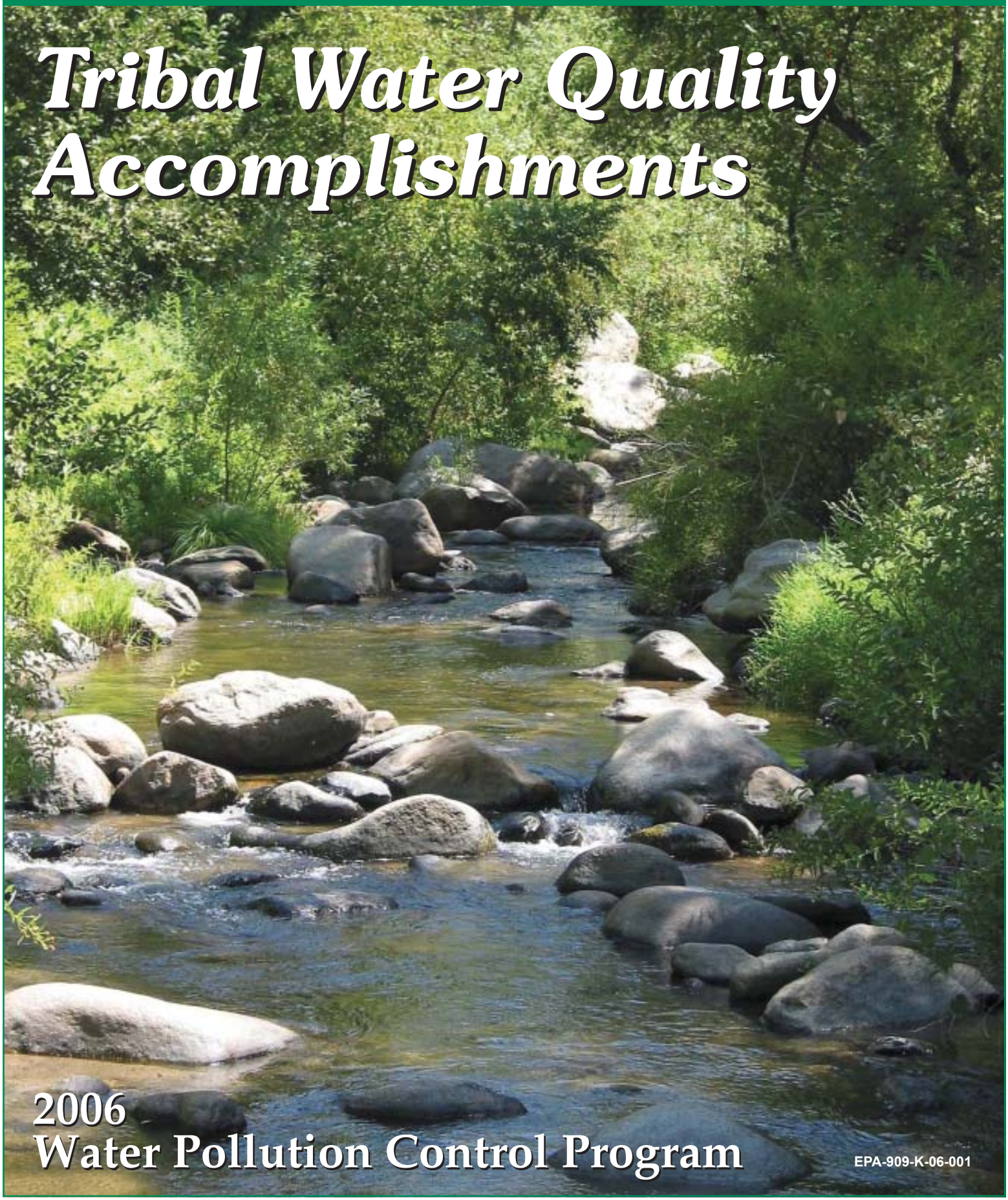
Pacific Southwest Region 9
Water Division

Tribal Water Quality Accomplishments



2006 Water Pollution Control Program

EPA-909-K-06-001

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On Cover: Tule River at Tule River Indian Reservation, California

Introduction

The U.S. Environmental Protection Agency (EPA) consists of ten regions throughout the United States which include 50 states, 572 federally recognized Indian Tribes and intertribal consortia, and U.S. territories. EPA's Region 9 works to protect public health and the environment in the southwestern United States (Arizona, California, Nevada, and Hawaii), territories of the South Pacific, and 146 federally recognized tribes in the Pacific Southwest.

The Tribal Office of the Region 9 Water Division administers Clean Water Act (CWA) grants for over 90 tribes in the Pacific Southwest. These grants are used for surface and groundwater monitoring, assessment, cleanup, and protection, as well as assistance for wastewater infrastructure and for prevention of polluted runoff. The purpose of this booklet is to inform the public about Region 9's tribal CWA Section (§) 106 program and highlight successful tribal CWA § 106 programs in the Pacific Southwest.

Summit Lake Tribe, Nevada

Yurok Tribe, California

Gila River Indian Community, Arizona

Water Pollution Control Program

The Clean Water Act (CWA) § 106 Water Pollution Control Program assists Federally-recognized Indian Tribes with achieving environmental results by developing institutional capacity for administering water quality programs to protect, improve, and enhance natural resources.

Eligible activities include (but are not limited to):

- **Hiring qualified staff to identify and prioritize water quality issues**
- **Leasing/renting office space and purchasing equipment and supplies**
- **Developing a Nonpoint Source Assessment Report and Management Program**
- **Performing water quality monitoring and assessments**
- **Conducting studies related to water pollution control**
- **Implementing and enforcing pollution control measures**
- **Developing and implementing ground water programs**
- **Developing Tribal Water Quality Standards (WQS)**
- **Training and Travel**

Nonpoint Source Workshop, Agua Caliente Band of Cahuilla Indians, California

Monitoring by Owens Valley Indian Water Commission, California

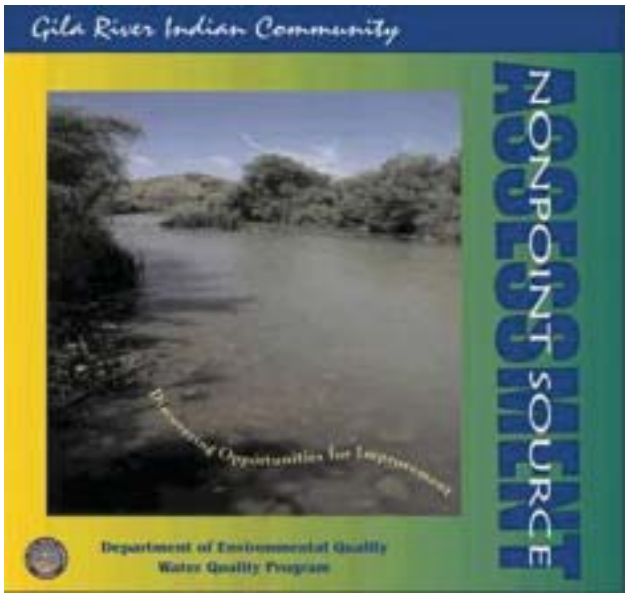
Definition of Accomplishments

Definition of Accomplishments:

- Implementation of a water quality program
- Development of Water Quality Assessment and Inventory Reports
- Collaboration with other agencies and local communities
- Adoption of Tribal Water Ordinances
- Development of Water Quality Standards
- Implementation of other CWA grant programs including CWA Section 319 Nonpoint Source Pollution Control Program

Results of Successful Water Quality Programs Include:

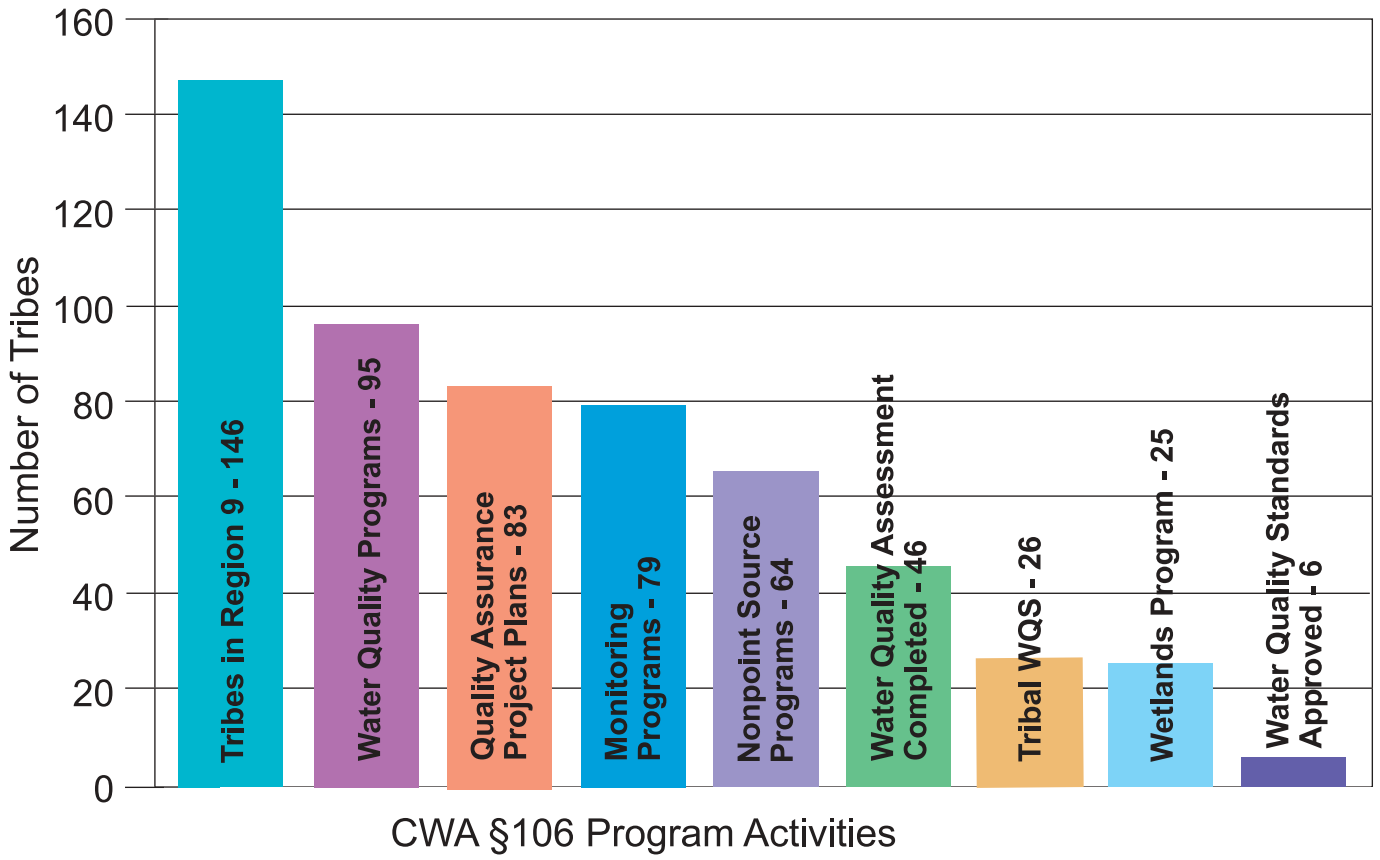
- Improvements in water quality
- Protection of water bodies and water resources
- Community effort and involvement
- Knowledge of water quality conditions on Tribal lands



Cover of Gila River Indian Community's NPS Assessment Report

Certificate of EPA Approval of Navajo Nation's Program Authorization to administer the Water Quality Standards Program, January 2006

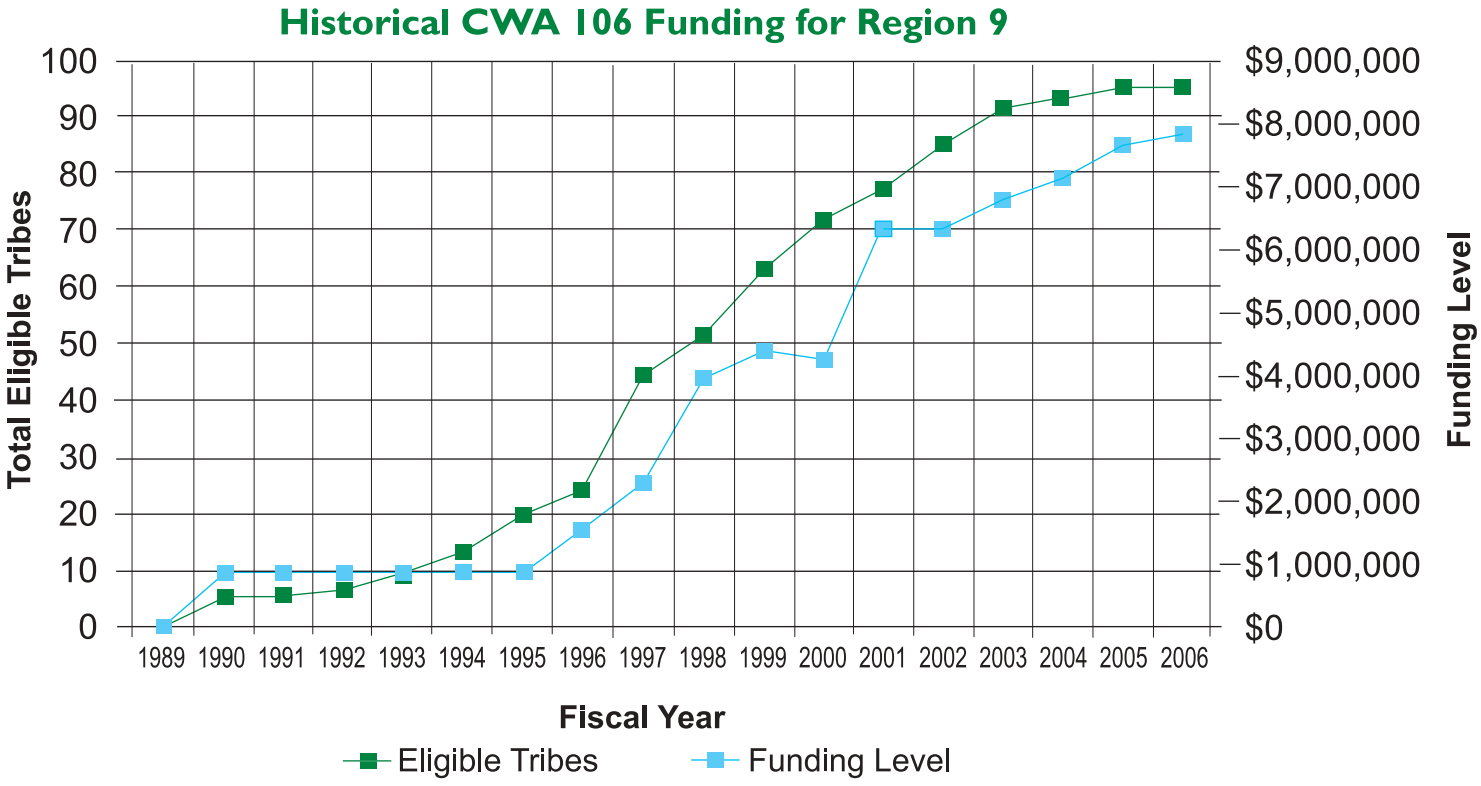
Snapshot of Accomplishments

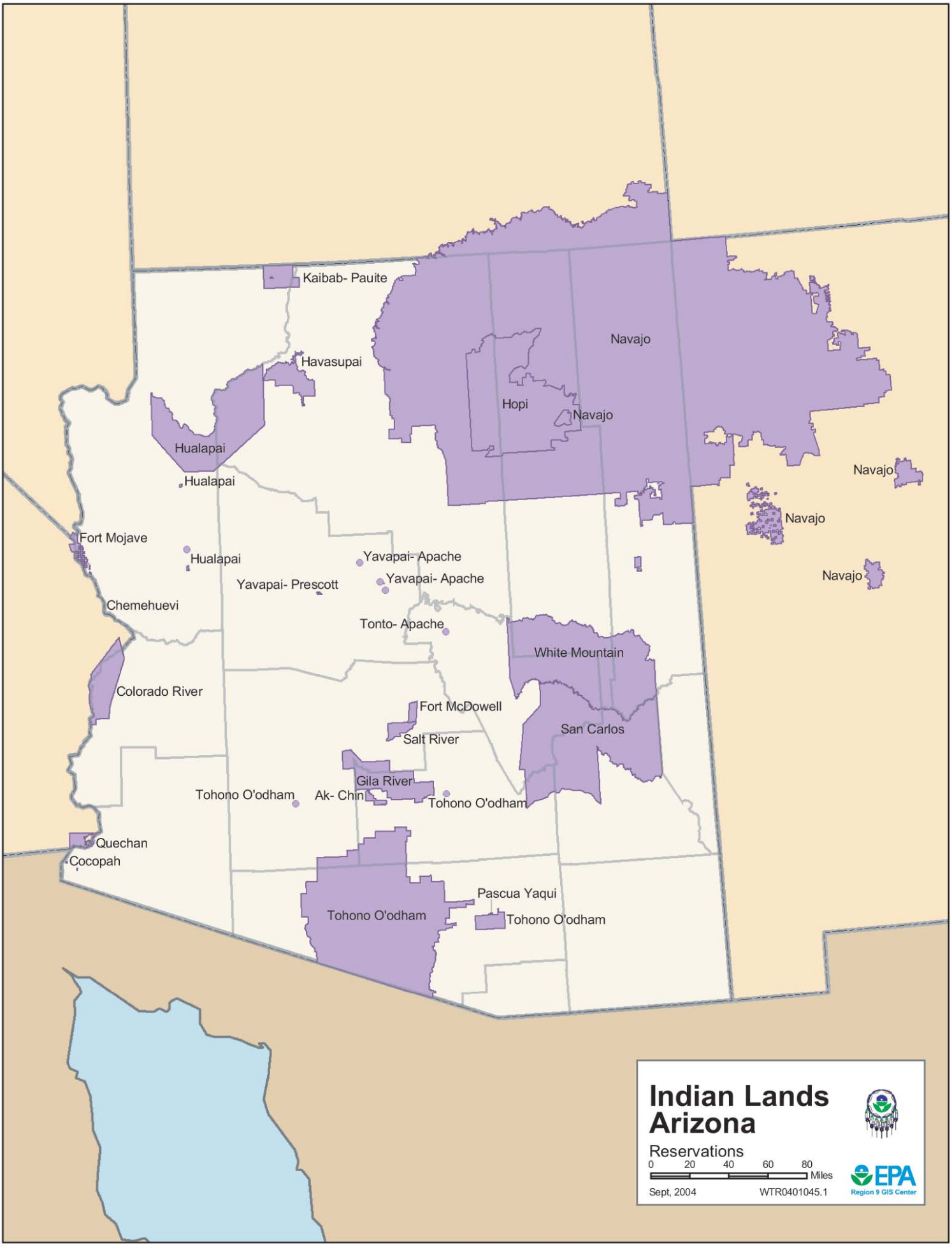


As of 2006, 95 tribes in Region 9 have been determined eligible to receive CWA Section 106 funding, the largest group nationwide. A large percentage of these tribes have implemented their water quality programs through monitoring the surface and ground waters on their reservations based on their EPA approved QAPPs. About half of the tribes have done intensive monitoring and submitted 305(b) Reports. More than half have identified sources of polluted runoff and developed NPS Assessment Reports and Management Plans to implement management measures to improve and maintain water quality. Several tribes have matured to a level of developing tribal approved WQS and EPA approved WQS.

Funding

The Clean Water Act (CWA) Section 106, Water Pollution Control Program (WPCP), began funding tribes in 1990 with 7 tribes and nearly $1 million. Presently WPCP funds 95 of the 146 tribes in Region 9 with an annual allocation of $7.5 million.

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Yavapai- Apache
Yavapai- Prescott
Yavapai- Apache
Chemehuevi
Tonto- Apache
White Mountain
Colorado River
Fort McDowell
Salt River
San Carlos
Gila River
Tohono O'odham
Ak- Chin
Tohono O'odham
Quechan
Cocopah
Pascua Yaqui
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Hualapai Nation

Introduction

The Hualapai Reservation encompasses approximately one million acres of land on the southern rim of the Grand Canyon in Arizona. It is bordered on the north by a section of the Colorado River that extends 108 miles, on the south by the lands of the State of Arizona, on the east by the Cononino Plateau, and on the west by the Lake Mead National Park. There are two satellite areas of the Reservation which are noncontiguous to the main body. One of these satellite areas is located at the community of Valentine, about fifteen miles west of Peach Springs, and the other area is on the Big Sandy River, about fifty miles southwest of Peach Springs. Approximately 2,300 tribal members live on the reservation.

Sampling basic water quality parameters just below Diamond Spring by Anthony Raymond, Water Resources Technician.

Historically, the tribe has maintained a society based on hunting, gathering, and farming. In recent years, the economic base of the Tribe has shifted to forestry, recreation, tourism, wildlife, and livestock. Most of the business and infrastructure is located in Peach Springs, the principal city of the Reservation. Since 1995, the tribe has hosted approximately 14,000 visitors per month every summer at its Grand Canyon West river-raft launching and heliport facilities. The tribe operates a river-rafting business that runs on sixty miles of the Colorado River, from Diamond Creek to Pierce Ferry.

The reservation's surface waterbodies consist of small seeps, springs, and meandering creeks. The tributaries drain three major watersheds — Diamond Creek, Spencer Canyon, and Truxton Wash — which supply water to the Colorado River. The Colorado River contains human waste from numerous rafters and power boat vacationers on the river, and the drainage from these tributaries contributes additional sediment and nutrient loadings from flash floods and runoff into the river. As a result of all this pollution, the Colorado River has become impaired for recreation and freshwater habitat use.

Description of Program

The tribe's Water Pollution Control Program began in 1991, when it received its first Clean Water Act (CWA) Section §106 grant. Using CWA §106 funds, the tribe developed its first EPA-approved Quality Assurance Program Plan (QAPP) and developed and implemented its water quality monitoring program.

The Tribe's monitoring network currently consists of three U.S. Geological Survey (USGS) streamflow-gauging stations, eleven miscellaneous surface-water sites, and fifty-two springs. These sites have been continually monitored for basic water quality parameters, which include pH, total dissolved solids, salinity, conductivity, dissolved oxygen, turbidity, fecal coliform, and temperature. In addition, the tributaries on the reservation have been continually monitored to ensure that they are not contributing to further impairment of the Colorado River.

Students representing several tribes participating in a recent water quality monitoring class cosponsored by the Hualapai Tribe and EPA Region 9 at the Hualapai Reservation.

The Music Mountain High School Science Class of the Hualapai Reservation sampling for macro-invertebrates in Peach Spring Canyon Creek.

Water Quality Accomplishments and Environmental Results

Many of the tribe's Nonpoint Source (NPS) projects are targeted at springs, streams, and seeps which were identified as impacted or potentially impacted by NPS because they were water sources for livestock and wildlife. This livestock and wildlife watering resulted in sediment loading of the springs and water quality problems caused by bacteria, nitrogen, and phosphorus. Through the installation of management measures, these impacted waterbodies were either restored or protected from further degradation. The removal of feral animals and the construction of reservation boundary fencing to exclude their access has significantly improved the water quality on the reservation. In addition, the removal of sagebrush and the fostering of native grasses to reduce erosion and sediment loading have also helped to improve the water quality. Coliform counts indicate that these improvements have significantly lowered the nutrient and total and fecal coliform levels, as well as the ambient temperature of the waterbodies.

The tribe developed its Water Quality Standards and Certification Programs under the CWA §303 and §401. It also developed its EPA Network Readiness grant application and workplan. Funding from this grant was used to develop the tribe's water quality database. The system uses Microsoft Access applications for multivariate approaches to looking at data. Currently, the system is used for entering and storing all water quality data, including all applicable field pictures which will be used to perform water quality trend analysis.

In 1995, the tribe developed its Water Quality Assessment Report in accordance with CWA §305(b). This report was updated in 2005, and contains monitoring data which indicates significant environmental improvement, with respect to use-support. This improvement is the result of the implementation of the NPS and wetlands restoration projects which primarily focused upon feral animal exclusion from primary wetland habitats. The data indicates that there are decreased levels of fecal coliform, conductivity, TDS, and turbidity, and soil erosion and increased wetland vegetation.

The tribe's Water Quality Assessment Report also indicates that all 170 perennial river and stream miles were assessed along with fifty-two springs, representing all of the perennial stream miles on the Reservation and approximately ninety-eight percent of all springs. Since the implementation of the NPS and wetland projects, these waters now support certain types of recreation, wildlife, livestock, and municipal and domestic uses.

Water Quality Technicians Anthony Raymond and Harry Sahneyah, sampling basic water quality parameters in Spencer Creek.

Navajo Nation

Introduction

The Navajo Nation encompasses 17,627,262 acres and is situated in the Four Corners Region, with the Reservation extending into the states of Arizona, New Mexico, and Utah. The Navajo Nation has 255,543 enrolled members with approximately 180,000 residing on the Reservation. There are approximately 39,184 miles of streams, mostly intermittent or ephemeral, 17,057 acres of lakes and ponds, and five major drainage systems: San Juan River, Little Colorado River, Lower Colorado River-Lake Mead, Upper Colorado River-Dirty Devil, and Rio Grande-Elephant Butte. These five systems are further divided into thirty-three watersheds. Other water resources on the Navajo Nation include groundwater (five major hydrologic basins), wetlands, springs, and seepages. Surface water on the Navajo Nation historically served as the primary source of potable water. Today, potable water comes primarily from groundwater sources. Currently, surface water is used as a dependable water source for farming and livestock production and plays a significant role in Navajo culture.

Description of Program

The Navajo Nation's Water Quality Program began in October 1992, and its first Clean Water Act (CWA) §106 grant was received in August 1993. From 1993 to1995, the program began assessing available Navajo Nation water quality data in the U.S. Geological Survey (USGS) and EPA databases. It established a water quality monitoring network utilizing active USGS and Navajo Water Resources stream-gauging sites, collected water quality samples that were analyzed for conventional water quality parameters, planned for the tribal water quality code and standards, and drafted a Tribal Nonpoint Source Assessment Report.

Melinda Deswood-Reust taking a turbidity measurement from Lukachukai Creek

From 1996 to 1998, the program developed a water quality database, drafted the initial Navajo Nation Water Quality Assessment Report in accordance with CWA §305(b), established an educational outreach component, including the Adopt-A-Stream program (a program that gives middle school and high school students an opportunity to learn about water quality monitoring), and prepared a Nonpoint Source Assessment Report and Management Plan (NPS A&MP).

In 1999, the nation implemented a new water quality monitoring strategy, drafted annual water quality watershed monitoring reports, began collecting benthic macroinvertebrate data, and implemented extensive rulemaking and associated enforcement. The nation also used other EPA grants including Nonpoint Source (NPS) grants to implement the management measures outlined in the (NPS A&MP), and the recommendations from the wetlands grants to further its water pollution control efforts on critical waterbodies. The management measures identified sediments and nutrients such as nitrogen and phosphorous water quality parameters that they plan to address. In addition, surface water quality assessment reports have been developed for the Chinle Creek Watershed (2001), Lower San Juan-Four Corners Watershed (2003) and the Lower Lake Powell Watershed (2005).

Water Quality Accomplishments and Environmental Results

In August 1999, the Navajo Nation Clean Water Act (NNCWA) was signed into tribal law after passage by the Navajo Nation Council (NNC). In November 1999 and July 2004, the Navajo Nation Surface Water Quality Standards (NNSWQS) were approved and amended by the NNC Resources Committee. Uses currently designated for surface waters in the NNSWQS include primary human contact, secondary human contact, domestic water supply, agriculture water supply, fish consumption, aquatic habitat, and livestock and wildlife watering. The NNSWQS and associated program authorization application are currently undergoing review for EPA approval.

During the past six years, water quality assessments have been conducted in over seventy waterbodies in twenty-three watersheds. Long-term surface water quality monitoring sites have been established and are monitored at least yearly in order to characterize the quality of Navajo Nation waters. Long-term water quality monitoring consists of obtaining samples of metals, nutrients, bacteria, organics, and inorganics for analyses by a contract laboratory. Program staff collects physical parameters (pH, temperature, conductivity/TDS, reduction/oxidation potential, dissolved oxygen, salinity) at each monitoring site. All field and laboratory water quality data collected for surface waterbodies since 1995 are organized by watershed into a water quality database. Queries within the database provide quick determinations of compliance with the Nation's Water Quality Standards.

Findings of the nation's water quality monitoring program indicate numerous numeric NNSWQS exceedances from mining operations including those for mercury, aluminum, and other compounds. The nation is in the process of creating a methodology to determine if individual waterbodies are in attainment of their designated uses based on Navajo's numeric surface water quality standards. Once these determinations are made, the waterbodies and watersheds can be managed to protect the designated uses. Biological assessments are also being conducted at five reference sites to characterize base-line biological conditions in surface waters. All water quality monitoring and biological assessments are conducted in accordance with EPA-approved Quality Assurance Program Plans (QAPPs).

The NPS A&MP identified the following sources of water quality impairment on tribal land: livestock grazing and irrigated agriculture; hydromodification; habitat modification; land disposal; resource extraction; construction projects; and land development. The management measures developed to address these sources of water quality impairment on tribal lands include: diminishing the impact to upland areas; intercepting tributary runoff and directing it onto field plots using low-tech constructions; improving the handling and disposal of pesticides and herbicides; working with EPA to identify, inspect, and assess potential pollution sites, manage cleanups and enforcement activities, and participate in emergency responses; remediating abandoned mines; sequencing clearing and grading activities; limiting vegetation removal; using temporary fencing, buffers and additional building setbacks; limiting land use; developing site management plans; restoring the site; and reducing streambank and channel erosion.

In addition, the nation implemented a NPS project to address sediment loading from the Asaayi (Bowl) Lake Watershed into the Asaayi Lake because the lake is a major recreation area and irrigation source. The main logging and fire access roads received erosion mitigation treatments, minor roads were closed, and in some cases recontoured, and livestock controls were installed. As a result, there has been a decrease in sediment loading that is benefiting the flora and fauna in the area.

An example of sediment deposition in Bowl Creek.

White Mountain Apache

Introduction

The White Mountain Apache Tribe is located in the east-central region of Arizona, 194 miles northeast of Phoenix. It encompasses 1.7 million acres (more than 2,600 square miles) in Gila, Apache, and Navajo Counties on its ancestral homeland on the Fort Apache Reservation. The Reservation ranges in elevation from 2,600 feet above mean sea level, in the Salt River Canyon on the southwest corner, to more than 11,400 feet at the top of Mount Baldy, one of the tribe's sacred peaks. It includes oak woodlands and an 800,000-acre Ponderosa pine forest, which supports a large stand of spruce and fir and is the resource base for a thriving tribal forest products industry.

Within the reservation, there are twenty-six cold-water lakes and more than 400 miles of streams. The major water bodies are the East Fork River, North Fork River, Cedar Creek, Carizo Creek, Cibecue Creek, Canyon Creek, White River, Salt River, and Black River. The streams are home to the Apache trout, a species brought back from the brink of extinction through the efforts of the Tribe and its many partners. The primary source of groundwater used for drinking water is the Coconino aquifer. The Reservation also provides some of the richest wildlife habitats in the state for elk, deer, sheep, bears, turkeys, and eagles.

Description of Program

The White Mountain Apache Tribe began its Water Quality Program in 1994, when it developed its Watershed Department and received its first Clean Water Act (CWA) §106 grant. Its Quality Assurance Program Plan (QAPP) was completed and approved by EPA in 1996, and an addendum Fish Tissue Analysis was approved by EPA in 2003. The use of water bodies by free range cattle, and the occurrence of droughts, which cause water levels to drop and water temperatures to rise, were identified as areas of concern in previous assessments. As a result, in accordance with the tribe's EPA-approved QAPP, the environmental staff has continuously monitored fecal coliform and temperature in priority water-bodies. These water bodies are used for swimming, camping, and other recreational purposes, and it is important to the Tribe to keep them safe and clean.

Soliders Spring – cross section monitoring.

The Watershed Department is also conducting cross section monitoring to assess the changes in channel shapes and pebble counts to determine the size of the sediments in streams at specific locations on the reservation. A multi-parameter probe is used to monitor pH, temperature, turbidity, and specific conductivity. In addition, stream morphology studies, which examine rock and channel type, are conducted in order to compare the number of pools formed in different streams at the same elevation and in different streams at different elevations.

The tribe's Watershed Department has also been developing a tribal water quality database to ensure reliable, easy, and secure access to all of the water quality data that has been collected over the years by environmental staff, including information on pH, temperature, fecal coliform, metals, fish tissue, and nutrients. The Datasight software program is used to store and analyze the data.

Water Quality Accomplishments and Environmental Results

In 1997, the White Mountain Apache Tribe's Watershed Department developed a Nonpoint Source Assessment and Management Plan (NPS A&MP) which was approved by EPA in 1998. The Tribe also became eligible for funding under the CWA §319 Nonpoint Source Pollution Control Program. Since then, the tribe has been awarded multiple Nonpoint Source (NPS) competitive grants to implement its NPS control program and help protect and restore watershed health through integrated land management planning and the Tribal project review process.

One of the tribe's ongoing NPS restoration projects is at Lofer Cienega, where an eight-foot-tall fence is being constructed to keep elk from entering and trampling the stream, destroying wetland springheads, and causing increased sedimentation and turbidity in the water. Another ongoing NPS project is at Sunrise Ski Resort, where a stream runs through the parking lot of the resort. In the spring, when the plowed snow melts and water flow is high, the resort's parking lot becomes flooded with water that is sediment loaded and high in turbidity. To correct this problem, the tribe is replanting wetland springheads that will help reduce erosion and reroute the stream so it will no longer run through the parking lot.

Using CWA §106 funds, White Mountain Apache Tribe developed their Water Quality Protection Ordinance, which requires that tribal waters be free of toxic substances, such as metals, for the protection of human health and wildlife. The tribe also developed and adopted Water Quality Standards, approved by EPA on September 27, 2001. As required by the CWA, the Tribe initiated a tri-annual review of its Water Quality Standards in 2005.

In June 2002, the Rodeo-Chediski Fire marked a big change in watershed conditions in the Cibecue and Carrizo watersheds, which are located upstream of two White Mountain Apache Tribe communities. About 470,000 acres were destroyed in the fire, making it the largest fire that ever occurred in the Southwest. Nearly 275,000 acres of the reservation were destroyed, including vast areas of the Ponderosa pine forest.

The White Mountain Apache Tribe's Water Quality Department has been monitoring and documenting changes in water quality resulting from the fire. Their findings show that, as a result of the fire, stream flow levels, which used to be 10 to 15 cfs during the winter, are now about 3000 to 4000 cfs. These high levels are causing increased flooding and turbidity, resulting in a scouring effect which wipes out wetland vegetation. As a result, replanting of spring-heads, revegetation, and bank stabilization has been implemented to help prevent additional erosion.

Water quality sampling of watersheds.

Gila River Indian Community

Introduction

The Gila River Indian Community (GRIC) encompasses approximately 580 square miles in central Arizona, adjacent to the Phoenix metropolitan area. There are approximately 20,000 Pima and Maricopa tribal members living in the community. The community's water resources are influenced by seven major watersheds. Within the community, there are approximately 20 million acre-feet of groundwater, which is used industrially and commercially, and is the sole source of the community's drinking water. The community has more than eight miles of perennially flowing riverine habitat, including the Salt River and the Lower Gila River, and 116 miles of ephemeral surface waters, including the Upper Gila River, the Santa Cruz River, and the Santa Rosa, Vekol, and McClellan Washes that only flow in response to precipitation. It also has more than 1,500 acres of wetlands, including the Lower Gila River Wetlands and the Pee Posh Wetlands, more than eighty miles of canals, and twenty miles of spillage and riparian areas. The current uses of the community's surface water resources include recreation, wildlife habitat, fisheries, livestock watering, and agriculture irrigation.

Description of Program

On March 30, 1990, the Gila River Indian Community was the first Region 9 tribe approved for Financial Assistance Eligibility (FAE) under the Clean Water Act (CWA) §106 grant program. Since then, GRIC has been receiving CWA §106 grant funds to conduct a variety of water quality activities, including but not limited to: water quality monitoring in accordance with its EPA-approved Quality Assurance Program Plan and Sampling and Analysis Plan; development of a water quality database for over 19,000 analyses; development of a Geographic Information System (GIS) database for geospatial data, including over twenty complex surface and groundwater mapping projects; assessments, characterizations, and studies, including a Nonpoint Source Assessment and Management Plan (NPS A&MP); water quality ordinance development and implementation, including a Groundwater Quality Management Ordinance, associated protection strategy, inventory and mapping of all community water wells, and oversight of groundwater remediation of a petroleum product plume; providing water quality education to elementary schools; conducting water quality inspections and providing compliance assistance at GRIC facilities, and; conducting a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) type investigation of groundwater for an approximately twelve-square-mile area for contaminants, including but not limited to the chemicals TCE, PCE, PCA, DCE, DCA, carbon tetrachloride, 1,4-dioxane, benzene, and perchlorate. The objectives of this investigation are to locate contaminant source areas, identify responsible parties, and mitigate the source to protect three local drinking water sources.

YSI sonde installation for continuous water quality monitoring at the PeePosh Wetlands.

The tribe is also conducting a nitrate investigation that evaluates the magnitude of nitrate contamination across the community, including an evaluation of vertical distribution and stratification of the contaminant in the drinking water aquifer. The study compared nitrate in groundwater conditions on the community with other groundwater basins across the state to better understand the extent of the problem and possible innovative solutions for mitigation.

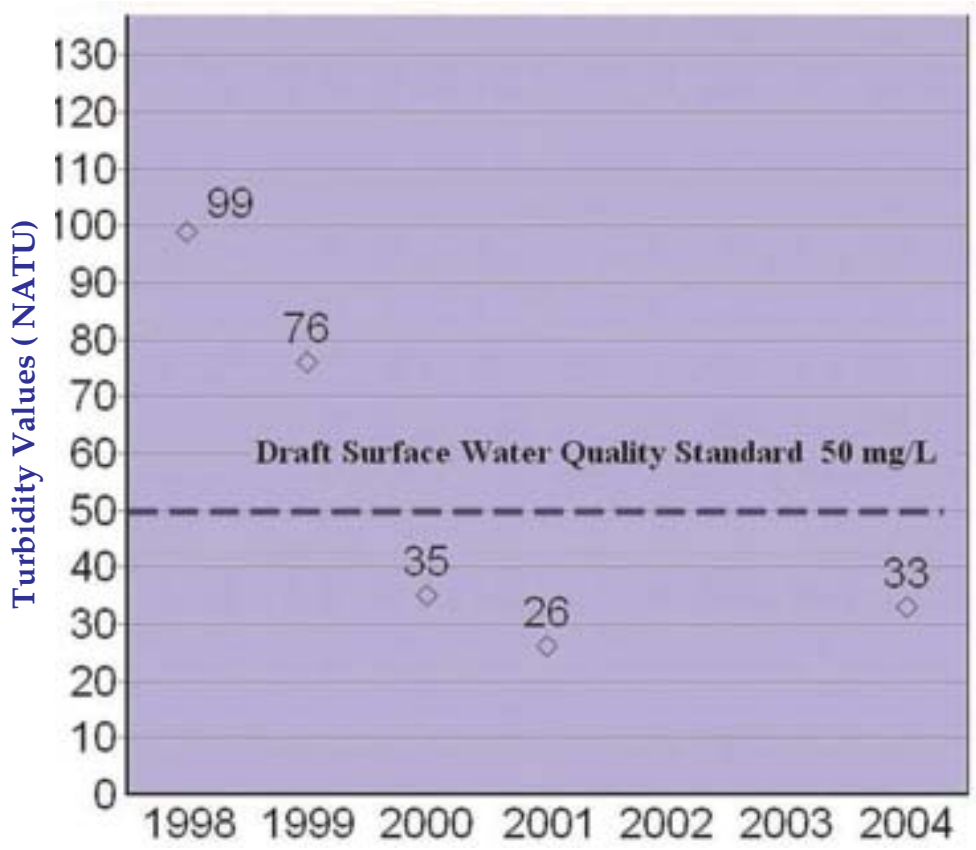
In addition, GRIC has developed Water Quality Indicators that are used to evaluate support of Community Water Quality Goals and the effectiveness of GRIC Department of Environmental Quality water quality programs. For example, Aquatic Ecosystems Protection is measuread by tracking stream channel stability, changes in ambient stream chemistry (e.g., nutrients, pH, DO), and macroinvertebrate richness, and Designated Uses Support is measured by tracking water bodies that have *E. coli*, nutrient, and metals criteria exceedances.

Water Quality Accomplishments and Environmental Results

GRIC's ongoing water quality investigations include surface water and groundwater sampling and continuous monitoring and streambed sediment sampling. Data from these investigations are entered into their integrated water quality database, and are used to advance water quality assessments, promote the development and implementation of tribal Water Quality Standards (WQS), help develop Nonpoint Source (NPS) management programs with data to support management decisions, and evaluate water quality trends.

Surface water sampling is collected seasonally as flow-weighted composites using the DH-81 Teflon7 sampler (basic ions and inorganics, total and dissolved metals, and pesticides), along with manual streamflow measurements and in-situ parameters (pH, temperature, conductance, dissolved oxygen, and turbidity). Continuous surface water monitoring is conducted at the Gila River wetlands with a data-logging water quality sensor system to measure temperature, conductivity, dissolved oxygen, pH, and turbidity, along with two continuously recording streamflow gauges to monitor stream base flows and stormwater discharges. Sampling at the Gila River (1998 - 2004) has shown a reduction in the average value of turbidity from 99 NATU to 33 NATU (*see graph below*).

Average Turbidity Values in the Gila River



Groundwater sampling is conducted at drinking water wells, agriculture production wells, and monitoring wells to measure the presence of pesticides, TDS, nitrates, metals, and organic contaminants. Monitoring wells are sampled using the low-flow "micro-purge" sampling technique. To conduct continuous groundwater monitoring, GRIC installed continuously recording water level sensors in four monitoring wells. This data assists GRIC with understanding the effects of land uses on the Community's groundwater system, the dynamic hydrologic and water quality nature of the Gila River Wetlands, and appropriate timing of future groundwater quality investigations, since monitoring wells are typically shallow and are used as an early indicator of potential future water quality problems at deeper depths.

An example of grab sampling (water) in the Gila River wetlands.

Using tribal funds, GRIC purchased a Mobile Water Quality Processing Lab that provides a clean, air-conditioned room in the field for sampling activities, including wet-sieve processing of streambed sediment samples, and "micro-purge" groundwater sampling using plastic sample chambers to ensure no sample contamination. In addition, a utility trailer houses a generator, air compressor, pressure washer, welding equipment, crane, and various tools for convenience in the field.

In preparing the NPS A&MP, GRIC used monitored data — 19,000 separate water quality analyses for five key parameter groups of physiochemical, pathogens, nutrients, metals, and toxics from stormwater, rivers, canals, agricultural related spillage riparian areas, sumps and tailwater, groundwater, sediment in river bottoms, fish tissue, and macroinvertebrates — and evaluation techniques, including best professional judgment. The assessment identified the following NPS impacts to the Pee Posh Wetlands: groundwater containing nitrates and naturally occurring metals (arsenic and fluoride), and surface water containing nutrients, pathogens, TDS, turbidity, sedimentation, toxics, and trash in the rivers and wetlands. The primary sources of these NPS impacts include natural, industrial, open space, rangeland, residential, commercial, agricultural, and waste disposal sources and hydrological modification from both on and off of the Community.

To improve the water quality at the Pee Posh Wetlands, GRIC will implement on-the-ground management measures with NPS grant funds to mitigate the effects of nutrients, pathogens, sediment and turbidity, toxics, trash, and salt cedar. Short-term plans include removal of illegal trash dumps, installation of signs, and other measures to prevent future dump sites. Future activities will include the installation of water quality improvement cells and an inflowing trash reduction feature for both low flows and larger stormwater flows, and the mitigation of salt cedar and replacement with native riparian vegetation.

Macroinvertebrate sampling in the Gila River wetlands.


Indian Lands
California
Reservations, Rancherias, Colonies
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Smith River
Karuk
Elk Valley
Karuk-Yreka
Resighini
Quartz Valley
Yurok
Karuk
Big Lagoon
Trinidad
Hoopa Valley
Blue Lake
Table Bluff
Rohnerville
Fort Bidwell
XL Ranch
Cedarville
Alturas
Lookout
Likely
Big Bend
Roaring Creek
Montgomery Creek
Redding
Susanville
Greenville
Round Valley
Paskenta Band of Nomlaki Indians
Laytonville
Grindstone Creek
Chico
Sherwood Valley
Berry Creek
Guidiville
Mooretown
Enterprise
Redwood Valley
Potter Valley
Coyote Valley
Upper Lake
Colusa (Cachil Dehe)
Pinoleville
Robinson
Scotts Valley
Big Valley
Cortina
Manchester
(Point Arena)
Hopland
Lower Lake
Sulphur Bank (El- Em)
Rumsey
Auburn
Cloverdale
Middletown
Shingle Springs
Washoe (Woodfords Community)
Stewarts Point
Dry Creek
Lytton
Graton
Jackson
Buena Vista
Bridgeport
California Valley Miwok Tribe
Tuolumne
Chicken Ranch
Benton Paiute
Bishop
Picayune
North Fork
Big Pine
Big Sandy
Table Mountain
Cold Springs
Fort Independence
Lone Pine
Santa Rosa (Rancheria)
Timbisha Shoshone Tribe
Tule River
Santa Ynez
Fort Mojave
Chemehuevi
San Manuel
Twenty- Nine Palms
Colorado River
Morongo
Soboba
Agua Caliente
Cabazon
Ramona
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Cahuilla
Pechanga
Santa Rosa
Torres- Martinez
Pala
Pauma-Yuima
La Jolla
Los Coyotes
Rincon
Santa Ysabel
San Pasqual
Mesa Grande
Inaja- Cosmit
Barona
Capitan Grande
Viejas
Cuyapaipe
Quechan
Sycuan
La Posta
Manzanita
Jamul Indian Village
Campo

Twenty-Nine Palms Band of Mission Indians

Introduction

The Twenty-Nine Palms Band of Mission Indians has two noncontiguous land areas in Southern California. The 250-acre Riverside County portion of the Reservation, in the eastern Coachella Valley, is approximately 30 miles east of Palm Springs and 13 miles west of the Salton Sea. The 150-acre San Bernardino County portion is next to Joshua Tree National Park in the City of Twenty-Nine Palms. The tribe's water quality efforts have focused primarily on the Riverside County Reservation lands. The primary surface water on the Riverside portion of the reservation is the Whitewater River, a perennial water body which begins its flow near where it bisects the reservation and, after exiting the Reservation, flows toward the Salton Sea. Tribal monitoring data has revealed that the surface water quality on the reservation is directly related to the groundwater and the impaired Whitewater River. In addition to the intermittent natural flows, the river conveys wastewater plant discharge, agricultural, and stormwater runoff through the lower Coachella Valley.

Surface water sampling on the Whitewater River.

The Whitewater River poses a problem for the reservation and for the lower watershed down to the Salton Sea. There is intensive agriculture and explosive population growth in the northern two-thirds of the watershed. Impacts to the Whitewater River stem from both point and nonpoint sources. The State of California lists the Whitewater River on the Clean Water Act (CWA) §303(d) list of impaired surface waters because of exceedances of the bacterial and chemical water quality objectives. Groundwater is also a concern for the Tribe because there are increasing water demands from agriculture, recreation, and population growth on lands adjacent to the reservation. This has resulted in chronic overdraft of the tribe's groundwater basin. In addition, groundwater recharge from the Colorado River water is having an impact on further degradation of the area's groundwater quality. This is because the Colorado River water is of considerably lesser quality than area groundwater.

Drilling groundwater monitoring well.

Description of Program

Twenty-Nine Palms Band began receiving CWA §106 funding in 1997. Since that time, long-term sampling programs for surface water (Whitewater River) and groundwater have been implemented. Most laboratory analyses are performed in-house using the Twenty-Nine Palms Laboratory. The lab (owned, operated by the tribe, and funded by EPA's General Assistance Program [GAP], Bureau of Indian Affairs [BIA], and the tribe) provides laboratory services to the Tribal EPA, other tribes, and non-tribal entities. The lab is certified by the State of California and EPA Region 9. The lab's capabilities include: microbiology, wet chemistry, organic chemistry, inorganic chemistry, and molecular biology.

The tribe uses seven groundwater monitoring wells (four in the semi-perched aquifer, two in the upper aquifer and one deep well in the lower aquifer). Monitoring wells are sampled routinely for nutrients, microorganisms, organic contaminants such as pesticides, petroleum products, MTBE and other volatiles, toxic trace metals, and perchlorate. In addition, surface water samples are collected at four locations on the Reservation, along the Whitewater River where preliminary data indicates high heterotrophic plate counts, total fecal coliform, and fecal coliform.

Water Quality Accomplishments and Environmental Results

The tribe prepared a Preliminary Water Quality Assessment Report in accordance with CWA §305(b) in 1998 which identified contamination of both surface and groundwater on the Reservation. Sampling and analyses have been conducted for multiple years along the Whitewater River and in various well locations under EPA-approved Quality Assurance Project Plans (QAPPs) for water quality, National Pollutant Discharge Elimination System (NPDES), pesticides, and nonpoint source. In 2000, the tribe developed and received approval for the NPS Assessment and Management Program Plan (NPS A&MP) and became eligible for CWA §319 funding. The Tribe has developed a multi-user geodatabase system to store monitoring data, which is then integrated with the Geographic Information System (GIS) and modeling software. This sampling data is being used to identify trends and changes in water quality on the Reservation and in the watershed as a whole, as well as to update the Tribe's CWA §305(b) Report.

Groundwater sampling training exercise with various tribes at Twenty-Nine Palms Reservation.

The tribe has been working with federal, state, and local government entities including BIA, Coachella Valley Water District, the Valley Sanitation District, and State Water Quality Control Boards towards developing Water Quality Standards and ultimately Total Maximum Daily Loads (TMDL) for the Whitewater River. The Valley Sanitation District discharges wastewater just upstream of the reservation. Besides bacteria and nutrients, the wastewater may contain endocrine disrupting chemicals which flow through the Reservation and towards the Salton Sea. Setting standards and developing TMDLs would ultimately reduce pollutant loading of the Whitewater River and the Salton Sea.

Surface water sampling training exercise at La Posta.

With the water quality monitoring efforts that the tribe has conducted over the past several years, it has been able to identify more specifically the surface and groundwater quality problems on the Reservation and is recognizing trends for both quantity and quality. The tribe has noted seasonal and spatial trends for bacteria, nitrates, and sulfates. It has also found evidence of perchlorate. The data collected enables the tribe to prevent further degradation of water quality on the Reservation and engage in constructive dialogue with off-reservation jurisdictions and parties who share an interest in the health of the water resourcess.

Coyote Valley Band of Pomo Indians

Introduction

The Coyote Valley Reservation encompasses 76 acres located 10 miles north of Ukiah, in Mendocino County in northwestern California. The Reservation is bordered by the Russian River and one of its tributaries, Forsythe Creek, and is also traversed by busy U.S. Highway 101. A key beneficial use for these waters is as a coldwater fishery, since both water bodies are anadromous fish streams supporting Chinook salmon and steelhead trout. The tribe has depended upon these waters for food as well as for its cultural and spiritual well being. However, over the years, siltation from timber harvesting, agricultural runoff, cattle grazing, gravel mining, and development by upstream and off-reservation landowners have contributed to the decline of this coldwater fishery. There are 1.6 acres of wetlands on the Reservation, and groundwater sources include three active and two inactive wells.

Staff preparing to conduct a bioassessment (spawning survey) on the Russian River.

Description of Program

Coyote Valley's water quality program began in 1991 as a summer program in water monitoring for tribal youth. This was in keeping with the current mission of Coyote Valley Tribal EPA, which is to conduct environmental projects that spring from traditional tribal mores, and to educate tribal youth to their full potential. Since then, tribal youth, under the supervision of the tribal technical staff, have monitored surface waters bordering the reservation using an EPA-approved Quality Assurance Program Plan (QAPP). The Tribal EPA has monitored Forsythe Creek and the West Bank of the Russian River for temperature, pH, dissolved oxygen, and turbidity. Monitoring methods include sampling using temperature loggers, grab sampling, and rapid bioassessment. Most of the sampling involves continuous field measurements including Onset Hobo temps, although a small number of grab samples are sent to a contract lab. Rapid bioassessment is conducted to assist with the determination of the health of the river for fish and other aquatic life. Data is collected into Boxcar® software which is used to graph hourly temperatures on a 24-hour basis from May through October, which is the period critical to juvenile salmonoid survival. Tribal EPA conducts winter and spring spawning surveys and fish counts in its water quality monitoring program in order to measure progress in the tribe's restoration activities in and along the Russian River and Forsythe Creek.

Staff conducting a spawning survey on Forsythe Creek.

Water Quality Accomplishments and Environmental Results

Coyote Valley's Clean Water Act (CWA) §106 program has been instrumental in identifying sites for restoration in the Tribe's CWA §319 Nonpoint Source Pollution Control Program, which began in 2001. After identifying areas of the Russian River and Forsythe Creek most in need of restoration through water quality monitoring, the Tribe began stream bank restoration, using funds from EPA's Nonpoint Source Program. Since the start of the restoration project, the Tribe has prevented nearly 10,000 cubic yards of sediment from entering Forsythe Creek by installing stream way laybacks and using native plants as vegetative cover to stabilize the banks.

Improvement in water quality has been demonstrated through field monitoring and spawning surveys. These studies indicate that, as a result of using bioengineering techniques to create more and deeper pools of water, the summer habitat for juvenile salmonoids has become cooler. Late springtime surveys of juvenile Chinook and steelhead populations, using a snorkel survey protocol as standard operating procedure, are providing a baseline gauge of stream health by which the tribe can judge the success of their restoration efforts.

Youth staff counting juvenile Steelhead and Chinook Salmon on Forsythe Creek.

Overall stream temperature improvement will take time to demonstrate empirically due to many variables, such as year-to-year weather cycles (hot years, cold years) and rainfall fluctuation. In the meantime, three additional grant programs from Bureau of Indian Affairs (BIA), U.S. Fish and Wildlife, and California Fish and Game augment the tribe's CWA §106 grant program to help support an ongoing assessment of the watershed through upstream stakeholder outreach, education, and cooperation. The assessment includes stream channel surveys, hydrological flow models, road/culvert impacts, and a site-by-site prescription for repairs. Now, landowners who wish to repair stream banks have a comprehensive framework to base restoration efforts on. These efforts will ultimately benefit Coyote Valley tribal lands as less silt will enter the channel from overburden. In addition, planted trees in the riparian zone will help to hold the banks and provide shade, which yield cool temperatures for improved salmonoid conditions.

Staff retrieving a Hobo temperature gauge on Forsythe Creek.

Data from the tribe's water quality CWA §106 program have also been used to identify other polluted runoff on the Reservation. Coyote Valley is located adjacent to U.S. Highway 101 and has approximately 300-500 visitors per year. During storm events, oil and other auto fluids enter the streams. In addition to water quality data, runoff was observable as oil film disappeared into the drain and then into the stream. In 2003, the tribe installed a riparian buffer zone, the largest in Mendocino County, with a 100 ft. setback from the high water mark, and native plants and grasses were planted to act as a filter. As a result of water quality program efforts, no oil film has been observed entering the stream during storm events.

Manzanita Band of the Kumeyaay Nation

Introduction

The Manzanita Band of the Kumeyaay Nation (Manzanita) is situated in southeastern San Diego County, California within 10 miles of the Mexican Border, and approximately 60 miles east of the Pacific Ocean. The Manzanita Reservation occupies approximately 3,580 acres and is comprised of high chaparral and grazing lands, with elevations ranging from 3,900 to 5,100 feet above mean sea level. Surface water resources of the Manzanita Reservation include 7.5 miles of Tule Creek and La Posta Creek and their tributaries, 9.1 miles of intermittent streams, 21 acres of freshwater wetlands, 14 springs, and the 1.8 acre Manzanita Lake formed by the Manzanita Dam. Groundwater from springs and wells is the sole source of drinking water for the Manzanita Reservation. Surface and groundwater uses include recreation, cultural/traditional, agriculture, wildlife and warm freshwater habitats, and groundwater recharge.

Coliform sampling at Manzanita Lake.

Description of Program

Manzanita's water pollution control program began in 1998 in order to implement its water quality management program, including the following activities: monitoring the quality of groundwater and surface water in accordance with an EPA-approved Quality Assurance Program Plan; issuing Water Quality Assessment Reports in accordance with Clean Water Act (CWA) §305(b); developing and implementing a Nonpoint Source Assessment and Management Plan (NPS A&MP) in March of 2000; and developing and implementing a source water protection program. Manzanita's surface water monitoring activities have been severely limited due to several years of drought in the region.

Coliform sampling at Manzanita Lake.

Manzanita determines its critical water quality sampling needs using the information from previous years' CWA §305(b) reports and conducts groundwater monitoring at least twice a year. Tribal wells are sampled and the analysis for nitrate-nitrogen is performed in the Manzanita laboratory using its Hach DREL-2000 spectrophotometer. For coliform analysis, Colisure media, an incubator, and a UV lamp are used to determine the presence or absence of total and fecal coliform. Manzanita has recently purchased supplies for the enumeration of *E. Coli* and *Entercocci* bacteria for use in 2005. In addition, groundwater samples are collected and sent to a laboratory to measure the presence of pollutants, including general minerals, dissolved metals, radionuclides, volatile organic chemicals, pesticides, and bacteria.

Water Quality Accomplishments and Environmental Results

To ensure that its sole source of drinking water is protected, Manzanita has developed and implemented a Wellhead Protection Program. Using EPA's Wellhead Analytic Element Model (WhAEM2000) along with the Calculated Fixed Radius Capture Zone method, Manzanita delineated fourteen wellhead protection areas (WHPAs), comprised of sixteen wells. These methods used several input parameters, including discharge (pumping rate), aquifer base elevation, ravel time (pumping duration), aquifer porosity, groundwater flow direction, hydraulic gradient, transmissivity, and saturated aquifer thickness. The WHPA delineations and well locations were mapped on United States Geological Survery (USGS) Digital Orthophoto Quarter Quadrangle (DOQQ) infrared aerial photograph base maps, using Manzanita's Geographic Information System (GIS). The GIS system also facilitates the identification of potential areas of contamination and well interference, and is instrumental in the public education and outreach activities of its Wellhead Protection Program.

Coliform sampling at Manzanita Lake.

Initial review of the WHPA aerial maps identified potential contaminant sources for each well, including septic wastewater disposal systems, vehicular activities, agricultural activities, and solid waste disposal sites. The immediacy and degree of risk associated with each potential contaminant source will be evaluated after field inspection and monitoring, which will be conducted regularly to ensure that information is updated and accurate. Manzanita's Wellhead Protection Program includes a management plan for water supply protection and is comprised of the following components: regular monitoring of water supply wells and inspection of each wellhead and surrounding area using a wellhead inspection form; remediation of existing contamination pursuant to an applicable remediation plan and a special monitoring plan; prevention of future contamination by posting signage denoting WHPAs; pollution prevention education and outreach to residents and visitors through literature and workshops; and implementation of management measures per its NPS A&MP.

In addition, Manzanita's NPS A&MP identified the following priority categories of NPS pollution and associated needs that contribute to diminished water quality: unrestricted livestock grazing, land disposal (septic systems, animal waste disposal), construction (road grading and drainage), erosion and sedimentation control, spring development and rehabilitation, and wetlands restoration. During 2000 through 2004, Manzanita, with NPS grant funding and with guidance from the National Resource Conservation Service (NRCS), improved water quality by implementing the following successful management measures that focused on livestock control, erosion control, revegetation, and stream bank restoration: installation and inspection of livestock restriction fencing around the wetland areas and springs; establishment of alternate water sources for livestock; use of straw bale and sediment basins during grading activities; construction of check dams made of natural materials to reduce bank scour by trapping sediment, slowing water velocity, building up the bottom of the creek bed, and filling the bank areas scoured by erosion; and clearing of sagebrush and thinning of willows to encourage willow growth and native plant revegetation.

Stream near Hubble Road.

Hoopa Valley Tribe

Introduction

The Hoopa Valley Indian Reservation is the largest in California, encompassing 89,572 acres. The Reservation is located in the northeastern corner of Humboldt County in Northern California, about 50 miles inland from the Pacific Ocean, and 300 miles north of San Francisco. The reservation is nearly a perfect square with each side 12 miles in length, making it approximately 144 square miles, and it encompasses roughly 50 percent of Hupa (Hoopa's traditional name) aboriginal territory.

The reservation is bisected by the north flowing Trinity River. The west flowing Klamath River flows through a small portion of the far northeastern part of the reservation. A number of smaller streams, with watersheds less than 6,000 acres in size, flow into the Trinity and Klamath Rivers within the reservation. The largest of these include: Mill Creek, Hostler Creek, Tish-Tang Creek, Campbell Creek, Supply Creek, Soctish Creek, and Pine Creek. Although these streams are relatively small, each of them provides habitat for anadromous fish.

The Hupa people's cultural integrity, along with the physical health of the people is dependant on clean, healthy water. Since time immemorial, the Hupa people have inhabited the banks of the Trinity River, dwelling in pit houses near the mouths of Trinity River tributaries. The Trinity River and its tributaries have proven to be an abundant source of life for the Hupa, providing fish, drinking water, bathing and many more beneficial uses throughout the course of the year.

The hydrology of Hoopa Valley is characterized by relatively wet, cool winters and dry summers. The reservation is mountainous, ranging in elevation from 320 feet to 5000 feet above mean sea level. The Valley floor consists of a sequence of prominent stream terrace benches carved out by the meandering channel of the Trinity River. The terraces represent ancient to modern flood plain levels. Along the ancient floodplains, the topography is relatively flat. These areas are suitable for habitation and have been designated into "fields" throughout the reservation.

During the rainy season, surface water on the Reservation is abundant. In contrast, groundwater aquifers are quite limited. The total amount of wetlands on the reservation is estimated at 3,200 acres with over 98 percent categorized as riparian or wet brush field. The groundwater basin in the Hoopa Valley is restricted to alluvial fans which encompass the area where streams deposit sediment and enter into the Trinity River.

Lower Tish Tang Creek Continuous Data Recorders (CDRs) site.

Description of Program

Hoopa Valley's water quality program began in 1990 when it received its Financial Assistance Eligibility (FAE) approval for a Clean Water Act (CWA) §106 Water Pollution Control grant. This grant was used to assist with the development of the Tribal Environmental Protection Agency (TEPA) to conduct water quality planning and management programs on the Reservation.

Since 1990, the tribe has continuously monitored its streams for water level, conductivity, pH, temperature, turbidity, dissolved oxygen, and fecal coliform. Hoopa Valley's Water Quality Standards (WQS), approved by EPA in 2002, contain water quality criteria that are monitored by environmental staff and are

designed to protect the uses of the reservation's surface waters. Two of these criteria, temperature and turbidity, are the keys to the Tribe's efforts to maintain and restore the natural populations of migratory salmon and steelhead.

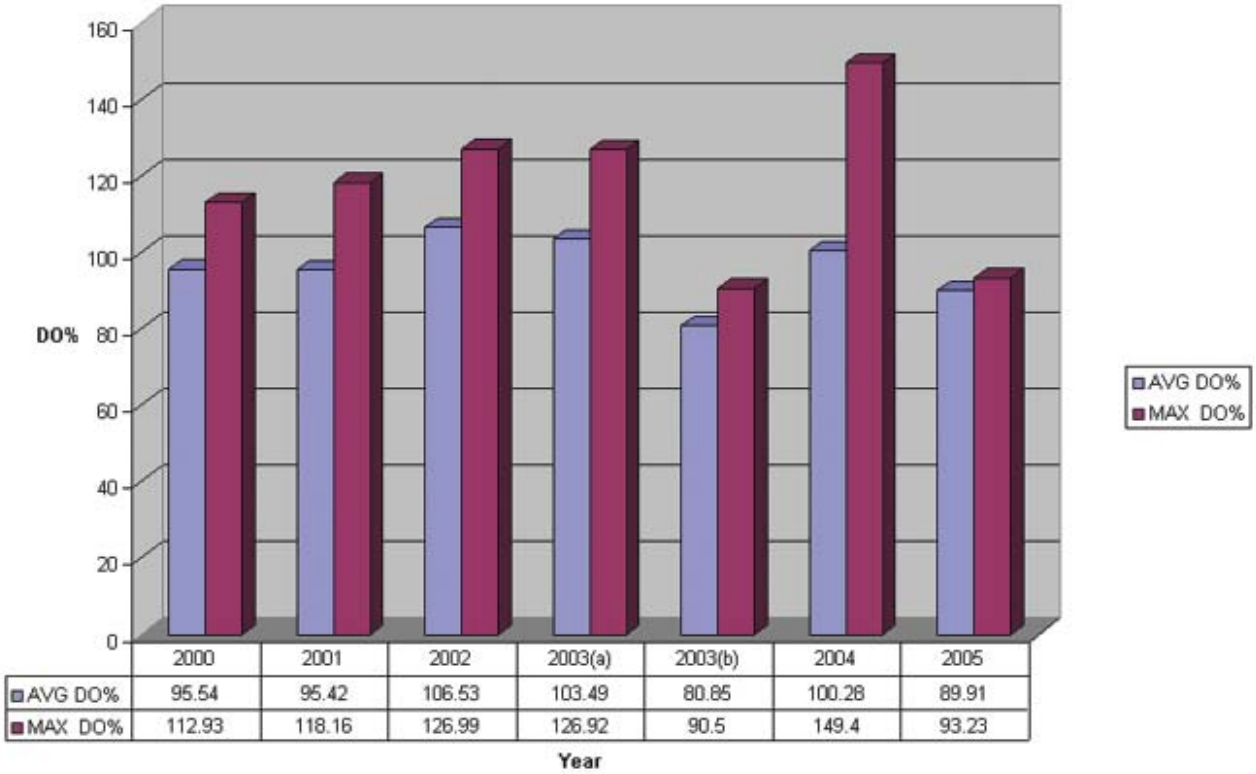
In September of 2002, the Trinity and Klamath Rivers experienced a massive fish kill, where an estimated 34,000 salmon were killed. The Fish Kill of 2002 was caused by a number of factors in combination with one another. Increased in-river temperatures and decreased flow, coupled with a large run size, created stress on returning salmon, which led to wide spread pathogen infection. Increased water temperatures are closely associated with and probably caused by decreased flows, which are ultimately controlled by upstream dams. The tribe's temperature criterion is based on temperature-flow relationships, and is designed to protect the holding and spawning of adult salmon in the Trinity River and its tributaries.

Logging is the main economic industry on the Reservation. The Tribe has been concerned about the soil runoff into streams from logging, which affects salmon spawning as well as other aquatic life. TEPA has established, under its WQS, turbidity criteria for

2002 Trinity and Klamath Rivers fish kill.

the Trinity River. TEPA has fifty stations on the reservation where probes record the temperature in the Trinity River and its tributaries. TEPA also has 13 locations where Continuous Data Recorders monitor temperature, turbidity, and dissolved oxygen (DO) along with other parameters *(see chart below.)* All monitoring data is collected and added to TEPA's database for analysis.

Trinity River Dissolved Oxygen Levels Over a 5-year Period (2000-2005)



	2000	2001	2002	2003(a)	2003(b)	2004	2005
AVG DO%	95.54	95.42	106.53	103.49	80.85	100.28	89.91
MAX DO%	112.93	118.16	126.99	126.92	90.5	149.4	93.23

Year

The data is then analyzed for trends and noticeable violations of existing water quality standards in the ordinances that are stated in the tribe's Water Quality Control Plan (WQCP). The tribe can enforce these ordinances against violators both on and off the Reservation for degrading, through point source or nonpoint source pollution, the Reservation's water bodies.

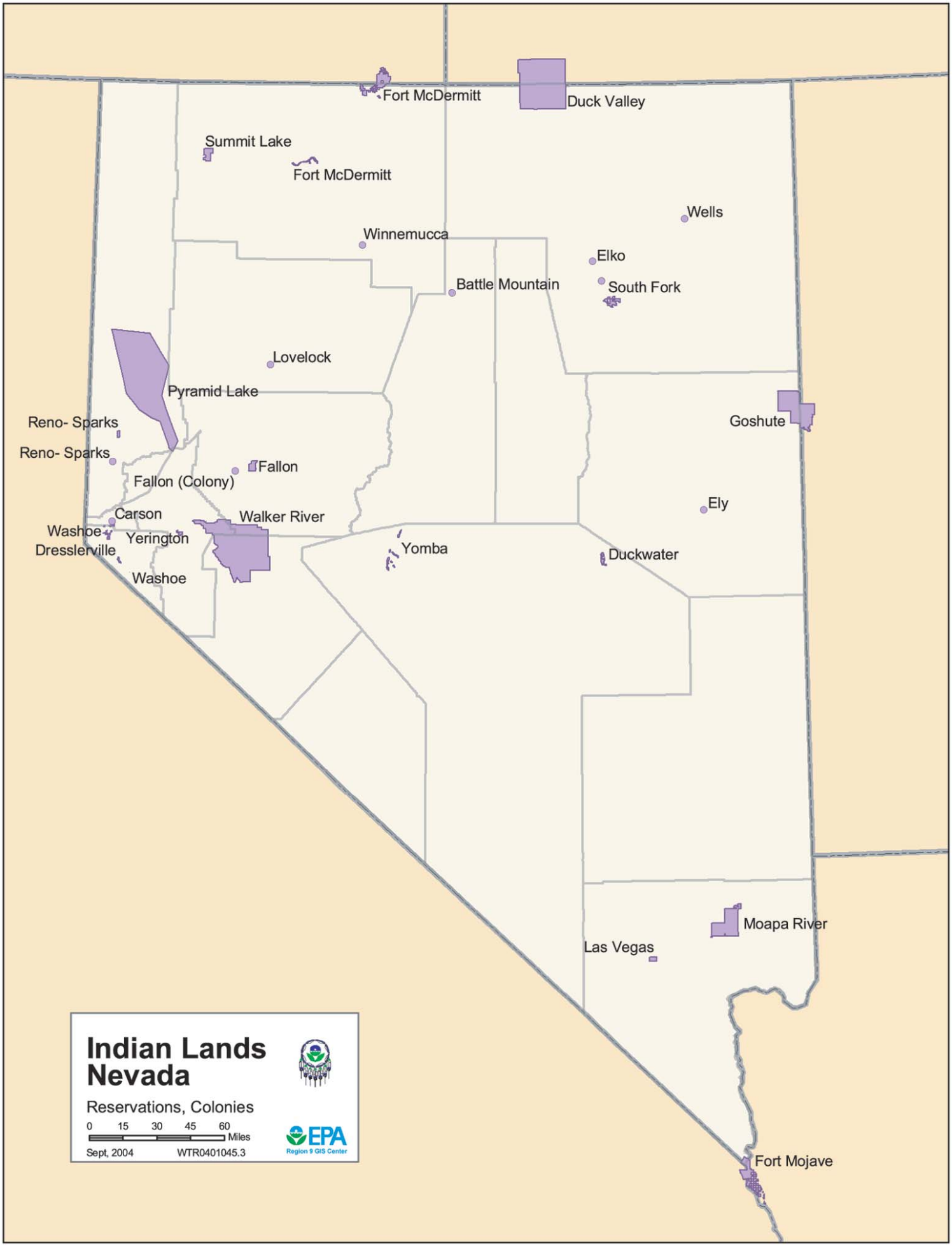
Water Quality Accomplishments and Environmental Results

Since 1990, the Hoopa Valley Tribe has been successful in monitoring and investigating water quality on the Reservation, based on its EPA-approved Quality Assurance Program Plan (QAPP). Other water quality accomplishments include the completion and approval of its Nonpoint Source Assessment Report and Management Program (NPS A&MP), which made it eligible for CWA §319 NPS funding. The tribe uses its NPS funding to address other pollutants such as dissolved oxygen (DO), pH, conductivity, phosphates, nitrates, and soil runoff from logging into the streams within the reservation. An example of an NPS project is the Abandoned Automobile Clean-up Project, where over 180 abandoned autos were removed from the banks of nearby creeks/streams, wells, and other water sources on the reservation. These vehicles were leaking brake fluid, antifreeze, and hydrocarbons including diesel and gasoline into the creeks and streams that could be seen with the naked eye. This leakage was harmful to the aquatic life and posed a threat to groundwater quality. As a result of the cleanup, the number of abandoned vehicle in these areas has been reduced, and auto fluids are no longer seen in the water.

Water quality sampling.

The Hoopa Valley Tribe has completed a Water Quality Assessment Report in accordance with CWA §305(b) and developed EPA-approved Tribal Water Quality Standards. The tribe has also developed a database to store monitoring data, ordinances, and reports related to water quality. The database stores all the environmental data in its raw form and all analysis files. The analysis files contain all the information that has been compiled and graphed so that it can be easily disseminated to the public. The database also contains standard operating procedures and the software necessary to carry out the functions of the water quality program.

CWA §106 funding has also enabled the Hoopa Valley Tribe to foster relationships with various federal, state, and tribal agencies to promote and further protect the waters of the Hoopa Indian Reservation. It now has cooperative agreements with integral agencies such as the US Fish & Wildlife Service (USFWS), North Coast Water Quality Control Board (NCWQCB), and all of the Klamath Basin Tribes. The working relationships are intended to protect the long-term beneficial uses and anadromous fisheries of the Trinity and Klamath Rivers. Through interagency cooperation, the tribe has been able to accomplish several things including recognizing and incorporating tribal cultural beneficial uses into the NCWQCB Basin Plan, and working with USFWS personnel to develop dissolved oxygen (DO) water quality criteria for the Trinity River.


Fort McDermitt
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Summit Lake
Fort McDermitt
Wells
Winnemucca
Elko
Battle Mountain
South Fork
Lovelock
Pyramid Lake
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Reno- Sparks
Goshute
Fallon
Fallon (Colony)
Ely
Carson
Walker River
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Pyramid Lake Paiute Tribe

Introduction

The Pyramid Lake Paiute Indian Reservation is located in western Nevada, about 30 miles northeast of Reno, and encompasses about 474,000 acres. Pyramid Lake, a slightly saline terminal desert lake, is located entirely within the reservation. The lake covers approximately 114,000 acres and is the focal point of the reservation. The Truckee River, which originates in Lake Tahoe, flows through the reservation for 31 miles and terminates in Pyramid Lake. The beneficial uses of Pyramid Lake and Truckee River include provision of a cold freshwater habitat, protection of threatened or endangered species, preservation of indigenous aquatic life, and the protection of aquaculture. Other water resources at Pyramid Lake include groundwater, streams, creeks, wetlands, springs, and seepages. The beneficial uses of groundwater and wetlands include cultural, indigenous aquatic life, livestock watering, and water quality enhancement. The tribe has depended upon Pyramid Lake and Truckee River for food, clothing and shelter materials, and cultural and spiritual health for time immemorial.

Description of Program

Monitoring with a YSI sonde on the Truckee River.

The Pyramid Lake Paiute Tribe has been investigating its water quality since 1975 and, in 1989, received its first Clean Water Act (CWA) §106 grant. Since that time, the Pyramid Lake Fisheries Department staff (from 1989 – 1997) and the Environmental Department staff (from 1997 – present) have continuously monitored the water quality of creeks, Truckee River, and Pyramid Lake on the Reservation, sampling water for nitrates + nitrites, total ammonia, total phosphorus, and dissolved reactive phosphorus. Water is monitored, using a YSI sonde, for water temperature, pH, total dissolved solids, salinity, conductivity, and dissolved oxygen. All water quality monitoring data are kept in the Tribe's water quality database and used for trend analysis.

The Environmental Department staff has conducted Rapid Bioassessment to help evaluate the biological conditions at multiple sites on the Lower Truckee River. This involves the collection of aquatic insects, riparian/bank/vegetation/river substrate assessments, and the collection of water samples at each site. The data helps the tribe track the health of the river for the benefit of aquatic life, wildlife, and the fish of Pyramid Lake. A multi-year Pyramid Lake Bioaccumulation Mercury Study is underway on Pyramid Lake to address concerns that elevated mercury loading and bioaccumulation in the Truckee River may affect the fisheries in downstream Pyramid Lake. This study includes the collection of fish to determine the extent and causes of mercury in the lake. Recent findings show that mercury came from the upstream Truckee River Watershed.

Members of the Environmental Department have been active in stakeholder efforts with state and local officials, water quality coordination meetings, and Truckee River Implementation Team meetings for ongoing Truckee River water quality monitoring and restoration efforts.

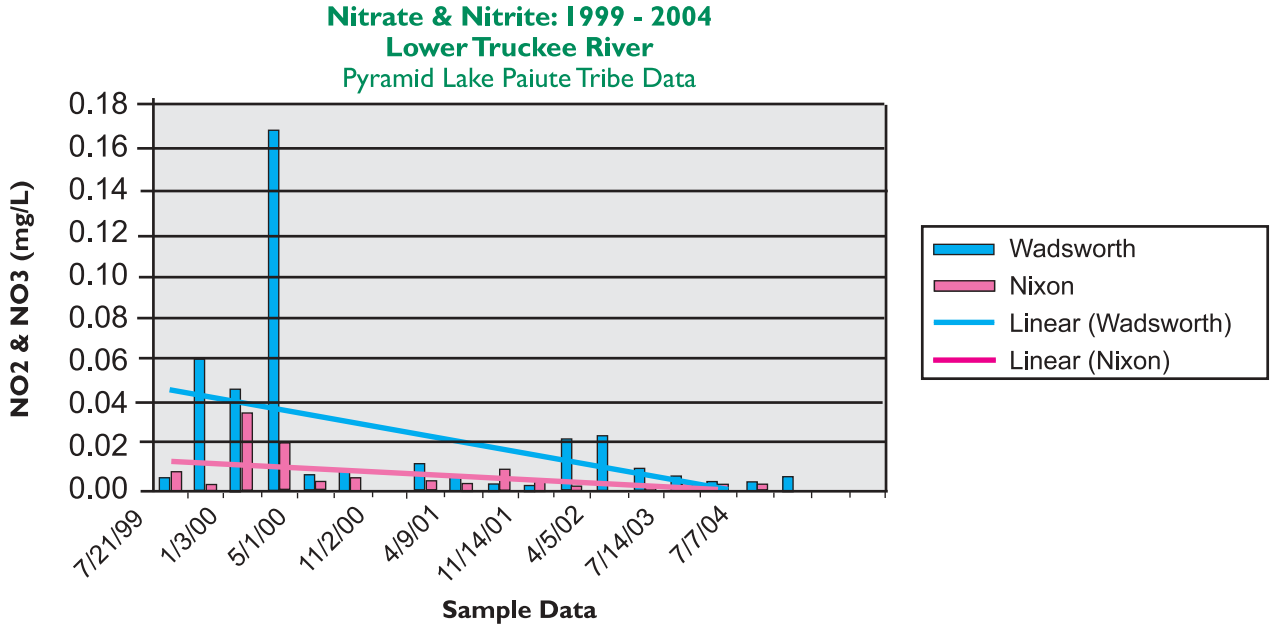
Water Quality Accomplishments and Environmental Results

Since 1989, the Pyramid Lake Fisheries Department and the Pyramid Lake Environmental Department have been successful in investigating the water quality on the reservation, based on the tribe's 1992 EPA-approved Quality Assurance Program Plan, in order to better protect Tribal waters. In 1994, the tribe's Nonpoint Source Assessment Report and Management Program Plan (NPS A&MP) was approved by EPA and the tribe became eligible for funding under CWA §319 Nonpoint Source (NPS) Pollution Control Program. The tribe has been awarded multiple competitive NPS grants to carry out its NPS pollution control program to address pollutants found through its water quality monitoring program. Specifically, the NPS program mitigated and prevented the effects of uncontrolled grazing by cattle that led to turbidity from soil erosion, nutrient loads, loss of native vegetation, and destabilized streambanks. This was accomplished through the implementation of management measures such as fencing and providing alternate water sources.

During 1999 to 2004, water quality monitoring and sampling on the Lower Truckee River has shown that riparian habitat has improved as a direct result of the implementation of NPS on-the-ground projects including the fencing out of livestock and improved water flow management for cottonwood and willow trees. The environmental results of the NPS projects show reduction in velocity and sedimentation and increased bank stability in the Truckee River. Specifically, nitrate and nitrite levels have declined from 0.17 *mg/l* in May 2000 to about 0.01 *mg/l* in July 2004 *(see chart below)*. The riparian areas restored under the NPS grant program will continue to recover through the intensive management of cattle grazing, which will allow the water level to rise back to support native vegetation and become properly functioning systems.

The water quality monitoring conducted over the past several years has enabled the tribe to identify water quality trends, particularly for drought seasons versus wet seasons. With macro-invertebrate and fish data collected during the drought years, the environmental staff has found that increased nutrients have resulted in increased algal blooms and higher temperatures in the river which have taken their toll on water quality and aquatic life. In contrast, during wet years, water quality monitoring during high river flows has shown improved water quality and increased abundant species richness values.

Recently, the tribe developed Water Quality Standards (WQS) to protect tribal waters. In 2004, the Tribal Council approved the WQS and a "Water Quality Enabling Ordinance," which implements the WQS within the Pyramid Lake Indian Reservation. As of 2006, the Tribe's WQS and program authorization application are undergoing review for EPA approval.



Shoshone-Paiute Tribes of Duck Valley

Introduction

The Shoshone-Paiute Tribes of Duck Valley reside on the Duck Valley Indian Reservation located in southwestern Idaho and northeastern Nevada. The reservation encompasses approximately 289,820 acres, and has two major terrain types according to elevation. The first is the basin where the developed resources are located (community of Owyhee, rural residences and productive farmlands), and the second is the upper elevations on the east and west sides of the reservation, consisting of rim-rock from ancient volcanic flows. The Owyhee River system, which is made up of the Upper (East Fork and South Fork), Middle (Middle and North Forks) and Lower Forks of the Owyhee River, is on the southern end of the Columbia River Basin and flows into the Snake River. The East Fork Owyhee River provides water to the Billy Shaw, Sheep Creek and Mountain View Reservoirs, which are used primarily for fishing. The river itself is used mainly for irrigation and livestock watering. The streams flowing from the high elevations provide recharge water to the East Fork all year. The primary land uses on the reservation are agriculture and livestock grazing. Other water resources at Duck Valley include groundwater, wetlands, springs, and seeps.

Description of Program

The Shoshone-Paiute Tribes of Duck Valley's water quality program began in 1997, when the tribes received their first Clean Water Act (CWA) §106 funds. Since that time, the tribes have continuously monitored the water quality of creeks, the Owyhee River, reservoirs, and groundwater on the Reservation in accordance with its EPA-approved Quality Assurance Management Program (QAPP). The tribes' monitoring program includes water quality parameters for nutrients, temperature, turbidity, pathogens, pesticides, and petroleum hydrocarbons.

Mary's Creek – section of a 100-meter measuring tape is visible on the upper right of the photo. This site is a bioassessment and a water quality monitoring site.

Before 2003, water quality monitoring occurred annually, and aquatic insects were collected from three sites in 2001 and seven sites in 2002. In 2003, water quality monitoring was increased to allow for seasonal characterization of the water quality and included Rapid Bioassessment. Rapid Bioassessment includes collecting aquatic insects and physical habitat such as epifaunal substrate assessment data, bank stability information, and riparian vegetation assessment. Rapid Bioassessment is conducted on the East Fork Owyhee River and five of its major tributaries. It is used to help the Tribes evaluate the health of the Owyhee River system for aquatic life and wildlife.

The tribes have also completed a well monitoring program. An agreement with the U.S. Bureau of Reclamation resulted in the collection of groundwater depth measurements of seven monitoring wells dispersed on the reservation and located mostly on agricultural land. Water samples were analyzed for nutrients, trace metals, and pesticides. When comparing the results with National Drinking Water Standards, it was found that one of the seven wells has exceedance above secondary standards for iron, but no pesticides were detected. The interpretation of these monitoring results on well depth trends and possible contamination from iron and pesticides will be submitted to Tribal Resource Management.

The confluence of the Mill Creek Tributary/East Fork of the Owyhee River is located approximately three miles southeast of the Duck Valley Indian Reservation boundary, and the Rio Tinto Mine is located about a mile and a half west of the confluence. In 2000, in support of EPA efforts to close Rio Tinto Mine, the tribes' water quality program began water quality monitoring of Mill Creek and found that it is impaired by metals, temperature, pH, TDS, turbidity, and TSS. In addition, acid mine drainage continues to move from the tailings at the closed mine into the creek. Data from the tribes' water quality monitoring of Mill Creek are being used to design the remediation plan for the Rio Tinto Mine site. All water quality monitoring data are kept in the tribes' EPA water quality database. The tribes will be working with a contractor to input the data into EPA Storage Retrieval Database (STORET). Data entry is scheduled to begin in early 2006.

Water Quality Accomplishments and Environmental Results

Since 1997, the tribes have been successfully monitoring water quality on the Reservation. They have learned that as a result of the seasonal effects of livestock grazing, bacteria counts at some locations increase substantially from midsummer to November. For this reason, beginning in 2003, three sites are monitored in December, January and February, and sixteen sites are monitored from March through November. Physical habitat data are also collected at this time.

The tribes drafted their Water Quality Standards in 2001, but the water quality criteria did not reflect the seasonal effects of livestock grazing. With the monthly data that is now being collected, the numerical criteria in the Water Quality Standards will be reviewed and modified as necessary. In addition, the tribes' comprehensive monitoring program will provide information that is needed for the Water Quality Assessment Report in accordance with CWA §305(b) and for interpretive reports that the tribal government will use for management purposes.

The water quality data collected by the tribes were used to develop the tribe's Nonpoint Source Assessment Report and Management Plan (NPS A&MP) which indicated that nonpoint source pollution is the primary source of water pollution on the Reservation. As a result, the tribes became eligible for funding under the CWA §319 Nonpoint Source Pollution Control Program in 2000, and received several competitive NPS grants to carry out its NPS pollution control program.

Through the NPS grants, the tribes have mitigated NPS pollution from poorly maintained roads and recent wildfires on the reservation, worked to install alternative livestock watering, restored springs previously used for watering, and completed bank restoration along the Owyhee River. As a result of management measures implemented on the Reservation, the tribes hope to realize water quality improvement by showing decreases in temperature, turbidity, and nutrients found in the streams and tributaries of the Owyhee River. The recent change from annual to monthly water quality monitoring collection should allow the tribes to show water quality trends and improvements. This information will then allow the tribes to make adjustments to future management measures implementation to ensure the effectiveness of their projects. In addition, the tribes are planning to integrate the biological monitoring data and the water quality data to give a better picture of the health of the reservation waters.

Owyhee River at the Tribal Ranch, a bioassessment sampling site.

Washoe Tribe of Nevada and California

Introduction

Carson River Watershed, surface water sampling upstream of Nonpoint Source Stewart Ranch Project.

The Washoe Tribe of Nevada and California is comprised of four communities located in western Nevada and eastern California. Carson, Stewart, and Dresslerville Communities are located in Nevada while Woodfords Community is located in Alpine County, California. The tribe also has at least ten additional uninhabited parcels and holds interests in about 61,000 acres of allotment land. These lands are located in the southeastern region of traditional Washoe territory, which encompasses both the east and west slopes of the Sierra Nevada and adjoining valleys centered around Lake Tahoe.

The tribe has employed a Watershed Protection Approach (WPA) as the framework for meeting the Tribe's water resources challenges. The WPA coordinates any point source, nonpoint source, wetland area, surface water, groundwater, and drinking water programs in support of the watershed approach. The tribe's Unified Watershed Assessment identified six hydraulic areas, prioritized based on water quality: Doud Springs, Bryant Creek, Jacks Valley Creek, Indian Creek, and James Canyon Creek in the Carson Watershed; and Upper and Lower Clear Creek in the Clear Creek Watershed. The designated beneficial uses of all surface water include, at a minimum, the protection and propagation of fish, shellfish, and wildlife, and recreation in and on the water. The traditional, spiritual, and physical life of Washoe Tribal members is focused around Lake Tahoe, the numerous springs/hot springs, and the Carson, West Walker, and Truckee Rivers.

Description of Program

Washoe Tribe's water quality program began in 1998 when it received its first Clean Water Act (CWA) §106 grant. Since then, the Washoe Environmental Protection Department (WEPD) staff has put in place a regimented routine water quality monitoring program, based on their EPA-approved Quality Assurance Program Plan (QAPP), defining the water quality conditions that will allow the tribe to better understand their surface water resources. The program will also help to ensure that tribal natural resources are used in a traditional and customary manner to better promote the health and well being of the tribe and members of the tribal communities.

Surface water sampling during spring runoff (first time this ephemeral stream has had flows in over 7 years), Pine Nut Mountains.

The WEPD monitors surface water at fourteen sites, primarily in the Carson River and Clear Creek Watersheds, for physical, inorganic, biological, and metals parameters including total phosphorus, color, temperature, turbidity, total suspended solids, total coliform, nitrate, and iron. In addition, during spring and fall runoff periods, the tribe monitors for organic parameters and pesticides. Clear Creek at Stewart Community has been monitored closely for total phosphorus, temperature, and turbidity due to historical conditions, including a high flooding event

in 1997, which caused negative impacts such as degradation of the creek channel and the floodplain; loss of riparian vegetation; and surrounding development pressure.

For several years, WEPD has been conducting aquifer characterization studies to investigate the quality of the tribe's groundwater resources and identify potential impacts for future management. Washoe Tribe is developing their own water quality laboratory to increase institutional capacity and provide faster turnaround time in receiving water quality analytic results. WEPD staff conducts community outreach and education programs including "Washoe on the River Day," which allows staff to discuss water quantity and quality issues with their local tribal youth and community members. WEPD staff participation at meetings on local, state, and federal levels for water quality protection on tribal lands has provided the WEPD staff the ability to bring issues to the forefront and build partnerships.

Washoe On The River Day: Education and Outreach for water protection.

Water Quality Accomplishments and Environmental Results

The WEPD staff has been successful in investigating the water quality on tribal lands in order to better protect their waters. In 1999, the Tribal Council approved a water code which protects the quality of Washoe's water resources for present and future generations. WEPD developed a water quality database in 2003 to track water quality and surface water data trends over time. The tribe is in the process of developing and revising its Water Quality Standards for approval by the Washoe Tribal Council.

The tribe developed an approved Nonpoint Source Assessment Report and Management Program Plan (NPS A&MP) and became eligible for funding under the CWA §319 Nonpoint Source Pollution Control Program in 2000. The tribe carried out a multi-year project funded by the Nonpoint Source (NPS) program on the Carson River. The program addressed temperature and turbidity water quality concerns, as identified in the water quality monitoring program, by stabilizing and revegetating the riverbanks within the boundaries of the reservation.

Carson River Watershed, surface water sampling downstream of Nonpoint Source Stewart Ranch Project.

Over time, Washoe Tribe's water quality monitoring results have shown seasonal trends in parameters such as high turbidity, temperature, and bacterial levels in the Carson River and the Clear Creek water systems. The tribe's EPA-approved Sampling and Analysis Program (SAP) and QAPP provide a systematic means to obtain and evaluate data that will allow the tribe to more effectively manage its surface water resources. WEPD plans to continue its monitoring program to determine the causes of these water quality pollutants.

Water quality monitoring on Clear Creek at Stewart Community has enabled WEPD staff to identify water quality pollutants that are negatively impacting the riparian area such as heavy sediment loading, turbidity, high fecal coliform, low dissolved oxygen, and physical (high sediment loading) parameter trends. In 2004 and 2005, the tribe was awarded NPS grants to begin restoration work on Lower Clear Creek including streambank restoration. Long-term results will reduce turbidity and sediment, and correct temperature impairments.

Yerington Paiute Tribe

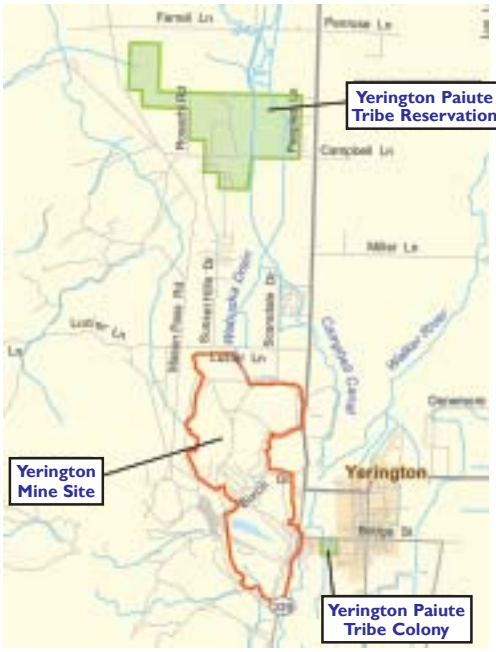
Introduction

The Yerington Paiute Tribe is located in western Nevada, approximately 85 miles southeast of Reno, near Yerington, Nevada. The reservation has two non-contiguous land areas: a 22-acre parcel located within the City of Yerington's boundaries, and a larger reservation of 1,631 acres located 10 miles north of the City of Yerington.

The Yerington Paiute Tribe recognizes that protection of groundwater is vital to the subsistence of its tribal members because groundwater is the only source of drinking water on the reservation. The tribe owns and operates a municipal water system that serves ninety homes and provides water to multiple administrative buildings including the Tribal Administration building, Tribal Health Clinic, and Social Services/Education building. The remainder of the residents on the reservation get their drinking water from private domestic wells.

There are two surface water conveyances on the reservation. The Campbell Canal is a partially unlined irrigation water delivery canal that originates from the diversion of water from the Walker River, just southeast of the Yerington Anaconda Mine site, and flows north through the Reservation. The Wabuska Drain is an irrigation return-flow drain that originates immediately north of the Yerington Anaconda Mine site and flows north through the reservation to the Walker River. The Wabuska Drain operates primarily by collecting return flows from crop irrigation and by intercepting shallow groundwater *(see map of the area above right.)*

In response to concerns expressed by local residents, U.S. Bureau of Land Management (BLM) officials investigated and determined that the Yerington Anaconda Mine site exhibits radiation levels 200 times above probable naturally occurring levels in soils. Although elemental uranium occurs naturally in the area, in addition to past Vat Leach extraction processing (mining activities), appear to have resulted in a significant increase in uranium concentrations at



Yerington, Nevada area.

the mine site. Currently, the mine site includes a large pit containing groundwater and numerous unlined evaporation ponds containing primarily storm water. Groundwater is also being pumped and stored in lined evaporation ponds on the site to prevent contaminated groundwater from migrating to the north toward the Reservation.

Description of Program

The Yerington Paiute Tribe's water quality program began in 2000, when the tribe received its first Clean Water Act (CWA) §106 grant and established a Water Quality Monitoring Program. Since May 2002, the Yerington Paiute Environmental Office has been monitoring water quality on the Reservation under an EPA-approved Sampling and Analysis Plan (SAP). The Environmental Office conducts quarterly sampling on the reservation to evaluate potential impacts from the Yerington Anaconda Mine site and other potential nonpoint sources, such as naturally occurring mineral deposits and agricultural runoff.

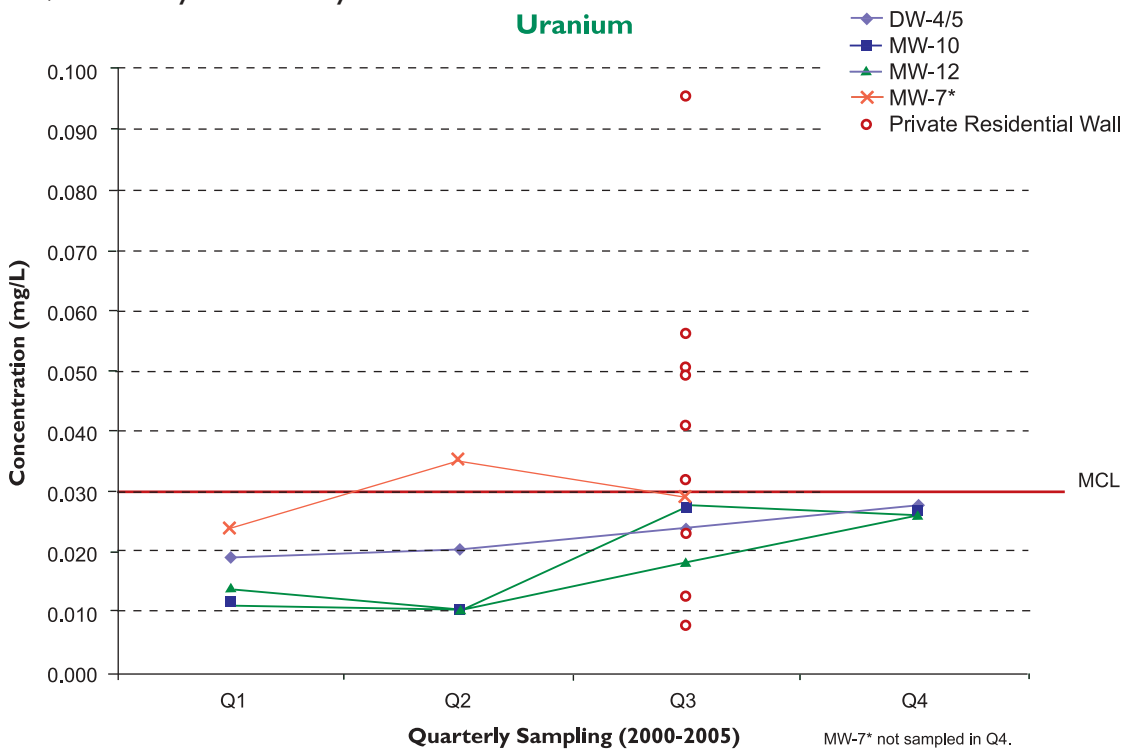
The tribe collects groundwater samples from a network of municipal supply and monitoring wells. In addition, when surface water is present, samples are collected from three locations in the Campbell Canal, and two locations in the Wabuska Drain. The

tribe's water quality technicians measure and record field parameters, using a YSI 600 XL Sonde and a YSI 500. Field parameters include water levels, pH, temperature, conductivity, and dissolved oxygen. Groundwater and quality control samples, which are collected using a submersible pump, are submitted to a contract laboratory for analysis of contaminants of concern. Current site investigations being conducted at the site by the Atlantic Richfield Company (ARCO) as a result of a Unilateral Administrative Order for Initial Response Activities (UAO 0-2005-2011) at the Yerington Anaconda Mine site have identified contaminants of concern including uranium, thorium, radium, gross alpha and gross beta. As a result, the tribe added uranium analysis to the monitoring program in August 2002. The tribe will also add radium 226/228, gross alpha, and gross beta to the list of field parameters to be analyzed during the 2005 – 2006 quarterly monitoring period.

Water Quality Accomplishments and Environmental Results

The Yerington Paiute Tribe has identified arsenic and uranium as contaminants of concern in groundwater on the reservation. Arsenic concentrations, which may be naturally occurring, routinely exceed the Maximum Contaminant Level (MCL) in the municipal wells. Uranium, which may be naturally occuring, has been detected above the MCL in one monitoring well (MW-7 [see figure below]) on the reservation. In October 2004, EPA sampled private residential drinking water wells on the reservation and uranium was detected in several residential wells at concentrations up to three times the current MCL (0.030 mg/L). As a result, ARCO, the potentially responsble party for the Yerington Anaconda Mine, is voluntarily supplying bottled drinking water to residents and administrative buildings on the reservation. The tribe continues to routinely monitor these contaminants to ensure safe drinking water for tribal members.

In an effort to protect water quality on the reservation, the Yerington Paiute Tribe has also developed and implemented a Source Water Assessment and Protection Plan and prepared an EPA-approved Nonpoint Source Assessment and Management Plan (NPS A&MP). In addition, it conducts ongoing oversight and monitoring of the progress on the Yerington Anaconda Mine site, and provides community outreach and environmental education. The tribe is also in the process of developing a water quality database to store data collected from the tribe's Water Quality Monitoring Program and from other monitoring activities conducted on or near the reservation, and will use this data for historical reference.



This graph represents multiple sampling events for uranium on the reservation. Notice that there were six samples over the MCL taken from private residential wells.

GLOSSARY

Algal Blooms: Simple rootless plants that grow in sunlit warm waters in proportion to the amount of available nutrients. They can affect water quality adversely by lowering the dissolved oxygen in the water.

Alluvial Fans: Sand deposited by flowing water, and when seen from a distance sometimes resembles a fan like shape.

Aquifer: An underground geological formation, or group of formations, containing water. Aquifers are sources of groundwater for wells and spring

Anadromous Fish: Fish that migrate from the sea up a river or stream to spawn.

Benthic Macro invertebrate Sampling: A method of determining water quality based on biologic characteristics of an aggregate of invertebrate organisms living on or at the bottom of a body of water.

Benzine: A liquid mixture of various hydrocarbons.

Berm: An edge or shoulder running alongside a road, canal, etc.

Bioaccumulants: Substances that increase in concentration in living organisms as they take in contaminated air, water, or food because the substances are very slowly metabolized or excreted.

Culvert: A drain or channel crossing under a road.

DCA: 1,2-Dichloroethane (1,2-DCA) is a colorless, oily, organic liquid with a sweet, chloroform-like odor. The greatest use of 1,2-dichloroethane is in making chemicals involved in plastics, rubber and synthetic textile fibers. Other uses include: as a solvent for resins and fats, photography, photocopying, cosmetics, drugs; and as a fumigant for grains and orchards.

Dissolved Oxygen (DO): The oxygen freely available in water, vital to fish and other aquatic life.

DOQQ: USGS Digital Orthophoto Quarter Quadrangle is a computer-generated image of an aerial photograph in which the image displacement caused by terrain relief and camera tilts has been removed. It combines the image characteristics of a photograph with the geometic qualities of a map.

Ephemeral Streams: A stream lasting a very short time, usually lasting one day.

Epifaunal Substrate: The amount and variety of hard stable substrates available to benthic macro invertebrates (i.e., substrates free of fine sediments).

Fecal Coliform: Bacteria found in the intestinal tracts of mammals. Their presence in the water or sludge is an indicator of pollution and possible contamination by pathogens.

Geographic Information System (GIS): A computer system designed for storing, manipulating, analyzing, and displaying data in a geographic context, like a map.

Grab Sampling: Collecting a single sample at a particular time and place that represents the composition of the water, air, or soil at that time and place.

Groundwater: The supply of fresh water down beneath the earth's surface, usually in aquifers, which supply wells in spring.

Hydro modification: Alteration of the hydrologic characteristics of coastal and noncoastal waters, which in turn could cause degradation of water resources.

Intermittent streams: Showing water only part of the year.

Management Measures: Formerly known as Best Management Practices. Methods that have been determined to be the most effective, practical means of preventing or reducing pollution from nonpoint sources.

Nonpoint Source: A diffuse pollution source (i.e. without a single point of origin or from a specific outlet). Rainfall, snowmelt, or irrigation runs over land or through the ground, picks up pollutants, and deposits them into rivers, lakes, or the ocean or introduces them into groundwater. Common nonpoint sources are agriculture, forestry, construction, and mining.

PCE: Tetrachloroethylene (PCE) is a colorless organic liquid with a mild, chloroform-like odor. Its greatest use is in the textile industry, and as a component of aerosol dry-cleaning products.

Perchlorate: Perchlorate is both a naturally occurring and man-made chemical. Most of the perchlorate manufactured in the United States is used as the primary ingredient of solid rocket propellant. Wastes from the manufacture and improper disposal of perchlorate-containing chemicals are increasingly being discovered in soil and water.

Point Source: A stationary location or fixed facility from which pollutants are discharged; any single identifiable source of pollution such as a pipe, and ditch, or a factory smokestack.

Potable: Water that is safe to drink.

Rapid Bioassessment: Biological assessment, or bioassessment, is an evaluation of the condition of a water-body using biological surveys and other direct measurements of the resident biota in surface waters. Rapid bioassesment is a synthe-sis of methods used in biological assessments. The basic information generated from these methods would enhance the coverage of broad geographical assessments.

Recharge: Specifically in reference to groundwater, it is the process by which water is added to a zone of saturation, usually by percolation from the soil surface.

Riparian Habitat: Areas adjacent to rivers and streams with the differing density, diversity, and productivity of plant and animal species relative to nearby upland.

Riprap: Broken stone used as a foundation for embankments in streams to prevent further erosion.

River Basin: The land area drained by a river and its tributaries.

Riverine Habitat: Habitat in the area of a river.

Seeps: Same as seepage (see below).

Seepage: Percolation of water through the soil from unlined canals, ditches, laterals, watercourses, or water storage facilities.

Silviculture: Management of forest land for timber.

Surface Water: All water naturally open to the atmosphere (rivers, lakes, reservoirs, ponds, streams, impoundments, seas, estuaries, etc.).

Turbidity: A cloudy condition in water to due to suspended silt or organic matter.

Wash: Depression or channel formed by flowing water.

Watershed: The land area that drains into a stream. The watershed for a major river may be made up of a number of small watersheds that ultimately combine at a common point.

ACRONYMS

BIA: Bureau of Indian Affairs

BLM: Bureau of Land Management

BMPs: Best Management Practices (also known as Management Measures)

CERCLA: Comprehensive Environmental Response, Compensation, and Liability Act (1980)

CWA: Clean Water Act

CFR: Code of Federal Regulations

DCA: 1,2-Dichloroethane (1,2-DCA)

DO: Dissolved Oxygen

EPA: Environmental Protection Agency

FAE: Financial Assistance Eligibility (also known as TAS).

GAP: General Assistance Program

GIS: Geographic Information System

MCL: Maximum Contaminant Level

NPDES: National Pollutant Discharge Elimination System

NPS: Nonpoint Source

NPS A&MP: Nonpoint Source Assessment and Management Plan

NRCS: Natural Resource Conservation Service

PCA: Principle Component Analysis

QAPP: Quality Assurance Program Plan

§: Section of the Clean Water Act

SAP: Sampling and Analysis Plan

STORET: Storage Retrieval Database

TAS: Treatment As a State (also known as FAE)

TCE: Trichloroethylene

TDS: Total Dissolved Solids

TSS: Total Suspended (non-filterable) Solids

TMDL: Total Maximum Daily Limit; Total Maximum Daily Load

USFWS: United States Fish and Wildlife Service

USGS: United States Geological Survey

WQS: Water Quality Standards

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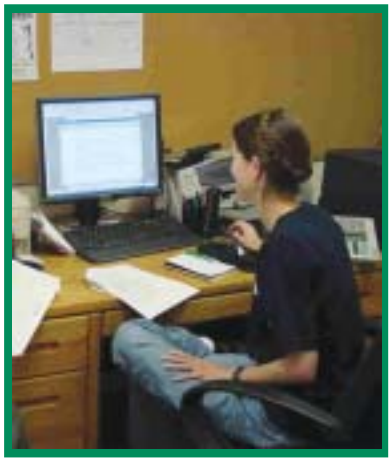

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