Special Prescription:
Aspen, Meadow, & Wet Area Restoration
(FPR 14 CCR §§ 913.4, 933.4 and 953.4(e))

Special Prescription:
Aspen, Meadow, & Wet Area Restoration

Purpose of presentation:

1. Update the Board of Forestry and Fire Protection (Board), Public, and Resource Managers on the 2012 effective rule language – Special Prescription, Aspen, Meadow, & Wet Area Restoration (pursuant to 14 CCR §§ 913.4 [933.4, 953.4](e)(7)).

2. Examine restoration projects that occurred prior to the current rule package or occurred on Federal lands.

3. Present information on current restoration projects utilizing the 2012 rules where photo point records have been established.

4. Present comments from the Registered Professional Forester (RPF) community, Unit Foresters and other Agencies on the application and use of the Special Prescription.

Special Prescription:
Aspen, Meadow, & Wet Area Restoration

Presentation Outline:

- Provide the regulation background, current numbers in use and associated acreage.
- Review the *"Measures of Success"* as defined in the Timber Harvesting Plan (THP) by the RPF.
- Discuss potential post-harvest environmental impacts.
- Identify regulatory compliance issues agencies may have observed within operated areas and identify regulatory issues that were discussed during the Pre-harvest Inspection (PHI).
- Discuss findings (observations) resulting from the review.

Special Prescription:
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- In 2011, the Board adopted rule language creating a *"special prescription"* that provided regulatory guidance for projects designed to harvest commercial conifer species within aspen stands, meadows, & wet areas for the specific purpose of restoring habitat, ecological and range values.

- This regulation change expanded the original aspen restoration regulation adopted in 2006 and identified it as a "special prescription", allowing for aspen, meadow and wet area restoration projects. Other regulatory provisions of the Forest Practice Rules (FPRs) were exempted to encourage forest landowners to consider operations to restore these areas.

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Exempted FPR regulations :

- Silvicultural regulatory standards –
  - (14 CCR §§ 913.1-913.3 [933.1-933.3, 953.1-953.3] and (14 CCR §§ 913.6 [933.6, 953.6])
  1. Opening size
  2. Adjacency requirements
  3. Conifer stocking requirements

- Minimum resource conservation standards
  - (14 CCR §§ 912.7 [932.7, 952.7])

- Timberland productivity and MSP requirements
  - (14 CCR §§ 913.10 [933.10, 953.10] and 14 CCR §§ 913.11 [933.11, 953.11])

Special Prescription:
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Prior to 2012 when the Special Prescription became effective, forest landowners were utilizing 14 CCR § 939.15, or 959.15(b), mostly as an "Alternative Prescription next closest to the Clearcutting Method" as the methodology to remove trees within meadows, wet meadows and aspen areas. There was no provision for the allowance of restoration projects in the Coast District.

Special Prescription:
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The adoption of the Special Prescription replaced previous versions of 14 CCR § 939.15, and 959.15(b). As per the Updated Information Digest within the Board's Rulemaking File: "This regulation follows the original aspen restoration regulation adopted by the Board in September 2006, but adds meadows and wet areas, and utilizes the special prescription process. In addition, the new regulation now exempts project proponents from the conifer stocking, project size, and harvesting unit adjacency requirements. The regulation is intended to encourage forest landowners to consider operations to restore stands of aspen, meadows, and wet areas in association with commercial timber harvesting activities."

Special Prescription:
Aspen, Meadow, & Wet Area Restoration

One of the main goals of this special prescription was to eliminate the need to prepare alternative prescriptions which were difficult to review and required justification from the RPF. The use of the term "Clearcutting" within 14 CCR § 939.15 and 959.15(b) caused ambiguity in the interpretation of the use of the code, and questions continued to arise concerning size limitations and adjacency constraints normally attributable to the clearcutting standards.

From CAL FIRE's data capture perspective, information regarding the use of the previous code sections (939.15(a) and 959.15(b)) is uncertain, as the areas were coded as "alternative prescription next closest to clearcut". It is difficult to say within any level of certainty whether there has been an increase in restoration projects without a substantial amount of effort going through old plans to determine which ones utilized the older code sections for restoration purposes.

Special Prescription:
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- Since 2012, five (5) years since enactment, there have been 30 THPs & 2 NTMPs submitted or approved with restoration projects utilizing the new special prescription.
- 21 of the Harvesting Documents utilizing the special prescription have had operations; however, only 5 of the these have had work completion reports submitted.
- Number of THPs submitted or approved with restoration projects since 2012 by Region. Note – Two THPs in the Sierra Region Were Withdrawn and one THP in the Cascade Region was withdrawn.

REGION	2012	2013	2014	2015	2016	TOTAL
Coast	0	0	0	0	0	0
Cascade	4	8	5	3	7	27
Sierra	0	1	0	3	1	5
South	0	0	0	0	0	0

Special Prescription:
Aspen, Meadow, & Wet Area Restoration

Cascade and Sierra Regions use by Unit and County.

Note: Two THPs In Tuolumne Were Withdrawn and one THP in Modoc was withdrawn

COUNTY	UNIT	2012	2013	2014	2015	2016	TOTAL
Plumas	LMU		1	2			9
Modoc				1			
Lassen		1		2	1	1	
Shasta	SHU	1	2				4
Trinity		1					
Siskiyou	SKU		4		2	3	9
Tehama	TGU	1					1
Butte	BTU					1	1
Sierra	NEU		1			1	3
Placer						1	
Tuolumne			1		3	1	5
						TOTAL	32

Special Prescription:
Aspen, Meadow, & Wet Area Restoration

PROJECT ACREAGE:

- Forest Practice System Database (FPS) reporting of acreage does not separate between the three restoration options, although the Special Prescription does mandate that these area be separated on the form.
  - ***(1)*** *The RPF shall state in the plan each project type(s) that is being proposed (aspen, meadow, and/or wet area restoration).*

- While the THP form only includes “Aspen Restoration”, many project proponents manipulate the form to distinguish between the three options, yet this is not currently captured in FPS.

Special Prescription:
Aspen, Meadow, & Wet Area Restoration

Acreage by CAL FIRE Unit since adoption of the special prescription.

The Northern Region accounts for 84% of the acres of restoration projects with 16% occurring within the Southern Region.

Acreage per THP ranges between 1 to 1,360 acres; averaging 65 acres per THP.

NOTE: SHU - 1,360 acres were under one THP specifically designed to address restoration activities. Removing that one plan as an outlier; average acreages per THP/NTMP that utilized the Special Prescription is 23 acres.

NOTE: Of the 32 plans submitted, 21 have had operations commence.

COUNTY	UNIT	TOTAL ACREAGE
Plumas	LMU	**138**
Modoc		
Lassen		
Shasta/Trinity	SHU	**1,382**
Siskiyou	SKU	**259**
Tehama	TGU	**2**
Butte	BTU	**24**
Sierra	NEU	**236**
Placer		
Tuolumne		**27**

Special Prescription:
Aspen, Meadow, & Wet Area Restoration

“Regulatory Compliance Issues”

Violations issued by CAL FIRE Unit since adoption of the special prescriptions.

- Two THPs that utilized the Aspen, Meadow and Wet Area Restoration have had violations issued.

- Neither plan was issued violations for failing to adhere to the standards of the Special Prescription. The violations were issued for:
  1) Failing to follow the Winter Period Operating Plan
  2) Failing to follow the plans requirement to restrict operations until adjacency constraints were met for even-aged harvest.

Special Prescription:
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2010 THP in El Dorado County – Prior to Special Prescription – Use of 14 CCR § 959.15(b):

"Clearcut- Aspen/meadow Restoration:
This treatment is for areas of Aspen dominated timberland and meadow areas where disruption of natural wildfire regimes has led to encroachment by conifer trees. The objective is to harvest all merchantable conifer and slash all sub-merchantable conifer that are within 100 feet of any aspen and/or associated meadows to enhance aspen growth and prevent conifer encroachment into meadows. Per 959.15, stocking requirements are exempt for such treatments. An on site pre-consultation was conducted by CDF, DFG, and CVRWCQB in November, 2007 where it was determined that the project met the conditions of CCR 959.15(b). A notice of Inspection documenting the pre-consultation can be found in Section V."

Special Prescription:
Aspen, Meadow, & Wet Area Restoration

2010 THP in El Dorado County – Prior to Special Prescription:

"Alternative Prescription most like clearcut tractor units #1952, 1999 and Clearcut unit #1 (Aspen Meadow restoration) exceed the 20 acre maximum unit size specified under the rules. These units conform to either all or portions of 14 CCR 953.1(a)(2)(A)(B)(C), (D) as explained in detail in section Ill under Item 14(c). No special Instructions are necessary for the LTO."

Photo log and comments from Post-Harvest Inspection

Special Prescription:
Aspen, Meadow, & Wet Area Restoration

2010 THP in El Dorado County – Prior to Special Prescription:

PHOTO E: (left) - “Open areas showing the ‘clumpy’ stocking patterns of the aspen stands. Note the sub-merchantable regeneration of conifer within the aspen clump.”

PHOTO G: (right) – “rapid growth rates of Jeffery Pine. This stump diameter is about 28”. Estimated age to be 50 to 60 years old. This underscores the need to remove the sub-merchantable conifer regeneration."

Special Prescription:
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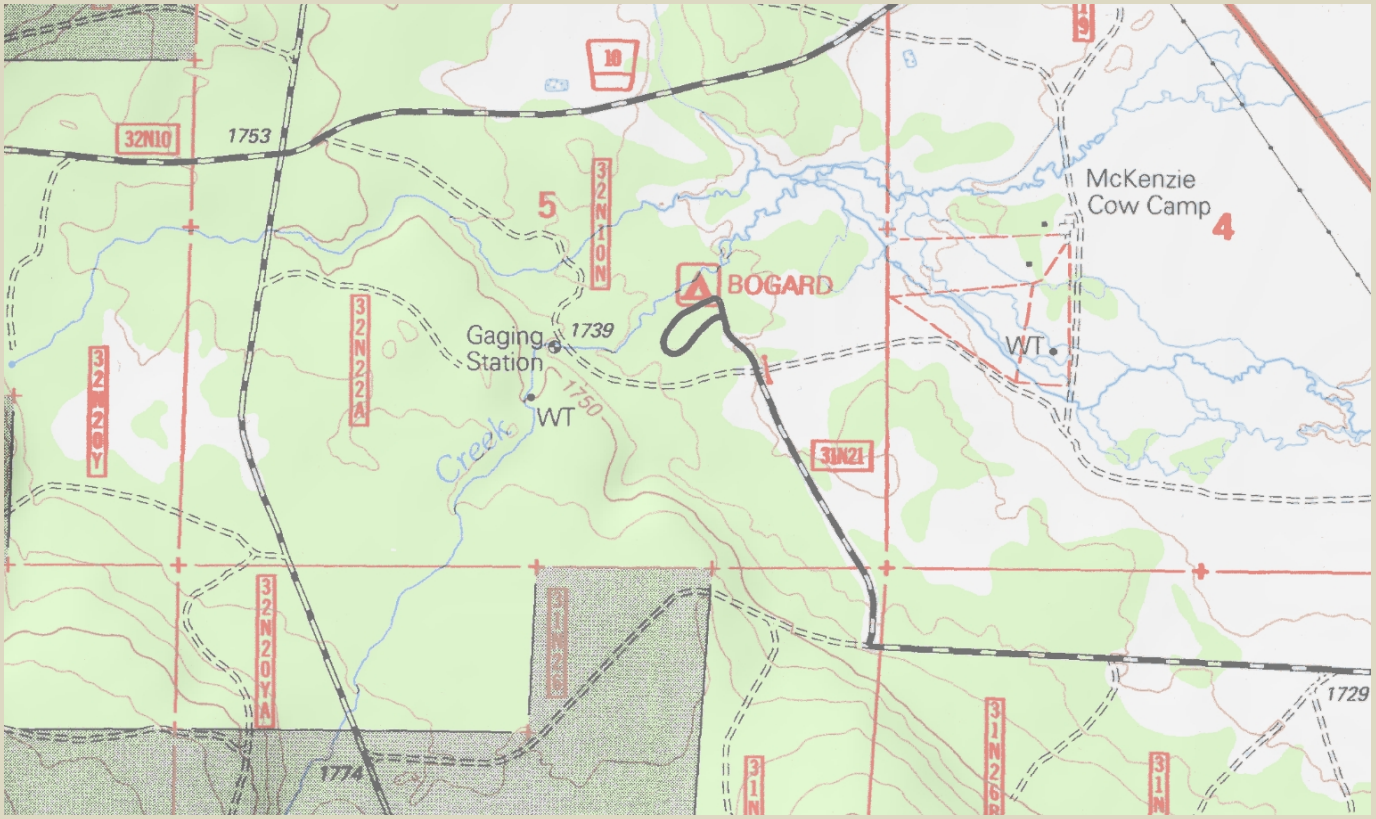
McKenzie Timber Sale, USFS, Lassen County:

250 Acres Harvested in Three Phases from 2004 Through 2008



Special Prescription:
Aspen, Meadow, & Wet Area Restoration

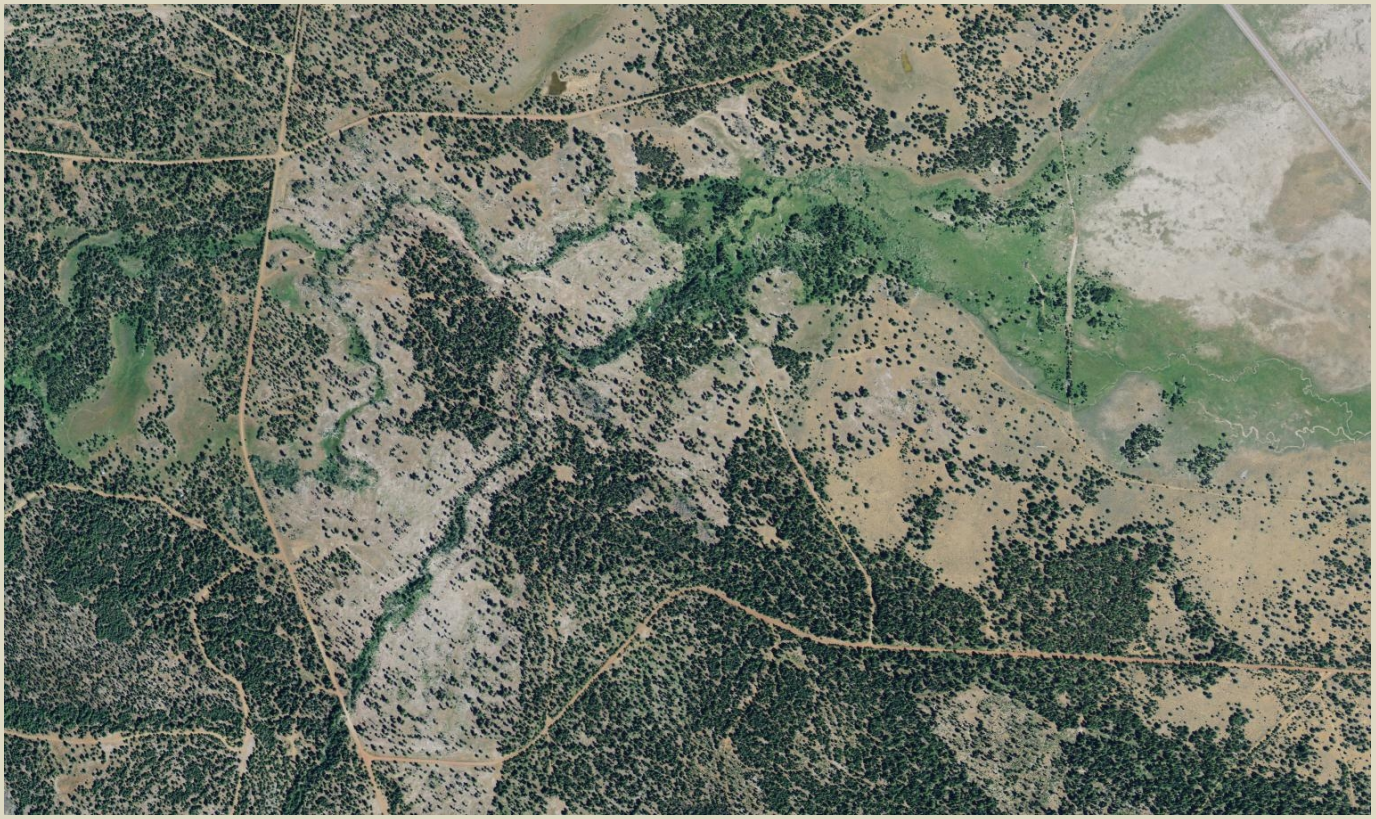
McKenzie Timber Sale, USFS, Lassen County:

2005 Imagery – Some Over-Snow Harvesting Had Occurred in Two Units

Special Prescription:
Aspen, Meadow, & Wet Area Restoration

McKenzie Timber Sale, USFS, Lassen County:

2009 Imagery – Harvesting Complete For Entire Project



Special Prescription:
Aspen, Meadow, & Wet Area Restoration

McKenzie Timber Sale, USFS, Lassen County:

Jones BE, Krupa M, Tate KW (2013) Aquatic ecosystem response to timber harvesting for the purpose of restoring aspen. PLoS ONE 8(12): e84561. doi:10.1371/journal.pone.0084561

From Abstract

- The removal of conifers through commercial timber harvesting has been successful in restoring aspen, however many aspen stands are located near streams, and there are concerns about potential aquatic ecosystem impairment.
- Examined the effects of management-scale conifer removal from aspen stands located adjacent to streams on water quality, solar radiation, canopy cover, temperature, aquatic macroinvertebrates, and soil moisture.
- For the Pine-Bogard Project - consisted of three treatments adjacent to Pine and Bogard Creeks: (i) Phase 1 in January 2004, (ii) Phase 2 in August 2005, and (iii) Phase 3 in January 2008.
- Treatments involved whole tree removal using track-laying harvesters and rubber tire skidders. More than 80% of all samples analyzed for NO_3-N, NH_4-N, and PO_4-P at Pine, Bogard, and Bailey Creeks were below the detection limit, with the exception of naturally elevated PO_4-P in Bogard Creek.

Special Prescription:
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Jones BE, Krupa M, Tate KW (2013) Aquatic ecosystem response to timber harvesting for the purpose of restoring aspen. PLoS ONE 8(12): e84561. doi:10.1371/journal.pone.0084561

From Abstract

- All nutrient concentrations (NO_3-N, NH_4-N, PO_4-P, K, and SO_4-S) showed little variation within streams and across years. Turbidity and TSS exhibited annual variation, but there was no significant increase in the difference between upstream and downstream turbidity and TSS levels.
- Significant decrease in stream canopy cover and increase in the potential fraction of solar radiation reaching the streams in response to the Pine-Bogard Phase 3 and Bailey treatments; however, there was no corresponding increase in stream temperatures.
- Macroinvertebrate metrics indicated healthy aquatic ecosystem conditions throughout the course of the study. Lastly, the removal of vegetation significantly increased soil moisture in treated stands relative to untreated stands.
- These results indicate that, with careful planning and implementation of site-specific best management practices, conifer removal to restore aspen stands can be conducted without degrading aquatic ecosystems.

Special Prescription:
Aspen, Meadow, & Wet Area Restoration

Use of Current Special Prescription: Examples and Discussion

- TRFRF Forester II Dan Craig and Forest Practice Manager John Ramaley visited 4 THPs/NTMPs and collected photographic points with GPS positions to track areas over time.

- TRFRF Forester II Dan Craig visited an additional 3 THPs and collected photographic points with GPS positions to track areas over time.

- Fresno and Redding Review Team Offices have initiated the use of a modified PHI Report (pre-screen form) sent to the Forest Practice Inspector utilizing the following:

21	**a.**	**If the plan contains Aspen, Meadow and Wet Area Restoration, are the measurable standards contained in the plan sufficient to document success?**	**N/A**	**Yes**	**No**
		If "No", explain:			
	b.	Are pictures of the pre-harvest Aspen, Meadow and Wet Area Restoration included in your report?	N/A	Yes	**No**
		If "No", how will monitoring data for the Board be provided?			

Special Prescription:
Aspen, Meadow, & Wet Area Restoration

Use of Current Special Prescription: Examples and Discussion

- All THP's and NTMP's have had inspections and review of the special prescription areas.
- Of the 32 plans submitted, 21 have had operations commence. Redding Review Team and the TRFRF program has visited 7 of these plans to document activities related to the use of the special prescription.
- This 33% review of plans where operations have commenced was intended to provide an overview of the use and application throughout the different counties.
- Four counties were visited where 22 of the plans have the special prescription.

Special Prescription:
Aspen, Meadow, & Wet Area Restoration

2013 THP in Siskiyou County – Use of Current Special Prescription:

FROM THP: "Aspen and Wet Area Restoration:
The boundary of the Aspen and Wet Area Restoration area shall be identified with blue and yellow ribbon. All *viable aspen stems* shall be *retained to the extent feasible.* All conifers greater that 12 inches in height shall be cl.it within the Aspen and Wet Area Restoration Area. Conifers with characteristics beneficial to wildlife may be retained and only trees to be retained shall be marked by the RPF or his designee with orange paint at dbh and a mark below the stump height as defined by 14 CCR 895.1. Conifers will not be planted as part the Aspen and Wet Area Restoration.

Viable Aspen Stem means, for this THP. all living aspen stems greater than 12 inches in height above the soil.
Retained to the Extent Feasible, for this THP, will be accomplished through the following operational guidelines:

- Conifers will be mechanically felled or directionally hand felled in a manner that reduces direct damage to viable Aspen stems where possible.
- Skidding shall be conducted on existing skid trails, except to avoid concentrations of existing viable Aspen stems. Tractor roads may be relocated to reduce direct damage to viable Aspen stems where possible."

FROM THP: "Merchantable sized conifers will not be limbed and bucked when felled but will be whole-tree skidded to the landing. Sub-merchantable sized conifers within the Wet Areas will be felled and removed. Sub- merchantable sized conifers outside of Wet Areas will be felled and loped on site so that no part remains more than 30 inches above the ground."

Special Prescription:
Aspen, Meadow, & Wet Area Restoration

2013 THP in Siskiyou County – Use of Current Special Prescription:

FROM THP: "Aspen, Meadow and Wet Area Restoration (14CCR 933.4(e)):

1) Project Type: The selected area will include Aspen and Wet Area Restoration. No meadow restoration is proposed.
2) Project location: The selected area under this provision is illustrated on the THP map and on the Aspen Restoration Area map located in Section II.
3) Extent of area and treatment types: The Aspen and Wet Area Restoration comprises 11 acres within the THP area. Viable aspen stems shall be retained to the extent feasible. All conifers greater that 12 inches in height shall be cut and loped. Within the Wet Area Restoration, all conifers will be cut and removed. Conifers with characteristics beneficial to wildlife may be retained.
4) Aspen stand conditions: See item 6 below.
5) Project goals and other factors: See item 6 below.
6) *For projects of twenty (20) acres or less in size, the RPF has the option to not include the requirements of 14 CCR§ 933.4, subsections (e)(4} and (5) if the RPF consults with DFG prior to plan submittal and, if wet areas are proposed, the RPF shall also consult with the appropriate RWQCB in those locations where the applicable basin plan identifies wet areas as a beneficial use. The results of the consultation(s) shall be included in the plan:* The RPF consulted with Mr. Joe Croteau and Mr. Andy Yarusso from the California Department of Fish and Wildlife (CDFW) and a field visit was conducted concerning the proposed Aspen and Wet Area Restoration. The RPF discussed the proposed project with Mr. Tom Williams of the North Coast Regional Water Quality Control Board (WQ) by phone. During the PHI on 5/22/2013. Mr. Tom Williams (WQ) and Mr. Andy Yarusso (CDFW) observed the site proposed for treatment and the objectives of the RPF and the concerns of WQ and CDFW were discussed further. The outcome of the above discussions are as follows:"

Special Prescription:
Aspen, Meadow, & Wet Area Restoration

2013 THP in Siskiyou County – Use of Current Special Prescription:

FROM THP – Measures of Success:

6) "The objectives of the proposed activity are to promote the establishment of new Aspen suckers and to enhance the existing isolated wet areas. These will be accomplished by following the treatments listed in (3) above. Removing competing conifers adjacent to Aspen will allow sunlight to reach the forest floor which stimulates sucker production. Removing conifers encroaching upon wet areas will reduce transpiration which will increase available ground and surface water in these isolated areas, potentially allowing increases in the size of the wet areas. The wet areas will be enhanced through the increase in available water and the introduction of sunlight which will promote the growth of more diverse riparian vegetation and possibly providing habitats for other organisms. Additionally, the interception of precipitation (primarily snowfall in this area) by conifers will be reduced. This will promote a localized increase of the snowpack in the treated area which should persist later into the spring, potentially providing increased surface and groundwater availability."

Special Prescription:
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2013 THP in Siskiyou County – Use of Current Special Prescription:

2014 Imagery: Black Bordered Area

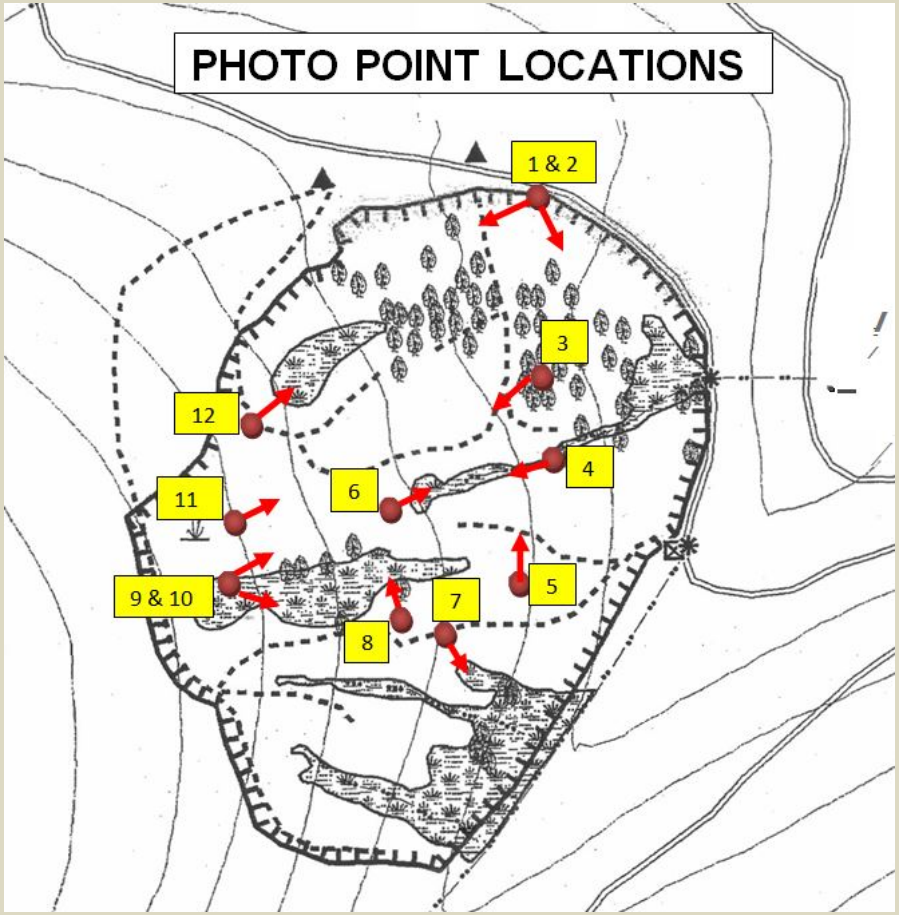
Special Prescription:
Aspen, Meadow, & Wet Area Restoration

2013 THP in Siskiyou County – Use of Current Special Prescription:

2016 Imagery: Black Bordered Area

Special Prescription:
Aspen, Meadow, & Wet Area Restoration

2013 THP in Siskiyou County – Use of Current Special Prescription:



Special Prescription:
Aspen, Meadow, & Wet Area Restoration

2013 THP in Siskiyou County – Use of Current Special Prescription:

PHOTO 4

PHOTO 6

Special Prescription:
Aspen, Meadow, & Wet Area Restoration

2013 THP in Siskiyou County – Use of Current Special Prescription:

PHOTO 12

From Inspection – "We also evaluated the post-harvest Aspen and Wet Area Restoration project in Unit 10. CDF&W agreed that initially the results appear favorable. Even in this drought year the water table appears to have increased and aspens are re-sprouting in the disturbed areas."

PHOTO 9

Special Prescription:
Aspen, Meadow, & Wet Area Restoration

2014 THP in Plumas County – Use of Current Special Prescription

FROM THP: "40 acres will be treated under the special harvesting method 14 CCR 933.4(e) "Aspen, Meadow and Wet Area Restoration". *The "Aspen, Meadow and Wet Area Restoration" area will be flagged with orange and white candy stripe flagging.* All conifer trees within this area will be removed except those that are designated to be retained for wildlife and aesthetic value. Trees to be retained are marked with a high-vis red/orange ring at dbh. There are also designated "no treatment" inclusions throughout the project area - denoted with red and yellow flagging. No harvesting or equipment is allowed within a specified inclusion. *Further operational guidelines concerning the ''Aspen, Meadow and Wet Area Restoration" project include: the posting of project signs on Highway 36/89, publication of a newspaper article, public meeting, and a public field trip to the restoration area. Harvesting within the meadow area will not occur until all said operational guidelines are fulfilled (see Section III -Item #14 and Section IV -"Visual" Impacts for further details).*

This special treatment area will not be held to the stocking standards of site II and III timberlands.

See "Meadow Restoration" Map for the location of this different silviculture treatment."

Special Prescription:
Aspen, Meadow, & Wet Area Restoration

2014 THP in Plumas County – Use of Current Special Prescription

FROM THP: "Meadow Restoration Protection Measures:

1. See "Meadow Restoration" Map for the location of the meadow restoration area.
2. General Guidelines for Harvesting Operations:
    a. May take place during the summer period when the ground is sufficiently dry and rutting is not likely to occur (ground is no longer saturated). Operations may also take place during the Winter Period (November 15th to April 1st) during dry rainless periods prior to snowfall and the first occurrence of saturated soils. Within the Winter Period, once soils become saturated, timber operations shall be suspended until the following summer period.
    b. Within the dry meadow area rubber tired and track equipment shall be permitted to accomplish meadow restoration effort.
3. Meadow Restoration Flag Scheme:
    a. Meadow Restoration area has been delineated with candy striped orange and white flagging. All trees within this zone will be removed except those trees that have been marked as leave trees (ringed with a hi-vis red/orange aerosol at or around dbh).
    b. Red and yellow flagging delineates a wildlife inclusion. These areas will be considered a "no treatment zone". No timber harvesting operations will be allowed within this area."

Special Prescription:
Aspen, Meadow, & Wet Area Restoration

2014 THP in Plumas County – Use of Current Special Prescription

FROM THP: "Meadow Restoration Protection Measures:

c. Blue and white candy striped flagging has been used to "center line" flag two Class III streamcourses that runs through the project area. Timber harvesting, to include the use of timber harvesting machinery will be allowed up to the edge of the stream channel (high water mark) but crossing of said watercourses will only be allowed at designated crossings (signified with solid pink flagging) . Crossing will only be permitted when said channels are dry at the time of traversing. Trees may be felled across dry channel if they cannot be felled away. Any debris that is put into the Class III channels because of the current logging activities will be removed prior to the end of the day if the U.S. Weather Service forecast is a "chance" (30% or more) of rain within the next 24 hours, and prior to weekend or other shutdown periods greater than 2 days.

4. Harvesting and Skidding Requirements:
   a. Whole trees will be skidded from the meadow to a landing site outside a given meadow area to be processed.
   b. Trees that are too large to be skidded whole may be bucked within a meadow area. Said trees will then be taken outside the designated Meadow Restoration area (orange and white candy striped flagging) to be processed (limbed).
   c. Excess material (to include small trees, larger limbs, and smaller downed woody material) will be *hand and (or) machined piled and burned in accordance to those provisions stipulated under Item 31 on page 17."*

Special Prescription:
Aspen, Meadow, & Wet Area Restoration

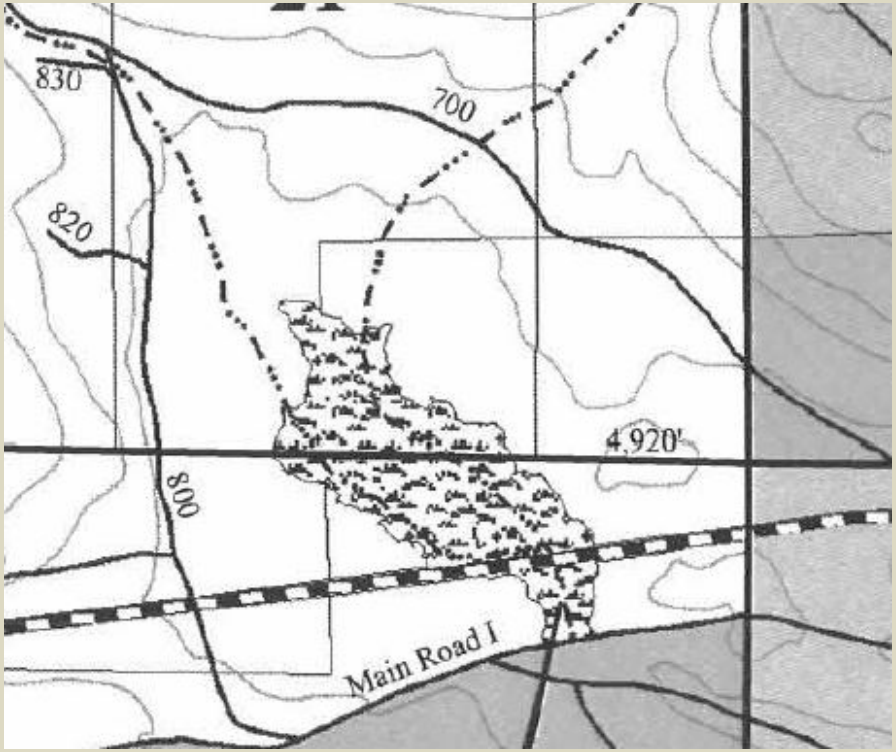
2014 THP in Plumas County – Use of Current Special Prescription

FROM THP – Measures of Success: "Meadows, both wet and dry comprise 983 acres of the Forest. Due to restrictive range and historical degradation all opportunities to enhance meadow communities within the Forest will be considered as areas come under plan. Enhancement projects will be completed pursuant to 14 CCR §933.4(e). This will be accomplished in part by; 1) identifying and delineating potential meadows as they come under plan, 2) removing competing conifers from in and around the meadow, 3) monitor treated stands using photo points and 4) repeating treatment as required to sustain the meadow.

The THP meadow restoration project was put together in consultation with the company Biologist and Fish and Game Region 2 Environmental Scientist Steve Cordes. It was upon their favorable approval of the proposed meadow work that it has been incorporated into this THP.

Special Prescription:
Aspen, Meadow, & Wet Area Restoration

2014 THP in Plumas County – Use of Current Special Prescription



Special Prescription:
Aspen, Meadow, & Wet Area Restoration

2014 THP in Plumas County – Use of Current Special Prescription

Preharvest Stand Condition 2014 Imagery - (black bordered area) – 40 acres. From THP - "Wet Meadows comprise <10% of the Sierra Nevada but are considered to be one of the most biologically active communities (Bailiff 1982)."

Special Prescription:
Aspen, Meadow, & Wet Area Restoration

2014 THP in Plumas County – Use of Current Special Prescription

Post Harvest Stand Condition- 2016 Imagery - (black bordered area) – Measure of Success "The ecological goal of this project is to restore the historical meadow margin. Currently, this area is being lost to the continued encroachment of several conifers tree species (mainly lodgepole pine)."

Special Prescription:
Aspen, Meadow, & Wet Area Restoration

2014 THP in Plumas County – Use of Current Special Prescription

1962 Imagery Of Meadow Area

Special Prescription:
Aspen, Meadow, & Wet Area Restoration

2014 THP in Plumas County – Use of Current Special Prescription

Post Harvest Stand Condition – “Within the meadow area some of the larger conifers (mainly Jeffrey pine and ponderosa pine) will be retained. These larger trees will serve as perch, "plucking posts", shade, and potential nest sites that have been dispersed.”

Special Prescription:
Aspen, Meadow, & Wet Area Restoration

2014 THP in Plumas County – Use of Current Special Prescription

"Preliminary analysis appears to point to a significant increase in soil moisture and groundwater in the study area". Masters thesis to be completed in November, 2016

Special Prescription:
Aspen, Meadow, & Wet Area Restoration

2009 NTMP in Lassen County – Use of Current Special Prescription (amendment)

FROM THP: "MEADOW RESTORATION (#14) -
An estimated +/- 20 acres is planned for "Meadow Restoration" where all conifer trees are to be treated and harvested in order to restore, retain and enhance these areas for ecological and range values. The following information is provided to comply with 14 CCR 939.15.

1. The project type is "meadow restoration."
2. The treatment area is shown on the "Silviculture" map on page 41.
3. The area is approximately 20 acres and is aimed at restoring former meadow land that has been encroached upon by lodgepole pine within the last 100 years. Conventional logging equipment including feller bunchers and tractor skidders will be used. Some hand felling may be needed.
4. The RPF met with Robin Fallscheer of CA DFW on the property on November 13, 2013 when the ground was free of snow. The following summarizes issues she addressed:
    i) Botanical surveys prior to operations should also include *Anthoxanthum nitens ssp. Nitens* (vanilla-grass). The botanist shall be informed prior to survey of potential skid routes if outside of forested areas.
    ii) Seasonal operating restrictions for sandhill cranes may be warranted.
    iii) Operations should be restricted to later than July 15th, later if dictated by other resources such as soil saturation criteria or sandhill crane breeding period as alternative to the discussion at the PHI.
    iv) Monitoring for weeds should be undertaken.
    v) No burning in the meadows.

George Cella of the Lahontan Water Quality Control Board was first consulted by phone on January 28, 2014. There was also an exchange of emails between the RPF and Mr. Cella with a final phone call on February 14, 2014."

Special Prescription:
Aspen, Meadow, & Wet Area Restoration

2009 NTMP in Lassen County – Use of Current Special Prescription (amendment)

FROM THP: "MEADOW RESTORATION (#14) - The RPF also consulted on site with Cassandra Roeder of the US fish and Wildlife Service on June 12, 2013. In September, the USFWS granted Federal environmental clearances for the meadow restoration project for biological and cultural resources to comply with NEPA.

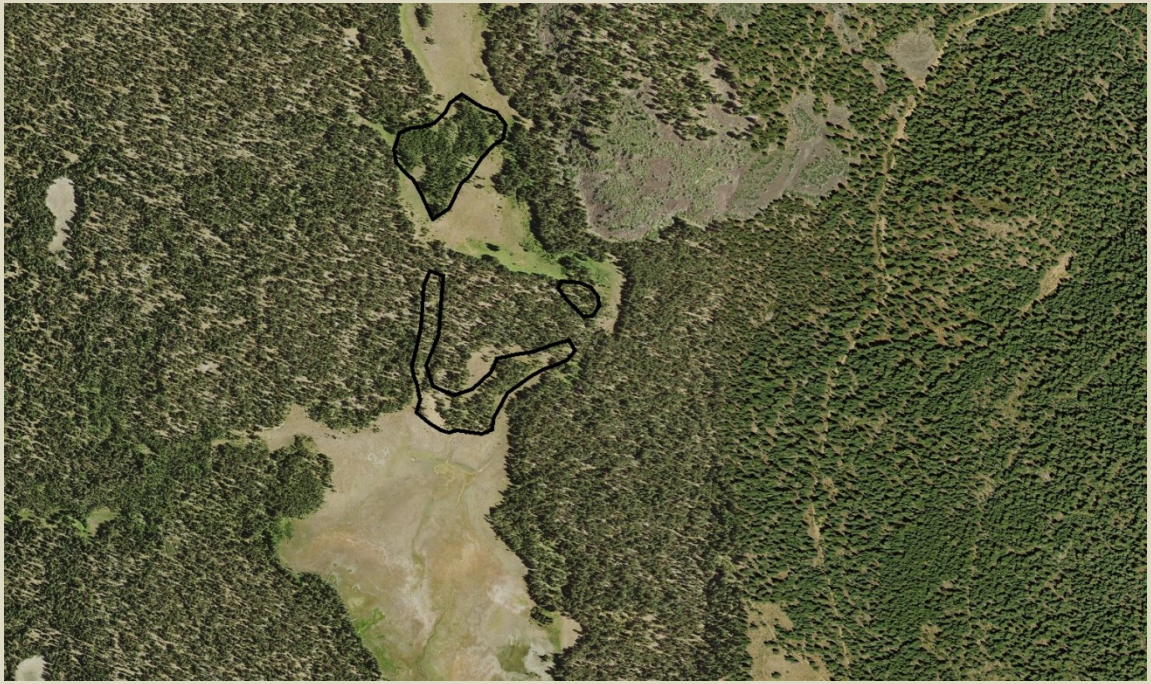
The RPF has also consulted with Linda Thomasma, the Collins Pine biologist in Chester, and Bobette Jones, a biologist with the Eagle Lake District of the Lassen National Forest. Both have experience with local meadow restoration projects.

The meadow area proposed for restoration under this NTMP is a portion of a larger project that also includes hand treatment of+/- 70 acres exempt from THP requirements and meeting Category 2 Timber Waiver conditions for hand crews (trees are under 11" dbh). Funding for the project is being sought by Lassen Land and Trails Trust (it holds a Conservation Easement on the property) from the Sierra Nevada Conservancy. The USFWS has already granted money towards the project. Biologists from the Lassen National Forest have offered to conduct meadow monitoring while Ducks Unlimited is interested in assisting with stream restoration on Pine Creek.

Of the area proposed for "Meadow Restoration" under this NTMP utilizing mechanical means, 12 acres was originally proposed for "Sanitation-Salvage" silviculture, I acre was proposed for "Commercial Thinning" silviculture, and 7 acres were classed using aerial photos as non-timber with no timber harvesting proposed . These latter 7 acres are principally areas that are recently being encroached upon by lodgepole pine. Boundaries of maps on pages 24 & 25 are not modified for these 7 acres to be treated because they are still basically non-timbered with trees generally under merchantable size for timber. On the other hand, the Silviculture map on page 41 does portray the perimeter of silviculture treatment areas that includes this 7 acres."

Special Prescription:
Aspen, Meadow, & Wet Area Restoration

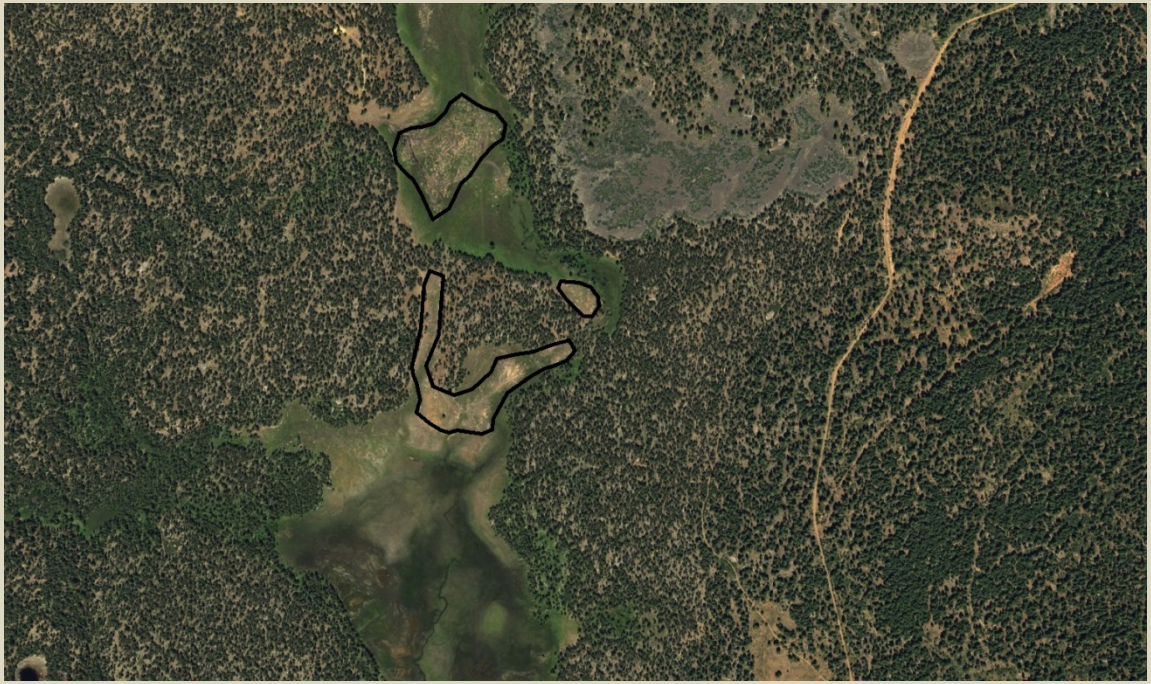
2009 NTMP in Lassen County – Use of Current Special Prescription (amendment)



2014 Imagery – Black Bordered Areas are the Amendment to Special Prescription

Special Prescription:
Aspen, Meadow, & Wet Area Restoration

2009 NTMP in Lassen County – Use of Current Special Prescription (amendment)



2016 Imagery – Black Bordered Areas are the Amendment to Special Prescription

Special Prescription:
Aspen, Meadow, & Wet Area Restoration

2009 NTMP in Lassen County – Use of Current Special Prescription (Amendment)

1952 Imagery

Special Prescription:
Aspen, Meadow, & Wet Area Restoration

2009 NTMP in Lassen County – Use of Current Special Prescription (Amendment)

Inspection – “The adjacent meadow restoration unit has significant standing water. Removal of the lodgepole pine may have substantially changed the water regime at this location.”

Special Prescription:
Aspen, Meadow, & Wet Area Restoration

2009 NTMP in Lassen County – Use of Current Special Prescription (Amendment)

Inspection – “A skid trail used during dry conditions is now fully submerged due to the abundance of water. Native grasses, sedges or woody plants will rapidly recolonize the site where sprouts are already visible.”

Special Prescription:
Aspen, Meadow, & Wet Area Restoration

2012 THP in Shasta County – Use of Current Special Prescription

FROM THP – Measures of Success: "(5) Project goals and measures of success: The Burney Gardens Meadow Restoration Project is designed to restore aspen stands and the natural form and function of the meadow, watercourses, and floodplain to reduce sediment flow into Burney Creek and the Pit River. The meadow will be restored from a transport reach to a response reach and deposition area. This objective will be accomplished by restoring the meadow and aspen to its historic pre-European condition as determined by historic aerial imagery. The THP proposes to remove all conifers within the Aspen, Meadow, and Wet Area Restoration. This project will benefit wildlife by enhancing the size of these habitats that are shrinking across the landscape. Success will be measured by the increased area of meadow vegetation, raised water table, increased forage, increased wildlife habitat, and late season water availability. Meadow vegetation (grasses and forbs) will quickly reoccupy the site.
However, meadow vegetation that occupies the site may be different than what currently exists and species locations may move to adjust to potential changes in the hydrology of the meadow. Lodgepole pine and aspen will regenerate and will need maintenance (prescribed fire, herbivory, hand cutting, or biomass). Removal of the lodgepole pine will increase the forage, allow distribution of cattle, and eliminate trailing of cattle along roads and watercourses that results in channelization and gullying.

(7) Monitoring: Project monitoring of the channel restoration work will be directed by Fall River Resource Conservation District in cooperation with the resource agencies and local landowners and managers. Photo points have been established, along with additional points set up during the data collection of the valley transects. Additional photographs and transect resurveys will take place periodically, especially after significant runoff seasons, to monitor channel stability and allow evaluation of project performance."

Special Prescription:
Aspen, Meadow, & Wet Area Restoration

2012 THP in Shasta County – Use of Current Special Prescription

FROM THP – Measures of Success: "Grazing management: A livestock management plan will be developed by working with project partners and landowners. The intent is to develop a plan that can be monitored to ensure project goals are met. This will include some fencing and rest of disturbed areas and aspen stands. Both meadow areas are fenced and cross fenced. Company has purchased additional fencing materials in anticipation of this project and the adjacent associated Company, THP project. Livestock currently graze the site when water still flows within the stream channels. Since the lodgepole encroachment is so severe, livestock concentrate in the open meadow areas, and during late fall when groundwater has dropped and pools no longer occur in the channel, livestock concentrate in meadow areas where springs or stock ponds have been created. After restoration, livestock forage is expected to be much greater and cattle will therefore be more dispersed through the THP area and upland area. This will greatly limit the impacts to the stream channel. However, if livestock continue to concentrate along the stream channels and cause impacts, the timing of grazing will be delayed in order for the ground conditions to become firm and withstand trampling. In general, a shorter duration of grazing that occurs later in the season will be the likely preferred grazing strategy to meet project goals.

Maintenance: The THP area is surrounded by a road system. The project includes biomass thinning between the road and meadows to facilitate prescribed burning in cooperation with the Cal Fire Vegetation Management Program and the USFS All Lands Initiative. However, prescribed burning does conflict with the closed cone forest type and there is a potential for rapid lodgepole pine reoccupation."

Special Prescription:
Aspen, Meadow, & Wet Area Restoration

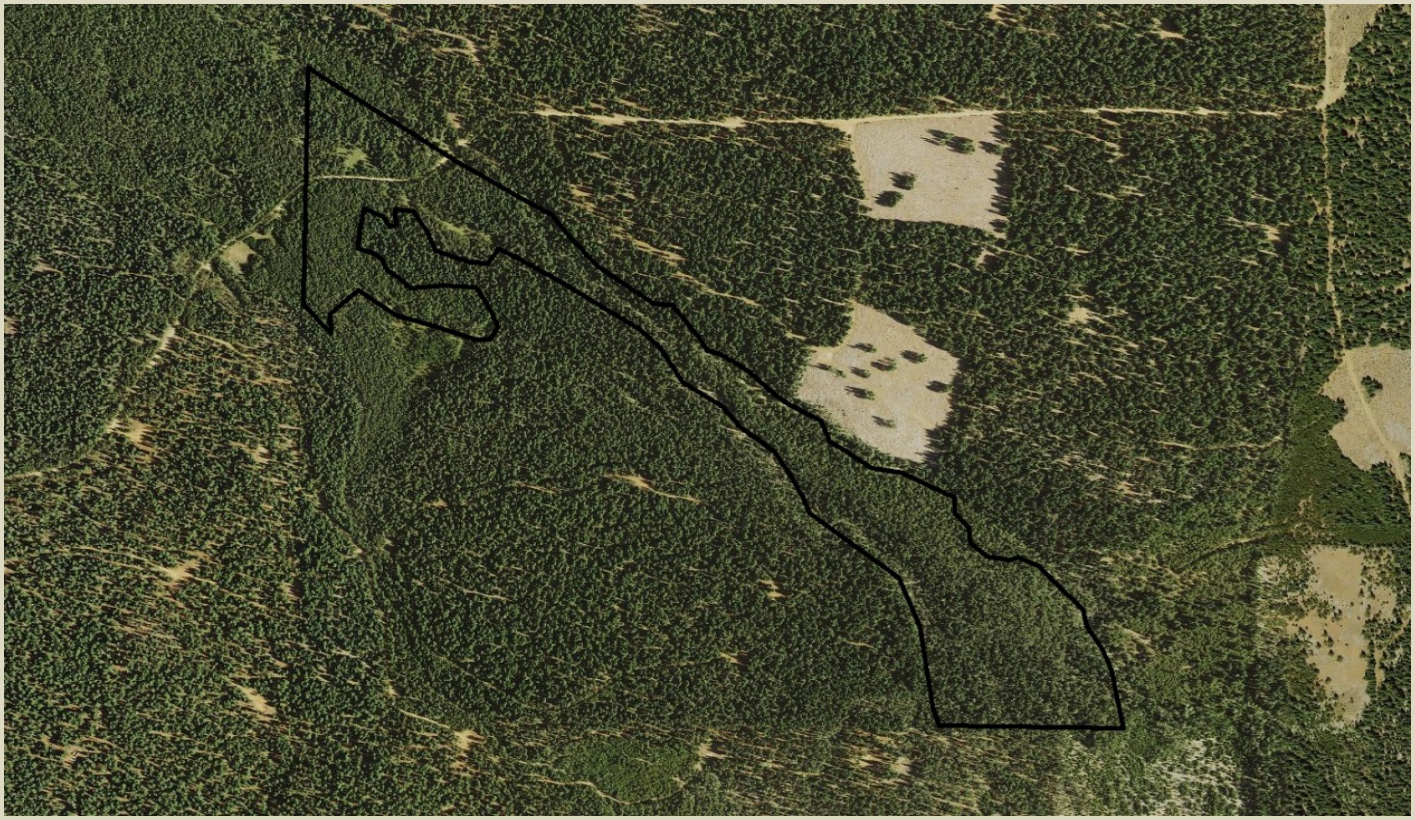
2012 THP in Shasta County – Use of Current Special Prescription

The following Pictures are only a small part of a 1,360 acre special prescription of aspen and wet meadow restoration project that includes multiple landowners.

Conversation with the RPF on the area harvested suggests many areas may not be harvested due to economic reasons. Some landowners are pursuing grants to accomplish the restoration projects due to low or negative economic return.

Special Prescription:
Aspen, Meadow, & Wet Area Restoration

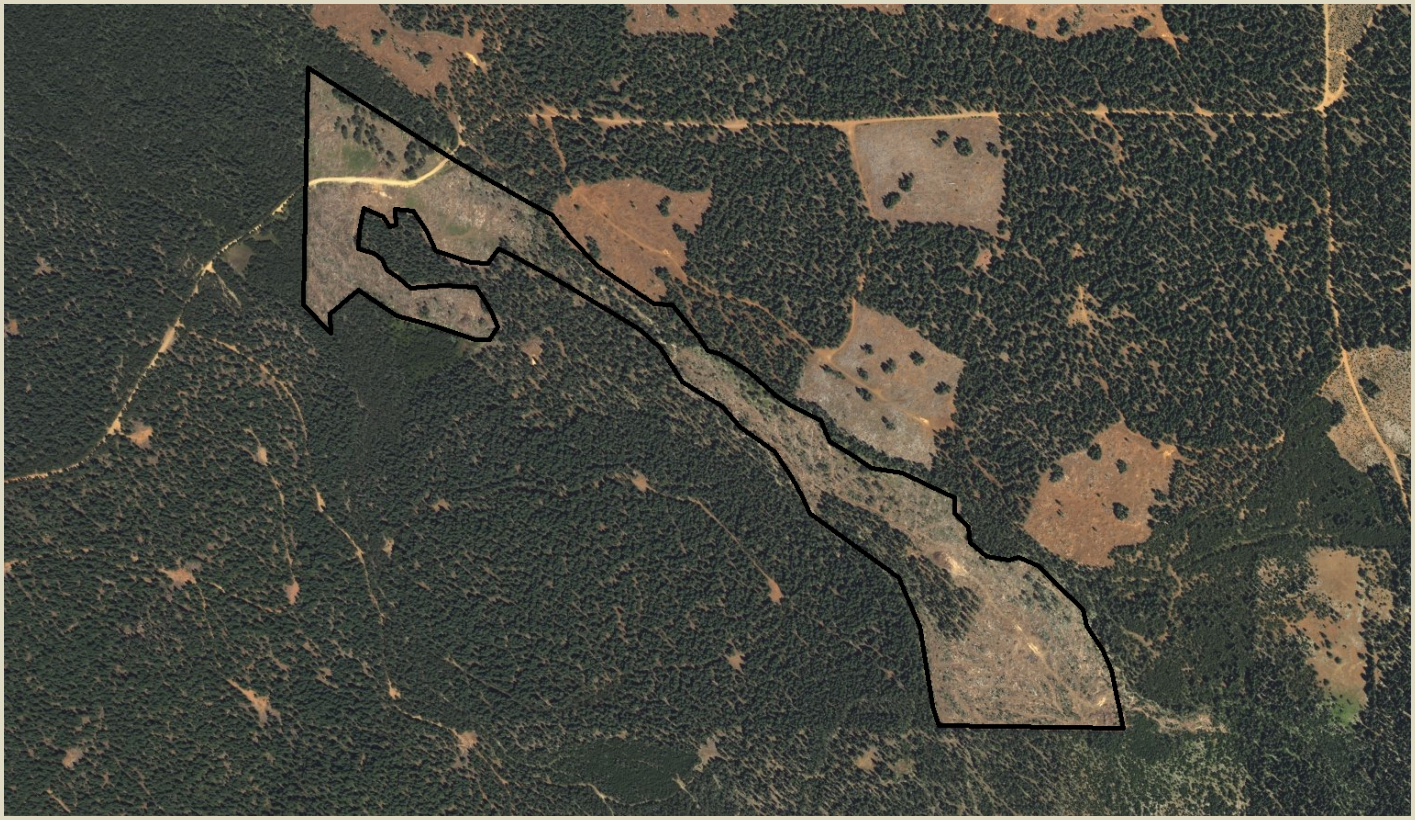
2012 THP in Shasta County – Use of Current Special Prescription



2014 Imagery – Black Bordered Areas are the Special Prescription

Special Prescription:
Aspen, Meadow, & Wet Area Restoration

2012 THP in Shasta County – Use of Current Special Prescription



2016 Imagery – Black Bordered Areas are the Special Prescription

Special Prescription:
Aspen, Meadow, & Wet Area Restoration

2012 THP in Shasta County – Use of Current Special Prescription

Blow down observed after harvest of surrounding dense lodgepole pine. Sucker sprouts were evident along the stump margins of the blown down aspens. Slash and blow down may help impede cattle in this free range location.

Special Prescription:
Aspen, Meadow, & Wet Area Restoration

2012 THP in Shasta County – Use of Current Special Prescription

Slash was heavy in concentrations in the meadow restoration areas. There was no plan to burn slash other than isolated piles. The area receives significant snow fall, so monitoring slash over time will determine how the slash breaks down and change in vegetation communities.

Special Prescription:
Aspen, Meadow, & Wet Area Restoration

2012 THP in Shasta County – Use of Current Special Prescription

Operational considerations – one area had a hot-saw operation, where small trees were able to be removed, this location utilized a bar-saw feller-buncher, and small trees were left. Most trees appeared to be poor form and vigor, but monitoring over time will determine if the regeneration quickly re-captures the site.

Special Prescription:
Aspen, Meadow, & Wet Area Restoration

2013 THP in Siskiyou County – Use of Current Special Prescription – Pre-harvest Photo Point establishment – Operations have not Commenced:

FROM THP – "(Aspen Restoration)
On 4/25/2013(DF&W Environmental Scientist) Andrew Yarusso was consulted regarding a 8 ac. Aspen Restoration Project in sec. 09. T47N R03W. Andrew Yarusso has field reviewed and approved this proposal. The proposal is to promote aspen regeneration through conifer removal and the creation of soil disturbance. The existing aspen stand encompasses approximately 5 acres of the proposed 8 acres of harvest area. The aspen grove is comprised of tree form and sprouts. The grove has approximately 140 BA of aspen up to 18" DBH. The aspen sprouts range from 20-200 sprouts/acre. The understory vegetation is comprise of deer brush willow, white oaks and grass and forbs. The surrounding stand is primarily a mixed conifer stand ranging from 40-160 BA . Conifer seedlings and saplings range from 25-100 seedlings/ acre under the present aspen grove. The proposal is to harvest all confers within the proposed 8 acre area except for 4 agreed conifers which were agreed to be retained for wildlife. This proposal is within 2 Class ill watercourses, the standard 25 ' equipment exclusion will be used adjacent to the watercourses. At least 50% of the understory vegetation present before timber operations shall be left living and well distributed within the EEZ, to maintain soil stability. To assure aspen enhancement hand slash lopping of submerchanable conifer saplings will be performed throughout the area. No Aspens are proposed for harvest under this prescription."

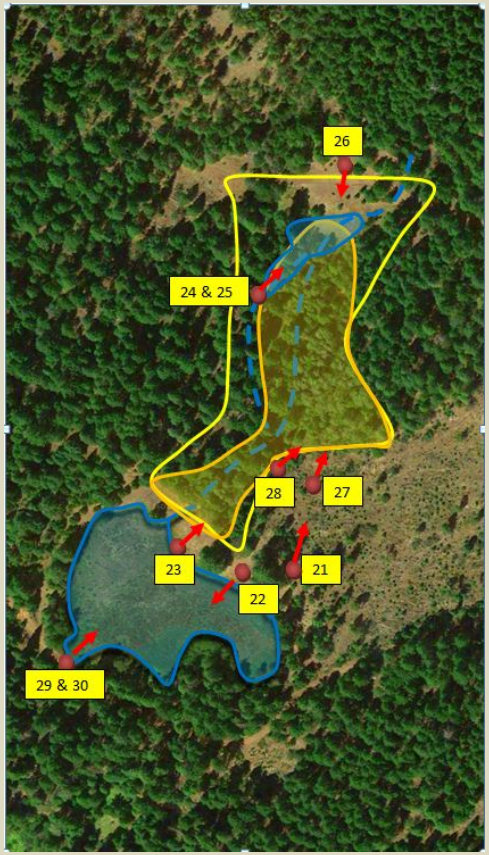
Special Prescription:
Aspen, Meadow, & Wet Area Restoration

2013 THP in Siskiyou County – Pre-harvest Photo Point Establishment:

2014 Imagery: Black Bordered Area

Special Prescription:
Aspen, Meadow, & Wet Area Restoration

2013 THP in Siskiyou County – Pre-harvest Photo Point Establishment:



Pond areas Class III WC Restoration area Aspen stand

Special Prescription:
Aspen, Meadow, & Wet Area Restoration

2013 THP in Siskiyou County – Pre-harvest Photo Point Establishment:

Pre-harvest Photo Point 23

Special Prescription:
Aspen, Meadow, & Wet Area Restoration

2013 THP in Siskiyou County – Pre-harvest Photo Point Establishment:

Pre-harvest Photo Point 26

Special Prescription:
Aspen, Meadow, & Wet Area Restoration

Post-harvest Environmental Impacts:

- The use of the special prescription is still relatively recent. No post-harvest negative impacts associated with the use of the special prescription have been noted in any inspection.

- Active and post-harvest Inspection comments have noted positive outcomes of the use of the special prescription, such as the increase in water yield and aspen sprouting.

Special Prescription:
Aspen, Meadow, & Wet Area Restoration

Comments from RPF Community:

- ❑ Biomass facilities are critical to help fund the removal of the non-merchantable trees that can be chipped and hauled.

- ❑ Having outside funding mechanisms, such as grants, is necessary in many cases for a “complete” restoration (removal of seedlings and saplings that won’t make chips and for continued maintenance).

- ❑ In many cases, the very nature of the Special Prescription necessitates the use of “in-lieu” practices, such as operations within the zone and reduction of canopy to enhance wet meadows or aspen stands along streams. Would the Board consider allowances for these practices without the need for explanation and justification as long as sideboards exist. It would be appropriate to just make these practices part of the standard rules for 14 CCR § 913.4 [933.4, 953.4] Special Prescriptions paragraph (e) Aspen, meadow and wet area restoration.

Special Prescription:
Aspen, Meadow, & Wet Area Restoration

Comments from RPF Community:

- The special prescription will, in many cases, increase the habitat availability for listed species, such as the Great Gray Owl. Landowners may be reticent to restore areas and then be required to have special mitigations for listed species at a later point in time after habitat improvement.

- Previously, 14 CCR §§ 939.15 and 959.15(b) allowed for clearcutting meadows for livestock and range improvement. This rule was simple and concise. The new special prescription rule changed a two sentence disclosure into a much longer discussion, which appears to be an unintended consequence. Many of these projects are a financial loss, so don't discourage or make it a disincentive for landowners who are willing to restore these features. Some managed ranches that have potential projects are unwilling to pay for the analysis and scrutiny that is required in the new rule.

Special Prescription:
Aspen, Meadow, & Wet Area Restoration

Comments from RPF Community:

- ❑ Can aspen be made a Group B species? In many cases thinning out the conifers around larger aspen in order to slowly progress to a more aspen dominated stand instead of a one-time removal of the conifers is preferable. Past THPs where this has occurred has resulted in aspen regeneration in openings created through the logging activities. Having aspen as a Group B species would reduce or eliminate the write-up required for aspen enhancement. This will assist in upland aspen stands where an established stand of larger diameter aspens is present but regeneration is lacking.

Special Prescription:
Aspen, Meadow, & Wet Area Restoration

Comments from RPF Community:

- ❑ It's important that the Review Agencies attend field trips with meadow enhancement biologists and visit sites during operations and post-harvest so they can learn about the positive effects of meadow restoration. Review Agencies may not understand the trade-offs between operations that may appear to negatively affect water quality, yet in the long run are actually proposed to enhance wildlife habitat, water yields, and other beneficial uses of water.
  - More involvement in inspections during and after operations may alleviate concerns they have expressed on proposed plans.
  - Mandating mitigation measures that actually are in contrast to the proposals desired future conditions, such as limiting operations within stream buffers, the necessity to leave trees when the goal is to enhance meadows, etc., places additional burdens on landowners already operating at a very low or negative rate of return.

Special Prescription:
Aspen, Meadow, & Wet Area Restoration

Comments from Unit Inspectors:

- Questions asked in the field are: If aspen related, would the aspen likely release if conifers are removed based on evidence of (coppice/ clonal) sprouting already on-site and is the aspen situated such that there is actually potential for root expansion based on soils? If I see no evidence of or potential for, then questions can arise as to the applicability of the Prescription. Example: A clump of aspen growing in a rock bowl is not likely to spread and expand beyond the natural "container" it is growing in.

- For meadows, it should be a meadow that is showing evidence of conifer encroachment where conifer removal would result in reversion back to a meadow. Example: Not every clear cut if left un-planted will become a meadow. Some Units have specified fairly strict slash treatment requirements where meadow grasses / plants will not typically grow well through dense mulch or slash. Whole tree yarding seems the most appropriate. For aspen, some ground disturbance is usually beneficial but WQ has expressed concerns.

Special Prescription:
Aspen, Meadow, & Wet Area Restoration

Comments from Unit Inspectors:

- An issue that is important to address in the review stage when considering any meadow/aspen Rx. The THP needs enforceable language about what to do with the remaining sub-merchantable "group-A" regeneration. If it needs to be (or should be) removed, then who does that and when does it need to be done.

- How are measures of success being addressed within the THPs? What is our roles as inspectors on enforcing that the measures are being followed and what happens if it is not successful? Discussion of the last two questions are still ongoing and may be moot if the special prescription, as described within the THP, are implemented as described.

- What has been suggested as a measureable standard ? More aspen stems present (obvious sprouting) than before? Then what to do if a standard that is described (hoped for in most cases) but is not achieved within the life of the THP for aspen and/or meadow?

Special Prescription:
Aspen, Meadow, & Wet Area Restoration

Comments from CDFW and WQ:

- ❑ It would be preferable to limit or exclude even-aged silviculture within 100-300 feet of the meadow to maintain an edge for nesting/denning species.
- ❑ There needs to be some kind of mechanism for removing sub-merchantable trees from the unit.
- ❑ Should the Board or Legislature consider meadow restoration as an exemption?
- ❑ Need to go and review each project – the variability's are vast between each project

Special Prescription:
Aspen, Meadow, & Wet Area Restoration

Comments from CDFW and WQ:

- Whereas aspen projects are fairly simple due to the presence of the species, meadow restoration projects are different, and sometimes it's difficult to tell whether a project will produce the desired results.
  - Sometimes not sure if there was a meadow there to begin with
  - Getting background info, like old photo's, could help in the discussion and determine the probability of success

Special Prescription:
Aspen, Meadow, & Wet Area Restoration

Findings/Observations/Suggestions:

1) Measures of Success

(e) Aspen, meadow and wet area restoration.

(5) *The RPF shall state the project goals and the measures of success for the proposed aspen, meadow, or wet area restoration project. For purposes of this subsection, measures of success means criteria related to a physical condition that can be measured using conventional forestry equipment or readily available technology to indicate the level of accomplishment of the project goals.*

(A) *Aspen, meadow or wet area project goals and measures of success shall be based on the condition assessment required in 14 CCR §§ 913.4, 933.4, and 953.4, subsection (e)(4), and identification of problematic aspen, meadow or wet area conditions and their agents/causes. Information shall include a description of factors that may be putting aspen stands, meadow, or wet areas at risk, and presence of any unique physical conditions. Projects shall be designed to contribute to rectifying factors that are limiting restoration, to the extent feasible.*

(6) *For projects of twenty (20) acres or less in size, the RPF has the option to not include the requirements of 14 CCR §§ 913.4, 933.4, and 953.4, subsections (e)(4) and (5) if the RPF consults with DFG prior to plan submittal and, if wet areas are proposed, the RPF shall also consult with the appropriate RWQCB in those locations where the applicable basin plan identifies wet areas as a beneficial use. The results of the consultation(s) shall be included in the plan*

Special Prescription:
Aspen, Meadow, & Wet Area Restoration

Findings/Observations/Suggestions:

1) Measures of Success Continued

- **The Board created options for the project proponent to utilize broad measures that can be easily measured with standard forestry equipment or readily available technology or if the project is <20 acres in size, utilize the pre-consultation process. Most of the smaller projects utilize the pre-consultation process. The one very large restoration project (1,360 acres) was prepared over multiple years, included many stakeholders and had a variety of input from professionals.**

- **For projects over 20 acres, the measures of success are relatively broad and simple; such as increase in meadow margins, increase in aspen sprouts, and the problems associated with the loss of these biological features over time.**

- **Quantifying the measure of success can be difficult; however, anecdotal evidence suggests that the projects that have been reviewed have initially met the measures and goals stated in the plans.**

- **The next 5 year review should re-visit the same sites to document vegetation changes, slash breakdown, water yield changes, aspen regeneration, and expansion or detraction of meadow margins**

Special Prescription:
Aspen, Meadow, & Wet Area Restoration

Findings/Observations/Suggestions:

2) Maintenance

- **The Forest Service project is planning on utilizing controlled burns to maintain the site and remove the small seedlings and saplings that will continue to invade. This mechanism of maintenance will most likely not be utilized in the private sector due to liability reasons.**

- **Seedlings and saplings must be continually treated to maintain these restoration projects over time; however, this is a costly endeavor and will unlikely be utilized. Regardless, the benefit to re-creating a habitat that has been disappearing is likely still gained through the use of the special prescription.**

- **Free range counties will continue to have issues with cattle browsing the aspen sprouts. Increased slash may actually be a benefit in some projects to impede cattle from reaching sprouts and allowing the sprouts to grow beyond the browsing stage.**

Special Prescription:
Aspen, Meadow, & Wet Area Restoration

Findings/Observations/Suggestions:

3) Comfort Level

- **Initial use of the special prescription caused some reactions from the regulatory agencies on possible negative environmental effects occurring from proposed projects. To date, no negative effects have been noted. Increased active and post-harvest inspections by all involved agencies is encouraged and projects that have "outside the box proposals", such as canopy removal and in-lieu proposals along streams to increase aspen expansion should be reviewed while operations are active, and then post harvest after at least one season to determine positive or negative impacts.**