United States Department of Agriculture
Forest Service

Pacific Southwest Region

Restoring, Enhancing, and Sustaining Forests in California, Hawaii & the Pacific Islands

Storrie Fire Restoration: FY 2011 Annual Report

November, 2011

This report documents the accomplishments the Plumas National Forest either completed or initiated in the last fiscal year.

CONTENTS

PLUMAS NATIONAL FOREST FISCAL YEAR 2011 ACCOMPLISHMENTS

INTRODUCTION

Background:

In August, 2000, the Storrie Fire burned 52,000 acres of National Forest System lands on the Mt. Hough Ranger District of the Plumas National Forest, and the Almanor Ranger District of the Lassen National Forest (Figure 1, Pg. 22). The Plumas and Lassen National Forests received approximately $80 million from a lawsuit settlement to restore the damage done on National Forest System lands during the fire. The settlement funding will support restoration of the landscape and the ecological balance on these lands so that the public can again experience the full enjoyment and benefit of our resources. A 10-Year Storrie Fire Restoration Plan was approved in 2008 to address the majority of these restoration needs.

The Storrie Fire Restoration Team was formed in 2010 to coordinate the restoration efforts for the PNF. The team consists of natural resource specialists who work collaboratively with multiple partners, including the US Forest Service Pacific Southwest Research groups, Plumas County, Plumas County Fire Safe Council, Plumas Unified School District, California Department of Fish and Game, Pacific Gas and Electric, California State University and the University of California.

Our Mission:

The mission of the Storrie Fire Restoration Project is to work collaboratively to restore publicly valued resources affected by the Storrie Fire while partnering with, educating, and maintaining transparency with our local communities.

Our Vision:

Our vision is to work with stakeholders to develop and implement strategies that integrate and coordinate restoration, protection, and evaluation measures to achieve restoration objectives for the Storrie Fire area.

Key Accomplishments

FY11 accomplishments demonstrate a balance between doing on-the-ground restoration work and planning for the implementation of future restoration projects. They consist of the Plumas and Lassen National Forests working jointly with the Plumas Unified School District (PUSD) on the development of the Storrie Fire Restoration Project Strategic Plan, which outlined the partnership between the School District and the Forest Service, thereby integrating the community in the fire restoration effort; coordination with the PSW Research group, both the Davis and Redding labs, to fill information gaps for restoration needs; the FY12 program of work being developed and planning, inventory and implementation activities commencing; and the development of products from the LiDAR data collected in FY09. Specific PNF FY11 accomplishments in the Storrie Fire area include:

Program Management:

- ✓ A Rapid Landscape Assessment (RLA) of the Storrie Fire area (Figure 1) was completed in April of 2011. The RLA helps guide the development of project level purpose and need statements in subsequent environmental documents by achieving two specific goals. The first is to identify opportunities for restoration activities to facilitate the re-establishment of resources that were lost or damaged in the Storrie Fire assessment area, and the second is to outline guidance, prescriptions, and constraints contained in the Plumas Land and Resource Management Plan (LRMP), the Herger-Feinstein Quincy Library Group Pilot Project (HFQLG) and the Sierra Nevada Forest Plan Amendment (SNFPA) that will affect future project designs and planning. By identifying the current and desired conditions within the assessment area, this document will help managers formulate an efficient program of work to satisfy multiple resource objectives. This assessment helps identify long range landscape objectives and actions that will help us move toward future desired conditions. See O:\NFS\Plumas\Project\MHRD\StorrieFireRestoration2010\RLA\Storrie_RLA_Final_2011_04_27.docx.

Hydrology/Transportation:

- ✓ FS Road 24N24 (Three Lakes Road) was brushed, graded, and improved to provide safe access to the Three Lakes Trailhead and Bucks Lake Wilderness, both of which are within the Storrie Fire area. Rolling dips were installed and wet seep areas were hardened to reduce impacts of the road. A new vault toilet was installed at the trailhead to replace one destroyed by vandals; this will improve the recreation experience and reduce impacts to water quality. Work was completed on approximately eight miles of the road. Five miles were improved and twenty acres of watershed were enhanced; and these accomplishments will be entered in the proper databases. See:

O:\NFS\Plumas\Project\MHRD\StorrieFireRestoration2010\Milestones\FY2011\Hydrology\3LakesSuccess.pdf

- ✓ Reconstruction of approximately 0.5 miles of OHV route 6M40 (Rock Creek) up to Tobin Ridge was completed to improve OHV opportunities for recreation users within the Storrie Fire area. In addition, there were severe erosion problems exacerbated by increased erosion, which were mitigated with rocking and reshaping the extremely steep route, as seen in the before and after photos below. Part of the route passed dangerously near a high voltage power line, so the section was realigned to provide safe passage. Future improvements will eventually reach 4 miles up to the ridge. Pacific Gas and Electric was brought into the project as a partner, and they subsequently improved and gated spurs in the area that are needed to access their transmission lines. 0.5 miles of motorized trail reconstruction and 14 acres of watershed improvement were recorded into the respective databases. See:

O:\NFS\Plumas\Project\MHRD\StorrieFireRestoration2010\Milestones\FY2011\Hydrology\RockCreekFactsheet.pdf

Minerals:

- ✓ Identified locations of abandoned mines in the Storrie Fire area in order to close those mines that present a health and safety hazard to the recreating public and agency employees, water quality, or wildlife.
- ✓ Closure of the Yellow Creek mine adit to impove recreation safety on the Yellow Creek Trail within the Storrie Fire area.
- ✓ Initiation of NEPA for two abandoned mine closures (Old Jura and Shenandoah) within the Storrie Fire area.
- ✓ Identification of three possible closure sites in the Storrie Fire area for FY12.

Noxious Weed Management:

- ✓ Noxious Weed Treatment necessitated by the fire:
  - Tobin Quarry: four-acre quarry site was treated for yellow starthistle to prevent spread through use of quarry rock at restoration sites (e.g. Rock Creek, Three Lakes). Treatment included five manual weed treatments totaling over 80 hours.
  - Manual treatment of 28 sites, (22 acres), for noxious weed infestations that were exacerbated by the Storrie Fire.

✓ Environmental analysis for a Storrie-Rich Fire Integrated Weed Management project is proceeding:

- An 80-page weed management strategy was completed outlining known weed issues that have been exacerbated by the Rich and Storrie Fires. This document will provide recommendations for weed management within and adjacent to these fire footprints.
- 76 new noxious weed occurrences were mapped and incorporated into the Natural Resource Information System (NRIS).
- Surveys were conducted for proposed project area for heritage sites, TES plant, terrestrial, and aquatic wildlife species.
- The Proposed Action covering ~90,000 acres has been reviewed by the IDT, and presented to the PNF Supervisor's Office on 09/15/11.

✓ Student Conservation Association (SCA) safely participated in three days of noxious weed mapping and treatments:

SCA members remove yellow starthistle from Tobin Quarry

Recreation:

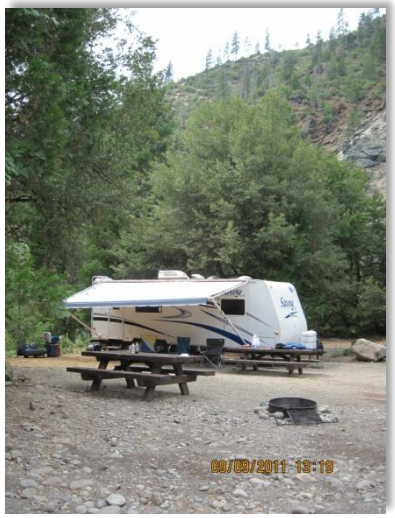
- ✓ The Three Lakes project was completed to improve access to the wilderness portion of the Storrie Fire area for recreation users and future fire management activities. A new restroom was installed at Three Lakes Trailhead, to replace the wilderness trailhead restroom that was vandalized in 2009. Approximately 8 miles of road was improved (see *Hydrology/Transportation* section above on FS Road 24N24).

Vault toilet being hauled to Three Lakes by excavator

New sweet smelling toilet at Three Lakes Trailhead

- ✓ Other recreation improvements to enhance/improve recreation opportunities within the Storrie Fire area:
  - Demolition of an unsafe restroom and hazard tree removal at old Belden Campground.
  - Installation of three host site septic systems and two new host sites on Caribou Road.
  - Roof replacement at Queen Lily Campground restroom.

Host site septic installation and new site construction at Queen Lily Campground



Completed host site at Queen Lily Campground

- Campground inspections and patrols at four developed campgrounds for compliance with terms of the permits.
- Patrols at dispersed camping areas where health and sanitation is an increasing issue.
- Water system repairs at Queen Lily Campground water system.

✓ Initiated a river recreation strategic assessment for North Fork of the Feather River (NFFR) to improve recreation opportunities for public river access and direct FS management of recreation opportunities on the NFFR.

✓ Issued & administered 12 recreation event permits (Belden Music Festivals) to enhance recreation opportunities provided within the Storrie Fire Area.

✓ Increased annual reporting target level for the Bucks Lake Wilderness by 25% through development of Recreation Site Monitoring (one-quarter of the wilderness was affected by the Storrie Fire).

✓ Completed NEPA Documentation for two recreation projects to improve recreation opportunities provided within the Storrie Fire area (Three Lakes recreation and road improvements and PCT hazard tree removal).

✓ Trail rehabilitation and restoration on 36 miles of trails within the Storrie Fire area to help restore trails affected by the Storrie Fire. Trails included: 12 mi. Pacific Crest Trail (PCT) Three Lakes to Lassen NF boundary, 2 mi. Chambers Creek Trail, 1 mi. Tobin Ridge motorized trail, 4 mi. Ben Lomand Trail, 2 mi. Yellow Creek Trail, and 15 mi. of trails within Bucks Lake Wilderness.

✓ Completed Chambers Creek Trail bridge repairs to help restore trail opportunities lost to the Storrie Fire. District recreation crew replaced railings and power-washed decking. All materials were transported by local pack outfit.

✓ Developed and advertised a hazard tree removal contract for 1,100 snags that pose a threat to visitor and employee safety along the LNF and PNF portions of the PCT (Figure 3). Contract was cancelled due to high bid costs and will be re-advertised in 2012, or done by fire crews.

✓ Coordination of Student Trail Crew under Participating Agreement with Student Conservation Association (SCA) to provide service learning within the Storrie Fire Restoration area; six high school students from PUSD schools rehabilitated 5 mi. of trails. Coordinated trail work with Pacific Crest Trail Association and Back County Horsemen for work on the PCT.

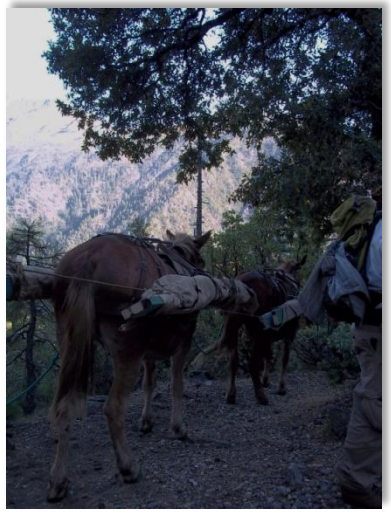
SCA Crew on lunch break on PCT

SCA Crew works on drainage feature – PCT

PCT drainage feature completed

Chambers Creek Trail bridge railing before repairs

Chambers Creek Trail bridge railing after repairs



Mule pack train at Chambers Creek Trail Bridge

Revegetation & TES Plant Species Management :

- ✓ Two acres of native grass revegetation:
  - Seed was sourced from local, on-forest collection sites and grown in conjunction with USFS's JH Stone nursery.
  - Revegetation occurred at Gansner Bar, Queen Lily, and North Fork campgrounds.
- ✓ Collection and production of locally-sourced seed for revegetation:
  - Moving Plumas NF towards conformity with R5's 1994 Native Plant Material Policy.
  - Seed was collected and two IDIQ contracts were signed to produce an additional 1000 pounds of locally-sourced grass seed in FY12.
  - Four additional grass species were added to the inventory of Plumas NF-sourced revegetation seed.
  - Responsible seed collection of select PNF sensitive plant species:
    - Seed was collected from Mildred's clarkia occurrences that were impacted by improvements on OHV route 6M40. Revegetation is scheduled for FY12.
    - Seed was collected from six Webber's milkvetch occurrences and genetic testing was conducted on the entire population to prepare for future revegetation.
- ✓ Student Conservation Association (SCA) safely participated in two days of native grass seed collection.

SCA member collects native grass seed

- ✓ Serpentine Endemic Plant Species Research:

- Coordination with Humboldt State University on a project investigating the use of remote sensing to map serpentine soils within the Storrie Fire area to better manage rare, endemic plant species.
- Coordinated a field day for researchers studying serpentine habitats and associated rare plants within the Storrie Fire area; thirteen people participated, representing USFS and four universities.
- Coordination with University of California, Davis on a cost share agreement investigating the conservation biology and fire ecology of 12 PNF sensitive plant species.

Researchers and USFS employees participate in a field discussion on experimental remote sensing of serpentine soils using LiDAR

Aquatics /Hydrology :

- ✓ Whirling disease study agreement signed with partners PG&E, Plumas Corporation, California Dept. of Fish & Game (CDF&G). The study will determine if there are chironomid worm host species present in Yellow Creek.
- ✓ Coordination with the LNF to complete Storrie Fire area amphibian surveys that may provide guidance for future aquatic passage projects.
- ✓ Initiated design on potential coldwater fish spawning channel at James Lee Campground site.
- ✓ Engineers and specialists on the Plumas NF are assisting the Lassen NF with the design of 3 aquatic organism passage (AOP) projects on the Lassen portion of the Storrie Fire.

Fire and Fuels :

- ✓ The Borderline Fuels Reduction and Forest Restoration Project has identified 1,712 acres of potential thinning and prescribed fire treatments within 16 units. Located along the Lassen-Plumas NF boundaries, this north/south oriented project has a road system on each side and ridge top in the middle. Strategically, this project lends itself well to the reintroduction of fire by providing abundant holding opportunities.

- ✓ The resource crew began collecting stand exam data within the Borderline Project, (42 plots within 3 units). This data will be entered into the Forest Vegetation Simulator so that fire risk and stand dynamics can be analyzed. The end result is the development of fuels reduction and forest restoration prescriptions that achieve desired conditions. A grid layout of 180 additional stand exam plots has been created for the remainder of the potential treatment units.

GIS:

The contributions of GIS to any restoration effort are supportive by nature. The maps and data that are created assist planners, hydrologists, botanists, biologists and other specialists to do their analysis, and to make decisions that result in the tangible physical changes that appear on the landscape. The maps also help communicate to interested parties and the general public the scope of these activities. So within that context, the most significant GIS accomplishments for FY11 were:

- ✓ Maps were created and analysis performed in support of the Rapid Landscape Assessment. This document provides a basis for planning future activities.
- ✓ Miscellaneous vicinity maps were used to inform and involve the public in our efforts. These included large format maps for use in public meetings, and smaller versions that appeared on websites and in flyers.
- ✓ Buffering, acreage computations, and related analysis were performed to support the NEPA process for noxious weed management. It is important that any proposed strategy be compliant with the relevant rules and regulations.
- ✓ A set of LiDAR data collected in FY09 was used to improve the geospatial accuracy of certain natural features within the fire boundary, which helped the specialists make more informed decisions, and a collection of standard products were derived from the data. These included:
  - The high resolution digital elevation model (DEM) provided by the vendor was used to produce an improved contour map, which in turn was used as a basis for detailed slope rasters. These have been of value to both the hydrologist and the fire ecologist in their planning efforts. Slope gradients show the limits for heavy equipment use on the ground, for example.
  - A highly accurate stream layer was digitized, then used in conjunction with the DEM to create detailed stream profile graphs that will be used by the hydrologist.
  - Canopy heights were computed from the highest hit and bare earth surfaces, and are being used to plan the revegetation activities.
  - Pulse return intensity maps were produced for the fire area, which show the extent and strength of plant photosynthetic activity.

Heritage:

- ✓ Cultural Resources within the Storrie Fire area were surveyed, monitored, and recorded. Thirteen previously recorded cultural resource sites were monitored, seven new sites recorded, one hundred two acres surveyed, and two ethnographic research interviews completed.

Outreach:

The goal of Storrie Fire Restoration outreach is to engage communities, schools, and the public in the Storrie Fire Restoration process. This will encourage stewardship of NFS lands and resources within the Storrie Fire area, thereby protecting NFS lands from future catastrophic wildfire, and also encourage conservation and protection of natural resources. FY 11 projects included:

- ✓ Design and publication of the Storrie Fire Restoration website www.fs.usda.gov/plumas.
- ✓ Development of three Storrie Fire Restoration Fact Sheets to educate both internal and external audiences on Storrie Fire Restoration: O:\NFS\Plumas\Project\MHRD\StorrieFireRestoration2010\Publications\storrie_fact_sheet.pdf.

  O:\NFS\Plumas\Project\MHRD\StorrieFireRestoration2010\Milestones\FY2011\Hydrology\3LakesSuccess.pdf

  O:\NFS\Plumas\Project\MHRD\StorrieFireRestoration2010\Milestones\FY2011\Hydrology\RockCreekFactsheet.pdf
- ✓ Twelve campfire programs and one interpretive hike were presented in the Feather River Canyon-Gansner Bar Campground Amphitheater. Target audiences were families and canyon residents. Topics included fire ecology and other topics pertinent to the Storrie Fire area.
- ✓ Over 1000 students and parents attended Plumas NF booths at county children's fair and Family Science Night at Quincy Elementary School, where topics pertinent to the Storrie Fire area were presented.
- ✓ Solar Cookoff participants were invited to learn about the Storrie Fire Restoration project in July.
- ✓ This year's theme for the Plumas National Forest booth at the Plumas-Sierra County Fair was ***"Watershed: It's the source!".*** Over sixteen thousand people attended the fair, learning about topics pertinent to the Storrie Fire.



Children at the Plumas-Sierra Co. Fair learn about watersheds using a stream table

- ✓ Development of partnerships with the Plumas County Fire Safe Council and Plumas Unified School District to educate the public about fire ecology, with particular reference to the Storrie area.



Students from Quincy Elementary School's 4th grade class learn about serotinous cones and taking a core sample to determine tree age

Plumas Unified School District (PUSD):

- ✓ Partnership agreement executed between the Plumas Unified School District (PUSD) and the Forest Service to restore and sustain natural and cultural resources of the Storrie Fire Area while enhancing student learning and stewardship through effective collaboration. Future hands-on school restoration projects are planned which will benefit NFS lands affected by the Storrie Fire. See attachment: O:\NFS\Plumas\Project\MHRD\StorrieFireRestoration2010\PUSD\Agreement\PUSD_SignedPAwAttachments.pdf.
- ✓ Storrie restoration team participated in PUSD's Learning Landscapes sessions. These sessions are intended to "teach the teachers" about fire ecology and other pertinent Storrie Fire topics. One classroom session on fire ecology was presented (28 students in attendance). Two pilot teacher field trips to the fire area and related strategy sessions were completed in preparation for the student restoration projects that began in October, 2011.

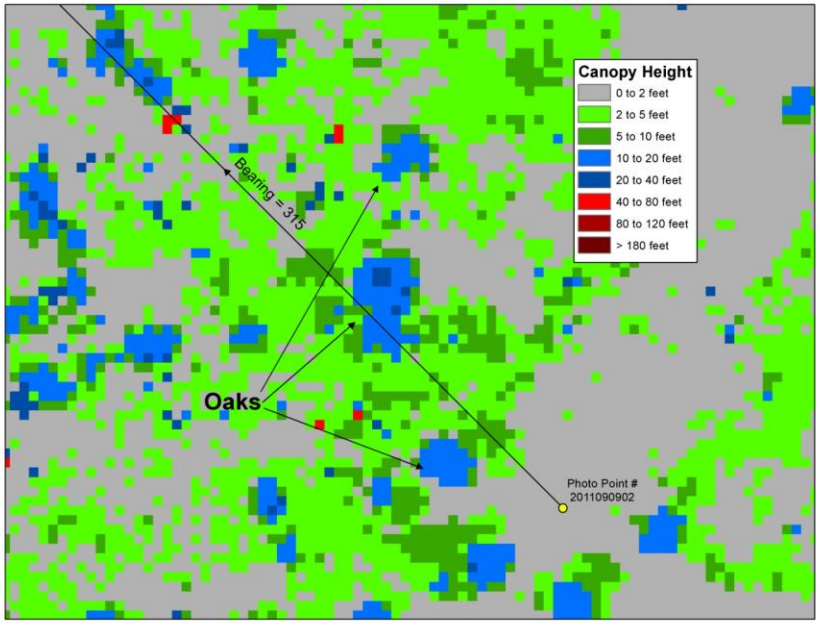
Teachers visit the Storrie Fire area on the Plumas and Lassen National Forests.

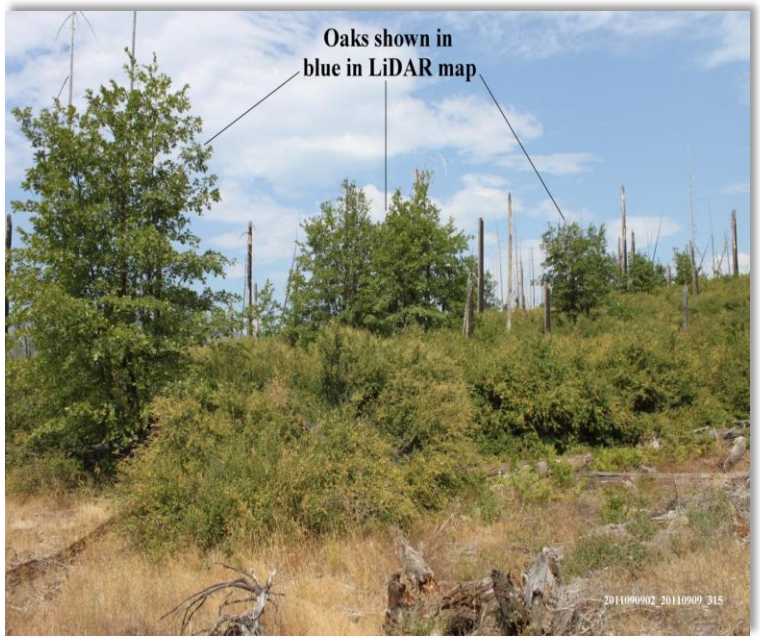
Reforestation :

- ✓ Brush mastication and plantation release treatments have been identified for 66 acres within the Storrie Fire area.
- ✓ Units for the certification of natural regeneration and reforestation activities have been defined on 360 acres.

Natural conifer regeneration within the Storrie Fire. Note surviving seed trees in the background.

- ✓ A process has been developed to certify natural regeneration of black oaks using canopy heights derived from LiDAR data. So far, 43 acres of oak regeneration have been quantified in this way; however this method holds tremendous potential for future accomplishment reporting and vegetation mapping.





Left: LiDAR derived canopy height map, showing permanent photo monitoring plot. Select canopy heights help define vegetation types such as shrub (shown as green), and black oak (shown as blue). Collection of oak plot data such as number of stems and basal area can help quantify oak stocking levels over the Storrie Fire landscape.

Right: On the ground photo taken from the point shown on the map. The three oaks pointed out on the map in blue are the same three oaks pointed out in the photograph on the right.

Wildlife:

- ✓ Deer telemetry study agreement has been signed with CDF&G to identify and manage vegetation along deer migration routes through the Storrie Fire area.

PSW Research/Administrative Studies : Sierra Cascade Province Ecology Program

- ✓ Additional stand exam plots were completed by Natural Resource Management during the summer of 2011 to ensure adequate data collection in remote areas and underrepresented vegetation types. These plots were inspected and the contract was closed in September of 2011.
- ✓ Stand exam data were used to produce a map of both conifer and hardwood seedling densities across the Storrie Fire area. This map will be used to certify natural regeneration in the Storrie area during FY12.
- ✓ Stand exam and GIS data were analyzed to develop the vegetation section of the Storrie Fire Rapid Landscape Assessment, including:
    - An evaluation of current conditions across the Storrie Fire area including species composition, patch size, and stand structure.
    - A comparison of pre- (1999) and post- (2005) fire conditions to evaluate fire effects and restoration opportunities.
    - A comparison of current conditions with historic (Weislander 1934, Leiberg 1902) vegetation data to develop reference and desired conditions for vegetation structure and composition throughout the Storrie Fire area.
    - Development of Management Objectives/Strategies/Actions for each major vegetation type within the Storrie Fire area.
- ✓ An agreement with Humboldt State University was finalized in 2011 and stand exams and post-fire regeneration surveys of the Rich Fire were conducted throughout the summer of 2011. Field work for this project will continue in 2012. These data will be combined with information from the Storrie Fire to allow for comparisons of post fire recovery on serpentine and non serpentine sites to develop management recommendations for these areas.
- ✓ Additional data analysis will be conducted during the winter of 2011-2012 to evaluate rates of snag and log retention, fuels development, tree mortality, seedling and sprouting regeneration, and patterns of vegetation succession. These data will be used to develop specific fuels and vegetation projects for the Storrie Fire Restoration effort in FY12.
- ✓ Terrestrial Bird Research with Point Reyes Bird Observatory (PRBO). This information is already being used to guide post-fire restoration activities in the Storrie Fire and elsewhere.

LiDAR based mapping research at Humboldt State University :

- ✓ Presented preliminary project results to Mt. Hough RD and Province staff.
- ✓ Presented poster of Storrie research at the American Society of Photogrammetry and Remote Sensing (ASPRS) conference.
- ✓ Preliminary project results provided during a serpentine field day for researchers working within the fire area.
- ✓ Used the field-verified data to further improve the preliminary classification using supervised and unsupervised techniques on LANDSAT image data. Accurate soil type classifications will enhance the efforts at reforestation.
- ✓ Generated a series of composite maps that indicated potential serpentine sites; currently implementing accuracy assessment procedures.
- ✓ FY 2012 work will involve independent analysis of LiDAR data and evaluation with field data and classified outputs.

PSW Spotted Owl surveys :

- ✓ Spotted owl surveys were conducted within remnant habitat within the Storrie Fire area. Owl calling occurred on 158 calling stations located along the Pacific Crest Trail, Chips Creek, Ben Lomond Trail, Indian Creek Trail, Chamber's Creek Trail, Hwy 70, and FS roads 26N26 and 26N26A. Three male owls were detected in the Storrie Fire area and one met resident status requirements.

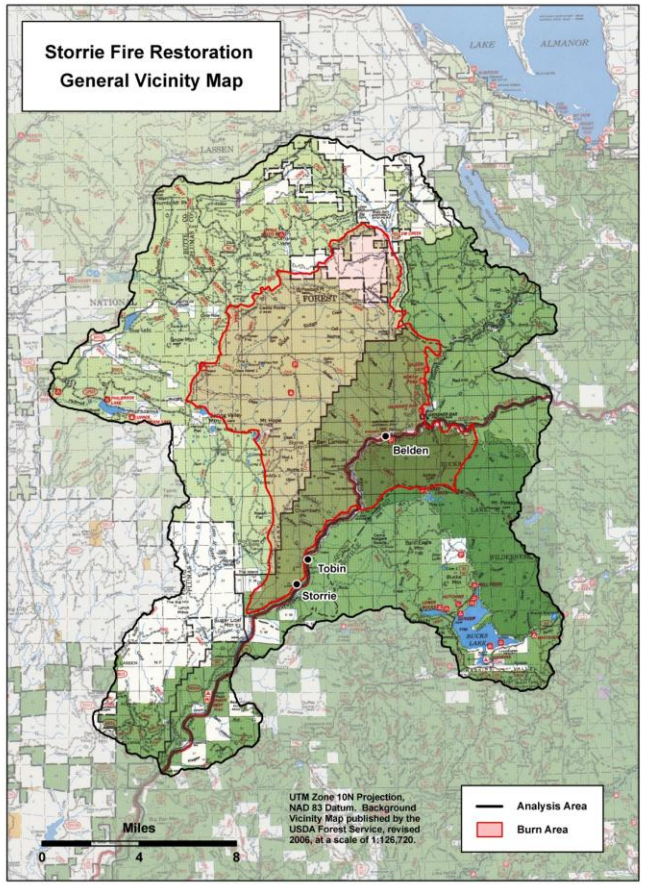


Figure 1. Location map of the Storrie Fire Rapid Landscape Assessment area.

Future Directions

Vegetation restoration treatments such as forest stand structure restoration and fuels reduction have been a challenge, given the steep slopes and rugged terrain within the Storrie Fire area. Broadening vegetation restoration activities will be important in developing productive and viable projects. The concept of “habitat equivalency damages” is discussed at length in the Storrie Fire Court Order. Equivalency damages were mainly focused on fuels reduction treatments, as they relate to providing protection for a wide variety of resources lost or damaged in the fire. The loss of forest resources within the Storrie Fire area necessitates the protection of forest communities that are currently intact, but at risk to loss from future fires.

The Storrie Fire Restoration Team will be focused on finishing natural resources inventories in the burn areas with the intention of modifying the Storrie Fire 10-year plan and refining expected restoration results. The Storrie Fire Restoration Plan and the RLA establish the management goals and directions, as set forth in the PNF LRMP, for the Storrie Fire area.

The modified Storrie Fire Restoration Plan creates goals and direction for restoration activities for the next ten to fifteen years, as funding allows, prescribes management practices for specified times to meet the desired conditions, establishes monitoring and evaluation requirements that measure implementation success, yields resource inventory data, and provides information for the development of programs and proposals.

The PNF Storrie Fire Restoration Team is developing the NEPA strategies for larger identified restoration opportunities, as many of the projects falling under the Categorical Exclusion category are being implemented or nearing completion. The team is also investing efforts in the Rich Fire Restoration endeavors, as appropriate.