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 planned work shall comply with federal, state and local laws and regulations.

Adjoining riparian corridors shall be managed in accordance with Natural Resources Conservation Service (NRCS) Field Office Technical Guide (FOTG) Standard 391- Riparian Forest Buffer as needed to benefit the target species.

Species planted shall be suitable for the planned purpose, soils, climate and site conditions. Native plant species shall be used whenever possible. Use of known invasive species shall be avoided.

Soil-bioengineering techniques shall be used where appropriate. See NRCS Engineering Field Handbook, Chapter 16 Streambank and Shoreline Protection for guidance.

Structures installed for any of the purposes shall not reduce channel capacity to the extent that excessive bank erosion or unintentional lateral migration of flow is induced. Structures shall be installed in accordance with NEH-653 - Stream Corridor Restoration: Principles, Processes, and Practices, or other NRCS-approved source.

When present, livestock shall be managed to prevent streambank erosion, bank trampling, over-grazing, and contamination of the stream from livestock waste. An approved grazing plan shall be developed in accordance with NRCS FOTG Standard 528A Prescribed Grazing.

Tree and/or shrub plantings shall follow site preparation, planting dates, planting and storage guidelines as detailed in NRCS FOTG Standard 612 Tree/Shrub Establishment.

Tree and shrub species shall be selected from NRCS FOTG 645 Wildlife Upland Habitat Management and/or NRCS FOTG 644 Wetland Wildlife Habitat Management.

Planned stream habitat improvements shall:

1. Be based on an assessment of current stream and riparian conditions. The assessment shall evaluate channel morphology, landform and position in the landscape (i.e. 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).
2. List the aquatic species and life history stage for which the stream is being managed.
3. Target native aquatic species that are historically endemic to the stream.
4. Provide fish passage upstream and downstream and allow movement of other aquatic species and stream organic matter to the extent possible.
5. Place fish passage on south or west side of stream to maximize available shade.
6. Provide capacity to carry average flow necessary to avoid solar heating above the tolerance level of target fish species.

Additional Criteria - Applicable to purposes 1 and 2

Structures placed across the channel to prevent stream incising, or to reduce the upstream energy slope to prevent bed scour, shall follow NRCS FOTG Standard 584 Stream Channel Stabilization.

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

Structural stream improvement measures applied shall be compatible with the stream's geomorphology.

The stream channel being managed under this practice shall:

1. Be hydrologically connected to its floodplain and associated wetlands where feasible.
2. Reflect sediment transport processes characteristic of the designed stable channel.
3. Have well vegetated banks.
4. Have stream bottom substrates suitable for spawning and/or rearing of desired aquatic species.

Incorporation of these stream channel criteria shall 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).

Accelerated erosion associated with un-vegetated banks, or bank erosion at rates not appropriate for the stream system, shall be stabilized using methods in NRCS FOTG Standard 580 Streambank and Shoreline Protection.

Additional Criteria - Applicable to provide aesthetic values and recreation opportunities associated with stream habitats

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

CONSIDERATIONS

Consider performing an assessment of watershed conditions that affect the physical, biological, and chemical conditions of the stream and its riparian area. See *Stream*A*Syst* under References.

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

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 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 the target aquatic species such as sediment-free spawning gravel, large wood, resting pools, overhead cover, and stable banks.
6. Eliminate fish migration barriers such as improperly installed culverts.
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.

Consider designing instream structures that are compatible with the dynamic nature of rivers, recreational uses, and other uses of the stream corridor.

Consider requesting technical assistance from a NRCS biologist, IDNR Division of Fish and Wildlife's fisheries biologist or U.S. Fish and Wildlife Service (FWS) biologist.

Consider Environmental Impact Concerns - Stream Habitat Management should improve aquatic habitats and subsequently benefit endangered or threatened species or species of concern and other native aquatic species dependent on this environment. However, 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 planting shrub species by direct seeding to provide wildlife habitat. Refer to IN-NRCS, Forestry Technical Note No. 16 *Direct Seeding of Shrubs*.

Drainage is important to many Indiana land users, but drainage projects can also be detrimental to ecological integrity. Consider referring land users to the *Indiana Drainage Handbook*. The Handbook:

1. Explains and clarifies federal, state, and local laws and regulations affecting drainage improvement activities within the State of Indiana
2. Provides descriptions of specific "Best Management Practices", which define how work should be performed with a minimum of adverse environmental impact, and
3. Explains procedures for timely access to IDNR drainage-related personnel.

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. As a minimum, all instream structural measures shall be evaluated on an annual basis.

REFERENCES

Conservation Corridor Planning at the Landscape Level: Managing for Wildlife Habitat, USDA Natural Resources Conservation Service, Part 190 - National Biology Handbook, August 1999.

Indiana Drainage Handbook, Christopher B. Burke Engineering, Ltd. (CBBEL), Indianapolis, IN, in accordance with State of Indiana Public Law 329-1995. Perfect Impressions Printing, October 1996, reprinted October 1999.

*Stream*A*Syst: A Tool to Help You Examine Stream Conditions on Your Property*, EM 8761, Oregon State University Extension Service and USDA NRCS Watershed Science Institute, reprinted March 2001.

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.

Streambank and Shoreline Protection, USDA Natural Resources Conservation Service, Engineering Field Handbook, Chapter 16, December 1996.