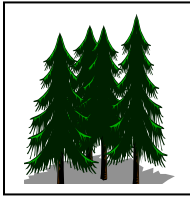


## Forestry (Silviculture) Management Measures



The SWRCB, CCC, and other State agencies have identified 12 MMs to address various phases of forestry operations relevant to controlling nonpoint sources of pollution that affect State waters. The forestry MMs are for the most part a system of practices used and

recommended by the Board of Forestry and Department of Forestry and Fire Protection in rules or guidance.

On a national level, silviculture contributes approximately 3 to 9% of NPS pollution to the Nation's waters (USEPA, 1992a). Without adequate controls, forestry operations may degrade the characteristics of waters that receive drainage from forest lands. For example (1) sediment concentrations can increase due to accelerated erosion, (2) water temperatures can increase due to removal of overstory riparian shade, (3) dissolved oxygen can be depleted due to the accumulation of slash and other organic debris, and (4) concentrations of organic and inorganic chemicals can increase due to harvesting and fertilizers and pesticides.

California's MMs to address silvicultural sources of nonpoint pollution:

- 2A. Preharvest Planning
- 2B. Streamside Management Areas
- 2C. Road Construction/Reconstruction
- 2D. Road Management
- 2E. Timber Harvesting
- 2F. Site Preparation/Forest Regeneration
- 2G. Fire Management
- 2H. Revegetation of Disturbed Areas
- 2I. Forest Chemical Management
- 2J. Wetlands Forest
- 2K. Postharvest Evaluation
- 2L. Education/Outreach

### **Management Measures:**

**Preharvest Planning.** Pursuant to MM 2A, silvicultural activities shall be planned to reduce potential delivery of pollutants to surface waters. Components of MM 2A address aspects of forestry operations, including: the timing, location and design of harvesting and road construction; site preparation; identification of sensitive or high-erosion risk areas; and the potential for cumulative water quality impacts.

**Streamside Management Areas (SMAs).** SMAs protect against soil disturbance and reduce sediment and nutrient delivery to waters from upland activities. MM 2B is intended to safeguard vegetated buffer areas along surface waters to protect the water quality of adjacent streams.

**Road Construction/Reconstruction.** Pursuant to MM 2C, road construction/reconstruction shall be conducted so as to reduce sediment generation and delivery. This can be accomplished by, among other means, following preharvest plan layouts and designs for road systems, incorporating adequate drainage structures, properly installing stream crossings, avoiding road construction in SMAs, removing debris from streams, and stabilizing areas of disturbed soil such as road fills.

**Road Management.** MM 2D describes how to manage roads to prevent sedimentation, minimize erosion, maintain stability, and reduce the risk that drainage structures and stream crossings will fail or become less effective. Components of this measure include inspections and maintenance actions to prevent erosion of road surfaces and to ensure the effectiveness of stream-crossing structures. The also addresses appropriate methods for closing roads that are no longer in use.

**Timber Harvesting.** MM 2E addresses skidtrail location and drainage, management of debris and petroleum, and proper harvesting in SMAs. Timber harvesting practices that protect water quality and soil productivity also have economic benefits by reducing the length of roads and skidtrails, reducing equipment and road maintenance costs, and providing better road protection.

**Site Preparation & Forest Regeneration.** Impacts of mechanical site preparation and regeneration operations—particularly in areas that have steep slopes or highly erodible soils, or where the site is located in close proximity to a waterbody—can be reduced by confining runoff onsite. MM 2F addresses keeping slash material out of drainageways, operating machinery on contours, timing of activities, and protecting ground cover in ephemeral drainage areas and SMAs. Careful regeneration of harvested forest lands is important in protecting water quality from disturbed soils.

**Fire Management.** Prescribed fire practices for site preparation and methods to suppress wildfires should as feasible be conducted in a manner that limits loss of soil organic matter and litter and that reduces the potential for runoff and erosion. Prescribed fires on steep slopes or adjacent to streams and that remove forest litter down to mineral soil are most likely to impact water quality.

**Revegetation of Disturbed Areas.** MM 2H addresses the rapid revegetation of areas disturbed during timber harvesting and road construction—particularly areas within harvest units or road systems where mineral soil is exposed or agitated (e.g., road cuts, fill slopes, landing surfaces, cable corridors, or skidtrails) with special priority for SMAs and steep slopes near drainageways.

**Forest Chemical Management.** Application of pesticides, fertilizers, and other chemicals used in forest management should not lead to surface water contamination. Pesticides must be properly mixed, transported, loaded, and applied, and their containers disposed of properly. Fertilizers must also be properly handled and applied since they also may be toxic depending on concentration and exposure. Components of MM 2I include applications by skilled workers according to label instructions, careful prescription of the type and amount of chemical to be applied, use of buffer areas for surface waters to prevent direct application or deposition, and spill contingency planning.

**Wetland Forest Management.** Forested wetlands provide many beneficial water quality functions and provide habitat for aquatic life. Activities in wetland forests shall be conducted to protect the aquatic functions of forested wetlands.

**Postharvest Evaluation.** The goals of MM 2K are to incorporate postharvest monitoring, including: a) implementation monitoring to determine if the operation was conducted according to specifications, and b) effectiveness monitoring after at least one winter period to determine if the specified operation prevented or minimized discharges.

**Education/Outreach.** The goals of MM 2L are to implement pollution prevention and education programs to reduce NPS pollutants generated from applicable silvicultural activities.

## **2. FORESTRY**

### **IMPLEMENTATION AUTHORITIES**

- 2A. Preharvest Planning
- 2B. Streamside Management Areas (SMAs)
- 2C. Road Construction and/or Reconstruction
- 2D. Road Management
- 2E. Timber Harvesting
- 2F. Site Preparation and Forest Regeneration
- 2G. Fire Management
- 2H. Revegetation of Disturbed Areas
- 2I. Forest Chemical Management
- 2J. Wetlands Forest
- 2K. Postharvest Evaluation
- 2L. Education/Outreach

**Management Measure 2A Preharvest Planning**

Component I. Perform advance planning for forest harvesting that includes the following elements where appropriate:

Agency	Authority	Programs	Implementation Location	Notes
Board of Forestry (BOF)/ California Department of Forestry and Fire Protection (CDF)	Forest Practice Act (Z' Berg Nejedly) (FPA) <sup>1</sup> ; Forest Practice Rules (FPRs) <sup>2</sup>	CDF Resource Management Program, Forest Practice Regulation	Statewide--Non-federal lands	<sup>1</sup> FPA is in PRC, Division 4, Chapter 8, § 4511 <i>et seq.</i> <sup>2</sup> FPRs are in Title 14, CCR, § 895 <i>et seq.</i> The authorities set forth on this page are the general informational requirements for each program document. On subsequent pages, more specific informational requirement authorities are given. These general requirements are not repeated, even where they specify relevant information.
	FPA 4551.3; FPR 1091.4-1091.7	Sustained Yield Plan	Same as above	Tiered landscape-scale option available to industrial timberland owners; may reduce issues to be addressed in subordinate Timber Harvesting Plans (THPs).
	FPA 4581, 4582; FPR 898, 1034	THP	Same as above	Required for all commercial timber harvesting not otherwise exempt.
	FPA 4581, 4582; FPR 1051.1	Modified THP (MTHP)	Same as above	Option for small low-impact operations meeting specified criteria
	FPA 4581, 4582; FPR 1092.9	Program THP (PTHP)	Same as above	THP tiered to a Program Timberland Environmental Impact Report (EIR). FPR 1092 requires that PTHPs comply with most operational and some informational requirements for THPs.
	FPA 4593.3, 4594; FPR 1090.5, 1090.7	Nonindustrial Timber Management Plan (NTMP) and Notice	Same as above	Option for uneven-age silviculture on nonindustrial parcels smaller than 2,500 acres. FPR 1090 requires that NTMPs comply with most operational and some informational requirements for THPs.
	FPR 921.1 (b)	THP	Coastal Zone Special Treatment Areas (CZSTA)	THP requirements are somewhat different and more stringent in Special Treatment Areas designated by CCC
	FPA 4516.5; 4516.8; FPR 927.2 4584	THP  Exemption	Marin Co.	These counties have slightly different planning requirements.

Agency	Authority	Programs	Implementation Location	Notes
Element (1): Identify (a) the area to be harvested including location of waterbodies and sensitive areas such as wetlands, threatened or endangered aquatic species habitat areas, or high-erosion-hazard areas (landslide-prone areas) within the harvest unit, and (b) the hydrologic unit where the project is located and name the waterbodies the project is tributary to.				
BOF/CDF	Same as Component; plus FPR 895.1; 912.5, Tech. Rule Addendum #1; 912.9, Tech. Rule Addendum # 2; FPR 914; 914.2(d), (f); 916.4(a), (b); 939.15	THP, MTHP, PTHP, NTMP	Statewide	
	Same as above, plus FPR 926.14	Same as above	Santa Cruz Co.	
	Same as above, plus FPR 965.5(e), (f)	Same as above	Monterey Co.	
	Same as above, plus FPR 921.1(a)	Same as above	CZSTA	
	FPR 1091.6(c)	Sustained Yield Plan (SYP)	Statewide	
Element (2): Time the activity for the season or moisture conditions to avoid degradation of water quality and prevent impacts to beneficial uses. Avoid any activities that cause soil disturbance or discharge from road surfaces during wet weather except for emergency maintenance work.				
BOF/CDF	Same as component I; plus FPR 895.1; 914.6(a), (b), (h); 914.7; 914.8(d); 915.1(b); 916.4(c); 916.7; 917.2(a); 917.3(b); 937.3(a); 957.3(a); 917.4(b), (c); 917.5(b); 923.1(j); 923.2(n), (q), (r), (s), (t); 923.4(d), (e), (f), (g), (o); 923.5(e), (f), (h), 923.6;	THP, MTHP, PTHP, NTMP	Statewide	
	Same as above, plus FPR 927.1; 927.9; 927.11(b); 927.17	Same as above	Marin Co.	
	Same as above, plus FPR 925.1; 926.18; 965.5	Same as above	Santa Clara, Santa Cruz, Monterey Co.	
	Same as above, plus FPR921.3(c); 921.5(c); 961.3(b); 961.5(f)	Same as above	CZSTA	
Element (3): Consider potential water quality impacts and erosion and sedimentation control in the selection of silviculture and regeneration systems, especially for harvesting and site preparation.				
BOF/CDF	FPA 4551.5, 4551.7, 4562.5; FPR 895.1; 912.9, Tech. Rule Addendum #2; 913.1(a); 913.4(a), (b); 913.6(b); 914; 914.7; 915; 915.3; 915.4; 917.3(d), (e)	THP, MTHP, PTHP, NTMP	Statewide	
	Same as above, plus FPR 954.4	Same as above	Southern District	
	Same as above, plus FPR 921.3(c)	Same as above	CZSTA	
	Same as above, plus FPR 913.8(b)	Same as above	Southern subdistrict of Coast District	
	Same as above, plus FPR 927.12(a)	Same as above	Marin Co	

Agency	Authority	Programs	Implementation Location	Notes
<b>Element (4): Reduce the risk of occurrence of landslides and severe erosion by identifying high-erosion-hazard areas and avoiding timber operations where they may exacerbate risk.</b>				
BOF/CDF	Same as component I, plus FPR 912.5, Tech Rule Addendum #1; 912.9, Tech Rule Addendum #2; 913.1(a), 914.2(d), (f), 914.6(c), 914.7, 916.4(a)	THP, MTHP, PTHP, NTMP	Statewide	
	Same as above, plus FPR 921.1(a), 921.5(a), (b), 961.5(d)	Same as above	CZSTA	
	Same as above, plus FPR 913.8(b)	Same as above	Southern Subdistrict of Coast District	
<b>Element (5): Consider cumulative effects from timber operations or roads to any known existing water quality impairments or problems in watersheds.</b>				
BOF/CDF	Same as component; FPR 898; 912.9, Tech. Rule Addendum #2	THP	Statewide	

#### Management Measure 2A Preharvest Planning

##### Component 2. Perform advance planning for forest road systems that includes the following elements where appropriate:

<b>Element (1): Locate and design road systems to minimize potential sediment generation and delivery to surface waters. Key components are: (a) locate roads, landings, and skid trails to avoid steep grades and steep or unstable hillslope areas, and to decrease the number of stream crossings; (b) avoid to the extent practicable locating new roads and landings in SMAs; and (c) determine road usage and select the appropriate road standard.</b>				
BOF/CDF	FPA 4562.7; 4582; 4593.3(b) FPR 895.1; 914; 914.2; 914.8; 916.3(c); 916.4(a), (d); 923; 923.1; 923.2(v); 923.3; 923.5(a), (b), (d)	THP, MTHP, PTHP, NTMP	Statewide	
	Same as above, plus FPR 921.1(b); 921.5(a), (b), (c), (d); 961.5	Same as above	CZSTA	
	Same as above, plus FPR 926.16	Same as above	Santa Cruz Co	
	Same as above, plus 927.2(e); 965.1	Same as above	Marin, Monterey Co.	
	FPR 1091.6(c)	SYP	Statewide	
<b>Element (2): Locate and design temporary and permanent stream crossings to prevent failure and control impacts from the road system. Key components are: (a) size, design and site crossing structures to prevent failure and minimize diversion potential; (b) for fish-bearing streams, design crossings to facilitate fish passage.</b>				
BOF/CDF	FPA 4562.7(b), (f) FPR 895.1; 914.8; 916.3(c); 916.4(c), (d); 923.2(e); 923.3(a), (c), (e)	THP, MTHP, PTHP, NTMP	Statewide	
	FPR 926.16	Same as above	Santa Cruz Co.	
<b>Element (3): Ensure that the design of road prism and the road surface drainage is appropriate to the terrain and that road surface design is consistent with the road drainage structures.</b>				
BOF/CDF	FPR 914.6(c); 923(c), (f); 923.1(d), (f), (g); 923.2	THP, MTHP, PTHP, NTMP	Statewide	
	FPR 921.5(b)	Same as above	CZSTA	
	FPR 927.11(a)	Same as above	Marin Co	
<b>Element (4): Use suitable materials for surface roads planned for all-weather use to support truck traffic.</b>				
BOF/CDF	FPR 895.1; 923.1(a), 923.2(t); 923.4(h)	THP, MTHP, PTHP, NTMP	Statewide	

Element (5): Design road systems to avoid high erosion or landslide hazard areas. Identify these areas and consult a qualified specialist for design of any roads that must be constructed through these areas.				
BOF/CDF	FPR 898.1(b); 912.5, Tech. Rule Addendum #1; 914.2(d); 923(c), (d), (f), (g); 923.1(c), (d)	THP, MTHP, PTHP, NTMP	Statewide	

The following are BACKUP AUTHORITIES that pertain to the Preharvest Planning Management Measure.				
Agency	Authority	Program	Implementation Location	Notes
Local governments	PZL (Gov. Code §§65000 et seq.) and CCA §30500	<ul style="list-style-type: none"> <li>• General Plans/GP updates</li> <li>• LCPs/LCP amendments</li> <li>• Permits pursuant to above</li> <li>• Enforcement</li> </ul>	Statewide (LCP policies/ordinances apply in coastal zone)	Local governments adopt ordinances and rules and make land-use decisions consistent with State law.
SWRCB/ RWQCB	PCWQCA	<ul style="list-style-type: none"> <li>• NPSMP</li> <li>• Basin Plans</li> <li>• Cease and Desist Orders</li> <li>• Cleanup and Abatement Orders</li> <li>• Admin. Civil Liability</li> </ul>	Statewide	
DFG	FGC § 5650	Discharge to waters of the State violations	Statewide	
DHS	HSC § 116275 et seq.	Drinking water source assessment and protection; drinking water sampling and analysis; regulation of public drinking water systems	Watersheds associated with drinking water sources	Assessment of potential contaminating activities in watershed; self-determined protection programs by drinking water systems and communities; collection of data on contaminants in drinking water supplies for the evaluation of water quality.
DPR	Div. I, Chapter 1.25, Div. V, PRC §5000 et seq.		SPS	DPR operates and maintains units of the SPS in forested areas.

**Management Measure 2B Streamside Management Areas (SMAs)**

**Component 1. Establish and maintain a streamside management area along surface waters that is sufficiently wide and which includes a sufficient number of canopy species to buffer against detrimental changes in the temperature regime of the waterbody, to provide bank stability, and to withstand wind damage.**

Agency	Authority	Programs	Implementation Location	Notes
BOF/CDF	FPA 4551; 4562.7; FPR 895.1; 912.9, Tech. Rule Addendum # 2; 953.7; 915.2(b); 915.3(a); 916; 916.2; 916.3(d); 916.4(a), (b), (c), (d); 916.5; 917.3(d); 923.1(h)	THP, MTHP, P THP, NTMP	Statewide— Nonfederal lands	
	Same as above, plus FPR 961.1(a); 921.5(b); 921.6(c); 921.7	Same as above	CZSTA	
	Same as above, plus FPR 965.6	Same as above	Monterey Co.	
SCC	PRC Chapter 6, Div 21	CREP	Coastal zone and coastal watersheds, statewide	The SCC may acquire fee or less than fee interests in land to protect coastal streams and wetlands.

**Component 2. Manage the SMA including flood-prone areas in such a way as to protect against soil disturbance in the SMA and delivery to the stream of sediments and nutrients generated by forestry activities, including harvesting.**

BOF/CDF	FPA 4551; 4562.7; FPR 953.7; 914, 914.1(a), (c); 914.3(e); 915.3(a); 916; 916.2; 916.3(a), (b), (c), (e); 916.4(b), (c), (d); 915.5; 916.7; 923.2(v)	THP, MTHP, P THP, NTMP	Statewide	
SCC	PRC Chapter 6, Div 21	CREP	Coastal zone and coastal watersheds, statewide	The SCC may acquire fee or less than fee interests in land to protect coastal streams and wetlands.

**Component 3. Manage the SMA canopy species to provide a sustainable source of large woody debris needed for instream channel structure and aquatic species habitat.**

BOF/CDF	FPA 4551; 4562.7; FPR 895.1; 912.9, Tech. Rule Addendum #2; 953.7; 915.3(a); 916; 916.2; 916.3(f), (g); 916.4(b); 916.5; 917.3(d)	THP, MTHP, P THP, NTMP	Statewide	
	Same as above, plus FPR 921.6(c)	Same as above	CZSTA	
	Same as above, plus FPR 927.12	Same as above	Marin Co.	
SCC	PRC Chapter 6, Div 21	CREP	Coastal zone and coastal watersheds, statewide	The SCC may acquire fee or less than fee interests in land to protect coastal streams and wetlands.

The following are BACKUP AUTHORITIES that pertain to the Streamside Management Areas Management Measure				
Agency	Authority	Programs	Implementation Location	Notes
Local governments	PZL (Gov. Code §§65000 et seq.) and CCA §30500	<ul style="list-style-type: none"> <li>• General Plans/GP updates</li> <li>• LCPs/LCP amendments</li> <li>• Permits pursuant to above</li> <li>• Enforcement</li> </ul>	Statewide (LCP policies/ordinances apply in coastal zone)	Local governments adopt ordinances and rules and make land-use decisions consistent with State law.
SWRCB/ RWQCB	PCWQCA	<ul style="list-style-type: none"> <li>• NPSMP</li> <li>• Basin Plans</li> <li>• Cease and Desist Orders</li> <li>• Cleanup and Abatement Orders</li> <li>• Admin. Civil Liability</li> </ul>	Statewide	
DFG	FGC § 5650	Discharge to waters of the State violations	Statewide	
DHS	HSC § 116275 et seq.	Drinking water source assessment and protection; drinking water sampling and analysis; regulation of public drinking water systems	Watersheds associated with drinking water sources	Assessment of potential contaminating activities in watershed; self-determined protection programs by drinking water systems and communities; collection of data on contaminants in drinking water supplies for the evaluation of water quality.
DPR	Div. I, Chapter 1.25, Div. V, PRC §5000 et seq.		State parks	DPR operates and maintains units of the SPS in forested areas.

Management Measure 2C: Road Construction/Reconstruction				
Agency	Authority	Programs	Implementation Location	Notes
Component (1): Follow preharvest planning (as described under Management Measure A) when constructing or reconstructing the roadway.				
BOF/CDF	Same as MM 2A, Component 2, plus FPR 923.2	THP, MTHP, PTHP, NTMP	Same as MM 2A, Component 2	
Component (2): Follow designs planned under Management Measure A for road surfacing and shaping..				
BOF/CDF	Same as above	Same as above	Same as above	
Component (3): Install road drainage structures according to designs planned under Management Measure A and regional storm return period and installation specifications. Match these drainage structures with terrain features and with road surface and prism designs.				
BOF/CDF	Same as above, plus FPR 895.1; 923.1(f), (g); 923.2(h), (o)	Same as above	Same as above	
Component (4): Guard against the production of sediment when installing stream crossings.				
BOF/CDF	FPR 916.3; 923; 923.3			
Component (5): Protect surface waters from slash and debris material from roadway clearing.				
BOF/CDF	FPR 914.1(a), (c); 916.3(a), (b), (c), (e); 916.4(b), (c); 923.19(d); 923.2(g), (u)			
Component (6): Use straw bales, silt fences, mulching, or other favorable practices on disturbed soils on cuts, fill, etc.				
BOF/CDF	FPR 916.7, 923.4(i), (k)			
Component (7): Avoid constructing new roads in SMAs to the extent practicable.				
BOF/CDF	FPR 916.3(c); 923.1(h); 923.3(v)			

The following are BACKUP AUTHORITIES that pertain to the Road Construction/Reconstruction Management Measure				
Agency	Authority	Programs	Implementation Location	Notes
Local governments	PZL (Gov. Code §§65000 et seq.) and CCA §30500	<ul style="list-style-type: none"> <li>• General Plans/GP updates</li> <li>• LCPs/LCP amendments</li> <li>• Permits pursuant to above Enforcement</li> </ul>	Statewide (LCP policies/ordinances apply in coastal zone)	Local governments adopt ordinances and rules and make land-use decisions consistent with State law.
SWRCB/ RWQCB	PCWQCA	NPSMP Basin Plans Cease and Desist Orders Cleanup and Abatement Orders Admin. Civil Liability		
DFG	FGC § 5650	Discharge to waters of the State violations	Statewide	
DHS	HSC § 116275 et seq.	Drinking water source assessment and protection; drinking water sampling and analysis; regulation of public drinking water systems	Watersheds associated with drinking water sources	Assessment of potential contaminating activities in watershed; self-determined protection programs by drinking water systems and communities; collection of data on contaminants in drinking water supplies for the evaluation of water quality.
DPR	Div. I, Chapter 1.25, Div. V, PRC §5000 et seq.		SPS	DPR operates and maintains units of the SPS in forested areas.

Management Measure 2D Road Management				
Agency	Authority	Programs	Implementation Location	Notes
Component (1): Avoid using roads for timber hauling or heavy traffic during wet or thaw periods on roads not designed and constructed for these conditions.				
BOF/CDF	FPR 923.2(i); 923.4(o); 923.6	THP, MTHP, PTHP, NTMP	Statewide	
Component (2): Evaluate the future needs for a road and close roads that will not be needed. Leave closed roads and drainage channels in a stable condition to withstand storms.				
BOF/CDF	FPR 923; 923.4(a), (b), (g); 923.8	Same as above	Statewide	
	FPR 926.17	THP, MTHP, PTHP, NTMP	Santa Cruz Co	
Component (3): Remove drainage crossings and culverts if there is a reasonable risk of plugging or failure from lack of maintenance.				
BOF/CDF	FPR 923.2(i); 923.4(d), (f), (l), (m); 923.8(e)	Same as above	Same as above	
Component (4): Following completion of harvesting, close and stabilize temporary spur roads and seasonal roads to control and direct water away from the roadway. Remove all temporary stream crossings.				
BOF/CDF	FPR 923.3(d); 923.4(b), (f), (g); 923.8	THP, MTHP, PTHP, NTMP	Statewide	
	FPR 926.19; 965.9	Same as above	Santa Cruz/Monterey Co	
Component (5): Inspect roads to determine the need for structural maintenance. Conduct maintenance practices, when conditions warrant, including cleaning and replacement of deteriorated structures and erosion controls, grading or seeding of road surfaces, and, in extreme cases, slope stabilization or removal of road fills where necessary to maintain structural integrity.				
BOF/CDF	FPR 923; 923.4(all); 923.8 PRC 4562.9	Same as above	Same as above	
Component (6): Conduct maintenance activities, such as dust abatement, so that contaminants or pollutants are not introduced into surface waters.				
BOF/CDF	FPR 916.3; 923, 923.4(h)	Same as above	Same as above	
Component (7): Properly maintain permanent stream crossings and associated fills and approaches to reduce the likelihood (a) that stream overflow will divert onto roads, and (b) that fill erosion will occur if the drainage structures become obstructed.				
BOF/CDF	FPR 923.2(h); 923.3(e); 923.4(n)	Same as above	Same as above	
The following are BACKUP AUTHORITIES that pertain to the Road Management Measure.				
Agency	Authority	Programs	Implementation Location	Notes
Local governments	PZL (Gov. Code §§65000 et seq.) and CCA §30500	<ul style="list-style-type: none"> <li>• General Plans/GP updates</li> <li>• LCPs/LCP amendments</li> <li>• Permits pursuant to above Enforcement</li> </ul>	Statewide (LCP policies/ordinances apply in coastal zone)	Local governments adopt ordinances and rules and make land-use decisions consistent with State law.
SWRCB/ RWQCB	PCWQCA	<ul style="list-style-type: none"> <li>• NPSMP</li> <li>• Basin Plans</li> <li>• Cease and Desist Orders</li> <li>• Cleanup and Abatement Orders</li> <li>• Admin. Civil Liability</li> </ul>	Statewide	
DFG	D&G Code §5650	Discharge to waters of the State violations	Statewide	

DHS	HSC § 116275 et seq.	Drinking water source assessment and protection; drinking water sampling and analysis; regulation of public drinking water systems	Watersheds associated with drinking water sources	Assessment of potential contaminating activities in watershed; self-determined protection programs by drinking water systems and communities; collection of data on contaminants in drinking water supplies for the evaluation of water quality.
DPR	Div. I, Chapter 1.25, Div. V, PRC §5000 et seq.		SPS	DPR operates and maintains units of the SPS in forested areas.

Management Measure 2E Timber Harvesting				
The timber harvesting management measure consists of implementing the following:				
Agency	Authority	Programs	Implementation Location	Notes
<b>Component 1. General</b>				
Element (1): Timber harvesting operations with skid trails or cable yarding follow layouts determined under Management Measure 2A.				
BOF/CDF	FPA 4562.7; FPR 914.2(f); 914.3(e);916.3(c); 916.4(d), (e)	THP, MTHP, PTHP, NTMP	Statewide	
	Same as above, plus FPR 921.1(a)	Same as above	CZSTA	
	FPA 4516.5(a); FPR 925.5; 926.16; 927.3; 928.3	Same as above	Santa Clara, Santa Cruz , Marin , San Mateo Co	
Element (2): Install landing drainage structures to minimize erosion and prevent sedimentation.				
BOF/CDF	FPR 923.1(d), (f); 923.5(f)	THP, MTHP, PTHP, NTMP	Statewide	
Element (3): Construct landings away from steep slopes and reduce the likelihood of fill slope failures. Protect landing surfaces used during wet periods. Locate landings outside SMAs.				
BOF/CDF	FPR 914.2(d), (f); 914.7; 916.3(c); 916.4(c), (d), (e); 923; 923.1(c), (d); 923.4(h), (i), 923.5(a), (b), (c), (f), (g); 923.6	THP, MTHP, PTHP, NTMP	Statewide	
Element (4): Protect stream channels and significant ephemeral drainages from logging debris and slash material.				
BOF/CDF	FPR 914.1(a), (c); 914.2(e); 916.3(a), (b) 916.4(c)	THP, MTHP, PTHP, NTMP	Statewide	
Element (5): Use appropriate areas for petroleum storage, equipment maintenance and service. Establish procedures to contain and treat spills. Recycle or properly dispose of all waste materials.				
BOF/CDF	FPR 914.5	THP, MTHP, PTHP, NTMP	Same as above	
<b>Component 2. For cable yarding:</b>				
Element (1): Limit yarding corridor gouge or soil plowing by properly locating cable yarding landings.				
BOF/CDF	FPR 914.3,(a), (d); 923(c)	THP, MTHP, PTHP, NTMP	Statewide	
Element (2): Locate corridors for SMAs following Management Measure 2B.				
BOF/CDF	Same as above	THP, MTHP, PTHP, NTMP	Statewide	

Component 3. For groundskidding:				
Element (1): Within SMAs, operate groundskidding equipment only at stream crossings. In SMAs, fell and endline trees to avoid sedimentation and damage to residual vegetation.				
Agency	Authority	Program	Implementation Location	Notes
BOF/CDF	FPR 914; 914.1(a), (c); 914.2(a); 916.3(c), (e); 916.4(c), (d), (e), (f)	THP, MTHP, PTHP, NTMP	Statewide	
Element (2): Use improved stream crossings for skid trails which cross flowing drainages. Construct skid trails to disperse runoff and with adequate drainage structures.				
BOF/CDF	FPR 914; 914.2(a), (i); 914.6 (c), (e), (f); 914.8(b); 916.3(c); 916.4(d), (f)	THP, MTHP, PTHP, NTMP	Statewide	
Element (3): On steep slopes, use cable systems rather than groundskidding where groundskidding may cause excessive erosion.				
BOF/CDF	FPR 914.2(b), (f); 914.3(e)	THP, MTHP, PTHP, NTMP	Statewide	
	FPR 921.5(a)	Same as above	CZSTA	

The following are BACKUP AUTHORITIES that pertain to the Timber Harvesting Management Measure.				
Agency	Authority	Programs	Implementation Location	Notes
Local governments	PZL (Gov. Code §§65000 et seq.) and CCA §30500	<ul style="list-style-type: none"> <li>• General Plans/GP updates</li> <li>• LCPs/LCP amendments</li> <li>• Permits pursuant to above</li> <li>• Enforcement</li> </ul>	Statewide (LCP policies/ordinances apply in coastal zone)	Local governments adopt ordinances and rules and make land-use decisions consistent with State law.
SWRCB/ RWQCB	PCWQCA	<ul style="list-style-type: none"> <li>• NPSMP</li> <li>• Basin Plans</li> <li>• Cease and Desist Orders</li> <li>• Cleanup and Abatement Orders</li> <li>• Admin. Civil Liability</li> </ul>	Statewide	
DFG	FGC § 5650	Discharge to waters of the State violations	Statewide	

DHS	HSC § 116275 et seq.	Drinking water source assessment and protection; drinking water sampling and analysis; regulation of public drinking water systems	Watersheds associated with drinking water sources	Assessment of potential contaminating activities in watershed; self-determined protection programs by drinking water systems and communities; collection of data on contaminants in drinking water supplies for the evaluation of water quality.
DPR	Div. I, Chapter 1.25, Div. V, PRC §5000 et seq.		SPS	DPR operates and maintains units of the SPS in forested areas.

**Management Measure 2F Site Preparation and Forest Regeneration**

Confine on-site potential NPS pollution and erosion resulting from site preparation and the regeneration of forest stands. The components of the management measure for site preparation and regeneration are:

Agency	Authority	Programs	Implementation Location	Notes
<b>Component (1): Select a method of site preparation and regeneration suitable for the site conditions.</b>				
BOF/CDF	FPA 4551.5, 4551.7, 4562.5; FPR 895.1; 914, 914.2(d), (e), (f), (j), 915, 915.1(a); 915.2; 915.3	THP, PTHP, NTMP	Statewide	Site preparation using fire is addressed in MM 2.0 G.  CA has extensive restocking requirements not included in MMs.
BOF/CDF	Same as above, plus FPR 914.2(k), 954.4	Same as above	Southern District	
BOF/CDF	Same as above, plus FPRA 921.3(b), (c)	Same as above	CZSTA	
BOF/CDF	Same as above, plus FPR 913.8(b)	Same as above	Southern subdistrict of Coast District	
BOF/CDF	Same as above, plus FPR 927.9	Same as above	Marin Co.	
<b>Component (2): Conduct mechanical tree planting and ground-disturbing site preparation activities on the contour of sloping terrain.</b>				
BOF/CDF				CA has no equivalent requirement
<b>Component (3): Do not conduct mechanical site preparation and mechanical tree planting on streamside management areas.</b>				
BOF/CDF	FPR 915.3(a), 916.4(c), (d)	THP, PTHP, NTMP	Statewide	
<b>Component (4): Protect surface waters from logging debris and slash material.</b>				
BOF/CDF	FPR 914; 914.2(e), (f), (j); 915; 915.3(a); 916.3(a), (b)	THP, MTHP, PTHP, NTMP	Statewide	
<b>Component (5): Suspend operations during wet periods.</b>				
BOF/CDF	FPR 914.7; 915.1(b)	THP, PTHP, NTMP	Statewide	
<b>Component (6): Locate windrows at a safe distance from drainages and SMAs to control movement of the material during high runoff conditions.</b>				
BOF/CDF	FPR 914.2 (e); 915.3(a)	THP, MTHP, PTHP, NTMP	Statewide	
<b>Component (7): Conduct bedding operations in high-water-table areas during dry periods of the year. Conduct bedding in sloping areas on the contour.</b>				
BOF/CDF	FPR 915; 915.3(a), 916.3(d); 916.4(c), (d)	THP, PTHP, NTMP	Statewide	
<b>Component (8): Protect small ephemeral drainages when conducting mechanical tree planting.</b>				
BOF/CDF	FPR 915; 915.3(a); 916.4(c), (d)	THP, PTHP, NTMP	Statewide	

The following are BACKUP AUTHORITIES that pertain to the Site Preparation and Forest Regeneration Management Measure				
Agency	Authority	Programs	Implementation Location	Notes
Local governments	PZL (Gov. Code §§65000 et seq.) and CCA §30500	<ul style="list-style-type: none"> <li>• General Plans/GP updates</li> <li>• LCPs/LCP amendments</li> <li>• Permits pursuant to above</li> <li>• Enforcement</li> </ul>	Statewide (LCP policies/ordinances apply in coastal zone)	Local governments adopt ordinances and rules and make land-use decisions consistent with State law.
SWRCB/ RWQCB	PCWQCA	NPSMP Basin Plans Cease and Desist Orders Cleanup and Abatement Orders Admin. Civil Liability	Statewide	
DFG	FGC § 5650	Discharge to waters of the State violations	Statewide	
DHS	HSC § 116275 et seq.	Drinking water source assessment and protection; drinking water sampling and analysis; regulation of public drinking water systems	Watersheds associated with drinking water sources	Assessment of potential contaminating activities in watershed; self-determined protection programs by drinking water systems and communities; collection of data on contaminants in drinking water supplies for the evaluation of water quality.
DPR	Div. I, Chapter 1.25, Div. V, PRC §5000 et seq.		SPS	DPR operates and maintains units of the SPS in forested areas.

**Management Measure 2G Fire Management**

Prescribe fire for site preparation and control or suppress wildfire in a manner which reduces potential nonpoint source pollution of surface waters.

**Component (1):** Intense prescribed fire should not cause excessive erosion due to the combined effect of removal of canopy species and the loss of soil-binding ability of subcanopy and herbaceous vegetation roots, especially in SMAs, in streamside vegetation for small ephemeral drainages, or on very steep slopes.

Agency	Authority	Programs	Implementation Location	Notes
BOF/CDF	FPA 4551.5, 4551.7; FPR 895.1; 915.2(a), (b); 915.3(a); 916.4(b); 916.5(e); 917.3(d); 937.3(c); 957.3(c)	THP, PTHP, NTMP	Statewide	CA has extensive logging-related fire hazard reduction requirements not in MMs.
	Same as above, plus FPR 921.6(b); 961.6	Same as above	CZSTA	
	Same as above, plus FPA, 4527, 4562; FPR 927.12(a)	Same as above	Marin Co.	

**Component (2):** Prescriptions for prescribed fire should protect against excessive erosion or prevent sedimentation.

BOF/CDF	PRC 4423; FPR 915.2; 917.3; 937.3; 957.3	THP, MTHP, PTHP, NTMP	Statewide	
	FPR 917.4(d)	Same as above	Southern Subdistrict of Coast District	
	FPR 957.4(d)	Same as above	High Use Subdistrict of Southern District	

**Component (3):** All bladed firelines, for prescribed fire and wildfire, should be plowed on contour or stabilized with water bars and/or other appropriate techniques if needed to control excessive sedimentation or erosion of the fireline.

BOF/CDF	FPR 914; 914.6(c), (e), (g), (h); 915.1	THP, MTHP, PTHP, NTMP	Statewide	
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**Component (4):** Rehabilitation and salvage logging areas burned by wildfires should be managed to minimize erosion and prevent sedimentation.

BOF/CDF		CDF Fire Protection Program	Statewide	CA has no BMPs for wildfire suppression as this is an emergency situation, not a land use.
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The following are BACKUP AUTHORITIES that pertain to the Fire Management Measure.				
Agency	Authority	Programs	Implementation Location	Notes
SWRCB/ RWQCB	PCWQCA	<ul style="list-style-type: none"> <li>• NPSMP</li> <li>• Basin Plans</li> <li>• Cease and Desist Orders</li> <li>• Cleanup and Abatement Orders</li> <li>• Admin. Civil Liability</li> </ul>	Statewide	
DFG	FGC § 5650	Discharge to waters of the State violations	Statewide	
DHS	HSC § 116275 et seq.	Drinking water source assessment and protection; drinking water sampling and analysis; regulation of public drinking water systems	Watersheds associated with drinking water sources	Assessment of potential contaminating activities in watershed; self-determined protection programs by drinking water systems and communities; collection of data on contaminants in drinking water supplies for the evaluation of water quality.
DPR	Div. I, Chapter 1.25, Div. V, PRC §5000 et seq.		SPS	DPR operates and maintains units of the SPS in forested areas.

Management Measure 2H Revegetation of Disturbed Areas				
Reduce erosion and prevent sedimentation by rapid revegetation of areas disturbed by timber operations.				
Component (1): Revegetate disturbed areas (using seeding or planting) promptly after completion of earth-disturbing activity. Local growing conditions will dictate the timing for establishment of vegetative cover.				
Agency	Authority	Programs	Implementation Location	Notes
BOF/CDF	FPR 914; 914.2(I); 914.6(a), (b), (f); 916.7, 923.2(m); 923.3(d); 923.4(i); 923.5(f); 923.8(b)	THP, MTHP, PTHP, NTMP	Statewide	The only pertinent FPRs are statewide.
SCC	PRC Chapter 6, Div 21	CREP	Coastal zone and coastal watersheds, statewide	SCC implements revegetation efforts to enhance coastal streams and wetlands.
Component (2): Use mixes of species and treatments developed and tailored for successful vegetation establishment for the region or area.				
BOF/CDF	FPR 916.7	THP, MTHP, PTHP, NTMP	Statewide	Same as above.
SCC	PRC Chapter 6, Div 21	CREP	Coastal zone and coastal watersheds, statewide	SCC implements revegetation efforts to enhance coastal streams and wetlands.
Component (3): Concentrate revegetation efforts initially on priority areas such as disturbed areas in SMAs or the steepest areas of disturbance near drainages.				
BOF/CDF	FPR 916.7; 923.3(m) ; 923.5(f)	THP, MTHP, PTHP, NTMP	Statewide	Same as above.
SCC	PRC Chapter 6, Div 21	CREP	Coastal zone and coastal watersheds, statewide	SCC implements revegetation efforts to enhance coastal streams and wetlands.

The following are BACKUP AUTHORITIES that pertain to the Revegetation of Disturbed Areas Management Measure.				
Agency	Authority	Programs	Implementation Location	Notes
Local governments	PZL (Gov. Code §§65000 et seq.) and CCA §30500	<ul style="list-style-type: none"> <li>• General Plans/GP updates</li> <li>• LCPs/LCP amendments</li> <li>• Permits pursuant to above</li> <li>• Enforcement</li> </ul>	Statewide (LCP policies/ordinances apply in coastal zone)	Local governments adopt ordinances and rules and make land-use decisions consistent with State law.
SWRCB/ RWQCB	PCWQCA	<ul style="list-style-type: none"> <li>• NPSMP</li> <li>• Basin Plans</li> <li>• Cease and Desist Orders</li> <li>• Cleanup and Abatement Orders</li> <li>• Admin. Civil Liability</li> </ul>	Statewide	
DFG	FGC § 5650	Discharge to waters of the State violations	Statewide	
DHS	HSC § 116275 et seq.	Drinking water source assessment and protection; drinking water sampling and analysis; regulation of public drinking water systems	Watersheds associated with drinking water sources	Assessment of potential contaminating activities in watershed; self-determined protection programs by drinking water systems and communities; collection of data on contaminants in drinking water supplies for the evaluation of water quality.
DPR	Div. I, Chapter 1.25, Div. V, PRC §5000 et seq.		SPS	DPR operates and maintains units of the SPS in forested areas.

**Management Measure 2I Forest Chemical Management**

Use chemicals when necessary for forest management in accordance with the following to reduce nonpoint source pollution impacts due to the movement of forest chemicals off-site during and after application:

**Component (1):** Conduct applications by skilled and, licensed applicators according to the registered use, with special consideration given to impacts to nearby surface waters.

Agency	Authority	Programs	Implementation Location	Notes
CDPR <sup>1</sup> and CAC	3CCR § 6530-6534 <sup>2</sup>		Statewide, via county farm advisors	<sup>1</sup> BOF/CDF have no authority to regulate pesticide or fertilizer use. <sup>2</sup> Applicable requirements are set forth in FAC, Title 3, Division 6, Pesticides and Pest Control Operations

**Component (2):** Carefully prescribe the type and amount of pesticides appropriate for the insect, fungus, or herbaceous species.

CDPR and CAC	3CCR §6550-6557		Same as above	
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**Component (3):** Prior applications of pesticides and fertilizers, inspect the mixing and loading process and the calibration of equipment, and identify the appropriate weather conditions, the spray area, and buffer areas for surface waters and mixing and loading areas.

CDPR and CAC	3CCR §6600-6620, 6622-6627		Same as above	
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**Component (4):** Establish and identify buffer areas for surface waters to protect beneficial uses. (This is especially important for aerial applications.)

CDPR and CAC	3CCR § 6800, 6802, 6540, 6544		Same as above	
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**Component (5):** Immediately report accidental spills of pesticides or fertilizers into surface waters to the California Office of Emergency Services (Cal/OES). Develop an effective spill contingency plan to contain spills.

CDPR and CAC	3CCR §6670-6684		Same as above	
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The following are BACKUP AUTHORITIES that pertain to the Forest Chemical Management Measure.				
Agency	Authority	Programs	Implementation Location	Notes
Local governments	PZL (Gov. Code §§65000 et seq.) and CCA §30500	<ul style="list-style-type: none"> <li>• General Plans/GP updates</li> <li>• LCPs/LCP amendments</li> <li>• Permits pursuant to above</li> <li>• Enforcement</li> </ul>	Statewide (LCP policies/ordinances apply in coastal zone)	Local governments adopt ordinances and rules and make land-use decisions consistent with State law.
SWRCB/ RWQCB	PCWQCA	NPSMP Basin Plans Cease and Desist Orders Cleanup and Abatement Orders Admin. Civil Liability	Statewide	
DFG	FGC § 5650	Discharge to waters of the State violations	Statewide	
DHS	HSC § 116275 et seq.	Drinking water source assessment and protection; drinking water sampling and analysis; regulation of public drinking water systems	Watersheds associated with drinking water sources	Assessment of potential contaminating activities in watershed; self-determined protection programs by drinking water systems and communities; collection of data on contaminants in drinking water supplies for the evaluation of water quality.
DPR	Div. I, Chapter 1.25, Div. V, PRC §5000 et seq.		SPS	DPR operates and maintains units of the SPS in forested areas.

**Management Measure 2J Wetlands Forest**

Plan, operate, and manage normal, ongoing forestry activities (including harvesting, road design and construction, site preparation and regeneration, and chemical management) to adequately protect the aquatic functions of forested wetlands.

Agency	Authority	Programs	Implementation Location	Notes
BOF/CDF	FPR 895.1; 912.9, Tech. Rule Addendum #2; 915.1(b); 916.3(c), (d); 923(d); 923.2(r); 923.5(e)	THP, MTHP, PTHP, NTMP	Statewide	FPR 1090 and 1092, respectively, require that NTMPs and PTHPs comply with all operational and some informational THP requirements.
	Same as above, plus FPR 953.7; 939.15; 959.15(b)	Same as above	Northern and Southern Districts	
	Same as above, plus FPR 921.5(c), 961.5(f)	Same as above	CZSTA	
	Same as above, plus FPR 927.11	Same as above	Marin Co.	
The following are BACKUP AUTHORITIES that pertain to the Wetlands Forest Management Measure.				
Agency	Authority	Programs	Implementation Location	Notes
Local governments	PZL (Gov. Code §§65000 et seq.) and CCA §30500	<ul style="list-style-type: none"> <li>• General Plans/GP updates</li> <li>• LCPs/LCP amendments</li> <li>• Permits pursuant to above</li> <li>• Enforcement</li> </ul>	Statewide (LCP policies/ordinances apply in coastal zone)	Local governments adopt ordinances and rules and make land-use decisions consistent with State law.
SWRCB/ RWQCB	PCWQCA	<ul style="list-style-type: none"> <li>• NPSMP</li> <li>• Basin Plans</li> <li>• Cease and Desist Orders</li> <li>• Cleanup and Abatement Orders</li> <li>• Admin. Civil Liability</li> </ul>	Statewide	
DFG	FGC § 5650	Discharge to waters of the State violations	Statewide	
DHS	HSC §116275 et seq.	Drinking water source assessment and protection; drinking water sampling and analysis; regulation of public drinking water systems	Watersheds associated with drinking water sources	Assessment of potential contaminating activities in watershed; self-determined protection programs by drinking water systems and communities; collection of data on contaminants in drinking water supplies for the evaluation of water quality.
DPR	Div. I, Chapter 1.25, Div. V, PRC §5000 et seq.		SPS	DPR operates and maintains units of the SPS in forested areas.

**Management Measure 2K Postharvest Evaluation**

Conduct post-operation evaluation of the effectiveness of the State's forest practices requirements as implemented. The components of this are: a) implementation monitoring to determine if the operation was conducted according to specifications, and b) effectiveness monitoring after at least one winter period to determine if the specified operation prevented or minimized discharges..

Agency	Authority	Programs	Implementation Location	Notes
BOF/CDF	FPR 916.6(a)(1)(E)	THP, MTHP, PTHP, NTMP	Statewide	Requires post-operation evaluation of alternative Watercourse and Lake Protection Zone (WLPZ) practices.
	FPR 016.10	Same as above	Statewide	Allows post-operation evaluation of domestic water supply protection.
	FPR 1050	Same as above	Statewide	Requires post-harvest inspection of erosion control maintenance and functioning.
	FPA 4588	Same as above	Statewide	Requires post-harvest inspection of stock success
	FPA 4588, 5604	Same as above	Statewide	Requires post-operations inspections of timber operation compliance with specifications.
	FPA 4551.3(b); FPR 1091.8	SYP	Statewide	Requires continuous monitoring of SYP compliance and effectiveness.
	All above citations	Long Term Monitoring Program (LTMP)	Statewide	Voluntary program specifically implementing this MM on a randomly selected set of THPs each year.

The following are BACKUP AUTHORITIES that pertain to the Postharvest Evaluation Management Measure.

Agency	Authority	Programs	Implementation Location	Notes
SWRCB/ RWQCB	PCWQCA	Forest Activities Program <ul style="list-style-type: none"> <li>• NPSMP</li> <li>• Basin Plans</li> <li>• Cease and Desist Orders</li> <li>• Cleanup and Abatement Orders</li> <li>• Admin. Civil Liability</li> </ul>	Statewide	<ul style="list-style-type: none"> <li>• Participation in LTMP with CDF</li> <li>• Some surveillance monitoring</li> <li>• Some compliant-driven monitoring.</li> </ul>
DFG	FGC § 5650	Discharge to waters of the State violations	Statewide	
DHS	HSC §116275 et seq.	Drinking water source assessment and protection; drinking water sampling and analysis; regulation of public drinking water systems	Watersheds associated with drinking water sources	Assessment of potential contaminating activities in watershed; self-determined protection programs by drinking water systems and communities; collection of data on contaminants in drinking water supplies for the evaluation of water quality.
DPR	Div. I, Chapter 1.25, Div. V, PRC §5000 et seq.		SPS	DPR operates and maintains units of the SPS in forested areas.

**Management Measure 2L Education/Outreach**

Implement educational programs to provide greater understanding of watersheds, and to raise awareness and increase the use of applicable forestry management measures and practices where needed to control and prevent adverse impacts to surface and ground water. Public education, outreach, and training programs should involve applicable user groups and the community.

[Refer to the Forestry Management Measures 2A – 2K listed in this document.]

Agency	Authority	Programs	Implementation Location	Notes