Montana Department of
Fish, Wildlife & Parks

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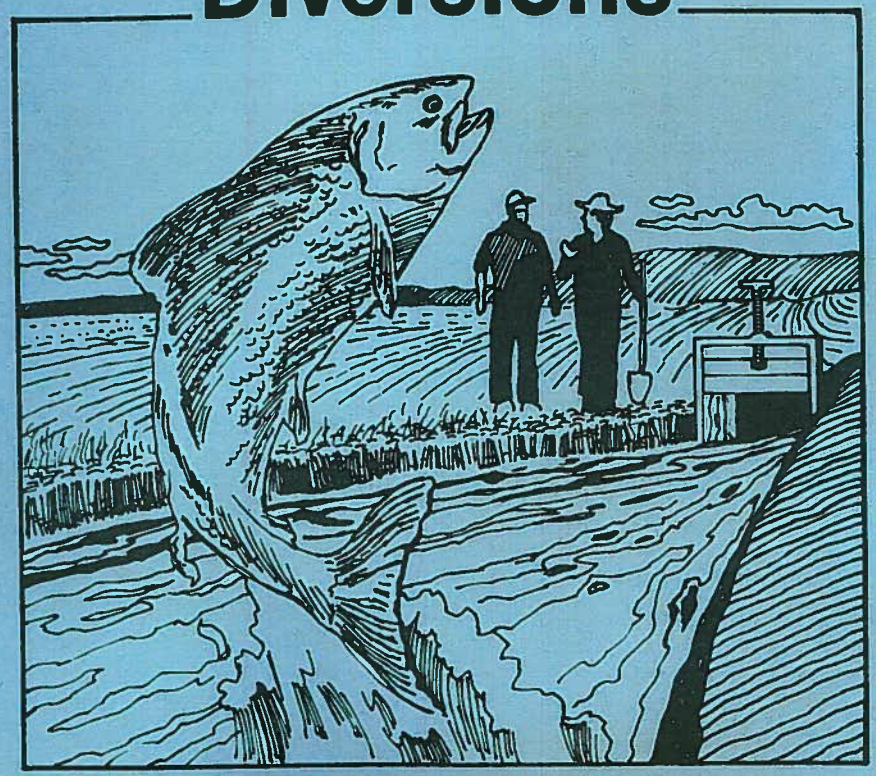
Methods to Reduce Trout Losses in Irrigation Diversions



Here in Montana rivers and streams are not stocked with hatchery-reared trout. We rely on natural reproduction of wild trout to replenish trout populations in our rivers and streams.

The Department of Fish, Wildlife and Parks, anglers and irrigators have long known that many wild trout are annually lost from river systems during the irrigation season. When water is diverted from a river to an irrigation ditch, many trout follow the diverted flow and are eventually "trapped" in the ditch. The problem is especially acute during times of low river flows when a high percentage of the existing stream flow is diverted into irrigation canals.

Irrigators can help save wild trout!

Irrigators who gradually shut down their diversions and headgates can save trout by affording them the time they need to return to the river.

Investigations conducted in the 1950s by the then Montana Department of Fish and Game, and the recent application of gradual headgate shut down methods by irrigators in southwestern Montana, show that timely headgate manipulation saved substantial numbers of trout that would surely have died had the ditches' water flow been cut off suddenly.

Trout need three days to move out of a ditch

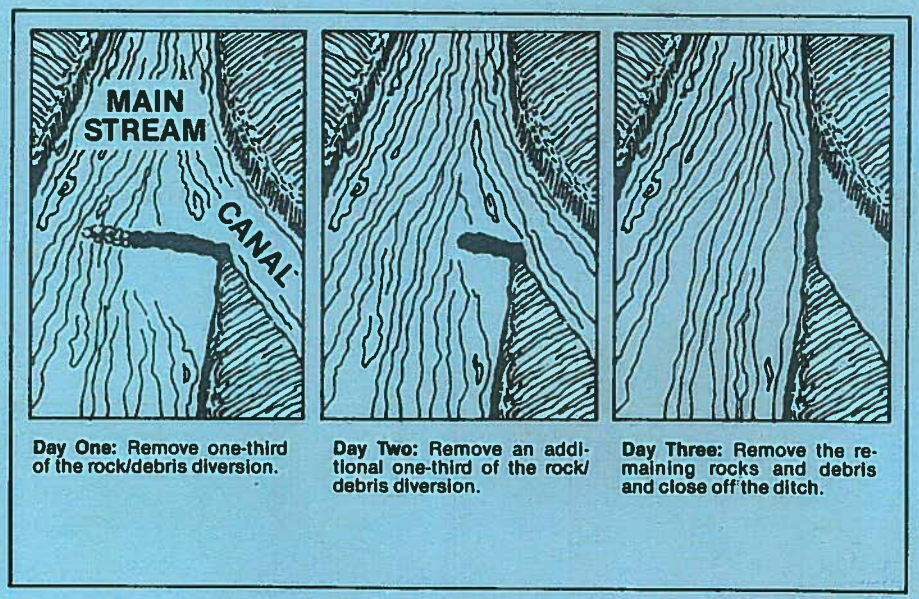
To help save trout, FW&P recommends that ditch companies and irrigators gradually reduce the flow in irrigation ditches in three equal increments, at least three days prior to the headgate being completely closed. The gradual, three-day shutdown is based on the time it takes the maximum number of trout to move up and out of an irrigation canal or ditch.

The gradual flow reductions are remarkably beneficial to trout and can be applied anytime the ditch is scheduled to be closed, or when conditions favor decreased flow during the irrigation season. For most effective results, the procedure should be followed before each cutting of hay and at the end of the irrigation season.

Open-channel diversions

On open-channel diversions, irrigators can simply remove equal portions of the diversion over a three-day period. During the first day, irrigators can remove a portion of the diversion farthest from the ditch and follow the same procedure over the following two days until the diversion is removed and closed (Figure 1).

Figure 1



Day One: Remove one-third of the rock/debris diversion.

Day Two: Remove an additional one-third of the rock/debris diversion.

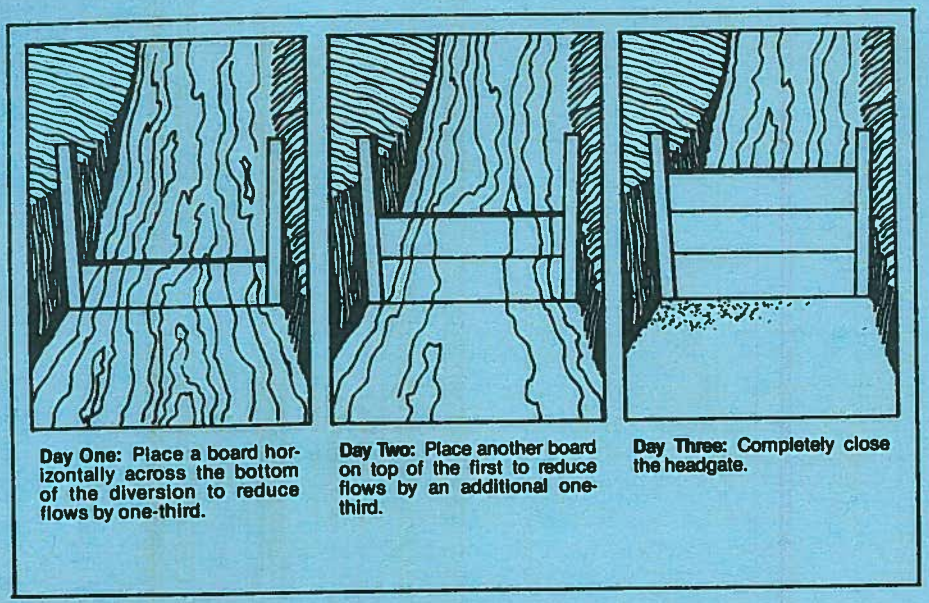
Day Three: Remove the remaining rocks and debris and close off the ditch.

Plank headgates

For plank-type headgates, on the first day irrigators can place a board **horizontally** across the bottom of the diversion to reduce flows by one-third. On the second day, another board can be placed on top of the first to reduce flows by an additional one-third. On the final day, the headgate can be shut down (Figure 2).

For twin headgate systems, completely close one side on the first day and follow the same procedure for the headgate remaining open as outlined above.

Figure 2



Day One: Place a board horizontally across the bottom of the diversion to reduce flows by one-third.

Day Two: Place another board on top of the first to reduce flows by an additional one-third.

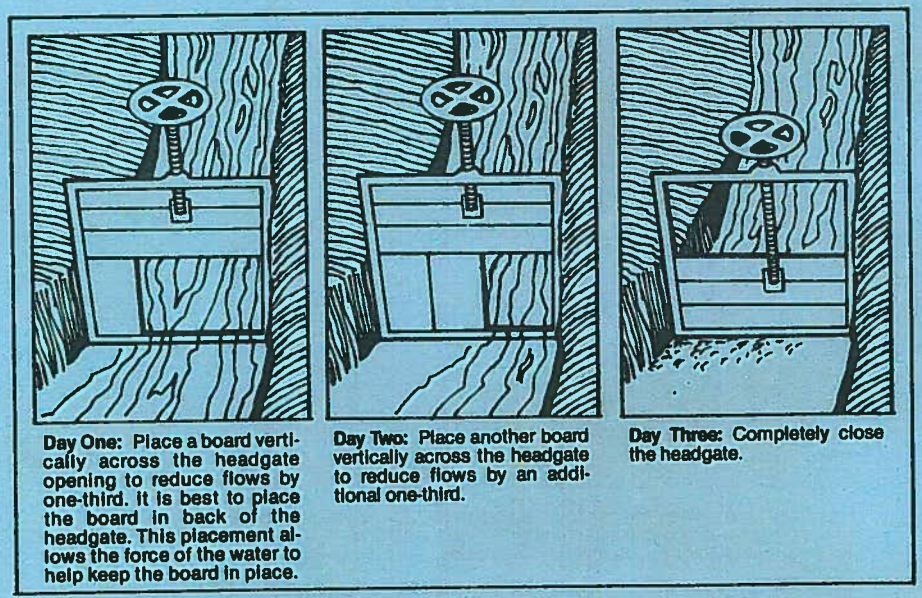
Day Three: Completely close the headgate.

Screw down headgates

For screw down headgate systems, on the first day irrigators can place a board **vertically** over the diversion to reduce flows by one-third. On the second day, a second board can be placed vertically over the diversion to again reduce flows by one-third. On the final day, the headgate can be shut down (Figure 3).

For twin headgate systems, completely close one side on the first day and follow the same procedure for the headgate remaining open as outlined above.

Figure 3



Day One: Place a board vertically across the headgate opening to reduce flows by one-third. It is best to place the board in back of the headgate. This placement allows the force of the water to help keep the board in place.

Day Two: Place another board vertically across the headgate to reduce flows by an additional one-third.

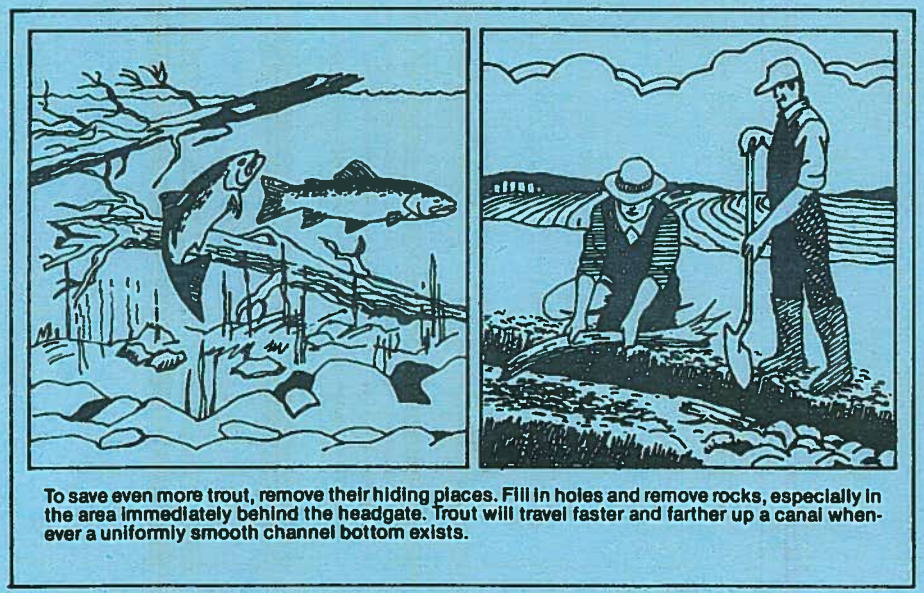
Day Three: Completely close the headgate.

Additional trout-saving measures

These methods work because the slow, staggered shut-down of an irrigation ditch gradually reduces trout living space in the ditch and prompts trout to move up the ditch until they reach the river or until they find temporary hiding places in the form of pools and rocks (Figure 4).

Trout will travel faster and farther up a canal whenever a uniformly smooth channel bottom exists. So, an even greater number of trout can be saved by filling holes and removing rocks from the ditch (Figure 5). This is especially important in the area immediately behind a headgate.

Figure 4 **Figure 5**



To save even more trout, remove their hiding places. Fill in holes and remove rocks, especially in the area immediately behind the headgate. Trout will travel faster and farther up a canal whenever a uniformly smooth channel bottom exists.

Anglers are willing to help

If irrigators or water managers believe that some of these practices would take too much time, it may be possible to cooperatively work with local anglers or sportsmen's clubs that may be willing to do the work under the direction of the irrigator.

A phone call to the nearest FW&P office, local Trout Unlimited chapter or sportsmen's club a few days prior to the anticipated ditch closure, could muster the help needed to begin.

Together, irrigators and anglers might set up a yearly schedule for carrying out these trout-saving measures.

Please call the Department of Fish, Wildlife and Parks office nearest you for more information.