Regional Information Report No. 5J15-03

An Evaluation of the Medvejie Creek Salmon Hatchery for Consistency with Statewide Policies and Prescribed Management Practices

by

Mark Stopha

August 2015

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

Symbols and Abbreviations

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Weights and measures (metric)

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

Weights and measures (English)

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

Time and temperature

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

Physics and chemistry

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

General

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

Mathematics, statistics

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

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AN EVALUATION OF THE MEDVEJIE CREEK SALMON HATCHERY FOR CONSISTENCY WITH STATEWIDE POLICIES AND PRESCRIBED MANAGEMENT PRACTICES

by
Mark Stopha
Alaska Department of Fish and Game, Division of Commercial Fisheries, Juneau

Alaska Department of Fish and Game
Division of Commercial Fisheries
333 Raspberry Road, Anchorage, AK 99518

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

Mark Stopha,
Alaska Department of Fish and Game, Division of Commercial Fisheries,
1255 W. 8th St. P. O. Box 115526, Juneau, AK 99811-5526, USA

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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 Medvejie Creek Hatchery located in Silver Bay near Sitka, Alaska. The hatchery was constructed in 1981 by the Northern Southeast Regional Aquaculture Association. The hatchery produces chum salmon *Oncorhynchus keta* for commercial harvest, coho salmon *O. kisutch* and Chinook salmon *O. tshawytscha* for sport and commercial harvest and pink salmon *O. gorbuscha* for mitigation for removing water from Medvejie Creek. The facility releases juveniles from the hatchery and other release sites near Sitka.

All fish incubated at Medvejie Creek Hatchery are otolith-marked differentially by release site. Fish are sampled when commercial fisheries occur 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: Medvejie Salmon Hatchery, hatchery evaluation, hatchery, Northern Southeast Regional Aquaculture Association, chum salmon hatchery, coho salmon hatchery, Chinook salmon hatchery, king salmon hatchery

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" (Alaska Legislature 1974).[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).

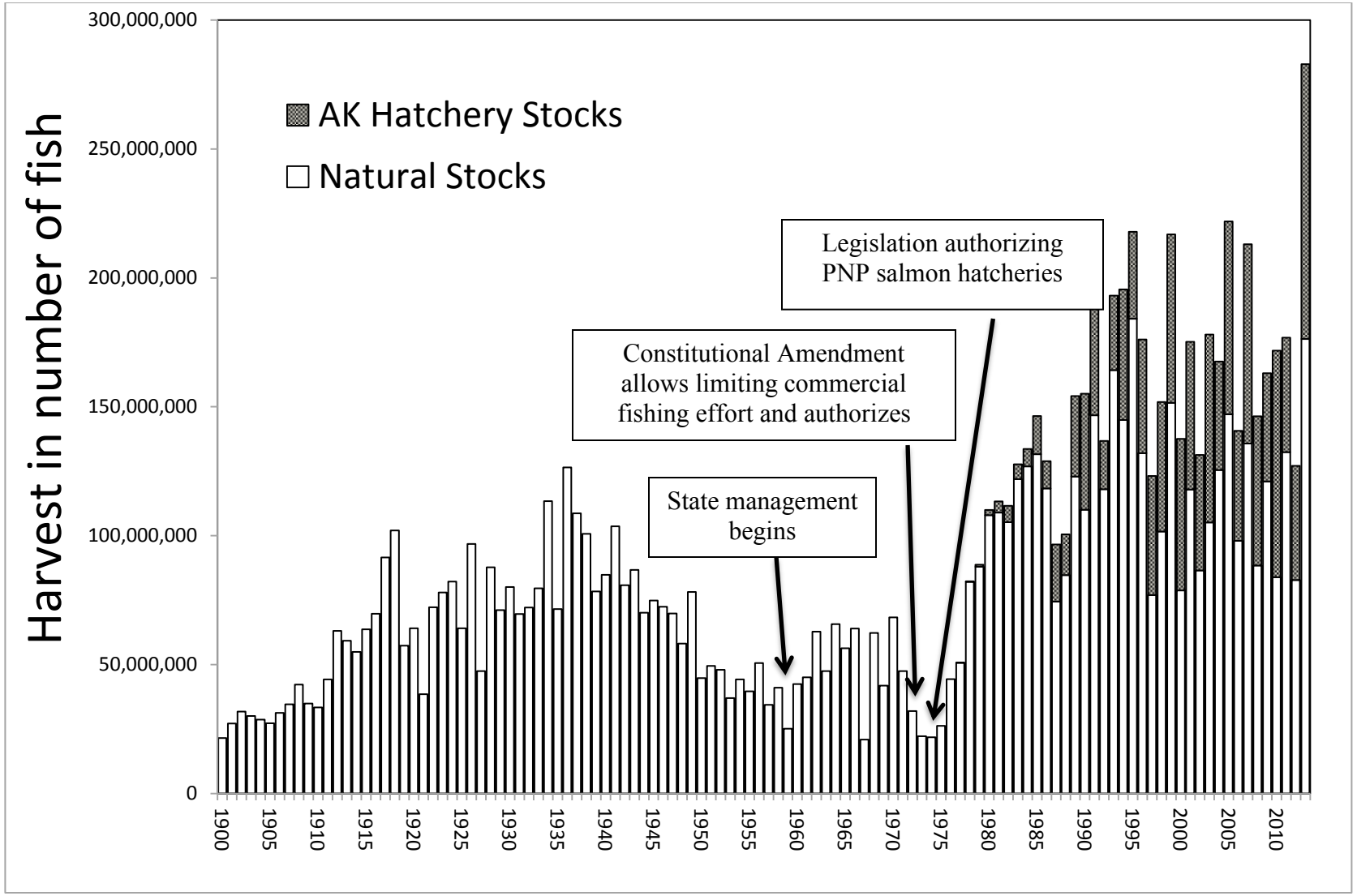

Figure 1.–Commercial salmon harvest in Alaska, 1900–2012.

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

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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 Fishery Biologist, multiplied by the hatchery percent of the commercial harvest.

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 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, 2014c, 2015a, 2015b*)* completed reviews of the remainder of the Cook Inlet and Prince William Sound hatcheries, and the Macaulay, Sheep Creek, Snettisham,

Haines projects and Sawmill Creek hatcheries in Southeast Alaska. This report is for the Medvejie Creek Hatchery located in Sitka, Alaska. 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, the 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).

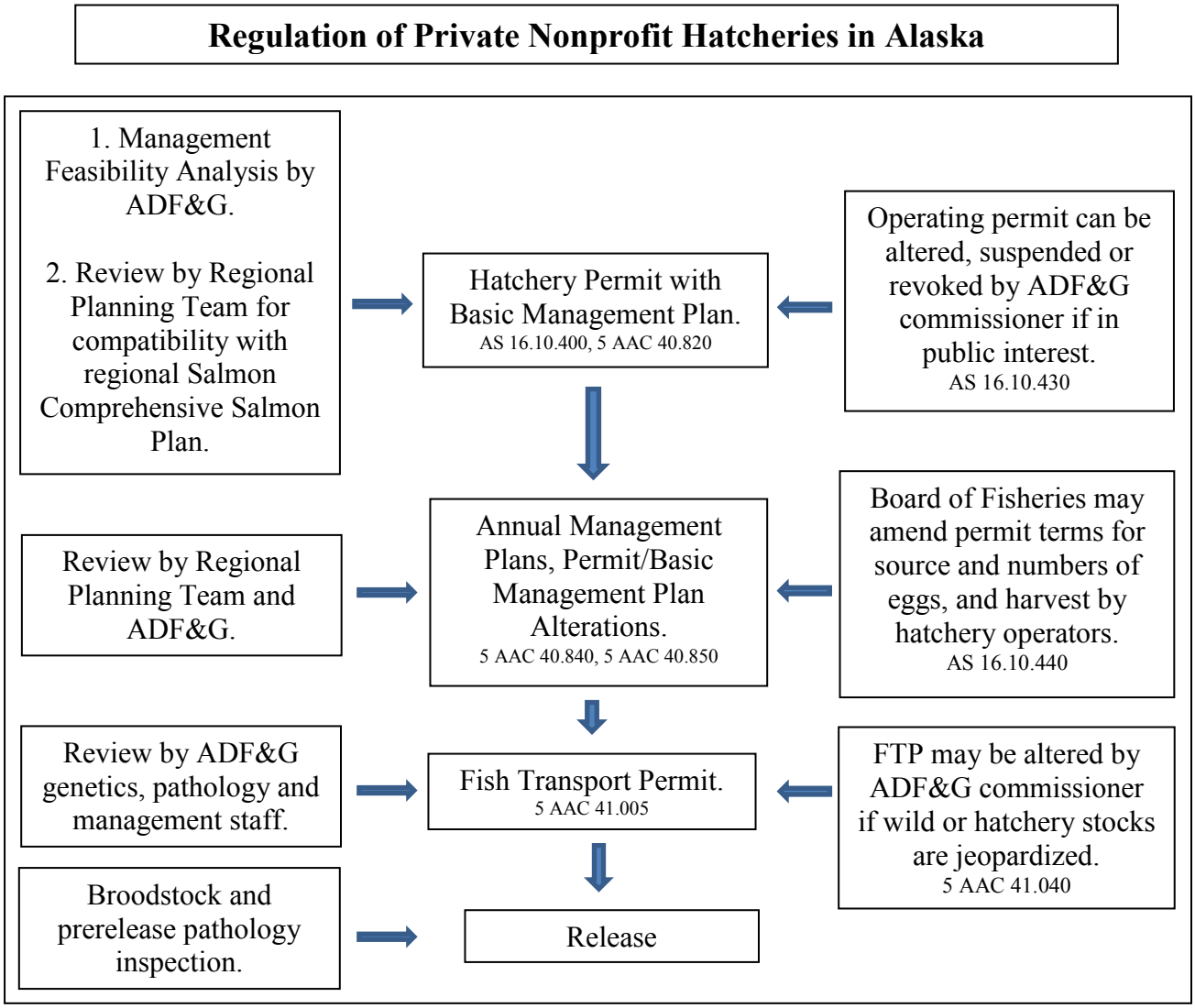

Figure 2.–Diagram of Alaska hatchery permitting process.

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

Hatchery permits/BMPs may be amended 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.

MEDVEJIE CREEK HATCHERY OVERVIEW

The initial site for a hatchery near Sitka was proposed at Blue Lake in 1979 by the Northern Southeast Regional Aquaculture Association (NSRAA), but potential disease complications negated this site.[5] The Medvejie Creek site was then selected and NSRAA submitted a preliminary hatchery application for the site in December 1980. Medvejie Creek is a short creek (0.75 miles) that drains Medvejie Lake. The steep upper gradient of the creek prevents migrating salmonids from entering the lake, but pink and chum salmon spawn in the lower portion of the creek.[6] The hatchery was to serve as a central incubation facility, where a portion of the fish would be released from the hatchery for broodstock returns, and the remainder released at other

[5] Memo from Derek Poon, NSRAA General Manager, to Donald Skoog, ADF&G Commissioner, dated December 8, 1980. Unpublished document obtained from Sam Rabung, ADF&G PNP Hatchery Coordinator, Juneau.

[6] Preliminary application for Medvejie Creek Hatchery. Unpublished document obtained from Sam Rabung, ADF&G PNP Hatchery Coordinator, Juneau.

locations. Coho salmon stocking was proposed in *hanging lakes*, which are lakes with outlet falls that are impassable to migrating adult salmon. Sea Lion Cove Lake on Kruzof Island and Banner Lake on Southeast Baranof Island were proposed as initial release sites. Chum salmon were also proposed for production for release at the hatchery.

The NSE RPT reviewed the preliminary application for consistency with the draft Regional Comprehensive Salmon Plan, and recommended to the ADF&G commissioner that the application was compatible with the plan.[7]

ADF&G staff reviewed the permit as well. ADF&G FRED Division staff comments included concerns over isolation of groups of fish to prevent lateral disease transfer in the hatchery, methods of water filtration to prevent disease pathogens from entering the hatchery water supply, implementation of a marking program to identify hatchery releases, and identification of long-term goals for the facility.[8] ADF&G management staff had no concerns regarding the hatchery location at Medvejie Creek, but had concerns over possible overharvest of wild Salmon Lake stocks during harvest of Medvejie Creek Hatchery chum salmon returns to the terminal area in Bear Cove. ADF&G staff expressed a willingness to explore other release sites in the Sitka area with NSRAA staff that would have less risk of negatively impacting important local wild stocks. ADF&G management staff had no concerns with NSRAA's coho salmon plans.[9]

In response to management concerns, NSRAA initially removed chum salmon production from the application,[10] and later proposed reducing chum salmon production at Medvejie Creek Hatchery from 10 million eggs to 2 million eggs in order to assess effects on local stocks.[11] Production of 20 million chum salmon eggs, however, could be accomplished through development of another release site.[12]

The ADF&G Pathology section recommended that an effluent depuration system be incorporated into Medvejie Creek Hatchery to protect resident fish in the area. NSRAA rejected the concept because of the costs, and intended to use husbandry procedures to minimize pathology risks.

The final hatchery application was received by ADF&G in April 1981. NSRAA did not include the depuration effluent system recommended by ADF&G. In addition, in May 1981, NSRAA decided to alter their original plan of a permanent facility using upwelling springs as the water

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[7] Memo to Derek Poon, NSRAA General Manager, from Don Collinsworth, ADF&G Deputy Commissioner, dated January 6, 1981. Unpublished document obtained from Sam Rabung, ADF&G PNP Hatchery Coordinator, Juneau.

[8] Memo to Jerry Madden, FRED Division Salmon Rehabilitation and Enhancement Coordinator, from Karen Crandall, Fishery Biologist, FRED Division, dated January 23, 1981. Unpublished document obtained from Sam Rabung, ADF&G PNP Hatchery Coordinator, Juneau.

[9] Memo to Jerry Madden, FRED Division Salmon Rehabilitation and Enhancement Coordinator, from Bob Wilbur, Aquaculture Harvest Coordinator, ADF&G Division of Commercial Fisheries, dated February 23, 1981. Unpublished document obtained from Sam Rabung, ADF&G PNP Hatchery Coordinator, Juneau.

[10] Memo to Jerry Madden, FRED Division Salmon Rehabilitation and Enhancement Coordinator, from R.E. Larson, NSRAA Hatchery Manager, dated March 10, 1981. Unpublished document obtained from Sam Rabung, ADF&G PNP Hatchery Coordinator, Juneau.

[11] Memo to Jerry Madden, FRED Division Salmon Rehabilitation and Enhancement Coordinator, from Derek Poon, NSRAA General Manager, dated March 24, 1981. Unpublished document obtained from Sam Rabung, ADF&G PNP Hatchery Coordinator, Juneau.

[12] Memo to Derek Poon, NSRAA General Manager, from Don Collinsworth, ADF&G Deputy Commissioner, dated May 21, 1981. Unpublished document obtained from Sam Rabung, ADF&G PNP Hatchery Coordinator, Juneau.

source. They planned instead to operate an interim facility using water directly from Medvejie Creek that would be irradiated to kill pathogens.[13]

ADF&G staff considered that Salmon Lake pink and coho salmon stocks and the Medvejie Creek chum salmon were the local stocks likely to be affected by harvest of hatchery returns. Staff recommended that the pink and coho salmon stocks should be maintained until their current and future production potentials could be determined. Commercial terminal harvests could only be held in Silver Bay when Salmon Lake pink salmon were showing harvestable levels unless Salmon Lake Creek stocks were consciously sacrificed in favor of harvesting hatchery returns. Management staff believed that more acceptable sites existed in the Sitka Sound area for hatchery releases where hatchery returns could be harvested with much less risk to wild stocks, with less potential conflict with the sport fishery, and with more potential to benefit the seine fleet.[14]

Cost-recovery fishing and broodstock collection would be the primary purpose for chum salmon releases at Medvejie Creek Hatchery. Harvest would be limited to Bear Cove, and ADF&G staff predicted that chum salmon quality would be poor until ADF&G evaluated the interception of nonhatchery fish in the cost recovery harvest. Sport fisheries would continue outside the special harvest area (SHA), but would be closed within the SHA during hatchery harvests. Depuration of hatchery effluent remained a concern. ADF&G staff continued to believe that effluent depuration was required, but accepted the waste treatment mitigation proposal by NSRAA. Staff recommended that the hatchery permit be suspended if water quality and fish pathogens from hatchery effluent adversely affected fish habitat surrounding the facility until the effects were mitigated.[15]

Alaska hatchery permit number 16 was issued in August 1981 to NSRAA for Medvejie Creek Hatchery for up to 20 million chum salmon eggs and 3 million coho salmon eggs (Appendix A). The BMP indicated that the chum salmon program would be split between releases from the hatchery and another release site because of the nearness to the hatchery of Salmon Lake pink and coho salmon stocks whose status was unknown.

The coho salmon program was to consist of eggs incubated at Medvejie Creek Hatchery for release in two general areas—Patterson Bay of southeast Baranof Island and Sea Lion Cove on Kruzof Island. The goal was to provide an additional 100,000 coho salmon for the fisheries.

The hatchery permit was amended in 1982 to add Chinook salmon production (Appendix A). Pink salmon production was added by permit amendment in 1986 to mitigate natural pink and chum salmon production loss in Medvejie Creek as a result of hatchery operations. A total of 100,000 pink salmon eggs are incubated each year, with half of the fry released in the north fork of Medvejie Creek and the remainder released in the south fork. The FTP was amended in 1992

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[13] Memo to Jerry Madden, Salmon Rehabilitation and Enhancement Coordinator, ADF&G FRED Division, from Bruce Bachen, NSRAA Operations Manager, dated June 3, 1981. Unpublished document obtained from Sam Rabung, ADF&G PNP Hatchery Coordinator, Juneau.

[14] Memo to Jerry Madden, ADF&G, from Bob Wilbur, ADF&G, dated February 23, 1981. Unpublished document obtained from Sam Rabung, ADF&G PNP Hatchery Coordinator, Juneau.

[15] Memo from Jerry Madden, PNP Program Coordinator, ADF&G FRED Division, to Don Collinsworth, ADF&G Deputy Commissioner, dated July 9, 1981. Unpublished document obtained from Sam Rabung, ADF&G PNP Hatchery Coordinator, Juneau.

to increase the egg number to 300,000 eggs because it was a requirement of an Alaska Department of Natural Resources permit for the site (FTP 87J-1036, Appendix I).

CHUM SALMON PROGRAM

Medvejie Creek Hatchery was initially permitted for up to 20 million chum salmon eggs. Donor stocks were fall chum salmon runs including Medvejie Creek,[16] Salmon Lake Creek,[17] and Nakwasina Creek.[18] The BMP indicated a goal to provide an additional 200,000 chum salmon to the fisheries from releases from the hatchery and another release site.

Of the total capacity of 20 million chum salmon eggs, releases from the hatchery were limited to 2 million chum salmon fry until the status of nearby wild stocks of pink and coho salmon stocks in Salmon Lake Creek was assessed. Initially, ADF&G assumed the stocks were important producers and would manage seine fisheries in Silver Bay on the basis of run strengths of these stocks, which meant that cost-recovery and common property fishing for hatchery returns might only be allowed directly in front of the hatchery where fish flesh quality would likely be poor. If evaluations of the stocks indicated they were minor producers, then the terminal seine fisheries could be managed for the size of the hatchery chum return and the fishing area near the hatchery could be expanded for higher quality fish harvest.

In 1982, a hatchery permit amendment allowed Deep Inlet as a release site (Appendix A). Deep Inlet was chosen because it provided a large area where good quality hatchery fish could be harvested over a protracted period and in an area with few wild stock concerns (FTP 82J-1039, Appendix B).

In 1986, the permit was amended to increase hatchery capacity from 20 million to 28 million chum salmon eggs to allow for full utilization of the hatchery. All of the increased production would be released at Deep Inlet (FTP 85J-1013). The permitted release at Bear Cove continued at 2 million to protect wild stocks, as recommended by ADF&G staff.[19]

In 1987, the permit was amended to increase production again from 28 million to 30 million eggs, and the releases at Medvejie Creek Hatchery increased from 2 million to 3 million fry. NSRAA requested the increase to address potential broodstock shortage of returns to Medvejie Creek Hatchery. When broodstock at the hatchery were below requirements, chum salmon had to be collected from Deep Inlet, which was expensive and logistically complicated. In the approval letter for the increased releases, the ADF&G deputy commissioner cautioned that the increase may not solve potential problem of broodstock shortages at the hatchery. In years of high pink salmon abundance, the incidental interception of hatchery chum salmon during the common-property seine fisheries may be substantial, especially since hatchery fish tended to mill outside the SHA. In years of low pink salmon abundance, NSRAA might see a substantial surplus of broodstock due to restricted commercial fishing, but the surplus fish may be of low quality by

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[16] 1981 Medvejie Creek Hatchery annual report. Unpublished document obtained from Sam Rabung, ADF&G PNP Hatchery Coordinator, Juneau.

[17] 1982 Medvejie Creek Hatchery annual report. Unpublished document obtained from Sam Rabung, ADF&G PNP Hatchery Coordinator, Juneau.

[18] Ibid.

[19] Memorandum from Bob DeJong, ADF&G Area Management Biologist, to Gary Gunstrom, ADF&G Division of Commercial Fisheries Southeast Research Supervisor, dated February 12, 1986. Unpublished document obtained from Sam Rabung, ADF&G PNP Hatchery Coordinator, Juneau.

the time they are available for harvest in the SHA. The deputy commissioner indicated that eventually the Alaska Board of Fisheries may have to consider whether to provide ADF&G the authority to manage for protection of hatchery returns resulting in underutilization of wild pink salmon returns in some years.[20]

The permit was amended in 1988 to increase hatchery capacity from 30 million to 38 million eggs. NSRAA requested the increase to take advantage of incubator modifications that increased chum salmon capacity at the hatchery. All additional releases would be in Deep Inlet. ADF&G staff had no objection to the increase.[21]

In 1989, an FTP was approved for the transfer of up to 13 million eyed eggs from Hidden Falls Hatchery summer-run chum salmon to Medvejie Creek Hatchery for incubation and release at Deep Inlet (FTP 89J-1006). Deep Inlet is an ideal location as a terminal area where hatchery returns could be harvested and wild returns avoided, but it is also a difficult place to operate purse seine gear. Deep Inlet has a steep shoreline and is very deep, which reduces the catch efficiency. In addition, the fall chum salmon returns showed an unusual diving behavior, sounding out of the reach of purse seine gear. The fall chum salmon harvested also tended to be dark colored and of reduced value when harvested. Returns of Hidden Falls Hatchery summer-run stock would allow comparison of quality, marine survival, and catchability with the returns from the fall-run Medvejie Creek Hatchery stock.[22]

Although FTP 89J-1006 allowed transfer of eggs, it did not, by itself, increase the permitted capacity at Medvejie Creek Hatchery. That would require an amendment to the Medvejie Creek Hatchery permit. Although the permitted capacity at Medvejie Creek Hatchery remained at 38 million chum salmon eggs, it appears that ADF&G and NSRAA staff believed the capacity had been increased to 52 million eggs (38 million fall chum eggs plus 14 million green egg equivalent summer chum eggs). This assumption was seen in applications by NSRAA for later permit amendments which were assessed and approved by ADF&G staff.

In 1990, the permit was amended to increase fry releases from 3 million to 5 million at Medvejie Creek Hatchery. NSRAA requested the increased release because insufficient broodstock was returning from previous releases to supply egg needs. The amendment contained stipulations that no common property fishery would be allowed outside the SHA to harvest hatchery returns, and that any surplus hatchery returns that reached the hatchery area could only be harvested within the Bear Cove SHA by purse or beach seine. In his letter approving the permit amendment, the ADF&G deputy commissioner cautioned NSRAA that the intent of the increase in release numbers to alleviate broodstock shortages may not be a long-term solution due to the increase in troll effort targeting chum salmon in Eastern Channel, as well as the incidental harvest of hatchery chum salmon by the seine fleet during years of high pink salmon abundance.[23] The permit alteration indicated that the permitted capacity of Medvejie Creek Hatchery remained at

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[20] Letter from Steve Pennoyer, ADF&G Deputy Commissioner, to Bruce Bachen, NSRAA, dated April 20, 1987. Unpublished document obtained from Sam Rabung, ADF&G PNP Hatchery Coordinator, Juneau.

[21] Memorandum from Bob DeJong, ADF&G Area Management Biologist, to Steve McGee, ADF&G Fishery Biologist, dated March 1, 1988. Unpublished document obtained from Sam Rabung, ADF&G PNP Hatchery Coordinator, Juneau.

[22] FTP 89J-1006. Unpublished document obtained from Sam Rabung, ADF&G PNP Hatchery Coordinator, Juneau.

[23] Memorandum from Norman Cohen, ADF&G Deputy Commissioner, to Bruce Bachen, NSRAA, dated April 25, 1990. Unpublished document obtained from Sam Rabung, ADF&G PNP Hatchery Coordinator, Juneau.

38 million chum salmon eggs, which appears to correct hatchery capacity assumptions mentioned earlier for the summer-run chum salmon program.

Chum salmon capacity was increased again in 1995, when the permit was amended to increase hatchery capacity from 38 million to 42 million eggs. NSRAA requested the amendment to create additional fishing opportunity and aid in harvest management during low return years, when it was very difficult to conduct common property and cost recovery fisheries in a way that maximized value. ADF&G staff had no objections.[24]

In 2000, NSRAA requested an increase in Bear Cove releases from 5 million fry to 7 million fry, with a corresponding reduction in Deep Inlet releases. Due to the successes of chum salmon returns to Deep Inlet and Bear Cove, the fishing fleet increasingly targeted chum salmon. When insufficient fish were available at Bear Cove in 2000, fisheries had to be restricted in Deep Inlet so that sufficient broodstock could be obtained to achieve hatchery capacity. NSRAA proposed increasing releases from Bear Cove to return greater numbers there and avoid having to take eggs from Deep Inlet in the future.[25] ADF&G Division of Sport Fish staff did not support the increase due to the potential risk to wild sockeye and coho salmon runs to Salmon Lake.[26] ADF&G Division of Commercial Fisheries staff supported the amendment. They did not believe shifting 2 million of the fry released from Deep Inlet to Bear Cove created a significant threat to wild stocks and believed the amendment request made sense in light of the intense commercial fishing pressure that had developed on the returns.[27] An RPT memo indicates that the RPT recommended approval on conditions that no common property fisheries occur in the Bear Cove SHA, that the permit amendment would expire after 3 years, and that the NSRAA board of directors formally agree not to request a common property fishery.[28] The PAR was not approved. Documentation was not found to indicate if the PAR was denied by the ADF&G commissioner or if NSRAA withdrew the PAR.

In 2002, the Medvejie Creek Hatchery permit was amended to transfer 10 million chum salmon eggs of permitted capacity from the Hidden Falls Hatchery permit to the Medvejie Creek Hatchery permit for release at Deep Inlet. This amendment increased Medvejie Creek Hatchery permitted capacity from 42 million to 52 million eggs, and decreased the Hidden Falls Hatchery permitted capacity from 101 million eggs to 91 million eggs. At the time, NSRAA was not using the full capacity available at Hidden Falls Hatchery, and therefore this was a transfer of unused capacity to Medvejie Creek Hatchery.[29] The request was made due to the success of returns to Deep Inlet, which had attracted 14 processors and as many as 90 seine boats, 140 gillnet boats and 150 troll vessels. With adequate processing and harvesting capacity, increased returns could

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[24] Email from Doug Mecum, ADF&G, to Steve McGee, ADF&G, dated March 16, 1995, 11:24 a.m. Unpublished document obtained from Sam Rabung, ADF&G PNP Hatchery Coordinator, Juneau.

[25] Letter from Steve Reifenstuhl, NSRAA, to Steve McGee, ADF&G, dated October 2, 2000. Unpublished document obtained from Sam Rabung, ADF&G PNP Hatchery Coordinator, Juneau.

[26] Email from Rocky Holmes to Carol Denton and 4 others, dated November 1, 2000, 11:59:03. Unpublished document obtained from Sam Rabung, ADF&G PNP Hatchery Coordinator, Juneau.

[27] Email from Bill Davidson, ADF&G, to Scott Kelley, ADF&G, dated October 9, 2000, 3:21 p.m. Unpublished document obtained from Sam Rabung, ADF&G PNP Hatchery Coordinator, Juneau.

[28] Garold Pryor, ADF&G Commercial Fisheries Region 1 Resource Development Biologist, personal communication.

[29] Email from Bill Davidson, ADF&G, to Scott Kelley and Andy McGregor, ADF&G, dated May 23, 2001, 4:50 p.m. Unpublished document obtained from Sam Rabung, ADF&G PNP Hatchery Coordinator, Juneau.

be effectively harvested.[30] ADF&G staff supported the amendment conditioned on a 5-year sunset clause, after which time the program would be assessed with information collected over that period. Stipulations of the permit amendment included conducting studies of hatchery chum salmon in the Sitka Sound ecosystem. The study was to include hatchery fry predation on herring, pink salmon, and other stocks of chum salmon; competition between hatchery fry and herring, pink salmon, and other stocks of chum salmon; study of the growth and migration of chum salmon; changes in primary productivity; and food habits of juvenile and adult chum salmon. In addition, a monitoring program was required at Salmon Lake to assess potential impacts from chum salmon production and harvest on resident coho and sockeye salmon populations. As part of these studies, the harvest, escapement, and total return were estimated for Salmon Lake coho salmon. Tydingco et al. (2008) reported estimated exploitation rates of Salmon Lake coho salmon of 62% in 2004 and 52% in 2005. These rates were similar to exploitation rates of coho salmon in Ford Arm Lake located on Baranof Island north of Sitka Sound (Skannes et al. 2014). An earlier study (Tydingco et al. 2006) reported the 2003 estimated exploitation rate of Salmon Lake coho salmon of 78%, which was higher than the 49% rate at Ford Arm Lake for the same year (Skannes et al. 2014).

In 2003, the transfer of chum salmon eggs from Hidden Falls Hatchery to Medvejie Creek Hatchery for release at Deep Inlet was increased by amendment to FTP 89J-1006 from 13 million to 23 million eggs. Eggs are taken at Hidden Falls Hatchery and transferred by boat to Medvejie Creek Hatchery during the eyed stage. The goal was to transfer 23 million eyed eggs, so the egg take goal was 24 million green eggs to account for green egg to eyed egg mortality. Since the permitted capacity at Medvejie was 52 million eggs at the time, this resulted in a cumulative working capacity of 24 million summer-run chum salmon eggs from Hidden Falls Hatchery stock and 28 million fall-run eggs from Medvejie Creek Hatchery stock.

In 2005, the permit was amended to allow an increase from 7 million to 10 million chum salmon eggs for release at Medvejie Creek Hatchery. Documentation indicated that this would increase the fall-run chum salmon capacity from 33 million to 36 million eggs.[31] The increase was requested to provide larger returns to the hatchery site in Bear Cove so that remote egg takes at Deep Inlet would not be required. This resulted in a cumulative capacity at Medvejie Creek Hatchery of 24 million Hidden Falls Hatchery stock summer chum salmon green egg equivalents and 36 million Medvejie Creek Hatchery stock fall chum salmon green eggs, for a total hatchery capacity of 60 million chum salmon eggs.[32]

In 2007, the 2002 permit amendment for transfer of 10 million eggs of permitted chum salmon capacity from Hidden Falls Hatchery to Medvejie Creek Hatchery was extended for one year. Part of NSRAA's justification for maintaining the transfer were that the results of chum salmon fry sampling from 2002 to 2006 "demonstrated that the Deep Inlet chum feed primarily on copepods and crustaceans with little or no evidence of herring larvae in the diet." The permit was amended again in 2010 without a sunset date. The 2010 amendment was retroactive to 2008, as

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[30] Letter from Steve Reifenstuhl, NSRAA, to Steve McGee, ADF&G Biologist, dated March 20, 2001. Unpublished document obtained from Sam Rabung, ADF&G PNP Hatchery Coordinator, Juneau.

[31] Memorandum from Flip Pryor, ADF&G, to McKie Campbell, ADF&G Commissioner, dated May 2, 2005. Unpublished document obtained from Sam Rabung, ADF&G PNP Hatchery Coordinator, Juneau.

[32] From 2007 emails dated April 30 and May 1 between Bruce White, ADF&G, Chip Blair and Steve Reifenstuhl, both of NSRAA, that were part of the PAR application for Lutak Inlet Chinook (Tahini stock) program dated February 12, 2007. Unpublished document obtained from Sam Rabung, ADF&G PNP Hatchery Coordinator, Juneau.

the PAR had been recommended for approval in 2008 but not processed for the ADF&G commissioner's signature in that year.[33] This amendment retained the cumulative capacity at Medvejie Creek Hatchery of 60 million chum salmon eggs comprised of 24 million Hidden Falls Hatchery stock summer chum salmon eggs and 36 million Medvejie Creek Hatchery stock fall chum salmon eggs.

In 2011, the permit was amended to increase chum salmon capacity from 60 million to 70 million eggs. The increase was intended to provide more chum salmon to the common property fisheries and ensure enough broodstock were available at the hatchery. The NSRPT unanimously recommended approval of the PAR, and there were no genetic or pathology concerns from ADF&G staff.[34] In the PAR application, NSRAA indicated that their fall chum salmon capacity at Medvejie Creek Hatchery was 43 million eggs, and that they were requesting an increase to 53 million eggs.

However, the actual permitted capacity for the fall-run Medvejie Creek Hatchery stock at the time was only 36 million eggs. In their PAR application, NSRAA based the effects of the PAR on an increase of 10 million eggs (i.e., the additional 200,000 to 300,000 adults produced,[35] benefit to cost ratio,[36] broodstock management,[37] and effect on wild stocks or existing fisheries[38]), and not on the 53 million egg capacity requested. Thus, reviewers were looking at the forecast effects of releases and returns from an additional 10 million eggs, and not an additional 17 million eggs, which is the number of eggs that the permitted capacity would have increased when levels were raised from 36 million eggs to 53 million eggs.

A review of FTPs current at the time shows that Medvejie Creek Hatchery was permitted to take more eggs and release more fry under FTPs than under the hatchery permit. In 1992, NSRAA was permitted to take up to 33 million eggs from Medvejie Creek Hatchery fall-run returns for release of resultant fry at Deep Inlet (FTP 92J-1016). In 2005, Medvejie Creek Hatchery was permitted to release up to 10 million fry from the hatchery under FTP 05J-1005, but this FTP did not indicate an associated egg take for the fry release. If the egg take was implied, than that would account for a total 43 million fall-run chum salmon. FTP 09J-1021 permitted transfer of 24 million green egg equivalent (i.e., 23 million eyed eggs) of summer-run Hidden Falls Hatchery stock to Medvejie Creek Hatchery for release at Deep Inlet. Thus, the sum of eggs permitted under FTPs totaled 77 million eggs (43 million + 24 million), and 70 million eggs under the hatchery permit. A review of the AMPs during this time period showed the permitted hatchery capacity totaling 70 million eggs in one part of the document, and 77 million eggs in other parts of the document.[39]

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[33] Letter from Bruce White, ADF&G PNP Hatchery Program, to Steve Reifenstuhl, NSRAA, dated June 23, 2010. Unpublished document obtained from Sam Rabung, ADF&G PNP Hatchery Coordinator, Juneau.

[34] Memo from Sam Rabung and Bruce White, ADF&G PNP Hatchery Program staff, to David Bedford, ADF&G Deputy Commissioner, dated April 21, 2011. Unpublished document obtained from Sam Rabung, ADF&G PNP Hatchery Coordinator, Juneau.

[35] PAR application submitted by NSRAA, dated 2/11/2011, page 1. Unpublished document obtained from Sam Rabung, ADF&G PNP Hatchery Coordinator, Juneau.

[36] Ibid, page 2.

[37] Ibid, page 3.

[38] Ibid, page 3.

[39] E.g., the 2011 Medvejie Creek Hatchery Annual Management Plan. Unpublished document obtained from Sam Rabung, ADF&G PNP Hatchery Coordinator, Juneau.

In 2012, a permit amendment was approved to increase the fall chum salmon egg capacity from 43 million to 53 million eggs and, in combination with the summer-run chum salmon permitted capacity of 24 million eggs, made for a total hatchery capacity of 77 million chum salmon eggs. This was to bring the hatchery permit, FTPs and AMP permitted egg take numbers into agreement.

Two permit alterations were permitted for single year actions resulting from egg shortages. In 2012, an additional 4 million Hidden Falls stock chum salmon eggs were permitted to be transferred to Medvejie Creek Hatchery to offset a shortage of eggs. In 2014, an additional 10 million Medvejie Creek Hatchery stock chum salmon eggs were allowed to be collected to offset a shortage of 10 million Hidden Falls stock chum salmon eggs for release at Deep Inlet.

The current chum salmon capacity at Medvejie Creek Hatchery stands at 77 million eggs comprised of 24 million summer-run Hidden Falls Hatchery stock green egg equivalents[40] and 53 million fall-run Medvejie Creek Hatchery stock green eggs. Of the 53 million Medvejie Creek Hatchery stock egg number, up to 20 million of the eggs may be incubated and the resulting fry released at Medvejie Creek Hatchery. The balance of production is for release at Deep Inlet.

Fry releases from Medvejie Creek Hatchery steadily increased from 3 million in 1982 to over 73 million in 2012. Since 1990, returns ranged from 5.1 million adult fish from the release of 41.6 million fry from brood year 1996 to less than 300,000 adult fish from the release of nearly 66 million fry in brood year 2007 (Appendix C).

COHO SALMON PROGRAM

Lake and Stream Stocking Projects

The coho salmon program at Medvejie Creek Hatchery initially consisted of egg incubation at Medvejie Creek Hatchery and offsite freshwater fry releases in the area of Sea Lion Cove in northwest Kruzof Island near Sitka and the Patterson Bay area on southeast Baranof Island in lower Chatham Strait (Appendix F).

Source stocks for the Sea Lion Cove area releases included 2 streams in Sea Lion Cove. The Patterson Bay area stock sources included Nakvassin Creek (which drains into nearby Port Herbert), Sashin Creek (which drains into nearby Port Walter), and 2 streams in the Patterson Bay area. An additional broodstock site listed, Luduik Lake, was not found on a chart of the area and thought by the author to be a local name for a lake on southeast Baranof Island.

Other release sites were added by permit amendment, including Elfendal (FTP 82J-1024) Lower Rostislaf (FTP 83J-1029), Deer and Upper Deer (FTP 84J-1074), Finger (FTP 85J-1020), Blanchard (FTP 85J-1021), Brentwood and Upper Brentwood (FTP 85J-1022), Parry and Fiddle (FTP 85J-1019), Surprise (FTP 85J-1018), Cliff (FTP 88J-1067), and Lord's Pocket lakes (FTP 88J-1066), as well as Deep Inlet (FTP 89J-1109), and Medvejie Creek Hatchery (Appendix D).[41] The lakes were stocked with fry from eggs collected from coho salmon broodstock from nearby

[40] *Green egg equivalents* means the number of green eggs taken that subsequently develop into eyed-eggs which are transferred to Medvejie Creek Hatchery.

[41] Osprey Lake was also stocked with coho salmon in 1985 under a scientific/educational permit to study and any risk a native cestode parasite posed to lake stocking programs, according to Alaska fish transport permit FTP 85J-1029.). Juvenile coho salmon were held in net pens and not released to the lake. Unpublished document acquired from Sam Rabung, ADF&G PNP Hatchery Coordinator, ADF&G Headquarters, Juneau.

systems from 1982 to 1988 (Appendix E). From 1990 to 1992, coho salmon eggs were collected annually from Game Creek, near Hoonah, and the resultant fry were released back to Suntaheen Creek above a fish ladder as part of a cooperative project with ADF&G and the U.S. Forest Service.[42]

Deer Lake

Deer Lake is the only lake stocking project that continues to date (Appendix F). Deer Lake is at 400 feet elevation on the southeastern shore of Baranof Island. A 330-foot falls at the outlet is a barrier to anadromous species.[43] A resident rainbow trout population was introduced to the lake in 1967.[44] Sashin Creek and Deep Cove stock coho salmon fry were stocked into Banner Lake in 1982 and 1983. In 1984, eggs from returns to Banner Lake were collected, incubated at Medvejie Creek Hatchery, and a portion of the resulting fry stocked into Deer Lake in 1985 (FTP 84J-1074). Deer Lake was not stocked in 1986. In 1987, Deer Lake was stocked with fry hatched from eggs collected in 1986 from Sashin Creek stock returns to Lower Rostislaf Lake (FTP 86J-1065). In 1988, the lake was stocked with fry hatched from eggs from returns from Sashin Creek stock returns to Deer Lake (FTP 88J-1068). In 1989, the lake was stocked with fry from eggs collected from Deep Cove stock returns to the Blanchard Lake releases site (FTP 88J-1023). Beginning in 1990, coho salmon returns to Hidden Falls were sufficient to meet brood stock needs. Deep Cove stock is used every third year and Sashin Creek stock in the other years.

When Deer Lake was stocked with coho salmon fry, this new prey source was a boon to the resident rainbow trout population, and survival to smolt size and emigration was disappointing in some years. In 2005, NSRAA developed a new rearing strategy using in-lake net pens for fry rearing to reduce predation. Fry were reared on fish food until late September and October and released into the lake. About 20% of the fry subsequently migrated over the falls within days of release and died. In 2006, fry were held and fed in the net pens until mid-November, and less than 1% migrated over the falls at release. NSRAA believed that release at lower temperatures in November lowered the fry's dietary needs and their motivation to seek overwinter habitat outside the lake. Freshets and high water events, which may stimulate fish to move out of the lake, are also rarer in November.[45] In 2008, NSRAA developed a system to overwinter fry in net pens.[46] Advancements in net pen rearing in the lake improved survivals and resulted in record smolt production in 2012 and 2013.[47]

Through 2004, NSRAA staff collected eggs at Hidden Falls Hatchery and incubated eggs to the eyed stage there, transported eyed eggs to Medvejie Creek 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 procedure was approved in the Medvejie AMP. An appropriate FTP for this change in operations was belatedly

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[42] FTPs for the Game Creek program were not found but certainly exist according to Ron Josephson, ADF&G Project Leader at the time, personal communication.

[43] From http://www.nsraa.org/?page_id=393 (accessed 05/20/14).

[44] Fish Transport Permit FTP 88J-1068. Unpublished document obtained from Sam Rabung, ADF&G PNP Hatchery Coordinator, Juneau.

[45] From http://www.nsraa.org/?page_id=393 (accessed 05/20/14).

[46] 2008 Medvejie Creek Hatchery annual report. Unpublished document acquired from Sam Rabung, ADF&G PNP Hatchery Coordinator, ADF&G Headquarters, Juneau.

[47] From http://www.nsraa.org/?page_id=393 (accessed 05/20/14).

issued in 2011 (FTP 11J-1022) to replace the FTP for the original transfer sequence through Medvejie Creek Hatchery (FTP 94J-1027). The Hidden Falls Hatchery permit was belatedly amended in 2014 to reflect the change in operations.

Returns to the Deer Lake project have totaled about 2.3 million fish to date, for an average of return about 100,000 fish per year (Appendix F).

Suntaheen Creek Fish Pass

In 1989, a permit amendment allowed NSRAA to incubate up to 100,000 eggs from coho salmon from Game Creek on Chichagof Island for incubation at Medvejie Creek Hatchery and subsequent fry release at Suntaheen Creek above barrier falls where the U.S. Forest Service planned to construct a fish ladder. Holland (1990) reported that egg collections in 1989 in the section of the river below the fish ladder were unsuccessful due to a low escapement. Wild fry were captured in the lower river, and tagged and released above the fish ladder in 1990 (ADF&G Mark, Age and Tag Laboratory database, accessed 06/24/2014).[48]

Sitka Sound Smolt Release Projects

In 1988, NSRAA submitted a PAR to implement a coho salmon smolt release program in Sitka Sound. Due to concerns of ongoing research occurring on coho salmon in nearby Salmon Lake, NSRAA proposed to release only enough smolts from the hatchery to provide broodstock, and the remainder would be released at Deep Inlet. In their comments to the PAR, the ADF&G area sport and commercial fishery managers both recommended that Salmon Lake stock coho salmon not be used as broodstock to minimize straying to Salmon Lake. They recommended the Indian River stock available from Sheldon Jackson Hatchery because it returned several weeks later than the Salmon Lake stock and would provide temporal separation and limit mixing and straying problems.[49] The permit amendment was approved, and allowed NSRAA to begin the broodstock program with Indian River stock fall-run coho salmon from Sheldon Jackson Hatchery. Both Sheldon Jackson Hatchery and Indian River are located near Medvejie Creek Hatchery in Sitka Sound. Eggs were collected at Sheldon Jackson Hatchery from 1988 to 1990 (FTP 88J-1109), after which eggs were collected from returns to the Medvejie Creek Hatchery release site and from Sheldon Jackson Hatchery when necessary.[50] The permit amendment allowed for incubation of up to 120,000 coho salmon eggs, but with a limited release of 4,500 coho salmon smolt from the hatchery. The remaining smolt would be released at Deep Inlet. Coho smolts could not be released before June 1 to minimize predation on wild pink and chum salmon fry.[51]

When NSRAA submitted an application in 1988 for the FTP to release smolt from Medvejie Creek Hatchery as provided for in the approved permit amendment however, the ADF&G Division of Sport Fish regional supervisor objected to the release due to potential impact to the

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[48] FTP not found for Suntaheen fry movement. ADF&G Mark, Age and Tag Laboratory database (accessed 06/24/2014).

[49] Comments on 1998 PAR application by Bob DeJong, ADF&G, Division of Commercial Fisheries Area Biologist, dated March 1, 1988, and Art Schmidt, ADF&G, Division of Sport Fish Area Biologist, dated February 23, 1988. Unpublished document acquired from Sam Rabung, ADF&G PNP Hatchery Coordinator, ADF&G Headquarters, Juneau.

[50] 1988 and later Medvejie Creek Hatchery annual reports. Unpublished documents acquired from Sam Rabung, ADF&G PNP Hatchery Coordinator, ADF&G Headquarters, Juneau.

[51] Comments on 1998 PAR application by Bob DeJong, ADF&G Division of Commercial Fisheries Area Biologist, dated March 1, 1988. Unpublished document acquired from Sam Rabung, ADF&G PNP Hatchery Coordinator, ADF&G Headquarters, Juneau.

Salmon Lake coho salmon population and NSRAA withdrew the application.[52] An FTP for release at Deep Inlet was approved (FTP 88J-1095). An FTP was later issued in 1991 for release of 4,500 smolts from Medvejie Creek Hatchery (FTP 91J-1029). The ADF&G geneticist approved the release, and the pathologist listed required steps for disease monitoring and control. ADF&G Divisions of Sport Fish and Commercial Fisheries, along with FRED staff, agreed to the FTP without comment.[53] Beginning in 1993, Indian River stock coho smolts were released from Shamrock Bay. From 1992 to 1997, Wrinkleneck Creek (FTPs 92J-1035, 92J-1039, 92J-1040), a tributary of Swan Lake in Sitka, was stocked with smolt as part of a Sitka High School project.[54] In 2001, Sheldon Jackson Hatchery was added as a release site.

A permit alteration approved in 2002 allowed NSRAA to switch brood stocks from Indian River stock to Plotnikof Lake stock in an attempt to develop a summer-run broodstock program. Use of the summer-run stock was intended to allow increased coho salmon production, which had been limited due to management concerns for potential overharvest of Salmon Lake stocks by terminal fisheries targeting Medvejie Creek Hatchery returns. It was hoped the summer-run stock would mitigate conflicts with wild stock interceptions and show better marine survival.[55] Stipulations for the project included operating a weir at Salmon Lake Creek for at least the first 4 years of returns and collecting any hatchery strays at the weir so they could not spawn.[56] If the program was successful, NSRAA intended to eliminate the fall-run Indian River stock program.[57]

NSRAA staff collected eggs from Plotnikof Lake coho salmon in 2002 and from 2004 to 2006. In 2007 and 2008, eggs were collected from both Plotnikof Lake stock returns to Medvejie Creek Hatchery and from Plotnikof Lake (FTP 02J-1012). After 6 years, several issues developed. There was more overlap in stock return timing with Salmon Lake returns than expected, and marine survival was lower than expected. Size of returning fish was also small. As a result, NSRAA ended the Plotnikof Lake program in 2008 and switched to Salmon Lake stock coho salmon in 2009.[58]

The ADF&G geneticist indicated that Salmon Lake stock was a local population and its use was consistent with the *Genetic Policy*. He did state a concern that hatchery releases could stray to Salmon Lake and influence the wild population.[59] All releases from the Medvejie Creek Hatchery release site were coded-wire-tagged such that releases could be comprehensively

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[52] Comments from Gary Sanders, ADF&G Division of Sport Fish Regional Research Supervisor, to the FTP 88J-1095 application for coho salmon release at Medvejie Creek Hatchery. Unpublished document acquired from Sam Rabung, ADF&G PNP Hatchery Coordinator, ADF&G Headquarters, Juneau.

[53] Comments to application for FTP 91J-1029. Unpublished document acquired from Sam Rabung, ADF&G PNP Hatchery Coordinator, ADF&G Headquarters, Juneau.

[54] 1992 Medvejie Creek Hatchery annual report. Unpublished document acquired from Sam Rabung, ADF&G PNP Hatchery Coordinator, ADF&G Headquarters, Juneau.

[55] FTP 02J-1012 for the Plotnikof Lake broodstock project. Unpublished document obtained from Sam Rabung, ADF&G PNP Hatchery Coordinator, Juneau.

[56] Notice of Permit Alteration for Medvejie Creek Hatchery dated August 21, 2002. Unpublished document obtained from Sam Rabung, ADF&G PNP Hatchery Coordinator, Juneau.

[57] Permit Alteration Request for Medvejie Creek Hatchery dated February 5, 2002. Unpublished document obtained from Sam Rabung, ADF&G PNP Hatchery Coordinator, Juneau.

[58] Permit alteration request for the Sawmill Cove Hatchery permit submitted by NSRAA dated January 26, 2009. Unpublished document obtained from Sam Rabung, ADF&G PNP Hatchery Coordinator, Juneau.

[59] Comments by William Grant, ADF&G Geneticist, on application for FTP 09J-1018 for the Salmon Lake broodstock project. Unpublished document obtained from Sam Rabung, ADF&G PNP Hatchery Coordinator, Juneau.

identified if sampled in fisheries and straying assessments. Stipulations for the project included implementing a wild presmolt tagging project for Salmon Lake coho salmon from 2013 to 2015 and developing a sustainable coho salmon escapement goal for the Salmon Lake system.[60]

In 2009, NSRAA staff began collecting brood stock from Salmon Lake for incubation, rearing, and release at Medvejie Creek Hatchery (FTP 09J-1018). Eggs were also collected for incubation at Medvejie Creek Hatchery and release at Deep Inlet (FTP 09J-1019).

As ADF&G management staff accumulated information about returns to the release sites, releases from the hatchery were allowed to increase. As mentioned earlier, the 1988 permit amendment allowed release of 4,500 coho smolt from the hatchery. Permit amendments were approved for further increases in 1994 (to 5,000 smolt), 1997 (to 7,000 smolt), 2000 (to 10,000 smolt) and in 2005, the permit was amended to double the release number from 10,000 to 20,000 smolts to increase the number of returning broodstock available and to improve genetic mixing. The Northern Southeast Regional Planning Team unanimously recommended approval of the 2005 PAR to the ADF&G commissioner, and the ADF&G sport fish regional supervisor praised NSRAA for previous work done studying potential straying of Medvejie Creek Hatchery releases into Salmon Lake.[61]

In 2007, NSRAA was issued a hatchery permit for Sawmill Creek Hatchery, located in Sitka Sound about 5 miles from Medvejie Creek Hatchery. The facility serves as a satellite of Medvejie Creek Hatchery for coho salmon production. Eggs are taken at Medvejie Creek Hatchery, incubated and reared at the Sawmill Creek Hatchery, and released at Deep Inlet. Eggs are also taken at the Medvejie Creek Hatchery for rearing and release at Medvejie Creek Hatchery (Bear Cove). Broodstock for both facilities are collected from returns to Bear Cove. The Sawmill Creek Hatchery BMP allows up to 300,000 smolt to be released from the Bear Cove release site, but with a limited release of 50,000 during the initial years so that straying assessments could be done at Salmon Lake. From 2009 to 2013, eggs were taken and incubated for the Sawmill Creek Hatchery program at Medvejie Creek Hatchery.[62] Brood year 2010 returns to Bear Cove were the best to date, with over 5,000 fish returning in 2013 (Appendix E).

Deep Inlet Release Site

Deep Inlet was selected as a release site because the area provided good separation between hatchery and wild stocks and provided a workable fishing area for large scale harvesting. A 1988 hatchery permit amendment allowed incubation of up to 120,000 Sheldon Jackson Hatchery (Indian River stock) coho salmon eggs, with up to 4,500 of the resulting smolt released from Medvejie Creek Hatchery to provide for a return for broodstock. The remainder of the smolt would be released at Deep Inlet.

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[60] FTP 09J-1018 for the Salmon Lake broodstock project. Unpublished document obtained from Sam Rabung, ADF&G PNP Hatchery Coordinator, Juneau.

[61] Memorandum from Flip Pryor, ADF&G Fishery Biologist, to McKie Campbell, ADF&G Commissioner, regarding recommendations from the Joint Northern/Southern RPT spring 2005 meeting dated May 2, 2005. Unpublished document obtained from Sam Rabung, ADF&G PNP Hatchery Coordinator, Juneau.

[62] In 2009, FTP 09J-1018 was issued to Sawmill Creek Hatchery to release 50,000 coho salmon smolts from Bear Cove until 2013. FTP 12J-1009 replaced FTP 09J-1018, but was issued to Medvejie Creek Hatchery under the Medvejie Creek Hatchery for collection and release of resultant progeny into Bear Cove of up to 410,000 coho salmon eggs. However, the FTP for the release should be under the Sawmill Creek Hatchery since Medvejie Creek Hatchery's permit only allows for a release of up to 20,000 smolts from Bear Cove.

A 1992 PAR requesting an increase from 120,000 to 400,000 smolt for release at Deep Inlet raised concerns about its potential effect on local wild stocks and conflicts between user groups. Shamrock Bay was selected as a better release site and that program is described below.

Smolt releases from Deep Inlet resumed in 2004 with the release of Plotnikof summer-run coho salmon stock. Releases continued from 2006 to 2009 with Plotnikof stock, and in 2011 and 2012 with Salmon Lake stock. Brood year 2010 returns were the best to date, with over 12,000 adults returning in 2013 (Appendix E).

Shamrock Bay Release Site

A PAR in 1992 requested an increase from 120,000 to 400,000 smolt for release at Deep Inlet. The Northern Southeast Regional Planning Team, ADF&G, and some NSRAA staff were concerned about the increase and its potential effect on local wild stocks and conflicts between user groups. Alternative release sites were discussed among ADF&G and NSRAA staff, and an agreement was reached that Shamrock Bay, located in West Crawfish Inlet south of Sitka, would be a better release site. Benefits of Shamrock Bay over Deep Inlet included reduced conflicts with existing fisheries, less risk to local wild stocks from overharvest and genetic dilution, and a large, deep terminal harvest area.[63] The permit was subsequently amended to increase egg capacity from 120,000 eggs to 400,000 eggs for release from Shamrock Bay.

No agreement could be reached on the broodstock for the Shamrock Bay release.[64] NSRAA wanted to utilize the Indian River broodstock in use at the time at Sheldon Jackson and Medvejie hatcheries for egg collection efficiency. ADF&G staff favored using a stock nearer the release site.

The ADF&G area sport fish manager supported increased releases from Shamrock Bay rather than Deep Inlet because of high straying of Deep Inlet releases back to the hatchery—which he thought might also indicate straying to Salmon Lake, the source of the largest coho spawning population in the area. He did not support the use of Indian Lake stock for release at Shamrock Bay because he believed straying would occur to "all native systems between Shamrock Bay and Medvejie Creek Hatchery." He recommended using a broodstock from a wild stock closer to Shamrock Bay, such as Redoubt Lake, which had an earlier timing and should provide a higher harvest rate.[65]

After receiving these comments, the ADF&G geneticist recommended against any remote releases at Shamrock Bay based on the report of straying of 950 Deep Inlet-released coho salmon back to Medvejie Creek Hatchery. He added that the issue of remote releases in general should be re-examined to determine if the procedure can be done in a way so as not to affect the structure and uniqueness of the adjacent wild stocks.[66]

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[63] Memorandum from Doug Mecum and Bob DeJong, ADF&G Division of Commercial Fisheries, to Steve McGee, ADF&G Fisheries Biologist, dated March 2, 1992. Unpublished document obtained from Sam Rabung, ADF&G PNP Hatchery Coordinator, Juneau.

[64] Ibid.

[65] Comments by Art Schmidt, ADF&G Division of Sport Fish Area Manager, dated 2/25/1992, on 1992 PAR application for the Medvejie Creek Hatchery permit. Unpublished document obtained from Sam Rabung, ADF&G PNP Hatchery Coordinator, Juneau.

[66] Comments by Jim Seeb, ADF&G Geneticist, dated 2/25/1992, on 1992 PAR application for the Medvejie Creek Hatchery permit. Unpublished document obtained from Sam Rabung, ADF&G PNP Hatchery Coordinator, Juneau.

ADF&G area managers indicated that Shamrock Bay offered a large terminal harvest area where good quality fish could be harvested with minimal wild stock and gear allocation concerns. Managers also indicated that the release number should not be increased until it was determined if straying was a problem.[67]

Associated with the permit amendment were a straying evaluation study and a broodstock selection plan for Shamrock Bay releases. NSRAA staff met with ADF&G staff and discussed the components of a study plan to evaluate straying of the Shamrock Bay release. Five area streams would be surveyed, with sampling in the saltwater off the mouth of each stream in late September and instream surveys the first and second weeks of October. Surveys were to occur for the 1993–1995 seasons.[68] NSRAA staff indicated that observations of offsite releases of hatchery coho and chum salmon elsewhere in the region suggested that most straying observed was straying back to the hatchery or water supply to the hatchery of incubation.[69]

Straying surveys were conducted over the 3-year period. Most of the strays observed were in a stream close to the release site location. Other strays observed were at Medvejie Creek Hatchery. The study report indicated a stray rate of less than 1% of the total return.[70] However, the regional ADF&G coho salmon stock biologist was concerned that all returns were not accounted for because the reported harvest rates of Shamrock Bay returns were much higher than those seen on other hatchery and wild stocks in the region, possibly indicating that all returning fish were not accounted for, and that perhaps these unaccounted-for fish strayed to systems not surveyed in the study.[71] In addition, the ADF&G area sport fish manager indicated that the stream surveys were carried out too late in the year to have observed peak numbers of coho salmon. Stream surveys were conducted in late October and early November, rather than in the first 2 weeks of October stated in the study proposal.[72]

The Northern Southeast Regional Planning Team took up consideration of the study at its April 1996 meeting. ADF&G staff made a motion for the RPT to recommend that the straying study be continued for another year to understand the distribution and utilization of Shamrock Bay releases. An ADF&G biologist indicated his concern for full utilization of returns to Shamrock Bay because of 3 years of vastly different estimated harvest rates and an uncertainty with regard to straying. NSRAA staff disagreed, stating that ADF&G did not have a legitimate concern and

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[67] Memorandum from Bob DeJong and Art Schmidt, ADF&G Area Management Biologists, to Steve McGee, ADF&G Fisheries Biologist, dated January 14, 1993. Unpublished document obtained from Sam Rabung, ADF&G PNP Hatchery Coordinator, Juneau.

[68] Memorandum from Bruce Bachen, NSRAA, to Jim Seeb, ADF&G Fisheries Pathologist, dated April 16, 1992. Unpublished document obtained from Sam Rabung, ADF&G PNP Hatchery Coordinator, Juneau.

[69] Memorandum from Bruce Bachen, NSRAA, to Steve McGee, ADF&G FRED Division, dated March 6, 1992. Unpublished document obtained from Sam Rabung, ADF&G PNP Hatchery Coordinator, Juneau.

[70] NSRAA Fish Resource Permit Report No. SF-95-023. Shamrock Bay Coho Project. January, 1996. Unpublished document obtained from Sam Rabung, ADF&G PNP Hatchery Coordinator, Juneau.

[71] Email author's name unreadable, but believed to be Leon Shaul, ADF&G Regional Coho Salmon Stock Biologist, to Bill Davidson, ADF&G Division of Commercial Fisheries Area Management Biologist, dated March 20, 1996. Unpublished document obtained from Sam Rabung, ADF&G PNP Hatchery Coordinator, Juneau.

[72] Email from Art Schmidt, ADF&G Division of Sport Fish Sitka Area Biologist, to Carol Denton, ADF&G Biologist, dated March 7, 1996. Unpublished document obtained from Sam Rabung, ADF&G PNP Hatchery Coordinator, Juneau.

that NSRAA had fulfilled its commitment at Shamrock Bay by the study they had completed.[73] The motion failed and the straying study was not continued.

NSRAA released coho salmon from Shamrock Bay from 1993 through 2005, except for 1999 (FTP 92J-1063). The Shamrock Bay release site was discontinued after 2005 due to unsatisfactory returns and relatively high cost of the program (Appendix E).[74]

CHINOOK SALMON PROGRAM

During the initial years of the Chinook salmon program (circa 1982), NSRAA tried to find a workable stock of Chinook salmon to rear in the hatchery. An FTP application in 1982 for using Situk River stock was rejected because of conflicts with an ADF&G project already underway there, and because of proposed fish holding techniques that ADF&G staff believed would result in excessive mortality.[75] A 1982 FTP was issued for egg takes from Farragut River Chinook salmon, with similar reservations by ADF&G staff for fish holding techniques leading to excessive mortality, as well as a probable small parent stock size that would not provide many surplus fish for broodstock (Appendix B).[76]

NSRAA also applied in 1982 for an FTP to use Unuk River stock from Little Port Walter research center. The FTP was not approved amid ADF&G staff concerns that the Unuk River, which flows into Behm Canal near Ketchikan, was too distant from the Medvejie Creek Hatchery location.[77] NSRAA appealed the denial of the Unuk River stock FTP to the ADF&G commissioner, and an agreement was reached to use Andrews Creek stock (a tributary to the Stikine River), which would be obtained from Crystal Lake Hatchery.[78]

In 1983, NSRAA staff attempted to obtain eggs from Farragut River broodstock but were unsuccessful. ADF&G provided NSRAA with about 50,000 Andrews Creek stock eggs in 1982 and about 40,000 eggs in 1983 (FTP 82J-1066[79]) to begin the hatchery's Chinook salmon program. In 1984, another 164,000 Andrews Creek stock eggs were transferred to Medvejie Creek Hatchery from Crystal Lake Hatchery (FTP 84J-1063).

A major expansion of Chinook salmon production facilities in 1988 allowed for a substantial increase in smolt releases from the facility, and the permit was amended in 1987 to increase Chinook salmon capacity from 300,000 eggs to 2 million eggs. ADF&G staff commented that the Sitka Chinook salmon sport catch was among the lowest in Southeast Alaska at the time. In

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[73] April 1996 Northern Southeast Regional Planning Team minutes. Unpublished document obtained from Sam Rabung, ADF&G PNP Hatchery Coordinator, Juneau.

[74] PNP Permit Alteration Request submitted by NSRAA dated September 29, 2004. Unpublished document obtained from Sam Rabung, ADF&G PNP Hatchery Coordinator, Juneau.

[75] Comments on application for FTP 82J-1016. Unpublished document acquired from Sam Rabung, ADF&G PNP Hatchery Coordinator, ADF&G Headquarters, Juneau.

[76] Comments on application for FTP 82J-1022. Unpublished document acquired from Sam Rabung, ADF&G PNP Hatchery Coordinator, ADF&G Headquarters, Juneau.

[77] Comments on application for FTP 82J-1025. Unpublished document acquired from Sam Rabung, ADF&G PNP Hatchery Coordinator, ADF&G Headquarters, Juneau.

[78] Comments on application for FTP 82J-1066. Unpublished document acquired from Sam Rabung, ADF&G PNP Hatchery Coordinator, ADF&G Headquarters, Juneau.

[79] Although FTP 82J-1066 does not indicate that eggs were to be first incubated at Crystal Lake Hatchery before transfer to Medvejie Creek Hatchery, and accompanying letter with the FTP confirms that the eggs are Andrews Creek stock from Crystal Lake Hatchery. Unpublished document acquired from Sam Rabung, ADF&G PNP Hatchery Coordinator, ADF&G Headquarters, Juneau.

addition, although trollers would benefit from increased production, harvest rates would likely be lower than rates on fish returning to hatcheries in the inside waters, resulting in large surplus returns to the hatchery area. This would result in harvest of the returns for cost recovery or in a common property harvest by the purse seine fleet.[80]

Initially, all releases were from the hatchery using Andrew Creek stock. In 1989, NSRAA began a switch from Andrew Creek stock to Chickamin River stock in an effort to increase marine survival of releases and harvest rates on returning adults (FTP 88J-1083).[81] Eggs were obtained from Whitman Lake Hatchery from 1989 to 1990. By 1992, the entire release was of Chickamin River stock.[82] However, in 1993, NSRAA decided to switch back to Andrew Creek stock.[83] Apparently, the low availability of Chickamin River stock eggs would have created a loss of Chinook production for a number of years. Continuation of Andrew Creek stock would have been necessary to maintain production levels in the interim, with the complication of maintaining separate genetic lines. During the intervening return years when both stocks returned to Medvejie Creek Hatchery, Andrew Creek stock eggs were obtained from other facilities, including Hidden Falls (FTP 94J-1009), Macaulay (FTP 94J-1029) and Crystal Lake hatcheries (FTP 84J-1063).[84] In 1997, NSRAA resumed taking eggs from the Andrew Creek stock broodstock returning to Medvejie Creek Hatchery (FTP 91J-1060).[85]

Also in 1997, the hatchery permit was amended to increase the Chinook salmon egg capacity from 2 million eggs to 3.2 million eggs. NSRAA indicated the increase was to maintain the spring troll fisheries, where regulations dictated that fishing time was based on the percentage of Alaska hatchery fish in the catch. As stocks from Canada and the U.S. west coast harvested during the spring rebounded, NSRAA expected that the Alaska hatchery portion of the catch would decline unless production was increased. NSRAA also indicated that additional Chinook salmon production would help resolve future allocation problems. ADF&G staff had no objection to the PAR.

At the time, NSRAA had been limited to rearing 1 million Chinook salmon smolts at the hatchery due to their water supply. In their PAR, NSRAA indicated that they could bypass the freshwater limitation by rearing fry in net pens in Green Lake until the fish were saltwater tolerant, at which time the fish would be moved to the saltwater net pens in Bear Cove until release. The first phase of the project was to gather data on Green Lake in 1997 (FTP 97J-1033).

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[80] Memorandum from Bob DeJong and Art Schmidt, ADF&G, to Steve McGee, ADF&G, dated March 13, 1987. Unpublished document acquired from Sam Rabung, ADF&G PNP Hatchery Coordinator, ADF&G Headquarters, Juneau.

[81] 1991 Medvejie Creek Hatchery Annual Management Plan. Unpublished document acquired from Sam Rabung, ADF&G PNP Hatchery Coordinator, ADF&G Headquarters, Juneau.

[82] 1991 Medvejie Creek Hatchery Annual Report. Unpublished document acquired from Sam Rabung, ADF&G PNP Hatchery Coordinator, ADF&G Headquarters, Juneau.

[83] 1993 Medvejie Creek Hatchery Annual Report. Unpublished document acquired from Sam Rabung, ADF&G PNP Hatchery Coordinator, ADF&G Headquarters, Juneau.

[84] 1994 Medvejie Creek Hatchery Annual Report. Unpublished document acquired from Sam Rabung, ADF&G PNP Hatchery Coordinator, ADF&G Headquarters, Juneau.

[85] 1997 Medvejie Creek Hatchery Annual Report. Unpublished document acquired from Sam Rabung, ADF&G PNP Hatchery Coordinator, ADF&G Headquarters, Juneau.

In 1998, Chinook salmon fry would be reared in Green Lake in net pens to evaluate growth and performance. If successful, the Green Lake program would be increased to full capacity.[86]

Fry were reared from May to October in Green Lake, then returned to saltwater net pens until release the following spring.[87] Fry reared in Green Lake consistently showed a higher survival rate than the same-aged fry reared in the hatchery. In 2001, NSRAA began experimenting with a zero-check Chinook salmon release. Juvenile Chinook salmon were reared from May to June at Green Lake, transferred to saltwater net pens at Medvejie Creek Hatchery for 3 more weeks of rearing, and released in early July.[88] Based on the success of the Green Lake rearing program, the Medvejie Creek Hatchery permit was amended in 2003 to increase Chinook salmon capacity from 3 million to 5.2 million eggs. ADF&G Division of Sport Fish staff, while not opposing the increase, did not believe the increase was necessary and would not consider funding it. Catch rates in the Sitka area were now the best in the state and exploitation rates of hatchery production at the time were not high. Division of Sport Fish staff was also concerned that juvenile Chinook salmon had escaped from the net pens in Green Lake, and that ADF&G would have to consider opening Green Lake to Chinook salmon sport fishing and ask NSRAA to assess the impact to the nonnative eastern brook trout population in the lake, which were initially stocked in 1932 (Brookover et al. 2000).[89]

The Green Lake zero-check program was discontinued in 2011 due to high cost per adult return, especially compared to the marine survival of the releases from the yearling Chinook salmon program at Green Lake, which continued.[90] In 2006, the hatchery permit was amended to add Deep Inlet as a release site for Green Lake production. ADF&G staff expressed concerns about managing fisheries for the increased number of Chinook salmon returns as well as possible straying into Salmon Lake.[91] The only FTP authorizing the release at Deep Inlet was FTP 09-1020 (issued in 2009), which authorized eggs collected from Andrew Creek stock Chinook salmon at Hidden Falls to be transferred for incubation and rearing at Medvejie Creek Hatchery for release at Bear Cove or Deep Inlet. No FTPs were found for the Deep Inlet releases from 2006 to 2008.

In 2012, the permit was amended to add Halibut Point Marine (FTP 12J-1002) and Sheldon Jackson Hatchery (FTP 12J-1001) as release sites. NSRAA made the request because Chinook salmon returning to Silver Bay comingled with high densities of jelly fish, which confounded troll harvest. The Halibut Point release site was along private property, and ADF&G warned the landowner that adult Chinook salmon returns to the site could have unintentional negative issues such as trespass, traffic problems and littering from roadside sport anglers targeting the returns.

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[86] PAR application submitted by NSRAA staff, March 27, 1997. Unpublished document acquired from Sam Rabung, ADF&G PNP Hatchery Coordinator, ADF&G Headquarters, Juneau.

[87] 1998 Medvejie Creek Hatchery Annual Management Plan. Unpublished document acquired from Sam Rabung, ADF&G PNP Hatchery Coordinator, ADF&G Headquarters, Juneau.

[88] 2001 Medvejie Creek Hatchery Annual Management Plan. Unpublished document acquired from Sam Rabung, ADF&G PNP Hatchery Coordinator, ADF&G Headquarters, Juneau.

[89] Email from Rocky Holmes, ADF&G, to Steve McGee, ADF&G, dated October 30, 2003 16:37:55. Unpublished document acquired from Sam Rabung, ADF&G PNP Hatchery Coordinator, ADF&G Headquarters, Juneau.

[90] 2011 Medvejie Creek Hatchery Annual Management Plan. Unpublished document acquired from Sam Rabung, ADF&G PNP Hatchery Coordinator, ADF&G Headquarters, Juneau.

[91] Memorandum from Flip Pryor, ADF&G Fishery Biologist, to Kevin Duffy, ADF&G Commissioner, dated December 20, 2004. Unpublished document acquired from Sam Rabung, ADF&G PNP Hatchery Coordinator, ADF&G Headquarters, Juneau.

Medvejie Creek Hatchery also provided Chinook salmon for a Haines area project. In 2007, the hatchery permit was amended to allow the incubation of 300,000 Chinook salmon eggs collected from Tahini River stock fish for release at Lutak Inlet. The amendment was part of a cooperative project with ADF&G Division of Sport Fish.

Medvejie Creek Hatchery chinook salmon returns exceeded 40,000 fish from brood years 1997–2000, 2003, 2006 and 2008 (Appendix F).

COMPREHENSIVE SALMON ENHANCEMENT PLAN

Phase I Comprehensive Salmon Plan

Comprehensive salmon plans (CSP) guide salmon enhancement for each region of the state. The plans set long-term salmon production goals, identify potential projects to achieve the goals, establish criteria for evaluating enhancement and rehabilitation projects, and may incorporate Alaska Board of Fisheries approved allocation and fisheries management plans with hatchery production plans.

Three phases of CSPs have been developed to date in Southeast Alaska. Phase I was issued in 1981, 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.[92] 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 3). 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, the Medvejie Creek Hatchery was still in the planning phase.[93] 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.

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

[92] 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 Hatchery Coordinator, Juneau.

[93] Ibid, page 40.

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 in Southeast Alaska for the Phase I CSP were to increase the salmon harvest by 134,000 Chinook, 1.4 million sockeye, 1.1 million coho, 14 million pink, and 4.6 million chum salmon through improved management and increased hatchery production. The overall goals were for harvests of 537,000 Chinook, 2.1 million sockeye, 2.65 million coho, 30.0 million pink salmon and 9.7 million chum salmon.

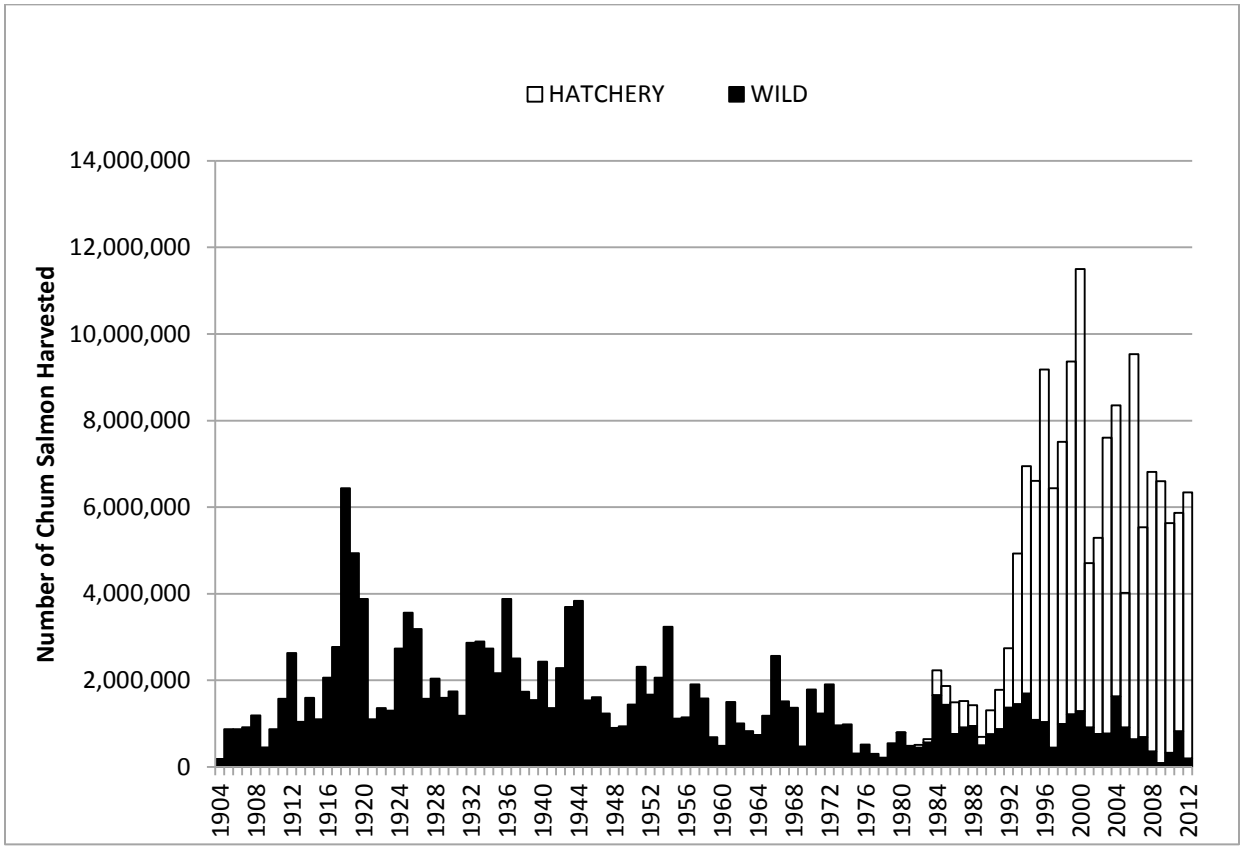

Figure 3.–Chum salmon commercial harvest, including hatchery cost recovery, in Northern Southeast Alaska, 1904–2012. Hatchery component includes contributions from all hatcheries.

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 data from Byerly et al. 1999.

Phase II Comprehensive Salmon Plan

For Phase II CSP planning, the RPTs for northern and southern Southeast Alaska developed separate plans. Medvejie Creek Hatchery is located in northern Southeast Alaska (NSE). The NSE CSP Phase II[94] 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

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

Strait/Chatham Strait Unit, Frederick Sound Unit, Stephens Passage Unit, and Lynn Canal Unit. Medvejie Creek Hatchery and most of its current and former release sites are located within the Outer Coastal Unit, and most Medvejie Creek Hatchery returns are harvested in this unit as well (Figure 4).

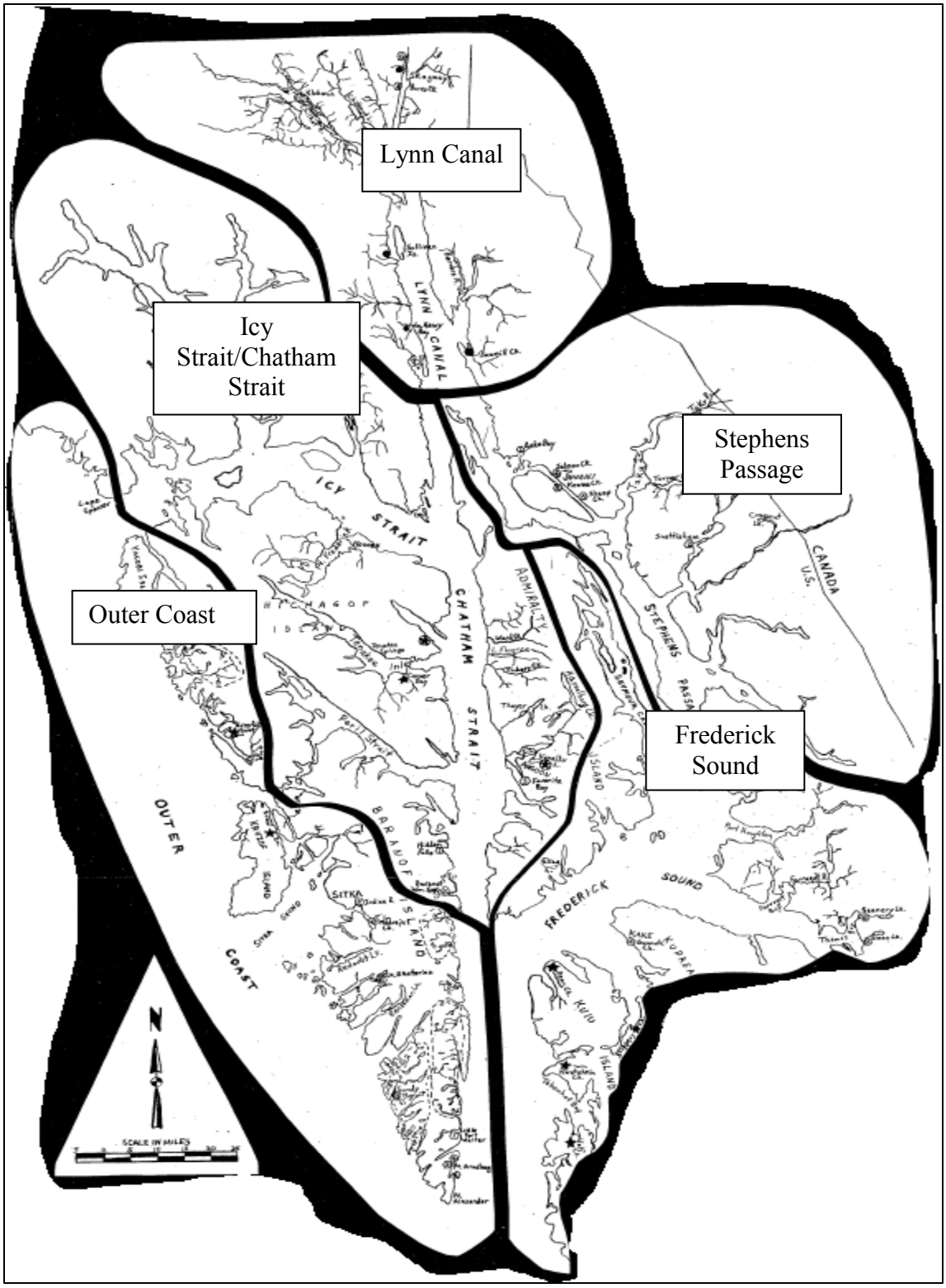

Figure 4.–Commercial fishing units for northern Southeast Alaska as described in the Phase II CSP.

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

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 Outer Coastal unit of 30,000 Chinook, 190,000 sockeye, 175,000 coho, 3,500,000 pink and 1.2 million 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 was 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." Medvejie Creek Hatchery was mentioned for Chinook salmon production in Sitka Sound.[95] The Medvejie Creek Hatchery coho salmon lake rearing program was mentioned, with projected total returns of lake releases of 100,000 by 1990. Chum salmon production at Medvejie Creek Hatchery at the time was projected to show returns of 172,000 fish.

At the time (1982), purse seine, hand troll, and power troll were the legal commercial gears in the Outer Coastal Unit. Troll gear targeted Chinook and coho salmon. Purse seine gear targeted pink and chum salmon. Hatchery production in the unit was expected to increase the northern Southeast Alaska chum salmon harvest by 24% and the coho salmon harvest by 49%.

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 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 sport fishery in Sitka would benefit from harvest of Medvejie Creek Hatchery-produced coho salmon, and later Chinook salmon.

In 1985, significant changes in hatchery production occurred in Southeast Alaska due to the Pacific Salmon Treaty (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.[96] 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.[97] Achieving the 100,000 Chinook salmon

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[95] Comprehensive Salmon Plan for, Phase II: Northern Southeast Alaska: Northern Southeast Regional Planning Team, revised January 1982. Unpublished document obtained from Sam Rabung, ADF&G PNP Hatchery Coordinator, Juneau.

[96] Comprehensive Salmon Plan for, Phase II: Northern Southeast Alaska: Northern Southeast Regional Planning Team, revised January 1986. Unpublished document obtained from Sam Rabung, ADF&G PNP Hatchery Coordinator, Juneau.

[97] 1988 Update, Comprehensive Salmon Plan, Phase II: Northern Southeast Alaska: Northern Southeast Alaska Regional Planning Team, Kevin C. Duffy, March 1989. Unpublished document obtained from Sam Rabung, ADF&G PNP Hatchery Coordinator, Juneau.

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.[98]

Beginning in 1986, the Phase II plan was updated annually through 1996. Expansion of the Medvejie Creek Hatchery Chinook salmon program was a high priority project in the 1986 update as part of the Chinook salmon enhancement under the PST.[99]

The 1987 update[100] indicated that Chinook salmon production was a priority for northern Southeast Alaska. The 1987 update indicated that the PST, signed in 1985, 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 salmon, 1.0 million chum salmon, and 20,000–40,000 sockeye salmon.

The 1988 update[101] added the following Medvejie Creek Hatchery programs as high priority projects: the Baranof Lake, Cliff Lake, and Lord's Pocket Lake coho salmon stocking projects; the Deep Inlet coho salmon smolt release project; and the Suntaheen Creek fish pass project.

The 1992 update[102] added the Deer Lake coho salmon project as a high priority project. The Shamrock Bay and Medvejie Creek Hatchery coho salmon smolt releases were added as high priority projects in the 1993 update.[103]

The Phase III CSP was issued in 2004 (Duckett et al. 2010). 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 production, and the low harvest rate of enhanced 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. The Phase III CSP also provides an extensive history of Southeast Alaska salmon fisheries and fishery enhancement.

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

[99] Northern Southeast Regional Planning Team (NSERPT). 1986. Comprehensive Salmon Plan, Phase II: Northern Southeast Alaska: Northern Southeast Regional Planning Team, revised January 1986. Unpublished document obtained from Sam Rabung, ADF&G PNP Hatchery Coordinator, Juneau.

[100] Northern Southeast Regional Planning Team (NSERPT). 1988. 1987 Update, Comprehensive Salmon Plan, Phase II: Northern SE Alaska: Northern Southeast Alaska Regional Planning Team. Unpublished document obtained from Sam Rabung, ADF&G PNP Hatchery Coordinator, Juneau.

[101] Northern Southeast Regional Planning Team (NSERPT). 1989. 1988 Update, Comprehensive Salmon Plan, Phase II: Northern SE Alaska: Northern Southeast Alaska Regional Planning Team. Unpublished document obtained from Sam Rabung, ADF&G PNP Hatchery Coordinator, Juneau.

[102] Northern Southeast Regional Planning Team (NSERPT). 1993. 1992 Update, Comprehensive Salmon Plan, Phase II: Northern SE Alaska: Northern Southeast Alaska Regional Planning Team. Unpublished document obtained from Sam Rabung, ADF&G PNP Hatchery Coordinator, Juneau.

[103] Northern Southeast Regional Planning Team (NSERPT). 1994. 1993 Update, Comprehensive Salmon Plan, Phase II: Northern SE Alaska: Northern Southeast Alaska Regional Planning Team. Unpublished document obtained from Sam Rabung, ADF&G PNP Hatchery Coordinator, Juneau.

Phase I and Phase II CSPs provided planning focused on increasing salmon production. The Phase III CSP planning was 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 impacts to 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 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 1–3. These templates identifying the key elements of state policies used to assess compliance of the Medvejie Creek Hatchery salmon program with each policy element in Tables 4, 5 and 8.

Table 1.–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 inter-regional 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 one 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 three hatchery stocks can be derived from a single donor stock. Offsite releases, such as for terminal harvest, should not be restricted by this policy if the release sites are selected so that they do not impact significant wild stocks, wild stock sanctuaries, or other hatchery stocks.
Minimum effective population size	The policy recommends a minimum effective population size of 400. It also recognizes that small population sizes may be unavoidable with Chinook and steelhead.
Genetics review of Fish Transport Permits (5 AAC 41.010–41.050)	
Review by geneticist	Each application is reviewed by the geneticist, who then makes a recommendation to either approve or deny the application. The geneticist may also add terms or conditions to the permit to protect wild or enhanced stocks.

Table 2.–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 3.–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 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 coho salmon broodstock for releases from Medvejie Creek Hatchery, Deep Inlet and Shamrock Bay originated from local stocks, including first the Sheldon Jackson Hatchery (Indian River) stock, then the Plotnikof River stock, and currently the Salmon Lake stock. Releases are marked by otolith thermal marking and coded wire tagging. Shamrock Bay systems were monitored, and Salmon Lake is currently monitored for hatchery strays. Stocking projects in hanging lakes used broodstock from systems near the stocking site.

The Chinook program used Andrew Creek and Chickamin River stocks for hatchery releases. Tahini River stock was used for releases near Haines, and is local to this program. Andrew Creek and Chickamin River stocks are distant from Sitka, but within the Southeast Alaska region as there are no native Chinook salmon stocks near Sitka.

Andrew Creek stock is used at more than th3ree hatchery facilities in Southeast Alaska. Although this exceeds the *Genetic Policy* guideline of use of one stock at no more than 3 hatcheries, there is has been little evidence of straying of Andrew Creek stock hatchery returns from any of the 4 production PNP facilities culturing the stock (Hidden Falls Hatchery, Macaulay Hatchery, Medvejie Creek Hatchery and Crystal Lake Hatchery), despite extensive annual monitoring of wild stock systems. Production of other stocks have been attempted (e.g., Tahini and King Salmon River stocks at Macaulay Salmon Hatchery) but returns from these releases were poor.

Both coho and Chinook salmon that are coded-wire-tagged also 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 hatchery racks, but not at most weirs on systems that monitor wild stock escapements; 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 Medvejie Creek, Salmon Lake Creek and Nakwasina River. Piston and Heinl (2012) conducted hatchery chum salmon straying studies in streams across Southeast Alaska from 2008 to 2010. Sampling results for Medvejie Creek Hatchery releases from Deep Inlet resulted in recoveries in 3 streams: 2 Deep Inlet releases out of a total sample to 96 fish in a West Crawfish Inlet stream in 2008, 1 Deep Inlet release out of a 28 fish sample at Ford Arm Lake in 2009, 1 Deep Inlet release out of a 94 fish sample at Camp Coogan Creek in 2009, and 8 Deep Inlet releases out of 183 fish sampled at Ford Arm Lake in 2010. No Medvejie Creek Hatchery chum salmon released directly from the hatchery were recovered in any samples.

Wild and hatchery stock chum salmon interaction studies are underway in Southeast Alaska to further document the degree to which hatchery-produced chum salmon are straying and interbreeding. The studies will assess the range of interannual variability in the straying rates and determine if there are effects on the fitness of wild populations (Prince William Sound Science Center 2013).

Table 4.–The Medvejie Creek Hatchery program and its consistency with elements of the ADF&G *Genetic Policy* (see Table 1).

I. Stock Transport	
Use of appropriate local stocks	Medvejie Creek Hatchery used local broodstock for all salmon projects.
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 the *Genetic Policy*.
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. Local systems were monitored for strays for chum and coho releases where straying was an issue.
Use of indigenous stocks in watersheds with significant wild stocks	Coho salmon projects used indigenous stocks when planting fry in systems with established runs.
Establishment of wild stock sanctuaries	No wild stock sanctuaries have been designated by the RPT.
Straying impacts	Straying studies were conducted for coho salmon at Salmon Lake and systems in Shamrock Bay during years of Shamrock Bay releases. Chum salmon straying studies occurred in 2008–2011 (Piston and Heinl 2012), with other studies are currently underway (Prince William Sound Science Center 2013).
III. Maintenance of genetic variance	
Maximum of three hatchery stocks from a single donor stock	The Andrews Creek Chinook salmon hatchery stock is also used at Medvejie Salmon Hatchery, Crystal Lake Hatchery, Hidden Falls Hatchery, and Macaulay Hatchery. A small number of Andrews Creek Chinook salmon hatchery stock were released at Sheldon Jackson Hatchery for educational purposes as well. The Medvejie Creek Hatchery chum and coho salmon stocks are used only at Medvejie Creek Hatchery.
Minimum effective population size	For brood year 2013, brood stock numbers used included over 39,000 chum, 928 coho, 754 Chinook, and 508 pink salmon.
Review by geneticist	The ADF&G geneticist reviewed the FTPs for the Medvejie Creek Hatchery programs.

Fish Health and Disease

FTPs for the Medvejie Creek Hatchery program were approved by the pathologist (Table 5). Pathology records showed no inconsistencies with fish health and disease policies. Appropriate salmon culture techniques were used and disease reporting and broodstock screening occurred as required (Appendix J).

The hatchery was been inspected regularly since at least 1982, and no major chronic health issues have been identified at the facility. ADF&G fish pathology staff indicated the facility is well run, with a proactive approach taken towards disease control.[104]

Table 5.–The Medvejie Creek Hatchery program and its consistency with elements of the Alaska policies on fish health and disease (see Table 2).

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 1982 to present.
Disease reporting	There are no chronic disease issues at the hatchery.
Pathology requirements for FTPs (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

Medvejie Creek Hatchery was built as a central incubation facility for offsite releases in large part because of fishery management concerns (Table 8). The hatchery site was workable for incubation and rearing, with sufficient water and land for the hatchery, and was located on the Sitka road system. Fishery managers were concerned that the marine area where hatchery returns would be harvested was along the migration corridor for local wild stocks, which could be overharvested in fisheries targeting hatchery returns.

As with most hatcheries in the state, production and harvest management at Medvejie Creek Hatchery evolved over time as more information about hatchery fish return fidelity, migration routes, timing of returns, and the status of local wild stocks was collected. As managers grew more confident with understanding these measures, releases at the hatchery were allowed to increase so that broodstock levels to the hatchery were sufficient in most years so as not to require costly and logistically difficult collection at the Deep Inlet release site.

The fishery targeting chum salmon returns to Deep Inlet has caused some controversy with local property owners. By 1995, chum salmon returns attracted an increasing contingent of fishing vessels. Local residents voiced concerns over having property access blocked by fishermen, navigation restricted due to fishing activity, noise pollution, conflicts concerning seal haul-out sites near the fishery, and behavior problems with individual fishermen.[105] A change was made in fishing area boundaries to address issues with fishing boat wake damage to some local

[104] FY 1997 Medvejie Inspection Report by ADF&G Fish Pathology staff. Unpublished document obtained from Sam Rabung, ADF&G PNP Hatchery Coordinator, Juneau.

[105] ADF&G Division of Commercial Fisheries, Sitka, Deep Inlet Terminal Harvest Area meeting summary, dated January 2, 1996. Unpublished document obtained from Sam Rabung, ADF&G PNP Hatchery Coordinator, Juneau.

residents' property and assets. ADF&G also adds language to news releases asking commercial fishermen to respect property owners concerns.[106]

For Chinook salmon fisheries, the goal of maximizing the troll harvest of hatchery fish returning to Medvejie Creek Hatchery has been impeded by the hatchery site location. The coastal area near Sitka is a rearing area for numerous stocks from the Pacific Northwest. Most of these stocks are managed under the PST, and their harvest is restricted during May and June when most of the Medvejie Creek Hatchery adult Chinook salmon return to the hatchery. As a result, the area permitted to access these fish by the troll fishery is limited because larger areas have resulted in a substantial percentage of the harvest of treaty fish in the catch. Furthermore, returning Chinook salmon tend to be less vulnerable to troll gear as they near their release site or spawning stream, resulting in more fish reaching the terminal area where net fisheries harvest returns that are surplus to broodstock requirements. These terminal Chinook fisheries have become increasingly important to the gillnet fleet as demand and value for these Chinook salmon has increased. In addition, the Chinook salmon hatchery returns are important to local anglers and charter boat operators.

Salmon escapements to Salmon Lake and other Sitka Sound systems have been monitored since statehood (1960). Other systems in Sitka Sound with escapement goals have met goals in most years since the first significant harvests of Medvejie Creek Hatchery returns beginning in about 1986 (Table 6). No escapement goals are in place for the Salmon Lake system, but pink salmon escapement counts at Salmon Lake are included in the Sitka Sound stock group of pink salmon stocks that do have a goal. From 1980 to 2012, escapement goals in the Sitka Sound pink salmon stock group were met or exceeded in 30 of 33 years.

Sitka sound chum salmon stocks are included in the escapement goal for the northern southeast outside stock grouping. From 1982 to 2013, the escapement index goal was met in of 26 of 32 years.

Since 1985, the Sitka Sound coho salmon stock group escapement goal has been met in every year except one. Sockeye salmon escapement to Redoubt Lake from 1982 to 2013 was met in 27 of 32 years.

[106] Dave Gordon, ADF&G Division of Commercial Fisheries Area Management Biologist, personal communication.

Table 6.–Annual return (catch and broodstock) of Medvejie Creek Hatchery salmon released in Sitka Sound and spawning escapement counts of systems or stock groups with escapement goals, 1980–2013.

	Harvest[a]				Escapement			
Year	Chum	Chinook	Coho	Total	Sockeye[b]	Coho[c]	Chum[d]	Pink[e]
1980				-				30,206
1981				-				375,311
1982				-	456		10,000	117,368
1983				-	2540		21,000	277,769
1984	1,600			1,600	11579		78,000	252,929
1985	39,300			39,300	10669	1117	31,000	545,041
1986	181,743	47		181,790	9,798	510	30,000	97,392
1987	132,403	233		132,636	14,251	1,834	17,000	100,126
1988	42,510	415		42,925	3,252	1,220	19,000	10,886
1989	131,307	495		131,802	31,570	683	15,000	13,286
1990	118,946	2,367		121,313	73,181	311	28,000	12,207
1991	53,962	7,291	11,811	73,064	45,510	549	36,000	57,623
1992	343,728	15,594	8,646	367,968	10,326	526	25,000	24,168
1993	1,635,231	18,763	21,936	1,675,930	25,018	566	16,000	19,841
1994	1,307,610	12,826	60,785	1,381,221	39,710	1,510	14,000	2,887,883
1995	1,287,743	13,039	29,845	1,330,627	34,798	1,899	19,000	237,776
1996	2,819,499	27,815	12,774	2,860,088	19,209	1,474	30,000	708,268
1997	2,595,025	34,542	2,305	2,631,872	28,898	1,961	50,000	1,038,900
1998	3,019,966	21,030	19,410	3,060,406	52,039	1,487	19,000	1,334,879
1999	3,662,701	19,728	17,550	3,699,979	57,754	1,451	52,000	1,615,142
2000	3,571,709	26,607	1,172	3,599,488	3,032	809	96,000	514,239
2001	1,020,368	31,730	4,037	1,056,135	3,665	1,242	58,000	689,227
2002	768,555	41,838	6,962	817,355	23,943	1,686	19,000	972,882
2003	1,107,909	47,332	8,663	1,163,904	68,893	1,101	30,000	1,447,610
2004	2,161,220	65,551	11,677	2,238,448	77,263	1,124	86,000	847,000
2005	1,725,312	28,055	21,547	1,774,914	65,653	1,668	77,000	1,474,000
2006	2,303,503	10,317	7,056	2,320,876	103,953	2,647	57,000	693,000
2007	803,582	30,600	5,439	839,621	66,938	1,066	34,000	667,000
2008	927,034	45,399	3,245	975,678	10,146	1,117	46,000	631,000
2009	787,827	19,631	840	808,298	12,851	1,156	15,000	689,000
2010	1,562,680	21,875	1,057	1,585,612	17,119	1,273	24,000	767,000
2011	368,683	39,684	-	408,367	21,806	2,222	23,000	929,467
2012	656,172	26,367	6,135	688,674	40,903	1,157	28,000	732,000
2013	2,239,714	41,363		2,281,077	48,355	1,414	18,000	1,413,000
				Escapement Goal:	7,000–25,000	500–800	19,000	21,000–70,000

[a] Harvest data from NSRAA.org (accessed August 2015).

[b] Sockeye salmon escapement is for Redout Lake (goal range 7,000–25,000)

[c] Coho salmon escapement (from Skannes et al. 2014) is for Sitka Sound systems (goal range 400–800; see Shaul and Tydingco 2006).

[d] Chum salmon escapement (from Gray et al. 2014) is for the northern outside stock group (escapement goal 19,000; See Eggers and Heinl 2008).

[e] Pink salmon escapement (from ADF&G Alexander database) is for the Sitka Sound stock group (goal range 21,000–70,000).

Although no escapement goal has been established for Salmon Lake, exploitation rates were estimated from 1983 to 1989, and from 2003 to 2005 through tagging of emigrating smolt (Schmidt 1996; Tydingco et al. 2006, Tydingco et al. 2008). Ford Arm Lake coho salmon have been monitored as an indicator stock for the area since 1982 by counts of adult escapement and annual tagging of emigrating smolt. (Skannes et al. 2014). Estimated exploitation rates were much higher at Salmon Lake than at Ford Arm Lake in 1988, 1989 and 2003, and similar to or lower than Ford Arm Lake in the other years. The average exploitation rate at Salmon Lake was 54% versus 59% for Ford Arm Lake for the years of Salmon Lake estimates (Table 7), and 52% for all years (1983–2012) assessed for Ford Arm Lake.

Table 7.–Exploitation rates of Salmon Lake and Ford Arm Lake coho salmon stocks. Rate values reflect the percentage of the total annual return that was harvested for each system.

Year	Salmon Lake Exploitation Rate %	Ford Arm Lake Exploitation Rate %
1983	36	54
1984	35	Not assessed
1985	57	52
1986	55	61
1987	47	45
1988	72	47
1989	74	62
2003	78	49
2004	62	64
2005	52	51
Average	54	59
Range	35–74	45–64

ADF&G operated an escapement weir at Salmon Lake from 2001 to 2005. NSRAA has operated a weir at Salmon Lake since 2007 and will continue operations until at least 2017 as part of the Sawmill Creek Hatchery BMP. Estimated escapements based on weir counts and mark–recapture experiments in the lake show no clear trends with regard to the magnitude of returns to Medvejie Creek Hatchery (Figure 5).

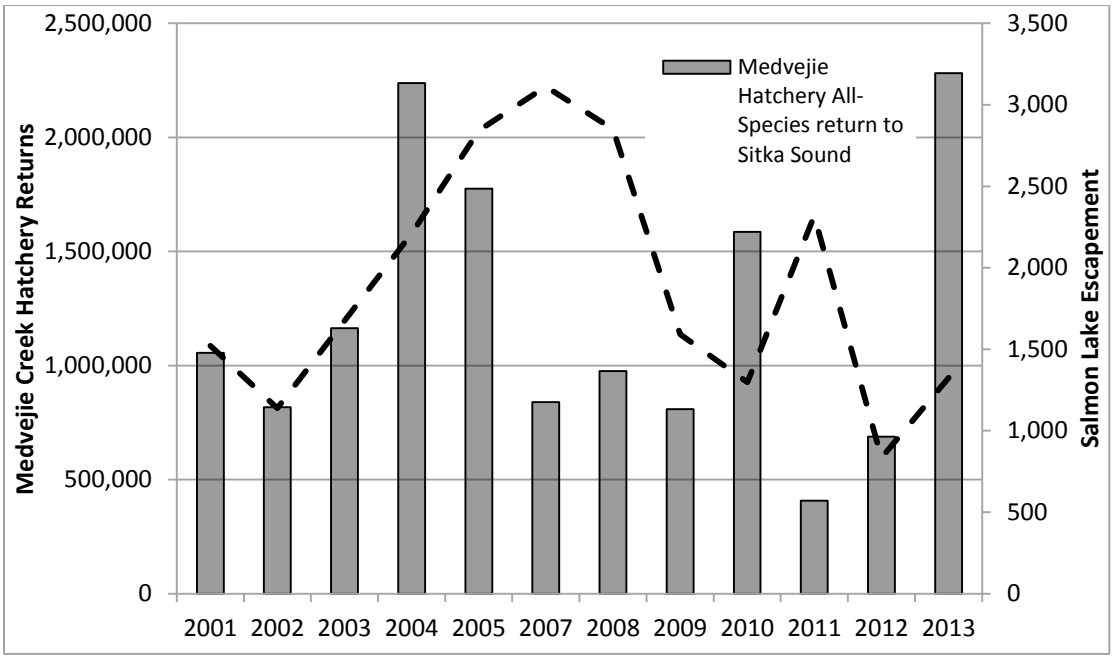

Figure 5.–Coho salmon escapement to Salmon Lake and the total return of all species of salmon to Medvejie Creek Hatchery Sitka Sound release sites, 2001–2004 and 2007–2013. The escapement weir was not operated in 2006.

Source: Coho salmon escapement to Salmon Lake data from Fish Resources Permit Report, Salmon Lake Coho Weir Project 2013, by Scott Wagner, NSRAA. Unpublished document obtained from Troy Tydinco, ADF&G, Sitka. Total return data from NSRAA reports.

Table 8.–The Medvejie Creek Hatchery program and its consistency with elements of Alaska fisheries management policies and regulations (see Table 3).

Sustainable Salmon Fishery Policy (5 AAC 39.222)	
I. Management principles and criteria	
Assessment of wild stock interaction and impacts	Salmon Lake escapement, harvest rate, and straying of hatchery fish has been periodically monitored since Medvejie Creek Hatchery began operations. Shamrock Bay systems were assessed for strays during releases there.
Use of precautionary approach	Releases from Medvejie Creek Hatchery site have been limited to return broodstock levels for hatchery releases to protect Salmon Lake salmon returns. The bulk of releases occur at Deep Inlet, where interaction with important wild stocks appears minimal.
Salmon Escapement Goal Policy (5 AAC 39.223)	
Establishment of escapement goals	Escapement goals are established for Sitka Sound area pink, chum, coho and sockeye salmon stocks.
Mixed Stock Salmon Fishery Policy (5 AAC 39.220)	
Wild stock conservation priority	The salmon fisheries are managed to achieve escapement goals.
Fisheries management review of Fish Transport Permits (5 AAC 41.010–41.050)	
Review by management staff	The FTPs for the Medvejie Creek Hatchery program were reviewed by fisheries management staff.

CONSISTENCY IN PERMITTING

Hatchery permit/BMP, AMP, and FTP documents for Medvejie Creek 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. Discrepancies in permitting described below were primarily related to FTPs, where egg takes, fry releases, and egg and fry transfers were authorized under the AMP and the hatchery permit but not accompanied by an FTP.

No FTP was found that permitted chum salmon egg takes from hatchery returns and their subsequent release until 1992 (FTP 92J-1017, Appendix K). The only FTP found for release of Medvejie Creek Hatchery stock chum salmon to Deep Inlet was 84J-1015 for a maximum 20,000 fry release. FTP 85J-1013 allowed release of up to 20 million fry from eggs collected from returns to Deep Inlet, but not from eggs collected from Medvejie Creek Hatchery.

In 2001, 24 million eggs were transferred to Medvejie Creek Hatchery from Hidden Falls Hatchery. The 2002 AMP indicated that the FTP had been amended to increase the transfer amount from 13 million to 23 million, but the FTP was not amended to reflect the increase until 2003. In addition, the Hidden Falls Hatchery goal was for a 24 million egg take, but the FTP allowed 23 million eggs. Likewise, the 2001 release at Medvejie Creek Hatchery increased from 5 million fry to about 7 million fry but the amendment to the FTP (92J-1017) authorizing the increase in the release was not issued until 2003.

For Chinook salmon, FTP 84J-1063 was used for egg takes from the hatchery from 1984 to 1988. Egg take increases from 100,000 to 200,000 in 1984, from 200,000 to 250,000 in 1985, and from 250,000 to 1.1 million eggs in 1987 were made to the FTP by amendment. However, the expiration date of the FTP was not extended past the 1986 expiration date (Appendix L).

Likewise, FTP 89J-1056 was used for Whitman Lake/Chickamin River stock Chinook salmon egg transfers to Medvejie Creek Hatchery from 1989 to 1991. The FTP was amended in 1990 to increase the egg number of from 800,000 to 1 million eggs, but the expiration date was not extended past the 1989 expiration date.

From 2004 to 2010, the egg-take limit permitted under FTP 91J-1060 of 3.2 million eggs was significantly exceeded annually. A hatchery permit alteration in 1997 increased Chinook salmon egg capacity from 3.2 to 5.2 million eggs. However, an accompanying FTP or amendment to an existing FTP was not processed permitting the increase.

In 2006 and 2007, Chinook salmon were released at Deep Inlet, but no FTP was found authorizing the release.

For coho salmon, no FTP was found authorizing egg takes at the hatchery for Indian River stock returns from 1991 to 2006, except for a small release at the hatchery under 95J-1003 (Appendix M).

No FTP was found for release of Medvejie Creek Hatchery returns incubated at Medvejie Creek Hatchery and released at Deep Inlet from 1991 to 1993.

A permit amendment in 2005 mistakenly reduced the hatchery permitted capacity for coho salmon from 3.3 million to 410,000 eggs. The permit was amended in 2014 to restore the 3.3 million permitted capacity.

For pink salmon, no significant discrepancies were seen across the permits (Appendix N).

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 Medvejie Creek Hatchery annual reports were received for all years.

RECOMMENDATIONS

(1) The BMP for Medvejie Creek Hatchery should be updated to reflect the current hatchery status and projects.

(2) If Andrew Creek stock Chinook salmon from Medvejie Creek returns are again released at Deep Inlet, an FTP will be required for the release.

(3) In 2009, FTP 09J-1018 was issued to release 50,000 coho salmon smolts from Bear Cove until 2013. A hatchery permit number was not designated on the FTP and no reference was made to any other hatchery but Medvejie Creek Hatchery.

FTP 12J-1009 replaced FTP 09J-1018, and was issued to Medvejie Creek Hatchery for collection and release of resultant progeny into Bear Cove with a sliding scale release beginning at 50,000 smolts and increasing to 75,000 smolts, which is based on language in the Sawmill Creek Hatchery BMP.

Medvejie Creek Hatchery is limited to releasing 20,000 smolts in Bear Cove under its 1995 hatchery permit amendment. Therefore, the permitted release numbers in FTP 12J-1009 exceed those in the Medvejie Creek Hatchery permit.

The FTP for releases from Bear Cove could be issued to Sawmill Creek Hatchery, which does not have a release limit from Bear Cove. Or, the Medvejie Creek Hatchery permit could be amended to increase the release limit from Bear Cove.

(4) The Phase III CSP language regarding 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 Section 1315 (b),[107] and reaffirmed such provisions in 2008 under the Tongass Land and Resource Management Plan (United States Department of Agriculture 2008, Chapter 3). The U.S.

[107] Alaska's National Interest Lands Conservation Act. Public L. No. 96-487. 94 Stat. 2371 (1980).

Forest Service has acknowledged that aquaculture projects, including facilities associated with hatcheries, may be considered for wilderness areas within the Tongass National Forest.[108] The U.S. Forest Service 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."[109]

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 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.

With full utilization of virtually the entire hatchery run and strong demand for salmon, there is heightened interest in increasing Alaska hatchery production. The processing industry has expanded infrastructure and markets for abundant salmon returns. 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 the Medvejie Creek Hatchery runs and meeting spawning escapement goals to wild stock systems in most years.

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."

Prior to Garforth et al. (2012), the executive directors of most of the southeast Alaska PNP hatchery operations met in 2009 with the ADF&G commissioner expressing the need for such a study. The following year, plans for funding and implementing the study were initiated. 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 proposed study length was about eleven years, with 4 years initially funded.[110] The study, entitled *Interactions of Wild and Hatchery Pink and Chum Salmon in Prince William Sound and Southeast Alaska*, is currently underway. Study funding is shared between the PNP operators and state of Alaska and administered by ADF&G. Field work is conducted by the Sitka Sound Science Center and Prince William Sound Science Center. The study will improve understanding of hatchery and wild stock interactions and provide Alaska-specific scientific guidance for assessing Alaska's hatchery

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

[109] Letter from C. Goularte, U.S. Forest Service District Ranger, to L. Speerstra, Department 7 of the Army, Sitka Field Office, dated February 11, 2014. Unpublished document obtained from Sam Rabung, ADF&G PNP Hatchery Coordinator, Juneau.

[110] Steve Reifenstuhl, NSRAA Executive Director, personal communication.

program, including recommendations for escapement goals, fisheries management, hatchery production levels, and hatchery practices.

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APPENDIX

Appendix A.–Medvejie Creek Hatchery permit and permit alterations, 1981–2014.

Date	Description	Chum Salmon Eggs	Coho Salmon Eggs	Chinook Salmon Eggs	Pink Salmon Eggs
08/17/1981	PNP hatchery permit number 16 and BMP issued to NSRAA for Medvejie Creek Hatchery in Sitka. Hatchery permitted for 20 million chum salmon eggs and 3 million coho salmon eggs. Chum salmon donor stream was Medvejie Creek. Coho salmon donor streams were Luduik Lake, Nakvassin Creek, Sashin Creek, unnamed creeks in Deep Cove and Gut Bay, and 2 unnamed creeks in Sea Lion Cove. BMP stated chum salmon would be released from the hatchery and at another site to be determined. Releases from up to 2 million eggs would initially be evaluated, and increased up to 10 million pending evaluation of returns. The second release site was to be satisfactory for release of 10 million and possibly up to 18 million eggs if releases at the hatchery were limited to 2 million eggs for fisheries management concerns. Coho salmon would be released within 2 general locations—Sea Lion Cove area near Sitka, and Patterson Bay area in Chatham Strait in southeastern Baranof Island.	20	3.0		
05/19/1982	Permit amended to allow: 1. Development of a second chum salmon stock for release at Deep Inlet. Proposed donor sources included Salmon Lake Creek, Nakwasina River, and a stream in West Crawfish Inlet. 2. Increase coho capacity from 3.0 to 3.3 million eggs and: a. Take up to 400,000 coho salmon eggs for stocking in Elfendal Lake in 1982. b. Take up to 300,000 coho salmon eggs for release at Deep Inlet beginning in 1982. (Permit amendment reads "300,000 million coho eggs" and is assumed to be a typographic error.) 3. Take up to 150,000 Chinook salmon eggs in 1982 and 300,000 eggs in subsequent years for release at the hatchery.	20	3.3	0.15	
05/22/1984	Permit amended to: 1. Increase the maximum number of chum salmon eggs permitted from local approved streams under the broodstock development schedule from 4 million to 6 million eggs. 2. Add Lower Rostislaf, Deer, Upper Deer, Finger, Blanchard, Brentwood, Upper Brentwood, Parry and Fiddle lakes as potential sites for coho salmon fry stocking.	20	3.3	0.3	
04/2/1985	Permit amended to allow Chinook salmon fry stocking into Banner Lake in 1985 only, added Surprise Lake as a coho fry release site, and specified hatchery harvest gear type.	20	3.3	0.3	
09/20/1985	Permit amended to increase the number of chum salmon eggs from 20 million eggs to 25.2 million eggs from 1985 to 1986.	25.2	3.3	0.3	

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Date	Description	Chum Salmon Eggs	Coho Salmon Eggs	Chinook Salmon Eggs	Pink Salmon Eggs
1/18/1986	Permit amended to require incubation of 100,000 eggs from Medvejie Creek pink salmon stock and release the resulting fry back to Medvejie Creek. In addition, 300 adult chum salmon per year will be introduced into the north fork of Medvejie Creek. The pink and chum salmon production actions were to mitigate potential loss of natural production in Medvejie Creek if the hatchery were to remove most of the stream flow for hatchery use.	25.2	3.3	0.3	0.1
4/3/1986	Permit amended to increase the maximum number of chum salmon eggs permitted from 20 million eggs to 28 million eggs. Only fry from 2 million eggs can be released from the hatchery. The remainder may be released at Deep Inlet.	28.0	3.3	0.3	0.1
4/21/1987	Permit amended to increase the number of chum salmon eggs from 28 million to 30 million eggs and to increase releases of chum salmon at Medvejie Creek Hatchery to 3 million fry.	30.0	3.3	0.3	0.1
5/28/1987	Permit amended to increase the number of Chinook salmon eggs from 300,000 eggs to 2.0 million eggs for release from the hatchery.	30.0	3.3	2.0	0.1
5/24/1988	Permit amended to incubate up to 120,000 coho salmon eggs for rearing and release as smolt from Medvejie Creek Hatchery. Up to 4,500 smolt may be released in Bear Cove, and the remainder released at Deep Inlet. Increase chum salmon production from 30 million eggs to 38 million eggs. All increased production to be released at Deep Inlet. Stock coho salmon fry in Cliff Lake and Lord's Pocket Lake.	38.0	3.3	2.0	0.1
5/24/1988	A second 5/24/1988 permit alteration increased pink salmon incubation up to 300,000 eggs. The number of eggs and methods of incubation were to be determined annually; between 100,000 and 300,000 is required. In addition, up to 800 returning pink salmon per year shall be routed to both the north fork and south fork of Medvejie Creek (1,600 total). Adds requirement to route up to 200 adult chum salmon into south fork Medvejie Creek, in addition to up to 300 adult chum routed in north fork.	38.0	3.3	2.0	0.3
8/16/1989	Permit amended to allow gillnet gear for cost recovery.	38.0	3.3	2.0	0.3
10/19/1989	Permit amended to allow incubation of up to 100,000 Suntaheen stock coho salmon eggs.	38.0	3.3	2.0	0.3

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Date	Description	Chum Salmon Eggs	Coho Salmon Eggs	Chinook Salmon Eggs	Pink Salmon Eggs
4/26/1990	Permit amended to increase annual chum salmon fry release at Bear Cove from 3 million fry to 5 million fry. No common property fisheries allowed in Silver Bay to harvest hatchery surpluses. Hatchery surpluses must be harvested by hatchery by purse or beach seine inside Bear Cove SHA.	38.0	3.3	2.0	0.3
6/27/1992	Permit amended to increase coho salmon production at Medvejie Creek Hatchery from 120,000 to 400,000 eggs for release as smolts at Shamrock Bay. Straying study to be designed by ADF&G and NSRAA staff. Straying study completed in 1996.	38.0	3.3	2.0	0.3
6/1/1994	Permit amended to increase coho salmon smolt release from Medvejie Creek Hatchery to 5,000 smolts to provide broodstock for the hatchery coho smolt program.	38.0	3.3	2.0	0.3
5/15/1995	Permit amended to increase chum salmon capacity from 38 million to 42 million eggs, with all increased production released in Deep Inlet.	42.0	3.3	2.0	0.3
5/15/1995	Permit amended to incubate an additional 1.5 million coho salmon eggs at Hidden Falls hatchery for transfer to Port Armstrong and Medvejie hatcheries. Up to 1.0 million eggs may be taken for backup purposes for Port Armstrong Hatchery and up to an additional 500,000 (3.0 million total) eggs for transfer to Medvejie Creek Hatchery for the Deer Lake fry stocking project. This increased coho capacity at Hidden Falls Hatchery to 5.7 million eggs, of which 1.7 million eggs may be reared and released as smolt at Kasnyku Bay.	42.0	3.3	2.0	0.3
6/17/1997	Permit amended to increase release of coho salmon smolts from the hatchery from 4,500 smolt to 7,000 smolt annually. Increase Chinook salmon capacity from 2 million to 3.2 million eggs annually.	42.0	3.3	3.2	0.3
6/26/2000	Permit amended to increase coho salmon smolt releases from the hatchery from 7,000 to 10,000 smolt annually.	42.0	3.3	3.2	0.3
10/2/2000	PAR to increase chum salmon release from Medvejie Creek Hatchery from 5 to 7 million fry to better ensure adequate broodstock is available at the hatchery. PAR not approved, apparently due to wild stock concerns in Silver Bay.	42.0	3.3	3.2	0.3
2/27/2002	Permit amended to transfer 10 million eggs of the permitted capacity for chum salmon at Hidden Falls Hatchery to Medvejie Creek Hatchery for a 5-year period. Studies required for ecosystem impact to Sitka Sound and monitoring program at Salmon Lake to assess chum salmon production and harvest on resident coho and sockeye salmon populations required.	52.0	3.3	3.2	0.3

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Date	Description	Chum Salmon Eggs	Coho Salmon Eggs	Chinook Salmon Eggs	Pink Salmon Eggs
5/21/2002	Permit amended to begin summer coho salmon program with production of up to 220,000 coho salmon eggs. Release at the hatchery is limited to 10,000 smolt annually, and the remainder released at Deep Inlet. NSRAA required to operate weir at Salmon Lake Creek for at least 4 years of returns to monitor for strays from the project.	52.0	3.3	3.2	0.3
12/30/2003	Permit amended to increase Chinook salmon capacity from 3.2 million to 5.2 million eggs annually. Increased production to be reared in Green Lake and released at the hatchery.	52.0	3.3	5.2	0.3
6/6/2005	Permit amended to release up to 10 million chum salmon fry at the hatchery for broodstock purposes. Permitted capacity at the hatchery is 36 million fall chum salmon and 24 million summer chum eggs.	60	3.3	5.2	0.3
6/6/2005	Permit amended to incubate up to 20,000 coho salmon eggs for release as smolts at the hatchery. Total permitted capacity at the hatchery remains 410,000 coho salmon eggs.	60	0.41	5.2	0.3
2/28/2006	Permit amended to rear to 1 million Chinook salmon smolt in Green Lake and release at Deep Inlet.	60	0.41	5.2	0.3
5/4/2007	Permit amended allow an additional incubation of 300,000 Tahini River stock Chinook salmon eggs for release at Lutak Inlet.	60	0.41	5.2	0.3
11/20/2007	Permit amended to transfer 10 million eggs of the permitted capacity for chum salmon at Hidden Falls Hatchery to Medvejie Creek Hatchery for a 5-year period. This was an extension of the 2002 permit amendment.	60	0.41	5.2	0.3
6/22/2010	Permit amended to make permanent the transfer of 10 million eggs of the permitted capacity for chum salmon at Hidden Falls Hatchery to Medvejie Creek Hatchery.	60	0.41	5.2	0.3
4/25/2011	Permit amended to increase overall chum salmon capacity to 70 million eggs by increasing the fall-run chum salmon stock to 46 million eggs.	70	0.41	5.2	0.3
1/18/2012	Permit amended to allow transfer of 4 million brood year 2011 Hidden Falls stock summer chum salmon eggs, in addition to the permitted transfer of 24 million eggs, to offset a shortage of brood year 2011 Medvejie chum salmon eggs. The amendment authorized this as a onetime transfer and release.	70	0.41	5.2	0.3
1/18/2012	Permit amended to add Halibut Point Marine and Sheldon Jackson College as Chinook salmon release sites.	70	0.41	5.2	0.3
3/9/2012	Permit amended to increase fall chum salmon capacity to 53 million eggs. Permitted capacity was then 24 million summer chum, 53 million fall chum, 10 million chum for Sheldon Jackson Hatchery, 5.2 million Chinook salmon plus 300,000 Tahini stock eggs for Lutak Inlet release, 410,000 coho salmon eggs, and 300,000 pink salmon eggs.	77	0.41	5.2	0.3

Appendix B.–Summary of chum salmon fish transport permits for Medvejie Creek Hatchery.

FTP No.	Issued	Expiration	FTP summary and reviewer comments
82J-1039	1982	1986	Collect up to 4.0 million chum salmon eggs from Salmon Lake Creek, located in Silver Bay, Baranof Island for incubation at Medvejie Creek Hatchery and release at Deep Inlet. Permit amended in 1984 to extend expiration date from 1985 to 1986.
82J-1040	1982	1985	Collect up to 4.0 million chum salmon eggs from West Crawfish Inlet for incubation at Medvejie Creek Hatchery and release at Deep Inlet.
82J-1041	1982	1986	Collect up to 4.0 million chum salmon eggs from the Nakwasina River for incubation at Medvejie Creek Hatchery and release at Deep Inlet. In 1984, FTP expiration date extended from 1985 to 1986.
84J-1015	1983	1986	Collect up to 20,000 chum salmon eggs from the Medvejie Creek for incubation at Medvejie Creek Hatchery and release at Deep Inlet.
85J-1013	1985	2006	Collect up to 20 million chum salmon eggs from the Deep Inlet release site for incubation at Medvejie Creek Hatchery and release at Deep Inlet.
89J-1006	1989	2009	Collect up to 13 million chum salmon eggs from Hidden Falls Hatchery, transfer eyed eggs to Medvejie Creek Hatchery, and release at Deep Inlet. In 2003, amendment permitted egg take increased from 13 million to 23 million. FTP 09J-1021 replaced this FTP in 2009.
90J-1050	1990	1991	Collect additional 4 million green chum salmon eggs from Hidden Falls Hatchery and transfer to Medvejie Creek Hatchery, and release at Deep Inlet.
92J-1015	1992	2022	Collect up to 20 million chum salmon eggs from the Deep Inlet release site for incubation at Medvejie Creek Hatchery and release at Deep Inlet. In 2012, FTP expiration date extended from 2012 to 2022.
92J-1016	1992	2012	Collect up to 33 million chum salmon eggs from Medvejie Creek Hatchery returns for incubation at Medvejie Creek Hatchery and release at Deep Inlet.
92J-1017	1992	2012	Collect up to 5 million chum salmon eggs from Medvejie Creek Hatchery returns for incubation at Medvejie Creek Hatchery and release at Medvejie Creek Hatchery.
02J-1020	2003	2012	Transport of up to 4 million chum salmon fry from Sheldon Jackson College Hatchery to Deep Inlet for rearing an release. FTP expiration date extended from 2007 to 2012 in 2008. Permit issued to Sheldon Jackson Hatchery.
05J-1005	2006	None	Increase the release of chum salmon from 7 million to 10 million at Medvejie Creek Hatchery.

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FTP No.	Issued	Expiration	FTP summary and reviewer comments
09J-1021	2010	2020	Renewal of FTP 89J-1006 to transport 23 million eyed eggs from Hidden Falls Hatchery to Medvejie Creek Hatchery for incubation and release at Deep Inlet.
09J-1024	2009	2009	Transport up to 2 million eyed Medvejie Creek Hatchery stock eggs from Sheldon Jackson Hatchery to Medvejie Creek Hatchery for incubation and release at Deep Inlet. FTP issued to Sheldon Jackson Hatchery.
10J-1026	2010	2020	Transport up to 9 million eyed Medvejie Creek Hatchery stock eggs from Medvejie Creek Hatchery to Sitka Sound Science Center (Sheldon Jackson Hatchery) for incubation and release at Deep Inlet. FTP served as a backup egg supply for Medvejie Creek Hatchery and FTP issued to Sitka Sound Science Center.
11J-1009	2011	2021	Transport up to 9 million fry from Medvejie Creek Hatchery from FTP 10J-1026 for release at Deep Inlet. FTP issued to Sitka Sound Science Center.
11J-1011	2011	2021	Collect up to 9 million eggs from Medvejie Creek Hatchery returns for release at Deep Inlet. FTP issued to Sitka Sound Science Center.
11J-1012	2011	2021	Collect up to 9 million eggs from Sheldon Jackson Hatchery returns for incubation at Sheldon Jackson Hatchery and release at Deep Inlet. FTP issued to Sitka Sound Science Center.
11J-1016	2011	2021	Collect up to 9 million eggs from Sheldon Jackson Hatchery returns for incubation at Medvejie Creek Hatchery and release at Deep Inlet. FTP issued to Sitka Sound Science Center.
12J-1004	2012	2022	Collect up to 9 million eggs from Sheldon Jackson Hatchery returns for incubation at Medvejie Creek Hatchery and release at Deep Inlet. FTP issued to Sitka Sound Science Center.
12J-1005	2012	2022	Collect up to 33million eggs at Medvejie Creek Hatchery returns for incubation at Medvejie Creek Hatchery and release at Deep Inlet. Renewal of 92J-1016.

Appendix C.–Chum salmon egg takes, releases and returns to Medvejie Creek Hatchery by brood year.

Brood Year	Stocks Used	Number Eggs	Number Released	Number Return
1981	Medvejie	255,855	223,697	36,437
1982	Medvejie	820,800	706,677	
	Nakwasina	812,000	656,586	
	Salmon Lake	1,330,000	1,097,414	
1982 Total		2,962,800	2,460,713	216,153
1983	Medvejie	822,483	794,282	
	Nakwasina	696,100	668,000	
	Salmon Lake	1,124,982	1,096,000	
1983 Total		2,643,565	2,558,282	111,821
1984	Medvejie	1,033,500	912,400	
	Nakwasina	4,066,000	3,802,398	
	Salmon Lake	1,623,800	1,517,602	
1984 Total		6,723,300	6,232,400	35,396
1985	Medvejie	18,721,000	17,662,005	
	Deep Inlet	7,579,400	7,085,500	
	Salmon Lake	496,400	475,900	
1985 Total		26,796,800	25,223,405	139,402
1986	Medvejie	31,013,000	29,166,200	137,228
1987	Medvejie	29,298,700	28,140,700	42,677
1988	Medvejie	8,658,000	8,052,363	
	Deep Inlet	9,184,000	8,321,937	
1988 Total		17,752,000	16,374,300	287,149
1989	Medvejie	14,199,100	13,143,500	
	Deep Inlet	16,970,000	14,913,600	
	Hidden Falls	7,100,000	6,348,000	
1989 Total		38,269,100	34,405,100	1,933,343
1990	Medvejie	19,974,000	17,073,500	
	Hidden Falls	13,820,000	12,574,500	
1990 Total		33,794,000	29,648,000	1,370,617
1991	Medvejie	9,664,000	8,745,400	
	Deep Inlet	2,836,000	2,598,000	
	Hidden Falls	13,473,000	12,011,000	
1991 Total		25,973,000	23,354,400	488,368
1992	Medvejie	17,689,900	16,570,500	
	Hidden Falls	14,010,000	13,160,000	
1992 Total		31,699,900	29,730,500	2,708,660

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Brood Year	Stocks Used	Number Eggs	Number Released	Number Return
1993	Medvejie	19,439,300	18,034,800	
	Hidden Falls	12,480,000	11,230,000	
1993 Total		31,919,300	29,264,800	3,258,597
1994	Medvejie	21,448,500	20,476,800	
	Hidden Falls	12,360,000	11,567,000	
1994 Total		33,808,500	32,043,800	2,734,032
1995	Medvejie	27,600,000	26,312,000	
	Hidden Falls	14,000,000	13,266,000	
1995 Total		41,600,000	39,578,000	2,637,691
1996	Medvejie	27,600,000	25,815,000	
	Hidden Falls	14,000,000	12,760,000	
1996 Total		41,600,000	38,575,000	5,132,505
1997	Medvejie	27,544,000	26,374,000	
	Hidden Falls	14,000,000	12,946,000	
1997 Total		41,544,000	39,320,000	750,129
1998	Medvejie	27,550,000	26,487,000	
	Hidden Falls	14,000,000	13,353,000	
1998 Total		41,550,000	39,840,000	602,766
1999	Medvejie	27,330,000	26,014,000	
	Hidden Falls	14,000,000	13,057,000	
1999 Total		41,330,000	39,071,000	1,171,444
2000	Medvejie	29,484,000	27,751,600	
	Hidden Falls	14,000,000	13,174,000	
2000 Total		43,484,000	40,925,600	1,963,110
2001	Medvejie	27,750,000	26,283,800	
	Hidden Falls	23,000,000	21,458,000	
2001 Total		50,750,000	47,741,800	2,017,267
2002	Medvejie	39,000,000	36,817,000	
	Hidden Falls	12,000,000	11,391,000	
2002 Total		51,000,000	48,208,000	2,082,882
2003	Medvejie	27,370,000	25,084,100	
	Hidden Falls	24,080,400	22,454,550	
	NSRAA Totals	51,450,400	47,538,650	946,254
SJC co-op fry (Medvejie stock)		3,540,000	3,257,000	79,741
2003 Total incl SJC co-op fry		54,990,400	50,795,650	1,025,995

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Brood Year	Stocks Used	Number Eggs	Number Released	Number Return
2004	Medvejie	27,710,000	25,076,900	
	Hidden Falls	24,990,000	23,551,000	
	NSRAA Totals	52,700,000	48,627,900	870,014
SJC co-op fry (Medvejie stock)		3,590,000	3,249,000	63,016
2004 Total incl SJC co-op fry		56,290,000	51,876,900	933,030
2005	Medvejie	33,986,000	31,623,323	
	Hidden Falls	24,541,840	23,246,064	
	NSRAA Totals	58,527,840	54,869,387	614,767
SJC co-op fry (Medvejie stock)		5,478,367	5,098,000	57,118
2005 Total incl SJC co-op fry		64,006,207	59,967,387	671,885
2006	Medvejie	32,261,000	31,170,401	
	Hidden Falls	24,700,020	21,888,618	
2006	NSRAA Totals	56,961,020	53,059,019	1,500,525
SJC co-op fry (Medvejie stock)		9,126,429	8,818,000	249,376
2006 Total incl SJC co-op fry		66,087,449	61,877,019	1,749,901
2007	Medvejie	32,183,778	28,933,505	
	Hidden Falls	25,245,800	23,701,769	
2007	NSRAA Totals	57,429,578	52,635,274	250,163
SJC co-op fry (Medvejie stock)		8,450,272	8,083,000	38,417
2007 Total incl SJC co-op fry		65,879,850	60,718,274	288,580
2008	Medvejie	27,757,612	26,286,868	
	Hidden Falls	19,635,759	18,600,504	
2008	NSRAA Totals	47,393,371	44,887,372	388,091
SJC co-op fry (Medvejie stock)		7,806,637	7,393,000	63,919
2008 Total incl SJC co-op fry		55,200,008	52,280,372	452,010
2009	Medvejie	30,947,448	29,717,235	
	Hidden Falls	24,255,000	22,719,243	
2009	NSRAA Totals	55,202,448	52,436,478	2,033,365
SJC co-op fry (Medvejie stock)		8,703,999	8,358,000	324,104
2009 Total incl SJC co-op fry		63,906,447	60,794,478	2,357,469
2010	Medvejie	31,972,238	30,350,052	
	Hidden Falls	23,857,144	21,804,394	
2010	NSRAA Totals	55,829,382	52,154,446	
SJC co-op fry (Medvejie stock)		8,992,243	8,536,000	
2010 Total incl SJC co-op fry		64,821,625	60,690,446	

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Brood Year	Stocks Used	Number Eggs	Number Released	Number Return
2011	Medvejie	38,521,926	35,607,422	
	Hidden Falls	24,345,075	23,936,742	
	Port Armstrong (HF)	4,197,592		
2011	NSRAA Totals	67,064,593	59,544,164	
SJC co-op fry (Medvejie stock)		8,254,523	7,630,000	
2011 Total incl SJC co-op fry		75,319,116	67,174,164	
2012	Medvejie	42,206,625	39,743,004	
	Hidden Falls	22,269,000	21,135,908	
	NSRAA Totals	64,475,625	60,878,912	
SJC co-op fry (Medvejie stock)		9,043,896	8,516,000	
2012 Total incl SJC co-op fry		73,519,521	69,394,912	

Source: 2013 Medvejie Creek Hatchery AMP. Unpublished document obtained from Lorraine Vercessi, ADF&G Assistant PNP Hatchery Program Coordinator, Juneau.

Appendix D.–Summary of coho salmon fish transport permits for Medvejie Creek Hatchery.

FTP No.	Issued	Expiration	FTP summary and reviewer comments
81-145	1981	1981	Collect 10 male and 10 female coho salmon from Sea Lion Cove stream, incubate eggs at Medvejie Creek Hatchery, and release fry to lake that drains into Sea Lion Cove.
81-149	1981	1981	Collect 25 male and 25 female coho salmon from stream in Deep Cove stream, incubate eggs at Medvejie Creek Hatchery, and release fry to Banner Lake.
81-150	1981	1981	Collect 25 male and 25 female coho salmon from Sashin Creek, incubate eggs at Medvejie Creek Hatchery, and release fry to Banner Lake.
81-151	1981	1981	Collect 25 male and 25 female coho salmon from Nakvassin Creek, incubate eggs at Medvejie Creek Hatchery, and release fry to Banner Lake.
81-152	1981	1981	Collect 25 male and 25 female coho salmon from stream in Gut Bay, incubate eggs at Medvejie Creek Hatchery, and release fry to Banner Lake.
81-153	1981	1981	Collect 10 male and 10 female coho salmon from Sea Lion Cove stream, incubate eggs at Medvejie Creek Hatchery, and release fry to lake that drains into Sea Lion Cove. This FTP may be for fry release of eggs collected under FTP 81-145.
82J-1023	1982	1983	Collect 135 male and 135 female coho salmon (370,000 eggs) from Sea Lion Cove stream, incubate eggs at Medvejie Creek Hatchery, and release fry to Elfendahl Lake.
82J-1024	1982	1983	Collect 135 male and 135 female coho salmon (370,000 eggs) from Falls Creek, incubate eggs at Medvejie Creek Hatchery, and release fry to Elfendahl Lake.
82J-1042	1982	1986	Collect up to 300,000 coho salmon eggs from Salmon Lake Creek, incubate eggs at Medvejie Creek Hatchery, and rear in freshwater ponds at hatchery, saltwater rear and release in Deep Inlet. FTP expiration date extended from 1984 to 1986 in 1984.
82J-1048	1982	1982	Release up to 10,000 Sea Lion Cove stock coho salmon fry into Sea Lion Cove stream.
83J-1028	1983	1984	Collect up to 250,000 eggs from Sashin Creek coho salmon, incubate eggs at Medvejie Creek Hatchery, and release in Lower Rostislaf Lake.
83J-1029	1983	1984	Collect up to 75,000 eggs from Deep Cove stream coho salmon, incubate eggs at Medvejie Creek Hatchery, and release in Lower Rostislaf Lake.
84J-1074	1984	2004	Collect up to 1.5 million eggs from coho salmon returns to Banner Lake (Deep Cove and Sashin Creek stock), incubate eggs at Medvejie Creek Hatchery, and release in Deer and Upper Deer Lakes.
84J-1075	1984	1985	Collect up to 150,000 eggs from returns to Sea Lion Cove (Sea Lion Cove stock) coho salmon, incubate eggs at Medvejie Creek Hatchery, and release in Sea Lion Cove Lake.
85J-1018	1985	2005	Stock up to 100,000 Sea Lion Cove stock coho salmon fry into barriered and fishless Surprise Lake.
85J-1019	1985	2005	Stock up to 40,000 Banner Lake (Deep Cove and Sashin Creek stocks) coho salmon fry into barriered and fishless Fiddle Lake.
85J-1020	1985	2005	Stock up to 80,000 Banner Lake (Deep Cove and Sashin Creek stocks) coho salmon fry into barriered and fishless Finger Lake.

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FTP No.	Issued	Expiration	FTP summary and reviewer comments
85J-1021	1985	2005	Stock up to 88,000 Banner Lake (Deep Cove and Sashin Creek stocks) coho salmon fry into barriered and fishless Blanchard Lake.
85J-1022	1985	2005	Stock up to 136,000 Banner Lake (Deep Cove and Sashin Creek stocks) coho salmon fry into barriered and fishless Brentwood Lake.
85J-1029	1985	2005	Stock up to 600 Banner Lake (Sashin Creek stock) coho salmon fry into Osprey Lake net pen to study *Diphyllobothrium* infection in coho fingerlings. The fry will not be released.
85J-1052	1985	2005	Stock resulting fry from egg take of up to 250,000 eggs of Banner Lake (Deep Cove and Sashin Creek stocks) coho salmon into barriered Lower Rostislaf Lake.
85J-1053	1985	2005	Stock resulting fry from egg take of up to 250,000 eggs of Sashin Creek stock coho salmon into barriered Lower Rostislaf Lake.
85J-1054	1985	2005	Stock resulting fry from egg take of up to 75,000 eggs of coho salmon from creek in Deep Cove into barriered Lower Rostislaf Lake.
86J-1065	1986	2006	Collect up to 1.6 million coho salmon eggs from Rostislaf Lake returns for incubation at Medvejie Creek Hatchery and release of fry to Deer Lake.
88J-1022	1988	1997	Collect up to 1.6 million coho salmon eggs from Deer Lake returns for incubation at Medvejie Creek Hatchery and release of fry to Banner Lake.
88J-1023	1988	1998	Collect up to 1.6 million coho salmon eggs from Blanchard Lake returns for incubation at Medvejie Creek Hatchery and release of fry to Deer Lake.
88J-1024	1987	1997	Collect up to 1.6 million coho salmon eggs from Deer Lake returns for incubation at Medvejie Creek Hatchery and release of fry to Blanchard Lake.
88J-1025	1987	1997	Collect up to 1.6 million coho salmon eggs from Deer Lake returns for incubation at Medvejie Creek Hatchery and release of fry to Lower Rostislaf Lake.
88J-1026	1987	1997	Collect up to 1.6 million coho salmon eggs from Deer Lake returns for incubation at Medvejie Creek Hatchery and release of fry to Lower Brentwood Lake.
88J-1066	1988	2008	Collect up to 1.6 million coho salmon eggs from Blanchard Lake returns for incubation at Medvejie Creek Hatchery and release of fry to Lord's Pocket Lake.
88J-1067	1987	2007	Collect up to 1.6 million coho salmon eggs from Deer Lake returns for incubation at Medvejie Creek Hatchery and release of fry to Cliff Lake.
88J-1068	1987	2007	Collect up to 1.6 million coho salmon eggs from Deer Lake returns for incubation at Medvejie Creek Hatchery and release of fry to Deer Lake. In 1991, egg take level increased from 1.6 million to 2.5 million eggs.
88J-1095	With-drawn		Release up to 4,000 Medvejie Creek Hatchery coho salmon from Sheldon Jackson Hatchery returns into Bear Cove. Opposed by Division of Sport Fish because of potential impact to wild stock coho salmon return to Salmon Lake in Bear Cove.

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FTP No.	Issued	Expiration	FTP summary and reviewer comments
88J-1109	1987	2007	Collect up to 120,000 Indian River stock coho salmon eggs from Sheldon Jackson Hatchery returns for incubation at Medvejie Creek Hatchery and release of fry at Medvejie Creek Hatchery.
89J-1057	1989	1989	Collect up to 100,000 eggs from Suntaheen Creek coho salmon eggs for incubation at Medvejie Creek Hatchery and release of fry at Suntaheen Creek above the fish ladder.
91J-1029	1991	2001	Allow up to 4,500 smolt hatched from Sheldon Jackson Hatchery Indian River coho salmon stock eggs that are incubated and reared at Medvejie Creek Hatchery to be released from Medvejie Creek Hatchery to be consistent with Medvejie Creek Hatchery BMP.
92J-1004	1992	1992	Allow up to 20,000 eyed eggs transferred from Medvejie Creek Hatchery to Sheldon Jackson Hatchery for incubation, rearing and release.
92J-1039	1992	1997	Allows release of up to 5,000 Indian River stock coho salmon from Medvejie Creek Hatchery to be release at Wrinkleneck Creek in Sitka for a Sitka High School project.
92J-1063	1993	2007	Allows transport and release of up to 400,000 Indian River stock coho salmon from Medvejie Creek Hatchery to Shamrock Bay. FTP amended in 1996 to extend expiration date from 1996 to 2007.
94J-1027	1994	2009	Allows up to 3 million Hidden Falls/Deer Lake/Deep Cove stock coho salmon eggs to be incubated to eyed stage at Hidden Falls, transferred to Medvejie Creek Hatchery for incubation and rearing and fry released at Deer Lake. FTP amended in 1995 to increase egg take to 3 million. FTP amended in 2004 to extend expiration date from 2004 to 2009.
95J-1003	1995	2015	Allows up to 4,500 Medvejie Creek Hatchery Indian River stock fry released at Medvejie Creek Hatchery. In 1997, release number increased from 4,500 smolt to 7,000 smolt. In 2000, release number increased from 7,000 smolt to 10,000 smolt.
99J-1032	1999	2009	Allows release of up to 5,000 Indian River stock coho salmon from Medvejie Creek Hatchery to be release at Wrinkleneck Creek in Sitka for a Sitka High School project.
02J-1012	2002	2009	Allows collection of up to 220,000 Plotnikof Lake summer-run coho salmon for incubation at Medvejie Creek Hatchery and release of up to 10,000 smolts from Medvejie Creek Hatchery and the remainder at Deep Inlet. In 2007, the expiration date was extended from 2007 to 2009.
09J-1018	2009	2015	Allows as back up to returns to Medvejie Creek Hatchery, collection of up to 325,000 Salmon Lake coho salmon eggs for incubation at Medvejie Creek Hatchery and release of up to 50,000 smolts from Medvejie Creek Hatchery. In 2012, the expiration date was extended from 2013 to 2015.
09J-1019	2009	2013	Allows as back up to returns to Medvejie Creek Hatchery, collection of up to 325,000 Salmon Lake coho salmon eggs for incubation at Medvejie Creek Hatchery and release of up to 200,000 smolt from Deep Inlet.
12J-1009	2012	2022	Allows egg take of up to 410,000 eggs from Medvejie Creek Hatchery Salmon Lake stock for release of resulting fry at Medvejie Creek Hatchery.

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FTP No.	Issued	Expiration	FTP summary and reviewer comments
12J-1010	2012	2022	Allows egg take of up to 410,000 eggs from Medvejie Creek Hatchery Salmon Lake stock for release of resulting fry at Deep Inlet.
14J-1001	2014	2024	Allows transfer of Deer Lake Sashin Creek stock coho salmon eggs from Hidden Falls Hatchery to Medvejie Creek Hatchery for incubation and rearing which was formerly permitted under FTP 92J-1005.
14J-1002	2014	2024	Allows transfer of Deer Lake Deep Cove stock coho salmon eggs from Hidden Falls Hatchery to Medvejie Creek Hatchery for incubation and rearing which was formerly permitted under FTP 94J-1027.

Appendix E.–Coho salmon egg takes, releases, and returns from Medvejie Creek Hatchery production, brood years 1988–2013. Adult return is harvested the year after release.

Brood Year	Brood Stock	Egg Take	Release Site	Fry Released	Smolt Released	Year Release	Adult Return
1988	Indian River	145,600	Deep Inlet		119,870	1990	11,811
1989	Indian River	115,600	Deep Inlet		100,992	1991	8,646
1990	Indian River	162,000	Deep Inlet		135,726	1992	21,390
			Medvejie		2,783	1992	546
1991	Indian River	504,400	Shamrock Bay		280,476	1993	41,145
			Deep Inlet		135,974	1993	19,059
			Medvejie		2,969	1993	427
			Wrinkleneck	5,400			154
			Sheldon Jackson College Hatchery [a]		20,000		
1992	Indian River	241,000	Shamrock Bay		156,442	1994	21,246
			Deep Inlet		49,970	1994	8,003
			Medvejie		4,988	1994	578
			Wrinkleneck	1,830			18
1993	Indian River	235,700	Shamrock Bay		170,297	1995	9,142
			Deep Inlet		41,896	1995	3,171
			Medvejie		4,990	1995	440
			Wrinkleneck	2,176			21
1994	Indian River	268,000	Shamrock Bay		230,511	1996	2,173
			Medvejie		4,860	1996	132
			Wrinkleneck	2,170			
1995	Indian River	245,000	Shamrock Bay		226,300	1997	18,406
			Medvejie		6,900	1997	1,004
			Wrinkleneck	2,186			
1996	Indian River	324,800	Shamrock Bay		238,024	1998	16,489
			Medvejie		7,039	1998	1,061
			Wrinkleneck	2,013		1997	
1997	Indian River	31,445	Shamrock Bay		0		
			Medvejie		7,045	1999	1,172
			Wrinkleneck		0		
			Sheldon Jackson College Hatchery [a]		16,856		
1998	Indian River	231,900	Shamrock Bay		198,949	2000	3,346
			Medvejie		10,083	2000	691
			Wrinkleneck	2,034		1999	
1999	Indian River	266,200	Shamrock Bay		226,600	2001	5,962
			Medvejie		10,045	2001	1,000
			Sheldon Jackson College Hatchery [a]		9,985		
	Hidden Falls (Sashin Cr)		Medvejie		22,850		
2000	Indian River	402,900	Shamrock Bay		348,799	2002	7,339
			Medvejie		10,040	2002	1,324
			Sheldon Jackson College Hatchery [a]		10,000		
	Kadashan River	22,950	Indian River [b]		18,352	2001	[c]
2001	Indian River	268,300	Shamrock Bay		220,300	2003	11,106
			Medvejie		9,952	2003	571
			Sheldon Jackson College Hatchery [d]		10,065		

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Brood Year	Brood Stock	Egg Take	Release Site	Fry Released	Smolt Released	Year Release	Adult Return
2002	Indian River	400,000	Shamrock Bay		362,961	2004	19,908
			Medvejie		11,348	2004	679
	Plotnikof Lake	42,300	Deep Inlet		39,398	2004	960
	Kadashan River	50,300	Indian River[b]		47,187	2003	[c]
2003	Indian River	324,855	Shamrock Bay		286,682	2005	6,438
			Medvejie		20,472	2005	618
	Kadashan River	52,015	Indian River[b]		45,573	2004	[c]
2004	Indian River	75,971	Sheldon Jackson College Hatchery[e]		69,569	2006	
	Plotnikof Lake	153,500	Bear Cove		9,895	2006	258
			Deep Inlet		118,772	2006	5,181
	Kadashan River	30,400	Indian River[b]		27,879	2005	[c]
2005	Indian River	166,671	Sheldon Jackson College Hatchery[f]		121,222	2007	
	Plotnikof Lake	245,455	Bear Cove		9,992	2007	117
			Deep Inlet		201,859	2007	3,128
2006	Indian River	108,000	SJH[g]				
	Plotnikof Lake	223,651	Bear Cove		20,181	2008	30
			Deep Inlet		193,459	2008	810
2007	Plotnikof Lake	443,296	Bear Cove		0		
			Deep Inlet		243,455	2009	1,057
2008	Plotnikof Lake	20,400	no release - fry destroyed; switching broodstock source				
2009	Salmon Lake	241,807	Bear Cove		54,720	2011	1,279
			Deep Inlet		162,826	2011	4,911
2010	Salmon Lake	174,903	Bear Cove		50,421	2012	5,571
			Deep Inlet		116,130	2012	12,253
2011	Salmon Lake	222,015	Bear Cove[h]	160,443			
2012	Medvejie[i]	405,390	Bear Cove[h]	395,705	72,114	2014	
	Salmon Lake	65,490					
2013	Medvejie	1,582,893	Bear Cove[j]				

Source: 2013 Medvejie Creek Hatchery AMP. Unpublished document obtained from Lorraine Vercessi, ADF&G Assistant PNP Hatchery Program Coordinator, Juneau. 2012 numbers updated from NSRAA staff.

[a] Transferred to Sheldon Jackson Hatchery as smolts.

[b] Indian River in Tenakee Inlet. This was a U.S. Forest Service project.

[c] Fry release for U.S. Forest Service project. Return not evaluated.

[d] Transferred to Sheldon Jackson Hatchery as smolts.

[e] Includes 52,272 eggs (2006 Sheldon Jackson Hatchery annual report) and 23,699 (2006 Medvejie annual report) smolt transferred to Sheldon Jackson Hatchery.

[f] Includes 94,096 eggs and 69,650 fry transferred to and released from Sheldon Jackson Hatchery.

[g] Transferred to Sheldon Jackson Hatchery as eggs.

[h] Transferred to Sawmill Creek Hatchery.

[i] Broodstock collected from Deep Inlet and Salmon Lake returns.

[j] Transferred as eggs and fry to Sawmill Creek Hatchery.

Appendix F.–Coho salmon egg take, release and return data for the NSRAA lake stocking program, brood years 1981–2012. Projects were permitted under Medvejie Creek Hatchery. The Deer Lake project was transferred fully to Hidden Falls in 2004.

Year	Broodstock	Eggs	Juvenile Site	Fry Release	Adult Return
1981	Sea Lion Cove	48,684	Sea Lion Lake	15,174	400
			Sea Lion River	9,508	
	Sashin Creek	90,110	Banner Lake	79,728	12,500
	Deep Cove	19,881	Banner Lake	17,784	55
1982	Falls Creek	226,440	Elfendahl	115,335	715
			Porcupine River	7,750	
1983	Sashin Creek	236,000	Lower Rostislaf Lake	188,603	2,144
1984	Sealion Cove	146,500	Sea Lion Lake	30,000	1,075
			Surprise Lake	75,163	1,250
			Surprise River	26,487	
1984	Banner Lake (Sashin Creek)	1,306,700	Deer Lake	780,800	20,300
			Blanchard Lake	74,961	594
			Finger Lake	49,958	0
			Fiddle Lake	29,977	162
			Osprey Lake	600	0
1985	Deep Cove	75,104	Blanchard Lake	69,974	1,648
1986	Lower Rostislaf (Sashin Creek)	988,000	Deer Lake	842,900	26,700
1987	Deer Lake (Sashin Creek)	1,026,300	Deer Lake	475,000	53,400
			Blanchard Lake.	90,000	2,715
			Banner Lake	100,000	6,040
			Lake Rostislaf Lake	200,000	2,050
			Cliff Lake	50,269	290
1988	Blanchard Lake (Deep Cove)	1,607,200	Deer Lake	1,443,500	165,700
1989	Deer Lake (Sashin Creek)	1,976,300	Deer Lake	1,741,500	143,650
1990	Deer Lake (Sashin Creek)	2,396,000	Deer Lake	1,875,000	100,000
1991	Deer Lake (Deep Cove)	2,329,600	Deer Lake	2,055,000	245,100
			Upper Deer Lake	218,000	
1992	Deer Lake (Sashin Creek)	2,458,000	Deer Lake	2,330,000	154,000

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Year	Broodstock	Eggs	Juvenile Site	Fry Release	Adult Return
1993	Deer Lake (Sashin Creek)	1,780,100	Deer Lake	1,600,000	168,475
	Hidden Falls (Sashin Creek)	481,400	Deer Lake	476,000	
1994	Hidden Falls (Deep Cove)	2,573,600	Deer Lake	2,425,000	99,640
1995	Hidden Falls (Sashin Creek)	2,626,100	Deer Lake	2,392,000	95,368
1996	Hidden Falls (Sashin Creek)	2,927,000	Deer Lake	2,714,500	287,280
1997	Hidden Falls (Deep Cove)	3,015,600	Deer Lake	2,829,000	78,764
1998	Hidden Falls (Sashin Creek)	2,832,150	Deer Lake	2,525,000	131,151
1999	Hidden Falls (Sashin Creek)	315,000	Banner Lake	300,063	17,881
2000	Hidden Falls (Deep Cove)	2,837,000	Deer Lake	2,408,500	84,122
2001	Hidden Falls (Sashin Creek)	No release	Deer Lake	-	
2002	Hidden Falls (Sashin Creek)	2,600,000	Deer Lake	2,326,500	134,864
2003	Hidden Falls (Deep Cove)	2,700,000	Deer Lake	1,755,085	94,421
2004	Hidden Falls (Sashin Creek)	675,550	Deer Lake	581,923	27,198
2005	Hidden Falls (Sashin Creek)	1,110,795	Deer Lake	938,277	18,468
2006	Hidden Falls (Deep Cove)	1,537,642	Deer Lake	1,056,903	51,494
2007	Hidden Falls (Sashin Creek)	1,558,136	Deer Lake	1,110,882	42,225
2008	Hidden Falls (Sashin Creek)	2,403,037	Deer Lake	2,037,104	82,670
2009	Hidden Falls (Deep Cove)	2,498,400	Deer Lake	2,123,950	83,571
2010	Hidden Falls (Sashin Creek)	2,511,040	Deer Lake	2,000,300	205,166
2011	Hidden Falls (Sashin Creek)	3,200,000	Deer Lake	2,801,419	
2012	Hidden Falls (Deep Cove)	3,132,330	Deer Lake	2,802,628	
2013	Hidden Falls (Deep Cove)	3,217,500	Deer Lake		

Source: 2014 Hidden Falls Hatchery AMP. Unpublished document obtained from Lorraine Vercessi, ADF&G Assistant PNP Hatchery Program Coordinator, Juneau, with updated information obtained from Chip Blair, NSRAA, personal communication.

Appendix G. –Summary of Chinook salmon fish transport permits for Medvejie Creek Hatchery.

FTP No.	Issued	Expiration	FTP summary and reviewer comments
82J-1016	Denied		Collect up to 300,000 Chinook salmon eggs from the Situk River for incubation and release at Medvejie Creek Hatchery. Denied due to low population size at Situk and anticipated high mortality using the proposed methods.
82J-1022	1982	1986	Collect up to 150,000 Chinook salmon eggs from the Farragut River for incubation and release at Medvejie Creek Hatchery and Farragut River.
82J-1025	Denied		Transport 300,000 eggs (150,000 in 1982 only) Unuk or Chickamin origin Little Port Walter Hatchery Chinook salmon eggs for incubation and release at Medvejie Creek Hatchery. Denied because stock origin and release site distance too great.
82J-1066	1982	1986	Transport 50,000 eggs Andrew Creek stock Chinook salmon eggs from Andrew Creek weir to Medvejie Creek Hatchery for incubation and release at Medvejie Creek Hatchery. Egg number increased from 50,000 to 150,00 in 1983.
84J-1052	1984	1986	Transport 50,000 Andrew Creek stock Chinook salmon eyed eggs from Crystal Lake Hatchery to Medvejie Creek Hatchery for incubation and release at Medvejie Creek Hatchery. Egg number increased from 50,000 to 150,000 in 1983.
84J-1063	1984	1986	Transport 100,000 green eggs and male gametes from Andrew Creek stock Chinook salmon eggs from Crystal Lake Hatchery to Medvejie Creek Hatchery for incubation and release at Medvejie Creek Hatchery. Egg number increased from 100,000 to 200,000 in 1984, to 250,000 in 1985, to 1.1 million in 1987. Although amendments above increased egg takes, no amendment was found extending expiration date from the original 1986 date.
88J-1083	1988	1990	Transport 20,000 Chickamin stock Chinook salmon eggs from Little Port Walter Hatchery to Medvejie Creek Hatchery for incubation and rearing to study saltwater tolerance between stocks. Fish will not be released.
89J-1054	1989	1989	Allows transfer of up to 800,000 Unuk stock eggs from Little Port Walter Hatchery for incubation, rearing, and release at Medvejie Creek Hatchery.
89J-1055	1989	1989	Allows transfer of up to 800,000 Unuk stock eggs from Neets Bay Hatchery for incubation, rearing, and release at Medvejie Creek Hatchery.
89J-1056	1989	1989	Allows transfer of up to 800,000 Chickamin stock eggs from Whitman Lake Hatchery for incubation, rearing and release at Medvejie Creek Hatchery. 1990 amendment increased egg number from 800,000 to 1 million in 1990 but expiration date remained 1989.
91J-1028	1991	1995	Allows transfer of up to 2.2 million Chickamin stock eggs from Little Port Walter hatchery for incubation, rearing, and release at Medvejie Creek Hatchery.

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FTP No.	Issued	Expiration	FTP summary and reviewer comments
91J-1060	1991	2011	Permits collection of up to 2.0 million eggs, incubation, rearing, and release of Crystal Lake/Andrew Creek Chinook salmon returns to Medvejie Creek Hatchery. In 1999, permit amended to increase egg number from 2.0 million to 3.2 million eggs.
94J-1009	1994	2009	Permits transfer of up to 1.5 million Andrew Creek stock eggs from Hidden Falls for incubation, rearing, and release at Medvejie Creek Hatchery. In 2004, permit amended to extend expiration date from 2004 to 2009.
94J-1029	1994	1997	Permits transfer of up to 1.0 million Andrew Creek stock eggs from Macaulay Hatchery for incubation, rearing, and release at Medvejie Creek Hatchery.
97J-1033	1998	2008	Renewal of 97J-1033. Transport 1.3 million Chinook salmon fry from Medvejie Creek Hatchery to net pens in Green Lake for rearing, then transport back smolts to Medvejie for saltwater rearing and release. In 2003, expiration date extended from 1998 to 2008.
09J-1020	2010	2020	Renewal of 94J-1009. Transport 2.5 million Chinook salmon eggs from Hidden Falls Hatchery to Medvejie Creek Hatchery for incubation, rearing and release. Transfer serves as a backup egg source as both facilities use Andrew Creek stock. In 2014, egg number increased from 2.5 million to 5.2 million eggs.
09J-1022	2008	2018	Renewal of 97J-1033. Transport 4.4 million Chinook salmon fry and resulting 2.2 million yearlings from Medvejie Creek Hatchery to net pens in Green Lake for rearing, then transport back smolts to Medvejie for saltwater rearing and release. In 2011, number of resulting yearlings increased from 2.2 million to 2.5 million.
12J-1001	2012	2020	Transport 400,000 Andrews Creek stock Chinook salmon smolt from Medvejie Creek Hatchery to saltwater net pens in front of Sheldon Jackson Hatchery for imprinting and release.
12J-1002	2012	2020	Transport 400,000 Andrews Creek stock Chinook salmon smolt from Medvejie Creek Hatchery to saltwater net pens at McGraw's HPM float for imprinting and release.
12J-1006	2012	2022	Renews 91J-1060. Permits collection of up to 5.2 million eggs, incubation, rearing, and release of Chinook salmon returns to Medvejie Creek Hatchery.
12J-1018	2012	2022	Permits transport, rearing and release of up to 600,000 Andrews Creeks stock Chinook salmon smolt from Medvejie Creek Hatchery to Crawfish Inlet.

Appendix H.–Chinook salmon egg takes, releases and returns to Medvejie Creek Hatchery by brood year.

Brood Year	Broodstock Source	Number Eggs	Number Released	Release Date	Adult Return
1982	Andrew Creek	46,500	26,572	1984	277
1983	Andrew Creek	36,509	21,883	1985	568
1984	Crystal Lake	163,500	108,041	1986	112
1985	Crystal Lake	291,600	227,536	1987	1,490
1986	Crystal Lake	223,850	174,577	1988	5,991
	Medvejie	4,209			
1987	Crystal Lake	1,041,450	831,224	1989	18,998
	Medvejie	303,200		1989	
1988	Crystal Lake	772,000	920,995	1990	17,022
	Medvejie	636,300		1990	
	Little Port W.	15,080		1990	
1989	Medvejie	611,300	866,839	1991	21,879
	Ohmer Creek	56,400			
	Little Port W.	475,800			
	Whitman Lake	425,000			
1990	Medvejie	1,200,000	(Transferred to Hidden Falls Hatchery)		
	Whitman Lake	1,561,030	1,144,688	1992	39,410
1991	Medvejie	1,803,354	(Transferred to Hidden Falls Hatchery)		
	Medvejie	882,000	762,369	1993	30,982
1992	Medvejie	272,724	(Transferred to Hidden Falls Hatchery)		
	Medvejie	1,208,000	1,083,432	1994	37,039
1993	Medvejie	1,308,900	1,130,236	1995	20,344
1994	Medvejie	585,500	1,004,878	1996	16,217
	Gastineau	390,400			
	Crystal Lake	378,400			
	Hidden Falls	177,000			
	Medvejie	225,890	(Transferred to Whitman Lake Hatchery)		
1995	Hidden Falls	1,384,500	1,052,995	1997	15,253
1996	Medvejie	275,600	1,119,512	1998	37,409
	Hidden Falls	1,170,000			
1997	Medvejie	1,957,000	1,596,867	1999	42,948
1998	Medvejie	2,617,200	2,071,083	2000	52,261
1999	Medvejie	2,781,000	1,872,609	2001	38,087
			205,623	2000	6,102
2000	Medvejie	2,845,700	1,953,356	2002	52,514
			309,500	2001	204
2001	Medvejie	2,845,500	1,502,186	2003	7,965
2002	Medvejie	3,200,000	1,929,602	2004	14,661
			261,663	2003	46
2003	Medvejie	2,793,000	1,538,388	2005	41,067
			709,368	2004	2,594

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Brood Year	Broodstock Source	Number Eggs	Number Released	Release Date	Adult Return
2004	Medvejie	3,481,000	1,790,477	2006	26,877
			891,070	2005	9,130
2005	Medvejie	4,715,928[a]	1,491,455	2007	6,912
			933,874	2006	601
			836,929[b]	2006	2,044
2006	Medvejie	4,894,083	2,103,213	2008	46,187
			1,084,641	2007	238
			1,002,211[b]	2007	510
2007	Medvejie	4,644,862	2,128,272	2009	19,668
			873,011	2008	64
			919,043[b]	2008	405
2008	Medvejie	4,789,294	1,837,901	2010	47,281
			1,852,661	2009	106
2009	Medvejie	3,967,390			
	Hidden Falls	964,701			
		4,932,091	802,790	2010	1,435
			1,696,344	2011	7,755
2010	Medvejie	4,448,922			
	Hidden Falls	724,000			
		5,172,922	2,906,139	2012	
2011	Medvejie	3,212,420	2,196,152	2013	
			406,301[c]	2013	
2012	Medvejie	2,931,055	1,780,952	2014	
	Hidden Falls	1,060,627	377,549[c]	2014	

Source: 2013 Medvejie Creek Hatchery AMP. Unpublished document obtained from Lorraine Vercessi, ADF&G Assistant PNP Hatchery Program Coordinator, Juneau. 2012 numbers updated from NSRAA staff.

[a] Additional 21,500 alevin, 25,385 eyed eggs and 27,296 green eggs transferred to Sheldon Jackson Hatchery.

[b] Released in Deep Inlet.

[c] Released at Halibut Point.

Appendix I. –Summary of pink salmon fish transport permits for Medvejie Creek Hatchery.

FTP Number	Issued	Expiration	FTP summary and reviewer comments
87J-1036	1987	2012	Collect up to 100,000 pink salmon eggs from Medvejie Creek for incubation and release at Medvejie Creek Hatchery. In 1992, egg take number increased from 100,000 to 300,000 eggs. In 2012, permit expiration date extended from 2012 to 2022.

Appendix J.–Summary of ADF&G pathology inspections at Medvejie Creek Hatchery.

Year	Inspection Notes
1982	Hatchery neat and clean. Foot baths are being strictly used and UV unit reportedly is functioning properly. Less than 1% of 1981 Medvejie Creek Hatchery chum lot was affected by cataracts. The reduction of Biodiet from 2% to 1% body weight feedings/day seemed to effectively reduce the gross incidence of cataracts.
1984	Hatchery very orderly and clean. UV unit functioning properly on inspection date. UV bulb burnout was reduced considerably after the substation was built. Falls Creek coho planted into Elfendahl Lake experienced heavy infections of *Diphyllobothrium* sp., and likely caused the heavy mortality from fry to smolt stage (94%). The resident population of Dolly Varden was the probable reservoir host.
1987	Vertical raceways in use were from the old Twin Lakes site. Diseases associated with fish from that location and the wood frames of the structures make such transport of equipment a concern. Effective sanitation of wood and styrofoam floats is not generally feasible. Recommend that such equipment not be moved from other hatcheries if a serious disease history is involved. An FTP for the pink salmon stock should be acquired. Malachite green still used for fungus control. ADF&G does not advocate for its use because FDA apparently does not approve it for therapeutic use on food fish.
1988	New buildings at hatchery provide incubation isolation of different stocks in separate buildings. Raceways inside the coho rearing building allow these fish to be in complete isolation from the rest of the hatchery. This is done because the fish originated from and will be returned to remote sites. Thus, depuration reduces the opportunity for any pathogens endemic to the hatchery to infect these fish. All eggs disinfected with iodophor after water hardening. Substrate, equipment and incubators seasonally disinfected with chlorine. Separate sets of utensils for the different stocks of fish are disinfected between use. Hyamine footbaths present at critical entrances and exits. Mortalities disposed of offshore after chlorine disinfection. Egg fungus controlled with flush treatments of malachite green. ADF&G repeated recommendation against its use. Hatchery is extremely clean and a well-run fish production facility. It has been designed to prevent cross-contamination between stocks and avoid fish stress. Facility management is a model for other PNP hatcheries to strive for.
1989	Previous recommendations adopted except for continued use of malachite green. Hatchery manager reported he has been sensitized to formalin, and so its use was not practical.
1990	Same as 1989.
1991	Same as 1989. Recommend that NSRAA apply for use of malachite green to FDA if use of malachite green was to continue.
1992	Nets very clean from daily air and sun drying. Grow-out facility was well organized and clean.
1993	Malachite green use discontinued. Facility well organized and clean. Considerable attention paid to fine tuning fish culture and fish disease prevention activities.
1994	Automatic feeders in use and population exhibited excellent behavior including feeding response. Complex was well organized.
1995	The Goede fish health condition assessment procedure routinely used to fine tune fish culture practices and identify disease problems when they occur. Hatchery staff practice preliminary diagnostic procedures as instructed by previous pathology workshops. An excellently managed facility and hatchery staff are commended for their efforts.
1997	Proactive approach taken towards disease control. Since the last inspection, fundal treatments for eggs switched primarily to hydrogen peroxide. Clean, well-run facility. Personnel careful to not overfeed fish and to watch fish for abnormalities. Recommend separate utensils with disinfectable handles should be available for each raceway.

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Year	Inspection Notes
1999	Medvejie Creek Hatchery personnel are impressive in their perseverance to improve fish cultural and fish health monitoring practices. Several feed trials underway with Chinook and chum salmon. Hatchery switched entirely to hydrogen peroxide for fungal treatment of eggs. Recommend closely monitoring Chinook salmon for bacterial kidney disease (BKD) and instituting planned strategies for addressing furunculosis problems.
2006	In general, good fish cultural practices are in place at this facility. Footbaths were in use as appropriate. A variety of bacterial problems (furunculosis, BKD, vibriosis) occur occasionally at Medvejie Creek Hatchery but current staff are very familiar with disease recognition and control measures. Staff members have had fish pathology training and routinely utilize their small laboratory facility to assess fish health.
2013	Overall this facility is well maintained and exercises good fish culture. Although some fish health problems have occurred (e.g., Vibrio), these have been controlled by instituting sound solutions. Water quality is routinely monitored, including total dissolved gasses. Fish are attended to daily and the experienced fish culturists make keen observations about any abnormalities. Large foot baths are used in appropriate areas and contained plenty of disinfectant. This hatchery has several investigational new animal drug permits on file, such as Aquamycin for prophylactic treatment of BKD and Chloramine-T for external flavobacteriosis. The latter has never been used. Occasionally approved aquaculture drugs are used, for example terramycin to control bacterial infections. There is a formalin safety plan in place and initial employee exposure monitoring has been conducted. This is a well-developed hatchery that is currently fine tuning a few programs in order to maximize production with available space.
2014	This facility operation was very good overall. There have been a number of infrastructural improvements made to the buildings and raceways. The raceway recoating and new air diffusion baffle system are good examples of how this hatchery continues to investigate ways to improve the culture environment. Another planned project is to install another instream intake in the North Fork of Medvejie Creek to obtain more water. It is thought this may also improve water quality in the gravel reservoir that holds water from the creek, which has been an issue when saprophytic microbes are agitated. Dolly Varden still infiltrate portions of the water system, but it is not known how they enter. Water quality is routinely monitored. Fish are attended daily and the experienced fish culturists make keen observations about any abnormalities. Large foot baths are used in appropriate areas and contained plenty of disinfectant. Hatchery staff are dedicated to solving fish health issues and are quite knowledgeable in this field. Bacteriology is even performed at this facility. Medvejie also sent 1 staff member to the last ADF&G Fish Health Workshop. Recently a new microscope and photomicroscopy equipment were purchased that will undoubtedly expedite the diagnosis of fish health problems, as these images can also be emailed to pathology for interpretation. This hatchery has a number of experienced staff that are skilled at successfully culturing a very large number of fish for NSRAA's programs.

Appendix K.–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 Medvejie Creek Hatchery, 1981–2013. Egg and juvenile salmon numbers are in millions and rounded.

Key: IL=Incubation Location, Exp.=Expiration, AR=Annual Report, MCH=Medvejie Creek Hatchery, MC=Medvejie Creek, Salmon Lake Creek=SL, Deep Inlet=DI, Hidden Falls Hatchery=HF.

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
1981	MH	20	0.11	[a]	MC	MC			0.26	MH	1982					0.29
1982	MH	20	2.0		MC	MC			0.82	MH	1983					0.71
	MH	20	2.0	82J-1039	SL	MC	1986	4.0	1.3	DI	1983		82J-1039	1986	4.0	1.11
	MH	20	2.0	82J-1041	NR	MC	1986	4.0	0.8	DI	1983		82J-1041	1986	4.0	0.66
1983	MH	20	2.0		MC	MC			0.82	MH	1984					0.77
										DI	1984		84J-1015	1986	0.02	0.025
	MH	20	2.0	82J-1039	SL	MC	1986	4.0	1.12	DI	1984		82J-1039	1986	4.0	1.1
	MH	20	2.0	82J-1041	NR	MC	1986	4.0	0.70	DI	1984		82J-1041	1986	4.0	0.67
1984	MH	20	2.0		MC	MC			1.03	MH	1985					0.885
										DI	1985		84J-1015	1986	0.02	0.028
	MH	20	2.0	82J-1039	SL	MC	1986	4.0	1.62	DI	1985		82J-1039	1986	4.0	1.517
	MH	20	2.0	82J-1041	NR	MC	1986	4.0	4.07	DI	1985		82J-1041	1986	4.0	3.802
1985	MH	20	6.0		MC	MC			18.72	MH	1986					2.143
										DI	1986		[b]			15.519
	MH	20	2.9	82J-1039	SL	MC	1986	4.0	0.50	DI	1986		82J-1039	1986	4.0	0.476
	MH	20	3.6	85J-1013	DI	MC	2006	20.0	7.60	DI	1986		85J-1013	2006	20.0	7.086
1986	MH	28	28.0		MC	MC			31.01	MH	1987					4.55
										DI	1987					24.621
1987	MH	30	30.0		MC	MC			28.650	MH	1988					3.138
										DI	1988					25.003
1988	MH	38	30.0	[a]	MC	MH			8.658	MH	1989					2.951
										DI	1989		[b]			5.102
	MH			85J-1013	DI	MH	2006	28.0	9.184	DI	1989		85J-1013	2006	28.0	8.322

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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
1989	MH	38	34.0		MC	MH			14.199	MH	1990					5.006
										DI	1990					8.137
	MH			85J-1013	DI	MH	2006	28.0	16.970	DI	1990		85J-1013	2006	28.0	14.937
	MH			89J-1006	DI	HF	2009	13	7.100	DI	1990		89J-1006	2009	28.0	6.348
1990	MH	38	34.5		MC	MH			19.974	MH	1991					4.802
										DI	1991					12.272
	MH			89J-1006	DI	HF	2009	13	13.820	DI	1991		89J-1006	2009	28.0	12.575
1991	MH	38	5.0		MC	MH			9.664	MH	1992		92J-1017	2012	5	4.039
			14.0							DI	1992		92J-1016	2012	33	4.706
				85J-1013	DI	MH	2006	20	2.836	DI	1992		85J-1013	2006	20	2.598
	MH		14.0	89J-1006	DI	HF	2009	13	13.473	DI	1992		89J-1006	2009	28.0	12.011
1992	MH	38	5.0	92J-1017	MC	MH	2012	5	17.690[c]	MH	1993		92J-1017	2012	5	4.86
			14.0	92J-1016	MC	MH	2012	33		DI	1993		92J-1016	2012	33	11.711
	MH		14.0	89J-1006	DI	HF	2009	13	14.010	DI	1993		89J-1006	2009	13	13.160
1993	MH	38	5.0	92J-1017	MC	MH	2012	5	19.439	MH	1994		92J-1017	2012	5	4.865
			14.0	92J-1016	MC	MH	2012	33		DI	1994		92J-1016	2012	33	13.170
	MH		14.0	89J-1006	DI	HF	2009	13	12.480	DI	1994		89J-1006	2009	13	11.230
1994	MH	38	5.0	92J-1017	MC	MH	2012	5	21.449	MH	1994		92J-1017	2012	5	5.331
			14.0	92J-1016	MC	MH	2012	33		DI	1994		92J-1016	2012	33	15.146
	MH		14.0	89J-1006	DI	HF	2009	13	12.360	DI	1994		89J-1006	2009	13	11.567
1995	MH	42	5.5	92J-1017	MC	MH	2012	5	27.6[d]	MH	1996		92J-1017	2012	5	4.842
			22.5	92J-1016	MC	MH	2012	33		DI	1996		92J-1016	2012	33	21.470
			14.0	89J-1006	DI	HF	2009	13	14.0	DI	1996		89J-1006	2009	13	13.266
1996	MH	42	5.5	92J-1017	MC	MH	2012	5	27.6[e]	MH	1997		92J-1017	2012	5	4.992
			22.5	92J-1016	MC	MH	2012	33		DI	1997		92J-1016	2012	33	20.823
			14.0	89J-1006	DI	HF	2009	13	14.000	DI	1997		89J-1006	2009	13	12.760

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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
1997	MH	42	5.5	92J-1017	MC	MH	2012	5	27.544	MH	1998		92J-1017	2012	5	4.563
			22.5	92J-1016	MC	MH	2012	33		DI	1998		92J-1016	2012	33	21.811
			14.0	89J-1006	DI	HF	2009	13	14.000	DI	1998		89J-1006	2009	13	12.946
1998	MH	42	5.5	92J-1017	MC	MH	2012	5	27.550	MH	1999		92J-1017	2012	5	5.298
			23.0	92J-1016	MC	MH	2012	33		DI	1999		92J-1016	2012	33	21.189
			14.0	89J-1006	DI	HF	2009	13	14.000	DI	1999		89J-1006	2009	13	13.353
1999	MH	42	5.5	92J-1017	MC	MH	2012	5	27.3[f]	MH	2000		92J-1017	2012	5	4.926
			23.0	92J-1016	MC	MH	2012	33		DI	2000		92J-1016	2012	33	21.088
			14.0	89J-1006	DI	HF	2009	13	14.000	DI	2000		89J-1006	2009	13	13.057
2000	MH	42	5.5	92J-1017	MC	MH	2012	5	29.484	MH	2001		92J-1017	2012	5	6.946
			23.0	92J-1016	MC	MH	2012	33		DI	2001		92J-1016	2012	33	20.806
			14.0	89J-1006	DI	HF	2009	13	14.000	DI	2001		89J-1006	2009	13	13.174
2001	MH	52	7.0	92J-1017	MC	MH	2012	5	27.55[g]	MH	2002		92J-1017	2012	5	7.009
			21.0	92J-1016	MC	MH	2012	33		DI	2002		92J-1016	2012	33	19.275
			14.0	89J-1006	DI	HF	2009	13	23.000	DI	2002		89J-1006	2009	13	21.458
2002	MH	52	7.0	92J-1017	MC	MH	2012	5	39.000	MH	2003		92J-1017	2012	5	6.803
			21.0	92J-1016	MC	MH	2012	33		DI	2003		92J-1016	2012	33	30.014
			24.0	89J-1006	DI	HF	2009	13	12.000	DI	2003		89J-1006	2009	13	11.391
2003	MH	52	7.0	92J-1017	MC	MH	2012	5	27.37[h]	MH	2004		92J-1017	2012	7	7.173
			21.0	92J-1016	MC	MH	2012	33		DI	2004		92J-1016	2012	33	17.912
			24.0	89J-1006	DI	HF	2009	23	24.080	DI	2004		89J-1006	2009	23	22.455
2004	MH	52	7.0	92J-1017	MC	MH	2012	7	27.710	MH	2005		92J-1017	2012	7	7.206
			21.0	92J-1016	MC	MH	2012	33		DI	2005		92J-1016	2012	33	17.861
			24.0	89J-1006	DI	HF	2009	23	24.990	DI	2005		89J-1006	2009	23	22.455
2005	MH	60		05J-1005	MC	MH	2012	10	33.967	MH	2006		05J-1005	2012	10	9.194
				92J-1016	MC	MH	2012	33		DI	2006		92J-1016	2012	33	22.424
				89J-1006	DI	HF	2009	23	24.542	DI	2006		89J-1006	2009	23	23.246

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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
2006	MH	60		05J-1005	MC	MH	2012	10	32.261	MH	2007		05J-1005	2012	10	9.614
				92J-1016	MC	MH	2012	33		DI	2007		92J-1016	2012	33	21.555
				89J-1006	DI	HF	2009	23	24.700	DI	2007		89J-1006	2009	23	21.889
2007	MH	60		05J-1005	MC	MH	2012	10	32.184	MH	2008		05J-1005	2012	10	9.175
				92J-1016	MC	MH	2012	33		DI	2008		92J-1016	2012	33	19.758
				89J-1006	DI	HF	2009	23	25.246	DI	2008		89J-1006	2009	23	23.702
2008	MH	60		05J-1005	MC	MH	2012	10	27.757	MH	2009		05J-1005	2012	10	9.844
				92J-1016	MC	MH	2012	33		DI	2009		92J-1016	2012	33	17.089
				89J-1006	DI	HF	2009	23	19.636	DI	2009		89J-1006	2009	23	18.601
2009	MH	60		05J-1005	MC	MH	2012	10	30.947	MH	2010		05J-1005	2012	10	9.852
				92J-1016	MC	MH	2012	33		DI	2010		92J-1016	2012	33	19.865
				89J-1006	DI	HF	2009	23	24.255	DI	2010		89J-1006	2009	23	22.719
2010	MH	60		05J-1005	MC	MH	2012	10	31.972	MH	2011		05J-1005	2012	10	9.949
				92J-1016	MC	MH	2012	33		DI	2011		92J-1016	2012	33	20.401
				09J-1021	DI	HF	2020	23	23.857	DI	2011		09J-1021	2020	23	21.804
2011	MH	70		05J-1005	MC	MH	2012	10	38.522	MH	2012		05J-1005	2012	10	19.034
				92J-1016	MC	MH	2012	33		DI	2012		92J-1016	2012	33	16.572
				09J-1021	DI	HF	2020	23	28.543	DI	2012		09J-1021	2020	23	23.937
2012	MH	77		12J-1004	MC	MH	2022	20	48.207	MH	2013		12J-1004	2022	20	18.167
				12J-1005	MC	MH	2022	33		DI	2013		12J-1005	2022	33	21.574
				09J-1021	DI	HF	2020	23	22.269	DI	2013		09J-1021	2020	23	21.136
2013	MH	77		92J-1017	MC	MH	2012	5	48.059	MH	2014		92J-1017	2012	5	18.782
				92J-1016	MC	MH	2012	33		DI	2014		92J-1016	2012	33	22.122
				89J-1006	DI	HF	2009	23	24.060	DI	2014		89J-1006	2009	13	21.349

[a] No FTP was found for egg takes or release at Medvejie Creek Hatchery or from Medvejie Creek until l992 (FTP 92J-1017).
[b] The only FTP found for release of Medvejie Creek Hatchery stock chum salmon to Deep Inlet was 84J-1015 for a maximum 20,000 fry release. FTP 85J-1013 allowed release of up to 20 million fry from eggs collected from returns to Deep Inlet (not Medvejie Creek Hatchery).
[c] Eggs taken represent egg takes under FTP's 92J-1017 and 92J-1016 combined from broodyear 1992 to 2014.
[d] An additional 3.5 million eggs transferred to Sheldon Jackson Hatchery and 2.8 million eggs discarded.
[e] An additional 2.4 million eggs transferred to Sheldon Jackson Hatchery and 1.4 million eggs discarded.
[f] An additional 1.076 million eggs transferred to Sheldon Jackson Hatchery and 1 million eggs discarded.
[g] An additional 3.23 million eggs transferred to Sheldon Jackson Hatchery.
[h] An additional 1.1 million eggs transferred to Sheldon Jackson Hatchery.

Appendix L.–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 Medvejie Creek Hatchery, 1981–2013. Egg and juvenile salmon numbers are in millions and rounded.

Key: IL=Incubation Location, Exp.=Expiration, AR=Annual Report, MH=Medvejie Creek Hatchery, AC=Andrews Creek, CL=Crystal Lake Hatchery, LPW=Little Port Walter, C=Chickamin River, OC=Ohmer Creek, UR=Unuk River, WL=Whitman Lake Hatchery, MC=Macaulay Hatchery, HP=Halibut Point.

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
1982	MH	0.15		82J-1066	AC	MH	1986	0.05	0.05	MH	1984		82J-1066	1986	0.05	0.027
1983	MH	0.15	0.15	82J-1066	AC	MH	1986	0.15	0.037	MH	1985		82J-1066	1986	0.15	0.022
1984	MH	0.3	0.05	84J-1063	CL/AC	MH	1986	0.15	0.164	MH	1986		84J-1063	1986	0.15	0.108
1985	MH	0.3	0.250	84J-1063	CL/AC	MH	1986	1.1	0.292	MH	1987		84J-1063	Expired	0.15	0.228
1986	MH	0.3	0.3	84J-1063	CL/AC	MH	1986	1.1	0.224	MH	1988		84J-1063	Expired	0.15	0.171
	MH	0.3		[a]	MH/AC	MH			0.004	MH	1988					0.004
1987	MH	2.0	0.3	84J-1063	CL/AC	MH	Exp.	1.1	1.041	MH	1989		84J-1063	Expired	1.1	0.547
	MH				MH/AC	MH			0.303	MH	1989					0.196
1988	MH	2.0	1.3	84J-1063	CL/AC	MH	Exp.	1.1	0.772	MH	1990		84J-1063	Expired		0.457
	MH				MH/AC	MH			0.636	MH	1990				0.15	0.454
	MH			88J-1083	LPW/C	MH	1990	0.020	0.015	MH	1990		88J-1083	1990	0.020	0.010
1989	MH	2.0	1.3		MH/AC	MH		1.1	0.611	MH	1991					0.495
	MH			[b]	OC	MH			0.056	MH	1991					0.034
	MH			[b]	LPW/UR	MH			0.476	MH	1991					0[c]
	MH			89J-1056	WL/C	MH	1989	0.8	0.425	MH	1991		89J-1056	Expired	0.8	0.337
1990	MH	2.0	1.3	89J-1056	WL/C	MH	Exp.[d]	1.0	1.561	MH	1992		89J-1056	Expired	1.0	1.145
1991	MH	2.0	2.0	91J-1060	MH/AC	MH	2011	2.0	0.882[e]	MH	1993		91J-1060	2011	2.0	0.762
1992	MH	2.0	3.6[f]	91J-1060	MH/AC	MH	2011	2.0	1.599	MH	1994		91J-1060	2011	2.0	1.083
1993	MH	2.0	2.3[g]	91J-1060	MH/AC	MH	2011	2.0	1.584	MH	1995		91J-1060	2011	2.0	1.130

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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
1994	MH	2.0	2.3	91J-1060	MH/AC	MH	2011	2.0	0.586[h]	MH	1996		91J-1060	2011	2.0	1.005[i]
	MH		1.3	94J-1029	MC/AC	MH	1997	1.0	0.390							
	MH			84J-1063	CL/AC	MH	Exp.	1.1	0.378							
	MH		1.5	94J-1009	HF/AC	MH	2004	1.5	0.177							
1995	MH	2.0	1.7	94J-1009	HF/AC	MH	2011	2.0	1.385	MH	1997		94J-1009	2004	1.5	1.053
1996	MH	2.0		91J-1060	MH/AC	MH	2011	2.0	0.403	MH	1998		91J-1060	2011	2.0	0.168
	MH		1.7	94J-1009	HF/AC	MH	2004	1.5	1.170	MH	1998		94J-1009	2004	1.5	0.952
1997	MH	3.2	1.7	91J-1060	MH/AC	MH	2011	2.0	1.957	MH	1999		91J-1060	2011	2.0	1.597
1998	MH	3.2	2.9	91J-1060	MH/AC	MH	2011	2.0	3.063	MH	2000		91J-1060	2011	3.2	2.071
1999	MH	3.2	2.7	91J-1060	MH/AC	MH	2011	3.2	3.112	MH	2000		91J-1060	2011	3.2	0.206
										MH	2000		91J-1060	2011	3.2	1.873
2000	MH	3.2	2.9	91J-1060	MH/AC	MH	2011	3.2	2.980	MH	2001		91J-1060	2011	3.2	0.310
										MH	2002		91J-1060	2011	3.2	1.953
	MH			94J-1009	HF/AC	MH	2004	1.5	0.336[j]							
2001	MH	3.2	2.9	91J-1060	MH/AC	MH	2011	3.2	3.142	MH	2002		91J-1060	2011	3.2	0.528
											2003					1.501
2002	MH	3.2	2.9	91J-1060	MH/AC	MH	2011	3.2	3.200	MH	2003		91J-1060	2011	3.2	0.262
											2004					1.930
2003	MH	5.2	2.9	91J-1060	MH/AC	MH	2011	3.2	3.16	MH	2004		91J-1060	2011	3.2	0.709[k]
											2005					1.538
2004	MH	5.2	5.2	91J-1060	MH/AC	MH	2011	3.2	3.800	MH	2005		91J-1060	2011	3.2	0.891
											2006					1.790
2005	MH	5.2		91J-1060	MH/AC	MH	2011	3.2	4.801[l]	MH	2006		91J-1060	2011	3.2	0.934
											2007					1.491
										DI	2006					0.837

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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
2006	MH	5.2		91J-1060	MH/AC	MH	2011	3.2	4.964	MH	2007		91J-1060	2011	3.2	1.084
											2008					2.103
										DI	2007					1.002
2007	MH	5.2		91J-1060	MH/AC	MH	2011	3.2	5.101	MH	2008		91J-1060	2011	3.2	0.873
											2009					2.129
										DI	2008					0.919
2008	MH	5.2		91J-1060	MH/AC	MH	2011	3.2	4.951	MH	2009		91J-1060	2011	3.2	1.853
											2010					1.838
2009	MH	5.2		91J-1060	MH/AC	MH	2011	3.2	4.932[m]	MH	2010		91J-1060	2011	3.2	0.803
											2011					1.69
2010	MH	5.2		91J-1060	MH/AC	MH	2011	3.2	5.173[n]	MH	2012		91J-1060	2011	3.2	2.257[o]
										HP	2012		12J-1002	2020	0.400	0.349
2011	MH	5.2		91J-1060	MH/AC	MH	2011	3.2	3.212	MH	2013		94J-1009	2011	3.2	2.196
										HP	2013		12J-1002	2020	0.400	0.406
2012	MH	5.2		12J-1006	MH/AC	MH	2022	5.2	2.931							
				09J-1020	HF/AC	MH	2020	2.5	1.061							
2013	MH	5.2		12J-1006	MH/AC	MH	2022	5.2	1.761							
				09J-1020	HF/AC	MH	2020	2.5	1.981							

[a] No FTP was found for egg takes or release at Medvejie Creek Hatchery or from Medvejie Creek until l991 (FTP 91J-1060).
[b] No FTP found for this activity. It was likely an egg take covered under a Fisheries Resource Permit.
[c] All Unuk stock destroyed due to disease.
[d] For FTP 89J-1056, amendment increased egg number 800,000 to 1 million in 1990 but expiration date remained 1989.
[e] An additional 1.785 million green eggs collected and sent to Hidden Falls Hatchery.
[f] Includes 2.0 eggs for transfer and release at Hidden Falls Hatchery.
[g] Includes 1.0 eggs for transfer and release at Hidden Falls Hatchery.
[h] An additional 226,000 eggs shipped to Whitman Lake.
[i] Release includes all 1994 brood year sources of Chinook eggs.
[j] All eggs discarded
[k] An additional 10,000 fry transferred to Sheldon Jackson Hatchery in 2004.
[l] Transferred an additional 0.074 million eggs to Sheldon Jackson Hatchery.
[m] Includes 916,000 eyed eggs from Hidden Falls Hatchery
[n] Includes 724,000 eggs from Hidden Falls Hatchery
[o] Transferred 421,000 fry to Port Saint Nicholas Hatchery.

Appendix M.–Comparison of permitted and reported coho salmon egg takes in hatchery permit, BMP, AMP, FTP and annual reports for Medvejie Creek Hatchery, 1981–2013. Egg and juvenile salmon numbers are in millions and rounded.

Key: IL=Incubation Location, Exp.=Expiration, AR=Annual Report, MH=Medvejie Creek Hatchery, SL1=Sea Lion Cove stream 113-61-05, SL2=Sea Lion Cove stream, SL=Sea Lion Cove, 113-61-06, SS=Surprise Lake, DC=Deep Cove, SC=Sashin Creek, BL=Banner Lake, GR=Goulding River, FC=Falls Creek, EL=Elfendahl Lake, LPW=Little Port Walter Hatchery, Porcupine River=PR, Lower Rostislaf Lake=LR, Deer Lake=DL, BL=Banner Lake, BC=Blanchard Lake, FL=Finger Lake, FI=Fiddle Lake, LP=Lords Pocket Lake, SJ=Sheldon Jackson Hatchery, Cliff Lake=CL, IR=Indian River, GC=Game Creek, WC=Wrinkleneck Creek, SR=Suntaheen River, SB=Shamrock Bay, KR=Kadashan River, PL=Plotnikof Lake, OL=Osprey Lake, IRT=Indian River located near Tenakee.

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
1981	SL1	3.0	0.1	81-145	SL1	MH	1981	[a]	0.02	SL1	1982		81-145	1982		0.02
	SL2		0.1	81-153	SL2	MH	1981	[b]	0.03	SL2	1982		81-153	1982		0.01
	DC		0.1	81-149	DC	MH	1981	[c]	0.02	BL	1982		81-149	1982		0.02
	SC		0.1	81-150	SC	MH	1981	[d]	0.09	BL	1982		81-150	1982		0.08
1982	FC	3.3	0.370	82J-1024	FC	MH	1983	0.37	0.23	EL	1983		82J-1024	1983	0.37	0.12
										PR	1984		82J-1024	1983[e]	0.37	0.008
1983	SC	3.3	0.250	83J-1028	SC	MH	1981	0.25	0.24	LR	1984		81-150	1984	0.25	0.19
1984	BL	3.3	1.5	84J-1074	BL	MH	2004	1.5	1.307	DL	1985		84J-1074	2004	1.5	0.781
										BC	1985		85J-1021	2005	0.088	0.075
										FL	1985		85J-1020	2005	0.080	0.050
										FI	1985		85J-1019	2005	0.04	0.030
										OL	1985		85J-1029	1985	0.0006	0.0006[f]
	SL		0.15	84J-1075	SL	MH	1985	0.15	0.147	SL	1985		84J-1075	1985	0.15	0.030
										SS	1985		85J-1018	2005	0.100	0.102
1985	DC	3.3	0.245	85J-1054	DC	MH	2005	0.075	0.075	BL	1986		85J-1054	2005	0.075	0.0700
1986	DL	3.3	1.5	86J-1065	LR/SC	MH	2005	1.6	0.988	DL	1987		86J-1065	2005	1.6	0.843
1987	DL	3.3	1.0	[g]	DL/SC	MH	1997	1.6	1.026	RL	1988		88J-1025	1997	1.6	0.200
										DL	1988		88J-1068	1997	1.6	0.475
										BC	1988		88J-1024	1997	1.6	0.090
										BL	1988		88J-1022	1997	1.6	0.100
										CL	1988		88J-1067	1997	1.6	0.050
1988	BC	3.3	1.2	88J-1066	BC/DC	MH	2008	1.6	1.607	DL	1989		88J-1066	2008	1.6	1.444
	SJ			88J-1109	SJ	MH	1998	0.120	0.147	DI	1990		88J-1109	1998	0.120	0.120

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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
1989	DL	3.3	1.81	88J-1068	DL/SC	MH	1997	1.6	1.908	DL	1990		88J-1068	1997	1.6	1.742
	SJ			88J-1109	SJ	MH	1998	0.120	0.116	DI	1991		88J-1109	1998	0.120	0.101
1990	DL	3.3	2.5	88J-1068	DL/SC	MH	1997	1.6	2.396	DL	1991		88J-1068	1997	2.5	1.875
	SJ		0.12	88J-1109	SJ	MH	1998	0.120	0.162	DI	1992		88J-1109	1998	0.120	0.136
										MH	1992		91J-1029	2001	0.0045	0.0028
	GC		0.050	[h]	GC	MH			0.060	GC	1992					0.058
1991	MH	3.3	0.120	[i]	MH/IR	MH	2001		0.504[j]	WC	1992		92J-1039	1997	0.005	0.005
										SJ	1992		[k]			0.020
										MH	1993					0.003
										DI	1993		[l]			0.136
										SB	1993		92J-1063	1996	0.400	0.280
	DL	3.3	2.5	91J-1015	DL/DC	MH	1998	2.5	2.628	DL	1992		88J-1068	1997	2.5	2.273
											1993					
	GC		0.050	[h]	GC	MH			0.074	GC/SR	1992					0.072
1992	MH	3.3	0.120		MH/IR	MH	2001		0.126	WC	1993		92J-1039	1997	0.005	0.002
										MH	1994					0.005[m]
										DI	1994					0.050
										SB	1994		92J-1063	1996	0.400	0.155
	SJ			88J-1109	SJ	MH	1998	0.120	0.115		1994					
	DL	3.3	2.5	88J-1068	DL/SC	MH	1997	2.5	2.458	DL	1993		88J-1068	1997	2.5	2.330
	GC		0.050		GC	MH			0.099	GC	1993					0.061
1993	MH	3.3	0.055		MH/IR	MH	2001		0.096	WC	1994		92J-1039	1997	0.005	0.002
	SJ			88J-1109	SJ	MH	1998	0.120	0.123	DI	1995					0.042
			0.165							SB	1995		92J-1063	1996	0.400	0.170
										MH	1995		95J-1003	2001	0.005	0.005
	DL	3.3	2.5	88J-1068	DL/SC	MH	1997	2.5	1.779	DL	1994		88J-1068	1997	2.5	1.6
	DL			92J-1005	HF/SC	MH	2002	2.5	0.481	DL	1994		92J-1005	2002	2.5	0.476
1994	MH	3.3		[n]	MH/IR	MH	2001		0.258	WC	1995		92J-1039	1997	0.005	0.002
			0.165							SB	1996		92J-1063	1996	0.400	0.231
			0.055							MH	1996		95J-1003	2001	0.005	0.005
	DL		2.5	92J-1005	HF/SC	MH	2002	2.5	2.574	DL	1995		92J-1005	2002	2.5	2.425
1995	MH	3.3		95J-1003	MH/IR	MH	2013	0.005	0.245	WC	1996		92J-1039	1997	0.005	0.002
			0.165							SB	1997		92J-1063	1996	0.400	0.226
			0.055							MH	1997		95J-1003	2013	0.005	0.007
	DL		2.5	92J-1005	HF/SC	MH	2002	3.0	2.626	DL	1996		92J-1005	2002	3.0	2.392

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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	MH	3.3	0.002	95J-1003	MH/IR	MH	2013	0.005	0.257[o]	WC	1997		92J-1039	1997	0.005	0.002
			0.005							MH	1997		95J-1003	2013	0.005	0.007
			0.220							SB	1998		92J-1063	2007	0.400	0.238
	DL		2.7	92J-1005	HF/SC	MH	2002	3.0	2.927	DL	1997		92J-1005	2002	3.0	2.715
1997	MH	3.3	0.007	95J-1003	MH/IR	MH	2013	0.007	0.031	MH	1999		95J-1003	2013	0.007	0.007[p]
	DL		2.8	94J-1027	HF/DC	MH	2004	3.0	3.016	DL	1997		94J-1027	2004	3.0	2.829
1998	MH	3.3	0.002	95J-1003	MH/IR	MH	2013	0.007	0.232	WC	1999		99J-1032	2009	0.007	0.002
			0.007							MH	2000		95J-1003	2013	0.010	0.010
			0.220							SB	2000		92J-1063	2007	0.400	0.199
	DL		2.9	92J-1005	HF/SC	MH	2002	3.0	2.832	DL	1999		92J-1005	2002	3.0	2.525
1999	MH	3.3	0.007	95J-1003	MH/IR	MH	2013	0.007	0.252[q]	MH	1997		95J-1003	2013	0.010	0.010
			0.400							SB	1998		92J-1063	2007	0.400	0.227
2000	MH	3.3	0.010	95J-1003	MH/IR	MH	2013	0.010	0.414	MH	2000		95J-1003	2013	0.010	0.010
			0.270							SB	2002		92J-1063	2007	0.400	0.349
	DL		2.8	94J-1027	HF/DC	MH	2004	3.0	2.837	DL	2000		94J-1027	2004	3.0	2.4
	IRT			00J-1013	KR	MH	2000	0.100	0.027	IRT	2001		00J-1013	2001	0.100	0.018
2001	MH	3.3	0.010	95J-1003	MH/IR	MH	2013	0.010	0.268	MH	2003		95J-1003	2013	0.010	0.010
			0.400							SB	2003		92J-1063	2007	0.400	0.220
2002	MH	3.3	0.010	95J-1003	MH/IR	MH	2013	0.010	0.327	MH	2004		95J-1003	2013	0.010	0.011
			0.400							SB	2004		92J-1063	2007	0.400	0.363
	IR			00J-1013	KR	MH	2002	0.100	0.050	IR	2003		00J-1013	2003	0.100	0.047
	MH			02J-1012	PL	MH	2007	0.220	0.042	MH	2004		02J-1012	2007	0.220	0.039
	DL		2.8	92J-1005	HF/SC	MH	2002	2.5	2.6	DL	2003		92J-1005	2002	2.5	2.327
2003	MH	3.3	0.010	95J-1003	MH/IR	MH	2013	0.010	0.325	MH	2005		95J-1003	2013	0.010	0.020
			0.200							SB	2005		92J-1063	2007	0.400	0.286
	IR		0.060	00J-1013	KR	MH	2003	0.100	0.052	IR	2004		00J-1013	2003	0.100	0.046
	DL		2.8	92J-1005	HF/SC	MH	2004	3.0	2.700	DL	2004		92J-1005	2004	3.0	1.755

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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
2004	MH	3.3	0.010	95J-1003	MH/IR	MH	2013	0.010	0.024[r]	SJ	2006		[s]			0.024
	IR		0.060	00J-1013	KR	MH	2004	0.100	0.030	IR	2005		00J-1013	2004	0.100	0.028
	DL		2.8	94J-1027	HF/DC	MH	2004	3.0	2.5	DL			94J-1027	2004	3.0	
	MH		0.220	02J-1012	PL	MH	2007	0.220	0.154	MH	2006		02J-1012	2007	0.220	0.010
										DI	2006		02J-1012	2007	0.220	0.119
2005	MH	0.410		95J-1003	MH/IR	MH	2013	0.010	0.073[t]	SJ						
	MH			02J-1012	PL	MH	2007	0.220	0.245	MH	2007		02J-1012	2007	0.220	0.010
										DI	2007		02J-1012	2007	0.220	0.202
2006	MH	0.410		95J-1003	MH/IR	MH	2013	0.010	0.108[u]							
	MH			02J-1012	PL	MH	2007	0.220	0.224	MH	2008		02J-1012	2007	0.220	0.020
										DI	2008		02J-1012	2007	0.220	0.193
2007	MH	0.410		02J-1012	PL	MH	2007	0.220	0.443	DI	2009		02J-1012	DI	0.220	0.243
2008	MH	0.410		02J-1012	PL	MH	2007	0.220	0.020[v]							
2009	MH	0.410		09J-1018	SL	MH	2013	0.325	0.242	MH	2011		09J-1018	2013	0.050	0.055
										DI	2011		09J-1019	2013	0.200	0.163
2010	MH	0.410		09J-1018	SL	MH	2013	0.325	0.175	MH	2012		09J-1018	2013	0.050	0.050
										DI	2012		09J-1019	2013	0.200	0.116
2011	MH	0.410		09J-1018	SL	MH	2013	0.325	0.222	MH	2013		09J-1018	2013	0.050	0.053
2012	MH	0.410		09J-1018	SL	MH	2013	0.325	0.471[w]							
2013	MH	0.410		12J-1009	MH/DI/SL	MH	2022	0.410	0.583[x]							

-continued-

[a] FTP 81-145 permitted up to 10 males and 10 females taken from Sea Lion Cove stream 113-61-05. No egg or release number was listed. A total of 12 coho salmon were taken.
[b] FTP 81-153 permitted up to 10 males and 10 females taken from Sea Lion Cove stream 113-61-06. No egg number was listed. A total of 21 coho salmon were taken.
[c] FTP 81-149 permitted up to 25 males and 25 females taken from Deep Cove stream 109-10-23 and release to Banner Lake. No egg number was listed. A total of 21 coho salmon were taken.
[d] FTP 81-150 permitted up to 25 males and 25 females taken from Sashin Creek. No egg number was listed. A total of 64 salmon were taken.
[e] FTP 82J-1024 allowed a 1983 release of fry. The 1984 release of smolt was not authorized.
[f] According to the FTP for this release, the fish were to be released into net pens in Osprey Lake for study and not released into the lake. It is unclear from the Annual Report if the fish were released into net pens or into the lake.
[g] The FTP for the egg takes to stock the barrier lakes each were for up to 1.6 million eggs. However, the eggs taken were not listed by project. Only the fry release was listed by project. So the egg take was for all the projects combined.
[h] FTPs for the Game Creek program were not found but likely exist according to Ron Josephson, ADF&G project leader at the time, personal communication. For the 1992 release of Game Creek fry to both Game Creek and Suntaheen River, it is uncertain if the release to Suntaheen was covered under an FTP or other permit. The 1992 AMP indicates that Game Creek fry would be released at Suntaheen River. An FTP was found for release of Suntaheen River coho stock back to the Suntaheen River, but no FTP was found authorizing Game Creek stock coho salmon stocking of Suntaheen River.
[i] No FTP found for egg collections from returns to Medvejie Creek Hatchery of Indian River fish. Only FTP was for use of eggs from Sheldon Jackson Hatchery.
[j] Includes 20,000 eggs which were transferred to Sheldon Jackson College Hatchery under FTP 92J-1004.
[k] No FTP found for release of fish at SJ of MH stock smolt reared at MH.
[l] An FTP was issued to release SJ returns incubated at MH at DI, but no FTP was found for release of MH returns incubated at MH and released at DI.
[m] Includes both SJ Indian River stock and MH Indian River stock smolt.
[n] No FTP found authorizing egg collections from returns to Medvejie Creek Hatchery of Indian River fish, except for 95J-1003, which permitted a small egg take.
[o] An additional 67,000 eyed eggs transferred to Sheldon Jackson Hatchery.
[p] An additional 16,856 smolt were transferred to Sheldon Jackson Hatchery for release at SJ.
[q] Includes 10,000 Indian River stock eggs which were transferred to Sheldon Jackson College Hatchery under FTP 99J-1022.
[r] An additional 81,000 eggs were collected and transferred to Sheldon Jackson Hatchery.
[s] Smolt transferred to Sheldon Jackson Hatchery for release.
[t] Transferred to Sheldon Jackson Hatchery for release.
[u] An additional 110,000 eggs were collected and transferred to Sheldon Jackson Hatchery.
[v] All eggs destroyed. Medvejie Creek Hatchery switching stocks.
[w] A total of 471,000 eggs collected, including 405,000 from hatchery returns and 65,000 from Salmon Lake broodstock. Of the eggs collected, 396,000 were transferred to Sawmill Creek Hatchery at the eyed stage.
[x] An additional 1.487 million eggs transferred to Sawmill Creek Hatchery.

Appendix N.–Comparison of permitted and reported pink salmon egg takes in hatchery permit, basic management plan, annual management plan, fishery transport permits and annual reports for Medvejie Creek Hatchery, 1981–2013. Egg and juvenile salmon numbers are in millions and rounded.

Key: IL=Incubation Location, Exp.=Expiration, AR=Annual Report, MH=Medvejie Creek Hatchery.

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
1985	MH	0.1		[a]	MC	MH			0.0.059	MH						0.058
1986	MH	0.1			MC	MH			0.107	MH						0.105
1987	MH	0.1	0.1	87J-1036	MC	MH	2012	0.100	0.102	MH	1988		87J-1036	2012	0.100	0.097
1988	MH	0.1	0.1	87J-1036	MC	MH	2012	0.100	0.036	MH	1989		87J-1036	2012	0.100	0.034
1989	MH	0.1	0.1	87J-1036	MC	MH	2012	0.100	0.020	MH	1990		87J-1036	2012	0.100	0.019
1990		No egg take reported.														
1991	MH	0.3	0.1	87J-1036	MC	MH	2012	0.100	0.251	MH	1992		87J-1036	2012	0.300	0.132
1992	MH	0.3	0.3	87J-1036	MC	MH	2012	0.300[b]	0.146	MH	1993		87J-1036	2012	0.300	0.132
1993	MH	0.3	0.3	87J-1036	MC	MH	2012	0.300	0.049	MH	1994		87J-1036	2012	0.300	0.032
1994	MH	0.3	0.3	87J-1036	MC	MH	2012	0.300	0.215	MH	1995		87J-1036	2012	0.300	0.193
1995	MH	0.3	0.3	87J-1036	MC	MH	2012	0.300	0.195	MH	1996		87J-1036	2012	0.300	0.186
1996	MH	0.3	0.3	87J-1036	MC	MH	2012	0.300	0.319[c]	MH	1997		87J-1036	2012	0.300	0.276
1997	MH	0.3	0.3	87J-1036	MC	MH	2012	0.300	0.224	MH	1998		87J-1036	2012	0.300	0.209
1998	MH	0.3	0.3	87J-1036	MC	MH	2012	0.300	0.384	MH	1999		87J-1036	2012	0.300	0.270
1999	MH	0.3	0.3	87J-1036	MC	MH	2012	0.300	0.220	MH	2000		87J-1036	2012	0.300	0.178
2000	MH	0.3	0.3	87J-1036	MC	MH	2012	0.300	0.312	MH	2001		87J-1036	2012	0.300	0.292
2001	MH	0.3	0.3	87J-1036	MC	MH	2012	0.300	0.266	MH	2002		87J-1036	2012	0.300	0.258
2002	MH	0.3	0.3	87J-1036	MC	MH	2012	0.300	0.298	MH	2003		87J-1036	2012	0.300	0.265
2003	MH	0.3	0.3	87J-1036	MC	MH	2012	0.300	0.312	MH	2004		87J-1036	2012	0.300	0.300
2004	MH	0.3	0.3	87J-1036	MC	MH	2012	0.300	0.292	MH	2005		87J-1036	2012	0.300	0.269
2005	MH	0.3		87J-1036	MC	MH	2012	0.300	0.467	MH	2006		87J-1036	2012	0.300	0.285
2006	MH	0.3		87J-1036	MC	MH	2012	0.300	0.330[d]	MH	2007		87J-1036	2012	0.300	0.325
2007	MH	0.3		87J-1036	MC	MH	2012	0.300	0.368	MH	2008		87J-1036	2012	0.300	0.325
2008	MH	0.3		87J-1036	MC	MH	2012	0.300	0.348	MH	2009		87J-1036	2012	0.300	0.285
2009	MH	0.3		87J-1036	MC	MH	2012	0.300	0.315	MH	2010		87J-1036	2012	0.300	0.271
2010	MH	0.3		87J-1036	MC	MH	2012	0.300	0.319	MH	2011		87J-1036	2012	0.300	0.300
2011	MH	0.3		87J-1036	MC	MH	2012	0.300	0.377	MH	2012		87J-1036	2012	0.300	0.300
2012	MH	0.3		87J-1036	MC	MH	2022	0.300	0.377	MH	2013		87J-1036	2022	0.300	0.277
2013	MH	0.3		87J-1036	MC	MH	2022	0.300	0.305							

[a] FTP 87J-1036 not issued until 1987. Egg take may have been taken under a Fisheries Resource Permit in the first year.
[b] FTP amended for increased egg take as a requirement of DNR water permit.
[c] An additional 17,400 green eggs were discarded.
[d] An additional 0.334 million eggs discarded.