A close-up photograph of charred tree bark, showing a mix of dark, blackened areas and lighter, reddish-brown patches where the bark has been partially charred or is peeling. The texture is rough and uneven. A black rectangular box with a white border is centered in the upper half of the image, containing the title text.

**RIM FIRE
RECOVERY
UPDATE**

July 2014

From the Desk of the Forest Supervisor



It's been almost a year since California's third largest wildfire on record roared through the hills of the Stanislaus National Forest, Yosemite National Park and private timberlands.

In the aftermath of that 400 square mile blaze, the Stanislaus National Forest and our partners are beginning the mitigation process that will make those burned lands more fire resilient and improve the wildlife habitat on them.

The tasks that we and our partners in the Rim Fire Recovery Project are undertaking will be an opportunity for restoration at a landscape scale. We'll consider the many features and structures that are desirable and sustainable for future forested conditions. We're fortunate to see a high level of community involvement.

The Rim Fire Recovery Project includes the salvage of dead trees to capture their economic value, the removal of roadside hazard trees to protect public and worker safety, the reduction of fuels for future forest resiliency, improvement of roads for hydrologic function, and, as I said, the enhancement of wildlife habitat.

The coming fire season promises to be as challenging as previous ones. Drought conditions throughout much of the state are mirrored here on the Stanislaus.

Many residents have taken the initiative to create defensible space around their property, as well as a fuel breaks around their communities. These efforts have paid off in the past when wildfires were slowed and even diverted away from valuable homes and property. The Fire Adapted Communities website (www.fireadapted.org) has information on how you and your neighbors can join in this worthwhile effort.

The rest of us can help too, by remembering Smokey Bear's message, "Only you can prevent wildfires."

Wishing you all a safe summer season.

Susan Skalski
Stanislaus National Forest Supervisor

DUSTIN VAUGHN



BAER team member investigates soil structure for damage following the Rim Fire.

Recovering from the Rim Fire: The Big Picture

As soon as access to the fire area was possible, the Stanislaus National Forest (STF) brought in a team of resource specialists to assess the condition of natural resources affected by the fire. The STF completed the Burned Area Emergency Response work to address imminent hazards. Hundreds of miles of primary roads have been treated to restore ditches, repair or replace culverts and prepare roads for winter weather. Many archaeological and historic sites were protected from additional damage from falling trees and erosion. Approximately 4,000 acres were treated with aerial mulching and 800 acres with ground-based chipping to help protect fragile soils.

With wildfire as an inevitable and frequent presence on the STF, the Rim Fire Recovery effort is an opportunity to help a forest grow back that is more resilient to fire. Two phases of the recovery process are currently underway. In late April the STF authorized the Rim Hazard Tree (HT) project for hazard tree removal along 194 miles of roads, recreation facilities, and areas adjacent to private infrastructures. The project spans 1,329 acres of National

Forest System (NFS) lands, many of which are along roads.

In mid-May the Rim Fire Recovery Project issued a Draft Rim Recovery Environmental Impact Statement (EIS) for broader scale salvage and restoration. The objective is to reduce the potential for future catastrophic fires by reducing the dead fuel loading created by the Rim Fire. This includes capturing the economic value of the fire-killed trees through timber salvage, before the wood decays beyond market value. Approximately 45,000 acres of NFS lands are proposed to be included in this project, depending upon which EIS alternative is selected.

The STF received funding to repair and replace range infrastructure damaged or destroyed by the fire. Over 30 miles of Forest Service range fence will be rebuilt. Twelve livestock water troughs will be replaced. The STF is coordinating with Yosemite National Park to restore the fence line along their shared boundary, which keeps grazing cattle out of the Park.

Reforestation and other resource recovery actions are yet to occur and are expected to take several years to complete.

On the Road to Recovery with Burned Area Emergency Response (BAER)



When a large scale wildfire, like the Rim Fire, burns an area, many resources are affected. Since last fall, the US Forest Service has been working to restore order to the damage that occurred. Our recovery accomplishments, along with the impacted resources, are highlighted below.

Soils can sustain damage due to over-heating causing a condition known as hydrophobicity or “water fearing.” Water beads up on the surface of these soils rather than soaking in as it normally would. Erosion and sedimentation can become an issue as ash and repelled water flow down burnt hillsides instead of being absorbed by the soil and forest debris like leaves, pine needles and small twigs. Some watersheds or stream runoff areas are more affected and will take one or more seasons to stabilize. How quickly slopes green-up and provide protective ground cover is a key factor.

In hotter portions of the fire, trees are also more heavily impacted. High tree density can equal high tree mortality due to crown closure

and the presence of ladder fuel. Heavy fuel buildups allow for the rapid spread of fire. With continuous fuels, the flames can readily extend from the forest floor into the tree crowns. Numerous downed trees can impact wildlife corridors. They also create safety hazards for people. Trees with weakened timber are often called widow-makers due to their inclination for falling and harming those nearby, hence the temporary forest closures you are now experiencing.

With so many resources being impacted at once during the Rim Fire, the US Forest Service would like to highlight just a few of their Burned Area Emergency Response (BAER) accomplishments to date:

Water Quality & Soil Productivity:

- Aerially mulched over 4,000 acres of hillsides with rice straw.
- Chipped over 800 acres and used the material as a soil stabilizer.
- Installed 96 water bars to help with runoff as well as 37 armored dips.

Road Infrastructure:

- Drainage restored on 64 miles of paved roads and 249 miles of native surfaced roads.
- Conducted storm patrols on 159 miles of roads to watch for unusually high water flows.
- Replaced and upsized 228 culverts and installed 86 drop inlets to improve culverts.
- Out-sloped 23 miles of roads to improve drainage and installed 342 rolling dips to improve road drainage.

Public Safety and Protecting Our Heritage:

- 28 gates installed to control entry into hazardous areas.
 - Hazard trees felled on 391 miles of roads, along 25 miles of trails and from around 17 recreational sites.
 - Installed 3,280 feet of rock barriers to protect cultural and historic sites from off-road vehicles.
- Recovering in the aftermath of a large fire takes time, brawn and brains. An assessment team

of scientists quickly reviewed the burned area to assess the damage so that they could devise a holistic plan to restore order and forest health. The accomplishments mentioned above reflect some of the work that has been underway since last fall. Additional temporary employees will soon be supplying more brain power as well as muscle to the recovery effort. Botanists, wildlife biologists, foresters and archaeologists are amongst those ready to assist in the recovery effort.

The US Forest Service wants you to know that they are working hard at restoring the much loved Stanislaus National Forest. As many community members have already voiced, “We are all in this thing together,” and forest officials are ensuring that your public servants are taking a front seat on the road to recovery.

LOOKING to HELP?

Visit the calendar on our website:
www.fs.usda.gov/main/stanislaus/workingtogether
and click on dates for details of volunteer opportunities.

RIM FACTS

Fire started on Aug. 17, 2013 and was human caused.

257,314 acres burned of which, 154,530 were on STF lands.

Half of the acres burned on 2 days in mid-August during a "fire-storm".

Example: on Aug. 22, 51,827 acres burned in one day consuming approximately 81 sq. mi.

Fire was contained on Oct. 24.

It cost approximately \$127 million dollars in suppression efforts.

At its peak, 5,000 personnel were battling the blaze or supporting those on the ground.

Restabilizing the area through BAER has cost about \$10 million dollars.

Rim Fire is the third largest fire in California history.

Park benches at Pinecrest Lake have been fashioned from cedar wood recovered from the Rim Fire.

GLOSSARY

BAER – Burned Area Emergency Response

GPS – Global Positioning System; a small device that uses satellites for accurately pinpointing things on the earth's surface.

Snag – Standing dead tree that is often unstable; scary for humans but can be used by wildlife.

Sedimentation - is the tendency for floating particles to settle out of the fluid in which they are suspended, to rest against an object like a rock or other barrier.

Know Before You Go!

Many forest closures are in effect until Nov. 18, 2014. Visit www.fs.usda.gov/goto/rimfirerecovery to obtain current closure data before visiting Stanislaus National Forest. Travel information can also be obtained by calling the US Forest Service at 209-532-3671.

THIS PUBLICATION IS ALSO AVAILABLE ONLINE IN PDF FORMAT AT WWW.3FORESTS.US/RIMFIRE

Jawbone Area

On Aug. 17, 2013, the Rim Fire started in the Jawbone area of Stanislaus National Forest. The fire, which burned 257,314 acres, was human caused. It is noted for being the third largest fire in the history of California. Recovery efforts are still underway. Please remember that recovering from any large event takes time.

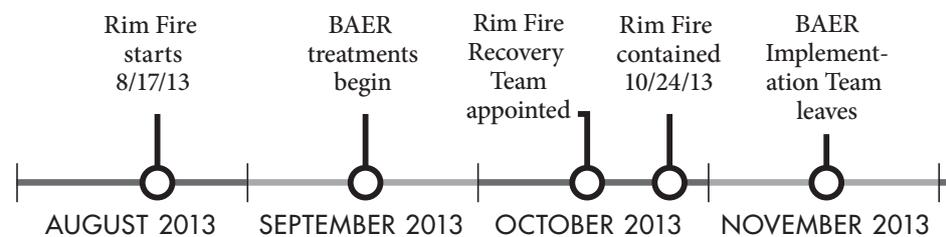
The Groveland Ranger District Office was under siege when the Rim Fire burned through the area last August. Information about the district can be obtained by calling (209)-962-7825.

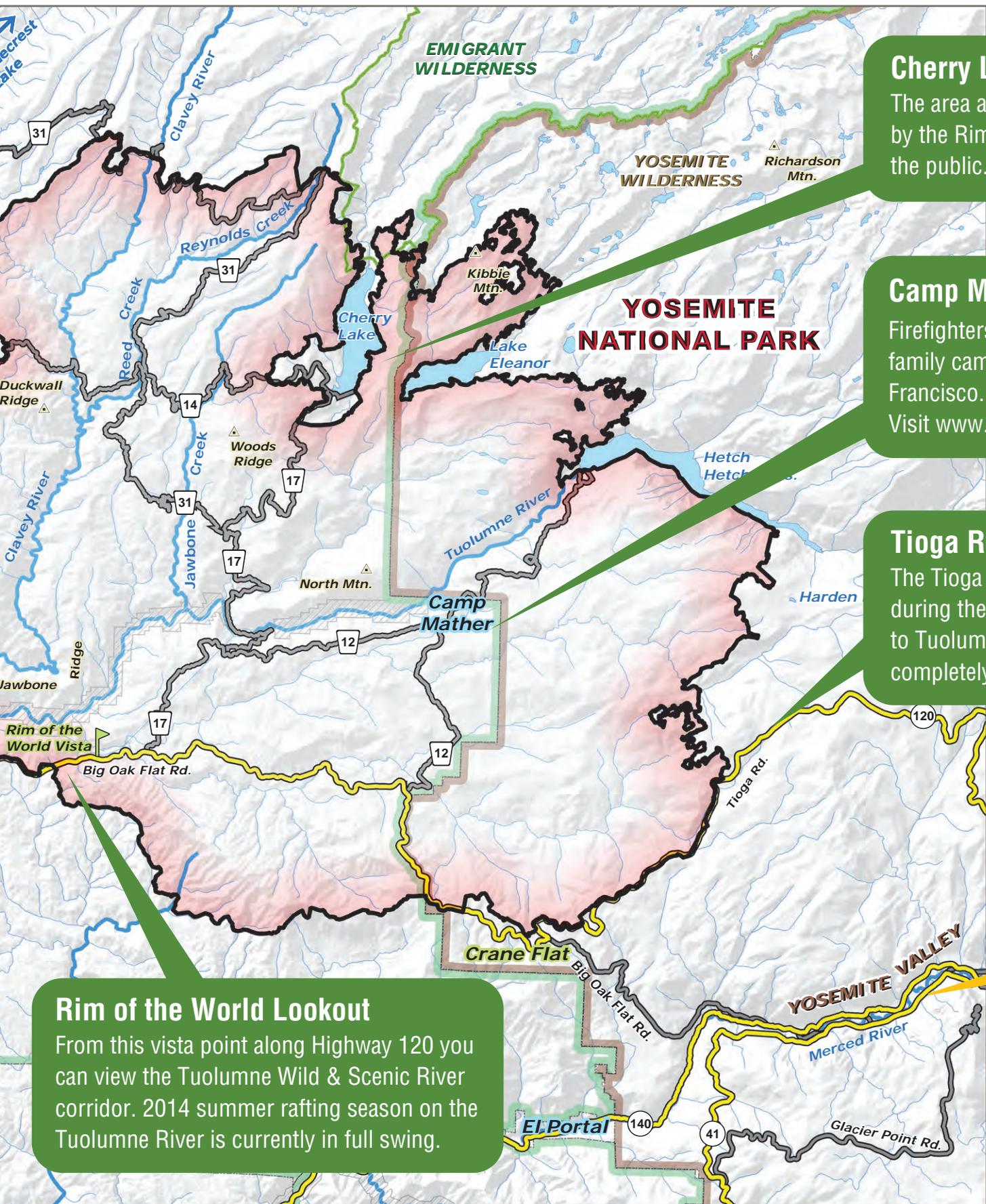
DUSTIN VAUGHN



-  Rim Fire
-  Highways
-  Other Major Roads
-  Emigrant Wilderness
-  Tuolumne Wild & Scenic River

0 1 2 3 4 5
Miles





Cherry Lake

The area around Cherry Lake was burned by the Rim Fire and is currently closed to the public.

Camp Mather

Firefighters were able to defend this historic family camp, owned and run by the City of San Francisco. It is open for the summer 2014 season. Visit www.campmather.com for more information.

Tioga Road

The Tioga Road was closed for a brief period during the height of the Rim Fire, limiting access to Tuolumne Meadows. It is now reopened completely from Crane Flat to Lee Vining.

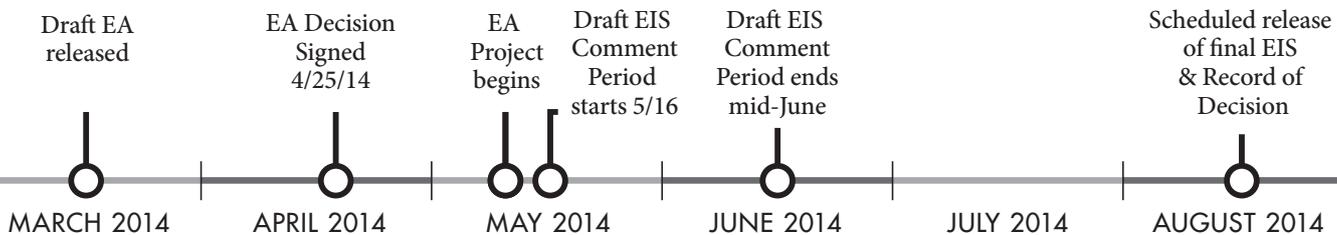
Rim of the World Lookout

From this vista point along Highway 120 you can view the Tuolumne Wild & Scenic River corridor. 2014 summer rafting season on the Tuolumne River is currently in full swing.

SHUTTERSTOCK



Yosemite National Park which was impacted by the Rim Fire, is now open. This area was designated as a World Heritage Site in 1984.



A MESSAGE FROM SMOKEY

It's Dry Out There!



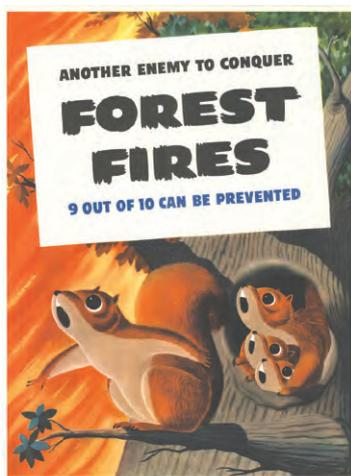
Smokey Bear has been reminding the public to help prevent wildland fires since the mid 1900's. Though everyone tends to think of Smokey as a fictional character, he actually was a bear living in the Lincoln National Forest in New Mexico. The Capitan Fire changed his life forever. The 17,000 acre blaze was escalated by 70 mph winds and not only did it affect Smokey, but it also dangerously trapped 19 firefighters. No one died but it was a close call.

Smokey got singed and suffered burns to his paws. He was found clinging tightly to a burnt pine tree and was shipped to a veterinary hospital where he was nursed back to health. Eventually, he moved to the National Zoo and became a well known icon for fire safety. Throughout the world, Smokey's words still echo as a powerful reminder, "Only you can prevent wildland fires."

With the effects of the 257,314 acre Rim Fire ever present in our minds, Smokey's words are now more important than ever. The drought from last year has not abated. The Forest is at a scant 48% of average for precipitation since Oct. 1, 2013. That means the fuels are tinder-dry. The Energy Release Component (ERC) which reflects the dryness of the fuels is very likely to surpass historical averages. Wildfires tend to get very large when the ERC soars because it promotes heat levels and flame lengths that firefighters cannot easily battle.

Though fires on the landscape can be beneficial for removing fuel and creating diverse patches of habitat for wildlife, large-scale unplanned wildfires can tax resources and put homes at risk. So if Smokey were to share a few sentences with us in 2014, they might just be, "It's dry out there so please conserve water. Be responsible in the woods and mindful of restrictions such as the fact that fireworks are prohibited in the Stanislaus National Forest."

Visit www.preventwildfireca.org to learn more about wildfire prevention.



Historic Jawbone Station was located in the Jawbone Ridge area.

Protecting Our Past, For Our Future

A waiting discovery in the hollows, mountains and river valleys of our national forest are the remnants of past cultures that confront us and remind us of the centuries-old relationship between people and the land. These heritage resources hold clues to past ecosystems, add richness and depth to our landscapes, provide links to living traditions, and help transform a beautiful walk in the woods into an unforgettable encounter with history.

The archaeological record indicates that as far back as 9,000 B.C., people were living in the Sierra Nevada area. The Central Sierra Me-Wuk were the most recent Native American occupants of this area. They lived in permanent villages and temporary camps, often located near springs or along creeks.

During the gold rush the area was a busy place, occupied by miners, immigrants, homesteaders, ranchers, dam builders and loggers. The legacy these people left behind offers crucial insights into the past and reminds us of the "tie that binds" people to the land. Like a jigsaw puzzle, each artifact and site that these inhabitants left in place, helps to tell the heritage story.

As is possible with any large scale event, cultural resources can be impacted with the passage of fire. When this happens, a piece of the historical puzzle can be lost. Nineteen hundred known archaeological and historical sites are located within the Rim Fire burned area. Sites include pre-historic camps, bedrock milling features, lithics (flaked stone), historic Forest Ranger Stations, cabins, logging camps, trestles, ditches and mines.

In an effort to maintain that cultural story line, Burned Area Emergency Response (BAER) efforts protected over 400 high risk sites by stabilizing soils, removing hazard trees and placing 3,280 feet of protective rock barriers. Unfortunately, Jawbone Station and the Niagara Trestle were completely burned, due to the rapid growth of the fire.

The plan for 2014 is to provide archeological support to the Rim Fire recovery efforts. The US Forest Service will conduct surveys, monitor known sites and provide additional protective measures to help ensure that the vast cultural history of the area lives on for all of us to enjoy, thus providing us with that special sense of place that history offers.

Life on the Wild Side

How is wildlife habitat affected by fire? Every animal has a different adaptive strategy for surviving fires. Some fare better than others. Burned forests can actually be a boon to some species by providing critical habitat such as snags and gaps in the forest canopy. Herbaceous cover usually flourishes after a wildfire and that provides food for animals like mule deer, rabbits and black bear. In the short-term, however, acorn crops and plant cover are removed and that can negatively impact animals as they try to fatten up for winter.

Let's look at how some animals survive a wildland fire. Western pond turtles inhabit lower elevation ponds and year-round streams. Some turtles may have died in the fire whereas others survived intact, even in dried out pond areas. Turtles tend to leave their summer resting burrows when a wildfire passes through an area, to return to their favorite pond. This phenomenon has been witnessed more than once by US Forest Service biologists and seems like a wise tactical move. By burrowing deep into the mud, many turtles survived the flames, even when the fire passed over their favorite "watering" hole.

Frogs, like the Foothill Yellow-Legged frog, are known to live in the Rim Fire area. Many frogs likely escaped harm by the virtue of the wet stream sites they inhabit. Post-fire conditions can impact them through erosion and sedimentation. It all comes down to lifestyle. Adult and sub-adult frogs spend much of their time in small, intermittently running tributaries where they hang out around pools of water. If sedimentation builds up in these pools, critical hiding spots found between rocks can get filled in, leaving the frogs vulnerable to predators.



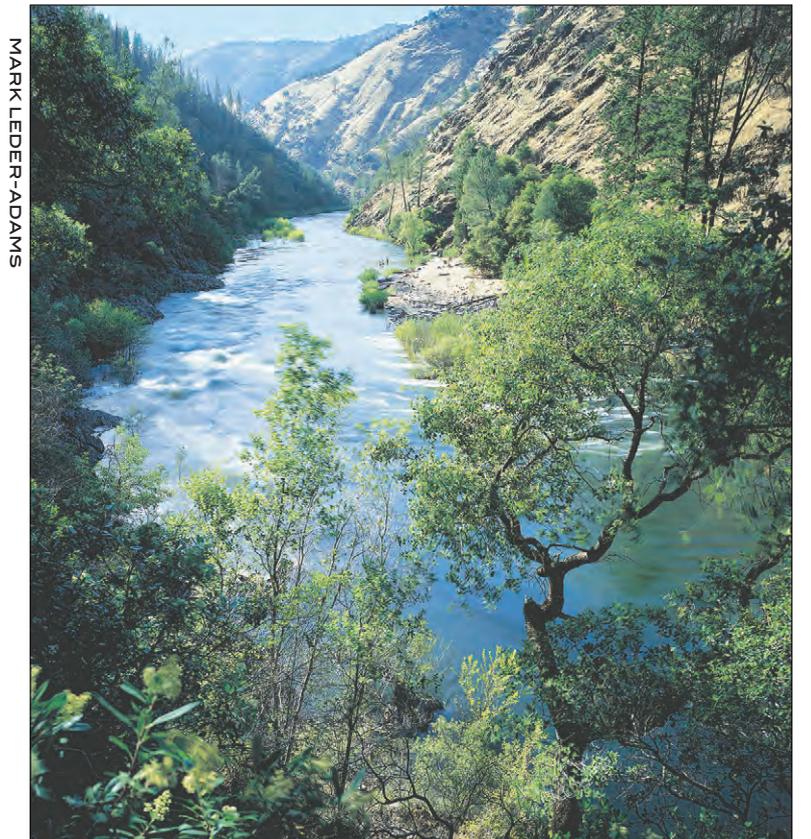
Yellow-legged frog

Streams used for frog breeding are different in nature. They tend to be wider and rockier than the tributaries mentioned above but they provide critical habitat for laying egg masses. Frog eggs are deposited when the water flow in breeding streams slows down. Female frogs use their legs to clean off some of the algae and silt so their eggs will adhere to the rocks. The remaining algae helps to camouflage the egg mass. Algae and gently flowing water also serve as a kind of amniotic fluid, bathing the tiny eggs in oxygen rich water and transporting waste materials away from the developing embryos. Excess sedimentation can interfere with egg growth and oxygen exchange. It can also impact food sources such as the fat-rich diatoms which are prized by frogs. If food supplies become overly impacted, frogs are forced to seek out new feeding grounds and that can tax their energy reserves.

The Stanislaus National Forest is well known for its bat population. Seventeen different species of bat inhabit these mountains. They feed predominantly on plant material and insects caught in mid-air. Bats roost and breed in caves, mine shafts, trees and cavities in dead trees. Like other animals in the fire area, most of the bats were probably able to escape the flames and smoke. However, their roosting and foraging sites were impacted and that can increase the distance they have to cover to get to feeding grounds.

Animals have learned to adjust to many different changes that affect their habitat, including wildland fire. Survival instincts have caused life on the wild side to become very adaptive over time.

PHOTO: KIMBERLY PETERSON



MARK LEDER-ADAMS

The Tuolumne River downstream from Clavey confluence.

Partnerships at Work



Tuolumne River Trust

The Tuolumne River Trust is taking a major role in helping with recovery efforts.

Partners are the cornerstones in helping rebuild the Stanislaus National Forest after the devastating Rim Fire of August 2013. Together they work with families, educators, elected officials and communities to promote environmental stewardship and to engage the public in caring for their lands.

The Tuolumne River Trust is the voice for the Tuolumne River. They promote stewardship of the Tuolumne through: education, community outreach and adventures; collaboration with a diverse array of stakeholders; on-the-ground restoration projects; advocacy and grassroots organizing to demonstrate public support for their work.

On their website, www.tuolumne.org, is a video sharing post fire images, what they are doing and how you can help, including a donation option that will match your contribution.

In the aftermath of the Rim Fire, the Trust strives to create a landscape that is more resilient to catastrophic wildfires through collaboration, volunteer restoration and outreach.

Fire Behavior 101

FUELS, TOPOGRAPHY & WEATHER

WILDLAND FIRES and how big they get are a result of fuel conditions, weather and topography. In sizing up a new start, crews will ask: How steep is the terrain? Is the wind gentle or is it howling up a steep slope? Is it hot and dry out and how long is the sun shining each day? These are important questions because they affect the length of the burning period. South slopes receive a lot more solar radiation and heating during the day, making them more fire prone. Thus it is important to know upon which side of the mountain, or aspect, the fire is burning.



CLINT GOULD

When crews consider the dryness of the fuels, they have to take into account the length of a drought. Woody debris dries out over time. The longer a drought persists, the crisper fuels become. Small things like pine needles, leaves and small twigs dry out first. During an extended drought, larger and larger fuels get parched. Big logs will dry out and become combustible during lengthy drought periods whereas fuels with a smaller diameter react much more quickly to daily fluctuations in humidity. A pine needle could be brittle-dry during the hot part of the afternoon but in the cool hours just before morning when the relative humidity is higher, this type of fuel will quickly absorb ambient moisture, making it less flammable at that time. Large downed logs do not recover so quickly.

The Stanislaus National Forest is in an extended drought along with most of California and the southwestern states. The same conditions that fueled the Rim Fire are present as we head into the recreational months of 2014. And there is still plenty of woody debris on the ground which brings us to the next topic: fuels.

Fuel composition is important. Fires in grasslands tend to move quickly, especially if the grass is cured. Often, grasslands are lacking in larger fuel and it is these big fuels that sustain the flaming front. Brush creates more dramatic fire behavior, especially if the fuel is tightly spaced. California is noted for its chaparral, a shrub ecosystem comprised of such things as chamise, manzanita, ceanothus and drought tolerant oaks. Interwoven branches, low fuel moisture levels and dried twigs and leaves can create very flammable conditions. The horizontal continuity of the fuel bed allows for rapid rates of spread, especially in steep terrain. It also greatly inhibits firefighting efforts.

As these brushy areas transition into lower elevation forests, the interwoven nature of the fuel bed adds a layer of complexity. Woody ground debris and shrubbery can then begin to act like ladder fuel, carrying fire from the surface of the forest

floor up into the trees. This effect can also be pronounced in dense forests where the spacing between trees is narrow. Tightly spaced tree crowns create a ripe scenario for the formation of crown fires. These are the most destructive and fastest moving fires that crews can encounter. Heavy fuels such as this are further impacted if a lot of dead, dry woody material is stacked up on the ground. When ground fires generate enough heat and intensity, this too can drive a fire from the forest floor up into the tops of the trees. Over half of the burned acres on the Rim Fire occurred in two days in August last year under these extreme crown fire conditions.

Unstable atmospheric conditions can also cause a fire to blow up by creating a suction-like force similar to that which is in play when huge thunder cells form. This creates a column of smoke that is filled with ash and burning embers. Heat and intensity fuel the bottom of the column and unstable atmospheric conditions provide the lift, giving us a huge plume. Much like a thunder storm, these plumes then begin to create their own weather, readily igniting spot fires with their erratic winds.

Two plume-dominated runs occurred on this wildland fire. As a result, on Aug. 21, the fire grew 37,639 acres and the next day added an additional 51,827 acres, making it the third largest fire in California history. When a forest burns with such speed and intensity there is very little fire crews can do to stop the blaze. Flame lengths can soar up to several hundred feet and often sound like the roar of a jet engine. Stopping a fire storm of this nature is rather like trying to stop a hurricane.

Hand crews are most effective when the flames are less than 4 feet tall. Engines, with water support, and air attack can assist to some degree to help protect key areas with retardant drops and much needed water. An ounce of prevention is truly worth a pound of cure, so please recreate safely while in the mountains this summer.