

NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD

STREAM HABITAT IMPROVEMENT AND MANAGEMENT (FEET)

CODE 395

DEFINITION

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

PURPOSE

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, 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.

No action shall have long-term adverse impacts on endangered, threatened, or candidate species or species of concern as defined by the Montana Natural Heritage Program and federal agencies. If threatened and/or endangered species or their critical habitats are present at the site, or upstream or downstream of the site, General Manual, 190-GM, ECS, Part 410.22 and the Montana Field Office Technical Guide (FOTG), Section I-General Resource Reference, Threatened and Endangered Species, shall be followed.

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

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.

Stream Habitat Management options when implemented should be ecologically integrated.

Instream structure design should 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.

NRCS, MT
August 2002

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

NOTE: This type of font (AaBbCcDdEe 123..) indicates NRCS National Standards.
This type of font (AaBbCcDdEe 123..) indicates Montana Supplement.

395-2

Planned stream habitat improvements will:

- 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)
- 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.
- **Stream segments to be improved shall be classified according to Rosgen (1996) and/or a channel evolution model including Schumm et al (1984) or Simon (1989). Stream improvement practices will then be designed using typical parameters from the same stream type.**
- Emphasize the establishment of an ecologically self-sustaining stream-riparian-system consistent with the watershed conditions and geomorphic setting.
- List the aquatic species and life history stage for which the stream is being managed.
- Provide fish passage upstream and downstream and allow movement of other aquatic species and stream organic matter to the extent possible. (See **FOTG, Section IV– Practice Standards and Specifications, 396– Fish Passage**)

Additional Criteria Applicable to Purposes 1 and 2

Instream structures will be designed to facilitate establishment and viability of riparian plants.

Structural stream improvement measures applied will be compatible with the stream's geomorphology. Use **Rosgen and Fittante (1986)** as a reference.

The stream channel being managed under this practice should:

- Be hydrologically connected to its floodplain and associated wetlands where physically possible and geomorphically appropriate.
- Reflect sediment transport processes characteristic of the designed stable channel.

- Have well vegetated banks and a healthy riparian root zone.
- 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. (See References)

Additional Criteria Applicable to Purpose 3

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

CONSIDERATIONS

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

1. Through watershed planning, establish soil conservation, nutrient practice, 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 FOTG, Section IV–Practice Standards and Specifications, 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.
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 water withdrawals.

Environmental Impact Concerns. 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 in-stream construction activities occur, i.e., sedimentation and turbidity. Therefore, timing of project activity is extremely important to reduce negative impacts.

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

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.
- Leopold, L.B. 1994. A View of the River. Harvard University Press, Cambridge, MA. 298 pp.
- Montana Natural Heritage Program—
<http://nris.state.mt.us/mtnhp/index.html>.
- Rosgen, D.L. 1996. Applied river morphology. Wildland Hydrology, Colorado.
- Rosgen, D.L. and B.L. Fittante (Mitchell). 1986. Fish habitat structures—A selection guide using stream classification. 5th Trout Stream Habitat Improvement Workshop. Lock Haven University, Lock Haven, PA. Pennsylvania Fish Commission Publics, Hamsburg, PA.
- Schumm, S.A., M.D. Harvey, and C.C. Watson. 1984. Incised channels: morphology, dynamics, and control. Water Resources Publications, Littleton, CO.
- Simon, A. 1989a. A model of channel response in distributed channels. Earth Surface Processes and Landforms 14(1): 11-26.
- USDA–Natural Resources Conservation Service, Field Office Technical Guide, Section I–General Resource References, Threatened and Endangered Species.
- USDA–Natural Resources Conservation Service, General Manual 190–GM ECS, Part 410.22.
- USDA–Natural Resources Conservation Service. 2001. Riparian Assessment. USDA–NRCS, Bozeman, MT.

395-4

NO INFORMATION