



PINOLEVILLE POMO NATION

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Restoring Ya-mo bida

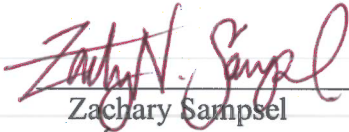
Wetland Program Plan

September 30, 2014



Pinoleville Pomo Nation Wetland Program Plan

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Executive Summary

The goal of the wetland program plan “Restoring Ya-mo bida” is to restore the health of Ackerman Creek and the associated wetlands, to monitor to ensure that restoration is effective, and to secure the rights to the waters of the reservation. Specific activities to support this goal include:

- Restoration of the wetlands to “proper functioning condition” through removal of invasive species, propagation and planting of native species, and other projects;
- Protection of the wetlands from damaging activities on and off of the reservation;
- Development of the skills and understanding of wetland management through education and outreach for PPN staff and citizens;
- Development and implementation of a strategy for restoration of the commercial properties within the floodplain;
- Development and implementation of a watershed plan with other stakeholders for the entire Ackerman Creek watershed;
- Ongoing monitoring of ground water, surface water, vegetation, macroinvertebrates, fish and birds; and
- Beginning a systematic approach to establishing a reserved water right for the PPN adequate to protect the wetlands and for other needs of the PPN.

These activities are documented in detail in Chapters VI – XI. In addition the document includes a chapter on potential sources of funding. Having a “wetland program plan” as described here, that is endorsed by the Tribal Council and approved by EPA, should be helpful in securing funding for the necessary work. The document also includes a glossary and several appendices summarizing the legal issues relevant to securing water rights for the PPN.

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I. Introduction

One of the outstanding physical features of the Pinoleville Reservation is the stream, Ackerman Creek, that runs through it. Ackerman Creek and its associated wetland is central to many of the Pinoleville Pomo Nation's most important cultural practices. The stream supports salmon, is a source of water for the Nation's sweat lodge, and the riparian vegetation provides material for a wide variety of cultural practices.

The following plan sets forth the goals, objectives and proposed activities by the Pinoleville Pomo Nation (PPN) for the riparian wetlands along Ackerman Creek where it runs through the Pinoleville Reservation. Preparation of the plan has been supported by the US Environmental Protection Agency (EPA) (Grant #EPA-REG9-WP-13).

As a working document for the PPN Environmental Department, it integrates many of the existing programs including water quality work (supported by EPA Clean Water Grants), wetland restoration activities (supported by Natural Resource Conservation Service (NRCS) grants), invasive plant control (supported by the North Coast Integrated Water Resources Management Plan (NCIWRMP)), as well as various activities supported by the General Assistance Program (GAP) of EPA.

For the sake of brevity, this document uses a great number of acronyms that some readers may not be familiar with. We have tried to give a full listing the first time they are used as in the paragraph above. This document also has a glossary of some of the more technical terms used in the text and all of the acronyms used in the text are also spelled out in the glossary.

II. Background

History of the Pinoleville Pomo People¹

The history of Pinoleville Pomo Nation begins in Potter Valley, an area called *Be-lo-kai*, meaning verdant valley. In the era just before Europeans arrived, there were three main villages, called *Pomo*, *Sedam* (or *Tse tum*) and *Canel* (or *Shanel*, *Sanel*), and several smaller villages and camps. These people all spoke Northern Pomo.

The name "*Pomo*" came from the village *Pomo poma*, where ancestors of some of the present tribal members lived. Literally, the word can be broken down as follows: *po-* something valuable, *mo-* hole combined is the word for magnesite bead; *poma-* people. It was chosen by an early ethnographer to name a large linguistic group of seven distinct languages. The thousands

¹ Much of this section is based on information presented in the PPN publication "Pinoleville Pomo Nation", an overview of the Tribal Nation's cultural and political history and current administrative structure..

of people who spoke any of those languages later became known as Pomos. The villages varied in size, from five to nearly a hundred houses, and were usually made up of a few families, who often intermarried with people from other villages or tribes.

The people moved with the seasons, gathering whatever they needed where it was abundant. In spring, a journey along an extensive system of trails was made to the coast for seaweed, abalone and shellfish. These were dried and brought back for winter supplies. Hunting of small game, taken with ingenious traps, spears, or arrows, was done year around.

In the meadows they gathered clover and other greens early in the year; later they harvested many varieties of seeds to make *yuhu*, or pinole, one of their staple foods, and dug the well-liked Indian potatoes. Late spring and summer found the people breaking into smaller groups, coming and going from their main village, camping along streams and rivers, gathering food, medicines, and materials for making their household tools, fishing, or hunting.

As summer progressed, trips would be made to gather berries and other plants on the hillsides. Summer was also a time for visiting neighboring villages, perhaps attending a celebration, doing some trading as far away as Clear Lake for obsidian or Stonyford for salt, or making a trip to the Coast for more seafood.

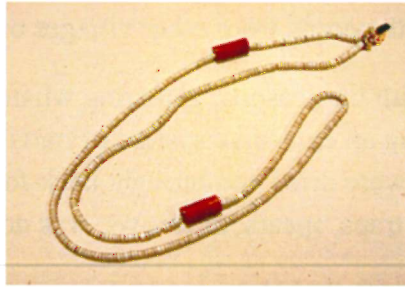
Winter shelters (*tca*) were hemispherical, with floors sunken a foot or so into the ground and walls woven of willow, thatched with thick grass, tules, or willow. These might house anywhere from one to five families. They also built small sweat houses (*tca-ne*), which also served as meeting places or warm winter quarters for men. The main villages had large meeting houses, or roundhouses, some of which could hold several hundred ceremonies together. Minor councilmen called *tca ka-li* in Northern Pomo, governed the villages. They were also referred to as Captains. Leaders were chosen for their abilities or their power, and the position often passed on down the family line.

Healing was done by outfit doctors (men) and sucking doctors (women or men), using ceremony, songs, and herbs. Some kinds of healing arts were passed down the family line, other knowledge came through dreams.

The most important staple food of the Pomo people was acorns, gathered in the fall and carefully stored for winter. Pepperwood nuts and buckeyes supplemented the winter diet. Fish, deer and elk meat were also dried for winter stores.

Winters were a time for making the implements needed for daily life. The Pomo people excelled in making baskets, which later became collectors' items and world famous. Beads were fashioned from clam shells, extra valuable ones from magnesite. Long strands of them served as money for the Pomos, and much trade was done using this medium of exchange. String was made. Arrow and spear points were shaped from obsidian or chert. Regalia for ceremonies and celebrations were created with the many feathers collected throughout the year.

Beads were
fashioned from



Ceremonies and celebrations were an important part of life for the Pomo people. They held ceremonies to insure and to give thanks for a good harvest. Other ceremonies honored their religious beliefs, or marked a new phase in a person's life. And whenever visitors got together, there was dancing and singing, gambling, foot races, and general good times.

Although the coming of the Spanish, Russians, and other Europeans in the early 1800's brought sudden devastation to Native Californians and their way of life, throughout the first half of the century the Pomos in Potter Valley were mostly removed from the battles, new diseases, and forced servitude, with the exception of a smallpox epidemic in the village of *Canel* in the 1830's.

With the Gold Rush in 1848-50, however, Europeans came in droves, to stay. Though treaties were proposed guaranteeing lands for most California Natives, including Pomos, they were not ratified, and California law made public all land not claimed. Land was open to be settled by non-Native people.

Beginning in 1853, non-native settlers arrived in Potter Valley. As land was taken up for ranching, the Pomos were forced to move their villages and camps, and lands they had always gathered their food and supplies on were suddenly taken over by livestock. They were forced out to the edges, where land was not fertile, not allowed to gather in the fields and were hard-pressed to find enough food to survive.

Some Potter Valley ranchers were friendly with the Pomo people, some set aside land for them or gave them work, some married Native women. But inevitably troubles arose between Natives and some of the settlers, as was happening all over northern California. In 1871 most of the remaining Potter Valley Pomos were rounded up by militia and brutally forced to walk to Round Valley Reservation. The Pomo people call this tragic event Bloody Run because the Eel River ran red with their blood.

Conditions were bad in Round Valley Reservation too, with broken promises of land and support. In 1878, a large group of Potter Valley Pomos left the Reservation and purchased 51 acres of land on the north side of Ukiah. It was called *ke-buk ke-bul*, but soon came to be known as Pinoleville.

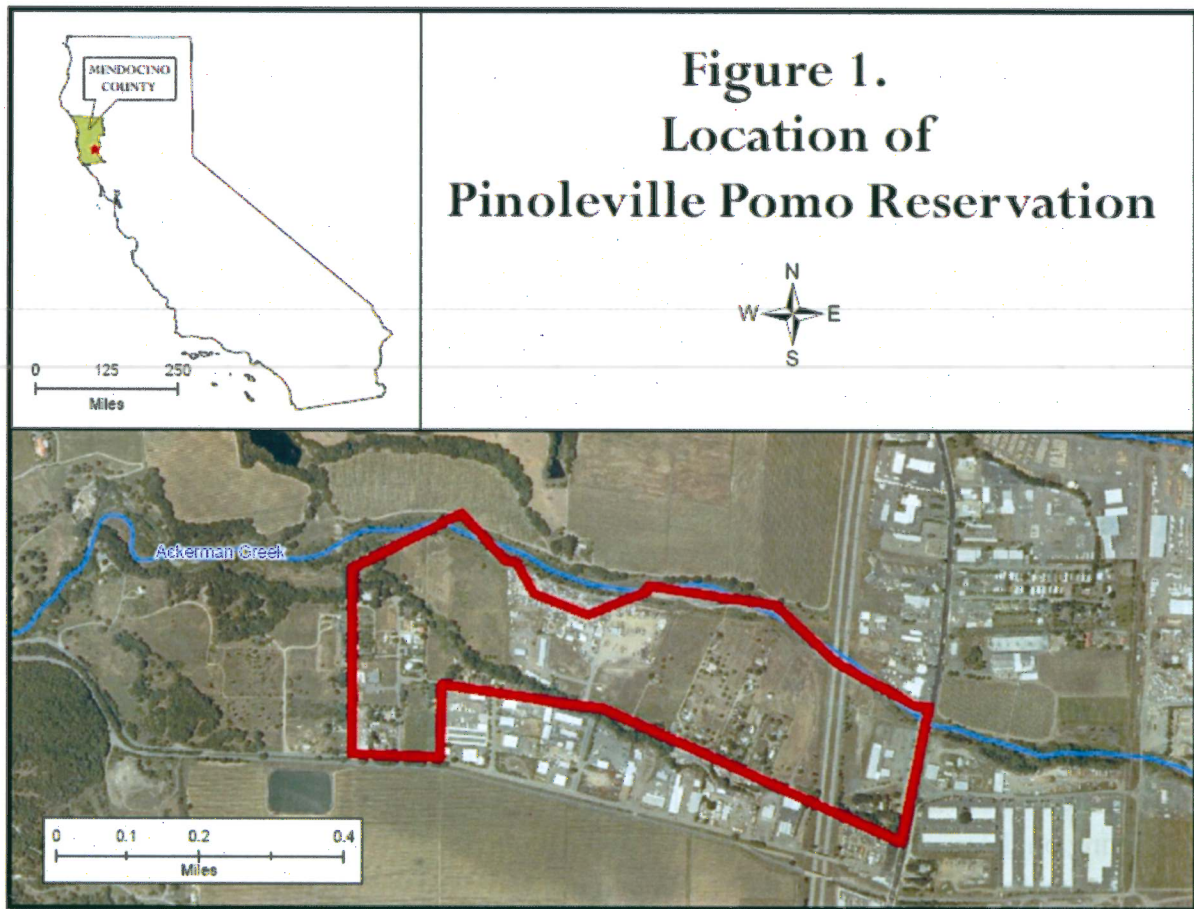
However, the Ukiah townspeople complained about the ceremonial cremation and loud wailing, which, in the traditional way, went on for days when there was a death. In 1893, the Pinoleville captains joined with other Northern Pomo captains and traded their land and \$10 for 117 acres between Ackerman Creek (*ya-mo bida* - wind hole creek), and Orr Springs Road. Their new home was named *ya mo* for the persistent winds coming out of the canyon.

Here the Pinoleville Pomo people settled. Native people were not citizens at the time, and many were prevented from or unable to acquire land for themselves. The 117 acres was established as trust held by the state's Superior Court, and came to be known as the Pinoleville Superior Court Trust Property. With so much homelessness and displacement among Native peoples, including those forced into the concentration camps at Round Valley, many families still needed homes. They arrived from other small tribes across Northern California and the Captains allowed them to live on Pinoleville. In 1905, a BIA survey assessed the Pinoleville Trust Property as overcrowded, and through the Homeless, Landless Indian Act, the Pinoleville Rancheria was purchased next to the Trust Property land in 1911. Other Rancherias were created at about the same time to address the needs of those from other Tribal Nations who had been living on the Pinoleville Trust Property.

A day school was built on the Pinoleville Trust Property; a second school and a Catholic church were built later, on the Pinoleville Rancheria. The BIA began efforts to organize the tribe in the 1930's. In the 1950's, the US government decided to follow a policy of integration of the Native people living on the rancheria into the general population. In 1966, Pinoleville Rancheria was terminated, and the land, already divided into parcels, was deeded to individuals, not all of whom were Pinoleville Pomo Indians. The privately purchased land remained held in trust for the Pinoleville Tribe by the Superior Court where it remains today.

Land Base

The Pinoleville Pomo Nation is a federally recognized Tribal Government, located north of the City of Ukiah, Mendocino County, California (see Figure 1). The initial land purchase for the Pinoleville Reservation (as well as many other Indian communities) came after the first of a series of Congressional Appropriation Acts in 1906, which were designated for purchasing small parcels of land for "homeless" California Indians. The Pinoleville Indian Reservation was established in 1911, pursuant to Congressional legislation passed in 1906 and 1908 that authorized the acquisition of land for Indians who were not then upon reservations in the State. Such Indians had occupied the northern Ukiah Valley until they were dispossessed by non-Indians, beginning in the 1850's.



In 1958 the California termination bill passed, which persuaded Pinoleville and other rancherias to terminate their federal trust status in exchange for land deeds and the promises of BIA-funded capital improvements. On February 16, 1966, the Tribe was terminated under the terms of the California Rancheria Termination Act. During the period of termination, the Tribe lost 50% of the land base that once comprised the reservation.

In 1979, the Tribe was a member of the class action suit, *Tillie Hardwick v. United States* that was filed in district court to restore the Tribe as a federally recognized Tribe and to re-establish its Tribal government and its jurisdiction over the reservation. The failure of the federal government and the BIA to keep up their end of the bargain led to the historic *Tillie Hardwick v. United States of America* case for “un-termination,” argued before the U.S. Supreme Court. The case originated at the Pinoleville Rancheria, and ended in a judgment which restored federal recognition to 17 reservations in total. Hence, though still quite small, the Pinoleville Reservation figures prominently in the larger struggle for Indian rights and recognition.

On December 22, 1983, as a result of this suit, a judgment was entered against the United States restoring federal recognition to the reservation and its Tribal government. The judgment also

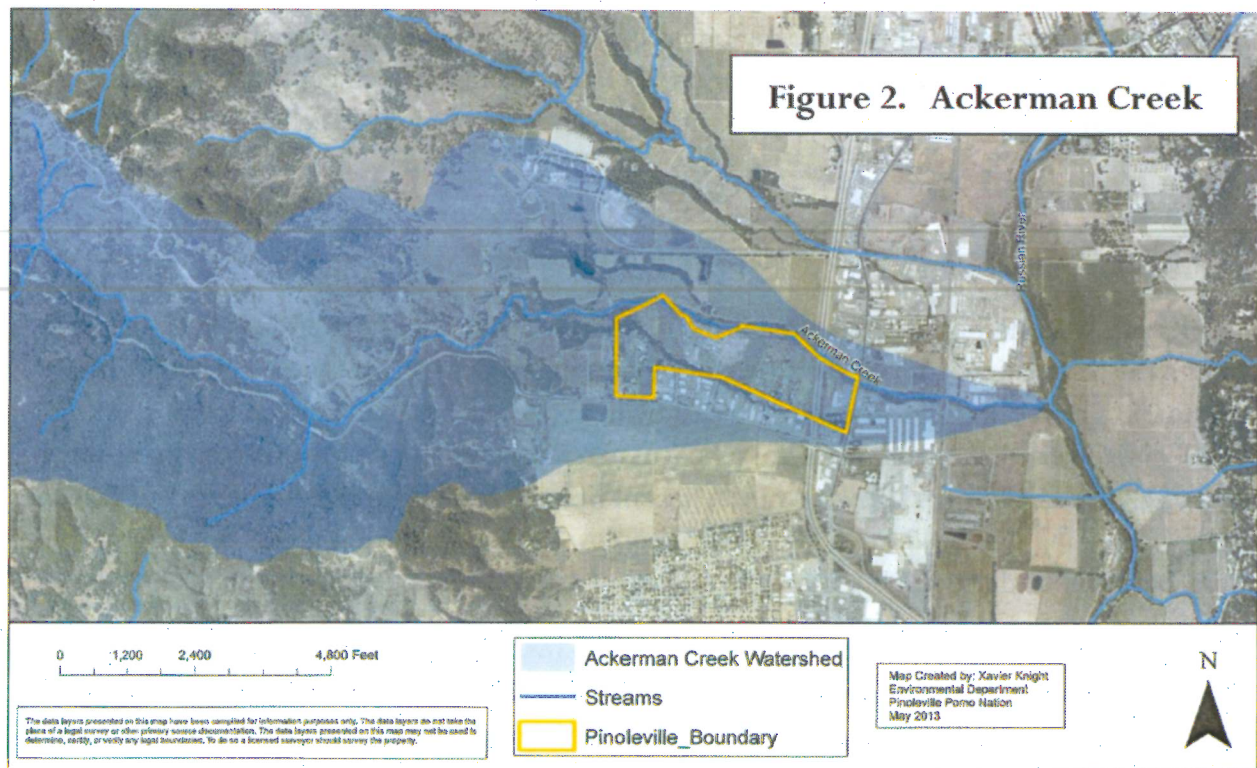
allowed for individual Indian property owners to return their property to Federal trust status. The effect of this judgment to the Tribe was to "unterminate" the Tribe. Subsequent judgments against Mendocino County and the United States, in 1985 and 1986, respectively, restored the entire exterior boundaries of the reservation, as they existed prior to the purported termination of the Tribe. The land regained the classification of "Indian Country," subject to the primary jurisdiction of the Tribal and Federal governments. The size of the reservation is 99.53 acres.

Reservation Wetlands

The primary wetland of the reservation is the riparian corridor along Ackerman Creek that runs through the reservation. Ackerman Creek originates in the Coast Range west of Ukiah, CA. (Figure 2). The creek flows from west to east, with upper reaches in evergreen forest on steep slopes, and lower reaches running across the Russian River valley into the urban and peri-urban areas of Ukiah. Ackerman Creek and the adjacent riparian habitat support a diversity of fish and wildlife including steelhead trout, chinook salmon, western pond turtles, great blue herons, river otters, black-tailed deer, and black bear to name just a few. However, the riparian habitat has been severely degraded.

The reaches adjacent to the Pinoleville Pomo Nation (PPN), particularly the lower reaches, are characterized by aggradation, high embeddedness, high concentrations of cobble, few in-stream topographic features, high width/depth ratios, and high water temperatures. These are likely the result of the installation of grade control structures downstream in 1978 and aggressive logging upstream prior to 2002, creating heavy sediment loads that could not be transported further downstream. Loss of canopy cover, almost to zero in some reaches, has also reduced wildlife habitat significantly. As a result, PPN elders note a substantial decline in fish, wildlife, and plant populations.

Figure 2. The Ackerman Creek Watershed.



The riparian wetlands associated with the creek are important to the health of the stream and also are important to maintain the cultural traditions of the Pinoleville Pomo Nation (PPN). A healthy Ackerman Creek ecosystem is at the center of many of PPN's most important cultural practices. Clean water is needed for ceremonies, and Ackerman Creek is the nearest source for the Tribe's sweat lodge. Riparian vegetation provides material for a wide variety of cultural practices.² Alder is favored at Big Time and other cultural events for smoking salmon. Dogbane and white root sedge are prized sources of basket-making fiber. Elderberry is hollowed out to make flutes and clappers for traditional music. Pepperwood is used to "bless homes, buildings and ceremonial areas. California black walnut is used for food and basket making, and the native California blackberry is used for food, medicine and dyes. And there are many more.

As for fauna, western pond turtle shells supply material for dance staffs and meat is used for soup. Feathers from the northern flicker and red-tailed hawk are favored for dance regalia, while California quail feathers are used for basket making. Steelhead trout and chinook salmon provide food, the latter having particular value for social and ceremonial feeds. The value of these wildlife species is not simply utilitarian; their presence is needed to teach children Pomo

² Pinoleville Native Plant Project (2004)

language, Pomo values regarding inter-species relations, and what it means to have a Pomo identity.

The condition of the creek and the associated wetlands has been severely degraded from various land use practices including livestock grazing and timber harvest in the upper reaches of the creek. Because of the importance to the Nation, the PPN Environmental Department has initiated an active program of stream monitoring and riparian restoration including removal of invasive (non-native) plant species.

There are also other minor wetlands on the reservation associated with springs. They include a series of springs at the southern edge of the flood plain on the reservation. One of these, behind PPN administrative offices, is currently being planted with native wetland species, and will likely be used as a nursery and educational resource. However, the focus of the wetland program for the next six years will be on the riparian wetlands along Ackerman Creek.

Wetland Restoration Activities

The PPN has been working on restoring stream conditions and riparian habitat within their reservation since a joint workshop with the Mendocino Environmental Center was held in 1998.³ This work includes:

1. A preliminary hydraulic and geomorphic analysis.⁴
2. A preliminary riparian corridor assessment.⁵
3. Contract with Natural Resources Conservation Service (NRCS) for removal of invasive Giant Reed (*Arundo donax*) and revegetation with native species 2008 (\$62,254);
4. Grant from Bureau of Reclamation for stream habitat improvement, barrier removal, and junk car removal, 2010 (\$78,941);
5. Preliminary studies and limited restoration work to develop a comprehensive restoration strategy (performed under a US Fish and Wildlife Service / Tribal Wildlife Grant, 2010 (\$128,770);
6. Contract with NRCS for streambank protection, 2011 (\$60,375);
7. Grant from the North Coast Integrated Regional Water Management Plan (NCIRWMP) for removal of giant reed and Himalayan blackberry, 2011 (\$46,950);

Much of this work has been funded because the decline in steelhead and salmon populations has resulted in funding to restore habitat for steelhead and other anadromous fish species. Thus

³ Pinoleville Band of Pomo Indians and Mendocino Environmental Center (1998)

⁴ Shea (2008)

⁵ West Coast Watershed (2008)

much of the work has been opportunistic depending on availability of funding for certain types or work, rather than being guided by an overall wetland restoration strategy.

The wetland program plan (WPP) here is designed to be a comprehensive strategy to achieve the PPN's goals and objectives for the Ackerman Creek wetlands and for the watershed as a whole.

III. Program Decisions and Long-term Environmental Outcomes that will benefit from the WPP

The EPA guidance on wetlands programs⁶ suggest that it is important to identify program decisions and long-term environmental outcomes that will benefit from the WPP, particularly the monitoring and assessment portion of it. These benefits for the PPN program are described here briefly.

A first and most obvious reason for implementing a WPP is so that limited money and resources for wetland restoration and protection can be used most efficiently and for the highest priority activities. One of the goals of the PPN, as described in section VIII, is the acquisition of inholdings within the wetland or potential wetland areas and the relocation of incompatible business or industrial operations. Such activities can be costly and contentious at times. Setting clear criteria and priorities for such activities can help leverage limited resources.

A second and overlapping reason is so that better decisions—decisions based on data—can be made about wetland protection and restoration. Monitoring data can be used not only to influence decisions made by tribal leadership and administrators but also to influence decisions made by other organizations that can influence the health of the Pinoleville wetlands. One of the objectives of the PPN is to develop a watershed plan for the entire Ackerman Creek watershed in conjunction with the upstream landowners as described in Section IX. Having good monitoring data can both contribute to the quality of such a plan and also influence the sorts of decisions and commitments that are made as a result of such a planning effort.

Finally, a WPP can provide the framework for the diverse interrelated programs that are being carried out on the wetland ecosystem which include fish surveys, water quality monitoring, bioassessment of streams, eradication of non-native vegetation, and habitat restoration. Ackerman Creek is a complex ecosystem with interdependent and interconnected components (plants, animals, soil, water, etc.) which can best be understood by looking at it holistically. By treating this ecosystem as a whole, the WPP can help in understanding these important interrelationships. In addition, having one master plan for the system can lead to better coordination and thus increased efficiency among fishery, water quality, and other environmental programs.

⁶ Starting to Think about Developing a State or Tribal Wetlands Program, EPA Wetlands Website http://water.epa.gov/grants_funding/wetlands/startnewprogram.cfm

IV. Pinoleville Pomo Nation (PPN) Goals and Objectives for Wetlands

The Goals and Objectives for the wetlands program are listed here and described in more detail in sections VI to XI. Goals here are general statements of purpose. They are then broken down into more specific objectives that are less abstract and more easily measured or observed. Specific actions and activities for each of these objectives are shown in Section XI.

Goal 1 – Recovery of the “Health” of the Wetland

- Objective: Restoration of the wetland to “proper functioning condition”
- Objective : Protection of the wetlands from damaging activities
- Objective : Development of the skills and expertise in wetland management by staff and understanding of wetland function and value by PPN citizens
- Objective: Restoring the commercial properties within the wetland
- Objective: Development and Implementation of a watershed plan for Ackerman Creek

Goal 2 – Determination if Wetland Management Activities are Effective

- Objective: Implement monitoring program planned and initiated in 2014

Goal 3 – Secure control of the waters of the Pinoleville Reservation

- Objective: Establish a reserved water right for the PPN adequate to protect the wetlands

V. Overall Goal Statement and Time Frame for the Plan

The overall goal of the plan is thus to restore Ackerman Creek to proper functioning condition, to monitor to ensure that restoration is effective and to secure the rights to the waters of the reservation. Achieving this goal may take decades, however, the work is already started. This plan describes priority actions for the next six years (from October 1, 2014 through September 30, 2020 and provides for developing a new plan in 2020 to cover the following six years.

VI. Restoring the “Health” of the Wetland

Although the use of the term “health” to describe an ecosystem such as a wetland is abstract, it is useful precisely because it is something people are familiar with. As James Karr, the noted wetland ecologist has written “it is not a huge intuitive leap from “my health” to “ecological health”.⁷ A doctor may have difficulty in providing a quick, all encompassing definition of “human health” but she does understand what it is and has both tools to restore health, to protect health, and to monitor a patient’s health. Ecologists and resource managers operate in the same manner focusing on restoration, protection, and monitoring.

Restoration

Restoring the health of the wetlands will be both passive and active. Many people have observed that if the causes of deterioration of an ecosystem such as a wetland are removed the system will recover its health over time. Using the analogy with human health this passive approach is comparable to the directive to go home and stay in bed and rest till you are better. As with the human body this works some of the time in ecosystems, but recovery may require some intervention to recover more rapidly.

Active measures that have been done or are proposed here for Ackerman Creek include:

- removal of invasive plant species giant reed and Himalayan blackberry
- revegetation with native plant species
- streambank protection / stabilization
- barrier removal
- junk car removal
- building of bioswales to capture and cleanse runoff from commercial properties above the wetland

Protection

Most of the protection efforts will involve keeping informed of activities in and around the wetlands that may pose a threat to their recovery. The major threats to the health of the Ackerman Creek wetlands are pollution, upstream logging, upstream grazing, and water diversion.

Pollution. As there are no commercial developments upstream from the Pinoleville Reservation, the threat of chemical contamination of the water above the reservation are fairly minimal. However, there is one commercial operation, an auto-dismantler on non-trust land within the reservation that has caused pollution and poses an ongoing risk of major

⁷ Karr (1999)

contamination during a flood event. The best protective measure would be for PPN to recover that land, clean up the site and restore it to a natural state as will be discussed in section VIII.

Other forms of pollution that have some potential to cause a problem are: (1) runoff from the commercial properties off the reservation to the south (between the Orr Springs Road and the reservation boundary); (2) occasional contamination from non-functional septic systems on or near the reservation lands; and (3) pesticide drift from the vineyards to the north. None of these are considered serious at this point.

Livestock Grazing. With the exception of a few inholdings where horses are grazed there is no livestock grazing at this time on the Reservation. However, there is evidence of past grazing as suggested by such things as lack of cottonwood regeneration. And upper Ackerman Creek is actively grazed by cattle and this may be affecting the downstream wetlands.

Logging. About half of the upper watershed is owned by Mendocino Redwood Company which has active logging operations there. With changes in ownership and improvement in logging practices the impact of logging on the watershed has probably lessened. However, the downstream wetlands are likely still impacted from past and current logging jobs. Upstream impacts on the riparian wetlands from logging and grazing will be addressed and remediated with a watershed plan as discussed in section IX.

Water Diversions. Water is diverted from wells along the lower stretch of Ackerman Creek, adjacent to the reservation to be used for frost protection for the vineyards to the north. The extent of this diversion and its effect on the flow of the creek is not known. Unfortunately, the period when water is in demand for this activity (early spring from roughly March 21 to April 21) is a critical period for salmon and steelhead spawning and rearing. The extent of this diversion and its effect on flow will need to be documented in preparation for obtaining a reserved water right as discussed in section X.



Water for
frost
protection
for grapes

Monitoring

Monitoring is a key element of any management plan. It is the basis for determining if your restoration and protection measures are effective and/or the wetland health is being maintained. Continuing with the medical analogy of health it is like the follow up visit to the physician to see if the ailment has gone away or, in some cases, like the annual physical to see if any new medical problems have arisen.

This section provides an overview of the monitoring planned for Ackerman Creek—including the objectives and strategies, the indices chosen, the measurement protocols tentatively chosen, and proposed timing. A more detailed technical monitoring plan is being prepared that will have detailed description of the monitoring and quality assurance protocols. Preparation of the technical monitoring plan is also being funded by the EPA Grant #EPA-REG9-WP-13) and is expected to be completed by September 30, 2014.

The overriding goal is to determine if the riparian wetlands are recovering their “health”.

Monitoring Strategies. There are thousands of measurements and monitoring techniques being used for wetlands. Furthermore monitoring can be time-consuming and expensive, and it represents a long term commitment. Therefore in choosing monitoring indices and monitoring techniques, it is important to have a well thought out strategy and to pick the most effective and efficient indices and techniques. The choices here have been guided by the following strategic guidelines:

- Emphasis on well developed techniques rather than experimental ones
- Emphasis on simple measurements and techniques which do not require high levels of skill, expensive equipment, or extensive training
- Emphasis on measurements with a high signal to noise ratio
- Mix of techniques that emphasize both function and structure
- Mix of techniques for long-term and short term monitoring
- Consideration of the potential for adequate ongoing funding
- Emphasis on ensuring the longevity of the data
- Careful consideration of quality assurance and quality control

Monitoring Indices. Monitoring indices are measurements that indicate something about the health of the wetland. Using the medical analogy they are like measurements of a person’s temperature and blood pressure. A group of Australian scientists⁸ developed a comprehensive set of recommendations for monitoring wetlands. They recommended nine categories of indices or indicators as they referred to them: surface water, ground water, soil,

⁸ Baldwin et al. (2005)

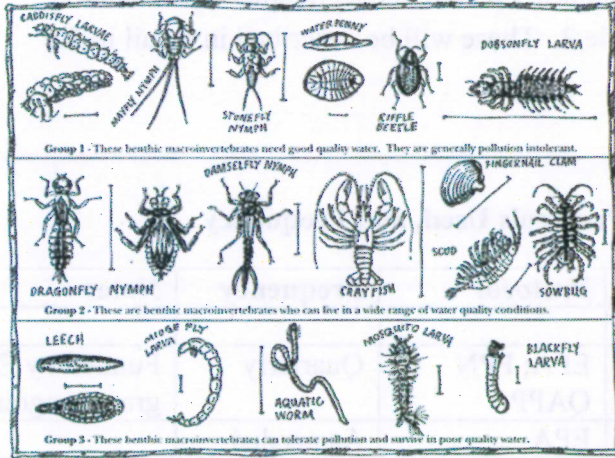
phytoplankton, vegetation, macroinvertebrates, fish, frogs, and birds. Within each of these general categories there are numerous potential measurements. For example, under surface water one can measure temperature, turbidity, flow, chemical constituents, etc. Six of these indices were chosen for the PPN wetlands as summarized in Table 1.

Index	Measurement	Selected	Notes
1	Surface Water	XX	Some work already being done on surface water can be finished by using EPA grants.
2	Ground Water	XX	Some work already being done on ground water can be finished by using EPA grants.
3	Soil	XX	May be selected in future if suitable efficient cost-effective techniques can be found and signal to noise ratio is acceptable.
4	Phytoplankton	XX	Possible techniques not available with current expertise and funding, may be less relevant in a riparian wetland setting.
5	Macroinvertebrates	XX	Macroinvertebrates are good indicators of water quality and the type of stresses in a watershed. Well tested and documented technique available (Bany Biomonitoring) staff has been trained on this technique and will be receiving additional training.
6	Vegetation	XX	Development in wetland system good techniques available for efficient measurements.
7	Fish	XX	Fish surveys for salmonids are ongoing fish are an important cultural species for PPN and a good indicator of wetland recovery.
8	Frogs	XX	Bufo boreas probably not a good indicator in this area, occurs too extensive and have too high a signal/noise ratio.
9	Birds	XX	Relatively inexpensive, good long-term indicator of wetland recovery as well as of global change.

Table 1. Indices Selected for Monitoring Pinoleville Reservation Wetlands.

Category (from Baldwin et al. (2005))	Selected	Not-selected	Reason
1. Surface Water	XX		Some work already being done on surface water; can be funded by ongoing EPA grants;
2. Ground Water	XX		Some work already being done on ground water; can be funded by ongoing EPA grants;
3. Soil		XX	May be selected in future if suitable efficient, cost-effective technique can be found and signal to noise ratio is acceptable
4. Phytoplankton		XX	Feasible techniques not available with current expertise and funding; may be less relevant in a riparian wetland setting
5. Macroinvertebrates	XX		Macroinvertebrates are good indicators of water quality and the types of stressors in a watershed. Well tested and documented technique available (Rapid Bioassessment); staff has been trained on this technique and will be receiving additional training
6. Vegetation	XX		Key element in health of system; good techniques available for efficient measurements
7. Fish	XX		Fish surveys for salmonids are ongoing; fish are an important cultural species for PPN and a good indicator of wetland recovery
8. Frogs		XX	Presence/absence probably not a good indicator in this area; census too expensive and have too high a signal/noise ratio.
9. Birds	XX		Relatively inexpensive; good long-term indicator of wetland recovery as well as of global change

Biotic Index of Water Quality



Macroinvertebrates are good indicators of water quality

Monitoring Techniques. The specific indices selected, the techniques used, and the frequency of measurement is summarized in Table 2. These will be described in detail in the technical monitoring plan.

Table 2. Monitoring Indices, Techniques or Protocols Used, and Frequency.

Category	Index	Protocol	Frequency	Notes
1. Surface Water	Chemical constituents	EPA; PPN QAPP	Quarterly	Funded by EPA PPG grant (ongoing)
	Coliform	EPA	As needed	
	Flow	EPA	Minimum monthly measurement	
2. Ground Water	Chemical constituents	EPA; PPN QAPP	As needed	Funded by EPA PPG grant (ongoing)
3. Vegetation	Plant species richness	Ground survey	Once every 5 – 10 years	This is part of baseline botanical inventory being funded this year by wetland grant
	Vegetation map	From aerial photography plus ground truthing	Once every 5-10 years	Part of baseline biotic survey
	Rephotography	Photographs from fixed points ⁹	Once every 5-10 years	Provides a visual record of changes
4. Macroinvertebrates	Benthic macroinvertebrates	Rapid Bioassessment Protocols for	Annual	Bioassessment is a well developed and documented protocol for macroinvertebrates; it also includes some measures of physical and chemical parameters of the stream as described below
		Use in Streams and Wadeable Rivers ¹⁰		

⁹ Hall (2001); Webb, R.H., D.E. Boyer, and R.M. Turner (2010)

¹⁰ Barbour et al. (1999)

5. Physical Habitat Features	Canopy cover	Densimeter	Annual	Approved QAPP
	Water quality measurements (temp, DO, pH, turbidity, conductivity, salinity, TDS)	YSI Sonde	Annual	Approved QAPP
	In Channel Fish Cover	Visual Estimates	Annual	Approved QAPP
	Riparian Cover	Visual Estimates	Annual	Approved QAPP
6. Fish	Spawner survey (salmonids)	CDFW ¹¹	Annual	These are already being done for the portion of Ackerman Creek within the reservation
	Juvenile Salmonid Count	Snorkel Survey CDFW ¹²	Annual	These are already being done for the portion of Ackerman Creek within the reservation
7. Birds	Species Richness	Modified point count methodology ¹³	Every 5-10 years (all season)	Technique provides species present plus habitat types utilized
8. Wildlife habitat analysis	Habitat improvement	Wildlife habitat relationships	Every 5-10 years	This analysis combines the information gathered in Category 4 and 7 to provide evidence of improvement or degradation of the wetland wildlife habitat

¹¹ Adams et al. (2011)

¹² Adams et al. (2011)

¹³ Ralph, C.J., J.R. Sauer, and S. Droege (1995)

VII. Developing the skills, expertise and understanding of wetlands and their management

Developing and maintaining a strong wetland program will require: (a) trained personnel to carry out the activities; (b) education of PPN citizens and neighbors on the values of wetlands and on conservation of wetlands; and (c) cooperative efforts with other tribes and agencies to share knowledge and equipment.

Training

The PPN will need trained people to implement the wetland program. Since knowledge of wetlands and their management is ever increasing, even experienced staff need ongoing education to keep up with new understanding and new techniques. Thus a high priority is to provide continuing training for existing staff and to the extent possible to retain experienced staff. Most of the work on the wetland program is managed or done by the Water Quality Specialist (WQS). The WQS is receiving training this year in *Determining Proper Functioning Condition of Wetlands*, and on the *California Rapid Bioassessment Procedure*. Such ongoing education for PPN environmental staff will continue and will be a high priority when funding is available.

Education and Outreach

In addition to training staff, the citizens of the PPN and their neighbors will need to develop a better understanding of wetlands. This will not only help with protection of such wetlands but will help develop support for the wetland program. Eventually it may lead to voluntary restoration and protection.

The education and outreach efforts will consist of periodic meetings, seminars, field trips and other informational activities as well as development of educational materials such as brochures, posters, and web related material. The PPN runs a *Tribal Head Start* program as well as a *Youth Build* program and center and these both provide good opportunities to inform younger citizens about the values of wetlands.

Intertribal Cooperation – the “Stream Team”

Most of the reservations of Mendocino and adjacent Lake and Sonoma Counties consist of small reservations with limited staff and limited resources. The environmental departments typically consist of one or two permanent staff, often funded by only one or two grants. Furthermore, turnover in these positions tends to be rather high with the result that much staff is on a steep

learning curve. Under these circumstances it is hard for one tribe to have all the expertise and equipment to carry out environmental activities such as wetland monitoring. In addition, many activities require mustering of a crew of from two to four or more people. To counter this limitation, the environmental staff of the tribes from these three counties have begun to work together to share information, expertise and personnel. The environmental directors and staff meet monthly to share information and to coordinate projects. This has resulted in numerous cooperative projects such as grant applications and funding to benefit several tribes and an annual environmental campout for youth that is open to all tribal youth in the region.

The concept of a tribal “stream team” to share equipment and expertise is already being implemented. Environmental personnel from different tribes have been getting together to assist with activities such as fish surveys—and training programs have been set up for the benefit of multiple tribes. For example, in 2013 the PPN Environmental Department arranged for Dan Mosley, a Pyramid Lake Paiute biologist with decades of experience in stream and wetland restoration to come out to Mendocino County and train tribal environmental staff from the three counties in stream bioassessment techniques.

The development of a more structured tribal “Stream Team” could benefit all of the tribes of the three counties. To this end the PPN wetland program will support and participate in such development with the ultimate goal of having a permanent “stream team coordinator” to assist all the tribes of the region.

VIII. Restoring the commercial properties within the wetlands

As discussed in section I, when the reservation was terminated many properties fell into non-tribal ownership and some of these parcels are within the floodplain and have been developed for commercial purposes. Two of them are of particular concern R&B & Ukiah Autodismantlers. Both of them are within the floodplain. They are problematic for wetland recovery for two reasons: (1) because they have built up berms to protect their enterprises from flooding, they are impeding the natural recovery and functioning of the wetland; and (2) their use of a great number of toxic chemicals and materials poses an ongoing problem of groundwater contamination and a potential hazard of widespread contamination in the event of a major flood event. This is particularly true of the auto dismantlers due to their location and to the high number of contaminants that pass through or are used in the operation. In 2006 their berms were breached and a lot of contaminated water was spread around the adjacent properties.

The PPN Council has wanted to acquire these properties for some time but has not been able to do so due to a combination of lack of funds and unreasonably high asking prices. However, acquiring and restoring these properties will be a key element in complete recovery of the wetland ecosystem within the reservation.

Recognizing that this may be a long term project, PPN will develop a strategy for acquisition and restoration of these properties. This strategy will evaluate:

- Priorities for acquisition
- Current values of such properties
- Potential sources of funding for acquisition
- Potential use of such properties for appropriate revenue generating activities compatible with wetland restoration and protection
- Potential of acquiring properties other than by fee simple such as acquiring all or parts as a conservation easement or for open space / parklands.
- Sources of funds for cleaning up and restoring properties such as EPA Brownfields

Grants

This strategy will be incorporated into the next revision of the PPN *Integrated Resource Management Plan (IRMP)*, or it could be prepared as part of an IRMP update.

A strategy of securing funds to acquire the parcels and restore them and then develop them as parks is one which should be explored in depth, since funding for parks is available from a wide variety of sources and a riverside park would be a valuable amenity for the citizens of the PPN.

IX. Development and implementation of a watershed plan for Ackerman Creek watershed

A watershed plan is a strategy and a work plan for achieving resource goals for a geographically defined watershed or drainage basin. Since most watersheds have more than one manager or owner or parties of interest (“stakeholders”), plans typically are prepared with input from as many of these stakeholders as possible.

EPA, as well as many other agencies concerned with water and wetlands, has recognized that watershed plans can be powerful tools to bring together people and resources to protect and restore rivers and streams and their associated wetlands. For this reason EPA has developed a great deal of guidance and tools for watershed planning.¹⁴

The development of a watershed plan for Ackerman Creek could be a powerful tool to bring together the different stakeholders in the watershed for the benefit of all. As mentioned earlier activities in the upper watershed can have a great effect on the reservation waters; logging and grazing can cause excess sediment to be carried into the lower reach of the creek, whereas restoring the upper watershed could help improve the reservation waters. And the condition of the reservation waters can have important upstream effects. The lower reaches of the creek running through the reservation can provide refugia for salmon and steelhead moving upstream to spawn and for young fish moving downstream toward the ocean.

To initiate a watershed plan for Ackerman Creek, a practical first step will be to do a joint assessment of what has been termed “proper functioning condition PFC” of the entire stream. PFC refers to *how well* the physical processes are functioning. PFC is a state of resiliency that will allow a riparian-wetland system to hold together during a 25 to 30 year flow event, sustaining that system's ability to produce values related to both physical and biological attributes. Techniques for assessing PFC are well developed and have been utilized by many tribes, federal and state agencies, and watershed groups.

The rationale for using a PFC assessment as a starting point for developing a watershed plan is that PFC assessment has proven to be an excellent communication tool for bringing a wide diversity of publics to agreement. This process forms a “common vocabulary” for identifying the needs for restoration and protection.¹⁵

The PPN environmental department has been working with Mendocino Redwood Company (MRC) which manages much of the upper watershed as well as with the Natural Resource Conservation Service (NRCS) which has a mission to facilitate watershed planning. Thus the logical beginning of the process would be to get necessary funding and agreement for a joint PFC assessment of the creek with MRC and NRCS and any other interested landowners. This

¹⁴ Environmental Protection Agency (2008) see: http://water.epa.gov/polwaste/nps/handbook_index.cfm

¹⁵ Pritchard et al (2008)

would then be used as a catalyst to begin the process of developing a watershed plan. After that the direction of the plan and its implementation would be driven by the stakeholders—so it cannot be spelled out in detail. It is worth noting that there are a lot of people around with experience with the process and lots of available guidance. And while development and implementation of good watershed plans have been shown to have many benefits, to humans and to the watersheds, the process can be quite slow and frustrating and requires patience and persistence of all those involved.

It should be noted that Pinoleville Pomo people and other Native Americans have been using the upper Ackerman Creek for thousands of years so the PPN has an active interest in the entire watershed. Currently PPN is working with Mendocino Redwood Company to co-manage an important and probably very old cultural site in the upper watershed.



Watershed planning can bring different stakeholders together to pursue a common interest—the health of the watershed.

X. Securing Water Rights

Importance

An unknown quantity of water is being diverted from Ackerman Creek by adjacent non-Indian landowners. The most obvious of these diversions is from the vineyards to the North. They used to pump directly from the creek but they now have sunk a well next to the creek. However, they still are, in all likelihood, pumping from the same aquifer as it has been noted that the flow in the creek drops noticeably when the vineyards start their diversions.

These diversions are particularly troublesome because of the timing. Much of the water in the county that is diverted by vineyard owners is done in the early spring for frost protection. This coincides with a critical time for migrating steelhead and salmon when unnatural low flows can be quite detrimental.

With a reserved water right, PPN would be in a better position to have some control over diversions from the creek and would also have a clear right to divert water from the creek for agricultural or household use.

With the possibility of extended periods of drought in the region and more and more demands for water, without a reserved water right and some control over outside diversion, most of the wetland protection and restoration efforts could be nullified by uncontrolled diversion. It is thus of central importance for the wetlands that PPN secure a reserved water right.

Basis for PPN Reserved Water Right

The legal basis for PPN water rights are derived from the federal reserved rights or “*Winters Doctrine*”. The 1908 Winters decision of the US Supreme Court held that when Congress set aside land for an Indian reservation, sufficient water is implicitly set aside to support the purposes of the reservation.

The quantification method is based upon the purpose of the reservation. Historically, the purpose of reservations was viewed as developing an agricultural lifestyle among its inhabitants. Thus the measure of water was deemed to be that which is necessary for growing and irrigating crops. The irrigation standard is expressed as the amount of water needed to irrigate all “practicably irrigable acreage (PIA) on the reservation. Appendices B through D provide more detail about the basis for establishing water rights.

Water law in general is complex and Indian water law even more so. However, the evidence suggests that the PPN has a right, at a minimum, to all the water under, flowing through, or

falling on the Pinoleville Reservation necessary to irrigate alfalfa¹⁶ on all the irrigable acres of the reservation. It is worthy of noting that the tribe does not have to have been or currently be using the water for such purposes. A rough approximation of how much water this is 13 million gallons of water per year.¹⁷

To establish their right to water, the PPN will need to go through a series of steps to provide the background for quantifying the amount of water to which the tribe is entitled. These steps are summarized in Table 3 and involve verifying the reasons for the establishing the reservation, determining the practicable irrigable acreage (PIA), and quantifying the amount of water available. With this information in hand the PPN can proceed to establish their right through legislation, litigation, or negotiation. Because of the difficulties and cost of litigation, many tribes prefer to pursue negotiation.

Relationship to EPA Core Elements.

We note that establishing a tribal water right does not fit neatly into the “Core Elements of a Wetland Management Program¹⁸” defined by EPA. We suspect that this is because the Core Elements were for both States and Tribes, and since States already have control over water rights it would not apply to them. However, as argued earlier, in the long run Tribes must have some control over the water if they are to restore and protect wetlands.

We note the following proposed objective under the EPA’s Program Building Activities of the Elements of a Regulatory Program Activities

Objective 1: Clearly Define the Jurisdictional Scope of the Program

Actions

a. Provide clear and comprehensive jurisdictional coverage of aquatic resources.

“Establishing tribal reserved water rights” is not one of the steps listed but it is an appropriate one for tribes.

The PPN also recognizes that the EPA may not have a mandate or authority to assist tribes in asserting their water rights. The EPA’s Tribal Water Plan¹⁹ does not deal with water rights at all. However, the EPA seems to have some recognition of the importance as they have sponsored

¹⁶ Alfalfa is used for such calculations because it is one of the most water demanding crops commonly grown in the West.

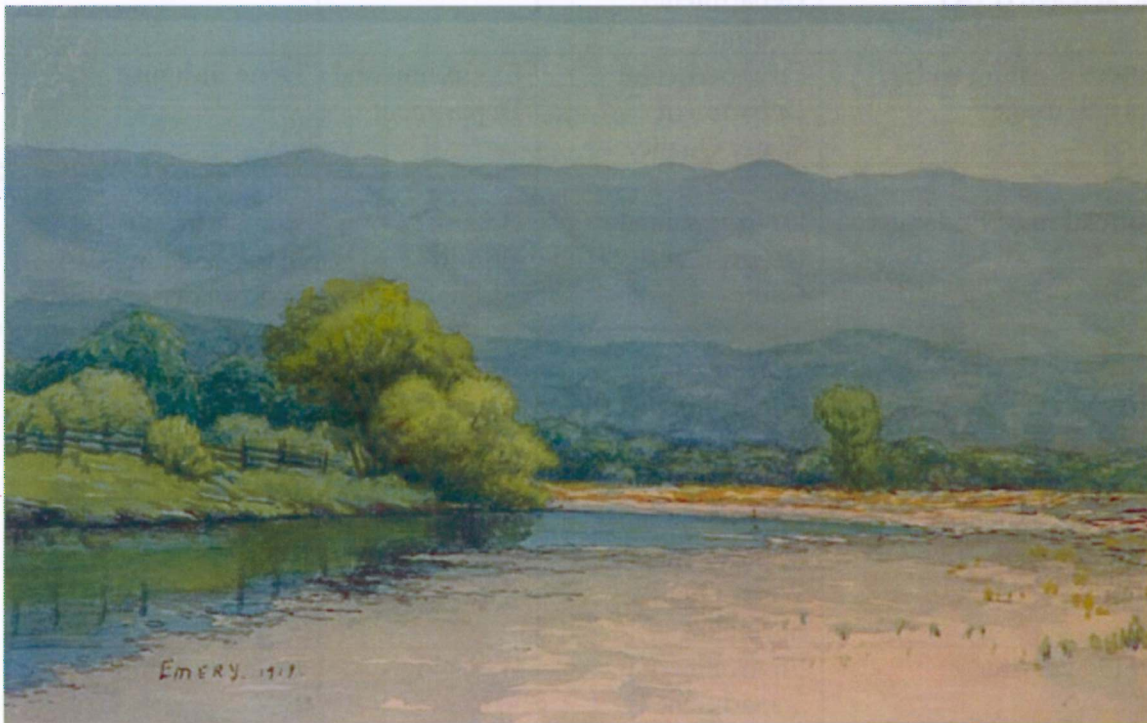
¹⁷ This is based upon an estimated practicable irrigable acreage of 40 acres, water use for alfalfa of 4 acre feet per year, and a conversion of 325,851 gallons per acre foot of water.

¹⁸ Environmental Protection Agency (2008a)

¹⁹ Environmental Protection Agency (2005) Tribal Water Plan

studies on the issue.²⁰ However, it is clearly a concern of other agencies of the Federal Government, particularly the Bureau of Indian Affairs (BIA) that has a program for assisting tribes in securing water rights.

By including the objective of securing water rights in this plan, PPN is not suggesting that this is something that the EPA could or should fund in the future but rather that it is an integral part of a long term program for restoration of their wetlands. Other Federal Agencies, particularly the BIA, have both the authority and funding to assist tribes with securing water rights so it is clearly an accepted Federal objective. The PPN has applied for assistance from BIA in securing water rights in the past and will continue to solicit support from that agency or from other sources to work on this objective.



Watercolor of Ackerman Creek looking east by Bertha Luce Emery, 1919.

When Congress set aside land for an Indian reservation, sufficient water was set aside for the purposes of the reservation.

²⁰ The Economics of American Indian Water Rights

Table 3. Procedures to Quantify Pinoleville Pomo Nation’s Reserved Water Right.

Step	Responsibility	Expertise	Notes
1. Determine the purposes for which the Pinoleville Reservation was created	Environmental Department / Contract	Historian Ethnohistorian	Done by Contract
2. Determine from the historical record what water resources existed at the time the Reservation was created	Environmental Department / Contract	Historian Ethnohistorian	Done by Contract
3. Determine “practicable irrigable acreage (PIA)”	Environmental Department / Contract	Agronomist	Done by Contract
4. Inventory existing water facilities and usage	Environmental Department / Water Quality Specialist	Environmental Department	Done in-house
5. Identification of Endangered Species	Environmental Department / Contract	Botanist / Wildlife Biologist	The biotic surveys being done in 2014-2015 under contract will complete this step.
6. Identify water needs of plant and animal species	Environmental Department / Contract	Botanist / Wildlife Biologist	Done by contract
7. Determine the quality of the water that exists on the reservation	Environmental Department / Water Quality Specialist	Water Quality Specialist	Done in-house
8. Hydrological Study	Environmental Department / Contract	Hydrologist	Done by contract
9. Secure funding for project	Environmental Department / Grant Writer	Grant Writers	Ongoing effort
10. Development of a “Strategic Plan” for securing water right through legislation, litigation, or negotiation	Environmental Department/ Tribal Council/ Counsel	All	BIA Funding is available for this step and preceding ones

XI. Actions and Activities Supporting Overall Goal and Objectives

The following tables summarize the actions and activities proposed for the wetlands for the next six years. They are shown in the “Core Elements Framework”²¹ of the EPA.

Core Element: Voluntary²² Restoration and Protection

Goal: Recovery of the “health” of the wetland

Objective 1: Restoration of the wetland to “proper functioning condition”²³

Activities	2015	2016	2017	2018	2019	2020	(Potential) Funding
Removal of invasive plant species: giant reed and Himalayan blackberry	X	X					NCIRWMP
Revegetation with native plant species	X	X	X				NCIRWMP
Streambank protection / stabilization							NCIRWMP
Barrier removal							NCIRWMP
Junk car removal							NCIRWMP
Building of bioswales to capture and cleanse runoff from commercial properties above the wetland							NCIRWMP
Evaluation of effectiveness of wetland program and priorities for next 6 years					XX		EPA
Development of a Wetland Program Plan for Years 2021-2022						XX	EPA

²¹ Reference: Environmental Protection Agency (2008)

²² The term “voluntary” here refers to the fact that restoration and protection is not mandated by law or regulation

²³ Riparian wetland areas are functioning properly when adequate vegetation, landform, or large woody debris is present to:

- Dissipate stream energy associated with high flows
- Filter sediment and capture bed load
- Aid floodplain development
- Improve flood water retention and groundwater recharge and
- Stabilize streambanks.

Objective 2: Protection of wetland from damaging activities.

Activity	2015	2016	2017	2018	2019	2020	(Potential) Funding
Ongoing monitoring by the Environmental Department of activities on and around the reservation that may be impacting the wetlands	X	X	X	X	X	X	EPA -GAP and Clean Water Act 319 Funding

Objective 3: Development of skills and expertise in wetland management by staff and understanding of wetland function and value by PPN Citizens

Activities	2015	2016	2017	2018	2019	2020	(Potential) Funding
Training of Environmental Department staff on wetland monitoring and management	X	X	X	X	X	X	EPA-GAP and Clean Water Act 319 Funding EPA Wetland Program Development Grants
Educational events for staff and citizens of PPN on wetlands	X	X	X	X	X	X	EPA-GAP and Clean Water Act 319 Funding Wetland Program Development Grants
Production of educational materials on wetlands	X	X	X	X	X	X	EPA-GAP and Clean Water Act 319 Funding Wetland Program Development Grants
Development of an intertribal "stream team"	X	X	X	X	X	X	EPA-GAP and Clean

							Water Act 319 Funding Wetland Program Development Grants
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Objective 4: Restoring the commercial properties within the wetlands.

Activities	2015	2016	2017	2018	2019	2020	(Potential) Funding
Develop a strategy for acquiring control of priority commercial properties	XX						EPA Wetland Program Development Grants
Obtain funding for purchase of priority properties		XX	XX				LWCF
Purchase properties or acquire control through other means				XX			LWCF
Obtain funding for clean-up / restoration of properties			XX	XX			Brownfields Grants
Clean-up and restore properties				XX	XX		Brownfields Grants
Develop properties as parks or open-space or other uses compatible with restoration and protection goals for the wetlands					XX	XX	EPA

Objective 4: Development and Implementation of a Watershed plan for Ackerman Creek.

Activities	2015	2016	2017	2018	2019	2020	(Potential) Funding
Joint assessment of proper functioning condition (PFC) of Ackerman Creek w/NRCS, other agencies, MRC, and other interested landowners		XX					EPA Wetland Program Development Grants NRCS
Organize a watershed group to deal with issues identified in PFC assessment			XX				EPA Wetland Program Development Grants NRCS
Develop watershed plan				XX	XX		EPA Wetland Program Development Grants NRCS
Seek funding; begin implementation of watershed plan						XX	EPA Wetland Program Development Grants NRCS

Core Element: Monitoring and Assessment

Goal: Determination if wetland management activities are effective.

Objective: Implement monitoring program initiated in 2014.

Activities	2015	2016	2017	2018	2019	2020	(Potential) Funding
Draft and peer review Quality Assurance Project Plan (QAPP) all monitoring activities	XX						EPA Wetland Program Development Grants
Ongoing monitoring of surface and ground water	XX	XX	XX	XX	XX	XX	Clean Water Act Section 104 & 319 Grants
Soil monitoring	XX					XX	EPA Wetland Program Development Grants
Rapid bioassessment	XX	XX	XX	XX	XX	XX	EPA Wetland Program Development Grants
Vegetation monitoring – Photo points	XX					XX	EPA Wetland Program Development Grants
Fish Monitoring – Juvenile Counts	XX	XX	XX	XX	XX	XX	EPA Wetland Program Development Grants
Fish Monitoring – Spawner Surveys	XX	XX	XX	XX	XX	XX	EPA Wetland Program Development Grants
Bird Survey					XX		EPA WPDG

CORE ELEMENT: REGULATORY

Goal: Secure control of the waters of the Pinoleville Reservation.

Objective: Establish a reserved water right for the PPN adequate to protect wetlands.

	2015	2016	2017	2018	2019	2020	(Potential) Funding
Compile background information necessary to secure a water right	XX	XX					BIA
Develop a strategy for obtaining water rights			XX				BIA
Pursue water right through legislation, litigation, or negotiation				XX	XX	XX	BIA

XII. Funding

Although the PPN administration and citizens support the efforts of the wetland program in many ways, they do not have funding for all the activities required. Therefore the wetland program will need an active, ongoing effort at raising funds through grants and other means.

We have alluded in section XI to some of the potential sources of funding and we describe them in more detail here. The EPA has a description of potential funders²⁴, some of which are shown in the following table. The most promising funding sources for funding this effort are shown in Table 4.

Funding Source	Description	Agency
Wetland Reserve Program (WRP)	Provides grants to tribes to protect watersheds from damage caused by erosion, floodwater, and sediment and to conserve and develop water and land resources.	Technical Assistance
Wetland Conservation Fund	The LWCP Program provides matching grants to States and local governments for the acquisition and development of public outdoor recreation areas and facilities.	Grants
Antiquities Act (AA)	ANA's Environmental Regulatory Enhancement grants provide tribes with resources to develop legal, technical and organizational capacities for protecting their natural environments.	Administration
National Park Service (NPS)	The NPS administers Historic Preservation Fund awards "Tribal Project Grants" to Indian tribes for the preservation and protection of their cultural heritage. NPS also administers the Land and Water Conservation Fund which provides grants to tribes to protect watersheds.	Grants
US Fish and Wildlife Service (FWS)	The FWS Tribal Wildlife Grant Program has ongoing funding for projects for the benefit of wildlife and their habitat, including species of Native American cultural or traditional importance and species that are imperiled.	Grants
Natural Marine Fisheries Service	NMFS is responsible for the management, conservation, and protection of living marine resources along the coast including salmon and halibut.	Grants
EPA	Provides grants for tribal environmental programs including wetland protection and restoration.	Agency (EPA)

²⁴ EPA (2001)

Table 4. Potential Sources of Funds or Support for Implementing the Wetland Program		
Agency or Organization	Types of Support	Notes / References
National Level		
Environmental Protection Agency (EPA)	Grants	EPA has been and will continue to be a primary source of funding for tribes for environmental programs including wetland protection and restoration. http://water.epa.gov/grants_funding/wetlands/restore/upload/funding.pdf Add Brownfields link as well if it's not on that page
National Marine Fisheries Service (NMFS)	Grants	NMFS is responsible for the management, conservation, and protection of living marine resources along the coasts including salmon and steelhead. http://www.usa.gov/directory/federal/national-marine-fisheries-service.shtml
US Fish and Wildlife Service (FWS)	Grants	The FWS Tribal Wildlife Grants Program has ongoing funding for projects for the benefit of wildlife and their habitat, including species of Native American cultural or traditional importance and species that are not hunted or fished; http://www.fws.gov/nativeamerican/grants.html
National Park Service (NPS)	Grants	The NPS administered Historic Preservation Fund awards "Tribal Project Grants" to Indian tribes for the preservation and protection of their cultural heritage; NPS also administers the Land and Water Conservation Fund listed below. http://www.nps.gov/tribes/financial_assistance.htm
Administration for Native Americans (ANA)	Grants	ANA's Environmental Regulatory Enhancement grants provide tribes with resources to develop legal, technical and organizational capacities for protecting their natural environments. http://www.acf.hhs.gov/programs/ana/programs
Land and Water Conservation Fund	Grants	The LWCF Program provides matching grants to States and local governments for the acquisition and development of public outdoor recreation areas and facilities. http://www.nps.gov/lwcf/
NRCS	Technical Assistance	NRCS provides assistance to tribes to protect watersheds from damage caused by erosion, floodwater, and sediment and to conserve and develop water and land resources. http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/landscape/wsp/

Bureau of Indian Affairs (BIA)	638 Contracts	The BIA manages the Water Rights Negotiation / Litigation Program for the purpose of defining and protecting Indian water rights and settling claims through negotiations if possible, or alternatively, through litigation. http://www.bia.gov/WhoWeAre/BIA/OTS/NaturalResources/Water/index.htm
State and Regional Level		
California Department of Fish and Wildlife (CDFW)	Grants; technical assistance	The CDFW's Fisheries Restoration Grant Program (FRGP) was established in 1981 in response to rapidly declining populations of wild salmon and steelhead trout and deteriorating fish habitat in California; the department also provides technical assistance. www.dfg.ca.gov/fish/Administration/Grants/FRGP/
North Coast Integrated Regional Water Management Plan (NCIRWMP)	Grants	The NCIRWMP is a stakeholder-driven collaboration among local government, watershed groups, tribes and interested partners in the North Coast region of California; they administer bond money from proposition 50 and 84. http://www.northcoastirwmp.net/
Local Level		
Mendocino County Fish and Game Commission (MCFGC)	Grants	The Mendocino County Fish and Game Commission solicits grant applications that comply with the California Department of Fish and Wildlife guidelines and codes. The Commission reviews the applications and provides recommendations to the Mendocino County Board of Supervisors for projects to award funding. http://www.co.mendocino.ca.us/dfg/grants.htm
Mendocino County Resource Conservation District (MCRCD)	Technical Assistance	The MCRCD is a non regulatory, local agency supporting voluntary stewardship of natural resources on wild and working landscapes. http://mcrcd.org/
Community Foundation of Mendocino County (CFMC)	Grants	The CFMC provides grant support in many areas of community life including, but not limited to, education, the arts, community health, alleviation of poverty, youth, and the environment. http://www.communityfound.org/grants/grant-programs/

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XIV. Glossary

aggradation - to fill and raise the level of (the bed of a stream) by deposition of sediment; it is typically accompanied by an increase in width/depth ratio, and a corresponding decrease in channel capacity; See:

<http://water.epa.gov/scitech/datait/tools/warsss/aggrad.cfm>

anadromous – refers to animals, usually fish, that are hatched in fresh water then migrate to the ocean where they may spend most of their life before returning to fresh water to spawn; chinook salmon, coho salmon and steelhead are all anadromous fish

benthic macroinvertebrates – these are the macroinvertebrates living among the sediments and stones on the bottom of streams, rivers and lakes

BIA – United States Bureau of Indian Affairs, a branch of the Department of the Interior

bioswales - a shallow depression created in the earth to accept and convey stormwater runoff; a bioswale uses natural means, including vegetation and soil, to treat stormwater by filtering out contaminants being conveyed in the water.

BMI – benthic macroinvertebrates

brownfields - the term "brownfield site" means real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant; EPA has an active program of assisting states and tribes to clean up these sites and put to productive uses; See:

<http://www.epa.gov/brownfields/overview/glossary.htm>

CDFW – California Department of Fish and Wildlife (formerly called the California Department of Fish and Game)

core elements – the EPA has identified four core elements that comprise and strengthen effective wetlands programs. The core elements are basic program functions that form the foundation of wetlands management and protection in a state or tribe. They are:

1. Monitoring and Assessment;
2. Regulatory Activities;
3. Voluntary Restoration and Protection; and
4. Water Quality Standards for Wetlands.

See: http://water.epa.gov/grants_funding/wetlands/cef_full.cfm#st_tribal

core elements framework (CEF) - The CEF was developed by EPA to outline the core elements of a state or tribal wetland program, describes each core element, and provides a comprehensive menu of program-building activities for each core element. EPA hopes that a clearer definition of core elements and collection of concrete actions outlined in the CEF will increase the understanding of what comprises a state and tribal wetlands program and encourage more states and tribes to pursue a strategic approach to wetland program development. The CEF is intended

to be fairly comprehensive so that states and tribes can choose from an array of actions that are best suited to their goals and resources. The CEF is designed as a menu of activities that states and tribes can draw from to design their own roadmap towards a more comprehensive wetland program. States and tribes will implement the CEF depending on their individual program goals and available resources. See: http://water.epa.gov/grants_funding/wetlands/cefintro.cfm

ecosystem - An ecosystem, short for ecological system, is a community of plants, animals and smaller organisms that live, feed, reproduce and interact in the same area or environment.

embeddedness – is an index of the degree to which larger particles (boulders, large cobbles) are surrounded or partially buried by fine sediments; as embeddedness increases, the biotic productivity of the substrate is considered to decrease

EPA – the United States Environmental Protection Agency; an independent cabinet level agency

floodplain - an area of low, flat land along a stream or river that may flood with high water

GAP – General Assistance Program; an EPA program to provide general assistance to tribes to develop programs for environmental protection

global change - changes in the global environment (including alterations in climate, land productivity, oceans or other water resources, atmospheric chemistry, and ecological systems) that may alter the capacity of the Earth to sustain life

inholding - a privately owned parcel of land within the boundaries of a federal preserve such as a national forest, a national park, or an Indian reservation

invasive plants – an invasive species is one that is non-native to the ecosystem under consideration and whose introduction causes or is likely to cause economic or environmental harm or harm to human health

IRMP – integrated resource management plan; a Tribal IRMP is a long-range, strategic level, comprehensive plan which integrates the management actions applied to a tribe's natural resources and other resources of value. It is a tribal policy document, based on the vision the tribe has for its resources. See:

<http://www.bia.gov/WhoWeAre/BIA/OTS/DFWFM/IRMP/index.htm>

macroinvertebrate - organisms that are large enough to be seen with the naked eye but do not have a back bone; they include arthropods (insects, mites, scuds and crayfish), mollusks (snails, limpets, mussels and clams), annelids (segmented worms), nematodes (roundworms), and platyhelminthes (flatworms).

magnesite - a mineral with the chemical formula $MgCO_3$ (magnesium carbonate).

MRC – Mendocino Redwood Company

native plants - A native plant species is one that occurs naturally in a particular region, state, ecosystem, or habitat without direct or indirect human actions; when talking about native plants

it is important to be clear about the geographic region to which they are native—e.g. native to California, to Mendocino County, to Ackerman Creek, etc.

NRCS – the United States Natural Resource Conservation Service; a branch of the Department of Agriculture

NCIRWMP – North Coast Integrated Water Resource Management Plan

organic matter (in soils) - Soil organic matter is the organic matter component of soil, consisting of plant and animal residues at various stages of decomposition, cells and tissues of soil organisms, and substances synthesized by soil organisms.

peri-urban - of or relating to an area immediately surrounding a city or town

PFC – see “proper functioning condition”

proper functioning condition (PFC) - riparian wetland areas are functioning properly when adequate vegetation, landform, or large woody debris is present to:

- Dissipate stream energy associated with high flows
- Filter sediment and capture bed load
- Aid floodplain development
- Improve flood water retention and groundwater recharge and
- Stabilize streambanks.

The term is also used to refer to the process of determining if a wetland area is in proper functioning condition.

PIA – practicable irrigable acreage; a measure used in determining Indian reserved water rights

pinole – in California the term pinole is used for all flours made by Indians by pounding the roasted seeds of wildflowers and grasses; the original Spanish term had a more limited meaning referring to meal made from ground corn, wheat or mesquite beans

PPG – performance partnership grants; grants from EPA that allow two or more environmental grants to be combined in order to allow more flexibility; See: http://www.epa.gov/ocir/nepps/pp_grants.htm

PPN – Pinoleville Pomo Nation

QAPP - quality assurance project plan; A Quality Assurance Project Plan documents the planning, implementation, and assessment procedures for a particular project, as well as any specific quality assurance and quality control activities; See: <http://www.epa.gov/quality/qapps.html>

reserved water right – also called “tribal reserved water rights”; The doctrine of reserved water rights evolved to ensure that Indian reservations (and other public lands) set aside by the federal government would have sufficient water to fulfill the purposes for which they were established.

Whereas most western water rights (state based appropriative rights) have a priority date based on when water was first put to beneficial use, federal reserved water rights have a priority date that goes back at least as far as the date on which the lands were set aside.

riparian - relating to or living or located on the bank of a stream or river

salmonid - Of, belonging to, or characteristic of the family Salmonidae, which includes the salmon, trout, and whitefish.

stakeholders - A stakeholder is anybody who can affect or is affected by an organization, strategy or project; for example, the stakeholders in a watershed such as Ackerman Creek would include not just the landowners, but also those who use the area for recreation, those with an interest in protecting the cultural heritage of the area, those affected by land use practices in the area, etc.

signal to noise ratio – Signal-to-noise ratio (often abbreviated SNR or S/N) is a measure used in science and engineering that compares the level of a desired **signal** to the level of background **noise**. It is defined as the ratio of signal power to the noise power. For example, using the medical analogy a person's body temperature as an index of health could be said to have a high S/N since under normal circumstances most people's temperature varies less than a degree. Thus the ratio of signal (98.6F) to the noise (1 degree F) would be 98. Thus a doctor can be reasonably confident that if a person has a body temperature of 104F it is due to illness and not to the normal variation (noise) in a person's body temperature.

species richness – refers to the number of species of a given type (birds, mammals, etc) found in a defined area; it is not a measure of the abundance or relative abundance

trust land – land owned either by an individual Indian or a tribe, the title to which is held in trust by the federal government. Most trust land is within reservation boundaries, but trust land can also be off reservation or outside the boundaries of an Indian reservation. There are lands west of the Pinoleville Reservation which are being held in trust by the State of California for Native Americans. They are frequently referred to on the reservation as "the trust lands" but they are not federal trust lands.

turbidity – refers to the cloudiness or haziness of a fluid caused by individual particles (total suspended or dissolved solids) that are generally invisible to the naked eye, similar to smoke in air; the measurement of turbidity is a key test of water quality.

watershed - the area of land where all of the water that is under it or drains off of it goes into the same place

WPP – wetland program plan

WQS – water quality specialist

XVI. Appendices

A. List of Common and Scientific Names of Plants and Animals discussed in text.

B. Indian Water Rights

C. Water Rights Law in California

D. Advantages of Negotiation versus Litigation in Establishing Indian Water Rights

Appendix A. Common and Scientific Names of Species in Text

	Common Name	Scientific Name
Plants		
	Alder	<i>Alnus rhombifolia</i>
	California black walnut	<i>Juglans californica</i>
	California blackberry	<i>Rubus ursinus</i>
	Dogbane	<i>Apocynum cannabinum</i>
	Elderberry	<i>Sambucus mexicana</i>
	Giant reed	<i>Arundo donax</i>
	Himalayan blackberry	<i>Rubus armeniacus</i>
	Pepperwood	<i>Umbellularia californica</i>
	White root sedge	<i>Carex barbarea</i>
Animals		
	Fish	
	Chinook salmon	<i>Oncorhynchus tshawytscha</i>
	Steelhead (trout)	<i>Oncorhynchus mykiss</i>
	Reptiles	
	Western pond turtle	<i>Actinemys mamorata</i>
	Birds	
	California quail	<i>Callipepla californica</i>
	Great blue heron	<i>Ardea herodias</i>
	Northern flicker	<i>Colaptes auratus</i>
	Red tailed hawk	<i>Buteo jamaicensis</i>
	Mammals	
	Black bear	<i>Ursus americanus</i>
	Black-tailed deer	<i>Odocoileus hemionus</i>
	River otter	<i>Lutra canadensis</i>

Appendix B. Indian Water Rights

Access to water is an area in which Native Americans enjoy special rights. The issue of water rights has been most pertinent in the western part of the United States, where most Indian reservations are located and where water is the scarcest. In the West, rights to water are determined by the "appropriative" system", which holds that water rights are not connected to the land itself. Rather, the right to water belongs to the first user who appropriates it for a beneficial use. That appropriator is guaranteed the right to continue to take water from that source, unhindered by future appropriators, as long as the water continues to be put to a beneficial use. When the appropriator ceases to use the water, he or she loses the right to it.

In contrast to this appropriative system, states in the East, where water is plentiful, follow the "riparian" system, which gives the owner of land bordering a body of water the right to the reasonable use of that water. All riparian owners are guaranteed the right to a continued flow of water, whether or not they use it continuously.

Native American water rights combine the features of the appropriative and riparian systems. The legal foundation for Indian water rights is the 1908 U.S. Supreme Court case *Winters v. United States*, 207 U.S. 564, 28 S. Ct. 207, 52 L. Ed. 340. That case involved a Montana Indian reservation that had a river as one of its borders. After the reservation was established, non-Indian settlers diverted the river's water, claiming that they had appropriated the water after the reservation was created but before the Indians had begun to use the water themselves. The U.S. Supreme Court ruled against the settlers, finding that when the reservation was created, reserved water rights for the Indians were necessarily implied. It was unreasonable, the Court argued, to assume that Indians would accept lands for farming and grazing purposes without also reserving the water that would make those activities possible.

A second important case involving Native American water rights is *Arizona v. California*, 373 U.S. 546, 83 S. Ct. 1468, 10 L. Ed. 2d 542 (1963). In that case, as in *Winters*, the U.S. Supreme Court held that the establishment of a reservation necessarily implied the rights to the water necessary to make the land habitable and productive. *Arizona* went beyond *Winters*, however, in also ruling on the quantity of water to which the reservation had a right. Although competing water users argued that the amount of water reserved to the reservation should be limited to the amount that was likely to be needed by the relatively small Indian population, the Court ruled that the Indians were entitled to enough water "to irrigate all the practicably irrigable acreage on the reservation," a much more generous allotment.

Based on *Winters* and *Arizona*, Native American water rights today are determined by a set of principles called "*Winters* rights." First, Congress has the right to reserve water for federal lands, including Indian reservations. Second, when Congress establishes a reservation, it is implied that the reservation has the right to water sources within or bordering the reservation. Third,

reservation water rights are reserved as of the date of the reservation's creation. Competing users with earlier appropriation dates take precedence, but those with later dates are subordinate. Fourth, the amount of water reserved for Indian use is the amount necessary to irrigate all of the practically irrigable land on the reservation. Finally, *Winters* rights to water are not lost through non-use of the water. All of these rights apply to both surface water and groundwater.

Even with the acknowledgement of Native Americans' *Winters* rights, water use in the West continues to be highly contested, as reservations fight to maintain their rights against the competing demands of state governments and non-Indian users. Several issues are yet to be resolved, such as the precise quantity of water that is needed to irrigate all "practically irrigable acreage" and the question of whether states can regulate non-Indian water users on Indian reservations. Because of the high costs and other difficulties involved in litigation, many tribes and states are choosing to try to negotiate water rights and then ask to Congress or the courts to approve their agreements.

Appendix C. Water Rights Law in California²⁵

Water right law in California and the rest of the West is markedly different from the laws governing water use in the eastern United States.

Seasonal, geographic, and quantitative differences in precipitation caused California's system to develop into a unique blend of two very different kinds of rights: riparian and appropriative. Other types of rights exist in California as well, among them reserved rights (water set aside by the federal government when it reserves land for the public domain) and pueblo rights (a municipal right based on Spanish and Mexican law).

Riparian rights usually come with owning a parcel of land that is adjacent to a source of water. With statehood, California adopted the English common law familiar to the eastern seaboard; such law also included the riparian doctrine.

A riparian right entitles the landowner to use a correlative share of the water flowing past his or her property. Riparian rights do not require permits, licenses, or government approval, but they apply only to the water which would naturally flow in the stream. Riparian rights do not entitle a water user to divert water to storage in a reservoir for use in the dry season or to use water on land outside of the watershed. Riparian rights remain with the property when it changes hands, although parcels severed from the adjacent water source generally lose their right to the water.

²⁵ Adapted from "Water Right Law in California"

http://www.waterboards.ca.gov/waterrights/board_info/water_rights_process.shtml

Water right law was set on a different course in 1849, when thousands of fortune seekers flocked to California following the discovery of gold. Water development proceeded on a scale never before witnessed in the United States as these “49ers” built extensive networks of flumes and waterways to work their claims. The water carried in these systems often had to be transported far from the original river or stream. The self-governing, maverick miners applied the same “finders-keepers” rule to water that they did to their mining claims. It belonged to the first miner to assert ownership.

To stake their water claims, the miners developed a system of “posting notice” which signaled the birth of today’s appropriative right system. It allowed others to divert available water from the same river or stream, but their rights existed within a hierarchy of priorities. This “first in time, first in right” principal became an important feature of modern water right law.

In 1850, California entered the Union as the thirty-first state. One of the first actions taken by its lawmakers was to adopt the common law of riparian rights. One year later, the Legislature recognized the appropriative right system as having the force of law. The appropriative right system continued to increase in use as agriculture and population centers blossomed and ownership of land was transferred into private hands.

The conflicting nature of California’s dual water right system prompted numerous legal disputes. Unlike appropriative users, riparian right holders were not required to put water to reasonable and beneficial use. This clash of rights eventually resulted in a constitutional amendment (Article X, Section 2 of the California Constitution) that requires all use of water to be “reasonable and beneficial.” These “beneficial uses” have commonly included municipal and industrial uses, irrigation, hydroelectric generation, and livestock watering. More recently, the concept has been broadened to include recreational use, fish and wildlife protection, and enhancement and aesthetic enjoyment.

Up to the early 1900’s appropriators – most of them miners and nonriparian farmers – had simply taken control of and used what water they wanted. Sometimes notice was filed with the county recorder, but no formal permission was required from any administrative or judicial body.

The Water Commission Act of 1914 established today’s permit process. The Act created the agency that later evolved into the State Board and granted it the authority to administer permits and licenses for California’s surface water. The act was the predecessor to today’s water Code provisions governing appropriation.

These post-1914 appropriative rights are governed by the aforementioned hierarchy of priorities developed by the 49ers. In times of shortage the most recent (“junior”) right holder must be the first to discontinue such use; each right’s priority dates to the time the permit application was filed with the State Board. Although pre- and post-1914 appropriative rights are similar, post-1914 rights are subject to a much greater degree of scrutiny and regulation by the Board.

Riparian rights still have a higher priority than appropriative rights. The priorities of riparian right holders generally carry equal weight; during a drought all share the shortage among themselves.

Appendix D. Advantages of Negotiation Versus Litigation in Establishing Indian Water Rights.²⁶

Whether litigated or negotiated, tribal water rights determination generally takes place in the context of a stream wide adjudication. If a tribe's water rights are adjudicated through litigation, its water right is identified and formalized, but the tribe receives no means of turning the right into a useful asset. Litigation is expensive and takes decades to wend through the court system,¹⁷ untold millions of dollars in studies, expert reports and attorney fees and disruption of community life. This has led parties to seek, and the federal government to prefer, a resolution through negotiated settlements. If a tribe's water rights are quantified through negotiation, a more comprehensive solution, which can include other issues, may be achieved.

Negotiated settlements, however also present challenges. Negotiations often require confidentiality, which delays or eliminates input from stakeholders, including Indian allottees whose rights are being negotiated by the tribal government. Negotiations also take years to complete, although probably far fewer than litigation, and the cost is considerable. Finally, whether a settlement agreement can make it through Congress depends on current economic, political and sponsorship conditions. This can be a source of acute frustration for all parties involved given the many years of hard work necessary to forge a compromise.

Settlement allows tribes to negotiate for the funds necessary to develop or sustain projects and goals by relinquishing some of their claims or making adjustments to priorities under certain conditions thus protecting non-tribal water rights or contributing in other ways to the livelihood and condition of the greater community. Tribal water right settlements are complex agreements that can involve more than tribal water and affect more than tribal communities. During negotiations, upon reaching an agreement, and during implementation, tribes, states and other stakeholders must undertake a concerted and sustained effort to explain the process and the details of an agreement to tribal and non-tribal communities alike. Community outreach is vital to keep the public informed, for building support for a settlement and to heal rifts resulting from misunderstanding, long standing grievances or suspicions created by litigation. Litigation results in a decree which allocates an amount of water to a tribe and describes its elements, nothing more. Settlement offers the stakeholders an opportunity to address these concerns with creative solutions.

For the most part, Indian reserved water rights remain unquantified and unused by the tribes. This state of affairs hampers tribes as they provide for their members and make plans to develop their economies. The unknown and unrecognized size and priority of Indian water rights create enormous uncertainty for state water administrators, water users, and political and economic leaders who fear disruption of established water allocation regimes once reserved rights are identified and exercised. It

²⁶ Adapted from: "Water in Indian Country: Challenges and Opportunities. A Report Prepared by the Tribal Water Working Group. http://uttoncenter.unm.edu/pdfs/2012White_Paper.pdf

is important to learn at how to effectively communicate with the Indian and non-Indian public about the nature of Indian water rights, and the litigation or settlement processes to reduce tensions and opposition to the determination of these water rights.
