NWQI/MRBI Watershed Assessment

The general planning process for development of a watershed-level plan is documented in *Title 180, National Planning Procedures Handbook, Part 600, Subpart F, "Areawide Conservation Planning" (180-NPPH-600-F).* For the NWQI, a watershed assessment is an areawide conservation assessment (as defined in 180-NPPH-600-F-600.50B(2)) conducted at the HUC-12 watershed scale. Compared to a typical NRCS areawide assessment, the NWQI/MRBI watershed assessment will have a much greater focus on: hydrologic processes and factors affecting those processes; and the resulting water quality conditions.

The general elements you should include in a watershed assessment are outlined below. Some of this information may be available in other complementary plans and documents, for example, in non-point source management plans, Clean Water Act (CWA) Section 305(B) water quality or assessment reports, TMDL implementation plans, groundwater protection plans, source water assessment reports source water protection plans, or CWA Section 319 9-element watershed-based plans. These documents can be referenced in the watershed assessment and the information does not need to be duplicated. Any elements not provided in complementary documents should be identified and completed prior to submitting the final, comprehensive watershed assessment. Gaps in data or analysis will need to be completed during the 1-year assessment, although additional time may be requested if needed. Data collection should inform the analyses for water quality assessment, especially transport mechanisms and critical source areas. Note that while the focus of NWQI/MRBI assessments developed in accordance with this guidance is on agricultural sources and pollutants (nutrients, sediments, and pathogens), the scope of complementary documents may cover a broader or narrower range of sources and pollutants. For a watershed assessment template that contains the elements needed in NWQI/MRBI assessments, use Attachment F.

I. Background and purpose of the assessment

Clearly identify the primary water quality resource concerns of the watershed, what the water quality objectives will be and to what extent the problem can be addressed through NRCS technical and financial assistance.

a. General overview and location of the watershed assessment area
b. Specific water quality degradation resource concerns and impairments
c. Constituents of concern
d. Opportunities and objectives for meeting water quality goals
e. An assessment of NRCS's ability to help partners reach the watershed goals

II. Watershed characterization

An overview of the watershed and identification of resource concerns. This overview should be information that is useful for the water quality assessment and not just a laundry list of collected information.

a. Location of watershed within the drainage network.
b. Landscape characteristics of the MLRA or ecoregion in which the watershed resides. Provide an overview of landscape conditions within which the watershed resides.
c. Climate. Provide overview that gives context for land cover/uses and a basis for the hydrologic conditions described in section III.
d. Topography.
e. Geology, geomorphology, and soils and soil interpretations.

f. Drainage network (USGS National Hydrographic Dataset link, GIS-derived flow network, National Wetland Inventory, tour and any visual assessments of the watershed).
g. Land cover and land use.
h. Socioeconomic conditions.
i. Other relevant information to characterize the watershed.

III. Hydrologic and water quality characterization

Fully describe the hydrology (including irrigation) and the water quality conditions within the watershed. The analysis should demonstrate the transport mechanisms for pollutants of concern, and the spatial and temporal characteristics of transport.

a. Available data and resources.
    i. Discuss available resources of information compiled by others.
    ii. Gaging stations in or near the watershed (e.g. local drinking water system source water monitoring, EPA-USGS Water Quality Portal data, USGS National Water Information System).
    iii. Surface and groundwater water quality sampling sites.
    iv. Biological monitoring.
    v. NRCS and partner sampling. During the 1-year assessment period, could ad hoc water quality monitoring be undertaken?
b. Runoff and streamflow hydrology, and irrigation. Using streamflow, irrigation and climate data and other watershed information, synthesize hydrological conditions of the watershed.
    i. Methods used in analysis.
    ii. Runoff and streamflow generation processes. What generates runoff? Irrigation conveyances and systems.
    iii. Precipitation-runoff budget. How much precipitation and irrigation returns as stream runoff? How much goes to deep groundwater? Evapotranspiration?
    iv. Spatial distribution of runoff. Do certain areas of the watershed generate more runoff, due to soils, geology, topography, or land uses?
    v. Temporal distribution of streamflow—monthly, runoff events, baseflows.
c. Water quality conditions in the watershed.
    i. What are the general concentrations and loads of major constituents and how do they vary with season, weather, land use, etc.?
    ii. Sediment (if a watershed resource concern).
    iii. Nutrients—N and P (if a watershed resource concern).
    iv. Pathogens (if watershed resource concerns).
    v. Other (pesticides, petroleum products, selenium, etc.).

IV. Resource Analysis and Source Assessment

Documentation and comparisons between existing and potential conditions. A preliminary analysis of what could be accomplished. The types of conservation practices and extent needed to assist in meeting the water quality objectives. The potential tools that can be used to analyze the resource problems identified, and results.

a. The causes of the resource problem are identified.
b. What are potential tools to use related to the type of resource problems?
c. Preliminary analysis to address the problem with available tools. Hydrologic modeling, GIS analyses, or both used to identify acres with greatest need for treatment (critical acres) based on pollutants of concern and the numbers of acres of conservation to achieve goals. Depending upon the complexity of the watershed, several methods could be used:
    i. Simple spreadsheet mass balance models for nutrients.
        1. Nutrient inputs based upon areas (acres) for given land cover and use.

2. Nutrient outputs.
3. Possible conservation measures. Use the mass balance spreadsheet to put acres of new conservation in and see results in water quality load reductions.

ii. Simple spreadsheet sediment delivery budget.
1. Identifies the sediment sources in the watershed.
2. Estimate quantity, sediment delivery ratio, to estimate total sediment.

iii. Load reduction spreadsheets for best management practices.
iv. Watershed-based modeling of potential sources and treatment effects.
v. Grid-based GIS modeling.
vi. GIS vulnerability analysis – simple GIS analyses using GIS coverages of land use, management, physical attributes, etc., to assist in the identification of critical areas within the watershed.
vii. Other analyses, including watershed and stream surveys, to identify areas needing treatment.

d. Analysis of treatment and opportunities
i. Current level of treatment in the watershed.
ii. An analysis of producers available in the watershed to participate in the initiative and their likely willingness to participate.
iii. An assessment of how critical area treatment is balanced with participation to achieve the most effective prioritization of implementation.
iv. A set of preferred practices, locations, responsible parties, costs, and time lines should be described based on the above analyses.

V. Summary and Recommendations

a. Description of water quality impairments.
b. Description of the goals (usually reduction goals) and practice efficiencies.
c. Establish interim metrics to track progress. Both implementation (practices implemented on high priority acres) and effectiveness metrics (estimates of the water quality impacts of implementation – e.g., load reductions, edge-of-field reductions, improvement in biological indicators or physical indicators, monitoring trends) should be selected.
d. Locations of critical source areas or vulnerable acres needing treatment.
e. Description and evaluation of planned practice scenarios and alternatives that meet the water quality objectives, including estimation of treatment costs. What are the best suites of practices (in-field, edge-of-field, and off-field) to use, and how much is needed to accomplish the treatment objectives?
f. Documentation of NEPA concerns – refer to the CPA-52 example on the NWQI SharePoint for areawide planning.

VI. Appendix: Follow-up

Although this is an assessment (NRCS planning steps 1-6), you will need to complete steps 7-9 for a successful watershed project if the watershed is selected. Tracking progress towards meeting project goals will be required, using the metrics established in section V. Interim metrics are established to assure the project is on track for meeting water quality objectives for agricultural lands in the watershed. Evaluation of alternatives may be necessary if anticipated progress is not being met. For watersheds with monitoring networks in place, instream monitoring data provides the best way to determine whether water quality objectives are being met for the watershed.

An outreach plan will be required for all watershed projects. The outreach plan should use the identified critical areas from the watershed assessment to target producers in those areas for an elevated level of outreach.