

SECTION 5.4

LOGJAM REMOVAL AND RIVER RESTORATION

Logjams restrict the flow and conveyance of natural streams and ditches which can cause increased flooding, destruction of property and wildlife habitat, and erosion and sedimentation. However, not all in-stream structures cause problems. Submerged and overhanging logs provide important wildlife habitat. In many cases, the ripples caused by obstructions oxygenate the water to improve water quality. It is therefore useful to classify in-stream obstructions based on severity, and employ management techniques based on each category.

Localized logjam removal practices (Practices 401 and 402) are considered superior over large-scale river restoration techniques (Practice 403) because they maintain streams' natural meander geometry with long-term environmental and economical benefits. Because of their non-interference with the geometry of the stream channel and in-channel sediments, localized logjam removal practices are also institutionally more acceptable (usually no permits required) and easier to implement than large-scale river restoration works such as that described in practice 403.

Large-Scale River Restoration (Practice 403) may be accomplished in various ways. The best documented of these methods is the "Palmiter Technique". The Palmiter Technique combines clearing & snagging and inexpensive streambank protection measures to restore the stream channel to its perceived original, non-obstructed capacity. It includes removing logjams and severely leaning trees and using some of the removed material for protection of eroding streambanks. The technique also involves removing or raking of sediment bars, when needed, and revegetating the banks with trees to provide shade.

Effectiveness of large-scale river restoration or clearing & snagging projects in reducing flooding is limited only to small annual floods. **Often times, the effect of these activities on reducing flood stages of larger less frequent floods is negligible or at best limited to 2 or 3 inches of stage reduction.** In most cases, similar hydraulic benefits may be achieved by following the American Fisheries Society Stream Obstruction Removal Guide, i.e., removing only localized logjams, at a fraction of cost and time. (See "Maumee Master Plan" and "Urban Surface Water Management" references for more details.)

Regardless of their effectiveness and despite their drawbacks (in particular, a lengthy and expensive permitting process), large-scale river restoration/clearing and snagging projects are still popular and are pursued by many jurisdictions. So long as the safeguards described in Practice 403 are adhered to, the project may be implemented with minimal impact to the environment.

In all cases, access routes for stream and ditch work should be selected to minimize disturbances to wetlands, floodplains, and riparian areas. All disturbed areas should be restored or replanted with native plant species.

The obstruction classification system used in this manual is based on the "American Fisheries Society Stream Obstruction Removal Guidelines" (see Section 6, References). Five conditions are described: Condition 1 (one) is the least severe, Condition 4 (four) is the most obstructive, and Condition 5 (five) describes special cases. The following discussions are taken from the above-noted document and a document entitled: "MRBC Obstruction Removal Assistance Program".

Condition 1

Minor flow impedance is present, but these obstructions are normally washed downstream or are naturally relocated during moderate flooding events. The obstructions do not pose a significant flood damage risk, and the overall conveyance is acceptable and expected to stay that way. It is recommended that obstructions in this class be left alone unless they are associated with or are within eye-sight of larger obstructions, in which case they may be removed using hand-held tools (Practice 401 Logjam Removal Using Hand-held Tools).



Exhibit 5.4a: Illustration of a Condition 1 Logjam (Source: American Fisheries Society Obstruction Removal Guidelines)

Condition 2

Stream or ditch segments contain small logjams that may be inter-locked and occasionally span the entire width of the stream. Logjams are isolated, but adjacent land use is such that a major obstruction at this location may cause damaging floods in the future. It is recommended that logjams be removed with hand-held tools such as axes, chain saws, and portable winches (Practice 401), unless the logjams are associated with, or are in close proximity to, larger obstructions that require heavy machinery to remove (Practice 402). The extent of the work should be limited to cutting, relocating, removing, or, if appropriate, securing (parallel to the streambanks) any free logs or affixed logs that are crossway in the channel. Isolated or single logs that are embedded, lodged, or rooted in the channel, but do not span the channel or cause any impediment to flow, do not need to be removed. Rooted stumps that do not pose potential blockage problems should remain in place where they will continue to protect the bank against erosion.



Exhibit 5.4b: Illustration of a Condition 2 Logjam (Source: American Fisheries Society Obstruction Removal Guidelines)

Condition 3

Stream or ditch segments contain large accumulations of lodged trees, root wads, and/or other debris that are inter-locked and frequently span the entire width of the stream. Large amounts of fine sediments have not yet covered or become lodged within the obstruction. Some flow can still move around the obstruction, though the flow is somewhat impeded. These obstructions pose an unacceptable flooding risk. It is recommended that stretches in this condition be restored using hand-held tools (Practice 401) if possible. Heavy machinery such as small tractors, bulldozers, log skidders, or other low ground pressure equipment may be used so long as they are not equipped for excavation (Practice 402). The extent of work shall be the same as Condition 2.



Exhibit 5.4c: Illustration of a Condition 3 Logjam (Source: American Fisheries Society Obstruction Removal Guidelines)

Condition 4

Stream or ditch segments contain major blockages that have caused severe and unacceptable flow conditions. Bank erosion and upstream ponding are evident. Existing flood potential will likely increase if the obstructions are not removed. The use of heavy machinery (Practice 402) is likely the only effective way to remove obstructions in this category. The extent of work shall be the same as Condition 2.

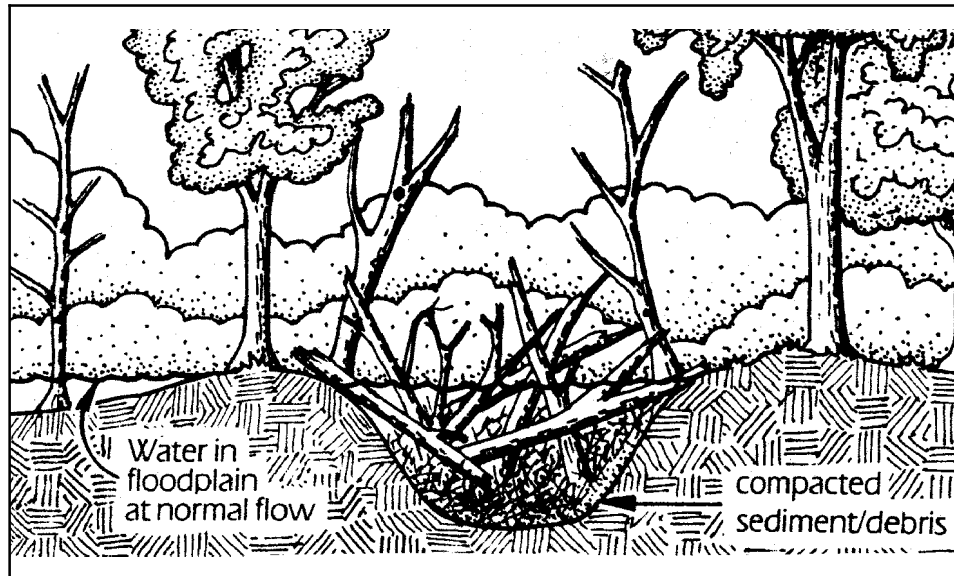


Exhibit 5.4d: Illustration of a Condition 4 Logjam (Source: American Fisheries Society Obstruction Removal Guidelines)

Condition 5

Stream or ditch segments possess unique, sensitive, or valuable ecological resources including rare plants and animals, and rare habitat. These include scenic or recreational rivers. The extent of obstructions may be similar to one of the four conditions described above. Removal of logjams in these streams must be approached on a case by case basis. Generally, obstruction removal using hand-held tools (Practice 401) is more acceptable than using heavy machinery.

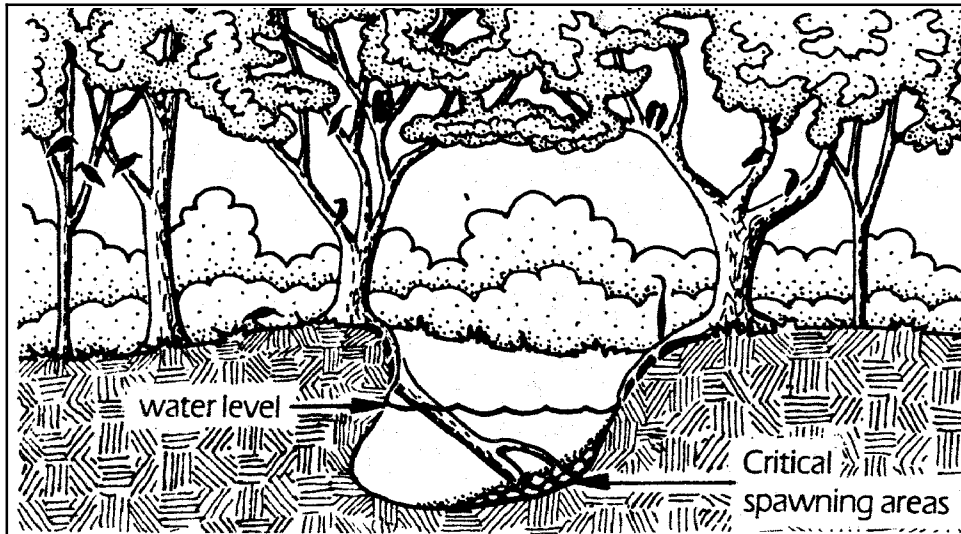


Exhibit 5.4e: Illustration of a Condition 5 Logjam (Source: American Fisheries Society Obstruction Removal Guidelines)