

Annual Report
to the USDA Forest Service
under Sponsor Award #10-DG-11031600-050 for 2010 and 2011
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Submitted by:

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Summary

This report presents an integrated and coordinated series of actions for \$3.0 million awarded to the ERI in Fiscal Years 2010 and 2011 under CFDA 10.694, Southwest Forest Health and Wildfire Prevention for the first two years in a 5-year domestic grant. The information provided herein reflects our annual progress as of 6/30/2011.

All of the activities (deliverables) summarized in this report were designed to be responsive to stakeholder needs and to be synthesized with the larger body of scientific evidence, translated into appropriate languages for target audiences, and delivered in a range of formats from in person one on one and group presentations and discussions, to printed and electronically accessible fact sheets, short technical reports, longer white papers and management reports, and peer reviewed archival literature.

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FY10 Plan of Work - Deliverables

FY10 Plan of Work

Project 1: Evidence-Based Conservation	
Deliverable	Status
<p>1. LEARN. Information will be analyzed using the rigorous standards of peer-reviewed scientific publications. One project will be completed for professional publication in 2010. This information, and all scientific information described throughout this work plan, will contribute to the practical, management-oriented outlets described in <i>Section 7: Service to the Intermountain West</i>.</p>	<p>✓ Korb, J.E, P.Z. Fulé, and M.T. Stoddard. In review. Historical reference conditions as a guide for forest restoration: an example from a mixed conifer forest, USA. <i>Journal of Applied Ecology</i>. Completed and in review.</p>
<p>2. A Systematic review on a topic to be developed with input from affected entities served by ERI.</p>	<p>✓ Springer, JD, CM McGlone, ML Daniels, MT Stoddard, JE Crouse, and E.L. Kalies. "Non-native plant encroachment in burned ponderosa pine forests: a mixed-methods systematic review of effects of prescribed and wild fires." 42 pp. Complete and draft in review as of 6-24-11. Preliminary copy available on request.</p>
<p>3. Wildlife responses. One summary report and one journal manuscript.</p>	<p>✓ Annual progress report completed (link to report). ✓ Loberger, C. D., T. C. Theimer, S. S. Rosenstock, C. S. Wightman. Tassel-Eared Squirrel use of Restoration-treated Ponderosa Pine Forest. Tentative acceptance by <i>Journal of Mammology</i> with final revisions in progress.</p>
<p>4. Rare Species. Report on restoration effects and implications for developing landscape-scale treatments that enhance rare species' habitat.</p>	<p>✓ Springer, J.D., P.Z. Fulé, and D.W. Huffman. In review. Long-term responses of <i>Penstemon clutei</i> (Sunset Crater beardtongue) to root trenching and prescribed fire: clues for population persistence. In Meyer, Susan, tech. ed. 2010. <i>Southwestern rare and endangered plants: Proceedings of the Fifth Conference; 2009 March 16-20; Salt Lake City, UT</i>. Gen. Tech. Rep. RM-GTR-XXX (to be assigned after review). Fort Collins, Co: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 14 pp. Complete and in review, draft as of 1-2011.</p> <p>✓ Springer, J.D., M.T. Stoddard, D. C. Laughlin, D. L. Crisp, and B.G. Phillips. In review. Ecology of Rusby's Milkvetch (<i>Astragalus rusbyi</i>), a rare endemic of northern Arizona ponderosa pine forests. In Meyer, Susan, tech. ed. 2010. <i>Southwestern rare and endangered plants: Proceedings of the</i></p>

FY10 Plan of Work - Deliverables

Project 1: Evidence-Based Conservation	
Deliverable	Status
	Fifth Conference; 2009 March 16-20; Salt Lake City, UT. Gen. Tech. Rep. RM-GTR-XXX (to be assigned after review). Fort Collins, Co: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 12 pp. Complete and in review , draft as of 1-2011
5. Fuel Treatments. Summary report on analysis of pre-treatment fire behavior data.	✓ Huffman, D., J.E. Crouse, W.K. Chancellor, P.Z. Fule. Stand- and landscape-level effects of fuel hazard reduction treatments on a pinyon-juniper-ponderosa pine landscape (Report on pre-treatment conditions). Completed may be submitted for publication.

Project 2: Stewards of Place	
Deliverable	Status
A document describing the design for landscape restoration handbook - -an illustrated guide describing decision support information approaches and lessons learned useful in collaborative, place-based restoration workshops and agency trainings.	✓ Egan, D. "Handbook for the Ecological Restoration of Frequent-fire Forests in the American West," an illustrated guide describing decision support information approaches and lessons learned useful in collaborative, place-based restoration workshops and agency trainings. Design outline completed (link to outline).

Project 3: Ecosystem Services	
Deliverable	Status
1. Systematic review of watershed impacts of wildfires and restoration treatments.	✓ Draft has been reviewed and is in final edit as of 6-30-11 (Allen/Ramstead)
2. Ecosystem Sustainability. Analysis of pinyon-juniper ecosystem sustainability at the landscape scale, prepared for professional publication.	✓ Huffman, D. Analysis of pinyon-juniper ecosystem sustainability at the landscape scale. Complete and publishable-quality manuscript in progress as of 6-30-11.

FY10 Plan of Work - Deliverables

Project 4: Climate	
Deliverable	Status
Report demonstrating the integration of existing and new information on fire/climate/fuels interactions.	✓ Fulé, P.Z., L.L. Yocom, A. B. Stan. Interaction of Fire, Climate, and Fuels in Southwestern North America. Completed (link to report).

Project 5: Economies and Job Creation	
Deliverable	Status
(FY10) Report and fact sheet describing the financial feasibility of enhancing economic development of Arizona's Native American tribes through a tradable carbon rights system.	<p>✓ Huang, C., C. Sorensen. The Economic Value of Selling Carbon Credits from Restored Forests: A Case Study from the Navajo Nation's Tribal Forests. West. J. Appl. For. 26(1) 2011. Society of American Foresters. Report describing the financial feasibility of enhancing economic development of Arizona's Native American tribes through a tradable carbon rights system. Completed (link to report).</p> <p>✓ Huang, C. H. Economic Value of Selling Carbon Credits: The Economic Value of Selling Carbon Credits by Restoring the Navajo Nation's Tribal Forests. Fact Sheet, Ecological Restoration Institute. January, 2011. Completed: http://library.eri.nau.edu/gsd/collect/erilibra/index/assoc/HASH0135/74e4ff0a.dir/doc.pdf</p>

Project 6: State and Private Forestry	
Deliverable	Status
A report on science support for the statewide assessment. Building on its track record with the Governor's Forest Health Council in the development of the Statewide Strategy for Restoring Arizona's Forests, ERI will work with its partners in the Rocky Mountain Research Station and other research institutes; institutions of higher education; and science-based NGO's to coordinate science support for the Division in its statewide assessment.	✓ Greco, B. Executive Summary: A report on Science Support Provided by the Ecological Restoration Institute for the Arizona Forest Resource Assessment and Strategic Plan- CY 2010. Completed (link to report).

FY10 Plan of Work - Deliverables

Project 7: Services to the Intermountain West	
Deliverable	Status
Outreach to forest managers across the West.	
Workshops for continuing professional education	<ul style="list-style-type: none"> ✓ Denton, C., D. Brewer, D. Lund. Conducted workshop for the Greater Ruidoso Area Wildland Urban Interface Working Group (GRAWUIWG) on Restoration Prescriptions and Desired Forest Condition Recommendations. Ruidoso, NM. March 16, 2010. 26 attendees. ✓ Greco, B., S. Masek Lopez, B. Stevens. Watershed/Water Users Workshop. Sedona, AZ. August 17, 2010. 21 attendees.
Continued Support for Forest Plan Revisions	<ul style="list-style-type: none"> ✓ Greco, B., M. Sensibaugh. One hour conference call meeting with 12 partners working on AZ Forest Resource Assessment and Strategic Plan. Discussion of document format and content. Flagstaff, AZ. January 19, 2010. ✓ Greco, B., M. Sensibaugh. Conference call meeting with partners working on AZ Forest Resource Assessment and Strategic Plan. Discussion of up-coming meeting. Flagstaff, AZ. January 25, 2010. ✓ Greco, B., M. Sensibaugh. Attended Forest Landscape Restoration Act meeting with Coconino National Forest to develop proposal. Flagstaff, AZ. January 28, 2010. 25 attendees. ✓ Greco, B., M. Sensibaugh. Conference call meeting with partners working on AZ Forest Resource Assessment and Strategic Plan. Discussion of up-coming Tribal meeting. Flagstaff, AZ. February 1, 2010. ✓ Greco, B., M. Sensibaugh. Attended meeting with partners working on AZ Forest Resource Assessment and Strategic Plan. Discussion of up-coming meeting. Flagstaff, AZ. February 3, 2010. 20 attendees ✓ Greco, B. Met with Mike Elson, Peaks-Mormon Lake District Ranger to coordinate Aspen Monitoring Strategy. Flagstaff, AZ. February 9, 2010. ✓ Greco, B., M. Sensibaugh, W. Greer. Participated in AZ Forest Resource Assessment (AZFRA) Tribal Workshop. Pinetop, AZ. February 18, 2010. 17 participants. ✓ Greco, B. Attended Natural Resources Working Group Presentation (4 FRI). Show Low, AZ. April 21, 2010. 23 attendees. ✓ Greco, B. Provided briefing and Fact Sheet on Carbon Credits

FY10 Plan of Work - Deliverables

Project 7: Services to the Intermountain West	
Deliverable	Status
	<p>and Sequestration to Forest Service Leadership. Flagstaff, AZ. April 22, 2010. 7 attendees.</p> <ul style="list-style-type: none"> ✓ Greco, B. Attended NRWG Organization Design meeting. Flagstaff, AZ. April 26, 2010. ✓ Greco, B. Proposed Planning Rule Roundtable. Phoenix, AZ. April 28, 2010. 35 attendees. ✓ Greco, B. Workshop Participation- Cohesive Wildland Fire Strategy Field Forum. Phoenix, AZ. May 14, 2010. 40 participants. ✓ Crouse, J. Created GSI Remote Sensing for Adaptive Management in Frequent Fire Landscape Restoration in response to request from Henry Provencio of the USDA Forest Service. Flagstaff, AZ. December 7, 2010. Report included as deliverable in Project 7 (Link to report). ✓ Brewer, D. Reviewed remaining allotments for data input for 4-Forest effort. Assisted in data input, also. Peaks Ranger Station, Coconino National Forest, AZ. December 13-22, 2010.
<p>Rapid Assessments Summary Reports included.</p>	<ul style="list-style-type: none"> ✓ Denton, C., D. Brewer, W. Greer. Rapid assessment for Mescalero Apache Tribe for the BIA. A workshop and a field trip included a training session on how to locate and identify pre-settlement evidence. They marked and used the GPS on 2 two acre plots and created maps. Mescalero, NM. May 11-12, 2010. <i>Note: conducted training and a presentation on restoration including a field visit and demonstration on how to do a restoration prescription. No formal report was written.</i> ✓ Denton, C., D. Brewer, B. Greco, M. Sensibaugh. Beaver Creek Rapid Assessment. Alpine, AZ. May 24-25, 2010. 5 attendees. (Link to summary) ✓ Greco, B. Show Low South Fuels Reduction Project. Show Low, AZ. August 1, 2010. (Link to summary) ✓ Clint's Rapid Assessment (Mogollon Rim RD, Coconino NF). (Link to summary) ✓ Timber Mesa Rapid Assessment (Lakeside RD, A/S NF) in progress and will transition into the FY11 programs. (Link to summary)
<p>Information requests</p>	<ul style="list-style-type: none"> ✓ Greco, B. Participated on the Joint Fire Sciences Panel. Flagstaff, AZ. January 20, 2010. 22 participants. ✓ Covington, W.W., B. Greco. Participated in 4FRI Coordination Meeting - Core Team. Flagstaff, AZ. February 22, 2010. 7 participants. ✓ Greco, B. Participated in 4FRI Landscape Strategy Working Group Meeting. Flagstaff, AZ. February 25, 2010. 10

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Project 7: Services to the Intermountain West	
Deliverable	Status
	<p>participants.</p> <ul style="list-style-type: none"> ✓ Greco, B. Conference call with R-3 Forest Supervisors & Regional Directors - 4FRI Support. Flagstaff, AZ. January 25, 2010. 12 participants. ✓ Covington, W.W., B. Greco, P. Fulé, D. Laughlin. Participated in 4FRI Science & Monitoring Working Group Meeting. Flagstaff, AZ. March 1, 2010. 12 participants. ✓ Greco, B., B. Stevens. Participated in 4FRI Communication Working Group Meeting. Flagstaff, AZ. March 5, 2010. 6 participants. ✓ Covington, W.W., B. Greco, P. Fulé, D. Laughlin. Participated in 4FRI Science & Monitoring Working Group Meeting. Flagstaff, AZ. March 9, 2010. 12 participants. ✓ Brewer, D. Met with Forest Service to discuss stratification scheme based Terrestrial Ecosystem Map Units groupings to facilitate determination of existing conditions for the four Forest Restoration Proposal. Flagstaff, AZ. April 7, 2010. ✓ Brewer, D. Assisted Mark Herron of the Kaibab National Forest in preparation of literature search for McCracken Project. Made copies of documents and sent to Forest. Flagstaff, AZ. April 9, 2010. ✓ Stevens, B. Inside NAU runs "Historic agreement boosts forest health," about ERI and 4FRI efforts in special Earth Day edition. Written by Bonnie Stevens. Flagstaff, AZ. April 22, 2010. ✓ Greco, B. Attended meeting with FS Silvicultural Staff & ID Team. Springerville, AZ. May 19, 2010. ✓ Greco, B. M. Sensibaugh. Met with Carl Sewestewa - Hopi Tribe. May 20, 2010. Flagstaff, AZ. ✓ Greco, B. M. Sensibaugh. Drafting AZ Forest Resource Strategy. Phoenix, AZ. May 24, 2010. 12 attendees. ✓ Greco, B. Four Forest Restoration Initiative Working Group. Flagstaff, AZ. June 3, 2010. 25 attendees. ✓ Greco, B. Attended 4 FRI Fire Module Working Group meeting. Flagstaff, AZ. June 8, 2010. 6 in attendance. ✓ Covington, W. W., B. Greco, C. Denton. Attended Forest Health Council Field Assessment. Springerville, AZ. June 10, 2010. 25 attendees. ✓ Greco, B. Beaver Creek Assessment ID Team Meeting. Alpine, AZ. June 11, 2010. 11 attendees. ✓ Vosick, D., B. Stevens, B. Greco. Attended 4 FRI Collaborative Meeting. Payson, AZ. June 23, 2010. 40

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Project 7: Services to the Intermountain West	
Deliverable	Status
	<p>attendees.</p> <ul style="list-style-type: none"> ✓ Greco, B., P. Fulé. Attended Needs Assessment Meeting with Forest Service Supervisors. Flagstaff, AZ. July 21, 2010. 8 in attendance. ✓ Greco, B., P. Fulé, D. Vosick. Attended Needs Assessment Meeting with BLM. Marble Canyon, AZ. July 22, 2010. 6 in attendance. ✓ Greco, B. Needs Assessment meeting with RMRS, Flagstaff, AZ. August 3, 2010. 2 attendees. ✓ Greco, B. White Mountain Stewardship MB Ecological Monitoring Working Group meeting. Pinetop, AZ. August 10, 2010. 7 in attendance. ✓ Greco, B. Facilitated Restoration Stewardship Working Group meeting. Show Low, AZ. September 27, 2010. 12 attendees. ✓ Gilbreath, K. Carol Ayer, Program Manager for the National Forest Service Library, asked for a copy of all of ERI's Working Papers, White Papers, and Homeowners' Guides for the library. All were sent to her and her information was added to the address database to receive hard copies of future ERI publications. Albuquerque, NM. October 28, 2010. ✓ Covington, W.W. Sent publications to use reference conditions and lines of evidence to guide restoration treatments to Tom Sensenig, the WS Oregon Regional Ecologist for the USFS Region 6. Flagstaff, AZ. November 5, 2010. ✓ Brewer, D. Discussed with members of team how stratification of TESU data could facilitate development of proposed action and effects analysis. Coconino National Forest Supervisor's office. November 16, 2010. ✓ Greco, B. Consultation with 4 FRI Collaborative group on Desired Forest Conditions development. Flagstaff, AZ. November 18, 2010. 12 attendees. ✓ Greco, B., J. Crouse. Met with Henry Provencio from the 4 FRI group to develop GIS/Remote Sensing Strategy for 4 FRI. Flagstaff, AZ. November 18, 2010. ✓ Vosick, D., Assistance to Henry Provencio to help compile the value of stakeholder contributions to the 4FRI. 11/19/10 ✓ Vosick, D. Sent information to S. Friedman at the Forest Service requested for research and synthesis of wildlife and fish response to restoration. November 22, 2010. ✓ Greco, B. Attended 4FRI Landscape Strategy Working Group Meeting. Flagstaff, AZ. November 30, 2010. 13 attendees. ✓ Greco, B., M. Sensibaugh. 4FRI Treatment Area Portfolio

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Project 7: Services to the Intermountain West	
Deliverable	Status
	<p>Working Group meeting. (This represents multiple meetings in Nov - Dec, 2010.) Flagstaff, AZ. November - December, 2010. 12 attendees.</p> <ul style="list-style-type: none"> ✓ Covington, W. W., B. Greco, B. Stevens. Attended joint Flagstaff City Council/ Coconino County Board of Supervisors meeting. Flagstaff, AZ. December 6, 2010. 30 attendees. ✓ Covington, W. W., B. Greco. Attended Large Tree Retention Strategy Meeting for 4FRI. Flagstaff, AZ. December 8, 2010. 8 attendees. ✓ Vosick, D. Follow up to Jeff Jarvis regarding whether or not fire could be safely used at Mt Trumbull. 12/22/10 ✓ Covington, W. W., B. Greco. Large Tree Retention Strategy Working Group for 4FRI. Flagstaff, AZ. January 6, 7, 2011. 7 attendees. ✓ Greco, B. 4 FRI Treatment Area Portfolio Working Group Meeting. Flagstaff, AZ. January 3, 2011. 15 attendees ✓ Greco, B. Joint White Mountain Stewardship Monitoring Board and NRWG meeting. Show Low, AZ. January 4, 2011. 18 attendees. ✓ Vosick, D. Request from Oregon TNC to provide information on CROP and Catherine Mater. 1/10/11
Associated field visits/training	<ul style="list-style-type: none"> ✓ Denton, C. Attended and presented at Greater Ruidoso Area Wildland Urban Interface Working Group (GRAWUIWG). Ruidoso, NM. January 26, 2010. 25 attendees. ✓ Greco, B. Conducted training for NPS Fire Staff on Ecological Restoration & AZFRA Program. Flagstaff, AZ. March 4, 2010. 4 participants. ✓ Greco, B. Congressional & USDA Field visit. Pinetop, AZ. June 4, 2010. 30 attendees. ✓ Greco, B., M. Sensibaugh. CFI (continuous forest inventory), Hopi lands inventory. Kykotsmovi, AZ. August 16, 2010. 10 attendees. ✓ Sensibaugh, M. Met with USFS to develop Landscape Strategy/Rapid Assessment process for Timber Mesa Assessment. Lakeside, AZ. November 30, 2010. Seven attendees. ✓ Sensibaugh, M. Met with USFS to finalize Landscape Strategy/Rapid Assessment process for Beaver Creek Assessment. Alpine, AZ. December 1, 2010. 9 attendees. ✓ Brewer, D., M. Sensibaugh, M. Stoddard, W. Chancellor. Completed Rapid Assessment of the Clint's Assessment Area. Long Valley, AZ. December 3, 2010.

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Project 7: Services to the Intermountain West	
Deliverable	Status
	<ul style="list-style-type: none"> ✓ Greco, B., D. Brewer, L. Kalies. Conducted Systematic Review developmental meeting with USFS. Flagstaff, AZ. December 8, 2010. 9 attendees.
Three field trips/training (non-RAP related)	<ul style="list-style-type: none"> ✓ Greco, B., M. Sensibaugh. Met with Hopi DNR to select Forester position - Interview Panel. Kykotsmovi, AZ. February 9, 2010. 9 participants. ✓ Stevens, B. Took NAZ Today television crew to Fort Valley to discuss 4FRI efforts toward landscape scale restoration and results 100 years of changes to western forests. Flagstaff, AZ. April 7, 2010. ✓ Smith, H. B., Sensibaugh, M. Stevens, B. Sustainable Forest Field Trip – Flagstaff Festival of Science, Field trip to Doney Park/Sunset Crater area (Smith, Sensibaugh, Stevens) and Highlands Fire Department (City of Flagstaff) topics discussed: Schultz/Hardy Fires, unnatural/natural fire, pre-settlement conditions, healthy/unhealthy forests, need for landscape-scale restoration, 4FRI effort. Flagstaff, AZ. October 2, 2010. 20 public participants. ✓ Brewer, D. Reviewed information collected by contractor that will be used in 4-Forest effort. Coconino National Forest, AZ. November 16, 2010.
Knowledge Services	
ERI website.	<ul style="list-style-type: none"> ✓ Coquia, K. Summary report on ERI web support with 2010 Search Engine Optimization (SEO) and 2010 ERI website Statistic Analysis. Completed. (Link to summary)
White paper(s)	<ul style="list-style-type: none"> ✓ Integrating Domestic and Wild Ungulate Grazing into Forest Restoration Plans at the Landscape Level. Completed. http://library.eri.nau.edu/gsd/collect/erilibra/index/assoc/HASH01ef.dir/doc.pdf
Working papers	<ul style="list-style-type: none"> ✓ Egan, D. "Protecting Old Trees from Prescribed Burning". Working Paper 24, Winter 2011. Completed. http://library.eri.nau.edu/gsd/collect/erilibra/index/assoc/HASH7f2a.dir/doc.pdf ✓ Stoddard, M. "A Compilation of Historical Forest Structural Characteristics across the Southern Colorado Plateau". Completed and in review by M. Moore (at request of W. Covington)

FY10 Plan of Work - Deliverables

Project 7: Services to the Intermountain West	
Deliverable	Status
Fact sheets	<ul style="list-style-type: none"> ✓ Stoddard, M.T. and M.D Hurteau. Carbon cost of mitigating high-severity wildfires. Fact Sheet, Ecological Restoration Institute. Completed. http://library.eri.nau.edu/gsd/collect/erilibra/index/assoc/HASH010b/cd429bd6.dir/doc.pdf ✓ Mt. Trumbull: Climate Change May Affect Tree Production, Burn Frequency. Trial abstract to BLM. ✓ Roccaforte, John Paul. Fact Sheet: Post-Wildfire Fuels and Regeneration Dynamics. Completed. http://library.eri.nau.edu/gsd/collect/erilibra/index/assoc/HASH017c/241f5228.dir/doc.pdf ✓ Hunter, M. Methods for Estimating Surface Live Fuel Loads. Completed. http://library.eri.nau.edu/gsd/collect/erilibra/index/assoc/HASH7e6f.dir/doc.pdf
Presentations	<ul style="list-style-type: none"> ✓ Egan D., J. Seidenberg. Participated in the Kaibab Fire Awareness Fair by having an informational booth that provided the public with information on forest restoration. Williams, AZ. April 10, 2010. 30 participants. ✓ Roccaforte, J.P., P.Z. Fulé, and W.W. Covington. “Monitoring landscape-scale ponderosa pine restoration treatment implementation and effectiveness.” A Decade of Discovery NLCS Science Symposium, Albuquerque, NM. May 24 – 28, 2010. 200 attendees. ✓ Greco, B. Presentation to White Mountain Stewardship group on adaptive monitoring framework. Show Low, AZ. September 20, 2010. 17 attendees. ✓ Stevens, B. Earth, Wind & Fire Panel Presentation – Flagstaff Festival of Science - ERI-hosted panel discussing the need and 4FRI effort for landscape-scale restoration and unnatural fire (Schultz/Hardy Fires) – High Country Conference Center, NAU – Covington, Stevens and members of 4FRI (The Grand Canyon Trust, The Nature Conservancy, U.S. Fish & Wildlife Service, Forest Service) reaching 60 members of the general public. September 28, 2010. ✓ Greco, B. Presentation on Southwest Ponderosa Pine Restoration and Research made to the USDA Forest Service. Flagstaff, AZ. September 29, 2010. 40 attendees. ✓ Greco, B. Presentation to private industry bio-fuel representatives on 4 FRI and small diameter wood supply study. Flagstaff, AZ. September 30, 2010. 5 attendees. ✓ Stevens, B. Flagstaff First Friday Art Walk – ERI

FY10 Plan of Work - Deliverables

Project 7: Services to the Intermountain West	
Deliverable	Status
	<p>representative (Stevens) and materials (Pocket Facts and 4FRI posters) presented to participants. Topics discussed – fire ecology, reference conditions, need for landscape-scale restoration, 4FRI efforts. Collaborative effort with Forest Service 4FRI team members. Estimated reach – 300 people – community members. October 1, 2010.</p> <ul style="list-style-type: none"> ✓ Covington, W.W. "Developing Science to Inform and Guide Collaborative Planning," presented at the "Solutions for Forests: Active Management Perspectives for Southwest Oregon." Ashland, OR. October 19, 2010. 120 people in attendance. ✓ Vosick, D. Participated on panel summarizing observations from the conference and the field trip, and a one hour sessions to develop a blueprint for restoration of SW Oregon forests. "Solutions for Forests: Active Management Perspectives for Southwest Oregon." Ashland, OR. October 22, 2010 ✓ Greco, B. Presentation on Southwest Ponderosa Pine Restoration and Research made to the Western Watershed Managers Association conference. Flagstaff, AZ. October 28, 2010. 70 attendees. ✓ Stevens, B., K. Gilbreath. Society of American Foresters Convention , Albuquerque Oct. 27 – 29 – 300 visitors to booth – landscape scale restoration + 4FRI Poster Session (Stevens)
Field trips	<ul style="list-style-type: none"> ✓ Vosick, D., P. Z. Fulé, B. Greco, J. Seidenberg, W. Greer. 4 FRI Desired Future Conditions (DFC) field trip. Flagstaff, AZ. July 24, 2010. 55 participants. ✓ Smith, H.B. At the request of the Park Service and Forest Service, led a four hour field trip/presentation/lecture entitled, "Among the Giant Ponderosas." Flagstaff, AZ. June 28, 2010. 13 attendees. ✓ Greco, B. Presentation to Ethiopian delegation on "Restoration of Southwest Ponderosa Pine." Belmont, AZ. August 23, 2010. 15 attendees. ✓ Vosick, D., B. Greco, J. Seidenberg. 4 FRI White Mountain field trip. Pinetop, AZ. August 26, 2010. ✓ Greco, B. Conducted field review of Restoration and Fire Applications. Silver City, NM. October 18-21, 2010. 5 attendees. ✓ Greco, B., D. Brewer, M. Sensibaugh. Conducted field review of Restoration and Fire Applications on the Clint's Assessment area. Happy Jack, AZ. November 3, 2010. 4 attendees. ✓ Covington, W. W., B. Greco, D. Brewer, M. Sensibaugh.

FY10 Plan of Work - Deliverables

<i>Project 7: Services to the Intermountain West</i>	
Deliverable	Status
	Conducted field review of Long Valley Experimental Goshawk guidelines for treatments. Happy Jack, AZ. November 4, 2010. 20 attendees.

<i>Project 8: Provide annual peer-reviewed reports</i>	
Deliverable	Status
1. Peer-reviewed report 60 days after completion of the agreement.	✓ In progress.

FY11 Plan of Work - Deliverables

FY11 Plan of Work

Project 1: Evidence-Based Conservation	
Deliverable	Status
1. LEARN. Data analysis and submission of journal article based on FY10 and FY11 field seasons.	✓ Working Title (Huffman): “Using a network of long-term monitoring sites to evaluate the success of forest restoration treatments in the American Southwest.” In progress.
2. Wildlife responses. Description of a new research initiative and one journal manuscript that synthesizes wildlife responses to restoration.	✓ AZ Game and Fish work in progress. ✓ Working title: Small mammal community occupancy responses to restoration treatments in ponderosa three pine forests, northern Arizona, USA” . In progress.
3. Rare Species. One working paper that reports on restoration effects and implications for developing landscape-scale treatments that enhance rare species’ habitat.	✓ Working title (Springer/Egan): “Rare Species.....”
4. Fuel Treatments. One journal manuscript for publication.	✓ In progress (D. Huffman). Working title: “Understory community responses to alternative fuel hazard reduction treatments in pinyon-juniper woodlands.”

Project 2: Stewards of Place	
Deliverable	Status
A working paper describing design of an adaptive management approach that includes ecological and socio-economic monitoring of restoration treatments on a landscape scale that builds upon results from the 2009 SWERI monitoring workshop and is consistent with the long-term CFRP monitoring objectives.	✓ “Monitoring” in progress (Egan) and reported in Project 7, Working Papers
A working paper describing methodologies to achieve ecological restoration at the landscape scale.	✓ “Restoration Strategies” in progress (Egan) and reported in Project 7, Working Papers
Provide services to the 4FRI	✓ Greco, B., D. Vosick. 4FRI MOU Development Meeting

FY11 Plan of Work - Deliverables

Project 2: Stewards of Place	
Deliverable	Status
<p>Stakeholder Group. <i>Note that the budget reduction in FY11 will result in reduced service to the 4FRI</i></p>	<p>with Forest Supervisors. Flagstaff, AZ. January 10, 2011. 15 attendees.</p> <ul style="list-style-type: none"> ✓ Stevens, B. 4FRI Web site goes live through ERI efforts: Krista Coquia, Joe Seidenberg, Bonnie Stevens and 4FRI Communications Working Group. Flagstaff, AZ. January 19, 2011. ✓ Greco, B. 4FRI Firescape development meeting. Flagstaff, AZ. February 1, 2011. 12 attendees. ✓ Greco, B., D. Vosick. 4FRI Collaborative Meeting. Flagstaff, AZ. February 23, 2011. 30 attendees. ✓ Greco, B. and ERI staff. Ongoing support and coordination with Southwest Crown of the Continent CFLRP (Bozeman, Mt). ✓ Greco, B. and ERI staff. Support to the CFLRP with a variety of place-based forums, Rapid Assessments, transfer of best-science, Systematic Reviews, etc. ✓ Dave Brewer conducted an extensive analysis for 4FRI, that included data collection, analysis, development of a database & report that will be utilized in the 4FRI NEPA EIS Proposed Action and in the Forest Plan revision for the Kaibab & Coconino NF's. This was a long-term project that took 4 months of Dave's time. The benefit to the FS was extensive savings in \$ and 1 professional FTE. The work included the following: <ol style="list-style-type: none"> 1. Development of an access database for 80 clusters for the Kaibab and 52 from the Coconino that track changes in understory species diversity from 1950 to 2010. 2. Analysis of each cluster through the period of record looking at understory diversity and changes in ground cover separates. 3. Determination of existing range conditions for the sites found within the project area. 4. For the Kaibab only, reproduction of the historical photos showing the plot at the earliest and latest read date. 5. Analysis of all clusters found in the project area and determination of which ones will be used in the assessment. 6. Development of numerous pivot tables to determine species frequency within the individual allotments, strata, TESU, and clusters. And development of a final report for the Forest Service. <p>✓</p>

FY11 Plan of Work - Deliverables

<i>Project 3: Ecosystem Services</i>	
Deliverable	Status
<p>1. Ecosystem Sustainability. One journal manuscript for publication of pinyon-juniper ecosystem sustainability at the landscape scale. Due to reduced funding in FY11 this project will be completed w/leveraged state funds (Prop 301)</p>	<p>✓ Working title (Huffman): “Historical fuels and fire behavior in ponderosa pine and pinyon-juniper ecosystems on Anderson Mesa, Arizona: implications for sustainability.” In progress.</p>

<i>Project 4: Climate</i>	
Deliverable	Status
Cancelled in FY11	

<i>Project 5: Economies and Job Creation</i>	
Deliverable	Status
<p>A white paper summarizing successful approaches to job creation and a white paper analyzing the tipping point between investment in restoration treatments and realizing savings in suppression costs.</p>	<p>✓ Pending and also reported in P-7 (Vosick/Egan) ✓ Pending and also reported in P-7 (Vosick/Egan)</p>

FY11 Plan of Work - Deliverables

Project 6: State and Private Forestry	
Deliverable	Status
Science and technical support to Arizona State Forestry and Science support and technical assistance to tribes (Greco).	<ul style="list-style-type: none"> ✓ Greco, B., D. Huffman. Southwest Fire Science Consortium Coordination Meeting. Flagstaff, AZ. April 13, 2011. 4 attendees. ✓ Covington, W.W. Congressional Field Hearing re: Wallow Fire. Springerville, AZ. June 29, 2011. 25 people in attendance, including Secretary of Agriculture, Vilsack. ✓ ERI outreach/research staff. Coordinated the Fisher-Rock Prescribed burn (Centennial Forest, NAU/AZ State Department of Forestry). 350 acre prescribed burn on State Land, for resource & research objectives. 4/26-4/28/11. ✓ ERI outreach/research staff. Facilitated a partner-based forum on development of a Fire-use Council for the State of Arizona. Multiple meetings were held with the FS and fire Management Organizations. 5/17/11 and ongoing.

Project 7: Services to the Intermountain West	
Deliverable	Status
Outreach to forest managers across the West.	
Continued Support for Forest Plan Revisions	<ul style="list-style-type: none"> ✓ Greco, B. USDA FS Coordination-Rx Fire Council Organization meeting. Flagstaff, AZ. March 21, 2011. 4 attendees.
Rapid Assessments	<p><u>FY11</u></p> <ul style="list-style-type: none"> ✓ Timber Mesa Rapid Assessment (Lakeside RD, A/S NF) ERI conducted Field training & 2 workshops for FS personnel. ERI collected data from several plots and identified sites for establishing LEARN research plots. ERI reestablished several long-term Range cluster sites for the FS & will update FS databases. ✓ Bluewater Monitoring Project (Grants RD, Cibola NF) ERI implemented a series of data collection plots and measurements to establish baseline data to monitor the Bluewater Ecosystem Management Project. A series of RA sites were established for pre & post treatment monitoring. A report was prepared for the FS. The effort involved several field trips to the site for District, Forest & RO Directors to view Restoration and Goshawk Guideline prescriptions & treatment prescription alternatives. 50 people attended. ✓ Wildcat Rapid Assessment (Black Mesa Rd, A/S NF) ERI

FY11 Plan of Work - Deliverables

Project 7: Services to the Intermountain West	
Deliverable	Status
	<p>initiated a workshop & field visits as a preliminary phase to conducting a Rapid Assessment for use in the NEPA process (Proposed Action). Data collection sites were visited with FS personnel prior to RA being conducted this summer. 12 personnel attended</p>
Information requests	<ul style="list-style-type: none"> ✓ Covington, W. W. , B. Stevens. Conference call with western forest restoration and media relations staff, The Nature Conservancy – Colorado/NM) (Stevens, Covington) regional landscape-scale, CFLRP, SWERI projects for public awareness/media news. January 25, 2011. ✓ Vosick, D. Assistance to Henry Provencio to help compile info for CFLRP work plan. 1/27/11 ✓ Covington, W. W. B. Stevens. Conference call with Forest Service Regional Office Public Affairs Officer regional landscape-scale, CFLRP, SWERI projects for public awareness/media news. January 28, 2011. ✓ Vosick, D. Request from TNC for citations related to water yield. 2/23/11 ✓ Vosick, D. Request from Gwen Garcylon with the Roaring Fork Project in Colorado concerning a collaborative start-up. 2/28/11 ✓ Greco, B. Congression meeting with Congressman Gosar. Show Low, AZ March 16, 2011. 17 attendees. ✓ Vosick, D. Mose Jones-Yellin- Dinkey Project--Request for resources on Monitoring. 4/19/11 ✓ Vosick, D. Cam Hunter Request for the TNC analysis of language of fire. 4/29/11 ✓ Vosick, D. Paula Cote request for assistance with information about Chad Hanson. 4/29/11 ✓ Vosick, D. and A. Waltz. 15 hours invested to assist with the CFLR national monitoring workshop. 5/1/11 ✓ Vosick, D. Lucy Murfitt, request for review of HR 4200. 6/20/11 ✓ Vosick, D. Lucy Murfitt, request for more information on salvage logging. 7/1/11 ✓ Vosick, D. Request from Chandler Morse on information concerning BAER. 7/1/11 ✓ Vosick, D. Jim Devos elk group for link to study on the efficacy of post-fire seeding. 7/5/11 ✓ Vosick, D. Request for information from CEQ via Marcus on how lessons will be shared. 7/18/11 ✓ Vosick, D. Dick Fleishman asked for additional information on economics and utilization pertaining to 4FRI for the CEQ.

FY11 Plan of Work - Deliverables

Project 7: Services to the Intermountain West	
Deliverable	Status
	7/25/11 ✓ Vosick, D. Facilitation assistance with the White Mountain Forest Restoration Partners. Ongoing
Associated field visits/training	✓ Greco, B. Black Mesa Restoration Workshop. Overgaard, AZ. February 10, 2011. 16 attendees.
Three field trips/training (non-RAP related)	✓ Pending
Knowledge Services	
ERI and SWERI (<i>new in FY11</i>) websites.	✓ Coquia, K. Summary report on ERI web support with 2011 Search Engine Optimization (SEO) and 2011 ERI website Statistic Analysis. In progress. (Link to summary)
White paper(s)	✓ Pending. Working Title: "Job Creation" based on analysis in Project 5. (Vosick/Egan) ✓ Pending. Working Title: "Tipping Point" based on analysis in Project 5. (Vosick/Egan)
Working papers	✓ "Monitoring" and "Restoration Strategies" (Egan) pending based on analysis performed in Project 2
Fact sheets	In progress (Egan, Vosick, Huffman) ✓ Kalies, L. Fact Sheet: Evidence-Based Restoration Systematic Review: Effects of Restoration on Wildlife Density and Populations. http://library.eri.nau.edu/gsd/collect/erilibra/index/assoc/HA_SH2138.dir/doc.pdf ✓ Vosick, D., D. Egan. Fact Sheet: Lessons Learned from the Wallow Fire. 7/2011 (pending post on ERI website) ✓ <i>Working Title: Grand Canyon-Parashant National Monument</i> ✓ <i>Working Title: Climate Change: What a Land Manager Needs to Know.</i> ✓ <i>Working Title: Organizing a Landscape-scale Restoration Monitoring Program</i> ✓ <i>Working Title: Forest Service Timber Sale Procedures: A Stakeholder's Guide</i> ✓ <i>Working Title: Workforce Development Prospects in the 4FRI Region</i>
Presentations	✓ Kalies, E.L., C.L. Chambers, and S.R. Rosenstock. 2011. Multi-season occupancy modeling: applications to avian-

FY11 Plan of Work - Deliverables

Project 7: Services to the Intermountain West	
Deliverable	Status
	<p>habitat relationships. The Wildlife Society's Arizona and New Mexico 44th Joint Annual Meeting, Pinetop, Arizona. February 3-5, 2011.</p> <ul style="list-style-type: none"> ✓ Chambers, C.L. and E.L. Kalies. 2011. Bird communities in wildfire-burned ponderosa pine landscapes 14 years post fire. Presentation to the USFS Williams District. 3/7/11. 20 attendees. ✓ Greco, B. "Utilizing Restoration Research in Development of Fire Management Plans." Presentation made at Southwest Interagency Fuels Conference. Flagstaff, AZ. March 8, 9, 2011. 85 attendees ✓ Greco, B. "Fire Strategies in Fire Adapted Ecosystems." Presentation made at Tri-Regional Fire Managers Conference. Flagstaff, AZ. February 24, 2011. 75 attendees. ✓ Covington, W. W. "Ecological Restoration: A Practical Imperative for Arizona's Future." Presentation made to the Greater Phoenix Area Chamber of Commerce. Phoenix, AZ. April 15, 2011. 29 attendees. ✓ Masek Lopez, S. Poster presentation at National Workshop on Climate & Forests: Planning Tools and Perspectives on Adaption and Mitigation Options, sponsored by USDA Forest Service. Poster titled, "Designing Effective Forest Restoration Treatments to Augment Snow Water." Northern Arizona University. Flagstaff, AZ. May 17, 2011. 50 attendees. ✓ Roccaforte, J.P. "Ponderosa pine ecological primer." Presentation for Grand Canyon-Parashant Partnership Workshop, St. George, UT. May 17-19, 2011. 50 participants ✓ Huffman, D. "Pinyon-Juniper". Presentation for Grand Canyon-Parashant Partnership Workshop, St. George, UT. May 17-19, 2011
Field trips	<ul style="list-style-type: none"> ✓ Roccaforte, J.P. "Ponderosa pine ecological primer." Presentation and field trip for Grand Canyon-Parashant Partnership Workshop, St. George, UT. May 17-19, 2011. 50 participants. ✓ Huffman, D., D. Smith, W. Greer. Field trip in association w/presentation on "Pinyon-Juniper". May 18, 2011

FY11 Plan of Work - Deliverables

<i>Project 8: Provide annual peer-reviewed reports</i>	
Deliverable	Status
1. Peer-reviewed report 60 days after completion of the agreement.	✓ In progress.

Website content and general maintenance

In FY 2010 the website grew in content and in viewers

- The library gained 45 new documents, and the new media of audio was added, with 7 audio interviews
- Five new video clips, mainly from ERI research featured on news programs, were added to the site, under Video on the homepage
- Upcoming meetings and events section was maintained
- Thirty-four news stories added to the website
- Links were regularly checked and maintained, and SEO was regularly monitored, with metatags being altered to improve SEO
- Work plans were added to the site (2005 through 2010)

Statistics for website and library

See appendix for detailed statistics on the website for January through December, 2010.

New features

We also added many new features to the website:

- Calendar
- RSS syndication of news stories
- Podcasts

Social Media

We enabled a Twitter account (@eri_nau) to post events, meetings, and new publications.

New sections within the website

- We added a Google field site map for ERI and for SWERI projects, under Ecological Restoration. We also added a section under Ecological Restoration for LEARN projects.
- A new tab and main section was added to the website for Evidence-based Restoration
- We completed a major revision to the education area of the site (did not launch)

Server development

SSL (secure sockets layer) was added to the server to provide a secure log-in feature for submitting information to the site.

2010 Search Engine Optimization (SEO) Rankings

5/19/2010:				
SEARCH TERM:	ERI	Ecological Restoration	Ecological Restoration Institute	ERI NAU
Google (Firefox)	10	2	1	1
Google (IE)	5	3	1	1
Yahoo	12	5	1	1
Bing	36	5	1	1
Ask	35	6	1	1
11/27/2010:				
SEARCH TERM:	ERI	Ecological Restoration	Ecological Restoration Institute	ERI NAU
Google (Firefox)	10	4	1	1
Google (IE)	10	5	1	1
Yahoo	2	6	1	1
Bing	21	6	1	1
Ask	15	5	1	1

2010 WEBSITE STATISTIC ANALYSIS

	# hits	hits/day	# visits	ave visit	# unique visitors	% from US	% errors	most visited	p most common	entry page
January	491,966	16,964	23,974	38 min	3,097	61	30			
February	355,867	13,687	31,216	36	3,167	65	11			
March	494,167	15,941	50,404	33	3,915	64	5			
April	608,266	19,621	50,470	33	4,294	62	3			
May	582,563	18,205	53,320	44	3,912	58	3	library	library	
June	532,083	17,164	37,139	73	4,711	61	10	library	home	
July	412,904	12,903	28,108	64	3,937	50	16	library	library	
August	370,253	11,570	27,451	54	3,838	56	15	library	library	
September	891,805	28,768	27,305	50	4,178	56	2	home	home	
October	315,902	9,872	24,873	55	4,521	55	10	library	home	
November	517,228	16,685	25,178	51	4,734	51	6	library	home	
December	401,031	12,532	25,761	56	4,143	52	3	library	home	

ERI Search Engine Optimization (SEO) Summary

7/27/2011:

SEARCH TERM:	ERI	Ecological Restoration	Ecological Restoration Institute	ERI NAU	SWERI	
Google (Firefox)	6	6	5	1	1	13
Google (IE)	6	6	6	1	1	13
Yahoo	2	2	5	1	1	1
Bing	2	2	6	1	1	1
Ask	10	10	7	1	1	27

5/19/2010: (Prior Report Summary)

SEARCH TERM:	ERI	Ecological Restoration	Ecological Restoration Institute	ERI NAU	
Google (Firefox)	10	10	2	1	1
Google (IE)	5	5	3	1	1
Yahoo	12	12	5	1	1
Bing	36	36	5	1	1
Ask	35	35	6	1	1

Note: Search Engine Optimization demonstrates placement in the search engine. "1" is the very first item to show up. The above shows a significant improvement in ERI's SEO between the last report in May, 2010 and the current report.

2011 WEBSITE STATISTIC ANALYSIS

	# hits	# visits	New visits	Ave time on site	most visited
January	396,394	25,670	64	2:11	homepage; directory;publications
February	357,652	23,871	64	1:50	directory; publications; evidence based restoration
March	380,745	25,266	67	1:53	directory; publications; undergrad
April	360,155	22,361	66	1:39	directory; publications; evidence based restoration
May	445,031	21,349	68	1:49	directory; evidence based restoration; publications
June	409,020	25,628	73	1:32	rodeo-chediski; urban interface; directory
July	355,178	19,394	66	1:33	directory; publications; news (santa fe national forest)