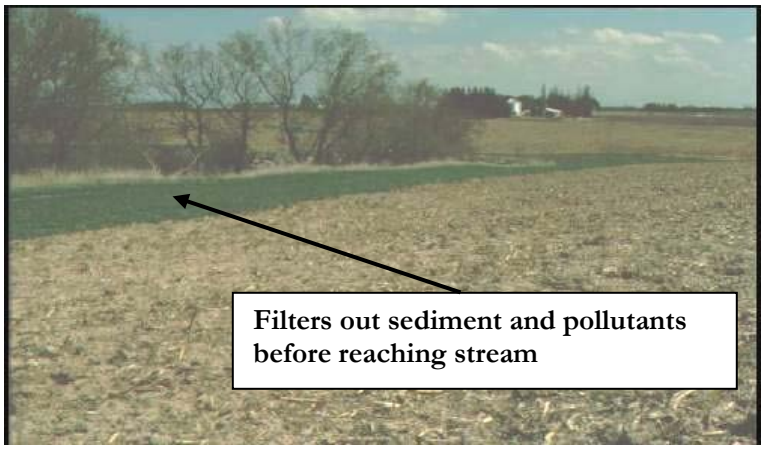
Table 1. Proposed Conservation Practices for the Santa Barbara County Permit Coordination Program

Practice Name (*FOTG #*)	Practice Description, Additional Conditions, Size Limits of the Practice Installed, and Environmental Benefits
Practices 1-9 primarily address excessive surface erosion from cultivated or grazed land, with the goal of preventing sediment and other pollutants from entering waterways. Many are installed in uplands.	
1. Access Road Improvements (560)	 **Add water bar to interrupt erosive flow** **Erosion** Improvements to an existing access road used for moving livestock, produce, and/or equipment for proper property management while controlling runoff to prevent erosion and maintain or improve water quality. Access road improvements typically involve multiple installations spread out over a long reach of road. This practice involves minor re-grading of previously disturbed soil and might include outsloping or the addition of a rolling dip to a road so that water is less erosive as it travels across the road. Additional Conditions: • This practice is used only on existing access roads, with the following exception: an existing road may be relocated away from a natural watercourse in order to plant riparian vegetation as part of a stream corridor restoration plan; the preferred location of a new road is, in decreasing order of preference: 1) outside of a 100 foot setback; or 2) as far back as possible from the watercourse within the 100 foot setback. New roads outside or within a 100 foot setback will not be placed on slopes greater that 20%. • Access road improvements will be performed only on private roads that do not serve as the primary access to habitable structures, unless the private road is the only access to the farm/ranch. • This practice does not include addition of asphalt or concrete to existing roads. • This practice does not include widening roads or increasing their weight-bearing capacity. • This practice does not include construction of all-weather roads, fire break roads, or logging roads. • Road improvements are modeled on the "*Handbook for Forest and Ranch Roads:*

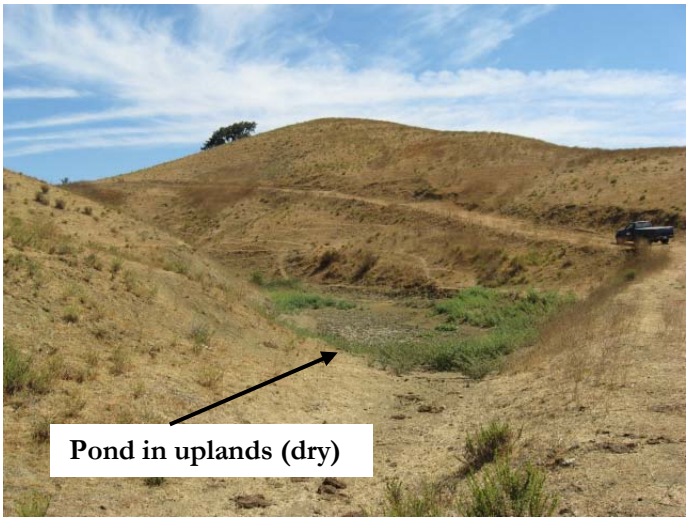
	A Guide for planning, designing, constructing, reconstructing, maintaining and closing wildland roads," by Weaver and Hagens. This manual contains descriptions of methods and designs to improve and maintain rural roads to correct problems associated with poor road placement and excessive runoff and erosion. • Improvements carried out under this practice will not be done for the purpose of accommodating future development or as a precursor to intensification of land use. • Size Limitations Length: ***Ave***: 1 mile; ***Max***: 4 miles Area: ***Ave***: 2 acres; ***Max***: 6 acres Soil disturbance: ***Ave***: 1500 cy; ***Max***: 3000 cy Environmental Benefits: • Improves water quality by decreasing sediment inputs to streams.
2. Diversion (Upland Flow Interceptors) (362)	**Diversion planted with grasses**  Construction of an earthen channel across a slope (much like a terrace) planted with grasses, from the approved plant list (Attachment 3), to slow and redirect excess surface flow. This is an upland practice primarily performed on cultivated land as part of a resource management system to break up concentrations of water on long slopes, reduce damage from runoff, and divert water away from active gullies or critically eroding areas. This practice is often used to deliver water to a sediment basin or a flat, vegetated area where flow velocities are slowed before discharging into a stream channel. Additional Conditions: • This practice **does not** involve the diversion of water from a waterway or redirection of flow to a different waterway. • This practice **does not** result in a change in volume of flow or flow reduction to surface waters. • Diversion of upland water **will not** prevent entry into a wetland or convert a wetland by changing the hydrology. • Each diversion must have a safe and stable outlet that conveys runoff to a point

	where outflow will not cause damage to a natural watercourse. Vegetative outlets or sediment basins, when required, will be installed and established prior to installation of a diversion. Size Limitations per property: • Length (farmland): ***Ave***: 5000 ft; ***Max***: 10,000 ft; Area (farmland): ***Ave***: 1.5 acres; ***Max***: 2.5 acres Soil disturbance (farmland): ***Ave***: 1500 cy; ***Max***: 3000 cy Width: 10 ft; Depth: 2.5 ft • Length (rangeland): ***Ave***: 1000 ft: ***Max***: 2500 ft Area (rangeland): ***Ave***: 0.5 acre: ***Max***: 1.25 acres Soil disturbance (rangeland): ***Ave***: 300 cy; ***Max***: 750 cy Width: 10 ft; Depth: 2.5 ft Environmental Benefits: • Reduces sediment and related pollutants delivered to surface waters • Helps prevent gully formation
3. Filter Strip (393)	 A strip of herbaceous vegetation planted between cropland, grazing land, or disturbed land and watercourses. This practice applies when planned as part of a conservation management system and is used at the lower edges of fields to remove sediment, organic matter, and other pollutants from runoff prior to entering streams. Filter strips are also used to provide permanent herbaceous vegetation to enhance habitat for wildlife and beneficial insects, and/or to maintain or enhance watershed function. Additional Conditions: • Filter strips may be installed within a 100 foot setback; however, existing riparian vegetation will not be removed in order to install a filter strip. • Vegetation planted for a filter strip will be non-invasive species chosen from the approved plant list (Attachment 3). • Filter strips may contain non-native plant species within a 100 foot setback only under the following conditions: 1) existing cultivated or range land is already within the setback or at the immediate edge of the setback; 2) the filter strip will be

	installed outside the edge of existing riparian vegetation. Size Limitations: Length: ***Ave***: 1 mile; ***Max***: 2 miles Area: ***Ave***: 2 acres: ***Max***: 3.5 acres Soil disturbance: ***Max***: Less than 50 cy Environmental Benefits: • Minimizes sediment and attached pollutants from entering waterways • Reduces erosion on the area on which they are installed • Enhances wildlife habitat • Provides habitat for beneficial insects
4. Grassed Waterway (412)	 A natural or constructed earthen channel or swale established with suitable vegetation for the stable movement of excessive runoff. This practice is used to convey runoff from diversions, terraces, or other concentrated water sources, to reduce gully erosion, reduce sediment delivered to receiving waters, and improve water quality downstream. Grassed waterways are usually installed on cultivated land and field ditches adjacent to cultivated land. Additional Conditions : • Grassed waterways **will not** divert water out of the natural sub-watershed. • Rarely, grassed waterways may be installed within a 100 foot setback, however, existing riparian vegetation, if present, will not be removed in order to install a grassed waterway. • Vegetation planted for a grassed waterway will be non-invasive species chosen from the approved plant list (Attachment 3). • Grassed waterways may contain non-native, non-invasive plant species within a 100 foot setback only under the following conditions: 1) existing cultivated or range land is already within the setback or at the immediate edge of the setback; 2) the grassed waterway will be installed outside the edge of existing riparian vegetation. Size Limitations: • Length (farmland): ***Ave***: 2500 ft; ***Max***: 4000 ft Area (farmland): ***Ave***: 2 acres; ***Max***: 5 acres

	Soil disturbance (farmland): ***Ave***: 3200 cy; ***Max***: 8000 cy Width: 30 ft: Depth: ***Ave***: 1 ft; ***Max***: 3 ft Length (in field ditches): ***Ave***: 2500 ft; ***Max***: 1 mile Area (in field ditches): ***Ave***: 0.5 acre; ***Max***: 1.5 acres Soil disturbance (in field ditches): ***Ave***: 800 cy; ***Max***: 2400 cy Width: ***Ave***: 8 ft; ***Max***: 12 ft Depth: ***Ave***: 1 foot; ***Max***: 3 feet Environmental Benefits: • Minimizes sediment and attached pollutants from entering waterways, riparian habitat, and/or wetlands. • May be used as a connective feature to other habitat types such as riparian areas and wetlands.
5. Irrigation System and Tailwater Recovery (447)	 A practice designed to capture excess irrigation water, provide temporary water storage, and redistribute water back to the system for reuse. This practice may be applied as part of a conservation management system to conserve irrigation water and improve offsite water quality. Additional Conditions: • Nutrient management measures, pest management measures, and irrigation system management are an essential component of this practice, and will be planned and implemented to limit chemical-laden tailwater as much as practical. • This practice may include pump house structures; when required, these will not exceed 120 ft^2. • Basins and pumphouses may be placed within a 100 foot setback, but only when the farmable or grazing area is already within a 100 foot setback; existing riparian vegetation will not be removed in order to install a tailwater recovery basin or pumphouse. • All pump intakes will be screened. • Storage basins will be sized to provide adequate retention time for the breakdown of chemicals contained in runoff.

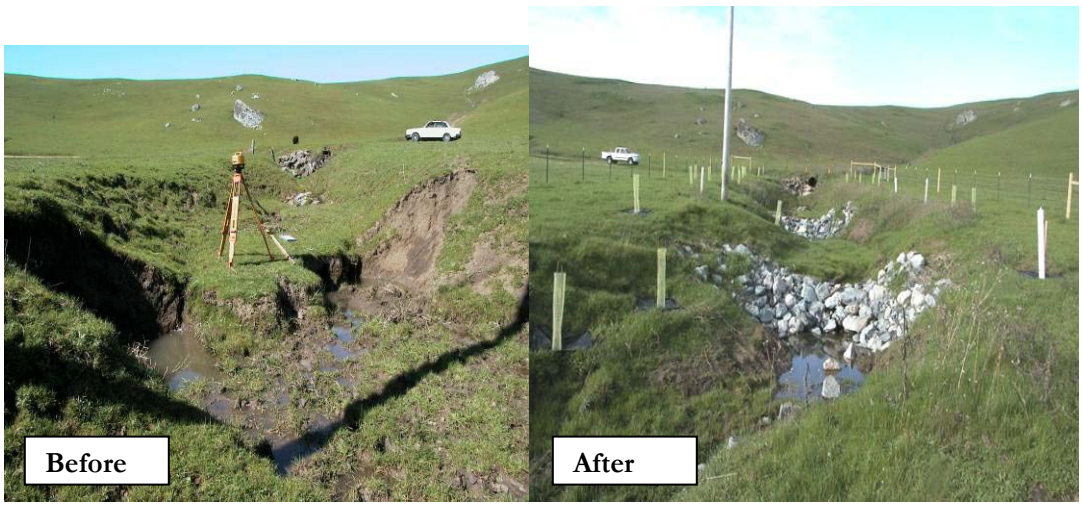
	• Seepage of chemical-laden water from a storage facility will be controlled to the extent possible by using natural soil liners, commercial liners or other approved methods. Size Limitations: Length: ***N/A*** Area of temporary storage basin: ***Max***: 0.5 acre Soil disturbance: ***Max***: 6500 cy Environmental Benefits: • Conserves limited water supplies • Improves downstream water quality by decreasing sediment and sediment-attached pollutants carried by runoff.
6. Pipeline (516)	  **Pipeline trench** **Alternative water source** A pipeline is used for conveying water from a source of supply to points of use to shift livestock to constructed water sources away from streams. Generally, buried pipelines are installed in upland areas. Occasionally, a pipeline may cross a stream; when this is necessary, pipelines will be buried to an appropriate depth to maintain channel and bank stability, and will minimize impacts to riparian habitat. In areas where channels are deeply incised and the substrate does not allow burying pipe easily (boulder/cobble), pipelines may be suspended across a channel and attached to posts on the banks; posts will be placed to avoid impacts to riparian vegetation. Additional Conditions: • This practice will not provide water for human consumption, recreation, or construction activities. • This practice will rely on an existing source of water supply. • Drafting of creek surface water is not allowed; pumping of underground water must be from a well or wells within the maximum permitted rate under a landowner's valid water rights permit. • If booster pumps are required, pumps will not be located within a 100 foot setback, except for pumps associated with existing wells; any new pump house will not be greater than 12 feet high and will be constructed of non-reflective material. • If installed in a stream, this practice will not include installation of grouted rock,

	headwalls or the like. Size Limitations: • Length (on rangeland): ***Ave***: 2 miles; ***Max***: 5 miles Area (on rangeland): ***Ave***: 0.5 acre; ***Max***: 1 acre Soil disturbance (on rangeland): ***Ave***: 800 cy; ***Max***: 2000 cy Width: 4 ft; Depth: 1 ft; Pipe Diameter: ***Max***: 2 inches • Length (instream/riparian zone): ***Ave***: 100 ft; ***Max***: 200 ft Area (instream/riparian zone): ***Ave***: 100 ft^2; ***Max***: 200 ft^2 Soil disturbance (instream/riparian zone): ***Ave***: 15 cy; ***Max***: 30 cy Width: 4 ft; Depth: 1 ft; Pipe Diameter: ***Max***: 2 inches Environment Benefits: • Limits livestock access to riparian areas reducing bank erosion, sediment inputs, and deposit of animal waste directly into streams, and enhances riparian vegetation establishment and health.
7. Ponds (378)	 A water impoundment made by constructing an embankment or by excavating a pit or dugout. This practice will be used to install new ponds; new ponds serve as part of a grazing management system to provide alternative water sources for livestock away from sensitive riparian areas and to create habitat for targeted species such as California tiger salamanders, California red-legged frogs, and other protected/rare species. Additional Conditions: • New ponds will be installed offstream, on rangeland located in upland areas; water will be supplied only from rainwater or sheet flow (no groundwater pumping); and NRCS assumes liability for proper functioning of engineered embankments and follows the NRCS review and certification process. • This practice will not provide water for irrigation, human consumption, recreation, or construction activities. • If excavated material is spread on adjacent uplands it will not exceed 1 foot in

	height. • Pond construction will require a landowner have a valid water rights permit. If a landowner does not have a valid water rights permit, this practice will not be allowed under the Project. • DFG and FWS will condition activities to avoid and minimize potential impacts to listed species; landowners assume responsibility for creating new habitat for listed species. • Length: ***N/A*** Area : ***Ave***: 0.25 acre; ***Max***: 0.5 acre Soil disturbance : ***Ave***: 3000 cy; ***Max***: 6000 cy Environmental Benefits: • Having numerous ponds in a watershed can help recharge aquifers and result in springs and creeks flowing for longer periods during the year • Reduces soil erosion and sedimentation in riparian areas when used as part of a grazing management system • Improves riparian habitat quality and provides long-term riparian habitat protection • May create habitat for California tiger salamanders, California red-legged frogs, and other aquatic species
8. Sediment Basin (350)	 A basin constructed to collect and store debris or sediment. This practice applies where physical conditions or land ownership preclude treating the sediment source by installing erosion control measures to keep soil in place. Sediment basins will trap sediment, sediment associated pollutants, and other debris and prevent undesirable deposition on bottomlands and in streams. Basins are generally located at the base of agricultural lands adjacent to a natural drainage. Additional Conditions: • Sediment basins **will not be constructed in a stream channel** or other permanent water body. • Basins near watercourses shall be located at least 100 feet from the top of creek bank or the edge of riparian habitat, whichever is further, to the maximum extent

	feasible. • Basins may be placed within a 100 foot setback, but only when the farmable area or grazed area is already within a 100 foot setback; existing riparian vegetation will not be removed in order to install a sediment basin. • Basins are usually partially below grade and embankments are planted with appropriate vegetation. • Basins are designed to release water at a natural flow rate (often by installing an *Underground Outlet*, see below). • When a basin outlets directly to a natural watercourse, appropriate energy dissipaters are installed to slow velocities and prevent scour These structures will not include grouted rock, headwalls and the like installed below the ordinary high water mark. Size Limitations: Length: ***N/A*** Area: ***Ave***: 0.3 acre; ***Max***: 0.5 acre Soil disturbance: ***Ave***: 3500 cy; ***Max***: 6500 cy Embankment Height: ***Ave***: 4 ft; ***Max***: 8 ft Environmental Benefits: • Prevents excessive sediment and sediment-attached pollutants from entering streams and wetlands
9. Underground Outlet (620)	 A conduit installed underground to collect excess surface water and carry it to a suitable outlet. This practice applies where a system is needed to dispose of excess water generated by farmland on steep slopes without causing erosion or flooding. Underground outlets are often installed as part of a water management system with upland diversions, terraces, or sediment basins to collect excess runoff and prevent erosive surface flow. Additional Conditions: • Underground Outlets may be used with Diversions, Grassed Waterways, and/or Sediment Basins to address surface erosion; see descriptions and maximum

	dimensions associated with those practices. • Where conditions allow, and to the maximum extent feasible, outlets shall not be constructed on or near creek banks or watercourses. • When a pipe outlets directly to a natural watercourse, appropriate energy dissipaters are installed to slow velocities and prevent scour These structures will not include grouted rock, headwalls and the like installed below the ordinary high water mark. • Size Limitations: Length: ***Ave***: 600 ft; ***Max***: 1500 ft Area: ***Ave***: 0.1 acre; ***Max***: 0.2 acre Soil disturbance: ***Ave***: 600 cy; ***Max***: 1500 cy Width: 5 ft; Depth: 5 ft. Environmental Benefits: • Essential part of a water management system to prevent or repair sheet and rill erosion and prevent excess water and sediment from entering waterways.
Practices 10-18 primarily address excessive stream erosion and deposition, with the goal of maintaining or restoring natural stream corridor stability and enhancing native plant communities and fish and wildlife populations. These practices are usually installed in streams.	
10. Channel Stabilization (584)	 **Example above: One-time removal of sediment causing damage to banks** This practice applies to stream channels undergoing damaging aggradation or degradation that cannot be reasonably controlled by upland Practices alone (establishment of vegetation, installation of bank protection, or installation of upstream water control devices). Measures that may be used to stabilize the bed or bottom of a channel include installation of instream structures such as grade stabilization structures (see Grade Stabilization Structure practice) to control large gullies caused by headcutting, limited removal of sand or sediment that have caused the channel to become plugged due to a large storm event or bank failure; and channel reshaping as needed under the Stream Habitat Improvement and Management practice.

	Additional Conditions: • Allowable structures include loose rock checks, rock buried at grade (keyways), timbers, and willow layering. • Concrete, grouted rock, and gabions are not allowed. • Planting native vegetation on the banks is incorporated with this practice. • Removal of accumulated sand or sediment that has caused the channel to become plugged will be permitted **one time only at any given location** when it is causing bank erosion or threatening infrastructure. Routine maintenance involving dredging of a waterway is not permitted. Size Limitations: • ***If channel stabilization is achieved with grade stabilization structures*** – (see Grade Stabilization Structure practice for dimensions) • ***If channel stabilization is achieved with sediment removal*** – Length: ***Ave***: ~~500 ft~~ 300 ft; ***Max***: ~~1000~~ 500 Area: ***Ave***: ~~0.5~~ 0.3 acre; ***Max***: ~~0.7~~ 0.5 acre Soil disturbance: ***Ave***: ~~1000~~ 700 cy; ***Max***: ~~1700~~ 1000 cy Environmental Benefits: • Stabilizes stream channels/corridors resulting in improved water quality to downstream areas, including wetlands • May improve riparian habitat and associated wildlife habitat such as nesting sites and movement corridors
11. Grade Stabilization Structure (410)	 **Gully repair using loose rock checks** A structure used to control the grade and prevent or stop headcutting. This practice applies where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Special attention is given to maintaining or improving stream function and wildlife habitat.

	Additional Conditions: • This practice falls into Tier IV of the Environmental Protection Measures. See Table 4 for additional conditions. • Structures installed above grade **will not be installed in steelhead streams**. Keyways (rock buried at grade) are allowed in steelhead streams. • Structures installed above grade **will not be installed in the coastal zone**. Keyways (rock buried at grade) are allowed in the coastal zone. • Structures will not impede wildlife movement. • Structures will be installed only when other channel stabilization measures are not feasible. • Structures may include loose rock checks, timbers, and willow layering. Concrete, grouted rock, and gabions are not allowed. • This practice incorporates planting native vegetation on channel banks. Size Limitations: • Loose rock checks are the largest structures that will be installed (see dimensions, below); dimensions for wood or plant material would be smaller: Length: ***Ave***: 3 structures per 500 ft of channel or gully; ***Max***: 10 structures per 1000 ft of channel or gully Area: ***Ave***: 0.2 acre; ***Max***: 0.3 acre Soil disturbance: ***Ave***: 900 cy (300 cy per structure*) ***Max***: 3000 cy (300 cy per structure*) * Grading dimensions are for actual structure (max 50 cy) and temporary work in channel (250 cy) Drop height (from top of structure to downstream toe): ***Max***: 4 ft (for 3 structures in 500 ft of channel) ***Max***: 2 ft (for 10 structures in 1000 ft of channel) Environmental Benefits: • Structures, if required, are part of an integrated channel stabilization plan. • Structures can stop headcutting, a process which left unchecked, will continue to erode stream channels and banks and deposit large amounts of sediment into the channel. • Native vegetation provides habitat for fish and wildlife.

12. Limited Vegetation Removal to Minimize Erosion (326)

Hand crews trimming vegetation to prevent further undermining of bridge

This practice will be used to remove dead, uprooted vegetation from a channel which may accumulate in large amounts after a storm, plugging a channel or deflecting water towards banks or infrastructure; to remove fallen trees and other obstructions from a channel if these are causing detrimental bed or bank erosion; and to remove a limited amount of channel vegetation to prevent failure of a structure such as a culvert.

Additional Conditions:

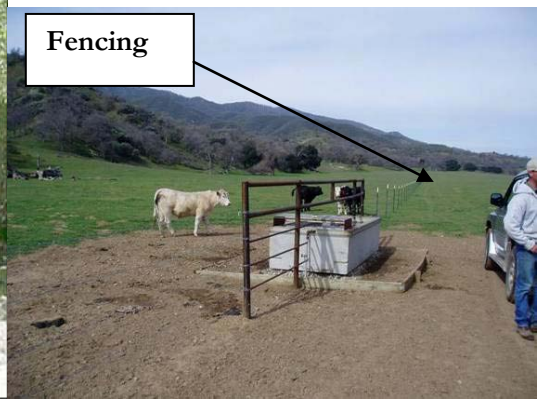
- Hand tools will be used whenever possible to remove debris or perform selective trimming. Heavy equipment in a channel will only be used to remove large objects (*e.g*. cars, appliances, concrete) when access with a crane is not possible from the top of the bank; approval by DFG of use of heavy equipment in the channel shall be required on a project-specific basis.
- Trimming willows, if required, will be accomplished in a way that retains a shaded tunnel-like effect.
- Whenever possible, willows will be limbed up into single trunk trees to reduce channel obstruction.
- Removed willow and cottonwood cuttings will be used on-site for erosion protection and to interplant open areas to provide shade and cover.
- Habitat forming elements that provide cover, food, pools, and water turbulence, when present, will be retained when not causing bank or bed erosion, or replaced in a nearby stream location where they will not cause bed or bank erosion.

Size Limitations:

- Removing native or non-native vegetation to protect eroding bank or infrastructure*:*

  Length: ***Ave***: 50 ft; ***Max***: 100 ft
  Area: ***Ave***: 500 ft^2 ***Max***: 0.05 acre
  Soil disturbance: ***N/A (no grading required)***

	Environmental Benefits: • Decreases sediment inputs from eroding stream banks • Helps prevent structural failure and maintain stream corridor stability • May enhance habitat for fish and wildlife, especially movement corridors
13. Critical Area Planting (342)	 **Just after planting to prevent bank erosion** **Establishing permanent vegetation on highly erodable areas.** This practice is used to stabilize the soil, reduce damage from sediment and runoff to downstream areas, and improve wildlife habitat and visual resources. Typically this practice is used after installation of other practices (*e.g.*, Stream Bank Protection) or to restore degraded sites such as gullies or deep rills or land disturbed by past oil development. Additional Conditions: • Native plants characteristic of the local habitat type will be used for this practice within the stream corridor, with the following exceptions: non-persistent, non-invasive grass species such as barley grass and others from the approved plant list (Attachment 3) may be used as nurse crops or for temporary erosion control benefits until natives are established. Non-native plants from the approved plant list may be installed in upland areas to repair degraded sites. • When installing or maintaining this practice above the ordinary high water mark, a filter fabric fence, fiber rolls and/or rice or straw bales will be used, if needed, to keep sediment from flowing into the adjacent water body; when vegetation is sufficiently mature to provide erosion control, it may be appropriate to remove these structures. Size Limitations: • Stream bank – Length: ***Ave***: 1500 ft; ***Max***: 2500 ft Area: ***Ave***: 0.5 acre; ***Max***: 1 acre Soil disturbance: ***N/A*** (Planting on stream banks is usually preceded by stabilizing the bank first; see Stream Bank Protection practice for soil disturbance limits) • Upland gullies - Length: ***N/A*** Area: ***Ave***: 3 acres; ***Max***: 5 acres Soil disturbance: ***Ave***: 3000 cy; ***Max***: 6000 cy

	Environmental Benefits: • The resulting vegetation cover is expected to reduce soil erosion and reduce soil nutrients and other pollutants from entering surface waters or leached into ground water. • Established riparian vegetation will improve habitat for fish and wildlife.
14. Restoration and Management of Declining Habitats (643)	   Restoring and conserving rare or declining native plant communities and associated wildlife species. This practice is used to restore land or aquatic habitats degraded by human activity; provide habitat for rare and declining wildlife species; and to manage unique or declining native habitats. Specifically, this practice will be used to 1) remove invasive plant species; 2) install cross-fencing and stockwater systems as part of a grazing management system designed to protect riparian habitat; and 3) restore existing ponds. Pond restoration primarily involves removing sediment and repairing spillways and embankments; occasionally this may include complete replacement of embankments. These activities do not include any increase in the original storage capacity of a pond or increases in other dimensions such as height of existing embankments. Without appropriate pond maintenance, ponds no longer serve their intended purposes, do not provide wildlife habitat and, when embankments eventually fail, large amounts of sediment are delivered to downstream receiving waters.

Additional Conditions:

- Removal of invasive plant species will be done by hand; any use of herbicides will follow approved manufacturer protocols and limitations by regulatory agencies (see Environmental Protection Measures, Table 3).
- Pond restoration will require a landowner have a valid water rights permit. If a landowner does not have a valid water rights permit, pond restoration will not be allowed under the Project.
- Landowners assume responsibility for creating new habitat for listed species.
- Sediment removal/maintenance will occur when the pond is dry or when stream flow is at its lowest level.
- A percentage of the native vegetated shoreline of the pond will be left intact, based on how much native habitat is currently present.
- Pond embankments will be vegetated with native plants appropriate to site conditions if in a stream; non-invasive plants from the approved plant list (Attachment 3) may be used in upland areas.
- During pond re-grading, a shallow bench/terrace around the pond will be left intact or installed if none exists.
- The minimum grade of finished slopes for ponds will be 2:1.

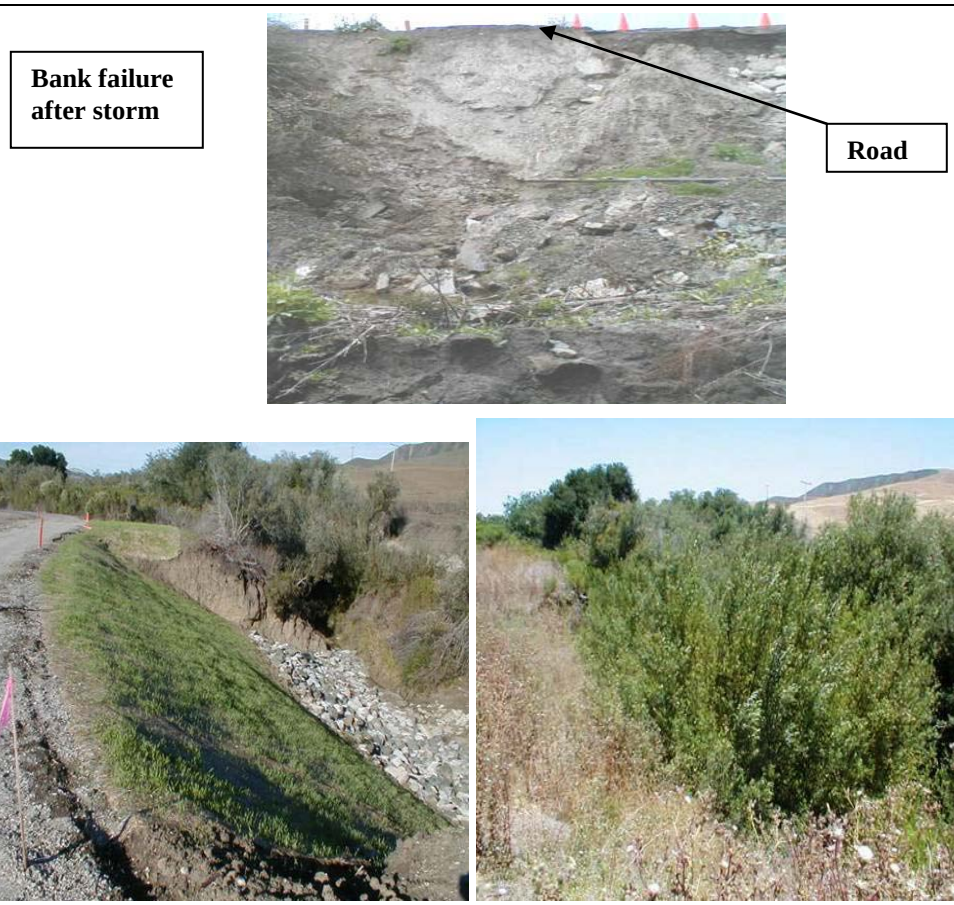
Size Limitations:

- Instream invasive plant removal –
  Length: ***Ave***: 500 ft: ***Max***: 2000 ft
  Area: ***Ave***: 0.5 acre: ***Max***: 2.5 acres
  Soil disturbance: ***N/A***
- Cross fencing -- Length: ***Ave***: 2 miles: ***Max***: 5 miles
  Area : ***N/A***
  Soil disturbance: ***N/A***
  Top wire: not higher than 4 ft; Bottom wire: 15” from ground
- Pond restoration – Length: ***N/A***
  Area: ***Ave***: 1 acre; ***Max***: 1.5 acre
  Soil disturbance: ***Ave***: 10,000 cy; ***Max***: 15,000 cy

Environmental benefits:

- Restores native plant communities and associated fish and wildlife
- Limits cattle access to riparian areas, reducing bank erosion, sediment inputs, and deposit of animal waste directly into streams; enhances riparian vegetation establishment and health
- May create or enhance essential habitat features (breeding ponds) for California red-legged frogs, California tiger salamanders, and other aquatic species.

15. Stream Bank Protection (580)



Just after completion **After 3 years**

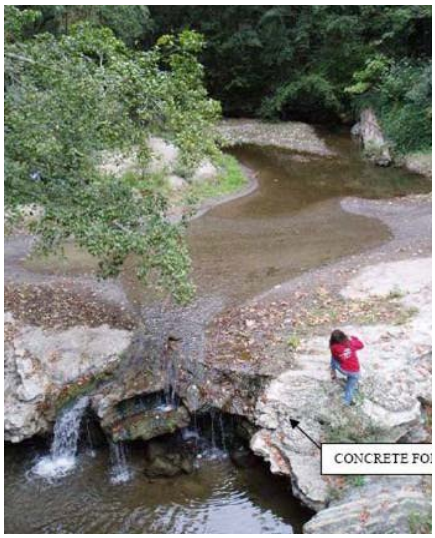
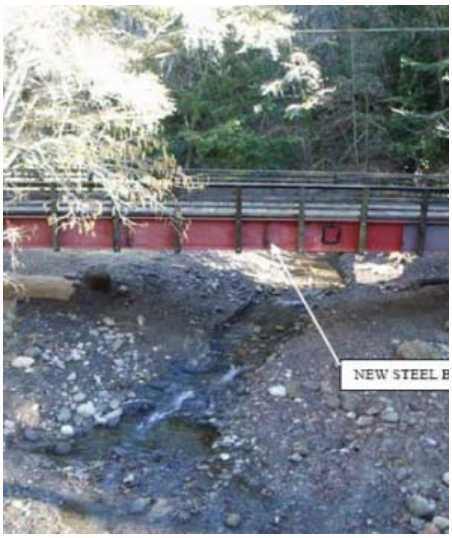
Example of bank repair with rock on lower bank and vegetation incorporated

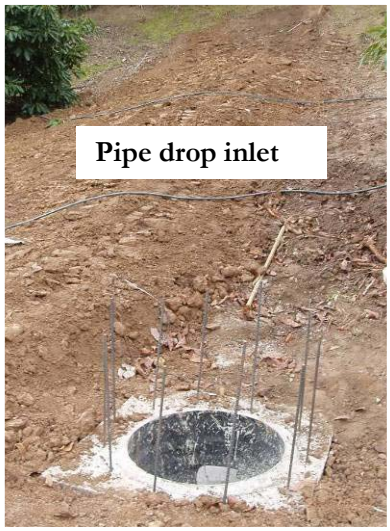
Treatments used to stabilize and protect banks of streams. This practice is used to prevent excessive loss of land where stream banks are eroding, to reduce the offsite or downstream effects of sediment resulting from bank erosion, and to improve or enhance the stream corridor for fish and wildlife. All treatments are designed to consider the changes that may occur in the watershed hydrology and sedimentation over the design life of the treatments.

Additional Conditions:

- All bank protection projects are carefully analyzed for cause. Banks will be stabilized only if they are the source of excessive erosion and sediment yields to streams or to protect infrastructure such as roads, culverts, or residences.
- Stabilizing banks using vegetation and bioengineering methods are the preferred options (may include toe rock as specified in Corps Regional General Permit 70); using rock above the toe may be needed in certain circumstances but will require additional agency review (see Table 3, Environmental Protection Measures, Tier IV).
- Grouted rock and concrete are not permitted.
- If rock is used above the toe, native riparian vegetation grown from plants in the watershed vicinity and appropriate to the site conditions will be incorporated

	within and above the rock. Size Limitations: • Bioengineered – Length: ***Ave***: 1000 ft; ***Max***: 2000 ft Area: ***Ave***: 1 acre; ***Max***: 2.3 acres Soil disturbance: ***Ave***: 2000 cy; ***Max***: 4000 cy • Ungrouted rock – Length: ***Ave***: 300 ft; ***Max***: 500 ft Area: ***Ave***: 0.1 acre; ***Max***: 0.2 acres Soil disturbance: ***Ave***: 300 cy; ***Max***: 500 cy Environmental Benefits: • Reduces excessive sedimentation to waterways from bank erosion • Improves riparian habitat benefiting fish and wildlife
16. Stream Habitat Improvement and Management (395)	 **Example of old concrete crossing blocking steelhead passage** Maintain, improve, or restore the physical, chemical, and biological functions of a stream. This practice applies to streams where habitat deficiencies limit survival, growth, reproduction, and/or diversity of aquatic species in relation to the potential of the stream. This practice will be used to 1) remove structures that are barriers to fish passage; 2) add habitat features for steelhead such as rock weirs, boulder clusters, or root wads; or 3) plant native riparian vegetation on stream banks. Additional Conditions: • Barrier removal or modification will be designed and implemented in accordance with the *California Salmonid Stream Habitat Restoration Manual* and in coordination with NMFS. Size Limitations: • This practice is limited to a maximum stream length of 3000 ft; within that length, the following activities may occur: barrier removal, placement of habitat structures, and planting riparian vegetation. • Barrier removal - Length: ***Ave***: 50 ft; ***Max***: 100 ft Area: ***Ave***: 0.25 acre; ***Max***: 0.5 acre Soil disturbance: ***Ave***: 2000 cy; ***Max***: 4000 cy

	• Install rock weirs – Length: ***Max***: 3 structures per 500 ft of stream Area: ***Max***: 0.2 acre; Soil disturbance: ***Max***: 900 cy (300 cy per structure*) Drop height: ***Max***: 2 ft (measured from weir to downstream toe) Jump height: ***Max:*** 1 ft (fish jump height to get upstream of structure during high flows) * Reflects actual size of structure (50 cy per structure) and temporary work area in the channel (250 cy per structure) • Planting riparian vegetation - Length: ***Ave***: 1500 ft; ***Max***: 2500 ft Area: ***Ave***: 0.5 acre; ***Max***: 1 acre Soil disturbance: ***Ave***: 850 cy; ***Max***: 1700 cy (Soil disturbance reflects the need to reconfigure banks before planting) Environmental Benefits: • Improves stream stability and function • May decrease sediment and attached pollutants from entering waterways • Enhances/creates essential habitat for steelhead and other aquatic species
17. Stream Crossing (578)	  A stable area or structure constructed across a stream to provide access for people, livestock, equipment, or vehicles. This practice is used to improve water quality by reducing sediment, nutrient, organic, and inorganic inputs to the stream; reduce stream bank and streambed erosion; and provide access to another land unit. This practice will be used to replace or modify existing crossings only, not to construct a new stream crossing where none currently exists. Typically, this practice is used to install fish-friendly crossings and is preceded by removal of a fish passage barrier (Stream Habitat Improvement and Management, see above). Fish-friendly crossings are typically replacements of undersized or perched culverts or replacement of a ford or culvert with a bridge.

	Additional Conditions: • This practice falls into Tier IV of the Environmental Protection Measures. See Table 3 for additional conditions. • In steelhead streams, bridges, bottomless arch culverts, embedded culverts, or other fish-friendly designs are required. • Bridges will not be replaced with fords or culverts. • The maximum grading limits for this practice (1000 cy), includes all placement of fill associated with bridge or culvert construction, including, but not limited to, bridge abutments/piles, wing walls, bridge deck, rock slope protection, and minor road realignments. Actual project size for excavation and grading may be larger than 1000 cy based on the size of the barrier that requires removal prior to installing a culvert or bridge and/or potential need for instream re-grading and/or placement of keyways (at-grade structures for channel stabilization) up- or downstream of the crossing (see Stream Habitat Improvement and Management and Channel Stabilization practices). • Culvert and bridge projects will require prior review and approval by the following County and City departments: Flood Control District, Building and Safety, appropriate Fire Departments. Any additional conditions required by these departments will be incorporated into the project design. Size Limitations (bridge installment): • Length: ***Max***: 100 ft Area: ***Ave:***: 0.1 acre (finished crossing footprint); ***Max:*** 0.25 acre (includes temporary work area) Soil disturbance: ***Max***: 1000 cy Environmental Benefits: • Reduces sediment and other pollutant inputs to streams • Reduces streambed and bank erosion from eroding crossings • Creates a crossing that is passable by steelhead
18. Structure for Water Control (587)	 **Culvert under access road**  **Pipe drop inlet**

	A structure in an irrigation, drainage, or other water management system, that conveys water, controls the direction or rate of flow, or maintains a desired surface elevation. This practice will be used to replace, modify, or install new culverts in ~~upland areas~~ non-steelhead streams and drainages such as under existing access roads. ~~;culverts that cross streams are not included (no new crossings will be installed under this practice).~~ This practice also includes water control structures such as pipe drop inlets, stand pipes, and pump boxes. Additional Conditions: • ~~Structures **will not** be installed where they could adversely impact wetlands or water-related wildlife habitats.~~ • New culverts **will not** be installed in perennial streams. • New culverts will only be installed in drainages that have runoff rates of 80 cubic feet per second (cfs) or less for a 10 year, 24 hour storm event. If runoff rates exceed that amount, new culverts will require individual permits. • Replacement of existing culverts may occur in perennial streams and may include replacing undersized, eroding culverts with properly sized culverts. • Other water control structures: Pump boxes are installed within existing irrigation systems; for example, to pump water from a tailwater recovery basin back into the irrigation system. Size Limitations: • New or modified culvert - Length: ***Ave***: 50 ft; ***Max***: 100 ft Area: ***Ave***: 0.1 acre; ***Max***: 0.25 acre Soil disturbance: ***Ave***: 300 cy; ***Max***: 1000 cy • New culvert – 80 cfs or less for a 10 year, 24 hour storm Environmental benefits: • By controlling the velocity of water running through an area, this practice reduces erosion and may help prevent down cutting of stream channels.