plan later on. By working together, stakeholders can expand the human and financial resources required for restoration.

Potential Benefits
- Information sharing and mutual learning
- More innovative and informed decisions
- Reduced stress among stakeholders and land management agencies
- Opportunity to work on landscape-level projects
- Long-term commitment
- Challenging projects get implemented

Potential Challenges
- Loss of autonomy
- Willingness to let go of personal positions
- Achieving transparent decision-making
- Complex interactions among several different interests
- Considerable time investment
- Unpredictable process and uncertain outcomes
- Focus on process may eclipse on-the-ground work

Natural Resource Agencies and Collaboration

Natural resource agency personnel face unique challenges in a collaborative process. They have specific legal responsibilities to uphold and operate under highly structured, bureaucratic management protocols. As professionals, they are trained to be technical experts, and may not be comfortable engaging in discussions of management tradeoffs, with people from different backgrounds. The time required for collaboration can be stressful if it is viewed as an additional job responsibility. Few agencies incorporate collaboration in job descriptions or as a performance goal or measure. Both agency and non-agency participants in collaborative efforts regularly cite agency organizational culture as the most significant obstacle to successful collaboration. Overcoming these challenges requires ongoing communication with upper management to ensure support for the collaborative effort, as well as ongoing communication with fellow participants in the collaborative process to ensure that they understand agency constraints.

Characteristics of Successful Collaborative Projects

Collaborative groups and the issues they address are too variable for any single set of criteria to apply in all cases. But the characteristics listed here are common to many successful groups. They should not be viewed as requirements of collaboration, nor are they a recipe for success. However, they can serve as useful ideas for those involved in or considering participating in a collaborative effort.

- Broad participation. All stakeholders, including anyone who could affect or be affected by their activities, are invited to participate in the process. Participants may include local community members; federal, state, and local government agencies; tribes; businesses; non-profit organizations; researchers; environmental groups; and others.
- Significant, shared need. A common, pressing need to work together on a specific issue provides an incentive to collaborate and can help maintain momentum. Often collaborative efforts are initiated in response to a resource management crisis, such as fire risk, a legal threat, or a legal requirement.
- Supportive political climate. The support of key decision-makers within the community – both elected officials and agency personnel, including those with the legal authority to plan and implement restoration projects – facilitates project implementation.
- Adequate resources. Money, time, and staff are available to support the function of the collaborative group. Often participants are willing to engage on a volunteer basis; however, many collaborative groups have suggested that having at least one paid staff member is essential to keep the group moving forward. Sources of support may include private foundations, government grants, or direct Congressional appropriations.

• Clear, agreed-upon goals. Participants have discussed and come to agreement on the purpose and desired outcomes of the collaborative process. Communication, respect, and mutual learning are all important in identifying and addressing differing expectations about the collaborative process and its outcomes.

• Fair process. The group is not secretive about how information is obtained or decisions are made. Participation is open to all interested parties. Everyone can participate in planning and decision-making discussions. Participants understand their roles and responsibilities within the group and understand the reasoning behind decisions.

• Trust and accountability. Participants can openly and freely express their opinions without fearing ridicule or derision from other group members. Participants are willing to negotiate and compromise. The group has developed strategies for managing conflict, reducing individual vulnerability, and encouraging commitment to group decisions.

• Realistic expectations. Realistic timelines are set for achieving restoration goals. Patience is vital. It is not uncommon for collaborative groups to spend years engaged in planning before a project is implemented on the ground.

• Measures of success. Progress is monitored on an established timeline, and project advancements, successes, and failures are reviewed in order to improve the group’s productivity and maintain momentum. The group finds ways to recognize and celebrate its efforts, such as using the local media to provide recognition for its accomplishments.

Figure 1. Types of Collaborative Forest Restoration Groups

Planning committees and advisory councils
Main purpose is to provide advice and/or help develop guidelines and plans for others, such as government agencies. Group members are usually invited or appointed based on expertise. The group typically has no decision-making authority, but its suggestions are used by authorities to guide the details of restoration projects. These groups may last for months or years, or may dissolve once the task at hand has been accomplished.

Example: Arizona Forest Health Oversight and Advisory Councils

Dialogue groups and community forums
Single events or ongoing gatherings to share ideas and create a broad vision for future action. May propose goals or make recommendations, but make no attempt to reach agreement.

Example: Seventh American Forest Congress

Comanagement
This is a formal process with focus on shared power among government authorities or between an agency and one or more user groups. Participation is limited to people with legal authority and decision-making capacity. Comanagement groups may develop and analyze restoration proposals, develop and ratify legally binding agreements, and share the decision-making process among a handful of key stakeholders. Comanagement can operate permanently or may be developed to work for a specified length of time.

Example: Valles Caldera Trust, New Mexico

Networks
Loosely defined groups of individuals with overlapping interests or responsibilities who engage in informal communication over extended periods of time. The goal is information exchange and resource sharing, not decision making or project implementation.

Example: National Network of Forest Practitioners

Partnerships
Generally long-standing and place-based, these groups are used to identify issues, gather information, generate management options, and develop recommendations for restoration projects within a specified geographic area. Participants usually represent an agency or special interest group, but non-aligned citizens may also participate. As with planning committees, partnerships usually do not have decision-making authority, but their suggestions are influential and are often adopted by agency personnel and government authorities.

Example: Applegate Partnership, Oregon
Introduction

Many policy makers, stakeholders, and land management agencies have embraced collaborative approaches as a means of guiding forest management on public lands. A growing number of federal policies, such as the Healthy Forests Restoration Act of 2003 and the “Facilitation of Cooperative Conservation” Executive Order of 2004, call for “cooperative conservation” by encouraging federal agencies to work collaboratively with multiple stakeholders on natural resource management issues. These directives have created both optimism and uncertainty. This publication presents an overview of collaborative forest restoration, including both benefits and challenges.

The idea of working collaboratively on forest management projects became popular in the 1990s. It grew from a grassroots demand for increased public participation in natural resource decision-making and the application of alternative dispute resolution methods to environmental conflicts.

One of the oldest and best-known collaborative forest restoration groups is the Applegate Partnership in Oregon. This collection of environmentalists, loggers, mill owners, ranchers, and agency scientists and managers came together in 1992 to assess, manage, and restore a 500,000-acre watershed in southwestern Oregon. In the decade since its inception, the Applegate Partnership has completed assessments of social, economic, and ecological conditions in the watershed, implemented forest and riparian restoration projects, developed an extensive monitoring program, and completed one of the first Community Wildlife Protection Plans in the country.

Collaborative efforts have also promoted forest restoration efforts in many other locales, such as Flagstaff, Arizona; Montezuma County, Colorado; and Catron County, New Mexico. These models have advanced the concept of collaborative resource management around the country. Increasingly, people who have grown tired of conflict and gridlock are coming together to explore new, innovative, and more effective strategies for informing land management.

What Is Collaborative Forest Restoration?

Collaborative forest restoration is a process through which multiple stakeholders jointly explore diverse values and interests and attempt to come to some level of agreement about appropriate management. Typically, the goal is to develop new approaches to restoration that are both scientifically credible and socially acceptable. Collaboration implies stakeholder involvement that goes well beyond the usual processes of public comment on agency proposals, such as public meetings and comment periods. In a collaborative process, all stakeholders participate directly in identifying issues of concern, developing proposed actions, and reviewing alternatives.

Not all collaborative groups are the same. Groups vary considerably in their number of participants, scope of goals and activities, land ownership represented, interest groups involved, and the decision-making processes used. There are a variety of ways to collaborate (Figure 1), but what they all have in common is the active involvement of multiple stakeholders.

Using Collaboration to Meet Restoration Goals

Forest restoration projects present an ideal opportunity for using the collaborative process. Forest restoration usually requires the input of many experts, including wildlife biologists, fire managers, and planners. It also affects many people and groups, from people who live near the project area to those with a strong interest in resource protection.

Often tradeoffs must be made that involve prioritizing differing values, such as protecting wildlife species and reducing fire risk. A project that includes multiple stakeholders in the restoration process from the beginning is likely to have more local involvement and support, resulting in improved results.
Ecological restoration seeks to heal degraded ecosystems by reestablishing native species, structural characteristics, and ecological processes. The Society for Ecological Restoration International defines restoration as “an intentional activity that initiates or accelerates the recovery of an ecosystem with respect to its health, integrity and sustainability. … Restoration attempts to return an ecosystem to its historic trajectory” (Society for Ecological Restoration International 2004).

In the southwestern United States, most ponderosa pine forests have been degraded during the last 150 years; many areas are now dominated by dense thickets of small trees and have lost their once diverse understory. Forests in this condition are highly susceptible to damaging, stand-replacing fires and increased insect and disease epidemics. Restoration of these forests centers on reintroducing frequent, low-intensity surface fires—often after first thinning dense stands—and reestablishing productive understory plant communities. The Ecological Restoration Institute at Northern Arizona University is a pioneer in researching, implementing, and monitoring ecological restoration of southwestern ponderosa pine forests. By allowing natural processes such as fire to resume self-sustaining patterns, we hope to reestablish healthy forests that provide ecosystem services, wildlife habitat, and recreational opportunities.

Every restoration project needs to be site specific, but the detailed experience of field practitioners may help guide practitioners elsewhere. The Working Papers series presents findings and management recommendations from research and observations by the ERI and its partner organizations.

This publication would not have been possible without significant funding from the USDA Forest Service. The views and conclusions contained in this document are those of the authors and should not be interpreted as representing the opinions or policies of the U.S. Government. Mention of trade names or commercial products does not constitute their endorsement by the U.S. Government.

1: Restoring the Uinkaret Mountains: Operational Lessons and Adaptive Management Practices
2: Understory Plant Community Restoration in the Uinkaret Mountains, Arizona
3: Protecting Old Trees from Prescribed Fire
4: Fuels Treatments and Forest Restoration: An Analysis of Benefits
5: Limiting Damage to Forest Soils During Restoration
6: Butterflies as Indicators of Restoration Progress
7: Establishing Reference Conditions for Southwestern Ponderosa Pine Forests
8: Controlling Invasive Species as Part of Restoration Treatments
9: Restoration of Ponderosa Pine Forests to Presettlement Conditions
10: The Stand Treatment Impacts on Forest Health (STIFH) Restoration Model

Further Readings

For More Information
For more information about forest restoration, contact the ERI at 928-523-7182 or www.eri.nau.edu.

Written by Kimberly Lowe and Ann Moote
Reviewed by Jesse Abrams, Dennis R. Becker, Sam Burns, Andrea Bedell Loucks, Dennis Lund, Vicky Sturtevant, and Diane Vesick
Series Editor Peter Friederici
Collaboration as a Tool in Forest Restoration

May 2005