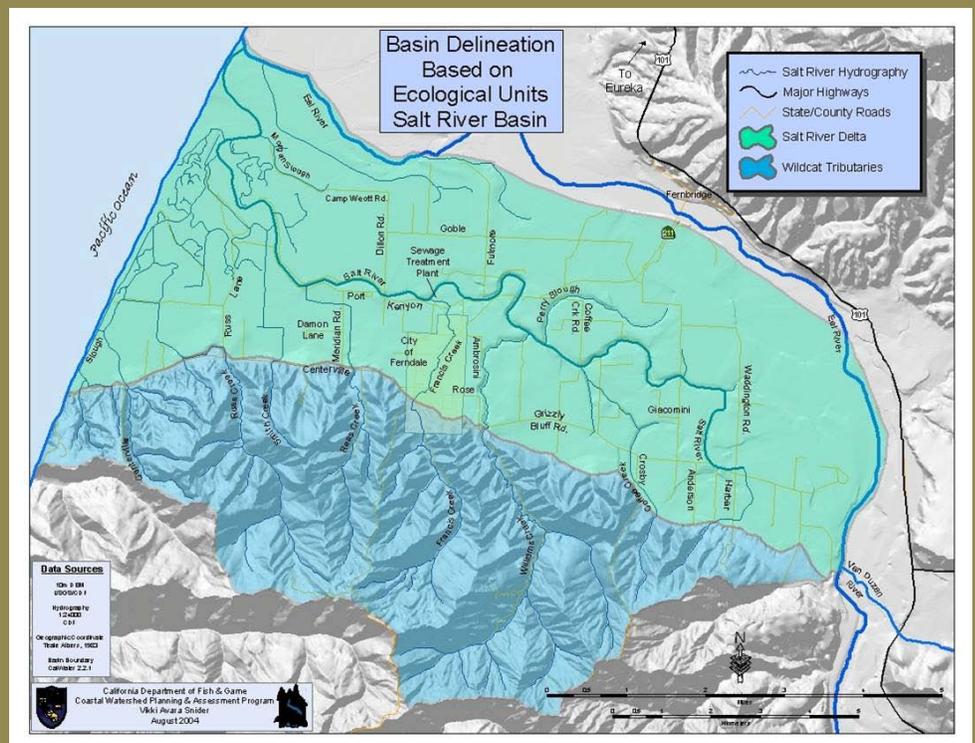


Description

The Salt River Watershed is located in Humboldt County, California approximately 15 miles south of Eureka and is considered a sub-watershed of the Eel River Delta. The watershed encompasses an area of approximately 47 square miles (30,425 acres) and is bordered by the Eel River on the north and east, the Wildcat Mountains to the south, and the Pacific Ocean to the west.

This watershed derives its name from the Salt River that courses west-northwest for 13.6 miles through the watershed delta (17,650 acres) and outlets into the Eel River estuary within one mile of the Pacific Ocean. Five tributaries originating in the Wildcat Mountains (12,775 acres) feed the Salt River – Williams, Francis, Reas, Smith, and Russ Creeks.

Located on the Northern Pacific Coast, the climate of the region is humid and cool, with dry summers and rainy winter seasons, where the average annual rain fall is 44 inches. Coastal fog is common in the summer months providing moisture during the summer and contributing to the average annual temperature of 52° degrees.



Ecology

Dunes

Approximately 5 miles of beach and dunes line the western-most edge of the watershed. Dune vegetation is dominated by non-native grasses, though small communities of native vegetation do exist such as the endangered, state-listed beach layia (*Layia carnosa*). Typical north coast shore birds inhabit the area including nesting Snowy Plovers.

Estuary

The lower Salt River watershed is inundated with a meandering slough network that experiences tidal fluctuations – a zone of fresh and salt water mixing – that makes up the estuary system. Regions of deep water, subtidal wetlands, intertidal areas (mudflats and sandflats) are all found in the watershed's estuary. These habitats support wading birds such as great egrets and blue herons. The area is also important to the endangered brown pelican (*P. occidentalis*) and the peregrine falcon (*Falco peregrinus*). The estuary complex also provides rearing habitats for salmonids species including coho (*Oncorhynchus kisutch*), Chinook (*Oncorhynchus tshawytscha*), steelhead (*Oncorhynchus mykiss*), and coastal cutthroat (*Oncorhynchus clarki*), Tidewater goby (federally listed), sticklebacks, smelts, sculpins, and surf perch.

Marsh

Lower portions of the watershed are permanently, periodically, or seasonally covered by



water and herbaceous plants. These areas include fresh water marshland, saltmarsh, and brackish marsh. A dominant invasive species found in the marsh landscape is *Spartina densiflora*, a cord grass that is causing havoc along the upper west coast of North America. Another introduced species, reed

canary grass (*Phalaris arundinacea*), is also present. Humboldt Bay owl's clover (*Orthocarpus castillejoides* var. *humboldtiensis*) Point Reyes bird's beak (*Cordylanthis maritimus* ssp. *palustris*), and eelgrass are three special status species found in the watershed's marsh. Other native plants include Pickleweed (*Salicornia virginica*), saltgrass (*Distichlis spicata*), bulrush (*Scirpus* spp.), and rushes (*Juncus* spp.). The riparian corridors of the freshwater marsh are dominated by willow and red alder (*Alnus rubra*) along with some small stands of black cottonwoods (*Populus balsamifera* ssp. *trichocarpa*). In addition to plant communities, avian species are abundant. A variety of raptors (harrier, red shouldered, red tail), wading birds (great egret, blue heron, least sandpiper), mallard duck, American crow, American goldfinch, black headed grosbeak, geese (Aleutian, Brants, and Canada), black capped chickadee, willow flycatcher, Wilson's warbler, and sparrows (savannah, song, white-crowned) have been identified. The salmonids and other fish listed above in the estuary description are also found in the marsh areas along with Sacramento pikeminnow (freshwater marsh).

Agricultural Lands

Of the 17,695 acres of the Salt River watershed delta, 86% is comprised of agricultural activities. These activities are dominated by pasture based dairies, many of which are certified organic. Other basin agriculture practices include the production of beef cattle, hay, silage, and corn.



Wildcat Hills

The Wildcat Hills form the southern boundary of the Salt River delta and contain the headwaters of the five tributaries that feed the Salt River - Williams, Francis, Reas, Smith, and Russ Creeks. Elevations in the Wildcats range from an average of about 800 feet to the highest point of 1,750 feet. The geology of the Wildcat Hills is composed of steeply sloped loosely consolidated sedimentary rock formation and are susceptible to large scale landslides and significant erosion. The high level of eroding sediment from these mountains are

annually deposited in the region's tributaries and the watershed's delta region. The upper slopes are home to coniferous and deciduous trees species such as Sika spruce, redwood, Douglas fir, grand fir, red alder, willow, and western red cedar. The amount of sediment deposition in the tributaries and sparse canopy cover causes tributaries to be currently classified as marginal fish (salmonid) bearing streams by California Department of Fish and Wildlife. The presence of Sacramento pikeminnow further inhibits the presence of salmonids; though recent surveys have identified the presence of individual coho salmon and cutthroat trout. The watershed is in private ownership and supports several small-to mid-sized timber and ranching operations.

Land Use

Dairy



Approximately 40 dairies operate in the Salt River Basin. All are small and family owned pasture-based dairies, 85% of which are certified organic. The cows are grazed in the pastures a majority of the year eating a combination of rye-grass, clover, and other grasses. In the winter, cows are fed the same forage in the form of silage or haylage. During wet periods, cows can be confined either using free stalls, unpaved lots with limited housing, or open corrals lined three to four feet

deep with wood chips. Milk is typically sold to a local creamery (Humboldt Creamery - once cooperatively held by dairy producers, now owned by Foster Farms (2012)), or to a family owned cheese company located in Crescent City (Rumiano), or to recognizable organic dairy companies (e.g. Horizon and Organic Valley).

Small amounts of acreage in the watershed are also designated to heifer (young dairy cows not yet producing milk) raising and dairy goats.

Ranching

The grazing of grass fed beef occurs in the watershed basin and in the upper slopes of the



Wildcat Hills. Approximately 4,000 acres are classified as supporting grazing in the upper

slopes, and 2,000 acres are categorized as grazing in the basin. Humboldt County is home to around 65 beef cattle ranches with 100 or more animals, accounting for more than 70 percent of the county's beef cattle population. Some 11 of these ranches are found in the hills above Ferndale. Many of these ranchers have been able to capitalize on a growing demand for local, grass-fed beef. The "grassfed" designation is reserved for cattle that consume mostly pasture grasses over their entire lifetime; in contrast to cattle "finished" at feed lots. The grassfed designation appeals to many consumers interested in the unique nutritional benefits found in grassfed products. This has led to the development of a niche market and several ranchers in the Wildcat Hills now sell their grassfed products locally as well as to a range of small and large markets, such as Whole Foods.

Timber

Douglas fir, Sitka spruce, and western hemlock are typical species found in the upper watershed. Fully-stocked stands with an unbroken canopy are not common. Estimated growth of timber in the region is approximately 1,109 board-feet per acre per year. Timber operations are primarily non-industrial and landowners often incorporate grazing immediately surrounding or within timber stands. Approximately 6,000 acres are classified as being managed for timber, or grazing and timber.

City of Ferndale

The picturesque City of Ferndale is the largest local community in the watershed and has an approximate population of 1,390 (2000 census). Ferndale covers 540 acres in the center of the watershed at the base of the Wildcat Hills. Francis Creek courses through town and occasionally floods beyond its banks. European settlers began to arrive in 1852, drawn to the area's abundance of natural resources. The city is known for its Victorian-lined Main Street and its "Butterfat Palaces" (large Victorian buildings built with dairy proceeds throughout town). It is listed as a state historic landmark. Public institutions such as a library, churches, an elementary and high school, Humboldt County fairgrounds, and a museum, exist along with local restaurants, and art and antique shops.

History

Watershed Description

Historical anecdotal records indicate that prior to European settlement the entire Salt River basin was covered with pine and spruce trees interspersed with an occasional redwood tree. Riparian zones held alder, cottonwood and willows. The upper watershed also contained extensive spruce, pine, and redwood stands. Wetlands were interspersed throughout the

watershed basin and sloughs meandered in and across the landscape from the Eel and Salt River. Thousands of acres of tidal marsh were sited at the coastal edge of the watershed.

Native Inhabitants

The Wiyot tribe inhabited the Salt River watershed, as well as the Humboldt Bay watershed, before written recorded history of this area. The Wiyot lived among redwood forests and experienced ample salmon runs. Before 1850, several thousands of the Wiyot people lived in the area. However by 1860, only an estimated 200 people were left. With European settlement of the Ferndale area, the Wiyot were displaced to make way for cattle and farms. Disease, slavery, murder, and massacres also contributed to the precipitous decline of their population.

Communities

Ferndale

In 1852, two brothers, Stephen and Seth Shaw, crossed the Eel River by boat and paddled up the Salt River. There they found a forest of spruce and redwood and savannahs of ferns 6 foot tall. They filed claims and cleared several acres of land that winter. More settlers arrived soon after.

Seth Shaw built the first large house in 1854, (pictured at right) which is still standing on Main Street. It was of a Carpenter-Gothic architecture. Shaw named his new home Fern Dale. The city adopted the name of Ferndale and the home was later renamed the “Shaw House”.



Early settlers initially worked to clear the land into orchards or grew crops, though the cleared land also showed promise of fertile pasturage. Dairy and cattle production soon followed. More settlers migrated to the area, many from diverse backgrounds – Danish, Irish, Canada, Swiss, Italian, German, and Portuguese. The dairy industry boomed and provided the economic base for the construction of ornate Victorian buildings, known as “Butterfat Palaces”.

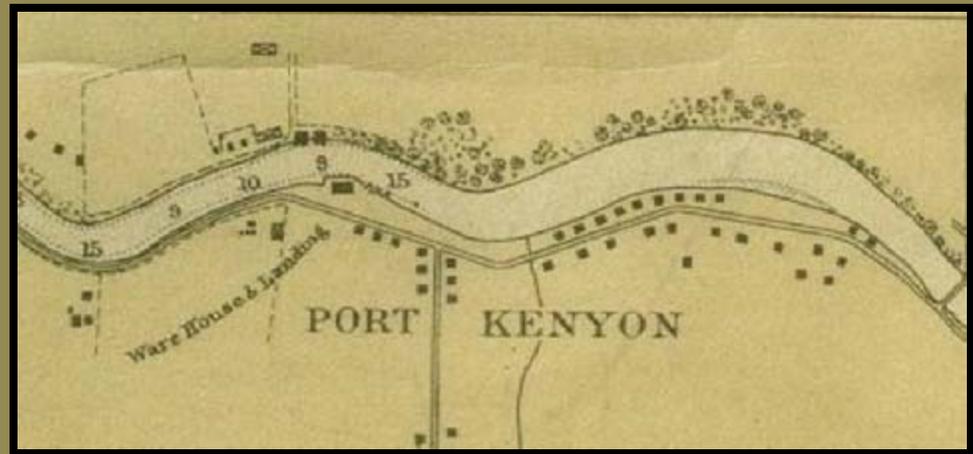


Cleveland

Cleveland was a small, short-lived port settlement along the south bank of the Eel River, four miles north of Ferndale, next to Dungan's Ferry crossing. It was named after the schooner, Mary Cleveland that first ported there. The port allowed farmers to ship produce to Eureka and San Francisco. A post office opened 1866. The settlement contained a saloon, blacksmith, shoemaking shop, hotel, cooper shop, and store. The town was short lived due to farmers losing interest in shipping from the port and the community fell into "disrepute". The post office was closed in 1868 and the town was eventually abandoned soon after.

Port Kenyon

Established by John Gardner Kenyon in 1876 on 60 acres on the south bank of the Salt River, the town of Port Kenyon was laid out approximately four miles from the confluence of the Eel River and 2



miles downstream from Ferndale. During the mid-to-late 1800's the Salt River was estimated to be some 200 feet wide and 15 feet deep in this area. The town continued to grow, and became a port of call for many small steam ships. A number of small ships made weekly trips between Port Kenyon and San Francisco. By 1878, the town boasted a hotel, livery stable, a general merchandise store, blacksmith shop, a saloon, some residences, a school, and a warehouse and wharf.

The forests on the delta had been almost fully cleared and much of the tidal wetlands had been dyked and drained. The resulting reduction in tidal prism (the volume of water exchanged on each tidal cycle) meant that less of the sediments remained suspended to be flushed out of the system on the tides. This resulted in sediment and vegetation gradually filling the waterways, limiting shipping traffic in the Salt River. By 1892 shipping had become even more precipitous due to shifting sand bars at the mouth of the Eel River. Without a stable shipping industry the town of Port Kenyon began to steadily decline. However, historical documents indicate that the Port Kenyon School(s) remained in operation until 1958.

Arlynda

John Gardner Kenyon's second small rural town in the Salt River watershed was called Arlynda (Arlynda Corners). This small neighborhood settlement began taking shape in the late 1870s. It consisted of a grocery store, a saloon, a blacksmith, a starch factory, and a feed mill/cooper shop. In 1889 the Humboldt Creamery was erected in Arlynda and was the Eel River Delta's first creamery (and ice factory). Later the creamery was sold and renamed the Pioneer Creamery. Many of Arlynda's businesses closed over time and it is now more of a residential area; however, the corner store is still in operation.

Island

Island was recognized as a community of farms, rather than a distinct town. It was an area of high ground between the Salt River and the Eel River, above Dillon Road and below Old River Slough. As Island was situated on an elevated area, it was often spared from the area's annual flooding; though it certainly didn't escape the inundating waters from every flood event. Before mid-1880s, the land was farmed for grain, peas, and potatoes. Beginning in the mid-1880s, farmers began to turn to dairy ranching. Creameries began to be built in the Island area – Silver Star (est. 1890), Riverside Ranch (est. 1892), Excelsior (est. 1893), and Valley Flower (est. 1913).

Camp Weott

Camp Weott was another small settlement along the south bank of the Eel River and close to the mouth. Before 1900 it was popular for fishing and picnicking. After



the turn of the century the county claimed the area and maintained the roads and wharves in the area. Cabins were built along the river and rented out by residents. The flood of 1955 completely destroyed the community and it was not rebuilt.

Timber

Timber was a huge and successful industry in the Salt River watershed during the late 19th century. The Enterprise Lumber Mill opened in 1878 on the Salt River and cut 20 thousand feet of redwood and 15 thousand feet of spruce per day. In 1887 a new mill was built and

cut an average of 28 thousand feet of lumber a day. The lumber was shipped from the Salt River watershed (Port Kenyon) to San Francisco. By 1888 the forests had been nearly cleared away, with only small stands of trees left dotting the landscape. The timber activity allowed for the rapid conversion of the forested basin to 40 acre tracks of cropland and dairy pasture. The upper watershed experienced similar timber extraction designed to increase ranching opportunities.

Shipping

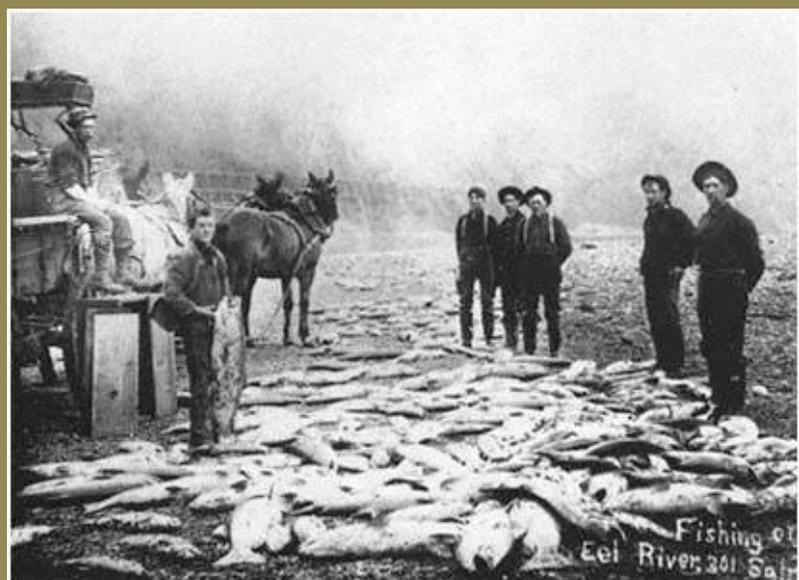
The Salt River saw the beginnings of a shipping industry around 1876 at the town of Port Kenyon (approx. two miles downstream from Ferndale). The Salt River was estimated to be 200 feet wide and 15 feet deep and was able to accommodate relatively large steamer ships. A shipping industry was the only means by which the settlers of the area could efficiently



export their goods and import supplies. However, sand bars at the mouth of the Eel River would often shift, making transit into the Eel River and up to the Salt River problematic. The industry operated for nearly 40 years, until the advent of the shipping port in Humboldt Bay, the Northwestern Pacific Railroad, and the construction of a highway. Although the Salt River Shipping industry faded, Ferndale remains the agricultural center of Humboldt County.

Cannery

The Eel River basin once supported significant salmon populations. It is reported that Chinook salmon runs likely ranged between 100,000 and 800,000 fish in the mid to late 1800s (in 2011 2,430 were



counted). During the plentiful fish runs the Cutting and Packing Company cannery was built and operated at the mouth of the Eel River. Over 4 million pounds of salmon were processed during its 13 years of operations. By 1880, the salmon runs progressively grew less and less, and the industry considered closing fishing in the river in early 1895. However, in mid-1895, the population recovered. The Tallant Cannery opened on the Salt River at Port Kenyon in 1905.

RESOURCE CONCERNS

Basin conversion to agricultural use not only occurred in forested areas but in also in the tidal marsh regions of the watershed. Levees were constructed to prevent tidal inundation and drain the land. Dykes and dams with flood gates were built across the mouths of small sloughs as well. An estimated 2,900 acres of tidal marsh were drained and transformed to agricultural land.

In 1888 Ferdinand Westdahl of the Coast and Geodetic Survey prepared a report to accompany a late winter/early spring survey and mapping he had completed. In his report he discussed his observations as he traveled down the Salt River from Ferndale to the area near the mouth of the Eel River. He noticed signs that the fragile threads of the ecosystem were beginning to unravel due to the extent of settlement activities.

Flooding

The Federal Emergency Management Agency (FEMA) has designated nearly the entire Eel River delta (which includes the Salt River watershed) as a flood way; an appropriate



designation since the delta is located at the culmination of one of California's largest rivers.

Intense, short lived, winter rains frequently occur on California's north coast. The inundation from these heavy rain events rapidly brings river flows near flood stage. In fact, since the 1970s, the Eel River has breached its flood stage of 20 feet at least three times per decade.

However, one monumental and recorded flood event occurred in 1964, where the carrying capacity of the Eel River was breached at 29.5 feet. The 1964 flood devastated the Eel River delta landscape. The flooding waters destroyed many homes, damaged thousands of acres of land, and killed approximately 2,000 ranch and dairy cows. The flooding waters also left 5,000 acre-feet of sand and 6,300 acre-feet of silt.



Though Salt River watershed residents expect severe flooding on average of every three to four years, the lack of a channel to carry Salt River flows now causes annual flooding and creates standing water across the landscape even from normal rain events. This has resulted in the loss of production on agricultural lands that support Humboldt County's unique pasture-based dairies, the reduction of habitat for a number of state and federally listed species; and negative impacts to houses and community infrastructures.

Sedimentation

Contributing to the flooding that occurs annually in the Salt River watershed is the amount of sediment that washes down from the upper slopes of the Wildcat Hills. The Wildcat Hills are composed of steeply sloped loosely consolidated sedimentary rock formation and are susceptible to large scale landslides and significant erosion. Large areas of the hills were exposed due to historic settlement and timber extraction activities, increasing erosion. The high level of eroding sediment from these mountains are transported as extremely turbid water by five tributaries, primarily during the wet winter periods, and delivered to the Salt

River watershed basin. As the heavily sediment laden water floods onto the delta plain and pools, the sediment drops out across the landscape on pasture fields, roads, and the Salt River channel. Annual sediment accretion can range from 1 inch on pastures up to 30 inches in flood plains immediate to waterways. This sediment load aggrades waterways to the point of hydrologic dysfunction in the lower Salt River watershed. The Salt River is a



prime example of a heavily aggraded river that can no longer carry and convey flooding or typical water volumes from its associated tributaries.