

Appendix F: Stream Restoration Techniques

**Return to Fairfield Marsh Conservation Partnership
Environmental Assessment**

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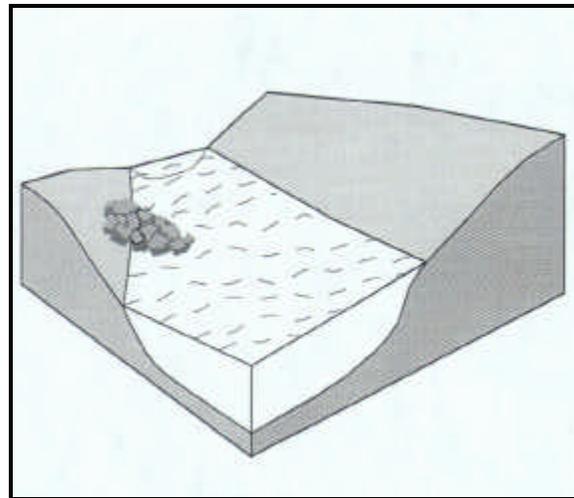
Habitat objectives of the Fairfield Marsh project include restoring the lower portion of Leech Creek to a natural channel and thereby all or a portion of the historic marsh. The following is a short description of the types of stream restoration techniques that could eventually be employed within the project area. A detailed study of hydrologic function in the marsh basin will be required before any restoration effort can begin.

Leech Creek is spring fed and drains a shrub marsh and upland hardwood area interspersed with pasture and cropland. The lower portion (approximately 3 miles) of Leech Creek has been channelized to facilitate agricultural drainage and does not resemble the upper section which still supports a trout fishery. Habitat features such as meanders, overhanging banks, vegetated banks, pools, riffles and substrate diversity are absent from the lower section. Historically this stream section was also associated with marsh, sedge meadows and wet prairie habitats.

Upper Leech Creek: In 1994, a study conducted by the Wisconsin DNR bestowed a low “good” rating to the upper, unchannelized section of Leech Creek based on habitat index scores. Factors which contributed to this rating were undisturbed riparian buffer zone, no significant bank erosion and a good meander ratio. The width to depth ratio was rated average, with average depth only 8" with pools only averaging 14 inches. Stream width averaged 15 feet. Habitat characteristics which received a poor rating were, substrate, which was dominated by sand and silt, and hiding cover, which was rated as fair to poor. Another factor which impacted trout habitat was the numerous beaver dams along the

stream. In the winter of 1992-93 several dams were removed in an effort to improve trout habitat. Limited grazing occurs within the upper portion of the drainage.

The Wisconsin DNR attributes the decline of the Leech Creek fishery to overharvest of trout and habitat degradation. Voluntary habitat enhancement efforts in the upper reaches of Leech Creek could greatly improve the existing fishery. Techniques recommended to restore high quality habitats include instream deflector structures which will create pools, scour the streambed and provide additional hiding cover. Other techniques



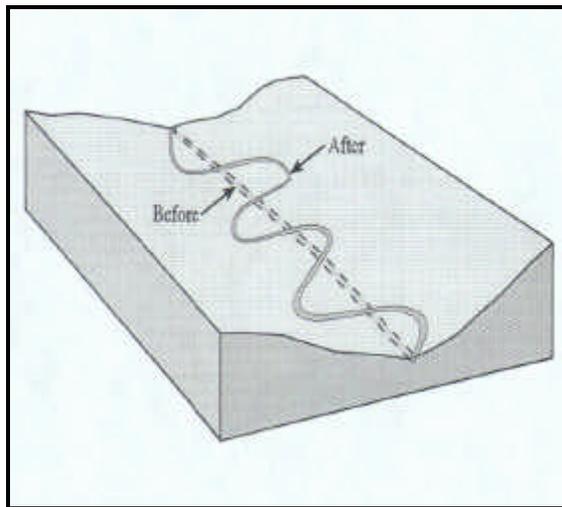
Wing deflectors placed directly into the stream channel will create new, deep pools for trout.

include fencing cattle and beaver population control. The Wisconsin DNR also recommends stocking transferred native brown trout or “native” hatchery brown trout to restore a fishable trout resource.

Lower Leech Creek: Restoration of lower Leech Creek could be achieved by various techniques with a common goal of restoring historical physical structure and hydrology.

Re-establishing instream meanders would be one of the main goals to restoring Leech Creek. The benefits of such a restoration effort would be improved channel stability, increased aquatic habitat area, increased diversity and visual aesthetics. This could be accomplished by excavating a new channel where the historic channel was located. The channel would simulate the historical meander design and would take into account stream characteristics such as bank slope, stream width and depth. Other considerations would be bank stabilization and placement of excavated material.

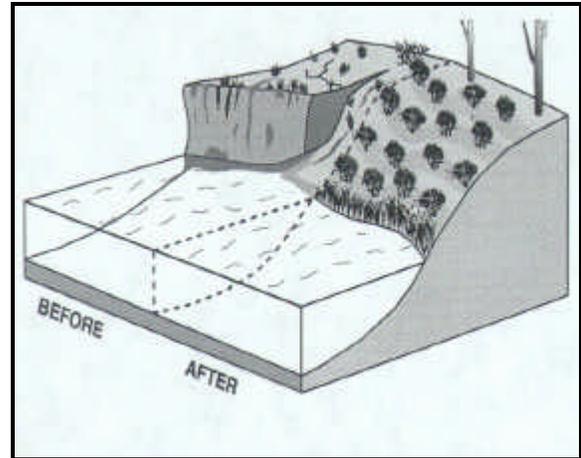
A second alternative could be to slope the



A new channel could be dug along the straightened creek to reconstruct a historical meander design.

existing banks of the channelized stream to promote frequent flooding. This would allow the stream to cut a new channel and recreate the natural meanders and associated wetlands. However, this process would take several years and a location to place the excavated material would be a concern.

A third alternative would be to plug the channelized section forcing the stream to cut a new streambed. This process would take



Existing drainage ditch channels could be regaded and planted with vegetation.

time and increase turbidity in the Baraboo River. It would also create a damming effect upstream of the plug until the streambed was re-established.