Section 2.2 Upper Truckee River Watershed -- Lake Tahoe Basin (2 of 5 Focus Watersheds)

The Upper Truckee River and the tributaries, which make up the Upper Truckee River Watershed comprise the largest contribution to the waters of Lake Tahoe. Lake Tahoe (see Figure 2.2), is an "Outstanding National Resource Water" under federal antidegradation regulations, and is losing clarity at the rate of one and one half feet per year. Many agencies, local jurisdictions, and concerned groups have been, and continue to work toward reversing this trend. In the summer of 1995, the RWQCB and the Tahoe Regional Planning Agency (TRPA) selected this watershed in which to focus programs, projects, studies, and resources in an attempt to create measurable improvements in water quality. Additionally, the watershed contains a variety of types of watershed disturbance, and includes many of the water quality problems affecting the Lake Tahoe Basin as a whole. The watershed contains sites of numerous past, current, and proposed remedial watershed restoration efforts.

In the summer of 1997, Lake Tahoe was the focus of an unprecedented Presidential forum, which resulted in $27.5 million in federal funds being allocated to address the continued decline of the quality of Lake Tahoe's pristine waters. One result of this forum was the completion of a watershed assessment study of the entire Lake Tahoe Basin by the U.S. Forest Service. In addition, proposed State funding for work at Lake Tahoe totaling $80 million was decided by voters in June of 1998. In 2000, Congress authorized $300 million to Lake Tahoe's environmental restoration (each year a separate appropriation must be approved.) The RWQCB has embarked on a coordinated and comprehensive effort to bring local, State, Regional and Federal resources to bear on the problems of the Upper Truckee River watershed in hopes of developing a prototypical environmental and economic strategy. The lessons learned from this focused watershed exercise could then be transferred to all of the other watersheds within the Lake Tahoe Basin.

2.2a Watershed Overview

The Lake Tahoe Basin is recognized as a national priority because of its high resource value and its sensitivity to water quality impacts. Increased development and watershed disturbance in the Basin continue to degrade the Lake and its tributaries in spite of a comprehensive point and nonpoint source control program. Efforts to protect Lake Tahoe since the 1960's have been pioneer examples of Watershed Planning and nonpoint source control, but much work remains to be done.

Lake Tahoe is a designated "Outstanding National Resource Water" under federal antidegradation regulations and is one of only two lakes with such a designation in California. The Lake Tahoe Basin receives over 20 million visitor days per year, about five times the visitation to Yosemite National Park. Five million of these visitor days are directly related to outdoor recreation. Lake Tahoe is operated as a reservoir, and together with other reservoirs in the lower Truckee River system, provides about 75 percent of the municipal water supply of the Reno-Sparks, Nevada area.

Lake Tahoe is the tenth deepest lake in the world, rivaled only by Crater Lake and Lake Baikal in Russia, for its combination of size, scenic beauty, and unique ecological qualities. Lake Tahoe has a mean depth of 1,027 feet (313 meters) and a maximum depth of 1,645 feet (501 meters). Much of the beauty of the Lake comes from its extraordinary transparency and related deep blue color. Secchi depths of over 131 feet (40 meters) were measured in the 1960's, and the Lake historically transmitted enough light to support beds of attached mosses and other plants at depths of up to 400 feet (122 meters). Saturated oxygen concentrations have been recorded throughout the Lake. Concentrations of nutrients are so low that special analytical methods are necessary to measure them. The Lake once supported the Lahontan cutthroat trout; rare species currently present include a unique wingless benthic stonefly, and the shorezone plant, Tahoe yellow cress.

insert Figure 2.2 -- watershed map

2.2b Water Quality Problems and Issues

Lake Tahoe -- Lake Tahoe and its tributaries have been monitored by University of California, Davis researchers since the early 1960's. This long-term monitoring has shown statistically significant trends of increased phytoplankton productivity and decreased transparency in Lake Tahoe. Phytoplankton productivity has nearly tripled since 1968 and average clarity has been lost at a rate of about one and half feet per year. The growth of attached algae (periphyton) in the littoral zone of the Lake has increased dramatically, particularly offshore of developed areas. In 1996 to 1997, the first statistically significant decrease in oxygen in the hypolimnion was measured. Although Lake Tahoe is still considered oligotrophic, it is not meeting California's water quality standards for clarity and productivity, based on levels measured in 1968-1971. These measured trends of degradation led to classification of the Lake as a "Water Quality Limited Segment" under Section 303(d) of the Clean Water Act; it is listed for siltation. In January 2002, the Regional Board recommended updating the listing for Lake Tahoe to include phosphorus and nitrogen; and adding listings for the Upper Truckee River for iron, phosphorus and pathogens. The Lake Tahoe Basin is currently one of the Lahontan RWQCB's highest priorities for the development of Total Maximum Daily Loads (TMDLs).

Lake Tahoe's naturally high quality is due to the relatively small size of its watershed in relation to the volume of the Lake, which led to very low nutrient inputs under natural conditions. Human activities, including watershed and wetland disturbance, and activities which have increased wet and dry atmospheric nutrient deposition, have greatly increased nutrient loading to the Lake since the 1960's. Phytoplankton bioassays show that the Lake, which was initially nitrogen limited, has changed to phosphorus limitation due to increased nitrogen loading. Sediment loading from watershed disturbance has also increased due to human activities, and control of sediment has become increasingly important because phosphorus is found in the sediments. Recent research indicates silt particles remaining in suspension in Lake Tahoe are equal to increased algal growth as a cause to declining water transparency.

Implementation of water pollution controls has been complicated by the politically fragmented nature of the Lake Tahoe watershed. One third of the watershed is within the State of Nevada. In California, land use controls are divided among entities including the U.S. Forest Service, El Dorado, Placer, and Alpine Counties, and the City of South Lake Tahoe. A bistate Tahoe Regional Planning Agency (TRPA) was formed by Act of Congress in 1969. There has been historic controversy between local economic interests and efforts to protect Lake Tahoe as a "national treasure". Recent national attention focusing on the efforts of these seemingly divergent interests to cooperate and coordinate has brought millions of dollars to the Basin. The TRPA's Environmental Improvement Program (EIP) identifies over one billion dollars of projects focused on improving the Basin's environmental quality, including reversing the Lake's declining water clarity.

The initial concern about impacts of human activities on Lake Tahoe led to mandates for the export of wastewater from the Basin in the 1960's. The emphasis turned to nonpoint source planning, using Section 208 grant funds, in the 1970's. Comprehensive land use and water quality controls were adopted in the 1980's. Current controls include limits on all types of new development, (including single family homes in existing subdivisions), waste discharge prohibitions related to specific types of watershed disturbance, limits on impervious surface coverage, requirements for retrofit of Best Management Practices (BMPs) for erosion and stormwater control to existing development, public acquisition of environmentally sensitive lands as an off-set to allow development on other lands, municipal stormwater NPDES permits, waste discharge requirements for a variety of nonpoint sources, and publicly funded programs to restore wetlands (Stream Environment Zones or SEZs) and implement erosion and stormwater control projects. New residential and commercial development is phased based on the accomplishment of remedial control measures. Because of the sensitivity of Lake Tahoe, these nonpoint source controls are mandatory, not voluntary, as is the case for most current Watershed Plans in California.

Over $400 million in federal, state and local funds have been spent on wastewater treatment and export, acquisition of sensitive lands, and implementation of remedial projects. However, the quality of Lake Tahoe continues to deteriorate. Implementing EIP has proven slow as agencies struggle with planning and

constructing projects in a short time frame. There is an increased need for interagency coordination and collaboration to improve all processes related to project implementation.

Upper Truckee River -- The Upper Truckee River watershed is located in Alpine and El Dorado Counties. Tributaries include Angora, Echo, Grass Lake, and Big Meadow Creeks, and Upper and Lower Echo, Round, and Dardanelles Lakes. Two large sphagnum bogs, Grass Lake and Osgood Swamp are located in the watershed and both are considered to be Significant Natural Areas by the Department of Fish and Game. Grass Lake has been designated a U.S. Forest Service Research Natural Area. The headwaters are in Desolation Wilderness and in roadless areas managed for quasi-wilderness uses by the U.S. Forest Service. Both areas receive heavy recreational use. The reach of the Upper Truckee above Christmas Valley is under study for inclusion in the federal Wild and Scenic Rivers system. Threatened Lahontan cutthroat trout have been reintroduced into the river in the Meiss Meadows area, and the endangered shorezone plant Tahoe yellow cress is found near the mouth of the river on the shores of Lake Tahoe. The lower reach of the river flows through the unincorporated community of Meyers and the City of South Lake Tahoe.

The Trout Creek watershed is a major subwatershed of the Upper Truckee River. Trout Creek enters the river just before it drains into Lake Tahoe. Named tributaries of Trout Creek include Saxon, Cold, and Heavenly Valley Creeks. The upper watershed provides habitat for the spotted owl, pine marten, and Tahoe draba (a rare plant). Heavenly Valley Creek supports a population of the threatened Lahontan cutthroat trout.

The Upper Truckee River watershed has been heavily impacted by human activities. Historically, the watershed was affected by nineteenth century logging and livestock grazing. Today, overnight camping in Desolation Wilderness is limited but the water quality impacts of human waste disposal in the backcountry are still of concern. Summer cabins in the Echo Lakes sub-watershed are allowed to dispose gray water to leachfields, which may affect lake quality. The watershed has been disturbed by off-road vehicle use, residential, commercial, and industrial development, highway construction and maintenance, and wetlands disturbance. The watershed includes two golf courses, and recreational and commercial facilities with expansive turf areas. Highway 50 crosses the Upper Truckee River at three locations. Discharges of abrasives and salt are inadequately treated prior to reaching surface waters within the watershed. The lower reach of the Upper Truckee River was channelized and much of the marsh near its mouth was filled to create the Tahoe Keys subdivision. Further hydrologic modification occurred (reaches of the river were channelized) for construction of the South Lake Tahoe airport. Spills of treated wastewater from the South Tahoe Public Utility District's export facilities in this watershed are an ongoing concern.

Potential future disturbance in the Upper Truckee River watershed includes expansion of the airport, expansion of Heavenly Ski Area, replacement of portions of the South Tahoe Public Utility District's (STPUD's) wastewater export system, a new USFS off-road vehicle trail, expansion of Lake Tahoe Community College, additional public and private timber harvest/forest management activities, new commercial and residential development, temporal disturbances from area-wide stormwater treatment and erosion control projects and large-scale stream and restoration projects. El Dorado County includes the largest number of high erosion hazard residential lots on the California side of the Lake Tahoe Basin.

The upper watershed of Trout Creek has been disturbed by ski resort development, timber harvest, range cattle grazing, and off-road vehicle use. A former municipal landfill, which is currently being remediated for vinyl chloride ground water contamination by the U.S. Forest Service, is located in the Saxon Creek watershed. Until 1968, secondary wastewater effluent from the STPUD was discharged to land in the Heavenly Valley Creek watershed. Impacts of that discharge were still measurable in the creek in the 1980's. The lower watershed of Trout Creek has been affected by residential, commercial, and highway construction, livestock grazing, and wetlands disturbance. Because Heavenly Valley Creek had been listed as a Water Quality Limited Segment under Section 303(d) of the Clean Water Act for the pollutant ‘siltation’, the Regional Board adopted a TMDL for one reach in 2001. As part its recommendation for updates to the list of Water Quality Limited Segments, in 2002, the Regional Board included listings for parts of Heavenly Valley Creek for sediment, chloride, and phosphorus.

2.2c Goals and Objectives with Milestones

The next five years in the Tahoe Basin will shape social and environmental direction for generations to come. An unprecedented spirit of cooperation has spread throughout the basin resulting in a unique opportunity for change. Many groups with similar objectives have emerged as focal points for social and environmental progress at the lake. The products of their efforts in conjunction with the efforts of all stakeholders in the Upper Truckee watershed should result in models of environmental improvement that can be applied to the entire basin.

The following objectives and milestones will result in a three-phase, iterative process of (1) develop, (2) implement and (3) monitor, then through feedback from monitoring to development, improve restoration efforts in the Upper Truckee River Watershed.

1. Establish a Watershed Plan to enhance water quality in the Upper Truckee River watershed of Lake Tahoe, through a concerted effort of implementing watershed project improvements.

    a) Continue focused watershed group consisting of all interested stakeholders

    b) Develop a Watershed Plan through cooperative effort with the Upper Truckee River Focused Watershed Group (including subcommittees) and a contractor. An initial, interim report was completed by the U.S. Army Corps of Engineers in December 2000. This will be used as the basis for a completed plan.

2. Use the Upper Truckee River Focused Watershed Group as a clearinghouse for existing information and to complete the following items (most are currently in progress)

    a) Develop a watershed map, which depicts ownership or jurisdiction in the watershed and includes project locations.

    b) Inventory existing data (i.e. location, type, years of record, etc.) and create a literature database.

    c) Identify appropriate monitoring at each scale.

    d) Identify most effective BMP and management implementation strategies.

    e) Evaluate BMPs for effectiveness.

    f) Evaluate existing monitoring and recommend additional monitoring if needed.

    g) Identify existing databases, GIS, and other information that describes watershed elements and indicators, and create a clearinghouse for this data. Identify data gaps, update existing GIS products, and convert hard copy data to electronic format.

    h) Describe physical watershed conditions and develop models to predict the effect of restoration efforts.

3. Implement solutions for restoration of watershed function (related to water quality), as well as a reduction of sediment and nutrient inputs.

    a) Inventory identified watershed improvement needs of all land management and regulatory agencies by category (map, data, and text).

b) Identify water quality management issues or problems by category and location.

c) List all management, regulatory, and resource related groups that could play a role in watershed improvements.

d) Identify financing options, needs, and strategies.

e) Identify priority areas for project implementation and monitoring. Also coordinate to identify project failures that can provide feedback on program and process improvements.

2.2d Performance Standards

How will we measure our successes? **(Performance standards will be added at a future chapter update.)**

2.2e Ongoing and Proposed Tasks (Fiscal Years 02/03 to 07/08)

The following is a summary of current RWQCB staff activities occurring and planned in the Upper Truckee River watershed.

Watershed Management

In the summer of 1995, the RWQCB, in cooperation with TRPA, selected the Upper Truckee River watershed for a focused watershed effort. One of the first tasks was to form a watershed group. The Upper Truckee River Focused Watershed Group (UTRFWG) was formed to coordinate and focus the activities of the various agencies, groups, and residents in a concerted effort to improve water quality, in a quantifiable fashion, within one watershed in the Tahoe Basin. It is anticipated that the successes, solutions, and knowledge acquired by the UTRFWG's efforts will eventually be transferred to all Tahoe Basin watersheds for improving water quality.

The UTRFWG meets on a regular basis and is currently working with property owners in the watershed to contract additional work to complete the Watershed Plan. The Plan will guide actions for achieving measurable improvements in water quality within the watershed. Once completed, the Watershed Plan will lay out a framework for increased staff work in education and outreach, evaluating various aspects of the watershed, and focusing restoration activities. RWQCB staff currently facilitates the UTRFWG group. The specific goals of the UTRFWG are listed in Section 2.2c.

UTRFWG project proposals recently funded in part from the US Bureau of Reclamation include:

- An environmental assessment of the upper reach of the Upper Truckee River to provide three restoration feasibility alternatives for the river ecosystem.
- Completion of the Angora Creek Stream Environmental Zone Restoration Project.
- Expansion of the Backyard Conservation Program as a public education approach within the watershed
- Support for a Watershed Coordinator position
- An environmental assessment of the reach of the river through the airport

Regional Board resources will also be used for parts of these projects.

Core Regulatory Program

The RWQCB will continue to implement its core regulatory program. Implementation of the core regulatory program is done in cooperation with TRPA under an existing MOU. The MOU will be updated with possible improvements in 2002 and in the future as needed. Review of projects on National Forest lands will be coordinated with the USFS under an existing Memorandum of Understanding (MOU).

- Continue to maintain and update waste discharge requirements and NPDES permits, and to take enforcement actions as necessary for wastewater collection, treatment, and export facilities, Caltrans and local government road maintenance programs, regional stormwater treatment and/or erosion control projects, stream restoration projects, and other recreational, commercial and public service development, including projects on National Forest land (where water quality certification or Basin Plan prohibition exceptions are required). Most permits for Lake Tahoe Basin activities are related to erosion and stormwater control.

- RWQCB staff will review and provide comments on environmental documents and consider permitting for new projects as they are proposed.

- Section 401 water quality certification will be considered on a project-by-project basis.

- Ground water protection, including oversight of cleanup for underground storage tank leaks, will continue. Issuance of enforcement actions will be considered to ensure prompt cleanup where drinking water is threatened or contaminated.

- Ensure compliance with existing time schedules for commercial BMP retrofits throughout the watershed (TRPA will emphasize its voluntary commercial and residential BMP retrofit program). -- also see 'Stormwater Program' below.

- Encourage voluntary compliance with BMP retrofit through education and outreach efforts. -- also see 'Stormwater Program' below.

- Intensify oversight of the airport, activities on National Forest land, CalTrans construction activities and City, County and California Tahoe Conservancy erosion control and stormwater treatment projects. RWQCB staff will also review data from new monitoring required for all golf courses beginning in 2002 to evaluate current controls on fertilizer and pesticide use. Improved fertilizer management and irrigation practices will be shared with other large turf area managers.

Stormwater Program

1. The RWQCB considers the following activities within the Upper Truckee River Watershed to fall under the ongoing Stormwater Program and will continue to work with dischargers under these programs:

    - Municipal NPDES Stormwater Permit for City of South Lake Tahoe and El Dorado County
    - Statewide NPDES Stormwater Permit for the California Department of Transportation (Caltrans)
    - NPDES Storm Water Permit for Industrial Activities
    - NPDES Permits for Construction Activities involving more than 5 acres of disturbance within the Lake Tahoe Basin (Beginning in 2003, applies to projects one or more acres in size)
    - NPDES Stormwater Permit for Industrial Activities associated with Marinas in the Lake Tahoe Basin

1. The RWQCB has identified urban runoff from unpaved parking lots, large parking areas and industrial/commercial areas as a significant source of pollution (nutrients, sedimentation and

oils/greases) to Lake Tahoe. In FY 02-03 and FY 04-05, the RWQCB will conduct extensive research and monitoring to quantify the contributions from these sources.

2. The RWQCB has identified the road systems within the watershed as a significant source of pollution to Lake Tahoe. The RWQCB will emphasize an intensive application of stormwater BMPs such as street sweeping, continued road salt/sand reduction and installation of stormwater runoff treatment/retention measures in the watershed. In FY 02-03 and FY 04-05, the RWQCB will conduct extensive research and monitoring to quantify the contributions from these sources.

Nonpoint Source Program

Most of the water quality impacts within the Tahoe Basin are nonpoint source in nature. However, many of these potential impacts are addressed through issuance of NPDES and waste discharge requirements under the Core Regulatory and Stormwater programs. Most of the remaining nonpoint source impacts are addressed by the nonpoint source program. These include many of the USFS land management activities such as livestock grazing, off-highway vehicles, road and trail decommissioning and rehabilitation, restoration projects, recreation projects, etc., private livestock grazing, and rotenone applications. Under the non-point source program, staff manages water quality mitigation funds and grants for project implementation.

- Pursuant to the MAA and MOU with the USFS, staff continues to work closely with the USFS in reviewing and commenting on environmental assessments and proposed projects and works to assure implementation of BMPs and adherence to waste discharge prohibitions within the basin.

- Staff also oversees implementation of CWA 319(h) grants for 1) BMP retrofit of properties in the Tahoe Basin, 2) revegetation and monitoring of eroding cut slopes in the Upper Truckee River watershed. Staff will continue to facilitate applications for federal Clean Water Act Section 205(j) and 319 grants, and state Proposition 13 grants. Staff also manages two water quality mitigation funds for implementing water quality improvement projects. Restoration of wetlands, riparian areas and channel morphology in the Upper Truckee River has been funded from one of the mitigation funds.

- The California Rangeland Water Quality Management Plan assists ranchers in voluntarily developing management plans and implementing BMPs for their operations. TRPA has adopted new grazing ordinances requiring management plans from private landowners. Staff continues to work with NRCS and private livestock operators to develop management plans for controlling livestock grazing impacts and implementing BMPs. The RWQCB Executive Officer has issued two notices of violation for exceedances of the fecal coliform standards from grazing operations on private and federal land in this watershed. Staff is conducting fecal coliform monitoring to evaluate effectiveness of BMP implementation.

- Additional NPS activities include increased emphasis on the mitigation of ORV impacts, restoring wetlands, treating runoff from dirt roads, and improving forest health and management.

Timber Harvest and Forest Management Activities

The amount of timber harvest activity within the Lake Tahoe Basin has increased dramatically in recent years. The combined effects of drought, fuel buildups due to fire suppression, and insect/disease infestations, have created expanses of thick, “overstocked” forests with many dead and dying trees. This poses a risk of intense wildfire that could not only result in the loss of lives and property, but have water quality impacts as well. Projects aimed at reducing the unnatural fuel loads to prevent catastrophic fires have only recently begun, and are likely to continue for many years. These “salvage,” “thinning,” and other “forest health” activities will include all of the water quality impacts normally associated with traditional timber harvest practices, i.e., sediment generated due to road construction and ground-skidding

of logs, construction of stream crossings, removal of ground cover, mobilization of nutrients from prescribed burns, etc.

Due to the high resource values of receiving waters (Lake Tahoe) and the sensitivity of its watershed to disturbance, the RWQCB has adopted stringent prohibitions against the discharge of waste earthen materials to Lake Tahoe's tributaries and their associated SEZs and floodplains. Without compliance with these long-standing control measures, the intense socio-political pressure to harvest timber threatens to create disturbances in the watershed that could frustrate or even negate intensive efforts to arrest the decline of Lake Tahoe's clarity.

Staff of the RWQCB review timber harvest plans and conduct pre-harvest inspections to recommend mitigation measures for the protection of water quality. Timber harvest plans in the Tahoe Basin most often include timber products extraction, fuel load reductions, fire-break ("defensible space") construction around homes or communities, and/or providing for improved "forest health." RWQCB staff also conduct post-harvest inspections (and take enforcement action when necessary) to assure implementation of "best management practices" and compliance with plans and regulations related to water quality.

Wetlands, Shorezone, and Riparian Protection

Wetland and riparian areas in the Lake Tahoe Basin have been impacted by urban and suburban development, road/bridge construction and maintenance activities, recreational activities, water diversion/water storage activities, grazing, and forest management. An important element of water quality protection in the Lake Tahoe basin is the preservation and protection of "Stream Environment Zones" (SEZs). SEZs are generally synonymous with wetland and riparian areas, but the SEZ delineation methods are unique to the Lake Tahoe and include more lands than those designated wetlands. SEZs for the Lake Tahoe basin are mapped, and boundaries developed on a project-by-project basis. With limited exceptions, no new land coverage or permanent disturbance is allowed in SEZs. Any new disturbance (except for water quality improvement projects), which is allowed, must be compensated for by onsite or offsite SEZ restoration at an area ratio of 1.5 to 1. In 1988, a formal, comprehensive SEZ Restoration Program was developed by TRPA. Restoration goals, development of a restoration tracking system, development of restoration guidelines, and re-mapping of SEZs are all elements of the program. Other restoration is underway by the federal and state land management agencies, such as the U.S. Forest Service, and the California Tahoe Conservancy. TRPA has classified SEZ functions and values in the Basin. Wetland treatment of storm water is practiced in the Basin, however more information is needed on what types of SEZs are best at treating urban runoff. TRPA is funding a study to evaluate the capacity for different wetland and SEZ types to treat stormwater runoff.

Staff will continue to work with TRPA staff toward updating and strengthening SEZ protection/restoration programs, particularly development of better means to measure success of SEZ restoration in terms of wetlands ecosystem functions. Analyze whether the 1:5-1 restoration area requirement is adequate to protect Lake Tahoe, or whether a larger ratio should be required. (The National Research Council has identified situations in which restoration requirements of up to 10:1 are appropriate.)

Monitoring and Assessment

RWQCB staff currently participates on the steering committee of the Lake Tahoe Interagency Monitoring Program. The group is developing standard monitoring protocols for various types of monitoring. The RWQCB maintains its own laboratory in South Lake Tahoe, which performs analyses for some types of compliance monitoring.

RWQCB staff also manages contract funds from the SWRCB for long-term water quality monitoring of Lake Tahoe, including analyses of data from the Lake Tahoe Interagency Monitoring Program's stream water quality database.

Considerable information is already available on the Upper Truckee River, Trout Creek and their tributaries from the Lake Tahoe Interagency Monitoring Program, the Toxic Substances Monitoring Program, discharger monitoring by the STPUD and Heavenly ski resort, and watershed problem surveys by the U.S. Forest Service, TRPA, the California Tahoe Conservancy, and others. Watershed Planning will include compilation and evaluation of all existing information, and identification of data gaps where additional monitoring, watershed and SEZ mapping, or watershed improvement needs evaluation is required. This work will likely be completed through the UTRFWG and Watershed Plan.

Assessment of the effectiveness of best management practices is needed to demonstrate that the requirements of the regulatory agencies are effective in improving water quality. Although BMPs for erosion and stormwater control have been implemented for Lake Tahoe Basin projects since the 1970's, and a number of large-scale public remedial control projects have been constructed, and special studies have shown that proper location and a combination of BMPs can greatly reduce sediment loading, there is still no good indication of the efficiency of specific practices in the Lake Tahoe Basin. The literature on the efficiency of "standard" BMPs (such as sedimentation ponds and infiltration trenches) has been developed largely in the eastern United States under climate and soil conditions differing greatly from those of the Sierra Nevada. The RWQCB and TRPA have initiated grant funded studies of the efficiency of infiltration trenches and of BMPs commonly used in construction in single family residences, however, much more assessment of the many BMPs employed here is needed. In 2002, the CA Tahoe Conservancy added additional grant funding for local governments to conduct pre- and post- project monitoring for stormwater treatment projects. The UTRFWG has also identified this as a need.

A desired task is to implement a comprehensive research and modeling program in the watershed to assess current conditions, sources of sediments and nutrients particularly runoff monitoring in the intervening zones (direct runoff to Lake Tahoe), and evaluate/predict trends in improvement.

Water Rights

RWQCB staff will continue participation in the Truckee River Operating Agreement planning process and will ensure that water quality impacts of changes in management of the Lake Tahoe reservoir are adequately considered. RWQCB staff will coordinate with SWRCB staff in review of proposed water diversion projects, which may affect water quality (e.g., changes in operation of the Echo Lake Dam). The RWQCB will also participate in review of any further revisions to the SWRCB's water rights policy for the Lake Tahoe Basin. Source water protection programs by TRPA and water purveyors may provide additional opportunities for reduction of nutrient loads and fuel contamination to Lake Tahoe; RWQCB staff will review specific proposals.

Water Quality Planning

Revision of water quality objectives for Lake Tahoe and its tributaries on the RWQCB's 1993-1996 Triennial Review priority list is currently scheduled for completion as part of the TMDL process (see below). During FY 99/00, the Regional Board approved revisions to its delegation of authority to the Executive Officer (EO) to grant exemption to waste discharge prohibitions included in the Basin Plan.

Other ongoing RWQCB staff activities related to water quality planning include review of proposed changes in TRPA, USFS, and local government plans, including Community Plans, Shorezone Development Plan, participation in TRPA's Advisory Planning Commission and the update of their 208 plan (scheduled for 2007). As part of the update process, standards and implementation programs will be reviewed. The Tahoe TMDL will be an integral part of TRPA's 208 plan update. Significant RWQCB time will be needed to collaborate with TRPA, USFS and Nevada on this bi-state update.

Regionwide planning efforts to allow use of aquatic pesticides for specific project types will be conducted in FY 02-03. For Tahoe, use of aquatic pesticides to control Eurasian water milfoil will be considered. RWQCB staff time will be needed to address this issue.

Other planning activities in the Upper Truckee River watershed include update of the RWQCB's Basin Plan to reflect development and implementation of TMDLs.

Restoration and Remedial Projects

TRPA's Environmental Improvements Program (EIP) identifies needs for a number of remedial erosion control projects along public rights of way in the Upper Truckee River watershed. Some of these projects have already been constructed. Through the UTRFWG, TRPA and the RWQCB will request El Dorado County, the City of South Lake Tahoe, and Caltrans to give the remaining projects high priority, and will seek to facilitate grant funding for implementation within the watershed. TRPA and the RWQCB will also work with other agencies (e.g., California Tahoe Conservancy and Tahoe Resource Conservation District) that have implemented or are implementing remedial watershed restoration projects for the Upper Truckee River (e.g., the Conservancy's Cove East project). RWQCB and TRPA staff will make special efforts to target funding for additional remedial projects to this watershed. The UTRFWG and Watershed Plan will also be developing strategies for prioritizing restoration and remedial efforts.

TMDL Development

Monitoring data on sediment, nitrogen, and phosphorus are available for several stations on the Upper Truckee River, Trout Creek and their tributaries, but these data have been collected at different times, sometimes by different methods. The assessment phase of the Watershed Plan will determine whether additional monitoring for these parameters is necessary to identify and quantify nonpoint source loads. TMDLs for sediment, nitrogen, and phosphorus could receive assistance through the UTRFWG, although this is not an identified task of the UTRFWG. However, the UTRGWG has acknowledged that a sediment and nutrient budget for the river is needed to pinpoint the sources. The sediment budget is partially funded and additional funds are needed to complete the models. Regional Board staff has completed a TMDL for Heavenly Valley Creek, a tributary to the Upper Truckee River. Staff will begin developing a TMDL for Lake Tahoe with plans to complete it by 2006.

The following specific tasks are listed in groups under the goal that they support.

Goal 1: Establish a coordinated Watershed Plan to enhance water quality in the Upper Truckee River watershed of Lake Tahoe, through a concerted effort of implementing watershed project improvements.

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Task 2.2/1:Serve as the RWQCB watershed management lead for the Upper Truckee River watershed: prepare WMI chapter, budgets; and facilitate coordination with RWQCB staff working in watershed as a watershed team.

Task 2.2/2: Organize and facilitate Upper Truckee River Focused Watershed Group, conduct regular meetings, prepare minutes, facilitate development and implementation of Watershed Plan.

Task 2.2/3: Coordinate with agencies and interested parties to further the Upper Truckee Watershed as a prototype for Basin-wide environmental improvement.

Goal 2: Use the focused watershed group as a clearinghouse for existing information

Task 2.2/4 Develop a watershed map that depicts ownership or jurisdiction in the watershed and includes project locations. **THIS TASK IS COMPLETED**.

Task 2.2/5 Identify effective BMP and management implementation strategies, evaluate existing monitoring, and recommend additional monitoring if needed. **THIS TASK IS COMPLETED**

Task 2.2/6 Coordinate with and assist the U.S. Army Corps of Engineers to describe the existing conditions in the watershed. **THIS TASK IS COMPLETED**

Goal 3 Implement solutions for restoration of watershed function (related to water quality), as well as a reduction of sediment and nutrient inputs.

Task 2.2/7 Develop an iterative approach to problem solving.

Subtasks

2.2/7-1 Identify water quality management issues or problems by category and location if possible. **THIS TASK IS COMPLETED**

2.2/7-2 List all management, regulatory, and resource related groups that could play a role in watershed improvements. **THIS TASK IS COMPLETED**

2.2/7-3 Identify financing options, needs, and strategies. **THIS TASK IS COMPLETED**

2.2/7-4 Develop coordinated watershed plan using existing data and collecting current data on topography, hydrology, channel profiles, etc.

2.2/7-5 Identify restoration needs, evaluate alternatives for stream restoration

Task 2.2/8:Continue and expand NPS efforts and BMP implementation.

Subtasks

2.2/8- 1.Management of NPS implementation, and CWA 319(h) contracts for Trout Creek restoration, TRPA residential and commercial BMP retrofit, and revegetation of cut slopes.

2.2/8- 2.Livestock grazing - Barton Meadows

2.2/8- 3.Forestry Management: USFS timber harvesting, forest health, prescribed burning issues, CDF programs - Regreen, timber harvesting. Need additional resources to review future forest health projects in this watershed.

2.2/8- 4.USFS projects - Staff works closely with the USFS in reviewing and commenting on environmental assessments and proposed projects and works to assure implementation of BMPs and adherence to waste discharge prohibitions within the basin. Need additional resources to review future forest health, stream restoration and road rehabilitation in this watershed.

Task 2.2/9: Continue and expand regulatory efforts.

Subtasks

2.2/9- 1. Commercial BMP retrofit - maintain existing and accelerate new retrofits for completion of retrofits by 2002.

2.2/9- 2. Continue to maintain and update waste discharge requirements, NPDES permits, and to take enforcement actions as necessary.

2.2/9-3. Review environmental documents and consider permitting for new projects as they are proposed.

2.2/9-4. Revise several existing permits, such as golf course monitoring plans, increase monitoring at the airport, ski resort and large parking lots.

2.2/9-5. Increase monitoring of Caltrans, City and County road maintenance activities (including sweeping, vactoring), road improvement projects and sand/salt issues.

2.2/9-6. Section 401 Certification will also be considered on a project-by-project basis.

Task 2.2/10: Strengthen SEZ protection/restoration

Subtask

2.2/10- 1. Continue to work with TRPA staff towards strengthening of SEZ protection/restoration programs, particularly development of better means to measure success of SEZ restoration in terms of wetlands ecosystem functions.

Goal 4: Evaluate water quality response of watershed management efforts in order to develop more effective implementation strategies.

Task 2.2/11 Coordinate with and assist the TRPA in its efforts to:

1. Develop an analysis and reporting system (feedback)
2. Customize software to track, analyze and evaluate thresholds and improvements
3. Develop a prototype monitoring program for the water quality threshold
4. Choose indicators for the prototype model
5. Develop a feedback loop for adjusting the models used to predict the effect of restoration efforts.

Goal 5: Implement a proactive program of community outreach

Task 2.2/12:Work with and through the UTRFWG and the Tahoe Environmental Resource Education Committee to enhance education and outreach.

Subtasks

Task 2.2/12- 1.Determine the extent of existing programs involving environmental education (schools, public agencies, etc...).

Task 2.2/12- 2. Determine cost of existing and new programs (also identify funding sources).

Task 2.2/12- 3. Identify needs (fiscal, coordination, development, outreach, training, equipment).

Task 2.2/12- 4. Develop a business plan to encourage local business involvement.

Task 2.2/12- 5. Develop a strategy to encourage local government and county involvement.

Task 2.2/12- 6. Utilize UTRFWG members as spokepersons for environmental education.

Task 2.2/12- 7. Facilitate sustainability and integration of new and existing programs.

Task 2.2/12- 8. Provide outreach for the UTRFWG.

Task 2.2/12- 9. Provide an ongoing assessment of program effectiveness.

Tahoe Unit Tasks Planned for FY 02-03 to FY 06--07
(PY estimates to be added in future chapter update)

EXPECTED TASKS	PY Estimate by Fiscal Year				
	FY 02-03	FY 03-04	FY 04-05	FY 05-06	FY 06-07
WATERSHED PROTECTION/SUPPORT TASKS					
Nonpoint source implementation					
Participate in implementation of Clean Sierra Waters 319 NPS Control Project – Sierra Nevada Alliance					
Field inspections/reports, meetings/meeting notes, formal written comments on silviculture and other forest management activities such as fire control (including forestwide/regionwide planning efforts)					
Field inspections/reports, meetings/meeting notes, formal written comments on grazing and other rangeland management activities (including regionwide planning efforts); implement *the California Rangeland Water Quality Management Plan*.					
Nonpoint source outreach/education					
Participate in regular meetings including (but not limited to) EIP Integration Team, Forest Health Consensus Group, Motorized Watercraft TAG; participate in one-time activities such as Earth Day, Science Fairs, etc.					
Solicit project proposals for funding under CWA 319, Prop 13 and CWA 205j					
Nonpoint source contract management					
Manage contract for Backyard Conservation and BMPs Education and Implementation ($132,878)					
Manage contract for Reveg. and Monitoring in the Upper Truckee Watershed ($94,380)					
Manage contract for TRPA Watershed Management ($240,000)					
Manage contract for Marine Research "On The Water Hands On" Environmental Education ($98,640)					
Manage contract for Lake Tahoe Water Quality Project at Tahoe Meadows ($180,000)					
Timber Harvest (non-federal lands)					
Prop. 13 contract management					
Manage contract for Region 6 (Lake Tahoe Truckee) Adopt a Watershed ($287,400)					
Manage contract for TRPA BMP Education and Implementation ($616,665)					
205j WQ planning contract management					

EXPECTED TASKS	PY Estimate by Fiscal Year				
	FY 02-03	FY 03-04	FY 04-05	FY 05-06	FY 06-07
No contracts for FY 02-03					
Basin Planning					
Eurasian water milfoil control issues					
Wetlands management and protection					
SEZ restoration and protection					
Watershed management					
Participate in the Upper Truckee River Focused Watershed Group					
REGULATORY TASKS					
NPDES					
6A090089000 Tahoe Keys POA Tahoe Keys Water Treatment Facility (expires by 6/03)					
6000U000039 Pacific Bell Statewide Utility (expires 8/15/01)					
Stormwater					
6A318901010 Homewood High and Dry Marina (expires by 6/99)					
Non-15 (WDR)					
6A098706007 CA Parks and Rec DL Bliss State Park (expires by 4/03)					
6A318705005 Tahoe Tree Company (expires by 11/02)					
6A0985048900 Christiana Inn (expires by 6/00)					
6A098505200 International House of Pancakes (expires by 6/00)					
6A091907001 Washoe Indian Cultural Center (expires by 5/02)					
6A311155401 Tahoe City PUD Maintenance Projects (expires by 7/99)					
Water Quality Certification					
As needed					
Enforcement					
As needed					
Chapter 15					
Dept of Defense					
(tasks not planned by watershed unit)					
Underground Storage Tanks					
(tasks not planned by watershed unit)					
Aboveground Storage Tanks					
(tasks not planned by watershed unit)					
Spills or complaints from unregulated sites					
As needed					

CONTRACT NEEDS TO SUPPORT ABOVE EXPECTED TASKS:

Description	Amount Needed	Contract Term

DESIRABLE TARGETED TASKS OR PROJECTS	PY Estimate by Fiscal Year				
	FY 02-03	FY 03-04	FY 04-05	FY 05-06	FY 06-07
Implement BMPs/Improve Water Quality					
Habitat Restoration/Beneficial Use Enhancement					
Assess Loadings and Impacts					
Research-oriented Studies					
Water Conservation and Management					
Monitoring					
Stormwater outfall monitoring to supplement TMDL monitoring					
Education and Outreach					
Large turf area/golf course workshops to promote low fertilizer use					
Update of marina fact sheets					
Watershed Planning					
Land Acquisition/Conservation					

CONTRACT NEEDS TO SUPPORT ABOVE DESIRABLE TARGETED TASKS:

Description	Amount Needed	Contract Term