Plumas National Forest
Ecological Restoration Program

Water, Forests, Communities…and room to breathe…

The 1.2 million acre Plumas National Forest (PNF) is located in the north eastern Sierra Nevada just south of the Cascade Range. The forest extends from the western foothills just above the Sacramento Valley/Lake Oroville to the Great Basin desert near the Nevada border with elevations ranging from 900 to 8,372 feet.

The PNF encompasses the majority of the upper Feather River watershed, the largest watershed in the Sierra Nevada at 3,500 square miles and one of the most significant sources of water for almost half of California's population (15 million) via the State Water Project. A series of dams and powerhouses on the Upper Feather River provide 9–30 percent of the State's electrical supply via hydroelectric generation.

Heavily forested and thinly populated, 70 percent of the forest lies within Plumas County with a population of around 20,000. PNF acreage is also within boundaries of Butte, Lassen, Sierra and Yuba counties. The PNF has historically been a regional leader in timber production.

Local community economies are largely natural resource dependent with a growing component of older retirees and affluent second home owners (e.g., Graeagle, Lake Almanor). Non local recreational traffic comes primarily from nearby cities of Reno, NV and the Sacramento Valley area. Developed recreation is primarily reservoir based.

Key Ecological Restoration Goals

FY 2012: Continue a Forest-wide defensible fuel profile zone (DFPZ) network per the Herger-Feinstein Quincy Library Group (HFQLG) Forest Recovery Act prior to expiration of the Act. Over 3500 acres of integrated projects (fuels, vegetation, watershed, timber, and wildlife) will occur, largely in priority watersheds.

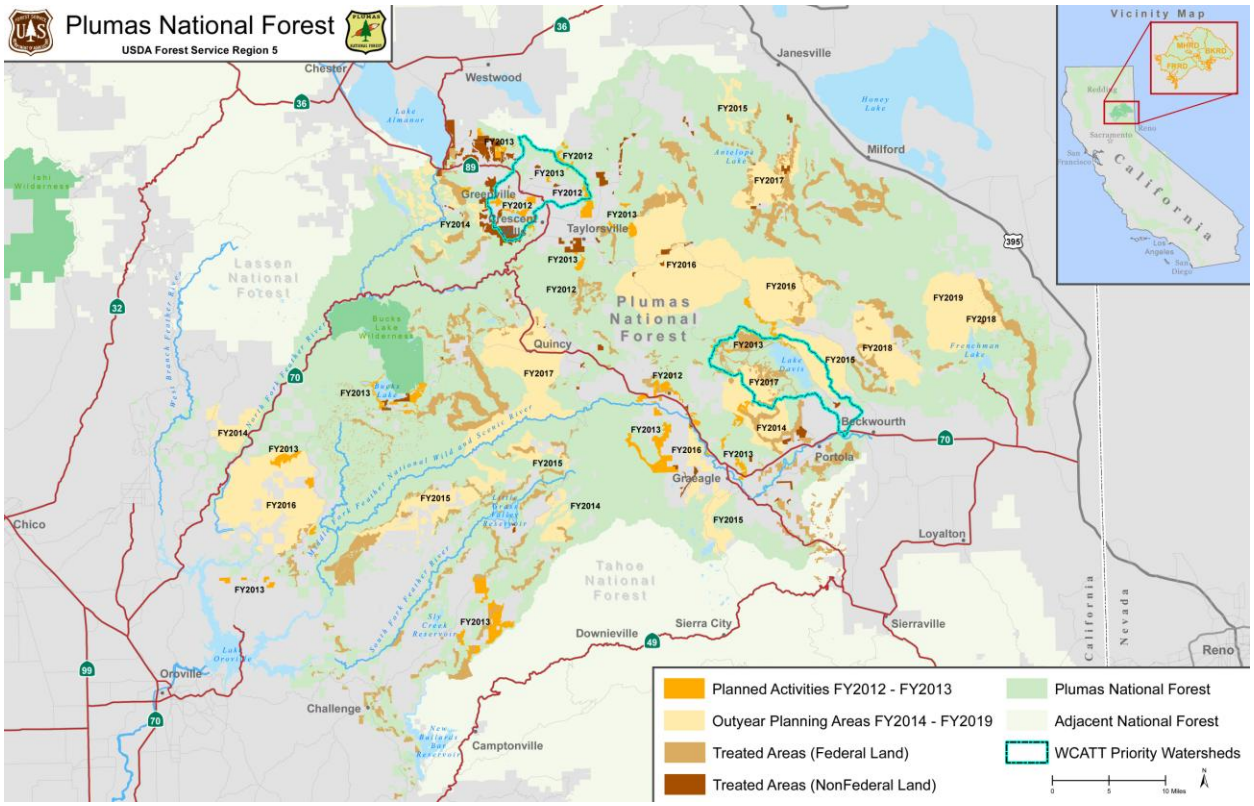
FY 2013: Substantially expand project integration with an increased level of partner engagement.

Strategic Goals for 5-year Program of Work [no priority order] include:

Focus on forest health restoration projects, including: (1) fuels reduction work that reduces fire risk to communities, strategic watersheds and recreation sites, and (2) watershed work that restores meadows and riparian/aquatic ecosystems

- Increase project coordination with tribal, local, county, state and federal partners
- Contribute to job creation in restoration and recreation as key components of local rural community stability and worker/industry sustainability for the PNF
- Complete a PNF Strategy for Sustainable Recreation; integrate recreation project work to the degree possible with forest health restoration projects
- Continue to revise the transportation system to enhance sustainability
- Improve resilience of general forested landscapes to stand-replacing wildfire, particularly in high-value wildlife habitat in keeping with the principles expressed in Pacific Southwest Research Station (PSW) publications GTR-220[6] and GTR-237.[7]
- Restore fire-damaged watersheds including re-establishing habitat connectivity in forested landscapes (Moonlight Fire alone destroyed 20 CA Spotted Owl Protected Activity Centers)
- Identify areas and resources most vulnerable to climate change, and develop management strategies to reduce vulnerability and support additional restoration actions (e.g., watershed restoration and potential salmon reintroduction to headwater tributaries)
- Reduce spread of invasive species and treat existing populations
- Improve economics of forest product removal
- Capitalize on existing and new opportunities for partnerships, particularly to leverage declining appropriated dollars.

6. Available for download at www.fs.fed.us/psw/publications/documents/psw_gtr220
7. Available for download at www.fs.fed.us/psw/publications/documents/psw_gtr237



Fiscal Year	NEPA Document	NEPA Status	Project Name	Fuels Acres	Volume (CCF)	Priority Watershed?	Other Integrated Targets
FY 2013	Big Hill	In progress	Eureka MP Thin (TS or IRTC)	1,415	11,600	yes	
			Gallagher (TS or IRTC)	900	4,400	yes	
	Bucks Lake Fuels/Hazard Tree	Complete	Bucks Lake Fuels/Haz Tree Stewardship	1,319	10,600		
	Empire	Complete	Refuge MP Thin Re-Reoffer IRTC or IRSC	1,038	11,285		
	Small Sales	Complete or Almost	Small Sales	100	1,350		
	Grass Flat (part)	In progress	Grass Flat DFPZ and GS	956	7,100		
	Grizz EA	Complete	Pano (TS or IRTC)	150	1,125	yes	Watershed (WS)
	Ingalls	Complete	Ingalls SC	770	-	yes	WS
	Keddie Ridge Fuels Reduction	Complete	Keddie Stewardship (IRTC)	1,385	9,840	yes	WS; Terrestrial Wildlife (WL-Terr)
	On Top	In progress	Palmetto MP Thin	695	16,450		
			Paulson MP Thin SBA	962	12,600		
	Sugarloaf	In progress	Sugarloaf DFPZ and GS	611	22,200		WS; WL-terr
	Jackson	Complete	Jackson SC	200	-		
	Integrated Fuels Program	Complete or Almost	Integrated Fuels Program	1,600	-		WL-terr
Total FY 2013				**2,101**	**108,550**		

Fiscal Year	NEPA Document	NEPA Status	Project Name	Fuels Acres	Volume (CCF)	Priority Watershed?	Other Integrated Targets
FY 2014	Belden	In progress	Belden	7,563	39,000		
	Big Hill	In progress	Big Hill SC	800	-	yes	WS
	Cradle Valley	In Development	TBD (TS or IRTC)	70	350		
	Eastside Underburning	In Development	Eastside Underburning FY 14	1,000	-		WL-terr
	Hayden	In Development	Hayden (TS or IRTC)	1,000	8,000		
	Union Hill	In Development	Union Hill	1,500	26,000		
	Integrated Fuels Program	Complete or Almost	Integrated Fuels Program	1,800	-		
Total				**13,733**	**73,350**		

Fiscal Year	NEPA Document	NEPA Status	Fuels Acres	Volume (CCF)
FY 2015	Camp Creek	In Development	10,000 – 14,000	70,000 – 85,000
	Crocker			
	Lakes Basin			
	Wildcat			
	Integrated Fuels Program			
FY 2016	Dogwood	In Development	10,000 – 14,000	70,000 – 85,000
	Genesee			
	Middle Fork			
	Pinchard			
	Plumas-Eureka			
	Poco			
FY 2017	French Creek	In Development	10,000 – 14,000	70,000 – 85,000
	Frenchman			
	Mohawk Vista			
	Monitor Flat			
	Murdock Crossing			

Challenges

- Overstocked stands with disproportionately large component of shade tolerant species with low resiliency to wildfire and climate change (forest health)
- Uncharacteristically severe and more frequent large fires compared to historical averages
- Challenging market conditions for forest products removed for ecological restoration purposes, particularly biomass
- Idled biomass facilities
- Watershed impacts from extensive road system and historic mining
- Air quality concerns as prescribed fire is reintroduced into fire-adapted ecosystems (small burn windows)
- Extremely steep canyons (topography)
- Landowner concerns about water rights downstream from some types of meadow restoration projects
- County & Community infrastructure is strained (losing schools, hospitals & funding for chambers of commerce)

- Recreation remains relatively undeveloped and organized recreation coalitions are few

Opportunities

- Landscape-scale treatments are possible as a result of consolidated Federal land ownership patterns; series of fuel breaks (HFQLG) already in place at the landscape scale (all lands) to protect investments
- Organizational experience remains; employees have successful track record with integrated resource management projects at the landscape-scale
- High local community drive and capacity as unemployment rate is twice national average (urgency)
- Community leaders are supportive of active forest management, particularly fuels reduction
- Existing wood products infrastructure
- Important partnerships in place (Feather River Coordinated Resource Management Group (FRCRM), HFQLG & Firesafe Councils)
- Little pressure from rapid human population growth in wildland urban interface
- Continue building resilience and re-alignment (integration) into our forest management strategies, as appropriated funding projections show declines
- Local interest and local capacity to enhance recreation-based economy
- Noxious weed populations are small
- Continue highly effective habitat enhancement projects, particularly for aspen, black oak, and aquatic species, with local, state and national partners
- Increase conservation education, interpretation and volunteer programs to increase understanding of the USFS mission

Compelling Need for Action

On a regional scale, the California Water Plan and the Integrated Regional Water Management Plan recognize the importance of forest management on water quantity and quality, and potentially timing of water delivery as well. Nearly all forest management, whether for recreation, roads, fuels management, forest health, wildlife habitat management or timber production, at some level comes down to water.

The Feather River region has been identified as "climate vulnerable" due to warming temperatures. (Example: winter average minimum nighttime temperatures have risen by as much as 9 degrees Fahrenheit in parts of the Feather River region over the past 50 years, compared to a more common range of 2–3 degrees Fahrenheit increases across the Sierra Nevada). As a result, the Feather River watershed has exhibited some of the largest changes in timing of runoff and loss of low-elevation snowpack observed in California (with potential long-term consequences to water supply, hydroelectric supply, flood control, etc.). Restoration takes on additional urgency as the National Marine Fisheries Service looks to the upper watersheds in the Sierra Nevada, including those on the PNF, for reintroduction and recovery of highly endangered salmon populations.

Recent fire history (160,000 acres burned/2000 – 2012; much at high severity) indicates a trend toward increases in disturbance events such as uncharacteristic large-scale wildfires, floods, and landslides, highlighting the urgency to improve forest health and resiliency especially in landscapes that haven't been impacted by large scale events.

The rural communities that lie within and adjacent to the PNF are heavily dependent upon the National Forest for forest products jobs, services and recreation-based tourism. Unemployment rates are twice the national average in some counties. From a community standpoint, economic recovery and ecological restoration are inseparable.

Readiness to Succeed

The PNF is uniquely positioned with opportunities to succeed in ecological restoration. A highly skilled and dedicated workforce and a multitude of existing partners and stakeholders, form a strong collaborative foundation for planning and leveraging federal dollars with non-appropriated sources of funding.

The FRCRM is made up of 24 federal, state, and local partner agencies, organizations and stakeholders, including the PNF. Since 1985, this highly successful partnership has implemented approximately 4100 acres of meadow/floodplain and 47 miles of stream/riparian restoration projects.

Other examples include:

1. PNF fisheries and watershed engineering staffs recognized in Region 5 in 2011 for their work restoring aquatic organism passage relative to streams and roads

2. PNF working closely with Plumas County on their County General Plan Update and the Plumas County Coordinating Council on various projects

3. Long term commitment to the Quincy Library Group, local Firesafe Councils, Plumas County Coordinating Council, Biomass Working Groups and Rock Creek Cresta Ecological Resources Committee (ERC), chartered in the 30-year hydropower license with PG&E (FERC 1962)

4. Partnerships with tribes (e.g., Maidu Stewardship Project)

5. Other timber industry, grazing permittee, recreation, school, and other non-governmental organizations, are also essential to the Plumas NF's integrated ecological restoration strategy.

An important partnership and advantage unique to the PNF is based on several years of the Plumas-Lassen Administrative Study, implemented under the HFQLG Pilot project in partnership with the Pacific Southwest Research Station, including multi-party monitoring. The Forest has trained personnel and a solid record of evaluating responses to different forest management practices and using predictive models to forecast responses to that management. There is an opportunity for follow-up surveys and evaluations (at 1, 5 and 10-year intervals). The objective is ecologically and socially responsible forest management within economic realities; reducing the risk of catastrophic wildfire while retaining biological diversity across the landscape and contributing to community economic stability.

Finally, the PNF has begun (2009) integrating PSW GTR-220 concepts into fuels reduction projects, thus improving collaboration, improving wildlife values of the treatments, and avoiding costly litigation.

Examples of Ecological Restoration Projects

Watershed Restoration: Watershed restoration on the Plumas National Forest can take many forms, including meadow restoration, riparian revegetation, road decommissioning, fish passage, grazing management, fuels reduction, and aspen restoration.

- The example provided in the photographs below is representative of meadow restoration projects implemented over the past several years on the Plumas NF. In addition to restoring degraded ecosystems, data indicates that these projects may also positively affect late-season water yields during a critical period when flows downstream are particularly beneficial to local watersheds and California's water users. The 1994 photo is pre-project; the 2005 and 2006 photos follow implementation of meadow restoration planned and implemented by the Feather River Coordinated Resource Management Group (FRCRM). Information for FRCRM available at http://www.feather-river-crm.org.

- The Cottonwood Creek/Big Flat project on the Beckwourth Ranger District moved Cottonwood Creek from its old down cut channel into 4,050 feet of new channel constructed on top of Big Flat Meadow. The abandoned gully was filled or converted into a series of ponds that created wildlife habitat. The project was sponsored by the USFS and carried out by Plumas Corporation with funding of $30,000 from the USFS, $10,000 from PG&E, $70,000 from the SWRCB, and other funds from Ducks Unlimited, CA Department of Water Resources, CA Department of Fish and Game, and the Milford Grazing Association for a total of $189,000. In 2004, modification to the channel to fill the riffles to the correct elevation was completed, allowing high surface flows to more readily access the floodplain. This element was funded by the Resource Advisory Committee (RAC) PL106-393, Secure Rural Schools, and Title II funds with contributions from the Plumas NF.

- Since this project was implemented, the FRCRM has been highly successful at obtaining grant funding (Prop 50) to increase the pace and scale of meadow restoration and other projects benefitting watershed health, riparian habitat, and water quality. This has been an important element of the HFQLG Pilot Project. This program also includes a substantial monitoring component.

Top Left (1994): The down-cut channel of Cottonwood Creek prior to restoration.
Bottom Left (2005): An aerial view of the restored Cottonwood Creek and Big Flat Meadow.
Top Right (2006): Cottonwood Creek flowing in its new channel.

Aquatic Organism Passage (AOP): Integrated planning between the Plumas NF Fisheries, Watershed and Engineering programs, accompanied by successful proposals for internal and external grant programs, has resulted in forest-wide accomplishments recognized at the regional level for successful restoration of fish and other aquatic organism habitat connectivity, plus watershed improvement. Example from Mount Hough Ranger District 2010–2011: Contracted to replace two AOP barriers and rehabilitate two additional barriers on Squirrel Creek and Pine Creek. Funded by the American Recovery and Reinvestment Act of 2009 (ARRA); planning accomplished with integration into HFQLG projects.

Fuels Reduction and Community Protection: The Slapjack DFPZ on the Feather River Ranger District is an example of a project supporting fuels reduction, community stability, and forest health objectives of the HFQLG Forest Recovery Act. Two stewardship projects were awarded in 2007; a service contract was awarded in 2008. The Slapjack project stewardship and service contracts collectively accomplish nearly 20,000 cubic feet (ccf) of sawlog removal, 13,000 ccf of biomass removal, and over 3,100 acres of fuels reduction.

This project was challenged under the 2004 Sierra Nevada 2004 Framework litigation, but the courts allowed it to proceed over 98 percent of the project area because of its focus around 7 communities in the wildland-urban interface (WUI). The stewardship projects are still in operation with a local contractor. Several of the workers on these projects are local residents who are literally building a DFPZ in their own back yards.

Culvert at the Pine Creek crossing of Road 25N29 on the Mount Hough Ranger District. Left photo shows the crossing prior to restoration, with a significant drop to the creek impairing passage for fish and other aquatic organisms. Right photo shows the crossing after restoration with streambed substrate and retention weirs.

Slapjack DFPZ Before (Left photo) and Unit Nearing Completion (Right photo). In the Before photo, a Timco is barely visible beginning operation in this overstocked stand.