

# Final Report

Salmon River Watershed Education Program –2004-E-02

Agreement # 113334G02

Date: March 15, 2005

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## A. Abstract

The Salmon River Restoration Council (SRRC), a 501(c)3 corporation, has been promoting stewardship in the remote Salmon River basin for nearly 13 years. The Salmon River watershed is the largest cold-water contributor to the Klamath River, and is known as one of the cleanest rivers in the state of California. This 751 sq. mile watershed is entirely within the Klamath National Forest and is considered a key watershed by the Forest Service.

The SRRC is guided by a Community Restoration Plan (CRP). The CRP is updated each year, and is included as a component of the Salmon River Subbasin Restoration Strategy (2002) to help facilitate and guide the SRRC in watershed and fisheries recovery. These documents compliment each other and provide the SRRC with programmatic direction and project development. Some of the projects run by the restoration council include, fisheries monitoring and restoration, water quality monitoring, noxious weed management, fuels reduction, and watershed education.

The watershed education project works in the two local elementary schools to teach natural resource sciences, ecosystem management and watershed stewardship. Students learn scientific protocol and gain valuable career development through experiential teaching methods, which comply with the state educational standards, and current resource management methods.

The SRRC's Watershed Education year in 2004-2005 went very well. All tasks in the agreement were performed by the coordinator, SRRC staff and volunteers. During the time of this agreement the program coordinator led at least 8 field trips, coordinated more than 12 in-class presentations, facilitated seven major student projects and hosted five teacher planning sessions. These activities all led up to the annual River Schools Watershed Fair, which was one of the best attended so far.

The coordinator involved several resource professionals from: local watershed councils, the U.S. Forest Service, the Department of Fish and Game, the Department of Fish and Wildlife, the Karuk Tribe of California, the Yurok Tribe of California, and the Hoopa Tribe of California. All of these organizations, in addition to community volunteers helped to enrich the watershed education curriculum.

## **B. Introduction**

The Salmon River Restoration Council (SRRC), a 501(c)(3) tax-exempt nonprofit corporation, believes that educating and empowering the riverine communities to become effective stewards of the ecosystem should be a centerpiece in the recovery of our watersheds and in particular the declining fisheries resource. The SRRC does this by carrying out a Community Restoration Work Plan, which includes several projects:

- Fisheries Monitoring and Management
- Fire and Fuels Management
- Roads Management
- Noxious Weed Management
- Water Quality Monitoring
- Watershed Education

The SRRC has promoted and coordinated a Watershed Education Program centered in the local elementary schools for the past 12 years. The teachers and SRRC staff develop an annual work plan prior to each school year. The core program ties to various educational guides and includes: anadromous fisheries surveys, salmonid aquarium incubation, water monitoring, macro-invertebrate sampling, native and invasive plant management, and general education and awareness in various fields (fire, roads, wildlife, water use, etc.) The SRRC helps facilitate an annual Watershed Fair, in which the students, teachers, and local organizations articulate their restoration work. The SRRC Project Staff develops Watershed Education activities that are incorporated into the schools required curriculum, offering specific activities that meet state standards and guidelines. The project is enriched by volunteers from the community, local tribes and resource agencies.

## **C. Description of Study Area**

The Salmon River is one of the most biologically intact watersheds in the west. It is the largest cold-water contributor to the Klamath River, and known as one of the cleanest rivers in the state of California. This 751 sq. mile watershed is entirely within the Klamath National Forest and is considered a key watershed by the Forest Service. Watershed analysis has been completed for the entire Subbasin, with the exception of Wooley Creek. The land base in the watershed is 98% USFS Public Lands with 45% in wilderness. 60% of the watershed is in Karuk Ancestral Lands. Four communities lie widely dispersed within this watershed. There are approximately 250 year round and 100 part time residents in the subbasin. The Salmon River is documented as having an area in the Russian Wilderness that has one of the highest conifer species diversities on Earth. It has long been known for its exceptionally high quality waters, and the entire river corridor and some tributaries are designated under the Wild and Scenic Act for the outstanding fisheries resources. The Salmon River is the home to several species of fish that are thought to be at risk: Spring and Fall Chinook Salmon, Coho Salmon, Green Sturgeon and summer and winter runs of wild Klamath Mountains Province Steelhead. The Klamath National Forest's Land and Resource Management Plan identifies the Salmon River as the system with the most available anadromous fisheries habitat. The Salmon River is recognized as a key refuge for Wild Spring Chinook in the Klamath Basin and has the largest wild run in the Klamath Basin. Wooley Creek is world renowned for its exceptional water quality, which runs almost exclusively from the Marble Mountains Wilderness, in the heart of the Klamath Knot. The salmon migrating in the hotter and lower water flows in the Klamath River during summer months rely on the cooler and cleaner waters contributed by the Salmon River.

## **D. Methods and Materials**

The project coordinator employed standard teaching methods used in education. Students and teachers learned by "hands-on" experiences and by modeling. Assessment for both students and teachers were provided "authentically" in the outcomes of the various activities in which they participated and especially at the culminating Watershed Fair event. A variety of curricular materials were utilized, including the Klamath River Education Program (KREP), D. Higgins.

Standard field protocols and methods were used for the various field activities, as determined by the natural resource professional partners. These included the CDFG, Fall Chinook Spawning Survey and Carcass Count Protocol, CA Stream Bioassessment Protocol for macro invertebrates, and accepted stream discharge and water quality monitoring methods.

## **E. Results and Discussion of Accomplishments during the Project**

### **Watershed Studies Website Update and Upgrade**

November 5, 2003

The coordinator met with a student from Forks of Salmon School and worked on updating the school Watershed Studies website. The student learned to create his own page off of the site, which detailed dissolved oxygen testing.

### **Aquarium Incubator Project**

November and December, 2003

Students raised Chinook salmon from egg to fry in their classrooms at both schools. Students kept journals and participated in related activities such as a salmon life cycle pageant.

### **Teacher ½ Day Planning Sessions**

January 13&14, 2004

The coordinator met with each of the three teachers separately for planning sessions. The coordinator worked with the teacher to decide how the Watershed Program could best support and implement the state required curriculum this winter and spring. Dates were scheduled and curriculum outlined.

### **Class Room Curriculum**

Thursdays from January 15-February 5, 2004

At Junction School, the coordinator facilitated classroom activities in the upper grades on geologic topics including local plate tectonics and the layers of the earth. In the lower grades the coordinator facilitated activities on weather and its causes.

### **Watershed Fair Project Work**

January 21, 2004

The coordinator worked with an upper grade student to create a display about the Fall Salmon and Carcass Surveys for the Watershed Fair.

### **Garden Club**

Ongoing, Every Thursday

The coordinator organizes students at Junction School for Garden Club. This club is actually a part of the science curriculum. Students learn sustainable gardening techniques and talk about how agriculture impacts watersheds. Students also learn about water conservation.

### **Native Plant Project**

February 2, 13, and 23, 2004

The Watershed Education Coordinator worked with community volunteers to create a multifaceted Native Plant unit for the students at Forks School. The unit involves a lesson each on three types of native plant propagation: taking cuttings, planting seeds,

and transplanting. Students also made baskets using native plants and grew native grasses for Easter baskets. At the end of the project, students each took home a plant. The remaining plants were donated to the local native plant garden project.

### **Watershed Poetry**

February 5, 2004

A local writer facilitated a “poetry jam” at Junction Elementary School. The students learned to create a watershed poem and then put it to a beat.

### **Student Video Project**

April 21, 2004, 11:00

Eighth grade students from Junction Elementary School learned about film making including the technical aspects and social skills. A local video expert worked with the students to help develop techniques. One student interviewed the tribal chairperson and the tribal fisheries biologist on camera.

### **Eel Basket Presentation**

April 1, 2004, 1:30

Ethnobotanist Bryan Colegrove presented his hand made Eel Baskets to students at Junction Elementary School. Bryan showed a video of traditional fishing and talked about the construction of the baskets.

### **Watershed Murals**

April 2, 2004, 10:00,

Local artist Amanita Mollier facilitated a watershed mural with each of the elementary schools. Students painted local flora and fauna on riparian backgrounds. Amanita taught the students about different brush strokes and color combinations. The students also studied the external anatomy of local animals in preparation for painting.



Left: Forks Student’s Mural.

### **River School’s Annual Watershed Fair**

May 7, 2004, 9:00

Students gathered once again for the annual Watershed Fair at Forks of Salmon School to display their watershed projects and to celebrate. This year we were joined by presenters from the North Coast Environmental Center, the Oregon State Universities Graduate program, the Karuk Tribe of California, and the Somes Bar Arts Council. Students

learned about watershed hydrology, radio telemetry, the Salmonid life cycle, and the ancient Japanese art of fish printing. This event recognizes the students for their accomplishments in the program and instills community interest in watershed issues and education.



**Above:** Students at the 2004 Watershed Fair learning about urban runoff in watersheds.

### **Knapweed Pulling Fieldtrip**

May 10, 2004, 12:30

Forks of Salmon students went to Missouri Bar on the South Fork of the Salmon River accompanied by the SRRC Noxious Weed coordinator, the Watershed Education coordinator, the SRRC Program Director and several community volunteers. The group dug and removed over 500 knapweed plants by hand. Students also listened to a presentation about the biomes from which some local noxious weeds originated.

### **Stream Field Trip**

May 14, 2004, 11:00

Lower Graders at Junction Elementary went to the confluence of the Salmon and Klamath rivers to study aquatic macro-invertebrates with the Watershed Education coordinator. Students learned the names of 10 different aquatic insects and even a few of the scientific names. Students also kept Caddis Fly Larvae in an aquarium in their class and studied this insect.



**Above:** Junction School Lower Graders taking a break during the Stream Field Trip.

### **Birding Field Trip**

May 18, 2004, 8:30

Junction School students went to Blue Heron Ranch with teachers, Watershed Education Coordinator, and Forest Service Wildlife Biologist Tony Hacking to observe and identify birds. Students utilized several different environments at the Ranch including riparian, meadow, forest and pond. Students kept a bird list in their watershed journals.

### **Hobo Temp and Water Monitoring Field Trips**

May 23, June 4, 2004, 11:00

Student from both schools monitored their adopted sites Merrill Creek, the Salmon River and Nordheimer Creek. Students placed and launched hobo temps, took the temperature and collected aquatic insects. This year the students learned about turbidity and took readings using Transparency Tubes. Students also visited the cooperative DSM Screw Trap on the lower Salmon River. Members of the Karuk Tribe fisheries crew and the SRRC fisheries crew instructed students on how to run the trap. Students took turns processing and identifying the fish.



**Above:** Students learning about the fish trap on the monitoring field trip.



**Above:** A student downloading Hobo data during the field trip.

### **Garden Club**

**Every Thursday, Spring 2004, 12:30**

Students in Junction School Garden Club grew vegetables and maintained the flower beds at school through out the year. The Watershed Education Coordinator taught students sustainable gardening techniques. Students also did garden related craft projects to spruce up the school. For example, they made a mosaic sign out of glass tiles for the Herb garden. The produce from the garden was used school lunches.



**Above:** Students with beets from the garden.



**Left:** The mosaic in progress.

### **Watershed Ed at Spring Chinook/ Summer Steelhead Dives**

July 21, 2004 at 10:00

Eight children participated in watershed education while their parents were participating in the fish dives. These students got a hands-on introduction to the Salmonid life cycle and identification.

### **Summer Teacher Planning Meeting and Workshop**

August 26, 2004 at 3:00

All teachers from Junction and Forks of Salmon School were present at this annual meeting. We mapped out the year, reviewed the standards and decided which ones watershed education would cover. This is the only time throughout the year that all of the teachers and the coordinator are all together, so it is also a great time for brainstorming.

### **Fish ID Lesson**

August 31, 2004 at 1:30 and November 16, 2004 at 12:45

Upper grade students at both schools studied fish ID with the coordinator. Students learned about external anatomy and the changes throughout the lifestages.

### **Stream Field Trip with Junction Lower Graders**

September 16, 2004 at 10:00

Students traveled to the confluence of the Salmon and Klamath rivers to study aquatic insects.

### **Natural History Rafting Trip**

September 22, 2004 at 8:00, September 24, 2004 at 8:00

On two separate days lower grade and upper grade students from Forks of Salmon and Junction School participated in a Natural History float trip on the Klamath River. Knowledgeable local naturalists taught students about riparian ecology as they floated. We saw a beaver dam, salmon, eagles, and other wildlife.



Left: Natural History Rafting Trip

### **Water Monitoring Stream Field Trip**

September 23, 2004 at 10:00

Students from Forks of Salmon School launched two Hobo temperature recording devices, took turbidity readings with Transparency Tubes, and studied aquatic insects.

### **Water Monitoring Stream Field Trip**

September 30, 2004 at 10:00

Students from Junction Elementary School participated in water quality monitoring at Merrill Creek, which is their adopted Hobo site. They studied temperature, pH, turbidity, and dissolved oxygen.



**Above :** students learning about turbidity with a transparency tube.

### **Teacher Planning Meetings**

October 5, 2004 at 2:30, October 13, 2004 at 8:00, 12:30

Each teacher from Forks and Junction schools met with the SRRC Watershed Education Coordinator for half of the day to plan out the year.

### **Fall Spawning Ground Survey Training**

October 15, 2004 at 10:00

The SRRC Watershed Education Coordinator organized training for the Fall surveys to teach students and community members the protocol and safety techniques. The training was very well attended with over 50 people. Professionals from the different agencies and non-profits instructed the students on all aspects of the surveys.



**Above :** Mark Hampton, CA Fish and Game, teaches survey protocol to students and community members.

### **Caddisfly Puppet Making**

October 21, 2004 at 10:30

Students at Forks of Salmon School loved making Caddis Fly Larvae puppets. Students first learned about the life cycle of the caddis fly and some behavior traits. Afterward they created caddis fly larvae puppets complete with a shell stuck together with a weblike substance, just like the real thing.

### **Fall Spawning Ground and Salmon Surveys**

October 1, 8, 15, 2004 at 7:30

Once again, students from Forks of Salmon and Junction Elementary Schools took part in the Fall surveys. Student survey the Salmon River alongside SRRC staff and other resource professionals from California Department of Fish and Game, the U.S. Forest Service, The Karuk Tribe of California, and others. Students collect data on live fish, redds, and carcasses. This data is compiled by Fish and Game. Students learn a lot about fish habits, identification, life cycle and habitat. Plus they are gaining valuable career skills and having fun too!



**Above :** SRRC Coordinator, volunteers, and students on the 2004 Fall Spawning Surveys.

### **In-Class Hobo Lesson**

November 2, 2004

The Water Quality Coordinator from the SRRC visited Forks of Salmon Students to help analyze data and review past records. Students gained a better understanding of the usefulness of the data. They also learned about the important role that temperature plays in Salmonid habitat.

### **Fish ID Lesson**

November 16, 2004

The SRRC Watershed Education Coordinator presented the fish ID video to Forks students. Then they participated in a lesson to help understand the key characteristics used to identify Salmonids locally. At the end of class students took part in the fish ID quiz and enjoyed the challenge.

### **Aquarium Incubator Project**

November 17- December 17, 2004

This year, the AmeriCorps Watershed Stewards Project placed a member with the SRRC. Watershed Stewards Project worker Melanie McPherson, helped facilitate the Aquarium Incubator project at both Forks of Salmon and Junction schools. The eggs were successfully hatched and raised to fry. Students and teachers alike marvel at the miracle they get to watch unfolding in their classrooms. Melanie also helped with life cycle lessons and aquarium activities.

### **Mountain Ecology and Avalanche Studies**

January 10 & 26, 2005

Junction and Forks School Students learned about mountain ecology and avalanches. Students used an alpine model with different types of terrain to test which terrain is more avalanche prone. Students discussed such factors as temperature, slope, and aspect. Students also calculated the approximate water contribution of snow melt into the watershed. Students learned about different types of snow and their densities. They also watched an Eyewitness video about mountain ecology and culture.



**Above :** Forks of Salmon Students on the Winter Ecology Field Trip.

### **Winter Ecology Field Trip**

January 13-14, 2005

Students from Junction School traveled to Mt. Shasta with the watershed education coordinator to study winter ecology. The students discussed the connection between mountains and rivers and the importance of snowfall to salmon. Students cross-country skied at the Shasta Nordic Center. Students recorded their activities and findings in their watershed education journals.

### **Watershed Stewards Project Curriculum**

January-March, 2005

Under the guidance of the Salmon River Restoration Council, AmeriCorps Watershed Stewards Project members facilitated a six week watershed studies curriculum in Forks of Salmon and Junction Elementary schools. Topics included: salmonid lifecycle, habitat, anatomy, watershed geography, water cycle, and more.

### **Teacher Planning Meetings**

January 24, January 26, February 2, 2005

SRRC's watershed education coordinator met with assistant coordinator, Watershed Stewards Project members, and each teacher individually to plan and evaluate watershed education activities. These meetings are essential to the program. They give the teachers time to brainstorm and create new curriculum ideas. This is also when the state educational standards are reviewed and integrated into the watershed program.

### **Coastal/Marine Ecology Field Trip**

February 3-4, 2005

Junction School students grades K-3 went with the watershed education coordinator to the HSU Natural History museum where they studied birds, reptiles and amphibians. They also went to the HSU Marine Lab where they learned about different marine environments such as eel grass beds, estuaries, and tide pools. Students learned about the lifecycle and other specifics of octopi and got to help the lab technicians release a Giant Pacific Octopus into Trinidad Bay. Students recorded their activities in their watershed journals.



**Above :** Junction students learn about Sea Stars at the HSU Marine Lab.

### **Garden Club**

February 4, 2005 and each Friday following

The SRRC's watershed education program facilitates a weekly garden club at Junction School. Students learn about botany and about agricultural practices in a hands-on manner. Students use the school greenhouse and flower beds to germinate seeds and grow flowers and food for the school lunches.

## **F. Summary and Conclusions**

The SRRC's Watershed Education year in 2004 went very well. During the time of this agreement the program coordinator led six field trips, coordinated 8 field trips, coordinated more than 12 in-class presentations, facilitated seven major student projects and hosted five teacher planning sessions. These activities all led up to the annual River Schools Watershed Fair, which was one of the best attended so far.

The coordinator involved several resource professionals from: local watershed councils, the U.S. Forest Service, the Department of Fish and Game, the Department of Fish and Wildlife, the Karuk Tribe of California, the Yurok Tribe of California, and the Hoopa Tribe of California. All of these organizations helped to enrich the watershed education curriculum.

This year, teachers did not participate in job shadowing opportunities, though they were made available by the coordinator. Teachers were invited to participate in mist netting of international migratory birds, with the U.S. Forest Service, and to participate in Seine netting with the Karuk Tribe fisheries crew. Teachers were unable to find substitute teachers to cover their classrooms so that they could attend such events.

Through the watershed education program teachers and students both learned technical skills and the use of equipment such as Hobo temp loggers, Box Car software, thermometers, transparency tubes, kick nets and magnifying scopes, dissolved oxygen testing kits, digital still cameras, power point software and digital video cameras. The coordinator maintained all of the technical equipment as well as survey gear such as stream boots, neoprene waders, and other gear.

The coordinator provided more than 15 community volunteers to enhance and facilitate the program. Most of these volunteers participated in the Fall Spawner Survey Training. But other volunteers also helped with Garden Club, the Eel basket presentation, the native plant propagation activities, the video project and the water quality monitoring trips.

Managing agencies were provided with meaningful data from the students in the watershed education program for temperature monitoring and for the Fall Spawner Surveys.

## G. Summary of Expenditures

### Budget Line Items

<u>PERSONNEL</u>	rate	
Project Coordinator @\$18/hr	\$ 25.00	\$ 6,258.96
Teachers Stipend	\$ 12.50	\$ -
Teachers Substitute Costs	\$ 11.25	\$ -
SRRC Tech Support	\$ 25.00	\$ -
SRRC Tech Support	\$ 14.00	\$ 56.00
SRRC Tech Support	\$ 12.00	\$ 90.00
SRRC Tech Support	\$ 10.00	\$ 320.00
Staff Benefits @ 30%		\$ 1,030.10
		\$ 7,755.06
Total Personnel Expense		
<u>Operating Expense</u>		
Lodging		\$ 517.00
Mileage – Coordinator	\$.345/mi	\$ 976.87
Mileage School Bus	\$2.50/mile	\$ 1,916.02
Total Operating Expense		\$ 3,409.89
<u>Materials &amp; Supplies</u>		
Printing & Duplicating		\$ 292.65
Curricular Materials		\$ 2,630.03
Telephone		\$ 122.87
Total Materials & Supplies		\$ 3,045.55
<u>Program Net Cost</u>		\$ 14,210.50
<u>Administrative Overhead @15%</u>		\$ 2,131.50
TOTAL Amount		\$ 16,342.00