Regional Information Report No. 5J17-02

An Evaluation of the Neets Bay Salmon Hatchery for Consistency with Statewide Policies and Prescribed Management Practices

by

Mark Stopha

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Alaska Department of Fish and Game **Division of Commercial Fisheries**

Symbols and Abbreviations

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Weights and measures (metric)

centimeter	cm
deciliter	dL
gram	g
hectare	ha
kilogram	kg
kilometer	km
liter	L
meter	m
milliliter	mL
millimeter	mm

Weights and measures (English)

cubic feet per second	ft^3/s
foot	ft
gallon	gal
inch	in
mile	mi
nautical mile	nmi
ounce	oz
pound	lb
quart	qt
yard	yd

Time and temperature

day	d
degrees Celsius	°C
degrees Fahrenheit	°F
degrees kelvin	K
hour	h
minute	min
second	s

Physics and chemistry

all atomic symbols	
alternating current	AC
ampere	A
calorie	cal
direct current	DC
hertz	Hz
horsepower	hp
hydrogen ion activity (negative log of)	pH
parts per million	ppm
parts per thousand	ppt, ‰
volts	V
watts	W

General

Alaska Administrative Code	AAC
all commonly accepted abbreviations	e.g., Mr., Mrs., AM, PM, etc.
all commonly accepted professional titles	e.g., Dr., Ph.D., R.N., etc.
at	@
compass directions:	
east	E
north	N
south	S
west	W
copyright	©
corporate suffixes:	
Company	Co.
Corporation	Corp.
Incorporated	Inc.
Limited	Ltd.
District of Columbia	D.C.
et alii (and others)	et al.
et cetera (and so forth)	etc.
exempli gratia (for example)	e.g.
Federal Information Code	FIC
id est (that is)	i.e.
latitude or longitude	lat. or long.
monetary symbols (U.S.)	$, ¢
months (tables and figures): first three letters	Jan,...,Dec
registered trademark	®
trademark	™
United States (adjective)	U.S.
United States of America (noun)	USA
U.S.C.	United States Code
U.S. state	use two-letter abbreviations (e.g., AK, WA)

Mathematics, statistics

all standard mathematical signs, symbols and abbreviations	
alternate hypothesis	H_A
base of natural logarithm	e
catch per unit effort	CPUE
coefficient of variation	CV
common test statistics	(F, t, χ^2, etc.)
confidence interval	CI
correlation coefficient (multiple)	R
correlation coefficient (simple)	r
covariance	cov
degree (angular)	°
degrees of freedom	df
expected value	E
greater than	>
greater than or equal to	≥
harvest per unit effort	HPUE
less than	<
less than or equal to	≤
logarithm (natural)	ln
logarithm (base 10)	log
logarithm (specify base)	$\log_2$, etc.
minute (angular)	'
not significant	NS
null hypothesis	H_O
percent	%
probability	P
probability of a type I error (rejection of the null hypothesis when true)	α
probability of a type II error (acceptance of the null hypothesis when false)	β
second (angular)	"
standard deviation	SD
standard error	SE
variance	
population	Var
sample	var

REGIONAL INFORMATION REPORT NO. 5J17-02

AN EVALUATION OF THE NEETS BAY SALMON HATCHERY FOR CONSISTENCY WITH STATEWIDE POLICIES AND PRESCRIBED MANAGEMENT PRACTICES

by

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The Regional Information Report Series was established in 1987 and was redefined in 2006 to meet the Division of Commercial Fisheries regional need for publishing and archiving information such as project operational plans, area management plans, budgetary information, staff comments and opinions to Board of Fisheries proposals, interim or preliminary data and grant agency reports, special meeting or minor workshop results and other regional information not generally reported elsewhere. Reports in this series may contain raw data and preliminary results. Reports in this series receive varying degrees of regional, biometric and editorial review; information in this series may be subsequently finalized and published in a different department reporting series or in the formal literature. Please contact the author or the Division of Commercial Fisheries if in doubt of the level of review or preliminary nature of the data reported. Regional Information Reports are available through the Alaska State Library and on the Internet at http://www.adfg.alaska.gov/sf/publications/.

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ABSTRACT

The salmon hatchery program in Alaska is governed by policies, plans, and regulations that emphasize protection of wild salmon stocks. A rotational series of hatchery evaluations will examine each hatchery for consistency with those policies and prescribed management practices. The evaluation includes a review of hatchery management plans and permits, an assessment of each hatchery program's consistency with statewide policies, and recommendations to address any deficiencies found. Management plans and permits were examined to determine whether they were current, consistent with each other, and accurately described hatchery operations.

This report reviews the Neets Bay Salmon Hatchery operated by the Southern Southeast Regional Aquaculture Association, a private nonprofit corporation. Neets Bay Hatchery is located in Neets Bay on Behm Canal 35 air miles north of Ketchikan, Alaska, on the west coast of Revillagigedo Island. The facility currently rears chum salmon *Oncorhynchus keta*, coho salmon *O. kisutch*, and Chinook salmon *O. tshawytscha*. The facility was constructed by the Southern Southeast Regional Aquaculture Association in 1979.

The original broodstock for chum, coho, and Chinook salmon were from area stocks. Juvenile salmon are released from the hatchery and other release sites in Southern Southeast Alaska. Some projects were not properly permitted in earlier years, and recommendations for clarification of outstanding issues are included in this report. The basic management plan for the hatchery should be updated with a description of current permit conditions and operations.

Key words: Neets Bay salmon hatchery, hatchery evaluation, hatchery, Chinook salmon, chum salmon coho salmon

INTRODUCTION

Alaska's constitution mandates that fish are harvested sustainably under Article 8, section 4: "Fish, forests, wildlife, grasslands, and all other replenishable resources belonging to the state shall be utilized, developed and maintained on the sustained yield principle, subject to preferences among beneficial uses."

Due in part to historically low salmon harvests, Article 8, section 15 of Alaska's Constitution was amended by popular vote in 1972 to provide tools for restoring and maintaining the state's fishing economy: "No exclusive right or special privilege of fishery shall be created or authorized in the natural waters of the State. This section does not restrict the power of the State to limit entry into any fishery for purposes of resource conservation, to prevent economic distress among fishermen and those dependent upon them for a livelihood and to promote the efficient development of aquaculture in the State." Alaska's salmon hatchery program was developed under this mandate and designed to supplement—not replace—sustainable natural production.

Alaska's modern salmon fisheries enhancement program began in 1971 when the Alaska Legislature established the Division of Fisheries Rehabilitation Enhancement and Development (FRED, AS 16.05.092) within the Alaska Department of Fish and Game (ADF&G; FRED Division 1976). In 1974, the Alaska Legislature expanded the program, authorizing private nonprofit (PNP) corporations to operate salmon hatcheries: "It is the intent of this Act to authorize the private ownership of salmon hatcheries by qualified nonprofit corporations for the purpose of contributing, by artificial means, to the rehabilitation of the state's depleted and depressed salmon fishery. The program shall be operated without adversely affecting natural stocks of fish in the state and under a policy of management which allows reasonable segregation of returning hatchery-reared salmon from naturally occurring stocks" (Alaska Legislature 1974).

Salmon fishery restoration efforts came in response to statewide annual salmon harvests of just 22 million fish in 1973 and 1974, among the lowest catches since 1900 (Figure 1). The FRED Division and PNPs engaged in a variety of activities to increase salmon production. New hatcheries were built to raise salmon. Fish ladders were constructed to provide adult salmon

access to previously nonutilized spawning and rearing areas. Lakes with waterfall outlets too high for adult salmon to ascend were stocked with salmon fry. Log jams were removed in streams to enable returning adults to reach spawning areas. Nursery lakes were fertilized to increase the available feed for juvenile salmon (FRED 1975). A combination of favorable environmental conditions, limited fishing effort, abundance-based harvest management, habitat improvement and protection, and hatchery production gradually boosted salmon catches, with recent commercial salmon harvests (2004–2013) averaging 180 million fish.[1]

In Alaska, the purpose of salmon hatcheries is to supplement natural stock production for public benefit without adversely affecting natural stocks (Duckett et al. 2010). Hatcheries are efficient in improving survival from the egg to fry or smolt stage. In natural production, estimates for pink salmon *Oncorhynchus gorbuscha* egg to fry survival in 2 Southeast Alaska creeks ranged from less than 1% to 22%, with average survivals from 4% to 9% (Groot and Margolis 1991). Under hatchery conditions, egg to fry survival is usually 90% or higher.

Alaska hatcheries do not grow fish to adulthood, but incubate fertilized eggs and release resulting progeny as juveniles. Juvenile salmon imprint on the release site and return to the release location as mature adults. Per state policy, hatcheries generally use stocks taken from close proximity to the hatchery so that any straying of hatchery returns will have similar genetic makeup as the stocks from nearby streams. Also per state policy, Alaska hatcheries do not selectively breed. Large numbers of broodstock are used for gamete collection to maintain genetic diversity, without regard to size or other characteristic. In this document, *wild* fish refer to fish that are the progeny of parents that naturally spawned in watersheds and intertidal areas. *Hatchery* fish are fish reared in a hatchery to a juvenile stage and released. *Farmed* fish are fish reared in captivity to market size for sale. Farming of finfish, including salmon, is not legal in Alaska (Alaska Statue 16.40.210). In addition, *egg takes* or *egg collections* denote eggs that are fertilized with milt from a male from the same stock unless otherwise noted.

Hatchery production is limited by freshwater capacity and freshwater rearing space. Soon after emergence, all pink and chum salmon *O. keta* fry can be transferred from fresh water to salt water. Most Chinook *O. tshawytscha*, sockeye *O. nerka*, and coho salmon *O. kisutch* must spend a year or more in fresh water before fry develop to the smolt stage and can tolerate salt water. These 3 species require a higher volume of fresh water, a holding area for freshwater rearing, and daily feeding. They also have a higher risk of disease mortality due to the extended rearing phase. There are economic tradeoffs between the costs of production versus the value of fish at harvest. Although Chinook, sockeye, and coho salmon usually garner higher prices per pound at harvest, chum and pink salmon are more economical to rear in the hatchery setting and generally provide a higher economic return.

[1] Data from http://www.adfg.alaska.gov/index.cfm?adfg=CommercialByFisherySalmon.exvesselquery (Accessed 08/12/14).

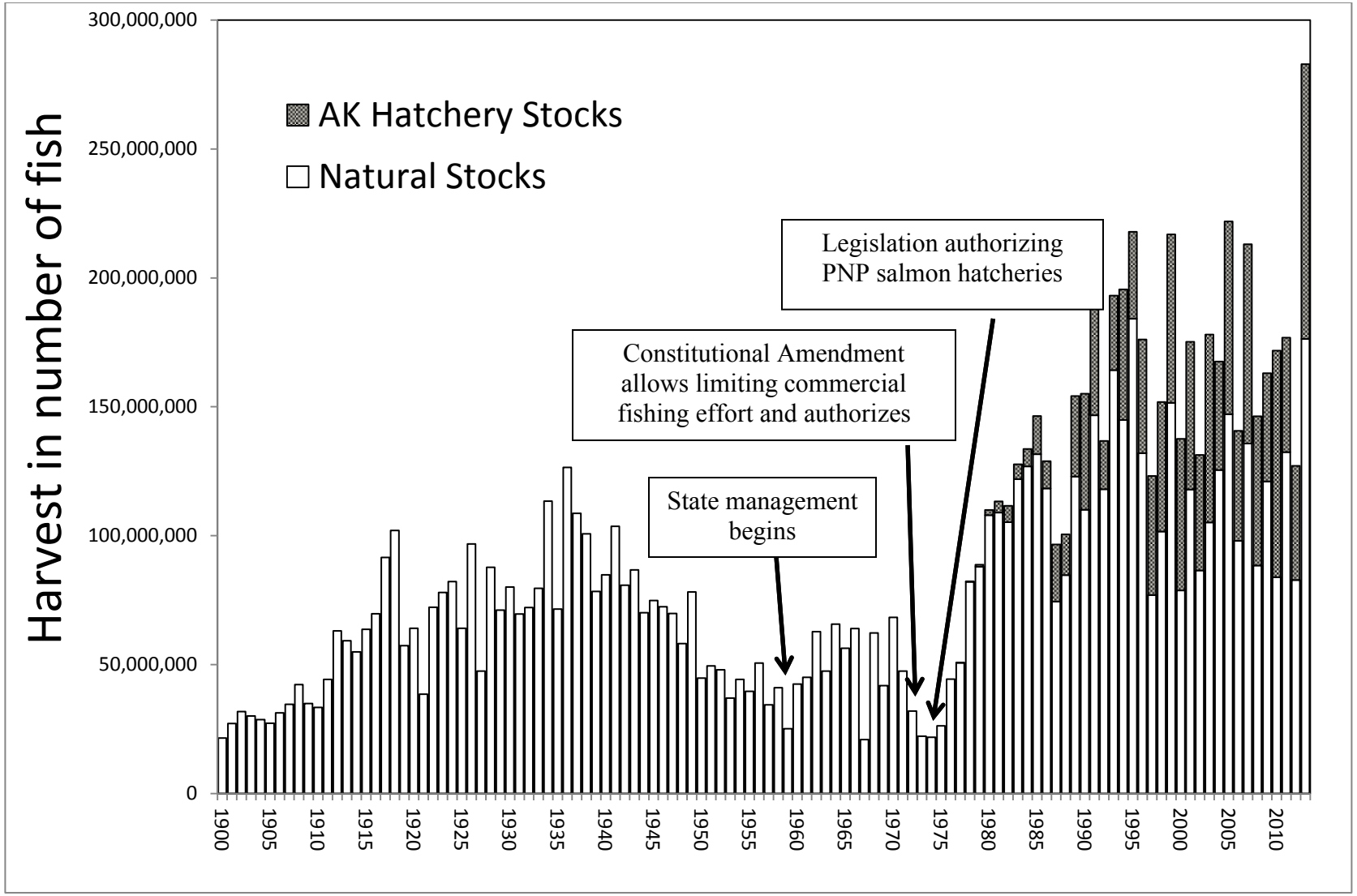

Figure 1.–Commercial salmon harvest in Alaska, 1900–2013.

Source: 1900–1976 from Byerly et al. (1999); 1977–2013 from Vercessi (2015).

Pink salmon have the shortest life cycle of Pacific salmon (2 years), provide a quick return on investment, and provide the bulk of Alaska hatchery production. From 2004 to 2013, pink salmon accounted for an average 74% of Alaska hatchery salmon returns by number, followed by chum (20%), sockeye (4%), coho (2%) and Chinook salmon (<1%; White 2005–2011; Vercessi 2012–2014).

The salmon marketplace has changed substantially since the hatchery program began. As the first adult salmon were returning to newly built hatcheries in 1980, Alaska accounted for nearly half of the world salmon supply, and larger harvests in Alaska generally meant lower prices to fishermen. Some believed the increasing hatchery production in some parts of the state was depressing salmon prices in others (Knapp et al. 2007). By 1996, rapidly expanding farmed salmon production surpassed the wild salmon harvest for the first time (Knapp et al. 2007) and wild salmon prices declined precipitously as year-round supplies of high-quality fresh farmed salmon flooded the marketplace in the U.S., Europe, and Japan. The Alaska fishing industry responded by improving fish quality and implementing intensive marketing efforts to differentiate Alaska salmon from farmed salmon. By 2004, these efforts paid off through increasing demand and prices.

Today, Alaska typically accounts for just 12% to 15% of the global supply of salmon (Alaska Seafood Marketing Institute 2011). Alaska's diminished influence on world salmon production means that Alaska's harvest volume has little effect on world salmon prices. Prices paid to fishermen have generally increased over the past decade (2004–2013) despite large fluctuations in harvest volume (ADF&G 2014; Stopha 2013a).

Exvessel value[2] of the commercial hatchery harvest increased from $45 million in 2004 to $191 million in 2013, with a peak value for the decade of $204 million in 2010. First wholesale value[3] also showed an increasing trend, with the value of hatchery fish increasing from $138 million in 2004 to a decadal high value of $532 million in 2013. Pink and chum salmon combined accounted for about 80% of both the exvessel value and the first wholesale value of the hatchery harvest from 2004 to 2013.

From 2004 to 2013, hatcheries contributed about a third of the total Alaska salmon harvest, in numbers of fish (White 2005–2011; Vercessi 2012–2014). As world markets supported a trend of increasing prices for salmon during this period, interest in increasing hatchery production by Alaska fishermen, processors, support industries, and coastal communities increased as well. In 2010, Alaska salmon processors encouraged hatchery operators to expand pink salmon production to meet heightened demand (Industry Working Group 2010).

Alaska's wild salmon populations are sustainably managed by ensuring adequate numbers of adults spawn, and the wild harvest is arguably at its maximum, given fluctuations due to environmental variability and imperfect management precision. Unlike Pacific Northwest systems—such as the Columbia River, where habitat loss, dam construction, and urbanization led to the decline of salmon stocks to the point of endangered species listings—Alaska's salmon habitat is largely intact. ADF&G, with the assistance and sacrifice of commercial, sport, personal

[2] Exvessel value for hatchery harvest is the total harvest value paid by fish buyers to fishermen for all salmon from http://www.adfg.alaska.gov/index.cfm?adfg=commercialbyfisherysalmon.salmoncatch (accessed 02/04/2012), multiplied by the hatchery percent of the commercial harvest (Farrington 2003, 2004; White 2005–2011; and Vercessi 2013).

[3] First wholesale value is the price paid to primary processors for processed fish from ADF&G Commercial Operators' Annual Reports obtained from Shellene Hutter, ADF&G, multiplied by the hatchery percent of the commercial harvest.

use, and subsistence users, has been successful recovering several populations identified as *stocks of concern* through restricted fishing and intensive spawning assessment projects. Other than regulatory actions, such as reductions of salmon bycatch in other fisheries or changes in fishing methods that would allow more precise management of escapement, hatchery production is the primary opportunity to substantially increase the harvest.

Alaska's salmon fisheries are among the healthiest in the world. The 2013 season was a record harvest overall, with the 283 million fish commercial harvest comprised of the second highest catch for wild stocks (176 million fish) and the highest catch for hatchery stocks (107 million fish) in history (Figure 1). The 2013 season was the first year the hatchery harvest exceeded 100 million fish. The 2013 hatchery harvest alone was greater than the entire statewide commercial salmon harvest in 1987 and every year prior to 1980 except for 6 years (1918, 1934, 1936–1938 and 1941; Figure 1).

Part of the reason for the rise in price of Alaska salmon was a message of the state's sustainable fisheries management to a growing audience of discriminating buyers. The Alaska Seafood Marketing Institute applied to the Marine Stewardship Council (MSC) for certification as a sustainably managed fishery. In 2000, the MSC certified the salmon fisheries managed by ADF&G as sustainably managed, and the state's salmon fisheries remained the only MSC-certified salmon fishery in the world for nearly a decade. Salmon fisheries elsewhere (Annette Islands Indian Reserve salmon; British Columbia pink and sockeye salmon; and Iturup Island, Russia, pink and chum salmon) were later certified for much smaller geographic areas, and in some cases, only for specific salmon species (MSC 2012). Alaska's certification was MSC's broadest and most complex, covering all 5 salmon species harvested by all fishing gear types in all parts of the state. Achievement of statewide certification was a reflection of the state's commitment to abundance-based fisheries management and constitutional mandate to sustain wild salmon populations.

MSC-certified fisheries are reviewed every 5 years. When Alaska salmon fisheries were recertified in 2007 (Chaffee et al. 2007), a condition of certification was to "Establish and implement a mechanism for periodic formal evaluations of each hatchery program for consistency with statewide policies and prescribed management practices. This would include a specific evaluation of each program relative to related policies and management practices." (Knapman et al. 2009).

The Alaska Seafood Marketing Institute changed to a new sustainable fishery certification under the Food and Agriculture Organization in 2011 (Global Trust Certification Ltd. 2011). The hatchery evaluations started under the MSC certification program continued as an important systematic assessment of Alaska salmon fishery enhancement and its relation to wild stock production—at a time of heightened interest in increased hatchery production and its potential impacts on wild salmon production. ADF&G established a rotational schedule to review PNP hatchery programsADF&G established a rotational schedule to review PNP hatchery programs. Musslewhite (2011a, 2011b) completed hatchery reviews for the Kodiak region in 2011, Stopha and Musslewhite (2012) completed the hatchery review for Tutka Bay Lagoon Hatchery in Cook Inlet, and Stopha (2012a, 2012b, 2013b, 2013c, 2013d, 2013e, 2013f, 2013g, 2013h, 2014a, 2014b, 2014c, 2015a, 2015b, 2015c, 2015d, 2015e, 2015f, 2016a, 2016b, and 2016c) completed reviews of the Trail Lakes, Port Graham and Eklutna hatcheries in Cook Inlet and the Solomon Gulch, Gulkana, Main Bay, Cannery Creek, Wally Noerenberg and Armin F. Koernig hatcheries in Prince William Sound, and the Macaulay, Sheep Creek, Snettisham, Sawmill Creek, Haines

Projects, Sheldon Jackson, Port Armstrong, Medvejie Creek, Hidden Falls, Whitman Lake, Port Saint Nicholas, and Klawock River hatcheries in Southeast Alaska. This report is for Neets Bay Hatchery in Southeast Alaska on Behm Canal about 35 air miles north of Ketchikan, Alaska.

OVERVIEW OF POLICIES

Numerous Alaska mandates and policies for hatchery operations were specifically developed to minimize potential adverse effects to wild stocks. The design and development of the hatchery program is described in detail in McGee (2004): "The success of the hatchery program in having minimal impact on wild stocks can be attributed to the development of state statutes, policies, procedures, and plans that require hatcheries to be located away from significant wild stocks, and constant vigilance on the part of ADF&G and hatchery operators to improve the program through ongoing analysis of hatchery performance." Through a comprehensive permitting and planning process, hatchery operations are subject to continual review by a number of ADF&G fishery managers, geneticists, pathologists, and the ADF&G commissioner.

A variety of policies guide the permitting of salmon fishery enhancement projects. They include *Genetic Policy* (Davis et al. 1985), *Regulation Changes, Policies, and Guidelines for Fish and Shellfish Health and Disease Control* (Meyers 2014), and fisheries management policies, such as the Sustainable Salmon Fisheries Policy (5 AAC 39.222). These policies are used by ADF&G staff to assess hatchery operations for genetic, health, and fishery management issues in the permitting process. Regional comprehensive salmon enhancement plans provide goals and objectives for enhancement planning, and are described in a later section.

The State of Alaska ADF&G genetic policy (Davis et al. 1985; Davis and Burkett 1989) sets out restrictions and guidelines for stock transport, protection of wild stocks, and maintenance of genetic variance. Policy guidelines include banning importation of salmonids from outside the state (except US/Canada transboundary rivers); restricting transportation of stocks between the major geographic areas in the state (Southeast, Kodiak Island, Prince William Sound, Cook Inlet, Bristol Bay, Arctic-Yukon-Kuskokwim, and Interior); requiring the use of local broodstock with appropriate phenotypic characteristics; maintaining genetic diversity by use of large populations of broodstock collected across the entire run; and limiting the number of hatchery stocks derived from a single donor stock.

Genetic Policy (Davis et al. 1985) also requires the identification and protection of *significant and unique* wild stocks: "Significant or unique wild stocks must be identified on a regional and species basis so as to define sensitive and non-sensitive areas for movement of stocks." In addition, Davis et al. (1985) suggests that drainages be established as wild stock sanctuaries where no enhancement activity is permitted except for gamete removal for broodstock development. The wild stock sanctuaries were intended to preserve a variety of wild types for future broodstock development and outbreeding for enhancement programs.

These stock designations are interrelated with other restrictions of the genetic policy (Davis et al. 1985), including (1) hatchery stocks cannot be introduced to sites where the introduced stock may have interaction or impact on significant or unique wild stocks; (2) a watershed with a significant stock can only be stocked with progeny from the indigenous stocks; and (3) fish releases at sites where no interaction with, or impact on, significant or unique stock will occur, and which are not for the purposes of development, rehabilitation, or enhancement of a stock (e.g., releases for terminal harvest or releases in landlocked lakes) will not produce a detrimental

genetic effect. Davis and Burkett (1989) suggest that regional planning teams (RPTs) are an appropriate body to designate significant and unique wild stocks and wild stock sanctuaries. To date, only the Cook Inlet RPT has established significant stocks and wild stock sanctuaries. The Southeast Alaska RPT has issued a *stock appraisal tool*, which identifies criteria to be used for evaluating the significance of a wild stock that may potentially interact with hatchery releases (Duckett et al. 2010).

Salmon fishery enhancement efforts are guided by comprehensive salmon plans for each region. These plans are developed by the RPTs, which are composed of 6 members: 3 from ADF&G and 3 appointed by the regional aquaculture association Board of Directors (5 AAC 40.310). According to McGee (2004), "Regional comprehensive planning in Alaska progresses in stages. Phase I sets the long-term goals, objectives and strategies for the region. Phase II identifies potential projects and establishes criteria for evaluating the enhancement and rehabilitation potentials for the salmon resources in the region. In some regions, a Phase III in planning has been instituted to incorporate Alaska Board of Fisheries approved allocation and fisheries management plans with hatchery production plans."

The Alaska Fish Health and Disease Control Policy (5 AAC 41.080) is designed to protect fish health and prevent spread of infectious disease in fish and shellfish. The policy and associated guidelines are discussed in *Regulation Changes, Policies, and Guidelines for Fish and Shellfish Health and Disease Control* (Meyers 2014). It includes regulations and guidelines for fish transports, broodstock screening, disease histories, and transfers between hatcheries. The *Alaska Sockeye Salmon Culture Manual* (McDaniel et al. 1994) also specifies practices and guidelines specific to the culture of sockeye salmon. As with Davis et al. (1985), these regulations and guidelines are used by ADF&G fish pathologists to review hatchery plans and permits.

The Alaska Policy for the Management of Sustainable Salmon Fisheries (5 AAC 39.222) mandates protection of wild salmon stocks in the management of salmon fisheries. Other applicable policies include the Policy for the Management of Mixed-Stock Salmon Fisheries (5 AAC 39.220), the Salmon Escapement Goal Policy (5 AAC 39.223), and local fishery management plans (5 AAC 39.200). These regulations require biologists to consider the interactions of wild and hatchery salmon stocks when reviewing hatchery management plans and permits.

The guidance provided by these policies is sometimes very specific, and sometimes less so. For example, the Alaska Fish Health and Disease Control Policy (5 AAC 41.080) mandates the use of an iodine solution on salmon eggs transported between watersheds—a prescribed practice that requires little interpretation. In contrast, several policies prioritize the protection of wild stocks from the potential effects of fisheries enhancement projects without specifying or mandating how to assess those effects. These less specific policies provide principles and priorities, but not specific direction, for decision making.

The initial rotation of these evaluation reports will assess the consistency of individual hatcheries with state policies by (1) confirming that permits have been properly reviewed using applicable policies, and (2) identifying information relevant to each program's consistency with state policies. Future reports may assess regional effects of hatcheries on wild stocks and fishery management.

OVERVIEW OF HATCHERY PERMITS AND PLANS

The FRED Division built and operated several hatcheries across the state in the 1970s and gradually transferred operations of most facilities to PNP corporations. Regional aquaculture associations (RAAs), whose membership comprises commercial salmon fishing permit holders in that region, operate most of the PNP hatcheries in Kodiak, Cook Inlet, Prince William Sound, and Southeast Alaska. Each RAA's board of directors establish goals for enhanced production, oversee business operations of the hatcheries, and work with ADF&G staff to comply with state permitting and planning regulations. RAA membership may vote to impose a salmon enhancement tax on sale of salmon in their region to finance hatchery, enhancement, and rehabilitation activities. Independent PNP corporations, not affiliated with an RAA, also operate hatcheries in several areas of the state. Both the RAAs and independent PNP hatchery organizations may harvest salmon returning to their release sites to pay for operations. Such harvests by hatchery operators are called *cost-recovery* fisheries, and are in contrast to *common property* fisheries, which are fisheries open to all commercial fishing permit holders, as well as subsistence, personal use, and sport harvesters. Several organizations have tourist and educational programs that may contribute to the financial support of their programs as well.

RAAs do not receive a blanket permit for their hatcheries. Each hatchery is permitted separately. Application for a hatchery permit is an extensive process (5 AAC 40.110–230). A preliminary application is submitted to ADF&G. The application consists of the goals of the hatchery, production goals, hatchery site information, water flow and chemistry data, land ownership and water rights, hatchery design, proposed broodstock, and a financial plan. ADF&G staff review the application with the applicant, address any deficiencies, and finalize the application. The RPT reviews the hatchery plan to determine if the hatchery operation is compatible with the regional comprehensive salmon plan. A public hearing is then held, where the applicant describes the proposed hatchery and ADF&G staff present the basic management plan for the hatchery. Public oral and written testimony and questions follow the presentations, and ADF&G must respond in writing to any specific objections.

Following review by the RPT and the public hearing, the application is sent to the ADF&G commissioner[4] for final consideration. By regulation (5 AAC 40.220) the commissioner's decision is based on the following considerations: (1) the suitability of the site for making a reasonable contribution to the common property fishery, not adversely affect management of wild stocks, and not require significant alterations of traditional fisheries; (2) the operation of the hatchery makes the best use of the site's potential to benefit the common property fishery; (3) the harvest area size at the hatchery is sufficient in size to provide a segregated harvest of hatchery fish of acceptable quality for sale; (4) proposed donor sources can meet broodstock needs for the hatchery for the first cycle; (5) water sources for the hatchery are secured by permit and are of appropriate quality and quantity; and (6) the hatchery has a reasonable level of feasibility and success.

Public participation is an integral part of the PNP hatchery system. Hearings are held before a hatchery is permitted for operation. RPTs comprised of ADF&G and RAA staff hold public meetings to define desired production goals by species, area, and time, and document these goals in comprehensive salmon plans (5 AAC 40.300). RPTs hold public meetings to review

[4] In this document, *commissioner* refers to the ADF&G commissioner or the commissioner's designee.

applications for new hatcheries and to make recommendations to the ADF&G commissioner regarding changes to existing hatchery operations, new hatchery production, and new hatchery facilities. Municipal, commercial, sport, and subsistence fishing representatives commonly hold seats on both RAA and independent PNP hatchery organization boards, providing broad public oversight of operations.

Alaska PNP hatcheries operate under 4 documents required in regulation (5 AAC 40.110–990 and 5 AAC 41.005–100) and statute (AS 16.05.092): hatchery permit with basic management plan (BMP), annual management plan (AMP), fish transport permit (FTP), and annual report (Figure 2).

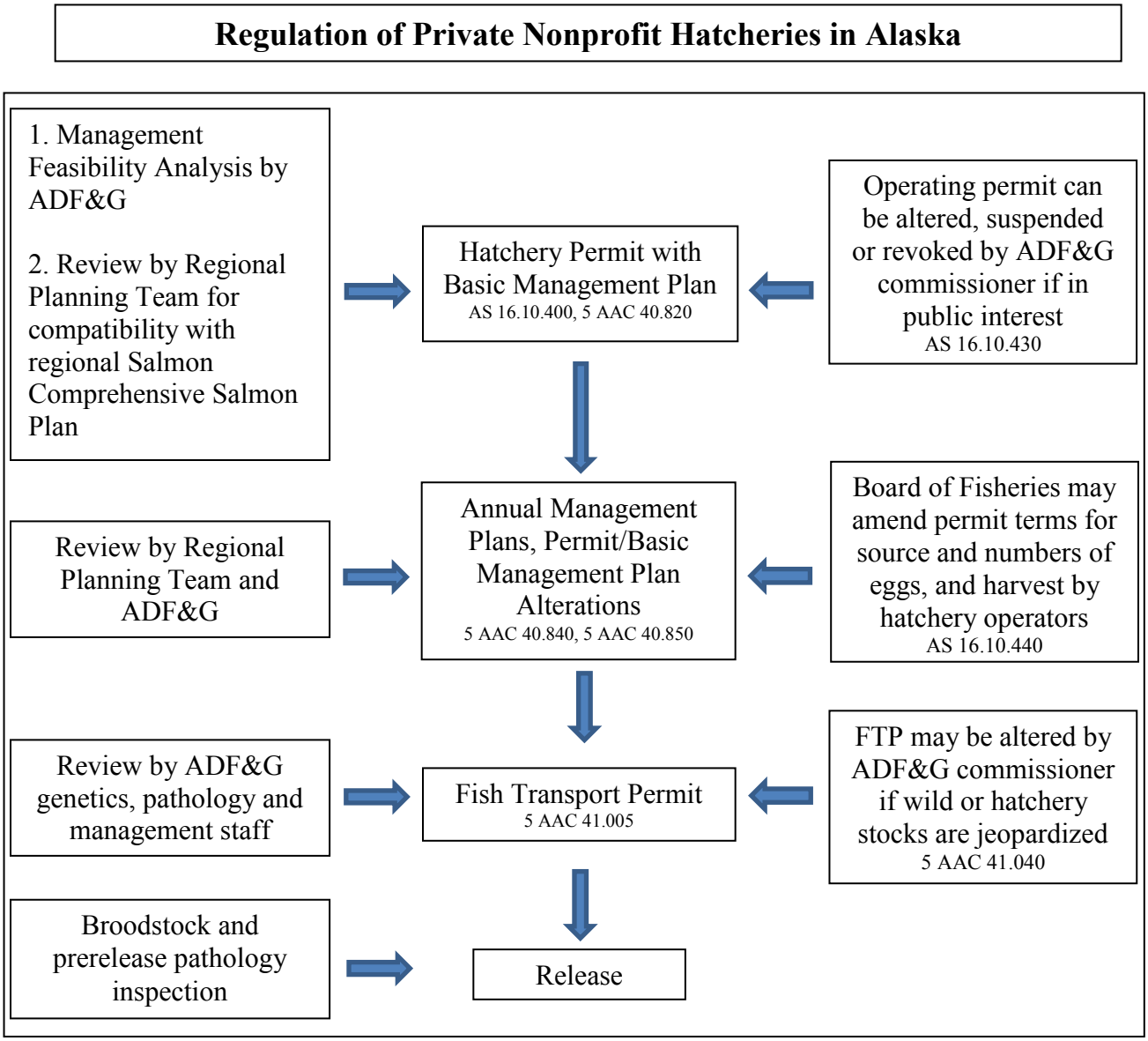

Figure 2.–Diagram of Alaska hatchery permitting process.

The hatchery permit authorizes operation of the hatchery, specifies the maximum number of eggs of each species that a facility can incubate, specifies the authorized release locations, and may identify stocks allowed for broodstock. The BMP is an addendum to the hatchery permit and outlines the general operations of the hatchery. The BMP may describe the facility design, operational protocols, hatchery practices, broodstock development schedule, donor stocks, harvest management, release sites, and consideration of wild stock management. The BMP functions as part of the hatchery permit and the 2 documents should be revised together if the permit is altered. The permit and BMP are not transferrable. Hatchery permits remain in effect unless relinquished by the permit holder or revoked by the ADF&G commissioner.

Hatchery permits/BMPs may be amended through a permit alteration request (PAR). Requested changes are reviewed by the RPT and ADF&G staff and a recommendation is sent to the ADF&G commissioner for consideration. If no agreement is reached through the RPT, the PAR is sent to the commissioner without a recommendation. If approved by the commissioner, the permit is amended to include the alteration. Reference to a *permit* or *hatchery permit* in this document also includes approved PARs to the hatchery permit unless otherwise noted.

The AMP outlines operations for the current year. It should "organize and guide the hatchery's operations, for each calendar year, regarding production goals, broodstock development, and harvest management of hatchery returns" (5 AAC 40.840). Typically, AMPs include the current year's egg-take goals, fry or smolt releases, expected adult returns, harvest management plans, FTPs (described below) required or in place, and fish culture techniques. The AMP must be consistent with the hatchery permit and BMP.

An FTP is required for egg collections, transports, and releases (5 AAC 41.001–41.100, Appendix B). The FTP authorizes specific activities described in the hatchery permit and management plans, including broodstock sources, gamete collections, and release sites. All FTP applications are currently reviewed by the ADF&G fish pathologist, fish geneticist, regional resource development biologist, and other ADF&G staff as delegated by the ADF&G commissioner. Reviewers may suggest conditions for the FTP. Final consideration of the application is made by the ADF&G commissioner or commissioner's delegate. An FTP is issued for a fixed time period and includes both the specifics of the planned operation and any conditions added by ADF&G.

Each hatchery is required to submit an annual report documenting egg collections, juvenile releases, current year run sizes, contributions to fisheries, and projected run sizes for the following year (AS 16.10.470). Information for all hatcheries is compiled into an annual ADF&G report to the Alaska Legislature (e.g., Vercessi 2014).

The administration of hatchery permitting, planning, and reporting requires regular and direct communication between ADF&G staff and hatchery operators. The serial documentation from hatchery permit/BMP to AMP to FTP to annual report spans generations of hatchery and ADF&G personnel, providing an important history of each hatchery's species produced, stock lineages, releases, returns, and pathology.

NEETS BAY HATCHERY OVERVIEW

Neets Bay Hatchery is located in Neets Bay on Behm Canal 35 air miles north of Ketchikan, Alaska on the west coast of Revillagigedo Island (Figure 3). The Southern Southeast Regional Aquaculture Association (SSRAA) operates Neets Bay Hatchery and constructed the facility in 1983. Neets Creek and Bluff Lake are the water sources for the hatchery. In 1982, SSRAA applied to the Alaska Department of Natural Resources for water rights for Neets Bay Hatchery. A water right certificate (ADL#103273) was issued 04/04/2007.

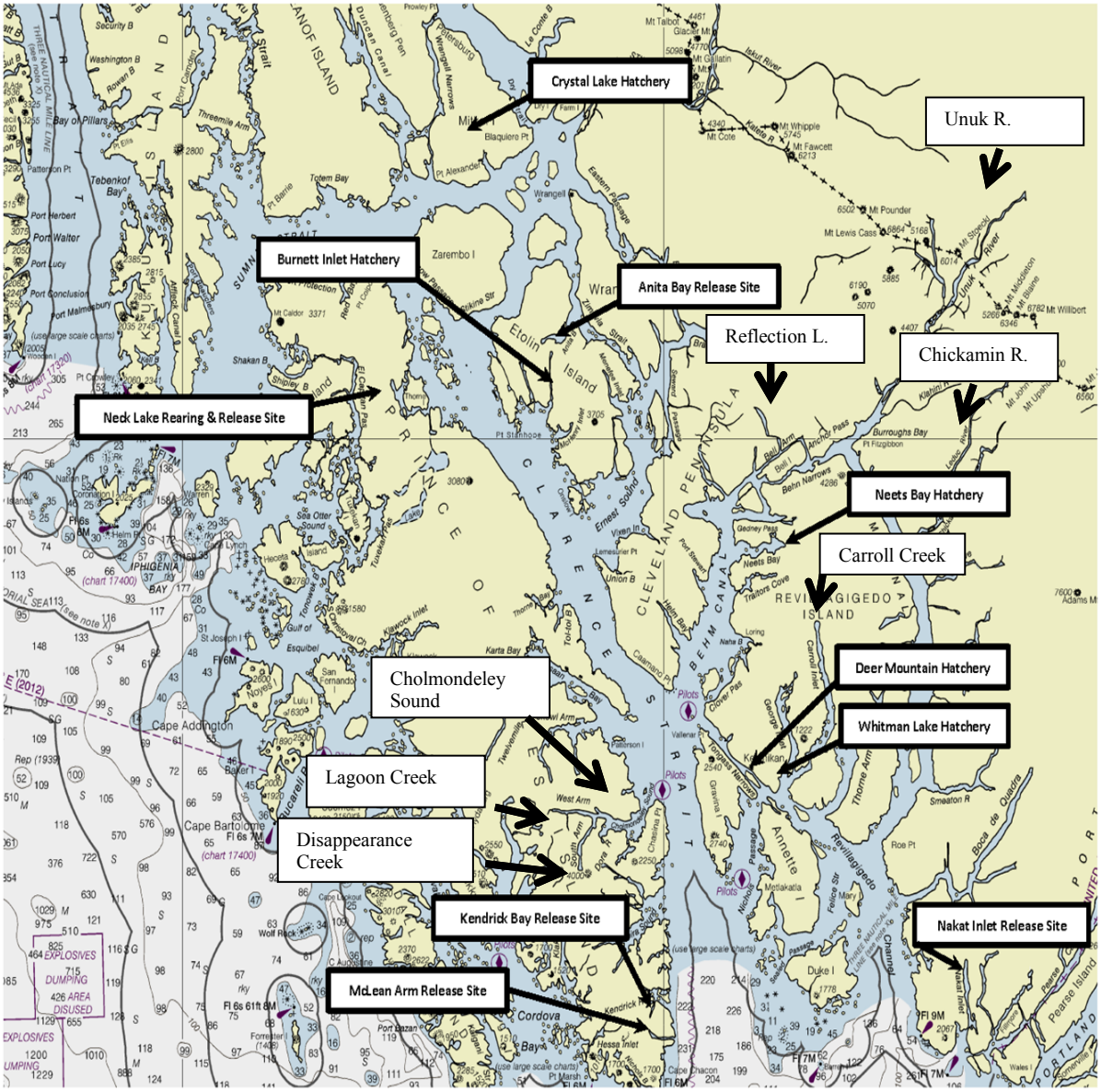

Figure 3.–Neets Bay Hatchery, release sites, and wild stock donor systems.

SSRAA applied for a PNP hatchery permit for the facility in 1982. The preliminary application requested a capacity of 60 million chum, 5 million coho, and 2 million Chinook salmon eggs.

The preliminary application requested summer and fall run chum salmon, fall run coho salmon, and Chinook salmon production. Since 1980, Neets Bay had served as a release site for Whitman Lake Hatchery, so the new hatchery site already had broodstock returns of fall run chum salmon (Disappearance Creek stock, a.k.a. Cholmondeley Sound stock) and fall run coho salmon (Indian Creek, a tributary of the Chickamin River, stock) onsite. The Unuk River stock Chinook salmon returning to Whitman Lake Hatchery was requested as the Chinook salmon donor broodstock. The hatchery return to Nakat Inlet (Whitman Lake Hatchery/Carroll River stock) was proposed as the summer run chum salmon broodstock.

Since Neets Bay was already in use as a release site, the fall run chum and coho salmon had been vetted during the permitting of FTPs under Whitman Lake Hatchery's permit. The new proposed summer chum salmon were projected to pose no problems in management. The proposed increased chum salmon releases did cause some concern as to whether the Behm Canal area could support the increased releases alongside naturally occurring pink and chum salmon production. ADF&G management staff recommended an evaluation of these factors as a condition of the BMP, and recommended that hatchery production be reduced if the evaluation showed negative impacts to the wild stocks.[5]

Managers did not foresee management problems with production of Chinook or coho salmon at the hatchery. The issue of coho and Chinook salmon predation on wild chum and pink salmon stocks was a concern. ADF&G staff recommended that coho and chum salmon smolt be released at the same time to minimize impacts of predation on wild stocks. In addition, staff recommended studies to evaluate predation as a condition of the BMP. If predation was determined to be a problem, then special conditions, such as offsite releases, production decreases, and different smolt release timing could be required. [6]

The Southern Southeast RPT recommended to the ADF&G commissioner that research be conducted to assess the issues. The director of the FRED Division recommended that given budget constraints at the time, it would be better to proceed with the programs and measure the results.[7]

The hatchery permit application was submitted in 1982, and the Southern Southeast RPT unanimously recommended approval. The application was for production of 60 million chum, 5 million coho and 2 million Chinook salmon eggs. Fall run Whitman Lake Hatchery/Cholmondeley Sound stock chum salmon and Whitman Lake Hatchery/Indian Creek coho salmon were already returning to Neets Bay from releases of Whitman Lake Hatchery fish, and these would serve as broodstock for the hatchery. Summer run chum salmon were to be obtained from Whitman Lake Hatchery/Carroll River returns to Nakat Inlet.

Chinook salmon brood stock sources proposed were from the Keta River, Chickamin River, or as a last resort, the Whitman Lake Hatchery/Unuk River stock. The draft BMP indicated that Chinook salmon eggs would be obtained either directly from Unuk River broodstock or from Unuk River stock returns to Little Port Walter Hatchery. ADF&G staff recommended use of Unuk Stocks over Keta and Chickamin River stocks because the Unuk River was closer to Neets

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[5] Memorandum from R. Logan and B. Wilbur, ADF&G, to J. Madden, ADF&G, dated January 12, 1983. Unpublished document obtained from Lorraine Vercessi, ADF&G PNP Coordinator, Juneau.

[6] Memorandum from R. Logan and B. Wilbur, ADF&G, to J. Madden, ADF&G, dated January 12, 1983. Unpublished document obtained from Lorraine Vercessi, ADF&G PNP Coordinator, Juneau.

[7] Memorandum from S. Moberly, ADF&G, to G. Freitag, RPT Chairman, dated March 2, 1983. Unpublished document obtained from Lorraine Vercessi, ADF&G PNP Coordinator, Juneau.

Bay. There was concern that the harvest rates on local Chinook salmon stocks could increase with increased effort targeting the returning hatchery fish.[8]

ADF&G staff questioned what would happen at Whitman Lake Hatchery, which had previously supplied Neets Bay releases, now that Neets Bay Hatchery would be providing for these releases. ADF&G staff requested that future plans for Whitman Lake Hatchery be submitted with the Neets Bay application to view the program in total.[9]

The Petersburg Vessel Owners Association was opposed to the hatchery. Their concerns included (1) SSRAA taking on loans that were beyond the fleet's capacity to repay, (2) opposition to further use of wild broodstock for hatcheries, (3) predation of hatchery coho salmon on wild salmon fry, (4) overharvest of wild stocks in Behm Canal during harvest of Neets Bay Hatchery Chinook salmon returns, and (5) negative impacts to fisheries management due to presence of hatchery stocks.[10] There was apparently no public testimony in opposition to the hatchery at the public hearing.[11]

The ADF&G commissioner approved the application and issued PNP Hatchery Permit number 19 to SSRAA for Neets Bay Hatchery in June 1983. Production limits were 60 million chum, 5 million coho, and 2 million Chinook salmon eggs. Approved stocks on the permit included the Whitman Lake Hatchery/Carroll Inlet summer chum salmon stock and Whitman Lake Hatchery/Indian Creek fall coho salmon returns to Neets Bay, the Whitman Lake Hatchery/ Cholmondeley Sound fall chum salmon stock, and the Unuk River Chinook salmon stock. Conditions in the BMP included limiting production of coho salmon to 2.5 million eggs until the impact of predation on wild pink and chum salmon was assessed.

SSRAA programs are exceptionally integrated among their Whitman Lake, Neets Bay, Burnett Inlet, Port St. Nicholas and Crystal Lake hatcheries.[12] Chum salmon returns to Neets Bay Hatchery serve as broodstock for all SSRAA chum salmon programs. Coho and Chinook salmon returns to Whitman Lake Hatchery serve as broodstock for multiple SSRAA programs. Burnett Inlet Hatchery incubates eggs from Whitman Lake Hatchery broodstock or eyed eggs initially incubated at Whitman Lake Hatchery.

In 2014, returns to SSRAA facilities, including harvest and broodstock, totaled about 57,000 Chinook, 704,000 coho, and 2.3 million chum salmon. Returns by brood year and release site are available from the most current SSRAA annual management plan.[13] Returns by year are available from the most current Alaska Salmon Fisheries Enhancement Program annual report (e.g., Stopha 2016d).

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[8] Memorandum from D. Siedelman, ADF&G, to S. McGee, ADF&G, dated May 3, 1983. Unpublished document obtained from Lorraine Vercessi, ADF&G PNP Coordinator, Juneau.

[9] Memorandum from K. Duffy, ADF&G, to W. Larrick, SSRAA, dated January 5, 1983. Unpublished document obtained from Lorraine Vercessi, ADF&G PNP Coordinator, Juneau.

[10] Letter from S. Mathisen, Petersburg Vessel Owners Association, to D. Collinsworth, ADF&G, dated May 21, 1983. Unpublished document obtained from Lorraine Vercessi, ADF&G PNP Coordinator, Juneau.

[11] Memorandum from J. Madden, ADF&G, to D. Collinsworth, ADF&G, dated June 13, 1983. Unpublished document obtained from Lorraine Vercessi, ADF&G PNP Coordinator, Juneau.

[12] SSRAA owns Whitman Lake, Neets Bay, and Burnett Inlet hatcheries. Crystal Lake Hatchery is owned by the state and operated by SSRAA.

[13] For example, the 2014 Annual Management Plan, Southern Southeast Regional Aquaculture Association. Unpublished document obtained from Lorraine Vercessi, ADF&G PNP Coordinator, Juneau.

This report is sectioned by species and release site. Hatchery permit/BMP, AMP, and FTP documents for Neets Bay Hatchery operations were reviewed to determine that they met the following guidelines:

- They are current.
- They are consistent with each other.
- They are an accurate description of current hatchery practices.

The hatchery permit and BMP do not expire. The BMP should be updated when any permit amendments are approved through PARs. FTPs for all egg takes and transfers are in place and current. Occurrences where permitting was not consistent are discussed under the permitting history for each species and release site.

CHUM SALMON PROGRAM

Neets Bay Hatchery is SSRAA's primary source of summer run and fall run chum salmon broodstock. Egg incubation rearing and release occur at the hatchery. In addition, eggs are transported to Whitman Lake Hatchery and Burnett Inlet Hatchery, and fry are transported to other sites for release.

Donor Stocks

Summer Run Chum Salmon

The summer run chum salmon donor stock was from Carroll River (Figure 3). SSRAA collected summer run chum salmon eggs from Carroll River from 1979 through 1982 for incubation at Whitman Lake Hatchery and release at Nakat Inlet and Neets Bay. From 1982 to 1985, summer run chum salmon eggs were collected from returns to Nakat Inlet for release at Nakat Inlet.

Returns to Neets Bay were used for all of SSRAA's summer run chum salmon programs beginning in 1986. For Nakat Inlet releases, eggs were incubated to the eyed stage at Neets Bay Hatchery (FTP 85J-1064), transferred to Whitman Lake Hatchery for incubation and rearing, and transferred to Nakat Inlet for release (FTP 82J-1058).

Fall Run Chum Salmon

The fall run chum salmon stock was primarily from 2 systems in Cholmondeley Sound—Disappearance Creek and Lagoon Creek (Figure 3). The stock has been collectively referred to as Cholmondeley Sound stock[14] or Disappearance Creek stock. Cholmondeley Sound stock eggs

[14] Initial donor sources approved with the hatchery permit were both fall run stocks—Disappearance Creek for release at Neets Bay and Walker Creek for release at Nakat Inlet. Chum salmon donor stock sources were added to the permit through permit alteration request (PAR) as SSRAA searched for systems that had a large enough return to allow for surplus broodstock to be taken to establish a hatchery stock (Letter from R. Skoog, ADF&G commissioner, to J. Milnes, SSRAA, dated April 21, 1978. Unpublished document obtained from Lorraine Vercessi, ADF&G PNP Coordinator, Juneau). In 1978, seine fleet skippers expressed concern about the potential impact to their fall chum salmon harvest if donor stock was collected from Disappearance Creek. As a result, a PAR was approved in 1978 adding fall run donor stocks, including Hetta Portage Stream, for release at Kendrick Bay, and 3 Walker Cove streams for release at Nakat Inlet or Neets Bay. No chum salmon eggs were collected in 1978 due to poor escapements in the donor systems. A permit amendment in 1979 allowed taking of up to 23 million chum salmon eggs in 1979 from either summer or fall run stocks (Appendix A). The permitted capacity of the hatchery remained at 26 million chum salmon eggs. The primary sources for summer run donor broodstock were the Keta and Carroll Rivers, with King Creek serving as a secondary source. Summer run chum salmon egg takes after 1979 would be restricted to the donor sources used in 1979. The primary source for fall run donor broodstock was the Karta River, with Disappearance Creek serving as a secondary source. The ADF&G commissioner encouraged SSRAA to consider using Disappearance Creek stock, despite SSRAA's reluctance due to the concerns of purse seiners mentioned earlier. Disappearance Creek had a weir in place, and the stock had a later run timing than the other approved donor stocks. ADF&G had a long track record of escapement and management data for the stock, and could manage the return as a single stock

were collected from 1979 to 1983, incubated at Whitman Lake, and released at Neets Bay. Beginning in 1983, Neets Bay returns were used as the broodstock for SSRAA's fall run chum salmon program, with egg incubation at Whitman Lake Hatchery and release at a number of release sites.

HATCHERY PERMIT AND PERMIT ALTERATIONS

This section describes the changes to the permit only as they affected the number of chum salmon eggs permitted for incubation at Neets Bay Hatchery. Permit alterations for chum salmon release levels at particular release sites which did not change the permitted capacity of the hatchery are described after this section for each release site.

The Neets Bay Hatchery Permit was issued with a capacity of 60 million chum salmon eggs. In July 1993, a PAR was approved increasing chum salmon capacity to 80 million eggs. The PAR was supported by the Southern Southeast RPT, and ADF&G staff had no concerns with the increase. The PAR was made due to increased capacity availability at the hatchery (Appendix A).

In 2001, a PAR was approved to transfer 8 million eggs of chum salmon capacity from Neets Bay Hatchery to Whitman Lake Hatchery in order to increase releases at Anita Bay from Whitman Lake Hatchery from 8 million to 16 million fry. The permit amendment decreased chum salmon capacity at Neets Bay Hatchery from 80 million to 72 million eggs.

In 2003, a PAR was approved increasing both Whitman Lake and Neets Bay hatchery production in order to increase chum salmon releases at Kendrick Bay, Anita Bay, and Neets Bay. The Neets Bay Hatchery chum salmon capacity was increased from 72 million to 84 million eggs.

In 2010, a PAR was approved increasing permitted capacity from 84 million to 102.7 million eggs. It also allowed an egg take of an additional 44.3 million eggs for incubation to the eyed stage and transfer to Whitman Lake Hatchery. Over the history of Neets Bay Hatchery, some of the production increases had been in increments of fry while the permitted capacity of the hatchery was in green eggs. The intent of this permit alteration was to adjust the permitted capacity of green eggs to match permitted fry releases; therefore it was considered a "housekeeping" PAR, rather than an increase in production.

Later in 2010, another PAR was approved to allow an additional 25 million eggs taken for incubation to the eyed stage for transfer to Burnett Inlet Hatchery.

Each chum salmon release site is discussed in detail below.

Nakat Inlet Fall Run Chum Salmon

SSRAA operated a fall run chum salmon release program at Nakat Inlet under the Whitman Lake Hatchery permit from 1984 to 1995 (Stopha 2016c). In 1996, the program was transferred to the Neets Bay Hatchery permit through an approved PAR of the Neets Bay Hatchery permit. The transfer did not change permitted capacity at either hatchery.

The permit alteration under the Neets Bay Hatchery permit approved production of 8 million fall run chum salmon eggs for release at Nakat Inlet. Although Whitman Lake Hatchery had been permitted for release of up to 15 million fry when the program was under that permit, only about

fishery such that the fishery could be closed by emergency order to increase escapement to the river for broodstock for the hatchery.

8 million fry were released annually from 1992 to 1995, so the program transfer did not represent a decline in what was actually being released from Nakat Inlet (Appendix C).

When the program transferred to Neets Bay Hatchery, the eggs were collected and incubated at Neets Bay Hatchery and fry released at Nakat Inlet. This required issuance of a new FTP, which did not occur at the time. In addition, AMPs from 1996 to 2000 showed a release goal for Nakat Inlet of 16 million fry, even though Neets Bay Hatchery was only permitted to release 8 million fry.

The oversight in the FTP and disparity in the AMP were apparently discovered in 2000, when a new FTP (FTP 00J-1004) was issued. This is the FTP currently in effect for the fall run program. The FTP permits the transfer of 8 million fry from Neets Bay Hatchery to Nakat Inlet for release. Beginning in 2001, the AMPs also planned for a release of up to 8 million fry at Nakat Inlet.

The release estimates reported by SSRAA exceeded the number permitted in their FTP in several years from 2000 to 2009, due in part to varying year-to-year egg-to-fry survival (Appendix C).

In most years, the overage was 5% or less, and the release numbers were estimates, not actual counts. When the FTP was renewed in 2010, the language in the permit was changed to state a release level of "approximately" 8 million fry to account for survival variance.

In 2012, to provide operational flexibility among SSRAA's facilities, an FTP (FTP 12J-1021) was issued that allowed transport of up to 4 million fall run chum salmon eggs from Neets Bay Hatchery to Whitman Lake Hatchery for incubation and release at Nakat Inlet. The permit exists alongside FTP 00J-1004 as a backup fall chum salmon source for Nakat Inlet.

Neets Bay Fall Run Chum Salmon

The fall run chum salmon program at Neets Bay began under the Whitman Lake Hatchery permit in 1979. Eggs were incubated at Whitman Lake Hatchery and released in Neets Bay from 1980 to 1982. When Neets Bay Hatchery began operations in 1983, eggs were incubated and released there. The FTP for fall run chum salmon releases at Neets Bay was transferred from the Whitman Lake Hatchery permit to the Neets Bay Hatchery permit in 1984. According to the FTP language (FTP 84J-1032), up to 40 million summer run stock eggs and up to 60 million fall run stock eggs could be taken, but the total eggs taken from both stocks could not exceed 60 million.

From 1984 to 1994, FTP 84J-1032 permitted collection and release of up to 60 million fall run chum salmon eggs at Neets Bay Hatchery. The FTP was approved without comment by ADF&G staff. The AMP during this period planned for egg takes of between 20 and 30 million eggs (Appendix D). No FTP was found for the period 1995–1997.

In 1998, SSRAA renewed the FTP for the fall run program and requested a reduction from the 60 million egg maximum allowed under FTP 84J-1032 to a 35 million egg maximum permitted by the new FTP (FTP 98J-1006). ADF&G staff reviewing the permit had no concerns. Unlike the earlier FTP, the new FTP did not include language addressing the total release limit for summer run and fall run stocks.

Neets Bay Summer Run Chum Salmon

In 1982, SSRAA submitted a PAR for Whitman Lake Hatchery to start a summer run chum salmon program at Neets Bay. SSRAA was in the process of obtaining a hatchery permit for the Neets Bay facility, and returns from this release were to be the founding summer run chum

salmon broodstock for the new hatchery. The summer run chum salmon production would be in addition to the fall run chum salmon program already in place.

ADF&G FRED Division staff indicated that the request was not consistent with good genetic practices, and that a summer run stock closer to Neets Bay (Traitors Cove) should be used as donor.[15] ADF&G salmon fishery management staff had no concerns with the PAR.[16] The PAR was approved for collection of 5 million Carroll River stock summer run chum salmon eggs from returns to Nakat Inlet for incubation at Whitman Lake Hatchery and release at Neets Bay. The permit alteration stipulated that when summer run chum salmon began to return to Neets Bay, they could not be used for broodstock for releases elsewhere until potential genetic impacts were assessed of any interbreeding between the summer run and fall run returns. No record of genetic impact assessment was found in the files.

In 1984, the summer run chum salmon releases at Neets Bay Hatchery were transferred from the Whitman Lake Hatchery permit to the Neets Bay Hatchery permit. Up to 40 million summer run chum salmon eggs were permitted to be incubated, reared and released from Neets Bay Hatchery (FTP 85J-1027). In 1999, the FTP was amended to increase the allowable production to 60 million chum salmon eggs. ADF&G staff reviewing the permit had no concerns.

In March 2003, a PAR was approved allowing production of Neets Bay summer run releases to come from either Neets Bay Hatchery or Whitman Lake Hatchery, presumably as a backup contingency measure in the event Whitman Lake Hatchery was needed.

In 2013, the FTP (FTP 85J-1027) was amended to increase releases of summer run chum salmon from Neets Bay from 60 million to 70.5 million. FTPs for egg takes and releases were in place for all transports. The reported egg and release numbers were within permitted levels for all years. The FTP, AMP and hatchery permitted levels were also in agreement (Appendix E).

Anita Bay Summer Run Chum Salmon

In 2000, SSRAA submitted a PAR to move releases of summer chum salmon from Earl West Cove to Anita Bay. The SSRAA Board of Directors believed moving the release site to Anita Bay would provide a higher interception rate of returns in the common property fisheries and provide better quality in the harvest. The permitted release number would remain the same as at Earl West Cove—up to 8 million fry. ADF&G staff had no concerns for the release site move, and the PAR and FTP (FTP 01J-1003) for the project were approved.

In March 2001, a PAR was approved to increase the Anita Bay release from 8 million to 16 million fry. This was done through a transfer of 8 million chum salmon egg capacity from the Neets Bay Hatchery permit to the Whitman Lake Hatchery permit. ADF&G staff were not concerned with the increase because the Anita Bay site was previously permitted to another PNP hatchery operator for release of up to 50 million chum salmon, and most of the returns from those releases were caught in the traditional fishing areas before reaching the Anita Bay terminal area. ADF&G staff suggested test fishing outside of the terminal harvest area prior to hatchery returns to determine a baseline indicator of the wild stocks.[17] In addition, staff recommended that

[15] Memorandum from K. Leon, ADF&G FRED Division, to J. Madden, ADF&G FRED Division, dated Jan. 10, 1983. Unpublished document obtained from Lorraine Vercessi, ADF&G PNP Coordinator, Juneau.

[16] Memorandum from B. Wilbur, ADF&G Division of Commercial Fisheries, to J. Madden, ADF&G FRED Division, dated Jan. 12, 1983. Unpublished document obtained from Lorraine Vercessi, ADF&G PNP Coordinator, Juneau.

[17] W. Bergman, ADF&G, to S. McGee and 11 others, dated April 18, 2001. Unpublished document obtained from Lorraine Vercessi, ADF&G PNP Coordinator, Juneau.

to protect wild stocks (including Stikine River Chinook salmon, Thoms Lake sockeye salmon, and Anita Bay/Olive Cove chum salmon), fishing time outside of the terminal area should not be increased above normal time periods. They recommended that targeted harvest of Anita Bay returns occur only in the terminal harvest area, and that hatchery releases be marked so that straying studies and fishery affects could be adequately monitored.[18] The ADF&G geneticist recommended a stray monitoring program.[19] Later in the FTP review process, the ADF&G geneticist recommended marking, but not stray monitoring, for the project (FTP 01J-1009).

The FTP for release of fry at Anita Bay that were incubated at Whitman Lake Hatchery (FTP 01J-1003) permitted an 8 million fry release. An additional FTP for release of fry at Anita Bay that were incubated at Neets Bay Hatchery (FTP 01J-1009) permitted a release of 6 million fry. As a result, the total release at Anita Bay permitted by FTPs was 14 million fry and the total permitted under hatchery permits was 16 million fry.

In 2003, a PAR was approved to increase the permitted Anita Bay release from 16 million to 22 million fry. The permit alteration also included increases for Neets Bay and Kendrick Bay release sites. The permit alteration increased chum salmon production by 500,000 eggs at Whitman Lake Hatchery (from 43.8 million to 44.3 million eggs). The ADF&G geneticist did not object to the increased releases, but cautioned that the incremental increases to chum production could lead to potentially "swamping" local stocks if all the hatchery returns are not harvested and hatchery fish strayed to local streams.[20] The ADF&G commercial fisheries manager commented that since the last increase, ADF&G had conducted test fishing around Anita Bay and very low numbers of wild chum salmon were caught in the terminal area. In addition, escapements of hatchery chum salmon into the 4 systems at the head of Anita Bay, which were known to not have had chum salmon runs before the hatchery releases, did not subsequently produce returns from any hatchery return escapement. The fishery manager indicated that 22 million fry should be the cap for Anita Bay for 5 years to allow observation of the initial returns and determine any effects on fisheries management in the area.[21] The FTP for releases from Neets Bay (FTP 01J-1009) was amended to allow for a release of up to 22 million fry at Anita Bay, whereas the FTP from Whitman Lake (FTP 01J-1003) remained at an 8 million fry Anita Bay release. The total release from both facilities combined could not exceed 22 million fry.

In 2010, the incubation of eyed eggs and rearing to fry for transfer to Anita Bay was moved from Neets Bay Hatchery to Burnett Inlet Hatchery by a permit alteration to the Burnett Inlet Hatchery permit.

FTPs for egg takes and releases were in place for all transports. The reported egg and release numbers were within permitted levels for nearly all years. The FTP, AMP and hatchery permit levels were also in agreement (Appendix F).

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[18] R. Holmes, ADF&G, to S. McGee and 6 others, dated April 16, 2001. Unpublished document obtained from Lorraine Vercessi, ADF&G PNP Coordinator, Juneau.

[19] D. Moore, ADF&G, to S. McGee, ADF&G, dated April 16, 2001. Unpublished document obtained from Lorraine Vercessi, ADF&G PNP Coordinator, Juneau.

[20] D. Moore, ADF&G, to S. McGee, ADF&G, dated Dec.2, 2002. Unpublished document obtained from Lorraine Vercessi, ADF&G PNP Coordinator, Juneau.

[21] W. Bergman, ADF&G, to S. McGee, ADF&G, dated Dec. 5, 2002 and Jan. 16, 2003. Unpublished document obtained from Lorraine Vercessi, ADF&G PNP Coordinator, Juneau.

Kendrick Bay Summer Run Chum Salmon

In 1990, SSRAA submitted a PAR to increase the permitted capacity for chum salmon at Whitman Lake Hatchery by 14 million eggs (from 31.8 million to 45.8 million eggs) for release at Kendrick Bay. The PAR was to increase harvest opportunity in the District 2 and District 4 net fisheries. The proposed brood source was either Neets Bay Hatchery/Carroll River stock summer chum salmon or Neets Bay Hatchery/Cholmondeley Sound stock fall chum salmon.

The ADF&G commercial fisheries area management biologist recommended against release of fall run chum salmon. An intense commercial net fishery occurred on the east shore of Prince of Wales Island, along the likely route of returns to Kendrick Bay, and a large influx of hatchery fish in the catch would alter the historic catch per unit effort estimates upon which the fishery was managed. The port sampling program conducted during the summer fisheries was not operated in the fall, so accurate hatchery and wild stock catch estimates during the fall were not available.

The area manager did support a summer run chum salmon release. A hatchery return in late June through mid-July could draw boats away from the District 104 fishery (taking pressure off of these stocks), and could be harvested early in the season in District 2 during openings managed for pink salmon. In addition, the return timing of summer run chum salmon was expected to overlap little with the natural pink salmon runs in Kendrick Bay. If the hatchery return drew a larger fleet that intensified pressure on pink stocks, the lower District 2 area would need to be managed more conservatively in years of weak pink salmon returns. [22]

The ADF&G fish pathologist indicated there were no disease concerns. No comments were found from ADF&G genetic staff for the PAR.

In May 1990, the deputy commissioner approved the PAR for up to 14 million summer run chum salmon eggs for release at Kendrick Bay. The FTP for the program (FTP 90J-1052) permitted eggs to be collected at Neets Bay, transported to Whitman Lake Hatchery for incubation and hatching, and the fry transported to Kendrick Bay for rearing and release.

In 2003, SSRAA submitted a PAR to increase the number of summer chum salmon eggs for the project from 14 million to 20 million eggs. SSRAA requested that production from either Whitman Lake Hatchery or Neets Bay Hatchery could be used for any of the 3 release sites (Kendrick Bay, Anita Bay, and Neets Bay Hatchery), as the same broodstock was used at both hatcheries. The PAR was intended to provide more chum salmon harvest opportunity for commercial fishermen in the Wrangell and Ketchikan areas, and provide backup egg options for SSRAA release sites. The PAR was approved for increased releases at Kendrick Bay (FTPs 03J-1008, 08J-1020, 08J-1022) under either the Neets Bay or Whitman Lake hatchery permits. The ADF&G geneticist had the same comments as those for Anita Bay releases in the previous section.

In 2010, a PAR was submitted under the Neets Bay Hatchery permit to increase releases at Kendrick Bay from 20 million to its current release level of 30 million fry. The increase at Kendrick Bay was intended to increase the purse seine and troll harvests to address an imbalance in the allocation of Alaska hatchery fish between drift gillnet, purse seine, and troll gears. The Southern Southeast RPT recommended approval of the PAR by a vote of 5-1, with the

[22] Memo from P. Doherty, ADF&G, to G. Gunstrom, ADF&G, dated 4/24/89. Unpublished document obtained from Lorraine Vercessi, ADF&G PNP Coordinator, Juneau.

opposition vote citing the need for more time to evaluate management concerns and a commitment of money for long-term assessment of straying. The deputy commissioner approved the PAR in June, 2010. [23] The FTP for the project (FTP 12J-1013) was approved without concern.

FTPs for egg takes and releases were in place for all transports. The reported egg and release numbers were within permitted levels for nearly all years. The FTP, AMP and hatchery permitted levels were also in agreement (Appendix G).

COHO SALMON PROGRAM

In the early 1980s, Neets Bay returns had been the source for most or all of SSRAA's fall run coho salmon production. Neets Bay Hatchery also became the source of fall run chum salmon eggs for SSRAA's programs. Since the fall run chum and coho salmon returns overlapped in timing, sorting the 2 species for acquiring broodstock became difficult. Gradually, more broodstock was used from Whitman Lake Hatchery fall coho returns.

Neets Bay is now the largest release site for SSRAA fall run coho salmon. Eggs and smolt are usually transferred from Whitman Lake Hatchery, where most SSRAA fall run coho salmon broodstock are collected. Eggs are incubated, reared and released from Neets Bay Hatchery and other release sites. Smolt are reared and released from Neets Bay as well.

Donor Stocks

Fall run coho salmon

Fall run coho salmon gametes were collected from Indian Creek, a tributary of the Chickamin River (Figure 3) in 1978, 1979, and 1980. All eggs were incubated at Whitman Lake Hatchery. The offspring were released from Whitman Lake Hatchery and Neets Bay. Beginning in 1981, broodstock from hatchery returns were used for egg takes.

HATCHERY PERMITTED CAPACITY HISTORY

Neets Bay Fall Run Coho Salmon

Beginning in 1983, Neets Bay Hatchery was operational. Neets Bay Hatchery was permitted for 5 million Whitman Lake Hatchery/Indian Creek stock eggs under the hatchery permit. However, the Neets Bay Hatchery BMP limited production to 1.95 million eggs in 1983 and 2.5 million eggs in 1984, with subsequent year egg levels "to be determined" until ADF&G staff concerns of coho salmon smolt predation on pink and chum salmon fry were addressed.

In September 1983, SSRAA submitted a PAR to increase coho salmon egg collections for Neets Bay Hatchery from 1.95 million eggs to 5.0 million eggs. In their PAR application, SSRAA stated that ADF&G's request in the Neets Bay Hatchery BMP to limit coho salmon production until research was conducted regarding coho predation on pink salmon was not justified because the region had seen record pink salmon harvests in spite of increased coho salmon hatchery production. SSRAA believed that the request did merit study, but should not restrict their progress in coho salmon production until definitive results were available. [24]

[23] Draft minutes by Garold Pryor from the Northern/Southern Southeast regional planning team meeting on Monday, April 26, 2010. Unpublished document obtained from Lorraine Vercessi, ADF&G PNP Coordinator, Juneau.

[24] Letter from W. Griffioen, SSRAA, to J. Madden, ADF&G, dated Sept. 12, 1983. Unpublished document obtained from Lorraine Vercessi, ADF&G PNP Coordinator, Juneau.

ADF&G salmon management staff did not support increased releases at Neets Bay Hatchery pending an assessment of coho salmon predation. As part of their recommendation for approval of the PAR, the Southern Southeast RPT recommended a study to determine optimum number, time, and locations of releases of the Neets Bay coho salmon smolt. The ADF&G commissioner approved the amendment to the BMP for Neets Bay Hatchery. Although eggs could be collected up to the full permitted number of 5 million eggs, the final disposition of the smolts from these eggs would be determined by a panel of ADF&G and SSRAA staff to determine an optimum number, time, and location of the releases to address the predation concerns.

A coho predation study was conducted annually from 1986 to 1988. Juvenile coho salmon were captured in Neets Bay and Carroll Inlet (near Whitman Lake Hatchery) and their stomach contents examined to determine the extent of predation on pink and chum salmon. Hofmeister et al. (1988) concluded that coho salmon did feed on pink and chum salmon, and that delaying the release of hatchery coho salmon until mid-June could reduce the impacts of predation. They found predation declined over time from mid-May to mid-June; however, the target release date for coho smolt in 1989 and later from Neets Bay remained at about June 1 as it had since 1983.[25]

An FTP issued in 1984 under the Neets Bay Hatchery permit (FTP 84J-1033) permitted the collection of 4.5 million eggs for incubation, rearing, and release at Neets Bay. In 1998, FTP 98J-1007 was issued and replaced FTP 84J-1033 for the same production level (4.5 million eggs) under the Neets Bay Hatchery permit. This is the current FTP authorizing the Neets Bay Hatchery releases for coho salmon that are incubated from green egg to smolt and released at Neets Bay Hatchery. Apparently, there was a lapse in permitting when FTP 84J-1033 expired in 1994 and when FTP 98J-1007 was approved in 1998.

FTP 05J-1008 was issued in 2005 and permits a backup egg source for this program. Broodstock may be taken from Neets Bay returns in the event sufficient broodstock is not available at Whitman Lake Hatchery. Currently, Neets Bay is the only release site permitted under the Neets Bay Hatchery permit.

Egg take and release permitting issues with the Neets Bay release site are primarily related to Whitman Lake Hatchery permitting. See Stopha (2016c) for further detail, as well as notes in Appendix H.

CHINOOK SALMON PROGRAM

Donor Stocks

Unuk River Stock

Unuk River stock Chinook salmon broodstock at Neets Bay was developed from releases of Unuk River stock eggs obtained from Deer Mountain Hatchery, Little Port Walter Hatchery, Whitman Lake Hatchery, and eggs collected directly from Unuk River (Cripple Creek tributary; Figure 3) beginning in 1983. From 1986 to 1990, Neets Bay Hatchery returns were used for broodstock. In 1991, the Neets Bay Hatchery switched Chinook salmon production to Chickamin River stock.

[25] 1983–2014 AMPs indicate the annual target release date was May 31 or June 1 each year, except for earlier release dates to test for marine survival.

Chickamin River Stock

Chickamin River (Figure 3) stock was developed at Whitman Lake Hatchery. Eggs were collected from Chickamin River broodstock from 1983 to 1987, incubated at Whitman Lake Hatchery, and released (FTP 83J-1017).[26] Beginning in 1988, Whitman Lake Hatchery returns were used for broodstock at Whitman Lake Hatchery. The first transfer of Chickamin River stock eggs to Neets Bay occurred in 1991.

Hatchery Permit Amendments

The Neets Bay Hatchery permit was issued in 1983 with a capacity of 2 million Chinook salmon eggs. Unuk River stock was the approved brood source. In 1985, SSRAA submitted a PAR to increase capacity at Neets Bay Hatchery to 4 million Chinook salmon eggs to increase the common property harvest.[27] The additional 2 million eggs could be taken from 1985 Unuk River stock returns to Whitman Lake Hatchery for incubation and release at Neets Bay. Some ADF&G staff recommended rejecting the PAR because they felt that under the recently signed Pacific Salmon Treaty, the returns might not be harvested in traditional fisheries due to the treaty restrictions. As a result, large numbers of hatchery Chinook salmon could return to West Behm Canal and Neets Bay, which is a wild stock Chinook salmon migration corridor, and increased effort there could increase harvest of the wild stocks. Other concerns included the unknown quality of the fish when they reached the terminal area and the unknown ability of the troll fleet to harvest them in the terminal area.[28] The PAR was approved increasing Chinook salmon capacity to 4 million eggs for 1 year only, pending evaluation of Chinook salmon enhancement strategies and fisheries management considerations (Appendix A).

The following year, SSRAA submitted a PAR to make the temporary increase in 1985 permanent. Some ADF&G staff had the same concerns as in 1985, as only 1 year of further data was now available and not conclusive. The PAR was again approved in 1986 to increase Chinook salmon capacity to 4 million eggs for 1 year only.

In 1987, the permitted capacity at Neets Bay returned to 2 million Chinook salmon, which is the current permitted capacity for this species.

The history of permitting for each Chinook salmon release site follows.

Neets Bay Chinook Salmon Release Site

A PAR approved for Whitman Lake Hatchery in May 1983 allowed the transfer of up to 200,000 Little Port Walter Hatchery/Unuk River (Cripple Creek) stock Chinook salmon smolt from Whitman Lake Hatchery to Neets Bay for rearing and release in 1983 only (FTP 83J-1015, Appendix I). Eyed eggs were transferred from Little Port Walter Hatchery to Whitman Lake Hatchery in 1981, incubated and reared at Whitman Lake Hatchery until 1983, and smolt transferred to Neets Bay for imprinting and release in 1983. Transfers of Unuk River stock eggs from Little Port Walter Hatchery (FTP 84J-1046), Deer Mountain Hatchery (FTP 84J-1048), and

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[26] Chickamin River stock eggs were also received from Little Port Walter Hatchery in 1981 (FTP 81-251) and 1987 (FTP 87J-1021) for release at Carroll Inlet. The brood year 1981 Little Port Walter Hatchery/Chickamin River stock Chinook salmon eggs received by Whitman Lake Hatchery and released into the Carroll River in 1982 were apparently a study to evaluate instream fry plants (FTP 82J-1006).

[27] Letter from K. Johnson, SSRAA Operations Manager, to H. Heinkel, ADF&G, dated 4/1/1985. Unpublished document obtained from Sam Rabung, ADF&G Aquaculture Section Chief, Juneau.

[28] Memorandum from D. Cantillon, ADF&G, to S. McGee, ADF&G, dated July 9, 1985. Unpublished document obtained from Sam Rabung, ADF&G Aquaculture Section Chief, Juneau.

the Unuk River (FTP 84J-1047) wild stock were permitted under the Neets Bay Hatchery permit beginning in 1984. Unuk River stock eggs were collected from returns to Whitman Lake Hatchery and transferred to Neets Bay Hatchery in brood year 1985 for incubation, rearing, and release, but no FTP authorizing the transfer was found.

The Neets Bay Hatchery permit allowed for donor sources to be finalized through FTPs approved by ADF&G. In 1991, SSRAA submitted an FTP to change stocks at the Neets Bay release site from Unuk River stock to Chickamin River stock for Neets Bay releases. At the time, Neets Bay Hatchery was permitted for production of 2 million Neets Bay/Unuk River stock eggs for release from the hatchery (FTP 85J-1028). Egg-take goals were not being met due to a limited holding area, high water temperatures, disease issues, and low water.

The FTP application requested use of up to 1.5 million Whitman Lake Hatchery/Chickamin River stock eggs to make up for a shortfall in broodstock availability. Eggs would be collected at Whitman Lake and then transferred to Neets Bay Hatchery, thereby bypassing the adult broodstock collection problems at Neets Bay Hatchery. The request was denied, primarily because the ADF&G geneticist indicated that the release would lead to undesirable hybridization of returns at Neets Bay Hatchery if returns were used from both stocks for broodstock.

A second FTP request was made with additional information. SSRAA stated that they did not intend to use Neets Bay Hatchery returns for broodstock while both stocks were returning. They would continue to use solely returns to Whitman Lake Hatchery for Chickamin River stock eggs for release from Neets Bay. In addition, SSRAA reviewed available information from tag recoveries, and concluded that the stray rate of Neets Bay Chinook salmon releases to other systems was low.

Most of the reviewers of the resubmitted FTP continued to recommend denial of the permit. Some believed the Unuk River stock should remain in use at Neets Bay because the Unuk River was the closest Chinook salmon system to Neets Bay, and that straying to the Unuk River system by Chickamin River stock could potentially cause deleterious genetic effects. Some were concerned that use of Chickamin River stock at Neets Bay Hatchery would mean that Chickamin River stock would then be in production as broodstock at more than 3 hatchery facilities and exceed the *Genetic Policy* (Davis et al. 1985) guideline. Several reviewers did not believe that Chickamin River stock would provide any better returns than the Unuk River stock, and that a different release site should be explored. Reviewers supporting the project indicated that Neets Bay Hatchery should be used for incubation and rearing only, with offsite release in a less sensitive area,[29] and that the project should be rigorously debated at the RPT and Chinook Salmon Planning Team meetings. The ADF&G pathologist did not find any health concerns for the permit.[30] The commissioner approved the FTP (FTP 91J-1039) for collection of 1.5 million Whitman Lake Hatchery/Chickamin River stock Chinook salmon eggs at Whitman Lake Hatchery for incubation and rearing at Whitman Lake Hatchery and then transfer and release at Neets Bay.

[29] Meaning in a location more distant from major Chinook salmon systems. Neets Bay is near both Chickamin River and Unuk River systems.

[30] ADF&G staff comments on FTP 91J-1039 in June and July, 1991. Unpublished document obtained from Sam Rabung, ADF&G Aquaculture Section Chief, Juneau.

The last year of any Chinook salmon broodstock collection at Neets Bay was 1990. Subsequent releases of Chinook salmon from Neets Bay were permitted under the Whitman Lake Hatchery using eggs collected from broodstock returning to Whitman Lake Hatchery (Stopha 2016c).

In review of permitting for the Neets Bay release site, egg takes and releases were within permitted limits in nearly all years (Appendix I).

COMPREHENSIVE SALMON ENHANCEMENT PLAN

Three phases of Comprehensive Salmon Plans (CSP) have been developed to date in Southeast Alaska. Phase I[31] set goals for salmon production in Southeast Alaska. The Phase II CSP[32] provided planning to achieve the goals of the Phase I CSP. The Phase III CSP (Duckett et al. 2010) focused on integrating hatchery production increases with natural production to sustainably manage fisheries.

The long-range (year 2000) harvest objectives for the Phase I CSP were to increase the harvest in Southeast Alaska by 537,000 Chinook, 2.1 million sockeye, 2.65 million coho, 30.0 million pink and 9.7 million chum salmon. Some of the harvest objectives could be achieved by better management. The remainder of the harvest objectives could be achieved through increased hatchery production. The estimated hatchery production necessary to meet the long-term harvest objectives at the time was 134,000 Chinook, 1.4 million sockeye, 1.1 million coho, 14 million pink, and 4.6 million chum salmon. Neets Bay Hatchery operated in support of filling these desired production gaps.

In the Phase I Plan, SSRAA established goals to increase salmon production for commercial, sport and subsistence users in Southern Southeast Alaska (commercial salmon fishing districts 1-8), to provide fishermen more time and area to fish, and to reduce gear crowding and intergear conflicts.

SSRAA held workshops for stakeholders for input on the plan. Participants' top 5 values included making a decent living from salmon fishing, maintaining an independent lifestyle, reducing costs and becoming more efficient, enjoying catching salmon and the challenges of the sea, and fishing more days during the season. Some of the problems mentioned regarding fishing included the harvest management decisionmaking process, not enough salmon in the water, area closures, and crowding of gear. Regarding increased production, seiners preferred chum, pink, sockeye, and coho salmon; gillnetters preferred chum, coho, and sockeye salmon; and trollers preferred Chinook and coho salmon. When asked if they felt "favorable," "unfavorable," or had "mixed feelings" towards 3 restoration options—management,[33] rehabilitation,[34] and supplemental production (hatcheries)[35]—for increasing stocks, just 36% of SSRAA respondents were favorable towards supplemental production compared to 73% of NSRAA respondents. For the remainder of SSRAA respondents, 32% had unfavorable feelings about supplemental

[31] Comprehensive salmon enhancement plan for Southeast Alaska: Phase I. Joint Southeast Alaska regional planning team, 1981. Unpublished document obtained from Sam Rabung, ADF&G Aquaculture Section Chief, Juneau.

[32] Comprehensive Salmon Plan, Phase II: Southern Southeast Alaska. Southern Southeast Alaska regional planning teams, September 1983. Unpublished document obtained from Sam Rabung, ADF&G Aquaculture Section Chief, Juneau.

[33] Management refers to managing harvest to obtain spawning escapements needed for optimum production.

[34] Rehabilitation refers to rebuilding a depressed stock to former levels of production through hatchery produced supplementation.

[35] Supplemental production, or *enhancement,* refers to building a hatchery stock to production levels that exceed natural or wild production capability.

production, and the remaining 32% had mixed feelings; 91% of SSRAA respondents were favorable towards rehabilitation and 72% favorable towards management.

Processors indicated a preference for increased production of coho, Chinook, and chum salmon. Chum salmon was preferred to pink and sockeye salmon because it's relatively large size made it ideal for processing as salmon steaks. A special demand was expressed for bright fall chum salmon for the fresh/frozen market because it filled a gap after the fall coho season waned. Processors indicated their major problems processing salmon was unpredictable and widely fluctuating supplies of salmon. They desired more reliable harvests extended over longer periods to allow for more efficient use of existing capacities and production of higher quality products.

From a management perspective, pink salmon hatchery production was not recommended because wild pink salmon stocks were managed on harvest data, and if hatchery-produced fish returned with wild stocks, management precision would decrease. Thermal marking of hatchery stocks had not yet been developed, and stock separation from tagging alone was not practical for inseason management because of the large number of releases that would need to be tagged and the large sampling effort required for tag recovery.

Like pink salmon, coho salmon was managed on harvest data. Tagging and harvest sampling, however, was seen as a practical tool for coho salmon due to the lower volume of releases and returns. Coho salmon hatchery production was expected to contribute increasingly larger numbers to the coho salmon harvest.

Hatchery production of sockeye salmon at the time consisted primarily of freshwater egg plantings and fry stockings, as rearing to the smolt stage was limited due the species' susceptibility to the infectious hematropoietic necrosis virus (IHNV).

Chinook salmon hatchery production was expected to be a vital component in attaining desired production levels, but at the time, there was a lack of data on producing Southeast Alaska Chinook salmon. In addition, depressed wild stocks provided few options for obtaining necessary broodstock until stocks recovered.

Chum salmon was the most preferred species for hatchery production. Summer run chum salmon would be caught during existing fisheries managed for pink and sockeye salmon so their presence would not affect wild stock management. Fall run chum salmon could generally be discretely managed and harvested in most areas of Southeast Alaska, except where significant stocks occurred naturally and were specifically managed for. According to the CSP, at the time, half of world production of chum salmon was coming from hatcheries, and thus production techniques were well established.

Phase II CSP planning identified projects and plans to meet the Phase I harvest objectives, and the RPTs for northern and Southern Southeast Alaska developed separate plans. The Southern Southeast Alaska CSP Phase II was issued in 1983.[36] Subsequent Phase II CSP plan updates were issued yearly through 1995.

In the initial Phase II CSP, hatchery opportunities were prioritized from "A" (high priority) to "B" (medium priority) to "C" (lower priority). Priorities were based on such things as feasibility, wild stock management concerns, and potential for harvest in the commercial fisheries. Production of Chinook salmon at Neets Bay was mentioned as a high priority project as well.

[36] Ibid.

The 1984 Phase II CSP update noted that Neets Bay Hatchery was nearing completion and that all Unuk River brood from Whitman Lake Hatchery were to be moved to Neets Bay Hatchery to establish the brood for the facility.

The 1985 Phase II CSP update began tracking progress of the plan towards achieving the harvest gaps identified in the Phase I CSP, noting each hatchery's contribution to the total. Neets Bay returns were a major contributor to Chinook, coho, and chum salmon production.

With the maturation of the salmon enhancement program, the harvest target objectives and programs in the Phase I and Phase II CSPs were replaced with objectives in the Phase III CSP[37] that supported an overriding goal to enhance the salmon fishery while minimizing the impact of enhancement on wild stocks. These new objectives included (1) minimizing the impact of hatchery stocks on wild stocks, (2) maintaining existing production potential for wild and enhanced stocks, (3) assuring that increases in hatchery production are consistent with region-wide goals and allocation plans, and (4) updating the RPT process periodically to provide status reports and recommendations in a timely manner.

The Phase III CSP provided *best practice* guidelines for enhancement planning to provide a systematic approach to project formulation and the decision-making process. Guidelines were developed for fishery supplementation, wild stock supplementation, and colonization. Four standards are to be documented in developing a fishery supplementation project: (1) the release site has an adequate freshwater supply for imprinting and is not in close proximity to significant wild stocks, (2) fish are adequately imprinted to the release site, (3) releases are marked and contribute to the harvest without jeopardizing the sustainability of wild stocks, and (4) the terminal area enables harvest or containment of all returning adults. These standards were to meet the Policy for the Management of Sustainable Salmon Fisheries (5 AAC 39.222) developed by the Alaska Board of Fisheries and ADF&G.

The Phase III CSP provided a stock appraisal tool for assessing the *significance* of stocks for assessment of projects with regard to the significant stock references in the *Genetic Policy* (Davis et al. 1985). The Phase III CSP states that significance is more complex than a simple production number because some of the region's most viable fisheries depend on aggregates of wild stocks, each of which is not very large. Diversity among wild stocks is a key factor in maintaining production capacity and the potential to maximize harvest opportunities over time. The tool identified 6 stock characteristics of consideration: wildness, uniqueness, isolation, population size, population trend, and the stock's economic and/or cultural significance.

The Phase III CSP also provided a framework for assessment of new projects: "All projects will have an approved evaluation plan to assess impacts and measure success. This plan will describe how the project benefits will be measured and include a method for detecting negative or unintended impacts. An evaluation plan includes (A) fish identification (marking) method to be used; (B) mark–recovery plan for common property and terminal site harvests; (C) identification of potential ecological and genetic impacts that might warrant evaluation, a strategy to detect them, and criteria to determine when measured impacts would warrant project modification; (D) a description of how impacts to fishery management will be evaluated; and (E) a plan for dispersing information about the project. Proposals for new projects should document all

[37] Phase III CSP was issued in 2004.

evaluation agreements between the hatchery corporation or agency and the department, including any agreements for funding evaluation activities."

No new projects have been initiated to date since the 2004 Phase III CSP at Neets Bay Hatchery.

PROGRAM EVALUATIONS

CONSISTENCY WITH POLICY

The policies governing Alaska hatcheries were divided into 3 categories for this review: genetics, fish health, and fisheries management. The key elements of the policies in each of those categories are summarized in Tables 1–3. These templates identifying the key elements of state policies used to assess compliance of the Neets Bay Lake Hatchery salmon program with the policy elements. Discussion of application of the policies in hatchery operations precedes each table.

Genetics

See Table 1.

Chum Salmon

Summer run chum salmon broodstock originated from Carroll Creek (aka Carroll River) at the head of Carroll Inlet near Ketchikan, with initial releases from Nakat Inlet (Figure 3). A total of 117,100 returning adults were used for broodstock in 2015. This stock is currently only in production at Neets Bay Hatchery.

The fall run chum salmon broodstock originated from Disappearance Creek and Lagoon Creek in Cholmondeley Sound on Prince of Wales Island, with initial releases from Neets Bay (Figure 3). Original broodstock were collected under a removal schedule approved by ADF&G staff in the FTPs to ensure adequate spawning escapement to the systems. A total of 33,137 returning adults to Neets Bay were used for broodstock in 2015. This stock is currently in production at Neets Bay and Burnett Inlet hatcheries.

Piston and Heinl (2012) conducted chum salmon straying studies from 2008 to 2010.

Coho Salmon

Fall run broodstock originated from Indian Creek, a tributary of the Chickamin River that empties into Behm Canal (Figure 3). Wild stock broodstock were collected under a removal schedule approved by ADF&G staff in the AMPs to ensure adequate spawning escapement. A total of 2,120 adult returns were used for broodstock in 2015 at Whitman Lake Hatchery, and 1,398 adult returns used for broodstock at Neets Bay Hatchery. This stock is currently permitted for production at Whitman Lake Hatchery and Neets Bay Hatchery.

Straying is monitored at other hatcheries but not routinely monitored at most wild stock systems where weirs or intensive sampling programs are used for coho salmon stock assessment. Wild stock juvenile coho salmon are coded-wire-tagged on these systems. A portion of the returns returning to these systems are therefore expected to be marked, so fish are not sacrificed for tag or otolith removal on these systems. This avoids sacrificing large numbers of wild stock fish. Systems are usually sampled for strays only during dedicated straying studies.

Chinook Salmon

Chinook salmon stocks originated from the Unuk and Chickamin River drainages, both which empty into Behm Canal (Figure 3). Original broodstock were collected under a removal schedule approved by ADF&G staff in the AMPs to ensure adequate spawning escapement. Straying was monitored at other hatcheries and at some escapement projects where adipose finclipped fish may be collected for tag recovery.[38] The stock is currently in production only at Whitman Lake Hatchery.

Table 1.–Key elements of the ADF&G *Genetic Policy*.

I. Stock Transport	
Use of appropriate local stocks	This element addresses Section I of the *Genetic Policy*, covering stock transports. The policy prohibits interstate or inter-regional stock transports, and uses transport distance and appropriate phenotypic characteristics as criteria for judging the acceptability of donor stocks.
	Local stocks are used at Neets Bay.
II. Protection of wild stocks	
Interaction with or impact on significant wild stocks	Priority is given to protection of significant wild stocks from harmful interactions with introduced stocks. Stocks cannot be introduced to sites where they may impact significant or unique wild stocks.
	No significant stocks have been recommended in Southeast Alaska by the RPT. The Phase III CSP denotes guidelines for significant stock determination.
Establishment of wild stock sanctuaries	Wild stock sanctuaries should be established on a regional and species basis. No enhancement activities would be allowed, but gamete removal would be permitted. The guidelines and justifications describe the proposed sanctuaries as gene banks of wild type variability.
	No wild stock sanctuaries have been established in Southeast Alaska.
Straying impacts	Prevention of detrimental effects of gene flow from hatchery fish straying and interbreeding with wild fish.
	Targeted harvest of hatchery returns at release sites is necessary to minimize straying.
III. Maintenance of genetic variance	
Maximum of three hatchery stocks from a single donor stock	A maximum of three hatchery stocks can be derived from a single donor stock. Offsite releases, such as for terminal harvest, should not be restricted by this policy if the release sites are selected so that they do not impact significant wild stocks, wild stock sanctuaries, or other hatchery stocks.
	Donor stocks to Neets Bay Hatchery broodstocks are not used as stocks at more than 2 other hatcheries.
Minimum effective population size	The policy recommends a minimum effective population size of 400. It also recognizes that small population sizes may be unavoidable with Chinook and steelhead.
	All Neets Bay Hatchery programs use well over the 400 fish minimum for broodstock.
Genetics review of Fish Transport Permits (5 AAC 41.010–41.050)	
Review by geneticist	Each application is reviewed by the geneticist, who then makes a recommendation to either approve or deny the application. The geneticist may also add terms or conditions to the permit to protect wild or enhanced stocks.
	The ADF&G geneticist reviewed the FTPs.

[38] Ed Jones, ADF&G, Juneau, personal communication.

Fisheries Management

See Table 2.

Neets Bay Hatchery release sites are located near Ketchikan. Fishery management plans are in place at all release sites to harvest hatchery returns and protect overharvest of wild stocks. Purse seining occurs in Clarence Strait for hatchery chum salmon returns to Kendrick Bay beginning in mid-June—a time when few wild stock salmon are in the area. This is the only fishery outside of a terminal harvest area that targets hatchery fish in Southern Southeast Alaska. The fishery is managed to maximize the quality of the hatchery chum salmon returns. When pink salmon management begins in July, purse seine openings in Clarence Strait are based on pink salmon abundance and escapements.

Other areas of purse seining are managed for wild sockeye, pink, and fall run chum salmon stocks. Except for targeted openings for hatchery chum salmon in the terminal harvest areas directly in front of the hatchery release sites, Neets Bay Hatchery chum salmon are caught in purse seine and drift gillnet fisheries during fishing periods managed for other salmon species.

Table 2.–Key elements of Alaska fisheries management policies and regulations relevant to salmon hatcheries and fishery enhancement.

Sustainable Salmon Fishery Policy (5 AAC 39.222)	
I. Management principles and criteria	
Assessment of wild stock interaction and impacts	As a management principle, the effects and interactions of introduced or enhanced salmon stocks on wild stocks should be assessed. Wild stocks should be protected from adverse impacts from artificial propagation and enhancement efforts.
Use of precautionary approach	Managers should use a conservative approach, taking into account any inherent uncertainty and risks.
II. Salmon Escapement Goal Policy (5 AAC 39.223)	
Establishment of escapement goals	Management of fisheries is based on scientifically-based escapement goals that result in sustainable harvests.
III. Mixed Stock Salmon Fishery Policy (5 AAC 39.220)	
Wild stock conservation priority	The conservation of wild stocks consistent with sustained yield is the highest priority in management of mixed-stock fisheries.
IV. Fisheries management review of FTPs (5 AAC 41.010 – 41.050)	
Review by management staff	All proposed FTPs are reviewed by the regional supervisors for the Divisions of Commercial Fisheries and Sport Fish, the deputy director of Commercial Fisheries, area management biologists, and the local Regional Resource Development Biologist before consideration by the commissioner of ADF&G. The commissioner may delegate approval authority to directors, assistant or deputy directors. Department staff may recommend approval or denial of the permit, and recommend permit conditions.

Southeast Alaska chum salmon escapement index streams are grouped into stock groups by area and run timing based on marine tagging and genetic studies (Eggers and Heinl 2008). Neets Bay Hatchery summer run chum salmon returns are harvested primarily in the Southern Southeast summer run chum salmon index area. The goal for this index area is a lower-bound sustainable escapement goal, rather than a range, because summer run chum salmon are harvested during

periods managed for pink and sockeye salmon, and therefore cannot be managed to fall within a lower and upper range. Escapement levels have been well above the current escapement goal since about 1984, with the exception of 2008, 2009, and 2010 (Figure 4).

For fall run chum salmon, Neets Bay Hatchery returns would be intermingled with returning fall run chum salmon stocks in Southern Southeast Alaska. The Cholmondeley Sound index grouping area is the only fall run chum salmon stock group in Southern Southeast Alaska that supports a directed commercial fishery. Naturally spawning chum salmon returning to Cholmondeley Sound are managed inseason based on return strength, and an escapement range has been established (Eggers and Heinl 2008). Escapements have been within or above the escapement goal range in most years since 1984 (Figure 5). Hatchery strays were estimated to represent less than 1% of the escapement at Disappearance Creek (one of primary spawning streams in Cholmondeley Sound) based on otolith sampling conducted from 2008 to 2010 (Piston and Brunette 2011).

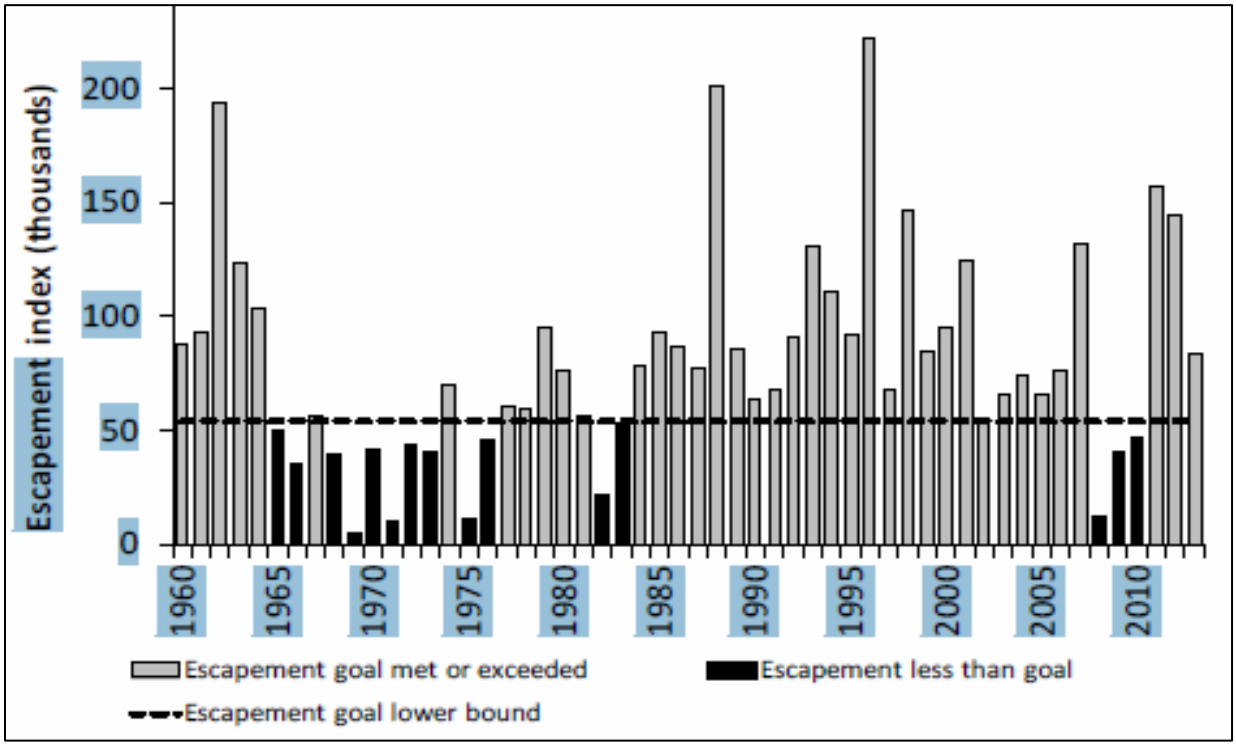

Figure 4.–Southern Southeast Alaska summer run chum salmon escapement index.
Source: Heinl et al. (2014).

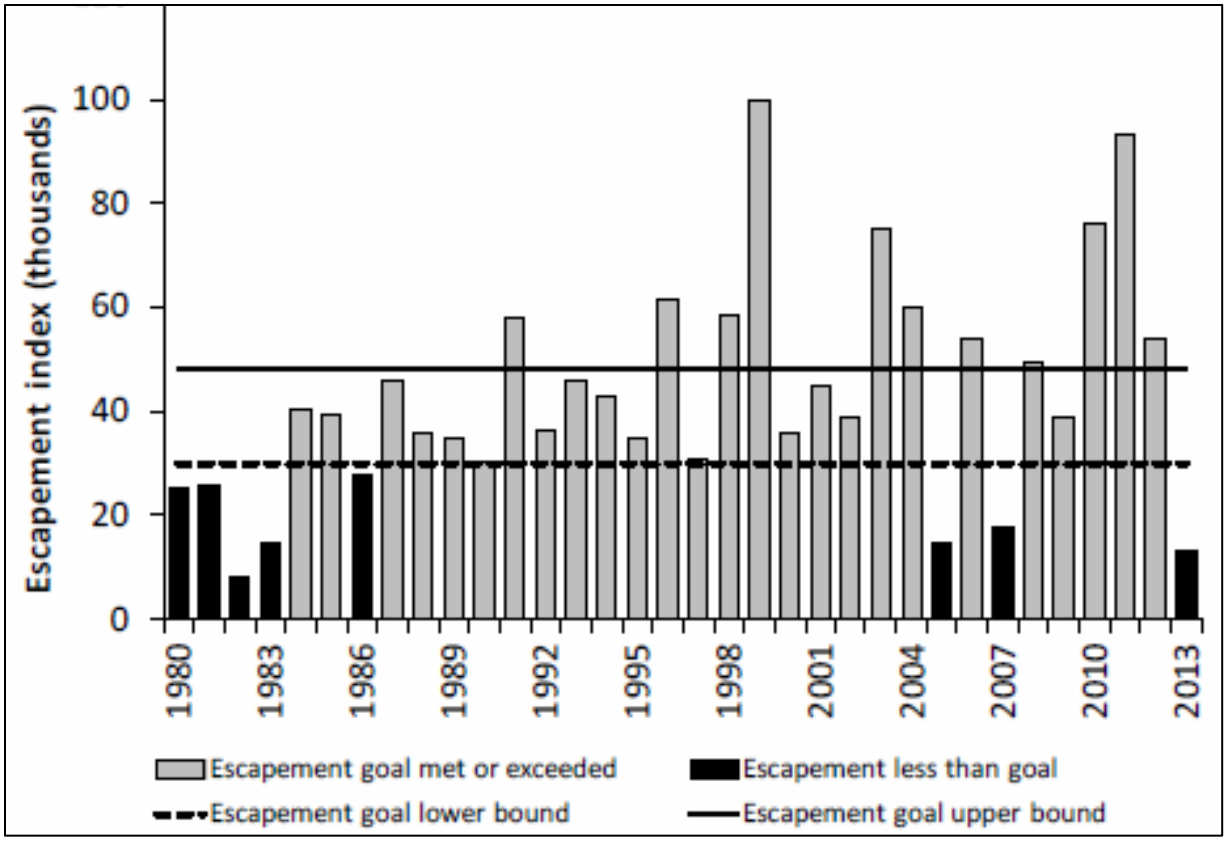

Figure 5.–Cholmondeley Sound fall run chum salmon escapement index.
Source: Heinl et al. (2014).

Fish Health and Disease, all species

See Table 3.

FTPs for the Neets Bay Hatchery program were approved by the ADF&G pathologist. Pathology records showed no inconsistencies with fish health and disease policies.

The hatchery was inspected regularly from 1984 to 1999 and again in 2015 by ADF&G Pathology Lab staff. The inspector remarked in the 2015 report that the facility was clean and in good order. The inspector noted historic incidence of bacterial gill disease and vibriosis for chum salmon but none at the time of his inspection. Coho salmon at various times experienced *Trichodina,* bacterial coldwater disease, bacterial gill disease, *Philonema* and *Phoma*. The inspector recommended that hatchery staff report pathology issues when the cause of elevated mortality is not obvious or typical for a presumptive diagnosis.

Table 3.–Key elements of Alaska policies and regulations pertaining to fish health and disease.

Fish Health and Disease Policy (5 AAC 41.080)	
Egg disinfection	Within 48 hours of taking and fertilizing live fish eggs or transporting live fish eggs between watersheds, all eggs must be treated with an iodine solution. This requirement may be waived for large scale pink and chum salmon facilities where such disinfection is not effective or practical.
Hatchery inspections	According to AS 16.10.460, inspection of the hatchery facility by department inspectors shall be permitted by the permit holder at any time the hatchery is operating.
	Hatchery inspections are conducted regularly.
Disease reporting	The occurrence of fish diseases or pathogens listed in 5 AAC 41.080(d) must be immediately reported to the ADF&G Fish Pathology Section.
Pathology requirements for Fish Transport Permits (5 AAC 41.005–41.060)	
Disease history	Applications for FTPs require either a complete disease history of the stock or a broodstock inspection and certification if the disease history is not available.
Isolation measures	Applications must list the isolation measures to be used during transport, including a description of containers, water source, depuration measures, and plans for disinfection.
Pathology review of FTPs	Each application is reviewed by the pathologist, who then makes a recommendation to either approve or deny it. The pathologist may also recommend to the commissioner terms or conditions to the permit to protect fish health. Transports of fish between regions are discouraged.

RECOMMENDATIONS

1. In 2000, FTP 00J-1004 was issued (and currently in effect) for the fall run chum salmon program at Nakat Inlet. The FTP permits the transfer of 8 million fry from Neets Bay Hatchery to Nakat Inlet for release. The 2014 AMP indicates an egg take goal of 9 million eggs for this release, but no FTP was found for the egg collection for this release. This issue should be clarified.
2. The BMP should be updated to reflect the current hatchery operation.

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REFERENCES CITED

ADF&G (Alaska Department of Fish and Game). 2014. Information by fishery. Commercial salmon catch, effort & value. http://www.adfg.alaska.gov/index.cfm?adfg=commercialbyfisherysalmon.salmoncatch (Accessed January 2014).

Alaska Legislature 1974. An Act authorizing the operation of private nonprofit salmon hatcheries. Section 1, Chapter 111, SLA 1974, in the Temporary and Special Acts.

Alaska Seafood Marketing Institute. 2011. May 2011 Seafood Market Bulletin. Alaska Seafood Marketing Institute. Juneau. www.alaskaseafood.org (Accessed October 2012).

Byerly, M., B. Brooks, B. Simonson, H. Savikko and H. J. Geiger. 1999. Alaska commercial salmon catches, 1878–1997. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 5J99-05, Juneau.

Chaffee, C., G. Ruggerone, R. Beamesderfer, and L. W. Botsford. 2007. The commercial Alaska salmon fisheries managed by the Alaska Department of Fish and Game, a 5-year re-assessment based on the Marine Stewardship Council program. Final draft assessment report, October 30, 2007 (IHP-05-069), Emeryville, CA. Prepared by Scientific Certification Systems, Inc., for the Alaska Department of Fish and Game, Division of Commercial Fisheries, Juneau.

Davis, B., B. Allee, D. Amend, B. Bachen, B. Davidson, T. Gharrett, S. Marshall, and A. Wertheimer. 1985. Genetic policy. Alaska Department of Fish and Game, Division of Commercial Fisheries, Juneau.

Davis, B., and B. Burkett. 1989. Background of the genetics policy of the Alaska Department of Fish and Game. FRED Report No. 95. Alaska Department of Fish and Game, Division of Commercial Fisheries, Juneau.

Duckett, K., D. Otte, J. Peckham, G. Pryor, A. McGregor, R. Holmes, S. Leask, D. Aho, G. Whistler, K. McDougal, A. Andersen, B. Pfundt, and E. Prestegard. 2010. Comprehensive salmon enhancement plan for Southeast Alaska: Phase III. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 5J10-03, Juneau.

Eggers, D. M., and S. C. Heinl. 2008. Chum salmon stock status and escapement goals in Southeast Alaska. Alaska Department of Fish and Game, Special Publication No. 08-19, Anchorage.

FRED (Division of Fisheries Rehabilitation, Enhancement and Development). 1975. Report to the 1975 Legislature. Alaska Department of Fish and Game, Juneau.

FRED (Division of Fisheries Rehabilitation, Enhancement and Development). 1976. Report to the 1976 Legislature. Alaska Department of Fish and Game, Juneau.

Groot, C., and L. Margolis, editors. 1991. Pacific salmon life histories. UBC Press, Vancouver, BC Canada.

Global Trust Certification Ltd. 2011. FAO-based responsible fishery management certification full assessment and certification report for the US Alaska Commercial Salmon Fisheries. AK/Sal/001/2011. Available from http://www.alaskaseafood.org/wp-content/uploads/2016/03/AlaskaSalmonFAOGTCCertificationSummary.pdf.

Heinl, S. C., E. L. Jones III, A. W. Piston, P. J. Richards, and L. D. Shaul. 2014. Review of salmon escapement goals in Southeast Alaska, 2014. Alaska Department of Fish and Game, Fishery Manuscript No. 14-07, Anchorage.

Hofmeister, K., J. R. Dangel, J. D. Jones. 1988. Southeast Alaska pink and chum salmon investigations, 1987-88. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 1J88-38, Juneau.

Industry Working Group (Trident Seafoods, Pacific Seafood Processors Association, Icicle Seafoods, Ocean Beauty Seafoods LLC, Alaska General Seafoods, North Pacific Seafoods, and Peter Pan Seafoods). 2010. Open letter to Alaska hatcheries, April 16, 2010. Available from http://brucebarcott.typepad.com/files/open-letter-to-alaska-hatcheries.pdf

REFERENCES CITED (Continued)

Knapman, P., G. Ruggerone, J. Brady, and A. Hough. 2009. Alaska salmon fisheries: first annual surveillance report 2007/08. February 2009 (MML-F-017), Houston, TX. Prepared by Moody Marine Ltd., for the Alaska Department of Fish and Game.

Knapp, G., K. Roheim, and J. Anderson. 2007. The great salmon run: Competition between wild and farmed salmon. TRAFFIC North America, World Wildlife Fund, 1250 24th Street NW, Washington, D.C.

MSC (Marine Steward Ship Council). 2012. www.msc.org (Accessed February 6, 2012).

McDaniel T. R., K. M. Pratt, T. R. Meyers, T. D. Ellison, J. E. Follett, and J. A. Burke. 1994. Alaska sockeye salmon culture manual. Alaska Department of Fish and Game, Commercial Fisheries Management and Development Division, Special Publication No. 6, Juneau.

McGee, S. G. 2004. Salmon hatcheries in Alaska – plans, permits, and policies designed to provide protection for wild stocks. Pages 317–331 [*In*] M. Nickum, P. Mazik, J. Nickum, and D. MacKinlay, editors. Symposium 44: Propagated fish in resource management. American Fisheries Society, Bethesda, MD.

Meyers, T. 2014. Policies and guidelines for Alaska fish and shellfish health and disease control. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 5J14-04, Anchorage.

Musslewhite, J. 2011a. An evaluation of the Kitoi Bay salmon hatchery for consistency with statewide policies and prescribed management practices. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 5J11-01, Anchorage.

Musslewhite, J. 2011b. An evaluation of the Pillar Creek salmon hatchery for consistency with statewide policies and prescribed management practices. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 5J11-02, Anchorage.

Piston, A. W., and M. T. Brunette. 2011. Disappearance Creek chum salmon weir study, 2010. Alaska Department of Fish and Game, Fishery Data Series No. 11-09, Anchorage.

Piston, A. W., and S. C. Heinl. 2012. Hatchery chum salmon straying studies in Southeast Alaska, 2008–2010. Alaska Department of Fish and Game, Fishery Manuscript Series No. 12-01, Anchorage.

Stopha, M. and J. Musslewhite. 2012. An evaluation of the Tutka Bay Lagoon salmon hatchery for consistency with statewide policies and prescribed management practices. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 5J12-05, Anchorage.

Stopha, M. 2012a. An evaluation of the Trail Lakes salmon hatchery for consistency with statewide policies and prescribed management practices. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 5J12-21, Anchorage.

Stopha, M. 2012b. An evaluation of the Port Graham salmon hatchery for consistency with statewide policies and prescribed management practices. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 5J12-28, Anchorage.

Stopha, M. 2013a. Recent trends in Alaska salmon value and implications for hatchery production. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 5J13-09, Anchorage.

Stopha, M. 2013b. An evaluation of the Eklutna salmon hatchery for consistency with statewide policies and prescribed management practices. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 5J13-02, Anchorage.

Stopha, M. 2013c. An evaluation of the Solomon Gulch salmon hatchery for consistency with statewide policies and prescribed management practices. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 5J13-04, Anchorage.

Stopha, M. 2013d. An evaluation of the Gulkana salmon hatchery for consistency with statewide policies and prescribed management practices. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 5J13-05, Anchorage.

REFERENCES CITED (Continued)

Stopha, M. 2013e. An evaluation of the Cannery Creek salmon hatchery for consistency with statewide policies and prescribed management practices. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 5J13-06, Anchorage.

Stopha, M. 2013f. An evaluation of the Main Bay salmon hatchery for consistency with statewide policies and prescribed management practices. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 5J13-07, Anchorage.

Stopha, M. 2013g. An evaluation of the Wally Noerenberg Hatchery for consistency with statewide policies and prescribed management practices. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 5J13-10, Anchorage.

Stopha, M. 2013h. An evaluation of the Armin F. Koernig salmon hatchery for consistency with statewide policies and prescribed management practices. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 5J13-11 Anchorage.

Stopha, M. 2014a. An evaluation of the Macaulay salmon hatchery for consistency with statewide policies and prescribed management practices. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 5J14-03, Anchorage.

Stopha, M. 2014b. An evaluation of the Sheep Creek salmon hatchery for consistency with statewide policies and prescribed management practices. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 5J14-06, Anchorage.

Stopha, M. 2014c. An evaluation of the Snettisham salmon hatchery for consistency with statewide policies and prescribed management practices. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 5J14-01, Anchorage.

Stopha, M. 2015a. An evaluation of the Sawmill Creek salmon hatchery for consistency with statewide policies and prescribed management practices. Alaska Department of Fish and Game, Regional Information Report 15-02, Anchorage.

Stopha, M. 2015b. An evaluation of the Haines Projects Hatchery permit for consistency with statewide policies and prescribed management practices. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 5J15-01, Anchorage.

Stopha, M. 2015c. An evaluation of the Sheldon Jackson salmon hatchery for consistency with statewide policies and prescribed management practices. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 5J15-07, Anchorage.

Stopha, M. 2015d. An evaluation of the Port Armstrong salmon hatchery for consistency with statewide policies and prescribed management practices. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 5J15-06, Anchorage.

Stopha, M. 2015e. An evaluation of the Medvejie Creek salmon hatchery for consistency with statewide policies and prescribed management practices. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 5J15-03, Anchorage.

Stopha, M. 2015f. An evaluation of the Hidden Falls salmon hatchery for consistency with statewide policies and prescribed management practices. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 5J15-05, Anchorage.

Stopha, M. 2016a. An evaluation of the Klawock River salmon hatchery for consistency with statewide policies and prescribed management practices. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 5J16-05, Anchorage.

Stopha, M. 2016b. An evaluation of the Port St. Nicholas salmon hatchery for consistency with statewide policies and prescribed management practices. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 5J16-04, Anchorage.

REFERENCES CITED (Continued)

Stopha, M. 2016c. An evaluation of the Whitman Lake salmon hatchery for consistency with statewide policies and prescribed management practices. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 5J16-08, Anchorage.

Stopha, M. 2016d. Alaska fisheries enhancement annual report 2015. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 5J16-03, Anchorage.

Vercessi, L. 2012. Alaska salmon fisheries enhancement program 2011 annual report. Alaska Department of Fish and Game, Fishery Management Report No. 12-04, Anchorage.

Vercessi, L. 2013. Alaska salmon fisheries enhancement program 2012 annual report. Alaska Department of Fish and Game, Fishery Management Report No. 13-05, Anchorage.

Vercessi, L. 2014. Alaska salmon fisheries enhancement program 2013 annual report. Alaska Department of Fish and Game, Fishery Management Report 14-12, Anchorage.

Vercessi, L. 2015. Alaska salmon fisheries enhancement program 2014 annual report. Alaska Department of Fish and Game, Fishery Management Report 15-15, Anchorage.

White, B. 2005. Alaska salmon enhancement program 2004 annual report. Alaska Department of Fish and Game, Fishery Management Report No. 05-09, Anchorage.

White, B. 2006. Alaska salmon enhancement program 2005 annual report. Alaska Department of Fish and Game, Fishery Management Report No. 06-19, Anchorage.

White, B. 2007. Alaska salmon enhancement program 2006 annual report. Alaska Department of Fish and Game, Fishery Management Report No. 07-04, Anchorage.

White, B. 2008. Alaska salmon enhancement program 2007 annual report. Alaska Department of Fish and Game, Fishery Management Report No. 08-03, Anchorage.

White, B. 2009. Alaska salmon enhancement program 2008 annual report. Alaska Department of Fish and Game, Fishery Management Report No. 09-08 Anchorage.

White, B. 2010. Alaska salmon enhancement program 2009 annual report. Alaska Department of Fish and Game, Fishery Management Report No. 10-05, Anchorage.

White, B. 2011. Alaska salmon enhancement program 2010 annual report. Alaska Department of Fish and Game, Fishery Management Report No. 11-04, Anchorage.

APPENDIX

Appendix A.–Neets Bay Hatchery permit and permit alterations, 1983–2016.

Date	Description	Green Eggs Chum Salmon	Coho Salmon	Chinook Salmon
06/17/1983	PNP hatchery permit number 19 and BMP issued to SSRAA for Neets Bay Hatchery. Hatchery permitted for 60 million chum, 5 million coho and 2 million Chinook salmon eggs. Coho salmon production was not to exceed 2.5 million eggs until impacts to wild pink and chum stocks was assessed. Approved donor sources include Neets Bay Hatchery/Carroll River summer run stock and Neets Bay Hatchery/Disappearance Creek fall run stock chum salmon. Neets Bay Hatchery/Indian Creek coho salmon stock, and Unuk River stock Chinook salmon.	60	5	2
10/26/1983	PAR approved to increase coho salmon production to the hatchery permitted capacity of 5 million eggs.	60	5	2
7/26/1985	PAR approved to increase Chinook salmon production to from 2 million to 4 million eggs for one year only.	60	5	4
7/16/1986	PAR approved to increase Chinook salmon production to from 2 million to 4 million eggs for one year only.	60	5	4
7/17/1992	PAR approved for 1993 only to allow release of 3 million coho salmon smolt because of a shortfall of Chinook salmon smolt. At the time, Hatchery releases were restricted to 2.5 million coho salmon smolt until impacts to pink and chum salmon were determined.	60	5	2
7/14/1993	PAR approved to increase chum salmon production from 60 million eggs to 80 million eggs.	80	5	2
9/3/1996	PAR approved to add Nakat Inlet as a release site for up to 8 million fall run chum salmon fry. Hatchery capacity remained at 80 million eggs.	80	5	2
6/21/2001	PAR approved to transfer 8 million eggs of chum salmon capacity from Neets Bay Hatchery to Whitman Lake Hatchery.	72	5	2
5/21/2003	PAR approved to increase chum salmon from 72 million to 84 million eggs.	84	5	2
5/17/2010	PAR approved to increase chum salmon from 84 million to 102.7 million eggs. An additional 44.3 million chum salmon eggs could be collected for incubation at Whitman Lake Hatchery.	102.7	5	2
6/2/2010	PAR approved to allow an additional collection of 25 million chum salmon eggs for incubation at the eyed stage to Burnett Inlet Hatchery and release at Anita Bay. The Anita Bay releases previously produced at Neets Bay (about 22 million fry) would now be released as increased releases at Neets Bay (about 12 million fry) and Kendrick Bay (about 10 million fry)	102.7	5	2

Appendix B.–Summary of fish transport permits for Neets Bay Hatchery.

Key: BIH=Burnett Inlet Hatchery; CLH=Crystal Lake Hatchery; DMH=Deer Mountain Hatchery; LPW=Little Port Walter Hatchery; NBH=Neets Bay Hatchery; WLH=Whitman Lake Hatchery.

FTP No.	Issued	Expiration	FTP summary and reviewer comments
80-63	1980	1980	Collect eggs from up to 7,181 Disappearance Creek female chum salmon for incubation WLH then rearing and releases from net pens in Neets Bay. FTP issued to WLH.
80-89	1980	1980	Collect up to 11.5 million eggs from Karta River chum salmon for incubation at WLH then rearing and releases from net pens in Neets Bay. FTP issued to WLH.
80-91	1980	1980	Collect up to 1.2 million eggs from Indian Creek coho salmon for incubation at WLH and release of up to 250,000 at Whitman Lake and 950,000 at Neets Bay. FTP issued to WLH.
81-12	1981	1981	Collect up to 563,800 eggs from Indian Creek coho salmon for incubation at WLH and release at Neets Bay. FTP issued to WLH.
81-13	1981	1984	Collect up to 14.758 million Disappearance Creek chum salmon eggs for incubation at WLH then rearing and releases from net pens in Neets Bay. In 1982, FTP renewed through 1984 and egg number increased to 15 million eggs. FTP issued to WLH.
81-15	1981	1990	Collect eggs from up to 7,181 Lagoon Creek female chum salmon for incubation WLH then rearing and releases from net pens in Neets Bay. In 1982, FTP renewed through 1990 and egg number limit at 15 million eggs. FTP issued to WLH.
81-17	1981	1981	Collect eggs from up to 7,181 Disappearance Creek female chum salmon for incubation WLH then rearing and releases from net pens in Neets Bay. FTP issued to WLH.
81-18	1981	1990	Collect between 1.2 and 2 million Neets Bay/Indian Creek stock coho salmon eggs for incubation WLH then rearing and releases from net pens in Neets Bay. In 1982, FTP renewed through 1990 and egg number limit of 1.95 million eggs. In 1983, egg number increased to 5 million eggs. FTP issued to WLH.
81-85	1981	1981	Collect up to 1.2 million eggs from Indian Creek coho salmon for incubation at WLH and release at WLH and Neets Bay. FTP issued to WLH.
82J-1049	1982	2002	Collect up to 15 million eggs from Disappearance Creek stock returns to Neets Bay for incubation at WLH and rearing and release at Neets Bay. Unclear which hatchery FTP was issued to. Duplicate of 82J-1070. In 1983, increased from 15 million to 28 million eggs. In 1992, expiry date extended from 1992 to 2002.
82J-1070	1982	1992	Collect up to 15 million eggs from Disappearance Creek stock returns to Neets Bay for incubation at WLH and rearing and release at Neets Bay. FTP issued to WLH.
82J-1085	1983	1995	Transfer up to 2 million Carroll River stock chum salmon from WLH to Neets Bay for release. In February, 1983, FTP amended to increase number from 2 million to 5 million smolt. In 1988, permit increased from 5 million to 9 million eggs and permit expiration date extended from 1985 to 1995.
83J-1015	1983	1983	Collect up to 200,000 eggs from LPW/Unuk River stock Chinook salmon for incubation at WLH and release at Neets Bay. FTP issued to WLH.
83J-1031	1983	1985	Collect up to 1,000,000 eggs from DMH/Unuk River stock Chinook salmon for incubation at WLH and release at Neets Bay.

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FTP No.	Issued	Expiration	FTP summary and reviewer comments
83J-1033	1983	1986	Collect up to 1 million DMH/Unuk River stock Chinook salmon eggs for incubation at Beaver Falls Hatchery and release at Neets Bay. It is unclear if this FTP was issued under the WLH PNP permit.
83J-1058	1983	1984	Transfer 100,000 LPW/Unuk River stock Chinook salmon fry from LPW to Neets Bay for release. FTP issued to WLH.
83J-1061	1983	1984	Collect up to 5 million WLH/Indian Creek stock coho eggs, incubate to eyed stage at WLH, transfer to Neets Bay for rearing and release. In 1985, expiry date extended from 1984 to 1985 and reduced to 300,000 eggs for 1985.
84J-1005	1984	1984	Transfer 200,000 LPW/Unuk River stock Chinook salmon smolt from WLH to Neets Bay for release. FTP issued to WLH.
84J-1030	1984	1994	Allows collection of up to 2 million eggs from Carroll River wild stock chum salmon eggs for incubation, rearing and release at NBH as a backup in the event of poor returns to the hatchery. FTP initially expired in 1988, then was renewed from 1991-1994 and increased from 2 million to 8 million eggs.
84J-1031	1984	1999	Allows collection of up to 30 million eggs of Carroll River stock chum salmon eggs from Nakat Inlet returns for incubation, rearing and release at NBH as a backup in the event of poor returns to the hatchery. FTP amended in 1989 to extend expiration date from 1988 to 1999.
84J-1032	1984	1994	Collect up to 60 million NBH/Cholmondeley stock fall chum salmon eggs for incubation, rearing and release at Neets Bay.
84J-1033	1984	1994	Collect up to 4.5 million NBH/Indian Creek coho salmon eggs for incubation, rearing and release at Neets Bay.
84J-1045	1984	1988	Collect up to 2.0 million WLH/Unuk River Chinook salmon eggs for incubation at NBH, transfer to WLH at eyed stage, then transferred for rearing and release at Neets Bay.
84J-1046	1984	1988	Collect up to 2.0 million LPW/Unuk River Chinook salmon eggs for incubation, rearing and release at NBH.
84J-1047	1984	1988	Collect up to 100,000 Unuk River wild stock Chinook salmon eggs for incubation, rearing and release at NBH.
84J-1048	1984	1988	Collect up to 2 million DMH/Unuk River wild stock Chinook salmon eggs for incubation, rearing and release at NBH.
84J-1082	1984	1999	Collect up to 8 million NBH /Cholmondeley stock fall chum salmon eggs for incubation at WLH and release at Nakat Inlet. In 1985, egg number increased to 15 million eggs. FTP issued to WLH.
85J-1027	1985	2024	Collect up to 40 million eggs from NBH/Carroll River stock chum salmon for incubation, rearing and release at NBH. In 1999, extended to 2009 and increased from 40 million to 60 million eggs. In 2009, extended to 2014. In 2013, increased from 60 million to 70.5 million eggs. In 2015, expiration date extended to 2024.
85J-1028	1985	1999	Collect up to 2 million eggs from NBH/Unuk River stock Chinook salmon for incubation, rearing and release at NBH.

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FTP No.	Issued	Expiration	FTP summary and reviewer comments
85J-1064	1985	2014	Collect up to 20 million eggs from NBH/Carroll River stock chum salmon for incubation at NBH to eyed stage, transfer to WLH to hatching, the release at Nakat Inlet. In 1999, expiration date extended from 1999 to 2009. In 2009, date extended to 2014. In 2013, number increased from 8 million eggs to 9.2 million eggs.
85J-1065	1985	1999	Collect up to 8 million eggs from NBH/Carroll River stock chum salmon for incubation at NBH to eyed stage, transfer to WLH to hatching, the release at Earl West Cove. FTP issued to WLH.
90J-1007	1990	2000	Collect up to 5 million WLH/Indian Creek stock coho salmon eggs at Neets Bay for incubation at WLH and release at Neets Bay. Renewal of 81-18. FTP issued to WLH.
90J-1010	1990	2005	Collect up to 4.5 million WLH/Indian Creek stock coho salmon eggs for incubation at WLH and release at WLH, Neets Bay, Nakat Inlet and Earl West Cove. In 2000, FTP renewed and expiration date extended to 2005. Renewal of 81-19. FTP issued to WLH.
91J-1016	Denied		Collect up to 1.5 million WLH/Chickamin River stock Chinook salmon eggs at WLH for incubation at WLH and release at Neets Bay. Denied for genetic reasons. FTP issued to WLH.
91J-1039	1991	2014	Same as FTP 91J-1016 but approved second time application was submitted in 1991. Collect up to 1.5 million WLH/Chickamin River stock Chinook salmon eggs at WLH for incubation at WLH and NBH and release at Neets Bay. FTP renewed in 1999 through 2009, and in 2009 through 2014. FTP issued to WLH.
95J-1027	1995	2005	Collect up to 1 million eggs from WLH/Chickamin River stock Chinook salmon for incubation at WLH, transfer to CLH for rearing, then transfer to Neets Bay for release. FTP issued to WLH.
95J-1028	1995	2005	Collect up to 1 million eggs from WLH/Chickamin River stock Chinook salmon from Carroll Inlet returns for incubation at WLH, transfer to CLH for rearing, then transfer to Neets Bay for release.
95J-1029	Not Approved		Collect up to 1 million eggs from LPW/Chickamin River stock Chinook salmon for incubation at WLH, transfer to CLH for rearing, then transfer to Neets Bay for release. Not approved apparently due to concerns of possible straying of Chickamin fish to the Unuk River.
95J-1030	1995	1996	Collect up to 1 million eggs from LPW/Unuk stock Chinook salmon for incubation at WLH, transfer to CLH for rearing, then transfer to Neets Bay for release.
98J-1007	1998	2018	Replaced 84J-1032. Collect up to 4.5 million NBH/Indian Creek stock coho salmon eggs for incubation, rearing and release at Neets Bay. Expiry date extended in 2008 from 2008 to 2018. FTP issued to NBH.
98J-1006	1998	2018	Replaced 84J-1032. Collect up to 35 million NBH/Cholmondeley stock fall chum salmon eggs for incubation, rearing and release at Neets Bay. Expiry date extended in 2008 from 2008 to 2018.
01J-1003	2001	2008	Release up to 8 million Carroll River stock summer chum salmon fry in Anita bay. Eggs are collected from returns to Neets Bay, incubated at WLH, and released to Anita Bay. This FTP transferred this release from Earl West Cove to Anita Bay. Renewal of FTP 85J-1065. FTP issued to WLH.

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FTP No.	Issued	Expiration	FTP summary and reviewer comments
01J-1004	2001	2020	Release up to 8 million NBH/Cholmondeley Sound fall chum salmon fry in Nakat Inlet. Eggs are collected, incubated and reared at NBH. This FTP transferred this release from Earl West Cove to Anita Bay. In 2010, expiry date extended from 2010 to 2020. Permit issued to NBH.
01J-1009	2001	2011	Release up to 6 million NBH/Carroll Inlet summer chum salmon fry in Anita Bay. Eggs are collected, incubated and reared at NBH. In 2004, number increased from 6 million to 22 million fry. Permit issued to NBH.
03J-1008	2003	2008	Collect up to 20 million NBH/Carroll Inlet summer chum salmon eggs. Eggs are collected, incubated and reared at NBH and released in Kendrick Bay. Permit issued to NBH.
05J-1007	2005	2015	Allows for collection of up to 4.5 million coho salmon eggs at WLH for release at Neets Bay, Nakat Inlet, Anita Bay and WLH. Renewal of FTP 90J-1010. FTP issued to WLH.
05J-1008	2005	2015	Allows for collection of up to 4.5 million coho salmon eggs at NBH and serves as a backup brood source for WLH. Renewal of FTP 90J-1007. FTP issued to WLH.
05J-1010	2005	2015	Allows for transfer of up to 1 million WLH/Chickamin River stock Chinook salmon eyed eggs to CLH, then transfer of resulting smolt to Neets Bay for release. Renewal of FTP 95J-1027. FTP issued to WLH.
08J-1020	2008	2013	Collect up to 22 million NBH/Carroll River stock summer chum salmon for incubation to eyed stage at NBH and transfer to WLH. FTP issued under NBH permit.
08J-1022	2008	2013	Transfer up to 20 million fry from FTP 08J-1020 from WLH to Kendrick Bay for release. FTP issued under NBH permit.
09J-1002	2009	2015	Collect up to 200,000 WLH/Indian Creek coho salmon eggs at WLH to eyed stage, then transfer to BIH for rearing, then release from Neets Bay.
10J-1028	2010	2015	Collect up to 25 million NBH/Carroll River summer chum salmon eggs at NBH, transferred at eyed stage to BIH, and release fry at Anita Bay. FTP issued under BIH permit.
11J-1002	2011	2016	Transfer up to 450,000 WLH/Chickamin River stock fall run coho salmon eggs or fry from WLH to CLH for rearing and later transfer and release of up to 400,000 smolt at NBH. FTP issued to WLH.
11J-1003	2012	2017	Collect up to 24.7 million NBH/Carroll Inlet stock chum salmon for incubation to eyed stage at NBH, transfer to WLH to hatching, then transfer to McLean Arm for rearing and release. FTP issued under WLH permit.
11J-1024	2012	2017	Transfer up to 1.2 million WLH/Indian River/Chickamin River fry from WLH to Neck Lake, then yearling transport from Neck Lake to Neets Bay for release. In 2012, permit amended to increase number to 2.0 million fry. FTP issued to WLH.
12J-1013	2012	2022	Collect up to 34.7 million NBH/Carroll River summer chum salmon eggs at NBH, transfer at eyed stage to WLH for rearing and release at Kendrick Bay. FTP issued to NBH.

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FTP No.	Issued	Expiration	FTP summary and reviewer comments
12J-1019	2012	2022	Collect up to 34.7 million NBH/Carroll River summer chum salmon eggs at NBH, transfer at eyed stage to WLH for rearing and release at McLean Arm. FTP issued to NBH.
12J-1021	2012	2022	Transport up to 4.0 million NBH/Disappearance creek chum salmon from Neets Bay to WLH for incubation, then transfer to Nakat Inlet for release. FTP issued to WLH.
13J-1002	2013	2023	Transport eyed eggs from WLH to BIH and transport resultant fry to Neck Lake and release the smolt at Neets Bay. FTP 11J-1024 allows transfer from WLH to Neck Lake and release at Neets Bay. FTP issued to WLH.
13J-1005	2013	2023	Transport of WLH/Indian Creek stock fall run coho salmon of up to 2.6 million eyed eggs in winter and additional 600,000 pre-smolt in the spring from WLH to NBH. FTP for egg take at WLH is 05J-1007. FTP issued to WLH.
13J-1006	2013	2023	Collect up to 6 million NBH/Cholmondeley Sound fall chum salmon at NBH for incubation then transfer of eyed eggs to BIH for rearing and release. FTP issued to BIH.
14J-1003	2014	2024	Transfer resultant fry of up to 6 million NBH/Cholmondeley Sound fall chum salmon eggs from NBH to BIH for rearing and release. FTP issued to NBH.
14J-1015	2014	2024	Transport up to 520,000 WLH/Chickamin River stock Chinook Salmon fry from WLH to CLH for rearing and eventual release at Neets Bay. FTP issued to WLH.
15J-1002	2015	2025	Egg take of up to 6.0 million Carroll River stock summer run chum salmon eggs at NBH, transfer to Burnett Inlet for incubation and release. FTP issued to WLH.
15J-1006	2015	2025	Transport 250,000 WLH/Chickamin River stock Chinook salmon smolts to Neets Bay for rearing and release. FTP issued to WLH.
15J-1021	2015	2025	Transport up to 1 million WLH/Chickamin River stock Chinook salmon eggs to CLH for incubation and rearing and then to Neets Bay for rearing and release. FTP issued to WLH.

Appendix C.–Comparison of permitted and reported fall run chum salmon egg takes in hatchery permit, basic management plan, annual management plan, fishery transport permits and annual reports for fall run chum salmon releases from Nakat Inlet.

The program was permitted under the Whitman Lake Hatchery permit from 1984 until 1996, when the program was transferred to the Neets Bay Hatchery permit.

Key: AMP=Annual Management Plan; AR=Annual Report; CS=Cholmondeley Sound (Disappearance Creek and/or Lagoon Creek); FTP=Fish Transport Permit; NI=Nakat Inlet; NBH=Neets Bay Hatchery; WLH=Whitman Lake Hatchery.

Brood Year	Hatchery Permit Egg Limit	Egg Source	FTP Egg Limit	FTP No	AMP Egg Limit	AR Egg Take	FTP Release Limit	FTP No	AMP Release Limit	AR Release
1984	26.8	NBH/CS	8.0	84J-1082	12.0	12.3	15.0	84J-1082	12.0	10.0
1985	33.8	NBH/CS	15.0	84J-1082	12.0	2.5	15.0	84J-1082	12.0	2.4
1986	33.8	NBH/CS	15.0	84J-1082	12.0	5.7	15.0	84J-1082	4.0	4.6
1987	33.8	NBH/CS	15.0	84J-1082	12.0[a]	3.9	15.0	84J-1082	3.5	3.5
1988	33.8	NBH/CS	15.0	84J-1082	12.0[a]	12.4[a]	15.0	84J-1082	6.7	4.8
1989	33.8	NBH/CS	15.0	84J-1082	8.0	12.2[b]	15.0	84J-1082	2.0	2.1[c]
1990	47.8	NBH/CS	15.0	84J-1082	24.0[d]	11.5[e]	15.0	84J-1082	8.0	5.8
1991	47.8	NBH/CS	15.0	84J-1082	8.0	4.1[f]	15.0	84J-1082	9.5	4.1
1992	47.8	NBH/CS	15.0	84J-1082	8.0	8.1[f]	15.0	84J-1082	8.0	7.9
1993	47.8	NBH/CS	15.0	84J-1082	8.0	8.1[f]	15.0	84J-1082	8.0	7.7
1994	47.8	NBH/CS	15.0	84J-1082	8.0	8.0[f]	15.0	84J-1082	7.9	7.5
1995	47.8	NBH/CS	15.0	84J-1082	8.5	8.2[f]	15.0	84J-1082	0.8	7.8
1996	47.8	NBH/CS		None[g]	8.5	31.1[h]	15.0		8.0	8.0
1997	47.8	NBH/CS		None	8.5	31.2[h]	15.0		8.0	7.2
1998	47.8	NBH/CS		None	9.0	30.7[h]	15.0	None	8.0	7.2
1999	47.8	NBH/CS		None	8.0	31.3[h]	8.0	00J-1004	8.0	7.6
2000	35.8	NBH/CS	8.0	00J-1004	8.0	23.2[h]	8.0	00J-1004	8.0	8.2
2001	43.8	NBH/CS	8.0	00J-1004	8.0	28.9[h]	8.0	00J-1004	8.0	8.2
2002	43.8	NBH/CS	8.0	00J-1004	8.0	22.5[h]	8.0	00J-1004	8.0	5.3
2003	44.3	NBH/CS	8.0	00J-1004	8.0	28.1[h]	8.0	00J-1004	8.0	8.7
2004	44.3	NBH/CS	8.0	00J-1004	8.0	33.4[h]	8.0	00J-1004	8.0	9.8
2005	44.3	NBH/CS	8.0	00J-1004	8.0	0	8.0	00J-1004	0	0
2006	44.3	NBH/CS	8.0	00J-1004	8.0	27.7[h]	8.0	00J-1004	8.0	6.6
2007	44.3	NBH/CS	8.0	00J-1004	8.0	38.2[h]	8.0	00J-1004	8.0	8.4
2008	44.3	NBH/CS	8.0	00J-1004	8.0	30.0[h]	8.0	00J-1004	8.0	8.0
2009	44.3	NBH/CS	8.0	00J-1004	8.0	27.3[h]	8.0	00J-1004	8.0	8.7
2010	44.3	NBH/CS	8.0	00J-1004	8.0	0	8.0	00J-1004	8.0	0
2011	44.3	NBH/CS	8.0	00J-1004	8.0	2.1	8.0	00J-1004	8.0	7.8[i]
2012	44.3	NBH/CS	8.0	00J-1004	8.0	29.4[h]	8.0	00J-1004	8.0	6.8
2013	44.3	NBH/CS	8.0	00J-1004	8.0	0	8.0	00J-1004	8.0	0
2014	44.3	NBH/CS	8.0	00J-1004	8.0	26.0[h]	8.0	00J-1004	8.0	9.3

[a] Egg take number is for all release sites, including NI.
[b] Eyed eggs from NB, and number is for all release sites, including NI.
[c] No release reported on the 1990 AR. This number taken from the 2012 AMP.
[d] Egg take number is for all release sites, including NI.
[e] Eyed eggs from NBH, and number is for all release sites, including NI.
[f] Eyed eggs from NBH.
[g] No FTP found for fall chum eggs collected and incubated to hatching at NBH and transfer to NI.
[h] Egg take number is for all release sites, including NI.
[i] Of the total, 1.9 million reared at WLH and 5.9 million reared at NBH.

Appendix D.–Comparison of permitted and reported fall run chum salmon egg takes in hatchery permit, basic management plan, annual management plan, fishery transport permits and annual reports production from Neets Bay release site. Numbers in millions and rounded.

From 1979 to 1981, the program was permitted under the Whitman Lake Hatchery permit, after which the program was permitted under the Neets Bay Hatchery permit.

Key: AMP=Annual Management Plan; AR=Annual Report; CS=Cholmondeley Sound (Disappearance Creek and/or Lagoon Creek); FTP=Fish Transport Permit; NBH=Neets Bay Hatchery; NF=Not Found; WLH=Whitman Lake Hatchery.

Brood Year	Hatchery Permit Egg Take	Egg Source[a]	FTP Egg Take	FTP No.	AMP Egg Take	AR Egg Take	FTP Release	FTP No	AMP Release	AR Release
1979	26	CS	[b]	NF	11.5	1.5	15.8	80-63	1.2	1.3
1980	26	CS	15.8	80-63	15.8	16.8	15.8	80-63	15.3	15.4
1981	26	CS	14.8	81-13	15.8	11.2	14.8	81-13	10.0	8.3
1982	26	CS		NF	15.0	16.0			15.0	14.6
1983	26	CS	15	81-15	15.0	28.8[c]	15	81-15	25.0	24.6[c]
		NBH/CS	15	82J-1070			15	82J-1070		
1984	60	NBH/CS	60	84J-1032	30.0	36.6	60	84J-1032	35.0	31.9
1985	60	NBH/CS	60	84J-1032	30.0	28.7[d]	60	84J-1032	23	17.0
1986	60	NBH/CS	60	84J-1032	30	42.6[e]	60	84J-1032	34	22.7
1987	60	NBH/CS	60	84J-1032	27	27.1[f]	60	84J-1032	20	9.5
1988	60	NBH/CS	60	84J-1032	25	32.1[g]	60	84J-1032	20	17.2
1989	60	NBH/CS	60	84J-1032	20	29.4[h]	60	84J-1032	23	23.6
1990	60	NBH/CS	60	84J-1032	28	38.5[i]	60	84J-1032	26	23.9[j]
1991	60	NBH/CS	60	84J-1032	28	34.3[k]	60	84J-1032	28	25.2
1992	60	NBH/CS	60	84J-1032	28	36.0[l]	60	84J-1032	25	25.6
1993	80	NBH/CS	60	84J-1032	28	36.1[l]	60	84J-1032	26	25.2
1994	80	NBH/CS	60	84J-1032	28	30.4[m]	60	84J-1032	20.2	20.2
1995	80	NBH/CS		NF[n]	22	30.1[o]		NF	18	18.3
1996	80	NBH/CS		NF	22	31.1		NF	20	20.9
1997	80	NBH/CS		NF	22	31.2	35	98J-1006	20	20.8
1998	80	NBH/CS	35	98J-1006	22	30.7	35	98J-1006	20	19.8
1999	80	NBH/CS	35	98J-1006	30.5[p]	31.3	35	98J-1006	20	20.0
2000	80	NBH/CS	35	98J-1006	30.5[p]	23.2	35	98J-1006	20	12.5
2001	72	NBH/CS	35	98J-1006	32[p]	28.9	35	98J-1006	20	17.4
2002	72	NBH/CS	35	98J-1006	32[p]	22.5	35	98J-1006	15	14.1
2003	84	NBH/CS	35	98J-1006	32[p]	28.1	35	98J-1006	20	17.0
2004	84	NBH/CS	35	98J-1006	32[p]	33.4	35	98J-1006	20	21.4
2005	84	NBH/CS	35	98J-1006	32[p]	12.8	35	98J-1006	11	11.8
2006	84	NBH/CS	35	98J-1006	32[p]	27.7	35	98J-1006	20	17.3
2007	84	NBH/CS	35	98J-1006	32[p]	38.2	35	98J-1006	26.5	26.8
2008	84	NBH/CS	35	98J-1006	32[p]	30.0	35	98J-1006	20	19.7
2009	84	NBH/CS	35	98J-1006	32[p]	27.3	35	98J-1006	20	16.5
2010	102.7	NBH/CS	35	98J-1006	32[p]	23.4	35	98J-1006	11	10.3
2011	102.7	NBH/CS	35	98J-1006	32[p]	31.8	35	98J-1006	20	19.4
2012	102.7	NBH/CS	35	98J-1006	32[p]	29.4	35	98J-1006	20	19.6
2013	102.7	NBH/CS	35	98J-1006	35[p]	21.2	35	98J-1006	14	13.6
2014	102.7	NBH/CS	35	98J-1006	35[p]	26.0	35	98J-1006	14	12.6
2015	102.7	NBH/CS	35	98J-1006	35[p]	34.8	35			

[a] Noted as the hatchery (if applicable) and the stock, re: hatchery/stock.

[b] No FTP found for the 1979 egg take. FTP 80-63 was not issued until Jan 1980.

[c] It appears eggs were collected both from CS and from returns to NBH and incubated at WLH, but the specific number of eggs collected from each location were not specified.

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[d] Includes 2.7 million eyed eggs transferred to WLH for NI release.
[e] Includes 5.7 million eyed eggs transferred to WLH.
[f] Includes 3.9 million eyed eggs transferred to WLH.
[g] Includes 12.4 million eyed eggs transferred to WLH.
[h] Includes 12.2 million eyed eggs transferred to WLH.
[i] Includes 11.5 million eyed eggs transferred to WLH.
[j] Includes 4.9 million fry transferred from WLH to NBH.
[k] Includes 4.1 million eyed eggs transferred to WLH.
[l] Includes 8.1 million eyed eggs transferred to WLH.
[m] Includes 8.0 million eyed eggs transferred to WLH.
[n] No FTPs found for egg take or release for period 1995–1997.
[o] Includes 8.4 million eyed eggs transferred to WLH.
[p] Includes about 8 million eggs for Nakat Inlet.

Appendix E.–Permitted and reported egg take and release of summer-run chum salmon, in millions and rounded, from the Neets Bay release site.

Releases were permitted through the Whitman Lake Hatchery and Neets Bay Hatchery.

Key: AMP=Annual Management Plan; AR=Annual Report; CR=Carroll River, ET=Egg take; FTP=Fish Transport Permit; IL=Incubation Location; NBH=Neets Bay Hatchery; WLH=Whitman Lake Hatchery.

Brood Year	IL	Hatchery Permit ET	Egg Source	FTP ET	FTP No.	AMP ET	AR ET	FTP Release	FTP No.	AMP Release	AR Release
1982	NBH		WLH/CR[a]	8	82J-1058	8	8.9	5	82J-1085	1.4	1.1
1983	NBH	60	WLH/CR[a]	8	82J-1058	20	3.7	5	82J-1085	3	2.8
1984	NBH	60	WLH/CR[a]	30	84J-1031	5	10.0	60	85J-1027	12	8.3
1985	NBH	60	NBH/CR	60	85J-1027	30	11.1	60	85J-1027	10	9.5
			WLH/CR[a]	30	84J-1031		2.3		82J-1085	5	
1986	NBH	60	NBH/CR	60	85J-1027	30	12.4[b]	60	85J-1027	10	8.4
1987	WLH	32.0[c]	NBH/CR	60	85J-1027	35	28.5[d]	60	85J-1027	[e]	26.7[f]
1988	NBH	60	NBH/CR	60	85J-1027	35	42.1[g]	60	85J-1027		23.9[h]
1989	NBH	60	NBH/CR	60	85J-1027	40	14.6[i]	60	85J-1027		9.0
1990	NBH	60	NBH/CR	60	85J-1027	40	37.7[j]	60	85J-1027		20.7
1991	NBH	60	NBH/CR	60	85J-1027	40	51.8[k]	60	85J-1027	24	23.3
1990	NBH	60	NBH/CR	60	85J-1027	40	37.8[j]	60	85J-1027		20.7
1991	NBH	60	NBH/CR	60	85J-1027	40	51.8[k]	60	85J-1027	24	23.3
1992	NBH	60	NBH/CR	60	85J-1027	40	62.3[l]	60	85J-1027	33	32.5
1993	NBH	60	NBH/CR	60	85J-1027	40	72.8[m]	60	85J-1027	40	40.2
1994	NBH	60	NBH/CR	60	85J-1027	52	77.7[n]	60	85J-1027	46.8	45.5
1995	NBH	60	NBH/CR	60	85J-1027	80	77.9[o]	60	85J-1027	43	43.4
1996	NBH	60	NBH/CR	60	85J-1027	80	83.7[p]	60	85J-1027	45	45.2
1997	NBH	60	NBH/CR	60	85J-1027	80	51.4	60	85J-1027	45	45.3
1998	NBH	60	NBH/CR	60	85J-1027	80	52.1	60	85J-1027	45	45.1
1999	NBH	60	NBH/CR	60	85J-1027	80	84.9[q]	60	85J-1027	45	45.4
2000	NBH	60	NBH/CR	60	85J-1027	80	86.8[r]	60	85J-1027	45	46.0
2001	NBH	72	NBH/CR	60	85J-1027	80	49.6[s]	60	85J-1027	39	36.5
2002	NBH	102.7	NBH/CR	60	85J-1027	80	51.8[t]	60	85J-1027	39	39.0
2003	NBH	102.7	NBH/CR	60	85J-1027	80	74.5[u]	60	85J-1027	49	47.8
2004	NBH	102.7	NBH/CR	60	85J-1027	100	108.4[v]	60	85J-1027	49	48.6
2005	NBH	102.7	NBH/CR	60	85J-1027	100	116.4[w]	60	85J-1027	49	46.3
2006	NBH	102.7	NBH/CR	60	85J-1027	100	123.5[x]	60	85J-1027	49	54.4
2007	NBH	102.7	NBH/CR	60	85J-1027	100	92.5[y]	60	85J-1027	36	34.5
2008	NBH	102.7	NBH/CR	60	85J-1027	100	110.8[z]	60	85J-1027	49	48.5
2009	NBH	102.7	NBH/CR	60	85J-1027	110	135.0[aa]	60	85J-1027	49	53.0
2010	NBH	102.7	NBH/CR	60	85J-1027	110	111.3[bb]	60	85J-1027	49	51.8
2011	NBH	102.7	NBH/CR	60	85J-1027	135	135.0[cc]	60	85J-1027	60	59.3
2012	NBH	102.7	NBH/CR	60	85J-1027	135	137.0[dd]	70.5	85J-1027	61	65.0
2013	NBH	102.7	NBH/CR	70.5	85J-1027	135	134.9[ee]	70.5	85J-1027	61	65.4
2014	NBH	102.7	NBH/CR	70.5	85J-1027	135	140.7[ff]	70.5	85J-1027	61	62.6

[a] Eggs collected WLH/CR returns to Nakat Inlet.
[b] Additional 3.2 million to WLH.
[c] Egg take is for all release sites, including NBH.
[d] Additional 23.5 million eggs to WLH.
[e] From brood year 1987 to brood year 1990, no release number was listed in the AMPs.
[f] Includes the 8.3 million fry transported from WLH back to NBH.
[g] Additional 22.4 million eggs transferred to WLH and 3.5 million transferred to Alaska Aquaculture Association.

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[h] Includes the 6.2 million fry shipped back from WLH.
[i] Includes 4.2 million eggs shipped to WLH.
[j] Includes 13.4 million eggs shipped to WLH.
[k] Includes 24.1 million eggs shipped to WLH.
[l] Includes 23.8 million eggs shipped to WLH.
[m] Includes 25.6 million eggs shipped to WLH.
[n] Includes 24.4 million eggs shipped to WLH and includes eggs collected for Kendrick Bay release site.
[o] Includes 25.38 million eggs shipped to WLH.
[p] Includes 26.6 million eggs shipped to WLH.
[q] Includes 30.1 million eggs shipped to WLH.
[r] Includes 32.0 million eggs shipped to WLH.
[s] Includes 29.0 million eggs shipped to WLH and includes eggs collected for Anita Bay release.
[t] Includes eggs collected for Anita Bay release.
[u] Includes eggs collected for Anita Bay and Kendrick Bay releases.
[v] Includes 33.8 million eggs transferred to WLH and includes eggs collected for Anita Bay release.
[w] Includes 38.3 million eggs transferred to WLH, 2 million eggs transferred to Tamgas Creek Hatchery, and includes eggs for Anita Bay release.
[x] Includes 39.8 million eggs transferred to WLH. Egg number from 2006 Neets Bay AR.
[y] Includes 37 million eggs transferred to WLH and includes eggs collected for Anita Bay release.
[z] Includes 36.7 million eggs transferred to WLH and includes eggs collected for Anita Bay release.
[aa] Includes 36 million eggs transferred to WLH and eggs collected for Anita Bay release.
[bb] Includes 35.5 million eggs transferred to WLH and eggs collected for Anita Bay release.
[cc] Includes 40.8 million eggs transferred to WLH and 22.7 million eggs transferred to BIH.
[dd] Includes 41.4 million eggs transferred to WLH and 22.4 million eggs transferred to BIH.
[ee] Includes 40.7 million eggs transferred to WLH and 23.1 million eggs transferred to BIH.
[ff] Includes 42.0 million eggs transferred to WLH and 23.5 million eggs transferred to BIH.

Appendix F.–Permitted and reported egg takes and releases of summer chum salmon, in millions and rounded, from the Anita Bay release site.

From 2001 to 2010, the project was permitted under both the Whitman Lake Hatchery (WL) and Neets Bay Hatchery (NB) permits. Eggs were collected at NB, incubated at WL and/or NB, and resulting fry released at Anita Bay. In 2011, the project was transferred to the Burnett Inlet Hatchery (BI) permit. Eggs were collected at Neets Bay, incubated at BI, and resulting fry released at Anita Bay.

Key: AMP=Annual Management Plan; AR=Annual Report; BIH=Burnett Inlet Hatchery; CR=Carroll River; FTP=Fish Transport Permit; IL=Incubation Location; NBH=Neets Bay Hatchery; WLH=Whitman Lake Hatchery.

Brood Year	IL	Hatchery Permit Egg Take[a]	Egg Source	FTP Egg Take	FTP No. Egg Take	AMP Egg Take[a]	AR Egg Take[a]	FTP Release	FTP No. Release	AMP Release[b]	AR Release
2000	WLH	35.8	NBH/CR	8	01J-1003	80	32	8	01J-1003	8	8
2001	WLH	43.8	NBH/CR	8	01J-1003	80	29	8	01J-1003	14	7
	NBH	72	NBH/CR	6	01J-1009			6	01J-1009		7
2002	WLH	44.3	NBH/CR	8	01J-1003	80	32	8	01J-1003	14	8
	NBH	72	NBH/CR	6	01J-1009			6	01J-1009		5
2003	NBH	84	NBH/CR	22	01J-1009	80	75	22	01J-1009	14	14
2004	NBH	84	NBH/CR	22	01J-1009	100	74	22	01J-1009	14	14
2005	WLH	44.3	NBH/CR	8	01J-1003		37	8	01J-1003		4
	NBH	84	NBH/CR	22	01J-1009	100	76	22	01J-1009	22	18
2006	WLH	44.3	NBH/CR	8	01J-1003		40	8	01J-1003		5
	NBH	84	NBHCR	22	01J-1003	100	84	8	01J-1003	22	20
2007	WLH	44.3	NBH/CR	8	01J-1003		37	8	01J-1003		5
	NBH	84	NBH/CR	22	01J-1009	100	51	22	01J-1009	22	15
2008	WLH	44.3	NBH/CR	8	01J-1003			8	01J-1003		4
	NBH	84	NBH/CR	22	01J-1009	100	111	22	01J-1009	22	19
2009	WLH	44.3	NBH/CR	8	01J-1003			8	01J-1003		5
	NBH	84	NBH/CR	22	01J-1009	110	135	22	01J-1009	22	19
2010	WLH	44.3	NBH/CR	8	01J-1003			8	01J-1003		4
	NBH	102.7	NBH/CR	22	01J-1009	111	111	22	01J-1009	22	19
2011	BIH	25	NBH/CR	25	10J-1028	135	23	25	10J-1028	22	22
2012	BIH	25	NBH/CR	25	10J-1028	135	22	25	10J-1028	22	22
2013	BIH	25	NBH/CR	25	10J-1028	135	23	25	10J-1028	22	23
2014	BIH	25	NBHCR	25	10J-1028	135	24	25	10J-1028	22	23

[a] Egg take number is for all release sites, including Anita Bay.
[b] Total release from Anita Bay.

Appendix G.–Permitted and reported egg takes and releases of summer chum salmon, in millions and rounded, from the Kendrick Bay release site.

Releases from the site were permitted through both Whitman Lake Hatchery and Neets Bay Hatchery over the years.

Key: AMP=Annual Management Plan; AR=Annual Report; BIH=Burnett Inlet Hatchery; CR=Carroll River; FTP=Fish Transport Permit; KB=Kendrick Bay; NBH=Neets Bay Hatchery; WLH=Whitman Lake Hatchery.

Brood Year	Hatchery Permit Egg Take	Egg Source	FTP Egg Take[a]	FTP No.	AMP Egg Take	AR Egg Take[b]	FTP Release	FTP No.	AMP Release	AR Release
1990	14	NBH/CR	14	90J-1052	14	0.7[c]	13	90J-1052	6	6
1991	14	NBH/CR	14	90J-1052	24[d]	24	13	90J-1052	8	8
1992	14	NBH/CR	14	90J-1052	26[d]	24	13	90J-1052	8	8
1993	14	NBH/CR	14	90J-1052	26[d]	26	13	90J-1052	9	9
1994	14	NBH/CR	14	90J-1052	12	24	13	90J-1052	9	8
1995	14	NBH/CR	14	90J-1052	13	25	13	90J-1052	8	8
1996	14	NBH/CR	14	90J-1052	13	29	13	90J-1052	9	9
1997	14	NBH/CR	14	90J-1052	13	29	13	90J-1052	9	9
1998	14	NBH/CR	14	90J-1052	13	30	13	90J-1052	9	9
1999	14	NBH/CR	14	90J-1052	80[d]	29	13	90J-1052	9	10
2000	14	NBH/CR	14	90J-1052	80[d]	32	13	90J-1052	14	10
2001	14	NBH/CR	14	90J-1052	14	29	13	90J-1052	14	10
2002	14	NBH/CR	14	90J-1052	14	32	13	90J-1052	14	11
2003	20	NBH/CR	20	03J-1008	14	26	20	03J-1008	20	20
2004	20	NBH/CR	20	03J-1008	20	34	20	03J-1008	20	20
2005	20	NBH/CR	20	03J-1008	20	37	20	03J-1008	20	21
2006	20	NBH/CR	20	03J-1008	20	40	20	03J-1008	20	22
2007	20	NBH/CR	20	03J-1008	20	37	20	03J-1008	20	18
2008	20	NBH/CR	20	03J-1008	20	38	20	03J-1008	20	19
2009	44.3	NBH/CR	20	08J-1020	22	39	20	08J-1022	20	21
2010	44.3	NBH/CR	20	08J-1020	22	36	20	08J-1022	20	20
2011	44.3	NBH/CR	20	08J-1020	22	41	30	08J-1022	30	29
2012	44.3[e]	NBH/CR	30	12J-1013	22	41	30	12J-1013	30	29[f]
2013	44.3	NBH/CR	30	12J-1013	22	42	30	12J-1013	30	30
2014	44.3	NBH/CR	30	12J-1013	22	42	30	12J-1013	30	29

[a] FTP was in number of eggs from 1990 to 2002. From 2003 to 2014, FTP was in number of fry.
[b] Eyed eggs from NBH. Egg take number is for all release sites, including KB.
[c] And additional 13.9 million eyed eggs transferred from NBH.
[d] Egg take number is for all release sites, including KB.
[e] The additional eggs for the increased release at KB were to come from BIH. WLH remained at 44.3 million eggs.
[f] Release was to McLean.

Appendix H.–Comparison of permitted and reported fall run coho salmon (Indian Creek stock) egg takes and releases (in millions) in hatchery permit, basic management plan, annual management plan, fishery transport permits, and annual reports for the Neets Bay release site, 1979–2012, permitted under the Whitman Lake Hatchery permit and Neets Bay Hatchery permit.

No FTP was found that permitted eggs to be taken and incubated at Whitman Lake Hatchery and transferred to Neets Bay Hatchery for release until 2013 (FTP 13J-1004). Due to the integration of the Whitman Lake Hatchery and Neets Bay Hatchery programs over the years, the history of permitting of Whitman Lake Hatchery fall coho salmon is provided below the appendix table to provide background information for interpreting the appendix table. See additional information on the Neets Bay release site at the end of the appendix table.

Key: AMP=Annual Management Plan; AR=Annual Report; FTP=Fish Transport Permit; IC=Indian Creek; Juv=Juvenile; NBH=Neets Bay Hatchery; NS=Not Specified in permit; WLH=Whitman Lake Hatchery.

Brood Year	Hatchery Permit Egg Limit	FTP Egg Limit	FTP No	Egg Source	Incubation Location	AMP Egg Limit	AR Egg Take or Juv Transfer	Release Site	FTP Release Limit	FTP No.	AMP Release Limit	AR Release
1978	2.3	[a]	78J-0118	IC	WLH	NS	0.776[b]	NBH	0.775	80-55	0.325	0.278
1979	2.3	1.0	80-10	IC	WLH	1.5	0.928[b]	NBH	Not found	Not found	0.530	0.563
1980	2.3	1.2	80-91	IC	WLH	1.2	0.630[b]	NBH	0.564	81-12	0.335	0.340
1981	2.3	2.0	81-18	NBH	WLH	2.0	1.903	NBH	1.950	81-18	0.950	0.980
1982	2.3	1.950	81-18	NBH	WLH	1.95	2.406	NBH	1.950	81-18	Not listed	0.958
1983	4.5		[c]	NBH	NBH		2.758	NBH	4.5	84J-1033	Not listed	2.153
1984	3.4		[d]	WLH	WLH	1.0	0.462[e]	NBH	5.0	81-18		
	4.5	4.5	84J-1033	NBH	NBH	5.0	3.352	NBH	4.5	84J-1033		
								NBH			2.75	2.356
1985	3.4			WLH	WLH	1.0	0.487[f]	NBH	5.0	81-18		
				WLH	WLH	1.0	0.172[g]	NBH	5.0	81-18		
	4.5	4.5	84J-1033	NBH	NBH	3.0	3.050	NBH	4.5	84J-1033		
								NBH			2.8	2.485
1986	3.4			WLH	WLH	1.0	0.144[h]	NBH	5.0	81-18		
				WLH	WLH		0.353[f]	NBH	5.0	81-18		
	4.5	4.5	84J-1033	NBH	NBH	3.0	2.080	NBH	4.5	84J-1033		
								NBH			1.683	1.779

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Brood Year	Hatchery Permit Egg Limit	FTP Egg Limit	FTP No	Egg Source	Incubation Location	AMP Egg Limit	AR Egg Take or Juv Transfer	Release Site	FTP Release Limit	FTP No.	AMP Release Limit	AR Release
1987	3.4			WLH	WLH	1.0	0.756[g]	NBH	5.0	81-18		
	4.5	4.5	84J-1033	NBH	NBH	3.0	1.138	NBH	4.5	84J-1033		
								NBH			2.242	2.142
1988	3.4			WLH	WLH	3.4[i]	1.5[j]					
							0.550[f]	NBH	5.0	81-18		
							0.565[f]	NBH	5.0	81-18		
	4.5	4.5	84J-1033	NBH	NBH	3.0	1.138	NBH	4.5	84J-1033		
								NBH			3.0	2.204
1989	3.4			WLH	WLH	4.0[k]	1.086[g]	NBH	5.0	81-18		
	4.5	4.5	84J-1033	NBH	NBH	3.0	3.615[l]	NBH	4.5	84J-1033		
								NBH			2.4	2.216
1990	3.4			WLH	WLH	4.0	1.187[f]	NBH	[m]			
				WLH	WLH		0.697[g]	NBH				
	4.5	4.5	84J-1033	NBH	NBH	3.0	0.414	NBH	4.5	84J-1033		2.303
1991	3.4			WLH	WLH/NBH	4.0	2.411[j]	NBH				
				WLH	WLH		0.488[f]					
				WLH	WLH		0.517[g]					
								NBH			3.0	2.677
1992	3.4			WLH	NBH/WLH	4.0	2.143[j]	NBH				
				WLH	WLH		0.394[f]	NBH				
				WLH	WLH		1.0[g]	NBH				
								NBH			2.5	2.315
1993	3.4			WLH	WLH	5.0	0.298[f]	NBH				
				WLH	WLH		0.893[g]	NBH				
	4.5	4.5	84J-1033	NBH	NBH	3.5	2.150	NBH	4.5	84J-1033	2.925	2.672

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Brood Year	Hatchery Permit Egg Limit	FTP Egg Limit	FTP No	Egg Source	Incubation Location	AMP Egg Limit	AR Egg Take or Juv Transfer	Release Site	FTP Release Limit	FTP No.	AMP Release Limit	AR Release
1994	3.4			WLH	WLH/NBH	5.0	2.078[j]	NBH				
				WLH	WLH		1.132[g]	NBH				
								NBH			3.1	3.002
1995	3.4			WLH	WLH/NBH	4.5	1.591[j]	NBH				
				WLH	WLH		1.355[g]	NBH				
	4.5		[n]	NBH	NBH	3.0	0.641	NBH				
								NBH			3.300	3.382
1996	3.4			WLH	WLH/NBH	4.5	1.540[j]	NBH				
				WLH	WLH		0.865[g]	NBH				
	4.5	4.5	[n]	NBH	NBH	3.0	0.542	NBH				
								NBH			2.700	2.414
1997	3.4			WLH	WLH/NBH	4.5	2.144[j]	NBH				
				WLH	WLH		0.913[g]	NBH				
								NBH			3.000	2.751
1998	3.4					4.5	0.137[f]	NBH				
							0.973[g]	NBH				
	4.5	4.5	98J-1007	NBH	NBH	3.0	2.220	NBH	4.5	98J-1007		
								NBH			3.000	3.099
1999	3.4					4.5	0.368[j]	NBH				1.180[j]
							0.100[f]	NBH				
							0.713[g]	NBH				
	4.5	4.5	98J-1007	NBH	NBH	3.0	1.772	NBH	4.5	98J-1007		
								NBH			2.830	2.738
2000	7.0					4.5	2.011[g]	NBH				
	4.5	4.5	[n]	NBH	NBH	3.0	0.347	NBH	4.5	98J-1007		
								NBH			2.900	2.046

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Brood Year	Hatchery Permit Egg Limit	FTP Egg Limit	FTP No	Egg Source	Incubation Location	AMP Egg Limit	AR Egg Take or Juv Transfer	Release Site	FTP Release Limit	FTP No.	AMP Release Limit	AR Release
2001	7.0			WLH	WLH/NBH	4.5	2.198[j]	NBH				
				WLH	WLH		0.829[f]	NBH				
				WLH	WLH		0.120[g]	NBH				
								NBH			2.900	3.026
2002	7.0			WLH	WLH/NBH	4.5	4.311[o]	NBH			2.900	2.537
2003	7.0			WLH	WLH/NBH	4.5	5.046[o]	NBH			2.900	2.999
2004	7.0			WLH	WLH/NBH	4.5	1.600[j]	NBH				
	4.5	4.5	98J-1007	NBH	NBH	3.0	1.319	NBH	4.5	98J-1007		
								NBH			2.900	3.075
2005	7.0			WLH	WLH/NBH	4.5	0.928[j]	NBH				
	4.5	4.5	98J-1007	NBH	NBH	3.0	1.723	NBH	4.5	98J-1007		
								NBH			2.900	2.814
2006	7.0			WLH	WLH/NBH	4.5	0.260[j]	NBH				
				WLH	WLH		0.589[g]	NBH				
	4.5	4.5	98J-1007	NBH	NBH	3.0	1.723	NBH	4.5	98J-1007		
								NBH			2.900	2.779
2007	7.0			WLH	WLH/NBH	4.5	2.600[p]	NBH				
				WLH	WLH		0.609[g]	NBH				
								NBH			2.900	2.775
2008	7.0	4.5	[q]	WLH	WLH/NBH	4.5	2.900[j]	NBH			2.900	3.011
2009	7.0			WLH	WLH/NBH	4.5	2.610[r]	NBH			2.900	3.285
2010	7.0			WLH	WLH/NBH	6.0	2.557[r]	NBH			3.000	2.823

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Brood Year	Hatchery Permit Egg Limit	FTP Egg Limit	FTP No	Egg Source	IL	AMP Egg Limit	AR Egg Take or Juv Transfer	Release Site	FTP Release Limit	FTP No.	AMP Release Limit	AR Release
2011	7.0			WLH	WLH/NBH	6.0	2.564[j]	NBH				
				WLH	WLH		0.626[g]	NBH				
		1.2	11J-1024	WLH	WLH		0.822[s]	NBH	1.2	11J-1024		
								NBH			4.05	3.702
2012	7.0			WLH	WLH/NBH	6.5	1.063[j]	NBH				
							0.219[g]	NBH				
		1.2	11J-1024	WLH	WLH	2.0	1.768[s]	NBH	1.2	11J-1024		
	4.5	4.5	98J-1007	NBH	NBH	3.0	1.405	NBH				
								NBH			4.2	4.46
2013	7.0	2.6	13J-1005	WLH	WLH/NBH	6.5	6.905	NBH	2.9	13J-1005		
	4.5	4.5	98J-1007	NBH	NBH	3.0	1.522	NBH	4.5	98J-1007		
								NBH			4.05	4.154

[a] No egg number was listed on FTP 78J-0118.

[b] Egg take for releases at WLH and NBH.

[c] FTP was not issued until 1984.

[d] No FTP permitted eggs to be taken at WLH, incubated at WLH, and transferred to NBH until 2013. FTP 81-18 permitted eggs to be taken at NBH, incubated at WLH, and transferred back to NBH.

[e] Annual report indicates that a total of 895,700 smolt were released from this egg take, including 234,250 at WLH, 100,307 from Earl West Cove and 99,063 from Nakat Inlet. The author subtracted these 3 releases from the total smolt number to get the Neets Bay release, as it was not found recorded in the annual report.

[f] Presmolts transferred from WLH to NBH.

[g] Smolts transferred from WLH to NBH.

[h] Fry transferred from WLH to NBH.

[i] It is unclear where the increase from 1.0 million to 3.4 million eggs came from. The hatchery capacity at the time was 3.4 million eggs, but the only FTP found in effect at the time (18-19) was for 1 million eggs.

[j] Eyed eggs transferred from WLH to NBH.

[k] It is unclear where the increase from 3.4 million to 4.0 million eggs came from. The hatchery capacity at the time was 3.4 million eggs, but the only FTP found in effect at the time (18-19) was for 1 million eggs.

[l] 1.311 million eyed eggs of the NBH egg take was transferred to WLH.

[m] It appears that this transfer was not approved under an FTP. Neets Bay releases were approved under FTP 84J-1033 to collect and release up to 4.5 million Neets Bay/Indian Creek stock eggs from Neets Bay, but not with eggs received from WLH (Whitman Lake Hatchery/Indian Creek stock eggs). In 1990, FTP 90J-1007 allowed for a collection of 4.5 million eggs at Neets Bay for incubation at Whitman Lake and release of resulting fry at Neets Bay. FTP 90J-1007 was amended in 2000 to increase egg take to 5 million eggs through 2005. No FTP was issued that stated the number of eggs collected or release number for eggs collected at WLH and released at Neets Bay. Since the donor stock at Neets Bay and Whitman Lake were the same (Indian Creek), this appears as an oversight. No FTP was found authorizing Neets Bay coho salmon releases from 2005 until FTP 13J-1005 was issued in 2013.

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[n] 84J-1033 had expired.

[o] Eggs for incubation at both WLH and NBH for release at NBH and other sites.

[p] Green egg number incubated to eyed stage at WLH and transferred to NBH.

[q] No FTP was found permitting transfer of eggs or fry from WLH to NBH. FTP 05J-1007 renewed FTP 90J-1010, and again permitted the egg take at WLH but not the transfer to NBH.

[r] Green eggs from WLH transferred to NBH as eyed eggs.

[s] Smolt transferred from Neck Lake.

Additional Information for Appendix H: Whitman Lake Hatchery is the primary egg collection site for SSRAA fall run (Indian Creek stock) coho salmon programs. Coho salmon eggs are incubated at Whitman Lake Hatchery, and released from the hatchery and other release sites. Eggs are also transferred to Neets Bay and Burnett Inlet hatcheries for rearing and release from those hatcheries and other sites.

The Whitman Lake Hatchery permit issued in May 1978 listed the coho salmon permitted capacity at Whitman Lake Hatchery as zero, with the option that it may be added when a satisfactory plan was presented and approved by ADF&G.

The first definitive permit alteration stating a permitted coho salmon capacity for Whitman Lake Hatchery was approved in November 1978. The permit alteration stated that the permitted capacity at Whitman Lake Hatchery was 2.3 million coho salmon eggs. The October 1982 basic management plan "discussion draft" indicated production goals of 400,000 eggs for release at Whitman Lake Hatchery and 1.85 million eggs for release at Neets Bay. It appears that releases at Whitman Lake Hatchery were permitted by FTPs from 1980 to 1983.

In the early 1980s, Neets Bay returns had been the source for most or all of SSRAA's fall run coho salmon production. Neets Bay Hatchery also became the source of fall run chum salmon eggs for SSRAA's programs. Since the fall run chum and coho salmon returns overlapped in timing, sorting the 2 species for acquiring broodstock became difficult. Gradually, more broodstock was used from Whitman Lake Hatchery fall coho returns.

The next approved PAR that increased coho salmon production on the Whitman Lake Hatchery permit occurred in 1983, when 500,000 eggs were added for release at Square Cove (aka Earl West Cove) to enhance the fisheries near Wrangell. This increased permitted capacity for coho salmon from 2.3 to 2.8 million eggs.

Later in 1983, a PAR was approved that allowed the release from Whitman Lake Hatchery to increase from 400,000 eggs to 1 million eggs. This increased overall coho salmon capacity at the hatchery from 2.8 million eggs to 3.4 million eggs. The increased production of 600,000 eggs was requested after additional space became available at the hatchery due to a shortfall in collection of summer run chum salmon eggs that year. The FTP for the project (FTP 81-19) was amended to increase the egg-take level from 350,000 eggs to 1 million eggs in 1983 as well. This FTP was updated in 1990 as FTP 90J-1010.

Beginning in 1988, several inconsistencies were found with coho salmon permitting for Whitman Lake Hatchery. The 1988 AMP permitted a 3.4 million egg coho salmon egg take for incubation at Whitman Lake Hatchery. However, the only FTP found in effect at the time was FTP 81-19, which authorized collection of 1 million eggs for release at the hatchery. The 1989–1992 AMPs permitted an annual egg take of 4 million eggs, again with only FTP 81-19, and its replacement, FTP 90J-1010, in place permitting collection of 1 million eggs. In addition to the AMPs permitting more eggs than allowed by the FTP, the 1989–1992 AMPs permitted an egg take above the permitted capacity at Whitman Lake Hatchery, which was 3.4 million eggs at the time. The planned egg takes increased to 5 million eggs in the 1993 and 1994 AMPs. The planned egg takes were 4.5 million eggs in the 1995 to 1999 AMPs. The hatchery permitted capacity remained at 3.4 million eggs over these periods.

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Over the same time period, annual egg-take goals in the AMP at Neets Bay declined from 3.0 million eggs annually from 1985 to 1988 to 500,000 eggs annually from 1989 to 1994. The Neets Bay Hatchery FTP in place during this period permitted 4.5 million eggs for incubation, rearing, and release at Neets Bay Hatchery (FTP 84J-1033). Beginning in 1995, the AMP indicated that all fall run coho salmon eggs would come from Whitman Lake Hatchery, with Neets Bay returns serving as a backup source. However, in 1998, FTP 98J-1007 was issued for Neets Bay Hatchery with the same conditions as FTP 84J-1033 (apparently no FTP was in effect from 1995 to 1997). By 2000, Whitman Lake Hatchery was SSRAA's primary egg take location for all its fall coho salmon projects.

Permitting inconsistencies continued. An amendment in 2000 to Whitman Lake Hatchery FTP 90J-1010 authorized an egg-take of 4.5 million eggs, which was in excess of the permitted hatchery capacity at the time of 3.4 million coho salmon eggs. The FTP amendment request indicated that SSRAA had moved egg take operations from Neets Bay Hatchery to Whitman Lake Hatchery, and that the increase in the FTP did not represent an increase in SSRAA's overall coho salmon production, but only the site where eggs were taken. The FTP also indicated all of the progeny from the 4.5 million egg take would be released from Whitman Lake Hatchery, which was in error. When FTP 90J-1010 was renewed in 2005 as FTP 05J-1007, the FTP resolved the earlier error regarding release sites, stating that the eggs were for release from Whitman Lake Hatchery, Nakat Inlet, Anita Bay, and Neets Bay. However, FTP 05J-1007 did not specify what portion of the egg take was for release from Whitman Lake Hatchery or Neets Bay Hatchery. The other release sites had separate FTPs stating the release levels from each site (Anita Bay, FTP 01J-1001; Nakat Inlet, FTP 05J-1026).

It appears as coho operations shifted from Neets Bay Hatchery to Whitman Lake Hatchery that permitting did not keep up with the operational changes. FTPs and AMPs appear to have been issued more to guide SSRAA's overall coho salmon program than to guide each hatchery's operations.

In 2010, the Whitman Lake Hatchery permit was amended to increase coho salmon capacity from 3.4 million to 7.0 million eggs. The 2010 permit alteration moved egg collections for all coho salmon projects to Whitman Lake Hatchery. The increase in permitted capacity at Whitman Lake Hatchery did not increase SSRAA's coho salmon production overall, but allowed their 7 million permitted egg total to all come from Whitman Lake Hatchery, with Neets Bay Hatchery serving as a backup. The permit alteration brought the Whitman Lake Hatchery PNP hatchery permit, FTP and AMP into agreement and compliance.

Appendix I.–Comparison of permitted and reported Chinook salmon egg takes in hatchery permit, basic management plan, annual management plan, fishery transport permits and annual reports for the Neets Bay release site.

Key: AMP=Annual Management Plan; AR=Annual Report; CI=Carroll Inlet; CR=Chickamin River; CLH=Crystal Lake Hatchery; DMH=Deer Mountain Hatchery; FTP = Fish Transport Permit; LPW=Little Port Walter Hatchery; NBH=Neets Bay Hatchery; UR=Unuk River (Cripple Creek); WLH=Whitman Lake Hatchery.

Brood Year	Egg Source/Stock	Incubation Location	Hatchery Permit Egg Limit	FTP Egg Limit	FTP No.	AMP Egg Limit	AR Egg Take	FTP Release Limit	FTP No.	AMP Release Limit	AR Release
1981	LPW/UR	WLH		200,000	81-59	200,000	189,500	200,000	83J-1015	138,000	135,163
1982	LPW/UR	WLH	400,000	200,000	81-59	200,000	124,000	2,000,000	84J-1046	150,000	144,106
	UR	LPW		200,000	81-16	200,000	49,150	100,000	84J-1047	100,000	
1983	LPW/UR	WLH	400,000	2,000,000	84J-1046	300,000	98,269	2,000,000	84J-1046	96,000	100,228
	DMH	NBH	2,000,000	1,000,000	83J-1031		633,756	1,000,000	83J-1031	200,000	283,813
1984	LPW/UR	NBH	2,000,000	2,000,000	84J-1046	2,000,000	1,372,575	2,000,000	84J-1046	1,000,000	930,000
	NBH/WLH	NBH		2,000,000	84J-1045		448,492	2,000,000	84J-1045	400,000	434,122
1985	WLH&NBH/UR	NBH	4,000,000	4,000,000	85J-1028	2,000,000	4,106,000	4,000,000	85J-1028	3,500,000	3,034,200
1986	NBH/UR	NBH	4,000,000	4,000,000	85J-1028	4,000,000	5,144,000	4,000,000	85J-1028	1,540,000	3,438,000
1987	NBH/UR	NBH	4,000,000	4,000,000	85J-1028	4,000,000	1,252,000	4,000,000	85J-1028	810,000	897,500
1988	NBH/UR	NBH	4,000,000	4,000,000	85J-1028	4,000,000	2,570,000	4,000,000	85J-1028	1,705,000	1,608,000
1989	NBH/UR	NBH	4,000,000	4,000,000	85J-1028	2,000,000	1,659,000	4,000,000	85J-1028	905,000	388,000
1990	NBH/UR	NBH	4,000,000	4,000,000	85J-1028	2,000,000	1,439,200	4,000,000	85J-1028	869,000	728,470
1991	LPW/UR	NBH	4,000,000	4,000,000	85J-1028	2,000,000	788,000	4,000,000	85J-1028	544,000	377,374
1992	LPW/UR	NBH	4,000,000	4,000,000	85J-1028	3,700,000	788,000	4,000,000	85J-1028	300,000	214,980

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Brood Year	Egg Source/Stock	Incubation Location	Hatchery Permit Egg Limit	FTP Egg Limit	FTP No.	AMP Egg Limit	AR Egg Take	FTP Release Limit	FTP No.	AMP Release Limit	AR Release
1994	WLH/CR	WLH	3,000,000	1,500,000	91J-1039	1,500,000	519,400				
	MH/CR	WLH		1,300,000	94J-1020		312,474				
	LPW/CR	WLH			Not Found[a]		200,600				
						Total:	1,032,474	1,500,000	91J-1039	675,000	564,655
1995	WLH/CR		3,000,000	1,500,000	91J-1039	1,365,000	743,469	1,500,000	91J-1039	0	1,000
	WLH/CR-CI			1,000,000	95J-1028		780,798	1,000,000	95J-1028		
1996	WLH/CR	WLH	3,000,000	1,500,000	91J-1039	1,600,000	2,162,161[b]	1,500,000	91J-1039; 95J-1028	150,000	138,100
		WLH/CLH[c]	3,000,000	1,000,000	95J-1027		567,777	1,000,000	95J-1027	400,000	404,278
1997	WLH/CR	WLH	3,000,000	1,500,000	91J-1039	1,600,000	2,120,000	1,500,000	91J-1039	250,000	194,133
		WLH/CLH[c]	3,000,000	1,000,000	95J-1027			1,000,000	95J-1027	400,000	347,344
1998	WLH/CR	WLH	3,000,000	1,500,000	91J-1039	1,600,000	1,892,000	1,000,000	95J-1027	400,000	421,803[d]
1999	WLH/CR	WLH/CLH[c]	3,000,000	1,000,000	95J-1027	1,600,000	503,766[e]	1,000,000	95J-1027	430,000	416,329[d]
2000	WLH/CR	WLH/CLH[c]	3,000,000	1,000,000	95J-1027	1,600,000	505,000[f]	1,000,000	95J-1027	450,000	452,644[d]
2001	WLH/CR	WLH/CLH[c]	3,000,000	1,000,000	95J-1027	2,000,000	577,500[g]	1,000,000	95J-1027	450,000	520,466[d]
2002	WLH/CR	WLH/CLH[c]	3,000,000	1,000,000	95J-1027	2,000,000	550,000[h]	1,000,000	95J-1027	450,000	491,882[d]
2003	WLH/CR	WLH	3,000,000	1,500,000	91J-1039	2,000,000	2,341,412[i]	1,500,000	91J-1039	450,000	89,451
	WLH/CR	WLH/CLH[c]		1,000,000	95J-1027		478,000[j]	1,000,000	95J-1027		395,179[d]
2004	WLH/CR	WLH	3,000,000	1,500,000	91J-1039	2,000,000	2,197,808[k]	1,500,000	91J-1039	250,000	249,418
	WLH/CR	WLH/CLH[c]		1,000,000	95J-1027		450,000[l]	1,000,000	95J-1027	450,000	404,931[d]

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Brood Year	Egg Source/Stock	Incubation Location	Hatchery Permit Egg Limit	FTP Egg Limit	FTP No.	AMP Egg Limit	AR Egg Take	FTP Release Limit	FTP No.	AMP Release Limit	AR Release
2005	WLH/CR	WLH	3,000,000	1,500,000	91J-1039	2,000,000	2,299,000[m]	1,500,000	91J-1039	250,000	240,000
	WLH/CR	WLH/CLH[c]		1,000,000	05-1010		492,000[n]	1,000,000	05-1010	450,000	376,363[o]
2006	WLH/CR	WLH	3,000,000	1,500,000	91J-1039	2,000,000	2,180,000[p]	1,500,000	91J-1039	250,000	252,400
	WLH/CR	WLH/CLH		1,000,000	05-1010		480,000[q]				390,000
2007	WLH/CR	WLH	3,000,000	1,500,000	91J-1039	2,000,000	1,243,000[r]	1,500,000	91J-1039	250,000	245,000
	WLH/CR	WLH/CLH[c]		1,000,000	05-1010		470,000[s]	750,000	05J-1009	450,000	404,352
2008	WLH/CR	WLH	3,000,000	1,500,000	91J-1039	2,000,000	1,360,000[t]	1,500,000	91J-1039	250,000	247,000
	WLH/CR	WLH/CLH[c]		1,000,000	05-1010		528,800[u]	750,000	05J-1009	450,000	426,012
2009	WLH/CR	WLH	3,000,000	1,500,000	91J-1039	2,000,000	1,100,000[v]	1,500,000	91J-1039	250,000	243,000
	WLH/CR	WLH/CLH[c]		1,000,000	05-1010		499,200[w]	750,000	05J-1009	450,000	465,555
2010	WLH/CR	WLH	3,000,000	1,500,000	91J-1039	2,000,000	1,155,000[v]	1,500,000	91J-1039	250,000	248,750
	WLH/CR	WLH/CLH[c]		1,000,000	05-1010		558,200[x]	750,000	05J-1009	450,000	477,400
2011	WLH/CR	WLH	3,000,000	1,500,000	91J-1039	2,000,000		1,500,000	91J-1039	250,000	249,744
	WLH/CR	WLH/CLH[c]		1,000,000	05-1010	2,000,000	555,000[y]	750,000	05J-1009	450,000	492,000
2012	WLH/CR	WLH	3,000,000	1,500,000	91J-1039	2,000,000	513,000[z]	1,500,000	91J-1039	500,000	1,031,700[aa]
	WLH/CR	WLH/CLH[c]		1,000,000	05-1010	2,000,000	544,000	1,000,000	05-1010	450,000	
2013	WLH/CR	WLH	3,000,000	1,500,000	91J-1039	2,000,000	2,612,628[bb]	1,500,000	91J-1039	500,000	415,000[cc]
				1,000,000	05-1010	2,000,000		1,000,000	05-1010	450,000	

[a] 87J-1021 authorized transport of LPW/CR stock eggs to WLH for release at Carroll Inlet for 1987 only.
[b] Eggs collected from WLH and CI returns.
[c] Eggs eyed at WLH then transferred to CLH.
[d] Eyed eggs from WLH to CLH, incubation and rearing at CLH.
[e] These eyed eggs shipped to Crystal Lake are part of the total 1,815,000 eggs collected.
[f] These eyed eggs shipped to Crystal Lake are part of the total 2,238,000 eggs collected. 530,000 eyed eggs of total discarded.
[g] These eyed eggs shipped to Crystal Lake are part of the total 2,035,000 eggs collected. 313,500 eyed eggs of total discarded.
[h] These eyed eggs shipped to Crystal Lake are part of the total 1,903,380 eggs collected. 258,000 eyed eggs of total discarded.

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[i] Total eggs collected for transfers to CLH and releases at Long Lake, NBH, and WLH.
[j] These eyed eggs shipped to Crystal Lake are part of the total 2,341,412 eggs collected. 698,624 eyed eggs of total discarded.
[k] Includes 450,000 eggs shipped to CLH, 534,232 eggs and 46,412 fry discards, and releases at CLH, WLH and NBH.
[l] These eyed eggs shipped to Crystal Lake are part of the total 2,197,808 eggs collected.
[m] Eggs include the 492,000 eggs shipped to CLH, fry transfer to Port St Nicholas Hatchery, and releases at NBH and WLH.
[n] These eyed eggs shipped to Crystal Lake are part of the total 2,299,000 eggs collected.
[o] Includes 123,856 smolt released 5/31/07 and 252,507 smolt released 5/31/07.
[p] Includes 480,000 eggs to CLH, 280,000 fry to Port St Nicholas Hatchery, and releases at WLH and NBH.
[q] These eyed eggs shipped to Crystal Lake are part of the total 2,180,000 eggs collected.
[r] Includes 470,000 eggs to CLH, 312,000 eggs to Port St Nicholas Hatchery, and releases at WLH and NBH.
[s] These eyed eggs shipped to Crystal Lake are part of the total 2,130,000 eggs collected.
[t] Includes 195,000 eggs discarded and for releases at NBH and WLH.
[u] These eyed eggs shipped to Crystal Lake are part of a total 2,430,000 eggs collected. 195,000 eyed eggs of total WLH egg take discarded.
[v] Includes releases at NBH and WLH.
[w] These eyed eggs shipped to Crystal Lake are part of the total 2,684,000 eggs collected. 742,000 eyed eggs of total WLH egg take discarded.
[x] These eyed eggs shipped to Crystal Lake are part of the total 2,570,500 eggs collected. 380,000 eyed eggs and 42,000 fry of total WLH egg take discarded.
[y] These eyed eggs shipped to Crystal Lake are part of the total 2,405,500 eggs collected. 350,000 eyed eggs of total WLH egg take discarded.
[z] This was a smolt transfer to NBH.
[aa] This release from the 513,000 smolt transferred from WLH and an additional 544,000 smolt transferred from WLHH to CLH to NBH.
[bb] Includes 417,000 eggs destroyed from BKD and excess eggs, 319,000 transferred to Port St Nicholas Hatchery, and 551,860 eyed eggs and 300,000 fry to CLH and 89,000 smolts to Deer Mountain Hatchery.
[cc] Smolts received from CLH and WLH.