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**Summary of Public Education and Outreach
Activities Conducted by the Salmon Trout
Restoration Education and Aquatic Management
(STREAM) Program, July 1990-June 1998**

by

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August 1999

Alaska Department of Fish and Game

Division of Sport Fish



Symbols and Abbreviations

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Weights and measures (metric)		General		Mathematics, statistics, fisheries	
centimeter	cm	All commonly accepted abbreviations.	e.g., Mr., Mrs., a.m., p.m., etc.	alternate hypothesis	H _A
deciliter	dL	All commonly accepted professional titles.	e.g., Dr., Ph.D., R.N., etc.	base of natural logarithm	e
gram	g	and	&	catch per unit effort	CPUE
hectare	ha	at	@	coefficient of variation	CV
kilogram	kg	Compass directions:		common test statistics	F, t, χ^2 , etc.
kilometer	km			confidence interval	C.I.
liter	L			correlation coefficient	R (multiple)
meter	m		east E	correlation coefficient	r (simple)
metric ton	mt		north N	covariance	cov
milliliter	ml		south S	degree (angular or temperature)	°
millimeter	mm		west W	degrees of freedom	df
		Copyright	©	divided by	÷ or / (in equations)
Weights and measures (English)		Corporate suffixes:		equals	=
cubic feet per second	ft ³ /s		Company Co.	expected value	E
foot	ft		Corporation Corp.	fork length	FL
gallon	gal		Incorporated Inc.	greater than	>
inch	in		Limited Ltd.	greater than or equal to	≥
mile	mi	et alii (and other people)	et al.	harvest per unit effort	HPUE
ounce	oz	et cetera (and so forth)	etc.	less than	<
pound	lb	exempli gratia (for example)	e.g.,	less than or equal to	≤
quart	qt	id est (that is)	i.e.,	logarithm (natural)	ln
yard	yd	latitude or longitude	lat. or long.	logarithm (base 10)	log
Spell out acre and ton.		monetary symbols (U.S.)	\$, ¢	logarithm (specify base)	log ₂ , etc.
		months (tables and figures): first three letters	Jan,...,Dec	mideye-to-fork	MEF
Time and temperature		number (before a number)	# (e.g., #10)	minute (angular)	'
day	d	pounds (after a number)	# (e.g., 10#)	multiplied by	x
degrees Celsius	°C	registered trademark	®	not significant	NS
degrees Fahrenheit	°F	trademark	™	null hypothesis	H ₀
hour (spell out for 24-hour clock)	h	United States (adjective)	U.S.	percent	%
minute	min	United States of America (noun)	USA	probability	P
second	s	U.S. state and District of Columbia abbreviations	use two-letter abbreviations (e.g., AK, DC)	probability of a type I error (rejection of the null hypothesis when true)	α
Spell out year, month, and week.				probability of a type II error (acceptance of the null hypothesis when false)	β
Physics and chemistry				second (angular)	"
all atomic symbols				standard deviation	SD
alternating current	AC			standard error	SE
ampere	A			standard length	SL
caloric	cal			total length	TL
direct current	DC			variance	Var
hertz	Hz				
horsepower	hp				
hydrogen ion activity	pH				
parts per million	ppm				
parts per thousand	ppt, ‰				
volts	V				
watts	W				

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**SUMMARY OF PUBLIC EDUCATION AND OUTREACH ACTIVITIES
CONDUCTED BY THE SALMON TROUT RESTORATION EDUCATION
AND AQUATIC MANAGEMENT (STREAM) PROGRAM,
JULY 1990-JUNE 1998**

by

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INTRODUCTION

BACKGROUND INFORMATION

Aquatic education in Southcentral Alaska began in 1989 with an experimental classroom salmon egg incubation program supported by the former Fisheries Rehabilitation Enhancement Division (FRED) of the Alaska Department of Fish and Game (ADF&G). This program was based out of the Big Lake Hatchery and initially concentrated on Matanuska-Susitna Valley schools, but by school year 1990/1991 supported projects in five Matanuska-Susitna Valley and five Anchorage area schools.

During this same time frame, FRED Division had plans to initiate a project to conduct research on stream rehabilitation techniques and structures the division was planning to construct in Anchorage area streams, with emphasis on Campbell Creek. The program was to be funded in part by the Alaska Science and Technology Foundation (ASTF), which was interested in the development of low cost stream restoration techniques that the general public and other agencies could afford and utilize along streams around Alaska. The projects would be small in design and materials would be inexpensive and easy to install.

A union of the fledgling aquatic education program and the new stream restoration effort occurred in July 1991 when the new project biologist realized there was an opportunity to combine these efforts to create an educational outreach program, which was named the Salmon Trout Restoration Education and Aquatic Management (STREAM) Program.

The main goal of the program was, as it remains today, to increase the public's awareness of Alaska's healthy wild salmon stocks through education and the offering of hands-on opportunities. In this way it is hoped that they will become personally involved and become better stewards of this valuable resource. In 1996, the STREAM Program was transferred to the Division of Sport Fish (SF). At that time, angler education and outreach became the main goal of the STREAM Program.

The STREAM Program's activities have been modeled after other existing agency aquatic education and outreach programs such as the Oregon Department of Fish and Wildlife's (ODF&W) Salmon Trout Enhancement Program (STEP) and the federal Department of Fisheries and Ocean's (DFO) Salmonid Enhancement Program (SEP) in British Columbia, Canada. Components of these programs have been incorporated into STREAM Program activities; however, these programs use activities to concentrate on enhancement of depleted salmon stocks while the ADF&G program focuses on maintaining already healthy stocks around the state. Salmonid enhancement is not an integral part of the STREAM Program.

The STREAM Program continues to expand its efforts and in 1998 moved into surrounding areas of Southcentral Alaska, including the Kenai Peninsula and the Copper River basin. The program has also been supporting Cooperative Extension Service (CES) classroom salmon egg incubation projects statewide on a technical basis since this program was established several years ago.

The success and popularity of the STREAM program is due to the high visibility of the program. Staff are in the schools and field with the students and volunteers that have the desire to learn more about Alaska's salmon resources. This not only allows the department to inform the public, but enables the public to become more aware of the department's concerns and to understand why and how the resource is managed.

1998 ACTIVITIES

The STREAM Program accomplishes its goals in many ways, but primarily incorporates and develops hands-on activities to increase the public's awareness of our salmon resources. The program focuses on education and outreach as its primary tools to accomplish its goals; however, with the ever increasing demand for educational activities and materials, the time consuming small scale stream restoration outreach activities have decreased significantly since the early days of the program.

Activities conducted by the STREAM Program are summarized in two categories, education and outreach. Education activities include: classroom salmon egg incubation, classroom visits and presentations, field educational experiences, teacher workshops/in-services, adopt-a-stream program and educational materials. The outreach component includes: stream restoration/habitat activities, shows and special events, requests for information, materials and equipment and media coverage. These activities are summarized below for fiscal years 1991-1998.

EDUCATION

Classroom Salmon Egg Incubation

As one of the original aquatic education tools, classroom salmon egg incubation activities have long been the backbone of the educational effort in Southcentral Alaska. Classroom salmon egg incubation came to Alaska using technology developed by the DFO-SEP in British Columbia. Classroom salmon egg incubation projects are used as a part of SEP's Salmonids in the Classroom program. Since its origins at the Big Lake Hatchery, these projects now exist in 55 ADF&G STREAM Program sponsored schools in Southcentral Alaska and statewide in approximately 60 Cooperative Extension Service (CES) sponsored schools. These projects continue to be for educational purposes only and not for enhancement.

Most schools are using 29-gallon aquariums with standard undergravel filter plates, powerheads and aquarium gravel. The tanks are insulated and darkened using 1-inch high density Styrofoam and water is refrigerated using a chiller unit from Taylor refrigeration in Vernon, British Columbia, Canada. If schools are on a city treated water system, they must dechlorinate their water before introduction into their tank. These systems incubate up to 250 eggs. Coho salmon *Oncorhynchus kisutch* is the species used to obtain salmon eggs for Southcentral Alaska school projects because its egg development stages from spawning to fry emergence coincide best with a school year.

Anchorage area incubator equipment is funded cooperatively between CES and the STREAM Program. The CES receives approximately \$5,000 from EXXON U.S.A. to purchase refrigeration units for Anchorage Schools. CES orders these units from Canada and turns them over to the STREAM Program for distribution. The STREAM Program supplies the other equipment and accessories required. Schools in other districts (Matanuska-Susitna, Kenai Peninsula and Copper River) are responsible for acquiring their own equipment or can receive assistance from the STREAM Program if they purchase a refrigeration unit themselves.

Several schools utilize a technique developed by the STREAM Program where the school cannot afford to purchase a refrigeration unit. This technique uses a small one gallon aquarium inside of a refrigerator, which chills the water, to incubate approximately 50 salmon eggs through the fry stage.

The classroom salmon egg incubation program enables students and teachers, as well as parents, to witness and monitor the early development of a salmon from egg to fry, probably the least understood stages of the salmon's life cycle, but a period we as humans have great control over. Classes are responsible for monitoring tank temperature on a daily basis and performing water exchanges once a week. Classroom salmon egg incubation projects focus on increasing student awareness of salmonid life histories, biology, anatomy and habitat requirements of these fish.

Educational materials have been developed and continue to be developed to complement this program. The STREAM Program modified the primary version of *Salmonids in the Classroom* with permission from DFO. The curriculum package has been well received and the intermediate version of this same series is in the process of being modified. *A Guide to Classroom Salmon Egg Incubation in Alaska* has been in draft form for several years but is also being distributed to teachers. A modified life-cycle poster originally produced by the Washington Department of Fish and Wildlife (WDF&W) and salmon egg vial displays constructed by high school students are also made available to educators.

In 1998, forty-one Anchorage area schools conducted classroom salmon egg incubation projects (Table 1); no increase from the previous year. There were 11 participating schools in the Matanuska-Susitna Valley area (Table 2); an increase of 2 schools from the previous year; 2 schools on the Kenai Peninsula (Table 3), where there was no participation during previous years; and 1 school in the Copper River basin (Table 4), where there also had been no previous project. Tables 1 through 4 also document the growth of incubation projects from the 1990/1991 school year to the present.

In late September and early October, classes from Anchorage and the Matanuska-Susitna Valley come to Campbell Creek and Spring Creek, respectively, to participate in a coho salmon egg take. The children witness the beginning of life of a salmon and leave with up to 250 fertilized eggs which they then observe and monitor throughout the winter. Schools on the Kenai Peninsula receive their coho salmon eggs at the eyed stage from the Fort Richardson Hatchery because there is no local egg-take site available. Those eggs are shipped at no charge via commercial air carrier. Copper River basin schools currently receive fertilized coho salmon eggs from an egg take at the privately operated Solomon Gulch Hatchery in Valdez. The classroom eggs eventually hatch and turn into fry at which point the class receives salmon food from the Fort Richardson Hatchery. The fish are released in mid-May in landlocked lakes: Taku-Campbell Lake in Anchorage, Matanuska Lake in Palmer, several lakes in the Kenai/Soldotna area and Strelna Lake near Kenny Lake.

Egg-take and release summary information for each area can be found in Tables 5-12. Anchorage area events continue to account for the largest amount of participation during egg takes (1,520 students) and releases (1,800 students) due to the large number of schools participating. Egg takes in Anchorage are held over a 2-day period for classes to attend. An egg take is conducted on a third day (Saturday) for instructors who could not attend with their class. The fry release in the Anchorage area is the only organized release in the region where classes come out on a single day to release their fry. In 1998 the program saw an increase in egg-take participation in the Matanuska-Susitna Valley (280 students in 1998 as compared to 150 the

Table 1.-Anchorage area classroom salmon egg incubation projects by school, 1991 through 1998.

School	1991	1992	1993	1994	1995	1996	1997	1998
Susitna Elem.	X	X	X	X	X	X	X	X
Gruening MS	X	X	X	X	X	X	X	
Girdwood	X		X	X		X		
Sand Lake Elem.	X							
Chugiak HS	X	X	X	X	X	X	X	X
Inlet View Elem.		X	X	X	X	X	X	X
Steller Alternative		X	X	X	X	X	X	
Rogers Park Elem.		X				X	X	X
Central JHS			X	X	X	X	X	X
Bear Valley Elem.			X	X	X	X	X	X
Northwood Elem.			X	X	X			
Dimond HS			X	X	X	X	X	X
Denali Elem.			X	X	X	X	X	X
Service HS			X	X	X	X	X	X
Eagle River Elem.			X	X	X	X	X	X
St. Elizabeth Ann Seton			X	X	X	X	X	X
Fairview Elem.				X	X	X	X	X
Chinook Elem.				X	X	X	X	X
Chugach Optional				X	X	X		X
East HS				X	X		X	X
Chester Valley Elem.				X	X	X	X	X
Wendler JHS					X	X		
Polaris Alternative					X	X	X	
Hanshew MS					X	X		
Scenic Park Elem.						X	X	X
Baxter Elem.						X	X	X
Nunaka Valley Elem.						X	X	X
Taku Elem.						X	X	X
Aurora Elem.						X		X
Alpenglow Elem.						X	X	X
O'Malley Elem.						X	X	X

-continued-

Table 1.-Page 2 of 2.

School	1991	1992	1993	1994	1995	1996	1997	1998
Bayshore Elem.						X		
Tudor Elementary							X	X
Homestead Elementary							X	X
Gladys-Wood Elem.							X	X
Kasuun Elementary							X	X
Willard Bowman Elem.							X	X
Turnagain Elementary							X	X
Mt. View Elementary							X	X
Orion Elementary							X	X
Chugiak Elementary							X	
Government Hill Elem.							X	X
Ocean View Elementary							X	X
Rabbit Creek Elementary							X	X
Abbott Loop Elementary							X	
Huffman Elementary							X	
Ursa Major Elementary							X	
Anchorage Montessori							X	
Pacific Northern Acad.							X	
Lake Otis Elementary								X
John F. Kennedy Elem.								X
William Tyson Elem.								X
College Gate Elementary								X
Mirror Lake MS								X
Goldenview MS								X
King Career Center								X
Total	5	6	14	19	21	29	41	41

Table 2.-Matanuska-Susitna Valley area classroom salmon egg incubation projects by school, 1991 through 1998.

School	1991	1992	1993	1994	1995	1996	1997	1998
Palmer HS	X	X	X	X				
Wasilla HS	X						X	X
Houston JHS	X	X						
Colony MS	X	X	X	X	X	X	X	X
Big Lake Elem.	X	X						
Colony HS		X	X	X				
Palmer MS			X	X	X	X	X	X
Goose Bay Elem.				X	X	X	X	X
Snowshoe Elem.					X	X	X	X
Sherrod Elem.					X	X	X	X
Finger Lake Elem.							X	X
Butte Elem.							X	X
Wasilla MS							X	X
Tanaina Elem.								X
Susitna Valley HS								X
Total	5	5	4	5	5	5	9	11

Table 3.-Kenai Peninsula area classroom salmon egg incubation projects by school, 1991 through 1998.

School	1991	1992	1993	1994	1995	1996	1997	1998
Nikiski Elem.								X
Tustumena Elem.								X
Total	0	0	0	0	0	0	0	2

Table 4.-Copper River area classroom salmon egg incubation projects by school, 1991 through 1998.

School	1991	1992	1993	1994	1995	1996	1997	1998
Kenny Lake Elem.								X
Total	0	0	0	0	0	0	0	1

Table 5.-Anchorage area school egg-take information, 1996-1998.

Date	Location	Stream	# Students
1996			
09/28	Anchorage	Campbell Creek	450
10/06	Portage (Girdwood)	Explorer Creek	25
Total		2	475
1997			
09/26	Anchorage	Campbell Creek	850 (31 classes)
09/26	Anchorage	Campbell Creek	500 (21 classes)
09/26	Anchorage	Campbell Creek	11 schools
Total		3	1,400
1998			
09/25	Anchorage	Campbell Creek	775 (31 classes)
09/26	Anchorage	Campbell Creek	705 (25 classes)
09/27	Anchorage	Campbell Creek	40
Total		3	1,520

Table 6.-Anchorage area school fry release information, 1996-1998.

Date	Location	Lake	# Students
1996			
05/17	Anchorage	Taku-Campbell Lake	700
Total		1	700
1997			
05/23	Anchorage	Taku-Campbell Lake	1,500
Total		1	1,500
1998			
05/15	Anchorage	Taku-Campbell Lake	1,800
Total		1	1,800

Table 7.-Matanuska-Susitna Valley area school egg-take information, 1996-1998.

Date	Location	Stream	# Students
1996			
09/25	Willow	Nancy Lake	60
Total		1	60
1997			
09/23	Willow	Nancy Lake	150
Total		1	150
1998			
09/29	Palmer	Spring Creek	105 (4 classes)
09/30	Palmer	Spring Creek	110 (4 classes)
10/01	Palmer	Spring Creek	65 (3 classes)
Total		3	280

Table 8.-Matanuska-Susitna Valley area school fry release information, 1996-1998.

Date	Location	Lake	# Students
1996			
05/96	Palmer	Matanuska Lake	200
Total		1	200
1997			
05/97	Palmer	Matanuska Lake	200
Total		1	200
1998			
05/98	Palmer	Matanuska Lake	200
Total		1	200

Table 9.-Kenai Peninsula area school egg-take information, 1998.

Date	Location	Stream	# Students
11/04	Anchorage	Ft. Rich Hatch.	N/A
Total		1	

Table 10.-Kenai Peninsula area school fry release information, 1998.

Date	Location	Lake	# Students
05/98	Soldotna	Arc Lake	30
05/98	Kasilof	Centennial Lake	60
Total		2	90

Table 11.-Copper River area school egg-take information, 1998.

Date	Location	Stream	# Students
10/97	Valdez	Solomon Gulch	28
Total		1	28

Table 12.-Copper River area school fry release information, 1998.

Date	Location	Lake	# Students
N/A	Kenny Lake	Strelna	0
Total			0

previous year) because of the introduction of class egg takes this past year at Spring Creek, which occurred over a 2-day period. In past years the egg take was conducted as part of an ADF&G production egg take at Nancy Lake and only a certain number of students were invited so that they would not interfere with staff attempting to conduct the ADF&G egg take.

Egg shipments to the two Kenai Peninsula schools were successful and approximately 90 students released fry at Arc and Centennial lakes.

Kenny Lake School in the Copper River basin successfully incubated, hatched and fed fry, but they died just a few days prior to their scheduled release in Strelna Lake.

Lakes that are approved for school fry releases are landlocked so that school-raised fry cannot mix with wild salmon in anadromous systems. Teachers may also elect to sacrifice their fry if they do not wish to release them. Classes may, by state policy, also release their fry into the system from which the eggs originated; however, projects sponsored by the STREAM Program are not offered this option in Southcentral Alaska.

Classroom Visits and Presentations

Making presentations to groups of people is one of the more conventional means of getting information out to interested groups. The STREAM Program, however, prefers to be very visual and hands-on when staff visit classrooms or adult groups to present topics relating to salmon. The STREAM Program attempts to make presentations interactive, where the audience must participate in some fashion. This may mean asking questions to the audience during the presentation or by giving them a hands-on activity to do while a presentation is occurring. Hands-on activities include puzzles, rubber stamps, fish dissections, and button making. Presentations focus on many salmon-related topics including: salmon life histories, biology,

habitat requirements, anatomy (dissections), coded wire tag demonstrations, watersheds, stream ecology or fishing.

Table 13 contains summary information on classroom visits and presentations for 1998. During this year, 45 presentations (up from 39 in 1997) were made to groups ranging in size from 4 to 285. Various presentations were made to 2,602 individuals from the kindergarten through adult age levels. Almost 85% of the presentations were conducted for elementary age children, 9% to high school students, 2% to college students and 4% to adult groups.

In 1998 the STREAM Program continued the salmon dissection program, where teachers could pick up salmon from a designated location to conduct dissections in the classroom or they could have STREAM Program staff bring fish and lead the dissection. North Alaska Fisheries, a local fish processor, donated 300 pink salmon to support the program this year. With those fish, along with coho salmon from the Elmendorf hatchery and school egg takes, the STREAM program distributed 592 fish for classroom dissections this year. The majority of school presentations this year were requests for salmon dissections (36%).

Field Educational Experiences

The STREAM Program occasionally receives requests from groups to lead outdoor presentations by a local stream or river. These talks range from assisting a Girl Scout Troop earn a nature badge to more detailed discussions with technical groups to consult on stream problems. Most of the field trips are based on a watershed perspective so that participants can become more aware of the “big picture,” that fish and aquatic organisms require more than just water to survive and how man’s impacts on a watershed can impact aquatic life. Hands-on activities usually always accompany these presentations and typically several sites may be visited along a stream to discuss changes that have occurred in the system. Hands-on activities may include: sampling aquatic macroinvertebrates using nets, trapping juvenile salmonids or testing water quality with test kits. All these activities are incorporated into the presentation so that the “big picture” becomes clear.

In 1998, eleven streamside presentations were made to 206 attendees (Table 14). Most of the requests were made by an organization or group that wanted to educate its members about a specific stream or watershed topic.

Teacher Workshops/In-Services

Teachers are becoming increasingly more interested in educating their students about salmon and streams. If trained properly, these teachers can assist the department in getting the word out in their classrooms. This becomes even more important when demand for STREAM Program staff class visitations exceeds available time. It is for this reason that the proper training of instructors is a high priority of the STREAM Program. Time is well spent when you can assemble several teachers together at a single time rather than on a one-on-one basis. Teacher workshops are considered formal or informal. Informal training sessions are not required by a school district where in-services are formal training sessions required by a district. Other sessions may involve the training of volunteers to assist at a STREAM Program event.

Table 13.-Classroom visits and presentations conducted by the ADF&G STREAM Program, 1996-1998.

Date	School	# Students	Age Group	Subject
1996				
10/24	St. Eliz. Ann Seton	20	Elementary	salmon life cycle (LC), requirements, etc.
10/25	Univ. of Alaska	12	College	Campbell Creek restoration projects
11/07	AK Pacific Univ.	12	College	salmonid education
11/08	East HS	40	High School	salmon LC, requirements, jobs, fishing, etc.
11/09	Scenic Park Elem.	25	Elementary	salmon LC, requirements, aging, etc.
01/19	Alpenglow Elem.	60	Elementary	salmon LC, requirements, dissections
01/23	Kenai Comm. School	18	Adult	Kenai R. watershed, salmon LC, habitat
01/29	Dimond HS	90	High School	careers, ADF&G info.
02/02	Snowshoe Elem.	210	Elementary	salmon dissections
02/05	Bear Valley Elem.	100	Elementary	salmon LC, requirements, etc.
02/07	Chester Valley Elem.	25	Elementary	salmon LC, requirements, aging, tagging
03/26	O'Malley Elem.	70	Elementary	salmon LC, requirements, etc.
03/27	Fairview Elem.	25	Elementary	salmon LC, requirements, etc.
03/28	King Career Center	40	High School	Sportsman's Show volunteer training
03/29	King Career Center	40	High School	Sportsman's Show volunteer training
04/03	Taku Elem.	40	Elementary	salmon LC, requirements, etc.
04/20	Kenai R. Forum	20	Adult	Kenai R. watershed, salmon LC, habitat
04/22	Ravenwood Elem.	40	Elementary	salmon LC, requirements, Eagle R. watershed
04/24	Chinook Elem.	400	Elementary	salmon LC, requirements, etc.
04/26	College Gate Elem.	17	Elementary	salmon LC, requirements, careers
04/26	Inlet View Elem.	25	Elementary	trout dissections
05/01	King Career Center	15	Parent	My Creek project info parent meeting
05/09	Grace Christian	20	Elementary	salmon LC, requirements, etc.
05/09	Eagle River Elem.	25	Elementary	salmon LC, requirements, etc.
1996 Total	24	1,389		
1997				
10/02	Sears Elementary	42	Elementary	salmon life cycle (LC), requirements, etc.
10/24	Alpenglow Elem.	24	Elementary	salmon dissections/CWT
10/24	AK Pacific Univ.	4	College	salmonid education
10/29	Chester Valley Elem.	28	Elementary	salmon dissection/CWT
10/31	East HS	28	High School	salmon LC, requirements, hatcheries, politics
11/12	Inlet View Elem.	25	Elementary	salmon dissections/CWT
11/13	Dimond HS	10	High School	fish branding experiment
11/20	Denali Elementary	27	Elementary	salmon dissections/CWT
11/25	Mt View Boys & Girl	20	Elementary	salmon LC, requirements, stamp activity
12/04	Palmer MS	120	Mid School	salmon LC, requirements, CWT dissection
12/05	Chugiak Elementary	35	Elementary	salmon dissections/CWT

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Table 13.-Page 2 of 3.

Date	School	# Students	Age Group	Subject
1997	continued			
12/09	Finger Lake Elem.	55	Elementary	salmon LC, requirements, stamp activity
12/09	Colony MS	80	Mid School	salmon LC, requirements, CWT dissection
12/09	Colony MS	50	Mid School	salmon dissections/CWT
12/13	Kasuun Elementary	90	Elementary	salmon dissections/CWT
01/22	Ship Cr. Task Force	10	Adult	Ship Creek fish, habitat and hydrology
01/23	Snowshoe Elem.	30	Elementary	salmon dissections/CWT
01/28	Gladys Wood Elem.	30	Elementary	salmon LC, requirements, etc.
01/29	Mt. View Elem.	27	Elementary	salmon LC, requirements, tagging, aging
02/17	Polaris Alternative	30	Elementary	salmon LC, requirements, stamp activity
02/21	Fairview Elementary	60	Elementary	salmon dissections/CWT
02/27	Huffman Elementary	20	All	Science night – salmon incubation project
03/06	Turnagain Elem.	60	Elementary	salmon LC, requirements, stamp activity
03/06	Kasuun Elementary	200	All	Science night – hands-on activities
03/13	Spenard B&G Club	30	Elementary	salmon LC, requirements, stamp activity
03/17	Turnagain Elem.	25	Elementary	STREAM Program - AK Board of Fish
03/24	King Career Center	50	High School	Sportsman’s Show training
03/25	King Career Center	50	High School	Sportsman’s Show training
03/26	King Career Center	50	High School	Sportsman’s Show training
03/27	Scenic Park Elem.	60	Elementary	salmon LC, requirements, etc.
03/31	BS Troop 26	13	Mid School	salmon LC, requirements, fishing opportunities.
04/14	Bayshore Elementary	28	Elementary	salmon dissection/CWT
04/16	Bowman Elementary	120	Elementary	salmon LC, requirements, stamp activity
04/21	Snowshoe Cub Scout	8	Elementary	habitat, fishing opportunities.
04/23	Orion Elementary	65	Elementary	salmon dissections/CWT
04/24	Elmendorf AAS	10	Adult	Ship Creek Adopt-A-Stream training
04/24	O’Malley Elementary	150	All	Science night – hands-on activities
05/02	Russian Jack Elem.	80	Elementary	salmon LC, requirements, stamp activity
06/24	AK CES	15	Adult	Master Watershed Program training
1997 Total	39	1,859		
1998				
07/23	N. Lights Pre and K	50	Pre and K	salmon life cycle (LC), requirements etc.
08/27	Kenny Lake School	20	Elementary	salmon LC, habitat and incubation project
10/06	College Gate Elem.	75	Elementary	Chester Creek “creek week” (3 classes)
10/07	College Gate Elem.	75	Elementary	Chester Creek “creek week” (3 classes)
10/08	College Gate Elem.	75	Elementary	Chester Creek “creek week” (3 classes)
10/09	College Gate Elem.	75	Elementary	Chester Creek “creek week” (3 classes)
10/10	College Gate Elem.	75	Elementary	Chester Creek “creek week” (3 classes)
10/21	King Career Center	50	High School	Watershed Fair volunteer training (2 classes)

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Table 13.-Page 3 of 3.

Date	School	# Students	Age Group	Subject
1998	continued			
10/29	Chester Creek Forum	17	Adult	Chester Creek presentation/discussion
11/05	Scenic Park Elem.	60	Elementary	salmon LC, habitat requirements (2 classes)
11/06	Alpenglow Elem.	22	Elementary	Alpenglow fish festival - dissections
11/19	Denali Elementary	24	Elementary	salmon dissections/CWT (1 class)
11/21	Chinook Elem.	225	Elementary	celebrity reader - fish books
11/24	St. Eliz. Ann Seton	8	Elementary	Girl Scouts biologist/resources talk
12/05	East HS	25	High School	salmon dissections/CWT (1 class)
01/12	Bear Valley Elem.	81	Elementary	salmon dissections/CWT (3 classes)
01/12	Huffman Elem.	54	Elementary	salmon dissections/CWT (2 classes)
01/14	Chester Valley Elem.	27	Elementary	salmon dissections/CWT (1 class)
01/14	Tudor Elementary	28	Elementary	salmon dissections/CWT (1 class)
02/02	Snowshoe Elem.	54	Elementary	salmon dissections/CWT (2 classes)
02/05	Chinook Elem.	54	Elementary	salmon dissections/CWT (2 classes)
02/10	Lake Otis Elem.	110	Elementary	salmon dissections/CWT (4 classes)
02/26	CES	10	Adult	Master Watershed Steward training
03/02	Copper Center Elem.	23	Elementary	Kyla Becker awards/LC stamp/puzzle
03/03	Kenny Lake Elem.	80	Elementary	Salmon "Eggtravaganza" - hands-on day
03/12	Kasuun Elementary	200	Elementary	Science night - hands-on activities
03/16	Nikiski Elementary	285	Elementary	hands-on activities - entire student body
03/17	Mt. View Elementary	25	Elementary	Tyler Smith awards/fishing
03/17	Sears Elementary	25	Elementary	LC presentation/stamp activity
03/17	Soldotna Elementary	25	Elementary	macroinvertebrate ID/AAS activities
03/17	Tustumena Elem.	45	Elementary	LC/habitat/stamp activity
03/23	King Career Center	30	High School	Sportsman's Show training
03/24	King Career Center	40	High School	Sportsman's Show training
03/26	Fairview Elem.	60	Elementary	salmon dissection/CWT (4 classes)
03/31	Northern Lights ABC	24	Elementary	LC presentation/stamp activity
04/15	Rogers Park Elem.	45	Elementary	salmon dissection/CWT (2 class)
04/16	Orion Elementary	75	Elementary	salmon dissections (3 classes)
04/17	Taku Elementary	22	Elementary	salmon dissection/CWT (1 class)
04/17	Gladys-Wood Elem.	28	Elementary	salmon dissection/CWT (1 class)
04/24	Wm. Tyson Elem.	60	Elementary	salmon dissections/CWT (3 classes)
04/24	Turnagain Elem.	50	Elementary	salmon dissection (2 classes)
04/27	Ravenwood Elem.	50	Elementary	watershed/stream ecology presentation (2 classes)
04/29	O'Malley Elem.	100	Elementary	Science night - hands-on activities
05/05	Boy Scout Troop 220	12	Elementary	LC/habitat/fishing presentation
06/18	Alaska Pacific Univ.	4	College	watershed presentation
1998 Total	45	2,602		

Table 14.-Field educational experiences conducted by the ADF&G STREAM Program, 1996-1998.

Date	School/Organization	# Students	Age Group	Location	Subject
1996					
07/18	Trailside Discovery	20	Elem/MS	Campbell Cr.	salmonid ed., habitat, dissect.
07/22	Anch Waterways Council	10	All	Chester Creek	“streamwalk”
09/09	Cub Scouts	50	Elementary	Cheney Lake	fishing opportunities
09/18	Alpenglow Elementary	25	Elementary	Campbell Cr.	watershed tour, sampling
09/19	Ravenwood Elementary	25	Elementary	Campbell Cr.	watershed tour, sampling
04/04	EPA/MOA/DEC	4	Agency	Ship Creek	fish habitat, water qual issues
04/23	AWC/EPA	3	Agency	Chester Creek	stream issues
05/08	O’Malley Elementary	30	Elementary	Ft. Rich Hatch	hatchery tour
05/15	Goose Bay Elementary	25	Elementary	Little Susitna	watershed tour, sampling
05/20	Sterling Elementary	40	Elementary	Moose River	monitoring training
05/23	Polaris School	46	Elem/MS	Campbell Cr.	watershed tour, sampling
06/22	Anch Waterways Council	10	All	Chester Cr.	“streamwalk”
06/25	ADF&G	50	Elem/HS	Campbell Cr.	enforcement talks
1996 Total	13	338			
1997					
07/02	Camp Challenge	14	Elementary	Palmer	stream and lake ecology
07/02	ADF&G	10	Elem/MS	Campbell Cr.	enforcement talks
07/16	Salamatoff Native Assoc.	8	High School	Beaver Creek	stream ecology/monitoring
07/23	Trailside Discovery Camp	8	Elementary	Campbell Cr.	stream ecology/dissections
08/24	BOW Workshop	8	Adult	Victory Camp	stream ecology
09/17	Klatt Elementary	25	Elementary	Rabbit Creek	stream ecology/sampling
10/01	Soldotna MS	60	Mid School	Russian River	stream ecology/sampling
10/03	Dimond HS	58	High School	Campbell Cr.	stream ecology/sampling
11/06	Ann Marie Leiser	1	Mid School	Ft. Rich Hatch	volunteer/vial displays
03/20	Future Farmers America	8	High School	Elm Hatchery	water quality testing
05/06	Ravenwood Elementary	65	Elementary	Fire Creek	watersheds/stream ecology
05/07	Turnagain Elementary	60	Elementary	Campbell Cr.	watershed walk/sampling
05/08	Wasilla HS	65	High School	Little Susitna	watershed walk/sampling
05/12	Fairview Elementary	63	Elementary	Chester Creek	watershed talk and activities
05/13	Polaris Alternative	31	Elem/MS	Campbell Cr.	watershed walk/sampling
05/28	Klatt Elementary	25	Elementary	Rabbit Creek	watershed walk
06/20	Inlet View Comm. Camp	18	Elementary	Campbell Cr.	stream ecology/sampling
06/28	CES Master Watershed	15	Adult	Campbell Cr.	watershed walk/sampling
1997 Total	19	542			

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Table 14.-Page 2 of 2.

Date	School/Organization	# Students	Age Group	Location	Subject
1998					
07/10	Salamatoff Native Assoc.	10	High School	Beaver Creek	watersheds/stream monitoring
07/16	BLM/general public	12	All	SF Campbell	Mid-Summers Night Series
07/20	Anchorage Waterways	15	All	NF Campbell	stream walk
07/22	Trailside Discovery Camp	19	Elementary	SF Campbell	stream ecology/dissections
04/20	Girl Scout Troop 100	7	Elementary	Potter Marsh	stream ecology/fish
04/23	ADFG daughters @ work	35	Elem./MS	Campbell Cr.	Stream ecology/fish
05/01	River Mgmt. Society	10	Adult	Anch. Streams	urban streams
05/07	Fairview Elementary	76	Elementary	Sitka Park	Chester Creek watershed
05/15	St. Eliz. Ann Seton B&G Scout Troops	10	Elementary	SF Campbell	stream walk
06/19	Alaska Pacific University	4	College	SF Campbell	watersheds/stream monitoring
06/23	Coop. Extension Service	8	Adult	SF Campbell	watersheds/stream monitoring
1998 Total	11	206			

During 1998 ten training sessions were held and attended by 134 people (Table 15). Workshops included incubation project training, adopt-a-stream workshops, watershed education and volunteer training for the annual “Coho Carnival.”

Table 15.-Teacher workshops and in-services conducted by the ADF&G STREAM Program, 1996-1998.

Date	District	# Teachers	Location	Subject
1996				
08/30	Anchorage	172	Tudor Elementary	2nd grade “cycles,” dissections, macros, inc. equip
09/14	Statewide	40	Chena Hot Springs	classroom incubation., watersheds
11/13	Anchorage	16	Baxter Elementary	classroom incubation (existing projects)
11/17	Mat-Su	8	Palmer	classroom incubation (existing projects)
02/09	Mat-Su	22	Palmer Middle	classroom incubation (teacher interest workshop)
03/21	Idaho	20	Coeur d’Alene	classroom incubation (how to)
03/30	Anchorage	20	Anchorage	watershed presentation
04/09	Statewide	0	UA Fairbanks	CES advisory board meeting
04/19	Kenai Pen.	12	North Star Elem.	lake monitoring training
04/25	Anchorage	45	King Career Center	classroom incubation (teacher interest workshop)
05/16	Mat-Su	19	Little Susitna River	watershed training, sampling
06/11	Anchorage	150	Campbell Creek	watershed training, sampling
06/13	Southcentral	23	Campbell Creek	stream sampling
1996 Total	13	547		

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Table 15.-Page 2 of 2.

Date	District	# Teachers	Location	Subject
1997				
08/27	Mat-Su	7	Willow Creek	Willow Creek watershed walk/sampling
08/28	Polaris Prog.	30	SF Campbell Creek	stream ecology/sampling/monitoring
09/13	Statewide	22	Fairbanks	CES incubation training workshop
10/01	Kenai	11	CIAA – Soldotna	Adopt-A-Stream Workshop
12/03	Anchorage	7	King Career Center	incubation workshop (returning teachers)
02/05	Mat-Su	9	Palmer MS	incubation workshop (returning teachers)
02/05	Mat-Su	7	Palmer MS	incubation workshop (interested teachers)
02/25	Anchorage	30	Lake Otis Elementary	school incubation meeting
02/28	Anchorage	50	United Methodist Chur	Community Action Project Fair
04/15	Anchorage	8	King Career Center	incubation workshop (interested teachers)
05/03	Kenai	6	K-Beach Elem/Slikok	Adopt-A-Stream sampling/watershed walk
05/09	Mat-Su/ APU	18	Little Susitna River	Little Susitna R. watershed walk/sampling
06/09	Anchorage	60	Campbell Creek	ASD teacher training watershed tour/sampling
06/09	Anchorage	12	East HS	mandatory incubation program meeting
1997 Total	14	277		
1998				
09/15	Anchorage	20	King Career Center	mandatory incubation program meetings
09/16	Anchorage	15	King Career Center	mandatory incubation program meetings
09/18	Statewide	35	Fairbanks	CES incubation training workshop
10/25	Kenai	3	Soldotna	Adopt-A-Stream Workshop
12/04	Anchorage	10	Fairview Elem.	Chester Creek Adopt-A-Stream workshop
02/16	Palmer	15	Palmer MS	watershed, incubation, AAS district in-service
05/09	Anchorage	12	Chester Creek	Chester Creek Adopt-A-Stream Workshop (field)
05/19	N/A	8	ADF&G	smolt release/coho carnival volunteer training
05/27	N/A	4	ADF&G	smolt release/coho carnival volunteer training
06/08	Anchorage	12	Campbell Creek	watershed training/stream ecology
1998 Total	10	134		

Adopt-A-Stream Program

Adopt-A-Stream (AAS) programs are becoming increasingly popular across the country. These programs enable the general public to care for or monitor a favorite section of stream. In Southcentral Alaska these AAS projects are also used as an educational tool. The STREAM Program works primarily with schools and non-profit groups to establish AAS projects. The program has grown from a single project in 1996 to 11 projects in 1998 (Table 16) with approximately 600 stream watchers. Participating adult groups are most interested in cleaning up sections of stream. Three of these groups are currently working in the Kenai River and Ship Creek, and in the past year have collected several thousand pounds of debris from these two systems.

Table 16.-Adopt-A-Stream programs sponsored by the ADF&G STREAM Program, 1996-1998.

Date	Stream	School/Organization	Number Participants	Activity	Sign
1996					
05/08	Ship Creek	Aerospace 3 rd EMS Ground Equip. and Flight Crew	100	cleanup	yes
Total		1	100		
1997					
05/09	Ship Creek	Aerospace 3 rd EMS Ground Equip. and Flight Crew	100	cleanup	yes
05/10	Ship Creek	3WG Maintenance Operations Center	40	cleanup	yes
Total		2	140		
1998					
05/09	Ship Creek	Aerospace 3 rd EMS Ground Equip. and Flight Crew	100	cleanup	yes
05/10	Ship Creek	3WG Maintenance Operations Center	40	cleanup	yes
09/13	Kenai R.	Alaska Fly Fishers	90	cleanup	yes
1998	Chester Cr.	Rogers Park Elementary	30	clean/monitor	no
1998	Chester Cr.	Fairview Elementary	30	clean/monitor	no
1998	Meadow Cr	Eagle River Elementary	30	clean/monitor	no
1998	Soldotna Cr	Soldotna Elementary	100	clean/monitor	no
1998	Swanson R	Nikiski Elementary	30	clean/monitor	no
1998	Moose R	Sterling Elementary	50	clean/monitor	no
1998	Slikok Cr	Kalifornsky Beach Elementary	50	clean/monitor	no
1998	Crooked Cr	Tustumena Elementary	50	clean/monitor	no
Total		11	600		

Schools may participate in AAS projects for educational purposes. Too many similar monitoring projects have promised teachers that their data would be stored in databases or used to fix potential problems in their streams, and historically these promises have never been kept. Many educators lost faith in these programs as a result and the STREAM Program is now attempting to restore some of that lost faith in the name of education.

Teachers in the Anchorage and Kenai Peninsula areas have attended training workshops through cooperative STREAM Program, U.S. Fish and Wildlife Service, Nature Conservancy and Anchorage Waterways Council (AWC) workshops. They are informed up front that the purpose

of the program is educational and not scientific in nature. It is suggested that schools participate at whatever level they feel comfortable with and that they are collecting water quality data to maintain their own database. This database can then be used to “communicate” findings with other schools in the same watershed or even different areas.

Water quality sampling equipment has been made available to teachers in Anchorage and the Kenai Peninsula. Instructors who have completed a training course may check the kits out for use at their AAS site. These kits are currently available for check out at the King Career Center (KCC) in Anchorage and the Kenai River Center in Soldotna.

Schools may participate at varying levels in activities which may include: stream cleanup (litter), stream and habitat surveys, macroinvertebrate (aquatic insect) surveys, water quality testing using chemical test kits, or involvement in an actual small-scale stream restoration project if they determine one may be necessary.

STREAM Program staff have been working with state Department of Transportation (DOT) personnel to implement an AAS sign recognition program at highway road crossings. Two military groups and the Alaska Fly Fishers are the only recognized groups at this time. The U.S. Air Force allowed signs to be posted on base through their own channels, while the Fly Fishers were granted permission from the Soldotna DOT. No other signs have been posted at this time pending final approval from the Anchorage DOT office.

Educational Material Development

As the STREAM Program’s educational effort continues to expand so to does the need for new materials to meet the demand of the growing program. The STREAM Program continues to design new effective hands-on ways to increase the public’s awareness of Alaska’s salmon resources.

Demand for curriculum from teachers continues to grow. Gaps in the STREAM Program’s educational programs have included learning materials in the areas of genetics and fish hatcheries in Alaska. Cooperative arrangements with ODF&W have resulted in receiving permission to “Alaskanize” an existing Oregon curriculum entitled *The Fish Hatchery Next Door*. This curriculum is ideal for educators who are not involved in other STREAM Program activities and whose only fisheries studies of the year may be to visit a local hatchery. This curriculum addresses all the basic salmon information currently available in the *Salmonids in the Classroom* packages but adds the hatchery connection. All too often the general public believes that hatcheries are the solution to all of our fisheries problems. Once completed, the Alaskan version will focus on the Fort Richardson and Elmendorf hatcheries in Anchorage and will discuss the enhancement role of these hatcheries. These two hatcheries currently conduct facility tours where several thousand school children attend. The teachers and students typically have little or no background information regarding the hatchery and its goals. This curriculum will eventually supply all the information necessary to increase visitors’ awareness of the role of hatcheries in Southcentral Alaska.

The STREAM Program has also been invited to comment and add Alaskan perspective information to a curriculum currently being developed by ODF&W called *Why Wild*. This curriculum focuses on genetics and the importance of maintaining wild stocks. Initial comments on the curriculum have been passed on to ODF&W and the ADF&G Genetics program is also reviewing these materials to insure that an Alaskan perspective is indeed addressed correctly.

This curriculum, which will target middle school and older aged students, will make an excellent addition to the classroom salmon egg incubation program in that it will address issues that commonly come up in regard to department policies on stocking school-reared fry.

The STREAM Program continues to work on modifications to the intermediate version of the Canadian *Salmonids in the Classroom*. The primary version has been completed and is currently in use in conjunction with most incubation projects across the state. The intermediate version will allow extension of the elementary level information to upper elementary grades.

Other STREAM Program educational developments from 1998 (Table 17) include a pilot hatchery tour program using high school students as tour guides. The project was piloted at the Elmendorf Hatchery and staff report that it was successful. The STREAM Program will be working on expanding the program for next school year with dedicated volunteers at both Anchorage area hatcheries.

Table 17.-Educational materials developed by the ADF&G STREAM Program, 1996-1998.

Educational Aid	Comments
1996	
Salmonids in the Classroom curriculum (primary)	modified Canadian curriculum
salmon life cycle poster	modified Washington Dept. of Fish and Wildlife poster
salmon egg development vial displays	constructed and marketed by King Career Center students
ASD primary and intermediate salmonid kits	kits containing most requested learning materials
salmon anatomy puzzle	hands-on activity for shows, special events and classroom
‘The Hazardous Game of Life’ wheel	hands-on activity for shows and special events
recycled RTS questionnaire fish species handouts	high school students processed these to be used as handouts
ASD and CES newsletters	latest information to educators in SC and bush schools
Salmonids in the Classroom curriculum (intermediate)	started curriculum modification of second in series
Canada DFO Community Involvement Directory	listing of Alaska schools in BC/Yukon directory
1997	
STREAM Program Home Page	Snowshoe Elementary students start building home page
salmon for dissection program	120 pink salmon donated by Trans-Aqua cannery in Kasilof for school dissections
salmon egg development vial displays	constructed and marketed by King Career Center students
“Pacific Salmon - Alaska’s Story” booklet	1,200 copy mailout to all Alaskan schools (except North Slope).
button making activity	paper disks are colored by students depicting anything related to salmon or fish , then a button is made.

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Table 17.-Page 2 of 2.

Educational Aid	Comments
1997 continued	
autographed Ray Troll “Midnight Run” prints	prints can be donated to schools or organizations to raise funds for their STREAM Program supported stream restoration activity.
STREAM Program display	updated photographs on STREAM Program public display
Classroom Incubation pamphlet	tri-fold pamphlet describes the incubation program and other activities students are doing in the classroom or field.
updated “Chucky Chum” lifecycle stamp form	tri-fold rubber stamp form describing the salmon lifecycle as told by Chucky Chum.
ASD smolt release information sheet	handed out to teachers during smolt release - several topics
ASD and CES newsletters	latest information to educators in SC and bush schools
Salmonids in the Classroom curriculum (intermediate)	continued curriculum modification of second in series
Canada DFO Community Involvement Directory	listing of Alaska schools in BC/Yukon directory
1998	
Elmendorf Hatchery HS student tour program	pilot project to train HS students to lead hatchery tours
Adopt-A-Stream Streamkeepers manual	distributed to participating AAS schools and agency people
Hach water quality kits	kits placed at KCC for checkout by participating schools
ASA kids fishing pond poles	40 poles to ASA for Great Alaska Sportsman’s Show pond
First Fish Catch card	cards developed for first time anglers who catch first fish
“Why Wild” genetics curriculum	working with ODF&W to create a Pacific NW curriculum
“Fish Hatchery Next Door” curriculum	received ODF&W permission to modify hatchery curriculum
Anatomy Puzzle	combined external and internal features in one puzzle
Foam Anatomy puzzle	floor puzzle constructed by volunteer Sandra Murley
salmon dissection program (520 fish distributed)	300 pink salmon donated by NAF Fisheries in Anchorage
“Miracle of the Scarlet Salmon” video	excellent life cycle video to supplement educational program
Alaska Fly Fishers fly fishing mentorship program	teaching kids to fly fish through AFF/4H mentorship
Rotary Club spin casting program	rotary members teach kids how to spin cast
ADF&G volunteer hats	for volunteers at large public events
ASD smolt release information sheet	handed out to teachers during smolt release - several topics
ASD and CES newsletters	latest information to educators in SC and bush schools
Salmonids in the Classroom curriculum (intermediate)	continued curriculum modification of second in series
Canada DFO Community Involvement Directory	listing of Alaska schools in BC/Yukon directory
Campbell Creek Informational kiosk funding	Alaska Fly Fishers donate \$1,000 for kiosk construction

Pilot fly fishing and spin-casting programs were conducted this spring during the Anchorage area fry and smolt releases. Members of the Alaska Fly Fishers worked with children on fly fishing techniques and fly tying, while a local Rotary club worked with spin casting technique. The STREAM Program later assisted the Rotary club with an actual fishing event at Taku-Campbell Lake.

Two puzzles were constructed as hands-on activities for events and shows, including a foam floor puzzle which was fabricated by a volunteer, and a wooden anatomy puzzle which was actually redesigned to include the internal and external features of a salmon in one puzzle.

Three informational kiosks for Campbell Creek will be constructed in 1999 thanks to a contribution by the Alaska Fly Fishers to the King Career Center in 1998. The wood shop will construct and assist with installation next year.

OUTREACH

Stream Restoration/Habitat Activities

Integration of small-scale stream restoration projects with education has been an effective tool in increasing the public's awareness of salmon and especially the protection of their habitat. These projects are often very time consuming to plan, coordinate and implement, so unfortunately, the STREAM Program in all likelihood will decrease its efforts in this area, but will make opportunities available to the public should they become available at a reasonable time cost.

During 1998 the main focus of the stream restoration effort was on completing a cooperative bank restoration and boardwalk project along Campbell Creek at Folker Street (Table 18). The joint ADF&G, Municipality of Anchorage (MOA) and Anchorage Waterways Council project, which has been done in phases over the past 3 years, recontoured and revegetated an eroded high traffic bank along the stream. A combination viewing platform/fishing deck was erected to protect the newly reestablished bank.

Volunteer efforts of the King Career Center helped erect a hand rail around the boardwalk, while the Boy Scouts and BP volunteers installed a new tree revetment along the bank and planted donated plant materials around the boardwalk. The project is now complete and the high traffic bank is now protected from pedestrian traffic and bank anglers.

Last summer a weir was again erected in Chester Creek to count returning adult coho salmon in the system. The weir was installed and manned by staff from the Alaska Greenhouse. Although the counts were low (12 fish) the project rekindled interest in reviving this once productive salmon stream.

Shows and Special Events

Large events or shows (Table 19) are an excellent way to reach out to segments of the population that may not have access to or a specific interest in fish or fishing. The activities at events in which the STREAM Program participates are always very hands-on oriented and easy to understand by the general public.

1998 saw the expansion of one popular fishing program and the pilot of another. In 1997 ice fishing events were held on Jewel Lake in Anchorage where almost 800 students participated. In 1998, some 1,500 students were scheduled to attend this year's pre-Christmas break event; however, lake conditions were not safe and after rescheduling a second time the event had to be canceled. The event did expand to the Matanuska-Susitna Valley this year; however, on Finger

Lake near Palmer, where 275 students caught a variety of fish, including catchable landlocked chinook salmon, rainbow trout and arctic char. Attendance at both of these events should increase in 1999.

Table 18.-Stream restoration/habitat activities (outreach) conducted by the ADF&G STREAM Program, 1996-1998.

Date	Location	No. Volunteers	Man Hours	Coop Agency/Org	Project
1996					
07/22	Campbell Creek	12	20	AWC/ASD	rootwad site revegetation
07/22	Campbell Creek	6	10	AWC/DNR	biolog site revegetation
09/06	Campbell Creek	3	12	AWC/MOA	Folker bank recontour
10/20	Hurricane	1	8	MOA	dormant willow collection
02/16	ADF&G	2	4	private citizens	dormant willow prep
02/19	20 ASD Schools	1,270	1,270	ASD	rooting willow cuttings
05/11	My Creek (Little Su)	8	48	ASD - KCC	brush collection and move
06/01	My Creek	7	96	ASD - KCC	brush mattress install
06/03	Campbell Creek	25	25	ASD - SAVE/private	57th St. revegetation
06/04	Chester Creek	100	100	ASD/AWC/MOA/DNR	Cherry Park revegetation
06/06	Campbell Creek	8	24	AWC/DNR	Folker Street revegetation
Total	11	1,442	1,617		
1997					
08/05	Campbell Cr. (Folker)	8	16	AWC/MOA	tree revetment install
08/07	Chester Creek	2	10	Alaska Greenhouse	adult coho weir - no count
10/03	Anchorage hillside	9	4.5	Cub Scout Pack 104	alder cone collection
10/22	My Creek (Little Su)	15	97.5	Boy Scout Troop 340	footbridge construction
05/29	Rabbit Creek	30	150	Klatt Elementary	streambank revegetation
06/17	My Creek (Little Su)	8	44.5	Boy Scout Troop 340	finish foot bridge
06/19	Campbell Creek	8	8.0	Anch Waterways Council	fish ladder rehab
Total	7	80	330.5		
1998					
07/25	Chester Creek	2	15	Alaska Greenhouse	adult coho weir – 12 fish
11/13	Ft. Richardson Hatch.	2	2	CES/watershed stewards	egg shipping to bush
05/11	Campbell Creek	30	360	ASD King Career Center	Folker b'walk hand rail
06/04	Campbell Creek	15	30	BSA/BP Exploration	Folker reveg and revet
06/06	Campbell Creek	8	24	BSA	Folker revegetation
Total	5	57	431		

Table 19.-Shows and special events attended or sponsored by the ADF&G STREAM Program, 1996-1998.

Date	Event	Location	Attendance	# Volunteers	Purpose	Comments
1996						
02/01	Chester Valley Ice Fishing	Cheney Lake	30	16	winter fishing opps	2 fish harvested
02/01	O'Malley Ice Fishing	Cheney Lake	7	6	winter fishing opps	0 fish harvested - special needs children outing
02/08	Chinook Ice Fishing	Jewell Lake	111	28	winter fishing opps	105 fish harvested
02/10	Fur Rendezvous Parade	Anchorage	2,000 +	90	salmonid and fishing awareness	90 parents, children and parents construct float at Ft. Richardson Hatchery
03/19	Baxter Ice Fishing	Cheney Lake	50	9	winter fishing opps	5 fish harvested
03/19	Scenic Park Ice Fishing	Cheney Lake	25	9	winter fishing opps	2 fish harvested
03/27	Alpenglow Science Fair	Alpenglow Elementary	0	0	judge	1st annual science fair
03/30	Big Bros. and Sisters Ice Fish	Jewell Lake	40	20	winter fishing opps	7 fish harvested
04/02	Cook Inlet Reg. Cover Art Contest	Southcentral Region	0	390	cover art for regulations	Tianna Panoncillo - winner Bayshore Elementary
04/11	Great Alaska Sportsman's Show	Ben Boeke/Sullivan Arena	2,000 +	50	ADF&G booth and ASA pond	fish pond stocking, maintenance, fish cleaning, activity booths, ADF&G booth, special needs fishing opps.
04/27	KidsDay 1996	Performing Arts Center	1,000 +	3	hands-on activities	hands-on salmonid activities to increase awareness
05/31	ASD Smolt Release	Campbell Creek	1,800	1	Anchorage fish opps	kids release 5,000 smolt and watch production plant
06/08	Ship Creek Derby	Ship Creek	20	0	hands-on activities	hands-on salmonid activities to increase awareness
1996 Total	13		7,083 +	622		
1997						
08/29	Alaska State Fair	Palmer	500	0	salmonid awareness	hands-on activities, live fish display
09/19	Anch Waterways Appreciation	Russian Jack chalet	75	0	accept award - assistance	volunteer award banquet

-continued-

Table 19.-Page 2 of 3.

Date	Event	Location	Attendance	# Volunteers	Purpose	Comments
1997 continued						
12/16	John Hofflich Eagle Scout Proj.	Anchorage	0	5	construct bamboo ice fishing poles	97 bamboo ice fishing poles constructed with donated materials
12/16	ASD ice fishing	Jewel Lake	785	5 (+parents)	winter fishing opps.	4 days – 18 schools, 36 classes, 1,134 fish (approx. 10% Catch & Release)
12/27	SF regulations cover art contest	3 regions	0	CI – 650 PWS – 75 KOD – 50	student artwork for reg covers	CI – Callista Nelson PWS/CPR – Leah Jarvis KOD/SW – Kathryn Jones
01/26	St. Eliz. Ann Seton ice fishing	Beach Lake	25	0	winter fishing opps.	St. Eliz. Ann Seton outing – no fish harvested
02/15	Fur Rendezvous Parade	Anchorage	2,000 +	90	salmonid and habitat awareness	90 parents, children and teachers construct float at Ft. Richardson Hatchery
3/04	ASD Business Partnership breakfast	Anchorage	15	0	STREAM Program = partner of the month	opportunity to meet with ASD superintendent to discuss program
03/17	AK Board of Fish	Anchorage	25	0	STREAM Program presentation	25 Turnagain Elem students give salmon talk. STREAM Program talk.
03/19	Alpenglow Science Fair	Alpenglow Elementary	0	0	judge	2 nd annual science fair
03/19	Chinook Science Fair	Chinook Elementary	0	0	judge	science fair judge
04/03	Great Alaska Sportsman's Show	Ben Boeke/Sullivan Arena	2,000 +	50	ADF&G booth and ASA pond	fish pond stocking, maintenance, fish cleaning, activity booths, ADF&G booth
04/22	Earth Day Celebration	Anchorage	200	0	hands-on activities	salmon puzzle, button making, stamp set
04/26	KidsDay 1996	Performing Arts Center	800	4	hands-on activities	hands-on salmonid activities to increase awareness
05/12	ASD recognition	ASD office	100	0	receive business partnership award	another recognition event for being business partner of the month - framed certificate

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Table 19.-Page 3 of 3.

Date	Event	Location	Attendance	# Volunteers	Purpose	Comments
1997 continued						
05/31	ASD Smolt Release	Campbell Creek	1,500	7	Anchorage fish opps	kids release 5,000 smolt and watch production plant
1997 Total	16		8,025+	936		
1998						
10/26	Watershed public fair	Anchorage	2,000 kids	10	salmonid awareness	hands-on salmonid activities to increase awareness
12/11	Mat-Su Borough School District ice fishing	Finger Lake – Palmer	140	4 (+parents)	winter fishing opps.	
12/12	MSBSD ice fishing	Finger Lake – Palmer	135	4 (+parents)	winter fishing opps.	
12/26	SF regulations cover art contest	4 areas	0	CI – 303 PWS – 46 KOD – 84 BB – 56	student artwork for regulation covers	Tyler Smith (CI), Kyla Becker (PWS), Trapper Alsworth (KOD), Rick Wysock (BB)
01/08	ASD ice fishing	Jewell Lake	<1,500>		winter fishing opps	CANCELLED – poor ice conditions
02/14	Fur Rendezvous Parade	Anchorage	3,000+	100	salmonid and fishing awareness	100 children, parents and teachers construct float at FRH – 1 st place.
03/10	Science Fair	Girdwood	0	0	judge	Lisa judged science fair
03/26	Science Fair	Alpenglow	0	0	judge	science fair judge
04/02	Great Alaska Sportsman Show	Anchorage	2,500	28 (350 man hours)	ASA Kids Fishing Pond	KCC Volunteers – booths, pond, stocking, fish cleaning
04/18	KidsDay 98	Anchorage	500	6 (24 man hours)	awareness	hands-on activities
05/29	smolt release/coho carnival	Campbell Cr	1,135	40 (200 man hours)	salmonid/ fishing awareness	51 classes
06/27	Anchorage Women’s Aid In Crisis fishing event	Taku-Campbell Lk	25		woman’s fly fishing event	stocked 750 rainbow trout in confinement net for pilot events – 3 fish caught
06/27	Rotary Club event	Taku-Campbell Lk	200		kid’s spin casting event	stocked 750 rainbow trout in confinement net for pilot events – 2 fish caught
1998 Total	12		9,635	681 (574 man hours)		

A local Rotary club in Anchorage began coordinating a spin casting loaner pole program this year and a pilot fishing event was held at Taku-Campbell Lake. ADF&G purchased a 500 ft X 12 ft X 7/16 in mesh net to confine fish in a small area of the lake. Approximately 500 catchable rainbow trout were then stocked in the confined area for anglers to catch. Water temperatures proved to be too warm and the 200 children that attended only caught two fish. A woman's fly fishing event held the same day with 25 participants yielded a catch of only three fish. A new location with better temperature profiles for these events will be selected for 1999.

The annual coho salmon smolt release at Campbell Creek included a new twist this past year, the addition of several hands-on activity booths for the 1,135 students attending. The combined release and booths were renamed the "coho carnival." School children receive coho salmon smolt to release as part of ADF&G's urban stocking project. After releasing their fish, classes then visit the booths where they can learn more about various salmon, stream and fishing topics. The booths included salmon life cycle rubber stamps, macroinvertebrate touch tank, salmon button making, salmon habitat "wheel of misfortune," coded wire tag fish display and detector, salmon anatomy puzzles, watershed models, fly tying and fly casting station, and spin casting station. The addition of the booths was well received by educators. The grand finale of the event was the release of the remaining 70,000 coho smolt into Campbell Creek by the Fort Richardson Hatchery.

Other major events this past year included: the kids fishing pond with activity booths at the Great Alaska Sportsmen's Show (GASS) (2,500 children), KidsDay 98 (500 children) and the Fur Rendezvous Parade, where a local school builds a salmon-related float for this annual parade. The parade was attended by approximately 3,000 people and the 90 students from Inlet View Elementary won first prize.

This year's regulation cover art contest was held in four regions: Cook Inlet, Prince William Sound/Copper River, Kodiak/Westward and Bristol Bay. Four hundred and eighty entries were received from all areas and fishing poles and other small prizes were awarded to the first place winners.

Many volunteers make these large events possible. In 1998, 681 volunteers (this includes volunteer participants) spent at least 574 man hours ensuring that events were a success. Nearly 10,000 people attended this year's events.

Media Coverage

The media (Table 20) continues to play an important role in getting the STREAM Program word out to the public. Anchorage area media are very interested in the various projects that the STREAM Program conducts and although most stories are considered general interest, it still assists the department in getting the word out. The positive nature of these stories can only help a department whose press, unfortunately, is often times negative. The STREAM Program also continues to work with a local network to produce several children-oriented segments relating to salmon. Media in other areas of the state and even the country are becoming interested in STREAM Program activities as it expands into new areas of the Southcentral region. In 1998 STREAM Program events or topics were covered 35 times as compared to 20 times in both 1996 and 1997. The STREAM Program will continue to take advantage of the media when there is interest in helping the department get more information out to the public. Examples of news articles that appeared in 1998 are presented in Appendix A.

Table 20.-Media coverage of the ADF&G STREAM Program, 1996-1998.

Date	Media Organization	Event	Coverage Type
1996			
07/22	KTUU Channel 2	Campbell Creek revegetation	television news
07/22	KTVA Channel 11	Campbell Creek revegetation	television news
07/24	Anchorage Daily News	Campbell Creek revegetation	newspaper article
08/07	Anchorage Daily News	focus on a profession	newspaper - article/photo
09/28	KTBY FOX 4 Kids Club	ASD coho egg take "green eggs"	children's TV program
09/28	KIMO Channel 13	ASD coho egg take	television news
11/04	Anchorage Daily News	thank you editorials - Baxter Elem.	newspaper - editorials
11/09	KTBY FOX 4 Kids Club	"eyed eggs" - Scenic Park Elem.	children's TV program
12/05	Anchorage Daily News	hard freeze affects on streams	newspaper - article
12/21	KTBY FOX 4 Kids Club	ice fishing opportunities	children's TV program
03/28	KTBY FOX 4 Kids Club	"alevin" - O'Malley Elem.	children's TV program
05/17	KTUU Channel 2	ASD Taku Lake fry release	television news
05/17	KTBY FOX 4 Kids Club	ASD fry release, CI regs cover winner	children's TV program
05/31	KTUU Channel 2	ASD Campbell Creek smolt release	television news
05/31	KTVA Channel 11	ASD Campbell Creek smolt release	television news
05/31	KIMO Channel 13	ASD Campbell Creek smolt release	television news
05/31	Anchorage Daily News	ASD Campbell Creek smolt release	newspaper release
06/01	Anchorage Daily News	ASD Campbell Creek smolt release	newspaper photo/caption
06/03	KTVA Channel 11	Campbell Creek revegetation (SAVE HS)	television news
06/25	KTVA Channel 11	Campbell Creek fishing problems	television news
Total	20		
1997			
07/23	KTUU Channel 2	Trailside Discovery Camp	television news
09/25	Anchorage Daily News	Ship Creek Corridor	newspaper article
09/26	KTBY FOX 4 Kids Club	ASD coho salmon egg take	children's TV program
09/26	KTVA Channel 11	ASD coho salmon egg take	television news
09/26	KIMO Channel 13	ASD coho salmon egg take	television news
09/27	KTUU Channel 2	ASD coho salmon egg take	television news
09/27	Anchorage Daily News	ASD coho salmon egg take	photo - Metro section
09/29	Anchorage Daily News	Soldotna Adopt-A-Stream meeting	news release
12/12	Anchorage Daily News	Jewel Lake jamboree fish stocking	photo - Metro section
12/28	KTBY FOX 4 Kids Club	Gladys Wood Elem incubation shoot	children's TV program
02/15	KTBY FOX 4 Kids Club	Fur Rendezvous Parade	children's TV program
03/97	Southside Pulse	STREAM Program	community newspaper
04/03	KTUU Channel 2	GASS Kids Fishing Pond	television news
04/22	KTUU Channel 2	Earth Day Celebration	television news
?????	Anchorage Daily News	SF regulation cover art contest winners	news release
05/23	KTVA Channel 11	ASD Taku-Campbell Lake fry release	television news
05/30	KTBY Channel 4	ASD Campbell Creek smolt release	children's TV program
05/30	KTVA Channel 11	ASD Campbell Creek smolt release	television news
06/10	KTVA Channel 11	ASD watershed training	television news
06/15	Anchorage Daily News	AWC Campbell Creek walk	AWC news release
Total	20		

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Table 20.-Page 2 of 2.

Date	Media Organization	Event	Coverage Type
1998			
07/13	Anchorage Daily News	AWC - NF Campbell Creek Streamwalk	AWC news release
07/14	Anchorage Daily News	BLM - Summers Night Science Series	BLM news release
07/25	KTVA Channel 11	Campbell Creek Sport Fishery	television news
09/25	KTVA Channel 11	ASD coho salmon egg take	television news
09/25	KIMO Channel 13	ASD coho salmon egg take	television news
09/26	KTUU Channel 2	ASD coho salmon egg take	television news
10/03	Valley Frontiersman	Mat-Su district coho salmon egg take	newspaper article
10/13	Anchorage Daily News	ASD coho salmon egg take	newspaper article
10/13	Anchorage Daily News	Chester Creek weir	newspaper article
12/13	KTBY Channel 4	Butte Elem. - CI Reg. Cover winner	children's TV program
12/19	Valley Frontiersman	Mat-Su district ice fishing	newspaper article
12/20	Anchorage School Dist.	Science training documentary	film clips
12/20	KTBY Channel 4	Colony MS - habitat requirements	children's TV program
12/27	KIMO Channel 13	Paul Gray's Kenai R. Alaska Show	TV Program
12/31	KTBY Channel 4	Year End Special - smolt release	children's TV special
01/12	KTVA Channel 11	Huffman Elem. salmon dissection	television news
02/04	Peninsula Clarion	Nikiski Elem. incubation project	newspaper article
02/04	KTUU Channel 2	Lake Otis Elem. salmon mural	television news
02/05	KIMO Channel 13	Chinook Elem. salmon dissection	television news
02/10	KTUU Channel 2	Lake Otis Elem. salmon dissection	television news
02/11	KTUU Channel 2	Inlet View Elem. Rondy float building	television news
02/12	KTVA Channel 11	Inlet View Elem. Rondy float building	television news
02/26	KTBY Channel 4	Chinook Elem. salmon dissection	children's TV program
03/26	Anchorage Daily News	GASS Kids Fishing Pond promo	GASS supplement
04/03	KTVA Channel 11	ASA Kids Fishing Pond	television news (live)
04/08	NW Education Magazine	Tyson incubation program	magazine
04/12	Anchorage Daily News	Ft. Rich Hatchery article	"We Alaskans"
05/12	KTUU Channel 2	KCC Folker boardwalk rail construction	television news
05/15	KTUU Channel 2	ASD fry release	television news
05/15	KTVA Channel 11	ASD fry release	television news
05/16	Anchorage Daily News	ASD fry release	newspaper article
05/29	KTVA Channel 11	Campbell Creek smolt release	television news (live)
05/29	KIMO Channel 13	Campbell Creek smolt release	television news
06/04	KTVA Channel 11	Folker boardwalk Eagle Scout project	television news
06/27	KTVA Channel 11	AWAIC fishing event	television news
Total	35		

Requests for Information or Materials

Table 21 documents requests for information or materials during 1996-1998. In 1998, 588 requests were responded to by the STREAM Program. These requests range from phone information to loans of scientific or educational materials.

Table 21.-Requests for information, materials and equipment from the ADF&G STREAM Program, 1996-1998.

1996	
requests for materials or information	397
educational material loans	26
scientific or field equipment loans	15
Total	438
1997	
requests for materials or information	615
educational material loans	21
scientific or field equipment loans	10
Total	646
1998	
requests for materials or information	555
educational material loans	24
scientific or field equipment loans	9
Total	588

FUTURE GOALS

In 1999, the STREAM Program will combine forces with Sport Fish Division’s visitor information services to improve the way in which the division gets information to the public. This project will be directed toward angler outreach with the goal of making anglers more aware of Alaska’s fishery resources and angling opportunities. This will be accomplished through the development and oversight of a public information visitors center in the Anchorage regional office, continued development and distribution of informational pamphlets describing fisheries and fishing opportunities, and the expanded development and support of the division’s internet web page. The progress of these activities will be reported in the 1999 final report.

Other goals for 1999 include:

Develop and expand existing educational programs in southcentral Alaska, in the Anchorage area, Matanuska-Susitna Borough and the Kenai Peninsula as well as other “rural” road system towns and Prince William Sound.

Assist Region III Sport Fish Division staff develop an educational program. One incubation project currently exists in the Copper River basin but there is a need for education in the interior.

Continue cooperative education efforts with other agencies, including the Oregon Department of Fish and Wildlife and the Canada Department of Fisheries and Oceans, to develop or modify educational materials.

Expand angler outreach “fishing” programs to include more groups and improved fishing area.

Develop and coordinate a volunteer hatchery school tour program for the Fort Richardson and Elmendorf Hatcheries.

Investigate cooperative educational opportunities with Division of Wildlife Conservation education staff and programs, which may include the proposed Potter Marsh Visitor Center.

Survey Sport Fish Division handout users to get information on the “usefulness” of information presented to the public by the division.

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APPENDIX A. NEWS ARTICLES



Photo by ERIC HILL / Anchorage Daily News

Chugach Optional School students peek at fertilized silver salmon eggs held by fisheries biologist Fritz Kraus.

Egg-citing days with Fish Man

Salmon-hatching process comes into local classrooms

by S. JANE SZABO
Daily News reporter

About 1,500 Anchorage schoolchildren — plus another couple of hundred in Mat-Su — and parents recently participated in a curriculum you won't find in Indiana. They went to Campbell Creek Sept. 25 and 26 to get salmon eggs to raise in incubators in their classrooms.

For each student group, Fish and Game fisheries biologist Fritz Kraus - known as Fish Man - scooped 2,500 to 4,000 eggs out a female silver salmon, then put male salmon sperm (called milt) into the egg bucket and added water to activate the fertilization process. He did this every half hour Thursday and Friday, and held an extra session Saturday morning. Through the winter, the students will observe the eggs. They'll watch for two black spots - eyes - to appear in November or December, when the eyed-egg stage should be reached. Later, a tail will stick out, followed by the fish hatching in early winter.

Kraus said that about 80 percent of the eggs usually survive, though in one or two instances classrooms have had 100 percent, a total of 250 salmon fry. On a special day in May, 2,000 or so students will go to Taku-Campbell Lake to release the fry. Eventually, you can catch them.

"I've had reports of people catching 14-inch silvers," Kraus said.

This is the ninth year of the program, which this year involves about 40 Anchorage schools, 10 from Mat-Su, two or three from the Kenai Peninsula and others elsewhere in the state.



Second-grader Cami Dalton helps Kraus remove eggs from a silver salmon.

Reprinted From

Anchorage Daily News
Saturday, May 16, 1998

"Metro" page

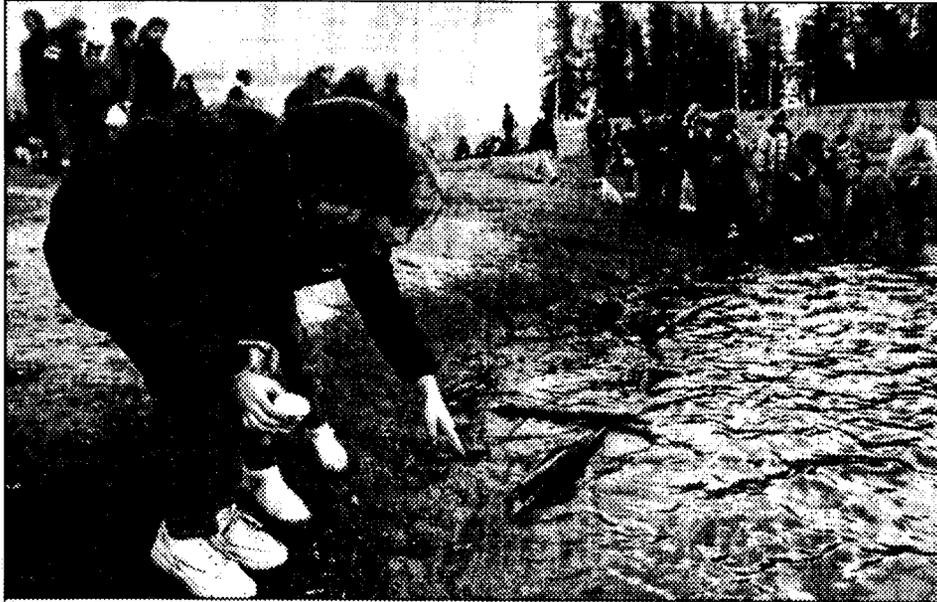


PHOTO BY GAIL HILLIS FOR ANCHORAGE DAILY NEWS



Fry, fry away

Susitna Elementary School students Brittany Mitchell, 8, foreground, and Kristin Armstrong, 8, release salmon fry into Taku Lake on Friday morning. The fry were grown from eggs in classrooms throughout the Anchorage area and were being released into the lake by several hundred elementary students. At left, salmon fry from Taku Elementary School's library aquarium await release into the lake.

Chester silvers

Creek's fans
warily mull
rebuilding run

By STEVE RINEHART

Daily News Reporter

Along a stretch of Chester Creek in Muldoon, where trees hang over the water, below a busy footbridge and between two subdivisions, a pair of silver salmon finned steadily upstream.

The creek was running clear and shallow, and the current tumbled cottonwood leaves like yellow polka-dots across the brown bottom. One fish, as red and green as a Christmas ornament, tailed the other, a fresher, nickel-silver specimen.

They and a few others like them are all that's left of what was once a strong run. They are a reminder of what Anchorage used to be. By all rights, they shouldn't have been there.

Getting to Muldoon wasn't easy. Somehow they had negotiated a nearly impassable fish ladder at Westchester Lagoon. They had swum through two artificial lakes; had traveled hundreds of yards through culverts under a dozen major streets, twice under Northern Lights Boulevard; and had squeezed past the scrap-lumber bridges people drop across their backyard creeks.

They had so far avoided kids' fishing hooks, and now, at 9 a.m. on a school day, there seemed a fair chance they would make it through Chester Valley subdivision, through Alaska Village trailer court, under Muldoon Road, through the middle of Alaska Greenhouse and past the boundary of Fort Richardson. There where the creek winds deep and slow through a soggy wetland, are the spawning, grounds that have kept this remnant run of silvers alive despite everything urban development and neglect has done to kill them off.

Now, in the latest of creek improvement efforts dating back to the 1950s, a group of people who live up and down its length are thinking about fixing the single biggest thing that has crippled the salmon run. The problem is the very thing that was supposed to save it, the Westchester fish ladder. They have discovered that rebuilding the salmon run and bringing more silvers back up through the heart of the city, might be easy, might be proper, and might be fun, but that it might also create havoc for property owners and could hurt the creek they are trying to help.

"On the surface, this sounds great," said Peter Raiskums, a member of the Chester Creek Forum, a group the city government has convened under a federal water-pollution law to study the watershed.

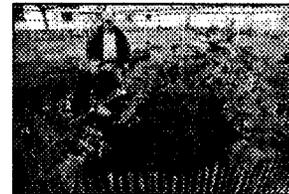
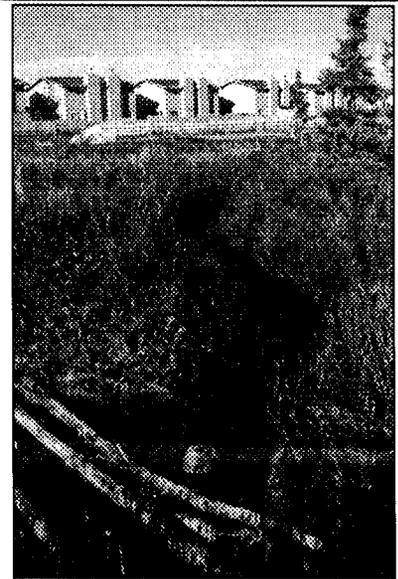
Raiskums lives near the creek, just east of Baxter Road. Like others on the forum, he has a passion for it. Remaking the historic run is a romantic notion, he said. But before that happens, people need to take a hard look at reality: Chester Creek is now an urban stream, surrounded by private property, and much of it runs in culverts that could suck young anglers underground.

"When I consider that, all of a sudden my vision of a pristine stream where children can joyfully catch silvers disappears," he said.

The Westchester fish pass was intended to maintain the salmon run when the city dammed the creek and turned the tidal estuary into a lake in the early 1970s. Critics at the time questioned whether it would work. Fish and Game Department officials assured them it would. It didn't.

"It would be impossible for other than the most persistent and determined of fish" to make it through the fish pass, a city engineering consultant reported in 1987. A more recent review, by HDR Alaska, reached the same conclusion. Dan Billman of HDR said those fish that make it through do so "by luck or by God."

To stand much chance of getting from Knik Arm into the lagoon, salmon must approach on a rising tide and find the 8-foot wide openings of a pair of culverts that jut out into the mudflats. If they come in at high tide, the openings are under several feet of water and are 50 to 100 feet out from the shoreline where silvers normally search for the home stream. On



ABOVE: Chester Creek near 17th Avenue east of Muldoon Road is just about to enter the populated part of the Anchorage Bowl.

LEFT: In one of the hothouses of Alaska Greenhouse, Fish and Game biologist Fritz Kraus, standing, installed a weir and Doug Laiser, general manager, counted the fish.

CHESTER CREEK: Group cautiously considers rebuilding salmon run

a low or falling tide, fish that find the culverts have to swim against rushing water for more than 300 feet, under the Alaska Railroad embankment, under a swale, under the Coastal Trail.

The fish that make it to the end of the pipe reach a hidden pool at the west end of the lagoon. Water pours into the pool from the Westchester spillway and from a second culvert. If they choose the culvert, as intended, and follow it 80 feet south they reach the lagoon. The spot is visible from the Coastal Trail as a small concrete box at water's edge. If they can't find the culvert, and if they are lucky, the tide may raise the level in the pool high enough for salmon to jump directly over the spillway and into the lagoon.

From there they follow a path their ancestors wouldn't recognize. For most of its length, Chester Creek has been ditched, diked and piped, and sometimes simply bulldozed out of the way of houses, roads and businesses.

From Westchester, the salmon cross under Minnesota, Drive, then Spenard Road. They follow their noses and instincts under Arctic Boulevard, past Valley of the Moon Park and Mulcahy stadium, past Worthington Ford and under the New Seward Highway.

Soon they reach a rare stretch of water, a natural winding channel that begins in the greenbelt below Rogers Park and ends at University Lake. Along the way, they jump a fish ladder into the culvert under Lake Otis Parkway, cross under Northern, Lights, Providence Drive and Bragaw Street.

From there it's back through a series of neighborhoods, back under Northern Lights and past Anchorage Baptist Temple on a northeast track to Muldoon Road and Alaska Greenhouse.

The creek burbles and glimmers and snakes between the potted plants, about 6 feet wide and a foot or two deep. Over the years, greenhouse workers have seen salmon swim by, and this year Fish and Game stream habitat biologist Fritz Kraus installed a counting weir inside. Greenhouse owner Doug Leiser agreed to periodically count salmon and lift the gate to let them pass.

Leiser said about 20 fish made it this year. Kraus figures maybe two dozen, allowing for those not seen. Once past the greenhouse the salmon are nearly home free; the Fort Rich boundary is about a half a mile away. It's not certain if these are a true remnant of an historical run, or silvers from other home streams that have strayed into Chester Creek. But one observation suggests they have ancient ties, Kraus said: Year after year the Chester silvers home in on the same spawning area.

"The creek, believe it or not, has some potential" as a salmon stream, Kraus said. But they have to get in it first. Billman's firm, under a contract with the Public Works Department, designed a replacement fish pass last year. It would reduce the distance through the main culverts by about one-third, provide an alternate route for fish coming in at high tide, and create an open step-pool channel between the railroad and the lagoon.

Overall, it would be less of an obstacle course, he said, and people would be able to watch the action from the Coastal trail. He said it would cost about \$800,000.

But even with a design and a cost estimate, the decision is not clear-cut.

The city will wait and see what the citizen forum decides, said Robert Palmer, watershed project administrator. The forum has so far identified two projects: Trace the source of a mysterious drain pipe that dumps foul smelling liquid into the creek near Gambell Street, and rebuild the Westchester fish pass. The first is easy; the second has divided the group.

Terry Burrell lives on Wesleyan Drive, just upstream from where the creek was diverted into an old gravel pit to form University Lake. "I think the fish pass is a fantastic idea. They should have done it way back," she said.

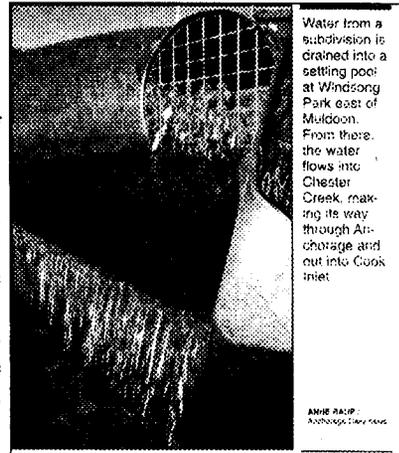
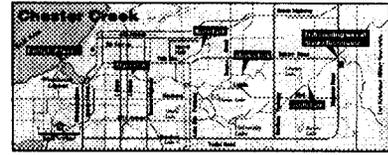
She said she's lived there since 1968 and remembers local kids sharing salmon they had caught.

"It really is a tradition, for the stream to be admired and utilized," Burrell said. If the creek had salmon, she said, people would value it more and would be more willing to protect it.

Tom Brooks lives on Bannister Drive in Rogers Park, near a still-natural piece of creek he'd love to see preserved. He likes salmon but fears fishermen would trample the few relatively unspoiled areas. "I'm not opposed to it, but I'm not sure you would be able to stop people.

Raiskums and his wife, Bernadine, often walk a patch of greenbelt near their home, collecting litter along the creek - "a never-ending process" - and watching for signs of change or damage. They saw a salmon once, he said.

"I'm just saying we need to think about this," he said. "Let's wait before we leap. ... I would hate to see our little creek get to the point where cars are stacked up by the bridge and people are stumbling up and down the creek snagging fish."



Water from a subdivision is drained into a settling pool at Windsor Park east of Muldoon. From there, the water flows into Chester Creek, making its way through Anchorage and out into Cook Inlet.

ANNE RAUP
ANCHORAGE TARIFFS

Students study salmon life cycle

By EOWYN
LeMAY IVEY
Frontiersman reporter

Dozens of local students gathered along Spring Creek near the old Matanuska town site this week to participate in one of nature's autumn rituals. As yellow leaves fluttered into the water and red salmon swam upstream, the children mixed coho salmon eggs and sperm in plastic buckets.

With a splash of creek water, thousands of salmon were brought to life.

During the coming winter, the students will watch the gelatinous eggs develop into



Butte Elementary's Stacey Whitstine splashes through Spring Creek with water for salmon eggs that her class will raise during the winter.

swimming, eating salmon — a transformation that is usually hidden in Mat-Su streams beneath snow and ice.

"It's a really positive experience for the kids," said Butte Elementary teacher Dwight Homestad. This is the second year Homestad and his third graders have raised coho salmon in their classroom

Ten Mat-Su schools are participating in the project. The eggs are kept in aquariums with cooling systems. Once they develop into fry, the salmon are given fish food until spring arrives.

In past years, Fish and Game has taken salmon eggs for classroom projects from the Nancy Lake area. The more remote location limited the number of students who could actually watch the egg take. But this year, the department chose Spring Creek so the children could get involved at the beginning of the project.



"We wanted them to be a part of the process," said Fritz Kraus, a biologist with the Department of Fish and Game's Anchorage office. As each group of students gathered around the stream, Kraus taught them about salmon anatomy and life cycles.

The children proved eager young biologists.

"Who is my volunteer?" Kraus asked Homestad's students.

All of the hands shot high into the air.

Palmer Fish and Game biologist Craig Baer handed Kraus a fat female coho salmon netted out of Spring Creek. The children crowded around the biologist. Kraus had one of the students slit its stomach open with a sharp blade, and thousands of pink salmon eggs cascaded into the bucket.

...Students



EOWYN LeMAY IVEY/Frontiersman

Top: Butte Elementary student Stephanie Hauser inspects a male coho salmon during a field trip to Spring Creek. Above: Butte third grader Dolly Hash pulls the eggs out of the abdomen as Fish and Game biologist Fritz Kraus holds a female coho salmon. The eggs were fertilized and placed in a aquarium in Dolly's classroom.

When the male salmon was pulled out of the water, Kraus had the students squeeze its abdomen so the milky sperm salmon would spray into the bucket.

"Eww. It's slimy," one girl said as she squeezed the salmon.

"Are these eggs fertilized yet?" Kraus asked the children.

"No," they answered in unison. "You need to add water."

Baer stepped into the stream and dipped the bucket into the stream. The biologists said the cool creek water almost immediately activates fertilization.

Kraus then asked the students how many eggs they thought were in the bucket. The guesses ranged from 1,000 to 8million. When Kraus told the students the few inches of eggs lining the bottom of the bucket probably numbered around 3,000, one boy said, "Oh, my gosh."

Kraus told the class only 10 percent of those eggs would probably survive in the wild.

"But in your little tanks, you could get as many as 90 percent because you can control the environment," Kraus said.

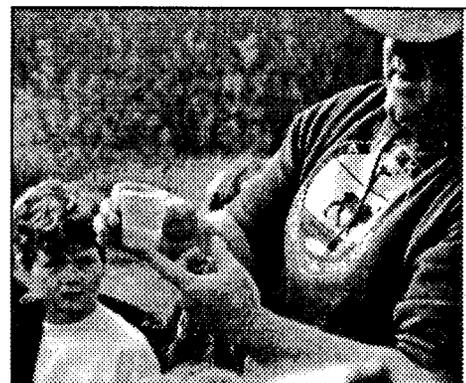
Next spring, the students will take the young salmon to Matanuska Lake where they will release them back into the wild. Homestad said this spring, the event was a success. Each of his students had their own salmon to release, and many of them had named their fish.

Kraus said while the survival rate is generally high, it is not the main goal of the project.

"We want you to understand the life cycle of the salmon," the biologist told the students. Kraus described how the decaying, spawned-out salmon feed the ecosystem. Smaller life forms feed on their flesh, and are in turn eaten by next season's juvenile salmon.

Homestad's students took a small cup of the fertilized eggs and prepared to go back to Butte Elementary. As, they headed toward the school bus, one student called out, "There's a fish trying to go up the stream."

The class watched a splashing coho salmon swim up Spring Creek.



EOWYN LeMAY IVEY/Frontiersman

Third grader Shannon Abrell peers into a cup of fertilized salmon eggs held by Fish and Game biologist Fritz Kraus.

Hooking through the ice



Biologists teach youngsters to catch fish in frigid waters

By HEATHER A. RESZ
Frontiersman reporter

First-time fishers and seasoned veterans circled icy holes cut in Finger Lake. Lines strung from poles dangled tasty offerings to the landlocked salmon, rainbow and arctic char waiting below.

Anchorage fisheries biologist Fritz Kraus and Palmer biologist Craig Baer, both with the Department of Fish and Game, taught between 300 and 350 Mat-Su students about ice fishing last week.

Kraus said he's offered a similar program to students in Anchorage for the past two years. He said Mat-Su district teachers heard of the program's success and requested he offer the program to Valley students as well.

The Anchorage biologist said several hundred students from Colony Middle, Wasilla Middle, Sherrod, Goosebay, Finger Lake and Tanaina elementary schools participated in the recent Mat-Su frigid fishing program.

Kraus said teaching students about ice fishing is another hands-on activity designed to teach students about fish.

In October Kraus and Baer taught Butte Elementary and other local students about fish anatomy and life cycles by helping them gather and fertilize eggs. The eggs will develop in classroom tanks and the adult fish will be released into the wild this spring, Kraus said.

But catching the fish with a hook and line, rather than a biologist's net, was the goal last Thursday. Kraus and Baer taught about 40 students from Finger Lake Elementary about ice fishing on the local lake.

Fifth-grader Lara Nations celebrated her inaugural ice fishing catch during the program.

"Good job Lara," a friend called out.

And fourth-grader Robina Gibson caught a rainbow as her first fish.

"It's been a good day so far," Kraus said of angler success in the pilot MatSu program.



Above left, fifth-grader Lara Nations displays her inaugural ice fishing catch at Finger Lake Dec. 11. Above, third-grader Laura Herman clears ice out of her ice fishing hole on Finger Lake. Department of Fish and Game biologists taught more than 300 local students how to fish for land-locked salmon and trout through the ice. The lessons were part of an on-going Fish and Game education program in Mat-Su schools.

To make the program fly, one parent chaperone was needed for every five students, he said. The beauty is, he said, sometimes it's the first time the parents have been ice fishing, too.

"For some of them it's a new experience entirely," Kraus said.

He said one woman from Hawaii said the ice-fishing outing was the first time she'd ever walked across a frozen lake.

"The whole idea is to introduce kids and parents to different winter-fishing opportunities," the biologist said. "This is a way to sort of get them interested in fishing. Hopefully they'll go home and beg their dads to take them fishing."

Fourth-grader Ben Knapp said he enjoyed the afternoon of ice fishing. He said he fishes Finger Lake in the summers with his dad, and he predicted he will definitely be pushing for a future ice fishing outing, too.

Kraus said one important aspect of the fishing program is good sportsmanship.

"Out here we teach them if they catch a fish it's OK to let it go," he said. "We don't want to waste the resource, obviously."

Given the favorable responses to this year's program, Kraus said he expects the program to grow next year.

"We've gotten a lot of good feedback," he said. "I think it's gonna' fly next year again."

Fourth-grader Laura Herman said her dad has taken her ice fishing and fly fishing, and their family went halibut fishing last summer.

But of the three, she said she prefers fly fishing "'cause it's warmer."

Reprinted From Anchorage Daily News
March 29, 1998

Great Alaska Sportsmen's Show Advertising Supplement

Kids Fishing Pond is Stocked and Ready for Young Alaskan Anglers!

The Alaska Sportfish Association's Kids Fishing pond is back again this year by popular demand! The pond is located in the Ben Boeke Arena and is open to young anglers 12 and under to try their hand at catching a fish. The pond is open daily during show hours and this always fun activity is free of charge. Children can visit the pond one time per day each day of the show and poles are provided.

The Alaska Sportfish Association coordinates pond activities as part of its youth fishing program. The Alaska Department of Fish and Game's Fort Richardson Hatchery supplies

char for the pond this year! As always, some of the fish will be tagged for prizes!

There are several hands-on fish activities for the kids at the pond while they wait to fish! Plenty of volunteers are on hand to make this an enjoyable event for the youngsters. ASA members and King Career Center student volunteers will be manning the pond and activity booths again this year to make sure your child catches the big one - which they can keep! ▲



Nikiski students don't deny something fishy's happening at school

By **LOUISE McDONALD**

Peninsula Clarion

In the library of Nikiski Elementary School, a child studied the very young salmon in the aquarium. Later she asked her

teacher, "Do baby fish have belly buttons?"

To find the answer, kids and teachers can't go outdoors and watch salmon eggs develop in streams, for they change from eggs to fish under the ice.

But all the kids at the Nikiski school will soon know if belly buttons are there, along with more important information, because they are studying the development of 199 coho eggs in a special cooled aquarium set up in the school's library.

Wayne Floyd, fifth-grade teacher, borrowed the incubator aquarium from Fritz Kraus of the Sport Fish Division of the state Department of Fish and Game. It is a backup unit for tanks Kraus has in other classrooms. In addition to the incubator loan, Floyd was given 250 free coho eggs.

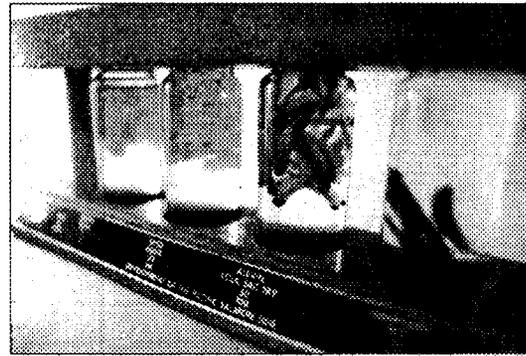
Floyd said the coho offspring, called fry, have provided a starting point for math, science and other projects for the school.

"It ties them all together and shows children how math and science have real life applications," Floyd said.

For example, the sixth-graders are making a log of development statistics to be used in spread sheets. Another class measures and logs water temperature - it is supposed to be kept at 38 degrees. Floyd said there was some trouble with rising temperature and some of the fish died, showing students how temperature change can affect the small fry. They've

'The most exciting thing about this is that it's open for anybody to come in and see it. It's a community resource, open to parents, home schoolers, everyone.'

—Wayne Floyd,
fifth-grade teacher,
Nikiski Elementary



Displayed here are the four stages of salmon egg development. Second to left, the fish develop eyes and then grow 1 to 2 inches long over seven months before they are released.



Nikiski Elementary School student Jon Bacaloff, 10, tests the water of a fish tank for brooding silver salmon in the school's library as Hayna Current, 12, and teacher Betty Kotylarz replenish the water in the tank. When the fish reach almost 2 inches in length, they are released into local lakes.

also learned that the colder the water, the slower fry develop. That's raw material that can be shown using graphs.

Kids in special education are changing the tank water once a week as part of their skill learning. Fifth-graders are taking photographs of the development and will create a multi-media presentation at the end of the year. That means they'll be learning how to use the scanner and other computer equipment.

The fry study began about Nov. 1, when the eggs were flown from Ft. Richardson Fish Hatchery in Anchorage to Kenai, by ERA at no charge. The eggs were in the second stage of development, meaning they had little black dots for eyes, and still sported their egg sacs, Floyd said. Eggs in the first

...Fish

stage of development can't be moved because they're too fragile.

The school's eggs are in the same stage as ones in the rivers right now, he said. Because their bright-orange yolk sack attracts predators, fry in streams hide among small rocks 1 to 2 inches tall and in the bottom of the stream. About breakup, the yolk disappears from the fry and they leave the bottom to eat, swimming to the edge of the stream to hide under roots and grasses along the edge of the bank. Once they get up to 2 inches long, some fry head out to sea, but coho usually hang out in the stream for a year, Floyd said.

Because the fry in the tank won't be able to leave the bottom and feed like the ones in streams, the class will feed them on a mixture provided by Fish and Game.

Aside from learning to apply math and science to the care of coho salmon, children are learning to be conservation stewards of the peninsula.

Study of coho development dovetails with the "Adopt-A-Stream" program Floyd began at the school in September. When Swanson River is ice-free, students inventory and monitor the stream health for the state and turn in monthly reports. During the summer, kids in the area and parents will go out and do it.

"Watching fry hide shows the importance of keeping streams free from silt that would cover up fry hiding places, he said.

Also, he teaches youngsters that stream bank preservation is necessary to protect fry during the early

feeding stage. If banks erode, the grasses and roots will be carried away and fish won't have protection. Another aim is that children will become more aware of how their actions affect the environment and wildlife.

"If they learn now, when they're 16 they'll be more aware of what they're doing. Maybe the kids won't ride through the stream on their four-wheelers," he said.

"The most exciting thing about this is that it's open for anybody to come in and see it. It's a community resource open to parents, home schoolers, everyone," Floyd said.

A commercial fisher came in because he'd never had a chance to see the process. The concept that baby salmon are very sensitive to environmental changes can help the whole community understand how important it is to keep the land and waters thriving.

Floyd has applied for a \$1,250 grant from Alaska Science and Technology Foundation to buy the school the special cooling unit, 30-gallon aquarium tank and hardware. One grant he applied for was turned down.

If Floyd finds a way to buy only the cooling unit, Fish and Game will furnish the rest of the equipment, said Kraus. The department has done that for Tustumena Elementary School, the only other educational facility on the peninsula with an incubator.

Kraus said the coho eggs are provided to schools for educational purposes only, and if any fish are alive at the end of the school year, they absolutely are not released into streams. Instead, they will be put in land-locked Arc Lake, where the coho will contribute to existing sport fishing.

Reprinted From

Peninsula Clarion
March 18, 1998

Young Kenai artist hooks winner

9-year-old Tyler Smith's fishing brochure cover design wins state contest

By **LOUISE McDONALD**
Peninsula Clarion

The artwork of 9-year-old Tyler Smith of Kenai will grace the full-color covers of 600,000 Sport Fishing Regulations for Cook Inlet brochures during the upcoming fishing season.

Tyler took home the blue ribbon for creating the most outstanding artwork from 300 entries in the Cook Inlet region cover design contest sponsored by the Alaska Department of Fish and Game, according to Fritz Kraus of the Sport Fish Division.

In teacher Dave Knutsen's class at Mountain View Elementary School Tuesday, Tyler was presented with a Shakespeare Ugly Stick rod and reel, pins, patches, a thermal drink mug and a big blue ribbon from Kraus, who also brought Tyler's original artwork to show classmates.

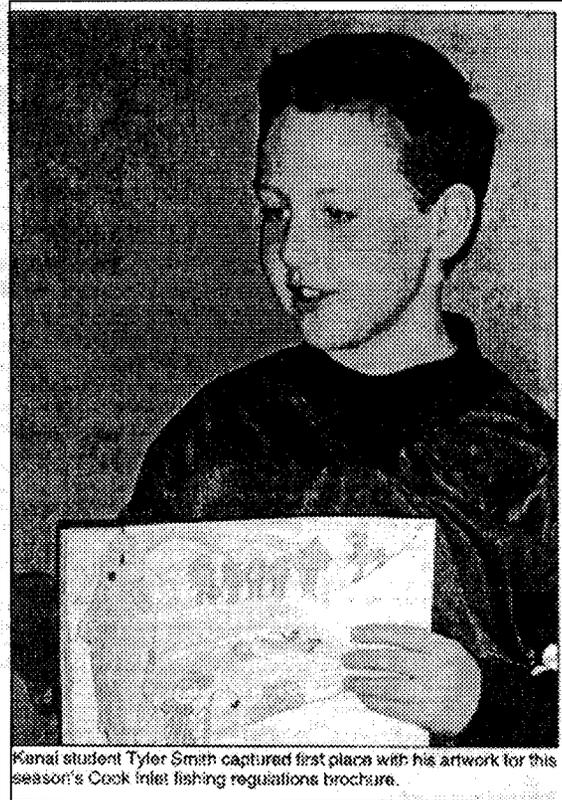
In the center of the drawing is a big lake, with someone in a boat catching a fish and another fish jumping. In the foreground a person stands beside a big king salmon being weighed in at 100 pounds. Behind the lake are trees, tall jagged mountains and a brilliant sun. On one of the mountains is a moose.

Kraus said the drawing's bright colors caught the eye of the judges and stood apart from the other 299 entries.

Tyler's colored-pencil artwork will be displayed at the Fish and Game booth at the Great Alaska Sportsman's Show April 2-5 in Anchorage.

The cover-art contest is open to school children from kindergarten through sixth grade. The state publishes four different fishing regulations annually and for the past three years, each has a cover sporting the winning artwork of a child. In addition to Cook Inlet, other regions are Copper River- Prince William Sound, Bristol Bay and Kodiak.

Tyler has been fishing since he was 4. So far he's caught at least four king salmon, including a 37 pounder last year in the Kenai River, just 10 minutes after putting the boat in the water. He also uses a dipnet and has fished for trout in creeks.



Kenai student Tyler Smith captured first place with his artwork for this season's Cook Inlet fishing regulations brochure.

Tyler also eats what he catches, enjoying salmon and deep fried halibut. He especially likes tuna, catching that in cans from the supermarket.

Fishing isn't his only hobby. Snowmachining and football—someday he'd like to play wide receiver for the Green Bay Packers — are two other interests. In school, he enjoys being a room representative to the student council.

The state cover-art contest is the first Tyler has won from a colored-pencil drawing. Using crayons he has won \$25, a rabbit and four Bigfoot-truck show tickets in the past.

Reprinted From

Fairbanks Daily News-Miner September 20, 1997

Section A

Teachers hooked on salmon

By ERIN LILLIE
Staff Writer

Inside a cozy lodge of blond logs near Fairbanks, windows revealing a Tanana Valley autumn panorama compete with a series of color illustrations depicting the life cycle of salmon.

Jim Jones pressed in close with 10 other teachers to get a better view. Not of yellow sun-splashed aspen and birch, and the snowy peaks of the Alaska Range beyond, but of the fish tank and related gear like the ones they will use to grow salmon in their classrooms.

It's the opening day of the 4-H fisheries in-service, a weekend crammed with seminars and activities designed to teach teachers how to operate a miniature hatchery in their classrooms and to craft an entire education program around chum, sockeye, king, coho, and pink salmon.

Jones, 36, teaches in Kaltag, an Athabaskan village of 232 located on the Yukon River 325 miles west of Fairbanks. It's a place where salmon is both a staple food and, like most Native Alaskan communities, a cultural foundation. He's never tried to raise salmon before, but after learning in a single morning about salmon physiology and how to maintain a tank of fertilized salmon eggs, he's confident.

"Before, I was a little bit nervous I would lose a lot of fish, but I learned they're not as sensitive as I thought," Jones said. "I can do it."

Peter Stortz, the Alaska Cooperative Extension agent from Palmer who coordinates the effort, said the program started in 1991 when his agency

won a U.S. Department of Agriculture grant to work with students in Yukon River villages who were at risk of succumbing to a variety of social ills.

The Yukon River Drainage Fisheries Association had recommended that the extension service, part of the University of Alaska Fairbanks, teach children about salmon. To program founders, the two ideas went hand-in-hand.

"Instead of using something abstract, we're using something dear to them," Stortz said. "The resource is the thread that draws the parts together."

Call it "outcome-based education" or "service education" or "cross-curriculum education," and it's likely to draw fire from many. But to Nome science teacher Nancy Bauer, it works.

Although this was her first 4-H fisheries in-service, Bauer has taught a fisheries class at Nome-Beltz High School since 1990 with the help of the local Alaska Department of Fish and Game office.

In the classroom, biology, anatomy, physiology, ecology, chemistry, culture, English and even economics are taught using salmon as the focus. Bauer said class discussion includes how El Nino, the periodic shift in ocean temperatures and resulting changes in weather, and high seas fishing affects salmon.

Bauer said that even students who normally aren't interested in academics learn from the projects. They develop good work habits by maintaining the schools' three large incubator tanks and making the connection between their actions and a future outcome—the number of salmon that hatch and are placed in Nome's streams.

"It's very important to see that what you do or don't do affects the fish," Bauer said. "It's very applicable in their lives."

Stortz said the program has seen explosive growth in the last six years, from

10 to 54 communities. This year, most participating schools are getting computers and, where available, Internet access, so classes can compare notes with each other and the world.

But the program, the only one of its kind in Alaska, is in trouble. The extension service budget was cut \$310,000, and the main federal grant ran out in March. The number of project staff has shrunk from eight to two. The number of in-services fell from three last year to the one in Fairbanks this year.

Above the picture windows in the Taste of Alaska Lodge where the session was held, color illustrations show the life cycle of the salmon—egg, eyed egg, alevin, fry, young salmon, adult, and spawning. Salmon die after they spawn, but other salmon grow to take their place.

The salmon education program might not fare as well. Stortz said if the money runs out, it is unlikely that enough teachers have been trained in six years to keep the program alive.

With the high rate of teacher turnover—he estimates 25-to-40 percent of the trained teachers move each year—it's important to hold annual sessions like the one in Fairbanks, Stortz said.

"To have any type of continuity, you need this kind of training," he said.

Federal and state wildlife agencies help train the teachers, including the federal Agriculture Department's 4-H program. Several University of Alaska departments, private corporations and foundations, Native groups, and fisheries organizations all chip in people and supplies. Stortz said he hopes that more cash will come in to keep the program alive.

"It could be the possibility that this is the last year unless we find additional funding," said Stortz.

Reprinted From Anchorage Daily News
June 15, 1997

Tour Campbell Creek for wildlife

Pull on the hip waders and join the Anchorage Waterways Council for a tour of Campbell Creek Thursday evening. The council has arranged for fisheries biologist Fritz Kraus of the Alaska Department of Fish and Game to guide a search for fish and other aquatic life. He also will talk about the history of the fish ladder in the Dimond Slough area. The fun starts at 6:30 p.m. along the creek at the end of Greenhill Road. To get there, take Raspberry Road west, turn left on Northwood, left on Duvoy Court and right on Greenhill. For more information, call Julie Garrigus, 277-9287.

ANCHORAGE, Alaska-

Daniel has been to the creek where the salmon are spawning, and he wants you to know something: "The fish are nasty and slimy" The recording of the second grader's voice coming from the computer speaker is soft and careful. These are the words he wrote, too, above his drawing of a person standing in a creek. The figure is holding a hapless salmon in the air. In the water below, a luckier fish darts between the figure's legs.

The drawing is bold and clever, and the boy's recollection of touching the salmon at the creek is vivid. His teacher, Sue Olsen, is delighted.

"Daniel is a very good student but very, very quiet," she says. "He is bilingual, and his family only speaks Chinese at home. So when he showed us the drawing he did on the computer, we thought it was terrific. We all thought the word 'nasty' was a great word choice—funny and apt. The visit to the creek was a very distinct experience for him. Something about working on the computer allowed him to express that, where he probably wouldn't otherwise."

Daniel and his classmates at William Tyson Elementary School are participating in a salmon incubation project sponsored by the Alaska Department of Fish and Game. The project is the focus of a year-long science unit on cycles in nature.

Last fall, Olsen and fellow teacher Cheryl Ondra took their students on a field trip to Campbell Creek in South Anchorage. There, Fritz "Fishman" Kraus, the biologist who founded the program, took a male and female coho salmon from the stream and artificially fertilized the eggs.

Roe Show

EYES, TAIL, YOLK SAC,
AND TINY FINS

By DENISE JARRETT

Making an incision down the female's underbelly, Kraus showed the students the red roe glistening inside. The students were awed.

"They were overwhelmed with the sheer number of eggs—they just couldn't believe it," recalls Ondra. "They wanted to know, 'What would she do with all of those babies?'"

To get an idea of what it's like to rear all of those "babies," Kraus helped the students place about 250 of the eggs in a cooler for transport back to their school. There, the students lowered the eggs into a specially prepared fish tank where the eggs will incubate for about eight months, first growing eyes, then a rudimentary tail and "yolk sac," and, finally, the tiny fins of the fry. By May, the fry will have grown large enough to be released into Taku-Campbell Lake, a landlocked lake inside the city limits. To avoid contact with wild salmon stocks, the fry must be released into a lake that doesn't feed into a stream.

As the students observe the development of the salmon eggs for several months, they record what they see and learn in drawings and writing assignments. Each day, they log the water temperature and any physical changes in the eggs in a notebook next to the fish tank.

Ondra and Olsen, who team-teach, recently added another dimension to the salmon-cycle curriculum: computer technology. Computers allow students multiple ways of expressing themselves, the teachers say. The explorative nature of the Internet and desktop publishing and presentation tools such as Kid Pix Studio or ClarisWorks increases students' motivation, creativity, and problem-solving, they say.

Working with Chery Bradley, the school's Title I technology specialist, they have integrated the computer into all aspects of the salmon project. Their students create their drawings and writings on the computer, incorporating recorded narration and a photograph of themselves into a multimedia presentation. Using a desktop presentation program (Kid Pix Studio), they are building a slide show that will take viewers from their creekside adventure, through each stage of fish development, and to the shores of Taku-Campbell Lake where they will set their fish free.

But the project doesn't end there. Students will collect their slide shows into one file and, with the help of their teacher, copy it from a computer to videocassettes. Then they will take their videos home to show their parents what they know about the role of cycles in nature, fish development, and multimedia computer technology.

Many parents are still uncertain about the computer's role in the classroom, Olsen says. They don't know what to think when their children use terms like linking, storyboarding, and downloading.

...Roe Show

"Many of them have a hard time comprehending what their children are talking about," she says. "Sometimes parents think they're just playing. But how do children learn? They learn through their play."

When students show their parents their slide shows, Ondra says, parents clearly will see the curriculum being taught—earth science, reading, writing, editing. They will see the concepts their children are learning: the role of cycles and timelines in nature; salmon development; and the importance of salmon to Alaska's culture, environment, and economy.

The computer can be a valuable tool to help teachers meet the needs of diverse learners. Three quarters

of the students at Tyson are Alaska Native, American Indian, African American, Hispanic, Asian, or Pacific Islander. Some speak English as a second language. Many of their students are thriving, the teachers say, because the computer facilitates their expression, helping them to demonstrate their knowledge in a variety of ways—visually, orally, and in writing.

Computers can help students in many aspects of their learning, Bradley agrees.

"Each time the students work with their pages of art and writing, and assemble them into a multimedia presentation, they revisit those core concepts," she says.

The computer is especially suited to helping students create their own representations of knowledge. As they draw, students can choose to add computerized design elements such as pat-

terns, borders, and colors. They can place graphs, photographs, clip art, or animated transitions between slides. They can write text onto their drawing, and they can include sounds or a recording of their own voice. And they can do this with a high degree of autonomy.

This gets students excited.

"Any time a child gets excited, you think, 'Wow, this is a good thing,'" says Olsen. "When you get excited about something, you learn it better. As an educator, you want to find what sparks the interest of your students. When you find it, it's like the light at the end of the tunnel."

On getting started:

Olsen: "For practice, students can start off with a simple slide show about their favorite foods. So when they start the big salmon project, they'll have an idea about what it's going to look like in the end, how it's going to run like a movie, and how they can put their voice in there. It gives them time to play with the program before jumping into the big project. You can do other projects on cycles that require less time by using sea, frogs, worms, or water cycles. The life cycle of a butterfly is a really easy one and the kids love it when the butterflies pop out of their pupas!"

On hardware:

Bradley: "In order to record students' voices, computers need to have either an internal or external microphone. To copy the slide shows from a computer to a videocassette, you need an S-video cable that plugs

TEACHER'S FOOTNOTES

into your CPU and into the back of a television that is hooked up with a videocassette recorder. You play the slide show on the computer while the VCR is recording."

On the Internet:

Ondra: "We have to have written parental permission for the kids to be able to use the Internet, as well as for us to publish students' work on our Web site." Olsen: "We usually explore the Internet as a whole class. From my computer, I put the sites up on a television monitor and we talk about what we find. But we don't download anything. Their slide shows are for their direct experiences only. We've found some good sites on salmon cycles: <http://wwwstate.ak.us/local/akpages/FISH.GAME/notebook/notehome.htm>

<http://wwwstate-ak.us/local/akpages/FISH.GAME/cftnd/geninfo/research/genetics/kids/kids.htm>

<http://wwwriverdale.k12.orus/salmon.html>

On salmon/trout programs:

Alaska Department of Fish and Game, Anchorage, Fritz Kraus, (907) 267-2265; **Washington** Department of Fish and Wildlife, Olympia, Bonnie Long, (360) 586-3106 or e-mail, longbkl@dfw.wa.gov; **Oregon** Department of Fish and Wildlife, Portland, STEP Coordinator, (503) 872-5252, extension 5431; **Idaho** Department of Fish and Game, Boise, John Gahl, 800-422-9453 (within Idaho only) or (208) 334-2633; **Montana**, Montana Fish, Wildlife, and Parks, Helena, Dave Hagengruber, (406) 444-9736.



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April 1, 1998

Fritz Kraus
Alaska Department of Fish and Game
Division of Sport Fishing
333 Raspberry Road
Anchorage, AK 99518-1599

Dear Mr. ^{Fritz} Kraus:

I want to thank you for sharing information about your organization's fish incubation program for school children. I included the information in the article, "Roe Show," in the enclosed edition of *Northwest Education* magazine. The article featured students at Tyson Elementary school in Anchorage, Alaska. These students created multimedia presentations based on their school's salmon incubation program.

Northwest Education is a quarterly magazine published by the Northwest Regional Educational Laboratory for educators, parents, and policymakers. Thank you for your contributions to this edition. Best wishes to you and to the continued success of your education programs.

Sincerely,

Denise Jarrett
Communications Specialist

DJ:SM

Enclosure