# A. Watershed Planning and Management

## *Background*

What is a watershed? Generally, a watershed is described as an area within a hydrographic or river basin which consists of interconnected water sources and drainages, bounded by topographic highs or water divides. For watershed planning and management purposes, a watershed is an area with specified boundaries set by a group of stakeholders who have interests in the water resources within the watershed.[1]

Watershed planning and management is described as a process for integrating water resource, natural resource, and land use considerations into a collaborative problem solving network, supported by interested parties within a designated watershed. Resources of concern may include all or parts of riparian, wetland, spring and stream ecosystems, as well as specific watershed values, including fish and wildlife habitat, flood plain storage, water quality, water yield and recharge, soil stability, and productivity of agricultural lands. Typically, effective watershed planning and management efforts have certain basic characteristics. These are:

- *comprehensive* - in terms of basin geography, political units, and water resources;
- *inclusive* - created by all stakeholders and attentive to their environmental, social, regulatory and economic goals; and,
- *integrated* - taking stock of relationships between the quantity and quality of water, ground and surface water interaction, as well as interactions of other natural resources and environmental conditions.

Taking a comprehensive, inclusive, and integrated approach to water resource planning, allocation and management is intended to produce a strategic action plan to better protect water quantity, water quality and related resources for current and future needs. Greater cooperation leads to widespread support for agreed upon management objectives and action plans, and reduced reliance on new regulatory requirements and litigation.[2] Solutions are more practical and acceptable, and thus, more effective and lasting.

The basic steps in watershed planning include:

1. Identify stakeholders and facilitators to assist with problem definition and administration;
2. Listen to and develop an understanding of interests being expressed;
3. Develop a number of strategies to meet the concerns expressed by the interests;

[1] Stakeholders could include individuals, organizations, and agencies working, residing, recreating, or regulating in the watershed.

[2] Watershed planning is not an alternative to satisfying applicable regulatory requirements. It can be complementary, but it cannot be a substitute.

4. Evaluate the strategies as to scientific validity, cost, practicality, environmental impacts;
5. Develop an action plan to implement the strategies;
6. Define ways to monitor outcomes and evaluate success; and,
7. Periodically review the interests, goals and plan itself, and make adjustments.

## *Need for A Watershed Approach*

The need for the state's support for the watershed approach stems from a recognition that water resource problems arise from a wide range of activities throughout a watershed, these activities are dispersed and cross political boundaries, and impacts on the environment are cumulative and are potentially long term and difficult to reverse.

Advantages to implementing a watershed management approach include:

1. A watershed is a logical geographic unit for water resource planning, permitting, reporting, and problem solving.
2. Management decisions are improved because agencies collaborate more on problem resolution.
3. Data collection resources are pooled, so databases are more comprehensive and more types of related data are available.
4. Resources are better directed to priority issues or those portions of the basin where the greatest problems exist.
5. Funding and human resources can be better leveraged. Volunteers can be involved.
6. Program efficiencies are enhanced by coordinating workloads. For example, monitoring can be done by participants closest to the sites and reporting requirements can be consolidated.
7. Public participation is encouraged and public understanding and support for management options enhanced.
8. A wider array of experts and citizens is involved in an integrated problem-solving process. A diversity of disciplines involved leads to expanded management choices.
9. The prospects of more stringent regulatory standards or programs may be averted with good planning and plan implementation.

## *State Agency Involvement With Watershed Planning and Management*

As the state's economy and population grows, so too does the intensity and diversity of land use activities, placing greater demand on the state's finite land and scarce water resources. To keep pace, over the past 20 years Nevada state agencies have administered regulatory and voluntary programs which have achieved significant reductions in both point and non-point sources of pollution; prevented contamination from hazardous waste sites; more efficiently allocated and managed water resources; and provided assistance, information and funding to local organizations for the management of watershed resources.

Watershed planning is well rooted in Nevada's water allocation process (Nevada Revised Statutes 533 and 534) and in the protection of water quality. In the 1960's, the Nevada State Engineer's

Office and the U.S. Geological Survey recognized the need for a systematic identification of the hydrographic areas throughout Nevada. Such a system was needed to more effectively study, develop, allocate and manage the state's water resources, both groundwater and surface water, to meet current and future demand. The first hydrographic map was developed in 1968, and while it has undergone some minor revisions, it continues to provide the basis for water planning, management and administration today. Watershed-oriented planning and management programs and projects implemented by state and federal agencies are described below.

**Department of Conservation and Natural Resources**

The mission of the Department of Conservation and Natural Resources (Department) is to conserve, protect, manage, and enhance the State's natural resources in order to provide the highest quality of life for Nevada's citizens and visitors. Administrative, technical, budgetary and supervisory support is provided to coordinate management goals and activities involving all of the Divisions within the Department. The Department plays a leadership role in determining the extent to which watershed planning and management is instituted. Recent notable instances where the Department coordinated various Division's involvement in major water resource management issues set within a watershed context include the Tahoe Presidential Forum and the Truckee River Negotiated Settlement.

**Division of Environmental Protection**

In the mid 1970's, the Division of Environmental Protection (NDEP) developed water quality management plans for the hydrographic basins under section 303 of the Clean Water Act (CWA). In the late 1970's and early 1980's, the designated local agencies developed comprehensive wastewater management plans under section 208 of the CWA for Clark County, Truckee River Basin, Lake Tahoe Basin and the Carson River Basin. For the remainder of the state, the Division developed a CWA 208 plan utilizing as a minimum the basic steps for watershed planning.

Currently, under the Comprehensive State Groundwater Protection Program, mandatory and voluntary groundwater protection programs are administered by NDEP. The Nevada Ground Water Protection Task Force is a voluntary coordinating group composed of state, local and federal agencies which promote public awareness of ground water protection issues and of alternative protection options. This group is defining hydrographic basins which have critical ground water quality concerns.

The Bureau of Water Quality Planning administers the Nonpoint Source Management Program through which voluntary watershed management demonstration projects are funded under the Clean Water Act, Section 319. Active watershed planning and demonstration projects are underway at Steamboat Creek; Muddy River; Mason Valley; and the Upper, Middle, and Lower portions of the Carson River. A notable example of a comprehensive, inclusive and integrated plan is the Upper Carson River Watershed Management Plan. The Plan draft was completed in 1996 and contains strategic recommendations which are being implemented.

Other examples of watershed planning include the State and local Wellhead Protection Programs, the Truckee River Strategy Group, the Lake Mead Water Quality Forum and the Truckee River Water

Quality Agreement. The Division also supports water quality planning efforts regarding Emergency Response Planning on the Truckee River.

**Divisions of State Lands and Conservation Districts**

With the guidance and support of the Nevada Division of Conservation Districts, local Conservation Districts have adopted goals and facilitated projects to conserve, protect, and manage development of Nevada's natural resources on a watershed basis. These activities often occur jointly with federal agencies such as the Natural Resource Conservation Service and federal land management agencies. Administration of the Tahoe Bond Act funding program for water quality improvements by watershed is an example of these coordinated activities. Another is the Steamboat Creek Restoration Project, which is lead by the Washoe-Storey Conservation District.

**Division of Water Planning**

The State Water Plan is being developed on a hydrographic basin basis, with a consideration of many water resource issues, and with a great deal of public involvement. The goal is to analyze issues in a comprehensive, integrated fashion and to develop realistic recommendations which address the viewpoints of many stakeholders.

Walker River Basin Technical Network is an effort to bring together a wide variety of stakeholders in a hydrographic basin to share information, coordinate activities, leverage dollars, avoid duplication of effort, and ultimately, to develop a watershed plan for the basin addressing water supply, water quality, habitat, recreation, and economic issues.

**Division of Water Resources**

Under the Cooperative Program with the U.S. Geological Survey, the Division of Water Resources (NDWR) funds and supports data collection and report development on surface and ground water conditions. In addition, the NDWR has participated in site specific studies for watershed scale projects, such as the Humboldt River Basin Study, Fallon Basalt Aquifer Recharge Study, Las Vegas Valley Subsidence Study, Beaver Dam Wash Study, Spanish Springs Study and Honey Lake Valley Study.

## *Federal Agency Involvement in Watershed Planning and Management* [3]

About 87 percent of the land in Nevada is managed by federal agencies. Most streams originate on and much of the ground water recharge occurs on upper and mid-level elevations of watersheds managed by the U.S. Forest Service and U.S. Bureau of Land Management. During the past 30 years, several laws have been enacted that direct federal agencies to make watershed protection a high priority in their management plans. These and other laws aim to protect riparian areas, wetlands, and stream ecosystems on federal lands, as well as protection of other watershed values, including fish and wildlife habitat, flood plains, water quality, water yield, soil stability, and productive agricultural lands. Since much of Nevada's water supply falls on portions of watersheds managed by federal agencies, their involvement in watershed planning and management is essential.

The Natural Resource Conservation Service (NRCS) is a federal agency involved in community level watershed planning and management activities. Their primary function is to provide natural resource planning and management assistance to farmers, ranchers and forest landowners. The NRCS also supports joint public/private watershed improvement projects with technical assistance and funding through a number of cost-share programs intended to improve water quality, soil stability, forest resources, flood plains, noxious weed management and wildlife habitat.

The U.S. Environmental Protection Agency (EPA) has championed the Watershed Protection Approach (WPA) for many years. The WPA strategy is based on the concept that many water quality and ecosystem problems are best solved at the watershed level, rather than the individual waterbody or discharger level. The WPA is grounded in the Clean Water Act and Safe Drinking Water Act, which contain provisions that promote aspects of watershed planning and management activities. Nevada's Wellhead Protection and Source Water Protection Programs, Area-wide Water Quality Management Plans, Comprehensive Ground Water Protection Program, and Nonpoint Source Pollution Program are examples of joint state, federal and local agency implementation of these programs.

The most recent federal initiative regarding the watershed approach is the President's *Clean Water Action Plan* (CWAP). Lead federal agencies are the EPA and NRCS; however, the CWAP provides incentives for state agency leadership in: (1) undertaking public/private cooperative efforts within a watershed framework; (2) conducting "unified watershed assessments" where impaired waters exist; (3) applying federal resources and technical expertise to state and local watershed restoration and protection; and, (4) making federal agencies' data and information about watershed conditions more available to the public. In response to the CWAP, NDEP and Natural Resources Conservation Service (NRCS) have developed a unified watershed assessment involving affected state, local and federal agencies, and interested organizations. Other key federal agencies could include the U.S. Forest, Service, U.S. Bureau of Land Management, U.S. Fish and Wildlife Service, U.S. Bureau of Reclamation and the Bureau of Indian Affairs.

[3] The involvement of federal agencies in watershed planning and management is discussed extensively in the Report of the Western Water Policy Review Advisory Commission, *Water in the West: Challenge for the Next Century*, June 1998.

## *Issues*

1. The watershed planning approach is already being implemented by various groups in Nevada, and appears to be an effective approach to integrating water and land resource issue. The Department is striving to improve coordination across divisions in a more integrated framework. It is anticipated that all agencies in the Department could be involved in implementing certain recommendations listed below, as well as agencies within other departments, such as the Divisions of Health, Emergency Management, Agriculture and Minerals. To implement Recommendation 1, the Department will review state policies, laws and regulations, staff workloads and skills, current coordination among agencies, mechanisms for future coordination, and the availability of watershed planning funds.

2. The application of a watershed planning approach to water resource problem solving is growing. Federal agencies and the Western Governors Association through the Western States Water Council promote and support it. Many local and regional planning efforts have been or will be initiated at a watershed level. To the extent practicable, Department staff should assist in meeting expressed needs of local watershed planning groups, whether the need is for data and information, or assistance in facilitating the planning process, mediating between local and federal concerns, developing watershed management plans, or implementing an action plan.

3. In principle, the watershed planning approach has applicability at the hydrographic basin level. Comprehensive and integrated water resource management can be accomplished by examining water resource linkages throughout a basin. The Department is well positioned to facilitate coordination across jurisdictions, land and resource management units, economic interests, and resource values. An integrated water basin plan provides a mechanism for focusing efforts, disseminating viewpoints, summarizing actions, and articulating a set of goals and strategies with a timetable.

   Recommendation 3 below, speaks to the next major step envisioned for State Water Plan development. It is a concept that has been informally discussed with the Advisory Board before. It is introduced here because instituting an integrated water basin planning approach: 1) is functionally similar to a watershed planning approach, and 2) should be complementary and consistent to watershed management plans in a basin where a plan has been developed and implemented.

4. Department agencies and the Bureau of Health Protection Services are involved in federally co-funded grant and loan programs for watershed planning-related activities under the Clean Water and Safe Drinking Water Acts. Currently, a key program is the Clean Water Action Plan (CWAP). Under the CWAP, federal funding is being provided to support joint state, federal and local agencies implementation of an Unified Watershed Assessment and coordinated restoration strategies. Other federal funding has been provided via direct Congressional appropriations. State agencies have supported watershed efforts through re-prioritization within programs, but few general fund appropriations have been made by the legislature to date to support these efforts. State funding could be used to train staff, and improve data gathering and dissemination, or as incentive grants to encourage local governments to participate in watershed planning.

5. Monitoring and assessment should be integral parts of all watershed management plans. Monitoring provides a vital feedback loop and can be used to determine:
   - whether planned restoration efforts have been implemented in the manner intended;
   - the effectiveness of implemented actions in achieving desired results;
   - the validity of the assumptions upon which management strategies were designed;
   - adjustments to restoration efforts that are needed due to changing conditions; and
   - the cost effectiveness of actions taken.

## *Recommendations*

To further enhance watershed management and planning in Nevada, the following recommendations are offered:

1. The Department of Conservation and Natural Resources (Department) should develop an inter-division watershed planning and management strategy in order to more effectively play an active, participatory role in watershed planning when a water resource assessment indicates there is a need for this strategy or when a water planning group requests Department support.

2. The Department should support watershed planning at the local level.

3. The Department should continue to work together with local, regional and federal agencies and non-governmental organizations to develop and implement integrated water basin plans for Nevada's hydrographic regions.

4. The Department should support watershed planning groups with additional funding to assist in the development of integrated, broad-based and comprehensive watershed plans.

5. The Department should assist in the review of watershed management plans, evaluate whether goals or objectives are being achieved, strategic actions implemented and results monitored, and cooperatively recommend changes where monitoring results indicate a need for improvements.

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watershed values (5A–1)