

Trial Balloon – 30/40/50% and 20/30/40% AMF and MMF

General Description

This trial balloon introduced an alternative method of developing ecological flows based somewhat on a water withdrawal permitting program currently used in South Carolina. The South Carolina program was developed based on instream-flow methodologies (SCWRC 1988, Bulak and Jobsis 1989) as related to percentages of annual mean flow (AMF).

The method presented in this trial balloon suggested using a percentage of the AMF or a percentage of the mean monthly flow (MMF) to assist the North Carolina Department of Environment and Natural Resources (DENR) in protecting the ecological integrity of streams. This method was specific for various physiographic regions, months, and selected stream biota. The suggested flows are:

- Upper coastal plain streams with consideration for anadromous fish:
 - high flows (50%) in January-April;
 - transitional flows (40%) in May, June, and December; and
 - low flows (30%) in July-November.
- Piedmont streams with considerations for minnows and suckers:
 - high flows (40%) in February-April;
 - transitional flows (30%) in January, May, and June; and
 - low flows (20%) in July-December.
- Mountain streams with considerations for trout:
 - high flows (40%) in December-April;
 - transitional flows (30%) in May, October, and November; and
 - low flows (20%) in June-September.

How this trial balloon helps the EFSAB to advise DENR in characterizing the aquatic ecology of different river basins

This trial balloon does not address this aspect of the statutory charge.

How this trial balloon helps the EFSAB to advise DENR in identifying the flows necessary to maintain ecological integrity

When used in the post-processing of results from the Oasis Model or another appropriate model, these flows should be helpful as a planning tool in predicting the frequency, duration, and timing of the impacts a potential water withdrawal or the cumulative impacts of increasing water withdrawals may have on the baseline flow statistics. If the frequency, duration, and timing of future withdrawals are predicted to be higher than the suggested percentages of the baseline flows, then stream ecological integrity may be preserved and further study may not be required.

However, any predicted flows similar to or lower than the suggested percentages of the baseline flows would be considered a potential issue which may trigger further investigation (e.g., site specific study).

Limitations of this trial balloon and options to address those limitations

Presently, there remains some uncertainty in the frequency, duration, timing, and percentages of the baseline flows needed to preserve the ecological integrity of most streams. Thus, a conservative approach must be used in applying this technique. Additional analysis of the suggested flow percentages, as well as an assessment of the flow calculations used in the aforementioned percentages (AMF and MMF), may be needed to tweak this trial balloon to improve its usefulness as a planning tool.

References

- South Carolina Water Resources Commission. 1988. Instream Flow Study Phase II: Determination of Minimum Flow Standards to Protect Instream Uses in Priority Stream Segments. Report Number 163. Columbia, SC.
- Bulak, J. S., and G. J. Jobsis, III. 1989. South Carolina Instream Flow Studies: A Status Report. SC Department of Natural Resources, Columbia, SC.