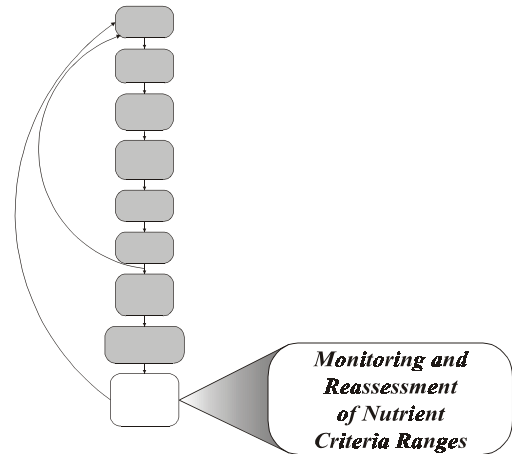


Chapter 9.

Monitoring and Reassessment of Nutrient Criteria Ranges



9.1 INTRODUCTION

After criteria are set, compliance determinations made, and management plans implemented, resource managers should continue to monitor river and stream systems while reassessing goals and nutrient criteria. This step should (1) evaluate the appropriateness of established nutrient criteria, (2) ensure that river and stream systems are responding to management action, and (3) assess whether water quality goals established by the resource manager are being met.

Those streams selected for management may be approached using a rational course of action beginning with a statement of major problems or symptoms and progressing logically to a final assessment to determine the relative success of the effort. Throughout this process, the water quality manager must re-examine (1) the initial goals identified for the stream system(s) prior to criteria development and (2) subsequent management actions taken to evaluate the effectiveness of criteria and management plans. The manager should assess the efficacy of management actions and potentially re-evaluate the appropriateness of established criteria if monitoring data indicate that goals are not being met.

9.2 ASSESSMENT OF PROCESS THROUGH MONITORING AND PERIODIC REVIEW

The management plan should always include “before,” “during,” and “after” water resource quality monitoring to demonstrate the relative response of the system to management efforts, thus the recommendation that initial survey stations should generally be maintained and expanded. Availability of continuous, year-to-year monitoring data is critical and can be used as a bench mark for evaluating progress. If monitoring data indicate that water quality is improved, monitoring should continue to validate the progress made. Should water quality decline, the criteria development process should be revisited and potentially revised. At a minimum, monitoring data should be reevaluated every five years to gauge progress. The reevaluation of monitoring data should include seasonality and periodic data assessment intervals for management review to provide the opportunity for responses to changing circumstances, modifications of methods, schedules, and changes of emphasis as needed. Control of point source nutrients may result in fairly quick system recovery from cultural eutrophication (Edmonson

1994), although nutrient cycling mechanisms and changes in food web dynamics may result in a persistent eutrophic state in many systems (Carpenter et al. 1999). Therefore, continued monitoring and reevaluation of nutrient control strategies is of particular importance.

9.3 COMPLETION AND EVALUATION

Management projects are frequently planned, initiated, and concluded with new initiatives undertaken to meet pressing schedules without sufficiently evaluating what was or was not initially accomplished. Review of progress, original objectives or goals, and monitoring data will reveal whether the river or stream trophic state was successfully protected or improved. Just as important, this evaluation will provide the documentation necessary to determine if methods and techniques attempted in this instance can be applied, perhaps with modification, elsewhere. Alternatively, it will also reveal if mistakes were made which should be noted and avoided in future projects and if perhaps a sequel to the current project is required to fully accomplish that which was intended.

9.4 CONTINUED MONITORING OF THE SYSTEM

Monitoring programs initiated and expanded in the course of the project can now be reduced to the periodic measuring of key variables at critical times and locations. At this stage, the purpose of monitoring is to keep sufficiently informed of the status of the river or stream to ensure that the protection or remediation achieved is maintained. Intervention should be possible at an early point to minimize the costs of remediation if periodic maintenance monitoring indicates a return of trophic decline. The evaluation and periodic monitoring steps of this process essentially close the loop. If new issues arise, the manager returns to step one with a new problem statement.