CHIGNIK LAKES SCALE PATTERN ANALYSIS, RUN ASSIGNMENT, AND SOCKEYE SALMON CATCH SAMPLING RESULTS, 2003

By

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ABSTRACT

Two distinct sockeye salmon *Oncorhynchus nerka* runs enter the Chignik River system and temporally overlap during late June and July. The overlap creates a need to differentiate between the runs to effectively manage the commercial salmon fishery. Scale pattern analysis was performed with discriminant analysis models to separate the early and late runs. A common logistic function was used to smooth the models' outputs which were then applied to the total escapement to estimate the escapement to each run. The run assignment was used inseason for commercial fisheries management purposes and postseason for run reconstruction and forecasting. Scale samples were collected from commercial catches in the Chignik Lagoon to estimate the age composition of the catch and subsequent run assignment. The analysis indicated that the 2003 run timing transition from the early to late was approximately a week earlier than the recent 10-year average. The postseason estimate of the Black Lake run was 990,051 sockeye salmon and the Chignik Lake run wwas estimated at 986,227 sockeye salmon.

INTRODUCTION

The Chignik Management Area (CMA) is located on the south side of the Alaska Peninsula between Kilokak Rocks to the north and Kupreanof Point to the south (Figure 1). The CMA supports a large sockeye salmon *Oncorhynchus nerka* commercial fishery. The Chignik River system is the major sockeye salmon producer in the CMA and supports two distinct runs (Templin et al. 1999). The Chignik River system is composed of Black Lake in the upper portion of the watershed which empties into Chignik Lake via the Black River (Figure 2). Chignik Lake discharges into Chignik Lagoon and the ocean via Chignik River. During June and July, the majority of the "early run" ascends to spawn in Black Lake and the upper watershed via Black River. The majority of the "late run" ascends to Chignik Lake during July and August. There is substantial temporal overlap of the two runs each year during late June and July as fish pass through the Alaska Department of Fish and Game (ADF&G) counting weir in the Chignik River below Chignik Lake (Figure 2).

These runs of fish are essential to the economy of the villages in the CMA, which are located in Chignik Bay, Chignik Lagoon, Chignik Lake, and Perryville (Figure 1). A number of fishery management plans in the CMA, Kodiak Management Area (KMA), and Alaska Peninsula Management Area (Area M) are impacted by the estimated portions of the two runs. The CMA manager's ability to effectively assign sockeye salmon escapement to the Black Lake and Chignik Lake spawning stocks depends upon the ability to distinguish between the two runs of fish inseason.

Estimating the catch and escapement's contribution to each of the runs has been accomplished in the past using several methods. Tagging studies conducted in the late 1960s, in which tags were applied to salmon at the weir and then recovered on the spawning grounds, were used to estimate each run's contribution to the total escapement (Lechner 1965; Dahlberg 1968; Phinney and Lechner 1969). Average time of entry curves (ATOE) were developed based on several of the tagging studies to separate the total escapement into early and late components during years in which tagging did not occur. The ATOE curves are still used in cases when the current method proves to be unreliable.

Differentiating salmon stocks by their scale patterns using various discriminant function analyses is referred to as scale pattern analysis (SPA). SPA has been used to provide estimates of individual run strength at Chignik from 1983 through 2003. The analysis has been performed inseason to ensure that early and late-run escapement goals were met and any surplus was available for harvest. Postseason SPA has been performed to more accurately separate the early and late portions of the escapement and catches allowed for reconstruction of the runs.

METHODS

Model Overview

The run strength estimates were derived from discriminant function analysis SPA models based on the studies of Conrad (1983 and 1984) and Swanton (1992). The models were based on differences in measurements of freshwater scale growth characteristics (i.e., focus to each circulus of freshwater growth) of each run. The model established a set of criteria by which the measurements from a scale from a fish of unknown origin were classified as being more similar to the scale measurements from the early run or the late run. This modeling was conducted both inseason (generally using a model based on age 2.3 sockeye salmon scales) and postseason (using two models based on age 1.3 and age 2.3 sockeye salmon scales) because the Black Lake and Chignik Lake sockeye salmon stocks are typically dominated by age 1.3 and age 2.3 sockeye salmon respectively.

The formation of each model required two initial data sets, one to represent each of the two runs involved. These data sets were established with attempts to provide "pure" data from each stock of origin and were referred to as *knowns*. The known data sets were age class specific and were composed of measurements of freshwater growth characteristics with a target sample size of 200 individuals from each run. For the inseason models, scales for the early-run knowns came from age 2.3 fish captured at the outlet of Black Lake in late June. Because late run fish were not available for inseason analysis, the late run known came from age 2.2 fish from the prior year's catch (those fish that returned the previous season, but are from the same brood year) during early August to early September in the Chignik Bay District commercial fishery.

The inseason models were based on two assumptions. The first assumption was that all fish in the Chignik Lagoon catch post July 31 were bound for Chignik Lake (Conrad 1983,1984). Secondly, the inseason model was based on the aassumption that age 2.2 fish (or age 1.2) during year *y* and age 2.3 fish (or age 1.3) during year *y+1* have similar freshwater growth patterns.

For postseason run reconstruction, the scales for the early run known were collected from the Black Lake escapement sample as described above. Scales for the late run known were collected in August from the Chignik Lagoon catch. Once the model was established, it was then applied to mixed stock, or unknown data sets collected from Chignik Lagoon commercial harvest samples (pre August 1).

There were several types of variables used in the models. The variable that generally describes the most variation between the knowns is the total number of freshwater circuli from the scale measurements. Another variable type is the distance from the scale focus to the outside edge of each freshwater circulus (e.g., focus to 1^{st} circulus); there are generally several of these variables. The measurement from the focus to last freshwater circulus is also used. Other variables are used when specific characteristics of the known scales indicate that a higher model classification accuracy can be achieved. For instance, during the 2002 season, there was a marked difference observed in the distance between the first four circuli between the knowns, so the average of these distances was used successfully as an additional variable. Since scales from different fish have a varying number of circuli, they have different numbers of possible variables. The model must analyze all scales with the

same number of variables, so the scale with the fewest number of variables dictated the number of variables that were used in the model.

After the variables were established, the discriminant function analysis was developed using the SAS ™ statistical software package. The model was based on a combination of observed variables which maximized the variation between groups relative to the variation within groups (Fisher 1936). This model was then used to classify scales collected from the Chignik Lagoon catch to either the early or late run. In order to assess the accuracy of a given model, the classification accuracy was estimated by applying the model to the known scale measurements to determine the percentage of scales that were classified correctly to their known stock of origin. Classification accuracy was determined for each stock in the model (i.e., Black Lake and Chignik Lake).

Each unknown data file consisted of age class specific measurements from a target sample size of 100 randomly sampled fish (of sufficient quality to measure) from the Chignik Lagoon commercial catch. Sampling frequency varied, ranging from once every two to three days during the period of transition between the two runs (i.e., June 26 to July 9), to once each week at the end of the season. These mixed run fishery files were analyzed throughout the season providing estimates of percent composition of the Black Lake early run and the Chignik Lake late run.

To account for the misclassification inherent in the model, a correction factor, developed by Cook and Lord (1978), was applied to the model output. Using a polynomial discriminant method, classification errors for known samples from each stock were considered and the correction factor was applied. The correction factor basically utilized the error structure, produced when the knowns were applied to the model, to adjust the model estimates. A DOS based computer program automated the correction factor procedure.

2003 Season

Scale Sample Collection

Sockeye salmon catches were sampled for scales during the 2003 season by the Chignik weir crew approximately every three days during the transition period (June 25 through July 9) and once per week after the Chignik Lake stock dominated the samples. When catch was available, samples were taken at one of the two processing plants in Chignik Bay (Figure 2). When catch samples were not available, the department conducted a test fishery and collected scales from the fish caught. All catch sampling was representative and presumed to be random; there was no pre-selection of fish for length, sex, condition, or any other factor. The targeted size per catch sample was 600 fish, which assumed a conservative estimate of at least 88.5% readable scales. This generally resulted in an adequate number of age 1.3 and/or 2.3 scales of sufficient quality to achieve the goal of measuring 100 scales per age class.

In an effort to improve the age 1.2 and 2.2 samples for the inseason baseline samples for the 2004 season's model, size selective samples were also taken late in the season. Sockeye salmon falling within the typical size frequency of age 2.2 and 1.2 class fish were selected and sampled by the catch sampling crew. The samples were taken during mid to late August to ensure that they were from the

late run. These samples were taken during the 2001 and 2002 season and significantly improved the models' performance.

Inseason Models

The age composition of the late 2002 sockeye salmon catch (both regular catch samples and size selective catch samples) indicated that there were sufficient numbers of both age 1.2 and 2.2 fish to develop either the age 1.3 or age 2.3 models for the 2003 inseason analysis (Tables 1 and 2). The escapement samples collected from Black Lake during late June revealed that there was also an adequate number of age 1.3 and age 2.3 sockeye salmon (Table 3) to develop either model. The age composition of sockeye salmon in catch samples from Chignik Lagoon during mid June were found to be similar to those of the Black Lake escapement sample (Table 4). Sufficient numbers of age 2.3 and 1.3 sockeye salmon were present in the catch samples providing enough resolution to justify conducting the inseason SPA with both age 2.3 and 1.3 models. This was the first season that sufficient numbers of all ages were available to develop both models inseason, due significantly to the late season size selective sampling conducted in 2002.

Two discriminant function analysis models were developed independently. The age 1.3 model was developed using Chignik Lagoon age 1.2 catch samples from the 2002 season and Black Lake age 1.3 sockeye salmon escapement scale samples from the 2003 season as knowns. The age 2.3 model was developed using Chignik Lagoon age 2.2 catch samples from the 2002 season and Black Lake age 2.3 sockeye salmon escapement scale samples from the 2003 season as knowns. Both linear and quadratic discriminant models for each age model were evaluated using the SAS™ statistical software package. The models with the highest classification accuracy were used. Both backward and forward stepwise analyses were performed to determine if classification accuracy of the models could be improved by removing one or more variables.

After the most accurate models were established, they were applied to the unknown samples to determine the proportions of Black and Chignik Lakes stocks. The sample size goal was 100 age 1.3 fish and 100 age 2.3 fish per sampling event. The estimated proportion of Black and Chignik Lake stocks from each unknown sample was then applied to the Cook and Lord correction factor (Cook and Lord 1978).

Logistic Function Smoothing

Because there was significant variability in the run composition estimates within any particular sample as well as between samples, a smoothing mechanism was necessary to interpret the transition from the early run to the late run.

During 2003, to estimate the proportion of the total escapement assigned to the Chignik and Black Lake stocks using the age 2.3 and 1.3 model results, the stock proportion data were fit to the common logistic function (Quinn and Deriso 1999). A nonlinear weighted (by sample size) least squares optimizing scheme was used to fit the respective models to the Chignik stock proportion data (weighting the data toward 100% Chignik run by July 31, similar to past seasons). Stock proportion data were fit to the logistic function and the resultant curves were used to estimate the

actual daily stock proportions. As incoming data were analyzed (via SPA and the model) the logistic curves were refit to the entire data set and resultant logistic curves were utilized to estimate the daily stock proportions between the date of the previous and most current samples (Figure 3 and 4). Using this method, previous escapement estimates that were released to the public remained unchanged, yet the entire logistic curve was refit to incorporate incoming data and only the new portion of the refit curves was used to assign the run to the Black and Chignik Lake stocks.

The logistic curve smoothing method was developed in 2001 so that each escapement proportion data point was estimated using the entire data set, which likely resulted in inherently more accurate results than the previously utilized three point smoothing method.

Inseason Escapement Estimates

The daily age composition of the catch was estimated by interpolating between the catch samples. An estimate of the daily escapement of each age class was derived from the total daily escapement and the daily age composition from Chignik Lagoon catch. The smoothed daily proportions of Chignik and Black Lake stocks from both inseason models were applied to the estimates of escapement for each applicapable age. The age 1.3 model was used to estimate the Black and Chignik Lake run contributions for age 1.3 and 1.2 fish while the age 2.3 model was used to estimate the run contributions for age 2.3 and 2.2 fish. An average of the two models' run proportion estimates were used to estimate the run contributions for all other age classes. All of the estimates of different age classes destined for Chignik Lake were then summed for an overall estimate of Chignik Lake escapement. The daily Chignik Lake escapement was subtracted from the total weir escapement to estimate the Black Lake escapement.

The escapement information assigned to each stock was then used by commercial salmon fishery managers to regulate the commercial fishery to ensure achievement of escapement goals for both runs and to harvest surplus fish.

Postseason 1.3 Model

After all of the scale samples were collected from commercial harvests for the season, the postseason models were developed. The postseason age 1.3 Chignik Lake stock known data set was developed from the scale samples of age 1.3 sockeye salmon sampled from the commercial salmon fishery in Chignik Lagoon after July 31. The postseason age 1.3 Black Lake known data set was the same data set used to develop the inseason models. Linear and quadratic discriminant function analyses postseason models were then developed using SAS™ and backward and forward stepwise analysis were performed to evaluate discriminating power of each variable and to determine if classification accuracy could be increased by the removal of any variables. The model and variables with the highest classification accuracy were used. Each sample from the commercial fishery was then run through the model and stock proportions of age 1.3 sockeye salmon were estimated for each sample and corrected using the Cook and Lord correction factor. The logistic function was then used to smooth the data and assign daily catch and escapement estimates of age 1.3 sockeye salmon to stock of origin.

Postseason 2.3 Model

Concurrent to the development of the age 1.3 postseason model, the age 2.3 postseason model was developed. The age 2.3 Chignik Lake data set was created from the scale samples of age 2.3 sockeye salmon taken from the commercial salmon catch in Chignik Lagoon after July 31. The inseason and postseason age 2.3 Black Lake knowns were identical. Similar stepwise analyses were performed and the model and variables with the highest classification accuracy were used. Unknown scale samples from the fishery were then run through the model to estimate age 2.3 stock composition of each sample, each sample was corrected using the Cook and Lord Correction factor, and the logistic function was used to smooth the data and assign daily catch and escapement estimates of age 2.3 sockeye salmon to stock of origin.

Catch and Escapement Estimates

A Microsoft™ Excel spreadsheet application was developed to automate the assignment of catches and escapement to each stock. Catches from all outside districts, the Cape Igvak Section in the KMA, the Southeastern District Mainland (SEDM) in Area M, and escapement from the Chignik weir were standardized to account for different travel times to the Chignik Lagoon fishery. The estimated travel time to the Chignik Lagoon for each area is summarized in Table 5 (Conrad 1983).

The stock assignment output from the logistic function curve for age 1.3 sockeye salmon was applied to assign the age 1.3 fish from the harvests and escapement to each stock. The procedure was repeated for the age 2.3 logistic function curve and catch and escapement numbers. Age 1.2 sockeye salmon were assigned to Black and Chignik Lake stocks in the same proportions as the age 1.3 fish, while the age 2.2 sockeye salmon were assigned the same as the age 2.3 fish. All other age classes were assigned to the Black and Chignik Lakes stocks using an average of the age 1.3 and 2.3 proportions. The resultant output consisted of daily estimates of the catch, escapement, and total run assigned to Chignik and Black Lakes by day. Post-weir estimates through September 30 (Vining 2003) were added to the daily escapement and assigned with the same method as described above.

RESULTS

Scale Sampling

The baseline scale sampling for the Black Lake stock was conducted on June 22 through June 24 by Chignik weir staff (n=1,858; Table 3). Catches from the commercial fishery and test fisheries in the Chignik Lagoon were sampled for scales on 16 occasions during the 2003 season (n=9,599; Table 4).

The Chignik Lagoon catch samples indicated a predominance of age 1.3 sockeye salmon in the early part of the run with a transition to a predominance of age 2.3 fish in mid to late July (Table 4). The Black Lake escapement scale samples had a similar age composition to that of the early portion of the Chignik Lagoon samples, consisting of mostly age 1.3 fish (Tables 3 and 4).

Inseason Models

Age 1.3 Model

The age 1.3 model that was estimated to have the highest accuracy utilized a quadratic discriminant function. When the stepwise analysis was used to evaluate the model's variables it was determined that three of the possible eight variables resulted in the highest accuracy. The variables used were: the number of freshwater circuli, and the focus-to-circuli (third and fifth) measurements. The classification accuracy of the age 1.3 model was 89.0% for the Black Lake stock and 89.9% for the Chignik Lake stock (Table 6).

After the results were applied to the correction factor and smoothed with the logistic curve, the results indicated a very low percentage of age 1.3 sockeye salmon from the Chignik Lake stock early in the season, with an initial estimate of less than 1.0% on May 28 (Figure 3). The low proportion of Chignik Lake fish present in the total run continued until a relatively rapid transition into the second run took place. The age 1.3 model estimated that the Chignik Lake stock composed 50% of the run on approximately July 6 (Table 7). The model results of each sample are displayed in Table 8.

Age 2.3 Model

The age 2.3 model with the highest accuracy utilized a linear discriminant function. The stepwise analysis determined that only four of the possible 11 variables were necessary for the highest accuracy. The variables used were: the number of freshwater circuli, the maximum freshwater growth, and the focus-to-circuli (third and fifth) measurements. The classification accuracy for the age 2.3 model was 91.0% for the Black Lake stock and 96.1% for the Chignik Lake stock (Table 6).

After applying the Cook and Lord correction and logistic curve smoothing, the results indicated approximately 13% Chignik Lake stock for age 2.3 sockeye salmon on May 28 (Table 7). The transition to the second run was more gradual and earlier than that of the age 1.3 model. The age 2.3 model estimated that the Chignik Lake stock composed 50% of the run on approximately June 23 (Figure 4). The model results of each sampling event are displayed in Table 9.

Escapement Assignment

Because the early Chignik River escapement was composed primarily of age 1.3 sockeye salmon (Table 4), the age 1.3 model was more influential on the total escapement assignment than the age 2.3 model early in the season and less influential as the season progressed, and the proportion of age 2.3 became dominant. The overall initial estimate of Chignik Lake stock proportion was approximately 3% with a 50% stock composition estimate date of approximately July 5 (Table 10).

Postseason Models

Age 1.3 Model

The age 1.3 postseason model with the highest classification accuracy was attained using the quadratic discriminant function with all of the nine possible variables. The variables used were the maximum freshwater growth, the number of circuli, and the focus to circuli measurements for the first seven circuli (seven variables). The classification accuracy of the model was 94.0% for the Black Lake stock and 85.9% for the Chignik Lake stock (Table 6).

The age 1.3 postseason model estimated that the transition of the proportion from dominantly Black Lake to dominantly Chignik Lake runs was relatively abrupt (Figure 5). This trend was similar to that estimated by the inseason age 1.3 model (Table 7). The model estimated that the Chignik Lake run composed 50% of the run on approximately July 7. The results from each sample estimate are displayed in Table 11.

Age 2.3 Model

The age 2.3 postseason model using the quadratic discriminant function with only four of the 11 possible variables had the highest classification accuracy. The variables used were maximum freshwater growth, and the focus to circuli measurements for the fifth, sixth and ninth circuli. The classification accuracy was 90.5% for the Black Lake stock and 93.0% for the Chignik Lake stock (Table 6).

The corrected, smoothed model output for the age 2.3 postseason model had a more gradual transition trend than the age 1.3 model, similar to that of the inseason age 2.3 model (Figure 6). The initial Chignik Lake stock composition was approximately 16% (Table7). The Chignik Lake stock was estimated to reach 50% on June 23 (Table 7). The individual sample estimates are displayed in Table 12.

Catch and Escapement Assignment

The results of the postseason run assignment (Tables 13 and 14) indicated that the transition between the Black Lake and Chignik Lake stock occurred one day earlier than was indicated by the inseason model (Table 10). The date at which the two runs were at equal proportions (the 50/50 date) was estimated as approximately July 4 (Table 10), which was seven days earlier than the previous 10-year average (Table 15). The overall Black Lake escapement including the post-weir estimate was

estimated at 350,004 sockeye salmon and the catch was estimated at 640,047 sockeye salmon (Table 13). The Chignik Lake escapement including the post-weir estimate was estimated at 334,119 sockeye salmon and catch was estimated at 652,108 sockeye salmon (Table 14).

The estimated age composition of the Black Lake escapement was characterized by a high proportion of age 1.3 sockeye salmon during the early portion of the season with a decreasing proportion as the season progressed (Table 16). The estimated age composition of the catch attributed to Black Lake exhibited a similar trend (Table 17). The Chignik Lake escapements had a lower proportion of age 1.3 and higher proportion of age 2.3 sockeye salmon early in the run than in recent seasons (Table 18; Witteveen 2002; Witteveen and Botz 2003). The percentage of age 2.3 sockeye salmon decreased throughout June which is atypical; however, the proportion of age 2.3 fish began increasing again early in July and generally increased throughout the rest of the season. The age compositions of catch attributed to Chignik Lake exhibited similar trends and are summarized in Table 19.

DISCUSSION

The 2003 season was characterized by an earlier than average transition timing from the Black Lake early run to the Chignik Lake late run, according to the postseason analysis (Table 15). The Black Lake escapement estimate fell just above the lower end of the escapement goal range of 350,000 fish. The total catch from the Chignik Area, the Cape Igvak Section of the KMA, and the SEDM of Area M attributed to the Black Lake run was approximately 640,047 sockeye salmon (Table 13) which was 49.5% of the total catch from both runs combined (Tables 18 and 20).

The late-run escapement to Chignik Lake was estimated at 334,119 sockeye salmon including the post-weir estimate (Table 14). The total catch attributed to the Chignik Lake run from the Chignik Area, the Cape Igvak Section of the KMA, and the SEDM of Area M was approximately 652,108 sockeye salmon. This harvest accounted for approximately 50.5% of the total Chignik River system harvest (Tables 18 and 20).

The transition timing was estimated inseason to be early with a 50/50 date estimated to be July 5 compared to the recent 10-year average of July 11 (Table 7 and 15). When the postseason models were employed, the 50/50 date was estimated at July 4 (Tables 7 and 15). The small changes in results from inseason to postseason in both the age 1.3 and 2.3 models corroborate the accuracy of the inseason models. This is the first season that both the age 1.3 and 2.3 models were able to be implemented concurrently inseason. This was likely a significant contributor to the similarity between the inseason and postseason results. Additionally, the variability of the individual sample results around the logistic curves was small when compared to previous years (Figures 3-6; Witteveen 2002; Witteveen and Botz 2003). This is likely due to the relatively high classification accuracies for each model (Table 6).

During past seasons, the inseason and postseason Chignik Lake known scales were selected from post-July 31 catches in the Chignik Lagoon; however, the distribution of the samples taken were weighted toward the later part of August due to better availability and under the assumption that the

later season sockeye salmon migrants were more likely to be composed of a higher proportion of Chignik Lake fish. A genetic analysis of sockeye salmon in the Chignik watershed indicated that there is a distinct difference between the late-run sockeye salmon that arrive earlier versus the late sockeye salmon that arrive later (Templin et al. 1999). In other words, some spawning areas within the Chignik watershed exhibit a late run and a "very late" run. Later spawn timing can lead to later emergence timing of fry (Brannon 1984; Nickelson et al. 1986), therefore, the progeny from the earlier timed sockeye salmon may be rearing at a different time than the progeny of the later timed sockeye salmon. This could result in differential growth and consequent differential scale patterns despite the fact that the adults spawn in the same location. If the late season knowns were derived from the "very late" portion of the Chignik escapement, the model would estimate a run transition between the early run and a later portion of the late run and would therefore shift to a later estimated transition.

In the postseason analyses during the 2002 season, the Chignik Lake known was constructed from samples evenly spread throughout the late run as opposed to more samples being collected from as late in the season as possible. Since the entire Chignik Lake run was evenly represented by the known (as opposed to only the later portion), the transition was estimated to occur earlier than was estimated inseason.

To prevent this inseason scenario from occurring again in 2003, increased efforts were made to ensure that sufficient size selective samples were available throughout August 2002 so that the known would be more representative of the entire late run and not just a portion of it (Table 21). The inseason knowns were then selected from scale samples that were more evenly distributed throughout August and a smaller difference between the inseason and postseason estimates was realized. Since this strategy proved successful, efforts were made again in 2003 to obtain size selective samples throughout August (Table 21).

LITERATURE CITED

Brannon, E.L. 1984. Influence of stock origin on salmon migratory behavior. P. 103-112 *In* J. D. McCleave, G. P. Arnold, J. J. Dodson, and W. H. Neill |ed| Mechanisms of Migration in Fisheries.

Conrad, R.H. 1983. Management applications of scale pattern analysis methods for the sockeye salmon runs to Chignik, Alaska. M.S. Thesis, University of Washington, Seattle.

Conrad, R.H. 1984. Stock composition of the 1983 sockeye salmon (Oncorhynchus nerka) run to the Chignik Lakes estimated using scale patterns and linear discriminant functions. Alaska Department of Fish and Game, Division of Commercial Fisheries, Anchorage.

Cook, R.C., and G.A. Lord. 1978. Identification of Bristol Bay sockeye salmon by evaluating scale patterns with a polynomial discriminant method. U.S. Fish and Wildlife Service, Fisheries Bulletin 76(2):415-23.

Dahlberg, M.L. 1968. Analysis of the dynamics of sockeye salmon returns to the Chignik Lakes, Alaska. Ph.D. dissertation, University of Washington, Seattle.

Fisher, R.A. 1936. The use of multiple measurements in taxonomic problems. Ann. Eugen. 7:179-188

Lechner, B.J. 1965. Chignik River Tagging Programs. Memorandum Dated November 17, 1965 to Robert J. Simon, Regional Supervisor, Division of Commercial Fisheries, Alaska Department of Fish and Game, Kodiak.

Nickelson, T.E., M.F. Solazzi, and S.L. Johnson. 1986. Use of hatchery coho salmon (*Oncorhynchus kisutch*) presmolts to rebuild wild populations in Oregon Coastal streams. Can. J. Fish. Aquat. Sci. 49: 336-342.

Phinney, D.E. and J. Lechner. 1969. Studies of adult Chignik sockeye salmon in 1967. Informational leaflet 130. Alaska Department of Fish and Game, Juneau.

Quinn, T. J., III, and R. B. Deriso. 1999. Quantitative fish dynamics. Oxford University Press, New York. 480p.

Swanton, C.O. 1992. Stock interrelationships of sockeye salmon runs, Alitak Bay District, Kodiak Island Alaska. M.S. Thesis, University of Washington, Seattle.

Templin, W., L. Seeb, P. Crane, and J. Seeb. 1999. Genetic analysis of sockeye salmon populations from the Chignik Watershed. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report No. 5J99-08, Anchorage.

LITERATURE CITED (Cont.)

Vining, I. W. 2003. Post-weir escapement Estimates & errors. Alaska Department of Fish and Game, Unpublished memorandum, dated October 7, 2003. Kodiak.

Witteveen, M.J. 2002. Chignik Lakes scale pattern analysis, run apportionment, and sockeye salmon catch sampling results, 2001. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report No. 4K02-2, Kodiak.

Witteveen, M.J. and J. C. Botz. 2003. Chignik Lakes scale pattern analysis, run apportionment, and sockeye salmon catch sampling results, 2003. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report No. 4K03-1, Kodiak.

Table 1. Age composition of Chignik Lagoon sockeye salmon commercial catch samples by day, post July 31, 2002.

		Ages														
Date		0.2	0.3	0.4	1.1	1.2	1.3	1.4	1.5	2.1	2.2	2.3	2.4	3.2	3.3	Total
8/6/02	Numbers	0	0	1	0	18	60	2	0	0	81	361	13	2	18	556
	Percent	0.0%	0.0%	0.2%	0.0%	3.2%	10.8%	0.4%	0.0%	0.0%	14.6%	64.9%	2.3%	0.4%	3.2%	
8/13/02	Numbers	1	0	0	0	5	22	2	0	0	72	386	14	3	8	513
	Percent	0.2%	0.0%	0.0%	0.0%	1.0%	4.3%	0.4%	0.0%	0.0%	14.0%	75.2%	2.7%	0.6%	1.6%	
8/20/02	Numbers	0	0	0	0	8	25	2	0	1	44	279	4	2	3	368
	Percent	0.0%	0.0%	0.0%	0.0%	2.2%	6.8%	0.5%	0.0%	0.3%	12.0%	75.8%	1.1%	0.5%	0.8%	
8/31/02	Numbers	0	1	0	0	7	16	0	0	0	47	168	8	3	8	258
	Percent	0.0%	0.4%	0.0%	0.0%	2.7%	6.2%	0.0%	0.0%	0.0%	18.2%	65.1%	3.1%	1.2%	3.1%	
Total	Numbers	1	1	1	0	38	123	6	0	1	244	1,194	39	10	37	1,695
	Percent	0.1%	0.1%	0.1%	0.0%	2.2%	7.3%	0.4%	0.0%	0.1%	14.4%	70.4%	2.3%	0.6%	2.2%	

Table 2. Age composition of size selected Chignik Lagoon sockeye salmon commercial catch samples by day, post July 31, 2002.

		Ages											
Date		0.2	1.2	1.3	1.4	2.1	2.2	2.3	2.4	3.1	3.2	3.3	Total
8/6/02	Numbers	0	23	4	1	0	184	48	0	0	3	3	266
	Percent	0.0%	8.6%	1.5%	0.4%	0.0%	69.2%	18.0%	0.0%	0.0%	1.1%	1.1%	
8/13/02	Numbers	0	15	2	0	1	116	17	1	0	4	0	156
	Percent	0.0%	9.6%	1.3%	0.0%	0.6%	74.4%	10.9%	0.6%	0.0%	2.6%	0.0%	
8/20/02	Numbers	1	6	1	0	1	52	17	0	0	1	0	79
	Percent	1.3%	7.6%	1.3%	0.0%	1.3%	65.8%	21.5%	0.0%	0.0%	1.3%	0.0%	
8/27/02	Numbers	1	16	2	1	0	140	34	0	1	5	0	200
	Percent	0.5%	8.0%	1.0%	0.5%	0.0%	70.0%	17.0%	0.0%	0.5%	2.5%	0.0%	
8/31/02	Numbers	0	1	0	0	0	10	0	0	0	0	0	11
	Percent	0.0%	9.1%	0.0%	0.0%	0.0%	90.9%	0.0%	0.0%	0.0%	0.0%	0.0%	
Total	Numbers	2	61	9	2	2	502	116	1	1	13	3	712
	Percent	0.3%	8.6%	1.3%	0.3%	0.3%	70.5%	16.3%	0.1%	0.1%	1.8%	0.4%	

Table 3. Age composition of Black Lake sockeye salmon escapement samples, 2003.

		Ages											
Date		0.2	0.3	1.2	1.3	1.4	2.1	2.2	2.3	2.4	3.2	3.3	Total
6/22	Numbers	0	7	75	344	0	1	49	78	1	0	1	556
	Percent	0.0%	1.3%	13.5%	61.9%	0.0%	0.2%	8.8%	14.0%	0.2%	0.0%	0.2%	
6/23	Numbers	2	4	52	379	1	0	24	83	1	1	1	548
	Percent	0.4%	0.7%	9.5%	69.2%	0.2%	0.0%	4.4%	15.1%	0.2%	0.2%	0.2%	
6/24	Numbers	1	2	53	348	2	0	15	59	0	0	0	480
	Percent	0.2%	0.4%	11.0%	72.5%	0.4%	0.0%	3.1%	12.3%	0.0%	0.0%	0.0%	
Total	Numbers	3	13	180	1071	3	1	88	220	2	1	2	1,584
	Percent	0.2%	0.8%	11.4%	67.6%	0.2%	0.1%	5.6%	13.9%	0.1%	0.1%	0.1%	

Table 4. Age composition of Chignik Lagoon sockeye salmon commercial catch and test fishery samples by day, 2003.

Date		Ages												Total
		0.2	0.3	1.1	1.2	1.3	1.4	2.1	2.2	2.3	2.4	3.2	3.3	
5-Jun	Numbers	1	12	0	43	345	3	0	24	78	0	0	0	506
	Percent	0.2%	2.4%	0.0%	8.5%	68.2%	0.6%	0.0%	4.7%	15.4%	0.0%	0.0%	0.0%	
12-Jun	Numbers	1	12	0	42	332	2	0	21	82	1	0	1	494
	Percent	0.2%	2.4%	0.0%	8.5%	67.2%	0.4%	0.0%	4.3%	16.6%	0.2%	0.0%	0.2%	
17-Jun	Numbers	1	10	0	35	361	1	0	15	79	0	0	0	502
	Percent	0.2%	2.0%	0.0%	7.0%	71.9%	0.2%	0.0%	3.0%	15.7%	0.0%	0.0%	0.0%	
26-Jun	Numbers	0	1	0	118	280	3	1	36	77	0	0	2	518
	Percent	0.0%	0.2%	0.0%	22.8%	54.1%	0.6%	0.2%	6.9%	14.9%	0.0%	0.0%	0.4%	
29-Jun	Numbers	0	23	0	62	292	0	0	16	100	1	0	1	495
	Percent	0.0%	4.6%	0.0%	12.5%	59.0%	0.0%	0.0%	3.2%	20.2%	0.2%	0.0%	0.2%	
2-Jul	Numbers	0	17	0	67	290	0	1	13	112	0	0	1	501
	Percent	0.0%	3.4%	0.0%	13.4%	57.9%	0.0%	0.2%	2.6%	22.4%	0.0%	0.0%	0.2%	
6-Jul	Numbers	0	3	0	39	183	0	0	15	164	0	0	4	408
	Percent	0.0%	0.7%	0.0%	9.6%	44.9%	0.0%	0.0%	3.7%	40.2%	0.0%	0.0%	1.0%	
9-Jul	Numbers	0	4	0	35	163	0	0	7	290	1	0	5	505
	Percent	0.0%	0.8%	0.0%	6.9%	32.3%	0.0%	0.0%	1.4%	57.4%	0.2%	0.0%	1.0%	
15-Jul	Numbers	0	7	3	37	110	2	6	25	327	1	0	3	521
	Percent	0.0%	1.3%	0.6%	7.1%	21.1%	0.4%	1.2%	4.8%	62.8%	0.2%	0.0%	0.6%	
22-Jul	Numbers	0	1	0	7	96	0	0	14	397	1	3	5	524
	Percent	0.0%	0.2%	0.0%	1.3%	18.3%	0.0%	0.0%	2.7%	75.8%	0.2%	0.6%	1.0%	

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Date		Ages 0.2	0.3	1.1	1.2	1.3	1.4	2.1	2.2	2.3	2.4	3.2	3.3	Total
29-Jul	Numbers	0	3	0	18	95	0	0	12	366	4	2	3	503
	Percent	0.0%	0.6%	0.0%	3.6%	18.9%	0.0%	0.0%	2.4%	72.8%	0.8%	0.4%	0.6%	
5-Aug	Numbers	0	6	0	8	59	4	0	23	404	5	2	7	518
	Percent	0.0%	1.2%	0.0%	1.5%	11.4%	0.8%	0.0%	4.4%	78.0%	1.0%	0.4%	1.4%	
12-Aug	Numbers	1	2	0	12	41	0	1	25	401	0	1	2	486
	Percent	0.2%	0.4%	0.0%	2.5%	8.4%	0.0%	0.2%	5.1%	82.5%	0.0%	0.2%	0.4%	
17-Aug	Numbers	0	1	0	5	45	1	0	31	406	8	3	1	501
	Percent	0.0%	0.2%	0.0%	1.0%	9.0%	0.2%	0.0%	6.2%	81.0%	1.6%	0.6%	0.2%	
26-Aug	Numbers	0	0	0	6	39	1	0	37	397	3	2	11	496
	Percent	0.0%	0.0%	0.0%	1.2%	7.9%	0.2%	0.0%	7.5%	80.0%	0.6%	0.4%	2.2%	
2-Sep	Numbers	0	0	0	4	40	1	1	18	421	3	2	4	494
	Percent	0.0%	0.0%	0.0%	0.8%	8.1%	0.2%	0.2%	3.6%	85.2%	0.6%	0.4%	0.8%	
Total	Numbers	4	102	3	538	2,771	18	10	332	4,101	28	15	50	7,972
	Percent	0.1%	1.3%	0.0%	6.7%	34.8%	0.2%	0.1%	4.2%	51.4%	0.4%	0.2%	0.6%	

Table 5. Estimated delay time for sockeye salmon traveling to Chignik Lagoon.

Location	Delay Days	Statistical Areas	Time Period
Weir Count	-1		Entire Season
Chignik Lagoon	0	27110	Entire Season
Outer Chignik Bay/Kujulik Sections	1	27220-27250	Entire Season
Cape Kumlik Section	2	27262-27264	Entire Season
Eastern District	3	27260, 27270-27296	Entire Season
Cape Igvak (Kodiak)	5	26275-26295	Through July 25
Western District	2	27370-27394	Entire Season
Perryville District	3	27540-27560	Entire Season
SEDM (Area M)	5	21815-28190	Through June 30
SEDM (Area M)	5	28115-28130, 28170-28190	June 30 through July 25

Table 6. Classification accuracy for Chignik and Black Lake inseason and postseason run assignment scale pattern analysis models.

	Model Classification Accuracy							
	Age 2.3 Inseason		Age 1.3 Inseason		Age 2.3 Postseason		Age 1.3 Postseason	
Actual Destination	Black Lake	Chignik Lake	Black Lake	Chignik Lake	Black Lake	Chignik Lake	Black Lake	Chignik Lake
Black Lake	91.0%	9.0%	89.0%	11.0%	90.5%	9.5%	94.0%	6.0%
Chignik Lake	3.9%	96.1%	10.1%	89.9%	7.0%	93.0%	14.1%	85.9%

Table 7. Estimated daily proportion of Chignik River sockeye salmon to Chignik Lake smoothed by the common logistic function, using age 1.3 and 2.3 scales inseason and postseason.

	Model			
Date	1.3 inseason %	2.3 inseason %	1.3 postseason %	2.3 postseason %
28-May	0.0%	13.0%	0.6%	15.7%
29-May	0.0%	13.8%	0.7%	16.6%
30-May	0.0%	14.7%	0.8%	17.5%
31-May	0.0%	15.6%	0.9%	18.5%
1-Jun	0.0%	16.6%	1.0%	19.4%
2-Jun	0.0%	17.6%	1.1%	20.5%
3-Jun	0.0%	18.7%	1.3%	21.5%
4-Jun	0.0%	19.8%	1.4%	22.6%
5-Jun	0.0%	21.0%	1.6%	23.8%
6-Jun	0.0%	22.2%	1.8%	25.0%
7-Jun	0.0%	23.5%	2.1%	26.2%
8-Jun	0.0%	24.8%	2.4%	27.4%
9-Jun	0.0%	26.1%	2.7%	28.7%
10-Jun	0.0%	27.6%	3.0%	30.1%
11-Jun	0.0%	29.0%	3.4%	31.4%
12-Jun	0.0%	30.5%	3.9%	32.8%
13-Jun	0.0%	32.1%	4.4%	34.3%
14-Jun	0.0%	33.7%	4.9%	35.7%
15-Jun	0.1%	35.3%	5.6%	37.2%
16-Jun	0.1%	37.0%	6.3%	38.7%
17-Jun	0.1%	38.7%	7.1%	40.3%
18-Jun	0.2%	40.4%	8.0%	41.8%
19-Jun	0.2%	42.1%	9.0%	43.4%
20-Jun	0.3%	43.9%	10.1%	45.0%
21-Jun	0.4%	45.7%	11.3%	46.5%
22-Jun	0.6%	47.5%	12.7%	48.1%
23-Jun	0.9%	49.3%	14.2%	49.8%
24-Jun	1.3%	51.1%	15.8%	51.4%
25-Jun	1.8%	52.9%	17.6%	53.0%
26-Jun	2.5%	54.7%	19.5%	54.6%
27-Jun	3.6%	56.5%	21.6%	56.1%
28-Jun	5.0%	58.2%	23.9%	57.7%
29-Jun	7.0%	60.0%	26.3%	59.3%
30-Jun	9.7%	61.7%	28.9%	60.8%
1-Jul	13.3%	63.4%	31.6%	62.3%
2-Jul	17.9%	65.0%	34.4%	63.8%
3-Jul	23.7%	66.6%	37.4%	65.3%
4-Jul	30.7%	68.2%	40.4%	66.7%
5-Jul	38.7%	69.8%	43.5%	68.1%

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	Model			
Date	1.3 inseason %	2.3 inseason %	1.3 postseason %	2.3 postseason %
6-Jul	47.4%	71.3%	46.7%	69.5%
7-Jul	56.2%	72.7%	49.9%	70.9%
8-Jul	64.6%	74.1%	53.1%	72.2%
9-Jul	72.3%	75.5%	56.3%	73.4%
10-Jul	68.0%	79.3%	59.4%	74.7%
11-Jul	73.5%	80.6%	62.5%	75.9%
12-Jul	78.3%	81.8%	65.4%	77.0%
13-Jul	82.5%	82.9%	68.3%	78.1%
14-Jul	86.0%	84.0%	71.0%	79.2%
15-Jul	79.7%	84.4%	73.6%	80.2%
16-Jul	82.7%	85.4%	76.0%	81.2%
17-Jul	85.3%	86.3%	78.2%	82.2%
18-Jul	87.6%	87.2%	80.4%	83.1%
19-Jul	89.6%	88.0%	82.3%	84.0%
20-Jul	91.3%	88.8%	84.1%	84.8%
21-Jul	92.7%	89.6%	85.7%	85.7%
22-Jul	91.3%	88.7%	87.2%	86.4%
23-Jul	92.6%	89.4%	88.6%	87.2%
24-Jul	93.7%	90.0%	89.8%	87.9%
25-Jul	94.6%	90.6%	90.9%	88.5%
26-Jul	95.5%	91.2%	92.0%	89.2%
27-Jul	96.1%	91.8%	92.9%	89.8%
28-Jul	96.7%	92.3%	93.7%	90.3%
29-Jul	97.2%	92.8%	94.4%	90.9%
30-Jul	96.8%	92.9%	95.0%	91.4%
31-Jul	97.3%	93.3%	95.6%	91.9%
1-Aug	97.7%	93.7%	96.1%	92.4%
2-Aug	98.0%	94.1%	96.6%	92.8%
3-Aug	98.3%	94.5%	97.0%	93.2%
4-Aug	98.6%	94.9%	97.3%	93.6%
5-Aug	98.8%	95.2%	97.6%	94.0%
6-Aug	98.5%	95.0%	97.9%	94.3%
7-Aug	98.7%	95.3%	98.2%	94.7%
8-Aug	98.9%	95.6%	98.4%	95.0%
9-Aug	99.1%	95.8%	98.6%	95.3%
10-Aug	99.2%	96.1%	98.7%	95.6%
11-Aug	99.3%	96.3%	98.9%	95.8%
12-Aug	99.4%	96.5%	99.0%	96.1%
13-Aug	99.4%	96.7%	99.1%	96.3%
14-Aug	99.5%	96.9%	99.2%	96.5%
15-Aug	99.6%	97.1%	99.3%	96.7%
16-Aug	99.6%	97.3%	99.4%	96.9%
17-Aug	99.7%	97.5%	99.5%	97.1%
18-Aug	99.7%	97.3%	99.5%	97.3%
19-Aug	99.8%	97.5%	99.6%	97.5%
20-Aug	99.8%	97.6%	99.6%	97.6%

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	Model			
Date	1.3 inseason %	2.3 inseason %	1.3 postseason %	2.3 postseason %
21-Aug	99.8%	97.8%	99.7%	97.8%
22-Aug	99.9%	97.9%	99.7%	97.9%
23-Aug	99.9%	98.0%	99.8%	98.0%
24-Aug	99.9%	98.1%	99.8%	98.1%
25-Aug	99.9%	98.2%	99.8%	98.3%
26-Aug	99.9%	98.4%	99.8%	98.4%
27-Aug	99.9%	98.5%	99.9%	98.5%
28-Aug	99.9%	98.5%	99.9%	98.6%
29-Aug	99.9%	98.6%	99.9%	98.6%
30-Aug	100.0%	98.7%	99.9%	98.7%
31-Aug	100.0%	99.3%	99.9%	98.8%

Table 8. Results from the Chignik River system age 1.3 sockeye salmon inseason SPA model.

					Second Order Estimate[a] - Cook and Lord					
		Unknown	Model Results		Black Lake			Chignik Lake		
Sample #	Catch Date	Sample Size	Black L	Chignik L	Low	Point	High	Low	Point	High
1	7-Jun	102	0.92	0.08	0.97	1.00	1.00	0.00	0.00	0.03
2	12-Jun	101	0.89	0.11	0.92	1.00	1.00	0.00	0.00	0.08
3	17-Jun	100	0.82	0.18	0.82	0.91	1.00	0.00	0.09	0.18
4	26-Jun	100	0.83	0.17	0.83	0.92	1.00	0.00	0.08	0.17
5	29-Jun	102	0.86	0.14	0.88	0.97	1.00	0.00	0.04	0.12
6	3-Jul	100	0.70	0.30	0.66	0.76	0.86	0.14	0.24	0.34
7	6-Jul	101	0.45	0.55	0.32	0.44	0.55	0.45	0.56	0.68
8	9-Jul	101	0.396	0.604	0.26	0.38	0.49	0.51	0.63	0.74
9	14-Jul	101	0.347	0.653	0.20	0.31	0.43	0.58	0.69	0.80
10	21-Jul	95	0.253	0.747	0.08	0.19	0.31	0.70	0.81	0.92
11	29-Jul	93	0.237	0.763	0.06	0.17	0.29	0.72	0.83	0.94
12	5-Aug	58	0.379	0.621	0.21	0.35	0.50	0.50	0.65	0.79
13	11-Aug	41	0.22	0.78	0.00	0.15	0.30	0.70	0.85	1.00
14	17-Aug	45	0.133	0.867	-0.09	0.04	0.17	0.83	0.96	1.09
15	26-Aug	39	0.128	0.872	-0.10	0.04	0.17	0.83	0.96	1.10
16	2-Sep	40	0.075	0.925	-0.15	-0.03	0.09	0.91	1.03	1.15

[a]The second order point estimate for the Chignik Lake stock is used to calculate the logistic curve and estimate the stock composition.

Table 9. Results from the Chignik River system age 2.3 sockeye salmon inseason SPA model.

					Second Order Estimate[a] - Cook and Lord					
		Unknown	Model Results		Black Lake			Chignik Lake		
Sample #	Catch Date	Sample Size	Black L	Chignik L	Low	Point	High	Low	Point	High
1	7-Jun	72	0.53	0.47	0.45	0.56	0.68	0.33	0.44	0.55
2	12-Jun	64	0.58	0.42	0.50	0.62	0.74	0.26	0.38	0.50
3	17-Jun	69	0.72	0.28	0.68	0.79	0.89	0.11	0.21	0.32
4	26-Jun	67	0.69	0.31	0.63	0.74	0.85	0.15	0.26	0.37
5	29-Jun	64	0.36	0.64	0.25	0.37	0.48	0.52	0.63	0.75
6	3-Jul	70	0.31	0.69	0.21	0.32	0.42	0.58	0.68	0.79
7	6-Jul	101	0.16	0.84	0.07	0.14	0.21	0.79	0.86	0.94
8	9-Jul	100	0.15	0.85	0.06	0.13	0.20	0.80	0.87	0.94
9	14-Jul	100	0.20	0.80	0.11	0.19	0.26	0.74	0.82	0.89
10	21-Jul	100	0.22	0.78	0.13	0.21	0.29	0.71	0.79	0.87
11	29-Jul	100	0.13	0.87	0.04	0.11	0.17	0.83	0.90	0.96
12	5-Aug	100	0.15	0.85	0.06	0.13	0.20	0.80	0.87	0.94
13	11-Aug	100	0.08	0.92	-0.01	0.05	0.11	0.90	0.95	1.01
14	17-Aug	100	0.16	0.84	0.07	0.14	0.21	0.79	0.86	0.93
15	26-Aug	100	0.04	0.96	-0.04	0.00	0.05	0.95	1.00	1.04
16	2-Sep	100	0.09	0.91	0.00	0.06	0.12	0.88	0.94	1.00

[a] The second order point estimate for the Chignik Lake stock is used to calculate the logistic curve and estimate the stock composition.

Table 10. The inseason and postseason estimated Chignik Lake stock composition and escapement estimates.

	Inseason Chignik Lake Stock Composition Estimate [a]	Postseason Chignik Lake Stock Composition Estimate
28-May	2.7%	3.7%
29-May	2.9%	4.0%
30-May	3.1%	4.2%
31-May	3.2%	4.5%
1-Jun	3.5%	4.8%
2-Jun	3.7%	5.1%
3-Jun	3.9%	5.5%
4-Jun	4.1%	5.8%
5-Jun	4.4%	6.2%
6-Jun	4.6%	6.7%
7-Jun	4.9%	7.1%
8-Jun	5.2%	7.6%
9-Jun	5.5%	8.2%
10-Jun	5.9%	8.8%
11-Jun	6.2%	9.4%
12-Jun	6.6%	10.1%
13-Jun	6.9%	10.7%
14-Jun	7.1%	11.3%
15-Jun	7.3%	11.9%
16-Jun	7.5%	12.7%
17-Jun	7.7%	13.5%
18-Jun	7.9%	14.6%
19-Jun	8.4%	15.8%
20-Jun	9.0%	17.1%
21-Jun	9.6%	18.5%
22-Jun	10.3%	20.1%
23-Jun	11.1%	21.7%
24-Jun	11.9%	23.4%
25-Jun	12.9%	25.3%
26-Jun	14.1%	27.3%
27-Jun	15.6%	29.5%
28-Jun	17.5%	31.9%
29-Jun	19.7%	34.4%
30-Jun	22.5%	36.9%
1-Jul	25.8%	39.4%

-Continued-

Table 10. (page 2 of 3)

	Inseason Chignik Lake Stock Composition Estimate [a]	Postseason Chignik Lake Stock Composition Estimate
2-Jul	29.9%	42.0%
3-Jul	34.8%	45.9%
4-Jul	42.2%	49.7%
5-Jul	49.7%	53.4%
6-Jul	56.9%	56.9%
7-Jul	63.6%	60.3%
8-Jul	69.4%	63.6%
9-Jul	74.0%	66.6%
10-Jul	74.8%	68.8%
11-Jul	77.9%	71.0%
12-Jul	80.5%	73.0%
13-Jul	82.8%	74.9%
14-Jul	84.6%	76.7%
15-Jul	83.0%	78.3%
16-Jul	84.6%	79.8%
17-Jul	86.0%	81.1%
18-Jul	87.3%	82.4%
19-Jul	88.4%	83.6%
20-Jul	89.4%	84.7%
21-Jul	90.2%	85.7%
22-Jul	89.2%	86.6%
23-Jul	90.0%	87.5%
24-Jul	90.8%	88.3%
25-Jul	91.5%	89.0%
26-Jul	92.1%	89.8%
27-Jul	92.7%	90.4%
28-Jul	93.3%	91.1%
29-Jul	93.8%	91.7%
30-Jul	93.8%	92.2%
31-Jul	94.2%	92.6%
1-Aug	100.0%	93.1%
2-Aug		93.5%
3-Aug		93.8%
4-Aug		94.2%
5-Aug		94.5%

-Continued-

Table 10. (page 3 of 3)

	Inseason Chignik Lake Stock Composition Estimate [a]	Postseason Chignik Lake Stock Composition Estimate
6-Aug		94.8%
7-Aug		95.1%
8-Aug		95.4%
9-Aug		95.7%
10-Aug		95.9%
11-Aug		96.2%
12-Aug		96.4%
13-Aug		96.6%
14-Aug		96.8%
15-Aug		97.0%
16-Aug		97.2%
17-Aug		97.4%
18-Aug		97.5%
19-Aug		97.7%
20-Aug		97.8%
21-Aug		97.9%
22-Aug		98.1%
23-Aug		98.2%
24-Aug		98.3%
25-Aug		98.4%
26-Aug		98.5%
27-Aug		98.6%
28-Aug		98.7%
29-Aug		98.8%
30-Aug		98.8%
31-Aug		98.9%
1-Sep		99.0%
2-Sep		99.0%
3-Sep		99.1%
4-Sep		99.2%
5-Sep		99.2%
6-Sep		99.3%
7-Sep		99.3%
8-Sep		99.3%
9-Sep		99.4%
10-Sep		99.4%
11-Sep		99.5%
12-Sep		99.5%
13-Sep		99.5%
14-Sep		99.6%
15-Sep		99.6%

[a] For inseason analysis, the escapement is assumed to be 100% Chignik Lake stock after July 31.

Table 11. Results from the Chignik River system age 1.3 sockeye salmon postseason SPA model.

					Second Order Estimate[a] - Cook and Lord					
		Unknown	Model Results		Black Lake			Chignik Lake		
Sample #	Catch Date	Sample Size	Black L	Chignik L	Low	Point	High	Low	Point	High
1	7-Jun	102	0.92	0.08	0.91	0.98	1.04	-0.04	0.02	0.09
2	12-Jun	100	0.86	0.14	0.82	0.90	0.98	0.02	0.10	0.18
3	17-Jun	100	0.85	0.15	0.81	0.89	0.97	0.03	0.11	0.19
4	26-Jun	100	0.78	0.22	0.71	0.80	0.89	0.11	0.20	0.29
5	29-Jun	100	0.84	0.16	0.79	0.88	0.96	0.04	0.13	0.21
6	3-Jul	100	0.70	0.30	0.60	0.70	0.80	0.20	0.30	0.40
7	6-Jul	100	0.46	0.54	0.29	0.40	0.51	0.49	0.60	0.71
8	9-Jul	100	0.41	0.59	0.23	0.34	0.44	0.56	0.66	0.77
9	14-Jul	101	0.32	0.68	0.12	0.22	0.32	0.68	0.78	0.88
10	21-Jul	95	0.28	0.72	0.08	0.18	0.28	0.72	0.82	0.93
11	29-Jul	93	0.30	0.70	0.09	0.20	0.31	0.69	0.80	0.91
12	5-Aug	57	0.35	0.65	0.13	0.26	0.40	0.60	0.74	0.87
13	11-Aug	41	0.15	0.85	-0.12	0.01	0.13	0.87	0.99	1.12
14	17-Aug	45	0.09	0.91	-0.17	-0.07	0.04	0.96	1.07	1.17
15	26-Aug	39	0.08	0.92	-0.18	-0.08	0.02	0.98	1.08	1.18
16	2-Sep	40	0.05	0.95	-0.20	-0.11	-0.02	1.02	1.11	1.20

[a] The second order point estimate for the Chignik Lake stock is used to calculate the logistic curve and estimate the stock composition.

Table 12. Results from the Chignik River system age 2.3 sockeye salmon postseason SPA model.

Sample #	Catch Date	Unknown Sample Size	Model Results		Second Order Estimate[a] - Cook and Lord					
					Black Lake			Chignik Lake		
			Black L	Chignik L	Low	Point	High	Low	Point	High
1	7-Jun	72	0.56	0.44	0.46	0.58	0.70	0.30	0.42	0.54
2	12-Jun	64	0.55	0.45	0.45	0.57	0.70	0.30	0.43	0.56
3	17-Jun	69	0.75	0.25	0.71	0.82	0.93	0.07	0.18	0.29
4	26-Jun	67	0.70	0.30	0.64	0.76	0.87	0.13	0.24	0.36
5	29-Jun	63	0.37	0.64	0.23	0.35	0.48	0.52	0.65	0.77
6	3-Jul	70	0.33	0.67	0.20	0.31	0.42	0.58	0.69	0.80
7	6-Jul	101	0.20	0.80	0.07	0.15	0.24	0.76	0.85	0.93
8	9-Jul	100	0.21	0.79	0.08	0.17	0.25	0.75	0.83	0.92
9	14-Jul	100	0.25	0.75	0.13	0.22	0.31	0.69	0.78	0.87
10	21-Jul	100	0.26	0.74	0.14	0.23	0.32	0.68	0.77	0.86
11	29-Jul	100	0.16	0.84	0.03	0.11	0.19	0.81	0.89	0.97
12	5-Aug	100	0.90	0.91	-0.04	0.02	0.09	0.91	0.98	1.04
13	11-Aug	100	0.12	0.88	-0.01	0.06	0.13	0.87	0.94	1.01
14	17-Aug	100	0.16	0.84	0.03	0.11	0.19	0.81	0.89	0.97
15	26-Aug	100	0.50	0.95	-0.08	-0.02	0.03	0.97	1.02	1.08
16	2-Sep	100	0.60	0.94	-0.07	-0.01	0.05	0.95	1.01	1.07

[a] The second order point estimate for the Chignik Lake stock is used to calculate the logistic curve and estimate the stock composition.

Table 13. Daily and cumulative sockeye salmon catch and escapement as determined by postseason scale pattern analysis for the Black Lake system stock, adjusted to Lagoon date, 2003.

Date	Escapement Counts	Catch[a]	Daily Total	Cumulative Catch and Escapement	Cumulative Percent	Daily Proportion of Entire Run
24-May	0	0	0	0	0.0%	0.0%
25-May	0	0	0	0	0.0%	0.0%
26-May	97	0	97	97	0.0%	0.0%
27-May	191	0	191	288	0.0%	0.0%
28-May	776	0	776	1,064	0.1%	0.1%
29-May	1,133	0	1,133	2,197	0.2%	0.1%
30-May	907	0	907	3,104	0.3%	0.1%
31-May	1,747	0	1,747	4,850	0.5%	0.2%
1-Jun	3,502	0	3,502	8,353	0.8%	0.4%
2-Jun	5,166	0	5,166	13,519	1.4%	0.5%
3-Jun	3,187	0	3,187	16,706	1.7%	0.3%
4-Jun	5,444	477	5,920	22,626	2.3%	0.6%
5-Jun	8,331	15,868	24,199	46,825	4.7%	2.4%
6-Jun	5,602	22,651	28,253	75,078	7.6%	2.9%
7-Jun	7,694	10,169	17,863	92,941	9.4%	1.8%
8-Jun	6,571	21,407	27,978	120,919	12.2%	2.8%
9-Jun	5,037	24,908	29,945	150,864	15.2%	3.0%
10-Jun	4,670	23,006	27,677	178,541	18.0%	2.8%
11-Jun	9,841	25,309	35,150	213,690	21.6%	3.6%
12-Jun	11,272	29,487	40,759	254,449	25.7%	4.1%
13-Jun	9,119	19,281	28,400	282,849	28.6%	2.9%
14-Jun	8,667	19,898	28,565	311,414	31.5%	2.9%
15-Jun	8,826	43,440	52,267	363,681	36.7%	5.3%
16-Jun	13,516	45,763	59,280	422,961	42.7%	6.0%
17-Jun	9,539	32,312	41,852	464,813	47.0%	4.2%
18-Jun	17,042	14,227	31,269	496,081	50.1%	3.2%
19-Jun	15,297	8,834	24,130	520,212	52.6%	2.4%
20-Jun	24,434	2,515	26,949	547,161	55.3%	2.7%
21-Jun	13,064	18,512	31,577	578,737	58.5%	3.2%
22-Jun	12,652	19,725	32,378	611,115	61.7%	3.3%
23-Jun	24,918	16,736	41,654	652,769	66.0%	4.2%
24-Jun	32,638	10,198	42,836	695,605	70.3%	4.3%
25-Jun	10,465	11,837	22,302	717,907	72.5%	2.3%
26-Jun	11,313	17,390	28,703	746,609	75.4%	2.9%
27-Jun	2,108	11,965	14,073	760,682	76.9%	1.4%
28-Jun	874	9,931	10,805	771,487	78.0%	1.1%
29-Jun	911	13,576	14,488	785,975	79.4%	1.5%
30-Jun	995	18,142	19,137	805,112	81.3%	1.9%
1-Jul	2,484	17,198	19,682	824,793	83.3%	2.0%
2-Jul	1,696	8,357	10,053	834,846	84.4%	1.0%
3-Jul	1,511	5,711	7,222	842,068	85.1%	0.7%
4-Jul	5,851	1,775	7,626	849,694	85.9%	0.8%
5-Jul	4,778	4,609	9,387	859,081	86.8%	0.9%
6-Jul	1,574	8,355	9,928	869,009	87.8%	1.0%

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Table 13. (page 2 of 3)

Date	Escapement Counts	Catch	Daily Total	Cumulative Catch and Escapement	Cumulative Percent	Daily Proportion of Entire Run
7-Jul	1,430	7,990	9,420	878,429	88.8%	1.0%
8-Jul	1,214	6,710	7,924	886,353	89.6%	0.8%
9-Jul	2,831	3,180	6,011	892,364	90.2%	0.6%
10-Jul	2,635	3,340	5,976	898,340	90.8%	0.6%
11-Jul	3,238	5,023	8,261	906,601	91.6%	0.8%
12-Jul	5,076	5,481	10,557	917,159	92.7%	1.1%
13-Jul	2,063	4,725	6,788	923,946	93.4%	0.7%
14-Jul	800	4,919	5,719	929,665	93.9%	0.6%
15-Jul	515	6,160	6,675	936,339	94.6%	0.7%
16-Jul	228	7,326	7,554	943,893	95.4%	0.8%
17-Jul	756	3,762	4,518	948,412	95.8%	0.5%
18-Jul	1,857	1,680	3,537	951,949	96.2%	0.4%
19-Jul	1,676	1,599	3,275	955,223	96.5%	0.3%
20-Jul	1,256	1,553	2,809	958,032	96.8%	0.3%
21-Jul	2,022	5,589	7,610	965,643	97.6%	0.8%
22-Jul	851	2,046	2,897	968,539	97.9%	0.3%
23-Jul	205	1,875	2,080	970,619	98.1%	0.2%
24-Jul	224	2,237	2,461	973,080	98.3%	0.2%
25-Jul	180	2,078	2,257	975,338	98.5%	0.2%
26-Jul	475	699	1,174	976,511	98.7%	0.1%
27-Jul	992	156	1,148	977,659	98.8%	0.1%
28-Jul	933	0	933	978,592	98.9%	0.1%
29-Jul	755	129	884	979,476	99.0%	0.1%
30-Jul	223	715	938	980,414	99.1%	0.1%
31-Jul	109	681	791	981,205	99.1%	0.1%
1-Aug	71	502	573	981,778	99.2%	0.1%
2-Aug	52	561	613	982,391	99.3%	0.1%
3-Aug	55	494	549	982,940	99.3%	0.1%
4-Aug	45	425	470	983,409	99.4%	0.0%
5-Aug	21	528	549	983,958	99.4%	0.1%
6-Aug	93	453	546	984,504	99.5%	0.1%
7-Aug	183	195	378	984,882	99.5%	0.0%
8-Aug	163	159	322	985,203	99.5%	0.0%
9-Aug	244	157	401	985,604	99.6%	0.0%
10-Aug	84	280	363	985,967	99.6%	0.0%
11-Aug	64	328	392	986,360	99.7%	0.0%
12-Aug	26	223	249	986,609	99.7%	0.0%
13-Aug	35	215	250	986,859	99.7%	0.0%
14-Aug	44	161	205	987,064	99.7%	0.0%
15-Aug	52	176	228	987,292	99.8%	0.0%
16-Aug	22	148	170	987,462	99.8%	0.0%
17-Aug	46	191	237	987,700	99.8%	0.0%
18-Aug	28	222	250	987,950	99.8%	0.0%
19-Aug	15	201	216	988,165	99.8%	0.0%
20-Aug	27	165	192	988,357	99.9%	0.0%
21-Aug	44	114	158	988,515	99.9%	0.0%
22-Aug	46	91	138	988,653	99.9%	0.0%
23-Aug	15	122	138	988,790	99.9%	0.0%
24-Aug	16	113	129	988,919	99.9%	0.0%
25-Aug	22	102	123	989,043	99.9%	0.0%
26-Aug	18	60	77	989,120	99.9%	0.0%
27-Aug	29	57	86	989,206	99.9%	0.0%
28-Aug	37	20	57	989,262	100.0%	0.0%
29-Aug	23	48	71	989,333	100.0%	0.0%

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Table 13. (page 3 of 3)

Date	Escapement Counts	Catch	Daily Total	Cumulative Catch and Escapement	Cumulative Percent	Daily Proportion of Entire Run
30-Aug	23	61	83	989,417	100.0%	0.0%
31-Aug	17	48	65	989,482	100.0%	0.0%
1-Sep	13	44	56	989,538	100.0%	0.0%
2-Sep	8	31	39	989,577	100.0%	0.0%
3-Sep	13	40	53	989,630	100.0%	0.0%
4-Sep		28	28	989,658	100.0%	0.0%
5-Sep		36	36	989,694	100.0%	0.0%
6-Sep		2	2	989,697	100.0%	0.0%
7-Sep		1	1	989,698	100.0%	0.0%
8-Sep		1	1	989,699	100.0%	0.0%
9-Sep		4	4	989,703	100.0%	0.0%
10-Sep		4	4	989,707	100.0%	0.0%
11-Sep		5	5	989,712	100.0%	0.0%
12-Sep		0	0	989,712	100.0%	0.0%
13-Sep		3	3	989,715	100.0%	0.0%
14-Sep		2	2	989,717	100.0%	0.0%
15-Sep		3	3	989,720	100.0%	0.0%
Post Weir	331					
Total	350,004	640,047	990,051			

[a] Catch includes the Cape Igvak and SEDM fisheries.

Table 14. Daily and cumulative sockeye salmon catch and escapement as determined by postseason scale pattern analysis for the Chignik Lake system stock, adjusted to Lagoon date, 2003.

Date	Escapement Counts	Catch [a]	Daily Total	Cumulative Catch and Escapement	Cumulative Percent	Daily Proportion of Entire Run
24-May	0	0	0	0	0.0%	0.0%
25-May	0	0	0	0	0.0%	0.0%
26-May	3	0	3	3	0.0%	0.0%
27-May	7	0	7	10	0.0%	0.0%
28-May	30	0	30	40	0.0%	0.0%
29-May	47	0	47	87	0.0%	0.0%
30-May	40	0	40	127	0.0%	0.0%
31-May	82	0	82	210	0.0%	0.0%
1-Jun	177	0	177	386	0.0%	0.0%
2-Jun	279	0	279	665	0.1%	0.0%
3-Jun	184	0	184	849	0.1%	0.0%
4-Jun	336	29	366	1,215	0.1%	0.0%
5-Jun	552	1,050	1,602	2,817	0.3%	0.2%
6-Jun	399	1,614	2,013	4,830	0.5%	0.2%
7-Jun	591	780	1,371	6,201	0.7%	0.1%
8-Jun	543	1,771	2,314	8,515	0.9%	0.3%
9-Jun	449	2,222	2,671	11,186	1.2%	0.3%
10-Jun	450	2,215	2,664	13,850	1.5%	0.3%
11-Jun	1,023	2,631	3,654	17,505	1.9%	0.4%
12-Jun	1,267	3,314	4,581	22,086	2.4%	0.5%
13-Jun	1,089	2,302	3,391	25,477	2.8%	0.4%
14-Jun	1,102	2,529	3,630	29,107	3.2%	0.4%
15-Jun	1,197	5,890	7,086	36,193	4.0%	0.8%
16-Jun	1,960	6,635	8,594	44,788	4.9%	0.9%
17-Jun	1,483	5,022	6,504	51,292	5.6%	0.7%
18-Jun	2,909	2,429	5,338	56,630	6.2%	0.6%
19-Jun	2,871	1,658	4,530	61,160	6.7%	0.5%
20-Jun	5,048	519	5,567	66,727	7.3%	0.6%
21-Jun	2,973	4,212	7,185	73,912	8.1%	0.8%
22-Jun	3,175	4,949	8,124	82,036	9.0%	0.9%
23-Jun	6,901	4,635	11,536	93,572	10.2%	1.3%
24-Jun	9,989	3,121	13,110	106,683	11.7%	1.4%
25-Jun	3,543	4,008	7,551	114,234	12.5%	0.8%
26-Jun	4,242	6,521	10,763	124,997	13.7%	1.2%
27-Jun	884	5,018	5,902	130,899	14.3%	0.6%
28-Jun	410	4,661	5,071	135,970	14.9%	0.6%
29-Jun	479	7,134	7,613	143,582	15.7%	0.8%
30-Jun	582	10,606	11,188	154,770	16.9%	1.2%
1-Jul	1,617	11,197	12,814	167,584	18.3%	1.4%
2-Jul	1,230	6,064	7,294	174,878	19.1%	0.8%
3-Jul	1,285	4,853	6,138	181,016	19.8%	0.7%
4-Jul	5,788	1,757	7,545	188,561	20.6%	0.8%
5-Jul	5,473	5,280	10,753	199,315	21.8%	1.2%
6-Jul	2,077	11,027	13,105	212,419	23.2%	1.4%
7-Jul	2,176	12,156	14,332	226,751	24.8%	1.6%

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Table 14. (page 2 of 3)

Date	Escapement Counts	Catch	Daily Total	Cumulative Catch and Escapement	Cumulative Percent	Daily Proportion of Entire Run
8-Jul	2,120	11,713	13,833	240,584	26.3%	1.5%
9-Jul	5,642	6,338	11,980	252,564	27.6%	1.3%
10-Jul	5,824	7,382	13,205	265,769	29.1%	1.4%
11-Jul	7,922	12,287	20,209	285,978	31.3%	2.2%
12-Jul	13,725	14,820	28,545	314,523	34.4%	3.1%
13-Jul	6,152	14,092	20,244	334,767	36.6%	2.2%
14-Jul	2,625	16,150	18,776	353,543	38.7%	2.1%
15-Jul	1,855	22,211	24,066	377,610	41.3%	2.6%
16-Jul	900	28,891	29,791	407,400	44.6%	3.3%
17-Jul	3,255	16,195	19,450	426,850	46.7%	2.1%
18-Jul	8,707	7,875	16,581	443,431	48.5%	1.8%
19-Jul	8,537	8,147	16,684	460,116	50.3%	1.8%
20-Jul	6,937	8,583	15,520	475,636	52.0%	1.7%
21-Jul	12,085	33,410	45,495	521,130	57.0%	5.0%
22-Jul	5,490	13,205	18,695	539,826	59.0%	2.0%
23-Jul	1,426	13,068	14,494	554,320	60.6%	1.6%
24-Jul	1,684	16,834	18,518	572,838	62.6%	2.0%
25-Jul	1,460	16,882	18,343	591,181	64.7%	2.0%
26-Jul	4,162	6,133	10,295	601,476	65.8%	1.1%
27-Jul	9,389	1,479	10,868	612,344	67.0%	1.2%
28-Jul	9,536	0	9,536	621,880	68.0%	1.0%
29-Jul	8,330	1,427	9,757	631,637	69.1%	1.1%
30-Jul	2,634	8,433	11,067	642,704	70.3%	1.2%
31-Jul	1,377	8,583	9,959	652,663	71.4%	1.1%
1-Aug	957	6,744	7,701	660,364	72.2%	0.8%
2-Aug	744	8,016	8,760	669,124	73.2%	1.0%
3-Aug	833	7,507	8,340	677,465	74.1%	0.9%
4-Aug	718	6,859	7,577	685,042	74.9%	0.8%
5-Aug	356	9,031	9,387	694,429	75.9%	1.0%
6-Aug	1,691	8,280	9,971	704,400	77.0%	1.1%
7-Aug	3,556	3,802	7,358	711,759	77.8%	0.8%
8-Aug	3,377	3,307	6,684	718,443	78.6%	0.7%
9-Aug	5,396	3,480	8,876	727,319	79.5%	1.0%
10-Aug	1,974	6,603	8,578	735,897	80.5%	0.9%
11-Aug	1,621	8,248	9,869	745,765	81.6%	1.1%
12-Aug	689	5,980	6,669	752,434	82.3%	0.7%
13-Aug	1,002	6,140	7,142	759,576	83.1%	0.8%
14-Aug	1,348	4,905	6,253	765,829	83.7%	0.7%
15-Aug	1,682	5,731	7,413	773,242	84.6%	0.8%
16-Aug	759	5,143	5,902	779,144	85.2%	0.6%
17-Aug	1,717	7,047	8,764	787,908	86.2%	1.0%
18-Aug	1,101	8,751	9,852	797,760	87.2%	1.1%
19-Aug	617	8,452	9,069	806,829	88.2%	1.0%
20-Aug	1,206	7,395	8,601	815,430	89.2%	0.9%
21-Aug	2,106	5,438	7,544	822,974	90.0%	0.8%
22-Aug	2,356	4,650	7,005	829,979	90.8%	0.8%
23-Aug	842	6,629	7,470	837,450	91.6%	0.8%
24-Aug	923	6,537	7,460	844,910	92.4%	0.8%
25-Aug	1,329	6,271	7,601	852,511	93.2%	0.8%

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Table 14. (page 3 of 3)

Date	Escapement Counts	Catch	Daily Total	Cumulative Catch and Escapement	Cumulative Percent	Daily Proportion of Entire Run
26-Aug	1,163	3,927	5,091	857,601	93.8%	0.6%
27-Aug	2,033	3,996	6,029	863,630	94.4%	0.7%
28-Aug	2,761	1,471	4,232	867,863	94.9%	0.5%
29-Aug	1,850	3,803	5,653	873,516	95.5%	0.6%
30-Aug	1,925	5,161	7,087	880,602	96.3%	0.8%
31-Aug	1,523	4,389	5,912	886,514	96.9%	0.6%
1-Sep	1,214	4,265	5,480	891,994	97.5%	0.6%
2-Sep	809	3,234	4,043	896,037	98.0%	0.4%
3-Sep	1,417	4,394	5,811	901,848	98.6%	0.6%
4-Sep		3,308	3,308	905,156	99.0%	0.4%
5-Sep		4,518	4,518	909,674	99.5%	0.5%
6-Sep		319	319	909,993	99.5%	0.0%
7-Sep		170	170	910,162	99.5%	0.0%
8-Sep		192	192	910,354	99.6%	0.0%
9-Sep		665	665	911,019	99.6%	0.1%
10-Sep		675	675	911,694	99.7%	0.1%
11-Sep		911	911	912,605	99.8%	0.1%
12-Sep		0	0	912,605	99.8%	0.0%
13-Sep		556	556	913,162	99.9%	0.1%
14-Sep		532	532	913,693	99.9%	0.1%
15-Sep		731	731	914,424	100.0%	0.1%
Post Weir	71,803					
Total	334,119	652,108	986,227			

[a] Catch includes the Cape Igvak and SEDM fisheries.

Table 15. Individual and total run size and estimated 50/50 date, 1983-2003.

Year	Total Black Lake Run	Total Chignik Lake Run	Total Run Size	Estimated 50/50 Date
1983	1,282,459	1,694,542	2,977,001	2-Jul
1984	3,517,697	880,936	4,398,633	20-Jul
1985	1,027,796	815,241	1,843,037	unknown
1986	1,922,067	803,108	2,725,175	23-Jul
1987	2,536,237	634,436	3,170,674	20-Jul
1988	692,654	809,481	1,502,136	8-Jul
1989	618,238	1,486,709	2,104,947	3-Jul
1990	1,017,070	2,083,295	3,100,365	7-Jul
1991	2,374,343	1,038,463	3,412,806	13-Jul
1992	1,107,022	1,181,066	2,288,088	5-Jul
1993	1,291,154	1,532,166	2,823,319	5-Jul
1994	2,364,641	613,821	2,978,462	28-Jul
1995	1,033,295	1,689,287	2,722,582	8-Jul
1996	2,152,972	990,046	3,143,018	20-Jul
1997	631,160	914,141	1,545,301	9-Jul
1998	723,686	1,107,320	1,831,006	5-Jul
1999	2,479,777	1,982,458	4,462,235	9-Jul
2000	2,111,996	844,681	2,956,677	14-Jul
2001	1,307,089	1,607,308	2,914,397	6-Jul
2002	1,065,416	909,870	1,975,286	8-Jul
2003	989,444	904,802	1,894,246	4-Jul
10-year Average 1993-2002	1,516,119	1,219,110	2,735,228	11-Jul

Table 16. Estimated age composition of Black Lake sockeye salmon escapement by week using postseason scale pattern analysis, 2003.

		Ages														
Stat Week		0.2	1.1	0.3	1.2	2.1	0.4	1.3	2.2	1.4	2.3	3.2	3.3	1.5	2.4	Total
22	Percent	0.2%	0.0%	2.4%	8.8%	0.0%	0.0%	70.5%	4.1%	0.6%	13.4%	0.0%	0.0%	0.0%	0.0%	100.0%
5/24-5/30	Number	6	0	74	273	0	0	2,189	128	18	416	0	0	0	0	3,104
23	Percent	0.2%	0.0%	2.4%	8.9%	0.0%	0.0%	71.3%	3.9%	0.6%	12.7%	0.0%	0.0%	0.0%	0.0%	100.0%
5/31-6/06	Number	66	0	787	2,932	0	0	23,514	1,286	195	4,197	0	2	0	2	32,979
24	Percent	0.2%	0.0%	2.4%	9.0%	0.0%	0.0%	71.9%	3.3%	0.4%	12.4%	0.0%	0.1%	0.0%	0.1%	100.0%
6/7-6/13	Number	110	0	1,308	4,873	0	0	38,998	1,795	244	6,721	0	78	0	78	54,204
25	Percent	0.2%	0.0%	1.8%	10.1%	0.0%	0.0%	74.2%	2.5%	0.3%	10.8%	0.0%	0.1%	0.0%	0.0%	100.0%
6/14-6/20	Number	168	0	1,756	9,800	26	0	72,250	2,454	270	10,500	0	75	0	23	97,322
26	Percent	0.1%	0.0%	0.7%	20.2%	0.1%	0.0%	64.8%	3.7%	0.5%	9.7%	0.0%	0.3%	0.0%	0.0%	100.0%
6/21-6/27	Number	59	0	774	21,597	149	0	69,417	3,987	506	10,369	0	299	0	1	107,158
27	Percent	0.0%	0.0%	3.0%	14.4%	0.1%	0.0%	63.5%	2.0%	0.0%	16.7%	0.0%	0.4%	0.0%	0.0%	100.0%
6/28-7/4	Number	0	0	423	2,065	16	0	9,089	281	2	2,386	0	54	0	6	14,322
28	Percent	0.0%	0.0%	1.0%	10.5%	0.1%	0.0%	47.4%	1.9%	0.0%	37.9%	0.0%	0.9%	0.0%	0.1%	100.0%
7/5-7/11	Number	0	9	173	1,862	20	0	8,398	344	6	6,715	0	156	0	19	17,700
29	Percent	0.0%	0.3%	1.1%	8.1%	0.7%	0.0%	30.0%	3.2%	0.2%	55.4%	0.1%	0.7%	0.0%	0.2%	100.0%
7/12-7/18	Number	0	39	120	915	78	0	3,389	361	26	6,257	6	82	0	22	11,295
30	Percent	0.0%	0.1%	0.4%	2.7%	0.2%	0.0%	19.1%	3.1%	0.1%	72.7%	0.4%	0.9%	0.0%	0.2%	100.0%
7/19-7/25	Number	0	8	29	172	16	0	1,224	199	5	4,662	29	55	0	13	6,412
31	Percent	0.0%	0.0%	0.5%	2.2%	0.0%	0.0%	13.3%	2.7%	0.0%	79.4%	0.4%	0.7%	0.0%	0.7%	100.0%
7/26-8/1	Number	0	0	19	79	0	0	472	96	1	2,826	15	24	0	25	3,558
32	Percent	0.0%	0.0%	1.0%	0.8%	0.0%	0.0%	4.7%	4.9%	0.5%	85.9%	0.3%	1.1%	0.0%	0.7%	100.0%
8/1-8/8	Number	0	0	6	5	0	0	28	30	3	524	2	7	0	5	610

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Table 16. (Page 2 of 2)

		Ages													
Stat Week		0.2	1.1	0.3	1.2	2.1	0.4	1.3	2.2	1.4	2.3	3.2	3.3	1.5	2.4	Total
33	Percent	0.1%	0.0%	0.6%	0.6%	0.1%	0.0%	2.8%	5.5%	0.2%	88.7%	0.3%	0.6%	0.0%	0.4%	100.0%
8/9-8/15	Number	1	0	3	3	1	0	15	30	1	486	2	3	0	2	549
34	Percent	0.0%	0.0%	0.2%	0.2%	0.0%	0.0%	1.5%	7.1%	0.2%	88.3%	0.5%	0.7%	0.0%	1.3%	100.0%
8/16-8/22	Number	0	0	0	0	0	0	3	16	0	202	1	2	0	3	228
35	Percent	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.9%	7.4%	0.2%	88.4%	0.4%	1.9%	0.0%	0.7%	100.0%
8/23-8/29	Number	0	0	0	0	0	0	1	12	0	141	1	3	0	1	160
36	Percent	0.0%	0.0%	0.0%	0.1%	0.2%	0.0%	0.6%	4.7%	0.2%	92.2%	0.4%	1.0%	0.0%	0.6%	100.0%
8/30-9/5	Number	0	0	0	0	0	0	1	5	0	90	0	1	0	1	98
	Percent	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%	0.3%	4.0%	0.2%	93.4%	0.4%	0.8%	0.0%	0.6%	100.0%
Post Weir	Number	0	0	0	0	1	0	1	12	1	286	1	2	0	2	306
Total	Percent	0.1%	0.0%	1.6%	12.7%	0.1%	0.0%	65.4%	3.2%	0.4%	16.2%	0.0%	0.2%	0.0%	0.1%	100.0%
	Number	410	56	5,470	44,576	306	0	228,991	11,036	1,279	56,776	57	845	0	203	350,004

Table 17. Estimated age composition of Black Lake sockeye salmon catch by week using postseason scale pattern analysis, 2003.

		Ages													
Stat Week		0.2	1.1	0.3	1.2	2.1	0.4	1.3	2.2	1.4	2.3	3.2	3.3	1.5	2.4	Total
23	Percent	0.2%	0.0%	2.4%	8.9%	0.0%	0.0%	71.5%	3.8%	0.6%	12.5%	0.0%	0.0%	0.0%	0.0%	100.0%
5/31-6/06	Number	78	0	932	3,481	0	0	27,898	1,481	226	4,886	0	7	0	7	38,995
24	Percent	0.2%	0.0%	2.4%	9.0%	0.0%	0.0%	71.9%	3.3%	0.5%	12.4%	0.0%	0.1%	0.0%	0.1%	100.0%
6/7-6/13	Number	311	0	3,711	13,826	0	0	110,413	5,103	694	19,065	0	223	0	223	153,567
25	Percent	0.2%	0.0%	2.1%	8.3%	0.0%	0.0%	75.5%	2.4%	0.3%	11.2%	0.0%	0.1%	0.0%	0.0%	100.0%
6/14-6/20	Number	327	0	3,433	13,878	9	0	126,135	3,963	431	18,641	0	95	0	78	166,989
26	Percent	0.1%	0.0%	0.8%	20.0%	0.1%	0.0%	64.8%	3.7%	0.5%	9.8%	0.0%	0.3%	0.0%	0.0%	100.0%
6/21-6/27	Number	56	0	893	21,293	144	0	68,893	3,904	487	10,390	0	295	0	8	106,364
27	Percent	0.0%	0.0%	3.8%	15.0%	0.1%	0.0%	65.4%	2.0%	0.0%	13.4%	0.0%	0.2%	0.0%	0.1%	100.0%
6/28-7/4	Number	0	0	2,826	11,175	68	0	48,856	1,467	19	10,030	0	173	0	76	74,690
28	Percent	0.0%	0.0%	0.9%	10.6%	0.1%	0.0%	48.7%	2.0%	0.0%	36.6%	0.0%	0.9%	0.0%	0.1%	100.0%
7/5-7/11	Number	0	13	336	4,170	27	0	19,095	799	8	14,360	0	362	0	36	39,207
29	Percent	0.0%	0.4%	1.1%	8.1%	0.9%	0.0%	27.6%	3.7%	0.3%	57.0%	0.0%	0.7%	0.0%	0.2%	100.0%
7/12-7/18	Number	0	148	392	2,748	297	0	9,401	1,266	99	19,397	16	225	0	65	34,053
30	Percent	0.0%	0.1%	0.4%	2.2%	0.1%	0.0%	17.9%	2.9%	0.0%	74.8%	0.5%	0.9%	0.0%	0.3%	100.0%
7/19-7/25	Number	0	11	62	366	22	0	3,033	494	7	12,707	83	148	0	43	16,977
31	Percent	0.0%	0.0%	0.7%	1.9%	0.0%	0.0%	11.6%	3.0%	0.1%	80.7%	0.4%	0.8%	0.0%	0.8%	100.0%
7/26-8/1	Number	0	0	19	56	0	0	335	88	4	2,325	12	22	0	22	2,883
32	Percent	0.0%	0.0%	1.0%	0.9%	0.0%	0.0%	5.7%	4.6%	0.6%	84.8%	0.4%	1.2%	0.0%	0.9%	100.0%
8/1-8/8	Number	0	0	29	25	0	0	160	128	17	2,387	11	33	0	25	2,815
33	Percent	0.2%	0.0%	0.5%	0.6%	0.2%	0.0%	2.5%	5.7%	0.1%	89.2%	0.3%	0.5%	0.0%	0.3%	100.0%
8/9-8/15	Number	2	0	7	9	2	0	38	87	2	1,374	4	8	0	5	1,540

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Table 17. (Page 2 of 2)

		Ages													
Stat Week		0.2	1.1	0.3	1.2	2.1	0.4	1.3	2.2	1.4	2.3	3.2	3.3	1.5	2.4	Total
34	Percent	0.0%	0.0%	0.2%	0.2%	0.0%	0.0%	1.6%	7.0%	0.2%	88.4%	0.6%	0.6%	0.0%	1.4%	100.0%
8/16-8/22	Number	0	0	2	2	0	0	18	79	2	1,001	6	7	0	15	1,133
35	Percent	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.9%	7.7%	0.2%	88.0%	0.4%	1.8%	0.0%	0.8%	100.0%
8/23-8/29	Number	0	0	0	1	0	0	5	40	1	458	2	10	0	4	521
36	Percent	0.0%	0.0%	0.0%	0.1%	0.2%	0.0%	0.6%	4.7%	0.2%	92.3%	0.4%	1.0%	0.0%	0.6%	100.0%
8/30-9/5	Number	0	0	0	0	0	0	2	13	1	266	1	3	0	2	288
37	Percent	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%	0.4%	4.0%	0.2%	93.4%	0.4%	0.8%	0.0%	0.6%	100.0%
9/6-9/12	Number	0	0	0	0	0	0	0	1	0	17	0	0	0	0	18
38	Percent	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%	0.3%	4.0%	0.2%	93.5%	0.4%	0.8%	0.0%	0.6%	100.0%
9/13-9/19	Number	0	0	0	0	0	0	0	0	0	8	0	0	0	0	8
Total	Percent	0.1%	0.0%	2.0%	11.1%	0.1%	0.0%	64.7%	3.0%	0.3%	18.3%	0.0%	0.3%	0.0%	0.1%	100.0%
	Number	774	172	12,641	71,029	570	0	414,279	18,915	1,998	117,311	136	1,611	0	610	640,047

Table 18. Estimated age composition of Chignik Lake sockeye salmon escapement by week using postseason scale pattern analysis, 2003.

		Ages													
Stat Week		0.2	1.1	0.3	1.2	2.1	0.4	1.3	2.2	1.4	2.3	3.2	3.3	1.5	2.4	Total
22	Percent	0.2%	0.0%	2.2%	1.4%	0.0%	0.0%	11.3%	19.9%	0.5%	64.5%	0.0%	0.0%	0.0%	0.0%	100.0%
5/24-5/30	Number	0	0	3	2	0	0	14	25	1	82	0	0	0	0	127
23	Percent	0.2%	0.0%	2.2%	2.1%	0.0%	0.0%	16.6%	18.4%	0.5%	60.1%	0.0%	0.0%	0.0%	0.0%	100.0%
5/31-6/06	Number	4	0	44	42	0	0	333	369	11	1,207	0	0	0	0	2,009
24	Percent	0.2%	0.0%	2.3%	3.0%	0.0%	0.0%	24.3%	14.6%	0.4%	55.0%	0.0%	0.1%	0.0%	0.1%	100.0%
6/7-6/13	Number	10	0	123	164	0	0	1,313	789	22	2,976	0	8	0	8	5,412
25	Percent	0.2%	0.0%	1.7%	5.3%	0.0%	0.0%	37.2%	10.6%	0.3%	44.6%	0.0%	0.1%	0.0%	0.0%	100.0%
6/14-6/20	Number	27	0	281	881	5	0	6,170	1,750	45	7,395	0	13	0	3	16,569
26	Percent	0.0%	0.0%	0.7%	12.6%	0.1%	0.0%	39.1%	13.1%	0.5%	33.6%	0.0%	0.3%	0.0%	0.0%	100.0%
6/21-6/27	Number	16	0	215	3,994	45	0	12,405	4,138	150	10,654	0	90	0	1	31,707
27	Percent	0.0%	0.0%	2.8%	9.9%	0.1%	0.0%	43.7%	4.4%	0.0%	38.6%	0.0%	0.4%	0.0%	0.0%	100.0%
6/28-7/4	Number	0	0	321	1,126	13	0	4,981	505	1	4,392	0	49	0	3	11,391
28	Percent	0.0%	0.1%	1.0%	6.7%	0.1%	0.0%	29.9%	2.8%	0.0%	58.3%	0.0%	0.9%	0.0%	0.1%	100.0%
7/5-7/11	Number	0	21	301	2,094	45	0	9,348	881	14	18,202	0	285	0	43	31,234
29	Percent	0.0%	0.4%	1.1%	5.8%	0.7%	0.0%	21.8%	3.8%	0.2%	65.2%	0.1%	0.7%	0.0%	0.2%	100.0%
7/12-7/18	Number	0	133	395	2,172	267	0	8,110	1,409	89	24,272	27	272	0	72	37,219
30	Percent	0.0%	0.1%	0.4%	2.5%	0.2%	0.0%	18.9%	3.1%	0.1%	73.1%	0.5%	0.9%	0.0%	0.2%	100.0%
7/19-7/25	Number	0	42	162	953	85	0	7,095	1,159	28	27,520	171	326	0	80	37,621
31	Percent	0.0%	0.0%	0.5%	3.2%	0.0%	0.0%	19.1%	2.5%	0.0%	72.8%	0.4%	0.7%	0.0%	0.7%	100.0%
7/26-8/1	Number	0	0	200	1,180	0	0	6,939	902	9	26,498	155	247	0	256	36,385
32	Percent	0.0%	0.0%	0.9%	1.9%	0.0%	0.0%	11.5%	4.5%	0.5%	78.4%	0.3%	1.1%	0.0%	0.7%	100.0%
8/1-8/8	Number	6	0	107	219	6	0	1,294	504	61	8,838	39	122	0	82	11,277

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Table 18. (Page 2 of 2)

		Ages													
Stat Week		0.2	1.1	0.3	1.2	2.1	0.4	1.3	2.2	1.4	2.3	3.2	3.3	1.5	2.4	Total
33	Percent	0.1%	0.0%	0.6%	2.1%	0.1%	0.0%	9.4%	5.1%	0.2%	81.0%	0.3%	0.6%	0.0%	0.4%	100.0%
8/9-8/15	Number	18	0	76	292	18	0	1,294	699	27	11,107	41	82	0	58	13,712
34	Percent	0.0%	0.0%	0.1%	1.1%	0.0%	0.0%	8.8%	6.5%	0.2%	80.6%	0.5%	0.8%	0.0%	1.3%	100.0%
8/16-8/22	Number	0	0	14	109	0	0	869	644	19	7,948	53	79	0	126	9,862
35	Percent	0.0%	0.0%	0.0%	1.1%	0.0%	0.0%	8.1%	6.7%	0.2%	80.9%	0.4%	1.9%	0.0%	0.7%	100.0%
8/23-8/29	Number	0	0	1	125	4	0	880	733	22	8,817	45	203	0	72	10,901
36	Percent	0.0%	0.0%	0.0%	0.9%	0.2%	0.0%	8.1%	4.2%	0.2%	84.4%	0.4%	1.0%	0.0%	0.6%	100.0%
8/30-9/5	Number	0	0	0	87	17	0	805	415	20	8,344	40	100	0	60	9,887
Post Weir	Percent	0.0%	0.0%	0.0%	0.8%	0.2%	0.0%	8.1%	3.6%	0.2%	85.2%	0.4%	0.8%	0.0%	0.6%	100.0%
	Number	0	0	0	560	139	0	5,595	2,506	139	58,613	279	557	0	418	68,805
Total	Percent	0.0%	0.1%	0.7%	4.2%	0.2%	0.0%	20.2%	5.2%	0.2%	67.9%	0.3%	0.7%	0.0%	0.4%	100.0%
	Number	81	197	2,242	13,998	643	0	67,445	17,427	659	226,865	849	2,433	0	1,281	334,119

Table 19. Estimated age composition of Chignik Lake sockeye salmon catch by week using postseason scale pattern analysis, 2003.

		Ages														
Stat Week		0.2	1.1	0.3	1.2	2.1	0.4	1.3	2.2	1.4	2.3	3.2	3.3	1.5	2.4	Total
23	Percent	0.2%	0.0%	2.2%	2.3%	0.0%	0.0%	18.3%	17.8%	0.5%	58.7%	0.0%	0.0%	0.0%	0.0%	100.0%
5/31-6/06	Number	5	0	59	61	0	0	493	479	14	1,582	0	0	0	0	2,694
24	Percent	0.2%	0.0%	2.3%	3.0%	0.0%	0.0%	24.1%	14.7%	0.4%	55.1%	0.0%	0.1%	0.0%	0.1%	100.0%
6/7-6/13	Number	29	0	346	458	0	0	3,664	2,234	64	8,397	0	22	0	22	15,235
25	Percent	0.2%	0.0%	2.0%	3.9%	0.0%	0.0%	35.3%	10.2%	0.2%	48.0%	0.0%	0.1%	0.0%	0.0%	100.0%
6/14-6/20	Number	46	0	483	974	2	0	8,718	2,521	61	11,854	0	13	0	10	24,681
26	Percent	0.0%	0.0%	0.8%	12.8%	0.1%	0.0%	39.3%	12.7%	0.5%	33.4%	0.0%	0.3%	0.0%	0.0%	100.0%
6/21-6/27	Number	14	0	264	4,150	45	0	12,758	4,130	149	10,858	0	93	0	3	32,465
27	Percent	0.0%	0.0%	3.8%	10.4%	0.1%	0.0%	45.5%	5.0%	0.0%	34.9%	0.0%	0.2%	0.0%	0.1%	100.0%
6/28-7/4	Number	0	0	1,746	4,790	47	0	21,054	2,308	9	16,161	0	113	0	43	46,271
28	Percent	0.0%	0.0%	0.9%	6.8%	0.1%	0.0%	31.0%	3.0%	0.0%	57.0%	0.0%	0.9%	0.0%	0.1%	100.0%
7/5-7/11	Number	0	31	578	4,525	64	0	20,543	2,011	21	37,708	0	626	0	75	66,183
29	Percent	0.0%	0.4%	1.2%	6.1%	0.9%	0.0%	20.8%	4.3%	0.3%	65.1%	0.1%	0.7%	0.0%	0.2%	100.0%
7/12-7/18	Number	0	539	1,399	7,312	1,078	0	24,981	5,139	359	78,322	70	802	0	232	120,233
30	Percent	0.0%	0.1%	0.4%	2.2%	0.1%	0.0%	18.8%	2.8%	0.0%	74.0%	0.5%	0.9%	0.0%	0.3%	100.0%
7/19-7/25	Number	0	62	390	2,413	123	0	20,695	3,126	41	81,478	545	960	0	294	110,128
31	Percent	0.0%	0.0%	0.7%	3.1%	0.0%	0.0%	17.9%	2.8%	0.2%	73.5%	0.4%	0.8%	0.0%	0.8%	100.0%
7/26-8/1	Number	0	0	220	1,001	0	0	5,856	918	51	24,108	135	256	0	253	32,798
32	Percent	0.0%	0.0%	1.0%	2.0%	0.0%	0.0%	12.6%	4.2%	0.6%	77.2%	0.4%	1.2%	0.0%	0.9%	100.0%
8/1-8/8	Number	8	0	478	920	8	0	5,902	1,958	282	36,119	175	548	0	405	46,802
33	Percent	0.1%	0.0%	0.5%	2.2%	0.1%	0.0%	9.1%	5.2%	0.1%	81.5%	0.3%	0.5%	0.0%	0.4%	100.0%
8/9-8/15	Number	61	0	189	899	61	0	3,736	2,143	48	33,482	119	198	0	150	41,087
34	Percent	0.0%	0.0%	0.2%	1.1%	0.0%	0.0%	8.9%	6.4%	0.2%	80.7%	0.5%	0.6%	0.0%	1.3%	100.0%
8/16-8/22	Number	2	0	75	515	2	0	4,171	3,014	92	37,814	256	304	0	630	46,875

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Table 19. (Page 2 of 2)

		Ages													
Stat Week		0.2	1.1	0.3	1.2	2.1	0.4	1.3	2.2	1.4	2.3	3.2	3.3	1.5	2.4	Total
35	Percent	0.0%	0.0%	0.0%	1.2%	0.0%	0.0%	8.1%	7.0%	0.2%	80.5%	0.4%	1.8%	0.0%	0.7%	100.0%
8/23-8/29	Number	0	0	9	380	5	0	2,658	2,276	66	26,262	140	599	0	241	32,635
36	Percent	0.0%	0.0%	0.0%	0.9%	0.2%	0.0%	8.1%	4.2%	0.2%	84.4%	0.4%	1.0%	0.0%	0.6%	100.0%
8/30-9/5	Number	0	0	0	256	51	0	2,382	1,221	59	24,710	118	294	0	178	29,269
37	Percent	0.0%	0.0%	0.0%	0.8%	0.2%	0.0%	8.1%	3.6%	0.2%	85.2%	0.4%	0.8%	0.0%	0.6%	100.0%
9/6-9/12	Number	0	0	0	24	6	0	239	107	6	2,497	12	24	0	18	2,931
38	Percent	0.0%	0.0%	0.0%	0.8%	0.2%	0.0%	8.1%	3.6%	0.2%	85.2%	0.4%	0.8%	0.0%	0.6%	100.0%
9/13-9/19	Number	0	0	0	15	4	0	148	66	4	1,549	7	15	0	11	1,819
Total	Percent	0.0%	0.1%	1.0%	4.4%	0.2%	0.0%	21.2%	5.2%	0.2%	66.4%	0.2%	0.7%	0.0%	0.4%	100.0%
	Number	165	632	6,235	28,694	1,496	0	137,997	33,652	1,325	432,901	1,577	4,868	0	2,565	652,108

Table 20. Chignik sockeye salmon daily escapement, catch by area, and total run adjusted to Chignik Lagoon date, 2003.

		Catch									
Date	Escapement	Chignik Lagoon	Outer Chignik Bay/Kujulik Sections	Cape Kumlik Section	Eastern District	Cape Igvak (Kodiak)	Western District	Perryville District	SEDM (Area M)	Total Catch	Daily Run Total
24-May	0	0	0	0	0	0	0	0	0	0	0
25-May	0	0	0	0	0	0	0	0	0	0	0
26-May	100	0	0	0	0	0	0	0	0	0	100
27-May	198	0	0	0	0	0	0	0	0	0	198
28-May	806	0	0	0	0	0	0	0	0	0	806
29-May	1,180	0	0	0	0	0	0	0	0	0	1,180
30-May	947	0	0	0	0	0	0	0	0	0	947
31-May	1,829	0	0	0	0	0	0	0	0	0	1,829
1-Jun	3,679	0	0	0	0	0	0	0	0	0	3,679
2-Jun	5,445	0	0	0	0	0	0	0	0	0	5,445
3-Jun	3,371	0	0	0	0	0	0	0	0	0	3,371
4-Jun	5,780	506	0	0	0	0	0	0	0	506	6,286
5-Jun	8,883	16,918	0	0	0	0	0	0	0	16,918	25,801
6-Jun	6,001	24,265	0	0	0	0	0	0	0	24,265	30,266
7-Jun	8,285	10,949	0	0	0	0	0	0	0	10,949	19,234
8-Jun	7,114	23,178	0	0	0	0	0	0	0	23,178	30,292
9-Jun	5,486	27,130	0	0	0	0	0	0	0	27,130	32,616
10-Jun	5,120	23,667	1,554	0	0	0	0	0	0	25,221	30,341
11-Jun	10,864	20,596	7,344	0	0	0	0	0	0	27,940	38,804
12-Jun	12,539	31,204	0	1,597	0	0	0	0	0	32,801	45,340
13-Jun	10,208	21,583	0	0	0	0	0	0	0	21,583	31,791
14-Jun	9,769	15,330	1,722	0	0	0	0	0	5,374	22,426	32,195
15-Jun	10,023	16,614	5,960	1,108	0	14,019	0	0	11,629	49,330	59,353
16-Jun	15,476	35,535	0	978	0	15,885	0	0	0	52,398	67,874
17-Jun	11,022	26,721	0	0	0	10,613	0	0	0	37,334	48,356
18-Jun	19,951	16,656	0	0	0	0	0	0	0	16,656	36,607
19-Jun	18,168	10,492	0	0	0	0	0	0	0	10,492	28,660
20-Jun	29,482	3,034	0	0	0	0	0	0	0	3,034	32,516
21-Jun	16,037	7,036	0	0	0	15,689	0	0	0	22,725	38,762
22-Jun	15,827	6,354	0	0	0	11,758	0	0	6,563	24,675	40,502
23-Jun	31,819	0	0	0	0	7,322	0	0	14,049	21,371	53,190
24-Jun	42,627	413	0	0	0	12,906	0	0	0	13,319	55,946
25-Jun	14,008	15,845	0	0	0	0	0	0	0	15,845	29,853
26-Jun	15,555	23,911	0	0	0	0	0	0	0	23,911	39,466
27-Jun	2,992	10,728	6,255	0	0	0	0	0	0	16,983	19,975
28-Jun	1,284	12,574	2,018	0	0	0	0	0	0	14,592	15,876
29-Jun	1,390	16,210	3,841	0	570	89	0	0	0	20,710	22,100
30-Jun	1,577	19,564	0	0	596	8,588	0	0	0	28,748	30,325
1-Jul	4,101	17,869	0	0	459	10,067	0	0	0	28,395	32,496
2-Jul	2,926	14,421	0	0	0	0	0	0	0	14,421	17,347
3-Jul	2,796	6,156	4,408	0	0	0	0	0	0	10,564	13,360
4-Jul	11,639	2,750	782	0	0	0	0	0	0	3,532	15,171
5-Jul	10,251	9,813	0	0	76	0	0	0	0	9,889	20,140
6-Jul	3,651	19,382	0	0	0	0	0	0	0	19,382	23,033
7-Jul	3,606	20,146	0	0	0	0	0	0	0	20,146	23,752
8-Jul	3,334	18,423	0	0	0	0	0	0	0	18,423	21,757
9-Jul	8,473	9,518	0	0	0	0	0	0	0	9,518	17,991
10-Jul	8,459	10,288	434	0	0	0	0	0	0	10,722	19,181
11-Jul	11,160	9,565	607	0	0	0	7,138	0	0	17,310	28,470

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Table 20. (page 2 of 3)

Date	Escapement	Catch									Daily Run Total
		Chignik Lagoon	Outer Chignik Bay/Kujulik Sections	Cape Kumlik Section	Eastern District	Cape Igvak (Kodiak)	Western District	Perryville District	SEDM (Area M)	Total Catch	
12-Jul	18,801	10,620	0	0	0	0	7,889	1,792	0	20,301	39,102
13-Jul	8,215	17,433	0	0	0	0	0	1,384	0	18,817	27,032
14-Jul	3,425	17,484	2,252	0	0	0	0	0	1,334	21,070	24,495
15-Jul	2,370	18,209	2,890	0	0	0	0	0	7,272	28,371	30,741
16-Jul	1,128	21,993	676	610	0	12,938	0	0	0	36,217	37,345
17-Jul	4,011	18,508	0	0	0	1,449	0	0	0	19,957	23,968
18-Jul	10,564	9,008	0	0	0	546	0	0	0	9,554	20,118
19-Jul	10,213	9,746	0	0	0	0	0	0	0	9,746	19,959
20-Jul	8,193	10,064	72	0	0	0	0	0	0	10,136	18,329
21-Jul	14,107	10,718	371	0	0	0	4,195	0	23,714	38,998	53,105
22-Jul	6,341	14,226	45	0	0	0	980	0	0	15,251	21,592
23-Jul	1,631	14,078	0	0	0	0	865	0	0	14,943	16,574
24-Jul	1,908	16,602	2,469	0	0	0	0	0	0	19,071	20,979
25-Jul	1,640	14,372	4,195	393	0	0	0	0	0	18,960	20,600
26-Jul	4,637	5,071	1,577	184	0	0	0	0	0	6,832	11,469
27-Jul	10,381	1,112	0	523	0	0	0	0	0	1,635	12,016
28-Jul	10,469	0	0	0	0	0	0	0	0	0	10,469
29-Jul	9,085	1,387	169	0	0	0	0	0	0	1,556	10,641
30-Jul	2,857	6,304	0	0	0	55	2,789	0	0	9,148	12,005
31-Jul	1,486	9,101	0	0	0	0	0	163	0	9,264	10,750
1-Aug	1,028	6,448	0	0	0	0	798	0	0	7,246	8,274
2-Aug	796	8,282	0	0	0	0	0	295	0	8,577	9,373
3-Aug	888	6,824	0	0	0	0	1,177	0	0	8,001	8,889
4-Aug	763	6,855	0	0	0	0	0	429	0	7,284	8,047
5-Aug	377	8,388	0	0	0	0	1,171	0	0	9,559	9,936
6-Aug	1,784	8,333	3	0	0	0	0	397	0	8,733	10,517
7-Aug	3,739	2,555	0	0	0	0	1,442	0	0	3,997	7,736
8-Aug	3,540	2,885	201	0	0	0	0	380	0	3,466	7,006
9-Aug	5,640	3,012	0	0	0	0	625	0	0	3,637	9,277
10-Aug	2,058	6,883	0	0	0	0	0	0	0	6,883	8,941
11-Aug	1,685	7,045	1,531	0	0	0	0	0	0	8,576	10,261
12-Aug	715	4,448	1,755	0	0	0	0	0	0	6,203	6,918
13-Aug	1,037	5,358	318	679	0	0	0	0	0	6,355	7,392
14-Aug	1,392	5,057	0	9	0	0	0	0	0	5,066	6,458
15-Aug	1,734	5,907	0	0	0	0	0	0	0	5,907	7,641
16-Aug	781	5,291	0	0	0	0	0	0	0	5,291	6,072
17-Aug	1,763	7,238	0	0	0	0	0	0	0	7,238	9,001
18-Aug	1,129	8,973	0	0	0	0	0	0	0	8,973	10,102
19-Aug	632	8,001	652	0	0	0	0	0	0	8,653	9,285
20-Aug	1,233	4,670	2,679	211	0	0	0	0	0	7,560	8,793
21-Aug	2,150	4,929	623	0	0	0	0	0	0	5,552	7,702
22-Aug	2,402	4,152	589	0	0	0	0	0	0	4,741	7,143
23-Aug	857	6,751	0	0	0	0	0	0	0	6,751	7,608
24-Aug	939	6,650	0	0	0	0	0	0	0	6,650	7,589
25-Aug	1,351	6,373	0	0	0	0	0	0	0	6,373	7,724
26-Aug	1,181	3,987	0	0	0	0	0	0	0	3,987	5,168
27-Aug	2,062	4,053	0	0	0	0	0	0	0	4,053	6,115
28-Aug	2,798	1,491	0	0	0	0	0	0	0	1,491	4,289
29-Aug	1,873	3,851	0	0	0	0	0	0	0	3,851	5,724
30-Aug	1,948	5,222	0	0	0	0	0	0	0	5,222	7,170

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Table 20. (page 3 of 3)

Date	Escapement	Catch									Daily Run Total
		Chignik Lagoon	Outer Chignik Bay/Kujulik Sections	Cape Kumlik Section	Eastern District	Cape Igvak (Kodiak)	Western District	Perryville District	SEDM (Area M)	Total Catch	
31-Aug	1,540	4,437	0	0	0	0	0	0	0	4,437	5,977
1-Sep	1,227	4,309	0	0	0	0	0	0	0	4,309	5,536
2-Sep	817	3,265	0	0	0	0	0	0	0	3,265	4,082
3-Sep	1,430	4,434	0	0	0	0	0	0	0	4,434	5,864
4-Sep		3,336	0	0	0	0	0	0	0	3,336	5,588
5-Sep		4,462	92	0	0	0	0	0	0	4,554	5,325
6-Sep		257	64	0	0	0	0	0	0	321	5,074
7-Sep		171	0	0	0	0	0	0	0	171	4,835
8-Sep		193	0	0	0	0	0	0	0	193	4,608
9-Sep		669	0	0	0	0	0	0	0	669	4,391
10-Sep		679	0	0	0	0	0	0	0	679	4,184
11-Sep		916	0	0	0	0	0	0	0	916	3,987
12-Sep		0	0	0	0	0	0	0	0	0	3,800
13-Sep		559	0	0	0	0	0	0	0	559	3,621
14-Sep		534	0	0	0	0	0	0	0	534	3,450
15-Sep		734	0	0	0	0	0	0	0	734	3,288
16-Sep		0	0	0	0	0	0	0	0	0	3,133
17-Sep		0	0	0	0	0	0	0	0	0	2,986
18-Sep		0	0	0	0	0	0	0	0	0	2,845
19-Sep		0	0	0	0	0	0	0	0	0	2,711
20-Sep		0	0	0	0	0	0	0	0	0	2,584
21-Sep		0	0	0	0	0	0	0	0	0	2,462
22-Sep		0	0	0	0	0	0	0	0	0	2,346
23-Sep		0	0	0	0	0	0	0	0	0	2,236
24-Sep		0	0	0	0	0	0	0	0	0	2,130
25-Sep		0	0	0	0	0	0	0	0	0	2,030
26-Sep		0	0	0	0	0	0	0	0	0	1,934
27-Sep		0	0	0	0	0	0	0	0	0	1,843
28-Sep		0	0	0	0	0	0	0	0	0	1,757
29-Sep		0	0	0	0	0	0	0	0	0	1,652
30-Sep		0	0	0	0	0	0	0	0	0	0
Post Weir	72,134										
Total	684,123	1,000,247	58,148	6,292	1,701	121,923	29,069	4,840	69,935	1,292,155	1,976,278

Table 21. Age composition of size selected Chignik Lagoon sockeye salmon commercial catch samples by day, 2003.

		Ages											
Date		0.2	0.3	1.1	1.2	1.3	2.1	2.2	2.3	2.4	3.2	3.3	Total
8/5	Numbers	0	0	0	4	0	0	10	1	0	1	0	16
	Percent	0.0%	0.0%	0.0%	25.0%	0.0%	0.0%	62.5%	6.3%	0.0%	6.3%	0.0%	
8/11	Numbers	0	0	0	0	0	0	1	2	0	0	0	3
	Percent	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	33.3%	66.7%	0.0%	0.0%	0.0%	
8/14	Numbers	0	0	6	17	4	0	39	35	0	1	1	103
	Percent	0.0%	0.0%	5.8%	16.5%	3.9%	0.0%	37.9%	34.0%	0.0%	1.0%	1.0%	
8/16	Numbers	0	0	2	41	29	0	126	305	1	7	7	518
	Percent	0.0%	0.0%	0.4%	7.9%	5.6%	0.0%	24.3%	58.9%	0.2%	1.4%	1.4%	
8/17	Numbers	1	1	0	56	36	2	131	206	1	5	4	443
	Percent	0.2%	0.2%	0.0%	12.6%	8.1%	0.5%	29.6%	46.5%	0.2%	1.1%	0.9%	
8/18	Numbers	1	0	0	3	5	0	8	16	0	0	1	34
	Percent	2.9%	0.0%	0.0%	8.8%	14.7%	0.0%	23.5%	47.1%	0.0%	0.0%	2.9%	
8/26	Numbers	1	0	0	8	38	0	60	279	3	8	8	405
	Percent	0.2%	0.0%	0.0%	2.0%	9.4%	0.0%	14.8%	68.9%	0.7%	2.0%	2.0%	
Total	Numbers	3	1	8	129	112	2	375	844	5	22	21	1522
	Percent	0.2%	0.1%	0.5%	8.5%	7.4%	0.1%	24.6%	55.5%	0.3%	1.4%	1.4%	

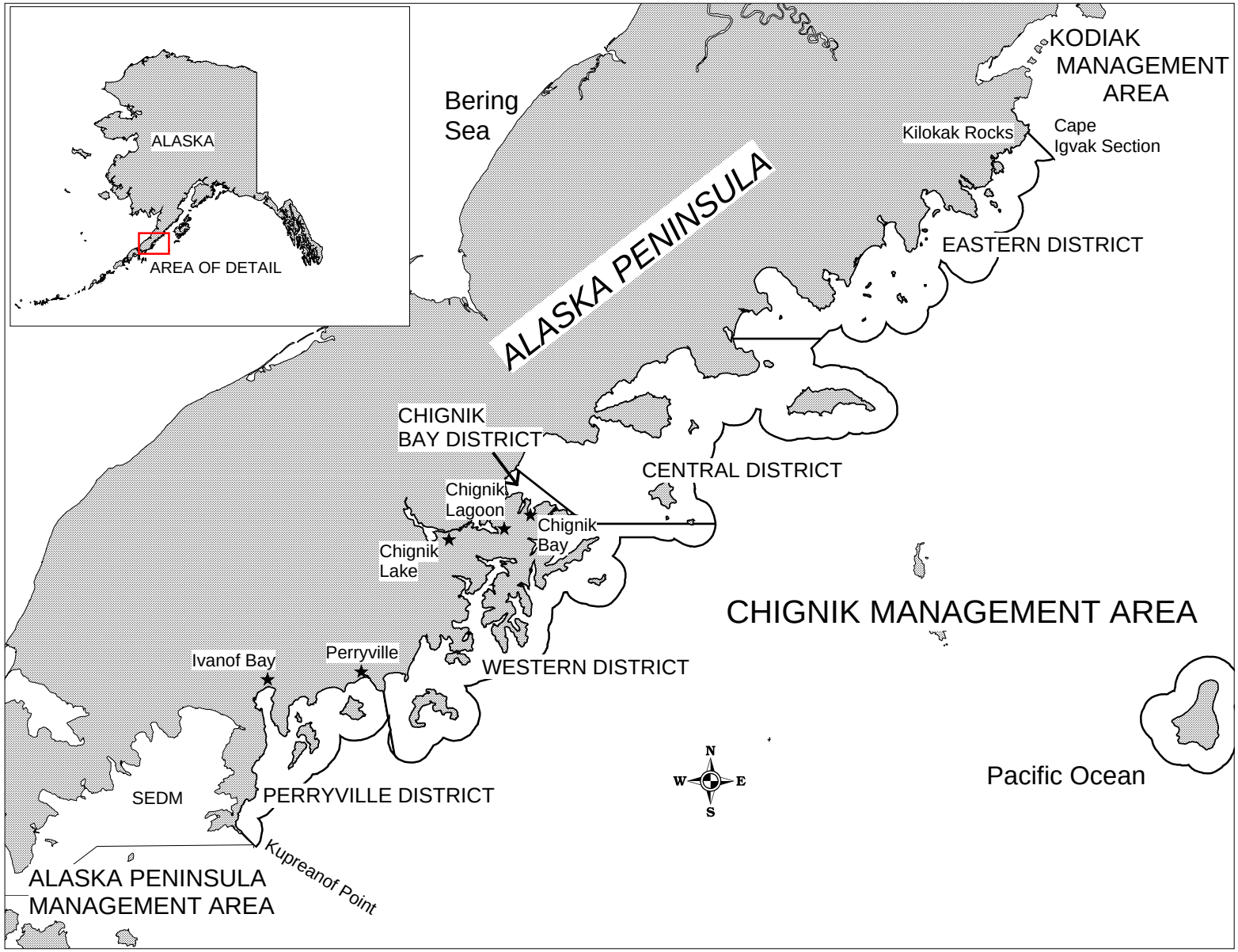

Figure 1. Map of the Chignik Management Area.

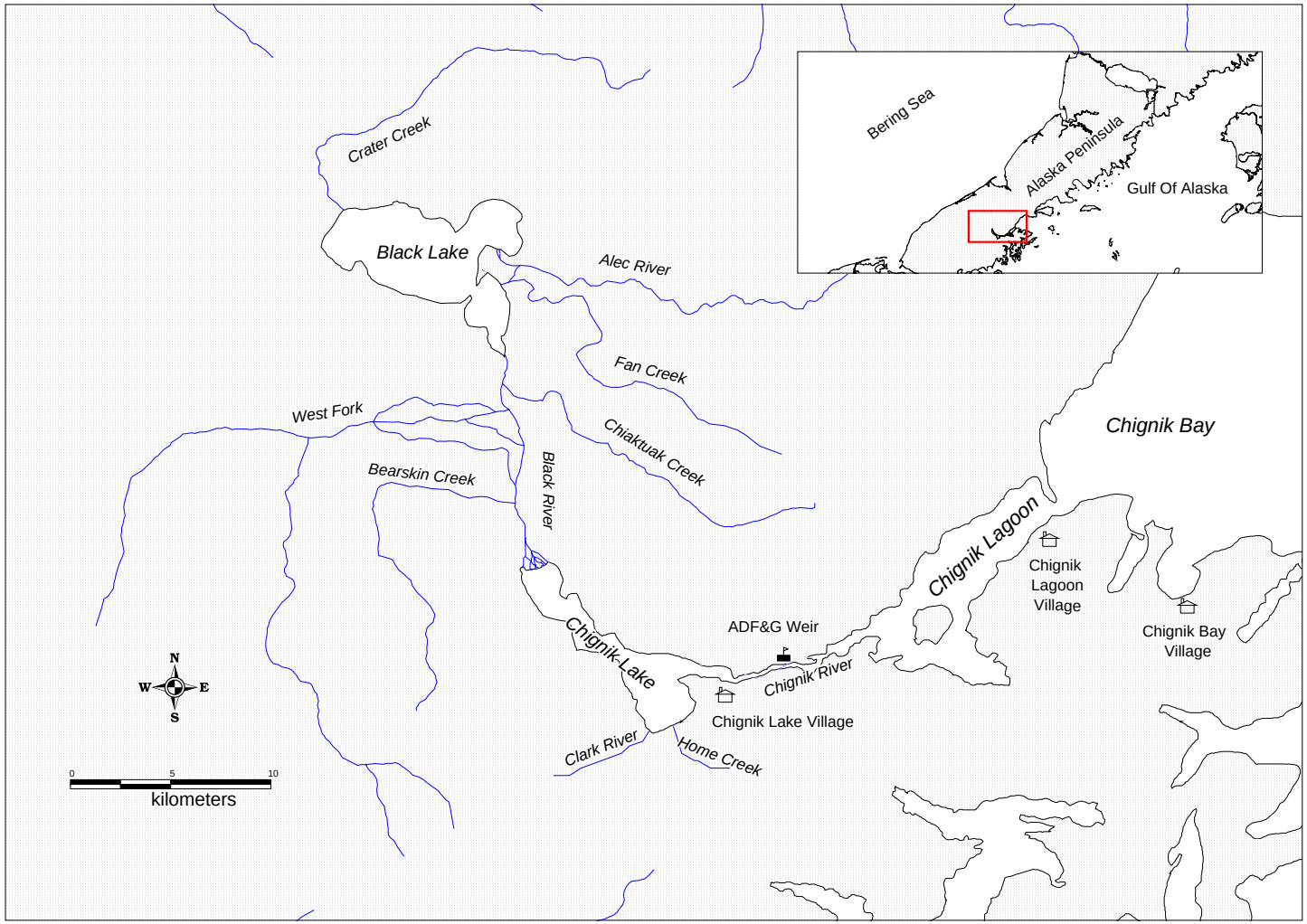

Figure 2. Map of the Chignik watershed including Black and Chignik Lakes.

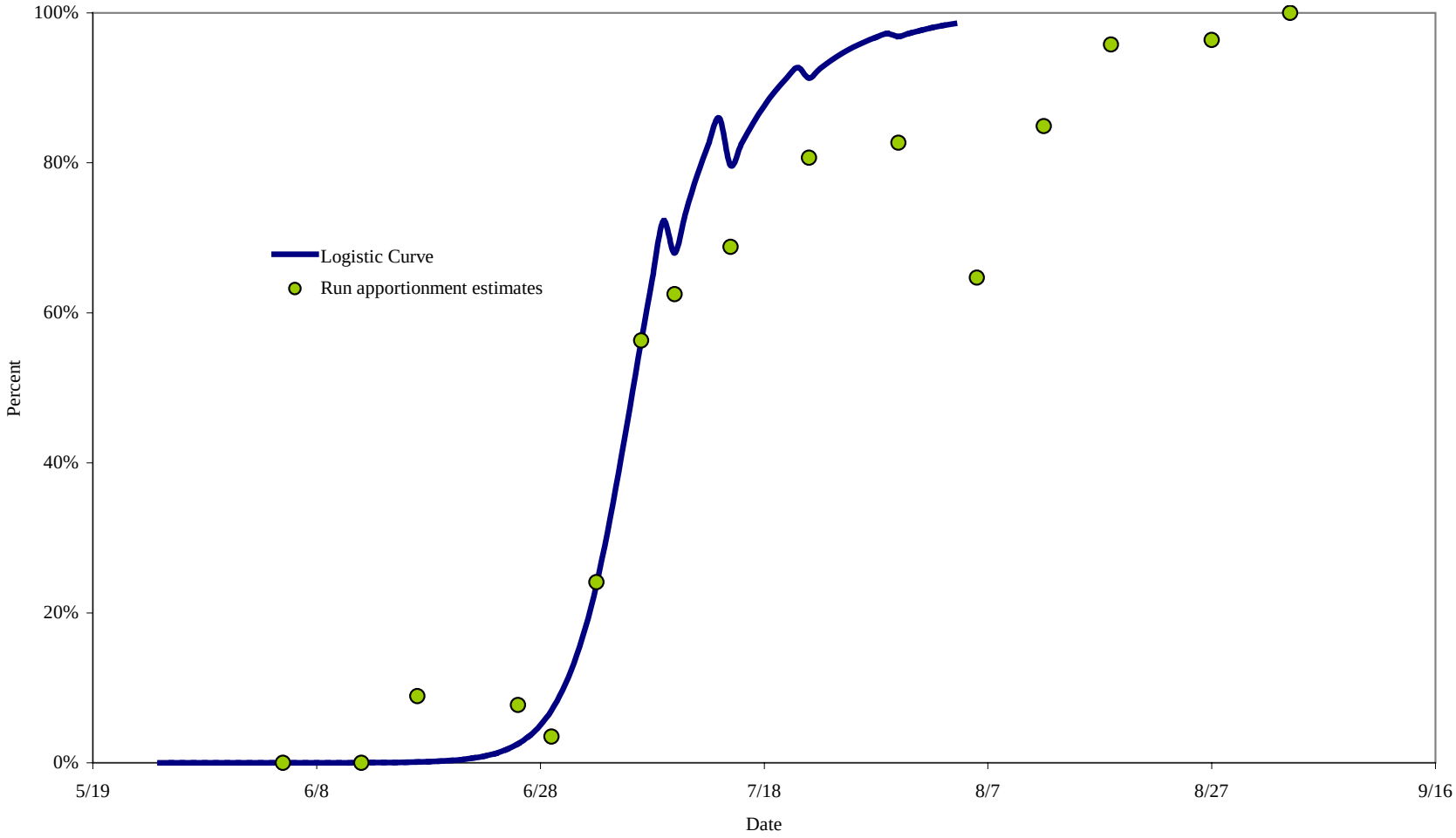

Figure 3. Estimated proportion of Chignik Lake sockeye salmon in the Chignik River system by day using a weighted logistic function fit to the age 1.3 model output data and refit for each sample inseason.

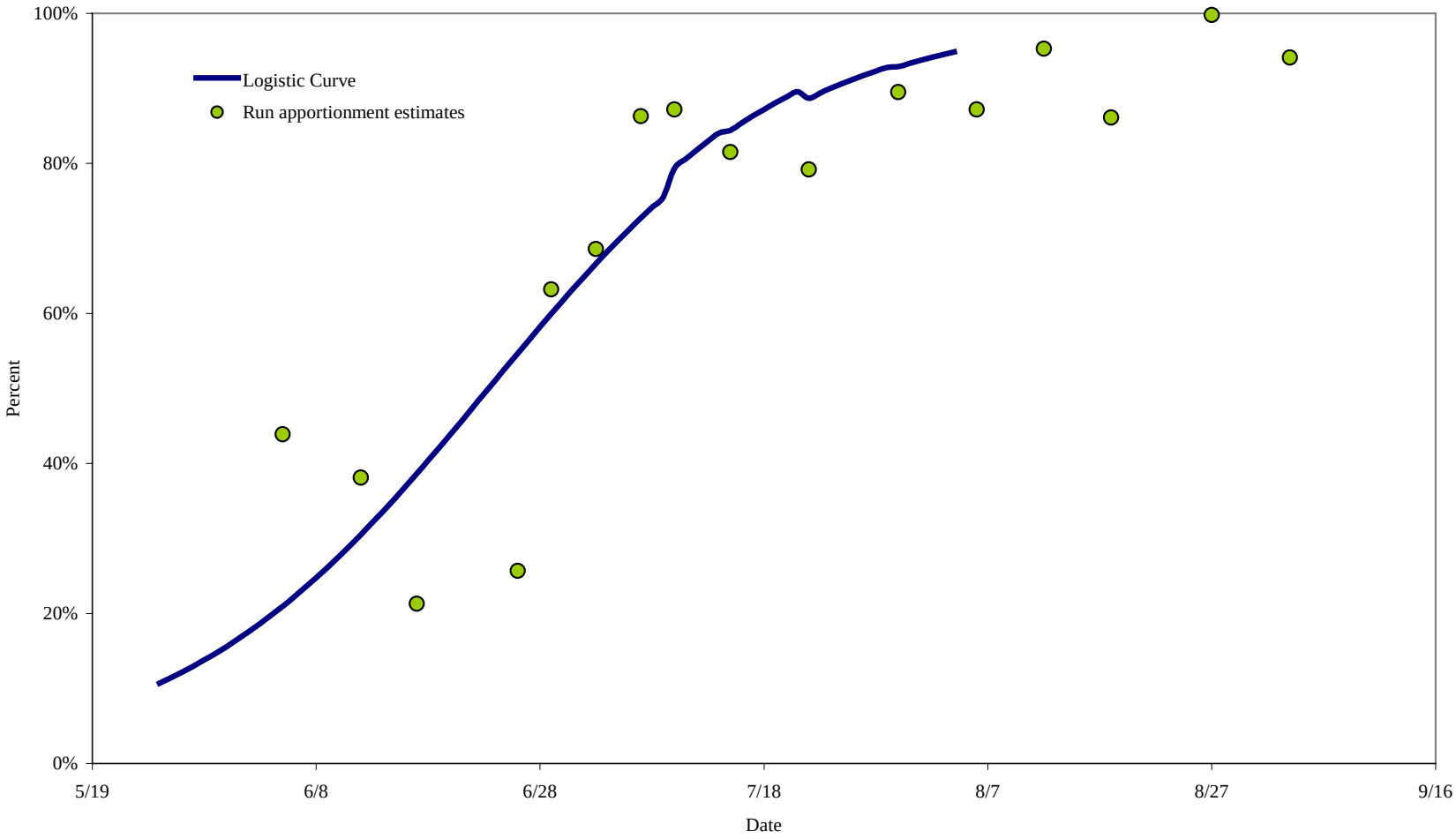

Figure 4. Estimated proportion of Chignik Lake sockeye salmon in the Chignik River system by day using a weighted logistic function fit to the age 2.3 model output data and refit for each sample inseason.

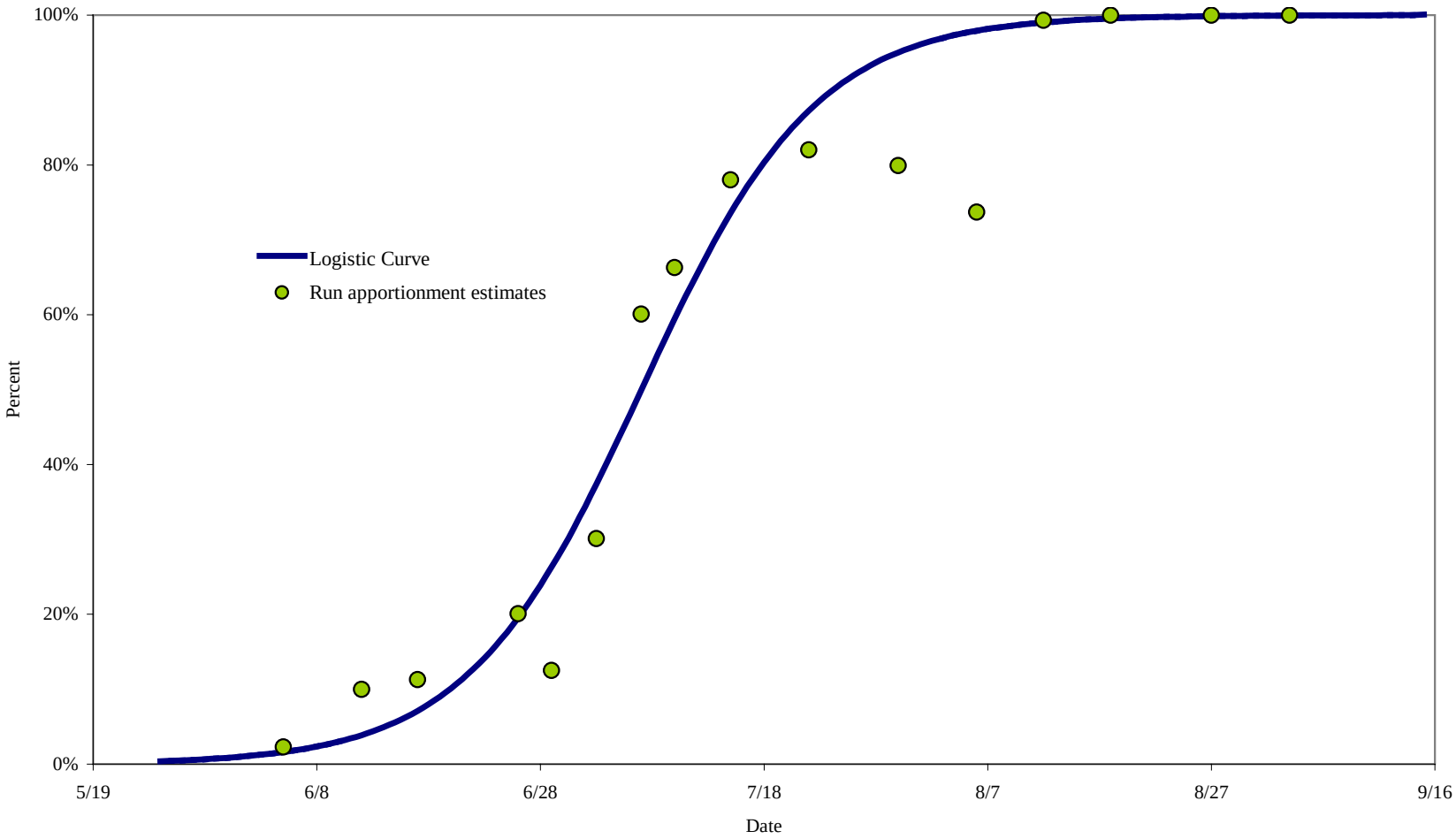

Figure 5. Estimated proportion of Chignik Lake sockeye salmon in the Chignik River system by day using a weighted logistic function fit to the age 1.3 model output data and refit for each sample postseason.

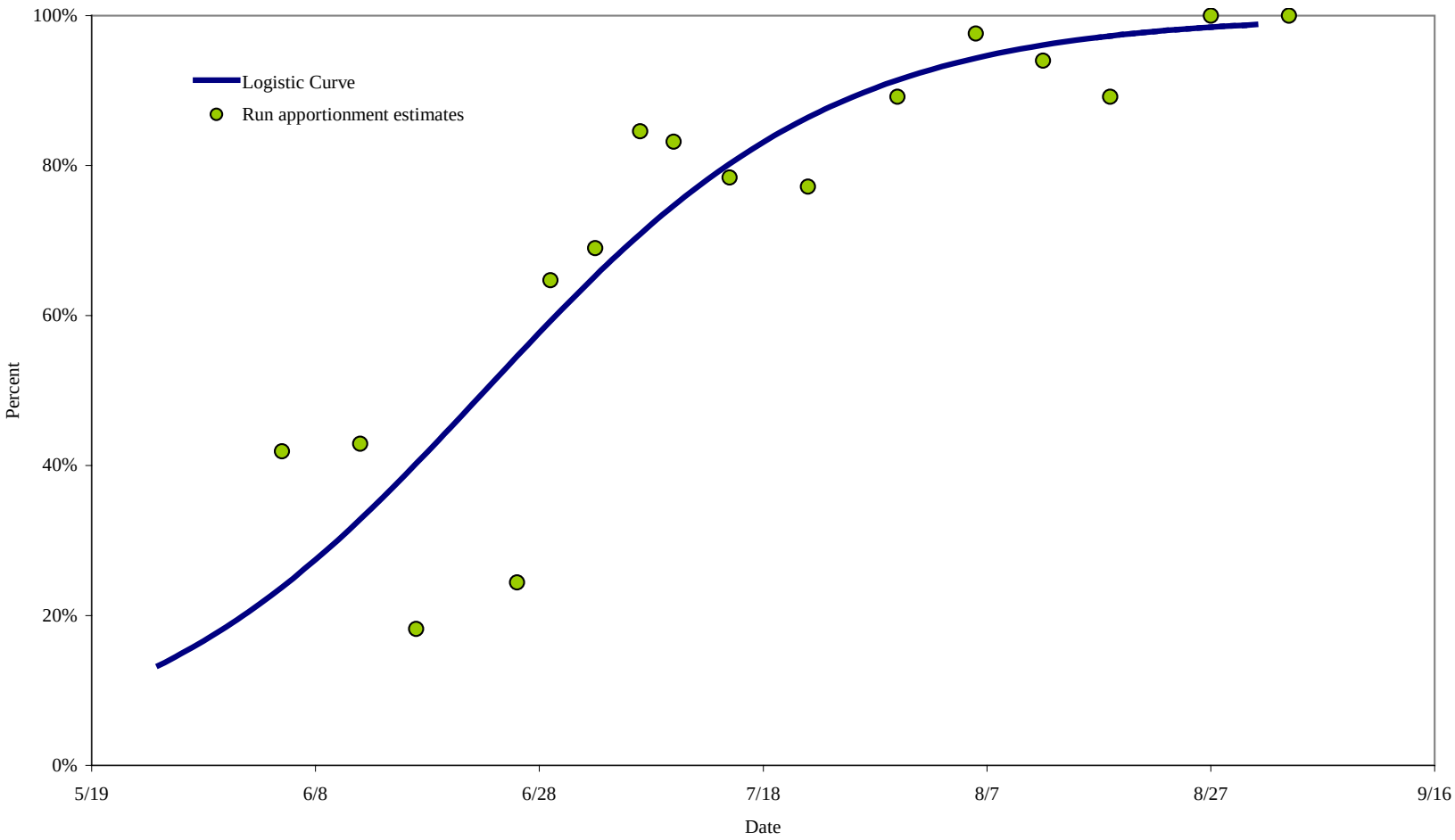

Figure 6. Estimated proportion of Chignik Lake sockeye salmon in the Chignik River system by day using a weighted logistic function fit to the age 2.3 model output data and refit for each sample postseason.