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An Evaluation of the Hidden Falls Hatchery for Consistency with Statewide Policies and Prescribed Management Practices

by

Mark Stopha

October 2015

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

Symbols and Abbreviations

The following symbols and abbreviations, and others approved for the Système International d'Unités (SI), are used without definition in the following reports by the Divisions of Sport Fish and of Commercial Fisheries: Fishery Manuscripts, Fishery Data Series Reports, Fishery Management Reports, Special Publications and the Division of Commercial Fisheries Regional Reports. All others, including deviations from definitions listed below, are noted in the text at first mention, as well as in the titles or footnotes of tables, and in figure or figure captions.

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. 5J15-05

AN EVALUATION OF THE HIDDEN FALLS HATCHERY FOR CONSISTENCY WITH STATEWIDE POLICIES AND PRESCRIBED MANAGEMENT PRACTICES

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October 2015

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 Hidden Falls Hatchery located in Chatham Strait in Southeast Alaska. The hatchery was constructed in 1981 by the State of Alaska, which retains ownership of the facility. The hatchery produces chum salmon *Oncorhynchus keta* for commercial harvest, and coho salmon *O. kisutch* and Chinook salmon *O. tshawytscha* for sport and commercial harvest. The facility releases juveniles from the hatchery and other release sites.

All chum salmon incubated at Hidden Falls Hatchery are thermal otolith-marked by release site. A portion of the coho and Chinook salmon releases are marked with coded wire tags. Fish are sampled weekly in the commercial fisheries to assess hatchery contribution. Spawning escapement goals for naturally spawning salmon stocks in systems near the hatchery and release sites have been met in most years of hatchery returns.

The basic management plan for the hatchery should be updated with a description of current permit conditions and operations.

Key words: Hidden Falls Salmon Hatchery, hatchery evaluation, hatchery, coho salmon, Chinook 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) 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."[1]

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, and 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.[2]

In Alaska, the purpose of salmon hatcheries is to supplement natural stock production for public benefit. 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).

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 for rearing. 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 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.

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[1] 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.

[2] Data from http://www.adfg.alaska.gov/index.cfm?adfg=CommercialByFisherySalmon.exvesselquery accessed 08/12/14.

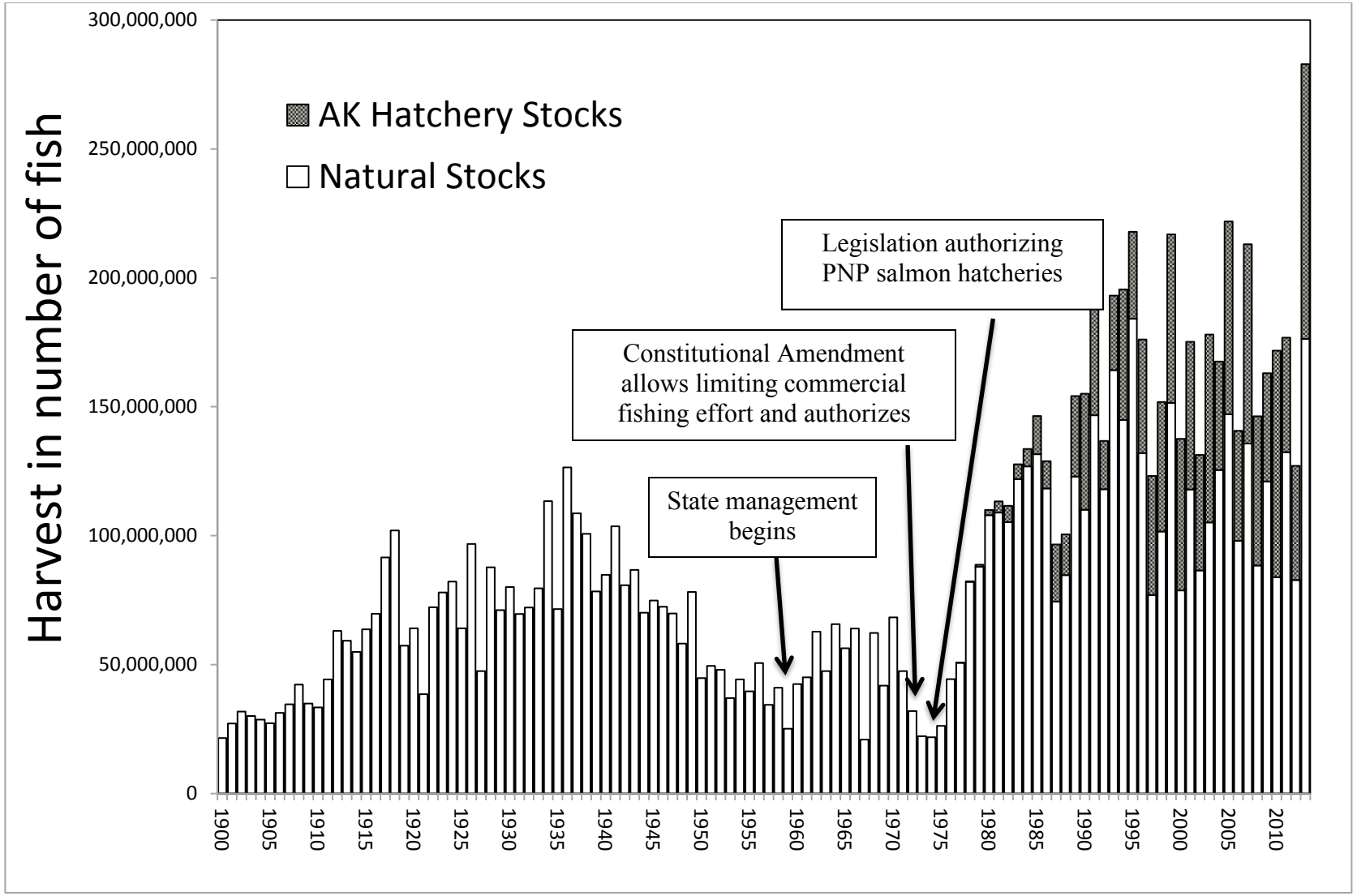

Figure 1.–Commercial salmon harvest in Alaska, 1900–2012.

Source: 1900–1976 from Byerly et al. (1999). 1977–2013 from Vercessi (2014).

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 to the competition 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[3] 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[4] 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). With world markets currently supporting a trend of increasing prices for salmon, interest in increasing hatchery production by Alaska fishermen, processors, support industries, and coastal communities has 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 use and subsistence users, has been successful in recovery of several populations identified as

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[3] 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 02/04/2014), multiplied by the hatchery percent of the commercial harvest in Farrington 2003, 2004; White 2005–2011, and Vercessi 2013.

[4] 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.

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 Alaska's history (Figure 1). The 2013 season was the first year the hatchery harvest alone exceeded 100 million fish. The 2013 hatchery harvest was greater than the entire statewide commercial salmon harvest in 1987 and every year prior to 1980 except for 6 years (1918, 1934, 1936, 1937, 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 first of these evaluations was published by ADF&G in 2011 (Musslewhite 2011a).

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 for increased hatchery production and potential impacts on wild salmon production. ADF&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, 2015a) completed reviews of the remainder of the Cook Inlet and Prince William Sound hatcheries, and the Macaulay, Sheep Creek, Snettisham and Sawmill Creek hatcheries in Southeast Alaska. This report is for the Hidden Falls Hatchery located in Sitka, Alaska. Following completion of reviews of hatcheries in the northern Southeast Alaska region, reviews of hatcheries in southern Southeast Alaska will follow.

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), *Policies and Guidelines for Alaska 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.

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 U.S./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 also recommends 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 nonsensitive areas for movement of stocks." In addition, *Genetic Policy* 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, including (1) hatchery stocks cannot be introduced to sites where the introduced stock may have significant 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 developing, 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. In addition, the Phase III Comprehensive Salmon Plan (described in the next paragraph) for Southeast Alaska includes 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.

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 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 *Genetic Policy*, 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 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 is comprised of the commercial salmon fishing permit holders and representatives of other user groups interested in fisheries within the 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 members may vote to impose a salmon enhancement tax on sale of salmon in their region to finance hatchery operations and 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* commercial fisheries, which are fisheries open to all commercial fishing permit holders. Several organizations have tourist and educational programs that 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 40.110–40.230). An application consists of the goals of the hatchery, production goals and hatchery site information, water flow and chemistry data, land ownership and water rights, hatchery design, initial proposed broodstock for the hatchery, and a financial plan. ADF&G staff review the application with the applicant, address any deficiencies, and draft a fishery management feasibility analysis for the proposed hatchery. 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 plan. ADF&G staff present the basic management plan for the hatchery, including fish culture aspects of the proposed hatchery and management of the hatchery return. Public testimony and questions follow the presentations. 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 for final consideration. By regulation (5AAC 40.220) the commissioner's decision is based on consideration of (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 requiring significant alterations of traditional fisheries; (2) the hatchery making the best use of the site's potential to benefit the common property fishery; (3) the harvest area size at the hatchery being sufficient in size to provide a segregated harvest of hatchery fish of acceptable quality for sale; (4) proposed donor sources meeting broodstock needs for the hatchery for the first cycle; (5) water sources for the hatchery being secured by permit and are of appropriate quality and quantity; and (6) the hatchery having a reasonable level of operational feasibility and an acceptable degree of potential success.

Public participation is an integral part of the PNP hatchery system. 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. Hearings are held before a hatchery is permitted for operation. RPTs comprised of ADF&G and RAA representatives 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 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.

Alaska PNP hatcheries operate under 4 documents required in regulation: hatchery permit with basic management plan (BMP), annual management plan (AMP), fish transport permit (FTP), and annual report (Figure 2).

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.

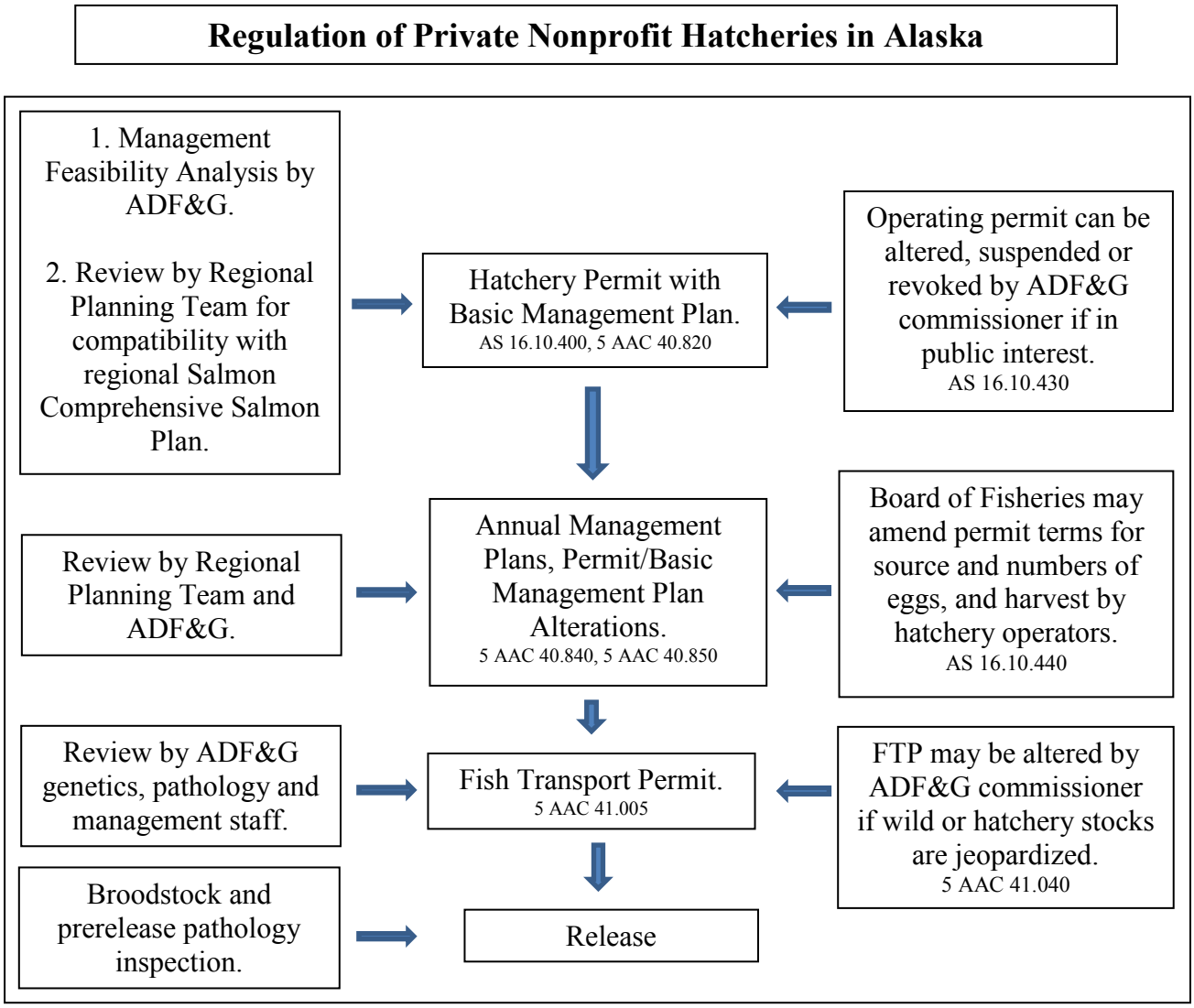

Figure 2.–Diagram of Alaska hatchery permitting process.

Hatchery permits/BMPs may be amended by the permit holder through a permit alteration request (PAR). Requested changes may be reviewed by the RPT and ADF&G staff and a recommendation is sent to the ADF&G commissioner for consideration. 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). 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 the ADF&G commissioner.

Each hatchery is required by law 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 (e.g., Vercessi 2014) to the Alaska Legislature (AS 16.05.092).

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.

HIDDEN FALLS HATCHERY OVERVIEW

Hidden Falls Hatchery

The Hidden Falls Hatchery is owned by the state of Alaska and operated by Northern Southeast Regional Aquaculture Association (NSRAA). The facility is located on Baranof Island along Chatham Strait in Southeast Alaska (Figure 3). The hatchery is supplied with water from a hanging lake, Hidden Falls Lake. The small creek between the base of the falls from the lake and saltwater supported a small run of pink salmon.[5] ADF&G operated the hatchery from 1977 to 1987, after which NSRAA operated the facility. The state retains ownership of the buildings and water rights (Alaska Department of Natural Resources permit numbers ADL 79922 and LAS 12194).

Construction began on the hatchery facility in 1977 and the facility was completed in 1979 with initial egg capacity of about 14 million eggs.[6] According to the BMP, the facility was envisioned primarily for chum salmon production, with coho and Chinook salmon produced for stocking lakes on the east side of Baranof Island. In 1988, Alaska PNP hatchery permit number 28 was issued to NSRAA to operate the hatchery. Permitted capacity was 68 million chum salmon eggs and 3.1 million Chinook salmon eggs. Coho salmon was added to the permit by amendment in 1989.

[5] Hidden Falls Hatchery BMP. Unpublished document obtained from Sam Rabung, ADF&G PNP coordinator, Juneau.

[6] Ibid.

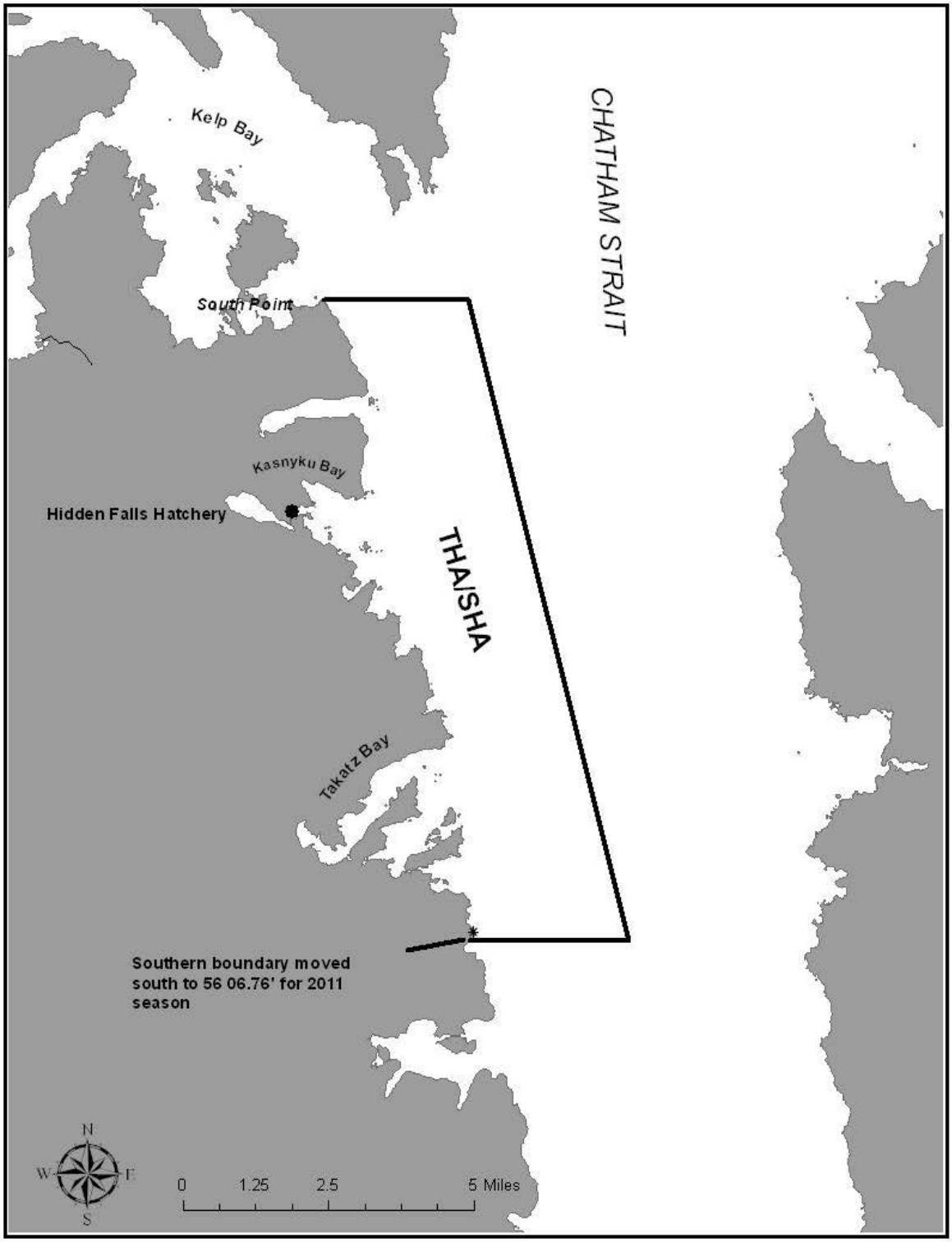

Figure 3.–Hidden Falls Hatchery and Takatz Bay release site in Chatham Strait, Southeast Alaska.
Note: THA = terminal harvest area; SHA=special harvest area.

Over the years, production increased gradually. ADF&G fishery managers learned migration routes, timing, and harvest of naturally spawning and hatchery stocks to ensure protection of wild stocks. NSRAA staff gained experience in hatchery production, harvest and broodstock management. The Pacific Salmon Treaty (PST) directed increased production of Chinook and coho salmon to mitigate harvest reductions resulting from the treaty. Market conditions incentivized increased salmon production to supplement harvest of naturally spawned production. Permitted capacity gradually increased to 125 million chum salmon eggs, 8.7 million Chinook salmon eggs and 7.7 million coho salmon eggs through 2014 (Appendix A).

The chum salmon program began with eggs collected annually from wild chum salmon from summer run stocks from the Kadashan, Clear and Seal rivers from 1977 to 1981. The Kadashan and Seal Bay rivers flow into Tenakee Inlet about 50 miles and 60 miles by water, respectively, from Hidden Falls. The Clear River flows into Kelp Bay about 10 water miles from Hidden Falls. Eggs were incubated at Snettisham Hatchery in 1977 (250,000 eggs[7]) and 1978 (2.462 million eggs[8]) while the Hidden Falls Hatchery was under construction. Resultant fry were transferred and reared in saltwater net pens at Hidden Falls, then released in May[9] in Kasnyku Bay. Beginning in 1979, incubation and rearing occurred at Hidden Falls Hatchery. Beginning in 1982, adult returns to the hatchery were used for broodstock.

Chum salmon releases were initially from Kasnyku Bay in front of the hatchery. The earliest year found for an FTP authorizing this egg take and release was 1995 (FTP 95J-1010, Appendix B). In 1987, releases also began at Takatz Bay just south of Kasnyku Bay (FTP 86J-1073 and 95J-1009).

Hidden Falls Hatchery stock eggs were also transferred to other facilities, including Medvejie Hatchery for release at Deep Inlet near Sitka (FTP 89J-1006 and FTP 09J-1021), Macaulay Salmon Hatchery for release at Boat Harbor near Juneau (FTP 91J-1065), Gunnuk Creek Hatchery near Kake (FTP 01J-1017 and FTP 07J-1023), Port Armstrong Hatchery (FTP 03J-1009), and Southeast Cove near Kake (FTP 12J-1022). Plans are also in place to collect eggs from Hidden Falls Hatchery stock returns to Southeast Cove (FTP 14J-1024) and Port Armstrong (FTP 11J-1023) if broodstock requirements fall short at Hidden Falls Hatchery (Appendix B).

The peak chum salmon return was from the 1992 brood year at nearly 4.6 million fish. The 10 year average annual return through the last complete brood year of return in 2007 (1998–2007) was about 1.5 million fish. Chum salmon returns to date from Hidden Falls Hatchery have totaled over 47 million fish. (Table 1; Appendix C).

The Chinook salmon program began with wild Chinook salmon gametes collected annually (1981–1983) from Andrew Creek, a tributary to the lower Stikine River north of Wrangell, for incubation, rearing, and release from the hatchery. Andrew Creek stock eggs were transferred from Crystal Lake Hatchery to Hidden Falls Hatchery from 1984 to 1986. From 1987 to 2014, eggs were used from Andrew Creek stock returns to the hatchery (FTP 92J-1019; Appendix D), with transfers of Andrew Creek stock eggs from Crystal Lake Hatchery or Medvejie Hatchery as needed.

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[7] From Kadashan and Clear Rivers according to the 1980 AMP, an unpublished document obtained from Sam Rabung, ADF&G PNP coordinator, Juneau.

[8] Of the 2.462 million eggs, 310,000 were collected from Clear River and 2.125 million eggs from Kadashan River. Unpublished document obtained from Sam Rabung, ADF&G PNP coordinator, Juneau.

[9] 1980 Annual Management Plan for Hidden Falls Hatchery. Unpublished document obtained from Sam Rabung, ADF&G PNP coordinator, Juneau.

Eggs from Chinook salmon from the Tahini River, a tributary of the Chilkat River near Haines, were collected annually from 1983 to 1990 for incubation and rearing at the hatchery. Brood years 1983 to 1987 and 1989 were released from the Hidden Falls Hatchery for broodstock development. Brood year 1988 fry were released at Lutak Inlet near Haines. The 1990 through 1993 brood year fry were transferred to Burro Creek Hatchery for rearing and release near Skagway. The Tahini River Chinook salmon program was discontinued after release of the 1993 brood year, apparently as result of continued poor returns to Hidden Falls Hatchery.[10] From 2007 to 2009, eggs from Tahini River stock Chinook salmon were collected from returns to the Pullen Creek release site near Skagway and incubated at Macaulay Salmon Hatchery. Eyed-eggs were transferred from Macaulay Salmon Hatchery to Hidden Falls Hatchery for incubation. Fry were transferred into saltwater net pens for imprinting at Lutak Inlet near Haines, and released. The project was transferred to Macaulay Salmon Hatchery in 2010.

Hidden Falls Hatchery coho salmon production began in 1988 with Blanchard Lake stock eggs transferred from Medvejie Hatchery and resultant smolt released from Hidden Falls Hatchery. Eggs were collected from Chinook salmon from the Farragut River, which empties into Frederick Sound northwest of Petersburg (FTP 89J-1028), for 1 year (1989), and the resultant fry were released back to the Farragut River. After 1989, NSRAA decided not to pursue broodstock development of the Farragut River stock because of the low number of eggs available annually and the high exploitation rates on returning Chinook salmon incidentally caught during the Hidden Falls terminal harvest of chum salmon.[11]

Brood year 1988 Deep Cove stock eggs were transferred to Hidden Falls Hatchery from Medvejie Hatchery in 1989 and resultant smolt released from the hatchery in 1990 (FTP 89J-1005, Appendix F and Appendix G). Blanchard Lake and Deep Cove are Baranof Island systems located in southern Chatham Strait.

Gametes were collected from returns of Sashin Creek stock coho[12] to Deer Lake (see Deer Lake project below) in 1989 and 1990, and incubated, reared and released from the hatchery. Sashin Creek is located about 60 miles south of Hidden Falls Hatchery.

Beginning in 1990, returns to the hatchery were used for broodstock. Sashin Creek and Deep Cove stocks are rotated at the hatchery. Hidden Falls Hatchery/Sashin Creek stock is used for 2 successive years, and then Hidden Falls Hatchery/Deep Cove stock is used every 3rd year. FTP 89J-1005 permitted egg takes at Deep Cove for incubation and release at Hidden Falls Hatchery. When Hidden Falls Hatchery moved to full production in 1992, an FTP was issued for egg takes and release of Sashin Creek stock returns to the hatchery, but not Deep Cove stock returns to the hatchery. FTP 03-1004 was issued for release of Deep Cove stock when the deficiency was discovered in 2003.[13]

Adult returns to date from releases from the hatchery totaled nearly 4 million fish. (Table 1; Appendix G).

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[10] The 1990 Hidden Falls AMP indicates that survivals were poor for the Tahini River stock, and that the program was under consideration to be discontinued.

[11] McGee, S. and 5 others. 1991 Annex: Chinook salmon plan for Southeast Alaska. Unpublished document obtained from Sam Rabung, ADF&G PNP coordinator, Juneau.

[12] These fish were stocked from Medvejie Creek Hatchery.

[13] From FTP 03J-1004. Unpublished document obtained from Sam Rabung, ADF&G PNP coordinator, Juneau.

Table 1.–Annual harvest (catch and broodstock) of Hidden Falls Hatchery salmon released in Chatham Strait, and spawning escapement counts of systems or stock groups with escapement goals, 1980-2013.

	Harvest				Escapement	
Year	Chum	Chinook	Coho	Total	Northern Inside Chum	Kelp Bay Pink
1980	5			5		35,656
1981	3,431			3,431		146,000
1982	58,030			58,030	60,000	98,000
1983	118,587			118,587	162,000	57,239
1984	616,193			616,193	159,000	84,000
1985	450,587	35		450,622	149,000	126,000
1986	664,819	199		665,018	141,000	35,600
1987	543,639	630		544,269	106,000	73,500
1988	421,971	558		422,529	162,000	68,000
1989	154,963	458		155,421	53,000	107,000
1990	479,719	823		480,542	107,000	32,500
1991	869,903	2,276	10,153	882,332	76,000	140,000
1992	1,026,984	2,243	18,661	1,047,888	153,000	37,372
1993	1,791,205	2,063	33,166	1,826,434	228,000	111,000
1994	3,207,873	8,375	92,400	3,308,648	272,000	117,000
1995	3,557,753	35,428	233,650	3,826,831	209,000	23,889
1996	4,055,342	41,458	192,045	4,288,845	931,000	77,500
1997	1,709,864	25,492	98,199	1,833,555	226,000	161,177
1998	2,252,468	11,409	177,425	2,441,302	197,000	106,880
1999	2,714,699	23,072	251,096	2,988,867	318,000	258,896
2000	3,103,707	39,304	170,082	3,313,093	443,000	86,295
2001	1,581,547	36,178	195,359	1,813,084	229,000	202,298
2002	1,620,490	23,453	412,992	2,056,935	397,000	62,576
2003	2,148,941	27,913	201,652	2,378,506	210,000	476,500
2004	1,914,938	28,898	206,819	2,150,655	242,000	78,800
2005	806,561	18,901	194,657	1,020,119	185,000	338,000
2006	2,185,079	10,013	226,205	2,421,297	282,000	41,500
2007	1,227,094	10,549	53,703	1,291,346	149,000	157,564
2008	2,251,557	12,274	243,544	2,507,375	99,000	72,600
2009	2,306,292	6,288	109,749	2,422,329	107,000	186,000
2010	993,556	6,858	201,890	1,202,304	77,000	85,500
2011	371,941	10,872	254,307	637,120	125,000	225,000
2012	1,240,087	9,577	36,476	1,286,140	177,000	15,800
2013	1,386,651	7,208	124,347	1,518,206	278,000	204,000
Total:	47,836,476	402,983	3,738,577	51,978,036		
				Escapement Goal or Target:	119,000	60,000–140,000

Source: Harvest data from NSRAA.org website. Chum salmon escapement is goal from Piston and Heinl (2011). The pink salmon escapement goal is from Piston and Heinl (2014).

Chinook salmon returns peaked at over 50,000 fish from the 1991 brood year (Table 1). Returns from 2004 to 2006 brood years were less than 8,000 fish. Adult Chinook salmon returns to date from Hidden Falls Hatchery releases totaled over 600,000 fish. (Appendix E).

In addition to releases from the hatchery, Hidden Falls Hatchery is used for coho salmon fry production for stocking Deer Lake, a barriered system on Baranof Island that empties via waterfall into south Chatham Strait. The Deer Lake project is described in detail in Stopha (2015b). From 1990 to 2004, NSRAA staff collected eggs at Hidden Falls Hatchery and incubated eggs to the eyed stage there, transported eyed eggs to Medvejie Hatchery until hatching, then transported fry to Deer Lake. Beginning in 2004, eggs were collected, incubated and hatched at Hidden Falls Hatchery and transported to Deer Lake. Beginning in 2005, this change in procedure was approved in the Medvejie Hatchery AMP. An appropriate FTP for this change in operations was belatedly issued under the Hidden Falls Hatchery permit in 2011 (FTP 11J-1022, Appendix F) to replace the FTP for the original transfer sequence under the Medvejie Hatchery permit (FTP 94J-1027). The Hidden Falls Hatchery permit was belatedly amended in 2014 to add Deer Lake (and other systems) as a release site to reflect the program transfer from Medvejie Hatchery to Hidden Falls Hatchery (Appendix A). In 2013, additional eggs were taken for fry stocking of Cliff Lake, northwest of Deer Lake (FTP 13J-1007 and FTP 13J-1008). In 2014, additional eggs were taken for fry stocking of Banner Lake, also northwest of Deer Lake (FTP 13J-1016 and FTP 13J-1017).

COMPREHENSIVE SALMON ENHANCEMENT PLAN

Phase I Comprehensive Salmon Plan

Three phases of Comprehensive Salmon Plans (CSP) have been developed to date in Southeast Alaska. Phase I was issued in 1981,[14] and established the philosophy and goals for Southeast Alaska salmon enhancement. The mission statement of the plan was "To promote, through sound biological practices, activities to increase salmon production in Southeast Alaska for the maximum social and economic benefit of the users consistent with public interest." Harvest objectives and methods for bridging the gap between the harvest goal and the natural and enhanced production at the time were developed in the Phase I CSP.

According to the Phase I Southeast Alaska CSP, the highest Southeast Alaska chum salmon harvest at the time (1981) was 9,350,000 fish in 1918. The highest average consecutive 30-year harvest of 5,200,000 chum salmon occurred between 1915 and 1944. After 1954, chum salmon runs declined sharply, with the regionwide harvest falling below 1 million chum salmon in the late 1970s. The Northern Southeast Alaska chum salmon harvest showed a similar dynamic to the regionwide harvest (Figure 4). The Phase I CSP indicated the achievable long-term 15-year average chum salmon harvest for naturally spawning chum salmon was 1.7 million fish. At the time of the Phase I CSP (1981), the Hidden Falls Hatchery had just been completed (1979) and was in the midst of broodstock development. The CSP indicated that chum salmon was the most preferred species in Southeast Alaska for major enhancement production, and that hatcheries would also contribute significant numbers of coho salmon harvests.

[14] Joint Southeast Alaska regional planning teams. 1981. Comprehensive salmon enhancement plan for Southeast Alaska: Phase I. Unpublished document obtained from Sam Rabung, ADF&G PNP coordinator, Juneau.

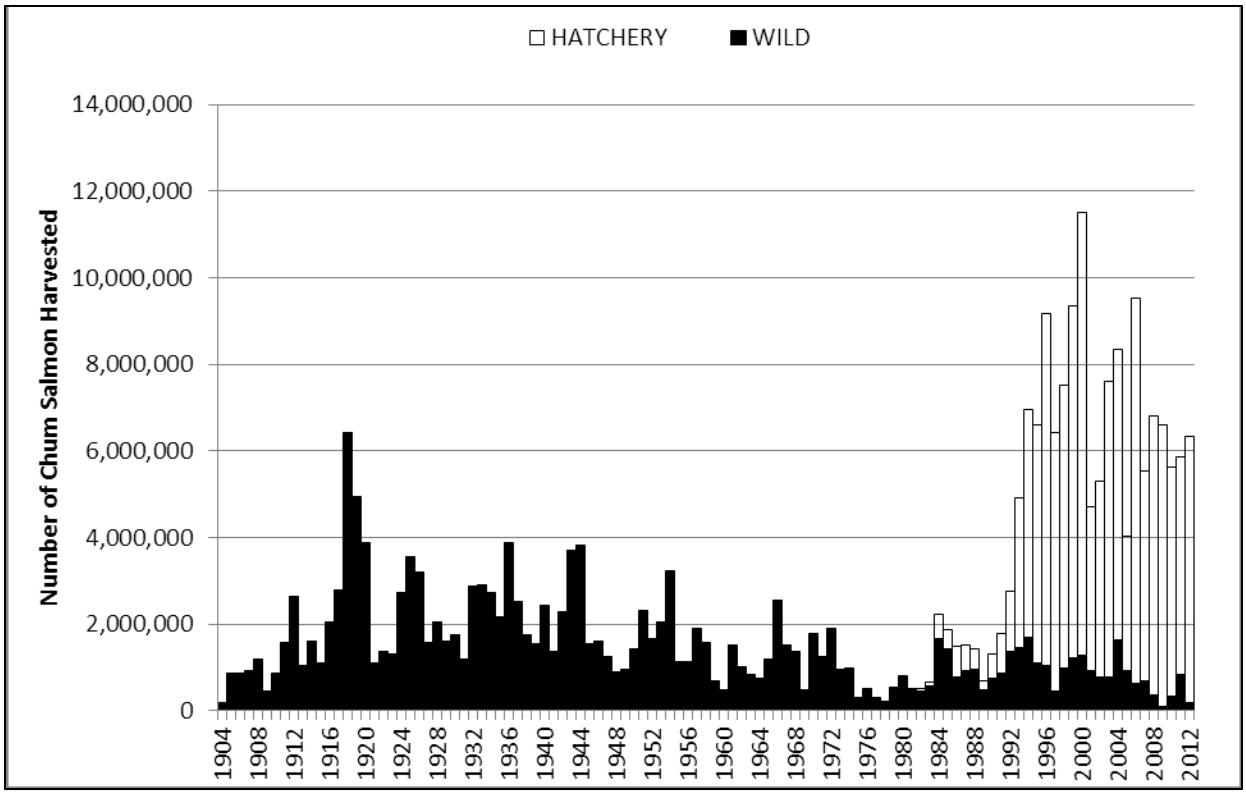

Figure 4.–Chum salmon commercial harvest, including hatchery cost recovery, in Northern Southeast Alaska, 1904–2012. Hatchery component includes contributions from all hatcheries.

Source: 1985–2012 ADF&G ZEPHYR database and hatchery database accessed 12/04/2013 by Lorraine Vercessi, ADF&G PNP Assistant Coordinator, Juneau (URL not publicly available). 1904–1984 from Byerly et al. (1999).

Salmon processors indicated an increasing demand for chum and pink salmon as an inexpensive frozen fish. Processors preferred chum salmon to pink and sockeye salmon because its relatively large size was ideal for processing salmon steaks. A special demand was expressed for fall chum salmon to fill a volume gap after the coho season waned. Chum salmon was the most preferred species for major hatchery production with respect to management because they were less likely to disrupt management precision. Hatchery summer chum salmon would enter existing fisheries managed for sockeye and pink salmon, and hatchery fall chum salmon could generally be discretely managed and discretely harvested in most areas of Southeast Alaska, except where significant wild fall chum salmon stocks occur.

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 salmon and 9.7 million chum salmon. Gaps at the time between the increases available by better management and the current hatchery capacity were 134,000 Chinook, 1.4 million sockeye, 1.1 million coho, 14 million pink, and 4.6 million chum salmon.

Phase II Comprehensive Salmon Plan

For Phase II CSP planning, the RPTs for northern and southern Southeast Alaska developed separate plans. Hidden Falls Hatchery is located in northern Southeast Alaska (NSE). The NSE

CSP Phase II[15] was issued in 1982. The purpose of the Phase II CSP was to identify and prioritize enhancement opportunities within 5 geographical units of NSE: Outer Coastal Unit, Icy Strait/Chatham Strait Unit, Frederick Sound Unit, Stephens Passage Unit and Lynn Canal Unit. Hidden Falls Hatchery is located in the Icy Strait/Chatham Strait Unit and the Deer Lake releases site is located in the Outer Coastal Unit. Most Hidden Falls Hatchery returns are harvested in these units as well (Figure 5).

The Phase II CSP was to provide direction to the efforts of the many government agencies and private groups involved with salmon management (e.g., ADF&G, U.S. Forest Service, National Marine Fisheries Service, RAAs, and independent hatchery PNP operators), and serve as a framework to prevent and resolve conflicts over the use and development of the region's salmon resources.

The Phase II CSP identified gaps between the harvest objectives and current harvests for the Icy/Chatham Strait unit of 20,000 Chinook, 100,000 sockeye, 100,000 coho, 500,000 pink and 1,000,000 chum salmon. Gaps between the harvest objectives and current harvests for the Outer Coastal unit were 30,000 Chinook, 190,000 sockeye, 175,000 coho, 3,500,000 pink and 1,200,000 chum salmon. These targets were to "provide an equitable distribution of production to serve user needs, while considering the limitations imposed by the availability of opportunities and requirements for effective management of wild and enhanced stocks. It is the accepted principle throughout this plan that mixed stock harvests will be managed on the basis of wild run strength, and the unit targets will direct enhancement to areas where it is believed that enhanced stocks can be harvested without ill effects on wild stocks or their management."

Completion of Hidden Falls Hatchery was recommended as part of the 5-year program for the CSP. Chum salmon production from Hidden Falls Hatchery returns at the time was anticipated to be about 848,000 fish per year, with capacity for an additional 32,000 fish harvest if the hatchery was completed as designed. The CSP indicated that major hatchery production was best directed towards chum salmon because the returns could be harvested in traditional seine fisheries that targeted pink salmon without impacting management.

The hatchery was cited as one of the best opportunities for Chinook salmon production in the Icy Strait/Chatham Strait unit if a stock could be found that would migrate to the hatchery primarily through lower Chatham Strait. At the time, it was known that both Taku River and Chilkat River stocks, both of which were depressed at the time, migrated through Icy Strait in route to their spawning streams, and it was therefore preferable not to produce a Chinook salmon hatchery return that would migrate through Icy Strait with the same run timing as these stocks.

The CSP indicated that the hatchery had the potential to produce 40,000 adult coho salmon returns to the hatchery and produce fry to stock lakes on northeast Baranof Island as part of filling the 100,000 gap in the Icy Strait/Chatham Strait unit.

At the time (1982), purse seine, hand troll, and power troll were legal commercial gears in the Icy Strait/Chatham Strait Unit. Troll gear targeted Chinook and coho salmon. Purse seine gear targeted pink salmon. Hidden Falls Hatchery production in the unit was expected to increase the northern Southeast Alaska chum salmon harvest by 75% and the coho salmon harvest by 8%.

[15] Northern Southeast Regional Planning Team. 1982. Comprehensive Salmon Plan, Phase II: Northern Southeast Alaska. Unpublished document obtained from Sam Rabung, ADF&G PNP coordinator, Juneau.

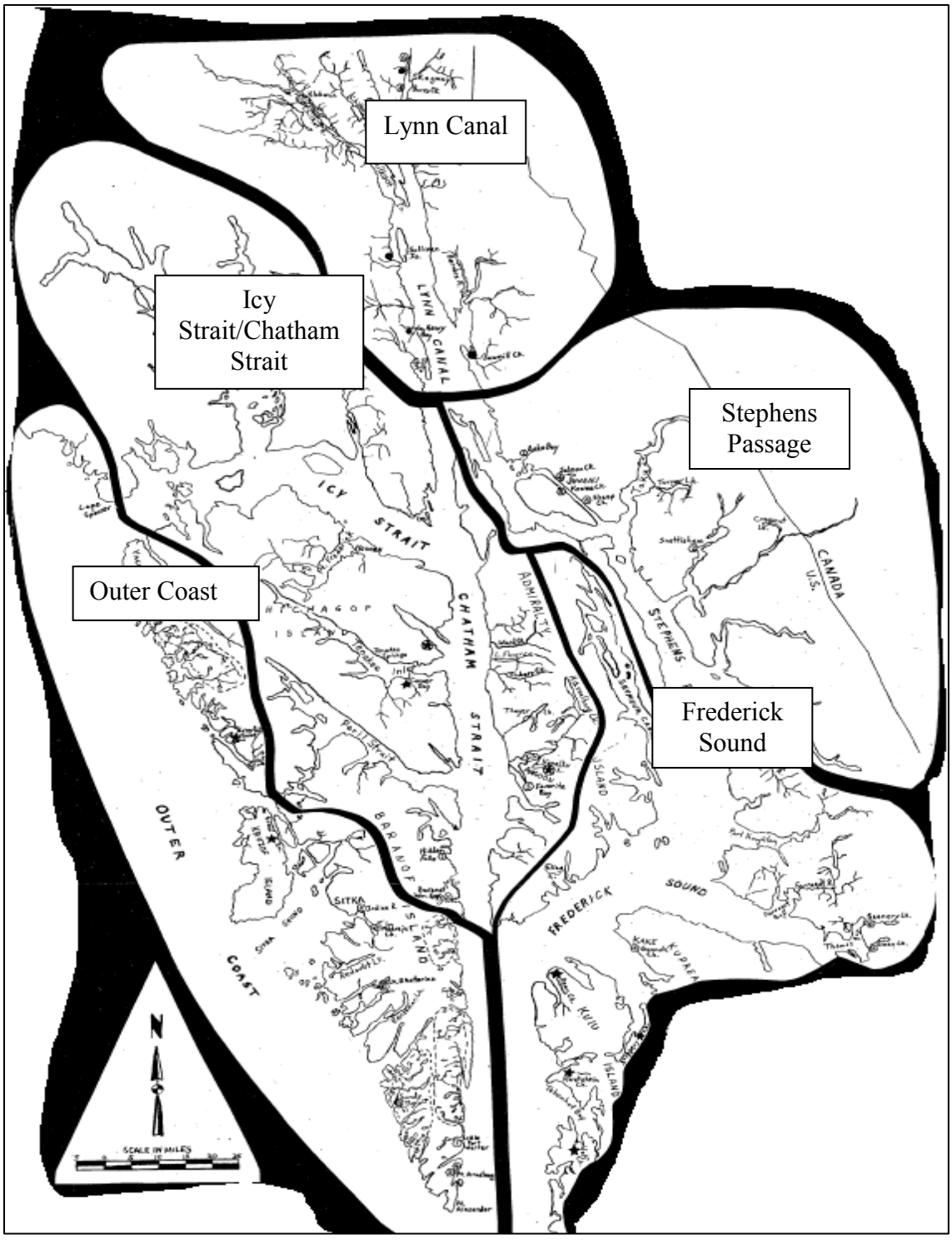

Figure 5.–Commercial fishing units for northern Southeast Alaska as described in the Phase II CSP.

Source: Northern Southeast Regional Planning Team. 1982. Comprehensive Salmon Plan, Phase II: Northern Southeast Alaska. Unpublished document obtained from Sam Rabung, ADF&G PNP Coordinator, Juneau.

The Phase II plan indicated that hatchery chum salmon production could become a major portion of the seine harvest, and contribute to Phase I CSP goals of moderating annual harvest fluctuations and providing fishermen more time and area to fish. For the troll fleet, the changing regulatory structure at the time made it difficult to determine how hatchery returns would benefit the fishery. However, if a successful enhancement program could effect a more even distribution of the troll fleet, both wild fish and fishermen should benefit. The CSP indicated that the sport fishery in Glacier Bay may benefit from harvest of Hidden Falls Hatchery-produced coho and Chinook salmon if returns migrated through Icy Strait en route to the hatchery release sites.

In 1985, significant changes in hatchery production occurred in Southeast Alaska due to the PST. From 1986 to 1992, $20 million of funding was made available for fishery enhancement projects to mitigate the harvest restrictions imposed on Southeast Alaska fishers by the PST agreement. Enhancement from PST mitigation funds initially focused on hatchery production of Chinook salmon.[16] Sockeye, coho and chum salmon program funding was added in subsequent years. As a result, adult production goals for Southeast Alaska in the U.S./Canada PST Mitigation program of 100,000 Chinook, 20,000 sockeye and 1 million chum salmon were part of the 1988 Phase II update as well.[17] Achieving the 100,000 Chinook salmon production goal proved difficult, and the concept of *Chinook equivalents* was later introduced. Coho production, on a 5 coho to 2 Chinook salmon ratio, could substitute for mitigation measures for Chinook salmon production lost under the PST.[18]

Beginning in 1986, the Phase II plan was updated annually through 1996.[19] For Hidden Falls Hatchery, establishing saltwater rearing facilities for chum salmon fry was a high priority and expanding Chinook salmon production moved to a lower priority in 1986 and 1987.[20]

The 1987 update[21] indicated that Chinook salmon production was a priority for northern Southeast Alaska. The PST included federal funds for enhancement projects to mitigate harvest losses by gear groups as a result of agreements in the PST. Initial goals included the adult production of 100,000 Chinook, 1.0 million chum, and 20,000 to 40,000 sockeye salmon.

As a result, the Chinook salmon program advanced to a high priority alongside the expansion of saltwater rearing facilities for chum salmon at Hidden Falls Hatchery for the 1988 through 1990 updates.[22] Beginning in 1991, after the Chinook salmon expansion was complete, chum salmon production expansion at Hidden Falls continued as a priority in the CSP updates through the

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[16] Northern Southeast Regional Planning Team. 1986. 1986 Update. Comprehensive Salmon Plan, Phase II: Northern Southeast Alaska. ADF&G, Juneau, Alaska. Unpublished document obtained from Sam Rabung, ADF&G PNP coordinator, Juneau.

[17] Northern Southeast Regional Planning Team). 1989. 1988 Update. Comprehensive Salmon Plan, Phase II: Northern Southeast Alaska. ADF&G, Juneau, Alaska. Unpublished document obtained from Sam Rabung, ADF&G PNP coordinator, Juneau.

[18] Sawmill Creek Hatchery BMP, section 2.6. Unpublished document obtained from Sam Rabung, ADF&G PNP coordinator, Juneau.

[19] Northern Southeast Regional Planning Team. 1986 (1986 Update), 1987 (1987 Update), 1989 (1988 Update), 1990 (1989 Update), 1991 (1990 Update draft), 1992 (1991 Update), 1993 (1992 Update), 1994 (1993 Update), 1995 (1994 Update), 1996 (1995 Update), 1997 (1996 Update). Comprehensive Salmon Plan, Phase II: Northern Southeast Alaska. All ADF&G, Juneau, Alaska, unpublished documents obtained from Sam Rabung, ADF&G PNP coordinator, Juneau.

[20] Northern Southeast Regional Planning Team). 1986 (1986 Update), 1987 (1987 Update). Comprehensive Salmon Plan, Phase II: Northern Southeast Alaska. All ADF&G, Juneau, Alaska, unpublished document obtained from Sam Rabung, ADF&G PNP coordinator, Juneau.

[21] Northern Southeast Regional Planning Team. 1987. 1987 Update. Comprehensive Salmon Plan, Phase II: Northern Southeast Alaska. ADF&G, Juneau, Alaska. Unpublished document obtained from Sam Rabung, ADF&G PNP coordinator, Juneau.

[22] Northern Southeast Regional Planning Team. 1989 (1988 Update), 1990 (1989 Update), 1991 (1990 Update draft). Comprehensive Salmon Plan, Phase II: Northern Southeast Alaska. ADF&G, Juneau, Alaska. All unpublished documents obtained from Sam Rabung, ADF&G PNP coordinator, Juneau.

1992 update. The Deer Lake coho salmon project, which was transferred from Medvejie Hatchery to Hidden Falls Hatchery in 1994, was added as a high priority project beginning with the 1992 CSP update.[23]

Phase III Comprehensive Salmon Plan

The Phase III CSP (Duckett et al. 2010)[24] was issued in 2004 by the joint Southeast Alaska RPT and provides an extensive history of Southeast Alaska fisheries and salmon enhancement. The Phase III CSP noted that annual harvests of coho, sockeye, chum and pink salmon wild stocks had generally exceeded the potential wild harvest levels indicated in the Phase I plan. Chinook salmon harvests did not meet goals because of the reduced harvest provided for in the PST, the high cost of Chinook salmon enhancement programs, and the low harvest rate of the hatchery production by salmon trollers. The chum salmon harvest met or exceeded the Phase I harvest objective of 9.7 million fish 4 times from 1990 to 2003, and the enhanced component of the harvest enabled the harvest to reach that objective in all of those years. For coho salmon, the harvest met or exceeded the Phase I harvest objective of 2.65 million fish 8 times during the same period, and the enhanced component of the harvest enabled the harvest to reach that objective in 5 of those years.

Phase I and Phase II CSPs provided planning focused on increasing salmon production. The Phase III CSP focused on integrating hatchery production increases with natural production to sustainably manage fisheries. With the maturation of the salmon enhancement program, the goal of enhancing the salmon fishery while minimizing the potential impact of enhancement on wild stocks became paramount over the other goals of enhancing the salmon resource as a public benefit and greater economic and social stability.

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: (A) the release site has an adequate freshwater supply for imprinting and is not in close proximity to significant wild stocks, (B) fish are adequately imprinted to the release site, (C) releases are marked and contribute to the harvest without jeopardizing the sustainability of wild stocks, and (D) the terminal area enables harvest or containment of all returning adults.

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 *Genetic Policy*. 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 5 stock characteristics of consideration: wildness, uniqueness, isolation, population size, population trend and the stock's economic and/or cultural significance.

The Phase III CSP 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

[23] Northern Southeast Regional Planning Team. 1993. 1992 Update. Comprehensive Salmon Plan, Phase II: Northern Southeast Alaska. ADF&G, Juneau, Alaska. Unpublished document obtained from Sam Rabung, ADF&G PNP coordinator, Juneau.

[24] The CSP was issued in 2004, but not compiled into an official ADF&G document until 2010, which is the year used to reference the document.

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

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 2–4. These templates identifying the key elements of state policies used to assess compliance of the Hidden Falls Hatchery salmon program with each policy element are in Tables 5–7.

Table 2.–Key elements of the ADF&G *Genetic Policy*.

I. Stock Transport	
Use of appropriate local stocks	This element addresses Section I of *Genetic Policy*, covering stock transports. The policy prohibits interstate or interregional stock transports, and uses transport distance and appropriate phenotypic characteristics as criteria for judging the acceptability of donor stocks.
II. Protection of wild stocks	
Identification of significant or unique wild stocks	Significant or unique wild stocks must be identified for each region and species as stocks most important to that region. Regional Planning Teams should establish criteria for determining significant stocks and recommend such stock designations.
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.
Use of indigenous stocks in watersheds with significant wild stocks	A watershed with a significant wild stock can only be stocked with progeny from the indigenous stocks. The policy also specifies that no more than 1 generation of separation from the donor system to stocking of the progeny will be allowed.
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.
Straying Impacts	Prevention of detrimental effects of gene flow from hatchery fish straying and interbreeding with wild fish.
III. Maintenance of genetic variance	
Maximum of three hatchery stocks from a single donor stock	A maximum of 3 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.
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 salmon and steelhead.
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 recommend adding stipulations to the permit to protect wild or enhanced stocks.

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.
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.

Table 4.–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.
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.
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.
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 the Division of Commercial Fisheries, and the local regional resource development biologist before consideration by the commissioner of ADF&G. Department staff may recommend approval or denial of the permit, and recommend permit conditions.

Genetics

The BMP indicated that coho and chum salmon donor stocks should be within 50 miles of the hatchery. Chinook salmon donor stocks were to be from central Southeast Alaska as no Chinook salmon stocks are located near the hatchery.

The coho salmon broodstock for releases from the hatchery and the lake projects were from Deep Cove and Sashin Creek systems, which are located in lower Chatham Strait near the outlet of Deer Lake.

The Chinook salmon program uses Andrew Creek stock for hatchery releases. Tahini River stock was used for releases near Haines and Skagway and is local to these programs. Tahini River stock was also attempted for use as a broodstock for the hatchery but discontinued. Andrew Creek and Tahini River are distant from the hatchery site, but within the Southeast Alaska region. Hidden Falls Hatchery is located in a "non-sensitive zone" as defined in the Southeast Alaska Chinook Salmon Plan (Holland et al. 1983). These zones are areas in which there are no systems containing self-sustaining populations of Chinook salmon, and where restrictions can be less stringent for broodstock development and transport.

Tahini Creek and Andrew Creek stocks were used simultaneously from brood years 1983 to 1993. According the 1990 Hidden Falls Hatchery annual report,[25] only tagged fish were used for broodstock, and tags were recovered and read for all Chinook salmon prior to spawning to ensure separation of the 2 stocks.

Coho and Chinook salmon that are coded-wire-tagged have their adipose fin removed at the time of tagging. In some cases, ADF&G staff manning escapement weirs and fish wheels across the region attempt to capture fish with missing adipose fins so that their tags can be examined for stock origin—more so for Chinook salmon than for coho salmon. In addition, finclipped coho and Chinook salmon that return to hatchery facilities are sampled to determine their origin.

Coho salmon are examined at hatcheries but not at most weirs on systems that monitor wild stock escapements because wild fish in these systems are also marked as smolts, meaning a significant number of fish that pass the weir are expected to be adipose finclipped and therefore a large number of fish would have to be sacrificed for sampling.

Chum salmon broodstock originated from local stocks from Kadashan, Clear and Seal Rivers. Piston and Heinl (2012) conducted hatchery chum salmon straying studies in streams across Southeast Alaska from 2008 to 2010. In 2008, Hidden Falls Hatchery releases from Deep Inlet, Takatz Bay, and the hatchery were found in 7 of 14 streams sampled. In streams where Hidden Falls Hatchery fish were found, they comprised 1% to 4% of the fish sampled. In 2009, Hidden Falls Hatchery releases were found in 12 of 23 streams sampled. Of the streams where Hidden Falls Hatchery releases were found, they comprised 5% or less of fish sampled in 9 streams, 8% in 1 stream, 18% in 1 stream, and 20% in 1 stream. In 2010, Hidden Falls Hatchery releases were found in 15 of 30 streams sampled. Of the 15 streams where Hidden Falls Hatchery releases were found, they comprised 5% or less of the fish sampled in 12 streams, between 9% and 10% in 2 streams, and 41% in 1 stream.[26]

Wild and hatchery chum salmon interaction studies are underway in Southeast Alaska to further document the degree to which hatchery chum salmon are straying and interbreeding. The studies

[25] Unpublished document obtained from Sam Rabung, ADF&G PNP coordinator, Juneau.

[26] Data by release site obtained from Steve Heinl, ADF&G, from Piston and Heinl (2012) report.

will assess the range of interannual variability in the straying rates and determine the effects of hatchery fish spawning with wild populations on the fitness of wild populations (Prince William Sound Science Center 2013).

Table 5.–The Hidden Falls Hatchery program and its consistency with elements of the ADF&G *Genetic Policy* (see Table 2).

I. Stock Transport	
Use of appropriate local stocks	Hidden Falls Hatchery used local broodstock for coho and chum salmon projects. Chinook salmon stocks used were somewhat distant from the hatchery but within the Southeast region. No Chinook salmon systems are near the hatchery.
II. Protection of wild stocks	
Identification of significant or unique wild stocks	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 *Genetic Policy*. New projects at Hidden Falls Hatchery implemented since the Phase III CSP was published were transfer of previously permitted programs (coho salmon lake stocking and chum salmon release from Southeast Cove) from other hatchery permits to the Hidden Falls permit. Results from the wild and hatchery chum salmon interaction studies underway may necessitate using these significance analyses tools to assess any risk to wild stocks.
Interaction with or impact on significant wild stocks	Indigenous coho salmon stocks were used for lake stockings, except for systems barriered by falls for which nearby local stocks were used. Local stocks were used for chum salmon. Systems in the region are monitored for strays for chum, coho and Chinook salmon.
Use of indigenous stocks in watersheds with significant wild stocks	Coho salmon projects used indigenous stocks when planting fry in systems with established runs. Farragut River Chinook salmon fry reared at Hidden Falls Hatchery were planted in the Farragut River.
Establishment of wild stock sanctuaries	In Southeast Alaska, no wild stock sanctuaries have been designated by the RPT.
Straying impacts	Chum salmon straying studies occurred in 2008–2011 as discussed above (Piston and Heinl 2012), with other ongoing studies currently underway (Prince William Sound Science Center 2013).
III. Maintenance of genetic variance	
Maximum of three hatchery stocks from a single donor stock	The Andrew Creek Chinook hatchery stock is also used at Medvejie, Crystal Lake, and Macaulay Hatcheries, and previously released at Port Armstrong and Sheldon Jackson Hatcheries. Hidden Falls Hatchery was allowed to continue to use Andrew Creek stock because there are no other Chinook salmon stocks nearby and the hatchery is located in a "non-sensitive" area as defined in Holland et al. (1983). Hidden Falls Hatchery coho salmon stock is also used at Port Armstrong Hatchery. Hidden Falls Hatchery chum salmon stock is used at Hidden Falls Hatchery and Port Armstrong Hatchery.[27]
Minimum effective population size	For brood year 2013, brood stock numbers used included over 71,000 chum, 2,240 coho, and 730 Chinook salmon.
Review by geneticist	The ADF&G geneticist reviewed the FTPs for the Hidden Falls Hatchery programs.

Fish Health and Disease

FTPs for the Hidden Falls Hatchery program were approved by the pathologist. Pathology records showed no inconsistencies with fish health and disease policies. Appropriate salmon

[27] Hidden Falls Hatchery chum salmon stock was also used at Gunnuk Creek Hatchery until it closed. The last release from Gunnuk Creek Hatchery was brood year 2013 released in 2014.

culture techniques were used and disease reporting and broodstock screening occurred as required (Table 6; Appendix J).

The hatchery was been inspected regularly since at least 1989. In the latest hatchery inspection, the ADF&G fish pathologist noted some bacteria cold water disease in rearing coho salmon and recommended investigation of automated methods for deterring birds that visit the tanks that are the likely source of the disease. The pathologist also recommended continued controls to manage bacterial kidney disease for coho salmon, and proceeding with plans to replace the pipeline in front of the hatchery. He noted that the hatchery staff continue to be dedicated to controlling disease and worked closely with ADF&G pathology staff to improve fish health.[28]

Table 6.–The Hidden Falls Hatchery program and its consistency with elements of the Alaska policies on fish health and disease (see Table 3).

Fish Health and Disease Policy (5 AAC 41.080; amended by Meyers 2014)	
Egg disinfection	Eggs are disinfected as necessary according to ADF&G regulations and guidelines.
Hatchery inspections	Hatchery inspections were conducted regularly from at least 1989 to present.
Disease reporting	There are no chronic disease issues at the hatchery.
Pathology requirements for Fishery Transport Plans (5 AAC 41.010)	
Disease history	Samples were submitted as requested by the fish pathologist for disease history.
Isolation measures	Isolation procedures were described on the FTP.
Pathology review of FTPs	FTPs were reviewed by the pathologist.

Fisheries Management

Production and harvest management at Hidden Falls Hatchery evolved over time as more information about migration routes of returning hatchery fish, timing of hatchery returns, and status of local wild stocks was collected. As managers grew more confident with understanding these measures, releases at the hatchery were allowed to increase.

Chum salmon returns are harvested primarily by the purse seine fleet in front of the hatchery. Salmon escapements likely to be impacted by this harvest include the northern inside chum salmon stock complex and Kelp Bay pink salmon stocks. From 1980 to 2012, escapement goals for both species were met in most years (Table 1). Sockeye salmon escapements to several small systems in Chatham Strait are also monitored. Bednarski et al. (2012) estimated that from 2002 to 2012, about 5% of the total sockeye salmon harvest in District 12 (Chatham and Peril Straits) was from fisheries targeting Hidden Falls Hatchery salmon.

For Chinook salmon, the facility's location in Chatham Strait provides the salmon troll fleet access to returns in the migration corridors to the hatchery in Icy, Chatham and Peril Straits, with low bycatch of Chinook salmon stocks managed under the PST. In addition, the Chinook salmon hatchery returns are important to local anglers and charter boat operators.

[28] Hatchery Inspection Report for Hidden Falls Hatchery dated 7/14/14 by J. Ferguson, ADF&G Fish Pathology staff. Unpublished document obtained from Sam Rabung, ADF&G PNP coordinator, Juneau.

For coho salmon, Hidden Falls Hatchery returns are harvested primarily by the troll fleet. Targeted harvest by purse seine gear at the hatchery occurs only by NSRAA to harvest fish excess to broodstock needs, and local stocks are not likely significantly affected by this harvest. Total returns to Hidden Falls Hatchery since 1980 were over 50 million salmon (Table 1).

Table 7.–The Hidden Falls Hatchery program and its consistency with elements of Alaska fisheries management policies and regulations (see Table 4).

Sustainable Salmon Fishery Policy (5 AAC 39.222)	
I. Management principles and criteria	
Assessment of wild stock interaction and impacts	Salmon escapements are monitored to area systems. Assessment of straying of chum salmon occurred through sampling of selected systems throughout Southeast Alaska as described in Piston and Heinl (2012).
Use of precautionary approach	Hidden Falls Hatchery returns were monitored for return timing, migration corridors, and for impacts to local stocks and fisheries management before significant increases to chum salmon production were approved.
Salmon Escapement Goal Policy (5 AAC 39.223)	
Establishment of escapement goals	Escapement goals are established for Northern Inside chum salmon stocks and for pink salmon stocks in Kelp Bay.
Mixed Stock Salmon Fishery Policy (5 AAC 39.220)	
Wild stock conservation priority	Salmon fisheries are managed to achieve escapement goals.
Fisheries management review of FTPs (5 AAC 41.010 – 41.050)	
Review by management staff	The FTPs for the Hidden Falls Hatchery program were reviewed by fisheries management staff.

CONSISTENCY IN PERMITTING

Hatchery permit/BMP, AMP, and FTP documents for Hidden Falls 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.

For chum salmon, no FTPs were found for egg takes and releases from the hatchery until 1995 (Appendix K). The Takatz Bay release FTP was issued to ADF&G in 1986 and later issued to NSRAA in 1995. Releases were usually less than permitted levels.

For Chinook and coho salmon, no FTPs were found for egg takes and releases from the hatchery, nor for transfer of Chinook salmon eggs from Medvejie Hatchery, until 1992. Egg take and release levels were otherwise less than permitted levels in most years (Appendices L and M).

OTHER REQUIREMENTS

ANNUAL REPORTING

All hatcheries are required to submit an annual report to ADF&G that summarizes their production and activities for the year (AS 16.10.470). The completed report is due on December 15 and the Hidden Falls Hatchery annual reports were received for all years.

RECOMMENDATIONS

(1) The BMP should be updated to reflect current hatchery practices and production at Hidden Falls Hatchery.

(2) As noted by 1 reviewer of this report, since 2009 the Hidden Falls Hatchery AMP has not been approved until July of each year. There is no regulatory date for issuance of the AMP. Events where decisions are made which may need to be part of an AMP—such as NSRAA Board, RPT, and Board of Fisheries meetings—may occur from January to July and influence when the AMP is completed.

Recent AMPs state the current year's AMP remains in effect until superseded by the following year's AMP. In this respect, then, the hatchery is always operating under an AMP, although a reviewer pointed out that the regulation (5 AAC 40.840) could be interpreted to indicate that the AMP only applies to the calendar year it is issued, and not the following year.

The late dates of issuance occur after a considerable amount of the plan for that year may already have taken place (e.g., releases, broodstock collection, cost recovery and rotational common property harvests), making those parts of the plan irrelevant because until the plan is passed, the hatchery is technically operating on the plan from the prior year.

Completion of the AMP currently involves development of a draft by NSRAA staff, circulation of the draft to ADF&G personnel for comment, finalization of the document, and then circulation of the AMP for necessary approval signatures.

ADF&G staff and NSRAA staff should review options for more timely completion of the AMP, including reviewing the AMP drafting process, establishing deadlines, and changing the AMP from covering a calendar year to an alternate 12 month period such as July 1 to June 30, which would require a regulation change.

(3) A reviewer also noted that permitting for Hidden Falls Hatchery showed apparent inconsistencies with regulation (Appendix A). Several permit amendments were considered to be approved by ADF&G staff, as evidenced by the amended language seen in subsequent AMPs, but the amendments did not apparently complete the regulatory process with a signature by the ADF&G commissioner. These unsigned permit amendments were later processed again and properly signed by the commissioner, and there are no outstanding questions for permitted levels at Hidden Falls Hatchery at this time. The PNP hatchery coordination staff at ADF&G have updated permitting review procedures in recent years to improve regulatory compliance.

(4) Phase III CSP language regarding de facto wild stock sanctuary status in wilderness areas of the Tongass National Forest should be revisited by the RPT. The Phase III CSP states that "In Southeast, enhancement activities are generally prohibited in all Forest Service lands/drainages classified as "wilderness," although such activities may be possible provided

a strong need has been identified. In most respects, these areas are essentially de facto sanctuaries." Unfortunately, no document or regulation was cited for this statement. The statement appears to directly conflict with federal law.

Since 1980, the federal government has clearly provided for hatchery activities in designated wilderness areas of the Tongass National Forest under the Alaska National Interest Lands Conservation Act (ANILCA, Section 1315 (b), United States Congress 1980) and reaffirmed such provisions in 2008 under the Tongass Land and Resource Management Plan (United States Department of Agriculture 2008, Chapter 3). The Banner Lake project is located in the South Baranof Wilderness area of the Tongass National Forest. The U.S. Forest Service (USFS) has acknowledged that aquaculture projects, including facilities associated with hatcheries, may be considered for Wilderness areas within the Tongass National Forest".[29] The USFS also indicated that "optimum sustained yield levels will be considered synonymous with the long-term harvest goals documented in the State of Alaska Comprehensive Salmon Plans and other state fisheries plans."[30]

DISCUSSION

Alaska hatchery and fisheries enhancement programs are governed by a comprehensive permitting system designed to protect wild stocks and provide increased harvest opportunities. The success of fishery enhancement efforts depends on implementing that system and ensuring policies are followed. Today, the combination of favorable environmental conditions, sustainable management of wild stock systems, and hatchery production supports economically healthy salmon fisheries in Southeast Alaska.

There is strong demand for wild salmon and a heightened interest in increasing hatchery production. The processing industry has expanded infrastructure and markets for abundant salmon returns, with full utilization of virtually the entire hatchery run, from ocean bright fish to broodstock carcass. The advent of otolith marking and additions to the time series of harvest, escapement, migration, and timing data have added to management precision for harvesting Hidden Falls Hatchery runs and meeting spawning escapement goals to wild stock systems.

Garforth et al. (2012), in the first surveillance report for certification of Alaska's salmon fisheries under the Food and Agriculture Organization-based responsible fisheries management certification, indicated the need for hatchery and wild stock interaction study "To evaluate whether or not fitness of natural-origin (wild) versus stray hatchery-origin salmon differ when spawning in the wild, survival of both types of fish and their relative spawning success needs to be documented."

A science panel composed of current and retired scientists from ADF&G, University of Alaska, aquaculture associations, and National Marine Fisheries Service with broad experience in salmon enhancement, management, and wild and hatchery interactions designed a long-term research project to potentially answer some of these questions. The study entitled *Interactions of Wild and Hatchery Pink and Chum Salmon in Prince William Sound and Southeast Alaska* currently underway is funded by the state of Alaska and administered by ADF&G, with field work conducted by the Sitka Sound Science Center and Prince William Sound Science Center. The

[29] Letter from D. Martin, Acting District Ranger, U.S. Forest Service to S. Wagner, NSRAA, dated June 4, 2014. Unpublished document obtained from Sam Rabung, ADF&G PNP coordinator, Juneau.

[30] Letter from C. Goularte, District Ranger, U.S. Forest Service to L. Speerstra, Dept. of the Army, Sitka Field Office, dated February 11, 2014. Unpublished document obtained from Sam Rabung, ADF&G PNP coordinator, Juneau.

study will improve understanding of hatchery and wild stock interactions and provide Alaska-specific scientific guidance for assessing Alaska's hatchery program, including recommendations for escapement goals, fisheries management, hatchery production levels, and hatchery practices at hatcheries in the state.

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APPENDIX

Appendix A.–Hidden Falls Hatchery permit and permit alterations, 1981–2014.

Date	Description	Chum Salmon Eggs	Chinook Salmon Eggs	Coho Salmon Eggs
06/22/1988	PNP hatchery permit number 28 and BMP issued to NSRAA for Hidden Falls Hatchery in Kasnyku Bay on Baranof Island. Hatchery permitted to incubate 68 million chum salmon eggs and 3.1 million Chinook salmon eggs. An additional 20 million chum salmon eggs allowed to be taken for incubation to the eyed stage for sale to other hatcheries. Donor source for chum salmon was the Hidden Falls Hatchery stock return already present. Chinook salmon egg sources included the Hidden Falls Hatchery (Andrew Creek stock) return already in place, Crystal Lake Hatchery (Andrew Creek stock), and Tahini River stock.	88	3.1	
10/17/1988	NSRAA submitted a PAR to increase chum salmon capacity from 88 million to 91 million eggs. The paperwork on file indicates that all reviewers of the application were in approval, but the PAR apparently was not finally approved by the commissioner (but there was no indication it was denied, either).	88	3.1	
01/23/1989	Permit amendment approved to allow incubation of 70,000 coho salmon eggs for rearing and release from the hatchery.	88	3.1	0.07
02/02/1990	Permit amendment approved to increase production of Chinook salmon from 3.1 million to 3.5 million eggs, increase coho salmon production from 70,000 to 250,000 eggs, and allow rearing of an additional 350,000 coho salmon eggs when Chinook salmon eggs are not available.	88	3.5	0.25
02/25/1991	NSRAA submitted PAR to increase chum salmon egg capacity from 88 million to 123 million and release fry at Thomas Bay near Petersburg. Area manager issues included (1) BOF regulation required to allow gillnetting in the area, (2) poor fish quality possible since fishing outside terminal area would only occur when surplus wild stocks were available, (3) cold water in Thomas Bay may impede survival and rearing of fry, and (4) project intended to benefit gillnetters but other gear fisheries outside the terminal area will harvest returning hatchery fish as well. The geneticist strongly recommended against the PAR based on the distance between Hidden Falls Hatchery and Thomas Bay. NSRAA then submitted a proposal to use Deep Cove, on Southeastern Baranof Island, as an alternative release site to Thomas Bay.[a] The paperwork on file indicates that the PAR was not finally approved by the commissioner (but there was no indication it was denied, either).	88	3.5	0.25
12/23/1991	PAR to increase collection of chum salmon eggs for sale to other hatcheries from 20 million to 30 million and increase overall capacity from 88 million to 98 million chum salmon eggs. The request was in order to use all Hidden Falls Hatchery chum salmon stock for Deep Inlet releases. Replacing the stock at Deep Inlet from the fall-run Medvejie Hatchery stock was hoped to improve fish quality in the terminal area. The paperwork on file indicates that although there was no objection by ADF&G staff to the PAR, it apparently was not finally approved by the commissioner (but there was no indication it was denied, either).	88	3.5	0.25

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Date	Description	Chum Salmon Eggs	Chinook Salmon Eggs	Coho Salmon Eggs
07/17/1992	Permit amendment approved to increase chum salmon capacity from 88 to 141 million eggs. 101 million eggs were for release at the hatchery or Takatz Bay and 40 million for offsite use including Deep Inlet and Boat Harbor. The request was in order to use all Hidden Falls Hatchery chum salmon stock for Deep Inlet releases. Replacing the stock at Deep Inlet from the fall-run Medvejie Hatchery stock was hoped to improve fish quality in the terminal area.	141	3.5	0.25
07/17/1992	Permit amendment approved allowed taking up to 1.45 million coho salmon eggs as part of the facility's 3.5 million Chinook salmon capacity. This increased the capacity for coho salmon from 0.25 million to 1.7 million eggs. NSRAA requested the amendment due to poor production at Hidden Falls, the Chinook return overlapping with the chum salmon return making it difficult for trollers to target the Chinook salmon, and the difficulty in collecting Chinook salmon eggs when the broodstock was mixed with chum salmon. ADF&G staff had no concerns with the amendment.[b]	141	3.5	1.7
01/25/1993	PAR to increase chum salmon release at Boat Harbor and increase Hidden Falls Hatchery chum salmon egg transfer to Macaulay Salmon Hatchery for Boat Harbor from 10 million to 25 million. DIPAC was using the Hidden Falls Hatchery stock, and this PAR was submitted in case DIPAC did not have enough Hidden Falls Hatchery stock eggs. ADF&G commercial fisheries management staff did not support the increase until more return evaluation was available from earlier releases.[c] The PAR was apparently not approved.	141	3.5	4.2
06/01/1994	Permit amendment approved to allow Hidden Falls Hatchery to incubate an additional 2.5 million coho salmon eggs to the eyed stage for transfer to Medvejie Hatchery. This made for a total incubation coho salmon capacity at Hidden Falls of 4.2 million eggs, 1.7 million of which may be reared and released at the hatchery. In the past, Hidden Falls Hatchery served as a backup supply of coho for Medvejie Hatchery. Hidden Falls Hatchery had good marine survival, and the stock origin was all from Deer Lake. Broodstock were being taken at Mist Cove, the return area for Deer Lake releases, and this would allow the egg take at HFH instead, which would be logistically easier and safer than remote egg takes at Mist Cove. There were no concerns expressed by ADF&G staff. One biologist said NSRAA should consider maintenance of genetic diversity through collection of wild milt after 3 generations. (Ron Josephson in comments, p. 10).	141	3.5	4.2
11/03/1994	Permit amendment approved to allow Hidden Falls Hatchery to incubate for 1 year an additional 1.5 million coho salmon eggs to the eyed stage for transfer to Port Armstrong Hatchery. No other information in file.	141	3.5	5.7

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Date	Description	Chum Salmon Eggs	Chinook Salmon Eggs	Coho Salmon Eggs
06/16/1995	Permit amendment approved for Hidden Falls Hatchery to incubate an additional 1.5 million coho salmon eggs. Up to 1 million eggs could be taken for backup purposes for Port Armstrong Hatchery and 0.5 million additional eggs taken for incubation to the eyed stage for transport to Medvejie Hatchery for the Deer Lake project. Increased permitted capacity for coho salmon from 4.2 million to 5.7 million eggs. No other paperwork on file.	141	3.5	5.7
06/26/2000	Permit amendment approved to allow Hidden Falls Hatchery to incubate an additional 400,000 coho salmon eggs for release of an additional 300,000 coho salmon smolts at Hidden Falls Hatchery. Increased permitted capacity for coho salmon from 5.7 million to 6.1 million eggs. Also allowed release of 300,000 coho salmon fry in Banner Lake as a substitute for part of the Deer Lake stocking program. This was following a crash in Deer Lake production and was to give Deer Lake time to rejuvenate. Troll manager objected because coho harvest objectives already met and further increases therefore not warranted until an updated CSP was completed.[d]	141	3.5	6.1
12/27/2000	Permit amendment approved to reduce Hidden Falls Hatchery capacity from 141 million chum salmon eggs to 101 million eggs. No further paperwork in file.	101	3.5	6.1
02/27/2002	Permit amendment approved to transfer 10 million chum salmon egg capacity from Hidden Falls Hatchery to Medvejie Hatchery for 5 years. This action reduced Hidden Falls Hatchery capacity from 101 million chum salmon eggs to 91 million eggs. No further paperwork in file. Conditions included studying impacts to Salmon Lake stocks near Medvejie Hatchery and impacts to Sitka Sound ecosystem from increased releases from Deep Inlet of the Medvejie Hatchery stock chum salmon.	91	3.5	6.1
05/11/2007	Permit amendment approved to increase Chinook salmon egg capacity from 3.5 to 3.8 million eggs. The additional 300,000 egg capacity was for Tahini River Chinook stock eggs for release at Lutak Inlet near Haines only. RPT unanimously approved PAR.	91	3.8	6.1
05/12/2009	Permit amendment approved to transfer additional 45 million chum salmon eggs to Gunnuk Creek Hatchery. Up to 35 million of the eggs could be incubated to the fry stage. ADF&G genetics staff cautioned about potential straying if released fish are not completely harvested.	91	3.8	6.1
05/17/2010	Permit amendment approved to increase Hidden Falls Hatchery coho salmon capacity from 6.1 million to 6.9 million eggs for transfer to non-NSRAA facilities. Increase to allow full utilization of the facility and increase smolt production at Deer Lake from 2 million to 3 million smolts annually.	91	3.8	6.9
06/02/2010	Permit amendment approved to increase Hidden Falls Hatchery chum salmon capacity from 91 million to 101 million eggs.	101	3.8	6.9
06/07/2012	Permit amendment approved to increase Hidden Falls Hatchery coho salmon capacity from 6.9 million to 7.7 million eggs to offset high rearing mortality and meet release goals at Hidden Falls Hatchery and Deer Lake.	101	3.8	7.7

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Date	Description	Chum Salmon Eggs	Chinook Salmon Eggs	Coho Salmon Eggs
05/14/2013	Permit amendment approved to add Sea Lion, Banner, Lower Rostislaf, Deer, Upper Deer, Finger, Blanchard, Brentwood, Upper Brentwood, Parry, Fiddle, Surprise, Cliff and Lord's Pocket lakes for release of juvenile coho salmon.	101	3.8	7.7
05/16/2014	Permit amendment approved to increase from 45 million to 55 million additional chum salmon eggs for Gunnuk Creek Hatchery.	101	3.8	7.7
09/2/2014	Permit amendment approved to allow collection of an additional 10 million Medvejie Hatchery stock chum salmon eggs as a substitute for 10 million Hidden Falls Hatchery stock eggs for release at Deep Inlet for brood year 2014 only.	101	3.8	7.7

[a] Letter from Bruce Bachen, Operations Manager, NSRAA, to Steve McGee, ADF&G FRED Division, dated Oct 1, 1991. Unpublished document obtained from Sam Rabung, ADF&G PNP Coordinator, Juneau.

[b] Letter dated July 17, 1992, from Carl Rosier, ADF&G Commissioner, to Pete Esquiro, NSRAA General Manager. Unpublished document obtained from Sam Rabung, ADF&G PNP Coordinator.

[c] Memorandum dated February 22, 1993, from Doug Mecum, ADF&G, to Steve McGee, ADF&G. Unpublished document obtained from Sam Rabung, ADF&G PNP Coordinator.

[d] Memorandum from Mark Stopha, ADF&G, to Steve McGee, ADF&G, dated January 25, 2000. Unpublished document obtained from Sam Rabung, ADF&G PNP Hatchery Coordinator, Juneau.

Appendix B.–Summary of chum salmon fishery transport permits for Hidden Falls Hatchery.

FTP No.	Issued	Expiration	FTP summary and reviewer comments
86J-1073	1987	1999	Incubate up to 60 million Hidden Falls Hatchery stock chum salmon fry and release from Takatz Bay. ADF&G cooperative project with NSRAA.
89J-1006	1989	2009	Incubate up to 13 million Hidden Falls Hatchery stock chum salmon fry and transfer at eyed stage to Medvejie Hatchery for release at Deep Inlet. FTP amended 4/11/03 to increase transfer number from 13 million to 23 million eggs.
89J-1027	1989	1999	Incubate up to 9 million Hidden Falls Hatchery stock chum salmon fry and transfer at eyed stage to Macaulay Salmon for release at Boat Harbor. FTP amended 4/4/94 to extend expiration date from 1993 to 1999.
90J-1050	1990	1991	Increase the total chum salmon egg take at Hidden Falls from 88 to 92 million eggs and transport the additional 4 million eggs to Medvejie Hatchery for incubation and release at Deep Inlet.
91J-1065	1992	1992	Transfer and release 6 million chum salmon fry from Hidden Falls Hatchery to Boat Harbor.
95J-1009	1995	2015	Collect up 60 million chum salmon eggs at Hidden Falls Hatchery for release at Takatz Bay.
95J-1010	1995	2015	Collect up 41 million chum salmon eggs at Hidden Falls Hatchery for release at Kasnyku Bay. Permit amended 4/11/03 to increase egg take from 41 million to 60 million eggs.
01J-1017	2001	2002	Transfer up to 3 million Hidden Falls Hatchery stock chum salmon eggs to Gunnuk Creek Hatchery for incubation and release.
03J-1009	2003	2022	Collect and transfer up to 30 million Hidden Falls Hatchery chum salmon eggs to Port Armstrong Hatchery. FTP amended in 2013 to extend expiration date from 2012 to 2022.
07J-1023	2007	2017	Renewal of 01J-1017. Transfer up to 5 million Hidden Falls Hatchery stock chum salmon eggs to Gunnuk Creek Hatchery for incubation and release. Permit amended in 2009 to increase egg number from 5 million to 10 million and extend expiration date from 2009 to 2012. Permit amended in 2012 to extend expiration date from 2012 to 2017. Permit amended later in 2012 to increase permitted transfer level from 10 million to 45 million eggs.
09J-1021	2009	2010	Collect and incubate up to 23 million Hidden Falls Hatchery stock chum salmon fry and transfer at eyed stage to Medvejie Hatchery for release at Deep Inlet. Permit amended 5/21/12 to increase transfer number from 23 million to 24 million eggs.
11J-1023	2011	2020	Collect up to 50 million Port Armstrong stock chum salmon for incubation and release at Kasyku and Takatz bays and Deep Inlet as a back-up for Hidden Falls Hatchery. The number taken of eggs taken would be to fill any deficit short of the 125 million egg take permitted at Hidden Falls Hatchery.
12J-1022	2012	2022	Collect up to 35 million eggs Hidden Falls Hatchery stock eggs for incubation at Hidden Falls Hatchery and release of fry at Southeast Cove near Gunnuk Creek Hatchery.
14J-1024	2014	2015	Allows collection of up to 65 million eggs from returning Hidden Falls Hatchery stock chum salmon to Southeast Cove as a back-up option for Hidden Falls Hatchery eggs.

Appendix C.–Chum salmon egg takes, releases and returns for Hidden Falls Hatchery by brood year.

Brood Year	Stock	Eggs	Release Site	No. Released	Return
1977	Kadashan River	575,000	KASNYKU BAY	212,551	3,340
1978	Kadashan River	2,192,000	KASNYKU BAY	1,889,184	44,540
	Clear River	333,000			
1979	Kadashan River	4,046,000	KASNYKU BAY	3,599,384	161,884
	Clear River	210,000			
1980	Kadashan River	9,797,056	KASNYKU BAY	9,013,938	738,628
	Seal Bay	132,140			
	Kadashan/Seal Bay/Hidden Falls				
1981	Hatchery	11,622,000	KASNYKU BAY	10,291,351	445,910
1982	Hidden Falls Hatchery	23,225,000	KASNYKU BAY	21,636,071	618,539
1983	Hidden Falls Hatchery	31,800,000	KASNYKU BAY	28,500,000	671,469
1984	Hidden Falls Hatchery	35,900,000	KASNYKU BAY	30,080,000	273,967
1985	Hidden Falls Hatchery		KASNYKU BAY	43,740,000	
			Baranof Bay	1,560,000	
	1985 Total	58,000,000		45,300,000	201,730
1986	Hidden Falls Hatchery		KASNYKU BAY	21,140,000	
			TAKATZ BAY	19,250,000	
	1986 Total	46,600,000[a]		40,390,000	620,857
1987	Hidden Falls Hatchery		KASNYKU BAY	29,181,000	
			TAKATZ BAY	21,574,717	
	1987 Total	72,200,000[b]		50,755,717	901,881
1988	Hidden Falls Hatchery		KASNYKU BAY	34,249,000	
			TAKATZ BAY	26,051,600	
	1988 Total	66,047,100[c]		60,300,600	1,494,332
1989	Hidden Falls Hatchery		KASNYKU BAY	36,371,500	
			TAKATZ BAY	26,135,291	
	1989 Total	67,392,800[d]		62,506,791	2,940,331
1990	Hidden Falls Hatchery		KASNYKU BAY	37,686,000	
			TAKATZ BAY	26,589,400	
	1990 Total	68,147,600[e]		64,275,400	2,812,054
1991	Hidden Falls Hatchery		KASNYKU BAY	36,479,100	
			TAKATZ BAY	19,650,100	
	1991 Total	68,099,645[f]		56,129,200	2,879,438
1992	Hidden Falls Hatchery		KASNYKU BAY	36,530,800	
			TAKATZ BAY	25,912,100	
	1992 Total	66,947,200[g]		62,442,900	4,596,885
1993	Hidden Falls Hatchery		KASNYKU BAY	33,155,175	
			TAKATZ BAY	27,067,798	
	1993 Total	77,925,444[h]		60,222,973	574,853
1994	Hidden Falls Hatchery		KASNYKU BAY	37,035,400	
			TAKATZ BAY	33,854,350	
	1994 Total	84,010,000[i]		70,889,750	3,125,145
1995	Hidden Falls Hatchery		KASNYKU BAY	49,715,678	
			TAKATZ BAY	26,956,000	
	1995 Total	80,812,522[j]		76,671,678	2,198,109
1996	Hidden Falls Hatchery		KASNYKU BAY	37,544,876	
			TAKATZ BAY	25,021,120	
	1996 Total	69,793,600[k]		62,565,996	3,777,135

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Brood Year	Stock	Eggs	Release Site	No. Released	Return
1997	Hidden Falls Hatchery		KASNYKU BAY	37,809,253	
			TAKATZ BAY	25,882,728	
	1997 Total	73,491,484[l]		63,691,981	867,533
1998	Hidden Falls Hatchery		KASNYKU BAY	48,905,343	
			TAKATZ BAY	25,744,971	
	1998 Total	78,370,675[m]		74,650,314	1,276,322
1999	Hidden Falls Hatchery		KASNYKU BAY	38,689,735	
			TAKATZ BAY	36,259,333	
	1999 Total	80,000,723[n]		74,949,068	2,873,891
2000	Hidden Falls Hatchery		KASNYKU BAY	38,918,758	
			TAKATZ BAY	41,925,974	
	2000 Total	85,364,360[o]		80,844,732	1,337,415
2001	Hidden Falls Hatchery		KASNYKU BAY	36,503,940	
			TAKATZ BAY	36,316,937	
	2001 Total	87,184,495[p]		72,820,877	1,116,972
2002	Hidden Falls Hatchery		KASNYKU BAY	38,788,889	
			TAKATZ BAY	36,626,794	
	2002 Total	93,584,100[q]		75,415,683	1,803,004
2003	Hidden Falls Hatchery		KASNYKU BAY	43,543,514	
			TAKATZ BAY	45,054,655	
	2003 Total	94,417,451[r]		88,598,169	1,458,159
2004	Hidden Falls Hatchery		KASNYKU BAY	43,815,552	
			TAKATZ BAY	44,984,748	
	2004 Total	95,749,671[s]		88,800,300	2,614,584
2005	Hidden Falls Hatchery		KASNYKU BAY	44,271,804	
			TAKATZ BAY	41,926,494	
	2005 Total	91,529,422[t]		86,198,298	1,830,789
2006	Hidden Falls Hatchery		KASNYKU BAY	43,906,777	
			TAKATZ BAY	44,395,047	
	2006 Total	95,646,157[u]		88,301,824	714,090
2007	Hidden Falls Hatchery		KASNYKU BAY	41,654,695	
			TAKATZ BAY	42,828,059	
	2007 Total	98,813,231[v]		84,482,754	368,385
2008	Hidden Falls Hatchery		KASNYKU BAY	41,302,992	
			TAKATZ BAY	40,294,519	
	2008 Total	90,866,197[w]		81,597,511	1,915,235[x]
2009	Hidden Falls Hatchery		KASNYKU BAY	40,268,478	
			TAKATZ BAY	39,039,177	
	2009 Total	91,266,939[y]		79,307,655	576,459[z]
2010	Hidden Falls Hatchery		KASNYKU BAY	37,630,694	
			TAKATZ BAY	38,807,328	
	2010 Total	88,813,994		76,438,022	2,611[aa]
2011	Hidden Falls Hatchery		KASNYKU BAY	38,332,488	
			TAKATZ BAY	42,658,158	
	2011 Total	101,007,524[bb]		80,990,646	

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Brood Year	Stock	Eggs	Release Site	No. Released	Return
2012	Hidden Falls Hatchery		KASNYKU BAY	34,867,366	
			SE COVE	8,712,136	
			TAKATZ BAY	39,654,350	
	2012 Total	106,666,265		83,233,852	
2013	Hidden Falls Hatchery		KASNYKU BAY	32,365,464	
			SE COVE	9,142,373	
			TAKATZ BAY	42,449,573	
	2013 Total	110,675,299[cc]		83,957,410	

Source: Hidden Falls Annual Reports 1988–2013. 1977–1987 egg takes from ADF&G hatchery database obtained from Lorraine Vercessi, ADF&G PNP Hatchery assistant coordinator. Brood year 1987–1997 and 2013 fry releases from ADF&G tag and otolith database (http://mtalab.adfg.alaska.gov/CWT/reports/default.asp). 1977–2013 returns by brood year from 2014 Hidden Falls AMP.

[a] Plus 11 million eggs to Gunnuk Creek Hatchery and 8 million eggs to Sheep Creek Hatchery. Source: Holland (1988).
[b] Plus 6.8 million to Snettisham and 10 million eggs to Gunnuk Creek. Source: Holland (1988).
[c] Plus 10 million eggs to Gunnuk Creek Hatchery and 12 million eggs to Macaulay Hatchery.
[d] Plus 7 million eggs to Medvejie Creek Hatchery and 10 million eggs to Snettisham Hatchery that were then transported as fry to Macaulay Hatchery for releases at the hatchery and at Boat Harbor.
[e] Plus 14 million eggs to Medvejie Creek Hatchery and 10 million eggs to Snettisham Hatchery that were then transported as fry to Macaulay Hatchery for releases at the hatchery and at Boat Harbor.
[f] Plus 14 million eyed eggs for Medvejie Creek Hatchery.
[g] Plus 10 million eggs for Macaulay Hatchery and 14 million eggs for Medvejie Creek Hatchery.
[h] Plus 14million eggs for Medvejie Creek Hatchery and 10 million eggs for Macaulay Hatchery.
[i] Plus 12 million eggs for Medvejie Creek Hatchery.
[j] Plus 14 million eggs to Medvejie Creek Hatchery.
[k] Plus 14 million eggs to Medvejie Creek Hatchery.
[l] Plus 13 million eggs to Medvejie Creek Hatchery.
[m] Plus 14 million eggs to Medvejie Hatchery, 112,000 surplus eggs from Medvejie Hatchery discarded; 1,959,200 surplus eggs from Hidden Falls discarded.
[n] Plus 1.2 million excess eggs discarded and 14 million eggs to Medvejie Creek Hatchery.
[o] Plus 715,623 excess eggs discarded and 14.098 million eggs to Medvejie Creek Hatchery.
[p] Plus 420,531 excess eggs discarded and 23 million eggs to Medvejie Hatchery and 3 million eggs to Gunnuk Creek Hatchery.
[q] Plus 11.8 million eggs to Medvejie Creek Hatchery.
[r] Plus 24.2 million eggs to Medvejie Creek Hatchery and 9.7 million eggs to Port Armstrong Hatchery.
[s] Plus 24.29 million eggs to Medvejie Creek Hatchery and 12.87 million eggs to Port Armstrong Hatchery and 5,752,500 eggs to Gunnuk Creek Hatchery.
[t] Plus 23,993,690 eggs to Medvejie Creek Hatchery and 2 million to Port Armstrong Hatchery.
[u] Plus 24.7 million eggs to Medvejie Creek Hatchery and 12 million eggs to Port Armstrong Hatchery
[v] Plus 24.9 million eggs to Medvejie Creek Hatchery
[w] Plus 19.6 million eggs to Medvejie Creek Hatchery
[x] Return incomplete for brood year.
[y] Plus 24.3 million eggs to Medvejie Creek Hatchery and 5 million eggs to Gunnuk Creek Hatchery.
[z] Return incomplete for brood year.
[aa] Return incomplete for brood year.
[bb] Plus 24.3 million eggs to Medvejie Creek Hatchery and 5.1 million eggs to Gunnuk Creek Hatchery.
[cc] Plus 23.8 million eggs to Medvejie Creek Hatchery and 19.3 million eggs to Gunnuk Creek Hatchery.

Appendix D.–Summary of Chinook salmon fishery transport permits for Hidden Falls Hatchery.

FTP No.	Issued	Expiration	FTP summary and reviewer comments
89J-1028	1989	1994	Collect up to 100,000 eggs from Farragut River Chinook salmon for transport to Hidden Falls Hatchery for incubation and release.
92J-1018	1992	1997	Transfer up to 1.5 million Crystal Lake Hatchery/Andrew Creek stock Chinook salmon to Hidden Falls Hatchery for incubation and release. Serves as a back-up if returns to Medvejie and Hidden Falls hatcheries are insufficient for needs.
92J-1019	1992	2022	Collect up to 3.1 million eggs from Hidden Falls Hatchery/Andrew Creek stock Chinook salmon returns for incubation and release from the hatchery. In 2012, permit amended to extend effective date from 2012 to 2022 and increase egg take to 3.5 million eggs.
07J-1043	2007	2012	Transport up to 250,000 Tahini River stock Chinook salmon smolt from Hidden Falls Hatchery to Lutak Inlet.
07J-1044	2007	2012	Transport up to 300,000 Tahini River stock Chinook salmon eggs from Macaulay Salmon Hatchery to Hidden Falls Hatchery. Smolt then transported and released at Lutak Inlet under 07J-1043 above.
09J-1020	2010	2020	Allows transfer of up to 2.5 million Hidden Falls Hatchery/Andrew Creek stock Chinook salmon eggs to Medvejie Hatchery. FTP issued to Medvejie Hatchery and update to FTP 94J-1009.

Appendix E.–Chinook salmon egg take, release and return data for Hidden Falls Hatchery.

Brood Year	Broodstock	Eggs	Release Site	Release Year	Fry Release	Adult Return[a]
1981	Andrew Creek	175,084	Hidden Falls	1983	80,460	93
1982	Andrew Creek	78,554	Hidden Falls	1984	70,002	910
1983	Crystal Lake Hatchery/Andrew Creek	81,600	Hidden Falls	1985	50,211	375
	Tahini River	50,571	Hidden Falls	1985	46,750	115
1984	Crystal Lake Hatchery/Andrew Creek	47,000	Hidden Falls	1986	45,583	215
	Crystal Lake Hatchery/Tahini River	54,000	Hidden Falls	1986	46,518	72
1985	Crystal Lake Hatchery/Andrew Creek	276,000	Eliza Lake	1986	130,000	283
			Indian River	1986	51,020	
	Andrew Creek		Hidden Falls	1987	46,137	
	Andrew Creek Stock total:	276,000			227,157	283
	Tahini River	63,000	Hidden Falls	1987	51,847	118
	1985 total	339,000			279,004	401
1986	Crystal Lake Hatchery/Andrew Creek	151,400	Hidden Falls	1988	101,571	2,204
	Tahini River	67,000	Hidden Falls	1988	57,460	302
	1986 total	218,400			159,031	2,506
1987	Crystal Lake Hatchery/Andrew Creek	176,000	Hidden Falls	1989	99,621	2,698
	Hidden Falls Hatchery/Andrew Creek	225,000	Hidden Falls	1989	184,511	
	Andrew Creek Stock total:	401,000			284,132	2,698
	Hidden Falls Hatchery/Tahini River	61,400	Hidden Falls	1989	53,768	382
	1987 total	462,040			337,900	3,080
1988	Crystal Lake Hatchery/Andrew Creek	138,329	Hidden Falls	1990	97,096	1,276
	Hidden Falls Hatchery/Andrew Creek	273,968	Hidden Falls	1990	213,687	
	Andrew Creek Stock total:	412,297			213,687	1,276
	Hidden Falls Hatchery/Tahini River	55,407[b]	Lutak Inlet	1990	40,685	NA
	1988 total	467,704			254,372	1,276

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Brood Year	Broodstock	Eggs	Release Site	Release Year	Fry Release	Adult Return[a]
1989	Hidden Falls Hatchery/Andrew Creek	311,159[c]	Hidden Falls	1991	169,693	2,697
	Hidden Falls Hatchery/Tahini River	62,368	Hidden Falls	1991	14,775	226
	Farragut River[d]	67,719	Farragut River	1990	29,402	
	1989 total	441,246			213,870	2,923
1990	Hidden Falls Hatchery/Andrew Creek	206,603[e]	Hidden Falls	1992	118,023	25,403
	Crystal Lake Hatchery /Andrew Creek	1,121,599	Hidden Falls	1992	247,034	
	Medvejie Hatchery/Andrew Creek	1,489,000	Hidden Falls	1992	1,189,011	
	Andrew Creek Stock total:	2,817,202			1,554,068	25,403
	Hidden Falls Hatchery/Tahini River	55,949[f]	Burro Creek	1991/1992	40,233[g]	NA
	1990 total	2,873,151			1,594,301	25,403
1991	Hidden Falls Hatchery/Andrew Creek	623,084[h]	Hidden Falls	1993	435,130	50,779
	Medvejie Hatchery/Andrew Creek	1,803,354	Hidden Falls	1993	1,319,425	
	Andrew Creek Stock total:	2,426,438			1,754,555	50,779
	Hidden Falls Hatchery/Tahini River	92,974[i]	Taiya Inlet[j]	1992/1993	80,858	NA
	1991 total	2,519,412			1,835,413	50,779
1992	Hidden Falls Hatchery/Andrew Creek	1,540,062[k]	Gastineau Channel	1993	67,400	28,363
			Indian River	1993	120,545	
			Hidden Falls	1993	25,200	
			Hidden Falls	1994	1,053,038	
	Andrew Creek Stock total:	1,367,489			1,120,438	28,363
	Hidden Falls Hatchery/Tahini River	73,829	Burro Creek	1992	24,500	NA
				1994	38,789	
	1992 total	1,441,318			1,183,727	28,363
	Medvejie Cr. Hatchery/Andrew Creek	272,724	Kasnyku Bay	1993	245,721	

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Brood Year	Broodstock	Eggs	Release Site	Release Year	Fry Release	Adult Return[a]
1993	Hidden Falls Hatchery/Andrew Creek	1,681,191[l]	Hidden Falls	1995	923,506	9,808
	Hidden Falls Hatchery/Tahini River	7,150	Burro Creek	1994	0	NA
	1993 total	1,688,341			923,506	9,808
1994	Hidden Falls Hatchery/Andrew Creek	1,373,717[m]	Hidden Falls	1996	888,538	8,217
1995	Hidden Falls Hatchery/Andrew Creek	1,471,330[n]	Hidden Falls	1997	944,457	42,706
1996	Hidden Falls Hatchery/Andrew Creek	1,411,194[o]	Hidden Falls	1998	1,070,885	48,496
1997	Hidden Falls Hatchery/Andrew Creek	1,400,000[p]	Hidden Falls	1999	1,104,403	15,285
1998	Hidden Falls Hatchery/Andrew Creek	1,400,000[q]	Hidden Falls	2000	1,232,716	33,905
1999	Hidden Falls Hatchery/Andrew Creek	1,400,389[r]	Hidden Falls	2001	1,214,625	23,582
2000	Hidden Falls Hatchery/Andrew Creek	1,400,000[s]	Hidden Falls	2002	1,145,835	19,957
2001	Hidden Falls Hatchery/Andrew Creek	1,400,000[t]	Hidden Falls	2003	1,248,290	14,671
2002	Hidden Falls Hatchery/Andrew Creek	1,814,536[u]	Hidden Falls	2003/2004	1,169,302	3,969
2003	Hidden Falls Hatchery/Andrew Creek	1,416,375[v]	Hidden Falls	2005	1,249,354	18,708
2004	Hidden Falls Hatchery/Andrew Creek	1,400,000[w]	Hidden Falls	2006	1,052,892	4,807
2005	Hidden Falls Hatchery/Andrew Creek	1,894,439[x]	Hidden Falls	2007	604,149	7,245
2006	Hidden Falls Hatchery/Andrew Creek	1,575,852[y]	Hidden Falls	2008	750,961	6,160
2007	Hidden Falls Hatchery/Andrew Creek	2,006,040[z]	Hidden Falls	2008/2009	1,172,794	
	Pullen Creek Hatchery/Tahini River	300,000[aa]	Lutak Inlet	2008	164,865	
	2007 total	2,306,040			1,337,659	
2008	Hidden Falls Hatchery/Andrew Creek	2,278,382[bb]	Hidden Falls	2009/2010	1,229,198	
	Pullen Creek Hatchery/Tahini River	230,126[cc]	Lutak Inlet	2009	222,151	
	2008 total	2,508,508			1,451,349	

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Brood Year	Broodstock	Eggs	Release Site	Release Year	Fry Release	Adult Return[a]
2009	Hidden Falls Hatchery/Andrew Creek	2,278,625	Hidden Falls	2010/2011	965,744	
	Pullen Creek Hatchery/Tahini River	326,342[dd]	Lutak Inlet	2010	80,672	
	2009 total	2,604,967			1,046,416	
2010	Hidden Falls Hatchery/Andrew Creek	1,953,046[ee]	Hidden Falls	2012	480,642	
2011	Hidden Falls Hatchery/Andrew Creek	876,778[ff]	Hidden Falls	2013	518,277	
2012	Hidden Falls Hatchery/Andrew Creek	899,558[gg]	Hidden Falls	2014	558,227	
2013	Hidden Falls Hatchery/Andrew Creek	920,151[hh]				

Source: Egg takes and releases from Hidden Falls Hatchery annual reports for 1988 to 2013. 1981–1988 egg takes and releases from ADF&G PNP Hatchery database. 1988–2013 releases from Hidden Falls annual reports. 2014 release data from ADF&G Tag and Otolith Lab database.

[a] Adult return is the sum of all returns for the ancestral stock by brood year.
[b] 7,000 eyed eggs sent to Pullen Creek (see 1989 AR), and assume this is referenced as Burro Creek.
[c] 51,860 additional eggs discarded due to BKD.
[d] Included 2 Unuk stock fish in broodstock.
[e] 25,825 additional eggs discarded due to BKD.
[f] 12,434 additional eggs discarded due to BKD.
[g] 10,000 unfed fry released in 1991 and 30,233 smolt released in 1992.
[h] An additional 155,736 eggs discarded due to BKD.
[i] An additional 6,641 eggs discarded due to BKD.
[j] 61,597 fry shipped to Burro Creek Hatchery for rearing and release subsequent release of 23,894 fry. 124,860 discarded due to BKD.
[k] It appears that 1,540,062 eggs were collected according to the 1993 annual report, and that fry were transferred to Macaulay Salmon Hatchery and Indian River, with a small release at Hidden Falls as well. The 1994 annual report then reports only 1,367,489 eggs but with the same number of emergent fry. The 1994 report does not show the fry releases reported in the 1993 report, only that 1,053,038 smolt were released in 1994.
[l] An additional 170,391 eggs discarded due to BKD.
[m] An additional 235,000 eggs sent to Medvejie Hatchery.
[n] An additional 1.5 million green eggs sent to Medvejie creek Hatcheyr; 320,755 discarded due to BKD.
[o] An additional 1.98 million eggs sent to Medvejie Hatchery; 568,806 discarded due to BKD.
[p] Additional 600,000 eggs discarded due to BKD.
[q] 500,680 discarded.
[r] 382,167 discarded as excess or due to BKD
[s] 500,680 discarded.
[t] Additional 190,854 eggs transferred to DIPAC, 228,304 eggs discarded as surplus, and 27,901 eggs discarded due to BKD.
[u] Additional 165,920 eggs discarded due to BKD.
[v] 259,125 with BKD were destroyed; 352,687 were excessed; 16,375 dead fry.
[w] 375,012 eggs were destroyed for high BKD titers; 260,281 discarded.
[x] 132,043 destroyed for BKD; 22,964 discarded. Plus approx. 600,000 excess fry were destroyed.

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[y] An additional 1.7 million eggs sent to Medvejie Creek Hatchery. Approx. 145,768 destroyed due to BKD; Approx. 400,000 fry lost due to operational error xferring fish between ponds.
[z] 34,518 eggs destroyed for high BKD titers.
[aa] Eggs transferred to Hidden Falls Hatchery from Macaulay Salmon Hatchery.
[bb] Approx. 77,643 eggs discarded.
[cc] Eggs transferred to Hidden Falls Hatchery from Macaulay Salmon Hatchery.
[dd] Eggs transferred to Hidden Falls Hatchery from Pullen Creek Hatchery.
[ee] An additional 771,044 eggs transferred to Medvejie Creek Hatchery; 24,248 eggs discarded due to BKD; and 400,000 fry sent to Crystal Lake Hatchery in April 2011.
[ff] Additional 750,000 eggs transferred to Crystal Lake Hatchery and unknown number discarded due to BKD.
[gg] Additional 1,040,140 eggs to Medvejie Hatchery, 321,700 eggs to Crystal Lake Hatchery, 749,212 eggs to Macaulay Hatchery, and 12,868 discarded due to BKD.
[hh] Additional 2,900,316 eggs transferred to Medvejie Hatchery, 760,370 eggs transferred to Crystal Lake Hatchery, and 463,134 eggs discarded due to BKD.

Appendix F.–Summary of coho salmon fishery transport permits for Hidden Falls Hatchery.

FTP No.	Issued	Expiration	FTP summary and reviewer comments
89J-1005	1989	2009	Transfer up to 70,000 eyed Blanchard Lake/Deep Cove stock coho salmon eggs from Medvejie Hatchery to Hidden Falls Hatchery for rearing and release.
90J-1054	1990	2000	Collect up to 600,000 eggs from Deer Lake/Sashin Creek stock coho salmon returns to Deer Lake, incubate to eyed stage at Medvejie Hatchery, transport to Hidden Falls Hatchery for rearing and release.
92J-1005	1992	2007	Collect up to 2.5 million Hidden Falls Hatchery/Deer Lake/Sashin Creek stock coho salmon eggs and release resulting fry into Deer Lake. FTP amended in 1995 to increase egg take to 3.0 million. In 2002, FTP effective period extended from 2002 to 2007.
92J-1042	1992	2022	Collect up to 1.75 million Hidden Falls Hatchery/Deer Lake/Sashin Creek stock coho salmon eggs and release resulting smolt at Hidden Falls Hatchery. FTP amended in 2001 to increase egg take to 2.1 million, in 2003 to increase to 3.0 million, and in 2012 to 4.5 million of Sashin Creek, only, stock and extended effective period from 2012 to 2022.
93J-1036	1993	2015	Transfer of up to 1.5 million Mist Cove/Sashin Creek stock coho salmon eggs from Hidden Falls Hatchery returns . In 2000, amendment extended expiration date to 2010. In 2005, amendment extended expiration date to 2015 and increased egg number to 3 million.
93J-1037	1993	2015	Transfer of up to 1.5 million Mist Cove/Sashin Creek stock coho salmon eggs from Mist Cove (Deer Lake) returns . In 2000, amendment extended expiration date to 2010. In 2005, amendment extended expiration date to 2015 and increased egg number to 3 million.
94J-1042	1994	2009	Collect up to 2.5 million Hidden Falls Hatchery/Deer Lake/Deep Cove stock coho salmon eggs, incubate to eyed egg stage at Hidden Falls, transfer to Medvejie Hatchery for final incubation and short-term rearing, and release fry into Deer Lake. FTP amended in 1995 to increase egg take to 3.0 million and in 2004 to extend effective period from 2004 to 2009.
00J-1008	2000	2001	Transport up to 300,000 Hidden Falls Hatchery/Sashin Creek Cove stock coho fry to Banner Lake.
03J-1004	2003	2022	Collect up to 3.0 million Hidden Falls Hatchery/Deep Cove stock coho salmon eggs and release resulting smolt at Hidden Falls Hatchery. FTP amended in 2012 to increase egg take to 4.5 million and extended effective period from 2012 to 2022.
07J-1019	2007	2022	Collect up to 3.0 million Hidden Falls Hatchery/Deer Lake/Sashin Creek stock coho salmon eggs and release resulting fry into Deer Lake. This FTP updated 92J-1005. Permit amended in 2012 increasing egg take to 3.2 million.
11J-1022	2011	2026	Collect up to 3.2 million Hidden Falls Hatchery/Deer Lake/Deep Cove stock coho salmon eggs and release resulting fry into Deer Lake. This FTP updated 92J-1005. Permit amended in 2012 increasing egg take to 3.2 million.
13J-1007	2013	2023	Transport up to 300,000 Hidden Falls Hatchery/Deer Lake/Deep Cove stock coho fry to Cliff Lake if there is surplus production under 11J-1022.
13J-1008	2013	2023	Transport up to 50,000 Hidden Falls Hatchery/Sashin Creek stock coho fry to Cliff Lake if there is surplus production under 07J-1019.
13J-1016	2013	2023	Transport up to 500,000 Hidden Falls Hatchery/Deer Lake/Deep Cove stock coho fry to Banner Lake if there is surplus production under 11J-1022.
13J-1017	2013	2023	Transport up to 300,000 Hidden Falls Hatchery/Deer Lake/Sashin Creek stock coho fry to Banner Lake if there is surplus production under 07J-1019.

Appendix G.–Coho salmon production at Hidden Falls Hatchery.

Brood Year	Brood Stock	Egg Take	Release Site	Juveniles Released	Year Release	Adult Return
1988	Blanchard Lake/Deep Cove[a]	63,800[b]	Hidden Falls	62,595	1990	10,152
1989	Deer Lake/Sashin Creek	65,871[b]	Hidden Falls	64,155	1991	18,661
1990	Deer Lake/Sashin Creek	238,060[b]	Hidden Falls	168,862	1992	33,166
1991	Hidden Falls/Deep Cove	475,195	Hidden Falls	404,069	1993	92,400
1992	Hidden Falls/Sashin Creek	1,734,600	Hidden Falls	1,651,071	1994	233,650
1993	Hidden Falls/Sashin Creek	1,644,450		1,458,667	1995	192,413
1994	Hidden Falls/Deep Cove	1,718,845[c]	Hidden Falls	1,554,122	1996	98,199
1995	Hidden Falls/Sashin Creek	1,771,529[d]	Hidden Falls	1,501,428	1997	177,425
1996	Hidden Falls/Sashin Creek	1,545,231[e]	Hidden Falls	1,489,644	1998	251,096
1997	Hidden Falls/Deep Cove	1,700,000[f]	Hidden Falls	1,657,809	1999	170,082
1998	Hidden Falls/Sashin Creek	1,805,545	Hidden Falls	1,599,069	2000	419,603
1999	Hidden Falls/Sashin Creek	2,197,345[g]	Banner Lake	300,063	2000	17,016
			Hidden Falls	1,758,775	2001	412,992
2000	Hidden Falls/Deep Cove	2,141,370[h]	Hidden Falls	1,954,204	2002	201,652
2001	Hidden Falls/Sashin Creek	2,131,200	Hidden Falls	2,023,849	2003	206,819
2002	Hidden Falls/Sashin Creek	2,696,499i	Hidden Falls	2,251,020	2004	194,657
2003	Hidden Falls/Deep Cove	2,624,000[j]	Hidden Falls	2,199,914	2005	226,548
2004	Hidden Falls/Sashin Creek	4,174,125[k]	Deer Lake	264,290[l]	2005	27,198
			Hidden Falls	2,802,729	2006	53,703
2005	Hidden Falls/Sashin Creek	4,371,790	Deer Lake	533,248	2007	18,468
			Hidden Falls	2,487,823	2007	243,544
2006	Hidden Falls/Deep Cove	5,179,497	Deer Lake	675,462	2008	50,883
			Hidden Falls	2,274,731	2008	109,749
2007	Hidden Falls/ Sashin Creek	6,001,774	Deer Lake	851,141	2009	42,577
			Hidden Falls	2,797,375	2009	201,890
2008	Hidden Falls/ Sashin Creek	5,997,186	Deer Lake	1,063,381	2010	81,845
			Hidden Falls	2,560,498	2010	254,307
2009	Hidden Falls/Deep Cove	6,046,186	Deer Lake	954,622	2011[m]	41,042
			Hidden Falls	3,185,142	2011	36,476
2010	Hidden Falls/Sashin Creek	6,342,377	Deer Lake	1,823,500	2012[n]	incomplete
			Hidden Falls	2,569,138	2012	124,347
2011	Hidden Falls/Sashin Creek	7,900,304	Deer Lake	2,366,619	2013[o]	incomplete
			Hidden Falls	3,136,431	2013	incomplete
2012	Hidden Falls/Deep Cove	7,727,880	Deer Lake	2,364,473		
			Hidden Falls	3,119,963		
			Cliff Lake	50,003	2013	
2013	Hidden Falls/Sashin Creek	7,703,300	Banner Lake	100,819	2014	

Source: Data from Hidden Falls annual reports. ADF&G hatchery database information received from Lorraine Vercessi, PNP Hatchery assistant coordinator, and 2014 Hidden Falls AMP.

[a] Deep Cove and Patterson Bay are from the same area in lower Chatham and collectively referred to as "Deep Cove" in this table.

[b] Eyed eggs received from Medvejie Hatchery.

[c] An additional 2,718,500 eggs taken for Medvejie Hatchery, 615,000 eggs for Port Armstrong Hatchery, and 584,197 excess eggs discarded.

[d] An additional 2,630,708 eyed eggs transferred to Medvejie Hatchery and 385,773 excess eggs discarded.

[e] An additional 3,132,798 eyed eggs transferred to Medvejie Hatchery.

[f] An additional 3,015,600 eyed eggs transferred to Medvejie Hatchery.

[g] Additional 1.1 million eggs transferred to Port Armstrong Hatchery.

[h] An additional 1.744 million eggs transferred to Port Armstrong Hatchery and 2,941,785 eyed eggs, dead and alive, sent to Medvejie.

[i] Additional 2,665,600 eggs for Deer Lake transferred to Medvejie Hatchery.

[j] Additional 2,870,400 eggs taken for Deer Lake project and later transferred to Medvejie Hatchery.

[k] Additional 1,523,200 eggs taken transferred to Port Armstrong Hatchery and 1,448,917 excess eggs discarded.

[l] Additional 750,000 fry discarded after project stocking goal was reduced.

[m] Brood year 2009 outmigrated from Deer Lake in both 2011 and 2012.

[n] Brood year 2010 smolt outmigrated from Deer Lake in both 2012 and 2013.

[o] Brood year 2011 smolt outmigrated from Deer Lake in 2013 and 2014.

Appendix H.–Summary of ADF&G pathology inspections at Hidden Falls Hatchery.

Year	Inspection Notes
1989	For Chinook salmon, pseudomonad health problems. Facility clean and well-organized. Recommend interaction with Crystal Lake Hatchery be eliminated as soon as practical due to the bacterial kidney disease (BKD) history at Crystal Lake Hatchery.
1990	For Chinook salmon, gill hyperplasia and pseudomonad health problems. Facility clean and well organized. Recommend reducing or eliminating interaction with hatcheries with BKD histories.
1991	Recommend discontinue water hardening Chinook salmon eggs with iodophor to improve survival to eyed stage.
1992	Takatz grow out facility inspection. No issues.
1993	For Chinook salmon, health problems noted include osmotic drop out, gill lamellar hyperplasia, and Trichodina. Facility clean and well organized. Recommend soaking mortalities overnight in 200 ppm CL_2 before discarding.
1994	Inspection of Takatz net pen operation. Grow out facility well organized and clean.
1995	For chum salmon, report notes that hatchery staff found NOPAD trays to incubate eggs and fry better and cleaner than R48's. Several fungus problems and clogged screens occurred with R48's and the fish were smaller than those hatched with NOPADs. For Chinook and coho salmon, Phoma was a problem. Addressed through elimination of organic debris in the rearing containers. Experimental treatment of egg fungus with saltwater was successful and adopted as practice. Chinook salmon egg survival improved to 98% by mixing gametes in plastic bags followed by rinsing in water, poured into single Heath trays of iodophor for 1 hr. Well run facility with high priority on cleanliness. Recommended replacing R48s with NOPAD incubators, disease history updates for coho and chum stocks, dispose of fish mortalities in deep water, consider quaternary ammonium compounds for foot baths as Diquat might not be adequate to destroy some fish pathogens.
1997	Noted Chinook salmon health problems with Phoma every year, despite raceways being kept clean and fish not overfed. Foot baths changed to quatermary ammonium compound. Mortalities are incinerated or chlorinated before disposal. Facility clean, well-organized and excellently managed. Fish culture practices such as minimizing excess feeding and using the Goede fish health condition index are incorporated to maximize fish health. Recommend collecting Dolly Varden from hatchery water supply to examine for Rs antigen and update
1999	Furunculosis and Phoma in Chinook salmon. Hatchery personnel perform fish health checks periodically and whenever a fish health problem is evident. Staff appear very knowledgeable on all fish health issues and operate smoothly with diligent attention to maintaining optimal rearing and incubation environments. Staff were unable to get Dolly Varden samples due to difficulty in finding them and inspector indicated sampling of the Dolly Varden not necessary.
2006	Noted outbreak of motile *Aeromonas* over winter. Advised moving Chinook salmon pen complex away from outfall lines. Recommended written safety plan for using formalin, removing dead fish from rearing units at least once per day, use separate utensils for each rearing unit, place bird netting over all outdoor rearing units, and disinfect eggs after pick if fungus continues to be a problem.
2015	Diatom bloom coupled with cold spring temperatures caused excessive pinheading and dropout for chum salmon. BKD and marine Flavobacteria, and minor bacterial cold water disease (BCWD) caused high coho salmon losses.

Appendix I.–Comparison of permitted and reported chum salmon egg takes in hatchery permit, basic management plan, annual management plan, fishery transport permits and annual reports for Hidden Falls Hatchery, 1988–2013. Egg and juvenile salmon numbers are in millions.

Key: HF=Hidden Falls Hatchery, M=Medvejie Creek Hatchery, T=Takatz Bay, BH=Boat Harbor, SH=Snettisham Hatchery, MH= Macaulay Hatchery, DI=Deep Inlet, S=Southeast Cove. NF=Not found. BH and DI are permitted release sites for other hatcheries (Macaulay and Medvejie Creek hatcheries, respectively) and listed here to track production.

Brood Year	Project	Hatchery Permit/ BMP Egg Take	AMP Egg Take	FTP for Egg Take	Egg Source	IL	FTP Exp. Year	FTP Egg Level	Egg Take from AR	Release Site	Release Year	AMP Juvenile Release Level	FTP for Release	FTP Exp. Date	FTP Release Level	Release from Annual Report
1988	HF	68	67.8	NF	HF	HF	NA	NA	66	HF	1989	34.7	NF			34
	T			86J-1073[a]	HF	HF	1999	60		T	1989	25.5	86J-1073	1999	60	26.1
	BH	20	6.6	89J-1027	HF	SH/MH	1993	9		BH	1989		89J-1027[b]	1993	9	8.5
1989	HF	68	76.6	NF					67.4	HF	1990	36.7	NF			36.4
	T		28.5	86J-1073	HF	HF	1999	60		T	1990	26.6	86J-1073	1999	60	26.1
	DI	20	14	89J-1006	HF	M	2009	13	7.1	DI	1990		89J-1006	2009	13	6.4
	BH		10	89J-1027	HF	SH/MH	1993	9	10	BH	1990		89J-1027	1993	9	6
1990	HF	68	39.4	NF					68.1	HF	1991	36.7	NF			37.7
	T		28.6	86J-1073	HF	HF	1999	60		T	1991	26.6	86J-1073	1999	60	26.6
	DI	20	10	89J-1006	HF	M	2009	13	14	DI			89J-1006	2009	13	12.6
	BH		10	89J-1027	HF	SH/MH	1993		10	BH			89J-1027	1993	9	8.9
1991	HF	68	39.4	NF					68.1	HF	1992					36.5
	T		28.6	86J-1073	HF	HF	1999	60		T	1992		86J-1073	1999	60	19.7
	DI	20	14	89J-1006	HF	M	2009	13	14	DI	1992		89J-1006	2009	13	12
	BH		6	89J-1027	HF	SH/MH	1993			BH	1992		89J-1027	1993	9	6.7
1992	HF	101	39.4	NF					67	HF	1993	36.7				36.5
	T		28.6	86J-1073	HF	HF	1999	60		T	1993	26.6	86J-1073	1999	60	25.9
	DI	40	14	89J-1006	HF	M	2009	13	14.1	DI	1993		89J-1006	2009	13	13.2
	BH		6	89J-1027	HF	SH/MH	1993		10.1	BH	1993		89J-1027	1993	9	9.5
1993	HF	101	92	NF	HF	HF			77.9	HF	1994	36.7	NF			33.2
	T			86J-1073	HF	HF	1999	60		T	1994	35.9	86J-1073	1999	60	27.1
	DI	40		89J-1006	HF	M	2009	13	13.9	DI	1994		89J-1006	2009	13	11.2
	BH	40		89J-1027	HF	SH/MH	1993		3	BH	1994		89J-1027	1993	9	6.5
	MH	40		NF					10.3		1994					2.9[c]
1994	HF	101	39.4	NF					84.0[d]	HF	1995	36.7	NF			37
	T		38.6	86J-1073	HF	HF	1999	60	39.8	T	1995	35.9	86J-1073	1999	60	33.8
	DI	40	14	89J-1006	HF	M	2009	13	12.5	DI	1995		89J-1006	2009	13	10.6
1995	HF	101	39.4	95J-1010	HF	HF	2015	41	80.8	HF	1996	50	95J-1010	2015	41	49.7
	T		39.6	95J-1009	HF	HF	2015	60		T	1996	26.7	95J-1009	2015	60	27
	DI	40	13	89J-1006	HF	M	2009	13	14	DI	1996		89J-1006	2009	13	13.3

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Brood Year	Project	Hatchery Permit/ BMP Egg Take	AMP Egg Take	FTP for Egg Take	Egg Source	IL	FTP Exp. Year	FTP Egg Level	Egg Take from AR	Release Site	Release Year	AMP Juvenile Release Level	FTP for Release	FTP Exp. Date	FTP Release Level	Release from Annual Report
1996	HF	101	52.6	95J-1010	HF	HF	2015	41	69.8	HF	1997	38.4	95J-1010	2015	41	37.5
	T		28.1	95J-1009	HF	HF	2015	60		T	1997	25.6	95J-1009	2015	60	25
	DI	40	14	89J-1006	HF	M	2009	13	14	DI	1997		89J-1006	2009	13	12.8
1997	HF	101	44.6	95J-1010	HF	HF	2015	41	73.5	HF	1998	48	95J-1010	2015	41	37.8
	T		29.8	95J-1009	HF	HF	2015	60		T	1998	25.6	95J-1009	2015	60	25.9
	DI	40	14	89J-1006	HF	M	2009	13	14	DI	1998		89J-1006	2009	13	12.9
1998	HF	101	53.7	95J-1010	HF	HF	2015	41	78.4[e]	HF	1999	48	95J-1010	2015	41	48.9
	T		28.4	95J-1009	HF	HF	2015	60		T	1999	25.6	95J-1009	2015	60	25.7
	DI	40	14	89J-1006	HF	M	2009	13	14	DI	1999		89J-1006	2009	13	13.4
1999	HF	101	53.7	95J-1010	HF	HF	2015	41	80.0	HF	2000	39.6	95J-1010	2015	41	38.7
	T		28.4	95J-1009	HF	HF	2015	60		T	2000	36.3	95J-1009	2015	60	36.3
	DI	40	14	89J-1006	HF	M	2009	13	14	DI	2000		89J-1006	2009	13	13.1
2000	HF	101	45	95J-1010	HF	HF	2015	41	85.4	HF	2001	41.6	95J-1010	2015	41	38.9
	T		42	95J-1009	HF	HF	2015	60		T	2001	38.4	95J-1009	2015	60	41.9
	DI	40	14	89J-1006	HF	M	2009	13	14	DI	2001		89J-1006	2009	13	13.2
2001	HF	101	45	95J-1010	HF	HF	2015	41	87.2[f]	HF	2002	45	95J-1010	2015	41	36.5
	T		42	95J-1009	HF	HF	2015	60		T	2002	45	95J-1009	2015	60	36.3
	DI	[g]	14	89J-1006	HF	M	2009	13	23	DI	2002		89J-1006	2009	13	21.5
2002	HF	91	45.5	95J-1010	HF	HF	2015	41	93.6[h]	HF	2003	45	95J-1010	2015	41	38.8
	T		45.5	95J-1009	HF	HF	2015	60		T	2003	45	95J-1009	2015	60	36.6
	DI		24	89J-1006	HF	M	2009	13	12	DI	2003		89J-1006	2009	13	11.4
2003	HF	91	45.5	95J-1010	HF	HF	2015	60	94.4[i]	HF	2004	45	95J-1010	2015	60	45.5
	T		45.5	95J-1009	HF	HF	2015	60		T	2004	45	95J-1009	2015	60	45
	DI		24	89J-1006	HF	M	2009	23	24.1	DI	2004		89J-1006	2009	23	22.5
2004	HF	91	45.5	95J-1010	HF	HF	2015	60	95.7[j]	HF	2005	45	95J-1010	2015	60	43.8
	T		45.5	95J-1009	HF	HF	2015	60		T	2005	45	95J-1009	2015	60	45
	DI		24	89J-1006	HF	M	2009	23	25	DI	2005		89J-1006	2009	23	23.6
2005	HF	91	45.5	95J-1010	HF	HF	2015	60	91.5	HF	2006	45	95J-1010	2015	60	44.3
	T		45.5	95J-1009	HF	HF	2015	60		T	2006	45	95J-1009	2015	60	41.9
	DI		24	89J-1006	HF	M	2009	23	24.5	DI	2006		89J-1006	2009	23	23.2
2006	HF	91	45.5	95J-1010	HF	HF	2015	60	95.6[k]	HF	2007	45	95J-1010	2015	60	43.9
	T		45.5	95J-1009	HF	HF	2015	60		T	2007	45	95J-1009	2015	60	44.4
	DI		24	89J-1006	HF	M	2009	23	24.7	DI	2007		89J-1006	2009	23	21.9

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Brood Year	Project	Hatchery Permit/ BMP Egg Take	AMP Egg Take	FTP for Egg Take	Egg Source	IL	FTP Exp. Year	FTP Egg Level	Egg Take from AR	Release Site	Release Year	AMP Juvenile Release Level	FTP for Release	FTP Exp. Date	FTP Release Level	Release from Annual Report
2007	HF	91	45.5	95J-1010	HF	HF	2015	60	98.8	HF	2008	45	95J-1010	2015	60	41.7
	T		45.5	95J-1009	HF	HF	2015	60		T	2008	45	95J-1009	2015	60	42.8
	DI		24	89J-1006	HF	M	2009	23	25.2	DI	2008		89J-1006	2009	23	23.7
2008	HF	91	45.5	95J-1010	HF	HF	2015	60	90.9	HF	2009	45	95J-1010	2015	60	41.3
	T		45.5	95J-1009	HF	HF	2015	60		T	2009	45	95J-1009	2015	60	40.3
	DI		24	89J-1006	HF	M	2009	23	19.6	DI	2009		89J-1006	2009	23	18.6
2009	HF	91	45.5	95J-1010	HF	HF	2015	60	91.3[l]	HF	2010	45	95J-1010	2015	60	40.3
	T		45.5	95J-1009	HF	HF	2015	60		T	2010	45	95J-1009	2015	60	39
	DI		24	09J-1021	HF	M	2020	23	24.3	DI	2010		09J-1021	2020	23	22.7
2010	HF	101	50.5	95J-1010	HF	HF	2015	60	88.8[m]	HF	2011	40.1	95J-1010	2015	60	37.6
	T		50.5	95J-1009	HF	HF	2015	60		T	2011	52	95J-1009	2015	60	38.8
	DI		24	09J-1021	HF	M	2020	23	23.9	DI	2011		09J-1021	2020	23	21.8
2011	HF	101	45.5	95J-1010	HF	HF	2015	60	101	HF	2012	40.1	95J-1010	2015	60	38.3
	T		55.5	95J-1009	HF	HF	2015	60		T	2012	52	95J-1009	2015	60	42.7
	DI		24	09J-1021	HF	M	2020	23	24.3	DI	2012		09J-1021	2020	23	23.9[n]
2012	HF	101	45.5	95J-1010	HF	HF	2015	60	106.7[l]	HF	2013		95J-1010	2015	60	34.9
	T		55.5	95J-1009	HF	HF	2015	60		T	2013		95J-1009	2015	60	39.7
	S		10	12J-1022	HF	HF	2022	35		S	2013					8.7
	DI		24	09J-1021	HF	M	2020	24	22.3	DI	2013		09J-1021	2020	24	21.1

[a] FTP 86J-1073 was issued to ADF&G but not to NSRAA for transfer of fry from Hidden Falls Hatchery to Takatz Bay.
[b] Could not find FTP that permitted apparent transfer of eggs or fry from Hidden Falls Hatchery to Snettisham Hatchery.
[c] Chum salmon transfer number from Hidden Falls to Macaulay Hatchery is unclear. The 1994 annual report indicated NSRAA collected "3,042,000" green eggs for the Boat Harbor project, and 10,258,487 for DIPAC. The fry from these eggs were then collectively released at Boat Harbor and Amalga Harbor, which are DIPAC release sites. Part of the fry destined for Boat Harbor from Macaulay Salmon Hatchery were released at Amalga Harbor due to poor weather, according to the 1994 Macaulay Salmon Hatchery annual report.
[d] Additional approximately 4.1 million eggs discarded or used for experimental incubation.
[e] Additional 112,000 surplus eggs from M transfer discarded and 2.0 million surplus to HF lot discarded.
[f] Additional 3 million eggs taken for Gunnuk Creek Hatchery and 430,531 eggs discarded as excess.
[g] Beginning in 2001, eggs taken for Deep Inlet were accounted for on the Medvejie Hatchery permit and deleted from the Hidden Falls permit.
[h] Additional 3 million eggs transferred to Gunnuk Creek Hatchery.
[i] Additional 9.7 million eyed eggs transferred to Port Armstrong Hatchery.
[j] Additional 5.7 million eggs transferred to Gunnuk Creek Hatchery and 12.9 million eggs transferred to Port Armstrong Hatchery.
[k] Additional 30 million eyed eggs transferred to Port Armstrong Hatchery.
[l] Additional 5 million eyed eggs transferred to Gunnuk Creek Hatchery.
[m] Additional 5.1 million eyed eggs transferred to Gunnuk Creek Hatchery.
[n] Additional 4.2 million eggs transferred to Medvejie Hatchery from Port Armstrong Hatchery and subsequent fry included in this release.

Appendix J.–Comparison of permitted and reported Chinook salmon egg takes in hatchery permit, basic management plan, annual management plan, fish transport permits and annual reports for Hidden Falls, 1987–2013.

Key: AR= Annual Report, HF=Hidden Falls Hatchery, AC=Andrew Creek stock, CL=Crystal Lake Hatchery, T=Tahini River, F=Farragut, L=Lutak Bay, MC=Medvejie Creek Hatchery, M=Macaulay Hatchery, B=Burro Creek Hatchery, P=Pullen Creek Hatchery, NR=Not Reported, NF=Not found.

Brood Year	Project	Hatchery Permit/BMP Egg Take	AMP Egg Take	Egg Take FTP	Egg Source	IL	FTP Exp. Year	FTP Egg Level	AR Egg Take	Release Site	Release Year	AMP Juvenile Release	Release FTP	FTP Exp. Date	FTP Release	AR Release
1987	HF			NF	HF/AC	HF			0.225	HF	1989	NR	NF			0.188
	HF			NF	CL/AC	HF			0.176	HF	1989	NR	NF			0.101
	T			NF	HF/T	HF			0.061	HF	1989	NR	NF			0.054
1988	T	3.1	3.1	NF	T	HF			0.055[a]	L	1990	0.045	NF			0.041
	HF			NF	HF/AC	HF			0.274	HF	1990	0.028	NF			0.214
				NF	CL/AC	HF			0.138	HF	1990	NR	NF			0.097
1989	HF	3.1	0.38	NF	HF/AC	HF			0.311	HF	1991	0.023	NF			0.170
	T		2.53	NF	T	HF			0.062	HF	1991	0.01	NF			0.015
	F			89J-1028	F	HF	1994	0.1	0.068	F	1990		89J-1028	1994	0.1	0.029
1990	HF	3.5	3.05	NF	HF/AC	HF			0.207	HF	1992	1.65	NF			0.118
	HF			NF	CL/AC	HF			1.122	HF	1992		NF			0.247
	HF			NF	MC/AC	M			1.489	HF	1992		NF			1.189
	B		0.05	NF	HF/T	HF			0.056	B	1991/1992	0.03	NF			0.040[b]
1991	HF	3.5	3.1	NF	HF/AC	HF			0.623	HF	1993	1.6	NF			0.435
	HF			NF	MC/AC	HF			1.803	HF	1993		NF			1.319
	HF		0.05	NF	HF/T	HF			0.093	B	1991/93	0.055	NF			0.079[c]
1992	HF	3.5	3.1	92J-1019	HF/AC	HF	2012	3.1	1.540	HF	1993/94	1	92J-1019	2012	3.1	1.053[d]
	HF			NF	M/AC				0.273	HF	1993					0.246
	B		0.05		HF/T				0.074	B						0.025
1993	HF	3.5	1.55	92J-1019	HF/AC	HF	2012	3.1	1.681	HF	1995	0.95	92J-1019	2012	3.1	0.924
1994	HF	3.5	1.5	92J-1019	HF/AC	HF	2012	3.1	1.374[e]	HF	1996	1	92J-1019	2012	3.1	0.889
1995	HF	3.5	3.0	92J-1019	HF/AC	HF	2012	3.1	1.471[f]	HF	1997	1	92J-1019	2012	3.1	0.944
1996	HF	3.5	3.25	92J-1019	HF/AC	HF	2012	3.1	1.411[g]	HF	1998	1	92J-1019	2012	3.1	1.071
1997	HF	3.5	1.75	92J-1019	HF/AC	HF	2012	3.1	1.400	HF	1999	1	92J-1020	2012	3.1	1.104
1998	HF	3.5	1.75	92J-1019	HF/AC	HF	2012	3.1	1.400	HF	2000	1	92J-1019	2012	3.1	1.233
1999	HF	3.5	1.75	92J-1019	HF/AC	HF	2012	3.1	1.400	HF	2001	1	92J-1019	2012	3.1	1.215
2000	HF	3.5	1.75	92J-1019	HF/AC	HF	2012	3.1	1.400	HF	2002	1	92J-1019	2012	3.1	1.146
2001	HF	3.5	1.75	92J-1019	HF/AC	HF	2012	3.1	1.400[h]	HF	2003	1	92J-1019	2012	3.1	1.248
2002	HF	3.5	1.75	92J-1019	HF/AC	HF	2012	3.1	1.815	HF	2003/04	1	92J-1019	2012	3.1	1.169

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Brood Year	Project	Hatchery Permit/BMP Egg Take	AMP Egg Take	Egg Take FTP	Egg Source	IL	FTP Exp. Year	FTP Egg Level	AR Egg Take	Release Site	Release Year	AMP Juvenile Release	Release FTP	FTP Exp. Date	FTP Release	AR Release
2003	HF	3.5	1.75	92J-1019	HF/AC	HF	2012	3.1	1.416	HF	2005	1.2	92J-1019	2012	3.1	1.249
2004	HF	3.5	1.75	92J-1019	HF/AC	HF	2012	3.1	1.400	HF	2006	1.1	92J-1019	2012	3.1	1.053
2005	HF	3.5	1.75	92J-1019	HF/AC	HF	2012	3.1	1.894	HF	2007	1.1	92J-1019	2012	3.1	0.604
2006	HF	3.5	1.75	92J-1019	HF/AC	HF	2012	3.1	1.576[i]	HF	2007	1.1	92J-1019	2012	3.1	0.253
									-	HF	2008					0.4968
2007	HF	3.8	1.75	92J-1019	HF/AC	HF	2012	3.1	2.006	HF	2008	1.15	92J-1019	2012	3.1	0.265
									-	HF	2009					0.908
	L			07J-1043	P/T	M/HF	2012	0.25	0.300[j]	L	2008	NL	07J-1043	2012	0.25	0.165
2008	HF	3.8	1.75	92J-1019	HF/AC	HF	2012	3.1	2.278	HF	2008/09	0.3	92J-1019	2012	3.1	0.289
									-	HF	2010	1.25				0.940
									-							1.229
	L		NL	07J-1043	P/T	MC/HF	2012	0.25	0.230[j]	L	2009	NL	07J-1043	2012	0.25	0.222
2009	HF	3.8	3.0	92J-1019	HF/AC	HF	2012	3.1	2.279	HF	2010	1.25	92J-1019	2012	3.1	0.367
										HF	2011	1.25				0.598
																0.966
	L	3.8		07J-1043	P/T	MC/HF	2012	0.25	0.326[k]	L	2010	NL	07J-1043	2012	0.25	0.081
2010	HF	3.8	3.0	92J-1019	HF/AC	HF	2012	3.1	1.953[l]	HF	2012	0.6	92J-1019	2012	3.1	0.481
2011	HF	3.8	3.0	92J-1019	HF/AC	HF	2012	3.1	0.877[m]	HF	2013	0.6	92J-1019	2012	3.1	0.518
2012	HF	3.8	2.09	92J-1019	HF/AC	HF	2022	3.5	0.900[n]	HF	2014		92J-1019	2012	3.1	0.558
2013	HF	3.8	3.1	92J-1019	HF/AC	HF	2022	3.5	0.920[o]				92J-1019	2012	3.1	

[a] 7,000 of these shipped as eyed eggs to Pullen Creek.
[b] 10,000 fry transferred to B in 1991 and 30,233 smolt to Skagway in 1992.
[c] Additional 23,894 fry shipped to B in 1991 and 56,964 to Skagway in 1993.
[d] Additional fry releases of 67,400 at Macaulay Salmon Hatchery, 25,200 at Indian River and 25,200 at HF.
[e] Additional 235,000 eggs sent to Medvejie.
[f] An additional 1.5 million eggs sent to Medvejie Creek Hatchery.
[g] An additional 1.98 million eggs sent to Medvejie Creek Hatchery.
[h] An additional 190,854 eggs sent to Macaulay Salmon Hatchery.
[i] An additional 1.7 million eggs sent to Medvejie Creek Hatchery.
[j] Eyed eggs received from Macaulay Hatchery.
[k] Eyed eggs received from Pullen Creek Hatchery.
[l] 771,000 sent to Medvejie Creek Hathery and 440,000 sent to Crystal Lake Hatchery.
[m] Additional 750,000 eggs transferred to Crystal Lake Hatchery.
[n] Additional 749,212 eggs transferred to Macaulay Hatchery.
[o] Additional 2,139,946 eyed eggs transferred to Medvejie Hatchery and 760,370 eyed eggs transferred to Crystal Lake Hatchery.

Appendix K.–Comparison of permitted and reported coho salmon egg takes in hatchery permit, basic management plan, annual management plan, fishery transport permits and annual reports for Hidden Falls Hatchery, 1988–2013.

Key: HF=Hidden Falls Hatchery, BL=Blanchard Lake, M=Medvejie Hatchery, D=Deep Cove/Patterson Bay, S=Sashin Creek, DL=Deer Lake, MC=Mist Cove, C=Cliff Lake, NA= no data reported, NF= FTP not found)

Brood Year	Project	Hatchery Permit/ BMP Egg Take	AMP Egg Take	FTP for Egg Take	Egg Source	IL	FTP Exp. Year	FTP Egg Level	Egg Take from AR	Release Site	Release Year	AMP Juvenile Release Level	FTP for Release	FTP Exp. Date	FTP Release Level	Release from Annual Report
1988	HF			89J-1005	BL/D	M	2009	0.07	0.06	HF	1990					0.06
1989	HF	0.07	0.07	89J-1005	DL/S	M	2009	0.07	0.07	HF	1991	NA	NF			0.06
1990	HF	0.25	0.07	NF	DL/S	HF			0.24	HF	1992	0.175	NF			0.17
1991	HF	0.25	0.6	NF	HF/D	HF	2009		0.48	HF	1993	0.4	NF			0.40
1992	HF	1.7	0.6	NF	HF/S	HF	2009		1.73	HF	1994	1.6	NF			1.65
1993	HF	4.2	1.7	92J-1042	HF/S	HF	2012	1.75	1.64			1.45	92J-1042	2012	1.75	NA
1994	HF	5.7	1.7	NF	HF/D	HF			1.72[a]	HF	1996	1.48	NF			1.55
1995	HF	5.7	4.3	92J-1042	HF/S	HF	2012	1.75	1.77	HF	1997	1.5	92J-1042	2012	1.75	1.50
	HF				HF/S	HF/M			3.02[b]							
1996	HF	5.7	4.4	92J-1042	HF/S	HF	2012	1.75	1.55	HF	1998	1.5	92J-1042	2012	1.75	1.49
	HF				HF/S	M			3.13[c]							
1997	HF	5.7	4.5	NF	HF/D	HF			1.70	HF	1999	1.5	NF			1.66
1997	HF			NF	HF/D	M			3.02[d]							
1998	HF	5.7	4.6	92J-1042	HF/S	HF	2012	1.75	1.81	HF	2000	1.65	92J-1042	2012	1.75	1.60
1999	HF	5.7	4.6	92J-1042	HF/S	HF	2012	1.75	2.20[e]	BL	2000	0.1	00J-1008	2001	0.3	0.30
										HF	2001	1.75	92J-1042	2012	1.75	1.76
2000	HF	6.1	4.9	NF	HF/D	HF	2012	1.75	2.14[f]	HF	2002	2	NF			1.95
2001	HF	6.1	4.9	92J-1042	HF/S	HF	2012	2.1	2.13[g]	HF	2003	1.75	92J-1042	2012	2.1	2.02
2002	HF	6.1	4.9	92J-1042	HF/S	HF	2012	2.1	2.68[g]	HF	2004	2.2	92J-1042	2012	2.1	2.25
2003	HF	6.1	5.7	03J-1004	HF/D	HF	2012	3.0	5.49[h]	HF	2005	2.3	03J-1004	2012	3.0	2.20
2004	DL	6.1	5.7	92J-1005	HF/S	HF	2007	3.0	5.70[h]	DL	2005	0.5	92J-1005	2007	3.0	0.57
	HF									HF	2006	2.9	92J-1042	2012	3.0	2.80
2005	DL	6.1	4.9	92J-1005	HF/S	HF	2007	3.0	4.37	DL	2007	1	92J-1005	2007	3.0	0.53
	HF									HF	2007	2.8	92J-1042	2012	3.0	2.49
2006	DL	6.1	4.9	03J-1004	HF/D	HF	2012	3.0	5.18	DL	2008	1	03J-1004	2012	3.0	0.68
	HF									HF	2008	2.3	03J-1004	2012	3.0	2.27

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Brood Year	Project	Hatchery Permit/ BMP Egg Take	AMP Egg Take	FTP for Egg Take	Egg Source	IL	FTP Exp. Year	FTP Egg Level	Egg Take from AR	Release Site	Release Year	AMP Juvenile Release Level	FTP for Release	FTP Exp. Date	FTP Release Level	Release from Annual Report
2007	DL	6.1	6.1	07J-1019	HF/S	HF	2022	3.0	6.00	DL	2009	1	07J-1019	2022	3.0	0.84
	DL			07J-1019			2022	3.0		DL	2010	1	07J-1019	2022	3.0	0.01
	HF									HF	2009	2.68	92J-1042	2012	3.0	2.80
2008	DL	6.1	6.1	07J-1019	HF/S	HF	2022	3.0	6.00	DL	2010	2	07J-1019	2022	3.0	1.06
	HF									HF	2010	2.6	92J-1042	2012	3.0	2.56
2009	DL	6.1	6.4	07J-1019	HF/D	HF	2022	3.0	6.05	DL	2011	2.3	07J-1019	2022	3.0	0.66
	DL			07J-1019			2022	3.0		DL	2012	2.3	07J-1019	2022	3.0	0.35
										HF	2011	3	92J-1042	2012	3.0	3.19
2010	DL	6.9	6.1	07J-1019	HF/S	HF	2022	3.0	6.34	DL	2012	2.4	07J-1019	2022	3.0	1.71
	DL			07J-1019			2022	3.0		DL	2013	2.4	07J-1019	2022	3.0	0.11
	HF									HF	2012	2.75	92J-1042	2012	4.5	2.57
2011	DL	6.9	6.9	07J-1019	HF/S		2022	3.0	7.90	DL	2013	2.6	07J-1019	2022	3.0	2.37
	HF									HF	2013	3.5	92J-1042	2012	4.5	3.14
2012	C	7.7	6.9	03J-1004	HF/D	HF	2022	4.5	7.73	C	2013	0.05	13J-1007	2023	0.05	0.05
2013	HF/DL	7.7	7.7		HF/S	HF			7.70							

[a] Additional 2,718,500 taken for M, 615,000 for Port Armstrong Hatchery and 584,197 discarded as excess.
[b] All eggs transferred to M (2,630,708 eyed eggs) except for 385,773 eggs discarded as excess.
[c] All eyed eggs from this egg take transferred to M.
[d] All eyed eggs from this egg take transferred to M except for 44,068 discarded as excess.
[e] Additional 1.1 million eggs transferred to Port Armstrong Hatchery.
[f] Additional 1,888,425 green eggs to Port Armstrong Hatchery and 2,941,785 eyed eggs to M.
[g] Additional 1.5 million eggs for Port Armstrong Hatchery.
[h] Additional 1.3 million eggs for Port Armstrong Hatchery.