Improving and Maintaining Roads to Reduce Impacts on Erosion and Water Quality
Why Are Roads a Concern?

Data from Drew Coe, Central Valley Regional Water Quality Control Board, based on studies in El Dorado County.
Roads Are The Main Source of “Unnatural” Sediment in Forested Watersheds

- Natural Inner Gorge/Streamside Delivery: 31%
- Natural Bank Erosion: 3%
- Natural Gullies: 13%
- Natural Landslides: 14%
- Timber Harvest Mass Wasting & Surface Erosion: 5%
- Other Mgmt: Road-related Mass Wasting: 6%
- Other Mgmt: Road-related Gullying: 6%
- Other Mgmt: Road-related Surface Erosion: 13%
- Other Mgmt: Vineyard Erosion: 0%

The First Step: Evaluating Your Roads and Diagnosing Problems

University of California
Cooperative Extension

Assessing the Condition of Your Roads

The purpose of this worksheet is to enable you to evaluate the condition of the roads on your property. Understanding road conditions will help you plan and prioritize actions that will improve your ability to manage your property. The assessment process includes several steps:

- Identifying access routes to your property and your rights and responsibilities concerning them.
- Mapping existing roads on your property.
- Deciding which roads you need for management.
- Deciding if you need new roads.
- Evaluating the condition of your existing roads, including both those you will use and those you won’t use.

Note: The worksheet asks for yes-no answers. A don’t know answer may imply a need-to-know.

Access to Your Property

If a public road adjoins or abuts your property and you have a legal encroachment permit to use it for access, you are in good shape. However, just because you have a driveway from a public road to your property does not necessarily mean that it is legal. Check your deed or check with the jurisdiction (city, county or state) that has responsibility for the public road. If you have access from a road on land owned by a federal agency such as the Forest Service, check with the agency’s local offices.

If you have access to your property through another property or by private road, you need to know if you have legal rights of access. This is usually recorded on your deed as a right-of-way. If you don’t have deeded access, then you need to know what rights you have to use the road. You also need to know what responsibilities you have for maintaining the road and what uses are restricted (e.g., hauling logs). In the absence of a legal right to use the road, you are vulnerable to the whims of your neighbor and need to negotiate that right.

1. Does a public road provide access to your property (e.g., county road or state highway)?
   - [ ] Yes
   - [ ] No
   - [ ] Don’t Know

2. Does a private (including public agency) road provide access to your property (e.g., subdivision road, road through adjoining private or public lands)?
   - [ ] Yes
   - [ ] No
   - [ ] Don’t Know

3. Do you have deeded access to your property?
   - [ ] Yes
   - [ ] No
   - [ ] Don’t Know
Common Problems
Road Prism Erosion

Road surface rills and sheet erosion, in-board ditch erosion, fill slope erosion at crossings, cut bank sloughing
Unstable Fills

Roads close to streams or intercepting groundwater, “perched” fills on steep slopes, un-compacted fills

Often these problems are due to poor road location and cannot be solved without road re-location or major re-construction.
Poor Drainage

The ultimate cause of most road-related problems

Through cut roads are like troughs that cannot drain

Potholes are caused when roads are too flat to drain
Gullies

They are always associated with a drainage problem and cannot be solved by “filling the hole”

Both of these gullies originated at points of road drainage discharge
Deficient Stream Crossings or Culverts
Inadequate Cross Drains

Cross drains are culverts or rolling dips that intercept and “relieve” ditch flow. They may be inadequately sized or spaced. As a result, ditches may erode or excessive runoff may be diverted down the road, causing rills and gullies.
Upgrading Existing Roads

Improving Drainage

• Out-sloping where appropriate
• Increasing the frequency or size of cross drains
• Replacing deficient stream crossings
• Eliminating stream diversion potential
Eliminating Diversion Potential - ensuring that if a crossing is plugged or overtopped, flow will return to the channel and not go down the road.

Sufficiently sized stream crossing is placed at “B”. “C” is critical dip axis. “A” and “D” are cross drains placed to intercept road runoff and disperse it over land instead of into the stream.
Upgrading Existing Roads
Improving Stability

• Stabilizing failing or vulnerable fill slopes
• Eliminating causes of gully erosion and protecting drainage outfall sites
Upgrading Existing Roads
Reduce Fine Sediment Production and Delivery

Usually involves surfacing and reducing “hydrologic connectivity”
Surfacing may be done on an entire all-season road or at critical locations such as stream crossings.
Eliminating Connectivity

• The goal is to intercept and disperse road runoff and sediment before it enters the stream.

• Can be accomplished with cross drains or outsloping that disperses runoff onto vegetated slopes.
Upgrading Existing Roads

Additional Treatments

Trash racks placed above stream crossings.

Water bars on temporary or seasonal roads.
Maintaining Roads

Annual Tasks

• Inspect your roads BEFORE the winter hits, and then during and after major storms.

• Clear debris and sediment from culvert inlets. Check upstream for accumulated debris. Check for erosion at outlets.

• Inspect rolling dips (if applicable) or cross drains to determine that they are functioning and that no erosion is occurring at outlets.

• Avoid frequent grading. Use a shovel to clear inboard ditches. Avoid grading ditches.

• Inspect cut and fill slopes for signs of instability.

• Keep records of problem sites. Mark these in the field for easy identification during storms.
The single most important thing to do is to keep crossings and culverts clear.
Thank You!