



Trout conservation strategies for the Rapid River

Habitat protection:

Key nursery areas, recently identified, should receive the highest level of protection from potentially adverse land use activities (timber harvesting, road construction/maintenance, seasonal residential developments on the shorefront or in the watershed, etc.). Also, it is essential that the connectivity of habitats critical to Rapid River trout be maintained. (These habitats include Pond in the River and Umbagog Lake, which provide important mid-summer and over wintering habitat for Rapid River trout.) For this reason the Department does not support proposals to construct a barrier to isolate the Rapid from Umbagog Lake. The impoundment formed by a barrier would also have the effect of eliminating important riverine habitat, as well as eliminating riverine fishing opportunities.

Reduce interspecific competition from landlocked salmon:

Landlocked salmon, which were introduced to this drainage late in the 19th century, are competitors with trout in the Rapid River. Competition for limited spawning substrate has been documented, and we have evidence that young salmon compete with trout for nursery space, particularly during the late summer period. In addition, there is likely strong competition for food among most age classes of each species. Therefore, our trout conservation plan should include efforts to reduce salmon numbers. The Department is moving forward to achieve this by relaxing harvest regulations and, if feasible, by manipulating flows from Middle Dam to favor trout over salmon and other species.

Trout genetics:

Studies to determine the genetic characteristics of the Rapid's brook trout population are in progress. If studies suggest that these fish are uniquely adapted to this portion of the Androscoggin River watershed, then maintaining the strain by establishing a broodline should be given strong consideration. This would provide a "hedge" in the event that natural reproduction fails due to predation and competition from bass. A stock enhancement program, using large spring yearling fish of the Rapid River strain, could potentially preserve fishing opportunities for these very special fish.

Minimize impacts from smallmouth bass:

Eradicating bass from this immense and biologically complex ecosystem is impossible because their reproductive potential is very high and habitat for all life stages is excellent. Based on our current knowledge, controlling bass numbers in Pond in the River through large-scale removal efforts (such as boat-electrofishing) is not likely to succeed due to



their high reproductive potential and the presence of excellent habitat, including in downstream Umbagog Lake. Moreover, there is some evidence to suggest that massive removal may actually exacerbate bass production by reducing competition among themselves, and/or by increasing their reproductive success. Also, there is the likelihood that large adult brook trout, which are present in Pond in the River during times when electrofishing would occur, could be severely injured or killed by high power outputs required for effective bass removal. The Department therefore concludes that large-scale efforts to remove bass from Pond in the River would be ineffective, costly, and potentially injurious to adult trout.

Studies conducted in 2003 indicate critical habitat for juvenile trout, the life stage most vulnerable to bass, is concentrated in the Rapid River rather than in Pond in the River, so any control program should focus on the river. Reducing bass numbers with electrofishing techniques may be possible and desirable in carefully defined areas (critical riverine brook trout nurseries), but this idea requires additional evaluation.

Additional bass control opportunities?

In northern climates, abiotic (climatic) forces have been shown to exert a powerful influence on smallmouth bass populations. Climatic forces, be they natural (such as spring and summer air temperatures) or anthropogenic (such as stream flows in regulated rivers), generally control bass reproduction, recruitment, and growth processes to a far greater extent than angler exploitation. Therefore, identifying abiotic factors that act as stressors to smallmouth bass recruitment and growth should take precedence over intensive, technical approaches. Techniques should have practical management application, be sensitive to water level/flow considerations in both upstream and downstream waters, and be sustainable over time.

A number of fishery researchers have established that water levels and flow velocities can influence habitat use, energetics, and growth of smallmouth bass. For example:

- In lakes or streams, nest abandonment and/or reduced egg and fry survival can occur with a rapid rise or fall in water level. A rise of just a few inches may displace advanced fry newly raised from the nest.
- In streams, bass nests located in areas where flow velocities exceed 0.10 ft/sec may fail to produce a brood. Swim-up fry may be displaced from nest sites at even slower velocities.
- Bass fry less than 1 inch long have difficulty maintaining position if current velocities exceed 0.7-1.0 ft/sec. The probability of displacement of advanced fry (1-1.5 in) may be 100% where stream velocities exceed 0.8 ft/sec.
- Optimal growth of fingerling bass appears to occur at velocities of 0.3 to 0.4 ft/sec; velocities above 0.5 ft/sec may result in reduced foraging and growth rates.



(Note: first-year growth is a critical determinant of over-winter survival of bass fingerlings in northern climates).

- High winter discharges may “flush” age 0 smallmouth bass from winter refuge habitat.

Researchers note that negative effects on bass, described above, can be reduced by the presence of good instream cover (especially cobbles and boulders), which is abundant in the Rapid River. Nevertheless, the feasibility of manipulating water levels and flow velocities during key life history periods should be thoroughly evaluated as a means of “stressing” smallmouth bass in the Rapid River.

The introduction of bass predators (e.g. another fish species) as a means of controlling bass has been suggested by a number of individuals. The Department strongly opposes this idea because brook trout are notoriously poor competitors with any fish - this is well documented in Maine and elsewhere. The presence of additional fish species, particularly predatory fish, would be counterproductive to our trout conservation efforts.

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