APPENDIX C

TAHQUITZ CANYON WETLAND CONSERVATION PLAN

Agua Caliente Band of Cahuilla Indians

Tahquitz Canyon Wetland Conservation Plan • 2000

Acknowledgements

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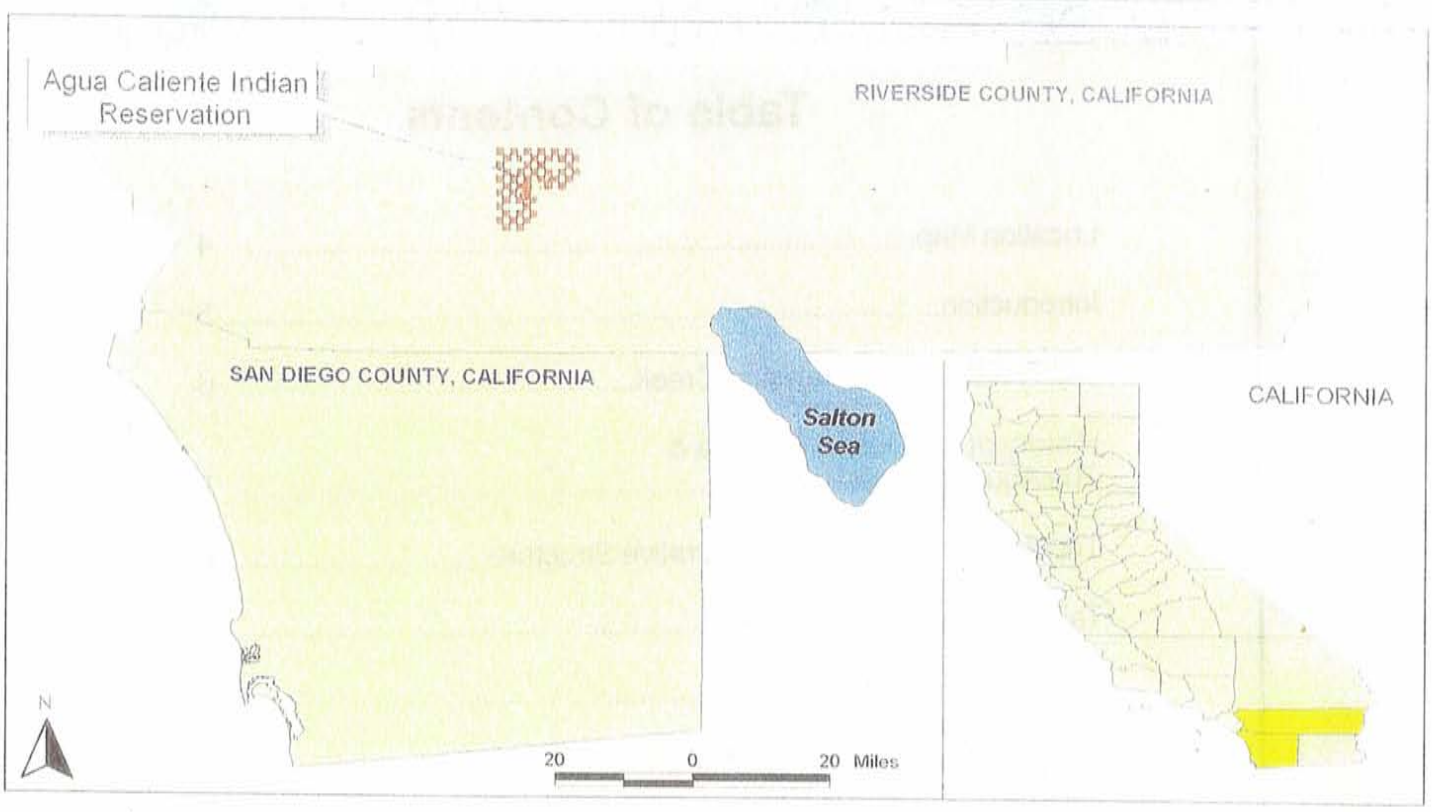
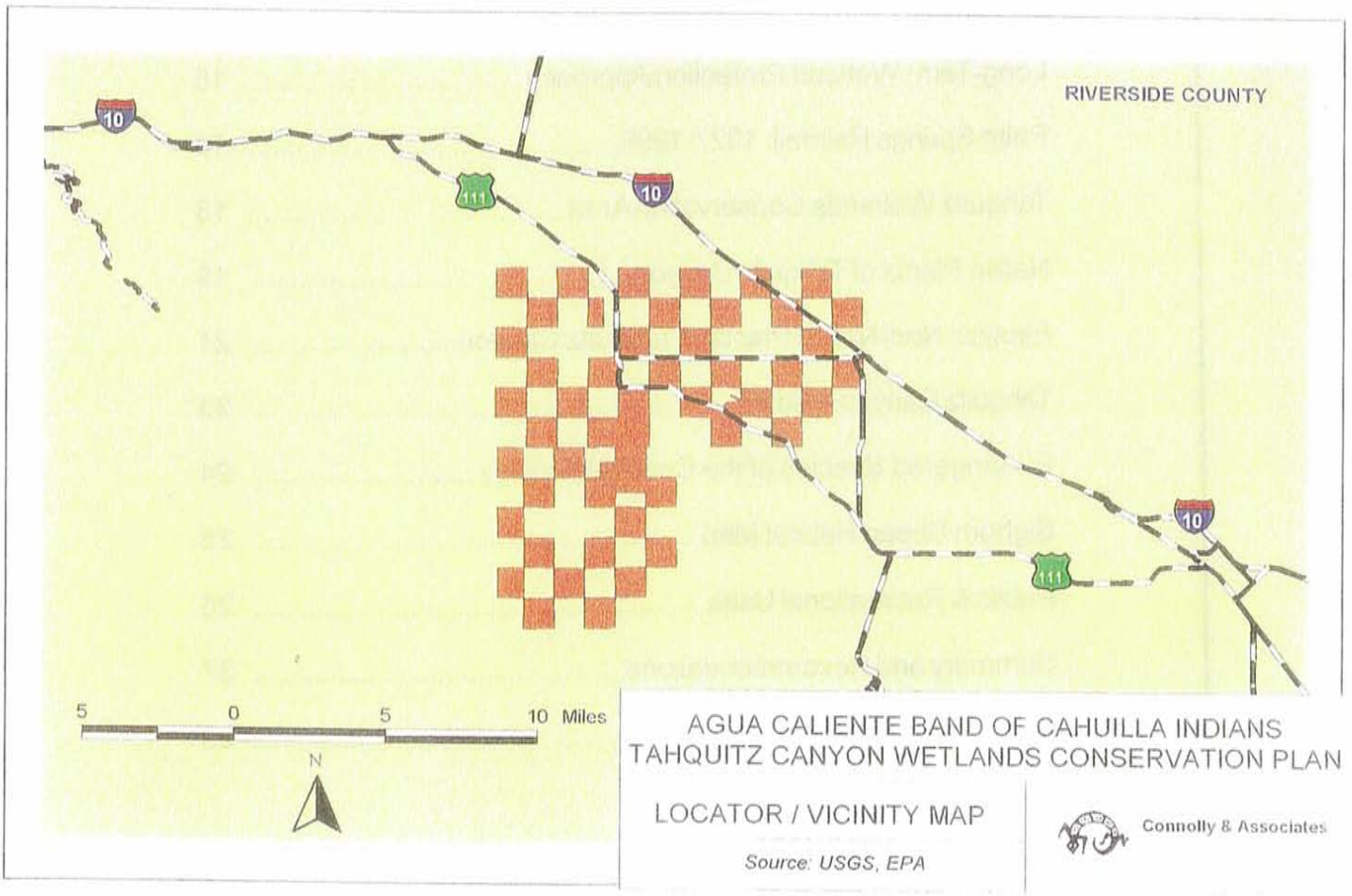


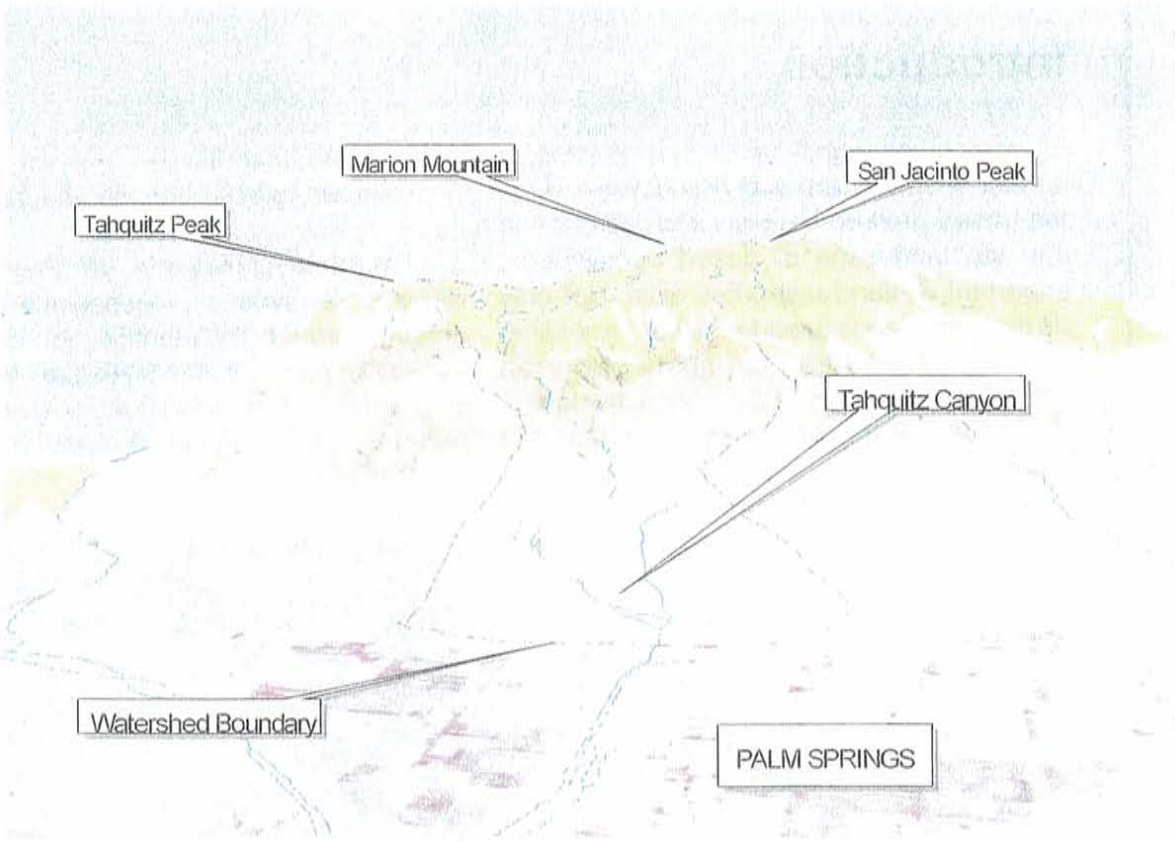


AGUA CALIENTE BAND OF CAHUILLA INDIANS
TAHQUITZ CANYON WETLANDS CONSERVATION PLAN

LOCATOR / VICINITY MAP

Source: USGS, EPA

Connolly & Associates



3-D terrain view of Tahquitz Canyon looking west from Palm Springs. A terrain model was used with digital USGS topographic maps to model the topography in the canyon.

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TAHQUITZ CANYON WETLANDS CONSERVATION PLAN

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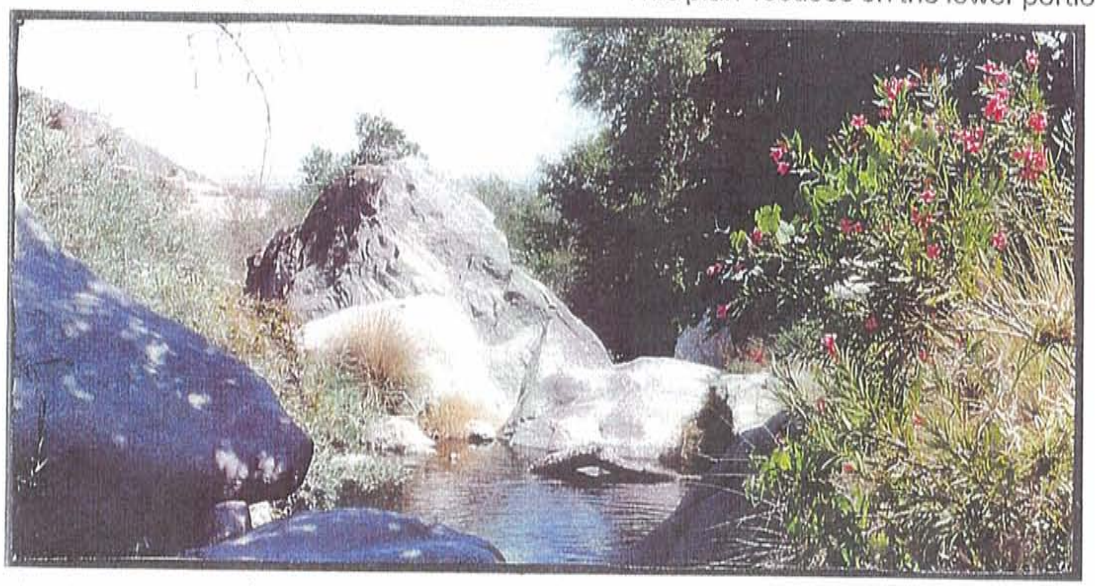
Introduction

The most significant factor in limiting habitat development and productivity within the desert environment is water. Yet, within the arid landscape of desert ecosystems, important wetland resources exist. Not only do these wetlands provide habitat for wildlife, but they contribute to the ability of human societies to thrive in otherwise hostile lands.

For the Agua Caliente Band of Cahuilla Indians, the wetland areas possess an additional and equally important dimension.



Wetlands are, to the Cahuilla people, historic regions which link the culture and traditions of the past with the economic necessities and culture of today.

Through mitigation, restoration and enhancement of the stream, this plan contains the following goals for Tahquitz Canyon:

- Reduce erosion
- Improve soil and water quality
- Improve and conserve wetlands
- Enhance fish and wildlife habitat
- Improve and maintain air quality
- Improve pasture and range conditions
- Reduce upstream flooding
- Improve woodlands
- Secure against erosion effects

The accomplishment of these goals requires a dynamic, responsive plan of action. Through the identification of current and past conditions, the development of plans to preserve or improve each aspect of the resource that is Tahquitz Canyon may be accomplished.

This plan focuses on the lower portion of the Canyon below the falls, which is quite different from the steep topography and rocky stream bed which give rise to dramatic changes in the upstream ecosystems.

This plan is the start of a conservation program that will incorporate further studies of Tahquitz Canyon, as well as more comprehensive studies and plans for other lands of the Agua Caliente people.

It represents a starting point from which the Tribe can begin the restoration and protection of its vital wetland resources. This plan will be subject to periodic review and update to include program successes and changing environmental conditions.

History of the Desert Cahuilla & The Agua Caliente Band

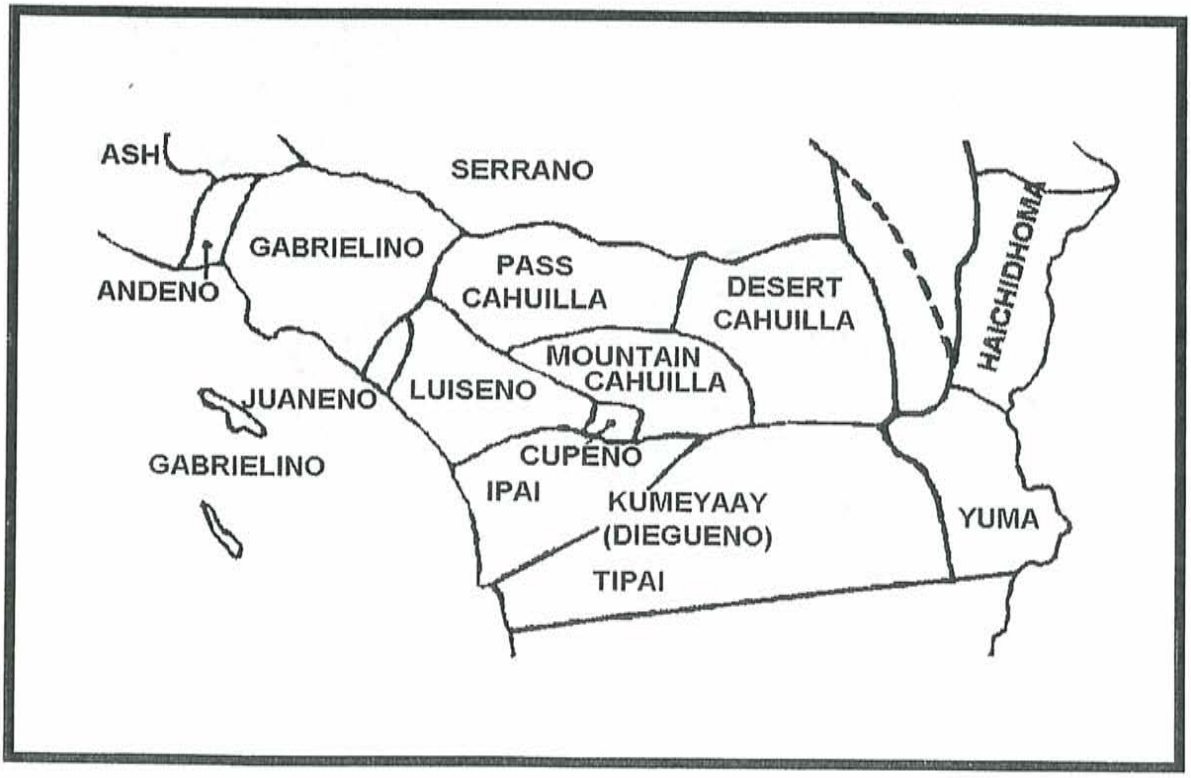
Consisting of many small communities located in and around Palm, Murray, Andreas, Tahquitz, and Chino Canyons, the Agua Caliente Band of Cahuilla Indians possessed a complex and well defined society long before the first Europeans reached North America. With as many as 200 residents in each village, several Cahuilla villages formed a larger territorial unit known as a "tribelet." Each tribelet recognized and divided its membership into lineages of both nuclear and extended family groups, with each branch receiving equal recognition in tribal and ceremonial life.

The traditional language of the Cahuilla has its roots in the Shoshonean branch of the Uto-Aztecan language family, which extends from the American Southwest far into central Mexico.

Always an independent people, the Cahuilla enjoyed a rich and active ceremonial life noted for an emphasis on peace and individual integrity.

Native palm trees provided dates which, along with pinon nuts, acorns, and mesquite beans served as staples of the Cahuilla diet. Agriculture also played an important role, primarily with the cultivation of melons, corn, squash and beans. When possible, this vegetarian fare was supplemented with rabbit, mountain sheep, deer, quail and squirrel. The agave plant served not only as a source of nutrition, but its fiber was used in the manufacture of fishing nets, sandals and many other useful items.

Until the later half of the 19th Century, due to the relative isolation of their desert homeland, the Cahuilla Indians were largely spared from the domination and abuses visited upon other California tribes.



Agua Caliente Band of Cahuilla Indians

Spanish colonization and the encroachment of non-Native American settlers brought many miseries to the Cahuilla.

Along with changes in diet and mistreatment by whites, measles and smallpox took a terrible toll on the Native population. There are only about 2,000 individuals living today who may properly claim Cahuilla descent. These survivors are scattered throughout Southern California, living not only on the Agua Caliente Reservation but on the Augustine, Cabazon, Cahuilla, Los Coyotes, Morongo, Ramona, Santa Rosa, Soboba, and Torres Martinez Reservations as well.

Tribal Government & Administrative Structure

Under a constitution and bylaws adopted on June 28, 1955 and last amended in 1992, the Agua Caliente Band of Cahuilla Indians is governed by a Tribal Council. The Council consists of five members including the Chairman, Vice-Chairman and Secretary who serve two-year terms and, two General Council members who are elected annually. Elections are held each March and are conducted by the general membership of the Agua Caliente Band. All tribal members aged 18-years and older are eligible to vote and run for office.

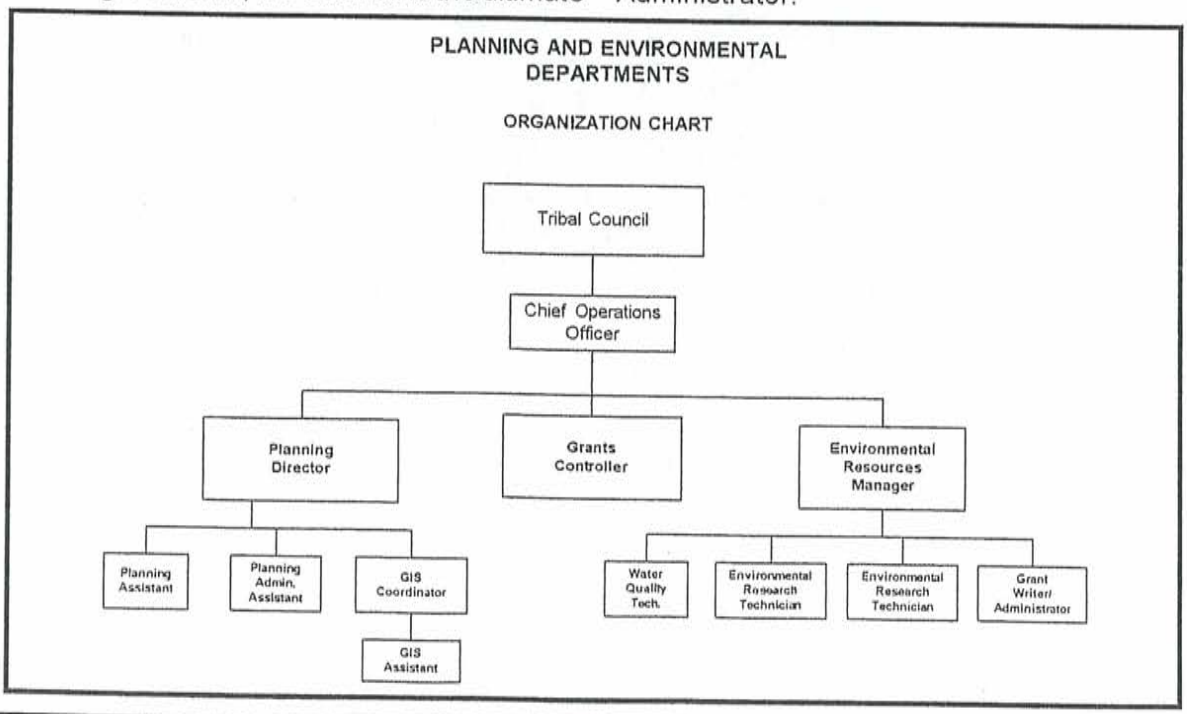
The Tribal Council is empowered, via the Constitution, to protect and preserve all Tribal property including wildlife and natural resources. The Constitution also mandates that the Council ensure the rights of all Tribal members to practice traditional cultural arts, crafts and religious activities.

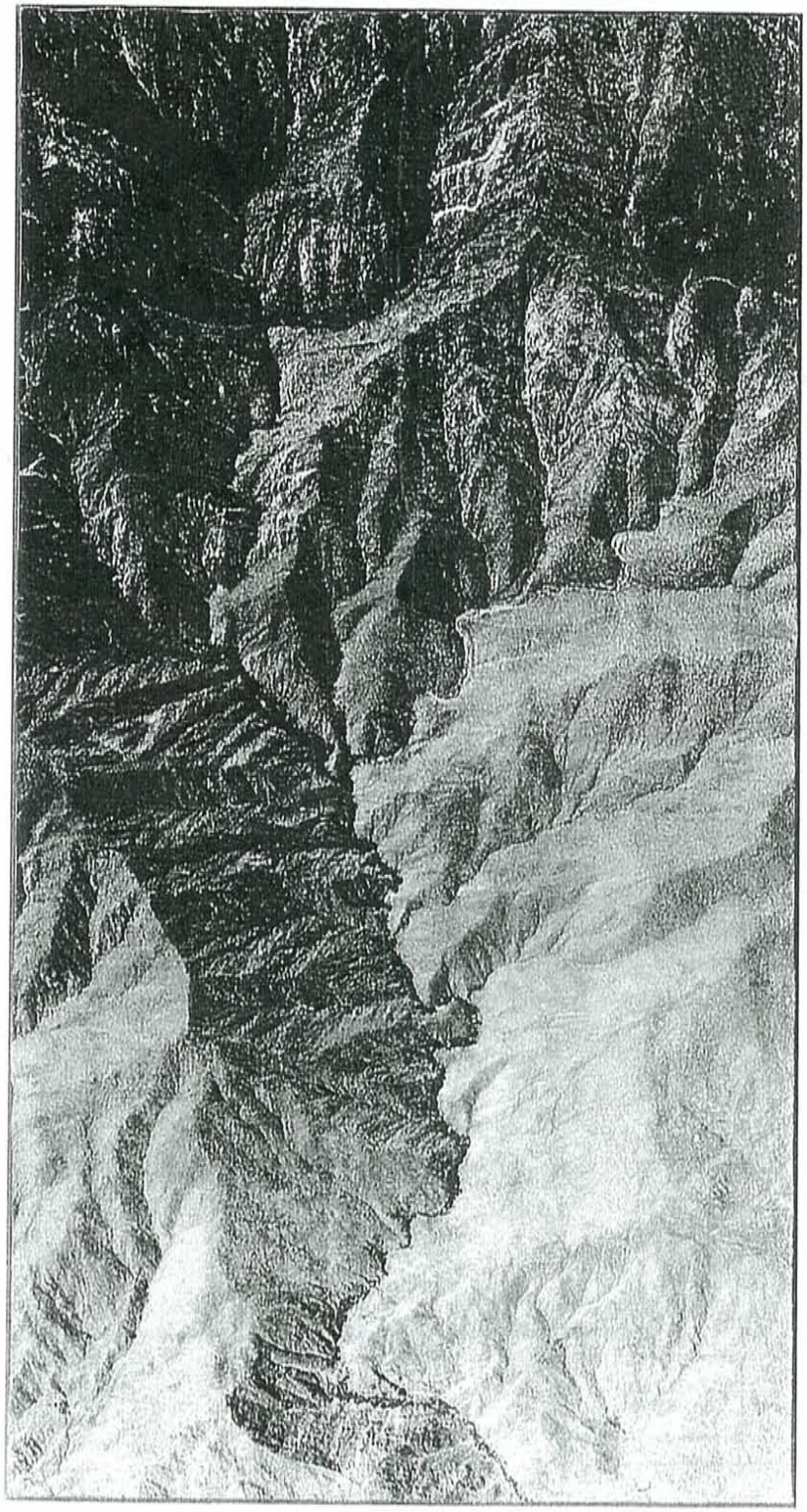
The Council is the Tribe's representative in all dealings with outside governments. Overseeing various land-use contracts and other agreements, the Council is the ultimate arbitrator in all matters that may affect Agua Caliente Tribal Trust lands.

Additionally, the Council maintains financial oversight of the Agua Caliente Band and all programs administered by the Tribal government.

Planning & Environmental Departments

The Planning and Environmental Departments of the Agua Caliente Band serve as the lead agencies in matters of development and environmental concern on the Reservation. The Planning and Environmental Departments, and Grants Controller report to the Tribal Council through a Chief Operations Officer. The Planning Department consists of the Director, a Planning Assistant, Planning Administrative Assistant, Geographic Information Systems (GIS) Coordinator and GIS Assistant. The Environmental Resources Department is made up of a Manager, a Water Quality Technician, two Environmental Research Technicians, and a Grant Writer/ Administrator.





Tahquitz Canyon: Aerial View

Tahquitz Canyon Geology

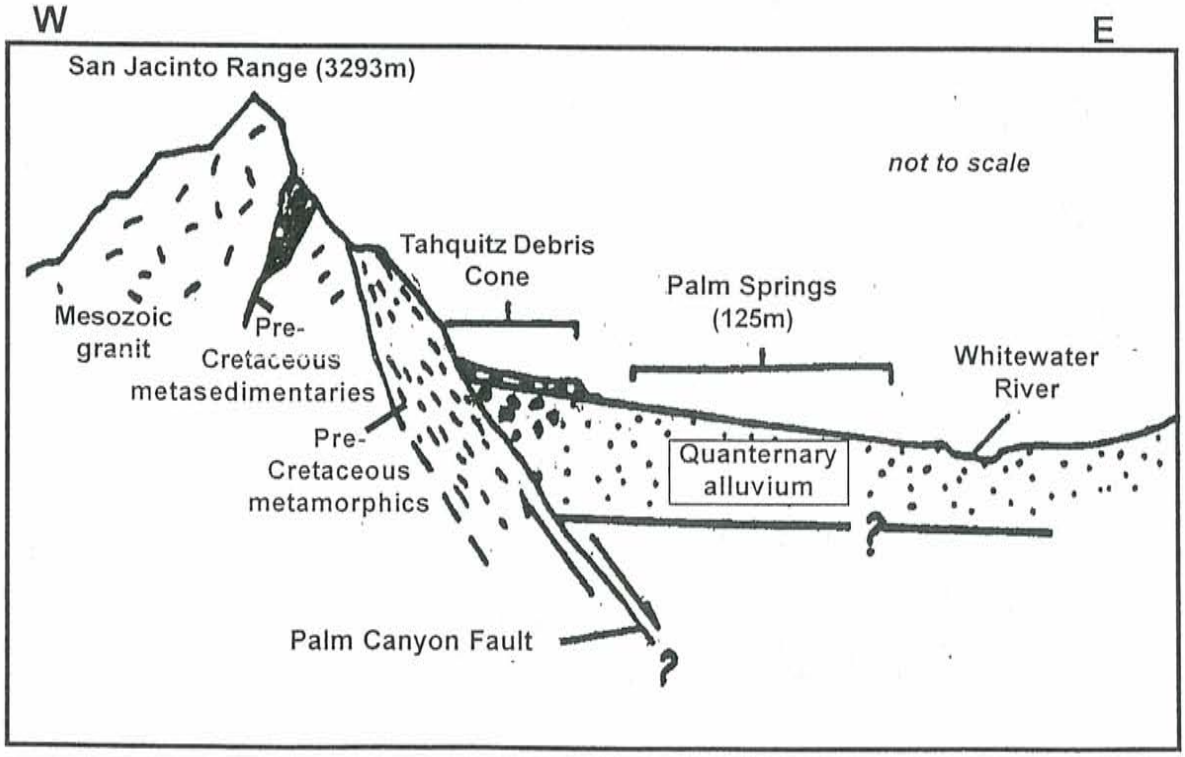
Tahquitz Canyon owes its existence to an unusually varied confluence of natural geologic and climatic features, not the least of which is it's proximity to the intersection of two major geographic areas — the Peninsular Mountain Ranges and the Colorado Desert.

Towering above Tahquitz Canyon, the steep slopes of the San Jacinto Mountains, along with earthquakes, temperature extremes and other factors, have all contributed to the area's unique geology.

Sheering along the eastern face of the San Jacinto Mountains has produced bedrock at the mouth of the Canyon which is composed primarily of schist and gneiss. However, the most significant factor shaping the geology of Tahquitz Canyon is Tahquitz Creek.

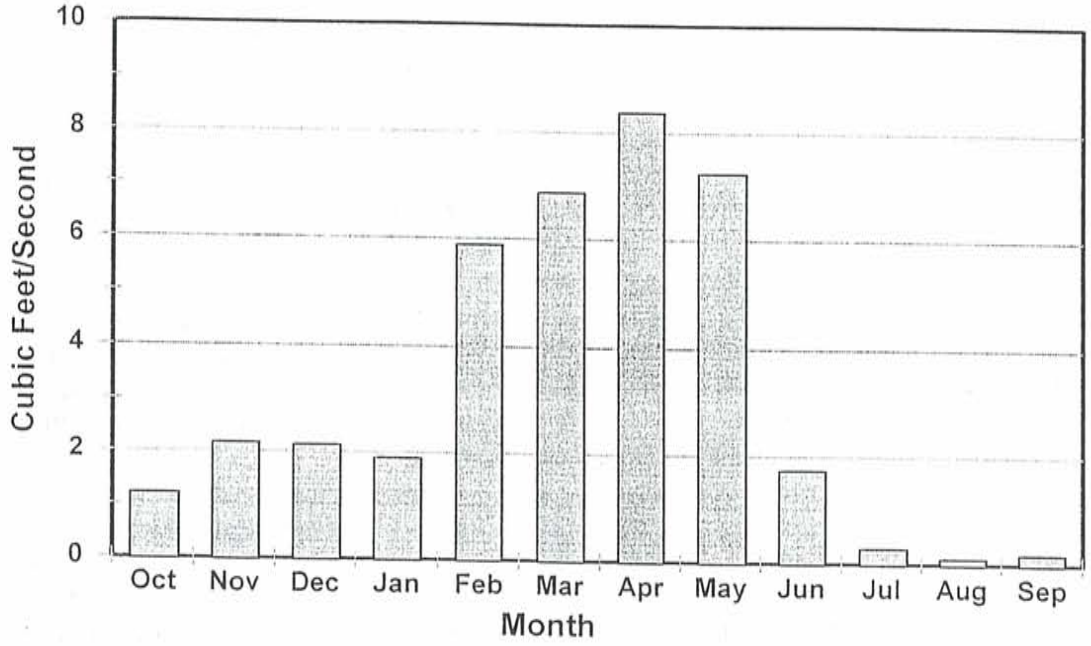
Alluvial deposits are commonly formed when steep mountain creeks flow out onto relatively flat surfaces. When these deposits take the shape of a cone, as they do at Tahquitz Creek, they are called alluvial fans. This Creek carries various sediments from the steep upper watershed and deposits them in the Tahquitz alluvial fan, which extends from the mouth of Tahquitz Canyon to the Whitewater River floodplain. Soils adjacent to the Creek include Carrizo stony sand and Carsitas cobbly sand, which are both very permeable.

Tahquitz Creek does not normally discharge to another body of water. Although a part of the Coachella Valley drainage into the Salton Sea, water from Tahquitz normally sinks into the alluvial fan at the canyon mouth.

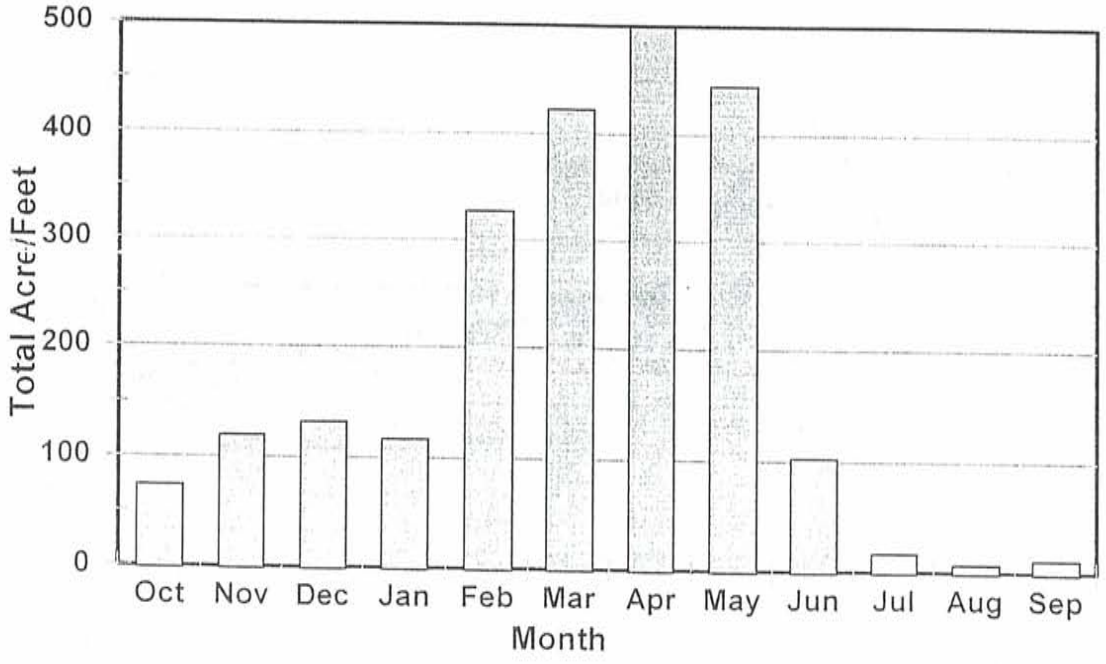


Cross Section of Tahquitz Canyon Area

Mean Water Flow of Tahquitz Creek
1993-1994



Monthly Total Water Flow
Tahquitz Creek 1993-1994



Wetlands

In general, wetlands are lands where saturation with water is the dominant factor determining the nature of soil development and the types of plant and animal communities living in the soil and on its surface. The single feature that most wetlands share is soil or substrate that is at least periodically saturated with or covered by water.[1]

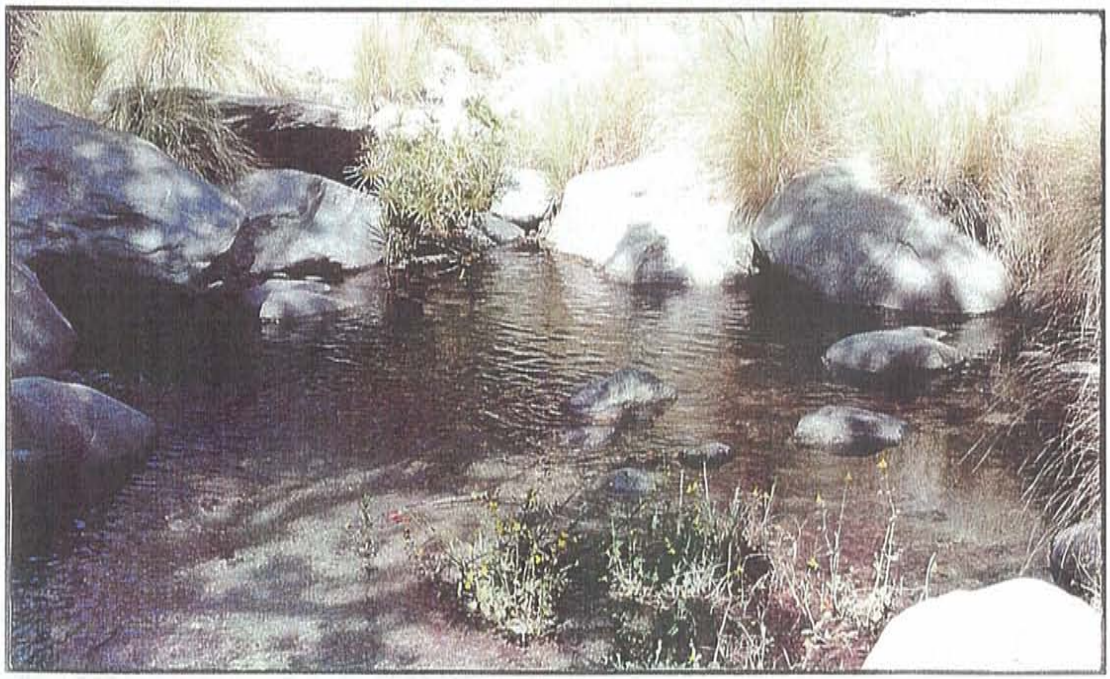
Among the many important ecologic functions of wetlands is the provision of habitat for mammals, amphibians, songbirds, fishes and migratory waterfowl. Wetland areas provide water, forage, and shade for animals, and also serve to purify the water as it moves through the area.

The cooling effect caused by evaporation and vegetation growing around the banks of wetlands helps many animals survive during periods of high temperatures. Additionally, wetlands are irreplaceable sources of ground water recharge and flood control.

These essential wetlands functions are of vital concern and are subject to the protections contained in this plan.

Under the Cowardin System (as described in "Classification of Wetlands and Deepwater Habitats of the United States by Lewis M. Cowardin, U.S. Fish and Wildlife Service, December 1979), Tahquitz Creek could generally be described as a Riverine System, Upper Perennial and/or Intermittent Subsystem, Rock Bottom Class. Riverine systems are bounded by the upland and by the channel bank and normally discharge to an ocean or lake. Unfortunately, the Cowardin System has some limitations. It's classification categories do not always cover terms of wetland function, basin size and shape, and water source.

[1]Classification of Wetlands and Deepwater Habitats of the United States by Lewis M. Cowardin, U.S. Fish and Wildlife Service, December 1979.



Agua Caliente Band of Cahuilla Indians

Tahquitz Canyon wetlands are primarily riparian in nature, occurring on the banks and floodplain of the stream. Flooding, along with the erosion and deposition of sediment, are common characteristics of riparian wetlands such as those found in Tahquitz Canyon.

Upstream from the mouth of the canyon, Tahquitz Creek generally flows year-round. Winter rains and the runoff from melting snows in the springtime allow the Creek to flow far to the east across the alluvial fan. As it spreads out over the fan much of the water in Tahquitz Creek seeps into the ground. During summer months the Creek carries only enough water to extend to the mouth of Tahquitz Canyon.

Domestic animal grazing, tree cutting and the erosion caused by water diversion are all past activities which have contributed to a decline in the quality of the Tahquitz riparian habitat. In many areas of the Canyon, exotic plants supplanted native vegetation and years of uncontrolled human intrusion took their toll. Litter, vandalism and other assaults on the ecosystem contributed greatly to the degradation of the stream.

In the 1990's, the Agua Caliente Band commenced a program aimed at the restoration of Tahquitz Canyon. Litter and other debris was removed, the effects of vandalism were mitigated, and human access to the area was controlled through regular patrols by Tribal Rangers.

To ensure the continued protection and restoration of the Tahquitz Canyon area, the Agua Caliente Band has prepared this wetlands conservation plan. With this plan's adoption, the Band seeks to formalize its goals toward the restoration and preservation of the unique Tahquitz Canyon wetland environment.

Long-Term Wetland Protection Approach

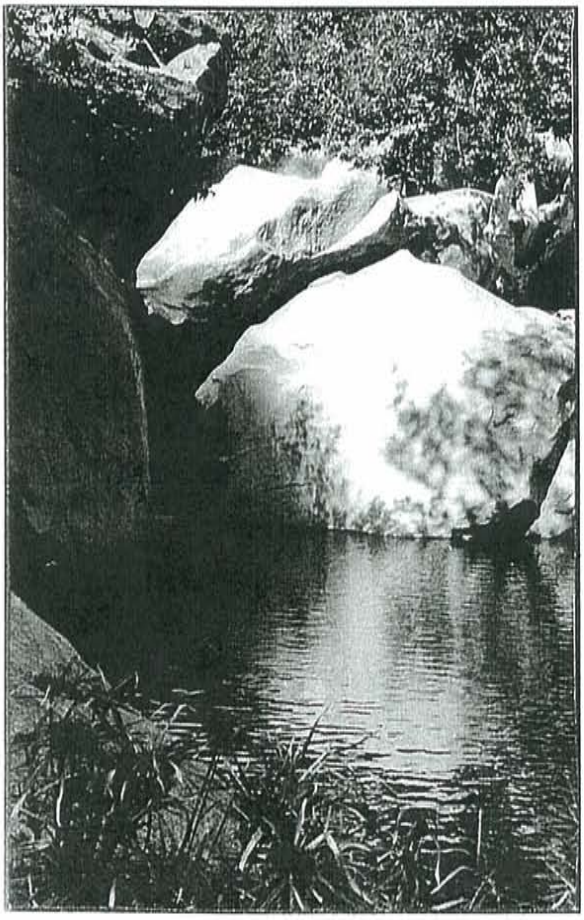
Wetland delineation is normally based on three factors:

- **Hydric Soils**
- **Water**
- **Wetland Plants**

The presence of any two of these attributes is generally considered an indication of the presence of a wetland area.

While this approach to wetland delineation may work in many areas, for the desert habitats of the Agua Caliente lands it may provide insufficient protection of Tribal resources.

Long-term climatic cycles may obliterate all traces of a wetland area. However, subsequent wet climatic cycles may cause the re-emergence of these wetlands.

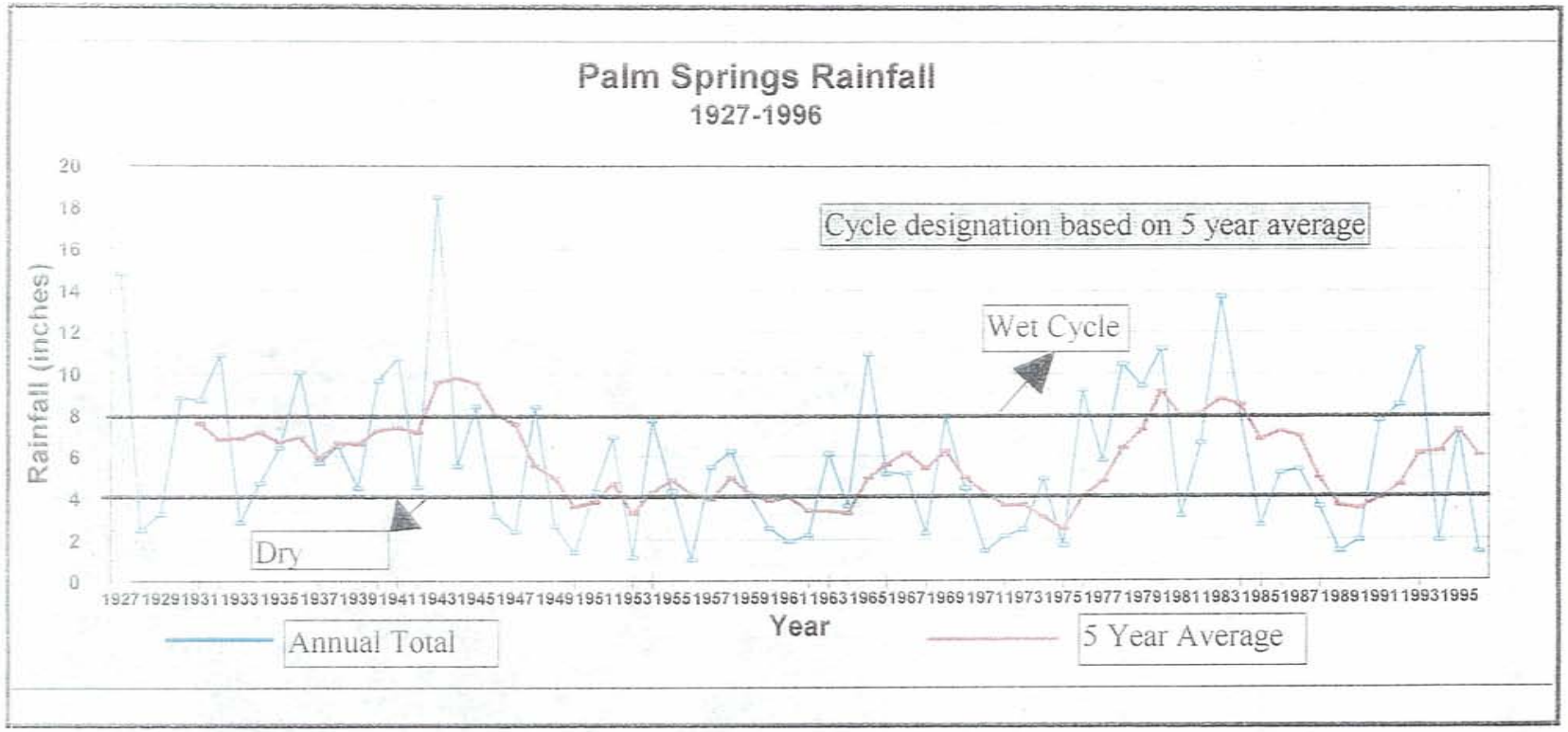


Rainfall patterns for the Palm Springs area show annual fluctuations from under two inches to over 10 inches since 1927. Long term trends appear to follow a 40-year pattern (although data is insufficient to make a definitive determination). We can, as a first step, characterize rainfall in broad categories of wet cycle, moderate cycle, and dry cycle of annual rainfall. Within these long term annual cycles we can identify the emergence and/or disappearance of wetland areas and correlate linkages to long-term precipitation patterns.

Monthly fluctuations over 70 years show a general pattern of rainfall. Wet season rainfall (and snow at the higher elevations) is certainly the greatest contributor to the Tahquitz Canyon system. These rains are the result of cold fronts moving in from the Pacific Ocean. Secondary, but important contribution to the rainfall picture are the summer thunderstorms and monsoon rains. Thunderheads build over the mountains during the summer and move out over the desert in unpredictable patterns. Monsoon rains are the remnants of hurricanes and tropical storms pushing up from the south.

The Agua Caliente Band seeks to ensure that dry cycle wetlands receive the highest protections and that wet cycle wetlands are not overlooked. To meet this challenge, the Band will establish the following approach to wetlands identification:

Dry Cycle Wetlands — those wetlands that exist continuously, even in the worst drought cycles. These wetlands represent the most critical resources and are accorded the highest level of protection.


Palm Springs Rainfall
1927-1996
Rainfall (inches)
0
2
4
6
8
10
12
14
16
18
20
1927 1929 1931 1933 1935 1937 1939 1941 1943 1945 1947 1949 1951 1953 1955 1957 1959 1961 1963 1965 1967 1969 1971 1973 1975 1977 1979 1981 1983 1985 1987 1989 1991 1993 1995
Year
Cycle designation based on 5 year average
Wet Cycle
Dry
Annual Total
5 Year Average

Moderate Cycle Wetlands — those wetlands that exist only during periods when the five-year running average rainfall is between 4 and 8 inches.

Wet Cycle Wetlands — those wetlands that exist only during periods of rainfall when the five-year running average is greater than 8 inches.

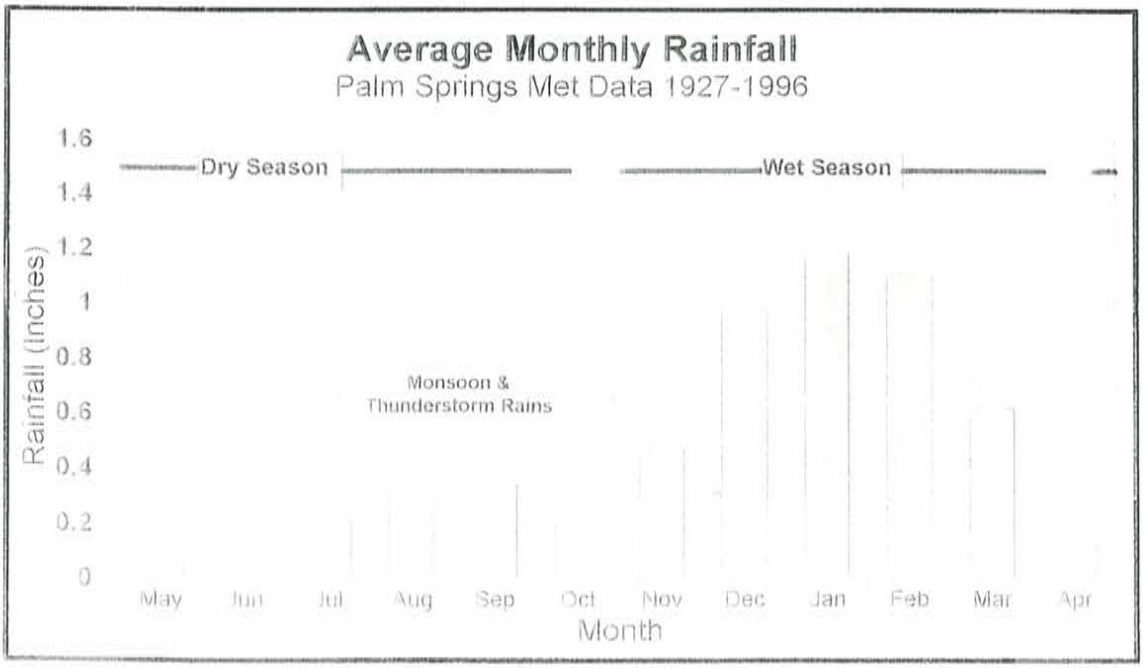
Seasonal Wetlands — seasonal affects on wetlands will be evaluated over time within the context of the general wet/mod/dry cycles. Some wetlands may appear only during the rainy season. Others may also appear during summer monsoon rains. Vernal pools, seeps and springs may result from localized periodic rainfall patterns. Many of these wetland areas may not fall into the standard definition of wetlands, yet may serve an important role in the life-cycle of some desert wildlife.

As a long-term standard, seasonal appearances of these wetland types will be recorded and incorporated into the overall protective plans for Tahquitz Canyon.

While all wetlands receive the protections mandated by federal law, wetlands will benefit from additional protection based on their priority classification. This tier system will also establish the basic classification system for any future wetland market trading program. This will ensure that wetlands are in the same classification to establish eligibility for offsetting development.

In keeping with its desire to exercise sovereign authority over its resources, the Agua Caliente Band is developing a comprehensive water quality management program to protect the existing high quality of waters in Tahquitz Canyon, and all Tribal surface and ground waters. This program includes development of water quality standards and long-term water quality monitoring and assessment, and laboratory capabilities, in accordance with the Clean Water Act.

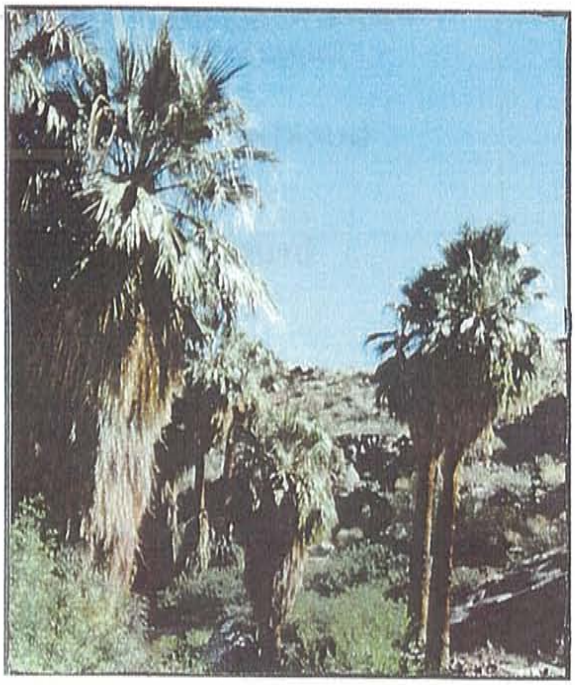
The Band also intends to develop watershed protection, wetlands management, and water conservation plans, and may also assume elements of the U.S. Environmental Protection Agency Section 401 water quality standards certification process and the U.S. Army Corps of Engineers Section 404 dredge and fill program.



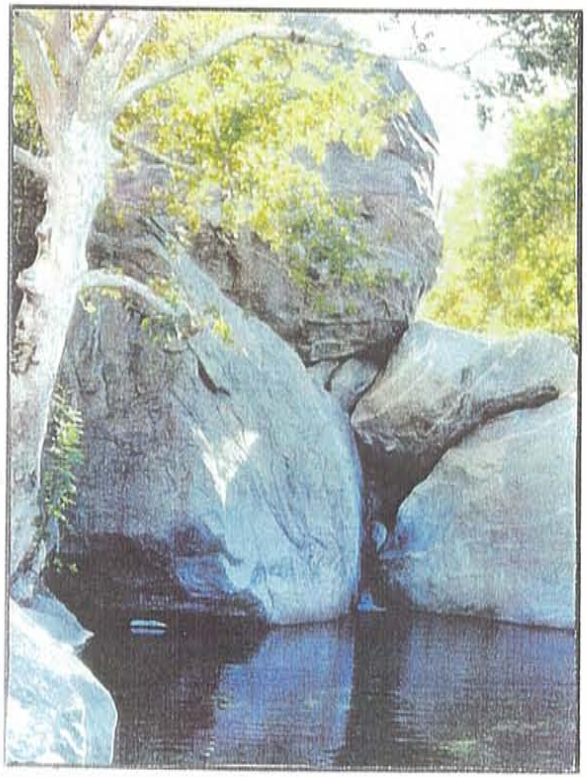
Native Plants of Tahquitz Canyon

Acre for acre the variety of plant life found in wetland areas rivals or surpasses that of almost any other type of habitat. The value of these plants to birds and other animals is without question. Of the approximately 140 species of birds found in California riparian areas, 88 are considered to be totally dependant on wetlands for their existence.

Unfortunately the most recognizable plant native to the area -- the California Fan Palm *(Washingtonia filifera)* -- has been virtually eliminated from the Tahquitz Canyon area, largely due to its use as a source of fuel and building materials by early settlers. Also known as the Desert Palm and the California Washingtonia, the California Fan Palm ranges from 20 to 60 feet tall. Valued as a food source by the early Cahuilla, the palm produces black berries with a large seed surrounded by a sweet pulp. The seeds were ground into flour and the pulp was eaten fresh or dried for later consumption. Fossil evidence indicates that the California Fan Palm once thrived throughout North America's western deserts and ranged as far as California's Pacific Coast. Now, the majestic palms are found primarily in southeastern California.



California Fan Palm

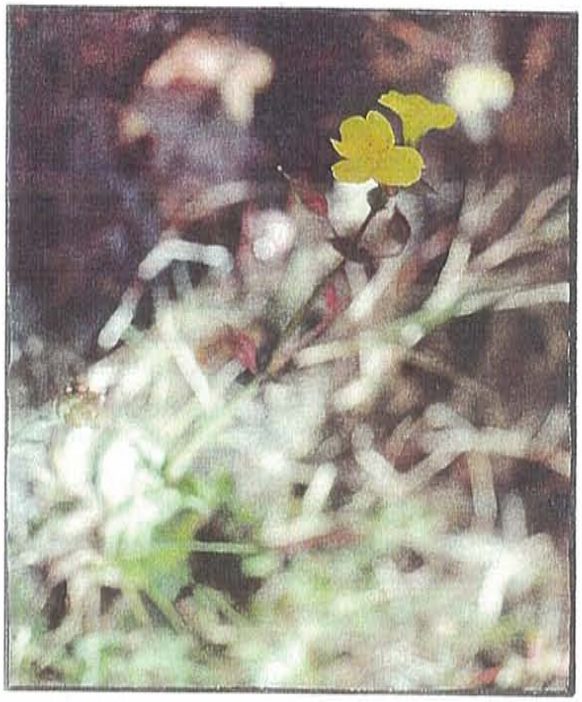


Sycamore

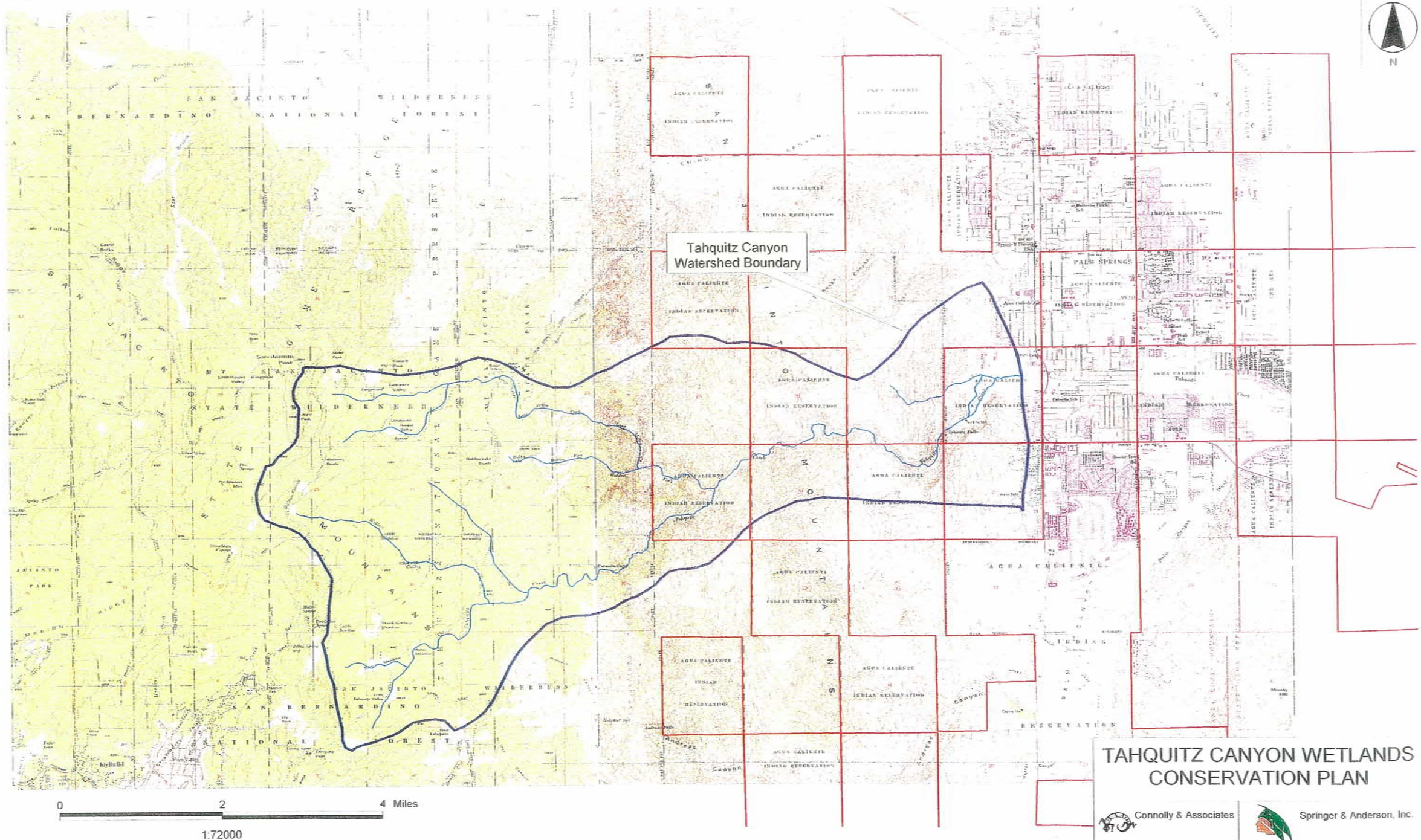
Another of Tahquitz Canyon's native trees is Fremont's Cottonwood *(Populus fremontii)*. Named for early western explorer Major John Fremont, these trees were known as a sure indicator of water due to their propensity to grow in watersheds along streams. Freemont Cottonwoods are easily identified by their broad, triangular shaped leaves edged with coarse, rounded teeth. These trees are an important source of nutrition for browsing animals such as mule deer, which find the foliage and twigs of the Cottonwood irresistible.

Plants found to occur in lower Tahquitz Canyon[2]*:*

buckthorn cholla
cattail
brittlebush
oak
creosote
Fremont cottonwood
buckwheat
desert lavender
yerba santa
catclaw acacia
chuparosa
desert apricot
desert almond
desert mistletoe
jojoba
sycamore
wild grape
sweetbush
apricot mallow
monkey flower
California fuschia
goldenbush
willow
honey mesquite



[2] Casual survey conducted April 9, 1999 by K. Leuschner, Desert Cities Bird Club, C.O.D., D. Walker, College of the Desert, and M. Clayton, Coachella Valley Wild Bird Center



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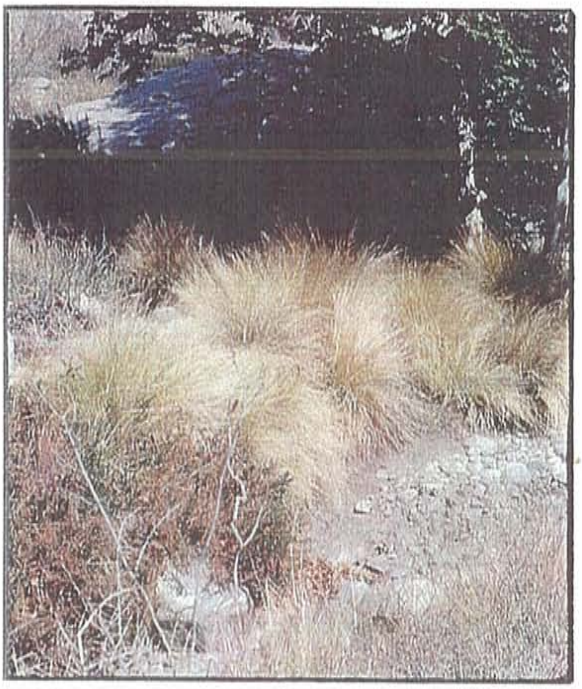
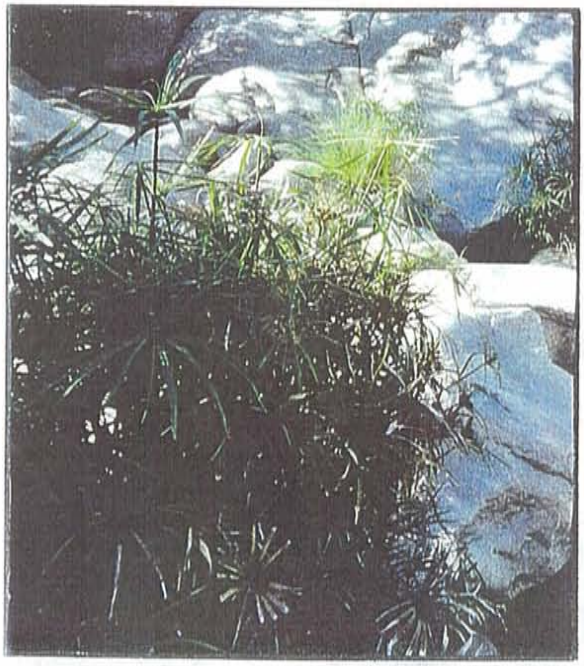
Exotics:Non-Native Plants of Tahquitz Canyon

Plants which are not considered native to Tahquitz Canyon are referred to as "exotics." While many so-called exotic plants present little or no threat to the natural habitat, others may be extremely intrusive, often crowding and severely limiting the growth of native vegetation. In the Canyon area three plants, fountaingrass, umbrella flat sedge and, tamarisk, are considered to be of primary concern due to their extremely invasive characteristics. Results of a vegetative survey for Tahquitz are found in Appendix 1.

Various control measures are utilized by the Agua Caliente Band to keep the influx of exotics in check. Control techniques are largely physical, relying for the most part on manual cutting or extraction of the plants and frequently checking for renewed growth. When necessary, the removal of persistent exotics may require the minimal and carefully monitored application of herbicides.



Fountaingrass



Umbrella Flat Sedge

Fountaingrass

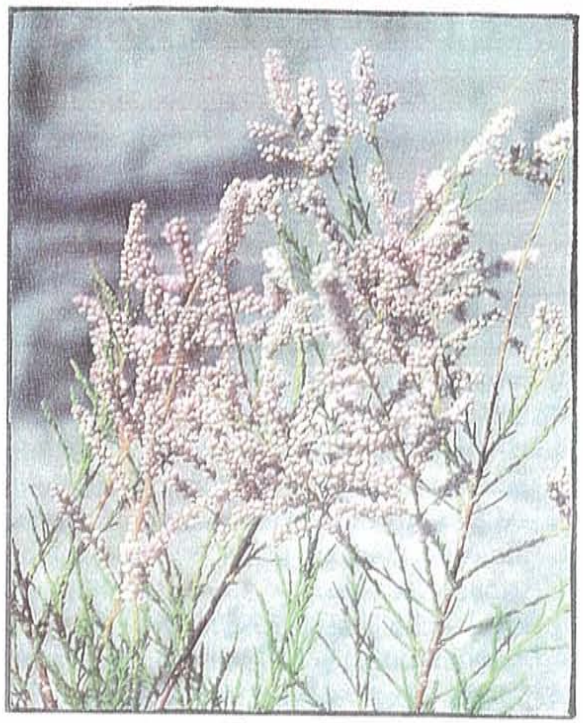
One plant invader is fountaingrass *(Pennisetum setaceum)*. Native to tropical Africa, southwestern Asia, and Arabia, fountaingrass has a host of traits which make it a very real threat to the Tahquitz Canyon habitat. Fountaingrass has long been used in Southern California gardens as an ornamental requiring very little water. Unfortunately, its seeds are easily dispersed by wind, water, and birds, allowing it to establish itself in delicate habitats. When fountaingrass finds its way into areas like Tahquitz Canyon, it quickly supplants native grasses and becomes a persistent pest. Control of this plant is exacerbated by the ability of its seeds to lie dormant in the ground for up to seven years.

Umbrella flat sedge

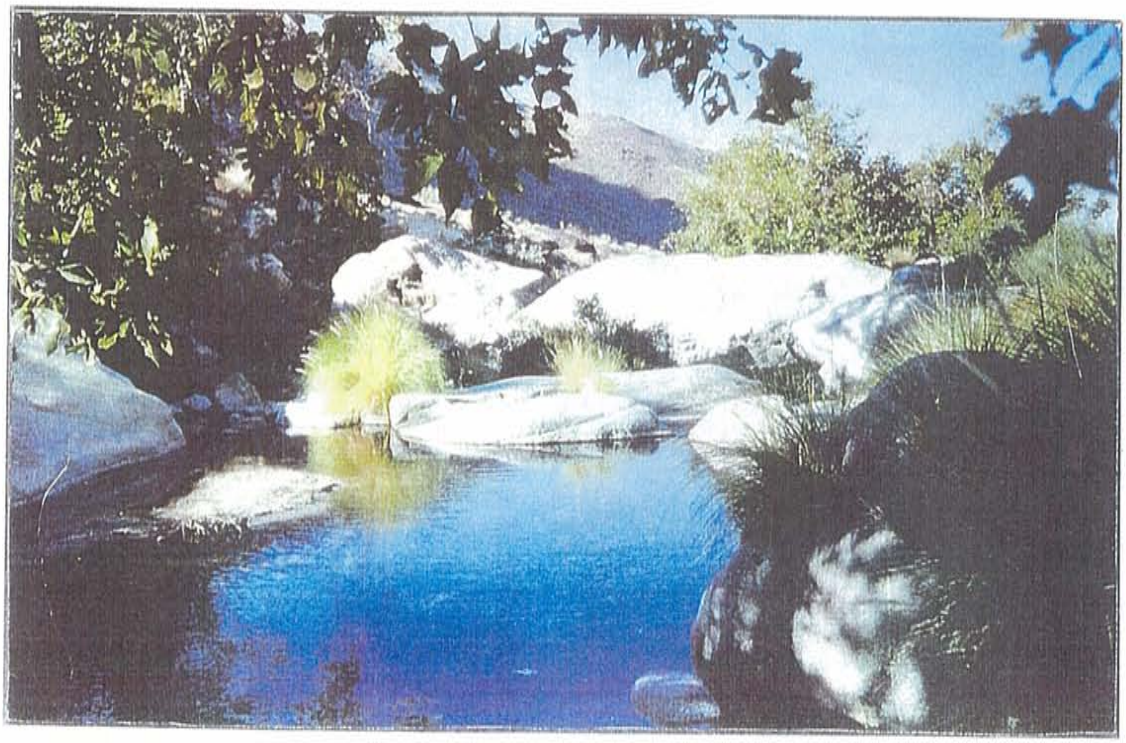
Another non-native intruder in the Tahquitz Canyon area is Umbrella flat sedge *(Cyperus alternifolius)*, a plant native to Madagascar and the Philippines. This plant, characterized by its long, narrow pointed spikelets, was first cultivated in the Southwest as an ornamental garden plant. Umbrella flat sedge is quite invasive in warm climates, and if its roots are not confined, it will take the place of delicate riparian species.

Tamarisk

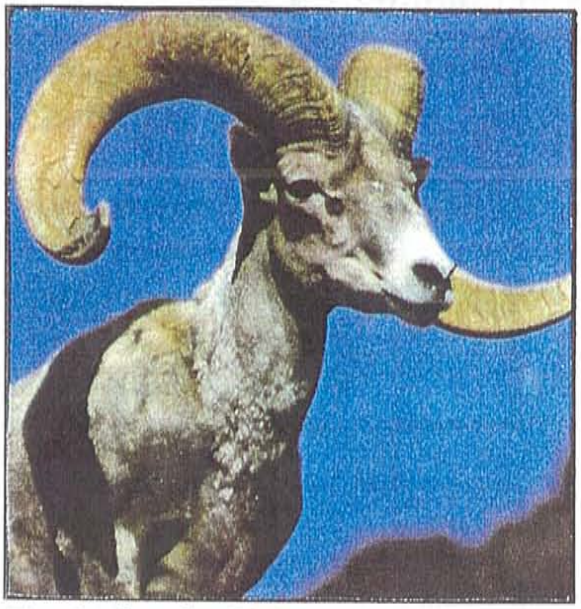
Often referred to as salt cedar, due to a tendency to ooze salt from its leaves, tamarisk *(Tamarix spp.)* is a particularly aggressive exotic intruder in the Tahquitz Canyon ecosystem. Native to China and Japan, tamarisk is difficult to control, and it is particularly harmful to sensitive riparian areas because it extracts large amounts of water from the ground, transforming valuable desert streams into dry, salty basins.



Tamarisk



Tahquitz Canyon Wildlife



The Peninsular Bighorn Sheep: *Officially listed as an Endangered Species in 1998 by the U.S. Fish and Wildlife Service.*

Riparian habitats have been vanishing from the Southern California landscape at an alarming rate. It is estimated that more than 90-percent of the wetlands in California have disappeared in the past 100 years. This extreme loss of wetland habitat makes preservation of the remaining 10-percent all the more imperative.

To the casual observer of Tahquitz Canyon, the quantity and diversity of animal life may not be readily apparent. However, a close inspection of the riparian and non-riparian areas of Tahquitz reveals an abundance of creatures — all specially adapted to the unique environment and all dependent on the maintenance of that environment for their continued survival.

While each living creature has unique requirements to ensure it's continued existence, all share common necessities such as food, water and shelter. Tahquitz Canyon provides these resources for a multitude of creatures.

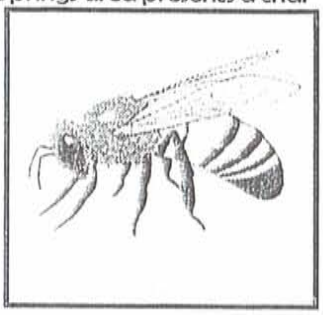
The diversity of animal life found in Tahquitz Canyon may be traced to the complexity of the habitats it provides and the ability of wildlife species to exist in different niches in the same location. Evidence of such niche overlap is displayed by the maps in Appendix 2. The evolution of animal behavior and needs allows wildlife in the same habitat to share common resources and to use different resources in the same locale, in a non-competitive and mutually beneficial manner.

Many of the animals which depend on habitats found in Tahquitz Canyon are listed as rare or endangered. Others may approach these unfortunate designations without the continued efforts of groups such as the Agua Caliente Band of Cahuilla Indians to restore these threatened areas.

An unwanted intruder:

Africanized Honey Bees

More of a nuisance to human visitors than a threat to the habitat, the arrival of so-called "killer bees" in the Palm Springs area presents a challenge to those wishing to enjoy the recreational aspects of the area.



While the sting from a single Africanized bee is no more harmful than that of the common European honey bee, the tendency of killer bees to attack in large numbers and to defend their nests aggressively has earned them the respect of cautious outdoor recreation enthusiasts.

Endangered Species of Coachella Valley which may occur in Tahquitz Canyon

Endangered Mammals:

Peninsular Bighorn Sheep
Palm Springs Ground Squirrel
Palm Springs Pocket Mouse
Southern Yellow Bat

Endangered Reptiles:

Coachella Valley Fringe-toed Lizard
Flat-tailed Horned Lizard
Desert Slender Salamander
Arroyo Toad
Desert Tortoise

Endangered Birds:

Burrowing Owl
Crissal Thrasher
Gray Vireo
Ash-Throated Flycatcher
Le Conti's Thrasher
Southwestern Willow Flycatcher
Summer Tanager
Yellow Breasted Chat
Least Bell's Vireo
Yellow Warbler

Endangered Plants:

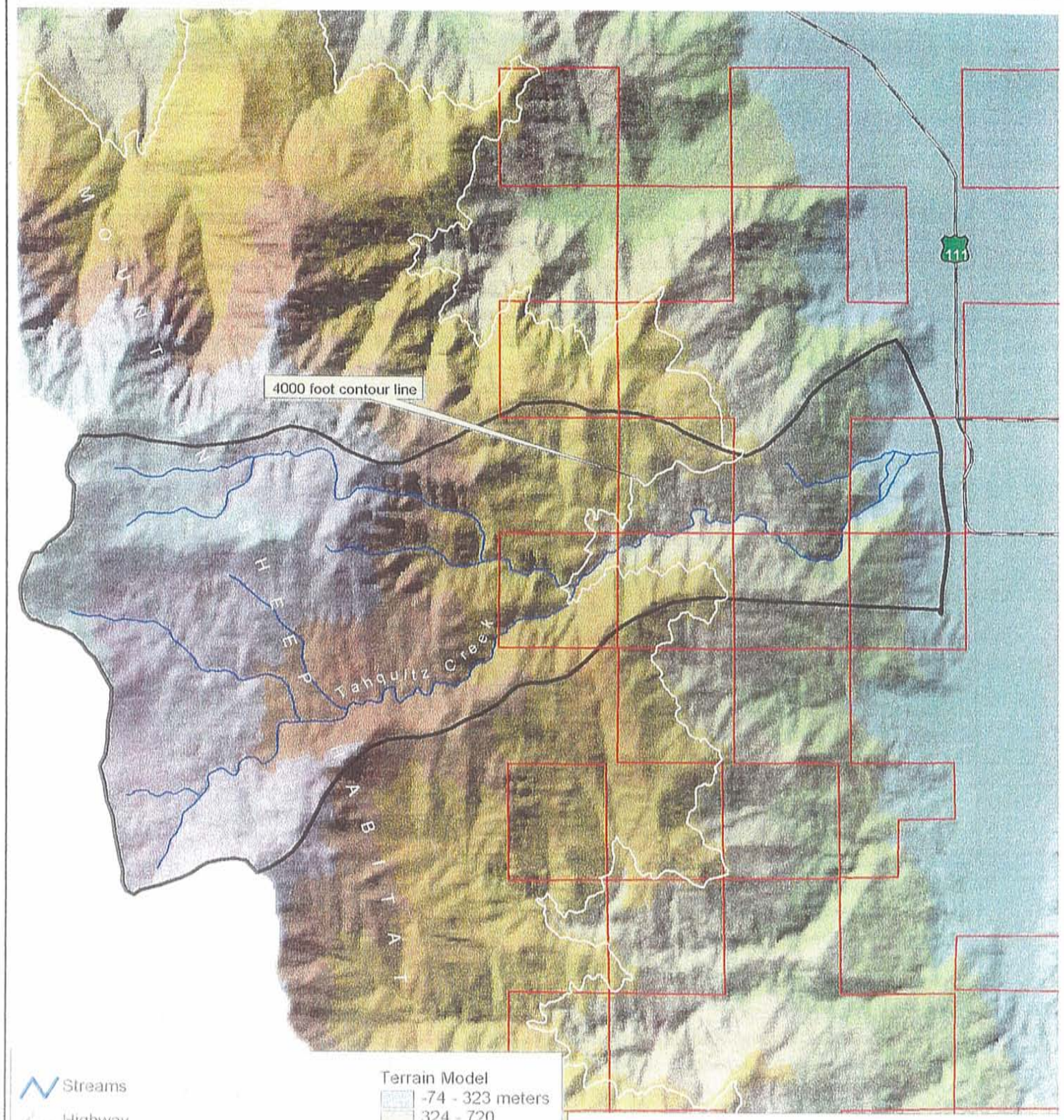
Coachella Valley Milk-Vetch
Triple-Ribbed Milk-Vetch
Little San Bernadino Gilia
Mecca Aster
Orocopia Sage

Endangered Insects:

Casey's June Beetle
Coachella Valley Grasshopper
Coachella Valley Jerusalem Cricket
Coachella Giant Sand Treader Cricket

An unwanted intruder: Red Imported Fire Ants

The red imported fire ant has invaded the warm, moist Palm Springs environment. Known for their aggressive behavior, fire ants interfere with outdoor activities and, most importantly, harm native wildlife.



TAHQUITZ CANYON WETLANDS CONSERVATION PLAN

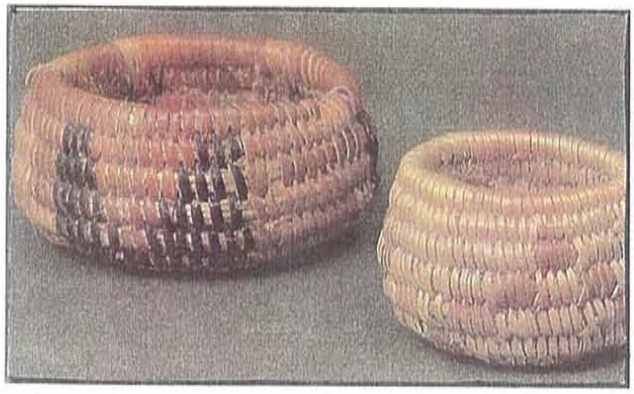
Connolly & Associates

Springer & Anderson, Inc

Public & Recreational Uses

Although the area is currently closed to public visitation, the Agua Caliente Band plans to develop a 26-acre park in and around Tahquitz Canyon. The park will include an interpretive center, as well as equestrian, picnicking, and hiking facilities, which will allow visitors the chance to experience Tahquitz Canyon with little impact on the natural ecology.

For those wishing an experience away from the glitter and golf courses more commonly offered at desert resorts, the 1,200-square foot visitor's facility will offer guests a glimpse into another culture. Located at the entrance to the Canyon, the interpretive center will include a 600-square-foot observation deck offering spectacular views of the natural beauty in Tahquitz Canyon. Along with exhibits of Tribal artifacts, visitors to the Center will have the opportunity to study rock art, examine the intricacies of ancient irrigation systems, and learn more about the Cahuillas' way of life. Educational exhibits will depict the natural ecology, wildlife, plants, and geology of the Canyon and a theater area will stage a narration on the rich cultural history of the Agua Caliente Band.



A system of hiking and equestrian trails, with appropriate signage, lighting and environmental controls, will lead out into the Canyon from the interpretive center facility. Plans include a trail through a reconstructed Indian village, with signs along the way to identify and explain the use of various Cahuilla tools and handicrafts.

Hikers and riders will also be able to view traditional Indian shelters, along with demonstrations of sacred rituals and ceremonies.

An interpretive garden trail, located near the Visitor's Center, will give hikers the opportunity to study important native plants and to see how they were once used by the Cahuilla. Many of the plant species which have disappeared from the area will be propagated from seed and reintroduced.

An area for picnickers is planned adjacent to the Visitor's Center. Able to accommodate several small groups, the picnic area will also allow for large group activities such as barbecues and other events.

Groups arriving by bus will utilize a circular drive in front of the Visitor's Center which will allow passenger drop off. Busses will then continue to a remote parking area located in the southeast corner of the 26-acre site. Parking for up to sixty passenger cars is planned adjacent to the Visitor's Center allowing easy access for all. Overflow parking will also be available at the remote parking area.

This park will serve as a delightful cultural and recreational facility for the general public. In addition, it will provide economic enhancement opportunities for the City of Palm Springs and the Agua Caliente Band of Cahuilla Indians.

Most importantly, the Tahquitz Canyon Park will protect the natural environment of the area by limiting access to more ecologically sensitive tracts, and it will help to educate the public regarding the natural desert wetland environment, and its first inhabitants.

Summary & Recommendations

This plan outlines the purpose, goals and objectives for protection of the Tahquitz Canyon wetlands. It includes discussions of the importance of the Canyon to the Cahuilla people, both historically, and as a contemporary expression of culture. The geology and hydrology are explained, with their impacts to the wetland areas. Native plants and animals of the Canyon are noted, as well as some exotic invaders and efforts to control their intrusion.

The Agua Caliente Band has already launched initiatives aimed at protecting and improving the Canyon. By limiting access and cleaning up the years of litter and vandalism, both the appearance and the functionality of the habitat have vastly improved.

The Band is also moving forward with a Tribal water quality management program under the Clean Water Act. This program will effect water quality protection of the waters of the Reservation, and will assist restoration and enhancement measures in Tahquitz Creek.

Recommendations:

From this report we can directly establish several recommendations for future actions:

1. Protect the wetlands as a cultural resource, maintaining native plants and removing exotics under specific removal programs.
2. Restrict or prohibit recreational activities, such as off-road vehicles, horseback riding, camping and swimming.
3. Develop a stable trail system and restrict hikers to the trails. Trails should be placed as far as possible from the riparian habitat. Final design of the trail system should incorporate considerations of the volume and nature of visitor traffic expected. Further studies should include an assessment of the timing and size of tour groups, both guided and un-guided.
4. Perform an annual survey of plant and animal species.
5. Monitor and record the emergence/ disappearance of wetland areas over time and protect the most critical, based on established priority characteristics.
6. Monitor impacts and control access by limiting hours or increasing fees to achieve a sustainable level of activity.
7. Restrict hiking tours to the first falls for safety reasons.
8. Continue to track meteorological and stream flow data.
9. Investigate the possibility of assuming 404 and/or 401 responsibilities for wetlands.
10. Designate areas for traditional gathering practices and work to enhance the traditional resources.
11. Reintroduce native plants and animals into restored areas.
12. Train staff in wetlands delineation, bioassessments and survey techniques.
13. Perform additional studies in the Upper Tahquitz Canyon area above the falls.
14. Incorporate Tahquitz Canyon studies within a comprehensive Indian Canyons Management Plan.
15. Incorporate Tahquitz Canyon studies into the Tribe's Multispecies Habitat Conservation Plan.

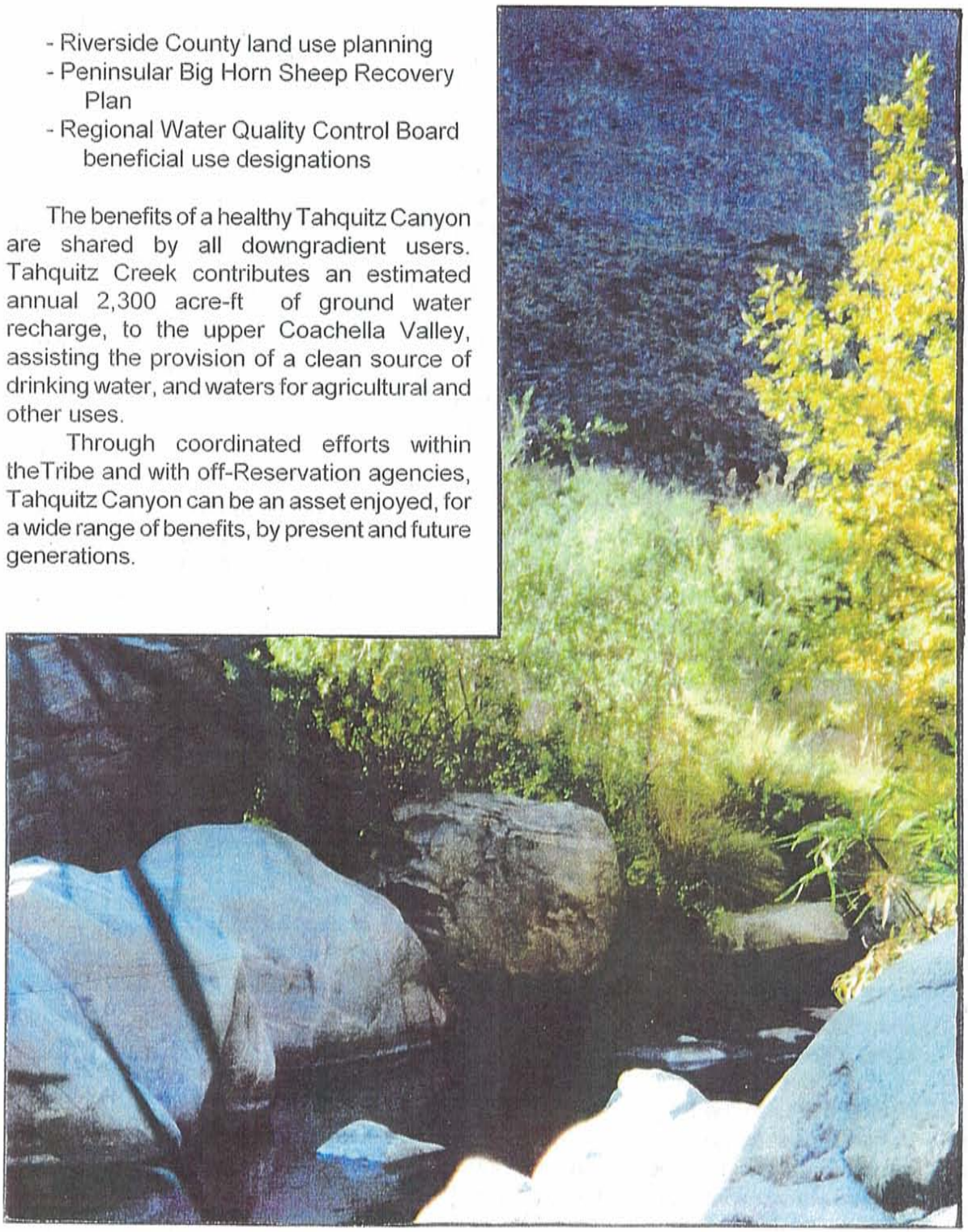
Additionally, the Tribe should actively participate in, or at least monitor, several regional initiatives which overlap Tribal efforts . These include:

- Least Bell's Vireo Recovery Plan
- Coachella Valley Multiple Species Conservation Plan

- Riverside County land use planning
- Peninsular Big Horn Sheep Recovery Plan
- Regional Water Quality Control Board beneficial use designations

The benefits of a healthy Tahquitz Canyon are shared by all downgradient users. Tahquitz Creek contributes an estimated annual 2,300 acre-ft of ground water recharge, to the upper Coachella Valley, assisting the provision of a clean source of drinking water, and waters for agricultural and other uses.

Through coordinated efforts within theTribe and with off-Reservation agencies, Tahquitz Canyon can be an asset enjoyed, for a wide range of benefits, by present and future generations.



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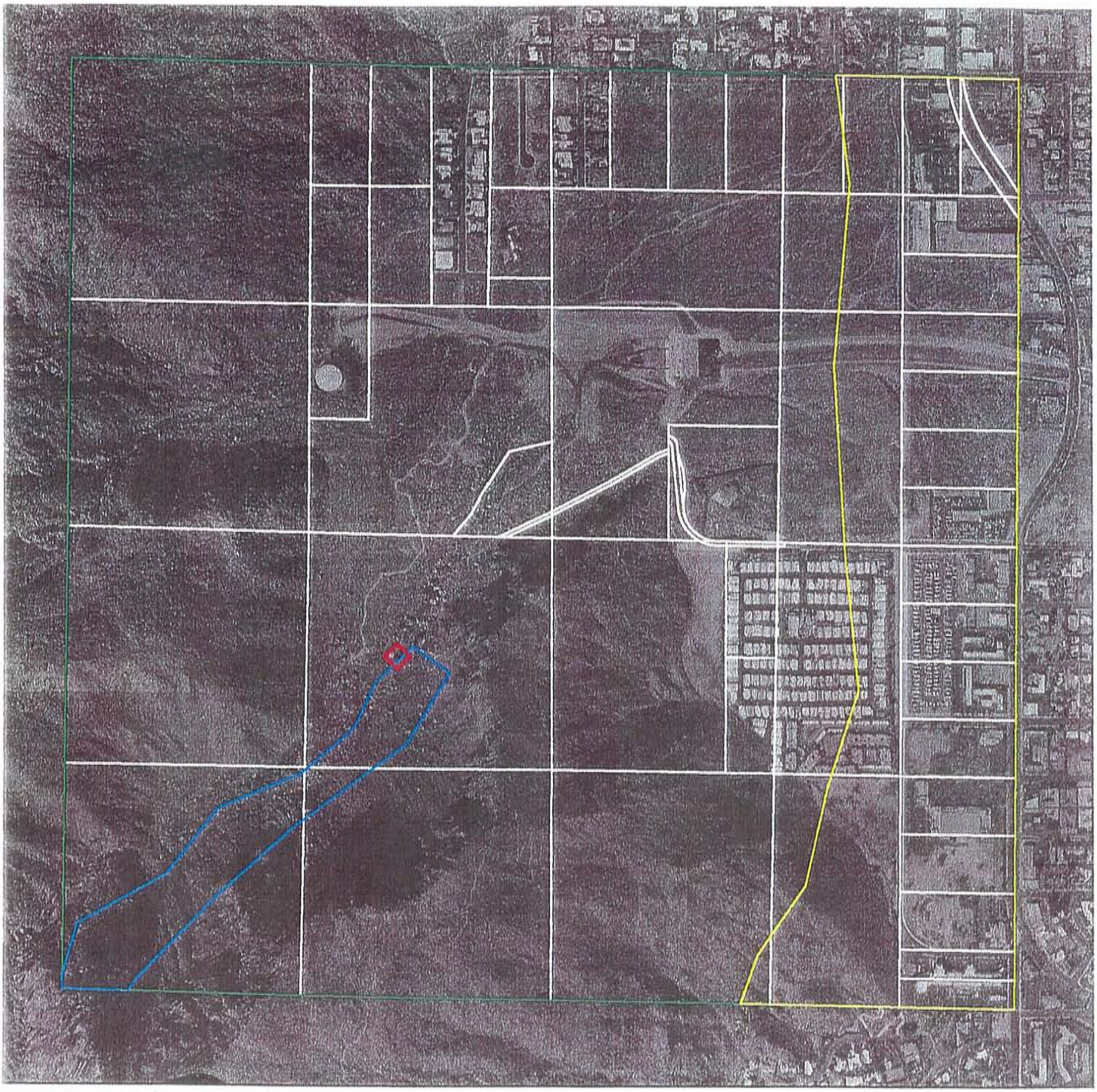
APPENDIX 1

Tahquitz Canyon
Vegetative Survey & Maps

Tanquitz Biological Survey: Plants Streamside

	Staked April '99 Counted 5/3/99	Counter Ron Cordes / Barbara Wicker					
	4 X 50' X 50' Sub-Section	SouthWest		SouthEast	NorthWest	NorthEast	4 Section
Register	Plant Name	# Counted	Notations	# Counted	# Counted	# Counted	Totals
Ref #							
1	*Pennisetum setaceum*	38		11	37	56	142
	Common Name: Fountain Grass/Rubrum						
2		2		1	3		6
	Common Name: Sycamore Trees						
3							
	Live Oak	0		0	1	0	1
4							
	Desert Lavender	0		0	0	1	1
5	*Acacia Greggii*	1		5	3	0	9
	Common Name: Cat Claw/"Wait a Minute"						
6	*Encelia farinosa*, BrittleBrush	5		4	0	0	9
	Common Name: Brittle Bush/Phenicodonta						
7		0		3	1	2	6
	Common Name: Umbrella Grass/Plant						
8	*Mimulus spp. (Figwort Family)*	0		16	1	18	35
	Common Name: Monkey Flower						
	Photo Cross Reference #						
	pg 51 Muriel Sweet: Common edible						
9		0		3	0	0	3
	Foxtails/Grass						
	Common Name:						
10		0		2	20	5	27
	Common Name: Ragweed				3'6" height colony	very large 6' across	
11	Chuparosa: Beloperone californica	8	3'-6' colonies	4		5	17
	Spanish for "Sucking Rose"					3'-6' colonies	
12	*Chilopsis Linearis:*					1	1
	Desert Willow: Bignonia Family						
13	Desert Sage	0		0		3	3
14	Creeping Fescue	20		10	0	10	40
		colony 4' X 8' approx area					
15	Noxious Weeds	7			6	12	25

Note: this chart redrawn from original for legibility and sizing purposes, data content is unchanged except for minor typographical corrections. Connolly, Jan. 2000



TAHQUITZ CANYON
Natural Communities used to Model Sensitive Habitat Distributions

AGUA CALIENTE INDIAN RESERVATION
Riverside County, California
Section 22 T4S R4E SBBM
June 1, 1998

PROJECT FUNDING:
State Wetlands Protection Development Grant
U. S. Environmental Protection Agency
Region 9

Reservation Townships with Section of Interest Highlighted

GEOGRAPHIC INFORMATION SYSTEMS
Agua Caliente Band of Cahuilla Indians
GIS Services
Cartographer: Beth A. Wenstrom

SCALE

250 0 250 500 750 1000 Feet
100 0 100 200 Meters

LEGEND

Natural Communites (Vegetation Types)
- Study Boundary
- Urban
- Tract Boundaries
- Southern Sycamore-Alder Riparian Woodland
- Sonoran Mixed Woody and Succulent Scrub

REFERENCES:
Data obtained from Bureau of Land Management
Palm Springs - South Coast Field Office
Coachella Valley Multiple Species
Habitat Conservation Plan
Natural Communities Database
April 21, 1999

GEOGRAPHIC DATA PARAMETERS:
State Plane Projection
North American Datum 1983
Zone 6
Land Status as of May 26, 1999

TAHQUITZ CANYON
Sensitive Habitat Distribution Model for
Southern Sycamore - Alder Riparian Woodland Community
AGUA CALIENTE INDIAN RESERVATION
Riverside County, California
Section 22 T4S R4E SBBM
June 1, 1998

PROJECT FUNDING:
State Wetlands Protection Development Grant
U. S. Environmental Protection Agency
Region 9

Reservation Townships with Section of Interest Highlighted

GEOGRAPHIC INFORMATION SYSTEMS
Agua Caliente Band of Cahuilla Indians
GIS Services
Geographer Beth A. Wenman

SCALE

LEGEND

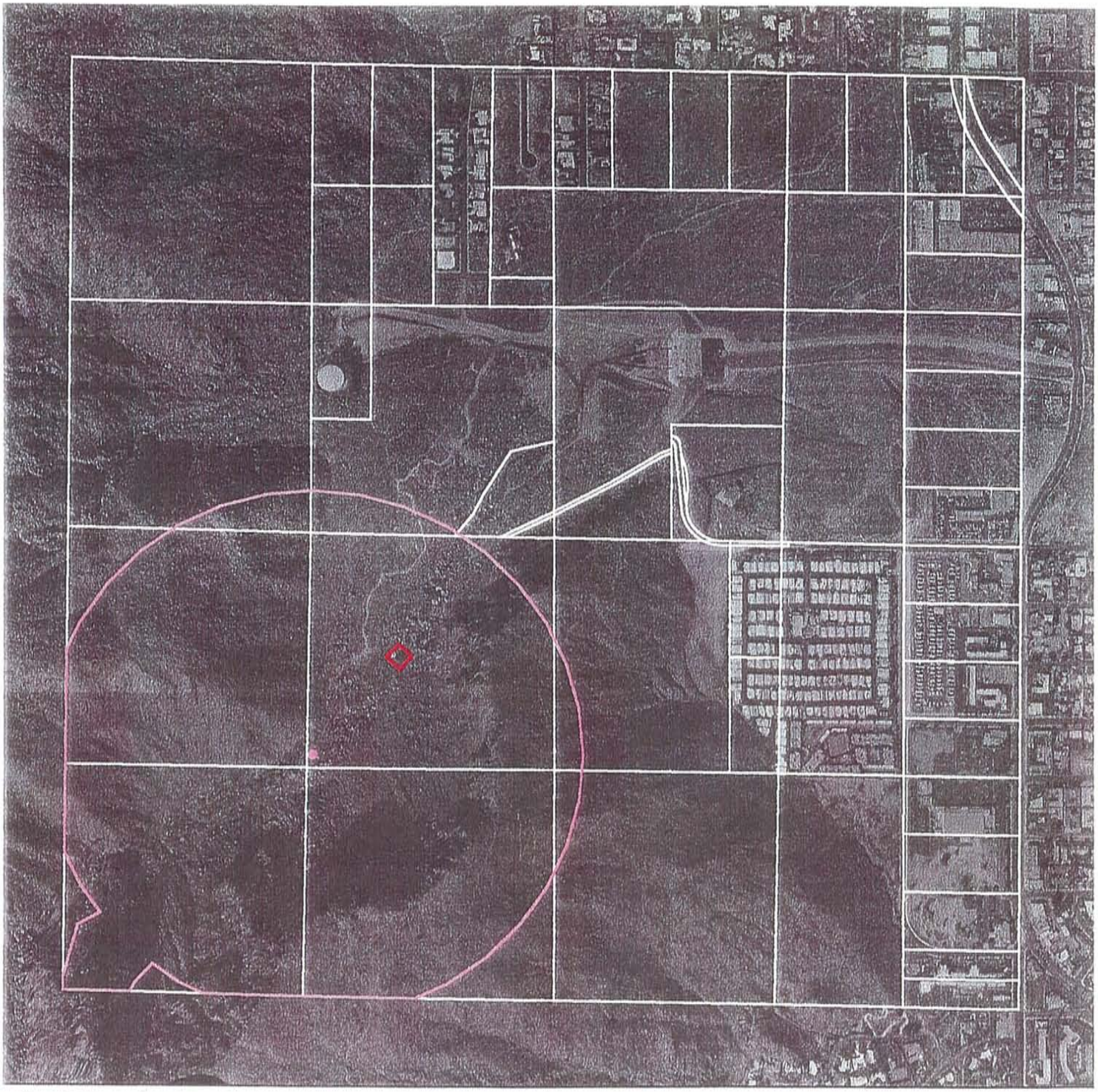
- Study Area
- Southwestern Willow Flycatcher
- Summer Tanager
- Yellow Breasted Chat
- Yellow Warbler
- Tract Boundaries

REFERENCES:
Data obtained from Bureau of Land Management
Palm Springs - South Coast Field Office
Coachella Valley Multiple Species
Habitat Conservation Plan
Natural Communities Database
April 21, 1999

GEOGRAPHIC DATA PARAMETERS:
State Plane Projection
North American Datum 1983
Zone 6
Land Status as of May 26, 1999

APPENDIX 2

Tahquitz Canyon Sensitive Species Habitat Maps



TAHQUITZ CANYON
Sensitive Habitat Distribution Model for Least Bell's Vireo
AGUA CALIENTE INDIAN RESERVATION
Riverside County, California
Section 22 T4S R4E SBBM

June 1, 1998

SCALE

250 0 250 500 750 1000 Feet

100 0 100 200 Meters

LEGEND

- Study Area
- Least Bell's Vireo Site
- Least Bell's Vireo Tract Boundaries

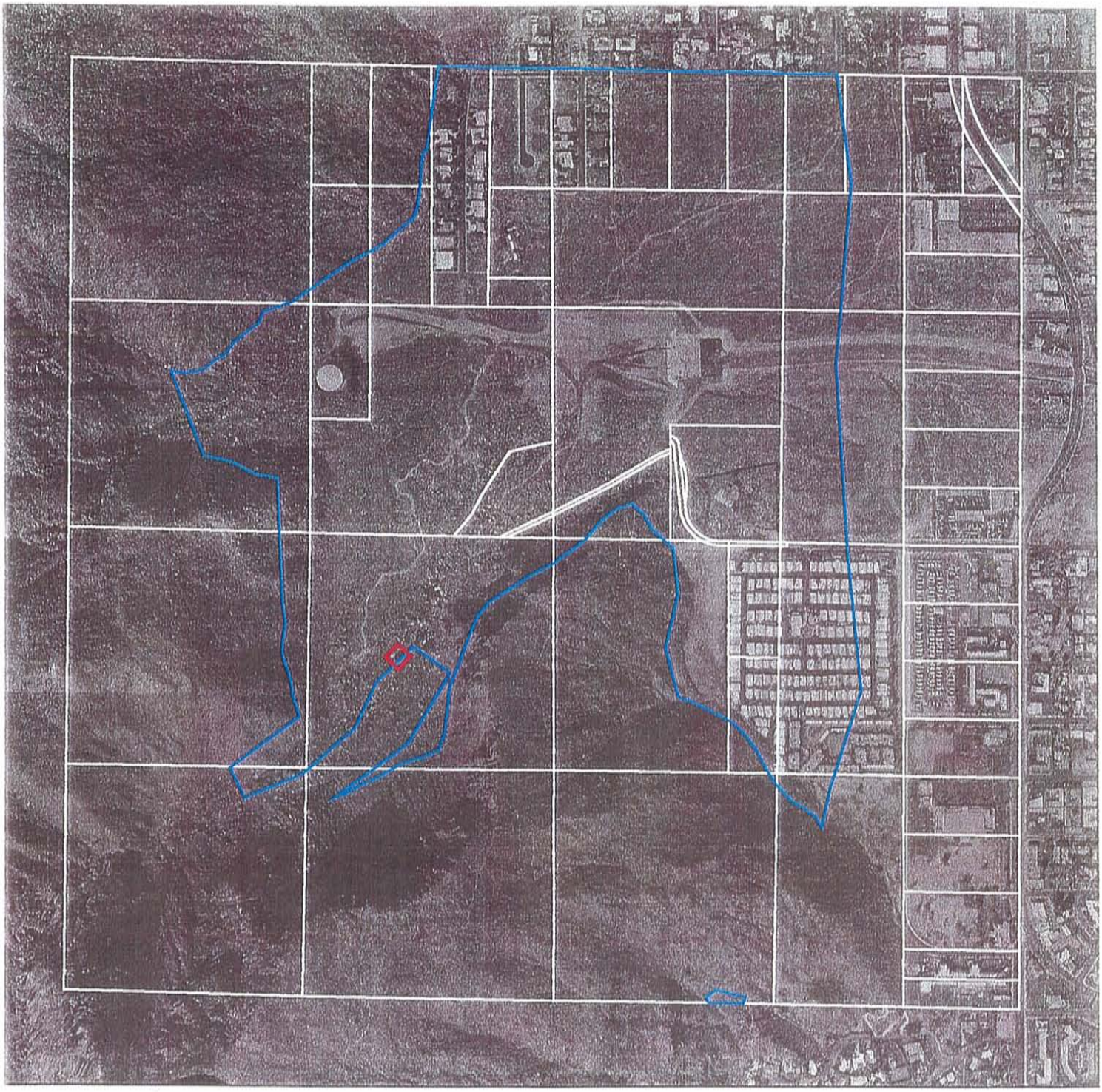
PROJECT FUNDING:
State Wetlands Protection Development Grant
U. S. Environmental Protection Agency
Region 9

Reservation Townships with Section of Interest Highlighted

GEOGRAPHIC INFORMATION SYSTEMS
Agua Caliente Band of Cahuilla Indians
GIS Services
Cartographer: Beth A. Wenstrom

REFERENCES:
Data obtained from Bureau of Land Management
Palm Springs - South Coast Field Office
Coachella Valley Multiple Species
Habitat Conservation Plan
Natural Communities Database
April 21, 1999

GEOGRAPHIC DATA PARAMETERS:
State Plane Projection
North American Datum 1983
Zone 6
Land Status as of May 26, 1999



TAHQUITZ CANYON
Sensitive Habitat Distribution Model for the Burrowing Owl
AGUA CALIENTE INDIAN RESERVATION
Riverside County, California
Section 22 T4S R4E SBBM
June 1, 1998

SCALE

250 0 250 500 750 1000 Feet
100 0 100 200 Meters

LEGEND

- Study Boundary
- Burrowing Owl Tract Boundaries

PROJECT FUNDING:
State Wetlands Protection Development Grant
U. S. Environmental Protection Agency
Region 9

Reservation Township with Section of Interest Highlighted

GEOGRAPHIC INFORMATION SYSTEMS
Agua Caliente Band of Cahuilla Indians
GIS Services
Cartographer: Beth A. Wenstrom

REFERENCES:
Data obtained from Bureau of Land Management
Palm Springs - South Coast Field Office
Coachella Valley Multiple Species
Habitat Conservation Plan
Natural Communities Database
April 21, 1999

GEOGRAPHIC DATA PARAMETERS:
State Plane Projection
North American Datum 1983
Zone 6
Land Status as of May 26, 1999

TAHQUITZ CANYON
Sensitive Habitat Distribution Model for Desert Tortoise
AGUA CALIENTE INDIAN RESERVATION
Riverside County, California
Section 22 T4S R4E SBBM

June 1, 1999

SCALE

250 0 250 500 750 1000 Feet

100 0 100 200 Meters

LEGEND

- Study Area
- Desert Tortoise
- Tract Boundaries

PROJECT FUNDING:
State Wetlands Protection Development Grant
U. S. Environmental Protection Agency
Region 9

Reservation Townships with Section of Interest Highlighted

GEOGRAPHIC INFORMATION SYSTEMS
Agua Caliente Band of Cahuilla Indians
GIS Services
Cartographer: Beth A. Wenstrom

REFERENCES:
Data obtained from Bureau of Land Management
Palm Springs - South Coast Field Office
Coachella Valley Multiple Species
Habitat Conservation Plan
Natural Communities Database
April 21, 1999

GEOGRAPHIC DATA PARAMETERS:
State Plane Projection
North American Datum 1983
Zone 6
Land Status as of May 26, 1999

TAHQUITZ CANYON
Sensitive Habitat Distribution Model for the Palm Springs Ground Squirrel
AGUA CALIENTE INDIAN RESERVATION
Riverside County, California
Section 22 T4S R4E SBBM
June 1, 1998

SCALE

250 0 250 500 750 1000 Feet
100 0 100 200 Meters

LEGEND

Palm Springs Ground Squirrel
- CARRIZO STONEY SAND, 2-9% SLOPES
- CARSITAS COBBLY SAND,2-9% SLOPES
- CARSITAS GRAVELLY SAND, 0-9% SLOPES
- Tract Boundaries
- Study Area

PROJECT FUNDING:
State Wetlands Protection Development Grant
U. S. Environmental Protection Agency
Region 9

Reservation Townships with Section of Interest Highlighted

GEOGRAPHIC INFORMATION SYSTEMS
Agua Caliente Band of Cahuilla Indians
GIS Services
Cartographer: Beth A. Wenamon

REFERENCES:
Data obtained from Bureau of Land Management
Palm Springs - South Coast Field Office
Coachella Valley Multiple Species
Habitat Conservation Plan
Natural Communities Database
April 21, 1999

GEOGRAPHIC DATA PARAMETERS:
State Plane Projection
North American Datum 1983
Zone 6
Land Status as of May 26, 1999

TAHQUITZ CANYON
Sensitive Habitat Distribution Model for the Palm Springs Pocket Mouse
AGUA CALIENTE INDIAN RESERVATION
Riverside County, California
Section 22 T4S R4E SBBM
June 1, 1999

SCALE

250 0 250 500 750 1000 Feet
100 0 100 200 Meters

LEGEND

- Palm Springs Pocket Mouse Tract Boundaries
- Study Area

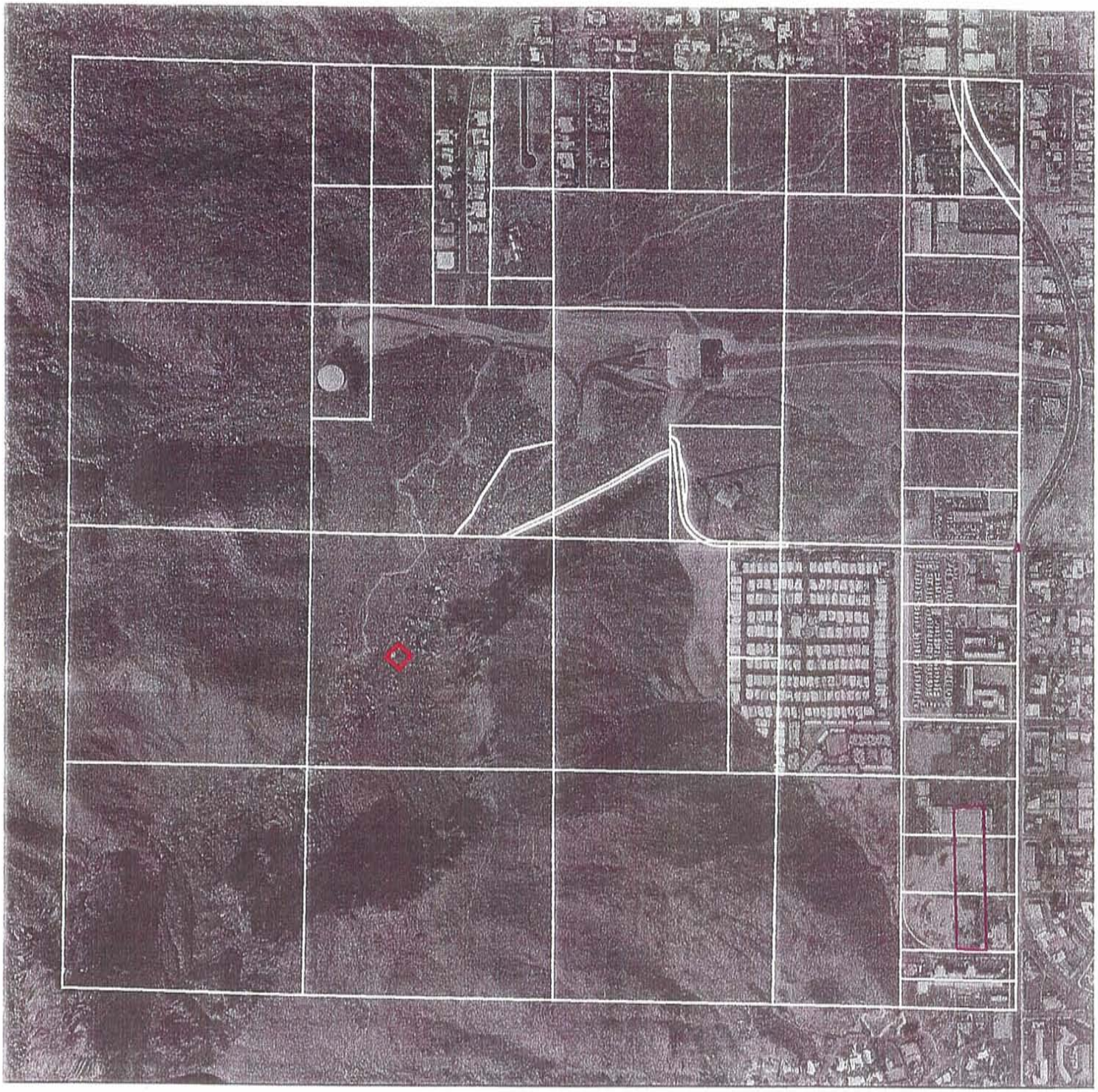
PROJECT FUNDING:
State Wetlands Protection Development Grant
U. S. Environmental Protection Agency
Region 9

Reservation Townships with Section of Interest Highlighted

GEOGRAPHIC INFORMATION SYSTEMS
Agua Caliente Band of Cahuilla Indians
GIS Services
Cartographer: Beth A. Wenstrom

REFERENCES:
Data obtained from Bureau of Land Management
Palm Springs - South Coast Field Office
Coachella Valley Multiple Species
Habitat Conservation Plan
Natural Communities Database
April 21, 1999

GEOGRAPHIC DATA PARAMETERS:
State Plane Projection
North American Datum 1983
Zone 6
Land Status as of May 26, 1999



TAHQUITZ CANYON
Sensitive Habitat Distribution Model for Casey's June Beetle
AGUA CALIENTE INDIAN RESERVATION
Riverside County, California
Section 22 T4S R4E SBBM
June 1, 1999

SCALE

250 0 250 500 750 1000 Feet
100 0 100 200 Meters

LEGEND

- Study Area
- Casey's June Beetle
- Tract Boundaries

PROJECT FUNDING:
State Wetlands Protection Development Grant
U. S. Environmental Protection Agency
Region 9

Reservation Townships with Section of Interest Highlighted

GEOGRAPHIC INFORMATION SYSTEMS
Agua Caliente Band of Cahuilla Indians
GIS Services
Cartographer: Beth A. Wenstrom

REFERENCES:
Data obtained from Bureau of Land Management
Palm Springs - South Coast Field Office
Coachella Valley Multiple Species
Habitat Conservation Plan
Natural Communities Database
April 21, 1999

GEOGRAPHIC DATA PARAMETERS:
State Plane Projection
North American Datum 1983
Zone 6
Land Status as of May 26, 1999