2024

ANNUAL MANAGEMENT PLAN

KITOI BAY HATCHERY

Kodiak Regional Aquaculture Association

This Annual Management Plan (AMP) is prepared to fulfill the requirements of 5 AAC 40.840. This plan must organize and guide the hatchery's operations regarding production goals, broodstock management, and harvest management of hatchery returns. The plan must be developed with consideration of the hatchery's production cycle. The production cycle begins with adult returns, that lead to egg takes and end with fish releases. Action may be taken outside of the management plan if allowed under the hatchery permit or modified by emergency order. Inseason assessments and project alterations by Kodiak Regional Aquaculture Association (KRAA) or Alaska Department of Fish and Game (ADF&G) may result in changes to this AMP in order to reach or maintain program objectives. KRAA will notify the ADF&G private nonprofit (PNP) hatchery program coordinator in a timely manner of any departure from the AMP. The ADF&G PNP coordinator will advise as to whether an amendment, exception report, or other action is warranted. No variation or deviation will be implemented until an AMP amendment has been approved or waived by both the department and KRAA. This policy applies to all hatchery operations covered under the AMP.

INTRODUCTION

The Kitoi Bay Hatchery (KBH) is located on Afognak Island (58°11.04′N lat., 152°21.04′W long.) on the west side of Izhut Bay approximately 48 km (30 miles) north of the city of Kodiak (Appendix A1). The hatchery infrastructure was constructed in 1954 by the U.S. Department of the Interior, Fish and Wildlife Service (USFWS), but was destroyed in the 1964 earthquake and rebuilt by ADF&G in 1965.

Funding for the hatchery was provided exclusively by ADF&G prior to state fiscal year 1987 (FY87) and was provided jointly by ADF&G and Kodiak Regional Aquaculture Association (KRAA) from FY87 to FY91. The hatchery has been fully funded by KRAA since FY92. KBH is owned by the State of Alaska, and KRAA operates the facility under an agreement with the State of Alaska. The hatchery is operated in accordance with AS 16.10.400–480, the *KBH Basic Management Plan* (BMP), *KBH Annual Management Plan* (AMP), private nonprofit (PNP) hatchery permit #29, and further delineated by fish transport permits

The hatchery was initially designed as a sockeye salmon (*Oncorhynchus nerka)* research facility. By 1976, hatchery production priorities switched to pink salmon (*O. gorbuscha)* fisheries enhancement. The present goal of the facility is to provide enhanced common property salmon fishing opportunities for Kodiak Management Area (KMA) fishermen by increasing returns of pink, chum (*O. keta)*, coho *(O. kisutch)*, and sockeye salmon through broodstock development, egg takes, incubation, hatching, rearing and releasing juvenile salmon, primarily to the Kitoi Bay area. KBH primarily increases salmon harvest in KMA

commercial fisheries. Secondary user groups (in terms of the number of salmon harvested) of hatchery production include subsistence and sport fishermen. KBH has the capacity to produce 230 million juveniles of all life stages (fry, fingerling, presmolt, and smolt).

The purpose of this AMP is to describe the proposed stocking, rearing, and egg-take activities to be undertaken by KBH in 2024, anticipated 2024 salmon returns resulting from KBH projects, and management of KBH salmon in Kodiak waters. Appendix A contains maps showing the KMA and the location of KBH and various projects. Appendix B contains KBH production records. Appendix C shows data and methodology used for return and harvest estimates, and Appendix D lists relevant KBH fish transport permits (FTP).

1.0 OPERATIONAL PLANS FOR 2024

1.1 Egg-take Limits and Broodstock Sources

PNP salmon hatchery permit number 29, approved permit alterations, and the KBH BMP specify the maximum green egg capacity and broodstock by species. Hatchery release sites are similarly authorized, and projects are further delimited by fish transport permits (FTPs).

Species	Permitted Level	Donor Stock / Ancestral stock	Egg-Take Goal	Release Site
Chum salmon	36,000,000	Kitoi Bay H / Sturgeon River	36,000,000	Kitoi Bay
Pink salmon	215,000,000	Kitoi Bay H / Kitoi Bay	215,000,000	Kitoi Bay
Coho salmon	2,300,000	Kitoi Bay H/ L Kitoi Lk[a]	1,800,000	Kitoi Bay
		Kitoi Bay H / L Kitoi Lk[a]	190,000	Crescent Lake
		Kitoi Bay H / L Kitoi Lk[a]	230,000	Jennifer Lake
		Kitoi Bay H / L Kitoi Lk[a]	40,000	Katmai Lake[b]
		Kitoi Bay H / L Kitoi Lk[a]	40,000	Ruth Lake
Sockeye salmon	850,000	Little Kitoi Lake / Saltery Lake[c]	850,000	Little Kitoi Lake
	100,000	Little Kitoi Lake / Saltery Lake[c]		Ouzinkie

[a] Starting with brood year 2013 and every third year after that (2019, 2022, 2025…), the ancestral stock of coho returns to KBH is Little Kitoi Lake and Buskin River combined.

[b] KRAA submitted a Permit Alteration Request (PAR) to release coho at Ouzinkie.

[c] Saltery Lake is ancestral stock for Little Kitoi Lake sockeye and is permitted as a backup brood source.

Note: Maximum numbers are specific to release site; in combination may not exceed permitted capacity.

1.2 Capture, Egg Take, Transport, and Carcass Disposal Plans

1.2.1 Chum Salmon: Big Kitoi Creek

Approximately 50,000 returning adult KBH chum salmon will be needed for broodstock to achieve the egg-take goal of 36 million eggs. Adults will be collected and contained behind a barrier seine prior to ascending the fish ladder to the broodstock raceways where the eggs are collected. KBH will use the dry spawning method and water harden eggs in an iodophor solution for one hour prior to loading into incubators. No Big Kitoi Creek (BKC) chum salmon gametes will be transferred to any other location. Chum salmon egg collection normally occurs between July 15th and August 1st. Chum salmon carcasses will be disposed of in Outer Kitoi Bay and are documented on the KRAA Salmon Hatchery Carcass Disposal Log.

1.2.2 Pink Salmon: Big Kitoi Creek

Approximately 425,000 returning adult KBH pink salmon will be needed for broodstock to achieve the egg-take goal of 215 million eggs. Adults will be collected and contained behind a barrier seine prior to ascending the lower section of the fish ladder where the eggs are collected. KBH will use the dry spawning method before loading eggs into incubators. No BKC pink salmon gametes will be transferred to any other location. Pink salmon egg collection normally occurs between September 1st and the 21st. Pink salmon carcasses may be disposed of in Outer Kitoi Bay and will be documented on the KRAA Salmon Hatchery Carcass Disposal Log, or they may be sold to processors.

1.2.3 Coho Salmon: Big Kitoi Creek

Approximately 6,000 returning adult KBH coho salmon will be needed for broodstock to achieve the egg-take goal of 2.3 million eggs. Coho salmon eggs will be collected for future releases into Big Kitoi Bay, Jennifer, Ruth, and Crescent Lakes, and Ouzinkie Harbor (pending permit approval) . Adults will be collected and contained behind a barrier seine prior to ascending the fish ladder to the broodstock raceways where the eggs will be collected. KBH will use the dry spawning method and water harden eggs in an iodophor solution for one hour prior to loading into incubators. No BKC coho salmon gametes will be transferred to any other location. Coho salmon egg collection normally occurs on November 1st. Coho salmon carcasses will be disposed of in Outer Kitoi Bay and documented on the KRAA Salmon Hatchery Carcass Disposal Log.

1.2.4 Sockeye Salmon: Little Kitoi Lake

Approximately 1,200 adult sockeye salmon returning to Little Kitoi Lake (LKL) will be used for broodstock to achieve the egg-take goal of 850,000 eggs. Sockeye salmon adults will be collected by seining in LKL during the first week of September. Broodstock will be held in 20’ x 20’ net pens in LKL for about two weeks prior to egg collection. Standard sockeye salmon egg-take procedures will be used during egg take, and eggs will be water hardened in an iodophor solution for one hour prior to transfer back to KBH for incubation. Sockeye salmon gametes will be transferred from LKL to

KBH for incubation, rearing, and release back into LKL, but none will be transferred to any other location. Egg collection normally occurs between September 14th and the 21st. Brood use for these egg takes will be documented in the KRAA Salmon Hatchery Carcass Disposal Log.

1.3 Incubation Plans

1.3.1 Chum Salmon

Chum salmon eggs will be incubated in the main hatchery building in two types of NOPAD incubators supplied with ultraviolet (UV)-treated water. Kitoi NOPADs will be loaded at 420,000 green eggs and 235,000 eyed eggs. Regular NOPAD incubators will be loaded at 336,000 green eggs and 200,000 eyed eggs. Fry generally emerge from incubators between the second week in January and the first week in March. All chum salmon fry will be non-volitionally ponded from these incubators through a high-density polyethylene (HDPE) line, directly to saltwater net pens. Approximately 21 million brood year 2023 (BY23) chum salmon juveniles are currently incubating at KBH for release in 2024.

1.3.2 Pink Salmon

Pink salmon eggs will be incubated in the main and expansion hatchery buildings in Kitoi NOPADs, regular NOPADs, and Kitoi box incubators. Kitoi NOPADs will be loaded at 500,000 green eggs and 350,000 eyed eggs. Regular NOPADs will not be loaded with green eggs, but will be loaded with 304,000 eyed eggs. Kitoi box incubators will be loaded at 825,000 green eggs at egg take and at 430,000 eyed eggs after pick. Fry generally emerge from incubators during the third week in March. All fry in Kitoi Box incubators will move volitionally to saltwater net pens through polyvinyl chloride (PVC) piping and will be enumerated with electronic fry counters. This represents about 43% of the number of juveniles, or about 87 million fry. The remaining 57% of pink salmon fry, or about 115 million juveniles, will move non-volitionally through a separate HDPE outmigration line to saltwater net pens. Approximately 202 million BY22 pink salmon juveniles are currently incubating at KBH for release in 2024.

1.3.3 Coho Salmon

Coho salmon eggs will be incubated in Kitoi box, NOPAD, and Heath tray incubators located in the Coho Annex. The annex is an isolated incubation room attached to the Main Hatchery Building. Coho salmon NOPAD incubators are partitioned for single family tracking for BKD and will be loaded at 60,000 to 180,000 green eggs at egg take. Heath tray incubators are partitioned for single family tracking and will be loaded at 126,000 green eggs per stack. After single family tracking is complete, Kitoi Boxes will be loaded at 280,000 eyed eggs. Fry generally emerge from incubators between the third week in May and the first week in June. All fry will move volitionally from incubators, through PVC piping, to a collection trough where they are enumerated and ponded into raceways. Approximately 2.3 million BY23 coho salmon eggs are currently incubating at KBH for release in 2024 and 2025.

1.3.4 Sockeye Salmon

Sockeye salmon eggs will be incubated at KBH in Kitoi box incubators in an isolated room supplied with UV-treated water. The eggs will be disinfected prior to loading into the incubators. Incubators will be loaded at approximately 125,000 green eggs each. Fry generally emerge from incubators between the second week of May and the last week in May. Fry will emerge volitionally from incubators into start tanks which are placed adjacent to the incubators and then will be transferred to raceways supplied with UV-treated water. Approximately 671,000 BY23 sockeye salmon eggs are currently incubating at KBH for release in 2024 and 2025.

1.4 Rearing and Release Plans

1.4.1 Chum Salmon

Approximately 21 million BY23 chum salmon fry will be reared in net pens and released between 2.0 and 4.0 grams (g) within the Inner Kitoi Bay Section between May 6 and June 1 (Appendix B1). Fry will be reared in saltwater net pens for approximately 10 to 16 weeks. Fry will be released in two separate groups: one half of the juveniles (otolith marked 4,4,2H) will be released between May 6 and May 18, and the second group (marked 3n,2HH) will be released two weeks later. The late release group may be split into empty pens that result from the first release.

1.4.2 Pink Salmon

Approximately 202 million BY22 pink salmon fry (marked 2,3H) will be reared in net pens and released at 0.8 g within the Inner Kitoi Bay Section between May 6 and May 30 (Appendix B2). The fry will be reared in saltwater net pens for approximately 3 to 9 weeks.

1.4.3 Coho Salmon

Approximately 1.34 million BY22 coho salmon smolt (marked 2,2,2H) will be reared in net pens and released at approximately 20.0 g within the Inner Kitoi Bay Section between June 3 and June 17 (Appendix B3).

Assuming permits are approved, approximately 40,000 BY22 coho salmon smolt (marked 2,2,2H) will be transferred to Ouzinkie Boat Harbor (OBH) for imprinting and release. The fish will be transported to OBH in an oxygenated transfer tank and pumped into net pens in the harbor for approximately three to four weeks of rearing and imprinting. Release will occur around the first week of June at approximately 20.0 grams per fish.

Approximately 2.0 million BY23 coho salmon fry will be ponded in June and reared at KBH for release to several different locations. After results of single family tracking are received, all eggs from hens with mean optical density values >0.2 will be culled and discarded. KBH plans to release 40,000 coho salmon fry (marked 2,2H) into Ruth Lake, 230,000 fry (marked 2,2H) into Upper and Lower Jennifer Lakes, and 190,000 fry (marked 2,2H) into Crescent Lake around the middle of July 2024. Assuming permits are approved, approximately 40,000 smolt (OBH) will be transferred for short-term net pen rearing and imprinting prior

to being released in the spring of 2025. Approximately 1.45 million fry will be retained at KBH for rearing and eventual release within the Inner Kitoi Bay Section as 20.0 g smolt (marked 2,2H) in June of 2025.

1.4.4 Sockeye Salmon

Approximately 287,000 BY22 Saltery Lake sockeye salmon smolt (marked 3,2H) will be reared in net pens in LKL and released at 24.0 g into the Little Kitoi Estuary (LKE) in the first week of June (Appendix B4). The fish will be transported to LKL in an oxygenated transfer tank and pumped into net pens in the lake for approximately three to five weeks of rearing and imprinting. Smolt will then be siphoned from net pens to the estuary for release at the beginning of June during the peak outmigration of the resident sockeye salmon smolt.

Approximately 40,000 BY22 Saltery Lake sockeye salmon smolt (marked 3,2H) will be transferred to Ouzinkie Boat Harbor (OBH) for imprinting and release. The fish will be transported to OBH in an oxygenated transfer tank and pumped into net pens in the harbor for approximately three to four weeks of rearing and imprinting. Release will occur around the first week of June at approximately 24.0 grams per fish.

Approximately 671,000 BY23 Saltery Lake sockeye salmon eggs are currently incubating at KBH and will be released into LKE and OBH in 2025. Approximately 620,000 to 670,000 smolt (LKL) and 0 to 50,000 smolt (OBH) will be transferred for short-term net pen rearing and imprinting prior to being released in the spring of 2025.

2.0 WILD DONOR STOCK MANAGEMENT

There are no plans or expectations to use naturally-spawning salmon stocks as donor stocks for KBH broodstock and egg takes. If sockeye salmon returns to Little Kitoi Lake are too low to provide the broodstock needed to meet the egg take goal, then a backup egg take may occur at Saltery Lake. Saltery Lake is a primary egg take site for late-run sockeye at Pillar Creek Hatchery. See the Pillar Creek Hatchery Annual Management Plan for Saltery Lake egg take plans.

Management of KBH salmon stocks is detailed in the *Hatchery Return Management* section below.

2.1 Common Property Fisheries

Not applicable.

2.2 Escapement Requirements

Not Applicable.

2.3 Donor Stock Collection Procedures

Not Applicable.

3.0 HATCHERY RETURN MANAGEMENT

Management of salmon harvested by subsistence and commercial fishermen will be conducted by the ADF&G Division of Commercial Fisheries through permitting, preseason development of regulatory management plans and annual harvest strategies, inseason management actions by emergency order (EO) establishing fishing time and area (within guidelines in management plans) based on harvest strategies and inseason salmon escapements and/or other conservation considerations.

Harvest of salmon by sport anglers and personal use fishermen is managed by the ADF&G Division of Sport Fish in accordance with regulations as provided in 5 AAC 47 – 5 AAC 75. Emergency orders may be issued to liberalize or restrict sport fisheries based on achievement of broodstock goals.

KRAA staff work closely with the Kodiak ADF&G commercial and sport fisheries area management biologists (AMBs) to assure that they have information that KRAA can provide to manage the associated fisheries. KRAA is involved in cooperative projects with ADF&G and assists in the management of natural stocks by providing funding and personnel to gather data necessary for sustainable management of Kodiak salmon populations. Further, KRAA staff share openly with ADF&G salmon management staff any inseason observations on salmon runs or fishery issues.

KBH is a remote facility located on the east side of Afognak Island (Appendix A1), and KBH-released salmon return to waters adjacent to the hatchery. The Kitoi Bay commercial fishery harvest strategy is described in the *Eastside Afognak Management Plan* (5 AAC 18.365) and is designed to increase fishing opportunities for the commercial salmon fishery in the Duck, Izhut, and the Inner and Outer Kitoi Bay Sections (Appendix A2) while providing for adequate returns to KBH.

Inseason management of KBH salmon runs is complex, with overlapping run timing between species and multispecies broodstock priorities. The ADF&G Kodiak commercial fishery salmon AMB will open and close the Duck, Izhut, and Inner and Outer Kitoi Bay Sections adjacent to KBH as needed to harvest hatchery salmon returns in common property or cost-recovery fisheries. During broodstock collection periods, adjustments to fishing periods in KBH management units will be necessary. Communication between the Kodiak salmon fisheries AMB and the Kitoi Bay hatchery manager is essential to secure broodstock to achieve egg-take goals while maintaining harvests on high quality hatchery returns.

3.1 Hatchery Return Projections

3.1.1 Chum Salmon

The midpoint estimate for adult chum salmon returning to KBH in 2024 is 138,000 fish (range 110,000 to 165,500 fish), assuming a 0.73% marine survival (Appendix C1) from the 2021 fry release of 30 million.

3.1.2 Pink Salmon

The midpoint estimate for adult pink salmon returning to KBH in 2024 is 4.6 million fish (range 3.45 million to 5.75 million fish), assuming a 2.4% marine survival (Appendix C1) from the 2023 fry release of 191.75 million.

3.1.3 Coho Salmon

The midpoint estimate for adult coho salmon returning to KBH in 2024 is 52,000 fish (range 39,000 to 65,700 fish), assuming a 9.8% marine survival (Appendix C1) from the 2023 smolt release of 535,000.

3.1.4 Sockeye Salmon

The midpoint estimate for adult sockeye salmon returning to LKL in 2024 is 6,000 fish (range 4,800 to 7,200 fish), based on poor recent brood year survivals of around 2.5% to 3% (Appendix C1). Additionally, there were no juvenile BY19 sockeye salmon released from the hatchery in 2021. As a result, the returning 3-ocean age class will be missing in 2024 which historically makes up 28.5% of the Kitoi Bay sockeye salmon run.

3.2 Returns to Common Property Fisheries

3.2.1 Chum Salmon

Chum salmon are produced for harvest by the common property fishery. The anticipated 2024 KBH chum salmon run is 138,000 fish. About 50,000 adults will be needed for broodstock. Additionally, BKC chum salmon escapement will be monitored by KBH staff with an annual escapement objective of 2,000 adults. An estimated 86,000 chum salmon will be available for common property harvest.

Chum salmon produced at KBH are taken in the commercial common property fishery in the Duck, Izhut, and Inner and Outer Kitoi Bay Sections. The chum salmon run begins in early June, peaks in late June to early July, and ends in late July. The initial KBH chum salmon commercial fishery opening is expected to occur on June 9, 2024, but may occur as early as June 1, 2024. Portions of the Inner and Outer Kitoi, Izhut, and Duck Bay Sections are expected to close for broodstock collection around June 30, 2024.

3.2.2 Pink Salmon

Pink salmon are produced for the common property fishery, as well as for cost recovery. The anticipated 2024 KBH pink salmon return is 4.6 million fish. Approximately 425,000 pink salmon adults will be needed for broodstock. The 2024 cost recovery harvest goal determined by the KRAA board of directors is 3.0 million lbs (909,000 pink salmon). Broodstock collection will be prioritized above cost recovery. Additionally, BKC pink salmon escapement will be monitored by KBH staff, with an annual escapement objective of 15,000 adults.

Pink salmon produced at KBH will be harvested in the commercial fishery in the Duck, Izhut, and Inner and Outer Kitoi Bay Sections. The Kitoi Bay pink salmon return begins in mid-July, peaks in early to mid-August, and ends in late August to early September. The initial fishery opening for pink salmon is anticipated to occur on July 6, 2024 and is designed to assess run strength and timing and to harvest excess males, which arrive during the early portion of the run. Traditionally, portions of the Inner and Outer Kitoi, Izhut, and Duck Bay Sections could close to commercial common property fishing for cost-recovery operations around August 1.

The number of pink salmon available for the common property fishery will depend on a combination of marine survival, average adult fish weight, and KRAA's cost recovery harvest needs. In addition, once cost recovery operations are complete, portions of the Duck, Izhut, and Inner and Outer Kitoi Bay Sections could close for pink salmon broodstock collection.

3.2.3 Coho Salmon

The anticipated 2024 KBH coho salmon return is 52,000 fish. About 6,000 adult coho salmon are required for broodstock. Approximately 46,000 coho salmon will be available for common property harvest.

Coho salmon produced at KBH will be harvested in the commercial common property fishery in the Duck, Izhut, and Inner and Outer Kitoi Bay Sections. The coho salmon run is expected to start in early August, peak in late August, and continue through early September. KBH coho salmon will be harvested incidental to the pink salmon fishery in the Duck, Izhut, and Inner and Outer Kitoi Bay Sections as well as in directed coho salmon fisheries in late August and early September. After August 24, fishing time in some of these sections will depend on the abundance of local and hatchery coho salmon. There is no anticipated return to Jennifer and Ruth Lakes, as there were no remote releases in 2022.

3.2.4 Sockeye Salmon

The anticipated 2024 KBH sockeye salmon return is 6,000 fish. About 1,200 adult sockeye salmon are required for broodstock. Sockeye salmon broodstock will be collected in LKL following a desired escapement of 6,000 into the system. When maturing adults aggregate in the lake, they will be captured by beach seine and sorted by sex into floating net pens where they are held until ready for egg collection. No sockeye salmon will be available for common property harvest.

Sockeye salmon produced at LKL will be incidentally harvested in the commercial common property fishery in the Duck, Izhut, and Inner and Outer Kitoi Bay Sections. However, a portion of the LKL sockeye run will also be harvested incidentally in the cost recovery program. The sockeye salmon run should begin in late June and continue through late August with the peak occurring during the last two weeks of July.

4.0 EVALUATION/SPECIAL STUDIES

4.1 Marking and Tagging Programs

4.1.1 Chum salmon

All chum salmon juveniles are thermal marked using differential water sources from Big Kitoi Lake (deep and shallow). Two different marks were given for BY23 chum salmon: 4,4,2H for the regular release group, and 3n,2H for the late release group which will be released approximately two weeks after the regular release group.

4.1.2 Pink Salmon

There is no marking requirement for pink salmon releases from KBH. However, a 2,3H saltwater mark was applied to all BY23 pink salmon.

4.1.3 Coho Salmon

There is no marking requirement for coho salmon releases from KBH. However, a 2,2H dry mark will be applied to all BY23 coho salmon eggs.

4.1.4 Sockeye Salmon

All sockeye salmon eggs are dry marked. Approximately 100,000 BY23 sockeye salmon eggs received a 2,7H dry mark and the remaining eggs received a 5,4H dry mark.

4.2 Evaluation

4.2.1 Chum Salmon

Chum salmon scales and otoliths will be collected in the common property fishery and from broodstock returning to hatchery raceways during egg take to determine the age composition of the returning adults. The data is used for determining survivals and forecasting.

Chum salmon returns will be evaluated for the success of the two different rearing strategies by collecting otoliths and evaluating differential thermal marks. Otoliths may be collected from broodstock and from Kodiak processors.

4.2.2 Pink Salmon

Adult pink salmon will be sampled throughout cost-recovery operations to gather information on average weight, sex ratio, average quality, and species composition of fish sold. Otolith samples will be collected during cost recovery harvest and from broodstock during egg-take operations. Otoliths will be analyzed to determine the efficacy of KRAA's saltwater marking program. All of the BY22 pink salmon released in 2023 were marked with a 2,3H saltwater mark.

4.2.3 Coho Salmon

Coho smolt are evaluated for osmoregulation capability each spring prior to the transfer of the entire juvenile population to salt water. Sequential test groups of 100 smolts will be held in saltwater test pens for up to one week starting around the middle of April. Once 100% survival is observed, the remaining smolts will be transferred to saltwater net pens. Additionally, otoliths may be collected from broodstock during egg take to evaluate the dry marking program.

4.2.4 Sockeye Salmon

Sockeye salmon scales and otoliths will be collected in the Kitoi Bay sport fishery and from sockeye salmon returning to hatchery raceways during chum salmon egg take to determine the age composition of the returning adults. In 2024, scales may also be collected from sockeye salmon adults entering Little Kitoi Lake. The data is used for determining survivals and forecasting.

Emigrating sockeye salmon smolt will be enumerated from Little Kitoi Lake. The data is used to aid in forecasting. In 2024, age, weight, and length data will be collected from the emigrating smolt. Data will be used to reconstruct brood tables and to provide condition factor for fish rearing in the lake.

5.0 Approval

Recommendation for Approval: Kitoi Hatchery Annual Management Plan, 2024

Tina Fairbanks: Executive Director, KRAA 5/1/2024

Tyler Polum: Area Management Biologist, Division of Sport Fish 5/1/2024

James Jackson: Area Management Biologist, Division of Commercial Fisheries 5/1/2024

Jason Dye: Regional Supervisor, Division of Sport Fish 5/1/2024

Nicholas Sagalkin: Regional Supervisor, Division of Commercial Fisheries 4/29/2024

Kevin Schaberg: Regional Research Biologist, Division of Commercial Fisheries 5/6/2024

Lorraine Vercessi: PNP Hatchery Program Coordinator, Division of Commercial Fisheries 5/7/2024

Approval:

The 2024 Kitoi Bay Hatchery Management Plan is hereby approved:

Tom Taube: Deputy Director, Division of Sport Fish 5/14/2024

Forrest Bowers: Operations Manager, Division of Commercial Fisheries 5/22/2024

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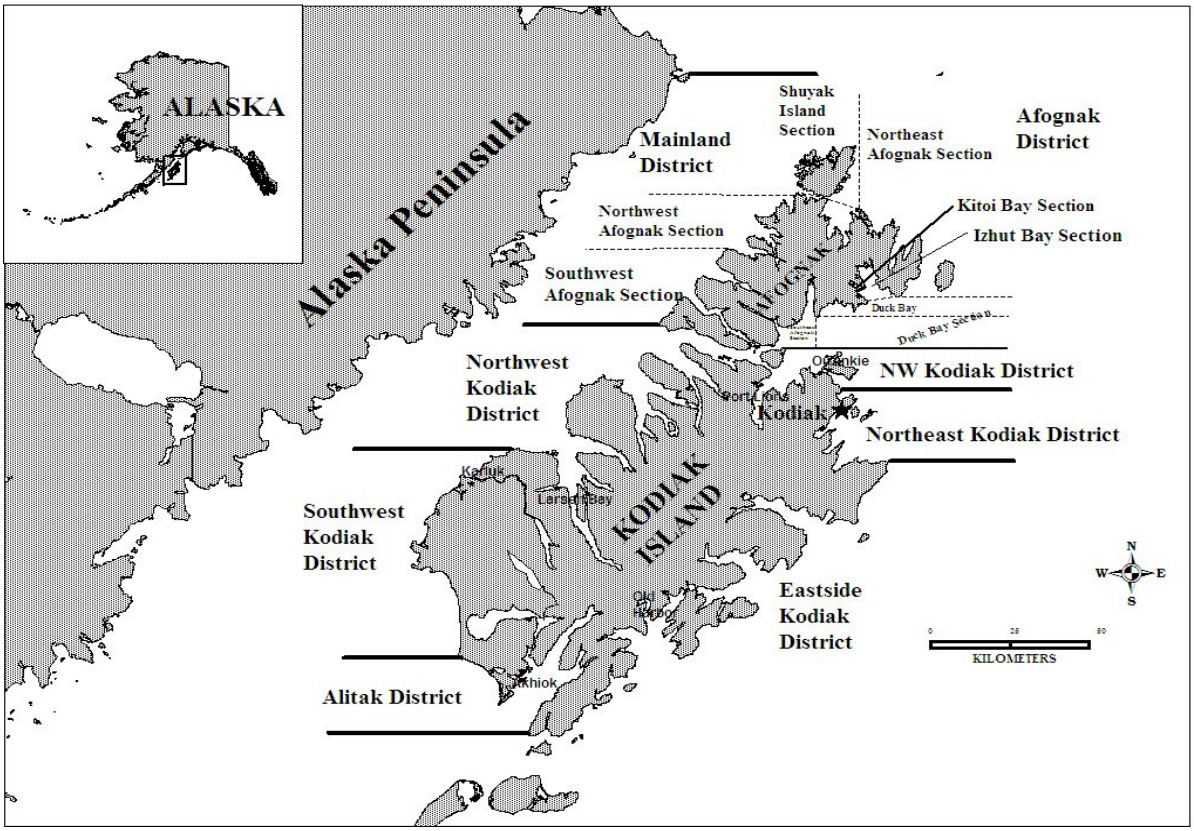
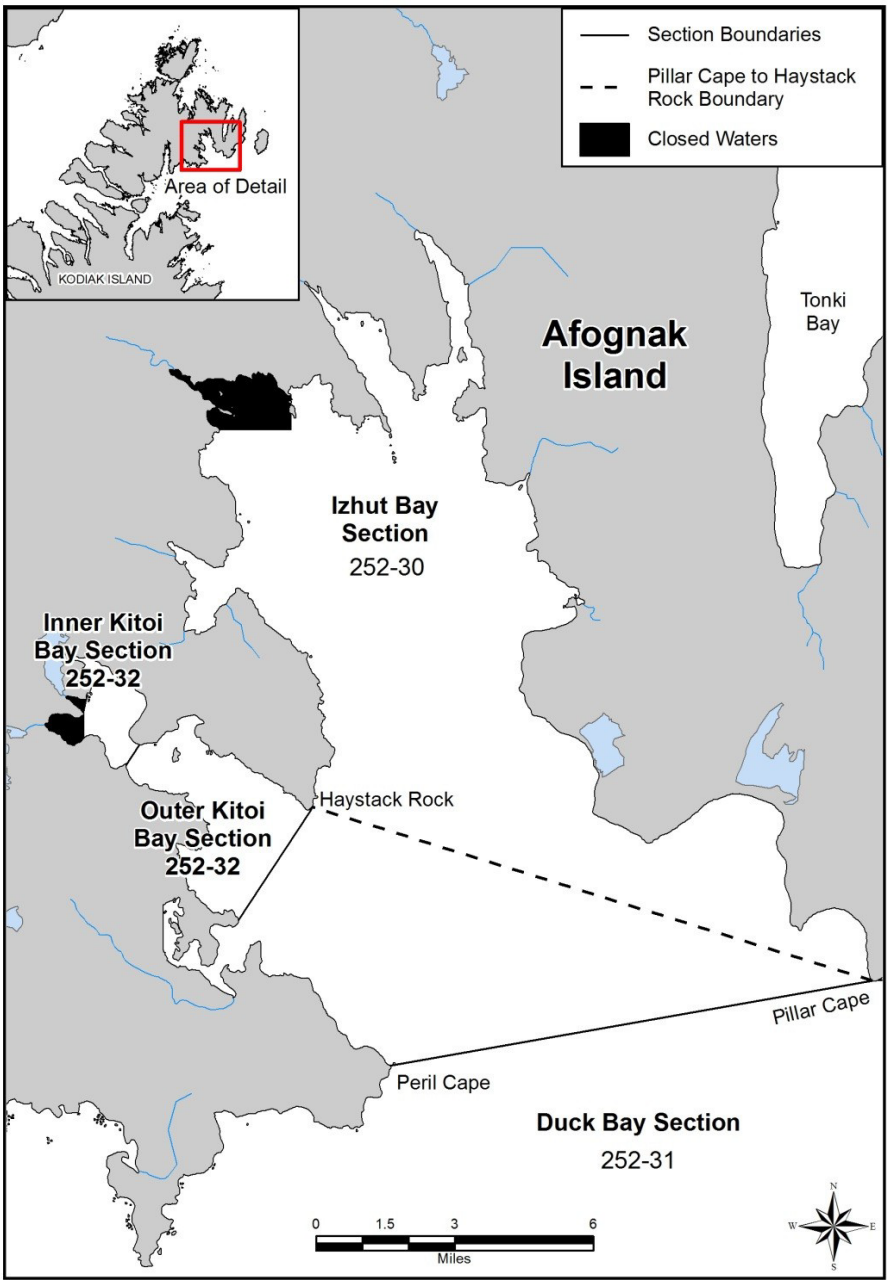
APPENDIX A. MAPS

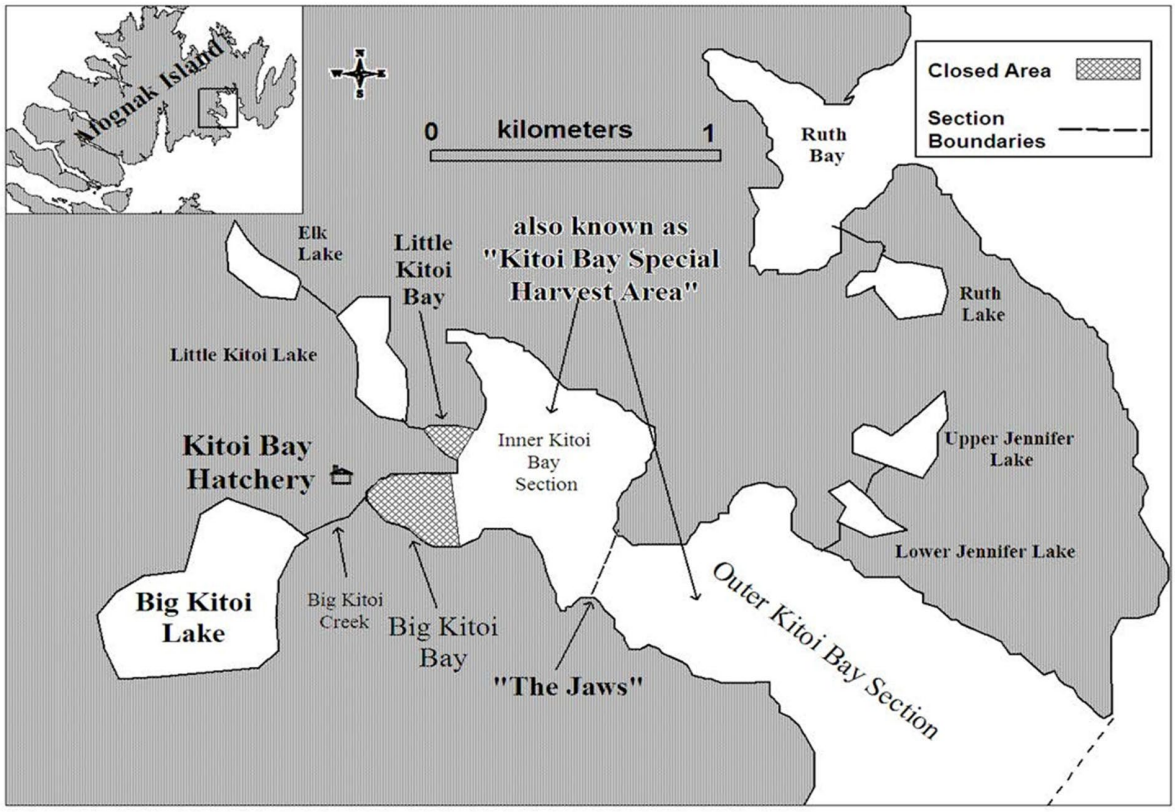
Appendix A1.–Map of the Kodiak Management Area.



Appendix A2.–Map of Izhut (252-30), Duck (252-31), and Inner and Outer Kitoi Bay Sections (252-32).



Appendix A3.–Map of the Kitoi Bay Special Harvest Area (Inner and Outer Kitoi Bay Sections).



APPENDIX B. HISTORIC PRODUCTION TABLES

Appendix B1.–Kitoi Bay Hatchery chum salmon release and return history, 1982–2022.

Brood year	Release year	Number released[a]	Returns					
			Avg. wt. (g)	0.2	0.3	0.4	Total[b]	Survival
1981	1982	36,846	0.56					
1982	1983	105,058	1.05					
1983	1984	630,422	1.16					
1984	1985	784,078	0.67					
1985	1986	414,233	-					
1986	1987	693,166	2.00	1,335	16,450	8,456	26,279	3.79
1987	1988	4,737,587	2.10	8,807	61,466	7,760	78,083	1.65
1988	1989	3,289,878	1.85	995	10,925	4,414	16,334	0.50
1989	1990	1,502,501	2.44	343	5,613	5,313	11,340	0.75
1990	1991	0						
1991	1992	22,214,472	1.80	43,866	260,658	18,093	322,637	1.45
1992	1993	10,101,986	2.02	2,633	27,835	6,960	37,439	0.37
1993	1994	6,507,497	1.52	464	21,170	5,892	27,526	0.42
1994	1995	9,738,472	1.51	6	20,847	269	21,122	0.22
1995	1996	20,139,843	1.27	29,211	153,042	17,147	200,345	0.99
1996	1997	23,500,000	1.50	20,411	322,369	144,630	487,423	2.07
1997	1998	12,310,015	1.50	3,429	99,433	10,487	113,349	0.92
1998	1999	6,859,982	1.02	0	14,266	458	14,724	0.21
1999	2000	22,334,640	1.70	119,494	480,137	40,672	640,303	2.87
2000	2001	20,032,140	1.73	26,311	231,777	12,451	271,424	1.35
2001	2002	19,593,070	1.55	6,129	80,032	24,518	110,679	0.56
2002	2003	18,721,700	1.66	32,479	131,324	2,883	166,683	0.89
2003	2004	21,778,050	2.01	55,727	251,318	34,846	341,891	1.57
2004	2005	21,578,500	2.02	3,192	83,519	16,301	103,012	0.48
2005	2006	17,567,016	2.39	10,670	99,026	15,209	124,905	0.71
2006	2007	21,648,839	1.72	37,909	155,766	5,193	199,822	0.92
2007	2008	21,690,168	1.94	64,567	310,948	101,240	477,341	2.20
2008	2009	22,173,160	1.96	4,391	144,619	36,894	185,904	0.84
2009	2010	20,765,381	2.02	5,654	88,160	18,079	112,018	0.54
2010	2011	19,412,409	1.98	5,945	68,566	9,154	83,665	0.43
2011	2012	22,244,780	1.75	10,618	111,340	34,060	156,018	0.70
2012	2013	16,722,259	1.59	6,095	82,180	12,998	101,276	0.60
2013	2014	21,908,923	2.26	5,704	146,458	36,941	189,103	1.80
2014	2015	29,767,082	2.88	61,638	142,713	1,276	205,627	0.70
2015	2016	29,122,550	3.08	28,187	54,703	34,314	117,204	0.04
2016	2017	14,192,919	2.22	16,859	55,070	233	72,162	0.51
2017	2018	22,935,542	2.03	34,355	93,433	22,871	150,772	0.66
2018	2019	29,800,000	2.85	17,242	140,743	149,401	307,632	0.97
2019	2020	18,173,783	2.84	11,953	182,902			
2020	2021	30,063,418	2.12	14,519				
2021	2022	35,452,207	2.24					
2022	2023	29,718,848	1.51					

[a] Big Kitoi Creek broodstock. Juveniles (fry life stage) were released into Big Kitoi Bay net pens for rearing then released into Big Kitoi Bay.

[b] Total reflects returns of all age classes (0.5 age class not shown).

Appendix B2.–Kitoi Bay Hatchery pink salmon release and return history, 1972–2022.

Brood year	Release[a]			Return		Survival (%)
	Year	Number	Avg. Wt. (g)	Year	Total[b]	
1972	1973	493,130	-			
1973	1974	447,642	-			
1974	1975	1,226,314	-	1976	12,500	1.02
1975	1976	2,486,410	-			
1976	1977	4,722,152	0.50			
1977	1978	17,255,424	0.44			
1978	1979	17,319,537	-	1980	359,205	2.07
1979	1980	22,458,947	0.63	1981	797,436	3.55
1980	1981	26,351,664	0.93	1982	322,300	1.22
1981	1982	47,828,701	-	1983	279,000	0.58
1982	1983	72,054,096	0.79	1984	487,000	0.68
1983	1984	87,065,569	0.58	1985	3,638,000	4.18
1984	1985	75,109,442	0.29	1986	510,500	0.68
1985	1986	97,773,052	0.78	1987	1,215,000	1.24
1986[c]	1987	90,017,823	0.27	1988	746,047	0.83
1987	1988	94,172,516	0.73	1989	7,622,000	8.09
1988	1989	80,502,220	0.62	1990	730,133	0.90
1989	1990	84,907,550	0.61	1991	1,622,000	1.91
1990	1991	121,543,338	0.60	1992	1,093,000	0.90
1991	1992	147,145,130	0.79	1993	12,395,000	8.42
1992	1993	169,552,112	0.51	1994	2,051,000	1.20
1993	1994	152,167,939	0.45	1995	4,768,000	3.13
1994	1995	134,104,406	0.53	1996	1,267,000	0.95
1995	1996	144,045,245	0.48	1997	1,468,000	1.02
1996	1997	102,583,724	0.50	1998	6,725,000	6.56
1997	1998	128,101,460	0.50	1999	4,537,000	3.54
1998	1999	127,685,500	0.54	2000	3,963,000	3.10
1999	2000	137,702,154	0.61	2001	13,604,000	9.89
2000	2001	134,823,670	0.72	2002	7,073,000	5.25
2001	2002	152,990,900	0.56	2003	5,896,000	3.85
2002	2003	144,823,895	0.86	2004	4,330,000	2.99
2003	2004	154,073,358	0.76	2005	14,014,000	9.10
2004	2005	136,287,250	0.62	2006	4,491,000	3.30
2005	2006	115,661,940	0.83	2007	8,223,000	7.11
2006	2007	140,898,860	0.60	2008	2,483,000	1.76
2007	2008	144,920,820	0.64	2009	9,967,000	6.40
2008	2009	153,705,600	0.67	2010	3,567,000	2.32
2009	2010	144,431,650	0.70	2011	2,527,000	1.75
2010	2011	146,461,254	0.85	2012	3,227,000	2.20

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Brood year	Release [a]			Return		Survival (%)
	Year	Number	Avg. wt. (g)	Year	Total[b]	
2010	2011	146,461,254	0.85	2012	3,227,000	2.20
2011	2012	156,644,477	0.62	2013	12,396,000	7.91
2012	2013	107,009,684	0.65	2014	6,215,000	5.81
2013	2014	191,501,986	0.80	2015	5,596,000	2.92
2014	2015	177,203,968	0.96	2016	1,522,000	0.86
2015	2016	138,103,485	0.99	2017	2,588,000	1.87
2016	2017	66,578,989	1.01	2018	3,517,000	5.30
2017	2018	191,952,116	1.10	2019	5,577,000	2.91
2018	2019	146,729,124	1.12	2020	4,967,000	2.83
2019	2020	175,359,011	0.91	2021	11,169,000	6.37
2020	2021	127,883,209	0.84	2022	4,015,000	3.10
2021	2022	196,429,159	0.51	2023	11,391,000	5.80
2022	2023	191,750,551	0.57			

[a] Big Kitoi Creek broodstock. Juveniles (fry life stage) were released into Big Kitoi Bay net pens for rearing then released into Big Kitoi Bay.

[b] Return estimates rounded to nearest 1,000.

[c] 1986 FRED Report. This number doesn't include the 138,500 reported as "Afognak fish passes".

Appendix B3.–Kitoi Bay Hatchery coho salmon release history by location (active projects), 1986–2023.

Brood year	Release year	Number released	Avg. wt. (g)	Life stage	Location
1986[a]	1987	9,600	5.00	Presmolt	Big Kitoi Creek
1987	1988	241,373	1.13	Fingerling	Crescent Lake
1988	1989	202,955	0.82	Fingerling	Crescent Lake
1988	1990	137,493	23.30	Smolt	Big Kitoi Bay
1990	1991	191,416	1.10	Fingerling	Crescent Lake
1990	1992	60,755	32.00	Smolt	Big Kitoi Bay
1991	1992	69,100	7.04	Presmolt	Crescent Lake
1991	1992	162,387	4.50	Fingerling	Jennifer Lake
1991	1993	613,681	18.90	Smolt	Big Kitoi Bay
1992	1993	68,420	14.60	Presmolt	Crescent Lake
1992	1993	135,486	1.94	Fingerling	Jennifer Lake
1992	1993	5,163	14.60	Presmolt	Big Kitoi Creek
1992	1994	97,973	28.40	Smolt	Big Kitoi Bay
1993	1994	163,680	0.98	Fingerling	Crescent Lake
1993[b]	1995	258,926	25.90	Smolt	Big Kitoi Bay
1994	1995	167,778	1.16	Fingerling	Crescent Lake
1994	1995	165,000	1.46	Fingerling	Jennifer Lake
1994	1995	59,500	1.74	Fingerling	Ruth Lake
1994	1996	894,486	23.54	Smolt	Big Kitoi Bay
1995	1996	163,200	0.40	Fry	Crescent Lake
1995	1997	819,046	19.57	Smolt	Big Kitoi Bay
1996	1997	165,000	0.35	Fry	Crescent Lake
1996	1997	163,000	0.35	Fry	Jennifer Lake
1996	1997	35,000	0.35	Fry	Ruth Lake
1996	1998	769,000	23.90	Smolt	Big Kitoi Bay
1997	1998	163,000	0.60	Fry	Crescent Lake
1997	1998	165,000	0.50	Fry	Jennifer Lake
1997	1998	35,000	0.50	Fry	Ruth Lake
1997	1999	1,098,338	19.30	Smolt	Big Kitoi Bay
1998	1999	165,000	0.57	Fry	Crescent Lake
1998	1999	136,000	0.55	Fry	Jennifer Lake
1998	1999	35,000	0.57	Fry	Ruth Lake
1998	2000	871,448	16.92	Smolt	Big Kitoi Bay
1999	2000	165,837	0.42	Fry	Crescent Lake
1999	2000	155,688	0.44	Fry	Jennifer Lake
1999	2000	30,695	0.72	Fry	Ruth Lake
1999	2001	936,913	20.76	Smolt	Big Kitoi Bay

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Brood year	Release year	Number released	Avg. wt. (g)	Life stage	Location
2000	2001	165,000	0.90	Fry	Crescent Lake
2000	2001	120,000	0.86	Fry	Jennifer Lake
2000	2002	1,041,342	16.90	Smolt	Big Kitoi Bay
2001	2002	164,487	0.65	Fry	Crescent Lake
2001	2002	201,320	0.57	Fry	Jennifer Lake
2001	2002	30,000	0.69	Fry	Ruth Lake
2001	2003	1,064,864	16.75	Smolt	Big Kitoi Bay
2002	2003	164,395	0.63	Fry	Crescent Lake
2002	2003	197,590	0.57	Fry	Jennifer Lake
2002	2003	30,000	0.63	Fry	Ruth Lake
2002	2004	969,483	20.08	Smolt	Big Kitoi Bay
2003	2004	165,000	0.76	Fry	Crescent Lake
2003	2004	200,000	0.76	Fry	Jennifer Lake
2003	2004	30,000	0.76	Fry	Ruth Lake
2003	2005	1,009,200	18.54	Smolt	Big Kitoi Bay
2004	2005	140,000	0.75	Fry	Crescent Lake
2004	2005	110,000	0.97	Fry	Jennifer Lake
2004	2005	30,000	0.97	Fry	Ruth Lake
2004	2006	976,059	17.06	Smolt	Big Kitoi Bay
2005	2006	121,410	0.84	Fry	Crescent Lake
2005	2006	199,943	0.78	Fry	Jennifer Lake
2005	2006	30,886	0.78	Fry	Ruth Lake
2005	2007	1,046,365	17.03	Smolt	Big Kitoi Bay
2006	2007	143,008	1.07	Fry	Crescent Lake
2006	2007	209,577	1.23	Fry	Jennifer Lake
2006	2007	30,000	1.23	Fry	Ruth Lake
2006	2008	991,498	16.31	Smolt	Big Kitoi Bay
2007	2008	165,479	0.71	Fry	Crescent Lake
2007	2008	200,655	0.87	Fry	Jennifer Lake
2007	2008	30,000	0.87	Fry	Ruth Lake
2007	2009	1,027,684	18.44	Smolt	Big Kitoi Bay
2008	2009	153,545	0.72	Fry	Crescent Lake
2008	2009	180,480	0.88	Fry	Jennifer Lake
2008	2009	30,295	0.88	Fry	Ruth Lake
2008	2010	1,048,670	19.68	Smolt	Big Kitoi Bay
2009	2011	1,045,331	17.30	Smolt	Big Kitoi Bay

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Brood year	Release year	Number released	Avg. wt. (g)	Life stage	Location
2009	2010	166,656	0.50		Crescent Lake
2009	2010	201,533	0.61	Fry	Jennifer
2009	2010	30,179	0.61	Fry	Ruth Lake
2009	2011	1,045,331	17.30	Smolt	Big Kitoi Bay
2010	2011	0	0.00		Crescent Lake
2010	2011	0	0.00		Jennifer Lake
2010	2011	0	0.00		Ruth Lake
2010	2012	81,649	19.17	Smolt	Big Kitoi Bay
2011	2012	165,000	0.63	Fry	Crescent Lake
2011	2012	200,000	0.78	Fry	Jennifer Lake
2011	2012	32,709	0.92	Fry	Ruth Lake
2011	2013	1,036,682	19.37	Smolt	Big Kitoi Bay
2012	2013	165,000	0.59	Fry	Crescent Lake
2012	2013	200,000	2.80	Fingerling	Jennifer Lake
2012	2013	30,000	0.63	Fingerling	Ruth Lake
2012	2014	1,047,756	18.00	Smolt	Big Kitoi Bay
2013	2014	20,000	2.67	Fingerling	Crescent Lake
2013	2014	14,000	7.83	Presmolt	Katmai Lake
2013	2015	838,580	16.34	Smolt	Big Kitoi Bay
2014	2015	12,000	5.87	Presmolt	Crescent Lake
2014	2015	12,000	5.87	Presmolt	Katmai Lake
2014	2016	1,210,099	21.56	Smolt	Big Kitoi Bay
2015	2016	12,000	5.61	Presmolt	Crescent Lake
2015	2016	12,000	5.61	Presmolt	Katmai Lake
2015	2017	1,026,348	19.41	Smolt	Big Kitoi Bay
2016	2017	19,612	3.11	Presmolt	Crescent Lake
2016	2018	373,133	21.1	Smolt	Big Kitoi Bay
2017	2018	165,000	1.5	Fingerling	Crescent Lake
2017	2018	30,000	1.5	Fingerling	Ruth Lake
2017	2018	170,000	1.5	Fingerling	Jennifer Lake
2017	2018	30,980	6.0	Presmolt	Katmai Lake
2017	2019	1,242,070	20.4	Smolt	Big Kitoi Bay
2018	2019	188,200	1.5	Fingerling	Crescent Lake
2018	2019	221,100	1.55	Fingerling	Jennifer Lake
2018	2019	30,000	1.8	Fingerling	Ruth Lake
2018	2019	35,500	5.50	Presmolt	Katmai Lake
2018	2020	1,071,447	20.46	Smolt	Big Kitoi Bay

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Brood year	Release year	Number released	Avg. wt. (g)	Life stage	Location
2019	2020	190,086	0.94	Fry	Crescent Lake
2019	2020	230,170	0.94	Fry	Jennifer Lake
2019	2020	40,074	0.94	Fry	Ruth Lake
2019	2020	34,947	5.31	Fingerling	Katmai Lake
2019	2021	1,332,880	15.7	Smolt	Big Kitoi Bay
2020	2021	185,336	1.05	Fry	Crescent Lake
2020	2021	110,062	1.05	Fry	Jennifer Lake
2020	2021	40,038	1.05	Fry	Ruth Lake
2020	2021	39,951	5.30	Fingerling	Katmai Lake
2020	2021	1,386,835	13.73	Smolt	Big Kitoi Bay
2021	2023	535,004	20.18	Smolt	Big Kitoi Bay
2022	2023	190,074	0.96	Fry	Crescent Lake
2022	2023	145,145	0.86	Fry	Jennifer Lake
2022	2023	40.128	0.86	Fry	Ruth Lake

[a] Broodstock from Little Kitoi Lake, 1986–1993.

[b] Broodstock from Big Kitoi Creek returns (Little Kitoi Lake ancestral stock), 1993 to present. Starting with brood year 2013 and every third year after that (2019, 2022, 2025…), ancestral stock was Little Kitoi Lake and Buskin River combined.

Appendix B4.–Kitoi Bay Hatchery sockeye salmon release history, 1988–2022.

Brood year	Broodstock	Release year	Number	Avg. wt. (g)	Life stage	Location
1988	Upper Station	1989	143,725	2.48	Zero Check	Little Kitoi Bay
1989	Upper Station	1990	249,346	0.20	Fry	Spiridon Lake
1989	Upper Station	1990	241,000	0.50	Fingerling	Little Kitoi Lake
1989	Upper Station	1990	337,932	0.18	Fry	Little Kitoi Lake
1989	Upper Station	1990	854,610	3.23	Zero Check	Little Kitoi Bay
1989	Upper Station	1990	458,118	0.48	Fingerling	Little Kitoi Bay
1990	Upper Station	1991	1,250,000	2.50	Zero Check	Little Kitoi Bay
1991	Upper Station	1992	1,463,000	1.60	Zero Check	Little Kitoi Bay
1992	Upper Station	1993	52,418	3.13	Presmolt	Little Kitoi Lake
1992	Upper Station	1993	180,000	0.50	Fingerling	Jennifer Lakes
1992	Upper Station	1994	326,500	15.00	Smolt	Little Kitoi Bay
1993	Upper Station	1994	1,672,710	1.11	Zero Check	Little Kitoi Bay
1993	Little Kitoi Lake	1994	10,108	4.60	Presmolt	Little Kitoi Lake
1993	Little Kitoi Lake	1995	916,677	10.08	Smolt	Little Kitoi Bay
1994	Upper Station	1995	266,952	1.83	Zero Check	Little Kitoi Lake
1994	Little Kitoi Lake	1995	84,861	4.98	Presmolt	Little Kitoi Lake
1994	Little Kitoi Lake	1996	573,242	12.70	Smolt	Little Kitoi Bay
1995	Little Kitoi Lake	1996	155,687	3.16	Presmolt	Little Kitoi Lake
1995	Upper Station	1997	587,435	12.10	Smolt	Little Kitoi Bay
1996	Little Kitoi Lake	1997	77,039	3.31	Presmolt	Little Kitoi Lake
1996	Little Kitoi Lake	1998	99,085	11.70	Presmolt	Little Kitoi Lake
1996	Little Kitoi Lake	1998	397,000	15.10	Smolt	Little Kitoi Bay
1997	Saltery Lake	1999	106,658	17.70	Smolt	Little Kitoi Lake
1998	Saltery Lake	1999	98,737	7.00	Fingerling	Little Kitoi Lake
1998	Saltery Lake	1999	74,463	14.63	Presmolt	Little Kitoi Lake
1998	Saltery Lake	1999	23,756	14.35	Presmolt	Little Kitoi Bay[a]
1999	Saltery Lake	2000	154,039	11.31	Presmolt	Little Kitoi Lake
2000	Saltery Lake	2001	282,089	9.53	Presmolt	Little Kitoi Lake
2001	Saltery Lake	2002	212,418	6.55	Presmolt	Little Kitoi Lake
2002	Saltery Lake	2003	102,822	8.75	Presmolt	Little Kitoi Lake
2002	Saltery Lake	2004	193,646	25.68	Smolt	Little Kitoi Lake[b]
2003	Saltery Lake	2004	20,664	9.40	Presmolt	Little Kitoi Lake
2003	Saltery Lake	2005	279,962	24.15	Smolt	Little Kitoi Lake[b]
2004	Saltery Lake	2005	20,000	7.89	Presmolt	Little Kitoi Lake
2004	Saltery Lake	2006	379,687	22.82	Smolt	Little Kitoi Lake[b]
2005	Saltery Lake	2006	206,884	6.14	Presmolt	Little Kitoi Lake
2005	Saltery Lake	2007	402,911	19.56	Smolt	Little Kitoi Lake[b]

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Brood year	Broodstock	Release year	Number	Avg. wt. (g)	Life stage	Location
2006	Saltery Lake	2007	133,533	7.65	Presmolt	Little Kitoi Lake
2006	Saltery Lake	2008	414,376	19.91	Smolt	Little Kitoi Lake[b]
2007	Saltery Lake	2009	417,803	20.01	Smolt	Little Kitoi Lake[b]
2008	Saltery Lake	2009	100,446	8.04	Presmolt	Little Kitoi Lake
2008	Saltery Lake	2010	393,006	20.99	Smolt	Little Kitoi Lake[b]
2009	Saltery Lake	2010	132,786	7.58	Presmolt	Little Kitoi Lake
2009	Saltery Lake	2011	414,333	22.30	Smolt	Little Kitoi Lake[b]
2010	Saltery Lake	2011	113,313	7.80	Presmolt	Little Kitoi Lake
2010	Saltery Lake	2012	413,015	24.40	Smolt	Little Kitoi Lake[b]
2011	Saltery Lake	2012	142,717	6.4	Presmolt	Little Kitoi Lake
2011	Saltery Lake	2013	412,472	21.57	Smolt	Little Kitoi Lake[b]
2012	Little Kitoi	2013	21,661	4.14	Presmolt	Little Kitoi Lake
2012	Little Kitoi	2014	654,583	18.96	Smolt	Little Kitoi Lake[b]
2013	Little Kitoi	2014	56,029	7.04	Presmolt	Little Kitoi Lake
2013	Little Kitoi	2015	652,460	24.01	Smolt	Little Kitoi Lake[b]
2014	Little Kitoi	2015	69,293	8.49	Presmolt	Little Kitoi Lake
2014	Little Kitoi	2016	577,086	21.92	Smolt	Little Kitoi Lake[b]
2014	Little Kitoi	2016	79,565	23.83	Smolt	Ouzinkie Harbor
2015	Little Kitoi	2016	106,273	8.23	Presmolt	Little Kitoi Lake
2015	Little Kitoi	2017	585,810	21.01	Smolt	Little Kitoi Lake[b]
2015	Little Kitoi	2017	49,388	21.60	Smolt	Ouzinkie Harbor
2016	Saltery Lake	2018	399,668	21.0	Smolt	Little Kitoi Lake[b]
2016	Saltery Lake	2018	55,326	23.1	Smolt	Ouzinkie Harbor
2017	Saltery Lake	2019	592,757	20.69	Smolt	Little Kitoi Lake
2017	Saltery Lake	2019	74,872	28.97	Smolt	Ouzinkie Harbor
2018	Saltery Lake	2020	400,337	23.10	Smolt	Little Kitoi Lake
2018	Saltery Lake	2020	49,550	21.70	Smolt	Ouzinkie Harbor
2020	Little Kitoi	2022	355,453	18.06	Smolt	Little Kitoi Lake
2020	Little Kitoi	2022	49,958	17.45	Smolt	Ouzinkie Harbor
2021	Saltery Lake	2023	403,880	15.53	Smolt	Little Kitoi Lake
2021	Saltery Lake	2023	50,000	15.40	Smolt	Ouzinkie Harbor

[a] This release resulted from a dissolved oxygen crash in the transfer tanks.

[b] Little Kitoi Lake net pen releases.

Note: There were no sockeye salmon eggs collected in 2019, therefore no smolt were released in 2021.

APPENDIX C. ASSUMPTIONS FOR RETURN ESTIMATES

Appendix C1. – Salmon survival (stocking to adult return) and age assumptions used to estimate 2024 Kitoi Bay Hatchery returns.

Species	Year	Stocking Life Stage[a]	Stocking Size (g)	Stocking-to-adult return	Age-at-return Proportions (%) 0.1	0.2	1.1	0.3	1.2	2.1	0.4	1.3	2.2	0.5	2.3
Pink	even	F	0.57	2.4%[b]	100										
	odd	F	0.95	2.91%[b]											
Chum	all	F	2.92	0.80%[c]		12.89		74.01			13.03			0.08	
Coho	all	FG	1.05	2.0%[d]			100								
Coho	all	S	13.7	9.8%[e]			100								
Sockeye	all	FPS	0	2.5%			2.7		66.2			25.3	3.1		2.7
Sockeye	all	SPS	0	2.5%			2.7		66.2			25.3	3.1		2.7

[a] F = Fry, FG = fingerling, FPS = fall presmolt, S = smolt, and SPS = spring presmolt.

[b] Pink salmon marine survival for odd and even years above are a two-year average specific to the four-year cyclical return percentage used for specific years.

[c] Chum salmon marine survival is an average based on adult scale data and historic return age structure (BY03, BY11, BY15).

[d] Coho salmon fingerling and fall presmolt survival rates are estimates.

[e] Coho salmon smolt marine survival is based on a four-year parent class average (BY11, BY14, BY17, BY20).

Appendix C2. – Forecasted runs, broodstock requirements, minimum escapements, cost recovery needs, and potential harvest of salmon returning to systems in 2024 as a result of prior Kitoi Bay Hatchery releases.

		Forecasted return			Broodstock	Minimum	Cost	Potential
Return location	Species	Point	Low	High	required	escapement[a]	recovery[b]	harvest[c]
Kitoi Bay Hatchery	Pink	4,600,000	3,450,000	5,750,000	425,000	15,000	909,000	3,251,000
Kitoi Bay Hatchery	Chum	138,000	110,000	165,600	50,000	2,000	0	86,000
Little Kitoi Lake	Coho	52,600	39,400	65,700	6,000	0	0	46,600
Little Kitoi Lake	Sockeye	6,000	4,800	7,200	0	6,000	0	0
Ouzinkie Harbor	Sockeye	1,000	825	1,200	0	0	0	1,000

[a] Minimum escapement for BKC refers to the number of adults remaining in the creek after KBH has completed the egg takes. These fish are allowed entry into the creek to spawn to continue the run in the event of the loss of the hatchery rearing fish.

[b] Cost recovery based on 250,000 pounds.

[c] Potential harvest is the return point estimate minus broodstock, escapement, and cost recovery needs.

APPENDIX D. FISH TRANSPORT PERMITS

Appendix D1.–Kitoi Bay Hatchery current Fish Transport Permits (FTPs).

FTP#	Species	Donor stock/ ancestral stock	Description [a]	Expiration date
22A-0003	Chum	KBH/ Sturgeon River	36M egg take at KBH, release Kitoi Bay	12/31/2026
22A-0004	Pink	KBH/ Big Kitoi Creek	215M egg take at KBH, release Kitoi Bay	12/31/2026
18A-0022	Coho	KBH/ Little Kitoi Lake	2.3M egg take at KBH (Big Kitoi Cr), of which 1.8M eggs are for release Kitoi Bay	12/31/2027
18A-0023	Coho	KBH/ Little Kitoi Lake	40k transfer and release Katmai Lake	12/31/2027
N/A[b]	Coho	KBH/ Little Kitoi Lake	40k transfer and release Ouzinkie Boat Harbor	N/A[b]
18A-0024	Coho	KBH/ Little Kitoi Lake	190k transfer and release Crescent Lake	12/31/2027
18A-0025	Coho	KBH/ Little Kitoi Lake	40k transfer and release Ruth Lake	12/31/2027
18A-0026	Coho	KBH/ Little Kitoi Lake	230k transfer and release Jennifer Lake	12/31/2027
15A-0089	Coho	KBH/ Little Kitoi Lake	500k juveniles from KBH to LKL for temporary net pen rearing, back to KBH for release	12/31/2024
18A-0021	Sockeye	Little Kitoi Lake/ Saltery Lake	850k egg take at Little Kitoi Lake, incubate at KBH, rear and release at Little Kitoi Lake	12/31/2027
15A-0074	Sockeye	Little Kitoi Lake/ Saltery Lake	850k egg take at KBH, incubate KBH, rear and release at Little Kitoi Lake	12/31/2024
16A-0038	Sockeye	Little Kitoi Lake/ Saltery Lake	100k smolt transfer from KBH, rear and release Ouzinkie Harbor	12/31/2025
17A-0045	Sockeye	Saltery Lake/ Saltery Lake	850k backup egg take at Saltery Lake, incubate KBH, release Little Kitoi Lake	12/31/2026

[a] M denotes million, k denotes thousand.

[b] Fish Transport Permit application will be processed concurrent with Permit Alteration Request.