



Targeted Watershed Improvement Plans

Watson Lake

A Step-by-Step Technical Guide



San Francisco River

Plan for Better Water Quality Step-by-Step

Improvements in water quality don't just happen. They take hard work, cooperation, and most of all, planning. Plans *targeted* at pollutants causing impairment of lakes and streams will focus efforts at the sites where remediation projects are critical to water quality improvement.

The goal of this guidance is to assist a Watershed Improvement Council (WIC) in developing Watershed Improvement Plans (WIPs) and implementing projects that will significantly improve water quality. This guide provides details for this planning process.

The result will be a plan that focuses watershed restoration efforts so that watershed-wide improvements occur through a process that creates strong public involvement, commitment to maintain improvements, and a knowledgeable community. These plans and strong public support will also increase priority for obtaining future grants needed to implement projects.

This document will describe the seven steps to developing and implementing a WIP:

1. Assemble the WIC. Set goals and objectives
2. Education and outreach
3. Survey the watershed
4. Analyze watershed data, evaluate alternatives, and set priorities
5. Complete the plan and develop the document
6. Implement the WIP
7. Monitor and evaluate effectiveness



| Step 1 | |
|---|-----------------------------|
| Assemble Watershed Improvement Coalition (WIC). Assemble information about the impairment, the watershed, and resources available. Establish roles, responsibilities, and plan of action. | |
| Things to consider | Roles & Responsible Parties |
| Assemble WIC <ul style="list-style-type: none"> Who is needed to make decisions and provide resources? All views represented? Maintaining respect for diverse opinions. Meeting times and locations appropriate? How to distribute info to absent members? | |
| Information about impairment <ul style="list-style-type: none"> Characteristics of the pollutant. Related pollutants of concern. Current and potential pollutant impacts on uses of water. Potential impacts on wildlife and other natural resources. Monitoring data available. Conditions when exceedances occur. Status of TMDL development. | |
| Watershed <ul style="list-style-type: none"> Activities and conditions that contribute to pollutant loading or impairment. Locating GIS map covers and aerial photography. | |
| Mitigation <ul style="list-style-type: none"> What actions have been taken to reduce pollutant loading? Proposed remediation activities. | |
| Goals, milestones, schedules, resources <ul style="list-style-type: none"> Goals, objectives and milestones must be clear and focused. Available resources and commitments to fulfill schedules and milestones. Available resources and commitments for initial improvements and education. | |
| Roles and responsibilities <ul style="list-style-type: none"> Establish roles and responsibilities for all WIC members and others. Establish methods to maintain coordination. If grants are funding plan development, determine: <ul style="list-style-type: none"> Who will be managing and distributing the grant funds, writing quarterly reports, tracking peoples hours and other matching funds Criteria to support the implementation phase. | |

WIC = Watershed Improvement Coalition

TMDL = Total Maximum Daily Load, the maximum pollutant amount (load) which can be carried by a surface water without causing an exceedance of water quality standards.

ADEQ = Arizona Department of Environmental Quality

NEMO = Nonpoint Education for Municipal Officials

MWS = Master Watershed Stewards

Note: Identify all parties and their roles for each task.



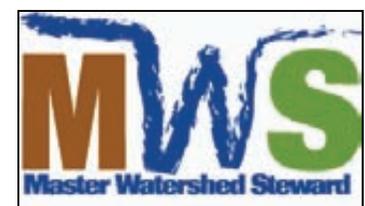


Salt River at Coon Bluff

| Step 2 | |
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| Education and outreach for plan development and initial implementation | |
| Things to consider | Roles & Responsible Parties |
| <p>Existing education and outreach efforts</p> <ul style="list-style-type: none"> • Identify efforts to provide community with information about: <ul style="list-style-type: none"> ◊ The pollutant characteristics, ◊ Pollutant impacts (why be concerned), ◊ Sources and conditions in the watershed that contribute to impairment, ◊ Ways to reduce pollutant loading. How they can make a difference! ◊ Mitigation actions taken and effectiveness (if known). • Who were target audiences for past education and outreach (if any)? • Were past education/outreach activities effective in changing behaviors or in getting improvements implemented? | |
| <p>Education needs identification</p> <ul style="list-style-type: none"> • For each step in this process, identify: <ul style="list-style-type: none"> ◊ Target audiences and education needs (e.g., target by land use, age), ◊ Potential methods to provide education, ◊ How to determine if education was effective in terms of behavior change or improvements. • Determine need and desire for basic "Watershed 101 Classes" (Master Watershed Steward curriculum) or needs for targeted classes. | |
| <p>Public involvement:</p> <ul style="list-style-type: none"> • Determine ways community individuals and groups can become involved. • Groups who should be encouraged to participate. • How will they stay abreast of developments and potential activities? • What education will be needed to support their involvement? | |
| <p>On-going presence</p> <ul style="list-style-type: none"> • Are behavioral changes needed? If so, how will on-going education be maintained? • Will a "presence" be needed at some sites to encourage behavioral changes? • How to determine long-term effectiveness. | |



Boots on the Ground





San Francisco River

Step 3

Survey the watershed

| Preliminary Survey Efforts | Roles & Responsible Parties |
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| Establish goals for the survey. <ul style="list-style-type: none"> Identify pollutants of concern Identify "key sites" where pollutant loading is clearly demonstrated and conditions can be measured and documented (probable remediation sites). Identify "reference sites" which demonstrate conditions that can be achieved. | |
| Develop the field survey. <ul style="list-style-type: none"> Write a monitoring plan. Obtain equipment and create field forms, field maps. Train volunteers. Develop database & methods to visually represent findings (GIS maps, photos) Notify landowners. Get permission to conduct field survey, where necessary. | |
| If a large watershed, subdivide watershed into "survey areas." For example: <ul style="list-style-type: none"> Sub-drainage areas (based on tributaries) Land uses (urban, grazing, mining, crop production, industrial, forests, etc) Sewered, age of subdivision/septic systems | |
| Prioritize "survey areas" and target areas to visit based on activities potentially contributing the pollutant or conditions in the watershed. Consider: <ul style="list-style-type: none"> Aerial photography and GIS covers, Agency records - allotment reports, septic system or floodplain surveys, water quality data, Knowledge among WIC members. | |
| NPDES permits. <ul style="list-style-type: none"> Identify permit discharge locations. Determine potential contribution based on permits and compliance records. | |



Aerial Photo
Manzanita Wash
Prescott, AZ





| Physical Survey | Roles & Responsible Parties |
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| Implement the field survey | |
| <p>If surveying to reduce <i>E. coli</i> bacteria and/or nutrients, identify the following <u>within 150 feet</u> of the impaired water or a tributary.</p> <ul style="list-style-type: none"> • Livestock operations (pastures, feedlots, corrals). <ul style="list-style-type: none"> ◊ Drainage into surface water, ◊ Livestock waste near stream bank, ◊ Livestock in the surface water or no fencing to keep livestock out of water, ◊ Poor riparian conditions / inadequate filter strips. • Crop production. <ul style="list-style-type: none"> ◊ Drainage into surface waters, ◊ Irrigated area return flow locations. • Waste-water disposal. <ul style="list-style-type: none"> ◊ Determine age, location, type of septic systems or other disposal system, ◊ Locations of sewer lines crossing streams. • Recreational areas. <ul style="list-style-type: none"> ◊ Inadequate or poorly maintenance of toilet and trash facilities (peak periods), ◊ Wildlife - trash interactions, ◊ Feeding wildlife (e.g., ducks & geese) resulting in fecal accumulation, ◊ Pet wastes, ◊ Riparian area / stream bank damage. • Urban storm water. <ul style="list-style-type: none"> ◊ Drainage into surface water with indications of stream bank erosion, ◊ Pet wastes, ◊ Poor riparian conditions / inadequate filter strips. | |





Slide Rock on Oak Creek

| Physical Survey (continued) | Roles & Responsible Parties |
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| Document flow regime along impaired waters and tributaries. <ul style="list-style-type: none"> • If perennial, determine normal flows for each month. • If intermittent, determine which months it normally flows. • If interrupted, determine where & when perennial or intermittent stretches occur. • Determine areas where & when ground water upwelling is primary water source. | |
| Social Survey | Roles & Responsible Parties |
| Before education and outreach projects and at end of grant (or later), determine: <ul style="list-style-type: none"> • Level of knowledge concerning pollutant and practices to reduce loadings (especially in target audiences), • Efforts being made to reduce pollutant contributions, • Reasons not implementing practices, projects, or improvements. | |
| Investigate potential and available regulatory authority to reduce pollutant discharges. | |
| Document underlying issues that could impede long-term success of a project. | |
| Share survey results with public to build a sense of community and purpose. | |
| Financial Survey | Roles & Responsible Parties |
| Determine potential funding sources. <ul style="list-style-type: none"> • Document their priorities, project selection criteria, funding timetables. • Identify common interests and priorities of funding sources. Look for funds that could be leveraged to support water quality improvements. | |



Geese at Chaparral Lake



Step 4

Analyze watershed data. Evaluate potential projects. Set Priorities

| Things to consider | Roles & Responsible Parties |
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| <p>Use survey results.</p> <ul style="list-style-type: none"> • Determine “key sites” and “reference sites“ (see step 3), and document conditions. These sites will be used to determine effectiveness after implementation. • Determine potential project sites. These may be at key sites or at the actual problem site higher in the watershed. | |
| <p>Utilize technical expertise to determine feasibility and effectiveness of potential mitigation methods and projects. (The effectiveness of this whole effort rests on putting in technically sound projects, so don’t skimp on this step!)</p> | |
| <p>Determine landowner’s interest in participation and maintenance at potential sites (and tenants). If not interested, document reasons.</p> | |
| <p>Any underlying issues or disputes that need to be addressed for long-term success.</p> | |
| <p>Rank projects based on technical, financial, and social feasibility and effectiveness.</p> <ul style="list-style-type: none"> • Potential for significant reduction in pollutant loadings. <ul style="list-style-type: none"> ◊ Estimate load reductions or other measures of effectiveness. • Costs and resources needed to implement and maintain are commensurate with expected benefits. • Potential for funding. • Interest of landowners (and tenants) to implement and ability to maintain. • Potential “life” of the improvement compared to estimated costs. • Complexity of the improvement (e.g., access to site, technical difficulties, permits or approvals, resources required to install, technical expertise needed to maintain). • Potential positive or negative impacts on wildlife habitat, cultural resources, and other natural resources. | |
| <p>Education needs or behavioral modifications needed to support long-term success.</p> | |
| <p>Community volunteers ability to participate in implementation or maintenance.</p> | |
| <p>Conduct stakeholder meetings to discuss findings and gather input.</p> <ul style="list-style-type: none"> • Consider alternatives and revise project rankings as needed. • If key projects need to be eliminated, document reasons. | |





| Step 5 | |
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| Complete the plan and develop the document | |
| Things to consider | Roles & Responsible Parties |
| Plan should support funding applications for one of more programs. If paid for by EPA 319 Grant funds, the WIP must include EPA's nine elements.* | |
| The final plan could include only high priority projects or a blend of alternatives (high, medium, low priority). Include criteria used for determining priority. | |
| Draft a plan. At a minimum the Watershed Improvement Plan (WIP) should: <ul style="list-style-type: none"> • Briefly summary of the planning process. • Include maps showing pollutant source categories in terms of land uses. • Description of priority improvement projects and Best Management Practices. Include maps with locations and types of improvements. Indicate technical complexity of each project (engineering, permits, authorities, time and resources). • Indicate reasons why project is a priority in terms of potential to significantly reduce pollutant loading and impairment. Provide estimated load reductions for each project. • Denote support for each project in terms of resources and potential funding. • Include a schedule for implementation and measurable milestones for progress. • Specify education and outreach components needed to support implementation or behavioral changes. • Describe how the community will be involved in implementation and maintenance, where appropriate. • Establish a plan for effectiveness evaluation of implemented projects and education components. Include criteria to determine effectiveness (what, when, where), and who will monitor to determine long-term effectiveness. | |
| Meet with landowners and other watershed stakeholders to discuss the draft watershed plan and obtain input. Revise plan as needed. | |
| Develop final plan. | |

* EPA's *Handbook for Developing Watershed Plans to Restore and Protect Our waters* — http://epa.gov/nps/watershed_handbook.





San Pedro River near Charleston

| Step 6 | |
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| Implement the WIP | |
| Watershed projects mean change: change in land management, attitudes and behavior, and hopefully water quality. Implementation of the final plan requires long-term efforts to fund and maintain community support. | |
| Things to consider | Roles & Responsible Parties |
| Obtain funding to implement projects. | |
| Hire and enlist technical assistance needed to implement projects. | |
| Kick off projects with meetings of landowners and stakeholders. | |
| Involve community volunteers in implementation and maintenance of projects, where possible. | |
| Maintain outreach. Continue to keep Watershed Improvement Council members, other stakeholders, funding agencies, landowners and volunteers informed. | |
| Implement supporting community education. Develop visual tools to explain water quality problems. Keep the community informed about actions they can take to reduce pollutants of concern. | |



Gabion in Whitewater Draw



| Step 7 | |
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| Monitor and evaluate effectiveness | |
| Things to consider | Roles & Responsible Parties |
| Periodically determine if the project is on schedule and satisfying the priorities established in the plan. | |
| Evaluate the long-term effectiveness of the project and educational components using methods and criteria established in the plan. (Modify methods if necessary) <ul style="list-style-type: none"> • Collect quantifiable data. • Compare conditions at “key sites” to “reference site” conditions. | |
| Evaluate what aspects of the project worked well and what didn't. <ul style="list-style-type: none"> • What issues occurred during the process? • Have all underlying issues been addressed? • Recommendations for avoiding similar issues in the future? | |
| Provide final reports to funding organizations and local partners at end of grants. | |
| Continue to evaluate the long-term impact of the project and educational components after grant project completion. <ul style="list-style-type: none"> • Occasional update reports of long-term effectiveness will demonstrate long-term commitment to project success and will support efforts to receive additional future grants. | |





Sunset at Watson Lake

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The future depends on what we do in the present.
— Mahatma Gandhi

Water Quality Improvement Grants

Arizona Department of Environmental Quality's (ADEQ) Watershed Improvement Grant Program administers funds from the United States Environmental Protection Agency (EPA) for implementation of nonpoint source management projects, under section 319(h) of the Clean Water Act. A water quality improvement grant may be awarded for development and implementation of a Watershed Improvement Plan, as described in this brochure. If you desire further information, please use contact information above or write to: ADEQ, Water Quality Improvement Grant Program, 1110 W. Washington, Phoenix, AZ 85007.

