

# An Overview of US Forest Service Contracting Practices in California

Produced for the California Forest Management Task Force  
Rural Economic Development Steering Committee/ Wood Utilization Work Group  
*Removing Barriers Team*

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*\*Funded by Placer County Air Pollution Control District*

## Forest Service Feedstock Collaboration On-Ramp Document

**Introduction:** The US Forest Service (USFS) has existing pathways that assist with National Forest (NF) restoration and fuel reduction work, as well as support for limited timber sales. The USFS promotes local economies by hiring forest operators to perform work to remove vegetation from the forest that promotes optimal stand dynamics and regeneration. Timber sales and restoration contracting can be directly with private businesses, or by entering into partnership agreements with private businesses who can then put contracts out for the NF.

**Purpose:** Provide information about several National Forests in California relating to timber and biomass removal.

**Information Collection Method:** We collected information through three different avenues: (1) limited amount of interviews to glean how forest priorities might deter new contracting mechanisms; (2) collected timber sale and contract history for fourteen NF in the Sierra Nevada and North Coast; (3) conducted research over internally and publicly-available databases on information to supplement notes from interviews and timber sale history.

### Definitions of Agreement Mechanisms and Contracting Tools

There were 9 different contract or agreement types that were chosen when collecting the timber sale and contract history data. Generally speaking, there are three primary federal laws that govern wood removal from federal lands. For the purposes of removing wood and biomass from forests these pathways are standard timber sale contracting<sup>1</sup>, Stewardship Authority<sup>2</sup>, and Good Neighbor Authority<sup>3</sup>.

### Agreements

It should be noted that non-competitive arrangements are called agreements in USFS terminology, whereas USFS contracts are released for a competitive bid. The “partners” who sign agreements will then release contracts for the USFS, administering project work and hiring operators through a competitive process. Agreements are a partnership with the USFS to get more work accomplished with limited staffing, and when partners share mutual interest and mutual benefit. There are two different types of authorities that lead to Agreements:

Agreement Number	Definition
FS-1500-21	<b>Stewardship Agreements (SA)</b> - collaborations between NF and key stakeholders in the region to have partners manage implementation of forest restoration work, including timber removal and service work of up to 20-years. The SA partner will usually then contract out work themselves via a competitive process.

<sup>1</sup> 16 U.S Code §472a Chapter 2.1

<sup>2</sup> 2014 Farm Bill, Section 8205 of Public Law 113-79.

<sup>3</sup> 16 U.S Code §2113a

N/A	<b>Good Neighbor Authority (GNA)</b> - allows a state, Tribe, or local government to perform authorized restoration services on federal land and administer timber sales. A state using GNA can also reinvest timber revenues into the project, including planning. Tribes and local government may not reinvest.
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## Contracts

Nested under each authority are contracting tools which serve as project-specific requirements that differentiate how much, what type and where this work is to be done. The project specific contractual obligations are contained within these contracts and take into consideration the value of timber, the complexity of the sale and the service performed. These are not to be confused with Supplemental Project Agreements (SPA) which are tiered off collaborative mechanisms like Stewardship Authorities mentioned above.

Contract Number	Definition
FS-2400-2	sale of decked logs - commonly associated with fire suppression, fuel breaks or utility corridor clearing.
FS-2400-3	simple small sales - commonly associated with small fire salvage, beetle outbreak or rerouting forest roads.
FS-2400-4	simple low value sales - common for salvage sales. These are deteriorated feedstocks that may have some residual value. There is no strict regulation dictating how to account for sale volume due to the low value the timber retains.
FS-2400-6	complex large sales - standard forest project containing high-value timber
FS-2400-13	integrated resource timber contract (IRTC) - a contract mechanism for private contractors to be hired when the value of the timber exceeds the value of the service.
SF-33	integrated resource service contract-construction (IRSC-C) - Is a subcomponent of IRSC contracting that is specific for construction projects. Another subcomponent is commercial services, not listed here.
SF-1449	integrated resource service contract (IRSC) - a contract mechanism for private contractors to be hired when the service exceeds the value of the timber. A credit is then applied for the contractor towards the value of the timber in order to offset costs.

### Five Year Timber Sale and Contract History

Below is the combined information relating to timber and non-merchantable biomass, with a list of Stewardship Agreements (SA) and Good Neighbor Authorities (GNA) made publicly available upon request from the USFS. Over the last five years, a total of 649 timber sales and collaborative mechanisms have been utilized throughout the 15 NF from the Southern Sierra to the North Coast.

The four NF with the highest amount of contracting activity were: Lassen NF with 66, Plumas NF with 72, Stanislaus NF with 93 and the Sierra NF with 120. (Red highlights indicate four forests with highest contracting numbers overall, and highlighted boxes indicate highest amount in a specific category.) Sierra NF has seen a high number of Sales of deck logs and simple low value sales, which can generally be attributed to tree mortality in the region. The Stanislaus NF also has a high number of simple low value sales which is another region where high tree mortality has occurred. Plumas NF has the highest number of IRTC and IRSC contracts awarded, indicating a strong working relationship with forest contractors operating on NF land. The Stanislaus also has a strong relationship with contractors when taking into account IRSC-C contracts. The Tahoe NF have the most SAs operating within their Forest.

	SAs	GNA	IRTC	IRSC	Complex Large Sales	Simple Low Value Sales	Simple small sales	Sales of deck logs	IRCS	Total
<a href="#">El Dorado NF</a>	4	-	10	1	11	8	6	1	-	41
<a href="#">Humboldt-T</a>	-	-	-	-	-	-	-	-	-	0
<a href="#">Inyo</a>	-	1	-	1	5	4	3	-	-	14
<a href="#">Klamath</a>	1	-	-	-	31	4	1	3	-	40
<a href="#">LTBMU</a>	2	1	-	8	1	6	-	10	-	28
<a href="#">Lassen</a>	3	-	2	2	38	8	5	8	-	66
<a href="#">Mendocino</a>	1	-	1	-	4	-	3	-	-	9
<a href="#">Modoc</a>	2	-	2	-	16	-	3	2	-	25
<a href="#">Plumas</a>	2	1	11	8	29	7	6	7	1	72
<a href="#">Sequoia</a>	4	-	-	-	5	5	-	15	-	29
<a href="#">Shasta-T</a>	2	-	4	-	16	14	5	16	-	57
<a href="#">Sierra</a>	-	1		6	11	66	-	34	2	120
<a href="#">Six Rivers</a>	1			1	12	1	-	5	-	20
<a href="#">Stanislaus</a>	3	1	8	1	21	41	1	4	13	93
<a href="#">Tahoe</a>	6		3	2	13	1	3	7	-	35
<b>Total</b>	<b>31</b>	<b>5</b>	<b>41</b>	<b>30</b>	<b>213</b>	<b>165</b>	<b>36</b>	<b>112</b>	<b>16</b>	<b>649</b>

## USFS Statewide Key Contacts

The below contacts for the USFS work at statewide level are available to answer questions, and support National Forests in their work. While these contacts can help clarify USFS policy, regulation, or process, if a partner is interested in discussing specific projects or work, those conversations are best had with local National Forest staff. The Ecosystem Staff Officer or Vegetation Management Coordinator positions on each National Forest are the best first points of contact regarding any forest restoration work, including timber removal.

State level Contacts:

Jason Ko	R5 Acting Shared Stewardship / Partnership Coordinator	707-562-8875	<a href="mailto:jason.ko@usda.gov">jason.ko@usda.gov</a>
Greg Schroer	R5 Wildlife Program Manager / Master Stewardship Agreements POC	707-562-8930	<a href="mailto:Greg.schroer@usda.gov">Greg.schroer@usda.gov</a>
Tim Howard	R5 Timber Sale Prep and Stewardship Contract POC	707-562-8694	<a href="mailto:tim.howard@usda.gov">tim.howard@usda.gov</a>
Kevin Roehrs	R5 Timber Appraisal Program Manager	530-295-5613	<a href="mailto:kevin.roehrs@usda.gov">kevin.roehrs@usda.gov</a>
Brad Seaberg	R5 Timber Sale Administration Program Manager	530-478-6245	<a href="mailto:bradford.seaberg@usda.gov">bradford.seaberg@usda.gov</a>

## Forests with Demonstrated Activity

**Lassen NF** – Deb Bumpus was hired as Forest Supervisor in 2019. Her latest position was as the Executive Officer of the Four Forest Restoration Initiative (4FRI), an innovative landscape-scale partnership in Arizona. According to representatives of the Fall River-Pit RCD and Sierra Institute for Community and Environment, Bumpus has a strong understanding on collaborative mechanisms and contracting tools to facilitate more partnerships<sup>4</sup>. Additionally they say, she has shown interest in continuing multi-stakeholder partnerships to conduct restoration projects on forest land. According to the timber sale and contracting history table, the Lassen NF has completed the fourth most sales and contracts on their land.

Lassen NF holds Stewardship Agreements with Lassen County Fire Safe Council, Mule Deer Foundation and Sierra Institute. There are four collaboratives working in the NF: Burney-Hat Creek Community Forest and Watershed Group, Butte County Collaborative, the Feather River Stewardship Council, and the South Lassen Watershed Group.

### Key Contacts

Deb Bumpus	Forest Supervisor	520-388-8307	<a href="mailto:deb.bumpus@usda.gov">deb.bumpus@usda.gov</a>
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<sup>4</sup> Personal Communication with Todd Sloat, Fall River-Pit RCD; and Kyle Rodgers, Sierra Institute for the Community and Environment

Bobette Jones	Ecologist	530-257-4188	<a href="mailto:Bobette.jones@usda.gov">Bobette.jones@usda.gov</a>
Greg Mayer	Timber Management Officer	530-336-5521	<a href="mailto:Greg.mayer@usda.gov">Greg.mayer@usda.gov</a>
Kevin Zeeman	Mule Deer Foundation		<a href="mailto:kevin@muledeer.org">kevin@muledeer.org</a>
Jonathan Kusel	Sierra Institute for Community and Environment		<a href="mailto:jkusel@sierrainstitute.us">jkusel@sierrainstitute.us</a>

**Plumas NF** – Chris Carlton is the Forest Supervisor for Plumas NF. In late 2019 Carlton joined the forest as the new supervisor and arrived from US Department of the Interior Bureau of Land Management. In 2018, the California Forestry Association was in the process of pursuing a coordinated regional approach to dramatically increase the number of projects performed under Stewardship Agreement projects<sup>5</sup>. At time of publication, other entities like the Mule Deer Foundation, Wild Turkey Foundation and Tuolumne County were considering pathways to replicate these approaches from Plumas within their local regions. Note also that Plumas NF has the most IRTC and IRSC out of all the forests in Region 5.

They have two Stewardship Agreements with the Mule Deer Foundation and the Sierra Institute. Additionally, they have a Stand-Alone contract through the GNA with Sierra Nevada Conservancy. Maurice Huynh is the USFS contact for the GNA. There is one collaborative working in the region: Feather River Stewardship Coalition.

#### Key Contacts

Chris Carlton	Forest Supervisor	530-934-1100	<a href="mailto:chris.cariton@usda.gov">chris.cariton@usda.gov</a>
Nancy Francine	Ecosystem Staff Officer	530-283-7754	<a href="mailto:nancy.francine@usda.gov">nancy.francine@usda.gov</a>
Maurice Huynh	District Silviculturist	530-283-7653	<a href="mailto:Maurice.huynh@usda.gov">Maurice.huynh@usda.gov</a>
Kyla Sabo	Timber Management Officer	530-283-7652	<a href="mailto:Kyla.sabo@usda.gov">Kyla.sabo@usda.gov</a>
Kevin Zeeman	Mule Deer		<a href="mailto:kevin@muledeer.org">kevin@muledeer.org</a>

**Sierra NF** – Dean Gould has been the Forest Supervisor for Sierra NF since 2013. There is limited publicly available information on Sierra NF. One known item is that the Yosemite-Sequoia Resource Conservation and Development (RC&D) Council just signed a Stewardship Agreement in support of the Northfork Biomass Facility. The Sierra also has one SPA agreement under the Statewide GNA with the California Natural Resource Agency. The SPA is with CAL FIRE, which ends in 2021. The Sierra held 66 simple low value sales in the past 5-6 years which contributed to them completing the most timber sales and contracts on their forest. Beyond the Yosemite-Sequoia RC&D Council, another local group is the Dinkey Creek Landscape Restoration Partnership.

<sup>5</sup> American Forest Resource Council. <http://amforest.org/wp-content/uploads/2018/09/AFRC-Plumas-IRSC-Project-Field-Review-07262018.pdf>

### Key Contacts

Dean Gould	Forest Supervisor	530-934-1100	<a href="mailto:dean.gould@usda.gov">dean.gould@usda.gov</a>
Jeanette Williams	Ecosystem Staff Officer	530-478-6238	<a href="mailto:jeanette.williams@usda.gov">jeanette.williams@usda.gov</a>
Matthew Reischman	CAL FIRE GNA Contact	916-653-5000	<a href="mailto:matthew.reischman@fire.ca.gov">matthew.reischman@fire.ca.gov</a>

**Stanislaus NF** – The Forest Supervisor, Jason Kuiken, was appointed in 2018 and is participating in all the collaboratives associated within the region. According to an interview with a representative of the Sierra Nevada Conservancy, the Stanislaus NF can be highly receptive to landscape scale partnership/initiatives<sup>6</sup>. They have two forest collaboratives working in the region: the Yosemite-Stanislaus Solutions (YSS) and the Amador Calaveras Consensus Group (ACCG). The Upper Mokelumne River Watershed Authority (UMRWA) is the implementing arm of the ACCG. The Forest has three SA with Mule Deer Foundation, Tuolumne County, UMRWA<sup>7</sup> and a GNA with California Natural Resource Agency. Additionally, they have performed many IRTC. There are seven SPAs total between all SA led by various forest staff. Sierra Institute’s SCALE meeting notes from Fall 2019 stated that the county will not pursue any project unless supported by the YSS collaborative<sup>8</sup>.

In the last decade there was an attempt to develop a landscape scale NEPA project with the USFS called Motor M2k, but it failed due to a lack of representation/communication between stakeholders in the region. Recently, a new landscape level initiative was awarded \$2 million from Department of Conservation called the Social and Ecological Resilience Across the Landscape (SERAL). YSS is the leading collaborative for this project. The North Yuba Partnership is attempting a conditions-based NEPA model from the Tahoe NF, in hopes of replicating a similar approach in their region. The Calaveras Ranger District was historically interested in collaborative partnership arrangements and contracts, according to our stakeholder interview process. However, the District Ranger has since moved to another NF.

### Key Contacts

Jason Kuiken	Forest Supervisor	530-934-1100	<a href="mailto:jason.kuiken@usda.gov">jason.kuiken@usda.gov</a>
Michael Jow	Resource Management Staff Officer	209-288-6292	<a href="mailto:michael.jow@usda.gov">michael.jow@usda.gov</a>
Maria Benech	Rim Fire Restoration Coordinator	209-288-6285	<a href="mailto:Maria.benech@usda.gov">Maria.benech@usda.gov</a>
Joe Aragon	Calaveras Ranger District	928-443-8285	<a href="mailto:Joseph.aragon@usda.gov">Joseph.aragon@usda.gov</a>
Kevin Zeeman	Mule Deer Foundation		<a href="mailto:kevin@muledeer.org">kevin@muledeer.org</a>
Liz Peterson	Tuolumne County	209-533-6396	<a href="mailto:epeterson@co.tuolumne.ca.us">epeterson@co.tuolumne.ca.us</a>
Lisa Stuart	UMRWA	209-772-8261	<a href="mailto:Lisa.stuart@ebmud.com">Lisa.stuart@ebmud.com</a>

<sup>6</sup> Personal Communication with Elliot Vander Kolk, SNC Forester

<sup>7</sup> The UMRWA member agencies contain six public water agencies (which includes the East Bay Municipal Utility District) and the counties of Amador, Calaveras, and Alpine.

<sup>8</sup> “Sierra to California All-Lands Enhancement: Fall 2019 Meeting Notes”. Sierra Institute for Community and Environment. November 6-7, 2018. Sacramento, CA.

Matthew Reischman	CAL FIRE GNA Contact	916-653-5000	<a href="mailto:matthew.reischman@fire.ca.gov">matthew.reischman@fire.ca.gov</a>
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### Other Busy Forests and Notes of Interest

**Tahoe NF** – Eli Ilano is the Forest Supervisor and has been working on the Tahoe NF for close to a decade<sup>9</sup>. The Tahoe NF currently has invited the highest number of Stewardship Agreements into this region, allowing partner organizations to administer more forest projects on public land than other NFs. There are three SPAs under these SAs administered by National Forest Foundation (NFF) and Placer County. Of particular mention, the North Yuba Partnership is a highly anticipated forest management project for public-private financing and considering different approaches to analyzing NEPA on a landscape level project<sup>10</sup>. Dave Fournier is the Ecosystem Staff Officer and the lead USFS contact on multiple Stewardship Agreements. The Tahoe NF works intimately with the Lake Tahoe Basin Management Unit (LTBMU).

Eli Ilano	Forest Supervisor	530-478-6200	<a href="mailto:eli.ilano@usda.gov">eli.ilano@usda.gov</a>
David Fournier	Ecosystem Staff Officer	530-478-6238	<a href="mailto:david.fournier@usda.gov">david.fournier@usda.gov</a>
Robin Mahoney	Placer County		<a href="mailto:Rmahoney@placer.ca.gov">Rmahoney@placer.ca.gov</a>
Matt Millar	NFF Tahoe Manager		<a href="mailto:mmillar@nationalforests.org">mmillar@nationalforests.org</a>

**Lake Tahoe Basin Management Unit** – LTBMU’s vegetation staff officer is Vic Lyon. Deputy Forest Sup Danielle (DD) Harrison was a new hire starting 2019 and is arriving with experience as a District Ranger from a district that participated in Arizona partnership, 4FRI. DD is now the Forest Supervisor for LTBMU. They have one SA and 3 SPAs with National Forest Foundation (NFF), the Washoe Tribe and Placer County.

The LTBMU also has a SPA biomass utilization project with Placer County and the State of Nevada Department of Conservation and Natural Resources, slated to end in 2026.

Danielle (DD) Harrison	Acting Forest Supervisor	530-934-1100	<a href="mailto:dd.harrison@usda.gov">dd.harrison@usda.gov</a>
Vic Lyon	Vegetation Staff Officer	530-543-2625	<a href="mailto:victor.lyon@usda.gov">victor.lyon@usda.gov</a>
Brian Garrett	Assistant Veg Staff Officer	530-543-2617	<a href="mailto:Brian.garret@usda.gov">Brian.garret@usda.gov</a>
Matt Millar	NFF Tahoe Manager		<a href="mailto:mmillar@nationalforests.org">mmillar@nationalforests.org</a>
Susan Jamerson	Washoe Tribe		<a href="mailto:Susan.jameson@washoetribe.us">Susan.jameson@washoetribe.us</a>
Erin Erst	California Tahoe Conservancy GNA Contact		<a href="mailto:Erin.erst@tahoe.ca.gov">Erin.erst@tahoe.ca.gov</a>

<sup>9</sup> Tahoe National Forest Webpage - <https://www.fs.usda.gov/detail/tahoe/news-events/?cid=FSEPRD491608>

<sup>10</sup> Personal Communication with Regine Miller, Calaveras Healthy Impact Product Solutions (CHIPS)



**Shasta-Trinity NF** – Scott Russell was appointed the Forest Supervisor in 2018 after leaving his latest position as the Chief Executive of 4FRI. The Shasta-Trinity NF has a total of 57 contracts, containing four IRTCs and two Stewardship Agreements. Most of their work has been in complex sales and selling of deck logs. The Trinity County Collaborative is in the Shasta-Trinity NF.

Scott Russell	Forest Supervisor	530-225-2522	<a href="mailto:scott.russell@usda.gov">scott.russell@usda.gov</a>
Lois Shoemaker	Ecosystem Staff Officer	530-226-2420	<a href="mailto:lois.shoemaker@usda.gov">lois.shoemaker@usda.gov</a>

**Eldorado NF** – Jeff Marsolais is the Forest Supervisor for the Eldorado NF. The Eldorado NF has awarded 10 IRTCs in the past 5 years, indicating there is a strong relationship between the Forest and its partners. They hold three Stewardship Agreements with the Mule Deer Foundation, the Wild Turkey Foundation and the Upper Mokelumne River Watershed Authority (UMRWA) and one GNA-based SPA with CAL FIRE. There are three SPA contracts to date between all Stewardship Agreements.

There are three active partnerships in the El Dorado NF. The Amador Calaveras Consensus Group is currently working on the “Cornerstone Project” landscape strategy. The South Fork American River (SOFAR) All Lands Cohesive Strategy is undertaking an all-lands approach to wildland fire management on a landscape scale. As mentioned above, the Upper Mokelumne River Watershed Authority (UMRWA) is a Joint Powers Authority that holds an MSA to conduct forest restoration on the El Dorado NF and Stanislaus NF as the implementing arm of the ACCG.

Jeff Marsolais	Forest Supervisor	530-543-2640	<a href="mailto:jeff.marsolais@usda.gov">jeff.marsolais@usda.gov</a>
Michelle Havens	Ecosystem Staff Officer	530-478-6238	<a href="mailto:michelle.havens@usda.gov">michelle.havens@usda.gov</a>
Travis Thane	District Fire Management Officer	530-503-5119	<a href="mailto:Travis.thane@usda.gov">Travis.thane@usda.gov</a>
Kevin Zeeman	Mule Deer Foundation		<a href="mailto:kevin@muledeer.org">kevin@muledeer.org</a>
Collin Smith	Wild Turkey Foundation	406-600-9241	<a href="mailto:csmith@nwtf.net">csmith@nwtf.net</a>
Matthew Reischman	CALFIRE GNA Contact	916-653-5000	<a href="mailto:matthew.reischman@fire.ca.gov">matthew.reischman@fire.ca.gov</a>

**Klamath NF** – Patty Grantham is the Forest Supervisor. According to a local news report, Supervisor Grantham is “very to open discussing” the potential for a Master Stewardship Agreement<sup>11</sup> with the Karuk Tribe<sup>12</sup>. In the same article, she stated that staffing on the Klamath NF “has been a challenge for the last year and a half”. She has been working as the Supervisor for over 5 years. Kris Sexton was hired

<sup>11</sup> A Master Stewardship Agreement (MSA) is a type of steward agreement that can be made under the Stewardship Authority (SA)

<sup>12</sup> <https://www.siskiyoudaily.com/news/20180705/klamath-national-forest-officials-give-update-to-supes>

in 2018 as the Deputy Forest Supervisor and is currently on Detail in the Modoc NF. Klamath has one GNA with CAL FIRE including the only GNA work that involves timber in R5.

The Klamath has one collaborative called the Mid-Klamath River Communities Project.

Patty Grantham	Forest Supervisor	530-841-4502	<a href="mailto:patty.grantham@usda.gov">patty.grantham@usda.gov</a>
Ben Haupt	Vegetation Program Manager	530-841-4419	<a href="mailto:ben.haupt@usda.gov">ben.haupt@usda.gov</a>
Matthew Reischman	CALFIRE GNA Contact	916-653-5000	<a href="mailto:matthew.reischman@fire.ca.gov">matthew.reischman@fire.ca.gov</a>

## Common Challenges

Across all National Forests in Region 5, the USFS and its partnerships have encountered a few recurring issues when accomplishing their restoration goals. The top three are a discretionary budget, high staff turnover, and the challenges of funding and completing NEPA analysis. There is also limited understanding within the non-federal sector regarding contract authorities and use of tools to implement forest projects on NF land. Many of the communities who want to work in this space need more technical support. According to Sierra Institute’s stakeholder interview research (2018)<sup>13</sup>, key stakeholders believed collaborative tools and authorities could get more work done, but knowledge on the subject was not easily accessible.

Another challenge is that private companies that bid for work on forest land have relied for decades on a business model that reflects short-term contracting. Short-term contracts reduce the risk of any monopoly developing, and open up the opportunity for multiple companies to work on various phases or regions of a large-scale multi-year project. Also, short term contracts are consistent with the USFS budget process. The benefits of longer term contracts for those who purchase the wood from these forestry professionals, however, is in grave need for financing projects that could use biomass waste for a business purpose<sup>14</sup>. If the scenario were to develop where companies began securing longer term contracts, then some of those who have had business models based on short term contracts might become uncomfortable with the new business environment<sup>15</sup>. Developing the needed long term contract options for one group within the sector will likely contribute to an environment with competing interests, which will need resolution in the near future.

In summary, the NF lands within California are clearly being managed with the intention of accomplishing forest restoration and some limited use of commercial timber sales. This document will hopefully shed light for those who are interested in learning more about contracting for timber, forest restoration or forest biomass within National Forest.

<sup>13</sup> “Forest Restoration: Are We Using Everything in the Toolbox”. Sierra Institute for Community and Environment. [scale.sierrainstitute.us](http://scale.sierrainstitute.us); 2018

<sup>14</sup> Swezy, C., Rodgers, K., Kusel, J.; *Paying for Forest Health: Improving the Economics of Forest Restoration and Biomass Power in California*. Sierra Institute for Community and Environment. Pg. 11. 2020.

<sup>15</sup> Personal Communication with Nick Goulette, The Watershed Research and Training Center