

McNeil River Chum Salmon Fishery Management Plan



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BACKGROUND

The McNeil River, located in Kamishak Bay, hosts one of the major chum salmon *Oncorhynchus keta* runs in the Lower Cook Inlet area. This system is unique not only in its importance as a historical commercial fishery, but also as a critical element for the bear population in the McNeil sanctuary and the associated bear viewing program administered by the Department of Fish and Game (ADF&G). The river provides approximately 14 miles of exceptionally good chum salmon spawning habitat extending from the intertidal lagoon, upstream to the outlet of McNeil Lake. Fish passage into the lake is blocked due to a series of small but steep falls. The commercial purse seine fishery targeting on this stock dates back to the early 1900's. Prior to statehood, this fishery was managed by the Federal Bureau of Commercial Fisheries, but now is managed by the ADF&G. The commercial harvest occurs primarily in McNeil Cove and occasionally inside McNeil Lagoon, which is a traditional safe anchorage for fishing boats.

ESCAPEMENT GOAL

Historically, the unpublished escapement goal in McNeil River was 10,000 chum salmon. Based upon the fishery manager's observation that large escapements produced greater than anticipated runs, this escapement goal was informally increased and converted to a range of 20,000 to 40,000 fish, in 1975. This range was formally adopted as the published chum salmon escapement goal in 1988. The escapement goal is in fact an "index", based upon aerial survey estimates of live spawners in the river. Aerial surveys are conducted on a weekly basis through the spawning migration. Because new fish are continually entering the river, as others are removed through spawning mortality or consumption by bears, the aerial index underestimates the true total escapement. There has never been a weir on the McNeil River to document the absolute number of spawners.

The annual estimated escapement index varies from year to year dependant upon environmental conditions and migratory behavior of the run. Some years, most fish hold and spawn in the lower section of the river below McNeil falls, while in others (normally during large runs), a substantial number of fish also utilize the upper reaches of the river above the falls. In those years when fish spawn in both the upper and lower sections of the river, the higher end of the escapement range is desirable.

A significant portion of the fish that escape into McNeil River are consumed by bears prior to spawning. Consequently the escapement goal ("index") of 20,000 - 40,000 chum salmon, is in essence an "in-river" goal, with a biological spawning component and a component to provide for bear consumption. Any modification of this goal will be conducted in conformance with the *ADF&G Salmon Escapement Goal Policy*, adopted in October of 1992.

RUN TIMING

The median run date, the date on which 50% of the annual catch and escapement was attained, of the McNeil River chum salmon run has varied between July 9 (1987) and August 18 (1985) during 1972-1991 (Table 1). Most of the catch and escapement has occurred, on average, between July 6 and July 28, with the greatest daily percentage accounted for on 22 July (Figure 1). Differences in run timing among years may be correlated with the age composition of the run (Figure 2). Runs dominated by five or six year old chum salmon (1983 and 1988) tended to have an earlier median date (July 12 and 11) than runs dominated by four year old chum (1977 and 1986; July 14 and August 6). Since all runs are comprised of a mix of these age class, there is often a slight delay or "lull" in the run during early July between the arrival of older and younger chum salmon."

Other factors also affect the timing of chum salmon movement into McNeil River. Environmental factors influencing chum salmon movement into the McNeil River include water temperature (chum salmon delay entry into the river if temperatures are lowered due to snow melt); local weather conditions (chum salmon tend to back out of McNeil Lagoon during storms with high winds); tidal currents (chum salmon tend to move into McNeil Lagoon during the highest high tides); and changes in river discharge (chum salmon tend to prefer slower moving water for upstream migration and spawning). Commercial fishing activity also affects the movement of chum salmon into McNeil River. While some chum salmon are able to avoid capture and enter the river during fishing periods, ADF&G closely monitors and tightly controls the commercial fishing schedule to ensure adequate chum salmon escapement.

MANAGEMENT GOAL

The goal of this plan is to maintain a healthy chum salmon population returning to McNeil River in sufficient numbers to provide fish for bear consumption within the sanctuary as well as providing for the established commercial purse seine fishery in Lower Cook Inlet. Simply put, the goal of this plan is to manage the chum salmon runs to McNeil River for maximum sustained yield.

MANAGEMENT STRATEGY

The primary means for achieving the stated management goal is to regulate the commercial fishery to insure adequate numbers of chum salmon spawn to provide for maximum sustained yield. As outlined above, the escapement goal of 20,000 - 40,000 chum salmon has been established to meet this objective. It has been demonstrated that management of the run to achieve an aerial index within this range is also sufficient to provide adequate food to support a relatively sizable population of brown bears inhabiting the McNeil River Sanctuary and Refuge.

The commercial purse seine fishery opens in the Kamishak Bay District by regulation on June 1 each year (5 AAC 21.310 (4)). This opening date precedes the timing of the McNeil chum run, and is established primarily for management of runs to the adjacent systems such as Mikfik Creek and the Kamishak River. Consequently the performance of these adjacent systems may set the tone for early season management of McNeil chums. The standard fishing schedule in the Kamishak District is two 48-hour fishing periods each week, however, this may be modified by emergency order as warranted by the fishery manager.

Critical to the management of the McNeil River chum salmon run is the identification of inseason run strength. To accomplish this task the commercial fisheries management staff:

- 1) Conducts periodic aerial surveys of McNeil Lagoon and McNeil River to visually enumerate chum salmon and generate indices of fish abundance in the river (escapement).
- 2) Obtains chum salmon samples from the commercial harvest (or spawning population, when there is no commercial harvest) to determine age and size characteristics of the run.
- 3) Compares inseason data with preseason forecasts and historical catch, escapement and age structure data.

Based on these data, adjustments are made to the commercial fishery in time and area by emergency order to meet the stated escapement objectives. The McNeil River Subdistrict was established to facilitate management of the returns (Figure 3). When a weak run is detected, the McNeil River Subdistrict is closed to offer protection to returning salmon.

Attempts will be made to obtain escapement from all segments of the run to maintain natural run timing and genetic variability within the chum salmon population. It is recognized that this strategy also facilitates good bear viewing opportunities in the Sanctuary.

The department recognizes that bear viewing opportunities in McNeil Sanctuary may be influenced by commercial fisheries activities occurring within or in close proximity to the Sanctuary. In order to minimize the potential for conflicts and enhance visitor safety, management strategy will adhere to the *Mikfik Creek - McNeil Lagoon Salmon Fishery Management Plan* approved by the ADF&G Commissioner in 1988 (Appendix A.). The department will manage the McNeil chum salmon fishery as follows:

- 1) The commercial fishery targeting on McNeil River chum salmon will take place outside of the lagoon to the maximum extent possible.
- 2) If the escapement goal has been met or is assured and a harvestable surplus in excess of 500 chum salmon has built up in the lagoon, the McNeil lagoon may open to commercial fishing, at the fishery manager's discretion.
- 3) Openings inside the lagoon will be of two hours duration, commencing approximately one hour prior to the high tide so that boats can avoid going dry.

Table 1. Median run dates, dates on which 50% of the annual catch and escapement was attained, for McNeil River chum salmon, 1972-1991.

Year	Median Date
1972	July 18
1973	August 6
1974	July 12
1976	July 25
1977	July 14
1978	July 24
1979	July 18
1980	July 15
1981	July 18
1982	July 22
1983	July 12
1984	July 6
1985	August 18
1986	August 6
1987	July 9
1988	July 11
1989	July 24
1991	August 7

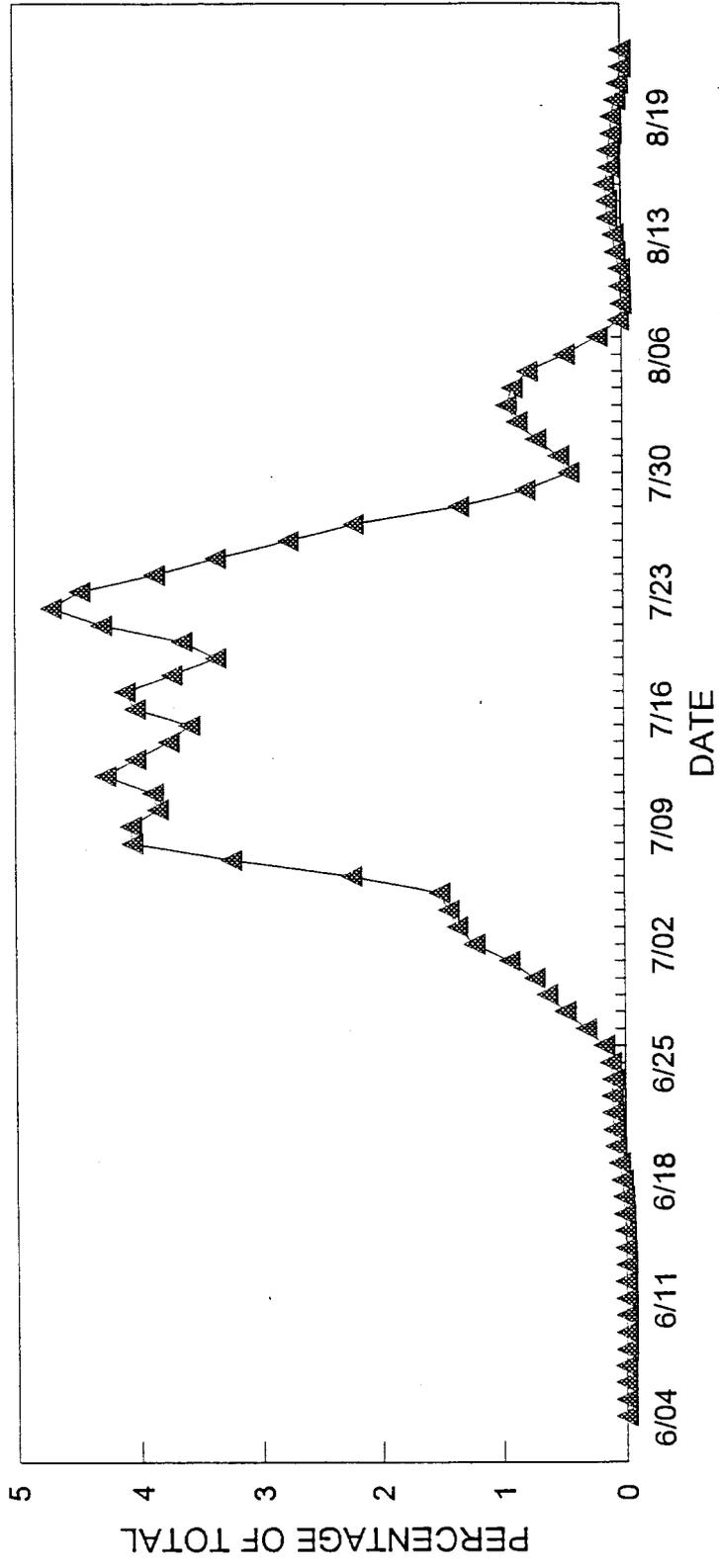


Figure 1. Mean combined catch plus escapement, 1972-1992 (excluding 1985).

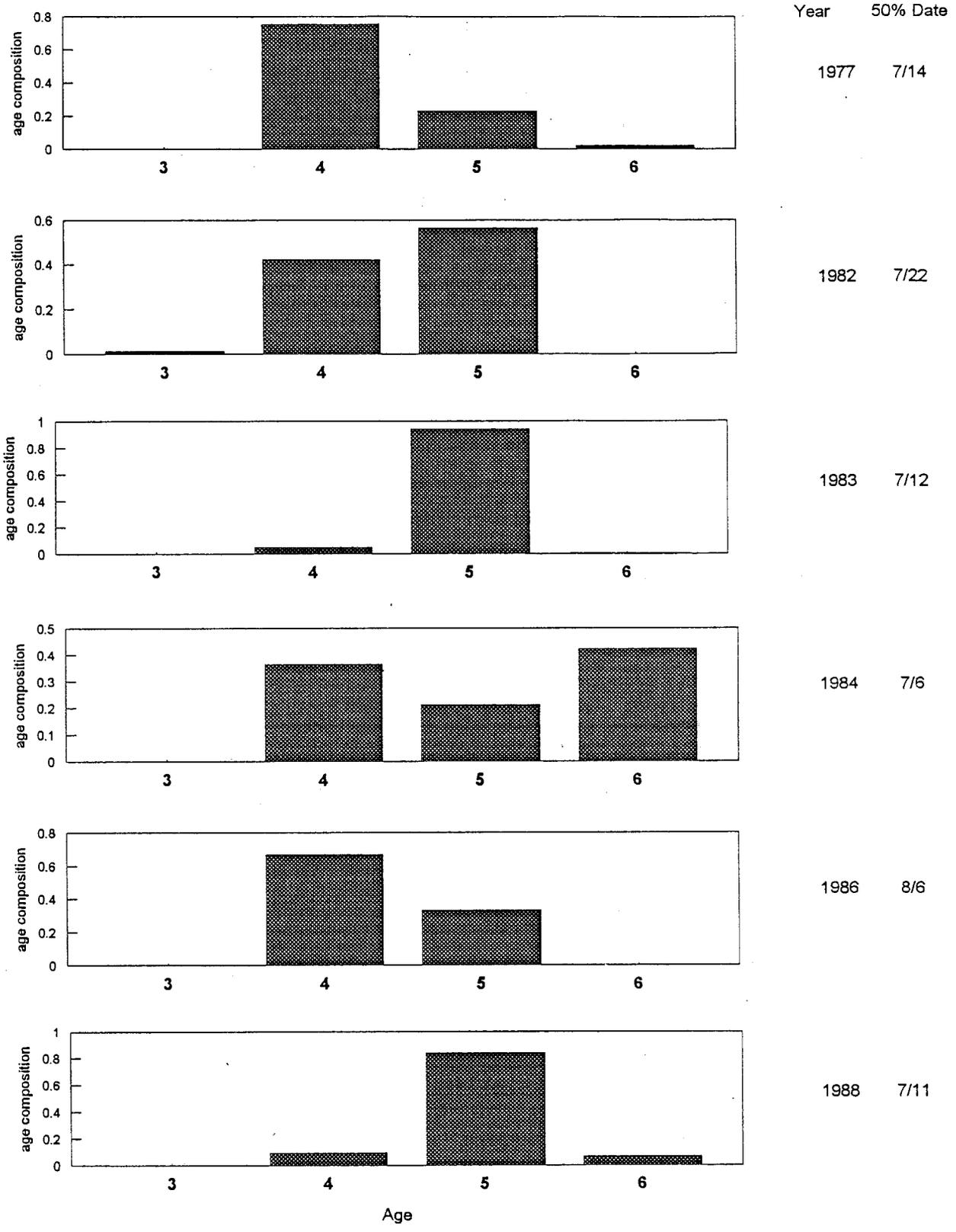


Figure 2. Age composition and 50% date for McNeil chum salmon catch and escapement.

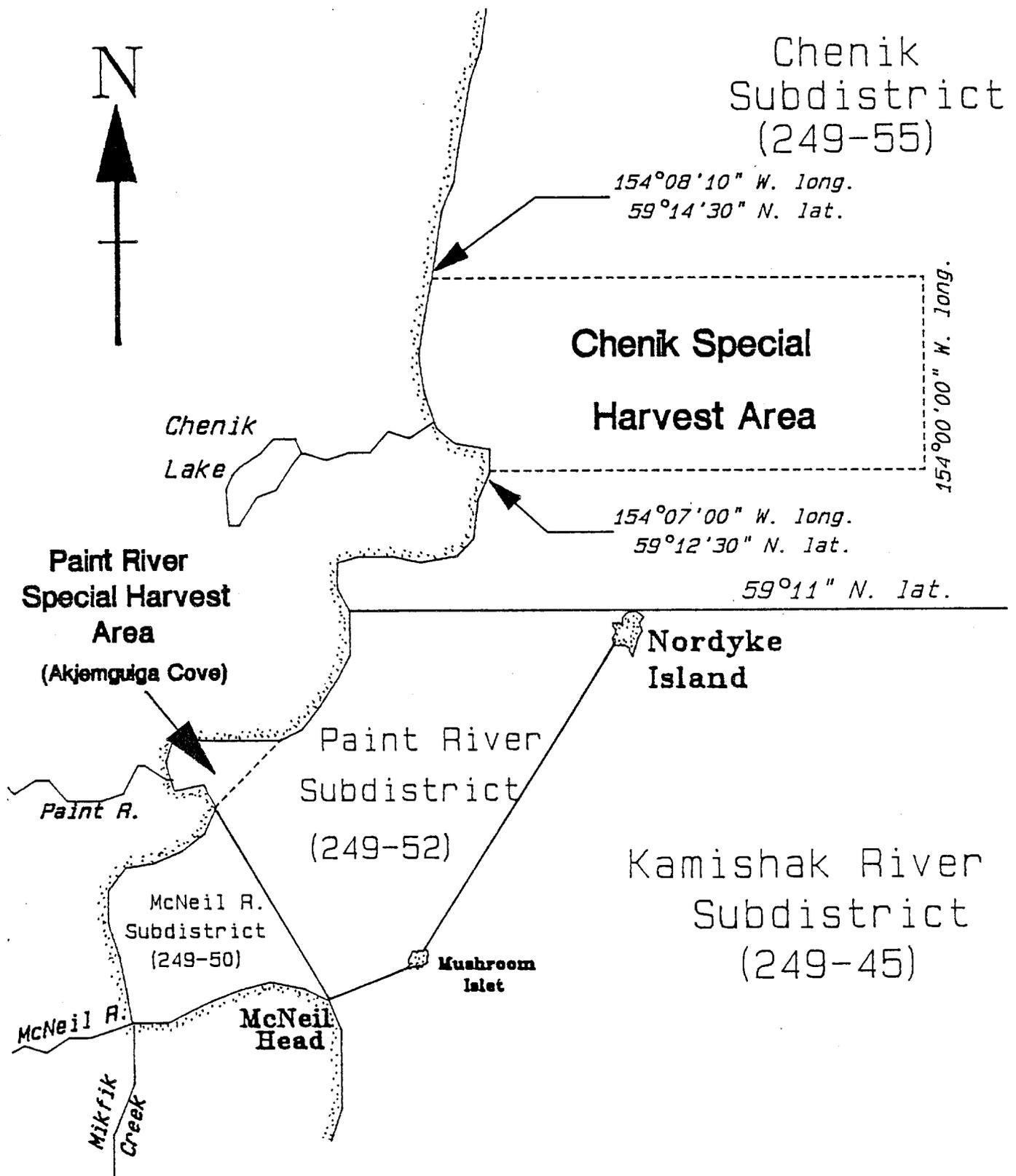


Figure 3. Chart of the McNeil River area in the Kamishak Bay District of Lower Cook Inlet showing the salmon fishing subdistricts.

MIKFIK CREEK - MCNEIL LAGOON
SALMON FISHERY MANAGEMENT PLAN

Management of the sockeye salmon return to Mikfik Creek will be carried out to allow adequate escapement and to provide fish for bear consumption throughout the course of the run. In an attempt to fully utilize this run, commercial fishermen will have the opportunity to harvest large surpluses of sockeye occurring in the lagoon. To achieve these ends, the fishery will be managed as follows:

- 1) Based on the best available data, the escapement goal for Mikfik Creek that will provide for the health of the run and the highest return per spawner is 5,000 to 7,000 fish.
 - (a) The escapement goal will therefore be 5,000 to 7,000 sockeye salmon.
 - (b) Escapement will be provided from all segments of the run to maintain genetic variability.
- 2) The commercial fishery will take place outside the lagoon to the maximum extent possible. Fishing outside the lagoon will be carried out as follows:
 - (a) standard fishing periods (two 48-hour periods per week) will begin June 1;
 - (b) fishing time will be adjusted by Emergency Order depending on run strength and escapement into Mikfik Creek;
 - (c) the inside marker defining the boundary for legal fishing will be located at the end of the spit;
 - (d) vessels will be allowed to anchor inside the spit as in the past.
- 3) When the minimum escapement goal of 5,000 fish is assured and it is projected that the upper limit of the escapement goal (7,000

fish) will be reached and a visually confirmed buildup of at least 500 salmon occurs in McNeil Lagoon, the lagoon may be opened to commercial fishing. Fishing inside the lagoon will be carried out as follows:

- (a) openings in the lagoon will occur for a two-hour period starting one hour before high tide and ending one hour after high tide;
- (b) nets must be fished from the boat and may not be fished from the beach;
- (c) fishermen will remain in their boats as much as possible while fishing.

Approved


Don W. Collinsworth, Commissioner

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