Watershed Plan Checklist

Prepared by the Indiana Department of Environmental Management [IDEM] Watershed Management Section ~ Effective for 2003

The items in this checklist are required in watershed plans prepared with Section 319 or Section 205(j) funds, or submitted for implementation funding under Section 319. These requirements are consistent with USEPA guidance.

BEFORE YOU START…..

TIPS ON PRODUCING THE PLANNING DOCUMENT:

Record-keeping: designate a person or agency to keep all the records and documents for future reference.

Unless a particular format is required for funding sources other than S319 or S205j, **please follow the outline below.**

Make it easy for the reader to find information by referring to Tables and Figures in the text. Repeat material if necessary in order to make the plan easy to understand.

Make sure the order of events in the plan is clear. Including a brief calendar of when important events occurred, and when future events are planned.

If the plan is weighty and includes a lot of technical information, summarize the concerns and goals in an **executive summary** or brochure to distribute to the public. Provide information on how citizens can get copies of the whole plan if they wish.

Include raw data, survey results, comments, and other space-consuming items in the **Appendix.**

Include a table of **acronyms.**

Create a **distribution list** to make sure that all the appropriate people get a copy.

Provide a **contact** person, phone #, or at least an address, in an obvious location in the plan, for those wanting more information.

Required Watershed Plan Content

1. INTRODUCING THE PROJECT:

Describe the process the community went through when developing the plan, list the parties involved, and summarize any important issues that influenced how the plan emerged.

- Write an introduction that contains the following points:
  - Place the mission, vision, or purpose statement of the group inside the front cover or in the introduction.
  - Briefly "introduce" the watershed, so readers will understand the scope of the plan. Include a map near the beginning of the introduction.
  - Include a brief history of how and why the group came together to write a plan.
- Building partnerships:
  - Describe how concerns were expressed (at meetings, through conversations, in surveys or interviews) and list the major concerns.
  - Describe the structure of the group that made decisions in the plan… i.e. steering committee, SWCD Board, etc. Describe sub-committees and their work.
  - List partners that developed the actual plan and include their roles and responsibilities.
  - List the major community groups [stakeholders] engaged in the planning process. Explain how you got these groups involved.

- If a TMDL is happening in the watershed, describe how the planning and TMDL activities are integrated, and how the community was involved (or not) in the TMDL development. [NOTE: If a TMDL is developed after the watershed plan is finished, the plan will need to be amended to be consistent with the load allocations in the TMDL, in order to get further S319 funding.]

2. DESCRIBING THE WATERSHED:

Describe features of the watershed, including land use, soil types, topographic features, hydrology, and any other information needed to understand the plan.

- In this section, describe all the features of the watershed that the reader needs to know in order to understand the decisions the group made.
- Refer to the Watershed Inventory Workbook, http://www.ecn.purdue.edu/SafeWater/watershed/inventoryf.pdf, or the Land Inventory Directory in the Indiana Watershed Planning Guide for sources of information.
  - Include maps clearly showing watershed boundaries, streams, lakes, towns, county boundaries, roads and other features. Show the location of the project watershed within the larger river basin. Identify watersheds using hydrologic unit code (HUC) as well as geographic name.
    - If the group designates smaller subwatersheds or special areas within the project boundaries, show those on maps as well.
  - Physical description: include the following…..
    - The physical setting of the watershed, with a brief description of the present geology and geologic history (examples: was the area glaciated or not, annual rainfall and climate.)
    - Natural History: Description of the native vegetation, current vegetation, and anything interesting or unique about the flora and fauna.
    - Endangered Species: List species that could occur in the area. Describe the habitat the species prefer.
    - Soils: Using the soil survey, describe or list the predominant soil types, and note characteristics of soils that can affect water quality, such as highly erodible, hydric, poor for septic systems, etc.
    - Topography: General nature of the topography; prevalence of steep slopes, valleys, floodplains, etc. and where they are located.
    - Hydrology: Major stream systems; how streams have been modified through drainage or channelization; presence of dams, reservoirs, drinking water sources; whether aquifers are vulnerable; what is known about wetlands in the watershed.
  - Land use: include the following….
    - When was the area settled; what was the historical land use; what is the current land use. Identify any important cultural resources.
    - Discuss historical events such as deforestation, industrial development, previous conservation projects, dam building, or other activities that help in understanding the watershed and establishing a sense of place.
    - Identify areas slated for development, unique recreational resources, and other important features.
    - Land ownership: If there are significant tracts of land in public or managed ownership, such as state forest, national forest, land trust, parks, reservoir boundaries, military holdings, and so forth, they should be shown on a map. The owners should be involved in the planning process, if possible.

3. ESTABLISHING BENCHMARKS:

Identify waterbody impairments, water quality threats, and baseline data for water quality and biological community parameters.

- In this section, list existing information that you gathered to establish 'baseline' or 'benchmark' conditions in the watershed. Possible sources:
  - Quality-assured water chemistry or biological monitoring conducted earlier in the project
  - Findings of the Land Inventory conducted during the project
  - Stream visual survey results
  - Volunteer monitoring data
  - LARE diagnostic studies
  - IDEM 305b Water Quality Report
  - IDEM 303d Impaired Waters List
  - NPDES discharge data
  - Watershed Restoration Action Strategies
  - Any other water quality data, reports, or studies that may be available.

- Requirements:
  - Existing data: State the source of the data, who collected it, the sampling dates and locations, and the testing methods if known. Summarize the data, and how the group interpreted it, in the text. Include the raw data in an appendix.
  - Reference the studies and reports the group found, and briefly summarize what they said—no need to include the whole thing.
  - If impairments are listed in the 305(b) report or there are streams or lakes listed on the 303(d) list, note the state water quality standards that have been exceeded. Include any numeric criteria that need to be used later in formulating goals.
  - Water quality impairments may involve surface water, ground water, or both. Include well-testing data or other groundwater information if you can.
  - If there is not enough water quality data to support a decision, the group will need to develop and carry out a monitoring program. Refer to IDEM Volunteer Monitoring guidance, Quality Assurance Project Plan (QAPP) requirements, the LARE program monitoring guidelines, and other sources for help in doing this.
  - If a QAPP was developed for monitoring, reference it in the plan.

4. IDENTIFYING PROBLEM CAUSES & STRESSORS:

Identify known or probable causes of water quality impairments and threats. Stressors (things that are affecting the environment negatively) may include specific pollutants, changes in land use, hydrologic changes, and other factors.

- In this section, identify and describe the things that are causing the watershed to fall short of the group's vision.
  - Review all the data and information gathered by the group.
    - For help in interpreting data, consult state and federal agency technical personnel (IDEM, IDNR, NRCS, USFWS, USGS, etc.)
    - Discuss findings with stakeholders and local agencies (Health Dept., Drainage Board, Cooperative Extension, etc.)
  - In the previous section, you listed the group's concerns. In this section, note whether you were able to confirm those concerns using the data you have. Some concerns may turn out to be groundless, and new ones may come to light with the data. Don't lose track of valid concerns during the planning process.

- Develop concise *problem statements* concerning impairments, threats, and stressors. State the problem clearly, followed by the probable cause, location of the problem, and extent.
- Tie concerns, benchmarks, and stressors together so there is a clear thought process throughout the plan. Use tables, bulleted lists, or any other format that makes it easy to see these relationships.

5. IDENTIFYING SOURCES:

Identify the source of the stressors and threats

- Identify specific sources for *each pollutant or condition* that is acting as a stressor or threat.
  - Explain why you believe these to be the sources. Document the evidence for each source. Conclusions must be clearly supported by data.
  - Identify all areas of the watershed -- specific subwatersheds, specific land uses, or other defined areas such as "all subdivisions without stormwater control" -- where each source exists.
  - A 'source' may be:
    - An activity without a specific location, like car washing or dog walking; to map it, you would identify the geographic areas where the activity happens.
    - Associated with a material or structure, such as impervious surfaces or copper roofs. These can also be mapped in a general way.
    - All the actions associated with a business or enterprise, such as construction or livestock production. Also, specific actions by a sub-set of operators, such as poor sediment control in subdivisions or inappropriate manure handling by turkey producers. You might not be able to map this easily, but you could identify the land uses where these activities are likely to occur.
  - Describe the sources in detail. At a minimum, state [for example] the number of dairy farms in each subwatershed, or the number of acres of cropland needing improved tillage methods, or the trend in the number of impervious acres added each year.
  - Include enough information to explain the magnitude of the source. For example, instead of saying that 'some stream corridors need restoration', state that 'there are 45 stream miles in the watershed, of which 17 miles have good riparian cover, 10 have fair cover, and the remaining 18 miles are in need of restoration'.

6. IDENTIFYING CRITICAL AREAS:

Target areas within the watershed where the sources/stressors are causing the greatest damage, and where applying treatment measures will have the greatest effect.

- Targeting: Select the areas to be addressed for each stressor/source. Show these areas on a map.
  - Areas selected should be feasible for the group to address
    - Select areas small enough to address in 3 to 5 years.
    - Consider funding possibilities, willingness of landowners to participate, and whether the impact of treatment can be measured.
  - Calculate existing *loads* for pollutants to assist with prioritization. Concentrations alone may be misleading. Load = concentration x flow (volume/time). In order to calculate a load you need flow data for the sample location. Calculating the load at the mouth of each tributary can highlight where practices need to be installed. See also Section 9, below.
- Prioritizing: Rank the critical areas, either by the problem they represent or by location, in the order the group plans to address them. At the least, identify the first few things the group plans to tackle.
  - Summarize the thought process used for targeting and prioritization.
  - Tie the discussion back to the concerns, benchmarks, and stressors.
  - Think "worst first"—where can the most impact on a stressor be accomplished?

7. SETTING GOALS & SELECTING INDICATORS:

State the water quality improvement or protection goals that were agreed on by the group. Goals must include specific, realistic targets for reducing pollutants or mitigating impacts, and identify timeframes for accomplishment.

- Use the problem statements developed earlier to craft goals that describe what will be addressed, where it will be addressed, what the targets are, and how long it will take.
  - Refer back to the concerns, benchmarks, stressors, sources, and critical areas.
  - For each goal, determine what parameters can be measured to track progress toward the goal. These are your indicators.
    - State indicators as water quality standards or criteria where appropriate.
    - Where applicable, select indicators that will show change in the aquatic ecosystem, such as benthic macroinvertebrate indices, fish community indices, or habitat evaluations.
    - For indicators other than water quality (such as rate of tillage adoption, miles of riparian forest, or indicators of behavior change) describe the measuring methods, including how the location of practices or improvements will be recorded.
- Goals should incorporate the following elements:
  - A problem, pollutant or condition;
  - The present pollutant load, baseline level, or benchmark value for the problem;
  - The target (desired future) load, level, or value;
  - When the group expects that target to be met.
- Create a table in the text or appendix listing the goals in order of importance to the group. Include the present level or condition, target level or condition, target date, and the indicator(s) to be used for measuring progress.
- Be sure there is a clearly understandable train of thought from concerns to stressors, sources, goals, targets, and indicators.

8. CHOOSING MEASURES TO APPLY:

Describe what needs to be implemented or changed to achieve the goals of the watershed plan. Select an array of measures or alternatives to accomplish this.

- Work with state, federal, local, or private specialists as needed to determine one or more measures that will effectively address each goal. Include a discussion of how and why these measures were selected.
  - A "measure" may be a practice, program, or process.
  - Measures could include further planning or assessment, developing local ordinances, installing BMPs, establishing an outreach program, or any other organized change to improve water quality.
  - Measures must be feasible, and must be acceptable to the community and not cause undue economic distress.
  - Measures should be connected to the appropriate goals. There may be overlap between measures & goals; for example, reducing sediment from crop fields will also reduce phosphorous and pesticide loads. You may be able to use a single indicator to track progress for more than one goal.
  - Show on a map where measures will be applied: by sub-watershed, as point locations, or whatever is clearest.
  - For practices (BMPs) recommended in the plan, identify standards and specifications that apply and which agency maintains those standards.
- Describe the potential impacts of the measures, both positive and negative.
  - Include economic and social impacts as well as environmental impacts.

- Where possible, describe effectiveness (for example, “a properly designed filter strip x feet wide can trap x% of sediment in overland flow.”)
- Describe the consequences of not doing anything.

9. CALCULATING LOAD REDUCTIONS:

Using methods appropriate to your situation, calculate estimated load reductions for the management measures identified. (See also “Identifying Critical Areas”)

- Identify the measures for which a load calculation makes sense. Load reduction from agricultural and urban practices such as waterways, buffers, silt fence, manure management planning, seeding & mulching, etc. can usually be calculated. Education and outreach, new ordinances, and changes in habitat or biological composition are not workable for load calculation.
- Determine a reasonable method (IDEM Loading Workbook, RUSLE2, SWAT, common sense) to calculate the estimated pollutant load change due to implementing measures. For each calculation, state the method used and the assumptions you made.
  - For agricultural practices, calculate sediment yields and nutrient loads. State the methods or models used and assumptions made.
  - For non-agricultural land, calculate impervious area, runoff, and any pollutant loads for which there is adequate information.

10. IMPLEMENTING THE MEASURES:

Describe the planned order of implementation, the time requirements for implementing the plan, who is responsible for carrying out tasks, and what milestones to check.

- Create an ‘action register’ (table) that lists **for each goal** what tasks will be performed, when each task will be complete, who is responsible for doing it, and what resources (money & technical assistance) are needed.
  - Estimate financial and technical assistance needed to implement the plan over the next 3 to 5 years.
    - Include sources for cost figures, and describe the reasoning behind the estimates.
    - Concentrate on developing estimates for the high-priority tasks the group wants to carry out in the near future.
    - For items difficult to estimate, indicate what agencies, programs, or organizations you will go to for implementation assistance.
  - Identify agencies that will be expected to provide technical assistance, such as NRCS, IDNR, or the county Health Department
  - Identify funding sources that will be asked to provide financial assistance, such as foundations, USDA programs, state land treatment programs, or S319 grants.
  - Discuss operation and maintenance responsibility for installed practices.
- Set dates when progress on each goal will be reported. EPA interprets “interim measurable milestones” as practices installed, people contacted, etc., not as changes in water quality.
- Acknowledge which problems will take longer than 3-5 years to address, and briefly discuss how they will be handled, i.e. through longer-range projects, follow-up monitoring, deferring to another agency, etc.
- Describe any permits, easements, and agreements with landowners; land acquisition; or other legal actions that have to happen in order to make the plan work. In your schedule, take into account the time needed to apply for permits, especially for wetland or floodplain work.

11. MONITORING INDICATORS:

Describe how indicators will be monitored to evaluate the effectiveness of implementation. If water quality standards and criteria are selected as indicators, describe how water quality will

be monitored. Monitoring for other goals may include spot-checking, landowner participation, adoption of practices, or other measurements.

- Refer back to the indicators chosen to track progress for each goal (see "Set Goals & Select Indicators"), and develop a monitoring plan to track these indicators for at least the next 3 to 5 years.
  - Determine how each indicator can be measured, who will be responsible, what equipment is needed, sample locations and sample frequency, when monitoring is to begin and end, who will evaluate the results, and how they will be reported to the group.
  - If required, develop a QAPP for monitoring.
  - The load reduction calculations that you did should be linked to the monitoring plan, so actual loads can be calculated as the project progresses.

12. EVALUATING & ADAPTING THE PLAN:

Describe when the watershed plan will be re-evaluated; who will do it; who is responsible for revisions or adaptations to the plan.

- Discuss how the group plans to evaluate plan implementation progress, and how often.
  - Assign responsibility for revising the plan as needed.
  - If a TMDL is being developed in the watershed and the IDEM staff have been working with the watershed group, describe how coordination will be maintained.
  - If a TMDL is completed in the watershed after the plan has been written, the plan will need to be updated to include the provisions of the TMDL.

Submitting Plans to Different Programs

IDEM's S319 & 205(j) Grant Programs

- 1. If there is a TMDL in the watershed, describe how the community was involved and include the findings and recommendations of the TMDL, as well as load calculations.
- 2. To be eligible for funding to implement the plan, submit a hardcopy and an electronic copy to the IDEM Watershed Management Section for review against this checklist. The checklist may change slightly with each federal fiscal funding cycle, in response to new EPA program requirements.

Natural Resource Conservation Service (NRCS)

The items in the checklist will correspond to the nine planning steps described in the NRCS Area-wide Planning Manual. With the addition of economic data, this checklist would supply most of the elements of a watershed land treatment plan prepared for PL-566 program funding. Contact the NRCS Indiana State Office for further information about the PL-566 program.

IDNR Lake and River Enhancement (LARE) Program

The LARE program has some special data requirements for their diagnostic studies. If the following material is included in the watershed plan, it is likely that it will meet LARE requirements for funding. To be sure, check with program managers.

- Include surveys, trends, and management recommendations from IDNR Division of Fish and Wildlife on any species that are dependent upon waterways or riparian areas in the project area. Fisheries reports may be available from IDNR, IDEM or other agencies for selected streams.
- Include an annotated bibliography of previous studies and data/literature cited. When appropriate, conduct recreational user surveys and/or homeowner surveys to document resource pressures and to understand local perceptions.
- Professional water quality assessments need to be completed at strategically selected sites, with the following considerations:

- Conduct water quality tests at pertinent sites in selected streams and tributaries, as well as one reference site in a high quality similar watershed (approximately 5-10 sites total). Select sites with input from LARE staff, the watershed steering committee or other local sponsor, participating SWCDs, and IDNR District Fisheries and Non-game Biologists. At each site, collect and analyze data on water quality, biological communities, and habitat, as indicated below.
- Water chemistry : pH, temperature, dissolved oxygen, nitrate+nitrite, organic nitrogen (TKN), ammonia nitrogen, total and dissolved phosphorus, turbidity, conductivity, and rate of flow. Fecal coliform may be sampled at selected sites, if appropriate. Stormflow and baseflow samples are collected at each tributary site. Note the intensity (inches of rain in number of hours) and date of storm events.
- Quality assurance: Water quality analyses must be conducted by a reputable laboratory and should follow analytical methods described in the most recent edition of one of the following publications:
  (a) Standard Methods for the Examination of Water and Wastewater, APHA, AWWA, WPCF.
  (b) Methods for the Chemical Analysis of Water and Wastes, USEPA, Environmental Monitoring and Support Laboratory.
- Water quality analyses must be conducted using detection limits appropriate for the analysis of lake water samples. Contact LARE staff for details. Quality assurance/quality control procedures (QA/QC) must be a part of the sampling and water quality analysis. A copy of the QA/QC plan from the laboratory(s) conducting the water and sediment sample analysis must be on file in the LARE program office.
- Aquatic biology: Assess benthic macroinvertebrate communities using Rapid Bioassessment Protocol II (EPA). One late summer sample is collected at each site. Upon completion of the analysis, the entire 100-organism subsample must be labeled with site, date, and collector's name, preserved and delivered to the IDNR Division of Soil Conservation.
- Habitat quality : Survey habitat quality using the Qualitative Habitat Evaluation Index (QHEI) once at each site, unless significant changes to habitat are expected (e.g., dredging, riparian clearing). Where indicated, contour sampling for sediment depth may be included at selected sites.
- Wetland inventory (functional assessment). Assess wetland restoration opportunities/needs. Describe the location and conditions of priority wetland restoration or construction sites.

In addition to the requirements listed above, consider the following:

- Analyze trends relating physical, chemical, biological, and habitat factors
- Use statistical analyses to predict the relationships between physical, chemical, habitat, and biological quality and indicate potential limiting factors. Where information is available, compare water quality with similar regional streams and set a reasonable goal for improvement in water quality factors.
- Identify, establish, or recommend volunteer monitoring groups to continue water quality assessment.
- Discuss unusual physical or social characteristics of the watershed or institutions that may support or challenge future watershed land treatment projects.

LARE requests a digital copy of the plan, associated figures, and GIS layers (if available). One unbound photo-ready hard copy should be submitted to the IDNR - Division of Soil Conservation.

Program needs will be satisfied if all of the above elements are included, as well as the creation of a public information fact sheet or brochure. The brochure should include the plan's findings, recommendations, and educational information about improving water quality.