

Watershed Management Planning Strategy

Missouri Watershed Initiative
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Project summary description: Watershed management planning projects initiated at the watershed-level are characterized by a comprehensive water resource assessment, planning and management process. Such projects result in a management strategy that is scientifically sound, involves local community forums (stakeholders) and provides a sustainable framework for future growth and development based on high quality water resources.

Process description: The process is comprised of two initial steps – an assessment and development of a steering committee and a technical group. The assessment is the more scientific of the two, relying on various scientific disciplines – water biology, entomology, hydrology, geology, microbiology, soils, economics, sociology - as well as records and published information, to characterize the watershed in terms of its resources as well as identify various kinds and amounts of pollutants. The development of the steering committee (individuals representing local stakeholder groups) and technical group (government agency personnel stationed in the local community) assures that their input regarding water resource issues is heard and is factored into the assessment framework. Parallel to the period of time during which the respective assessment projects are being conducted, periodic (monthly or more frequently, as needed) meetings are held with the committees during which their respective water resource concerns are identified and recorded, and during which the individuals conducting the assessments provide updates regarding their processes and findings. This is a two-way educational process for all groups because of the amount of exchange that takes place. Further, it is an effective means of providing engagement and building trust among the groups.

After the assessment projects have been completed a watershed management plan and implementation strategy must be developed. The plan must include the information obtained through the respective assessments and the water resource issues and needs identified by the steering committee and technical group. As much as possible, a detailed itemized list of needs and action strategies to address the needs must be formulated. This list must include a timetable for implementation, specific responsibilities (stakeholders and agencies), pertinent regulations, anticipated outcomes and a monitoring/evaluation protocol to measure progress.

Project components:

Watershed assessment – It is essential that a number of resource inventory projects be conducted to adequately describe the watershed in terms of biological, physical, social and economic characteristics. The specific number and types of assessment projects will vary depending on the particular watershed selected. In addition, the findings of specific projects also constitute the baseline from when the project starts, and they can be used as the project progresses to measure change. The following assessment projects are typical of the types which might be undertaken.

Physical characteristics (GIS-based)

Water supply inventory – surface water, ground water, availability, quality characteristics

Geologic inventory – formation, water bearing characteristics, aquifers

Soils inventory – types, characteristics, distribution

Sediment source inventory – sources of sediments in streams (use diatoms)

Nutrient contamination – types, quantities, possible sources

Chemical contamination – types, quantities, possible sources

Land use – types, amount, locations, sensitive areas

Hazardous waste sites – types, specific materials, amount, water-related risks

Biological characteristics

Water biology – clarity, turbidity, temperature, dissolved oxygen, pH, flow rates, mineral content, nutrient content, chemical content

Macro invertebrates – type, quantity, distribution

Water-borne bacteria and viruses – *e. coli*, pathogens, sources

Social/community characteristics

Population description – number, age, gender, education, income, employment, access to water

Household characteristics – structure, income, education, sewage disposal

Farmer characteristics – family structure, age, education, sources of income, availability of water, sewage disposal

Farm operation characteristics – crop practices (kinds, areas, rotations), livestock practices (types, classes, areas), mineral application (dates, amounts, kinds), nutrient application (dates, amounts, kinds), pesticide application (dates, amounts, kinds), Best Management Practices (dates, amounts)

Agricultural services characteristics – applicators (number, kind, equipment, materials applied, dates, amounts, methods)

Industry characteristics – type, products, water use, wastewater disposal

Community characteristics – water availability, water use, sewage disposal

Economic characteristics

Economic infrastructure of specified area – employment (total, related to water availability), salary base, community economic activity, taxes generated, public expenditures (total, water related)

Economics of households – number of wage earners, salaries (total, related to water), types of employment, location of work, health impacts of employment

Economics of farming operations – on-farm employment, off-farm employment, costs of production, revenues from crop and livestock sales, in-kind trading of crops and livestock

Economics of industrial operations – types, amounts, dependence on water resources for water supply or waste disposal

Steering committee formation and operation – Formation of the local steering committee comprised of local stakeholder representatives is paramount to the success of the process in terms of identifying community concerns regarding the many facets of water resources, but

primarily the concern of availability of safe drinking water. Further, this process is the first step in enabling community members to be a relevant, active and contributing member of the process team, thus building trust through the processes of education and open communication.

Identification of local steering committee membership – A meeting of identified community leaders, conducted by a trained facilitator, is held in communities associated with the watershed. At this meeting, broad categories of issues related to water resources are identified by these persons. After the broad categories of issues have been identified and discussed, then the community leaders are asked to identify the various groups (stakeholders) in the communities who are most closely related to these issue categories. These individuals are then invited to be a part of the local steering committee.

The local steering committee will be sent information about the process and how it can benefit those who are associated with the watershed, and are asked to attend an initial informational meeting. At this meeting, the process is described in more detail, all questions are answered, and a first step is taken by a trained facilitator at identifying broad categories of water resource issues. In addition, at this meeting, attendees will be informed of the on-going watershed assessment, and that they have a role in the particular projects which are to be undertaken, based on their identification of water resource issues. Over subsequent meetings, the facilitated issue identification process will be continued, at a pace dictated by the assimilation capacity of local steering committee members. Ultimately, the facilitated process will yield a series of specific actions which the members feel need to be taken, and which they agree with and support, to achieve their goals regarding water resources. In addition, at subsequent meetings, scientists and technical staff engaged in the various assessment projects will make periodic presentations to the committee membership regarding their projects – what the project entails and how the findings will relate to water resource watershed management.

Technical group formation and operation – Formation of the technical group is somewhat different from the forum because the members are defined through their agency assignment. In addition, for the initial part of the project, the technical group is kept separate from the steering committee membership because agency personnel must adhere to their agency's agenda, while the lay person who is a stakeholder representative on the steering committee is free to act and promote their own interests and agenda. However, in a fashion similar to that followed in formation of the steering committee, identification of broad categories of water resource issues in the watershed area must take place through facilitated meetings.

Technical group members will be sent information about the process and how it can benefit those who are associated with the watershed, and will be asked to attend an initial informational meeting. At this meeting, the process is described in more detail, all questions are answered, and a first step is taken by a trained facilitator at identifying broad categories of water resource issues. In addition, at this meeting, attendees will be informed of the on-going watershed assessment, and that they have a role in the particular projects which are to be undertaken, based on their identification of water resource issues. Over subsequent meetings, the facilitated issue identification process will be continued, at a pace dictated by the assimilation capacity of group members. Ultimately, the facilitated process will yield a series of specific actions which the group members feel need to be taken, and which they agree with and support, to achieve their

goals regarding water resources. In addition, at subsequent meetings, scientists and other technical staff engaged in the various assessment projects will make periodic presentations to the technical group membership regarding their projects – what the project entails and how the findings will relate to water resource watershed management.

Watershed management plan development – The watershed management plan should be developed by a combined group of both the local steering committee and the technical group. To accomplish this, the groups should begin meeting together as soon as possible upon completion of the various assessment projects. At this point, it might prove wise to increase the frequency of meetings to insure that members of the two groups become acquainted and can begin to engage in productive dialogue regarding water resource issues. Further, as the assessment reports become available, and written and verbal reports are presented to the combined group for comments, significant learning will take place.

The watershed management plan should contain the following basic sections – overall watershed description; assessment project summaries; steering committee issues identified with action strategies; technical group issues identified with action strategies; overall detailed recommendations for management of the watershed. Appendixes should contain relevant maps, supporting data, institutional frameworks, regulations, participants, agreements, and etc. Obviously, the watershed management plan should be dynamic, adaptable and flexible to be able to meet and accommodate a changing environment.

Watershed management plan implementation – Implementation of the watershed management plan should be a combined effort of the local steering committee and the technical group. No set protocol for implementation can be described, because the strategy should be one that has evolved during the course of watershed management plan development.

Public awareness – A public awareness campaign that describes and discusses the project should have been initiated at the beginning of the project and should continue as it matures. Periodic newspaper articles, radio and television appearances and public forums should be incorporated to keep the general public informed as to the project, its intent and progress. Consequently, when the final draft watershed management plan is released for further public comment, it should not be unanticipated, especially by relevant officials and local leaders.

Timeline: The total period required for project completion is an estimated five years.

Year 1: Initiate assessment projects; develop steering committee and technical group; begin public relations effort

Year 2: Complete assessment projects; continue meetings with steering committee and technical group; continue public relations effort

Year 3: Initiate watershed management plan development; combine steering committee and technical group; continue public relations effort

Year 4: Finalize watershed management plan; initiate management plan implementation; continue public relations effort

Year 5: Watershed management plan implementation and update/revision