USDA
NATURAL RESOURCES
CONSERVATION SERVICE

MARYLAND CONSERVATION
PRACTICE STANDARD

STREAM HABITAT IMPROVEMENT AND MANAGEMENT

CODE 395
(Reported in Acres)

DEFINITION

Maintain, improve or restore physical, chemical and biological functions of a stream, and its associated riparian zone, necessary for meeting the life history requirements of desired aquatic species.

PURPOSE

This practice may be applied for one or more of the following purposes:

1. Provide suitable habitat for desired aquatic species;

2. Provide stream channel and associated riparian conditions that maintain ecological processes and connections of diverse stream habitat types important to aquatic species.

CONDITIONS WHERE PRACTICE APPLIES

This practice may be applied in all streams and their adjoining backwaters, floodplains, associated wetlands, and riparian areas where geomorphic conditions or habitat deficiencies limit reproduction, growth, survival and diversity of aquatic species.

CONSIDERATIONS

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. Stream habitat management provisions should be planned in relation to other land uses that may affect stream corridors.

Before designing and implementing stream habitat improvements, consider the known or expected concerns within the watershed, such as: point and non-point source pollution, water diversions, and land management activities likely to influence stream habitat conditions. Consider factors upstream and downstream of the site that may impact stream condition, both before and after improvement. Additional measures that may be taken singularly or in combination to improve stream habitat include:

1. Complete a site-specific stream assessment using the NRCS Stream Visual Assessment Protocol or comparable evaluation tool;

2. Complete a general assessment of watershed conditions that are likely to affect the functions of the stream and its riparian area;

3. Incorporate stream habitat improvements into a conservation plan that addresses soil quality, nutrient management, pest management and other management practices for reducing non-point sources of pollution;

4. Provide fish passage upstream and downstream and allow movement of other aquatic species and organic matter to the extent possible and when compatible with state and federal fish management objectives (see Code 396 – Fish Passage);

5. Reduce or manage excessive runoff due to watershed development, roads or land-use activities;

6. Restore or protect riparian and floodplain vegetation and associated riverine wetlands;

7. Maintain adequate in-stream flows to sustain diverse habitats for aquatic species, especially during critical life history stages of spawning, incubation and rearing;

8. Provide heterogeneous and complex physical habitat components consistent with the

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physiographic setting and important to aquatic species in the watershed. These include suitable spawning substrates, structural elements such as boulders and/or large wood where appropriate, resting pools, overhead cover, and riparian vegetation;

9. Provide barriers to exclude aquatic nuisance species from stream habitats where prescribed by the appropriate state and federal fish management agencies;

10. Provide screens on water pumps, diversion ditches, or any area where unintentional entrapment of aquatic species is likely to occur;

11. Improve floodplain-to-channel connectivity for development of seasonal or permanent backwater, wetland and off-channel habitats consistent with the local climate and hydrology of the stream;

12. Maintain natural surface water and ground water interactions to the extent possible;

13. Control spread of exotic plant and animal species;

14. Manage recreational and other land use activities to minimize impacts on stream banks, riparian vegetation and water quality.

Refer to *Stream Corridor Restoration: Principles, Processes, and Practices* (210-VI-NEH-653) for further discussion of planning considerations.

CRITERIA

Stream habitat improvements shall:

1. Address the aquatic species and life history stages for which the stream is being managed;

2. Be based on a detailed site-specific assessment of local hydrology, channel morphology, geomorphic setting, upstream and downstream impacts, aquatic species, riparian and floodplain conditions, and any habitat limitations including water quantity and quality, food supply, and restriction of upstream and downstream movement of aquatic species;

3. When applied, result in a conservation system that meets or exceeds the minimum quality criteria for stream habitat established in Section III of the FOTG;

Manage adjoining riparian areas to support diverse natural vegetation suitable for the site conditions and desired ecological benefits. Such benefits include stream temperature moderation, recruitment of instream large wood and fine organic matter, input of riparian nutrients and terrestrial insects, streambank stability, and filtration of contaminants from surface runoff;

Manage livestock to sustain a healthy stream corridor and associated habitats.

Design in-stream structures that are compatible with the dynamic nature of streams and rivers, encourage natural geomorphic recovery when possible and minimize disruption of recreational and other traditional uses of the stream corridor;

Structures installed for the purposes of this standard will not:

1. Impede or prevent passage of fish and other aquatic organisms at any time;

2. Cause excessive bank erosion;

3. Cause unintentional lateral migration, aggradation or degradation of the channel;

4. Hinder channel-floodplain interactions.

Where practical, restore or maintain stream habitat and channel forming processes such as natural flow regime, meander migration, sediment transport, recruitment and storage of large wood, and floodplain interactions with the stream.

All stream and riparian activities will occur within state and federal guidelines with regard to timing of spawning, incubation, and rearing of aquatic organisms, and breeding and nesting of terrestrial organisms.

Necessary permits or approvals from federal, state, or local government agencies shall be obtained before any work is performed.

Note: Specific cost-sharing programs or other funding sources may dictate criteria in addition to, or more restrictive than, those specified in this standard.

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PLANS AND SPECIFICATIONS

Plans and specifications shall be prepared in accordance with the Considerations, Criteria, and Operation and Maintenance described in this standard, and shall describe the requirements for applying the practice to achieve its intended purpose.

Site-specific plans will specify the overall objectives, design, layout, and construction requirements for stream habitat improvement and management.

OPERATION AND MAINTENANCE

A detailed operation and maintenance plan shall be developed for each project. The plan shall provide for periodic inspection and prompt repair or modification of any measures that are found to cause excessive streambank or streambed instability.

All structural measures shall be evaluated on an annual basis. Any repair actions, if needed, shall comply with state and federal guidelines for protecting spawning, incubation and rearing times of aquatic species and breeding and nesting times of terrestrial species.

SUPPORTING DATA AND DOCUMENTATION

Planning Information, Field Data, and Survey Notes

Record on survey note paper, SCS-ENG-28 & 29, and/or in the conservation plan folder, as appropriate. The following is a list of the minimum data and documentation to be recorded in the case file:

1. Field location of the project, extent of stream reach and riparian zone to be restored, and assistance notes. Also note the location of the project on the conservation plan map. Assistance notes shall include dates of site visits, name or initials of the person who made the visit, specifics as to alternatives discussed, decisions made, and by whom;
2. Site-specific assessment(s);
3. Description of the objectives of the project;
4. Soil investigation logs and notes;
5. Topographic survey of the site, as appropriate for site conditions and the proposed design.

Design Data

Record on appropriate engineering paper. For guidance on the preparation of engineering plans see chapter 5 of the EFH, Part 650. The following is a list of the minimum required design data:

1. Hydrologic and hydraulic design computations;
2. Normal and design storm water surface elevations;
3. Plan view of the restoration project, including location map;
4. Detailed construction drawings showing site elevations, description and analyses of design flows, and other features, as applicable;
5. Construction sequence;
6. Erosion and sediment control requirements;
7. Locations of spoil and borrow areas;
8. Final grading plan for site;
9. Seeding and/or planting requirements, as applicable, including species selected for each planting area, stocking/seeding rates, and the size and type of planting stock to be used (e.g., bare-root seedlings, containerized stock, etc.), shown on plans;
10. Quantities estimate;
11. Show job class on plans;
12. Operation and maintenance plan, including guidance for post-construction evaluation and monitoring to assess compliance with design criteria.

Construction Check Data/As-Built

Record on survey notepaper, SCS-ENG-28, or other appropriate engineering paper. Survey data will be plotted on plans in red. The following is a list of minimum data needed for as-builts:

1. A copy of the “As-Built” plans;
2. Documentation of site visits on CPA-6. The documentation shall include the date, who performed the inspection, specifics as to what

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was inspected, all alternatives discussed, and decisions made and by whom;

3. Statement on seeding/planting;

4. Final quantities and documentation for quantity changes. Materials certification;

5. Sign and date checknotes and plans by a person with appropriate approval authority. Include statement that practice meets or exceeds plans and NRCS practice standards.

REFERENCES

1. Bureau of Land Management. 1998. *Riparian Area Management: A User Guide to Assessing Proper Functioning Condition and the Supporting Science for Lotic Areas*. TR-1737-15.

2. Federal Interagency Stream Restoration Working Group (FISRWG). 1998. *NEH-653 –Stream Corridor Restoration: Principles, Processes and Practices.*

3. USDA, Natural Resources Conservation Service. *Conservation Practice Standards.* Maryland Field Office Technical Guide, Section IV.

4. USDA, Natural Resources Conservation Service.. 2005. *National Biology Handbook, Aquatic and Terrestrial Habitat Resources*.

5. USDA, Natural Resources Conservation Service. 2006. *NEH-654 – Stream Restoration Design Handbook.*

6. USDA, Natural Resources Conservation Service. 1998. *The Practical Streambank Bioengineering Guide.*

7. USDA, Natural Resources Conservation Service. 2002. *Streambank Soil Bioengineering Field Guide for Low Precipitation Areas*.

8. USDA, Natural Resources Conservation Service. 1998. *Tech. Note 99-1: Stream Visual Assessment Protocol.*

9. U.S. Fish and Wildlife Service, Chesapeake Bay Field Office. 2001. *Riparian Corridor Rapid Assessment Method.* http://www.fws.gov/chesapeakebay/streampub.htm.

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