7 Management Activities, Best Management Practices, and Design Standards

As described in the MCOSD's Strategic Plan (2008) one of the high level goals of the RTMP is to provide insight into better maintenance and management practices that will contribute to the protection, restoration, and enhancement of natural resources that have been adversely affected by poor road and trail alignment or construction, and concentrated visitor use. To achieve this goal, the Strategic Plan recommended reviewing BMPs to reduce sedimentation from roads and trails in critical watersheds, preserve in-stream habitat to protect populations of rare and threatened or endangered fish species, and protect water quality.

According to the Strategic Plan, the RTMP is intended to serve critical functions related to land and resource management decision-making. As highlighted in the Strategic Plan, the RTMP is to be the MCOSD's "key vehicle for striking the appropriate balance between resource protection and public use, and provide guidance for sustainable maintenance of roads and trails." The following sections define the types of MCOSD actions subject to the RTMP, identify and define requirements for the construction and maintenance of roads and trails (BMPs), and identify design standards to ensure that future road and trail management decisions and road and trail projects meet the environmental goals and desired outcomes of the Strategic Plan. Identified BMPs and design standards are also consistent with the policies regarding environmental protection and trail development contained in the Marin Countywide Plan (2007).

7.1 Road and Trail Management Activities and Actions

Acting within the goals and policies, and with the management direction of the RTMP, the MCOSD will implement various actions in managing its existing road and trail network. This section summarizes the five management categories that capture the types of road and trail projects and actions that the MCOSD would plan, manage, and implement. The five management categories described below include emergency projects, operations and maintenance, new construction, new facilities, and management actions.

7.1.1 Emergency Projects

Emergency projects are defined to include:

- Projects to maintain, repair, restore, demolish, or replace property of facilities damaged or destroyed as a result of a disaster proclaimed consistent with the requirements and standards of the California Emergency Management Act (Government Code, Section 8550 et seq.);
- Emergency repairs to publicly or privately owned service facilities necessary to maintain the public health, safety, or welfare; or,
- Specific actions necessary to prevent or mitigate an emergency, not including projects undertaken for the purpose of preventing or mitigating a situation that has a low probability of occurrence in the short-term.

Road and trail projects likely to qualify as "emergency projects" include: necessary replacement or maintenance of a utility or fire access road due to damage caused by a wildland fire, flood, mudslide, or other natural disaster, as proclaimed by the Governor in compliance with the California Emergency Management Act; emergency improvements to major utility lines and service facilities, such as electrical, water, gas, or communication lines, necessary to maintain public health, safety, and welfare; and possibly repairs to road and trail segments and related infrastructure, such as foot bridges, or culverts severely damaged by a natural disaster.

Except for the temporary closure of roads and trails necessary to protect public safety, no RTMP management actions would be considered an "emergency project" unless they met the definition and provisions for an emergency outlined above.

7.1.2 Operations and Maintenance

As defined by this RTMP, operations and maintenance is defined as:

- **Routine operation and maintenance**. Day-to-day upkeep that allows for the smooth and safe functioning of a trail. It includes grading, cleaning water bars and other drainage features, cleaning culverts, litter pick-up, trash and debris removal, vegetation management, sign replacement, and tree and shrub pruning to allow access. Routine maintenance also includes minor repairs and replacements such as repairing a broken handrail (source: American Trails website), and seasonal closure of trails.

Most operation and maintenance work for road and trail projects would consist of the operation, repair, maintenance, or minor alterations of existing public or private structures, facilities, mechanical equipment, or topographical features. Operation and maintenance activities would involve negligible or no expansion of an existing use. Examples applicable to road and trail projects may include, but are not limited to the following: minor alterations to bicycle and pedestrian trails, including grading for public safety; addition of health and safety facilities; new road and trail signage; landscaping; and maintenance of habitat areas and structures.

Operation and maintenance activities can also include the passive decommissioning of an existing road or trail, the passive conversion of a road to a trial, or a minor change in recreational use. The scopes of these activities are defined as follows:

- **Passive Decommissioning** - activities that result in the stabilization and restoration of unneeded roads or trails to a more natural state. Passive decommissioning involves activities that range from blocking the entrance points and signing the roads or trails as closed, through permitting vegetation to naturally encroach along roads and trails (source: USDA Forest Service San Dimas Technology Center).

- **Passive Road to Trail Conversion** – actions necessary to encourage the evolution of a road to a narrower trail. Actions may include re-vegetation and stabilization of the unused portions of the former roadbed.

7.1.3 New Construction

Many actions necessary to carry out the provisions of the RTMP would be classified as new construction. As defined in the RTMP, new construction would consist of:

- **Reconstruction** - refers to correcting significant defects as well as repairing, replacing, or restoring major components of a road or trail that have been destroyed, damaged, or significantly deteriorated during the life of the facility. Reconstruction includes re-surfacing, replacing or restoring trail tread, and installing new water bars and other drainage features. Stabilizing a severely eroded hillside or replacing a bridge are examples of reconstruction (source: American Trails website). Re-opening a trail or road that has not been maintained would also be considered reconstruction.

- **Rerouting** - changing the alignment of a road or trail on any portion of its length.

- **Active Decommissioning** - activities that result in the stabilization and restoration of unneeded roads or trails to a more natural state. Active decommissioning involves full obliteration of the road or trail, including ripping the road bed, re-contouring, re-vegetating and restoring natural slopes (source: USDA Forest Service San Dimas Technology Center).

- **Active Road to Trail Conversion** – actions necessary to encourage the evolution of a road to a narrower trail. Actions may include re-vegetation, stabilizing, and restoration of the unused portions of the former roadbed.

7.1.4 New Facilities

New facilities would be located both within existing Open Space Preserves and in any new preserves that would be acquired in the future. New facilities would consist of:

- **New road or trail** - constructing new routes on undisturbed lands to connect previously unconnected points.

7.1.5 Management Actions

Management actions would consist of those temporary or permanent activities necessary to implement the visitor use and environmental protection policies set forth in Chapter 8, *Visitor Use Policies*, of this RTMP that would not involve any construction. As defined by this RTMP, management actions could include:

- **Change in recreation use** - changing the types of permitted recreation activities along a road or trail. Permitted activities could include any one or all of the following activities: natural area, pedestrian travel, equestrian use, or mountain biking. MCOSD decisions regarding administrative access by other agencies for maintenance or fuel control would be considered.

7.2 Best Management Practices

As defined by this RTMP, a BMP is a practice, or combination of practices, that have been determined to be most effective and practicable in preventing or reducing the amount of pollution generated, or the level of environmental harm created from an activity to a level compatible with environmental goals and regulatory standards. Within the context of this definition, the RTMP establishes the following BMPs as adopted by the MCOSD to guide future road and trail management actions and activities.

Prior to any road and trail management work, the MCOSD will secure any necessary authorizations and permits from federal and state resource agencies and Marin County as applicable. While many routine maintenance activities will not require special permits, some maintenance activities and new trail construction may. When required, this process will typically result in implementation of BMPs required by the resource agencies to protect natural and cultural resources; protect air and water quality; and reduce construction nuisance effects (e.g. dust and noise).

This Plan provides a programmatic set of BMPs for all road and trail management activities that will be implemented as necessary and practicable. This programmatic set of BMPs can be drawn upon during the resource permitting process and can be supplemented by any additional BMPs required by the resource agencies. For projects not requiring permits or regulatory involvement, these BMPs will be implemented as necessary and practicable to protect sensitive resources on MCOSD and adjacent lands. The general and topically-specific BMPs can be considered as standards to be followed and implemented as appropriate for any road and trail management action.

The following sections establish BMPs for aquatic and terrestrial biological resources, cultural resources, hydrology and water quality (including sediment production), geological hazards, air quality, and noise. Specific BMPs for known sensitive resources on MCOSD lands, construction activities, and possible environmental contaminants can be found in: Table 7-1, Special-Status Wildlife Protection BMPs; Table 7-2, Special-Status Plant Protection BMPs; Table 7-3, Invasive Plant Management BMPs; Table 7-4, Including BMPs in Construction Contracts; Table 7-5, Cultural Resources Protection BMPs; Table 7-6, Water Quality Protection and Erosion Control BMPs; Table 7-7, Road and Trail Damage and Water Quality BMPs; Table 7-8, BMPs for Protection against Geological Hazards; Table 7-9, Road and Trail Air Quality BMPs; and Table 7-10, Road and Trail Construction Noise BMPs below.

7.2.1 Biological Resources

Many of the BMPs listed below stem from other existing documents adopted and approved by the Marin County Board of Supervisors and the MCOSD Board of Directors.

Protecting sensitive biological resources and habitat types is a primary focus of BMPs designed for this plan. Properly implemented BMPs will allow road and trail management projects to avoid, minimize, and mitigate impacts to sensitive resources and habitats to the maximum extent possible. The following BMPs will be followed by the MCOSD, its representatives, and project contractors as practicable and appropriate.

Road and Trail Construction General BMPs

Pre-Construction Literature Reviews

Prior to any new road and trail construction activities, the MCOSD natural resource staff or a representative will conduct a literature review to determine if any special-status species and habitats have the potential to occur in the construction project area.

The first source reviewed will be the MCOSD's extensive database of special-status plant and wildlife occurrences and sensitive habitats. This database is actively updated and maintained by the MCOSD natural resource staff and contains the most relevant data on sensitive resources on MCOSD land.

In addition to the MCOSD database, other resources will be reviewed prior to work as necessary, including:

- USGS topographic maps
- USFWS National Wetlands Inventory maps
- Bay Area Aquatic Resource Inventory Database
- Aerial photographs
- CDFG California Natural Diversity Database (CNDDB) records
- USFWS quadrangle species lists
- CNPS Inventory records
- University of California at Davis Information Center for the Environment Distribution Maps for Fishes in California (2008)
- National Marine Fisheries Service Distribution Maps for California Salmonid Species (NOAA 2007)

Database searches for known occurrences of special-status species will focus on the vicinity of the project area. Biological communities present in the project location and surrounding areas will be classified based on existing plant community descriptions described in the *Preliminary Descriptions of the Terrestrial Natural Communities of California* (Holland 1986). Biological communities will be classified as sensitive or non-sensitive as defined by the California Environmental Quality Act (CEQA) and other applicable laws and regulations.

Pre-Construction Surveys

If it is determined that sensitive resources may occur in the project area, a qualified biologist from the MCOSD natural resource staff or outside contractor will survey the area during the appropriate time window (e.g. season, time of day, flowering period, etc.) to determine the presence or absence of the sensitive resources identified. If sensitive resources are located, the appropriate resource agencies will be contacted and the necessary permits acquired. Additionally, these programmatic BMPs will be implemented as necessary and practicable.

Construction Timing Windows

All construction activities will be timed to avoid impacts to sensitive resources. If nesting birds are present in the project area, construction will take place outside of the breeding bird season or after the young have fledged; or appropriate buffers will be established consistent with state and federal law. See Table 7-1 for specific BMPs for special-status and nesting bird species located in the project area.

If any other reproductive special-status plant or animal species are present, construction will take place outside of the reproductive season. If migrating birds or other wildlife are present and/or using the project area as a migration corridor, construction activities will occur outside of this window, unless an alternative method for avoiding disturbance can be applied that is consistent with state and federal law. If construction activities must take place in or around a watercourse or waterbody, construction will take place during the dry season when impacts to water quality and aquatic habitats will be minimized. See Table 7-6 for specific BMPs to protect water quality.

As described below, invasive plants in the project area will be treated prior to construction. However, if this is not feasible or treatments are ineffective, construction will be planned to occur when invasive plant species in and adjacent to the project area are not in seed. When plants are in seed, their populations can be distributed and inadvertently dispersed to new areas by construction personnel, equipment, and general activities. See Table 7-3 for specific BMPs for working near invasive plant populations.

The MCOSD and contractors will work on a project-specific basis to determine appropriate construction timing windows.

Impact Area Planning

The MCOSD will plan all new facilities to avoid sensitive resources to the maximum extent possible and to minimize construction footprints. When feasible, construction impact zones (including staging areas and associated infrastructure to complete projects) will be confined to areas of existing disturbance such as a current road or trail alignment. If sensitive resources are present in the impact area or immediate surroundings, their location (including an appropriate buffer) will be demarcated in the field and personnel will be advised to avoid these areas. Project personnel will also be provided with maps showing sensitive resources in the project impact area that must be avoided. Workers will receive environmental sensitivity training prior to the commencement of project activities as described below. If necessary, exclusion fencing will be installed to keep nearby special-status wildlife species from entering the area of impact.

Wetlands and Waters / Water Quality Protection and Erosion Control

Wetlands and other waters (e.g. streams, ponds, and lakes) are sensitive communities that have the potential to support a diversity of life and provide other ecosystem services. Projects will be planned to avoid wetlands and water habitats to the maximum extent possible. The MCOSD will perform road and trail construction in a manner that controls and minimizes the potential for soil erosion and contribution of sedimentation to wetlands. All construction that must take place in or adjacent to wetlands and waters (e.g. stream crossings) will take place during the dry season.

Sedimentation filtration barriers, stormwater pollution prevention plans (SWPPPs), and other measures to protect water quality will be implemented as necessary for work in the vicinity of wetlands and waters. Specific water quality protection and erosion control BMPs are listed in Table 7-6.

Design Considerations

During the project planning phase, sensitive resources identified during background literature reviews and pre-planning surveys will inform project design to account for sensitive resources in and around the project area. As mentioned above, the project footprint will be confined to pre-disturbed areas to the maximum extent possible and disturbance to new areas will be minimized.

If special-status species known from the area are dependent upon a vegetative community in the area of impact, efforts will be made to maintain that habitat where possible. If actively breeding birds are known from the area, large tree and shrub vegetation in the immediate vicinity that could provide nesting and protective habitat will be preserved to the maximum extent possible.

Other habitat, special-status species, and sensitive resource design elements will be considered on a case-by-case basis as necessary to ensure resource-friendly design and reduction of impacts. Specific wildlife design considerations are listed in Table 7-1.

Worker Awareness Training and Construction Tailgate Meetings

A qualified biologist will conduct worker awareness trainings prior to any construction activities in areas with Federal and State-listed sensitive resources to educate workers about resource identification, avoidance measures, and necessary actions if a sensitive resource is encountered. All project personnel who will be involved with implementation activities should be present for these meetings so that all workers have a consistent understanding of sensitive resources issues. Potential invasive weed populations and the possibility for spread of invasive weeds will also be covered during these trainings.

Worker awareness trainings will include the following:

- a photograph and description of each special-status species, sensitive resource, or invasive plant known from the project area
- a description of its ecology and habitat needs
- potentially confusing resources (e.g., similar species or habitats)
- an explanation of the measures being taken to avoid or reduce adverse impacts
- reporting and necessary actions if sensitive resources are encountered
- responsibility of the individual worker under the applicable environmental regulation

One tailgate meeting will be conducted on the construction site with all project personnel the day before work begins to reemphasize materials covered during the worker awareness training. The tailgate meeting will also be a good opportunity to cover any potential resource issues that might be encountered for specific project elements in more detail and reinforce resource issues for workers on the ground.

Resource-specific items to be covered during worker awareness training and tailgate meetings are listed in Tables 7-1 through 7-4 below.

Additionally, an annual MCOSD-wide road and trail maintenance worker education program will provide information on all sensitive resources on MCOSD land to MCOSD road and trail management personnel.

Construction Monitoring

If Federal or State-listed sensitive resources are known to be present in the project area or immediate surroundings, a qualified biologist from the MCOSD natural resource staff or outside contractor will monitor construction activities to ensure impacts to sensitive resources will be avoided. If special-status wildlife species are present within the vicinity of the project area, a more involved monitoring program might be necessary to ensure that these species do not enter the project area. If a special-status species is observed by a worker or construction monitor, work will cease immediately and the appropriate resource regulatory agency will be contacted if necessary. A construction monitoring program will be developed for each project on a project-specific basis.

Noise Control

Equipment and vehicles should utilize the best available noise control techniques (e.g., improved mufflers, equipment redesign, and use of intake silencers, ducts, engine enclosures and acoustically attenuating shields or shrouds) to prevent disturbance of nearby wildlife populations.

Preventing and Reducing Potential for Pollution

The MCOSD will ensure that actions are undertaken during road and trail management projects to prevent or reduce the potential for pollutants entering the MCOSD preserve system from management activities that could affect sensitive resources. Specific BMPs listed in Table 7-7 will be implemented as needed to reduce the potential for pollution.

Controlling Food-Related Trash

Food-related trash can attract wildlife to construction sites disrupting their normal behavior patterns. Food-related trash will be stored daily in closed containers and removed from the construction site daily.

Relocation of Special-Status Species

If special-status plant species are located in the project area and impacts to these species are unavoidable, plants and/or propagules[1] will be relocated to suitable habitat off-site prior to the commencement of construction activities. Alternatively, off-site mitigation for impacts could be considered. If special-status wildlife species are located on site, the appropriate resource agency will be contacted and a qualified biologist possessing any necessary permits will relocate individuals to suitable habitat off-site as applicable.

[1] Any of various structures that can give rise to a new individual organism, especially parts of a plant that serve as means of vegetative reproduction, such as corms, tubers, offsets, or runners. Seeds and spores are also propagules.

Invasive Weed Control

If invasive exotic weeds (identified on the California Invasive Plant Council Inventory of Invasive Plants) are located in the project area, they will be treated prior to the commencement of project activities to reduce the potential for their spread. Project design will avoid soil disturbance in heavily invaded areas to the maximum extent possible to reduce the potential for spread on and off-site. Any imported soil, compost, gravel, stone aggregate, erosion control materials, or other fill material of any kind will be certified weed-free.

Specific invasive weed control BMPs are provided in Table 7-3.

Revegetation with Native Plant Species

Following the completion of construction elements or soil disturbance, disturbed areas will be revegetated with native plant species as necessary and practicable. Revegetation with annual grasses and forbs can provide rapid vegetative cover and initial soil stabilization. Planting or seeding with a combination of native annual and perennial grasses, forbs, shrubs, and trees can provide longer term and stronger erosion control, as well as more desirable visual cover. The end goal of revegetation should be a species composition and vegetative structure that integrates with the surrounding natural community, or a desired natural community, to the maximum extent possible.

Locally collected native plant materials from the project footprint and surrounding areas will be the preferred standard for revegetation efforts. Plant materials should be collected from within the same watershed or MCOSD preserve if possible. The MCOSD will allow collection of no more than 5 percent of any native plant population to prevent over-collection of wild plant material sources. If sufficient local plant materials are not available for collection prior to project activities, geographically-appropriate native plant materials will be purchased from a local nursery or seed supplier.

A project-specific revegetation plan will be developed by the MCOSD natural resource staff for projects as needed to guide revegetation efforts.

Mitigation

Any approved impacts to sensitive resources will be mitigated as required by resource agencies, on a project-specific basis.

Road and Trail Maintenance General BMPs

The following list of BMPs is specific to road and trail maintenance. Previously described BMPs for road and trail construction (e.g. preconstruction literature reviews and surveys, noise control, etc.) will be implemented as necessary and applicable in addition to these maintenance-specific protective measures.

Inspections

During regular inspections, the MCOSD staff will check to ensure that road and trail features and associated infrastructure are well-maintained and posing no threat to surrounding sensitive biological resources. Inspectors will record information pertaining to: runoff and effects to water quality of nearby habitats; the spread of invasive, exotic plants; and the status and quality of any known sensitive resources in the immediate vicinity that could be affected by road or trail use and/or maintenance. Inspectors will report any findings and make recommended corrective actions if appropriate.

Grading and Maintenance Windows

Grading will only occur during the dry months (generally May 15 to October 15) when associated erosion will be reduced to the maximum extent possible.

Culverts

Culverts will be inspected on a regular basis to ensure that they do not clog with sediment or debris. Blocked culverts may affect water quality, change the water course, increase erosion or sediment run-off, or affect wildlife. Any materials blocking culverts will be removed and disposed of outside of the watercourse in an area not subject to erosion. If a significant blockage or sedimentation exists, the MCOSD will plan and implement corrective actions as necessary. Excavation of sediments within streams may require a maintenance permit from the U.S. Army Corps of Engineers, CDFW, and/or SF RWQCB.

Disposal of Materials

Any maintenance-related materials (including soils, debris, trash, or other materials that need to be removed as part of maintenance activities) will be disposed of at an appropriate site where materials could not impact sensitive resources. For example, grading-related excess soils or removed debris will not be placed in or around a waterbody or wetland where the materials could be subject to erosion, thereby affecting water-quality.

Road and Trail Decommissioning General BMPs

The following list of BMPs is specific to road and trail decommissioning. Previously described BMPs for road and trail construction and maintenance (e.g. preconstruction literature reviews and surveys, noise control, work windows, etc.) will be implemented as necessary and practicable in addition to these decommissioning-specific protective measures. Roads and trails will be decommissioned as necessary, but any segments that have the potential to affect sensitive resources (e.g. water quality) will be addressed immediately to ensure that impacts are avoided or minimized.

Closing a road or a trail is not sufficient to decommission it and protect sensitive resources. Instead, road and trail decommissioning will involve: removing fills in the project area; removing creek crossings, bridges, and culverts; excavating unstable fillslopes; treating road and trail surfaces, shoulders, ditches, and embankments to prevent runoff and erosion; and revegetating any disturbed areas as necessary. These actions will eliminate the potential for runoff and erosion to enter wetlands and waters habitats and will restore natural vegetative communities and habitats.

Removal of Stream Crossings

When removing a stream crossing, sediment filtration barriers will be placed around the extent of the construction area to prevent sediment from entering streams. All removed materials will be disposed of in an off-site location where they will not be subject to erosion. Slopes where infrastructure and fill were removed will be stabilized to prevent erosion. Work within streams may require regulatory agency permits. If the stream is not a perennial watercourse, the work should be done when the creek is dry.

Removal of Unstable Fillslopes and Cutbanks

Any unstable fillslopes and cutbanks that have the potential to erode and negatively affect water quality of nearby wetlands and waters will be removed entirely and graded to a stable contour. These areas will be revegetated with native species as appropriate. Sediment filtration barriers will be deployed around the edges of unstable slopes as necessary to prevent erosion and runoff into wetlands and waters.

Reuse and Replanting of Excavated Trees and Shrubs

Where feasible, excavated trees and shrubs removed from unstable fillslopes and cutbanks will be replanted on graded contours to restore the areas with native vegetation. These plants will represent the most locally-appropriate materials for restoration and conform to the vegetation types of the surroundings.

Ripping and Recontouring Road and Trail Surfaces

Road and trail surfaces should be ripped and decompacted where appropriate. Ripping surfaces provides a more suitable substrate for the recolonization or revegetation of native plant materials. Road and trail surfaces should be recontoured to prevent the potential for erosion into wetlands and waters areas (i.e. sloped away from these locations). Any shoulders, ditches, and embankments can also be removed and the area graded to a natural contour.

Invasive Plant Species

Decommissioned road and trail areas will be monitored for the presence of invasive plant species for two years following decommissioning to ensure no infestations develop. If invasive species are detected at this time, corrective actions will be taken as appropriate. See Table 7-3 below for invasive-plant specific BMPs.

Table 7-1 Special-Status Wildlife Protection Best Management Practices

BMP ID	Description	Standard Detail	Exceptions/Comments
BMP - Special-Status Wildlife Protection-1 Pre-Management Activity Literature Reviews	Prior to all management activities, literature reviews will be conducted to determine if special-status wildlife species or critical habitats exist within the project area. The first source reviewed will be the MCOSD's extensive database of special-status wildlife occurrences and sensitive habitats. This database is actively updated and maintained by the MCOSD natural resource staff and contains the most relevant data on sensitive resources on MCOSD land. In addition to the MCOSD database, other resources will be reviewed prior to work as necessary, including: • USGS topographic maps • Aerial photographs • California Natural Diversity Database (CNDDB) records • USFWS quadrangle species lists • University of California at Davis Information Center for the Environment Distribution Maps for Fishes in California (2008) • National Marine Fisheries Service Distribution Maps for California Salmonid Species (NOAA 2007) Database searches for known occurrences of special-status wildlife species will focus on the vicinity of the project area. Biological communities will be classified as sensitive or non-sensitive as defined by the California Environmental Quality Act (CEQA) and other applicable laws and regulations		
BMP - Special-Status Wildlife Protection-2 Pre-construction Surveys	If it is determined that special-status wildlife species may occur in a project area, a qualified biologist from the MCOSD staff or an outside contractor will survey the area during the appropriate time window to determine the presence or absence of the species. If the species is located, MCOSD should conduct the activity to avoid impacts to the species. If avoidance is not possible, the appropriate resource agencies will be contacted to obtain guidance or the necessary permits as necessary.		
BMP - Special-Status Wildlife Protection-3 Implement Seasonal Restrictions During Bird Nesting Season; Avoid Active Nests or Obtain and Comply	• Identify potential habitat for nesting birds and survey to determine if active nests are present before initiating road and trail management actions. Surveys will include the proposed road and trail management footprint and the areas within 500 feet of the work zone. Surveys will be conducted within 14 days of the start of active ground disturbing activities. • If any active nests of protected bird species are found, prohibit brushing, mowing and tree removal activities at the nest site and within a buffer area		If work will occur outside of the nesting bird window of February 1 to August 31, surveys and avoidance measures will not be necessary for nesting birds. Surveys for special-status species may still be necessary if they are present in the area.

Table 7-1 Special-Status Wildlife Protection Best Management Practices

BMP ID	Description	Standard Detail	Exceptions/Comments
with a 2081 Agreement with DFG.	until the young birds have fledged and left the site, and/or the nest has been abandoned. The buffer area will be 50-300 feet, or as determined through consultation with the CDFW, pursuant to Section 2081 of the state Fish and Game Code and the federal Migratory Bird Treaty Act. In general, a line-of site buffer of at least 150 feet between the nest site and road and trail management activities is recommended. For raptors, buffer distances may be increased to 250 feet or more, depending on the visual distance from the nest to the road and trail management work area, and the sensitivity of the raptor species to road and trail management activities. In addition, a 5 mile per hour speed limit will be enforced in and near bird nesting habitats and other sensitive habitat areas. If impacts to nesting birds cannot be avoided, contact the USFWS and CDFW to obtain the necessary permits before initiating road and trail management activities.		
BMP - Special-Status Wildlife Protection-4 Avoid and Protect Northern Spotted Owl	Northern Spotted Owls have potential to occur on MCOSD preserves. The MCOSD will undertake the following actions when construction-related road and trail management is planned to occur within or adjacent to potential NSO habitat: • Identify potential habitat for Northern Spotted Owl and survey to determine if it is occupied or if active nests are present before initiating road and trail management actions. Surveys will include the proposed road and trail management footprint and ¼ mile buffer area. Surveys will be conducted within 14 days of the start of active ground disturbing activities. • To the greatest extent possible, avoid occupied habitat completely during key Northern Spotted Owl breeding and nesting season (March-September). • Establish a buffer of at least ¼ mile around occupied habitats. Within the buffer area, select least harmful road and trail management activities. Within the buffer area, retain old growth forest trees and forest canopy, and minimize removal of other vegetation to the fullest extent possible. • Mark occupied habitat with flagging or temporary fencing. • Ensure that mechanical fuel reduction activities in suitable Northern Spotted Owl habitat do not substantially alter the percent cover of canopy over-story and ensure that multilayered structure is preserved. If shaded fuelbreak features are constructed in suitable Northern Spotted Owl habitat, then the resulting multilayered canopy will only be reduced to a height of 6 to 8 feet, or along roadways as needed for emergency vehicle clearance.		Removal of trees with documented NSO nests should be avoided. Removal of nest trees typically requires compensatory mitigation.

Table 7-1 Special-Status Wildlife Protection Best Management Practices

BMP ID	Description	Standard Detail	Exceptions/Comments
	• Avoid cutting native trees greater than 10 inches diameter at breast height within Northern Spotted Owl habitat within occupied habitat areas. This condition will not apply if a determination is made that the native tree presents a clear hazard in the event of a fire or is the only option to reduce high fuel loading. • Conduct a worker-training program for all field personnel involved with the proposed road and trail management project prior to initiating project. The program will consist of a brief presentation by person's knowledgeable about the Northern Spotted Owl. The program will include the following: a photograph and description of the Northern Spotted Owl, a description of its ecology and habitat needs, an explanation of the measures being taken to avoid or reduce adverse impacts, and the workers' responsibility under applicable environmental regulations. The worker training may be conducted in an informal manner (e.g., as part of a routine tailgate safety meeting). • If impacts cannot be avoided, contact the USFWS and/or the DFG to obtain the necessary permits before initiating road and trail management activities Notify the USFWS and/or the DFG within 24 hours of finding any injured special-status species or any unanticipated damage to their habitats associated with the proposed action. Notification must include the date, time, and precise location of the specimen/incident, and any other pertinent information. Dead animals should be sealed in a zip lock bag containing a piece of paper indicating the location, date and time when it was found, and the name of the person who found it; and the bag should be frozen in a freezer in a secure location. The MCOSD will contact the USFWS within 7 days to transfer any dead or injured specimens.		
BMP - Special-Status Wildlife Protection-5 Avoid and Protect Double Crested Cormorant Nests, Heron, and Egret Rookery Sites	There are several known or suspected double-crested cormorant, great blue heron, snowy egret and black-crowned night heron rookery and or nesting sites on MCOSD preserves. The following procedures are similar to those described in BMP-Special-Status Species-1 for nesting birds, but are more specific to these particular bird species, and, therefore, supersede procedures described in BMP-Special-Status Species-1. The MCOSD will undertake the following actions when construction-related road and trail management is planned to occur within or adjacent to potential nest or rookery sites:		

Table 7-1 Special-Status Wildlife Protection Best Management Practices

BMP ID	Description	Standard Detail	Exceptions/Comments
	• Identify potential habitat for double-crested cormorant, heron, and egret nest and rookery sites and survey to determine if they are occupied, or if nests are present before initiating road and trail management actions. Surveys will include the proposed road and trail management footprint and 150-foot buffer area. Surveys will be conducted within 14 days of the start of active ground disturbing activities. • To the greatest extent possible, avoid nests and rookery sites completely during key breeding and nesting periods. Activities in or near known sites will be limited during the known nesting seasons for each species, or until young have fully fledged. • Establish a buffer of at least 100 feet around rookery and nest sites. Within the buffer area, select least harmful road and trail management activities. Restrict activities within the buffer to those that will not disturb roosting or nesting behavior (e.g., noise and visual disturbances). • Mark occupied habitat with flagging or temporary fencing. • Prohibit the removal of known roost or nest trees. Restrict the removal of other mature riparian trees within buffer zone. • Conduct a worker-training program for all field personnel involved with the proposed road and trail management project prior to initiating the project. The program will consist of a brief presentation by person's) knowledgeable about the special-status species. The program will include the following: a photograph and description of the special status species, a description of its ecology and habitat needs, an explanation of the measures being taken to avoid or reduce adverse impacts, and the workers' responsibility under applicable environmental regulations. The worker training may be conducted in an informal manner (e.g., as part of a routine tailgate safety meeting). • Notify the DFG within 24 hours of finding any injured special-status species or any unanticipated damage to their habitats associated with the proposed action. Notification must include the date, time, and precise location of the specimen/incident, and any other pertinent information. Dead animals should be sealed in a zip lock bag containing a piece of paper indicating the location, date and time when it was found, and the name of the person who found it; and the bag should be frozen in a freezer in a secure location. The MCOSD will contact the USFWS within 7 days to transfer any dead or injured specimens.		

Table 7-1 Special-Status Wildlife Protection Best Management Practices

BMP ID	Description	Standard Detail	Exceptions/Comments
	• If impacts cannot be avoided during the nesting season (February 1 – August 31), contact the DFG to obtain the necessary permits before initiating road and trail management activities. • Prohibit, or restrict equipment refueling, fluid leakage, equipment maintenance, and road surfacing activities near wetlands. Require placement of fuel storage and refueling sites in safe areas well away from wetlands. Safe areas include paved or cleared roadbeds, within contained areas such as lined truck beds, or other appropriate fuel containment sites. Inspect equipment and vehicles for hydraulic and oil leaks regularly. Do not allow leaking vehicles on MCOSD preserves, and require the use of drip pans below equipment stored onsite. Require that vehicles and construction equipment are in good working condition, and that any and all necessary onsite servicing of equipment be conducted away from the wetlands. • Require all contractors to possess, and all vehicles to carry, emergency spill containment materials. Absorbent materials should be on hand at all times to absorb any minor leaks and spills.		
BMP - Special-Status Wildlife Protection-6 Avoid and Protect California Clapper Rail, California Black Rail, and Salt Marsh Harvest Mouse	MCOSD preserves encompass some tidal areas that are known to support, or have the potential to support, salt-marsh harvest mouse, California clapper rail, and California black rail. In areas where road and trail management is planned to occur within or adjacent to salt marsh or brackish marsh habitats, MCOSD will first consult with the USFWS and the CDFW to determine locations where salt-marsh harvest mouse, California clapper rail, and California black rail could potentially be affected by proposed road and trail management actions and activities. The MCOSD would obtain and comply with necessary permits for working in suitable habitat for these species, including, but not limited to the following types of protective actions to prevent harm to the species: • To the greatest extent possible, avoid occupied habitat completely during key breeding and nesting periods. Noise-generating activities including operating heavy machinery in or near known California clapper or black rail sites will be avoided from February 1 to August 31, during the nesting season. • Identify potential habitat for California clapper rail and California black rail, and survey to determine if it is occupied before initiating road and trail management actions. Surveys will include the proposed road and trail management footprint and 700-foot buffer area during the California		

Table 7-1 Special-Status Wildlife Protection Best Management Practices

BMP ID	Description	Standard Detail	Exceptions/Comments
	clapper rail (CCR) and black rail (BR) breeding season. Surveys will be conducted within 14 days of the start of active ground disturbing activities. • Assume presence of salt marsh harvest mouse in appropriate habitats, avoid impacting these areas, and establish appropriate buffer. Because the USFWS frequently does not allow trapping of the salt marsh harvest mouse (SMHM) to determine presence, MCOSD will assume presence in appropriate SMHM habitats and avoid disturbing them. If appropriate habitats are present, a 200-foot buffer will be established around these salt marsh habitats. If work is required within the buffer, vegetation will be removed by hand under the supervision of a qualified biologist to ensure no impacts to SMHM occur. • Establish a buffer of at least 700 feet around occupied CCR or BR habitat and 200 feet for SMHM habitat. Within the buffer area, select least harmful road and trail management activities. Restrict activities within the buffer to those that will not disturb roosting or nesting behavior (e.g., noise and visual disturbances). • Mark occupied habitat with flagging or temporary fencing.		
BMP - Special-Status Wildlife Protection-7 Protect Fish Habitats	If a stream crossing is part of a project in a stream with the potential to support fish, proper fish passage will be designed. A bridge which will not affect stream flow will be the preferred option. If a culvert is necessary, an open-arch design that does not affect the bed or flow of the stream will be preferred. If an open arch culvert is not possible, pipe culverts should be installed slightly below grade in an area perpendicular to the crossing where the existing stream flow is linear. Resting pools will be designed above and below culverts to allow fish to rest before and after having to pass through culverts.		
BMP - Special-Status Wildlife Protection-8 Worker Awareness Trainings	Worker awareness trainings will include the following: • a photograph and description of each special-status species, sensitive resource, or invasive plant known from the project area, • a description of its ecology and habitat needs, • potentially confusing resources (e.g. similar species or habitats) • an explanation of the measures being taken to avoid or reduce adverse impacts • reporting and necessary actions if sensitive resources are encountered, and • the workers' responsibility under the applicable environmental regulation.		

Table 7-1 Special-Status Wildlife Protection Best Management Practices

BMP ID	Description	Standard Detail	Exceptions/Comments
BMP - Special-Status Wildlife Protection-9 Construction Monitoring	If Federal or State-listed wildlife species are known to be present in the project area or immediate surroundings, a qualified biologist from the MCOSD natural resource staff or outside contractor will monitor construction activities to ensure impacts to species will be avoided. If listed wildlife species are present within the immediate vicinity of the project area, a more involved monitoring program might be necessary to ensure that these species do not enter the project area. If a listed species is observed by a worker or construction monitor, work will cease immediately and the appropriate resource regulatory agency will be contacted if necessary. A construction monitoring program will be developed for each project on a project-specific basis.		
BMP - Special-Status Wildlife Protection-10 Relocation of Special-Status Species	If state or federal-listed wildlife species are located on site, the appropriate resource agency will be contacted and a qualified biologist possessing any necessary permits will relocate individuals to suitable habitat off-site as applicable.		
BMP - Special-Status Wildlife Protection-11 Noise Control	When in close proximity to occupied sensitive wildlife habitat, equipment and vehicles should utilize the best available noise control techniques (e.g., improved mufflers, equipment redesign, and use of intake silencers, ducts, engine enclosures and acoustically attenuating shields or shrouds) to prevent disturbance of nearby wildlife populations.		
BMP - Special-Status Wildlife Protection-12 Trash Control	Food-related trash can attract wildlife to construction sites disrupting their normal behavior patterns. Food-related trash will be stored daily in closed containers and removed from the project site daily.		
BMP - Special-Status Wildlife Protection-13 Road and Trail Inspections	During regular inspections, the MCOSD staff will check to ensure that road and trail features and associated infrastructure are well-maintained and posing no threat to surrounding special-status wildlife species. Inspectors will record information pertaining to: • the spread of invasive, exotic plants which could affect wildlife habitats, and; • the status and quality of any known special-status wildlife species in the immediate vicinity that could be affected by road or trail use, maintenance, or management activities. Inspectors will report any findings and make recommended corrective actions if appropriate.		

Table 7-2 Special-Status Plant Protection Best Management Practices

BMP ID	Description	Standard Detail	Exceptions/Comments
BMP - Special-Status Plant Protection-1 Pre-Management Activity Literature Reviews	Prior to all management activities, literature reviews will be conducted to determine if special-status plant species, critical habitats, or sensitive communities exist within the project area. In addition to the MCOSD database, other resources will be reviewed prior to work as necessary, including: • USGS topographic maps • USFWS National Wetlands Inventory maps • Bay Area Aquatic Resource Inventory Database • Aerial photographs • California Natural Diversity Database (CNDDB) records • USFWS quadrangle species lists • CNPS Inventory records Database searches for known occurrences of special-status plant species will focus on the vicinity of the project area. Biological communities present in the project location and surrounding areas will be classified based on existing plant community descriptions described in the *Preliminary Descriptions of the Terrestrial Natural Communities of California* (Holland 1986). Biological communities will be classified as sensitive or non-sensitive as defined by the CEQA and other applicable laws and regulations.		
BMP - Special-Status Plant Protection-2 Avoid and Protect Special-Status Plant Species near Road and Trail Management Projects	The MCOSD will undertake the following actions when construction-related road and trail management is planned to occur within or adjacent to special-status plant populations: • Identify potential special-status plant habitat and survey to determine if it is occupied before initiating road and trail management actions. Surveys will include the proposed road and trail management footprint and 100-foot buffer area. Surveys will be conducted within 14 days of the start of active ground disturbing activities. • To the greatest extent possible, avoid occupied special-status plant populations completely. • If full avoidance is not possible, restrict work to the period to when special-status plants have completed set seed. • Establish a buffer of at least 100 feet around special-status plant populations. Within the buffer area, select least harmful road and trail management activities.		If special-status plant species with the potential to occur in a project area are annuals or only identifiable during a certain time of year, surveys should be conducted during that window. This will avoid eliminating special-status plant populations, seed banks, and/or habitats.

Table 7-2 Special-Status Plant Protection Best Management Practices

BMP ID	Description	Standard Detail	Exceptions/Comments
	• Mark special-status plant populations with flagging or temporary fencing. • Prevent unnecessary vehicular and human intrusion and use into special-status plant species habitat from adjacent construction, maintenance, and decommissioning activities. Where necessary, reroute or sign and fence trails to avoid the special-status plant population. • Prohibit, or restrict equipment refueling, fluid leakage, equipment maintenance, and road surfacing activities near special-status plant populations. Require placement of fuel storage and refueling sites in safe areas well away from special-status plant populations. Safe areas include paved or cleared roadbeds, within contained areas such as lined truck beds, or other appropriate fuel containment sites. Inspect equipment and vehicles for hydraulic and oil leaks regularly. Do not allow leaking vehicles on MCOSD preserves, and require the use of drip pans below equipment stored onsite. Require that vehicles and construction equipment are in good working condition, and that all necessary onsite servicing of equipment be conducted away from special-status plant populations.		
BMP - Special-Status Plant Protection-3 Avoid and Protect Special-Status Plant Species near Road and Trail Management Projects.	• To minimize downslope erosion and sedimentation near special-status plants, maintain erosion and sediment control devices during ground disturbing activities and until all disturbed soils have been stabilized. Measures include rice straw, hydromulch, geofabrics, wattles, sediment traps, check dams, drainage swales, and sand bag dikes. Materials must be certified weed-free to prevent the introduction of wheat, barley, and other non-native plant seeds. Erosion control materials must be constructed of natural fibers (e.g., coconut fiber mats, burlap and rice straw wattles, etc.) and may not be constructed with plastic monofilaments or other materials that could entrap snakes or amphibians. • Conduct a worker-training program for all field personnel involved with the proposed road and trail management project prior to initiating project. The program will consist of a brief presentation by people knowledgeable about the special-status species. The program will include the following: a photograph and description of the special status species, a description of its ecology and habitat needs, an explanation of the measures being taken to avoid or reduce adverse impacts, and the workers' responsibility under applicable environmental regulations. The worker training may be conducted in an informal manner (e.g., as part of a routine tailgate safety meeting).		If work occurs during the dry season and is greater than 100 feet from special-status plant species habitat, erosion control and water quality protection measures generally will not be necessary.

Table 7-2 Special-Status Plant Protection Best Management Practices

BMP ID	Description	Standard Detail	Exceptions/Comments
	• If impacts cannot be avoided, contact the USFWS and/or the CDFW to obtain the necessary permits before initiating road and trail management activities. Permit conditions will likely require presence of a biological monitor, installation of exclusion fencing, surveys to relocate or avoid the species, and/or possibly timed or staged road and trail management activities that avoid the species or reduce potential for take or harm. • If a special-status plant species is detected during work activities, stop work immediately at that location and contact the USFWS and/or CDFW within two working days. Work will not resume at that location until authorization is obtained from the USFWS and/or CDFW unless prior approval has been granted by these agencies. • Notify the USFWS and/or the CDFW within 24 hours of finding any damaged special-status species or any unanticipated damage to their plant habitats associated with the proposed action. Notification must include the date, time, and precise location of the specimen/incident, and any other pertinent information. Dead plants should be sealed in a zip lock bag containing a piece of paper indicating the location, date and time when it was found, and the name of the person who found it; and the bag should be frozen in a freezer in a secure location. The MCOSD will contact the CDFW or USFWS within two days and transmit the specimen in the appropriate manner.		
BMP - Special-Status Plant Protection-4 Ensure Proposed Actions are Consistent with Ongoing Program (For Work within Preserves with Ongoing Special-Status Plant Management Programs)	Some MCOSD preserves have ongoing special-status plant management and monitoring programs (e.g., Ring Mountain and Old St Hillary's). In these locations the MCOSD should ensure that all new proposed road and trail management projects are consistent with the ongoing management of these sites. The MCOSD will: • Review existing management plans and analyze proposed actions for consistency against adopted procedures. • Ensure that new road and trail management projects do not interfere with ongoing management and maintenance projects.		

Table 7-2 Special-Status Plant Protection Best Management Practices

BMP ID	Description	Standard Detail	Exceptions/Comments
BMP - Special-Status Plant Protection-5 Use Native Soils Where Earthwork Occurs near Special-Status Plant Populations	Many special-status plants are closely associated with specific soil types or geologic conditions (e.g., serpentine or ultramafic soils). To protect these species, the MCOSD will: • Do not allow the introduction of incompatible fill near special-status plant populations. Use only clean, native soils and aggregate materials from projects within the preserve, or use fill that is purchased from a certified weed-free source, before allowing the importation of materials from outside the preserves. Fill materials should be approved by natural resource staff to ensure compatibility with future restoration/rehabilitation goals. • Salvage, store, and reuse topsoil. Where activities disturb soil temporarily, require salvage of the top 6 to 12 inches of topsoil (to retain seeds, soil mycorrhizae, and fungi) from all excavation and disturbance areas. Require reapplication of the salvaged topsoil as a topdressing or topcoat over backfill, unless it is known to contain invasive plant seeds or propagules.		Native soil will generally be used in all MCOSD road and trail management projects in natural habitat areas.
BMP - Special-Status Plant Protection-6 Limit Erosion Potential near Special-Status Plants	The MCOSD will seek to prevent erosion near special-status plants. Where practical and appropriate, measures will include: • Unless no feasible alternative is available, avoid using heavy equipment in areas with soils that are undisturbed, saturated, or subject to extensive compaction. Where staging of heavy equipment, vehicles, or stockpiles is unavoidable, limit and mark the allowable disturbance footprint with flagging or fencing. Following the end of work, scarify surface soils to retard runoff and promote rapid revegetation. • Maintain a 15 mile per hour speed limit in sensitive habitat areas. This will reduce the potential for dust impacts on vegetation. For larger projects, water the roads for dust control near sensitive resources. • Immediately rehabilitate areas where project actions have disturbed soil. Require areas disturbed by equipment or vehicles to be rehabilitated as quickly as possible to prevent erosion, discourage the colonization of invasive plants, and address soil compaction. Techniques include decompacting and aerating soils, recontouring soils to natural topography, stabilizing soils via erosion control materials, revegetating areas with native plants, and removing and monitoring invasive plants. • To minimize erosion and sedimentation, maintain erosion and sediment control devices to protect special-status plant populations during ground disturbing activities and until all disturbed soils have been stabilized.		If work occurs during the dry season and is greater than 100 feet from special-status plant populations, erosion control and water quality protection measures will not be necessary.

Table 7-2 Special-Status Plant Protection Best Management Practices

BMP ID	Description	Standard Detail	Exceptions/Comments
	Measures include rice straw, hydromulch, geofabrics, wattles, sediment traps, check dams, drainage swales, and sand bag dikes. Materials must be certified weed-free to prevent the introduction of wheat, barley, and other non-native plant seeds. Erosion control materials must be constructed of natural fibers (e.g., coconut fiber mats, burlap and rice straw wattles, etc.) and may not be constructed with plastic monofilaments or other materials that could entrap snakes or amphibians.		
BMP - Special-Status Plant Protection-7 Use Weed-Free Plant Materials for Restoration in and near Special-Status Plant Populations	The MCOSD will prevent the introduction of invasive and other non-native plant material in to special-status plant habitats. Preventative measures will include: • To minimize erosion and sedimentation, maintain erosion and sediment control devices during ground disturbing activities and until all disturbed soils have been stabilized. Measures include rice straw, hydromulch, geofabrics, wattles, sediment traps, check dams, drainage swales, and sand bag dikes. Materials must be certified weed-free to prevent the introduction of wheat, barley, and other non-native plant seeds. Erosion control materials must be constructed of natural fibers (e.g., coconut fiber mats, burlap and rice straw wattles, etc.) and not of plastic monofilaments or other materials that could entrap snakes or amphibians. • Do not allow the introduction of incompatible fill. Use only clean, native soils and aggregate materials from projects within the preserve, or use fill that is purchased from a certified weed-free source, before allowing the importation of materials from outside the preserves. Fill materials should be approved by natural resource staff to ensure compatibility with future restoration/rehabilitation goals. • Segregate and treat soils and vegetation contaminated with invasive plant seeds and propagules. Treat, as appropriate, to prevent the spread of invasive plants. Treatment may include disposal onsite within already infested areas, chipping or pile burning and mulching to eliminate viable seeds, or disposal at an approved cogeneration plant or green waste facility. • Establish vehicle-cleaning areas to clean vehicles, inside and out, of soil or invasive plant seeds or plant parts before entering MCOSD preserves, whenever moving equipment between areas within the preserves, and before leaving preserves. Within the wash areas, the tires and body of equipment will be brushed off or hosed down. • Inspect construction equipment for soil or invasive seeds or plant parts. Require contractors to make equipment available for inspection before entering MCOSD preserves, when moving between sites within the preserves, and before leaving preserves.		Weed-free restoration materials and BMPs will be the standard for all road and trail management projects.

Table 7-2 Special-Status Plant Protection Best Management Practices

BMP ID	Description	Standard Detail	Exceptions/Comments
BMP - Special-Status Plant Protection-8 Revegetation with Native, Geographically-Appropriate Plant Species	MCOSD will: • Following the completion of construction elements or soil disturbance, revegetate disturbed areas with native plant species as necessary and practicable to promote appropriate habitat for native species. √ Revegetation with annual grasses and forbs can provide rapid vegetative cover and initial soil stabilization. √ Planting or seeding with a combination of native annual and perennial grasses, forbs, shrubs, and trees can provide longer term and stronger erosion control, as well as more desirable visual cover. The end goal of revegetation should be a species composition and vegetative structure that integrates with the surrounding natural community, or a desired natural community, to the maximum extent possible. • Locally collected native plant materials from the project footprint and surrounding areas will be the preferred standard for revegetation efforts. √ Plant materials should be collected from within the same watershed or MCOSD preserve if possible. √ The MCOSD will allow collection of no more than 5 percent of any native plant population to prevent over-collection of wild plant material sources. √ If sufficient local plant materials are not available for collection prior to project activities, geographically-appropriate native plant materials will be purchased from a local nursery or seed supplier. A project-specific revegetation plan will be developed by the MCOSD natural resource staff for projects as needed to guide revegetation efforts.		
BMP - Special-Status Plant Protection-9 Worker Awareness Trainings	Worker awareness trainings will include the following: • a photograph and description of each special-status species, sensitive resource, or invasive plant known from the project area, • a description of its ecology and habitat needs, • potentially confusing resources (e.g. similar species or habitats) • an explanation of the measures being taken to avoid or reduce adverse impacts • reporting and necessary actions if sensitive resources are encountered, and. • the workers' responsibility under the applicable environmental regulation.		

Table 7-2 Special-Status Plant Protection Best Management Practices

BMP ID	Description	Standard Detail	Exceptions/Comments
BMP - Special-Status Plant Protection-10 Relocation of Special-Status Plants	If special-status species are located in the project area and impacts to these species are unavoidable, plants and / or propagules will be relocated to suitable habitat off-site prior to the commencement of construction or management activities. Alternatively, off-site mitigation for impacts could be considered. If special-status wildlife species are located on site, the appropriate resource agency will be contacted and a qualified biologist possessing any necessary permits will relocate individuals to suitable habitat off-site as applicable.		This measure will only be implemented if special-status plant species are located within a project area.
BMP - Special-Status Plant Protection-11 Road and Trail Inspections	During regular inspections, the MCOSD staff will check to ensure that road and trail features and associated infrastructure are well-maintained and posing no threat to surrounding special-status plant resources. Inspectors will record information pertaining to: • the spread of invasive, exotic plants which could affect special-status plant habitats; • the status and quality of any known special-status plant populations in the immediate vicinity that could be affected by road or trail use, maintenance, or general management. Inspectors will report any findings and make recommended corrective actions if appropriate.		
BMP - Special-Status Plant Protection-12 Reuse and Replanting of Native Trees and Shrubs	Where feasible, excavated trees and shrubs removed from unstable fillslopes and cutbanks will be replanted on graded contours to restore the areas with native vegetation and promote native plant habitat. These plants will represent the most locally-appropriate materials for restoration and conform to the vegetation types of the surroundings.		
BMP - Special-Status Plant Protection-13 Ripping and Recontouring Roads	Road and trail surfaces should be ripped and decompacted where appropriate. Ripping surfaces provides a more suitable substrate for the recolonization or revegetation of native plant materials. Road and trail surfaces should be recontoured to prevent the potential for erosion into wetlands and waters areas (i.e. sloped away from these locations). Any shoulders, ditches, and embankments can also be removed and the area graded to a natural contour.		

Table 7-3 Invasive Plant Management Best Management Practices

BMP ID	Description	Standard Detail	Exceptions/Comments
BMP - Invasive Plant Management-1 Comply with IPM Ordinance	All herbicide use will be administered under Marin County's Integrated Pest Management (IPM) Ordinance, and work will only be conducted under the supervision of a certified Pest Control Applicator. All herbicide use for vegetation management actions will be posted and reported consistent with the IPM Ordinance.		
BMP - Invasive Plant Management-2 Limit Herbicide Use near Sensitive Natural Resources	Limit herbicide use within 100 feet of sensitive natural resources. Where possible, ensure use of least harmful method to conduct vegetation management (e.g. hand control, mechanical control, cultural controls).		
BMP - Invasive Plant Management-3 Survey and Control Invasive Plants in Project Footprint, Including Access Roads and Staging Areas	• Before ground-disturbing activities begin, inventory and prioritize invasive plant infestations for treatment within the project footprint and along access routes. As feasible, control priority invasive plant infestations at least a year prior to the planned disturbance to minimize invasive plant seeds in the soil. • Where feasible, survey the road shoulders of access routes for invasive plant species and remove priority invasive plants that could be disturbed by passing vehicles. • Avoid establishing staging areas in areas dominated by invasive plants. If populations of priority invasive plants occur within or near staging areas, flag their perimeters so that vehicle and foot traffic can avoid them. • Establish vehicle-cleaning areas (BMP-Invasive-5) to clean vehicles, inside and out, of soil or invasive plant seeds or plant parts before entering MCOSD preserves, whenever moving equipment between areas within the preserves, and before leaving preserves. Within the wash areas, the tires and body of equipment will be brushed off or hosed down. • Inspect construction equipment for soil or invasive seeds or plant parts. Require contractors to make equipment available for inspection before entering MCOSD preserves, when moving between sites within the preserves, and before leaving preserves.		
BMP - Invasive Plant Management-4 Limit Soil Disturbance	Soil disturbance during road and trail management projects, including road and trail maintenance, mechanical treatments, and prescribed bums, will be minimized to the greatest extent possible to reduce the potential for introduction or spread of invasive plant species, to protect topsoil resources and to reduce available habitat for new invasive plant species. Plan all road and trail management activities to disturb as little area as possible.		

Table 7-3 Invasive Plant Management Best Management Practices

BMP ID	Description	Standard Detail	Exceptions/Comments
BMP - Invasive Plant Management-5 Clean Invasive Plant Materials and Propagules from Heavy Equipment, Maintenance Tools, and Fire Management Vehicles	The MCOSD will implement the following procedures when working in or near infested areas: • Establish vehicle-cleaning areas to clean vehicles, inside and out, of soil or invasive plant seeds or plant parts before entering MCOSD preserves, whenever moving equipment between areas within the preserves, and before leaving preserves. Within the wash areas, the tires and body of equipment will be brushed off or hosed down. • Inspect construction equipment for soil or invasive seeds or plant parts. Require contractors to make equipment available for inspection before entering MCOSD preserves, when moving between sites within the preserves, and before leaving preserves.		
BMP - Invasive Plant Management-6 Reduce Potential for Establishment of Invasive Plants on Disturbed Soil Surfaces	Measures will be taken to minimize the establishment of invasive species in disturbed soil areas. The MCOSD will implement one or more of the following actions: • To minimize erosion and sedimentation, maintain erosion and sediment control devices during ground disturbing activities and until all disturbed soils have been stabilized. Measures include rice straw, hydromulch, geofabrics, wattles, sediment traps, check dams, drainage swales, and sand bag dikes. Materials must be certified weed-free to prevent the introduction of wheat, barley, and other non-native plant seeds. Erosion control materials must be constructed of natural fibers (e.g., coconut fiber mats, burlap and rice straw wattles, etc.) and may not be constructed with plastic monofilaments or other materials that could entrap snakes or amphibians. • Do not allow the introduction of incompatible fill. Use only clean, native soils and aggregate materials from projects within the preserve, or use fill that is purchased from a certified weed-free source, before allowing the importation of materials from outside the preserves. Fill materials should be approved by natural resource staff to ensure compatibility with future restoration/rehabilitation goals. • Segregate and treat soils and vegetation contaminated with invasive plant seeds and propagules. Treat, as appropriate, to prevent the spread of invasive plants. Treatment may include disposal onsite within already infested areas, chipping or pile burning and mulching to eliminate viable seeds, or disposal at an approved cogeneration plant or green waste facility.		

Table 7-3 Invasive Plant Management Best Management Practices

BMP ID	Description	Standard Detail	Exceptions/Comments
BMP - Invasive Plant Management-7 Monitor and Control Invasive Plants in Road and Trail Management Work Areas	Monitor areas subject to road and trail management, including fuel management treatments periodically for a minimum of 3 years following project completion for the presence of invasive plant species. If invasive plants become established or spread as a result of project activities, treat and remove invasive plants.		
BMP - Invasive Plant Management-8 Protect Stream Banks and Water Quality During Invasive Plant Removal	The MCOSD will install approved erosion control measures and non-filament based geotextiles when working near wetlands, streams, creeks, ponds, and riparian areas, and following the removal of invasive plants from stream banks to prevent sediment movement into watercourses and to protect bank stability. MCOSD will obtain and comply with necessary wetland permits and IPM procedures related to work in and near wetlands. Where appropriate, the MCOSD will also seek guidance from a fisheries biologist regarding the amount of material permissible to remove when controlling large patches of invasive plants from stream corridors, so as to prevent changes in water temperature and quality.		If work occurs during the dry season near seasonally wet areas, erosion control and water quality protection generally measures will not be necessary.
BMP - Invasive Plant Management-9 Road and Trail Inspections	During regular inspections, the MCOSD staff will check to ensure that road and trail features and associated infrastructure are well-maintained and posing no threat to surrounding sensitive biological resources. Inspectors will record information pertaining to: • Invasive exotic plant populations and new infestations that may be threatening sensitive species and habitats Inspectors will report any findings and make recommended corrective actions if appropriate.		
BMP - Invasive Plant Management-10 Monitoring Decommissioned Areas	Decommissioned road and trail areas will be monitored for the presence of invasive plant species for two years following decommissioning to ensure no infestations develop. If invasive species are detected at this time, corrective actions will be taken as appropriate.		

Table 7-4 Including Best Management Practices in Construction Contracts

BMP ID	Description	Standard Detail	Exceptions/Comments
BMP- Construction Contracts -1 Include Standard Procedures in Construction Contracts	When using contractors to perform road and trail management, the MCOSD will include some or all of the following standard procedures into construction contracts: • Time of work. The contractor will work with MCOSD natural resource staff to determine the optimal timing of contracted work. Many timing restrictions relate to protecting special-status species. Other types of timing restrictions include timing to control invasive plants; timing to avoid migration, gestation, or flowering periods for special-status species; or timing work in wetlands to the dry season. • Work in and near wetlands. Establish a buffer of 100 feet from wetland and tidally influenced areas (i.e., from the ordinary high water mark of flowing or standing water in creeks, streams, or ponds). Avoid construction work within this buffer area. √ Within the buffer, restrict routine road and trail management activities in creeks, streams, other waterways, and tidally influenced areas. Limit road and trail management work to least-harmful methods; restrict herbicides to those that are EPA-approved for use near water. Prohibit activities that disturb soil or could cause soil erosion or changes in water quality. √ Within the buffer, limit work that may cause erosion to low flow periods. Low flow months for local creeks are typically August to October. For tidal areas, work will not occur within 2 hours of high tide events at construction sites when high tide is greater than 6.5 feet at measured at the Golden Gate Bridge, using corrections for areas near individual MCOSD preserves. Tide charts are available online form the National Oceanic and Atmospheric Agency / National Weather Service (http://www.wrh.noaa.gov/mtr/sunset.php). √ If construction work cannot be fully avoided in wetlands and riparian areas, consult with the appropriate state and federal agencies to obtain permits √ Require the contractor to prepare and implement a Stormwater Pollution Prevention Plan (SWPPP) to protect water quality for road and trail management work in or near wetlands, ponds, seeps, creeks, tidal areas, or stream crossings. • Work in and near invasive plant infestations. The contractor will work with MCOSD natural resource staff to identify any priority invasive plants		These BMPs will be added to construction contracts as appropriate.

Table 7-4 Including Best Management Practices in Construction Contracts

BMP ID	Description	Standard Detail	Exceptions/Comments
	that occur near the project work area, including the project footprint, access roads, staging areas, and similar work areas. The contractor agrees to comply with requirements to reduce the spread or transport of priority invasive plants related to construction activities. Requirements may include some or all of the following: √ Conduct a training program for all field personnel involved with the proposed road and trail management project prior to initiating project. The program will consist of a brief presentation by person's knowledgeable in the special-status species, sensitive resource, or invasive plants known from the project area. The program will include the following: a photograph and description of each special-status species, sensitive resource, or invasive plant known from the project area, a description of its ecology and habitat needs, an explanation of the measures being taken to avoid or reduce adverse impacts, and the workers' responsibility under the applicable environmental regulation. The worker training may be conducted in an informal manner (e.g., as part of a routine tailgate safety meeting). √ Restrict work to periods when invasive plants are not in fruit or flower. √ Establish dedicated area for cleaning vehicles, inside and out, of soil or invasive plant seeds or plant parts before entering MCOSD preserves, whenever moving equipment between areas within the preserves, and before leaving preserves. Within the wash areas, the tires and body of equipment will be brushed off or hosed down. √ Inspect construction equipment for soil or invasive seeds or plant parts. Require contractors to make equipment available for inspection before entering MCOSD preserves, when moving between sites within the preserves, and before leaving preserves. √ Dispose of green waste in a manner that does not spread invasive plants (i.e. onsite disposal in an already infested area; offsite disposal to a cogeneration plant or an approved green waste composting facility). • Protect environmentally sensitive areas. MCOSD natural resource staff shall identify any Environmentally Sensitive Areas in or near construction work areas prior to the start of work. Environmentally Sensitive Areas may include special-status plant or wildlife species or their habitats (e.g., woodrat nests, habitat for special-status plant and wildlife species,		

Table 7-4 Including Best Management Practices in Construction Contracts

BMP ID	Description	Standard Detail	Exceptions/Comments
	individuals or populations of listed special-status plant or wildlife species or locally rare species), wetlands including creeks streams and related riparian area, and sensitive vegetation types as described in this report. MCOSD staff and contractors will fully avoid and protect such areas during habitat restoration work; or to help obtain and comply with necessary permits and regulatory requirements. • Use locally collected plant materials for revegetation projects. Plant materials will be collected onsite at MCOSD preserves or within the same watershed as the revegetation project. The contractor will work with the MCOSD to identify native plant nurseries that can collect and propagate seed and other plant materials from the local area. No use of commercial grassland mixtures for erosion control unless approved in advance by the MCOSD. The contractor will allow the MCOSD to inspect and approve all plant materials and seed prior to use onsite. • Work in and near special-status species habitat. For road and trail management work in or near special-status species habitat, the contractor is required to comply with requirements of MCOSD project permits to protect special-status species and their associated habitats before and during construction, and to cooperate with the MCOSD in implementing any state and federal permits and agreements for the project. The special-status species population plus a buffer should be designated as an "Environmentally Sensitive Area" using lath and flagging, pin flags, or temporary fencing (depending on resource sensitivity to work). The contractor will be required to avoid all designated Environmentally Sensitive Areas during construction. For any special-status species or their habitats that cannot be fully avoided, the contractor will work with the MCOSD to obtain and comply with federal and state Endangered Species Acts, the federal Migratory Bird Treaty Act, and the state Fish and Game Code permits and agreements. • Restrict soil disturbance, import of non-native soil or fill material. To reduce the potential for damage of native plants and/or introduction of invasive plants, the contractor will be required to minimize the footprint of soil disturbance to the minimum amount necessary to complete the contracted work. In particular, minimize the footprint of access roads, staging areas, and areas of temporary disturbance. The contractor and its staff and subconsultants agree not to drive off-road or drive or park on native vegetation unless approved in advance by MCOSD natural resource		

Table 7-4 Including Best Management Practices in Construction Contracts

BMP ID	Description	Standard Detail	Exceptions/Comments
	staff. The contractor agrees that if soil excavation is required, every attempt will be made to have a balanced cut and fill project that reuses all native soils onsite. Unless pre-approved by MCOSD natural resource staff, there will be no use of non-native soil or fill material during the contractor's activities. • Erosion control. To minimize erosion and sedimentation, maintain erosion and sediment control devices during ground disturbing activities and until all disturbed soils have been stabilized. Measures include rice straw, hydromulch, geofabrics, wattles, sediment traps, check dams, drainage swales, and sand bag dikes. Materials will be certified weed-free to prevent the introduction of wheat, barley, and other non-native plant seeds. Erosion control materials will be constructed of natural fibers (e.g., coconut fiber mats, burlap and rice straw wattles, etc.) and may not be constructed with plastic monofilaments or other materials that could entrap snakes or amphibians. • Other procedures: √ All entry gates to the project site not used for construction access will be locked at all times and gates used for construction access will be locked during non-construction hours. √ All vehicles will carry a suitable fire extinguisher. √ Immediately rehabilitate areas where project actions have disturbed soil. Require areas disturbed by equipment or vehicles to be rehabilitated as quickly as possible to prevent erosion, discourage the colonization of invasive plants, and address soil compaction. Techniques include decompacting and aerating soils, recontouring soils to natural topography, stabilizing soils via erosion control materials, revegetating areas with native plants, and removing and monitoring invasive plants.		

7.2.2 Cultural Resources

Table 7-5 Cultural Resource Protection Best Management Practices

BMP ID	Description	Standard Detail	Exceptions/Comments
BMP-Cultural Resources-1 Historical and Archaeological Resource Mapping	Prior to constructing any project that would involve disturbance of earth outside road or trail beds or other areas previously disturbed when constructing the road and trail system, MCOSD[2] staff shall determine whether or not the project area is located within an area that is mapped as "historically or archaeologically sensitive" according to Map 4-1, *Historical Resources* in the Marin Countywide Plan and according to other confidential cultural sensitivity maps on file with the County that list prehistoric or archaeological site. If the project area is mapped as "historically or archaeologically sensitive" according to Map 4-1 or other confidential County sensitivity maps, the site shall be field surveyed by a State-qualified or FIGR[5] recommended archaeological consultant who shall make recommendations and develop proposals for any procedures deemed appropriate to further investigate and/or mitigate adverse impacts to those resources.	CWP[3] VMP[4]	CWP Implementing Program HAR-1.a *Map Resource Areas* CWP Implementing Program HAR-1.d *Require Archaeological Surveys for New Development* CWP Implementing Program HAR-1.p *Consultation Regarding Confidentiality of Important Sites*
BMP-Cultural Resources-2 Consultation with Northwest Information Center	Prior to constructing any project that would involve disturbance of earth outside road or trail beds or other areas previously disturbed when constructing the road and trail system, MCOSD[2] staff shall contact the Northwest Information Center of the California Historical Resources Information System and request a records search of known historic and cultural resources within and adjacent to the proposed project area, and seek the determination of the NWIC coordinator regarding the potential for cultural resources on the site. Should the records request or the recommendation of the NWIC coordinator indicate the presence of sensitive resources, the site shall be field surveyed by a State-qualified or FIGR[5] recommended archaeological consultant who shall make recommendations and develop proposals for any procedures deemed appropriate to further investigate and/or mitigate adverse impacts to those resources.		

Table 7-5 Cultural Resource Protection Best Management Practices

BMP ID	Description	Standard Detail	Exceptions/Comments
BMP-Cultural Resources-3 Tribal Consultation	Prior to constructing any project that would involve disturbance of earth outside road or trail beds or other areas previously disturbed when constructing the road and trail system, require tribal consultation prior to modifying or changing the use of any road or trail alignment by: a) Sending the road and trail project description information to the Native American Heritage Commission (NAHC) and requesting contact information for tribes with traditional lands or places located within the geographic areas affected by the proposed changes. b) Contacting each tribe identified by NAHC in writing and providing them the opportunity to consult about the proposed project. c) Organizing a consultation with tribes that respond to the written notice within 90 days. d) Referring proposals associated with proposed road and trail modifications or changes in use to each tribe included on the NAHC list at least 45 days prior to the proposed action. e) Providing notice of a public hearing at least 10 days in advance to tribes and any other persons who have requested that such notice be provided.	CWP[3]	CWP Implementing Program HAR-2.i *Implement SB 18 Tribal Consultation Requirements*
BMP-Cultural Resources-4 Alteration of Historic Structures	Limit the modification of ranch structures or other historical features to maintain the aesthetic quality, historical setting, and rural character of the preserves.	CWP[3]	CWP Policy HAR-1.5 Regulate Alteration of Historical Buildings
BMP-Cultural Resources-5 Permanent Protection	Where road and trail improvements cannot avoid sensitive cultural resources, require road and trail modifications to incorporate the resource and include a resource protection plan for the maintenance and future protection.	CWP[3] VMP[4]	CWP Implementing Program HAR-1.e Require Permanent Protection CWP Implementing Program HAR-1.h Seek Certified Local Government Status CWP Implementing Program HAR-1.i Seek Funding to Protect Resources Sites
BMP-Cultural Resources-6 Construction Discovery Protocol	If cultural resources are discovered on a site during construction activities, all earthmoving activity in the area of impact shall be halted until a qualified archaeological consultant examines the findings, assesses their significance, and develops proposals for any procedures deemed appropriate to further investigate and/or mitigate adverse impacts to those resources.		

Table 7-5 Cultural Resource Protection Best Management Practices

BMP ID	Description	Standard Detail	Exceptions/Comments
BMP-Cultural Resources-7 Human Remains	In the event that human skeletal remains are discovered, work shall be discontinued in the area of the discovery and the County Coroner shall be contacted. If skeletal remains are found to be prehistoric Native American remains, the Coroner shall call the Native American Heritage Commission within 24 hours. The Commission will identify the person(s) it believes to be the "Most Likely Descendant" of the deceased Native American. The Most Likely Descendant would be responsible for recommending the disposition and treatment of the remains. The Most Likely Descendant may make recommendations to the landowner or the person responsible for the excavation/grading work for means of treating or disposing of the human remains and any associated grave goods as provided in Public Resources Code Section 5097.98.	PRC Section 5097.98[4]	
BMP-Cultural Resources-8 Community Awareness	Increase public awareness of local historical and archaeology, and the need to protect these resources by highlighting cultural resources along road and trail network with interpretive signage and information kiosks, and/or by placing a historical marker along the MCOSD road and trail segment to inform trail users about the importance of the site and/or event.	CWP[3]	CWP Goal HAR-2 Community Involvement in Historical Protection CWP Policy HAR-2.1 Encourage Recognition of Significant Sites CWP Implementing Program HAR-2.c Install Markers and Plaques

Notes:

1 MCOSD = Marin County Open Space District
2 SP = Marin County Open Space District Strategic Plan (2008)
3 CWP = Marin Countywide Plan (2007)
4 VMP = Vegetation Management Plan (2012)
5 PRC = Public Resources Code
6 FIGR = Federated Indians of Graton Rancheria, includes the Coast Miwok and Southern Pomo

7.2.3 Hydrology and Water Quality

Table 7-6 Water Quality Protection and Erosion Control Best Management Practices

BMP ID	Description	Standard Detail	Exceptions/Comments
BMP – Construction Water Quality-1 Modify Road and Trail Management Actions in and near Wetlands and Riparian Vegetation Types. Limit Necessary Work to Low Flow or Low Tide Periods.	Restrict road and trail management activities near wetlands in a manner that reduces the potential for sediment or pollutants to enter wetlands. Implement the following BMPs, as needed: • Establish a buffer of 100 feet from wetland and tidally influenced areas (i.e., from the top of bank of creeks, streams, or ponds). Avoid management work within this buffer area if possible. • If construction work in wetlands and riparian areas cannot be fully avoided, consult with the appropriate state and federal agencies to obtain permits. • Within the buffer, restrict construction activities in creeks, streams, other waterways, and tidally influenced areas. Limit road and trail management work to least-harmful methods; restrict herbicides to those that are EPA-approved for use near water. Prohibit activities that disturb soil or could cause soil erosion or changes in water quality. • Within the buffer, limit work that may cause erosion to the low flow or low tide periods. Low flow months for local creeks are typically August to October. For tidal areas, work will not occur within 2 hours of high tide events at construction sites when high tide is greater than 6.5 feet at measured at the Golden Gate Bridge, using corrections for areas near individual MCOSD preserves. Tide charts are available online form the National Oceanic and Atmospheric Agency / National Weather Service (http://www.wrh.noaa.gov/mtr/sunset.php). • Within the buffer, minimize erosion and sedimentation; maintain erosion and sediment control devices during ground disturbing activities and until all disturbed soils have been stabilized. Measures include weed-free straw, hydromulch, geofabrics, wattles, sediment traps, check dams, drainage swales, and sand bag dikes. Materials must be certified weed-free to prevent the introduction of wheat, barley, and other non-native plant seeds. Erosion control materials must be constructed of natural fibers (e.g., coconut fiber mats, burlap and rice straw wattles, etc.) and may not be constructed with plastic monofilaments or other materials that could entrap snakes or amphibians.		If work occurs during the dry season and is greater than 100 feet from creeks and wetlands, erosion control and water quality protection measures will not be necessary.

Table 7-6 Water Quality Protection and Erosion Control Best Management Practices

BMP ID	Description	Standard Detail	Exceptions/Comments
BMP - Construction Water Quality-2 Temporary Erosion and Sediment Control	Temporary sediment control BMPs are to be implemented when new trail construction or existing trail improvements will result in greater than one acre of disturbance. Temporary BMPs may also be required when disturbance is less than one acre but close to a sensitive resource or has the potential to discharge a significant amount of sediments or pollutants to surface water. Several of the listed temporary BMPs can also be used as post-construction stabilization measures. Temporary fencing is to be installed around staging areas and along limits of construction when work areas are immediately adjacent to sensitive resources. This will limit the disturbance footprint and help protect resources including native vegetation, wetlands, and streams during grading operations. • Temporary Exclusion Fencing Linear sediment barriers protect water quality by slowing and filtering stormwater runoff from disturbed areas. Fiber or straw roll barriers can also be spaced along the contours of a disturbed area post construction to prevent concentrated flow and stabilize the area until there is sufficient vegetation coverage. • Filter fence • Fiber, coir or straw rolls One or more of the following is to be applied to restore or protect areas disturbed by excavation or grading operations. • Tilling (minimum 6 inch depth) and Seeding • Hydromulch and Tackifier • Planting • Straw or Wood Mulch • Coir (Jute) Netting • Biodegradable Erosion Control Blankets • Plastic Sheeting (only as an interim protection during storm events when construction site is still active) Soil and loose material stockpiles are to be covered with weighted plastic sheeting or seeded and hydro-mulched when inactive or prior to storm events. Active and inactive material stockpiles should be encircled at all times with a linear sediment barrier.	Appendix "X" Filter Fence *(CASQA 2009)* 8B Straw Roll Placement *(Best 2009)* 2009 Construction BMP Handbook Portal (CASQA - http://www.cabmphandbooks.com/)	Information and standard details for temporary erosion control BMPs can be accessed via the California Stormwater Quality Association's (CASQA) 2009 Construction BMP Handbook Portal. For this reason they were not reproduced here.

Table 7-6 Water Quality Protection and Erosion Control Best Management Practices

BMP ID	Description	Standard Detail	Exceptions/Comments
	When constructing trail or road crossings at a stream, temporary diversion (i.e. clear water diversion) may be required. The following lists options for isolating the work area and protecting the resource when diverting stream flows via gravity fed flexible pipe or active pumping around the work area. • Sand or gravel bag coffer dam enclosed in plastic sheeting • Water-filled dam (i.e. Aquadam or other) • Sheet piling • Turbidity curtains The following options are to be considered for applying or containing and treating sediment laden water produced during dewatering operations. • Sprinkler System to Open Area (as long as there is no visible surface runoff) • Temporary Constructed Sediment Basin or Trap • Rented Sedimentation Tank (i.e. Baker Tank or other)		
BMP - Construction Water Quality-3 Erosion Control Measures	• Unless no feasible alternative is available, the use of heavy equipment will be avoided in areas with soils that are undisturbed, saturated, or subject to extensive compaction. Where staging of heavy equipment, vehicles, or stockpiles is unavoidable, the allowable disturbance footprint will be limited and flagged or marked in the field. Following the end of work, newly disturbed soils will be scarified to retard runoff and promote rapid revegetation. • Immediately rehabilitate areas where project actions have disturbed soil. Require areas disturbed by equipment or vehicles to be rehabilitated as quickly as possible to prevent erosion, discourage the colonization of invasive plants, and address soil compaction. Techniques include decompacting and aerating soils, recontouring soils to natural topography, stabilizing soils via erosion control materials, revegetating areas with native plants, and removing and monitoring invasive plants. • In areas with highly erosive soils or steep slopes, roots of target invasive trees and shrubs will be left in place. Stumps may be cut or ground-to-ground level.		If work occurs during the dry season and is greater than 100 feet from creeks and wetlands, erosion control and water quality protection measures will not be necessary.
BMP - Construction Water Quality-4 Reduce and Prevent the Potential for Pollution	The following BMPs will be implemented as needed: • Properly use, store, and dispose of chemicals, fuels, and other toxic materials according to manufacturer's specifications and agency regulations. • Prohibit, or restrict equipment refueling, fluid leakage, equipment maintenance, and road surfacing activities near wetlands. Requiring		

Table 7-6 Water Quality Protection and Erosion Control Best Management Practices

BMP ID	Description	Standard Detail	Exceptions/Comments
	placement of fuel storage and refueling sites in safe areas well away from wetlands. Safe areas include paved or cleared roadbeds, within contained areas such as lined truck beds, or other appropriate fuel containment sites. Inspect equipment and vehicles for hydraulic and oil leaks regularly. The MCOSD will not allow leaking vehicles on MCOSD preserves, and require the use of drip pans below equipment stored onsite. Require that vehicles and construction equipment are in good working condition and that all necessary on-site servicing of equipment be conducted away from the wetlands. • Require all contractors to possess, and all vehicles to carry, emergency spill containment materials. Absorbent materials should be on hand at all times to absorb any minor leaks and spills.		Ensure MCOSD staff is trained in spill prevention and clean-up during annual training sessions.
BMP - Construction Water Quality-5 Road and Trail Inspections	Road and trail maintenance inspectors will record information pertaining to: • Concentrated flows on roads and trails that cause erosion, rilling, or gullying; • runoff and effects to water quality of nearby habitats; • the spread of invasive, exotic plants near wetlands and waters; • and the status and quality of any known sensitive resources in the immediate vicinity that could be affected by road or trail use and/or maintenance. Inspectors will report any findings and make recommended corrective actions if appropriate.		Using road/trail inspection forms will facilitate complete and consistent data capture and reporting.
BMP - Construction Water Quality-6 Grading Windows	Grading should only occur during the dry months (generally May 15 to October 15) when associated erosion will be reduced to the maximum extent possible.		
BMP - Construction Water Quality-7 Culvert Inspection	Culverts should be inspected on a regular basis. Inspections will ensure that culverts do not clog with sediment or debris. Blocked culverts may affect water quality, change the water course, increase erosion or sediment run-off, or affect wildlife. Any materials blocking culverts will be removed and disposed of outside of the watercourse in an area not subject to erosion. If a significant blockage or sedimentation exists, the County will plan and implement corrective actions as necessary. Excavation of sediments within streams may require a maintenance permit from the U.S. Army Corps of Engineers, CDFW, and/or SF RWQCB.		

Table 7-6 Water Quality Protection and Erosion Control Best Management Practices

BMP ID	Description	Standard Detail	Exceptions/Comments
BMP - Construction Water Quality-8 Proper Disposal of Excess Materials	Any construction, maintenance, decommissioning, and management-related materials (including soils, debris, trash, or other materials that need to be removed as part of management activities) will be disposed of at an appropriate site where materials could not impact sensitive resources. For example, grading-related excess soils or removed debris will not be placed in or around a waterbody or wetland where the materials could be subject to erosion, thereby affecting water-quality.		
BMP-Construction Water Quality-9 Sidecasting Construction Material	When constructing a new road or trail avoid sidecasting or at a minimum contain and remove side cast material when it has the potential to reach surface waters. The following "rules of thumb" based on Fishnet 4C Guidelines (2007) will be used as guidance: Slope Gradient / Distance to Watercourse / Sidecast Rule Any slope / Will likely enter watercourse / Not Allowed ≤20% / ≥150 Feet / Allowed ≤50% / ≥300 Feet / Allowed > 50% / Long Vegetated Slope / Allowed >50% / Shorter, Sparsely Veg. Slope / Not Allowed		

Table 7-7 Road and Trail Drainage and Water Quality Best Management Practices

BMP ID	Description	Standard Detail	Exceptions/Comments
Design Standards for New Trail or Road Construction and Existing Trail or Road Drainage Improvements			
BMP-Operational Water Quality-1 Trail and Road Cross-Section	Proper drainage is critical to maintaining trails long term and preventing the onset of erosion and water quality impacts. Trails and roads are to have one of the following cross-sections. • Outsloped (Preferred Method) • Insloped to Ditch • Crowned to Ditch Outsloped is the preferred cross-section, since it more readily disperses runoff onto the native vegetation. In almost all cases an outsloped road shall be paired with rolling dips or water bars listed next.	6G Road Surface Geometry (*Best 2009*)	In some cases trail sections may be narrow enough or constructed of stair steps or switchbacks that negate the need for an insloped or outsloped cross-section.
BMP-Operational Water Quality-2 Dips and Waterbars	Rolling dips or waterbars are to be implemented to disperse flow and minimize the potential for concentrated flow that may incite rilling or gullying. • Rolling/Reverse Grade Dip (Preferred Method) • Water Bars Rolling dips are more durable and drivable then water bars and are therefore the preferred method. Gently sloped (less than 2% grade) or sloped trail and road sections that are short in length (less than 200 feet) do not necessarily require dips or bars. Dip and bar spacing is dependent upon grade, soil type, and expected runoff volume. General guidance for spacing dips based on a US Forest Service Pocket Guide is as follows: 2% - 3% Grade = 200 to 300 Feet 5% - 7% Grade = 180 to 160 Feet 8% - 10% Grade = 140 to 150 Feet	6A Reverse Grade Dip and 6C Waterbar (*Best 2009*)	

Table 7-7 Road and Trail Drainage and Water Quality Best Management Practices

BMP ID	Description	Standard Detail	Exceptions/Comments
BMP-Operational Water Quality-3 Trail/Road Surface Treatment and Delineation	Heavy pedestrian, bicycle, and vehicle traffic can degrade an earthen trail or road over time, resulting in eroded sediment material becoming mobilized in storm water runoff and wind. When trails, roads or parking at trailheads are highly active, the following surface treatments will be applied to minimize degradation. • Road Aggregate Surfacing • Permeable Pavers • Pervious Concrete Veering off of designated trails by users can lead to accelerated erosion at the margins. When volunteer trails are a concern due to potential damage that may result to an adjacent sensitive resource such as a wet meadow or special status species, the following trail delineation measures will be applied. • Wood Fencing (split rail, MCOSD compliant) • Vegetation barriers (i.e. thorny or medium to tall native vegetation) • Boulders (placed along the trail margin) • Signage (i.e. "sensitive resource please stay on designated trail", etc.)	4D Road Aggregate Surfacing *(Best 2009)* Permeable Pavers and Pervious Concrete – (See Manufactured Product Design Requirements) Wood Fencing – (Several options but needs to be MCOSD compliant)	
BMP-Operational Water Quality-4 Conveyances	Insloped and crowned roadways shall incorporate conveyances such as native grass- or rock-lined ditches, vegetated swales or subdrains to convey to culverts. The materials selected to line the installations (i.e. vegetation, rock, gravel, etc.) are dependent upon estimated peak flow velocities and infiltration requirements. • Inside Road Ditch (Vegetated or rock-lined) • Grass-lined Swale • Subdrain Relief culverts are necessary to drain an inside ditch at specified intervals to prevent excess velocities in the ditch or overflow onto the trail from the ditch. Relief culverts convey the flow under and across the trail or roadway to the outsloped area below. • Ditch Relief Culvert When a ditch relief or permanent culvert outlets onto a steep slope an extension of the piping may be warranted to prevent erosion at the outlet. • Downspout	6E Inside Road Ditch (*Best 2009*) Appendix "X" Grass-lined Swale (*Caltrans 2008*) 6G Subdrain (*Best 2009*) 6D Ditch Relief Culvert (*Best 2009*) 5G Downspout (*Best 2009*)	If road grade is slight and velocities are less than 4 feet per second (fps) native grasses are appropriate in the ditch, if the road grade is steeper and velocities are likely to exceed 4 fps than 4 to 6 inch rock is required. Subdrains can be installed adjacent and parallel to or within the road prism when there is a benefit to infiltrating surface water flows more quickly such as in the case of reducing stagnant water sources as a vector control measure or when collecting drainage behind a retaining wall structure. In cases where there is ample space and the trail grade is very slight (<5%) a broader, shallower grass or vegetated swale may be used to provide additional infiltration.

Table 7-7 Road and Trail Drainage and Water Quality Best Management Practices

BMP ID	Description	Standard Detail	Exceptions/Comments
BMP-Operational Water Quality-5 Conveyance Outlets	Energy dissipation is critical to preventing erosion at culvert outlets. The following application is to be combined with relief and permanent culvert installations shown under BMPs 4D and 7D. • Energy Dissipater	5H Energy Dissipater *(Best 2009)*	
BMP-Operational Water Quality-6 Conveyance Flow Attenuation	Repairs to existing inside ditches that exhibit erosion or rilling due to excess gradient or insufficiently spaced relief culverts. Rock or log check dams reduce the effective slope of the ditch thereby attenuating flow velocities and reducing erosion. • Check Dams (Rock or log)	Appendix "X" *(CASQA November 2009)*	Temporary check dams may also be constructed of fiber rolls, staked straw bales or gravel bags but these should only be considered as interim measures to prevent erosion until a more permanent repair can be made.
BMP-Operational Water Quality-7 Drainage, Wetland, or Stream Crossings	Proper cross-drainage will be required when a trail or road crosses an existing drainage, wetland or stream. Whether a pipe or open conveyance is chosen, adequately sizing and sloping the cross-drainage to convey up to the 100-year design flow is critical to ensuring long term functionality with minimal maintenance. Selection and design of each crossing installation will consider at a minimum; 1) road or trail type, 2) required vehicle use and load bearing, 3)stream type, 4)fish passage requirements, and 5) estimated flood flows. Any stream crossing construction should be done in mid to late summer when flows are low to non-existent in order to reduce diversion and dewatering efforts and minimize potential risks to water quality. If the drainage or stream is small and does not host any fish species, a permanent culvert, ford crossing or boardwalk may be used. Engineering design and analysis must be conducted to ensure correct size, material and placement before construction can begin. • Permanent Culvert • Rock Ford • Stream Ford • Low Puncheon (Boardwalk) When fish species are known to inhabit the stream or may end up populating the stream as part of future restoration efforts one of the following may be used to provide cross-drainage. As stated above engineering design is required to determine the appropriate size, material and placement for each type of crossing. • Embedded Culvert • Open Arch Culvert • Bridge	5A Permanent Culvert *(Best 2009)* 5C Rock Ford *(Best 2009)* 5D Stream Ford *(Best 2009)* 5E Low Puncheon *(Best 2009)* 5B Embedded Culvert *(Best 2009)* Bridge (Engineered Design Only)	

Table 7-7 Road and Trail Drainage and Water Quality Best Management Practices

BMP ID	Description	Standard Detail	Exceptions/Comments
Slope and Trail Stability			
BMP-Operational Water Quality-8 Slope Stability	Steep slopes adjacent to trails and roadways can result in slumping or gullying that can damage the road or trail and degrade water quality. The following measures are to be considered in stabilizing steep slopes adjacent to trails and roads. • Lay back slopes (modify to 2:1 or flatter) and vegetate • Rip rap steep slopes (1:1) • Concrete block wall Trails and roads that impinge upon stream riparian corridors often degrade stream banks either directly from road construction or indirectly from road drainage that flows over the banks or pedestrians who access the stream via volunteer trails down the banks. Any restoration within the banks of streams or creeks has to be done with care and will almost always require prior authorization from various regulatory agencies including CA Fish and Game (i.e. Streambed Alteration Agreement), US Army Corps of Engineers (404 Permit) and the San Francisco Regional Water Quality Control Board (401 Certification and NPDES permit). The following is a list of potential applications to stabilize creek banks, however any repairs should be properly engineered and permitted before being implemented: • Lay back slopes (modify to 2:1 or flatter), seed and blanket • Install biotechnical treatments (**Preferred Method**) such as √ Willow staking and pole planting √ Seed and blanket √ Salvage and reuse topsoil √ Brush Mattress √ Soil wraps √ Wattles/Fascines √ Brush Layering √ Willow/blanket combination √ Boulder or log weirs √ Large woody debris revetment • Plantable Rip Rap • Retaining Walls Slopes associated with bridge crossings also require protection as follows:	7E Rip Rap *(Best 2009)* Appendix "X" Concrete Block Wall *(Verdura Detail)* Appendix "X" Various Bank Stabilization Measures *(Fishnet4C 2007)* 5F Bridge Abutment Armor *(Best 2009)*	

Table 7-7 Road and Trail Drainage and Water Quality Best Management Practices

BMP ID	Description	Standard Detail	Exceptions/Comments
	• Bridge Bank Armor There are additional measures for extremely vertical or unstable slopes such as terracing, concrete retaining walls, soldier pile walls, or subsurface geogrid installations; however these approaches will require full engineering design and analysis on a case by case basis. Slopes that are sloped back to 2:1 or flatter and seeded may also require temporary erosion control blanket installations to stabilize the hillslope while the vegetation matures. The concrete block wall may only be applicable in special cases where a short vertical slope (around 3 to 5 feet) needs to be stabilized in a park area that includes some urban or residential interface. There are plantable interlocking concrete blocks that provide an added benefit of vegetation growth along their face. Biotechnical treatments are the preferred method over hardscape solutions, such as rip rap when the designs are feasible under existing and forecasted site conditions.		
BMP-Operational Water Quality-9 Trail Buttressing	When a trail is built in steep terrain or on a steep cross-slope the following approaches will to be implemented as necessary to maintain trail stability and prevent erosion: • Wood lag retaining wall • Rock or log trail buttress • Trail steps	7A Wood Lag Retaining Wall (*Best 2009*) 7B Rock Retaining Wall (*Best 2009*) 7C Single Log Retaining Wall (*Best 2009*) 7D Wood Trail Steps (*Best 2009*)	

Table 7-7 Road and Trail Drainage and Water Quality Best Management Practices

BMP ID	Description	Standard Detail	Exceptions/Comments
Drainage Collection and Treatment			
BMP-Operational Water Quality-10 Catchment Basins	There may be a desire to capture and infiltrate runoff from MCOSD facilities, parking areas or roadways. The following is a list of options that may be selected based on the site's available land area, soil type, groundwater level and estimated volume of runoff to be collected. All options require engineering design prior to installation. • Dry Basin • Wet Basin • Infiltration Trench • Subsurface Infiltration Gallery or Drywell	Appendix "X" Dry Basin *(TRPA Handbook 2011)* Appendix "X" Wet Basin *(TRPA Handbook 2011)* Appendix "X" Infiltration Trench *(CA BMP Handbook 2003)* Appendix "X" Infiltration Gallery or Drywell *(TIRRS or various Product Manufacturers of Prefabricated Subsurface Galleries)*	The details provided for each catchment basin type are fairly generic and will require specific design modifications and analysis to "best fit" the design to the conditions and flow requirements of each individual site.
Decommissioning Existing Roads or Trails			
BBMP-Operational Water Quality-11 Slope Restoration	The end goal of road and trail decommissioning is to restore the area to more closely mimic its pre-existing topographic and drainage conditions. In doing so there will be temporary soil disturbance that requires similar BMP measures discussed above under Slope Stability and Temporary Erosion and Sediment BMPs. Measures will include tilling and seeding, mulching, and/or installing fiber rolls along contour intervals in order to revegetate and stabilize the newly graded areas. Graded slopes are not to exceed 2 to 1 unless additional measures, such as rock rip rap, are incorporated to stabilize any steepened slopes. Large woody debris and slash when available can be placed intermittently across and through the area to prevent pedestrian and/or vehicle traffic from accessing the restored site. Temporary fencing may also be used until the restored vegetation has matured and the area has reached a more stable condition.	9C Rock Grade Check *(Best 2009)* 9D Wood Grade Check *(Best 2009)* Appendix "X" Rock Vortex Weir *(Maryland Dept of Rnvironment and Water Management 2000)*	

Table 7-7 Road and Trail Drainage and Water Quality Best Management Practices

BMP ID	Description	Standard Detail	Exceptions/Comments
	• Exclusion Fencing • Large woody debris When stream crossings such as culverts or fords are removed as part of trail decommissioning, grade control structures within the stream beds will likely be required to prevent incision and maintain channel bed stability These methods require engineering design prior to installation and can be one of the following types: • Rock Grade Check • Log Grade Check • Boulder Weirs		

7.2.4 Geological Hazards

Table 7-8 Best Management Practices for Protection against Geological Hazards

BMP ID	Description	Standard Detail	Exceptions/Comments
BMP-Geological Hazards-1 Assessment and Requirements in Areas of Potential Geologic Hazard	Given the unique and potentially high risks associated with geologic hazards, general BMP prescriptions or standard details for these types of potential impacts are not appropriate. Instead, when new trails or trail improvements are proposed in Preserve areas with a propensity for geologic instabilities including slides or debris flows in the more elevated areas and subsidence or liquefaction in the low-lying areas, a site assessment shall be conducted by a certified geologist or geotechnical engineer. If geologic hazards are confirmed in the area, the site assessment will propose adequate avoidance measures or engineering elements to ensure trail and infrastructure stability and maintained public safety.		
BMP-Geological Hazards-2 Construction in areas of slides and debris flows	In areas of identified slide and debris flow hazards, locate and design new trails, drainage improvements, or irrigation so as not to alter the shape or stability, or change the drainage or groundwater conditions of an existing slide area, that would result in reactivation or destabilizing the slope even further.		
BMP-Geological Hazards-3 Construction in areas of erodible and expansive soils	Use avoidance tactics or engineered grading to mitigate adverse geologic conditions and potential hazards. Prior to finalizing road or trail project design, consult with engineering geologists and/or geotechnical engineers to identify and implement mitigating road or trial designs for new facility locations or when improving existing facilities.		
BMP-Geological Hazards-4 Construction in areas of collapsible soils	In any of the lower elevation preserves (i.e., those near sea level) assess soil type and the potential for subsidence to determine optimum trail location and structural foundations necessary to avoid collapsible soils. In consultation with a certified geologist or geotechnical engineer, design roads and trails to avoid or reduce this potential hazard through optimizing location or by implementing appropriate engineering designs.		

7.2.5 Air Quality

Table 7-9 Road and Trail Air Quality Best Management Practices

BMP ID	Description	Standard Detail	Exceptions/Comments
BMP-Air Quality-1 Implement BAAQMD Measures	As part of the Environmental Review Process, the MCOSD use the current BAAQMD CEQA Guidelines[1] to evaluate the significance of air quality impacts from road and trail management plans and projects, and to establish appropriate mitigation requirements.		Marin Countywide Plan Implementing Program AIR-1.b, Evaluate Air Quality Impacts of Proposed Projects and Plans.
BMP-Air Quality 2 Minimum Dust Control during Construction	MCOSD will require its staff or contractors to implement appropriate BAAQMD basic control measures for emissions of dust during construction of all road and trail modifications and improvements, including: • Water all active construction areas at least twice daily. • Cover all trucks hauling soil, sand, and other loose materials *or* require all trucks to maintain at least two feet of freeboard. • Pave, apply water three times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas and staging areas at construction sites. • Sweep daily (with water sweepers) all paved access roads, parking area and staging areas at construction sites. • Sweep streets daily (with water sweepers) if visible soil material I carried onto adjacent public streets.	BAAQMD CEQA Guidelines[1]	Covers routine operation and maintenance and day-to-day upkeep of road and trail network, minor road and trail reconstruction, and minor decommissioning activities. Also includes change in recreation use and/or the conversion from a road to a trail, for example any proposed action that does not involve construction activities, but an increase or decrease in the level of activity.
BMP-Air Quality-3 Enhanced Dust Control during Construction	MCOSD will require its staff or contractors to implement appropriate, BAAQMD enhanced control measures for emissions of dust during construction of all road and trail modifications and improvements that exceed more than four acres in area, including: • All "Basic" control measures listed above. • Hydroseed or apply (non-toxic) soil stabilizers to inactive construction areas (previously graded areas inactive for ten days or more). • Enclose, cover, water twice daily or apply (non-toxic) soil binders to exposed stockpiles (dirt, sand, etc.) • Limit traffic speeds on unpaved roads to 15 mph. • Install sandbags or other erosion control measures to prevent sil runoff to public roadways. • Replant vegetation in disturbed areas as quickly as possible.	BAAQMD CEQA Guidelines[1]	Includes major road and trail reconstruction, re-routing, and decommissioning activities such as repairing, replacing, or restoring heavily used and wide road and trail segments. Also covers re-surfacing, replacing, and restoring trailhead areas and installing new water quality and drainage features.

Table 7-9 Road and Trail Air Quality Best Management Practices

BMP ID	Description	Standard Detail	Exceptions/Comments
BMP-Air Quality-4 Dust Control during Construction for Sensitive Areas	MCOSD will require its staff or contractors to implement appropriate BAAQMD optional control measures for emissions of dust during construction of all road and trail modifications and improvements that are large in area, located near sensitive receptors or which for any other reason may warrant additional emission reductions including: • Install wheel washers for all exiting trucks, or wash off the tires or tracks of all trucks and equipment leaving the site. • Install wind breaks, or plant trees/vegetative wind breaks at windward side(s) of construction areas. • Suspend excavation and grading activity when winds (instantaneous gusts) exceed 25 mph. • Limit the area subject to excavation, grading and other construction activity at any one time.	BAAQMD CEQA Guidelines[1]	Covers re-routing road and trail alignments, significant decommissioning or restoration activities, and the construction of a new road and trail alignment on undisturbed land to connect previously unconnected points (e.g. 680 trail).

Notes:

1 BAAQMD CEQA Guidelines = Bay Area Air Quality Management District CEQA Guidelines (Table 2 – Feasible Control Measures for Construction Emissions of PM_{10}), 1999

2 CWP = Marin Countywide Plan (2007)

7.2.6 Noise

Table 7-10 Road and Trail Construction Noise Best Management Practices

BMP ID	Description	Standard Detail	Exceptions/Comments
BMP-Noise-1 Implement County Noise Ordinance Requirements	For all maintenance and construction projects using powered or heavy equipment, MCOSD shall implement the day and time restrictions for equipment operation and maintenance specified by Marin County Ordinance 3431, Construction Noise, as it shall be amended		
BMP-Noise-2 Noise Control during Construction Within and Adjacent to Sensitive Wildlife Populations	Equipment and vehicles shall utilize the best available noise control techniques (e.g., improved mufflers, equipment redesign, and use of intake silencers, ducts, engine enclosures and acoustically attenuating shields or shrouds) to prevent disturbance of nearby wildlife populations. Except for emergency projects as defined in Section 7.1.1, night-time operations, or planned operations during breeding season, in such areas shall be prohibited.		

7.3 Design Standards for Roads and Trails

The MCOSD has developed typical design standards for roads and trails to be used in the planning, construction, and maintenance of both existing and new facilities within the MCOSD's preserves. These design standards are set forth in Road and Trail Typical Design Specifications (Best 2008) attached to this RTMP as Appendix B. These specifications include trails, roads, stream crossings, road/trail drainage, structures, erosion control, and trail abandonment. Additional trail design standards derived from the County of Los Angeles Trails Manual (Los Angeles County 2011) are set forth in Appendix C. Road design standards derived from the Mendocino County Resource Conservation District's Handbook for Forest and Ranch Roads, A Handbook for planning, designing, constructing, reconstructing, maintaining, and closing wildland roads (MCRCD, et. al. 1994) are set forth in Appendix D.

With approval of the RTMP, the MCOSD will adopt these design specifications to guide all future work on roads and trails within the preserves.