



## Casa Grande High School's State-of-the-Art Fish Hatchery

*"Spearheaded by a tireless and ambitious faculty advisor, this high school has not only become a leader in environmental awareness but has rejuvenated a once-dead San Francisco Bay Area stream!"*

Don Vachini

Crackling over the school intercom, "Code Blue" was met with sudden stares and glances. As the second "Code Blue" sounded, masses of students scrambled for their vehicles like fire fighters off to battle a big blaze. The creek had received over three inches of rainfall from the previous day's deluge and was flowing a bit murky. As cars approached the "A" Zone, a group of students hastily pointed and then gazed in respectful awe as first a male then two female steelhead circled, seemingly trapped in the cloudy shallows.

After a momentary caucus, the group acted swiftly. As they had performed sev-

eral times during dry runs, fish were deftly netted, quickly anesthetized, and eggs and milt skillfully collected. Once fertilized in a sperm bath, a few eggs were kept as classroom controls while approximately 3,000 fertile eggs were transported a few miles upstream. They were guided into hand-carved gravel nests and gently buried in a pristine headwater section which maintains adequate flows.

A month and a half later, two dozen tiny hatchlings appeared among the classroom-control gravel which duplicated conditions in the stream. These 24 baby steelhead, along with their brethren in the

stream section a few miles above, carry the genetic hopes for their nearly-extinct species, as well as the dreams of a mid-sized northern California high school!

### Background

Sitting astride a natural trade route which included the Santa Rosa and Russian River valleys, the Petaluma River was the focal point in transporting goods to the outside world. In the fall of 1850, game hunters serving the San Francisco market camped along the upper reaches of the waterway and by the following spring, a settlement was under way. A short eight years later,

the city of Petaluma was incorporated.

Ebbing and flowing with five foot tides and bustling with both steamboat and passenger services, the estuarine waterway coursed through San Pablo Bay, into the much larger San Francisco Bay and ultimately the Pacific Ocean. Though tidewater-controlled, the main river was bolstered by the flows of several key freshwater tributaries, all carrying runoff and spring-fed infusions from the Sonoma and Coastal mountains. Partially hidden under canopies of oak, buckeye and bay laurel, the upper sections of Washington, Thompson, Lynch and Willow Brook creeks ran year-round and contained summer trout, a.k.a. immature steelhead and Chinook salmon in fair numbers. Although all maintained marginal habitat and flows, Adobe Creek was a key stream because its headwaters provided nearly double the flow of the others, it had a moderate gradient, and timely willow growth which cooled and oxygenated its water for a lengthier period.

In 1910, this serene scenario quickly changed. While a diversion dam constructed on the creek created a water supply for steadily-growing Petaluma, it virtually drained flows after the arrival of spring. Although steelhead and salmon routinely ascended during the high runoff times of



**This tiny Chinook represents the hatchery's first success story.**

**Top left : In assembly line fashion, each salmon is coded. All students are involved in each phase at various times.**

**Lower left: Students enter their state-of-the-art, on-campus fish hatchery.**

January and February, they suddenly came in far less numbers than before.

Despite the drop in piscatorial recruitment, it still remained an early season favorite among a few local sportsmen well into the late 1950s. One of my first memorable childhood fish came while working garden hackle and red salmon eggs in the upper sections of this stream with my dad in May 1954. Derricking the eight-inch trout from beneath an undercut bank held fast with willow roots, I pounced on it like

a cat after a mouse. The steady flows which surrendered this prize, plus seven others, gurgled over rocks and pebbles as it snaked among the scattered but plentiful cover, gently descending toward the open valley and its confluence with the wide, brackish waterway serpentineing the salt-water marsh.

While diversions dealt near-fatal blows, the construction boom beginning in the late 50s released the likewise-destructive forces of channelization, pollution and siltation. A key tract of farmland was developed, infringing directly upon a sector of fragile banksides. As the town's population zoomed beyond 12,000, I never found fishing to be quite the same as when I was a lad. Reduced to a mere trickle and strewn with litter, the creek was pretty much given up for dead before I graduated from high school.

To keep up with the city's continued growth, a new high school was constructed in the mid-70s. As fate would have it, the site of Casa Grande High School was less than a block away from the banks of this now nearly forgotten water.

### The Dream

Hired in the early '80s as the school's wildlife teacher, Tom Furrer operates with a unique philosophy—never stop believing, never stop caring. The saga started more than a dozen years ago as a semester project in one of Furrer's natural resources classes. They were studying "dry creeks"—those designated by the state DFG as almost depleted of fish populations. Adobe Creek had just been given dry creek status and members of the class began walking the banks to see why. While on these strolls, several students began to envision the water the way it was a hundred years before when it was a vibrant salmon and steelhead stream.

Under Furrer's guidance, the class organized a group known as the United Anglers of Casa Grande (UACG) and along with it set their sights on an ambitious plan to replenish the Adobe Creek watershed. Students became enamored with the cause, vowing to make a difference, not just within the community but to the environment as well. "We wanted this to be a long term project, one which will continue to involve our students long after graduation," he admitted.

The dream began in 1984 with the adoption of the waterway now as the Adobe Creek Restoration Program. Furrer's initial efforts resulted in a massive cleanup of the creekbed in order to maintain a clean, stable environment. Volunteering their valuable weekend and after school time, students and volunteers hauled over 40 truckloads of garbage

(which equaled about 10 tons) out of the creek. "Commonly used as a dumping ground, we hauled out all matter of debris. Washing machines, tires, refrigerators, vacuum cleaners, auto parts, along with tons of discarded refuse, even diapers."

The one disturbing fact the students soon discovered was that the cleanup seemed endless. "People were putting in litter as fast as garbage was hauled away," Furrer mused. "For this reason, cleanup duties have become an ongoing endeavor."

The students have also sought to restore riparian vegetation to much of the lower sections in order to prevent siltation and provide cooler water temperatures. One of the first projects was to divide the stream into five zones in order to better delegate management of each section.

While the cleanup and planting (more than 1,200 willow and redwood trees are planted annually) were necessary to create the proper environment for fish to return, the students turned their attention toward the actual restoration of the anadromous fisher. Their first step in this direction was petitioning the Petaluma City Council for adequate flows. Since this action would have involved a minimum release agreement with the city's Lawler Reservoir, the mitigation petition, though deemed very admirable by city leaders, was initially rejected.

In the meantime, students converted an unused campus greenhouse into a fish hatchery. Initially growing token numbers of catfish and steelhead obtained from nearby Warm Springs Fish Hatchery, student believed this was the first step toward restoration. However, within a year, setback number two occurred as the state condemned the building as unsafe by earthquake standards.

### The Dream Continues

The hatchery closure became a time of reckoning for the students. Much to Furrer's pleasure, however, the kids were undaunted and became even more focused on their long-range target. After several intense meetings, they drew up plans to have their own hatchery constructed. The group solicited pledges, held fund raisers and cleaning sessions, but were still far short of the nearly-impossible figure of over a quarter million dollars. In addition, as time moved on, initial cost estimates kept escalating. With the dream seemingly stalled, the organization put out a plea for help.

Responding in an unheard of manner, the community suddenly seemed to rally to their support. The DFG donated \$105,000, the Sonoma County Board of Supervisors allotted \$25,000, The Sonoma County Foundation sent \$15,000, Chevron



**Giving nature a boost, the UACG are proficient at collecting eggs and milt, fertilizing the eggs, hatching and rearing the salmon entirely within the walls of their hatchery.**



**Salmon smolts are removed from raceways and placed in smaller tanks.**



**In the next step, the fish are anesthetized to prevent injury during handling.**

\$11,000 and Firemen's Fund donated \$10,000. In all over 1,500 private citizens and more than two dozen corporations provided funds to keep the project moving. Probably the biggest boost came when costs again escalated above projections and the project again seemed hopelessly stymied due to the recession. Occurring like a jolt from an energetic sea-run Chinook, nearby ranchers Peter and Conni Pfendler provided the final impetus to the project, donating the \$180,000 needed to allow completion. "We'd been following the group's progress for some time," said Pfendler, who owns an 800 acre ranch on Sonoma Mountain. "We'd watch these kids working in the creek as we drove by each day. When we heard they were having trouble raising the last chunk of money, we asked ourselves, 'Why not?'"

Finally in late 1992, the construction of the state-of-the-art, \$510,000 campus fish hatchery was completed.

### **The First Major Success**

The 1994 school year started normally with textbooks, homework and lectures. Unique, however, were numerous calls from people in the community regarding salmon sightings in the river. When the area was given over six inches of rain in early November, things turned to pandemonium. Several area creeks including Adobe were greeted with the largest runs of Chinook salmon ever documented in the Petaluma River system. Department of Fish and Game biologists estimated that over 200 fish migrated upriver during this unusual run (five fish was the previous recorded high).

Members of the UACG, including numerous alumni, scoured several Petaluma feeder creeks, rescuing and retrieving salmon trapped and doomed to die at the hands of predators, poachers or high temperatures. Of special interest to them was the fact that most fish came to the areas of Adobe Creek which had received restoration efforts over the past five seasons. In all, 29

fish were returned to the on-campus facility, where, under the tutelage of fishery personnel and volunteers, students collected eggs and sperm. Giving nature a boost, the whole lot was fertilized and, when hatched, pampered with a high protein diet until half-inch fry. Then, still receiving tons of attention and affection, they remained in the well designed raceways to develop strength. When the surviving 6,800 juveniles reached about 1/3 pound they were trucked to the Tye Club in Tiburon where they were placed in net pens to adjust to the saltwater of San Francisco Bay. Then, on June 25, 1995, an 11 year culmination of what is hopefully the become a routine occurrence took place. Combined with about 60,000 other salmon raised by the Tye Club, Casa's fledglings were released into the Pacific Ocean in an emotional ceremony attended by both past and present members.

The entire procedure was repeated again the following season and on June 2, 1996 approximately 4,500 additional salmon were set loose in the bay. Together with those released the previous year, they will fan out in the ocean, some ranging as far as Mexico and Alaska. These Chinook are the first large generation of hatchery-raised fish in what is hoped to be the long-dreamt renewal of Petaluma river salmon. (The reason they were not released in the Petaluma River is that the DFG believes them to be stray winter-run fish from the Sacramento River and for that reason won't allow them to be set free in local waters). Most of those surviving oceanic rigors for three years are expected to migrate back up the Petaluma River—to the place where Casa students crated them in the first place—to spawn on their own. "Some will head up the Sacramento River, following other salmon, and some will come back to us," Furrer asserts. "The ETA for those two groups of fish will be the winters of 1998 and '99. Hopefully, at that

time, students will be able to welcome their 'babies' back home!"

Wherever they end up, be it caught by commercial or sport anglers or back in Adobe Creek, the Casa kings will be readily identifiable according to Furrer. "They are all marked with a new dye, injected into their ventral and anal fins, visible under black light," he informs. "They are the only West Coast salmon with this kind of advance tagging technique."

### The Hatchery

After meeting with adversity around seemingly every corner, the United Anglers of Casa Grande finally overcame bureaucracy to fully operate this new facility, with the long-anticipated grand opening finally taking place on April 25, 1993. The 3,000 square foot facility, which houses a visitor center, classroom, incubator system and tagging area, also contains four 32 x 5 x 6 foot trough raceways. One of the troughs duplicates the environment of Adobe Creek. Operating on its own recycled well water disinfected by ozone, the facility has the capability to house 20,000 steelhead and salmon hatchlings.

With regards to the hatchery operation itself, the original idea was not just to start hatching typical domesticated fish. According to Furrer, a lot of thought went into developing a conservation hatchery, quantifying the numbers of fish the habitat can support and using the hatchery in the best possible way to finally meet these numbers. While the kings found in the river system are believed to be from the Sacramento River, the steelhead belong to a localized genetic strain "almost gone from the Petaluma River," informed Furrer.

With these local species nearing or on the endangered list, USCG students have set an ongoing, long-range goal to save them from extinction. "Their ultimate aim is to have a conservation hatchery to use in the best way possible for the creek."

It's definitely a hands-on, working lab, acknowledges Furrer. "Here, the kids are doing it all themselves, working together to save a future generation for all of us. What better classroom," he continues, "could the kids have?"

In 1994, the Federal government granted the campus facility a special permit to raise winter-run Chinook from the Sacramento River, one of the nationally selected hatcheries to participate in this project for the nearly extinct salmon species.

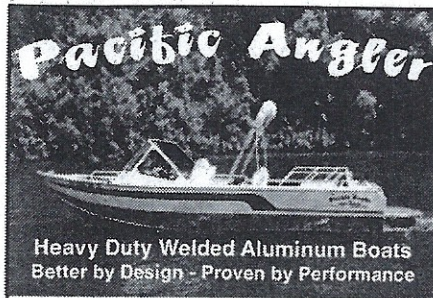
Although working with the Bodega Marine Lab and the DFG, UA already has a day-to-day working knowledge of how a hatchery operates. The students are involved in everything from netting the fish to taking their eggs from the females

and obtaining milt from the males to gauging the progress of the eggs in incubators. From the 60' or so salmon collected in the fall of '94 and '95, Casa students have already produced 40,000 salmon fry from their fish rescue program!

### Looking Ahead

While Casa Grande runs what is believed to be the only student-operated hatchery for salmon and steelhead in the continental United States, Furrer makes it clear to the students that working in the hatchery is a privilege not a right. Each stu-

dent in the United Anglers must first pass a rigid evaluation process, and with a waiting list approaching 200, only the most committed are admitted. The result is a group dedicated to maintaining a hatchery that does more than provide fodder for fishermen.



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## Brief Sequence of Highlights and Lowlights

- 1910-1984:** City water diversions take nearly 100% of Adobe Creek flows. Virtually all downstream life perishes.
- 1984:** Students form United Anglers of Casa Grande and officially adopt Adobe Creek in an attempt to improve its environmental condition. Massive creek cleanup begins with over 30 truckloads of illegally dumped waste removed.
- 1985:** Student tree planting project begins and continues through today. Over 1,200 trees are planted annually.
- 1986:** \$60,000 is collected to convert an abandoned on-campus greenhouse into a student operated fish hatchery.
- 1987:** 2,000 steelhead are released into Adobe Creek.
- 1988:** Fish hatchery condemned and closed after failing earthquake standards. Student begin plans to build their own on-campus fish hatchery.
- 1989:** 21 steelhead return to spawn in creek.
- 1990:** Five king salmon return to spawn in creek—first time documented this century. Ground breaking takes place for a new, state-of-the-art, on-campus hatchery. Estimated cost: \$150,000.
- 1992:** The city of Petaluma announces its plan to abandon all water diversions on Adobe Creek, giving it back to nature and the United Anglers of Casa Grande.
- 1993:** Grand opening of the State-of-the-art fish hatchery, April 25, 1993.
- 1994:** Federal Government grants a permit to raise winter run Chinook salmon from the Sacramento River, a registered endangered species—one of three nationally selected hatcheries to participate in the project and the only student group so bestowed.
- 1995:** 6,800 Chinook salmon from hatchery tagged and released into San Francisco Bay.

## Breakdown of Five Zones

The Adobe Creek Restoration Project covers the section of creek from its headwater aquifers emanating from the Sonoma Mountains to its confluences with the Petaluma River four miles below. For purposes of identification, the creek has been sectioned into the following five zones:

- Headwaters:** Currently this area is closed to the public and under consideration for total protection in the future. It is the last of the natural habitat and holds what is left of the genetic strain of steelhead trout fingerlings.
- Zone A—Adobe Road to Casa Grande Road:** One of the more open areas, it is also susceptible to dumping.
- Zone B—Casa Grande Road to Ely Road:** Runs through (or near campus).
- Zone C—Ely road to Lakeville Highway:** Channelized course between homes. Also heavily used by people.
- Zone D—Lakeville Highway to Petaluma River:** Open section courses salt marsh.

All zones require near constant monitoring to keep the area waste free and to protect trees and riparian vegetation. When winter and spring flows are high, a fish watch is also kept.

## What UACG Membership Means

Deep soul searching, tedious memorization and impossibly long lectures only begin to describe the membership process of the United Anglers. It is a difficult and harrowing experience; of which only the truly dedicated can survive. It requires maturity, intelligence and, above all, a true love for animals. The rigorous standards include two tests on the history of the organization of which we have three chances to pass with a perfect score. We must also participate in a creek walk, a personal interview and a fund raising event. After all of this is completed, we are each finally awarded the honor of being a member of the United Anglers of Casa Grande High School.

These moments never fail to remind me of why I joined United Anglers in the first place. I wanted to make a difference and I am. Nothing, not even the threat of a test every day, could drive me away from my goals. The hope and determination is what carries me through all the exams and long hours after school. I have yet to regret any of it. I am confident we will bring the Adobe Creek steelhead trout back, for the greatest lesson I've learned is to never, ever underestimate the power of hope.

Joanna Stiles, Vice-President of UACG, Class of '95

With their sights set on an ambitious, ongoing plan to replenish the local watershed, the future holds additional grant writing to secure needed state and federal funding as well as indoctrinating the elementary schools via tours, stream profiles and adopt-a-fish programs. In addition, Furrer's portages will continue the cycle that started in '94, rescuing salmon and steelhead from the feeder creeks, ferrying them to the hatchery to be artificially bred and finally releasing the offspring in either San Francisco Bay or creek headwaters. Since they are indigenous to the area, steelhead progeny can be freed in local creeks according to Furrer. "Plans are to release these fish in Adobe and Willow Brook Creeks, waters with the most ideal headwater habitat."

Without hatchery help he feels the Petaluma River's anadromous fish are pretty much doomed. "As it is now, the creek habitat is still degraded to the point that naturally-spawning Chinook cannot survive. If the creek habitat can be sufficiently restored, steelhead and salmon may someday spawn on their own in Adobe Creek. This remains a primary goal."

While hatchery efforts will most likely never sustain angling in the fragile tributary creeks as locals experienced during the early Petaluma years, Furrer feels the facility will definitely impact the species' survival as well as the sport fishery in the ocean. "While there is little doubt our hatchery will eventually improve the commercial catch, our main focus continues to be making a difference on Adobe Creek."

Suffice it to say the United Anglers of Casa Grande High School have worked long and hard against formidable odds to keep their dream alive. For every inch of progress, there were equally devastating reality checks along the way. While the initial hatchery building was condemned for failure to meet earthquake standards, other pitfalls included a Sonoma County public works bulldozer accidentally destroying over 200 two year-old trees along a part of the creek, numerous funding shortfalls and denied permits. However, for each blow, the students came back just as determined, never giving up, never losing sight of their dream.

For over a decade, Furrer and classes of his highly enthusiastic students involved in a special wildlife classroom have been a model for future fishery enhancement. Not only have they prolonged the miracle of Adobe Creek steelhead and salmon, but enhanced habitat, raised funds for a state-of-the-art hatchery and innovated numerous programs which put them on the cutting edge of modern fishery science. The United Anglers of Casa Grande are sharing their dream, a symbol of the fight between life and death, environmental right and wrong!

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