



State of Alaska  
Department of Fish and Game  
Habitat and Restoration Division

Nomination for Waters  
Important to Anadromous Fish

Region SOUTHCENTRAL

USGS Quad Seldovia A-5

Anadromous Water Catalog Number of Waterway 242-32-10170

Name of Waterway Windy Creek  USGS Name  Local Name

Addition  Deletion  Correction  Backup Information

For Office Use

Nomination #	<u>01 553</u>	Regionat Supervisor	<u>[Signature]</u>	Date	<u>3/18/02</u>
Revision Year:	<u>2001</u>	AWC Project Biologist	<u>[Signature]</u>	Date	<u>5/5/02</u>
Revision to:	Atlas _____ Catalog _____ Both <u>X</u>	Drafted	<u>[Signature]</u>	Date	<u>3/18/02</u>
Revision Code:	<u>A-2</u>				

OBSERVATION INFORMATION

Species	Date(s) Observed	Spawning	Rearing	Present	Anadromous
<u>Coho</u>			<u>X</u>		<input checked="" type="checkbox"/>
					<input type="checkbox"/>
					<input type="checkbox"/>
					<input type="checkbox"/>
					<input type="checkbox"/>

**IMPORTANT:** Provide all supporting documentation that this water body is important for the spawning, rearing or migration of anadromous fish, including: number of fish and life stages observed; sampling methods, sampling duration and area sampled; copies of field notes; etc. Attach a copy of a map showing location of mouth and observed upper extent of each species, as well as other information such as: specific stream reaches observed as spawning or rearing habitat; locations, types, and heights of any barriers; etc.

**Comments:** ADD Windy Creek REARING PAVES & CHANNELS #2 TO AWC per information contained in EVOS PROJECT 98263, 99263 REPORTS.

Name of Observer (please print): Ed Weiss  
Signature: [Signature]  
Address: 333 Raspberry Rd  
Anchorage AK 99518

Date: 3/5/02

This certifies that in my best professional judgment and belief the above information is evidence that this waterbody should be included in or deleted from the Catalog of Waters Important for Spawning, Rearing or Migration of Anadromous Fishes per AS 16.05.870.

Signature of Area Biologist: [Signature]

Revision 3/97

*Exxon Valdez* Oil Spill  
Restoration Annual Report

Assessment, Protection and Enhancement of  
Wildstock Salmon Streams  
in the Lower Cook Inlet.

Restoration Project 98263

This annual report was prepared for peer review as part of the *Exxon Valdez* Oil Spill Trustee Council restoration program for assessing project progress. Peer review comments have not been addressed in this annual report.

Arvid J. Hall  
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April 1999

Assessment, Protection and Enhancement of Wildstock  
Salmon Streams  
in the Lower Cook Inlet.

Restoration Project 98263

## Executive Summary

Subsistence users in the LCI area and specifically the residents of Port Graham are heavily dependent on salmon from the Port Graham River, Windy Creek, Scurvy Creek and Rocky River. These four major salmon streams and their tributaries were inventoried and assessed with existing data from previous EVOS projects including aerial photo interpretation, ground truthing, and field inventories. The goal is to replace lost or damaged resources by replacing or enhancing the habitat of wildstocks of salmon important to the people who live in Lower Cook Inlet. Subsistence users were interviewed to assess the historical level of runs and the current, depressed level due to EVOS and preferences for replacing damaged subsistence resources. Existing data includes the baseline studies commissioned by the EVOS Trustee Council: Stream Habitat Assessment Project: Prince William Sound and Lower Kenai Peninsula Project No. R-51, (Sundet & Kuwada, 1994), Fish Habitat and Channel Conditions for Streams on Forested Lands of Coastal Alaska: An Assessment of Cumulative Effects, (Martin, 1996), Survey and Evaluation of Instream Habitat and Stock Restoration Techniques for Wild Pink and Chum Salmon (Carpenter, Dickson Dudiak, Honnold & Willette, 1995). Habitat Protection Information for Anadromous Fish Channel Type Classification Study (Olson & Zemke, 1993)

Field surveys were then conducted during FY 97 to augment existing data and to ground truth aerial photo inventories. As a result, eight specific enhancement and restoration projects were then developed from this field inventory. With the information from the interviews with local subsistence users and an evaluation of the existing species and available quantities, the decision was made to target coho salmon for enhancement and restoration for subsistence purposes. Of these eight projects, two were approved for funding by the EVOS Trustee Council: the Port Graham River Fishpass and the Windy Creek Left Rearing Ponds. The design and implementation of the specific projects were conducted with the assistance of Dr. Doug Martin and Dr. William Hauser, Assistant Fisheries Program Manager of the Alaska Dept. of Fish and Game Habitat and Restoration Division.

Environmental analysis was required by the National Environmental Policy Act (NEPA) and two EA's were written to document any impact. The environmental analysis for this project was coordinated with Region 10 of the USDA Forest Service. Ken Holbrook of the Chugach National Forest and Vic Starostka of the Chatham Area of the Tongass National Forest were instrumental in coordinating environmental analysis' for this project.

For several decades fisheries biologists have successfully modified existing stream structures as a technique to improve habitat conditions for salmon spawning and rearing in Alaska and the Pacific Northwest. Fishpasses and wall based rearing ponds can be very effective in adding spawning and rearing habitat for the existing wildstock salmon. Both of these structures were installed with data and insight derived from a thorough inventory and analysis of the current habitat conditions in the

## Methods

**Objective One:** Objective One focused on the compilation and review of all available fisheries information relevant to the EA's. The project team consulted with personnel in ADF&G (Fish & Habitat) and the USDA Forest Service. We then proceeded to acquire all available maps, aerial photos, ADF&G records and reports concerning these areas. Meetings were scheduled with ADF&G, CIRPT and the USDA Forest Service in January to March of 1998.

## Objective Two:

**Phase I Environmental Analysis and Permitting:** The EA's were approved on June 29, 1998 by James A. Caplan, the Acting Regional Forester in Juneau. On June 4, 1998 the Title 16 Permit was received on the Port Graham River Fishpass, however the Title 16 on the Windy Creek Rearing Ponds was delayed by ADF&G until August 26, 1998 pending more detailed engineering. Permits from the Army COE were approved and received on May 14 and June 11, 1998 for the fishpass and rearing ponds respectively. Phase Two funding was then approved by ADF&G the Trustee agency for 98263 on August 29, 1998. Contracts were then executed with Taiga Resource Consultants (TRC) of Girdwood for the construction of the fishpass and with CIC, an excavating and road building company based in Soldotna and an active subcontractor on the Port Graham Number One timber sale for Klukwan Forest Products (KFP) for construction of the rearing ponds. TRC also performed the field layout and supervised the construction of the rearing ponds. Engineering plans were drafted by TRC and reviewed and approved by Tobben Spurkland, P.E. of Anchorage.

**Phase II Construction of Fishpass:** During Sept 10-20 all construction materials were mobilized to Port Graham from Anchorage via trucks from Anchorage and then a local fishing boat from Homer to Port Graham. Procurement of all equipment and materials was accomplished by TRC as a subcontractor. Equipment and construction materials were then mobilized to a staging area located at the 8.5 mile spur of the Port Graham road approximately 300 meters from the construction site on the Port Graham River (Plates 1 & 2).

The work crew for this project consisted of Arvid J. Hall and John L. Hall of TRC and Steve Anahonak and Bob Huntsman, full-time residents of Port Graham. TRC personnel also stayed at Huntmans Bed and Breakfast during the construction phase of this project. Two other residents of Port Graham provided day labor during the mobilization phase.

The fish pass was constructed out of 4" x 4" x 4" galvanized steel beams, 1/4" thick. These beams were then bolted to the bedrock by 1" drop in inserts and affixed with 5/8" grade 8 bolts. 4" x 8" and 4" by 12" sitka spruce timbers of various lengths obtained from McMullen's sawmill in Port Graham were placed across the channel into the steel beams. Each timber was

custom fit and then 1/4" plywood was affixed to the upstream side by zinc-coated screws and 1/4 inch x 4" flat steel was affixed to the downstream side on the dams in a vertical manner by 3/16" galvanized lag bolts (Plates 3-6.) Holes for the inserts were drilled into the bedrock with a Bosch 11230 SDS Max Rotary Hammer and a 1" carbide tipped drill bit (Plate 10.) The drop in inserts were then secured with a 2 lb sledge, driving a set pin to expand the insert into the bedrock (Plate 7.) The galvanized steel beams were cut and shaped using a Stihl TS 400 cut-off saw (Plate 8.) Bolts were affixed with either a Dewalt 1/2 hp impact wrench or a 3/4 inch drive ratchet. Timbers were trimmed and shaped with a Stihl 026 Pro chainsaw or a Milwaukee Sawzall (Plate 3.) A Honda 2500 KWH generator provided power to the electrical tools. Weir dam locations were determined based upon the existing morphology of the bedrock and the engineering plan for the five dams (Plate 9.) Desirable weir locations were those where the rock was smooth, relatively on an even plane to the parallel bedrock wall and free of frost cracks or excessive protrusions. Based upon these parameters, the location and spacing for the five weir dams was marked prior to construction on the bedrock walls.

A temporary dam was created upstream of dam #1 using logs, tarps and approximately 30 sandbags (Plate 3.)

Due to high water and flood conditions encountered during the latter part of September by the remnants of Typhoon Stella (Plate 1,) construction on the fish pass was delayed until October 2, 1998. Construction was completed during the following ten days. On October 13, 1998 the fishpass was opened up during a mild rainstorm and approximately 10 Dolly Varden and eight coho salmon proceeded to ascend the fishpass within 1 hour of its initial operation (Plate 12.) On October 14, the pass was closed temporarily to adjust the height and contour of the notches for a more even flow of water. The shape and contour of the opening in each pass was designed with the recommendations of Dr. John Orsborn. Field modifications were made to customize each notch to maximize the performance based upon the pool and channel conditions of each dam. Demobilization was completed by October 14, 1998.

**Phase II Construction of Rearing Ponds:** During Sept 20-25 all field layout of both rearing ponds was accomplished by TRC. CIC was contracted to excavate both ponds using a Hitachi Super Model excavator and a Caterpillar D-6 bulldozer (Plate 3.) Excavation occurred over a five-day period. All permits were complied with fully during construction. Due to stipulations in the ADF&G Title 16 permit these ponds will not be opened up to the mainstem of Windy Creek Left until May/June of 1999. However, on Nov 4, 1998 coho and Dolly Varden fry and fingerlings were observed in the area immediately below pond #2 and fry were observed in the mainstem of Windy Creek Left during the construction of pond #1 (Plate 18.)

Approximately 4,000 cu. yds of material was removed and placed in mounds on the uplands surrounding each pond (Plate 14.) Sod strips from the excavation of the top layer were then placed on the mounds to provide immediate revegetation. Each pond consisted of a center

channel 50 to 75 meters long with side channels of 25 to 50 meters long (Plate 16.) These channels were designed to have a center of approximately two meters deep and shoulders of one meter deep on each side (Plate 17.)

These ponds will be revegetated and underwater structure beneficial for anadromous juveniles will be installed during FY99. Grass and willows will be planted along the banks and woody debris will be added to the center and side channels for structure.

### **Objective Three Phase II:**

Monitoring of the ponds will be delayed until FY99 due to the stipulations of the ADF&G Title 16 Permit not allowing opening up these structures until June of 1999. The monitoring on the Port Graham River fishpass consisted of the observations of the subcontractors during construction. The construction was completed near the end of the coho run in the river for 1998. Monitoring for FY99-01 will be more intensive (see detailed monitoring plan in Appendix B.)

### **Results and Discussion**

#### **Objective One:**

The Ea's were approved on June 29, 1998. Permits for the Port Graham River Fishpass and the Windy Creek Rearing Ponds from the Army COE were received on May 14 and June 4, 1998 respectively. Title 16 permits for the Port Graham River Fishpass and the Windy Creek Left Rearing Ponds were received on June 11 and August 26, 1998 respectively. Preliminary engineering was completed by TRC on April 15, 1998 and modified on August 12, 1998 for the rearing ponds. Approval for both projects was received by the CIRPT on March 5, 1998. No other permits or approvals were necessary.

#### **Objective Two:**

Port Graham River Fishpass: On October 14, the barrier falls on Port Graham River were bypassed by the completion of the five dam fishpass. The falls consists of two channels which spilt around a large 6 by 10 meter bedrock outcropping in the center of the channel (Chart 1). The upper Port Graham reaches contain 23 percent of the total available spawning and 12 percent of the total available rearing habitat for the entire Port Graham River watershed. Satisfactory operation of the fish pass could result in a substantial increase in the number of additional coho spawners annually. Sufficient rearing habitat exists throughout the entire watershed to support the additional production from these spawners.

Windy Creek Left Rearing Ponds: Approximately 4,135 meters upstream from the mouth were two low wet meadows adjacent of the stream channel which showed evidence of being ancient abandoned stream channels. During our field survey these were investigated for the suitability for enhancement into wall based rearing habitat structures. Ground water was found in several small channels. Fry were observed in the shallow pools. There was excellent access to the main channel at the base of a large pool. The other meadow contained similar conditions. On the basis of the total amount of rearing habitat available on Windy Left, these enhancement projects should add critical off-channel winter rearing habitat for coho salmon and add a substantial amount of overall rearing habitat for coho salmon in this watershed.

**Objective Three:** Monitoring will be delayed on the rearing ponds due to stipulations in the Title 16 permit. The fish pass was constructed during or near the end of the fall coho run on the Port Graham River. Intensive monitoring is planned for both projects in FY99-01.

### Conclusions

Instream restoration and enhancement were completed in the fall of 1998 (September 10 to October 15, 1998). Construction was coordinated with the ongoing timber sale (Klukwan Forest Products) and road building operators and their equipment in the Port Graham drainage. With the excellent road access and the availability of heavy equipment, PGC was able to implement these projects on a cost effective basis. Work crews for the fishpass project consisted of four people, two of whom were full-time residents of Port Graham.

Future monitoring will be critical to assess the rate of success and to determine which objectives have been met or exceeded. Monitoring will continue for ten years conducted by PGC with assistance from ADF&G COMFISH. A final report and data will be compiled in FY 2001. Further enhancement in the form of revegetation will occur during FY 99 and FY 00 on the rearing ponds. Hand tools and manual labor will be the primary method of revegetation and enhancement for FY99.

Estimated Project Summary	FY98	FY99	FY00
Port Graham River Fish Pass	\$57.0	\$16.0	\$11.5
Windy Creek L Ponds	\$50.0	\$26.0	\$12.0
Summary	\$107.0	\$42.0	\$23.5

*Exxon Valdez Oil Spill*  
Restoration Annual Report

Assessment, Protection and Enhancement of  
Wildstock Salmon Streams  
in the Lower Cook Inlet.

Restoration Project 99263

This Annual Report is presented to  
Kenai Peninsula Borough Economic Development  
District Inc.  
and  
Alaska Department of Fish and Game

This annual report was also prepared for peer review as part  
of the *Exxon Valdez* Oil Spill Trustee Council restoration  
program for assessing project progress. Peer review  
comments have not been addressed in this annual report.

This Annual Report was prepared by  
Arvid J. Hall and John L. Hall  
Taiga Resource Consultants  
and  
Walter Meganack, Jr.  
Port Graham Corporation

This project was funded by  
Alaska Department of Fish and Game  
333 Raspberry Road  
Anchorage Alaska 99518

April 2000

## Conclusions

Enhancement and maintenance projects were completed in the summer of 1999 (June 10 to July 31, 1999). Work crews for the revegetation project consisted of four people, two of whom were full-time residents of Port Graham.

Rearing pond #2 is judged to be very successful. Rearing pond #1 was only holding water in the early fall and it is too soon to tell if it will be a successful rearing pond. Additional work might need to be done at the outlet to make it more accessible to coho fry. This would require possibly two man-days of labor with hand tools.

The Port Graham River fishpass dams held during extreme high water. Minor maintenance was needed on one dam. Coho and Dolly Varden were observed above the fishpass, however not in great numbers. The late fall flood could have pushed all the salmon down in to the lower river at a crucial spawning period. The other factor was Port Graham River had a noticeably weak run of coho in 1999, as did most streams in the Cook Inlet basin.

Future monitoring will be critical to assess the rate of success and to determine which objectives have been met or exceeded. Monitoring will continue in FY 00 conducted by PGC with assistance from ADF&G COMFISH. A final report and data will be compiled in FY 2000.

<b>Project Budget Summary</b>	<b>FY 98</b>	<b>FY 99</b>	<b>FY 00</b>
Port Graham River Fish Pass	\$57.0	\$13.0	\$11.5
Windy Creek L Ponds	\$50.0	\$26.0	\$12.0
Summary	\$107.0	\$39.0	\$23.5

## Results and Discussion

### **Objective One:**

**Monitoring, Maintenance and Revegetation:** Taiga Resource Consultants (TRC) of Girdwood conducted the maintenance of the fishpass and the maintenance of the rearing ponds. TRC also performed the field work and supervised the revegetation of the rearing ponds.

The field crew for this project consisted of Arvid J. Hall and John L. Hall of TRC and full-time residents of Port Graham and Walter Meganack, Jr.. Three other residents of Port Graham provided day labor during the mobilization phase.

The banks of the two rearing ponds were revegetated with willow and alder cuttings and seedlings. Spruce and alder branches, beneficial for anadromous juveniles, were put in the center and side channels of the ponds during FY 99.

### **Objective Two:**

**Monitoring Rearing Ponds:** On September 9, 1999 monitoring was conducted on both rearing ponds. Pond #1 was holding water and flowing into Windy Creek L. The staff gauge, which was established in the lower end of the pond read 27.5 inches. Dissolved oxygen was measured at 7 ppm and the water temperature was 6.5° C. PH was measured at 6.3. Three minnow traps were placed in the main channel and one each in the side channel and upper side channel. After a 24-hour soak, no fry were observed in the traps. (see sample Monitoring form in appendix.) Relative abundance was observed to be nil. Water clarity was excellent.

Pond #2 was flowing into a tributary of Windy Creek L. The staff gauge, which was established in the lower end of the pond read 30.5 inches. Dissolved oxygen was measured at 6.5 ppm and the water temperature was 6° C. PH was 6.3. Three minnow traps were placed in the main channel and one each in the side channel and upper side channel. After a 24-hour soak the following were our observed fry counts: 38 coho fry and 10 DV(Dolly Varden) fry in trap #1, 28 coho fry and 8 DV fry in trap #2, 22 coho fry and 19 DV fry in trap #3, 20 coho fry and no DV fry in trap #4 and 18 coho fry in trap #5 for a total of 136 coho and 37 DV. Average length was 3 cm. Relative abundance was observed to be high. Water clarity was excellent.

**Monitoring Fish Pass:** Port Graham River (PGR) was surveyed three times during the 1999 coho run. The run was late in returning to PGR. The first survey was conducted on August 18, 1999. The following is a summary: PGR #1, stream mouth to 6-mile bridge (FP5, length-2,948') had 0 coho, 1,000 pink, 500 chum and 200 DV (Dolly Varden), PGR #2, 6-mile to 8-mile bridge (FP4, length-2,892') had 0 coho, 400 pink, 50 chum and 8 DV, PGR #3, 8-mile to fishpass (LC1, length-1,097') had 0 coho, 0 pink, 0 chum and 2 DV. PGR #4, fish pass to 9.5-mile (FP4, length-1,792') had 0 coho, 0 pink, 0 chum and 2 DV. PGR #5, 9.5-mile to headwaters (MC2 &FP3, length-5,725') had 0 coho, 0 pink, 0 chum and 0 DV.

On September 24, 1999 most of the coho run was still holding in Port Graham Bay, only one reach was surveyed on this date due to this fact. PGR #4, fish pass to 9.5-mile (FP4, length-1,792') had 5 coho, 0 pink, 0 chum and 30 DV. This observation proved that coho and DV had ascended the fish pass. On October 12-14, a fierce fall storm flooded the entire Port Graham system.

The final survey was conducted on October 27, 1999. River conditions were excellent with clear water visibility, however it was snowing and near 0° C. The following is a summary: PGR #1, stream mouth to 6-mile bridge (FP5, length-2,948') had 800 coho, 500 spawning redds and 2 carcasses and 1,200 DV, PGR #2, 6-mile to 8-mile bridge (FP4, length-2,892') had 291 coho, 180 redds, 0 carcasses and 0 DV, PGR #3, 8-mile to fishpass (LC1, length-1,097') had 0 coho, 0 pink, 0 chum and 0 DV. PGR #4, fish pass to 9.5-mile (FP4, length-1,792') had 0 coho, 0 pink, 0 chum and 0 DV. PGR #5, 9.5-mile to headwaters (MC2 &FP3, length-5,725') had 0 coho, 0 pink, 0 chum and 0 DV.

**Objective Three:** Numerous subsistence users were consulted with and involved in the planning and implementation of this project for FY99. Confidence in the availability of subsistence resources seems to be on the upswing. A greater understanding of fisheries management and conservation will continue to increase as more subsistence users in the Port Graham area become aware of the benefit of these projects.

WINDY BAY

1:1000'

5-19-98

8-11

WINDY CREEK WATERSHED

#1 W C REARING PONDS #2



ADD stream/pond complex AS

# 242-32-10170-2037

Use 

Arch# 4516

