NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD

STREAM HABITAT IMPROVEMENT AND MANAGEMENT

(Acre)

CODE 395

DEFINITION

Maintain, improve, or restore physical, chemical and biological functions of a stream.

PURPOSES

1. Provide suitable habitat for desired aquatic species and diverse aquatic communities.
2. Provide channel morphology and associated riparian characteristics important to desired aquatic species.
3. Provide aesthetic values and recreation opportunities associated with stream habitats such as angling and fish viewing.

CONDITIONS WHERE PRACTICE APPLIES

Streams where habitat deficiencies limit survival, growth, reproduction, and/or diversity of aquatic species in relation to the potential of the stream.

CRITERIA

General Criteria Applicable to All Purposes

All measures implemented under this practice shall comply with all applicable federal, tribal, state and local laws, rules and regulations. Adjoining riparian corridors will be managed with diverse vegetation suitable for the site conditions and desired ecological benefits such as:

- stream temperature moderation;
- recruitment of instream large wood and fine organic debris;
- input of riparian nutrients and terrestrial insects;
- stream bank stability; and
- flood attenuation.

Consideration should be given to the continued level of instability and erosion potential of the site. When necessary, use of Critical Area Planting (342) standards should be considered when natural establishment of plants is unlikely, or when there is a potential for invasive or noxious weeds.

No action shall have long-term adverse impacts on endangered, threatened, or candidate species or species of concern.

All required permits will be obtained prior to installation of any stream improvement measures.

The California State Department of Fish and Game should be notified before any stream improvement practices are undertaken that alters the streambed as per Section 1600 of the Fish and Game code (http://www.dfg.ca.gov/1600/).

All activities will occur within the respective state's guidelines on timing with regard to breeding and nesting seasons of aquatic and terrestrial organisms.

Structures installed using this standard for any of the purposes will not reduce channel capacity to the extent that excessive bank erosion or unintentional lateral migration of flow is induced.

Where practical, stream habitat and channel forming processes such as natural meandering and floodplain functions will be restored or maintained.

Changes in channel alignment shall be considered only after an evaluation of the effect on the land use, interdependent water disposal systems, hydraulic characteristics, existing structures, and fish and wildlife habitat.

Stream Habitat Management options when implemented should be ecologically integrated.

Instream structure design shall be compatible with the dynamic nature of rivers and recreational and other uses of the stream corridor.

When present, livestock will be managed to prevent streambank erosion, bank trampling, over-grazing, and contamination of the stream from livestock waste. Where riparian grazing is allowed, a grazing management plan shall be prepared as an integral part of the application of this practice.

Refer to practice standard 528A, Prescribed Grazing to address grazing concerns related to

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resources Conservation Service.

Streambank erosion, water quality and special status species considerations.

Planned stream habitat improvements will:

1. Be based on an assessment of watershed conditions that affect the physical, biological, and chemical conditions of the stream and its riparian area (see References).
2. Be based on an assessment of current stream and riparian conditions. The assessment shall evaluate channel morphology, geomorphic setting, aquatic species, riparian and/or floodplain conditions, and any habitat limitations including restriction of upstream and downstream movement of aquatic species (see References).
3. Emphasize the establishment of an ecologically self-sustaining stream-riparian-system consistent with the watershed conditions and geomorphic setting.
4. Maintain or enhance fish and wildlife species diversity relative to the site's potential. As a part of planning, the aquatic species and life history stage for which the stream is being managed should be evaluated and listed.
5. Maintain or provide fish passage upstream and downstream and allow movement of other aquatic species and stream organic matter to the extent possible (see Practice 396 – FISH PASSAGE).

Additional Criteria Applicable to Purposes 1 and 2

Instream structures will be designed to facilitate establishment and viability of riparian plants. Native riparian-wetland species adapted to local conditions should be used where appropriate and feasible.

Structural stream improvement measures applied will be compatible with the stream's geomorphology. Bioengineering techniques should be considered to protect the banks and re-establish riparian-wetland vegetation

The stream channel being managed under this practice should:

1. Be hydrologically connected to its floodplain and associated wetlands where physically possible and geomorphically appropriate.
2. Reflect sediment transport processes characteristic of the designed stable channel.
3. Have well vegetated banks and a healthy riparian root zone based on the site's potential.
4. Have stream bottom substrates suitable for spawning and/or rearing of desired aquatic species.

Incorporation of these stream channel criteria will generally involve restoration of an appropriate channel width-to-depth ratio, suitable riffle-pool complexes, well-vegetated banks, and/or stream length-gradient relationships in a meandering stream consistent with local conditions and stream geomorphology and relative to the site's potential (see References).

Additional Criteria Applicable to Purpose 3

Recreational and other land use activities will be planned and managed to minimize potential negative impacts on stream corridor vegetation and water quality.

CONSIDERATIONS

There are several options that can be used singularly or in combination to improve stream habitat:

1. Through watershed planning, establish soil conservation, nutrient management, and pesticide management practices and other management techniques for non-point sources of pollution.
2. Reduce or manage excessive runoff due to watershed development.
3. Restore or protect riparian and floodplain vegetation and associated riverine wetlands.
4. Maintain suitable flows for aquatic species and channel maintenance.
5. Provide physical habitat components important to aquatic species such as sediment-free spawning gravel, boulders, large wood, resting pools, overhead cover, and stable banks.
6. Eliminate fish migration barriers such as improperly installed culverts (see Practice 396 - FISH PASSAGE).
7. Provide barriers/screens to exclude fish and other aquatic species from water pumps, diversion ditches, or any area where unintentional entrapment could occur (for fish

screens refer to Practice 587 - STRUCTURE FOR WATER CONTROL).

8. Improve floodplain-to-channel connectivity including off-channel habitats.
9. Provide alternative streamside access for recreational use, livestock, and equipment.
10. Restore natural surface water and ground water interactions by managing ground water withdrawals.

Each reach of a stream is unique, and measures implemented for stream habitat improvement and management must be according to a plan adapted to the specific site.

Stream habitat management provisions should be planned in relation to other land uses that may impact stream habitat. Before designing and implementing stream habitat improvements, consider the known or expected problems within the watershed, such as: point and non-point source pollution, land management activities, and other watershed-related concerns. Any stream habitat management project is most effective when applied within the context of overall watershed conditions and with clear objectives for stream management goals.

Instream structures such as flow deflectors may be considered to provide stream stability and/or habitat elements until the channel and adjacent riparian area can function as a habitat of complex stream structure in dynamic equilibrium.

Cultural Resources Considerations

NRCS' objective is to avoid any effect to cultural resources and protect them in their original location. Determine if installation of this practice will have any effect on any cultural resources.

Document any specific considerations for cultural resources in the design docket and the Practice Requirements worksheet.

GM 420, Part 401, the California Environmental Handbook and the California Environmental Assessment Worksheet provide guidance on how the NRCS must account for cultural resources. The Field Office Technical Guide, Section II contains general information, with Web sites for additional information.

- Consider cultural resources when planning. This practice may adversely affect cultural resources and should comply with GM 420, Part 401, during planning, installation and maintenance.

Environmental Considerations

Stream Habitat Management will improve aquatic habitats and subsequently benefit endangered or threatened species or species of concern and other native aquatic species dependent on this environment. There may be short-term negative impacts when instream construction activities occur, i.e. sedimentation and turbidity. Therefore, timing of project activity is extremely important to reduce negative impacts.

Special attention shall be given to maintaining or improving existing habitat for fish and wildlife and avoiding any damages that could occur with project construction.

Endangered species considerations

Determine if installation of this practice with any others proposed will have any effect on any federal or state listed Rare, Threatened or Endangered species or their habitat. NRCS's objective is to benefit these species and others of concern or at least not have any adverse effect on a listed species. If the Environmental Evaluation indicates the action may adversely affect a listed species or result in adverse modification of habitat of listed species which has been determined to be critical habitat, NRCS will advise the land user of the requirements of the Endangered Species Act and recommend alternative conservation treatments that avoid the adverse effects. Further assistance will be provided only if the landowner selects one of the alternative conservation treatments for installation; or at the request of the landowners, NRCS may initiate consultation with the Fish and Wildlife Service, National Marine Fisheries Service and/or California Department of Fish and Game. If the Environmental Evaluation indicates the action will not affect a listed species or result in adverse modification of critical habitat, consultation generally will not apply and usually would not be initiated. Document any special considerations for endangered species in the Practice Requirements Worksheet.

Some species are year-round residents in some streams, such as, freshwater shrimp. Be aware that critical periods, such as spawning, eggs in gravel's (redds), and rearing of young may preclude activities in the stream that may directly affect the stream habitat during those periods. For example

there should be no disturbance of stream gravel beds that may have eggs in them. That could include any equipment in the stream or even walking in the stream or work upstream that may result in sediment depositing in the gravel beds. Document any special considerations for endangered species in the Practice Requirements Worksheet. These issues will be addressed as part of the 1600 Stream Alteration Permit process required by the California Department of Fish & Game.

PLANS AND SPECIFICATIONS

Plans and specifications shall be in keeping with this standard and shall describe the details adequately to apply the practice to achieve its intended purpose.

OPERATION AND MAINTENANCE

An operation and maintenance plan shall be developed for all applications. The plan shall provide for periodic inspection and prompt repair should the application of practices cause streambank or streambed instability. All instream structural measures shall be evaluated on an annual basis.

REFERENCES

NEH-653 - Stream Corridor Restoration: Principles, Processes, and Practices. Federal Interagency Stream Restoration Working Group (FISRWG)(15 Federal agencies of the US Government). Stream Corridor Restoration Handbook. October 1998. http://www.usda.gov/stream_restoration/

California Department of Fish and Game, 1979. *Anadromous Fishes of California*. http://www.dfg.ca.gov/nafwb/pubs/anadfish.pdf

California Department of Fish and Game. 1998. *California Salmonid Stream Habitat Restoration Manual, 3rd Edition, Part X Fish Passage Evaluation At Road Crossings* (Part X is in preparation, expected fall 2001). http://www.dfg.ca.gov/nafwb/pubs/manual3.pdf

Internet Resources:

California Department of Fish and Game

http://www.dfg.ca.gov

http://www.dfg.ca.gov/nafwb/index.html

National Marine Fisheries Service Southwest Region

http://swr.nmfs.noaa.gov

California Department of Fish and Game, June 19, 2000, *Fish Screen Criteria*, http://iep.water.ca.gov/cvffrt/DFGCriteria2.htm

National Marine Fisheries Service, January 1997, *Fish Screening Criteria for Anadromous Salmonids*

National Marine Fisheries Service, May 9, 1996, *Addendum to Fish Screening Criteria for Pumped Water Intakes.*