The YSS Forest Resiliency Pilot Project:
A strategy for sustaining forests for future generations
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OVERVIEW:
A NATIONWIDE PROBLEM AND A SCIENCE-BASED SOLUTION

Within the Stanislaus National Forest there are thousands of acres of green forest stands that are unnaturally dense. Excessive surface fuels on the forest floor, combined with thickets of small tree “ladder fuels,” can carry ground fires into the forest canopy, leaving the forest vulnerable to high severity wildfires. In addition, this crowded, unhealthy condition leaves the forest susceptible to bark beetle infestations and decreases resistance to the effects of drought.

The Yosemite Stanislaus Solutions (YSS) collaborative group has built strong consensus for significantly increasing forest management actions that aggressively reduce forest fuels and restore forest conditions that can withstand wildfire and other threats.

YSS proposes a Forest Resiliency Pilot Project to demonstrate that a combination of unified consensus support and an increased pace and scale of science-based forest treatments can significantly shift an unhealthy “at risk” forest to a precedent-setting state of resiliency, productivity, and ecological health.
INTRODUCTION

The severity and magnitude of the 2013 Rim Fire created economic and environmental ripples that will affect the region for decades into the future. The unprecedented size and burn intensity of the fire, combined with four years of drought, have provided strong evidence for the need to move beyond the status quo when it comes to forest management in a changing climate.

The YSS Forest Resiliency Pilot Project builds upon recent scientific studies to put forward a plan to greatly increase the scope of on-the-ground treatments in order to create a more natural and resilient forest condition within areas of the Stanislaus Forest that are currently highly vulnerable to drought, insects, and wildfire.

With the diverse interests of the YSS group providing consensus support, this plan offers a unique opportunity for the Forest Service to move forward decisively with a broad base of collaborative advocacy.
Why is this YSS Forest Resiliency Pilot Project so urgently needed?

The Stanislaus National Forest is experiencing the effects of multiple years of drought and an escalating outbreak of bark beetles. Hundreds of thousands of conifers have died across the lower and middle elevations of the forest. In addition, the region's climatic trend towards longer fire seasons and drier conditions increases the potential for green, unburned forest areas to suffer high severity wildfires similar to the 2013 Rim Fire and the 2015 Butte Fire.

The combined effects of wildfires, drought, and insect damage have already affected the region's economy. Each of these threats diminishes the forest’s scenic, recreation, and watershed values. In the Stanislaus Forest, with so much acreage affected by the 402-square-mile Rim Fire, the remaining unburned green forest areas have become even more important for economic and ecosystem benefits. Yet a large percentage of the Forest’s green forest areas contain dense, overstocked stands with heavy fuel loading and excessive ladder fuels. Most green forest areas also suffer from decades of fire exclusion.

In recent years, agency and university scientists have publicly agreed that past forest management actions have been inadequate to make the Stanislaus Forest (and other national forests) sufficiently resilient to fire, insects, and drought. A significantly greater pace and scale of forest treatments is urgently needed to protect the remaining green forest areas, moving the overall forest to a more resilient condition.

Region 5 USFS leaders have stressed the need for increased levels of forest treatments to move toward “ecological restoration” objectives. Yet the limited capacity of the Stanislaus National Forest continues to constrain the pace and the scale of forest restoration projects. To continue to apply the same level of limited treatments applied in the past and expect a different outcome is unrealistic. Innovative strategic planning is needed to produce a significant increase in the implementation of science-based forest thinning treatments and a significant increase in prescribed fire use within the Forest.
Rather than wait passively for that desired management change to be eventually driven by forces outside the local region, the Yosemite Stanislaus Solution (YSS) collaborative group seeks support from regional, state, and federal interests for a Forest Resiliency Pilot Project that will not only result in measurable benefits for the local national forest, but can also serve as a precedent-setting example for other forests experiencing similar threats.

The State of California strongly agrees there is a critical problem.

The Sierra Nevada Watershed Improvement Program - A joint program by the Sierra Nevada Conservancy and the U.S. Forest Service

“Sierra Nevada forests and watersheds are at a critical point. A four-year drought, a century of fire suppression, widespread tree mortality due to insect and disease, and a changing climate have led to an increased risk of large, damaging wildfires.”

“The pace and scale of science-based ecological restoration needs to dramatically increase in order to stem the tide of large, uncharacteristic wildfires and further degradation of these ecosystems.”

“The Watershed Improvement Program will be a large scale restoration program designed to address a variety of ecosystem health issues in the Sierra Nevada.”

“There is a growing consensus that more must be done to increase the pace and scale of forest restoration in the Sierra Nevada, but a number of policy-related barriers need to be addressed in order to restore our forests and watersheds to a healthier state.”

All taken from the SNWIP website at CA.gov
YSS FOREST RESILIENCY PILOT PROJECT WILL FOCUS ON GREEN FOREST NEEDS

Given the magnitude of the 257,000-acre Rim Fire’s impact on the local region, YSS fully intends to continue to advocate for restoration treatments and to partner with the Stanislaus Forest in ongoing work within the burn area. Huge amounts of down woody material and large piles of sub-merchantable poles still exist within the burn perimeter and continue to create high fuel loads that could greatly increase fire severity when future wildfires occur. Accordingly, YSS representatives have reached out to the Sierra Nevada Conservancy, the CA Air Resources Board, CAL FIRE, and a variety of other agencies to attempt to gain funding for sorely needed biomass removal and other fuel reduction actions on public forest lands within the Rim Fire.

Because many burned areas in the Rim Fire will not provide mature forest habitat or resource values for many decades into the future, YSS also recognizes the urgent need for proactive treatments across the unburned “green forests” of the region. Due to the drought and the resulting threat of new high severity wildfires igniting, the value of existing green, unburned forest habitat has become even more important. In 2015, YSS engaged with Forest Service officials to discuss options for applying science-based logging and prescribed fire treatments to green forest areas at a far higher pace and scale. In that process, YSS reached out to directly connect with research scientists with expertise on Sierra Nevada forest issues.

In June and July of 2015, YSS organized and sponsored two major forest field sessions at the Experimental Forest study area in the Summit District of the Stanislaus Forest.

USFS science researchers Malcom North and Eric Knapp led forest tours of Knapp’s variable treatment study area to discuss options for making overstocked forest stands more resilient to forest pests, drought, and wildfire. One strong emphasis was the need for science-based forest thinning treatments to help return forests
to a more natural mosaic of forest conditions. Members of the media and representatives for federal and state legislators attended and enthusiastically supported the examples shown of GTR-220 concepts and variable treatment prescriptions. Tour participants also heard from the scientists how important it is for low intensity prescribed burning treatments to be applied strategically in order to return the positive role of low-intensity fire back into the forest ecosystem.

Despite positive interactions with Forest Service staff at the Experimental Forest field sessions and despite intensive efforts by YSS to ramp up the pace and scale of forest projects, no significant additional funds have been acquired to implement on-the-ground treatments to restore the health of the green, unburned forest landscape. Forest Service officials have acknowledged that limited staffing and tight regional and local forest budgets combine to constrain the shared desire for a major increase in forest resiliency treatments within the Stanislaus Forest.

Recognizing the need for a significant level of agency planning and projects in the near term to prevent any further high severity fire damage to forest resources within the Stanislaus Forest, YSS has collaborated with forest research scientists and various agency specialists to launch a pilot project to get the essential work planned and then implemented on the ground.

Based on the above, YSS is proposing a Forest Resiliency Pilot Project that is centered on a precedent-setting increase in the pace and scale of forest treatments and a new programmatic approach to project planning.

In order to make a significant change in the existing unhealthy and unnatural condition of many green forest areas, it is essential to achieve a major increase in the pace and scale of forest treatments over the next 10 years compared to past levels of work. Building upon collaborative support from YSS and the input of various USFS scientists, this Pilot Project can set a national precedent for how to bring forest conditions back toward the natural resiliency and ecological health that characterized forests prior to decades of fire suppression and decades of management that aimed for high stocking levels of forest stands.

The following pages spell out a programmatic plan for responding to current and near-term threats to forest and watershed resources. This Pilot Project plan also identifies essential steps that need to be taken to most effectively achieve on-the-ground objectives as speedily as possible in order to truly make green forest areas of the Stanislaus Forest resilient to the compounding stresses caused by a changing climate.

The need to adapt and sustain healthy forests in the midst of a changing climate requires more than just attempting to replicate conditions that were resilient in historical, pre-management periods. Recent scientific studies and proposals are attempting to respond to the great changes occurring in weather patterns and fire behavior that have never been documented previously.
CONTEXT AND BACKGROUND FOR THE YSS FOREST RESILIENCY PILOT PROJECT

Over the last decade, the U.S. Forest Service, in partnership with state agencies and university researchers, poured millions of dollars into scientific studies focused on how to respond to high severity wildfire risk while sustaining at-risk wildlife species within the national forests of the region. The Sierra Nevada Adaptive Management Project (SNAMP) funded key studies on five topics: the California spotted owl, the Pacific fisher, assessments of fuel reduction options, the potential for enhanced water production by adjusting forest treatments, and analysis of ways to better engage stakeholders in Forest Service planning.

As these important SNAMP studies were moving forward, Regional USFS leaders promoted the goal of Ecological Restoration for the national forests of Region 5. A total of 15 Sierra Framework Dialogue workshops have been held to bring diverse interests together for theme-based discussions with USFS line officers and regional staff. Various other USFS workshops have been held to discuss forest plan revision processes, motor vehicle travel management planning, and the topic of reforestation alternatives after high severity wildfires.

The background for all of these public engagement and scientific assessment efforts has been a desire by Region 5 to build science-supported consensus in order to move past years of polarized divisiveness that has often pitted pro-use interests against environmental interests. At a time when the Region and the Forest Service at the national level have called for increased collaboration and citizen engagement in forest planning, there have continued to be high levels of litigation challenging agency actions and delaying projects. In contrast to typical polarized debates over forest management, YSS offers a strategic, balanced middle-ground approach based upon utilizing the best available science to mimic natural resilient forest conditions. Consensus for science-based treatments translates into broad support for forest actions with less controversy and fewer delays.

PILOT PROJECT PLANNING OBJECTIVES

This YSS Forest Resiliency Pilot Project proposal aims to achieve the following objectives:

1) SIGNIFICANTLY INCREASE STRATEGIC FOREST TREATMENTS

At least 20% of all green forest acres across the lower and middle elevations of the central portion of the Stanislaus Forest will be treated in the 10-year planning period with the most appropriate method of fuel reduction, watershed enhancement, and ecological restoration treatments.

2) RAMP UP PRESCRIBED BURNING

In addition to those actions in green forest areas, the Forest’s overall program of prescribed burning will ramp up from a beginning target of 1,000 acres the first year to a minimum treatment level of 5,000 acres annually by year 10. This plan
will spell out how the increased use of prescribed fire as a tool in green forest areas and adjacent areas can be most strategic and most feasible within the constraints of air quality limitations and burn windows.

3) DESIGN TREATMENTS TO ENHANCE AND PROTECT KEY WILDLIFE VALUES

Forest treatments in the Pilot Project will be carefully designed to retain essential habitat values for at-risk wildlife species and to move overall forest structure towards more natural, historic vegetative diversity. Programmatic objectives for all projects will aim to enhance wildlife values.

4) DEFINE AND PUBLICIZE PROJECT OUTPUT TARGETS

As part of the planning proposal, wood products industry proponents, state agencies, and the Stanislaus Forest staff will collaboratively develop a realistic program of production levels expected to be generated from forest projects. This will allow the wood products industry to plan for long-term infrastructure and investments.

5) INCLUDE RESTORATION ACTIONS WITH FOREST TREATMENTS

In conjunction with the strategic treatment of 20% of green forest acres within the Pilot Project landscape by science-based forest thinning, biomass removal, mastication and shredding, or other methods of treatment, this plan proposes additional ecological actions within those treatment areas. The goal of these actions will be to rehabilitate special aquatic features, restore degraded riparian areas and meadows, or restore areas suffering from erosion or sediment discharge.

6) ANALYZE AND TREAT DEFICIENT ROADS IN PROJECT AREA

the Forest will also evaluate economically feasible actions to improve necessary roads within treatment areas, close or decommission unneeded roads, identify appropriate roads to convert to off-highway-vehicle routes, and identify sites where developing new road access is essential.

THE FOREST RESILIENCY PILOT PROJECT PROPOSAL

Unburned green forest stands across the lower and middle elevations of the Stanislaus Forest are currently dominated by undesirable, unhealthy conditions. Typically there are excessive fuel loads, overly dense forest stands, and unnatural levels of flammable ladder fuels. Risk of severe wildfire is high every summer/fall fire season and is even higher in drought years.

The widespread high degree of canopy closure, while favored by some at-risk wildlife species, shades out oaks and other ecologically-essential hardwoods, prevents adequate pine and hardwood regeneration, and often eliminates most of the native groundcovers, grasses, forbs, and other plants that are beneficial for deer and many other plant-eating wildlife species.

The YSS Forest Resiliency Pilot Project proposes to significantly improve these unhealthy forest conditions as follows:
A) ASSEMBLE PILOT PROJECT PLANNING TEAM TO IDENTIFY AND ASSESS PROJECT AREA

The U.S. Forest Service, the Sierra Nevada Conservancy, and additional state and federal interests will assemble an enterprise team of technical specialists to combine with a few selected interdisciplinary team members from the Stanislaus Forest staff. This assembled Pilot Project Planning Team will be assigned the objective of producing a streamlined, programmatic assessment of the green forest areas of the Stanislaus Forest that lie northwest and north of the Rim Fire, extending as far as the main fork of the Stanislaus River, east along the North Fork Stanislaus, and south across the Summit and Mi-Wok Districts from Beardsley Reservoir to the Rim Fire high-severity areas at Hells Mountain. The area to be assessed totals roughly 200,000 acres of national forest land. Cooperative projects associated with 25,000 acres of private lands would also be considered for benefits that could result from overlapping project actions.

B) IDENTIFY AND UTILIZE LEADING-EDGE TECHNOLOGIES FOR PROJECT AREA ANALYSIS

The Pilot Project Planning Team will identify the most progressive, leading-edge technologies, such as Lidar and other proven high tech assessment tools, to effectively assess the Pilot Project area. The goal will be that all agencies will use the Pilot Project to determine how quickly-developing technologies can be meshed with the local knowledge of agency staff and interested members of the public to produce high-quality analysis.

That Forest Resiliency programmatic assessment will locate all green forest stands in the landscape area that exhibit excessive stocking and fuel loads, or that have other priority needs for treatment, and it will model the green forest areas for risks from wildfire, insects, or drought. The assessment outcome will prioritize a minimum of 60,000 acres for the potential application of variable retention forest thinning treatments, prescribed burning, or alternative forest resiliency treatments to be done within 10 years of plan approval.

C) ASSEMBLE “FRIENDLY FIRE” COORDINATION TEAM TO ASSESS PRESCRIBED FIRE OPTIONS

The USFS, SNC, CAL FIRE, State Air Resources Board, and the local air district will convene a precedent-setting FRIENDLY FIRE Coordination Team to analyze the Pilot Project area with mapping and resource data modeling and with in-the-forest field visits. The FRIENDLY FIRE Coordination Team will initially identify at least 20,000 acres of ridgeline treatment opportunities within the Pilot Project landscape. These will be areas where roads along upper slope contours already provide existing fire lines to allow prescribed burns to be ignited on the crests of the ridges and backed downslope to the roads under dry winter periods, spring, or fall prescriptive conditions. The Coordination Team, under USFS leadership, will select Strategically Placed Areas for Treatment (SPLATs) that will significantly en-
hance the ease and safety for subsequent adjacent lower slope burns to be backed
downslope from the roads and the already burned ridgelines in the year or years
after the initial ridge burns are done.

With an initial goal of burning at least two ridgeline areas (each site averag-
ing 2,000 to 3,000 acres in size) per year for the first five years, the objective will
be to achieve a minimum of 20,000 acres of ridgeline and upper slope burns
across the Pilot Project landscape in the first five years of treatment. CARB and
local air district staff will assist the FRIENDLY FIRE team in planning how to
achieve burn objectives with the least impacts to air quality.

D) UTILIZE THIS PILOT PROJECT TO DEMONSTRATE SUCCESS OF STREAMLINED
PLANNING

National and Regional USFS attention will focus on using this YSS Forest Re-
siliency Pilot Project as a test example to measure how quickly a programmatic
assessment for a landscape level suite of forest treatments can be launched, com-
pleted, and utilized to lay out the first round of on-the-ground project actions.
Every aspect of the Pilot Project will be streamlined by the USFS to the maximum
extent permitted by law to demonstrate to Congress and the interested public how
effective such expedited processes can be when given full agency support.

E) RAPID RELEASE OF RESOURCE OUTPUTS TO ALLOW FOR EXPANSION OF INDUSTRY
INFRASTRUCTURE

As rapidly as possible, release to the public and prospective bidders accu-
rate, targeted estimates of biomass to be produced, sawlogs to be sold, mastic-
tion or shredding acres to be contracted, and other quantifiable outcomes of the
programmatic assessment. The prompt release of credible estimates of the 10-
year program of work will allow contractors and wood processing facilities the
planning time needed to accomplish the work.

SUPPORTING SCIENCE

In June and July 2015 USFS forest researchers Malcom North and Eric Knapp led
forest field tours in the Experimental Forest in the Stanislaus National Forest. As part
of their presentations, they each provided slide show presentations summarizing the
best available science concerning forest structure, historical fire effects, and restora-
tion options. The slides that follow are from those presentations and strongly mesh
with this Pilot Project proposal..

North’s slides describe a diverse spatial pattern of trees and frequent low-in-
tensity fire that provided historic forests with substantial resiliency to high severity
wildfire effects.

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Why does this matter?
It’s the structure that makes the forest resilient.
- Regeneration
- Fire
- Drought

M. North
In the Sierra Nevada, what was the historical (pre-fire suppression) spatial structure associated with resilient forests?
- Half of forest in gaps
- 10-15% area single large trees
- 35-40% areas in tree groups
Ecological effect of fire suppression

Lack of Heterogeneity

[Diversity = Resilience]

1) High stem density: Many ecosystem processes (nutrient cycling, decomposition, etc.) stall.
2) High canopy cover: dramatically reduces variability in microclimate and wildlife habitat, reduces surface snowpack depth and possibly water production.
3) Fuels accumulations: Heavy litter and coarse woody debris homogenizes the forest floor substrate reducing understory plant diversity and cover.

Significant reduction in habitat, species richness, and ecosystem function

M. North

Current levels of forest treatments to reduce fuel loading, open up dense thickets, and create spatial diversity are greatly inadequate compared to the natural, historic rate of fire frequency.

As the gap widens between the historic frequency of fires and the current inadequate rate of projects, there is an urgent need for a significant increase in the pace and scale of forest treatments.
Current Pace and Scale on National Forests

<table>
<thead>
<tr>
<th>Historical Rate of Fire</th>
<th>487,486 acres/year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current Rates of Treatment</td>
<td>87,923</td>
</tr>
<tr>
<td>• Mechanical treatment</td>
<td>28,598</td>
</tr>
<tr>
<td>• Prescribed fire</td>
<td>8,256</td>
</tr>
<tr>
<td>• Wildfire*</td>
<td>51,069</td>
</tr>
</tbody>
</table>

À Annual Deficit = 400,000 acres/year

*33% of Forest Service acres burned in wildfires in the Sierra Nevada burned at high severity according to Miller et al. (2012)

M. North
Balancing wildlife, resilience, and fuels reduction
Proposed Ecosystem Management Strategy

Objective: Increase forest heterogeneity at different scales

How: Look at what produced variable forest conditions—soil moisture availability and fire regime

Flexible ways to implement: Use micro and macro topography as a guide
Historical role of fire in the Sierra Nevada

Fire history from the Pinecrest/Strawberry area

Median fire return interval: 6 years
Last major fire: 1889

Fire and historical forest structure

Clark Fork, Stanislaus NF, 1931

Amador Co. 1931
Three slides above all E. Knapp (plus slides on following page)

YSS provides consensus support for managing overly dense, unnaturally fuel choked forest stands by applying science-based forest treatments that will shift forest structure, fuel arrangement, and stand density to conditions more representative of forests that naturally withstood wildfires without suppression or active fuel treatments.

The graph on the preceding page (Knapp) shows from tree stump analysis that the study stand in the Experimental Forest had frequent exposure to wildfires until active management suppressed wildfires post 1889. Historic photos of Sierra Nevada forests also consistently reveal stands with scattered medium and large trees amidst open, park-like diverse conditions.

To achieve a more resilient forest condition, YSS supports proposals by research scientists for forest thinning to achieve forests containing individual scattered trees, clumps, and openings (ICO) in variable patterns. YSS also supports treatments tied to slope considerations as outlined in GTR-220 and GTR-237. YSS further supports the equally important reintroduction of managed prescribed burn treatments to complement the mechanical thinning treatments. In combination, mechanical treatments and ecological burn effects can strategically shift unburned, green forest stands toward increased resiliency to fire, insect, and drought threats. The slides on the fol-
Following page (Knapp) show how a change in structural variability in forest stands can...
YSS asserts that this Pilot Project provides an opportunity for state and federal interests to join in partnership to put known science-based strategies into action. With climate change exacerbating already unhealthy forest conditions, further delays in ramping up the pace and scale of treatments will only make recovery that much more difficult.

The slide below from science researcher Malcom North summarizes the science that the YSS Forest Resiliency Pilot Project is designed to implement on a broad scale. The slide clarifies that prescribed fire combined with science-based mechanical thinning can help restore forest resilience.

There is certainly more to learn, but “we now have the tools...”

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**In Sum:**

- Many forests lack resilience due to past logging (absence of large trees and snags), fire suppression and the resulting high-density of small, fire-sensitive treespecies

- Forests are also not resilient to additional stress such as climate change and likely to experience increased mortality

- Management (i.e., mechanical and fire) can help restore resilience but it needs to create heterogeneous forest conditions that can provide habitat, moisture stress relief and fire resistance

- Although there is much to learn, we now have the tools to move in this direction

M. North
NEEDED STEPS FOR THIS PILOT PROJECT TO PROCEED

1) Acceptance of a participatory role in the Pilot Project by the following agencies:
   - U.S. Forest Service
   - Sierra Nevada Conservancy
   - CAL FIRE
   - CA Air Resources Board
   - Tuolumne County Air Pollution Control District

2) Demonstrated support for the Pilot Project by:
   - State legislators
   - Congressman McClintock, Senators Feinstein and Boxer
   - Tuolumne County supervisors
   - Community groups

3) Acquisition of essential funding to implement the planning assessment and preparation of the programmatic plan

4) Approval by the appropriate agencies to expedite planning for the Pilot Project and to demonstrate the fullest extent of existing authorities to streamline planning efficiency.

WHAT IS THE YOSEMITE STANISLAUS COLLABORATIVE GROUP?

In 2009, Stanislaus Forest staff reached out to engage forest stakeholders who had previously participated in project level or forest level planning in the local forest. With the hope of acquiring extra funding for local forest projects, the invited stakeholders began meeting with Forest Service staff to work collaboratively in support of restoration projects and to develop a grant proposals.

In December 2010, nearly 30 stakeholders agreed to formally organize as the Yosemite Stanislaus Solutions (YSS) collaborative group and to use a consensus-based process (in partnership with Forest Service, BLM, and Yosemite Park staff) toward achieving the goal of healthy forests and watersheds, fire-safe communities, and sustainable local economies. A broadly shared purpose that was fully agreed upon by all YSS participants was the need to increase the pace and scale of forest treat-
ments in order to deal with densely stocked, high fuel conditions across the green forest areas of the Stanislaus Forest.

In 2013, the unprecedented Rim Fire burned across more than 400 square miles of the YSS region. Recognizing the urgency of recovery needs within the burned landscape, YSS participants chose to establish YSS as a separate, fully independent collaborative group.

Due to the scale of high severity fire effects within the Rim Fire, the critical question of fire salvage quickly rose to the forefront of agency planning. YSS cooperated with local forest officials to request expedited planning for the assessment of how much salvage logging should take place. YSS focused not only on the benefits of producing wood from some portion of the dead trees, but YSS also focused on the need to remove a substantial portion of dead trees in order to reduce the massive amount of woody fuel that the snags created across the landscape.

In the year following the Rim Fire, YSS engaged in the highly publicized debate over the proper role of salvage logging in the burned area. YSS efforts eventually helped craft a negotiated agreement that ended up receiving acceptance by key conservation groups, the timber industry, and the Forest Service.

To help with Rim Fire recovery, YSS worked with Forest staff to acquire grant funds from the Sierra Nevada Conservancy and the National Fish and Wildlife Foundation for field inventories that led to successful assessments of springs and degraded meadows in the burn area.

YSS also worked Forest staff to develop restoration projects on USFS lands within the fire that matched other funding opportunities in state grant programs.