

PERFORMANCE REPORT

STATE: Alaska

GRANT NO.: F-41-8

GRANT TITLE: William Jack Hernandez Sport Fish Hatchery, Operations and Maintenance (OM-2-1)

PERIOD COVERED: July 1, 2017 – June 30, 2018

GRANT OBJECTIVES:

Administrative Needs:

1. Maintain hatchery equipment and facilities in operational condition.

Purpose/Target ID-1:

1. Produce and stock coho salmon fingerling (133,700 fish) and smolt (895,000 fish).
2. Produce and stock Chinook salmon smolt (1,962,500 fish) and catchables (91,000 fish).
3. Produce and stock rainbow trout fingerling (472,900 fish) and catchables (150,200 fish).
4. Produce and stock 20,800 Arctic char catchables.
5. Collect and incubate 65,000 Arctic grayling eggs

RESULTS/DISCUSSIONS:

Results and discussion of all objectives are in the attached report.

FINAL REPORT STATUS:

The attached report is the final report of F-41-8 for this grant period.

PREPARED BY: Gary George

DATE: August 2018

William Jack Hernandez Sport Fish Hatchery

Gary George

August 2018

Alaska Department of Fish and Game

Division of Sport Fish



Symbols and Abbreviations

The following symbols and abbreviations, and others approved for the Système International d'Unités (SI), are used in Division of Sport Fish Fishery Manuscripts, Fishery Data Series Reports, Fishery Management Reports, and Special Publications without definition. All others must be defined in the text at first mention, as well as in the titles or footnotes of tables and in figures or figure captions.

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			base of natural logarithm	e
Gram	g	All commonly accepted professional titles.	e.g., Dr., Ph.D., R.N., etc.	catch per unit effort	CPUE
Hectare	ha	And	&	coefficient of variation	CV
Kilogram	kg	At	@	common test statistics	F, t, χ^2 , etc.
Kilometer	km	Compass directions:		confidence interval	C.I.
Liter	L			correlation coefficient	R (multiple)
Meter	m			correlation coefficient	r (simple)
metric ton	mt	east	E	Covariance	cov
Milliliter	ml	north	N	degree (angular or temperature)	°
Millimeter	mm	south	S	degrees of freedom	df
		west	W	divided by	÷ or / (in equations)
		Copyright	©	Equals	=
		Corporate suffixes:		expected value	E
		Company	Co.	fork length	FL
		Corporation	Corp.	greater than	>
		Incorporated	Inc.	greater than or equal to	≥
		Limited	Ltd.	harvest per unit effort	HPUE
		et alii (and other people)	et al.	less than	<
		et cetera (and so forth)	etc.	less than or equal to	≤
		Exempli gratia (for example)	e.g.,	logarithm (natural)	ln
		id est (that is)	i.e.,	logarithm (base 10)	log
		Latitude or longitude	lat. or long.	logarithm (specify base)	log ₂ , etc.
		Monetary symbols (U.S.)	\$, ¢	mid-eye-to-fork	MEF
		Months (tables and figures): first three letters	Jan, ..., Dec	minute (angular)	'
		Number (before a number)	# (e.g., #10)	multiplied by	x
		Pounds (after a number)	# (e.g., 10#)	not significant	NS
		Registered trademark	®	null hypothesis	H ₀
		Trademark	™	Percent	%
		United States (adjective)	U.S.	Probability	P
		United States of America (noun)	USA	probability of a type I error (rejection of the null hypothesis when true)	α
		U.S. state and District of Columbia abbreviations	use two-letter abbreviations (e.g., AK, DC)	probability of a type II error (acceptance of the null hypothesis when false)	β
				second (angular)	"
				standard deviation	SD
				standard error	SE
				standard length	SL
				total length	TL
				Variance	Var

Weights and measures (English)					
cubic feet per second	ft ³ /s				
Foot	ft				
Gallon	gal				
Inch	in				
Mile	mi				
Ounce	oz				
Pound	lb				
Quart	qt				
Yard	yd				
Spell out acre and ton.					

Time and temperature					
Day	d				
degrees Celsius	°C				
degrees Fahrenheit	°F				
hour (spell out for 24-hour clock)	h				
Minute	min				
Second	s				
Spell out year, month, and week.					

Physics and chemistry					
all atomic symbols					
alternating current	AC				
Ampere	A				
Calorie	cal				
direct current	DC				
Hertz	Hz				
Horsepower	hp				
hydrogen ion activity	pH				
parts per million	ppm				
parts per thousand	ppt, ‰				
Volts	V				
Watts	W				

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WILLIAM JACK HERNANDEZ SPORT FISH HATCHERY

by

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August 2018

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ABSTRACT

This was the sixth full year of operation for the William Jack Hernandez Sport Fish Hatchery (WJHSFH). A total of 3,757,800 fish weighing 97,831 kgs were stocked, including 2,121,700 Chinook salmon, 1,079,400 coho salmon, 535,000 rainbow trout, and 21,700 Arctic char. In addition, a total of 200,000, 668,900, and 25,000 triploid eyed rainbow trout eggs were transferred to the Pillar Creek Hatchery in Kodiak, to the Ruth Barnett Hatchery in Fairbanks, and to the Macaulay Hatchery in Juneau respectively. An additional 50,000 Chinook salmon eyed eggs were transferred to the Wally Noerenberg Hatchery in Prince William Sound, and 18,100 triploid Arctic char eggs were shipped to the Ruth Barnett Hatchery.

KEY WORDS: William Jack Hernandez Sport Fish Hatchery, rainbow trout, *Oncorhynchus mykiss*, Chinook salmon, *Oncorhynchus tshawytscha*, coho salmon, *Oncorhynchus kisutch*, Arctic char, *Salvelinus alpinus Linnaeus*, fish production, enhancement.

INTRODUCTION

The William Jack Hernandez Sport Fish Hatchery (WJHSFH) is a large, state-of-the-art, complex facility employing recirculating aquaculture technology, as well as partial reuse, and flow through water use strategies. It is designed to use only well water for fish production, the exception being two imprinting raceways which use Ship Creek water, and natural gas fired boilers to attain target water temperatures. By recirculating up to 98% of the water the heat and water are utilized more efficiently.

The WJHSFH is a state-owned facility, operated by the Alaska Department of Fish and Game (ADF&G), Sport Fish Division. The hatchery is located at 941 N. Reeve Blvd. at 61° 13' 48" N., 149° 49' 50" W, a short distance from downtown Anchorage.

The WJHSFH is capable of producing 133,000 kgs. of fish annually. The hatchery includes:

- a) Ninety-eight stacks of eight incubation trays
- b) Fifteen tanks each 2 feet in diameter x 2 feet deep (0.16 m³)
- c) Twelve tanks each 5 feet in diameter x 3 feet deep (including 1-foot deep insert tanks) (1.4 m³)
- d) Thirty three tanks each 10 feet in diameter x 4 feet deep (8.2 m³)
- e) Four tanks each 16 feet in diameter x 5 feet deep (25.6 m³)
- f) Two tanks each 20 feet in diameter x 5 feet deep (40.1 m³)
- g) Thirty-nine tanks each 26.2 feet in diameter x 6.5 feet deep (91.7 m³)
- h) Two aluminum raceways each 40 feet long x 5 feet wide x 4 feet deep (22.6m³).
- i) Four aluminum raceways each 80 feet long x 8 feet wide x 3 feet deep (55 m³)

Hatchery web site:

<http://www.adfg.alaska.gov/index.cfm%3Fadfg%3DfishingSportStockingHatcheries.williamjackhernandez>

GOAL

The William Jack Hernandez Sport Fish Hatchery's primary goal is to provide high quality, disease-free fish for enhancement projects in South Central Alaska. Approved objectives for FY18 are listed below:

OBJECTIVES

Administrative Needs:

1. Maintain hatchery equipment and facilities in operational condition.

Purpose/Target ID-1:

1. Produce and stock coho salmon fingerling (133,700 fish) and smolt (895,000 fish).
2. Produce and stock Chinook salmon smolt (1,962,500 fish) and catchables (91,000 fish).
3. Produce and stock rainbow trout fingerling (472,900 fish) and catchables (150,200 fish).
4. Produce and stock 20,800 Arctic char catchables.
5. Collect and incubate 65,000 Arctic grayling eggs

METHODS AND MATERIALS

The William Jack Hernandez Sport Fish Hatchery (WJHSFH) produces fish using standard fish culture technology, and follows policies and procedures outlined in the Fishery Rehabilitation and Development (FRED) Division Fish Culture Manual, State pathology guidelines and genetics policies. A combination of water use strategies is employed at the WJHSFH: flow through, partial reuse (50 – 90% of the water reused), and full recirculating aquaculture (>90% of the water reused). Rainbow trout and Arctic char gametes are collected from a captive broodstock program residing in the WJHSFH using air spawning techniques. Gametes from all other species are either collected at Ship Creek adjacent to the WJHSFH, or collected at remote locations and transported to the hatchery. All eggs are disinfected for 15 minutes in a 100 parts per million iodine solution as they enter the incubation area. At the eyed-egg stage of development, dead eggs are removed with electronic egg pickers, live and dead eggs are enumerated, and live eggs are returned to the incubators where they remain until emergence. At emergence, fry are transferred from the incubators and placed into small start up rearing containers. Standard rearing densities range from <math><30 \text{ kg/m}^3</math> to >math>>80 \text{ kg/m}^3</math> depending on life stage and species with an average water-exchange rate of 1/h (R= 1). Emergent fry are fed approximately every 30 min as necessary. When the fish reach an average weight of 1.0 to 4.0 g, they are either released or transferred to larger grow out tanks for extended rearing. Rearing in the grow out tanks may last from several months to over 3 years, depending on the species and program objectives. All of the feed is presented using automatic feeding equipment. The grow out tanks employ a large centralized feeding system, and the start up and broodstock holding tanks use smaller systems with an individual feed hopper for each tank. Fish growth is manipulated through daylight control, water temperature control and feeding to meet project objectives.

All of the Chinook and coho salmon smolts are marked using otolith banding techniques.

With the exception of the Ship Creek releases of Chinook and coho salmon, all fish produced at the WJHSFH are released at sites remote to the hatchery. Several vehicles ranging from pickup

trucks to 50,000 GVWR trucks equipped with 125 to 3,000 gal tanks are used to transport the fish. Life support during transport is provided by injecting oxygen and aerating the water.

FINDINGS

All coordination, administration and reporting functions were performed and met as expected, and the facility was well maintained. Egg collection objectives were met and fish released partially met objective targets. All species released at the requested lifestages, except for rainbow trout fingerling, met or exceeded the objective goal. Released rainbow trout fingerling were 75.3% of the objective goal, falling 117,124 fish short of fully meeting the objective goal. It is unclear as to the source of the rainbow shortfall, but enumeration methods of eyed eggs and fingerling rainbow trout revealed that the beginning eyed egg and stocking enumeration methods yielded acceptable results when compared to each other. When loading trucks for stocking, a commercial fish counter was utilized as a comparison standard and the traditional enumeration methods used in the past for stocking rainbow trout fingerling were within acceptable accuracy. While the enumeration methods of eyed eggs resulted in totals that are acceptably close, future work will utilize a commercial egg counter to verify the number of eggs held for rearing and are not less than anticipated. Other efforts will focus on the size of fingerling when start-up tank drain screens are changed to larger sizes to assure that smaller fingerling are not lost through the larger drain screens. The future efforts target verification that an accurate number of eyed eggs are retained for fingerling production and that fingerling remain in the start-up tanks during early rearing, both of which could be factors contributing to the shortage of rainbow trout available for stocking. The results are summarized in Table 1.

Species	Number to Release	Actual Number Released	Percentage of Objectives
Coho Salmon			
smolt	895,000	938,505	104.9
fingerling	133,700	140,910	105.3
Chinook Salmon			
smolt	1,962,500	2,029,889	103.4
catchable	91,000	91,825	100.9
Arctic Char			
catchable	20,800	20,848	100.2
broodstock		876	
Rainbow Trout			
catchable	150,200	151,736	101
fingerling	473,440	356,316	75.3
broodstock		2278	
Total	3,726,640	3,733,183	100.0

TABLE 1. PRODUCTION OBJECTIVES AND ACTUAL PRODUCTION

The receiving and incubation of Arctic grayling eggs fully met the objective as 86,063 egg were received and incubated, exceeding the expected goal by 32.4%.

FINAL REPORT STATUS:

This constitutes the final report for this project.