

Multiparty Monitoring Plan

This ecological and socio-economic monitoring plan strives to capture the effects of the Bluewater project on forest structure, ecosystem components, and the surrounding communities and economies. The monitoring goals formulated by the multiparty monitoring team are restated below to provide context for the monitoring indicators.

Monitoring Goals:

Goal 1: Reduce the threat of large, high-intensity wildfire.

Goal 2: Preserve old and large trees both living and dead.

Goal 3: Restore pre-settlement forest structure.

Goal 4: Restore historic hydrologic function.

Goal 5: Improve local restoration business and workforce skills.

Goal 6: Establish value-added uses for small diameter wood.

Goal: To provide some measure of Rx effectiveness.

Goal: To create community awareness and to educate youth and college students about the ecological and socio-economic elements of the project.

The actual monitoring will where possible, follow the guidelines presented in CFRP Handbook 4: Monitoring ecological effects, CFRP Handbook 5: Monitoring Social and Economic effects of forest restoration, and in a Short Guide for Grant Recipients.

Ecological Monitoring Indicators:

Pinon and Juniper Savanna Treatment Areas:

Goal 1: Reduce the threat of large, high-intensity wildfire.

Goal 2: Preserve old and large trees both living and dead.

Goal 3: Restore pre-settlement forest structure.

Indicator	Metric	Sampling Method	Who will Monitor	When will Monitoring Occur
Forest Structure	Density, size, species of live and dead standing trees, and sapling and seedling species and density	6 30x30' plots along 300 ft. transect	Cottonwood Gulch Foundation (CGF), Grants High School (GHS), Forest Guild (FG)	Pre data in Spring and subsequent data during Summer session
Forest Structure	Canopy Cover	PVC tube	FG, CGF, GHS	Pre data in Spring and subsequent data during Summer session
Understory Cover	% ground cover	Eight 1 meter squares along 300 ft. transect	FG, CGF, GHS	Pre data in Spring and subsequent data during Summer session

Fuel Loading	Brown's Lines	4 lines along 300ft. transect	FG, CGF, GHS	Pre data in Spring and subsequent data during Summer session
Biodiversity	Butterfly Species (indicate presence of specific larval host plants in area,	ERI methodology	FG, CGF, GHS	
Physical Landscape Changes as a result of treatment	Photographic Documentation (photo points in digital and 35mm)	At each end of transect	FG, CGF, GHS	Pre data in Spring and subsequent data during Summer session
Changes in vegetation on the landscape	Vegetation community mapping	Traditional and GPS/GIS mapping techniques	NMSU-Grants	Summer

*Meadow Enhancement Treatment Areas:**Goal 4: Restore historic hydrologic function.*

Indicator	Metric	Sampling Method	Who will Monitor	When will Monitoring Occur
Physical Landscape Changes as a result of treatment	Photographic Documentation (photo points in digital and 35mm)	At each end of transect	FG, CGF, GHS	Pre data in Spring and subsequent data during Summer session
Forest Structure	Density, size, species of live and dead standing trees, and sapling and seedling species and density	6 30x30' plots along 300 ft. transect	FG, CGF, GHS	Pre data in Spring and subsequent data during Summer session
Forest Structure	Canopy Cover	PVC tube	FG, CGF, GHS	Pre data in Spring and subsequent data during Summer session
Understory Cover	% ground cover	Eight 1 meter squares along 300 ft. transect (at least 32 squares sampled for all meadows)	FG, CGF, GHS	Pre data in Spring and subsequent data during Summer session

Hydrologic Response to Woody Removal	In-stream yield and timing, water table,	To be determined	Grants High School (GHS)	Pre data in Spring and subsequent data during late spring, summer, or fall
Loss of soil due to stunted Understory as a result of fire suppression, grazing, and impacts of restoration techniques	Sediment catchment basin (% ground cover provides some measure of soil loss; if vegetative ground cover increases then soil loss should decrease)	To be determined	GHS	Pre data in Spring and subsequent data during late spring, summer, or fall

Ponderosa Treatment Area:

Based on the multiparty monitoring team meeting held 04/10/2007 in Grants, there are some updates to the multiparty monitoring plan document. As many of you may know, the Bluewater CFRP originally was only restoring pinyon-juniper savanna and upland meadow vegetation types. Due to the influence of the WIN wood cluster and its members, 50 acres of ponderosa pine restoration have been added to the roster. As a result, the multiparty monitoring plan developed in fall of 2005 has been revised to include monitoring in ponderosa pine.

Project goals 1-6 can be all applicable to the added ponderosa pine treatment. To refresh our collective memory, these goals are:

1. *Reduce the threat of large, high-intensity wildfire.*
2. *Preserve old and large trees both living and dead.*
3. *Restore pre-settlement forest structure.*
4. *Restore historic hydrologic function.*
5. *Improve local restoration business and workforce skills.*
6. *Establish value-added uses for small diameter wood.*

The multiparty team agreed on several ecological indicators that address goals 1-3 and agreed that the existing socioeconomic indicators being collected will address how goals 5 and 6 relate to the ponderosa stand. The indicators chosen to monitor the ponderosa stand are:

Indicator to Measure	Metric	Targets	Sampling Method	Who will Monitor	When will Monitoring Occur
Forest Structure	Density, species, and size of live and dead standing trees, seedling and sapling species and density	40-60 Basal Area	6 30x30' plots along 300 ft. transect (6 transects)	FG, GHS, CGF	Summer Pre and Post
Physical	Photographic		At each end	FG, GHS,	

Landscape Changes	Documentation (photo points in digital and 35mm)		of transect	CGF	
% Canopy Cover	PVC method (modified into quadrants)		Points along transect	FG, GHS, CGF	
Retention of closed canopy PIPO clumps	Clumpiness mapping method – Clumps/acre	5 – 8 clumps/acre	.5 acre grids	FG, GHS, CGF	
Fuel Loading	Brown's Lines	8 – 12 tons/acre	4 lines along 300ft. transect	FG, GHS, CGF	
Ladder Fuels	Crown base height estimate		6 Plots along 300 ft. transect	FG, GHS, CGF	
Understory health	% Ground Cover	Double amount of grass and forbs	Eight 1 meter squares along 300 ft. transect	FG, GHS, CGF	

Socioeconomic Monitoring:

Goal 5: Improve local restoration business and workforce skills

Indicator	Metric	Who will Monitor	When will Monitoring Occur
Workforce	<ul style="list-style-type: none"> • # of Jobs in total, by FTE, and total # employed • # of trainings • # of successfully awarded contracts (pre and post) • Annual # of acres treated by Ramah pre and post • Narrative • Other work (besides Bluewater) obtained for crew 	FG	During and after treatment implementation. To be compiled annually

Goal 6: Establish value added use for small diameter wood

See Wood Industries Network (WIN) for progress in achieving Goal 6.

Goal: To learn of changes in the community and economies proximate to the project areas that relate to the project.

Indicator	Metric	Who will Monitor	When will Monitoring Occur
Ability of partners to utilize restoration by-product and coordinate efforts	<ul style="list-style-type: none"> • Sign-in sheets for CFRP and WIN meetings • Agenda and meeting notes for CFRP and WIN meetings • Survey of CFRP partners and WIN members pre and post 	FG, WIN	During and after treatment implementation. To be compiled annually

	<p>treatments</p> <ul style="list-style-type: none"> • Number of local businesses using wood from restoration treatments • Number of business plans funded with the grant that helped to establish or enhance a local business • Amount and diversity of wood products from project areas that are processed locally • Amount and type of technical assistance provided to local businesses and capacity building that resulted • Narrative of pre and post conditions and WIN and the process that made WIN successful • Trickle Down Effects Narrative (addressing increase in utilization capacity) 		
Changes in local economy or community related to project	Potential for individual projects by students to investigate by multiple approaches such as, interviews, surveys, GIS, or other means.	NMSU – Grants / GHS / CGF	Unknown

Goal: To make Bluewater Village a Firewise Community

Indicator	Metric	Who will Monitor	When will Monitoring Occur
Are there Firewise Communities?	<ul style="list-style-type: none"> • # of Firewise communities designated • # of homes included • # of people engaged in meetings and planning 	FG	Annually

Community Outreach and Education:

Goal: To generate awareness about the project and ecosystem restoration in the communities proximate to the project area.

Indicator	Metric	Who will Monitor	When will Monitoring Occur
Community	# of meetings and estimate of	NMSU –	Throughout project

meetings where components of the project are presented	turnout (e.g. Earthday @ NMSU-Grants)	Grants / GHS / CGF / FG	
Amount of education	<ul style="list-style-type: none"> • # students trained in ecological monitoring • Amount of time spent training and monitoring 		
# of classroom presentations or field trips to the treatment areas	# of presentations and field trips and # of students involved	NMSU – Grants / GHS / CGF / FG	Throughout Project