

# KODIAK AREA COMMERCIAL SALMON FISHERY HARVEST STRATEGY, 1998



By:

Dave Prokopowich  
Kevin Brennan  
and  
Dennis Gretsch

Regional Information Report<sup>1</sup> No. 4K98-26

Alaska Department of Fish and Game  
Commercial Fisheries Management and Development Division  
211 Mission Road  
Kodiak, Alaska 99615

May 1998

---

<sup>1</sup>The Regional Information Report Series was established in 1987 to provide an information access system for all unpublished division reports. These reports frequently serve diverse ad hoc informational purposes or archive basic uninterpreted data. To accommodate timely reporting of recently collected information, reports in this series undergo only limited internal review and may contain preliminary data; this information may be subsequently finalized and published in the formal literature. Consequently, these reports should not be cited without prior approval of the author or the Commercial Fisheries Management and Development Division.

KODIAK AREA COMMERCIAL SALMON FISHERY  
HARVEST STRATEGY, 1998

By:

Dave Prokopowich  
Kevin Brennan  
and  
Dennis Gretsich

Regional Information Report<sup>1</sup> No. 4K98-26

Alaska Department of Fish and Game  
Commercial Fisheries Management and Development Division  
211 Mission Road  
Kodiak, Alaska 99615

May 1998

---

<sup>1</sup>The Regional Information Report Series was established in 1987 to provide an information access system for all unpublished division reports. These reports frequently serve diverse ad hoc informational purposes or archive basic uninterpreted data. To accommodate timely reporting of recently collected information, reports in this series undergo only limited internal review and may contain preliminary data; this information may be subsequently finalized and published in the formal literature. Consequently, these reports should not be cited without prior approval of the author or the Commercial Fisheries Management and Development Division.

## TABLE OF CONTENTS

	<u>Page</u>
LIST OF TABLES .....	i
LIST OF FIGURES .....	ii
LIST OF APPENDICES.....	iii
INTRODUCTION .....	1
HARVEST PROJECTIONS .....	2
FISHING PERIODS .....	2
Length of Fishing Periods .....	2
Sockeye Salmon .....	2
Pink Salmon .....	4
First Period.....	4
Second Period .....	4
Third Period .....	5
Fourth Period .....	5
Fifth Period .....	5
Sixth Period.....	5
Seventh Period .....	5
Eighth Period .....	5
Chum Salmon.....	6
Coho Salmon.....	6
Opening Times .....	6
Advance Notice for Each Fishing Period.....	6
Inperiod Closures.....	7
INSEASON EMERGENCY ORDER ANNOUNCEMENTS .....	7
REGULATIONS .....	8
Regulations and Statistical Charts.....	8

## TABLE OF CONTENTS (Cont.)

	<u>Page</u>
MISCELLANEOUS REGULATORY CLARIFICATIONS .....	9
Closed Water Adjustments.....	9
Closed Water Markers.....	9
Additional Closed Water Sanctuaries .....	9
Buskin River Closed Water Sanctuary .....	9
Ayakulik River Closed Water Sanctuary.....	10
Section Boundaries.....	10
Purse Seine Leads.....	10
Set Gillnets - Operation of Gear.....	10
Leads.....	10
Operation of Set Gillnets.....	10
FISH TICKETS.....	10
Seiners .....	11
Gillnetters .....	11
MANAGEMENT PLANS .....	11
Cape Igvak.....	11
Alitak Bay District.....	12
Westside Kodiak.....	13
North Shelikof Strait Sockeye Salmon .....	13
Crescent Lake .....	14
Eastside Afognak.....	15
Spiridon Bay Sockeye Salmon.....	15

## TABLE OF CONTENTS (Cont.)

	<u>Page</u>
Eastside Kodiak .....	16
North Afognak and Shuyak Island .....	16
SOCKEYE SALMON ESCAPEMENT GOALS FOR KMA MAJOR SOCKEYE SALMON SYSTEMS .....	17
TABLES .....	18
FIGURES .....	32
APPENDIX .....	40

## LIST OF TABLES

<u>Table</u>	<u>Page</u>
1. Actual vs. projected 1997 commercial salmon harvest, by species and fishery, and 1998 harvest projections, for the Kodiak Management Area.....	18
2. Expected harvest from supplemental salmon production, by system and species for the Kodiak Management Area, 1998.....	20
3. Commercial salmon season opening times and dates, by species and fishery, for the Kodiak Management Area, 1998.....	21
4. Board of Fisheries approved fishery management plans for the Kodiak Management Area, 1998 .....	23
5. Biological and allocative criteria and the management chronology of the Cape Igvak Management Plan for the Kodiak Management Area, 1998.....	24
6. Primary management species and fishery chronology of the Alitak Bay District Salmon Management Plan for the Kodiak Management Area, 1998 .....	25
7. Primary management species and fishery chronology of the Westside Kodiak Management Plan for the Kodiak Management Area, 1998 .....	26
8. Primary management species and general fishery chronology in management units affected by the North Shelikof Strait Sockeye Salmon Management Plan for the Kodiak Management Area, 1998 .....	27
9. Primary management species and fishery chronology of the Eastside Afognak Management Plan for the Kodiak Management Area, 1998 .....	28
10. Primary management species and fishery chronology of the Eastside Kodiak Management Plan for the Kodiak Management Area, 1998 .....	29
11. Primary management species and fishery chronology for the North Afognak/Shuyak Island Salmon Management Plan for the Kodiak Management Area, 1998.....	30
12. Sockeye salmon escapement goals for major and minor systems with fish counting weirs in the Kodiak Management Area, 1998 .....	31

## LIST OF FIGURES

<u>Figure</u>	<u>Page</u>
1. Commercial salmon fishery chronology, by species, in the Kodiak Management Area .....	32
2. Boundaries of the Foul Bay Terminal Harvest Area in the Kodiak Management Area .....	33
3. Boundaries of the Waterfall Bay Terminal Harvest Area in the Kodiak Management Area.....	34
4. Boundaries of the Settler Cove Terminal Harvest Area in the Kodiak Management Area .....	35
5. Boundaries of the Spiridon Bay Terminal Harvest Area (Telrod Cove) in the Kodiak Management Area .....	36
6. Buskin River closed water sanctuary in the Kodiak Management Area.....	37
7. Ayakulik River closed water sanctuary in the Kodiak Management Area. ....	38
8. Map of the "North Shelikof Seaward Zone" and the "Southwest Afognak Seaward Zone" of the North Shelikof Strait Sockeye Salmon Management Plan for the Kodiak Management Area .....	39

## LIST OF APPENDICES

<u>Appendix</u>	<u>Page</u>
A.1. Projected salmon harvest curve, all species combined, for the Kodiak Management Area, 1998 .....	41
A.2. Projected sockeye salmon harvest curve for the Kodiak Management Area, 1998 .....	42
A.3. Projected pink salmon harvest curves for the Kodiak Management Area, 1998 .....	43
A.4. Projected coho salmon harvest curve for the Kodiak Management Area, 1998 .....	44
A.5. Projected chum salmon harvest curve for the Kodiak Management Area, 1998 .....	45
B.1. Upper and lower escapement goal curves for the early run of Karluk sockeye salmon in the Kodiak Management Area, 1998 .....	46
B.2. Upper and lower escapement goal curves for the late run of Karluk sockeye salmon in the Kodiak Management Area, 1998 .....	47
B.3. Upper and lower escapement goal curves for the early run of Upper Station sockeye salmon in the Kodiak Management Area, 1998 .....	48
B.4. Upper and lower escapement goal curves for the late run of Upper Station sockeye salmon in the Kodiak Management Area, 1998 .....	49
B.5. Upper and lower escapement goal curves for Ayakulik sockeye salmon in the Kodiak Management Area, 1998 .....	50
B.6. Upper and lower escapement goal curves for Frazer (Dog Salmon) sockeye salmon in the Kodiak Management Area, 1998 .....	51
B.7. Upper and lower escapement goal curves for Saltery and Akafura (early and late runs) sockeye salmon in the Kodiak Management Area, 1998 .....	52
B.8. Upper and lower escapement goal curves for Litnik and Pauls Bay sockeye salmon in the Kodiak Management Area, 1998 .....	53
B.9. Upper and lower escapement goal curves for Buskin and Malina sockeye salmon in the Kodiak Management Area, 1998 .....	54

## INTRODUCTION

The Alaska Department of Fish and Game (ADF&G) will manage the 1998 Kodiak Management Area (KMA) commercial salmon fisheries according to a harvest strategy that emphasizes three criteria:

- (1) **Promote maximum production of future KMA salmon returns by ensuring salmon escapements of sufficient magnitude and distribution.**
- (2) **Provide for orderly fisheries by maximizing harvest opportunities on the highest quality salmon.**
- (3) **Adhere to the biological and allocative requirements of all Alaska Board of Fisheries (BOF) Management Plans for the KMA.**

The management chronology is based on the run timing of the four targeted salmon species; sockeye, pink, chum, and coho salmon (Figure 1). This chronology is used as a guide, with species specific management requirements dictating inseason adjustments in the harvest strategy.

Sockeye salmon management requires escapement information from up to nine salmon counting weirs. This information is used to regulate fishing time and areas open to fishing. Prorating fishing time for sockeye salmon solely on the basis of preseason expectations is generally not an acceptable method of managing KMA sockeye salmon stocks. The only exception is for initial "commercial test fisheries" in early June.

Initial fishing periods for pink salmon are set preseason, based upon the forecast. This can be done with little chance of adverse effects on future production and is the most desirable way of managing the return of the KMA's relatively large pink salmon runs.

Chum and coho salmon require a blend of these two management approaches. Both species are initially harvested in directed pink or sockeye salmon fisheries. Specific fisheries targeting on chum and coho salmon require assessment of run strength, using weirs and/or aerial surveys, before those fisheries can occur. Escapement data along with inseason assessment of harvests determines if the chum and coho salmon runs can support additional terminal or near terminal harvests.

Chinook salmon are not targeted in specific fisheries, but are harvested in fisheries directed toward sockeye and pink salmon.

**For sockeye and coho salmon returning to major systems, management will emphasize the use of inseason weir escapement data to determine fishing time by geographical area.**

**For minor sockeye and coho systems without fish weirs, fishing time will be determined by ADF&G's assessment of run strength for these systems.**

For pink and chum salmon runs, management will use preseason forecasts to determine initial fishing time, with inseason adjustments in fishing time and areas open to fishing as the actual run strength becomes more apparent.

## HARVEST PROJECTIONS

Initial projections for the 1998 KMA commercial salmon fisheries are for a harvest of approximately 9,670,000 salmon (Table 1). This harvest includes approximately 20,000 chinook, 2,352,000 sockeye, 6,348,000 pink, 650,000 chum, and 300,000 coho salmon.

The Kodiak Regional Aquaculture Association (KRAA) Kitoi Bay Hatchery is projected to contribute 48,000 sockeye, 20,000 chum, 850,000 pink (range .4 to 1.7 million), and 90,000 coho salmon to the total 1998 harvest. Additional enhancement projects conducted by KRAA and ADF&G's Commercial Fisheries Management and Development Division (CFMDD) should contribute a projected 310,000 sockeye salmon to the common property fisheries of the KMA (Table 2). Supplemental production estimates are included in the total harvest projections.

*A good tool for illustrating the timing and magnitude of salmon harvests are the projected harvest graphs (Appendix A.1 - A.3.). A curve is calculated, based on the historical cumulative average salmon catch by date, that is scaled to the current preseason harvest projection. By keeping track of the actual salmon harvest by date, and plotting this on the graphs, a comparison of expected and actual returns can be made.*

## FISHING PERIODS

All fishing periods will be established by Emergency Order (EO) with the initial openings based on a general harvest chronology (Table 3).

### *Length of Fishing Periods*

#### **Sockeye Salmon**

There will be a commercial test fishery beginning **June 9** in the **Alitak Bay and Northwest Kodiak Districts**. The initial commercial test fishing period will extend from 12:00 noon Tuesday, June 9 through 9:00 P.M. Wednesday, June 10, a 33 hour period. Additional fishing time in the Alitak Bay District will depend on the results of the June 9 commercial test fishery, an ADF&G test fishery in Olga Narrows, Dog Salmon (Frazer) weir escapements, and sockeye salmon buildups (see Alitak Bay District Management Plan, 5AAC 18.361).

There will also be fisheries beginning **June 9** in the **Foul Bay and Waterfall Bay Terminal Harvest Areas (Figure 2 and 3)**, and the **Duck Bay, Izhut Bay and Kitoi Bay Sections**, targeting supplemental and enhanced sockeye salmon production. Fishing periods for enhanced sockeye runs in terminal harvest areas (Figures 2 and 3) will be continuous, 24 hours per day, for as long as there are harvestable surpluses and orderly fisheries are occurring. The fishery on Kitoi Bay Hatchery sockeye run may extend only through June 20, while fisheries on enhanced sockeye systems in Foul and Waterfall Bays may extend through early July.

The sockeye run to the **Afognak Lake System (Litnik)** has been very robust in recent years and this section (the Southeast Afognak Section) **may open as early as June 9**, depending on weir escapement and sockeye buildups.

Initial fishing periods in the **Southwest Kodiak District** targeting Ayakulik River sockeye salmon (the Inner and Outer Ayakulik Sections) will be dependent on Ayakulik (Red River) weir escapements and sockeye salmon buildups.

A second commercial test fishery will begin **June 14**, in the **NW Kodiak District**. This second commercial test fishing period will extend from 12:00 noon Sunday, June 14 through 9:00 P.M. Monday, June 15, a 33 hour period. In conjunction with this fishing period, there will be a 33 hour fishing period for surplus production from **minor sockeye salmon systems** (Afognak Lake, Saltery, Uganik, Paramanof, Pauls/Perenosa, Kafliia, and Swikshak). The EO announcement for this opening will specify which sections are to be opened.

Further fishing time from mid June to early July will be based entirely on sockeye salmon returns to major and minor systems, dependent on weir escapements, salmon buildups, and fishery performance.

For most late run sockeye salmon stocks, a portion of the harvestable surplus is taken during targeted pink salmon fishing periods. Consequently, a "blended" management strategy is needed to ensure escapements are achieved by species with the upper escapement requirements not being exceeded.

By regulation fishing time in the **Cape Igvak Section** can begin as early as June 5, however fishing time will be dependent upon evaluation of the Chignik system sockeye salmon run strength. Chignik sockeye salmon are the dominant contributing stock harvested in this section. Review the Cape Igvak Management Plan (5 AAC 18.360) to clarify the biological and allocative requirements. Due to the forecasted sockeye salmon return to Chignik and Black Lakes, fishing time will initially be allocated in the Cape Igvak Section based upon the criteria listed in paragraph (c) of the plan. **HOWEVER**, the Chignik Area Management Biologist has expressed concerns on the accuracy of this years' forecast, which in turn may cause some delay in evaluating the actual strength of the sockeye return to Black and Chignik Lakes. If it is not obvious that the sockeye return is as strong or stronger than forecast, the initial fishing period in the Cape Igvak Section may be delayed or no fishery may be allowed as was the case in 1997. Fishing periods, when they occur, in the Cape Igvak Section will be in 24 hour increments running from 12:01 A.M. to 12:01 A.M.

## **Pink Salmon**

Preemergent pink salmon fry sampling of the KMA index streams conducted during March and April of 1997 indicated variable, but overall average over-winter survival of the eggs and sac fry. Sampling resulted in an unweighted live fry index of 168.36 live fry per square meter of spawning area. This live fry index ranks as the ninth highest of the past 17 even-year indices on record.

These fry were from a 1996 brood year escapement of 3.35 million pink salmon, above the minimum KMA escapement goal of 2.4 million but below the recent 5 even-year average escapement of 4.0 million pink salmon. During the fall, weather conditions in the KMA were good, with moderate rain causing little flooding of streams. Conditions were cold in early winter but with good snow cover. Early January and most of February were warm with significant rainfall. During the sampling period most of the index streams were open, though there were periods of very cold weather. Karluk Lake was opening early in March, much earlier than in recent past years. Signs of flooding and ice scouring were seen in only a few streams.

The forecast for the 1998 Kitoi Bay Hatchery pink run was developed using survival rates from the 1978–1996 even numbered brood years. The range estimates were calculated by using the average survival rate of the two lowest and two highest even-year returns.

In addition to the three management criteria identified in the introduction of this document, the harvest strategy for pink salmon utilizes: 1) a fixed July 6 opening date, 2) a pink salmon forecasting program to set the length of the initial fishing periods, and 3) coordination of multiple fisheries whenever possible to allow for dispersion of the purse seine fleet.

The initial July 6 fishing period will be 2½ days in length while subsequent fishing periods are expected to be 3½ days per week. During the peak harvest period of late-July to mid-August, fishing periods may be increased to ensure that pink salmon in excess of escapement requirements are harvested.

Listed below is a schedule of fishing periods that may be used for planning purposes by both ADF&G and industry.

***First Period: 2½ days (57 hours) - 12:00 Noon July 6 through 9:00 P.M. July 8.*** This period provides important harvest data to assess early run strength of KMA pink salmon and certain chum salmon stocks. There will be no extensions in fishing time based on pink or chum salmon harvests during this period. *Mainland District sections will also be opened for 2½ days (57 hours), from 12:00 Noon July 6 through 9:00 P.M. July 8.*

***Second Period: 3½ days (81 hours) - 12:00 Noon July 13 through 9:00 P.M. July 16.*** During this second period run strength for both pink and chum salmon will again be assessed from harvest data. No extensions in fishing time based on pink or chum salmon harvests will occur during this period. *Mainland District sections will only be opened for 2½ days (57 hours), from 12:00 Noon July 13 through 9:00 P.M. July 15.*

**Third Period: 3½ days (81 hours) - 12:00 Noon July 20 through 9:00 P.M. July 23.** The previous 3½ day closure will allow an influx of pink and chum salmon into terminal areas to enhance the build-up of potential escapement. At this time a combination of harvest and early escapement or build-up information will provide an indication of the actual run strength for major pink salmon stocks. *Mainland District sections will only be opened for 2½ days (57 hours), from 12:00 Noon July 20 through 9:00 P.M. July 22.*

**Fourth Period: 3½ days (81 hours) - 12:00 Noon July 27 through 9:00 P.M. July 30.** This fourth period is critical, as the harvest should increase and a fairly realistic assessment of total run strength should be evident by the end of the period. Extensions in fishing time commonly occur during this period in years when the pink and chum salmon runs are strong. The initial pink salmon opening for the Kitoi Bay Section is expected to occur at the beginning of this fishing period.

**Fifth Period: 3½ days (81 hours) - 12:00 Noon August 3 through 9:00 P.M. August 6.** This fifth period should yield the peak harvest day and period, provided that normal run timing occurs. The first significant announcement of differential fishing time by management unit may occur as stronger production areas are extended, while moderate or lower production areas are not.

**Sixth Period: 3½ days (81 hours) - 12:00 Noon August 10 through 9:00 P.M. August 13.** This sixth period should be the first post peak period. Returns to major late production systems should be evident by period's end. There may be increases in closed water sanctuaries to enhance escapement levels. Evaluation of run strength is used to determine if reductions in fishing time are needed for the remaining periods to ensure adequate escapement. A strategy to achieve full escapement in all systems is developed from this period.

**Seventh Period: 3½ days (78 hours) - 12:00 Noon August 17 through 6:00 P.M. August 20.** During the seventh period, a blended multi-species management approach is used for those sections where pink salmon were the targeted species for the previous six periods. Emphasis will still be on harvesting excess, good quality pink salmon and achieving escapement goals. However, major concern will be directed toward the run strength of late run Karluk and Upper Station sockeye and late run chum salmon.

**Eighth Period: 3½ days (78 hours) - 12:00 Noon August 24 through 6:00 P.M. August 27.** The eighth period will primarily be a cleanup period for pink salmon stocks. Escapement requirements should be assured at this point. Excess pink salmon of acceptable quality should be available for harvest in near terminal areas. This period also will require a major emphasis on multi-species management. It is a critical management period for late run sockeye and chum salmon stocks, as well as early run coho salmon.

**A change to this schedule of fishing periods should be expected if significant deviation in the actual pink salmon return occurs.**

## **Chum Salmon**

A large portion of the 1998 KMA chum salmon harvest will occur in non-terminal locations during major pink salmon fisheries. The initial opening where chum salmon may be targeted will begin on July 6, and will follow the opening dates and times set for pink salmon (see below). System specific chum salmon fisheries, which occur during the pink salmon fishery, will commonly result in some management units having less fishing time than management units targeting primarily pink salmon stocks. For the past several years (beginning in the early 1990's) chum salmon runs to Mainland District streams have been weak. **From July 6 to July 25 fishing time for that portion of the Mainland District north of Cape Aklek will not exceed 57 hours per week.**

## **Coho Salmon**

Initial 1998 KMA coho salmon harvest will occur in non-terminal locations during major pink salmon fisheries. System specific coho salmon fisheries, which occur during the pink salmon fishery, may result in some management units having more or less fishing time than management units targeting primarily pink salmon stocks. This approach emphasizes the use of more terminally located management units for targeted coho salmon fisheries (i.e., Inner Kukak Section, Zachar Bay Section, Kizhuyak Section, etc.). Coho salmon run strength will be assessed from weir escapements, aerial surveys, and harvest data.

### *Opening Times*

**All regular fishing periods will begin at 12:00 Noon and end at 9:00 P.M., except:**

- **Cape Igvak** fisheries will usually open at 12:01 A.M. and close at 12:01 A.M. from June 5 through July 25.
- **Inner Ayakulik Section** fisheries will usually begin near low tide. These will be daylight openings, and will be initiated by ADF&G "flare openings". Fishing will begin when a flare is launched by ADF&G personnel. When such openings occur, the opening time for the Outer Ayakulik Section may be adjusted to coincide with the Inner Ayakulik Section.

**Beginning on August 16, all fishing periods will end at 6:00 P.M. instead of 9:00 P.M.**

### *Advance Notice for Each Fishing Period*

All advance notice times will be based upon the initial announcements being made on SSB frequency 4125 kHz, following the **6:00 P.M.** daily marine weather broadcasts.

- For the **initial Cape Igvak fishery**, there will be at least a **30 hour advance notice**. All subsequent fishing periods will have at least **18 hours advance notice**, unless it is an extension of an ongoing fishing period.

- For the **initial June sockeye fisheries** in the Alitak, SW Kodiak, and NW Kodiak Districts, there will be at least a **42 hour advance notice** (this includes the June 9 fishing period for the Alitak and NW Kodiak Districts, and the June 14 fishing period for the NW Kodiak District).
- **All subsequent fishing periods prior to July 6 will have at least 18 hours advance notice.**
- For the **initial pink/chum salmon fisheries**, there will be at least **42 hours advance notice**, with the fishery starting at 12:00 noon on July 6.
- **All subsequent fishing periods after the July 6 fishing period will have at least 18 hours advance notice.**
- For **all extensions** in fishing time from a previously announced fishing period there will be at least **3 hours advance notice**.

### *Inperiod Closures*

From July 6 through July 25 inperiod closures of designated "Seaward Zones" may occur in North Shelikof management units, in accordance with the North Shelikof Strait Sockeye Salmon Management Plan (SAAC 18.363). Fishers operating in North Shelikof from July 6 to 25 are advised that inperiod closures of "Seaward Zones" are possible. Closures will be announced on SSB frequency 4125 kHz at 8:00 A.M., 10:00 A.M., 2:00 P.M., or 6:00 P.M. There will be at least **3 hours advance notice** of an inperiod closure.

### **INSEASON EMERGENCY ORDER (EO) ANNOUNCEMENTS**

**Fishing period announcements may not always be predictable** because the fishery is managed on data that is compiled and evaluated daily. Data used to make fishery decisions includes: (1) escapement reports via weir counts or aerial surveys, (2) harvest trends (total catch and catch per unit effort), and (3) information on fish buildups in closed water sanctuaries.

**After enough information has been collected to determine the fishing time needed to harvest surplus fish, an EO and a fishery announcement are issued in the following manner:**

- 1) A news release is constructed detailing:
  - a) The date, time, and number of the emergency order announcement.
  - b) The length of the fishing period.
  - c) The opening and closing times and dates of the fishing period.
  - d) The areas opening to fishing.
  - e) The areas closing to fishing.
  - f) The location of "closed water" marker adjustments (if any).

- 2) The news release is posted at the main entrance of the Kodiak ADF&G office. Copies of the news release are available in the Kodiak ADF&G office during office hours (Monday to Friday, 8:00 AM to 5:00 PM). For after hours availability, copies are stored outside, by the main entrance.
- 3) The news release is recorded on a 24 hour recorded message phone (Number **486-4559**).
- 4) The news release is made available to local radio stations (KVOK-AM / KRXX-FM and KMXT-FM).
- 5) The news release is announced over SSB channel 4125 kHz following the marine weather broadcasts. Commonly, the first reading of a news release occurs after the 6:00 P.M. weather broadcast, but occasionally the initial reading comes after the 8:00 A.M. weather broadcast.
- 6) The news release is distributed to all registered processors either by hand, verbally on the telephone, by fax, or through the ADF&G recorded message phone.
- 7) Copies of emergency orders, which detail specific regulation changes and justifications, are mailed to a current listing of required and interested recipients.

Information on the most current news release or emergency order can also be obtained by calling the Kodiak ADF&G office (486-1830) during office hours, or by calling Dave Prokopowich (487-4919), or Kevin Brennan (486-6475) after office hours or on weekends.

*Many fishers, ADF&G vessels and camps, and Fish and Wildlife Protection vessels use a small tape recorder to document the exact wording of each announcement as it is broadcast. This is advisable, considering the detailed nature of each announcement.*

## REGULATIONS

### *Regulations and Statistical Charts*

There are no new regulations in effect for the 1998 commercial salmon fishery. All regulations pertaining to KMA salmon fisheries are in the 1996-1998 Cook Inlet, Kodiak, and Chignik Areas Commercial Fishing Regulations (ADF&G, 1996). The current commercial salmon fishing regulation book and the 1998 Kodiak Area Salmon Statistical Chart are available at the Kodiak ADF&G Office. **Note: All longitude and latitude coordinates in Kodiak Area Regulations have been converted to decimal minutes and are based on the North American Datum of 1983.**

## MISCELLANEOUS REGULATORY CLARIFICATIONS

### *Closed Water Adjustments*

There have been conflicting interpretations of Alaska Statute 16.05.785 regarding the failure to remove markers. As a result there will be no inseason adjustments of closed waters unless ADF&G personnel are able to remove old markers and install new markers, or unless inseason adjustments of closed waters are made to a specific stream terminus. All adjustments to closed waters listed in 5AAC 18.350 will be made by emergency order and announced by news release.

### *Closed Water Markers*

In areas where ADF&G has deployed regulatory markers to establish waters closed to fishing a straight line closure is in effect, provided that **no portion of that line is less than 500 yards from the seaward extremities of the exposed tideland banks that designates the stream mouth.** Consequently, common closed water configurations will be areas of various shapes, depending upon the nature of each individual stream mouth extending between the two regulatory markers

ADF&G is expanding its stream marker program in the Mainland District. Fishers participating in salmon fisheries located in the Mainland District should be aware that closed water sanctuaries to protect salmon buildups may be larger in some areas due to the placement of markers.

### *Additional Closed Water Sanctuaries*

In addition to the closed water areas listed within the 1996-1998 Commercial Salmon Fishing Regulation Book (Regulation 5AAC 18.350), the following two closed water sanctuaries will also be in effect for the 1998 season.

#### **Buskin River Closed Water Sanctuary**

The stream mouth of the Buskin River (stream no. 259-211) moves considerably from year to year. The previous markers were not providing adequate protection to salmon migrating into the stream. The north shore marker was moved and an offshore point designated to aid in triangulation of the closed water area. The offshore point is at the reef directly east of the spit, and may be marked with a buoy (Figure 6). The location of the closed waters will be described in the first salmon EO.

5AAC 18.350 CLOSED WATERS (a)(6) Northeast Kodiak District

(E) Buskin River: all waters inside of a line running from a marker on the bluff north of the mouth of the Buskin River at approximately 57°45.80' N. lat., 152°28.38' W. long. to a point offshore at 57°45.35' N. lat., 152°28.15' W. long. to a marker located onshore south of the river mouth at approximately 57°4 5.15' N. lat., 152°28.65' W. long. (NOAA Chart 16595).

## **Ayakulik River Closed Water Sanctuary**

ADF&G regulatory markers will be placed in such a manner as to better define the "stream terminus" of the Ayakulik River (stream no. 256-201). The intent of this closed water sanctuary is to prevent seines from being set which completely block access to the river for migrating fish (Figure 7).

### *Section Boundaries*

The Raspberry Strait Section **is not** part of the Southwest Afognak Section.

### *Purse Seine Leads*

The minimum mesh size that can be used in leads is seven (7) inches. Double panels of web overlapped in the lead of a purse seine are **not** legal.

### *Set Gillnets - Operation of Gear*

#### **Leads**

"Seine webbing" used as a lead for set gillnets is not intended to "gill salmon". Set gillnet leads which have similar mesh size and web construction to the actual set gillnet gear are **not** considered legal gear.

#### **Operation of Set Gillnets**

Set gillnets must be operated in substantially a straight line, except that no more than **25 fathoms of a set gillnet may be used as a hook**. A hook may be used in any configuration. When a set gillnet is being operated primarily as a "**hook in any configuration**" it will be considered **illegal to actively operate that gillnet as a purse or beach seine (such as "round hauling")**.

## **FISH TICKETS**

**Harvest location(s) must be recorded on fish tickets, by statistical area number.** It is the responsibility of each fisher to ensure that tender operators or cannery personnel record the correct harvest location and number of fish harvested by species on each ticket. This information is extremely important in evaluating inseason harvest levels, stock contribution, and effort distribution.

### *Seiners*

**Provide estimates of harvest by area to tender operators.** For example: "1/3 of my sockeye salmon were from Cape Alitak (257-20) and 2/3 were from Outer Ayakulik (256-20). The rest of my fish were 1/2 and 1/2 from each of those two areas." Prior to signing your tickets, check to make sure the proper harvest information by **STATISTICAL AREA** has been entered.

Accurate recording of the harvest from the Cape Igvak Section and that portion of the Shelikof Strait regulated by the North Shelikof Strait sockeye salmon management plan is particularly important. In order to provide an accurate accounting of sockeye salmon harvests in these areas, it is imperative that the correct statistical areas be reported on the fish ticket at the time of delivery.

### *Gillnetters*

**Because of the fixed nature of this gear, each permit holder's reporting area (statistical area) should be consistent between landings.** In the event that gillnet fishers move into a new statistical area, please provide the tender operator with that information. Prior to signing your tickets, ensure that the proper harvest information by **STATISTICAL AREA** has been entered.

## MANAGEMENT PLANS

Currently there are nine BOF approved management plans which direct management activities for specific portions of the KMA (Table 4). Two management plans were adopted by the BOF in November 1995, the Eastside Kodiak and the North Afognak/Shuyak Island Salmon Management Plans. Each management plan affects several management units through part or all of the salmon fishing season. Any plan requires the test of time and a continued review process to determine its effectiveness at accomplishing the desired biological and allocative goals.

Proper implementation of these plans in 1998 will require a major effort in communication between ADF&G and the industry. All inquiries, suggestions, and concerns regarding management plans should be directed to ADF&G, Kodiak. A discussion of each plan follows.

### *Cape Igvak*

The Cape Igvak Management Plan covers the time period from June 5 through July 25 for salmon fishing in the Cape Igvak Section of the Mainland District (Table 5). This plan has been in effect since 1978 and allocates, as near as possible, 15% of the available Chignik sockeye salmon for harvesting to Kodiak permit holders if specific biological and harvest criteria are met in the Chignik Management Area. The 1998 forecast for Chignik sockeye salmon runs indicate that early production may be below average and late production should be above average. Fishing time after

July 25 in the Cape Igvak Section will be based on pink, chum, and coho salmon bound to spawning streams in the Cape Igvak and Wide Bay Sections.

The regulation implementing the Cape Igvak Salmon Management Plan appears in the 1996-1998 Commercial Salmon Fishing Regulation Book under 5AAC 18.360.

### *Alitak Bay District*

This plan covers the entire commercial salmon fishing season, and identifies the primary species by management unit throughout the season (Table 6). The plan affects the sockeye salmon stocks returning to the Frazer (Dog Salmon), Upper Station, and Akalura systems, and the pink and coho salmon stocks returning to Dog Salmon, Upper Station, Akalura, Humpy Cove, Deadman, Horse Marine, and Silver Salmon systems. This plan has been in effect since 1988.

The management chronology for Olga Bay stocks identifies the targeted stocks by approximate time period. In situations where two or more targeted stocks overlap in run timing a blended management approach will occur. Adequate fishing time will be provided to ensure that the upper escapement goals are not exceeded for the dominant stock(s), while still attempting to ensure that the lower escapement goals for the non-dominant stock(s) are achieved. As outlined in this management plan, fishing time directed on these stocks will occur simultaneously in the traditional management units for harvesting these stocks, the Cape Alitak Section and the Moser-Olga Bay Section. Management for these stocks will emphasize an aggressive strategy to contain the harvest to these traditional harvest units; this strategy also applies to the remainder of the stocks in the Alitak Bay District.

The regulation implementing this management plan appears in the 1996-1998 Commercial Salmon Fishing Regulation Book under 5AAC 18.361. The dates listed in this plan are approximate and may vary with changes in run timing. However, the June 9 commercial test fishery is a firm opening date.

Some specific points to emphasize this year are:

- The approximate June 12 through June 24 period is identified as an aggressive management time for the Frazer sockeye salmon run.
- The lower biological escapement goal for Frazer sockeye salmon (140,000) will be targeted.
- The even year pink salmon biological escapement requirement for the Dog Salmon system ranges from 50,000 to 150,000 fish.
- In the event that fishing time is required in the Upper Olga Bay management units, there will be at least 18 hours advanced notice prior to any opening.

- Sockeye returning to Akalura will be managed in the Inner Akalura Section, so that sockeye escapement does not exceed 60,000 fish. The lower biological escapement goal of 40,000 sockeye will be targeted.

### ***Westside Kodiak***

The BOF adopted into regulation the Westside Kodiak Management Plan in 1989. This plan identifies a management chronology for the major Westside Kodiak salmon stocks (Table 7).

The goal of this management plan is to achieve escapement and harvest objectives of sockeye salmon returning to the Karluk, Ayakulik, and other minor Westside systems. Further, it details the management of pink, chum, and coho salmon returning to systems in the Southwest Afognak, Central, North Cape, Anton Larsen Bay, Sheratin Bay, Kizhuyak Bay, Terror Bay, Inner Uganik Bay, Spiridon Bay, Zachar Bay, Uyak Bay, Outer and Inner Karluk, Sturgeon Bay, Halibut Bay, and Outer and Inner Ayakulik Sections. The intent of the plan is to ensure salmon bound to these systems are harvested, to the extent possible, by the traditional fisheries located in all 17 sections. The plan directs the department to manage the Northwest Kodiak and the Southwest Kodiak Districts and the Southwest Afognak Section in accordance with the guidelines set out in this plan.

This management plan reflects long term management goals and management practices which were initially implemented in 1971. The basis for these goals and practices was primarily to rebuild depleted Karluk and depressed Ayakulik sockeye salmon stocks. This plan provides a predictable management framework for these rebuilt stocks, as well as major pink, chum and coho salmon stocks of westside Kodiak Island and southwest Afognak Island. It also helps to stabilize fishing opportunities between the three gear types on the highest quality fish in these districts and sections.

Sockeye returning to Karluk Lake will be managed so that an escapement of 200,000 sockeye salmon is attained for the early run and an escapement of 400,000 sockeye salmon is attained for the late run.

The regulatory wording of this plan appears in the 1996-1998 Commercial Salmon Fishing Regulation Book under 5AAC 18.362.

### ***North Shelikof Strait Sockeye Salmon***

The BOF, in December 1989, created the North Shelikof Strait Sockeye Salmon Management Plan because of concerns that the fishing patterns and quantities of sockeye harvested by Area K seiners in July 1988 represented the onset of an expansion of the interception of Cook Inlet bound sockeye in KMA. This plan was meant to contain this interception by restricting purse seine fisheries so as not to exceed the estimated historical interception level while still providing for traditional opportunities to harvest high quality local pink and chum salmon stocks.

The plan covers the time period from **July 6 through July 25** and establishes two specific sockeye salmon harvest "caps" for two defined management units which border the north Shelikof Strait from Dakavak Bay to Cape Douglas in the Mainland District and from Raspberry Cape to Shuyak Island in the Afognak District (Figure 8). These management units are:

1. The Southwest Afognak management unit, comprised of the entire Southwest Afognak Section, and;
2. The North Shelikof management unit, comprised of the Dakavak Bay, Outer Kukak Bay, Hallo Bay, and Big River Sections of the Mainland District plus the Shuyak Island and Northwest Afognak Sections of the Afognak District.

By regulation "Seaward Zones" are established in each management unit; these zones are comprised of all waters seaward of a baseline drawn cape to cape. If a Seaward Zone closure occurs, only the inshore "Shoreward Zone" (all waters inside the baseline) will be open to commercial fishing during normal fishing periods.

**The Seaward Zone of the Southwest Afognak Unit will close to fishing if more than 50,000 sockeye salmon are harvested between July 6 through July 25.**

**The Seaward Zone of the North Shelikof Unit will close to fishing if more than 15,000 sockeye salmon are harvested between July 6 through July 25.**

In January 1993, the BOF modified the management plan to allow for the traditional near shore seine fisheries to continue in the Southwest Afognak Section, in the event the sockeye harvest cap was reached. After the harvest cap is met, fishing will be restricted in waters inside of a 0.5 mile corridor (Figure 8).

*Permit holders who intend to fish in management units covered by this plan are advised that inperiod closures of the Seaward Zones might occur. In order to provide for orderly inperiod closures, permit holders are notified that such closures will be announced on SSB channel 4125 kHz, at 8:00 AM, 10:00 AM, 2:00 PM, or 6:00 PM daily, with the effective closure time occurring in as little as three hours following the initial announcement.*

The regulatory wording for this management plan is listed in the Regulation Book under 5AAC 18.363.

### *Crescent Lake*

The Crescent Lake Management Plan is associated with a relatively small coho enhancement project that could impact the subsistence fishery in the vicinity of Port Lions. This plan clarifies the harvest priorities for coho salmon returning to the Settler Cove area near Port Lions. This plan was adopted by the BOF in 1990, and was slightly modified in January 1993. The plan is in effect from July 15 through October 31, and allows for the commercial harvest of coho salmon inside the breakwater at Port Lions only after September 10. The wording of the regulations guiding this plan are listed in the 1996-1998 Commercial Salmon Fishing Regulation Book under 5AAC 18.364. The Settler

Cove Terminal Harvest Area (Figure 4) may be used to harvest sockeye or coho salmon when the Central Section is closed. This area is defined in the 1996-1998 Commercial Salmon Fishing Regulation Book under 5AAC 18.377.

### *Eastside Afognak*

The Kitoi Bay Hatchery on the eastside of Afognak Island produces significant returns of pink salmon. In 1990, the BOF approved a regulatory management plan to govern the fisheries in the vicinity of the hatchery. Although occasionally modified, the plan has been in effect since 1981, and was formulated jointly by KMA commercial fishery managers and the Kitoi Bay Hatchery manager. It is the intent of this plan to achieve escapement and harvest objectives for salmon stocks of the Southeast Afognak, Duck Bay, Izhut Bay, and Kitoi Bay Section, and assure adequate broodstock for the hatchery. The board intended that local stocks and hatchery fish be harvested within these sections. This plan details the key species and targeted stocks that are managed in each of these sections throughout the fishing season (Table 9).

The management unit closest to the hatchery, the Kitoi Bay Section, is normally closed to allow buildup and collection of fish for hatchery broodstock. The initial openings in July for pink salmon fisheries around Kitoi are scheduled to coincide with general KMA pink salmon fisheries. Early July fisheries may be allowed if broodstock requirements are met for early chum and sockeye salmon, and fisheries may be limited from late July to late August until pink salmon broodstock requirements are met.

Within the Southeast Afognak Section, the Afognak Lake system produces significant runs of sockeye, pink, and coho salmon. This system has been fertilized yearly, and has had sockeye salmon fry planted in the lake. Though no formal forecast is prepared for this system it is felt that the 1998 return should be in excess of escapement requirements. The initial opening for this system is based on weir escapements but could be as early as June 9.

The regulatory wording of this plan is listed in the 1996-1998 Commercial Salmon Fishing Regulation Book under 5AAC 18.365.

### *Spiridon Bay Sockeye Salmon*

The KRAA in conjunction with ADF&G, has developed a supplemental run of sockeye salmon in Spiridon Bay. Sockeye fry are stocked in Spiridon Lake to rear and then migrate into Spiridon Bay. Because of the steep topography of the creek leading to the lake the returning sockeye can not ascend to naturally spawn. All returning sockeye are intended for common property fisheries. The ADF&G, KRAA, and the U.S. Fish and Wildlife Service have developed a management plan that attempts to fully utilize these salmon while protecting local stocks. The Spiridon Bay Sockeye Salmon Management Plan was adopted into regulation by the BOF in 1993, and the plan was slightly modified in 1995.

The purpose of the plan is to allow for the orderly harvest of sockeye salmon returning to Telrod Cove from the Spiridon Lake enhancement project while providing adequate protection for local natural salmon stocks returning to other streams of the bay. The intent of the enhancement project is for the harvest of returning enhanced salmon to occur in traditional commercial fishing areas of the Northwest Kodiak District during openings directed at harvesting Karluk sockeye and westside pink and chum salmon stocks.

A Terminal Harvest Area is defined within Telrod Cove (Figure 5). In the event that enhanced sockeye salmon migrate through the traditional fishing areas along the westside of Kodiak a seine fishery will occur within Telrod Cove to harvest these surplus sockeye salmon.

The regulatory wording of this plan is listed in the 1996-1998 Commercial Salmon Fishing Regulation Book under 5AAC 18.366.

### *Eastside Kodiak*

The Eastside Kodiak Salmon Management Plan shows which species effect fishing time in management units located in the Northeast and Eastside Kodiak Districts throughout the season (Table 10). This plan was adopted into regulation by the BOF in November 1995 and was based upon historical management activity that has been implemented annually since 1978. The goal of this plan is to achieve escapement and harvest objectives for sockeye, pink, chum, and coho salmon returning to natural spawning systems located in the Northeast and Eastside Kodiak Districts.

This plan allows for fisheries during June in the Eastside Kodiak District to harvest local and mixed Kodiak sockeye salmon, and allows for pink, chum and coho salmon fisheries in both the Northeast and Eastside Kodiak Districts after July 5. The regulatory wording of this plan is listed in the 1996-1998 Commercial Salmon Fishing Regulation Book under 5AAC 18.367.

### *North Afognak and Shuyak Island*

The North Afognak and Shuyak Island Salmon Management Plan shows which species effect fishing time in the Northeast Afognak, Perenosa Bay, Shuyak Island, and Northwest Afognak Sections of the Afognak District (Table 11). This plan was adopted into regulation by the BOF in November 1995 and was based upon historical management activity that has been implemented annually since 1986. The goal of this plan is to achieve escapement and harvest objectives of sockeye, pink, and coho salmon returning to spawning systems and sockeye and coho salmon returning to enhancement projects located in the northern portion of the Afognak District.

This plan allows for June sockeye fisheries in the Perenosa Bay Section and sockeye, pink, and coho salmon fisheries after July 5. The regulatory wording of this plan is listed in the 1996-1998 Commercial Salmon Fishing Regulation Book under 5AAC 18.368.

## **SOCKEYE SALMON ESCAPEMENTS GOALS FOR KMA MAJOR SOCKEYE SALMON SYSTEMS**

The amount of fishing time for targeted sockeye salmon fisheries on systems having fish weirs is dependent on actual escapements. These include the Karluk, Ayakulik, Upper Station, and Frazer systems (major systems) and for the Afognak (Litnik), Saltery, Buskin, Pauls, Malina, and Akalura systems (minor systems). For sockeye salmon systems without weirs, fishing time is generally conservative and occurs at the discretion of ADF&G, in proportion to the perceived system specific run strength.

Upper and lower biological escapement requirements have been identified for each river's sockeye salmon stocks (Table 12). A basic management function is to achieve at least the lower escapement goal for stocks exploited by targeted fisheries, even if it means that directed fishing time on those stocks does not occur. When the possibility exists that the upper escapement goals may be exceeded, and significant deviations from optimum production could occur because of that excess; maximum directed fishing time on these stocks would be allowed, even if it requires continuous stream terminus fishing. This is the extreme case, and is only occasionally needed to manage KMA sockeye salmon runs. More common is a moderate amount of directed fishing time to harvest surplus sockeye salmon and provide escapements which approach desired levels.

*Escapement graphs by stream are a good tool for illustrating escapements, similar to preseason harvest projections (Appendix B.1. - B.5.). These curves are calculated based on historical average cumulative escapement by day, scaled to the upper and lower biological escapement goal for each particular system. Actual escapements can be plotted on these graphs to compare with the projected cumulative count. Since fishing time is strongly tied to escapement levels, these graphs can be valuable aids in understanding current ADF&G management actions, and in planning for future fisheries. Actual inseason escapement counts can be heard daily at 8:15 A.M. on SSB channel 3230 kHz.*

Table 1. Actual vs projected 1997 commercial salmon harvest, by specie and fishery, and 1998 harvest projections, for the Kodiak Management Area.

		<b>Chinook</b>	<b>Sockeye</b>	<b>Coho</b>	<b>Pink</b>	<b>Chum</b>	<b>Total</b>
Projected	Harvest 97	20,000	3,498,500	320,000	21,600,000	700,000	26,138,500
Actual	Harvest 97	18,700	2,505,000	381,000	11,035,000	520,000	14,459,700
<b>Projected</b>	<b>Harvest 98</b>	<b>20,000</b>	<b>2,352,000</b>	<b>300,000</b>	<b>6,348,000</b>	<b>650,000</b>	<b>9,670,000</b>

<b>FISHERY</b>	1997 Harvest <sup>a</sup>		1998 Harvest <sup>a</sup>
	Projection	Actual <sup>b</sup>	Projection

(1998 Harvest Projections as of 12/29/97)

**Early Run Sockeye Salmon Fisheries (6/9-7/15)**

Kitoi Bay Hatchery	23,000	1,000	18,000
Cape Igvak	112,500	0	94,000
Karluk	290,000	586,000	208,000
Ayakulik	321,000	288,000	246,000
Frazer	620,000	170,000	319,000
Upper Station	80,000	23,000	48,000
Minor Systems	90,000	14,000	120,000
Minor Enhancement <sup>c</sup>	83,000	56,000	55,000
Spiridon	0	0	155,000
Other	70,000	123,000	70,000
<b>Subtotal</b>	<b>1,689,500</b>	<b>1,261,000</b>	<b>1,333,000</b>

**Late Run Sockeye Salmon Fisheries (7/16-10/1)**

Kitoi Bay Hatchery	21,000	49,000	48,000
Cape Igvak	190,000	0	119,000
Karluk	380,000	345,000	191,000
Ayakulik	214,000	58,000	164,000
Frazer	155,000	113,000	80,000
Upper Station	635,000	382,000	267,000
Minor Systems	20,000	10,000	20,000
Spiridon	164,000	192,000	100,000
Other	30,000	95,000	30,000
<b>Subtotal</b>	<b>1,809,000</b>	<b>1,244,000</b>	<b>1,019,000</b>

**TOTAL SOCKEYE 3,498,500 2,505,000 2,352,000**

**Pink Salmon Fisheries (7/6-9/5)**

Kitoi Bay Hatchery	6,815,000	1,211,000	850,000
Afognak (Wild)	1,834,000	235,000	254,000
Westside Kodiak	4,300,000	6,573,000	2,750,000
Alitak	3,376,000	954,000	1,876,000
Eastside/Northend Kodiak	4,500,000	1,334,000	130,000
Mainland	770,000	728,000	488,000
<b>Subtotal</b>	<b>21,595,000</b>	<b>11,035,000</b>	<b>6,348,000</b>

- Continued -

Table 1. (page 2 of 2)

FISHERY	1997 Harvest <sup>a</sup>		1998 Harvest <sup>a</sup>
	Projection	Actual <sup>b</sup>	Projection
<b>Chum Salmon Fisheries (6/9-9/5)</b>			
Kitoi Bay Hatchery	0	11,000	20,000
Afognak (Wild)	50,000	9,000	50,000
Westside Kodiak	370,000	215,000	300,000
Alitak	70,000	86,000	70,000
Eastside/Northend Kodiak	130,000	164,000	150,000
Mainland	80,000	35,000	60,000
<b>Subtotal</b>	<b>700,000</b>	<b>520,000</b>	<b>650,000</b>
<b>Coho Salmon Fisheries (8/1-10/1)</b>			
Kitoi Bay Hatchery	143,000	109,000	90,000
Afognak (Wild)	25,000	43,000	25,000
Westside Kodiak	86,000	111,000	90,000
Alitak	20,000	34,000	25,000
Eastside/Northend Kodiak	36,000	75,000	60,000
Mainland	10,000	9,000	10,000
<b>Subtotal</b>	<b>320,000</b>	<b>381,000</b>	<b>300,000</b>
<b>GRAND TOTAL<sup>d</sup></b>	<b>26,133,500</b>	<b>14,459,700</b>	<b>9,670,000</b>

<sup>a</sup> Numbers of fish.

<sup>b</sup> Actual harvest estimates by fishery as of 11/12/97.

<sup>c</sup> 1998 harvest projections for enhanced early run sockeye include the following expected returns: Waterfall Lake-28,000, Hidden Lake-13,000, and Crescent Lake-14,000 fish.

<sup>d</sup> Includes 20,000 chinook 1997 projected harvest, 18,700 chinook 1997 actual harvest, and 20,000 chinook salmon for 1998 projected harvest.

Table 2. Expected harvest from supplemental salmon production, by system and species for the Kodiak Management Area, 1998.

System	Early Sockeye <sup>a</sup>	Late Sockeye <sup>a</sup>	Pink <sup>b</sup>	Coho <sup>c</sup>	Chum <sup>d</sup>
Kitoy Bay Hatchery Complex	18,000	48,000	850,000	90,000	20,000
Spiridon Lake (Telrod Cove)	155,000	100,000	-	-	-
Hidden Lake (Foul Bay)	13,000	-	-	-	-
Waterfall Lake (Waterfall Bay)	28,000	-	-	-	-
Crescent Lake (Settler Cove)	14,000	-	-	7,000	-
Katmai Lake (Ouzinkie Cove)	-	-	-	1,500	-
Kodiak Road System Lakes	-	-	-	2,000	-
<b>Total</b>	<b>228,000</b>	<b>148,000</b>	<b>850,000</b>	<b>100,500</b>	<b>20,000</b>

<sup>a</sup> Approximate timing of early sockeye salmon is June to mid July, while late sockeye is mid July to early September. Lake enrichment of Afognak, Malina, Pauls, Portage, and Waterfall lake systems may yield additional sockeye salmon production. Spiridon early fish are from Saltery Lake broodstock, the actual return may be less than forecast if most of the fish decide to return after three years at sea instead of two.

<sup>b</sup> Approximate timing of Kitoy Bay pink salmon is late July to late August.

<sup>c</sup> Approximate timing of supplemental coho salmon is early August to early September. Supplemental coho returns to Crescent Lake, Katmai Lake, and Kodiak Road System Lakes are intended primarily for subsistence and sport harvest, and are not included in commercial harvest forecasts.

<sup>d</sup> Early chum salmon production at Kitoy Bay Hatchery is expected to exceed broodstock requirements.

Table 3. Commercial salmon season opening times and dates, by species and fishery, for the Kodiak Management Area, 1998.

FISHERY	<u>EARLIEST POTENTIAL OPENING TIME/DATE</u>	
	Firm Time/Date	Approximate Time/Date
<b><u>Early Run Sockeye Salmon Fisheries</u></b>		
Cape Igvak Section <sup>a</sup>	-	12:01 A.M. June 5-9
NW Kodiak District <sup>b</sup>	12:00 Noon June 9	-
Alitak District <sup>b</sup>	12:00 Noon June 9	-
Eastside District	12:00 Noon June 14	
Inner Ayakulik and Outer Ayakulik Sections <sup>c</sup>	-	Low tide June 7-9
Spiridon Lake Terminal Harvest Area (Telrod Cove)	-	12:00 Noon June 30
Minor Systems <sup>d</sup>		
Litnik	-	12:00 Noon June 9-14
Uganik	-	12:00 Noon June 9
Paramanof	-	12:00 Noon June 14
Pauls/Perenosa	-	12:00 Noon June 14
Saltery	-	12:00 Noon June 14
Kafliia/Swikshak	-	12:00 Noon June 14
Foul Bay and Waterfall Terminal Harvest Areas	-	12:00 Noon June 9
<b><u>Pink/Chum Salmon Fisheries <sup>c</sup></u></b>		
Mainland District	12:00 Noon July 6	-
Afognak District	12:00 Noon July 6	-
NW Kodiak District	12:00 Noon July 6	-
SW Kodiak District	12:00 Noon July 6	-
Alitak District	12:00 Noon July 6	-
Eastside Kodiak District	12:00 Noon July 6	-
NE Kodiak District	12:00 Noon July 6	-
<b><u>Late Run Sockeye Salmon Fishery</u></b>		
Cape Igvak Section <sup>f</sup>	-	12:01 A.M. July (?)
All remaining late run sockeye fisheries <sup>g</sup>	-	12:00 Noon July 15
<b><u>System Specific Coho Salmon Fisheries <sup>h</sup></u></b>		
Mainland District	-	12:00 Noon Sept. 1
Afognak District	-	12:00 Noon Aug. 15
NW Kodiak District	-	12:00 Noon Sept. 1
SW Kodiak District	-	12:00 Noon Sept. 1
Alitak District	-	12:00 Noon Sept. 1
Eastside Kodiak District	-	12:00 Noon Sept. 5
NE Kodiak District	-	12:00 Noon Sept. 5

-Continued-

Table 3. (page 2 of 2)

- 
- <sup>a</sup> Actual opening date will be determined by sockeye escapement levels into the Chignik River system. Fishing time will be in 24 hour increments.
  - <sup>b</sup> Actual opening time/date is as shown. This opening is considered a commercial test fishery; fishing time for this initial period will be 33 hours (12:00 Noon 6/9 through 9:00 P.M. 6/10).
  - <sup>c</sup> Actual opening date will be determined by the sockeye escapement level into Ayakulik River and opening time by low tide timing during daylight hours.
  - <sup>d</sup> Actual opening time will be determined by sockeye escapement levels into minor systems. Fishing time for this period will be 33 hours (12:00 Noon through 9:00 P.M.)
  - <sup>e</sup> Actual opening time/date is as shown. Fishing time for the initial period will be 57 hours (12:00 Noon 7/6 through 9:00 P.M. 7/8) for the Kodiak Archipelago sections and 57 hours (12:00 Noon 7/6 through 9:00 P.M. 7/8) for the Mainland District sections. See section on Fishing Periods for additional information.
  - <sup>f</sup> Actual opening date will be determined by sockeye escapement and anticipated harvest levels in the Chignik Management Area. Fishing time will be in 24 hour increments.
  - <sup>g</sup> Actual opening date for system specific fishing time will be determined by sockeye escapement levels into major systems. All fishing periods will begin at 12:00 noon and end at 9:00 P.M. prior to 8/16 and end at 6:00 P.M. from 8/16 to season's end.
  - <sup>h</sup> Actual opening date for system specific fishing time will be determined by overall coho run strength evaluation and by escapement levels into major systems and minor systems with reliable escapement data.
-

Table 4. Board of Fisheries approved fishery management plans for the Kodiak Management Area, 1998.

MANAGEMENT PLAN	YEAR INITIATED	MGMT. UNITS AFFECTED	DATES IN EFFECT
Cape Igvak Salmon Management Plan	1978	Cape Igvak Section Wide Bay Section	6/5 - 7/25
Alitak Bay District Salmon Management Plan	1987	Alitak Bay District	6/9 - 10/1
Westside Kodiak Management Plan	1990	NW Kodiak District SW Kodiak District SW Afognak Section	6/9 - 10/1
Crescent Lake Coho Salmon Management Plan	1990	Portion of the Central Section in Vicinity of Port Lions	8/1 - 9/15
North Shelikof Strait Sockeye Salmon Management Plan	1990	SW Afognak Section NW Afognak Section Shuyak Section Big River Section Hallo Bay Section Inner and Outer Kukak Section Dakavak Section	7/6 - 7/25
Eastside Afognak Management Plan	1993	Kitoy Bay Section Izhut Bay Section Duck Bay Section	6/9 - 10/1
Spiridon Bay Sockeye Salmon Management Plan	1993	Special Harvest Area in Spiridon Bay Section	6/9 - 10/1
Eastside Kodiak Salmon Management Plan	1995	NE Kodiak District Eastside Kodiak District	6/14 - 10/1
North Afognak / Shuyak Salmon Management Plan	1995	NE Afognak Section Perenosa Bay Section Shuyak Island Section NW Afognak Section	6/9 - 10/1

Table 5. Biological and allocative criteria and the management chronology of the Cape Igvak Management Plan for the Kodiak Management Area, 1998.

**BIOLOGICAL AND ALLOCATIVE CRITERIA FOR MANAGING THE CAPE IGVAK FISHERY ON CHIGNIK BOUND SOCKEYE**

BIOLOGICAL REQUIREMENTS			ALLOCATIVE REQUIREMENTS		
REGULATION 5AAC 18.360	ESCAPEMENT NEEDS		REGULATION 5AAC 18.360	CHIGNIK MINIMUM HARVEST	IGVAK %
	CHIGNIK (EARLY RUN)	CHIGNIK (LATE RUN)			
(a) (b) (c)	THROUGH 6/30 350,000-400,000	-	(a)	EXPECTATIONS OF LESS THAN 600,000	CLOSED
-	-	-	(b)	EXPECTATIONS OF 600,000 ARE IN DOUBT	CLOSED
(a) (b) (c)	-	THROUGH 7/30 195,000-200,000	(c)	EXPECTATIONS OF 600,000 OCCUR	OPEN TO ACHIEVE 15%
-	-	-	(d)	CHIGNIK SALMON % INTERCEPTION CALCULATIONS	80% OF CATCH AT IGVAK ARE CHIGNIK SOCKEYE
-	-	-	(e)	ALLOCATION PERIOD 600,000	6/5 - 7/25 % NOT APPLICABLE
(f)	FROM JUNE 26 - JULY 9 CAPE IGVAK SECTION CLOSED OR SEVERLY LIMITED UNTIL CHIGNIK LAKE RUN EVALUATED		-	-	-
-	-	-	(g)	-	ONE DAY ADVANCE NOTICE
	400,000	250,000		600,000 MINIMUM	15 %

**MANAGEMENT CHRONOLOGY FOR CHIGNIK BOUND SOCKEYE AND KODIAK SALMON**

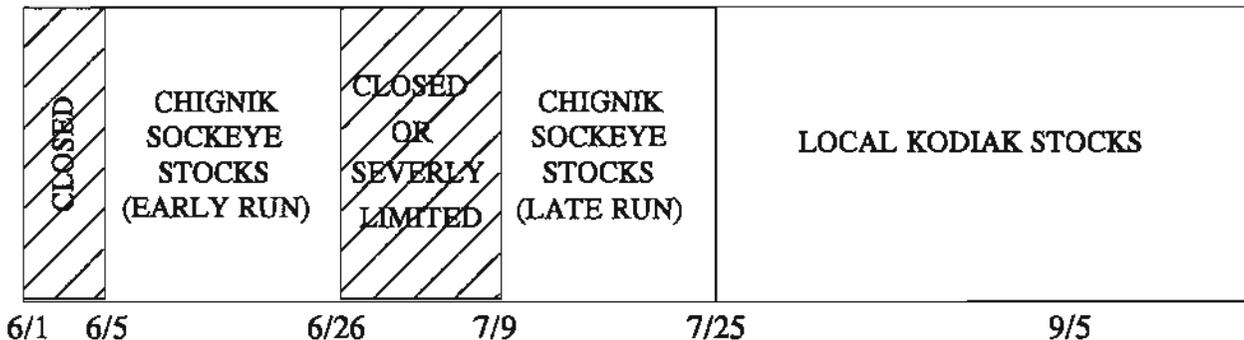




Table 7. Primary management species and fishery chronology of the Westside Kodiak Management Plan for the Kodiak Management Area, 1998.

		6/1	6/9	6/16	6/23	7/6	7/16	8/1	8/16	8/25	9/6	10/31
AFOG. DIST.	S.W.AFOGNAK	CLOSED		COMMERCIAL TEST FISHERIES	E.R.KARLUK SOCKEYE	LOCAL AND MIXED PINK		L.R.KARLUK SOCKEYE/ LOCAL & MIXED PINK		L.R.KARLUK SOCKEYE	LOCAL COHO	
	NORTH CAPE: CENTRAL	CLOSED	COMMERCIAL TEST FISHERIES		E.R.KARLUK SOCKEYE	LOCAL AND MIXED PINK		L.R.KARLUK SOCKEYE/ LOCAL & MIXED PINK		L.R.KARLUK SOCKEYE	LOCAL COHO	
NORTHWEST KODIAK DISTRICT	ANTON LARSEN	CLOSED	COMMERCIAL TEST FISHERIES	COMMERCIAL TEST FISHERIES	LOCAL SOCKEYE AND E.R. CHUM	LOCAL SOCKEYE, E.R. CHUM & PINK	LOCAL PINK & L.R. CHUM	LOCAL PINK/ L.R. CHUM/ COHO	LOCAL COHO			
	SHERATIN											
	KIZHUYAK											
	TERROR											
	IN. UGANIK											
	SPRIDON											
	ZACHAR											
	UYAK											
SOUTHWEST KODIAK DISTRICT	OUT.KARLUK	CLOSED	E.R. KARLUK SOCKEYE				ODD-YEAR CYCLE: L.R. KARLUK SOCKEYE		L.R. KARLUK SOCKEYE	KARLUK COHO		
							EVEN-YEAR CYCLE: L.R. KARLUK SOCKEYE/PINK					
	IN.KARLUK	CLOSED	E.R. KARLUK SOCKEYE				ODD-YEAR CYCLE: L.R. KARLUK SOCKEYE		L.R. KARLUK SOCKEYE	KARLUK COHO		
							EVEN-YEAR CYCLE: L.R. KARLUK SOCKEYE/PINK					
	STURGEON	CLOSED			E.R.KARLUK & AYAKULIK SOCKEYE & STURGEON CHUM		ODD-YEAR CYCLE: L.R. KARLUK SOCKEYE		L.R. KARLUK SOCKEYE	LOCAL COHO		
							EVEN-YEAR CYCLE: L.R. KARLUK SOCKEYE/PINK					
HALIBUT	CLOSED			E.R.KARLUK AND AYAKULIK SOCKEYE		ODD-YEAR CYCLE: L.R. AYAKULIK SOCKEYE		L.R.KARLUK SOCKEYE	LOCAL COHO			
						EVEN-YEAR CYCLE: L.R. AYAKULIK RBD&PINK		L.R.KARLUK SOCKEYE & AYAKULIK PINK				
OUT.AYAKULIK	CLOSED	E.R. AYAKULIK SOCKEYE				ODD-YEAR CYCLE: L.R. AYAKULIK SOCKEYE		AYAKULIK COHO				
						EVEN YEAR CYCLE: L.R. AYAKULIK SOCKEYE/PINK						
IN.AYAKULIK	CLOSED	E.R. AYAKULIK SOCKEYE				ODD-YEAR CYCLE: L.R. AYAKULIK SOCKEYE		AYAKULIK COHO				
						EVEN YEAR CYCLE: L.R. AYAKULIK SOCKEYE/PINK						



COMMERCIAL TEST FISHERIES

E.R. = EARLY RUN STOCKS

L.R. = LATE RUN STOCKS

Table 8. Primary management species and general fishery chronology in management units affected by the North Shelikof Strait Sockeye Salmon Management Plan for the Kodiak Management Area, 1998.

MAINLAND DISTRICT	Big River Section	CLOSED	Early Run Sockeye Minor Systems	NORTH SHELIKOF MGMT UNITS (5AAC 18.363 (b)(3)(A) & (B))	MANAGEMENT BASED ON LOCAL PINK AND CHUM SALMON STOCKS EXCEPT:  IF SOCKEYE HARVEST EXCEEDS 15,000 THEN THE "SEAWARD ZONES" ARE CLOSED, AND ONLY THE "SHOREWARD ZONES" MAY REMAIN OPEN. (5AAC 18.363 (b))	Pink and Chum Salmon		COHO
	Hallo Bay Section	CLOSED	CLOSED			Pink and Chum Salmon		
	Inner Kukak Section	CLOSED	CLOSED			Pink and Chum Salmon		
	Outer Kukak Section	CLOSED	Early Run Sockeye Minor Systems			Pink and Chum Salmon		
	Dakavak Section	CLOSED	CLOSED			Pink and Chum Salmon		
AFOGNAK DISTRICT	Shuyak Is. Section	CLOSED	Early Run Sockeye Minor Systems	SW. AFOGNAK (5AAC 18.363 (g)(3))	MANAGEMENT BASED ON PINK AND CHUM SALMON STOCKS EXCEPT:  IF THE SOCKEYE HARVEST EXCEEDS 50,000 THEN THE "SEAWARD ZONE" CLOSES, AND ONLY THE "SHOREWARD ZONE" MAY REMAIN OPEN. (5AAC 18.363 (c))	Pink Salmon		COHO
	NW Afognak Section	Early Run Sockeye Minor and Enhanced Systems				Pink Salmon		
	Southwest Afognak Section	CLOSED	Early Run Karluk Sockeye			Pink Salmon	Pink Salmon and Late Run Karluk Sockeye	
		6/9	6/14	7/6		7/25	8/15	9/5



Table 10. Primary management species and fishery chronology of the Eastside Kodiak Management Plan for the Kodiak Management Area, 1998.

DATE		6/1	6/14	6/21	7/6	7/10	8/25	9/6	10/31
MANAGEMENT UNIT									
NORTHEAST KODIAK DISTRICT	Outer Chiniak Bay	CLOSED			LOCAL AND MIXED PINK		LOCAL PINK & COHO	LOCAL COHO	
	Inner Chiniak Bay	CLOSED			LOCAL AND MIXED PINK		LOCAL PINK & COHO	LOCAL COHO	
	Buskin River	CLOSED			LOCAL PINK & BUSKIN SOCKEYE	LOCAL PINK & CHUM	LOCAL PINK, COHO, CHUM	LOCAL COHO	
	Monashka/Mill Bay	CLOSED			LOCAL AND MIXED PINK		LOCAL PINK & COHO	LOCAL COHO	
EASTSIDE KODIAK DISTRICT	Seven Rivers	CLOSED	 CLOSED	 CLOSED	CLOSED	LOCAL AND MIXED PINK		LOCAL PINK & COHO	LOCAL COHO
	Two Headed	CLOSED	 CLOSED	 CLOSED	CLOSED	LOCAL AND MIXED PINK		LOCAL PINK & COHO	LOCAL COHO
	Sitkalidak	CLOSED	 CLOSED	 CLOSED	CLOSED	LOCAL AND MIXED PINK		LOCAL PINK, CHUM, COHO	LOCAL COHO
	Outer Ugak Bay	CLOSED	 CLOSED	 PASAGSHAK SOCKEYE	LOCAL AND MIXED PINK		LOCAL PINK, CHUM, COHO	LATE CHUM & COHO	
	Inner Ugak Bay	CLOSED	 CLOSED	 SALTARY SOCKEYE	LOCAL PINK & CHUM, SALTARY SOCKEYE	LOCAL PINK & CHUM	LOCAL PINK & COHO	COHO	

 Local and mixed sockeye 33 hour fishing period.

Table 11. Primary management species and fishery chronology for the North Afognak / Shuyak Island Salmon Management Plan for the Kodiak Management Area, 1998.

DATE	6/9	7/6	7/21	8/21	8/25	9/6	10/31
MANAGEMENT UNIT							
NORTHEAST AFOGNAK SECTION	CLOSED	LOCAL AND MIXED PINK			LOCAL PINK AND COHO	LOCAL COHO	
PERENOSA <sup>a)</sup> BAY SECTION	PAULS BAY AND PORTAGE LAKE SOCKEYE	LOCAL AND MIXED PINK SALMON, AND PAULS & PORTAGE SOCKEYE	LOCAL & MIXED PINK	LOCAL PINK AND COHO		LOCAL COHO	
SHUYAK <sup>b)</sup> ISLAND SECTION	CLOSED	LOCAL AND MIXED PINK			LOCAL COHO		
NORTHWEST <sup>c)</sup> AFOGNAK SECTION	THORSHEIM & LONG LAGOON SOCKEYE	LOCAL AND MIXED PINK			LOCAL COHO		

- a) Additional fishing time to harvest enhanced sockeye bound to Waterfall Lake will only occur in the Waterfall Lake Terminal Harvest Area.
- b) From July 6 to 25 this section must also be managed in accordance with the North Shelikof Strait Sockeye Salmon Management Plan.
- c) Additional fishing time to harvest enhanced sockeye bound to Hidden Lake will only occur in the Foul Bay Terminal Harvest Area. From July 6 to 25 this section must also be managed in accordance with the North Shelikof Strait Sockeye Salmon Management Plan.

Table 12. Sockeye salmon escapement goals for major and minor systems with fish counting weirs in the Kodiak Management Area, 1998.

	<u>Early Run (Before 7/15)</u>		<u>Late Run (After 7/15)</u>		<u>Total</u>	
	Lower	Upper	Lower	Upper	Lower	Upper
<u>Major Systems</u> <sup>a</sup>						
Karluk <sup>b</sup>	150,000	250,000	400,000	550,000	550,000	800,000
Ayakulik <sup>c</sup>	160,000	220,000	40,000	80,000	200,000	300,000
Upper Station <sup>b</sup>	50,000	75,000	150,000	200,000	200,000	275,000
Frazer <sup>d</sup>	<u>140,000</u>	<u>200,000</u>	—	—	<u>140,000</u>	<u>200,000</u>
Subtotal	500,000	745,000	590,000	830,000	1,090,000	1,575,000
<u>Minor Systems</u> <sup>a</sup>						
Saltery <sup>d</sup>	20,000	40,000	-	-	20,000	40,000
Buskin <sup>d</sup>	8,000	13,000	-	-	8,000	13,000
Litnik <sup>d</sup>	40,000	60,000	-	-	40,000	60,000
Pauls <sup>d</sup>	20,000	40,000	-	-	20,000	40,000
Malina <sup>d</sup>	10,000	20,000	-	-	10,000	20,000
Akalura <sup>d</sup>	<u>10,000</u>	<u>15,000</u>	<u>30,000</u>	<u>45,000</u>	<u>40,000</u>	<u>60,000</u>
Subtotal	108,000	188,000	30,000	45,000	138,000	233,000
<b>GRAND TOTAL</b>	<b>608,000</b>	<b>933,000</b>	<b>620,000</b>	<b>875,000</b>	<b>1,228,000</b>	<b>1,808,000</b>

<sup>a</sup> Escapements into these systems represents 85% of the KMA total sockeye escapement.

<sup>b</sup> These systems have a bimodal sockeye escapement, with distinct early and late runs. Early run escapement occurs before July 15, and late run escapement occurs after July 15.

<sup>c</sup> Escapement into this system is not truly bimodal, but extends through mid to late August. However a portion of the escapement is desired after July 15.

<sup>d</sup> Escapement into these systems is essentially complete by July 25.

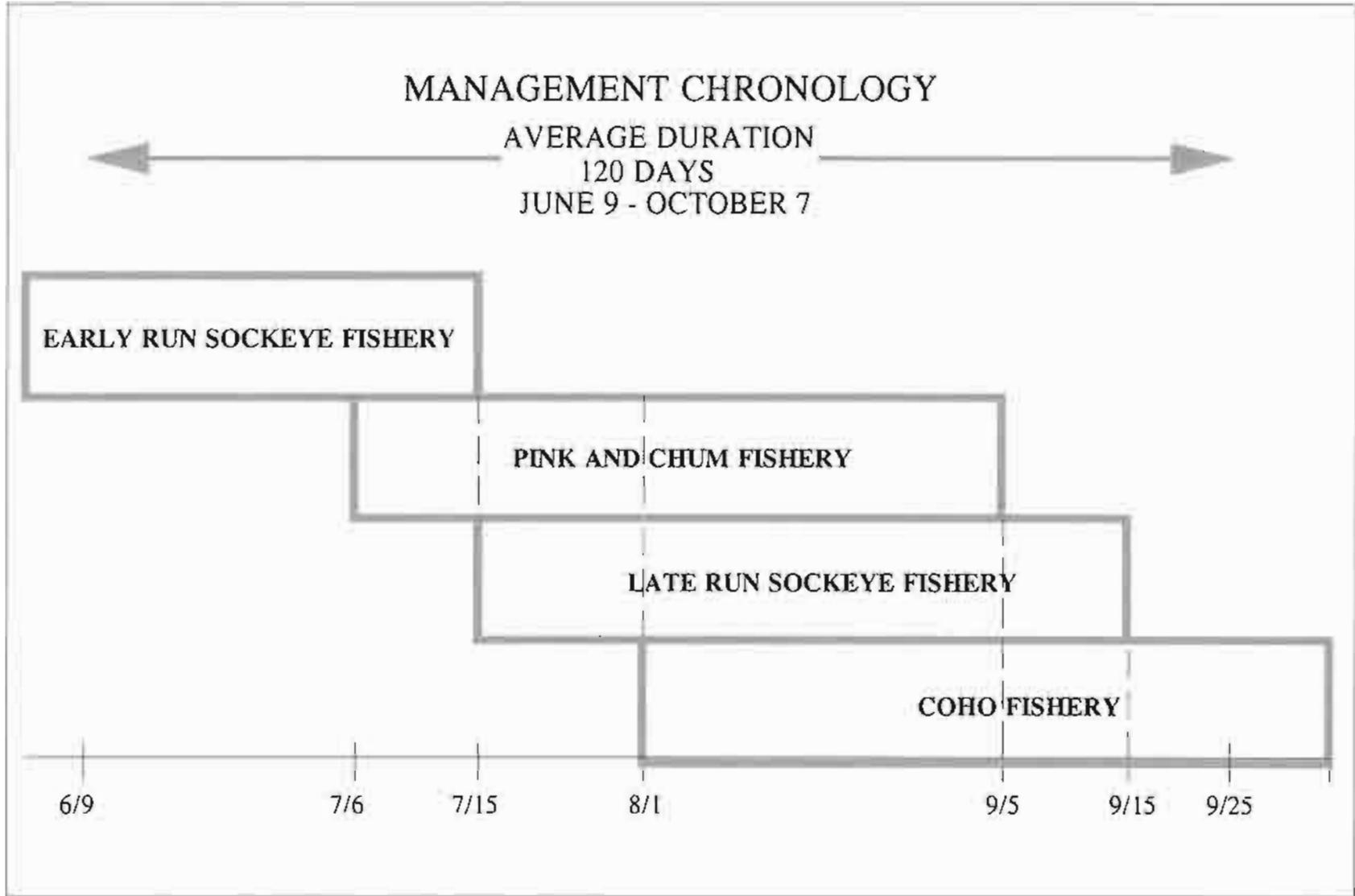


Figure 1. Commercial salmon fishery chronology, by species, in the Kodiak Management Area, 1998.

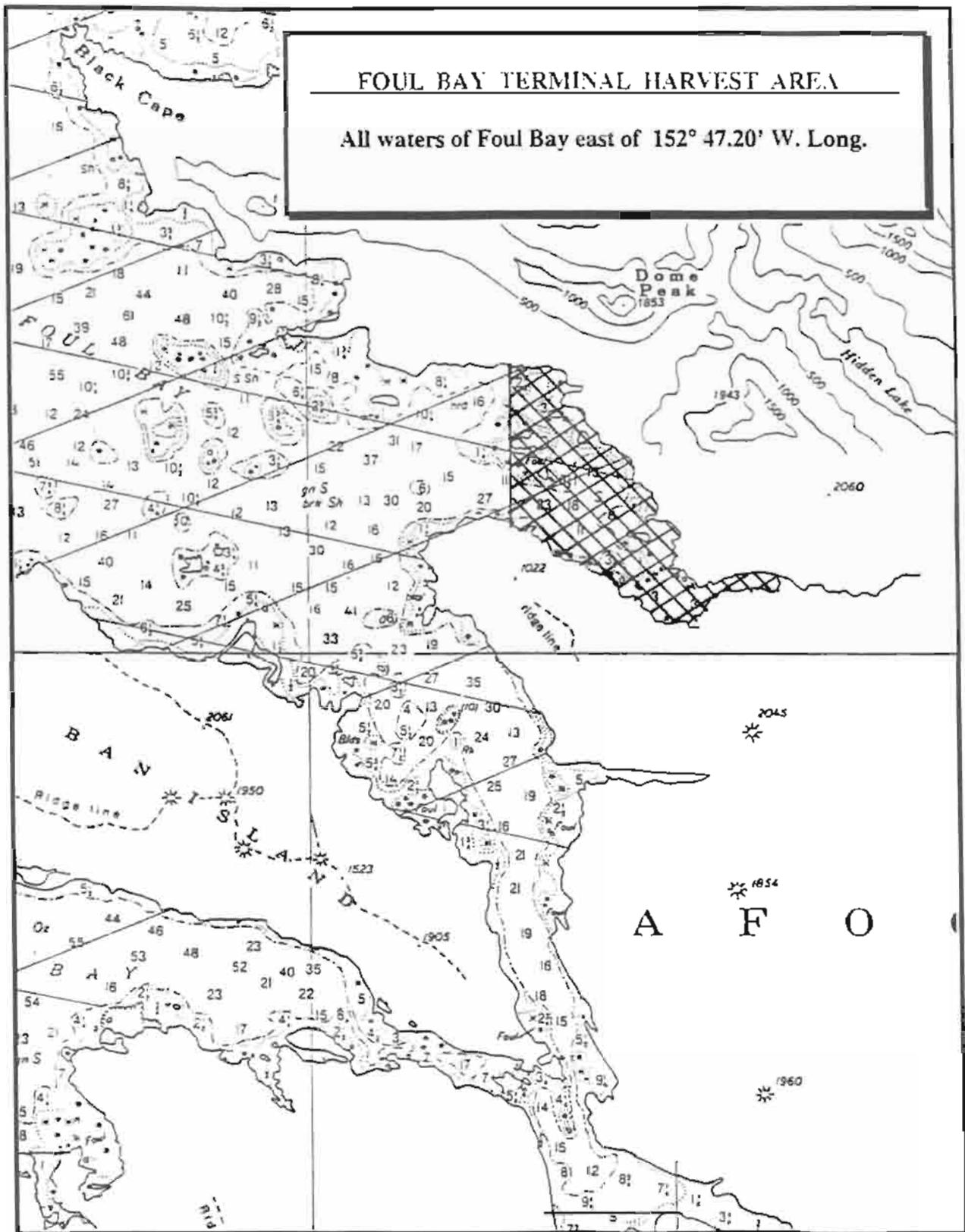


Figure 2. Boundaries of the Foul Bay Terminal Harvest Area in the Kodiak Management Area.

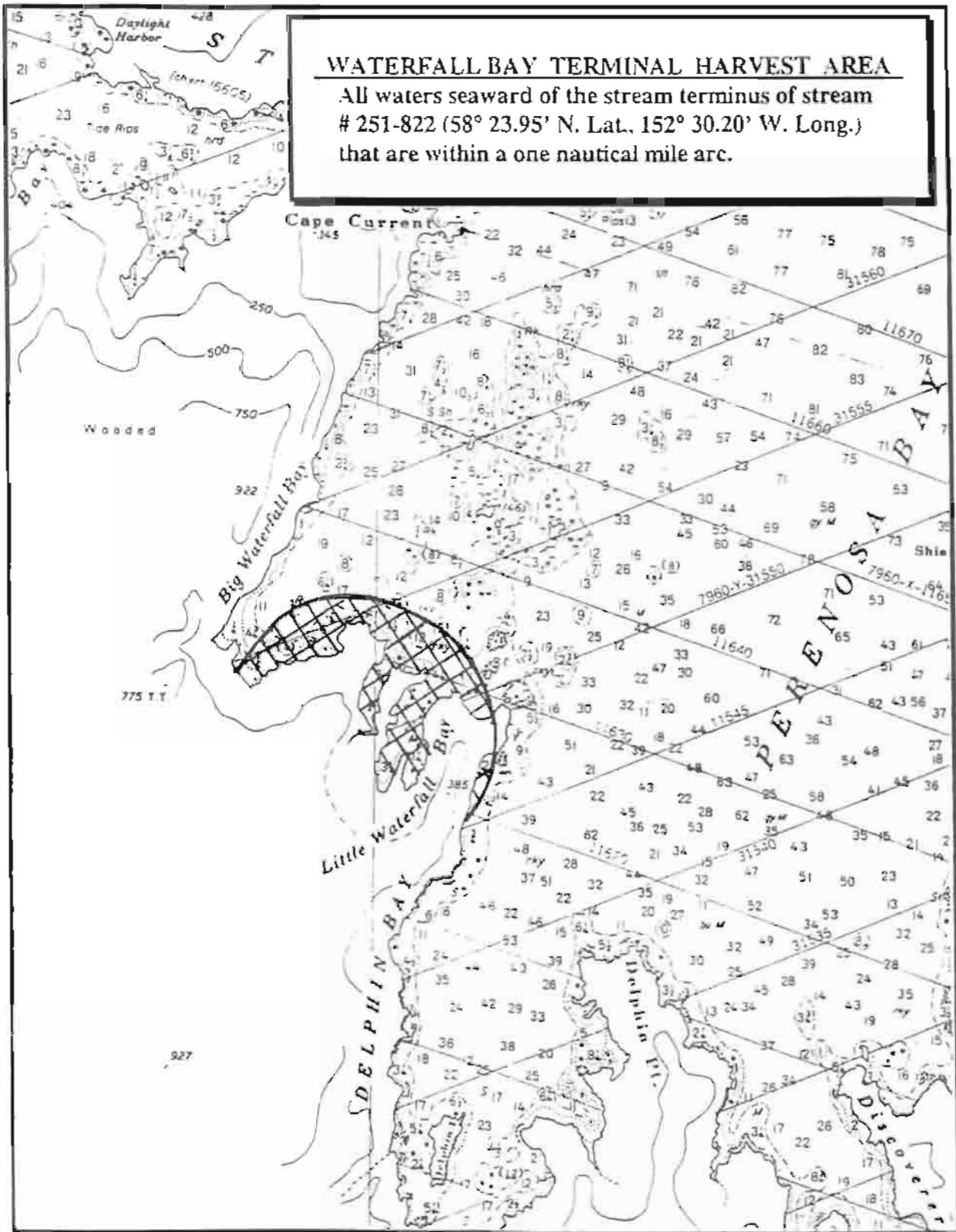


Figure 3. Boundaries of the Waterfall Bay Terminal Harvest Area in the Kodiak Management Area.

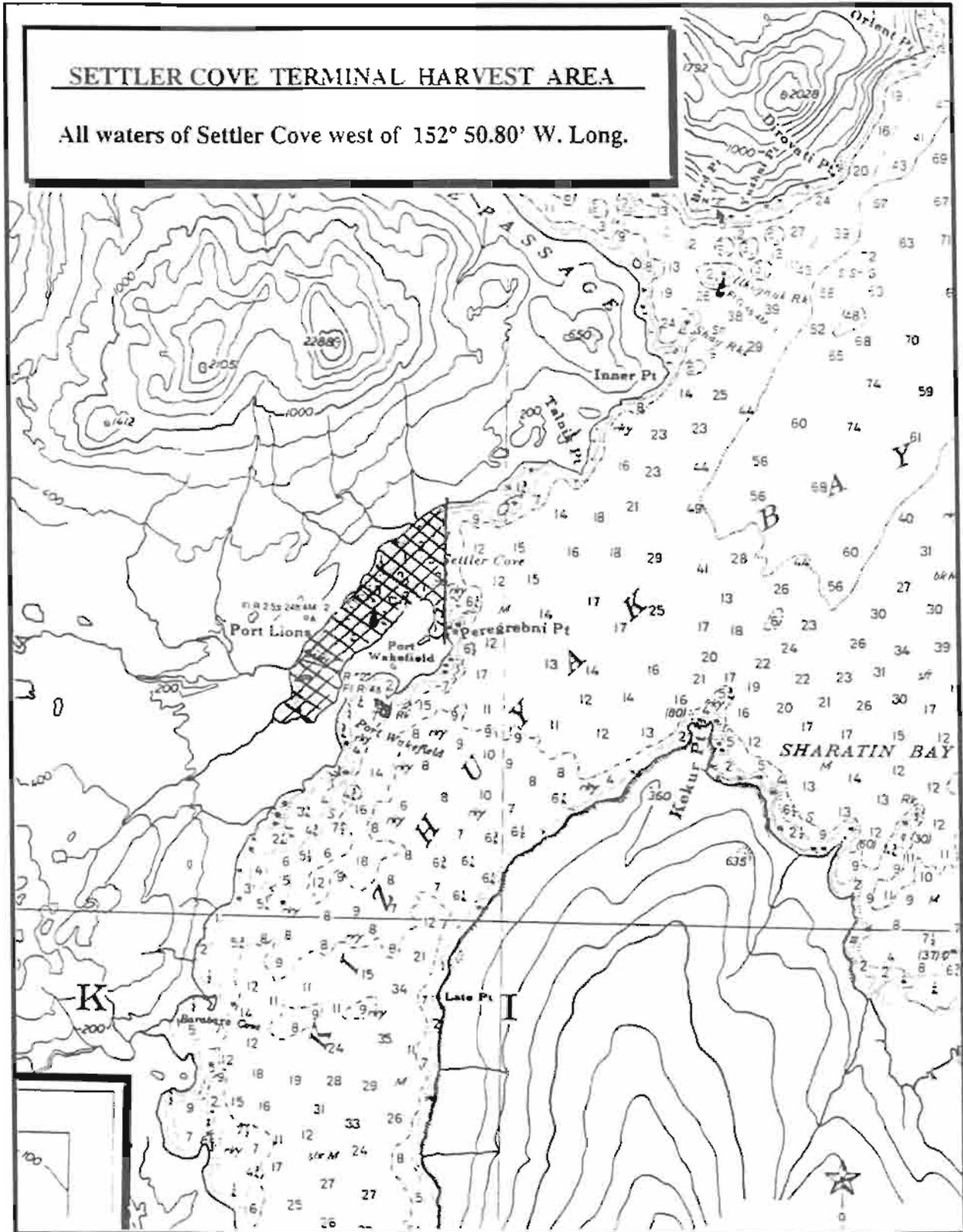


Figure 4. Boundaries of the Settler Cove Terminal Harvest Area in the Kodiak Management Area.

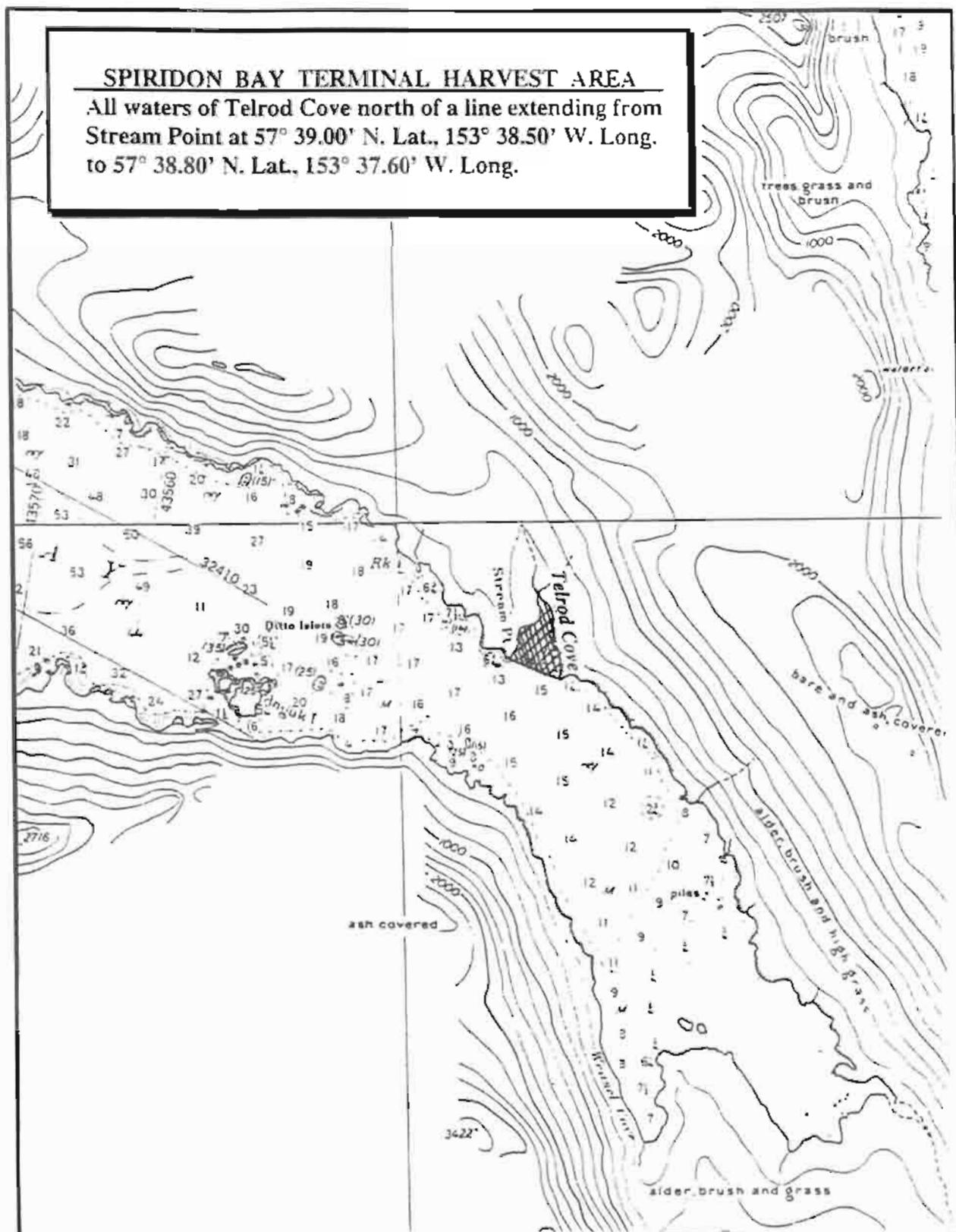


Figure 5. Boundaries of the Spiridon Bay Terminal Harvest Area (Telrod Cove) in the Kodiak Management Area.

## BUSKIN RIVER CLOSED WATER SANCTUARY

Waters closed to commercial and subsistence salmon fishing.

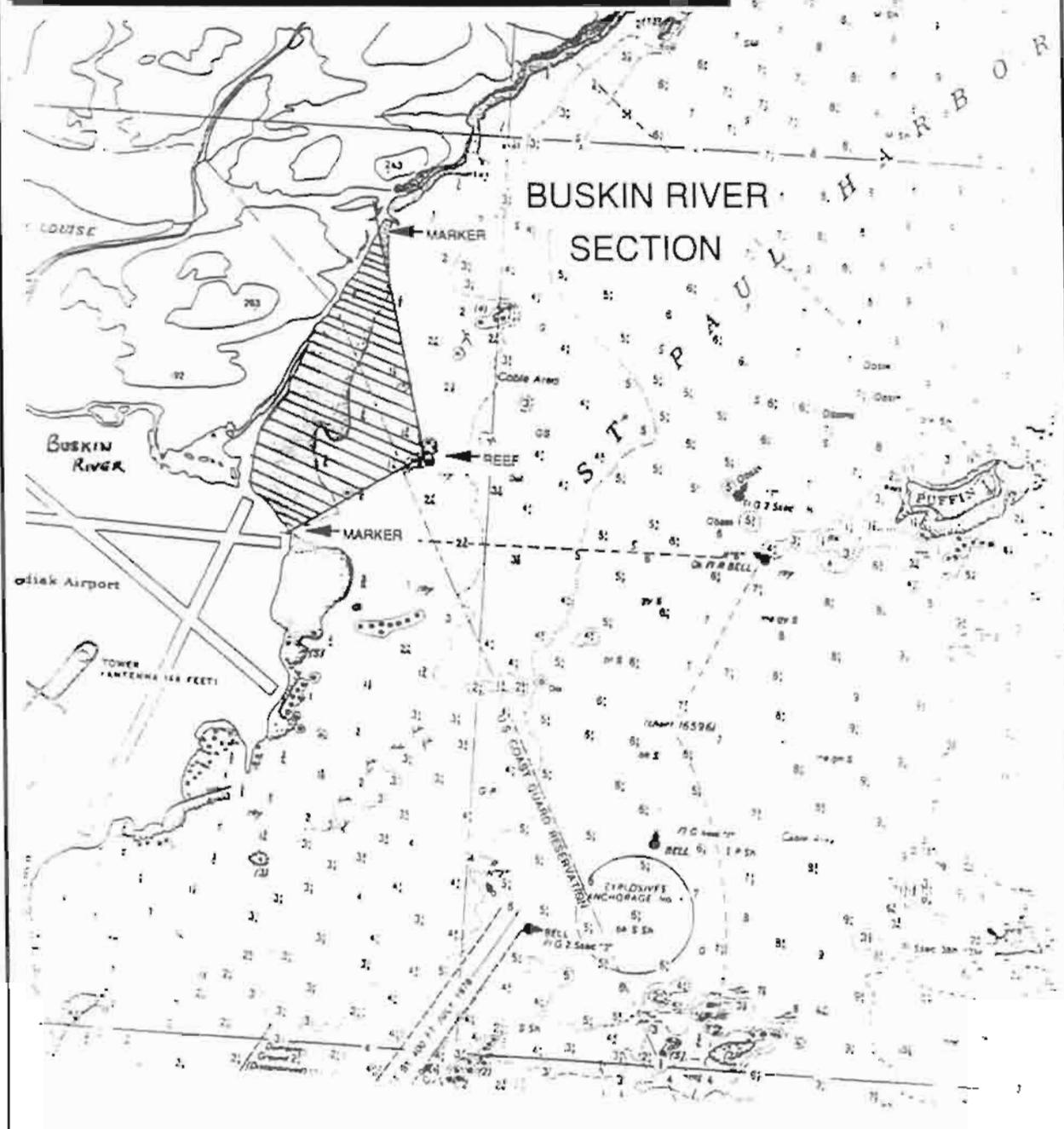


Figure 6. Buskin River closed water sanctuary in the Kodiak Management Area.

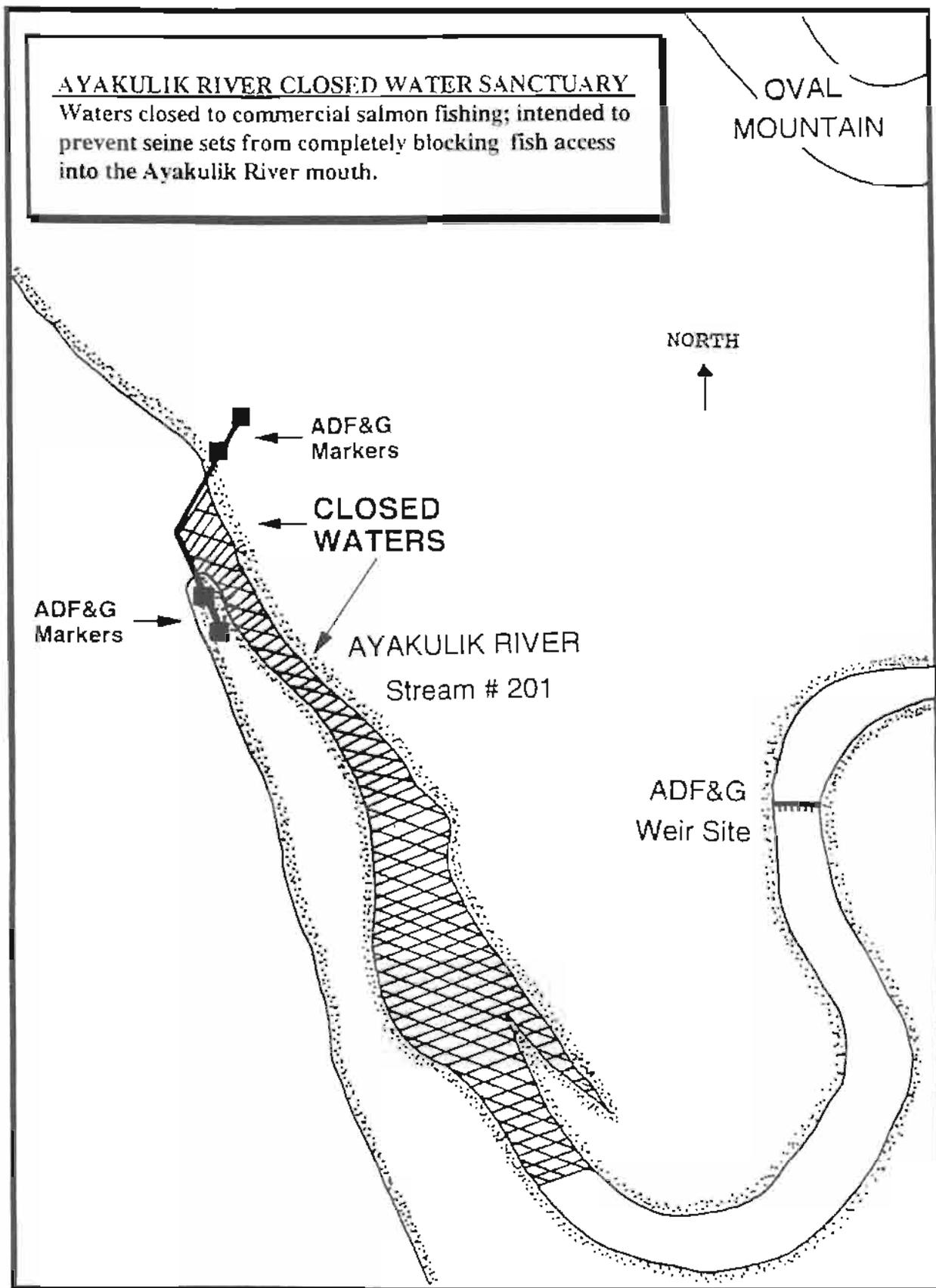


Figure 7. Ayakulik River closed water sanctuary in the Kodiak Management Area.

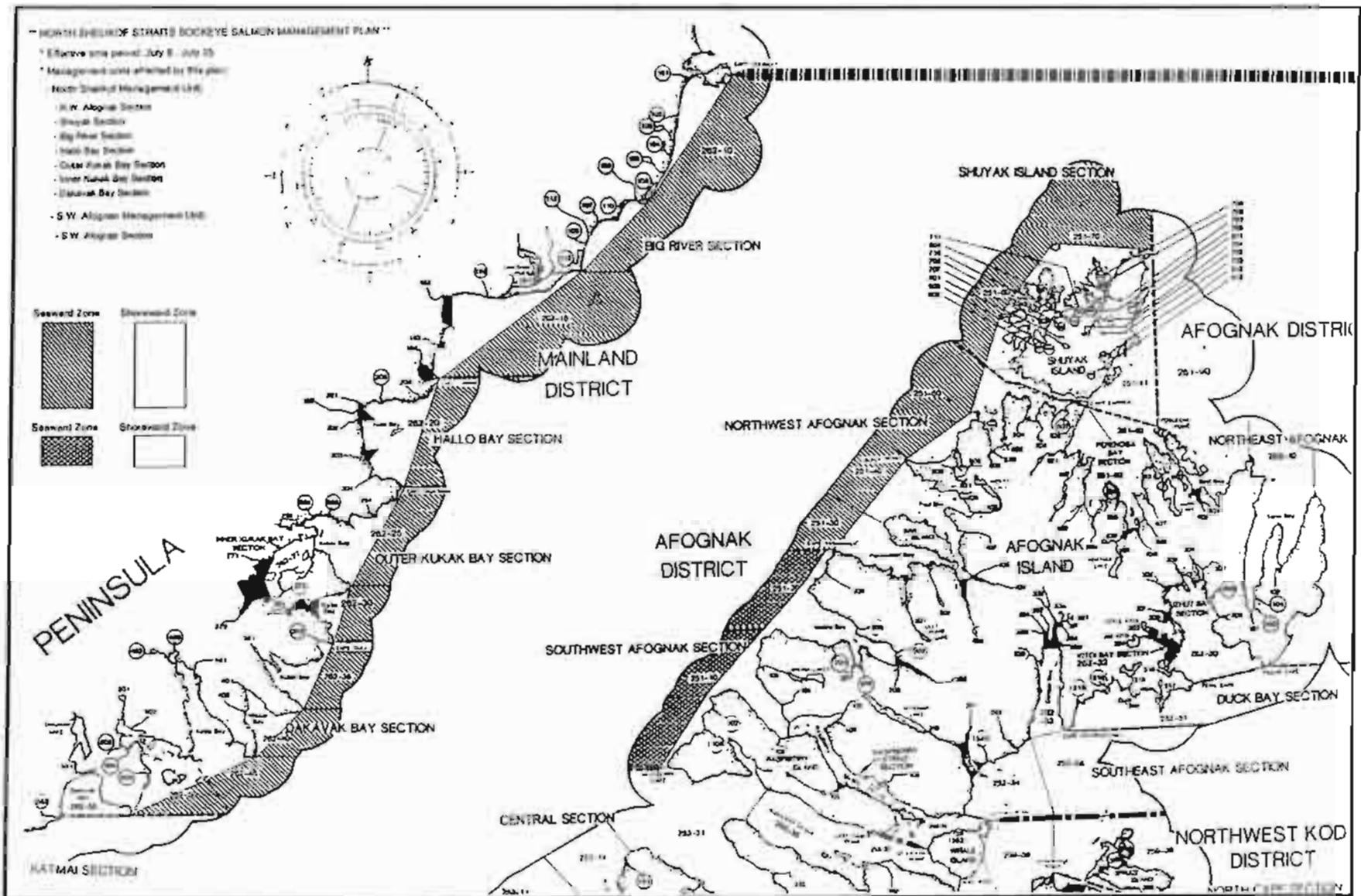
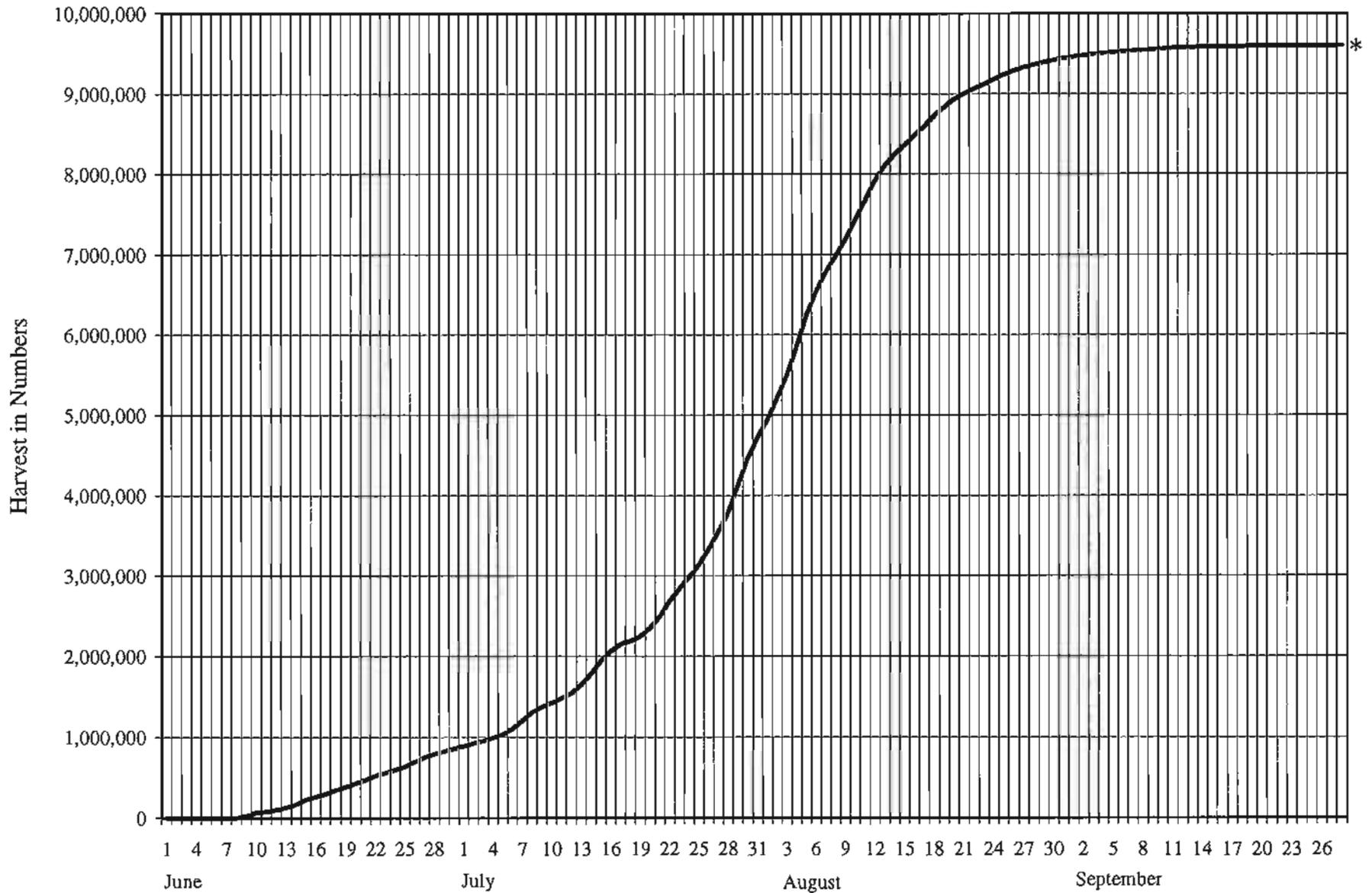


Figure 8. Map of the "North Shelikof Seaward Zone" and the "Southwest Afognak Seaward Zone" of the North Shelikof Strait Sockeye Salmon Management Plan for the Kodiak Management Area.

## **APPENDIX**

# Projected Cumulative Salmon Harvest by Day, All Species Combined, 1998

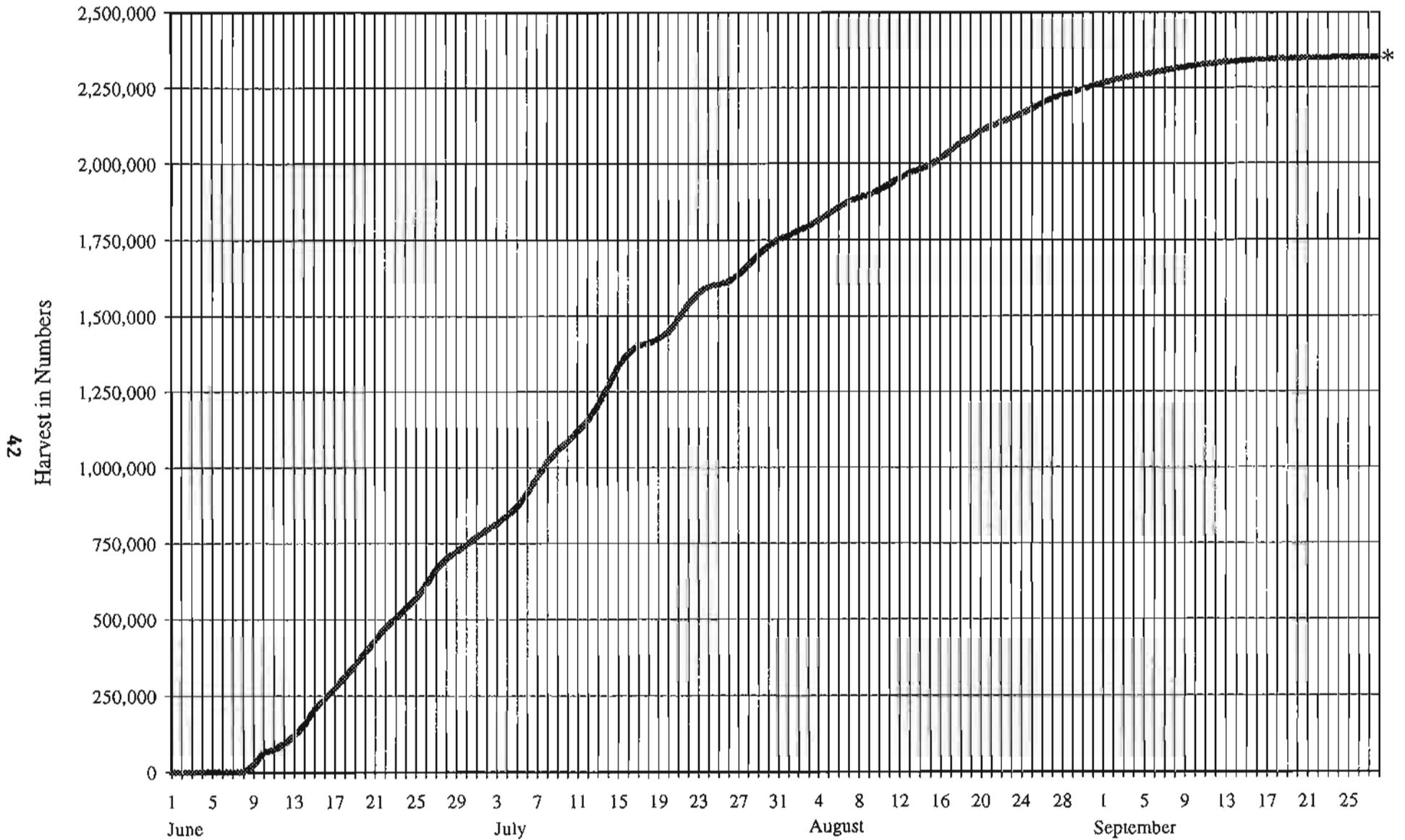
17



\* 1998 All Salmon Species Projected Harvest Total = 9,670,000

Appendix A.1. Projected salmon harvest curve, all species combined, for the Kodiak Management Area, 1998.

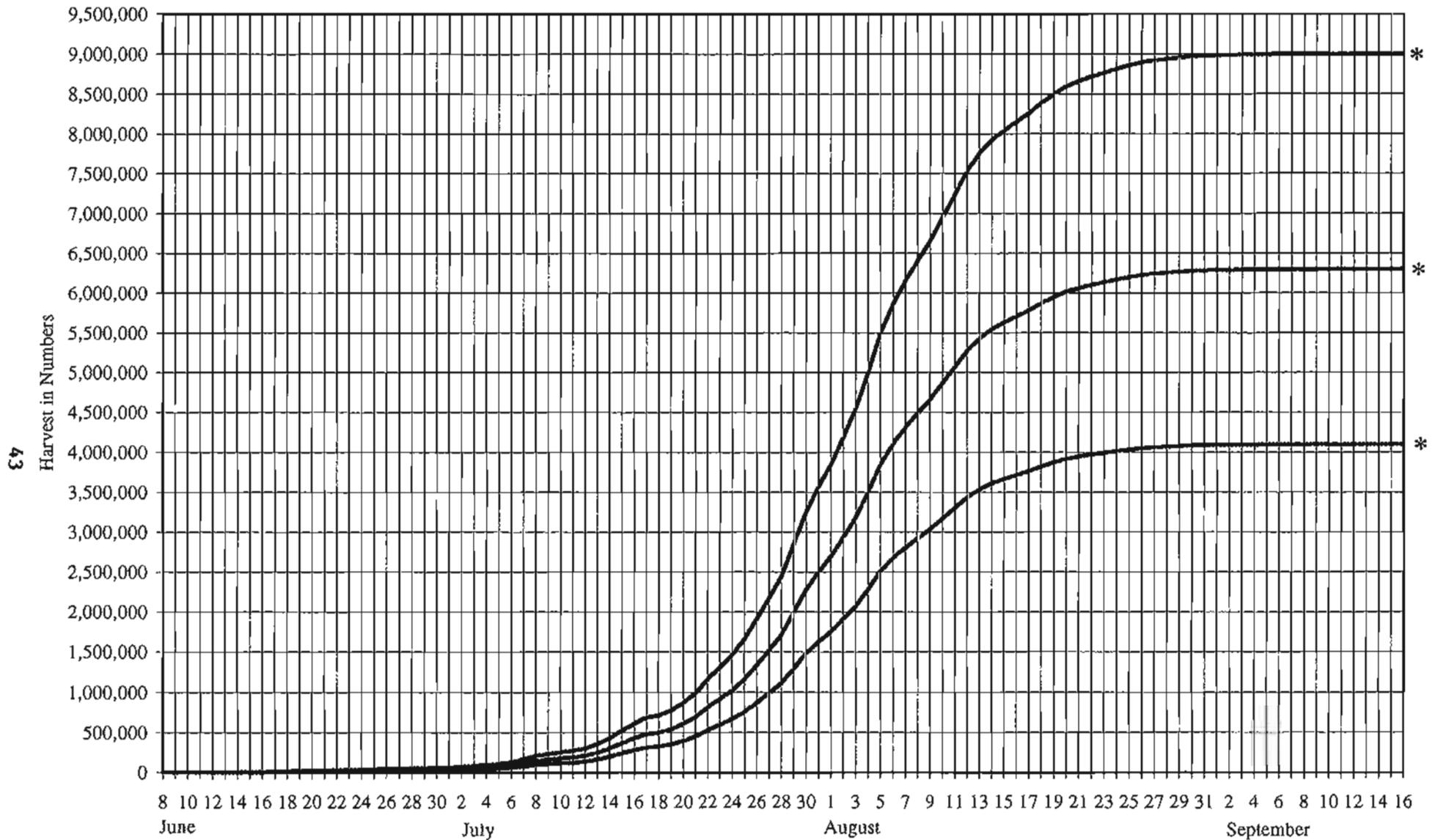
# Projected Cumulative Sockeye Salmon Harvest by Day, 1998



\* 1998 Sockeye Salmon Projected Harvest Total = 2,352,000

Appendix A.2. Projected sockeye salmon harvest curve for the Kodiak Management Area, 1998.

# Projected Cumulative Pink Salmon Harvest by Day, 1998



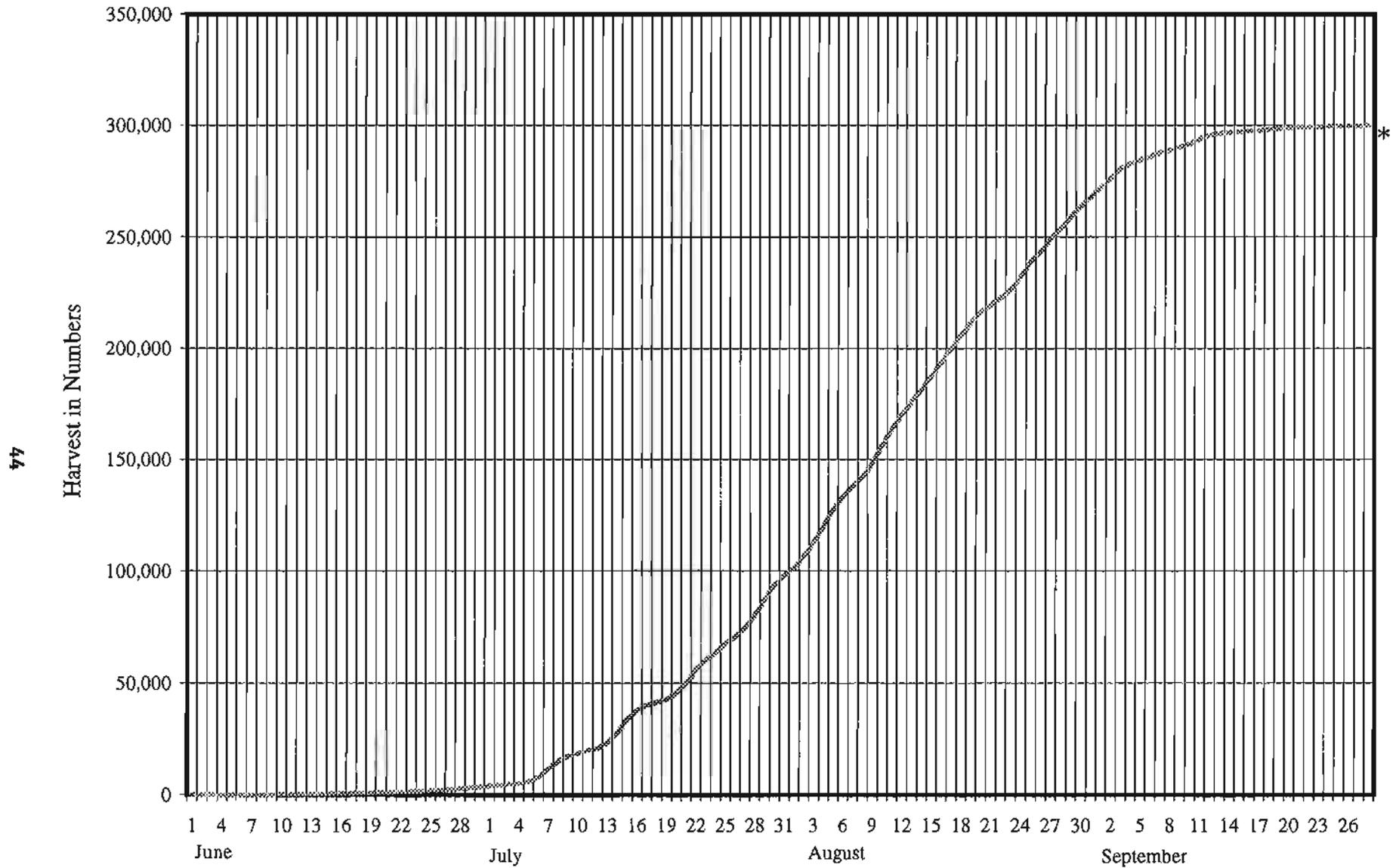
\* 1998 Pink Salmon Projected Harvest = 6,400,000

\* Projected Low = 4,100,000

\* Projected High = 9,000,000

Appendix A.3. Projected pink salmon harvest curve for the Kodiak Management Area, 1998.

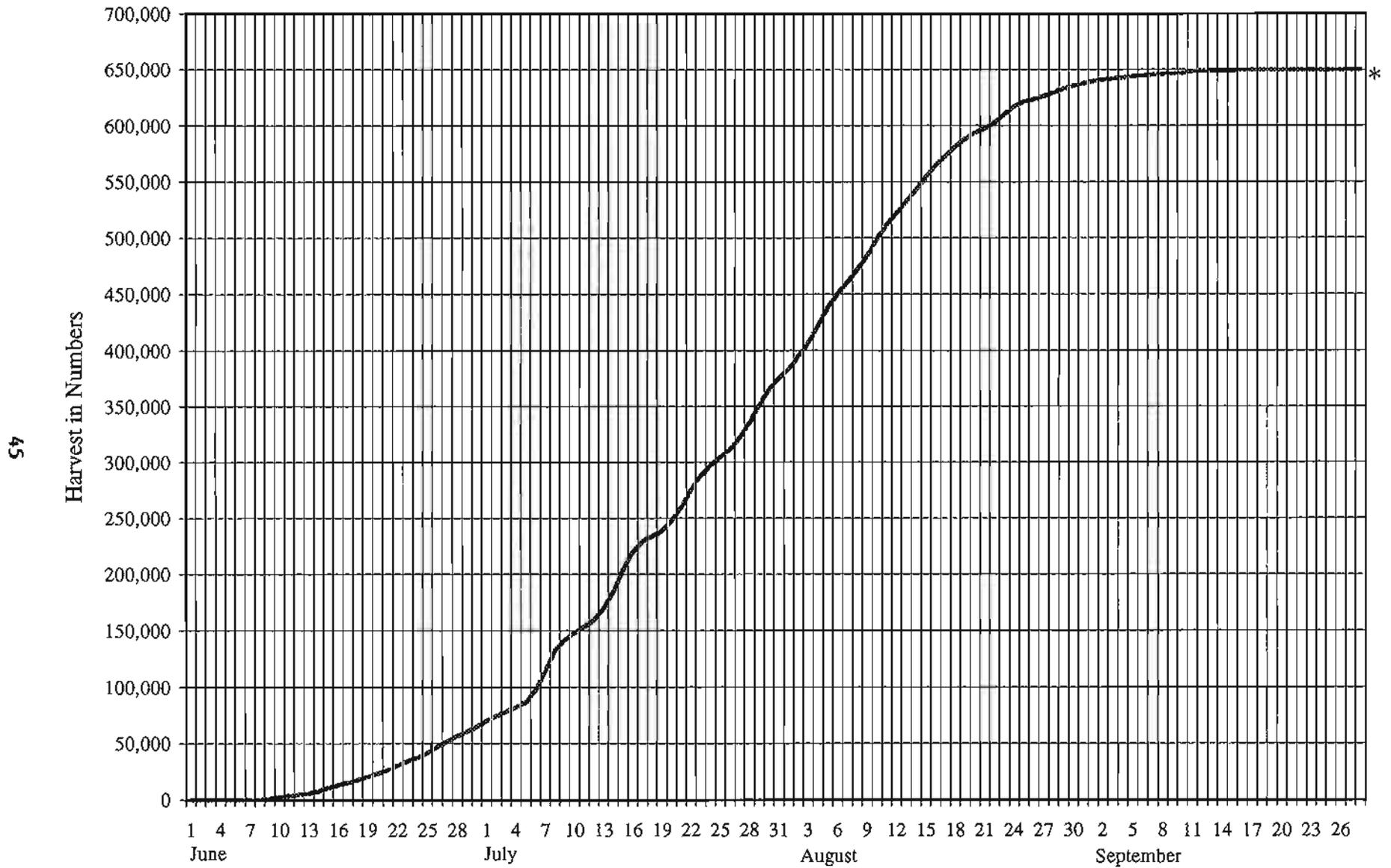
# Projected Cumulative Coho Salmon Harvest by Day, 1998



\* 1998 Coho Salmon Projected Harvest Total = 300,000

Appendix A.4. Projected coho salmon harvest curve for the Kodiak Management Area, 1998.

# Projected Cumulative Chum Salmon Harvest by Day, 1998

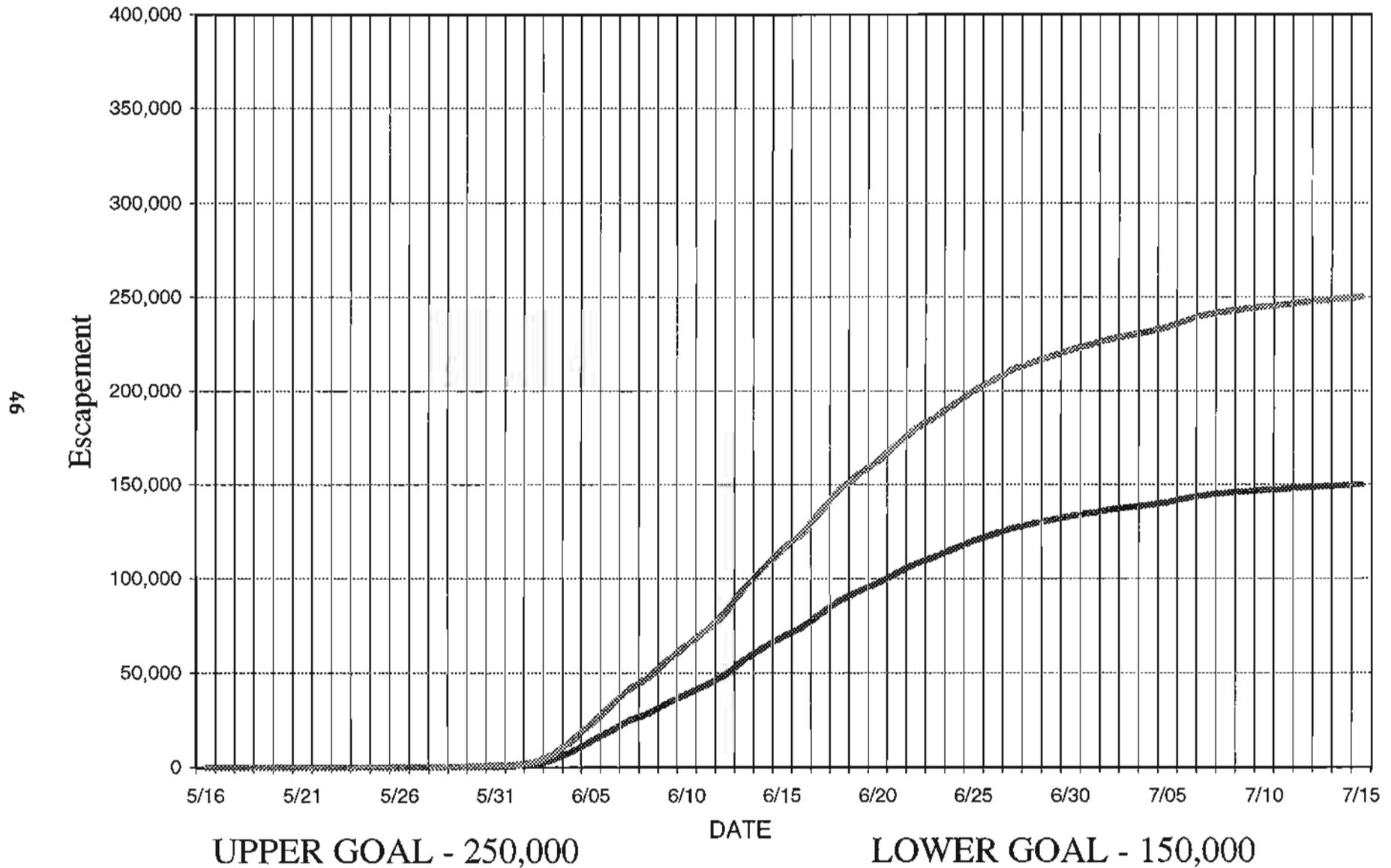


\* 1998 Chum Salmon Projected Harvest Total = 650,000

Appendix A.5. Projected chum salmon harvest curve for the Kodiak Management Area, 1998.

# KARLUK SOCKEYE SALMON, EARLY RUN

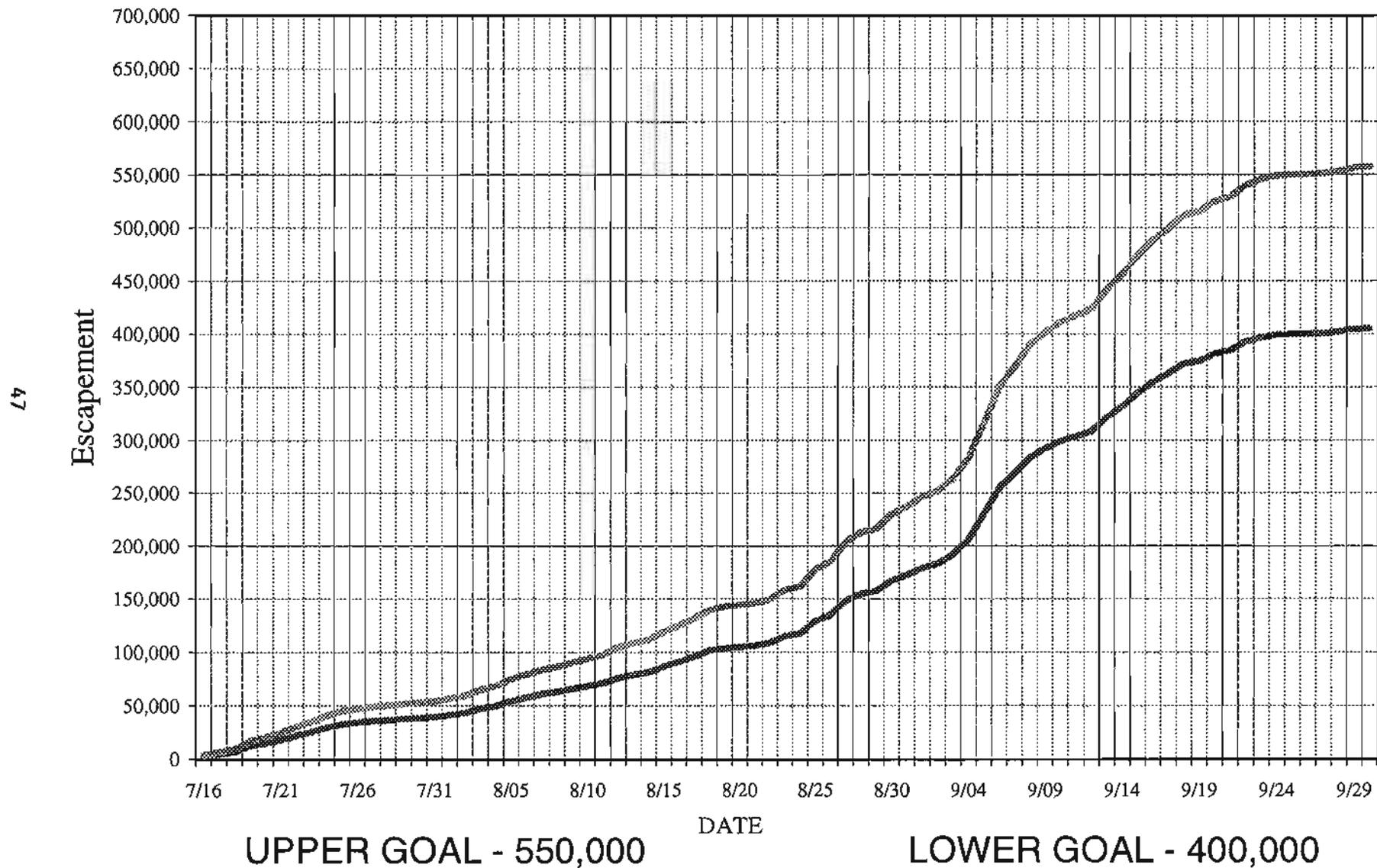
## Upper and Lower Escapement Goals



Appendix B.1. Upper and lower escapement goal curves for the early run of Karluk sockeye salmon in the Kodiak Management Area, 1998.

# KARLUK SOCKEYE SALMON, LATE RUN

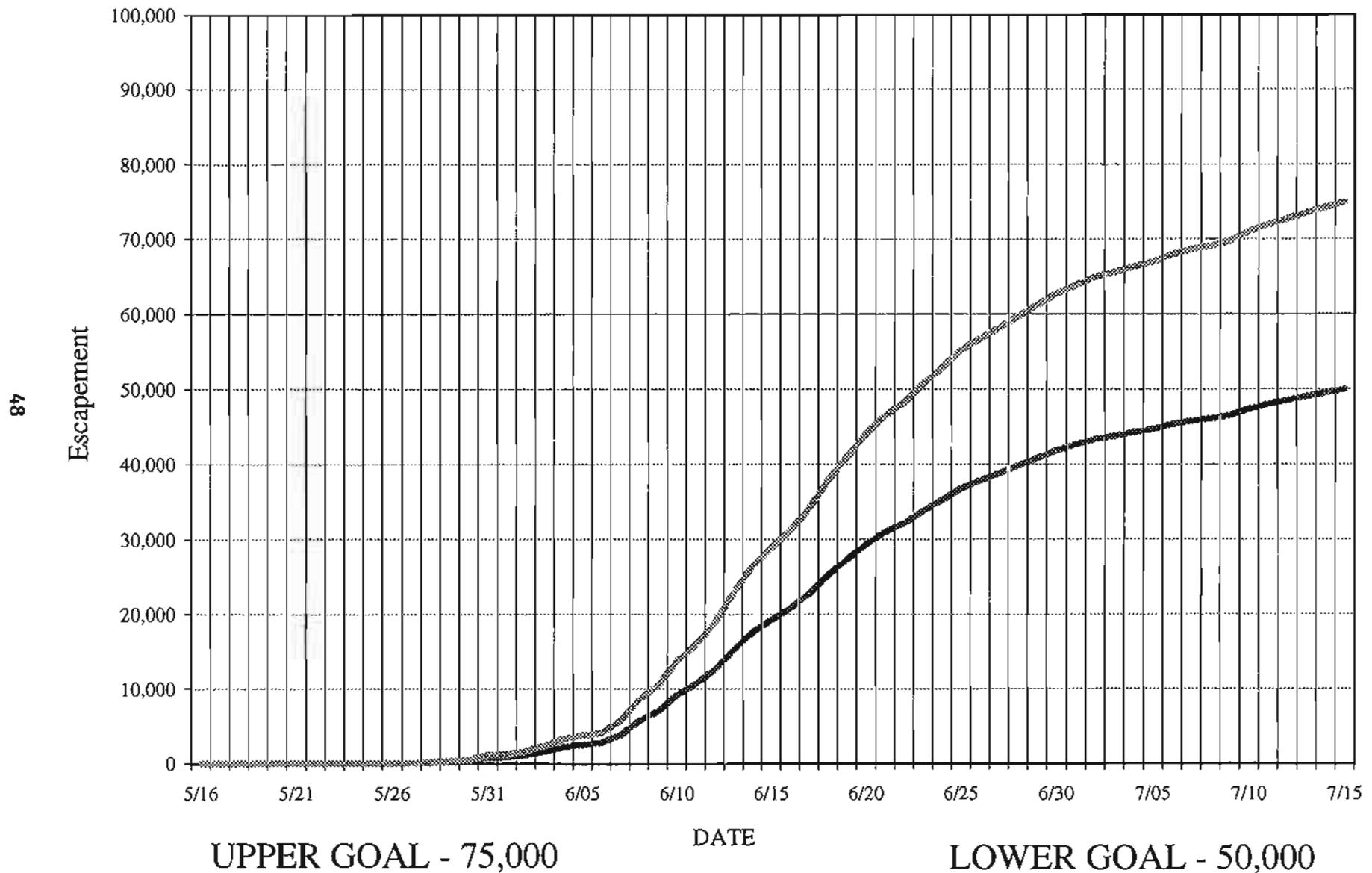
## Upper and Lower Escapement Goals



Appendix B.2. Upper and lower escapement goal curves for the late run of Karluk sockeye salmon in the Kodiak Management Area, 1998.

# UPPER STATION SOCKEYE SALMON, EARLY RUN

## Upper and Lower Escapement Goals

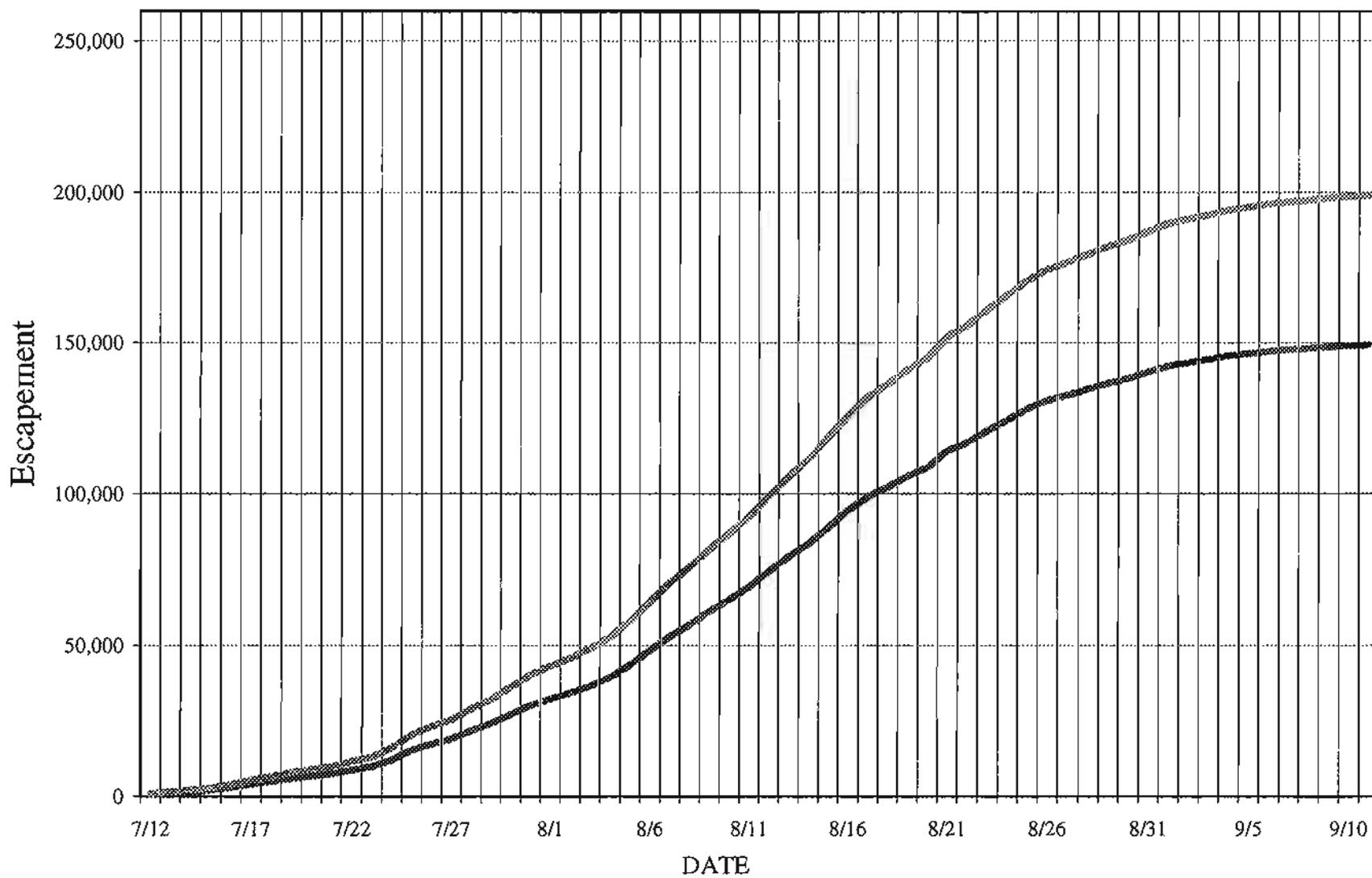


Appendix B.3. Upper and lower escapement goal curves for the early run of Upper Station sockeye salmon in the Kodiak Management Area, 1998.

# UPPER STATION SOCKEYE SALMON, LATE RUN

## Upper and Lower Escapement Goals

67

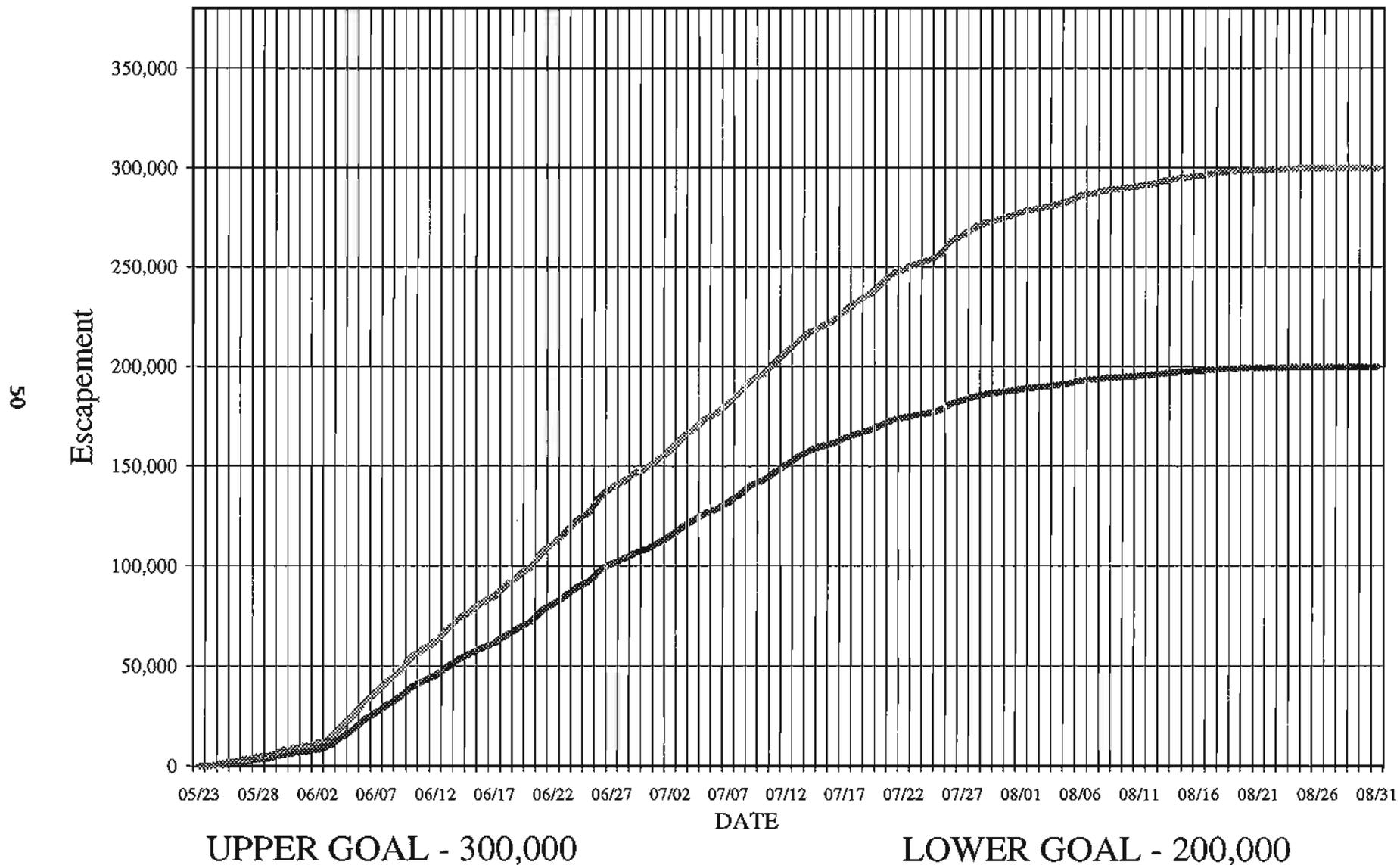


UPPER GOAL -200,000

LOWER GOAL -150,000

Appendix B.4. Upper and lower escapement goal curves for the late run of Upper Station sockeye salmon in the Kodiak Management Area, 1998.

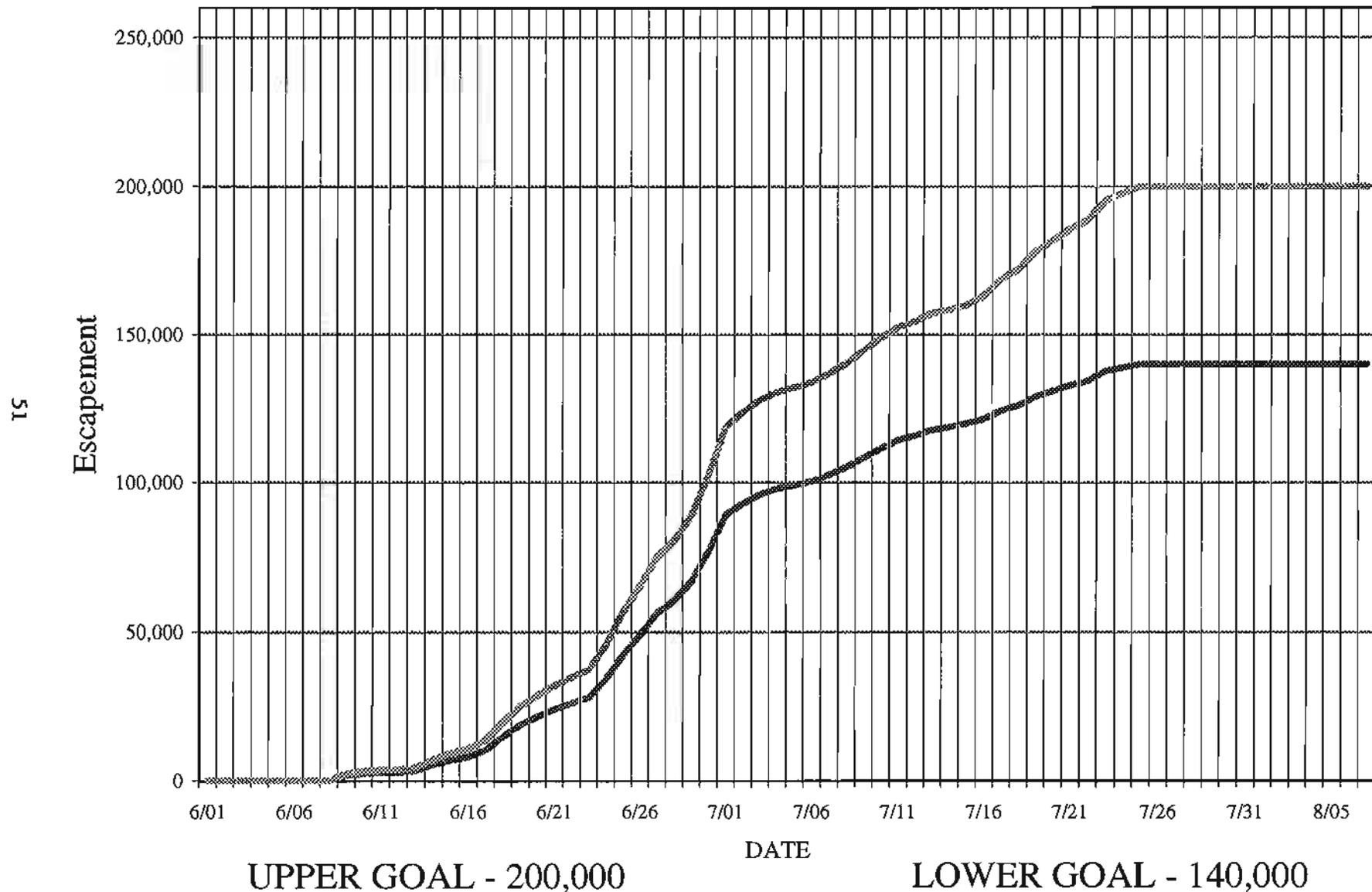
# AYAKULIK SOCKEYE SALMON Upper and Lower Escapement Goals



Appendix B.5. Upper and lower escapement goal curves for Ayakulik sockeye salmon in the Kodiak Management Area, 1998.

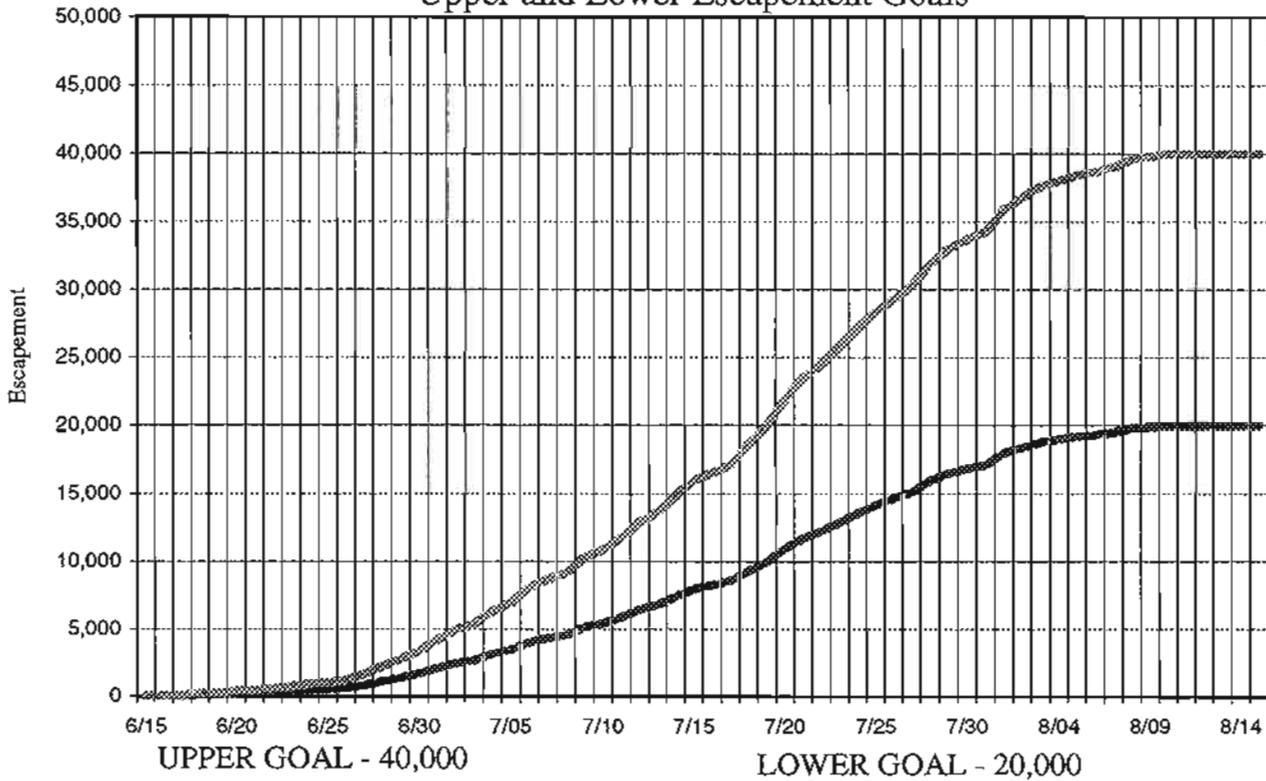
# DOG SALMON RIVER SOCKEYE SALMON

## Upper and Lower Escapement Goals

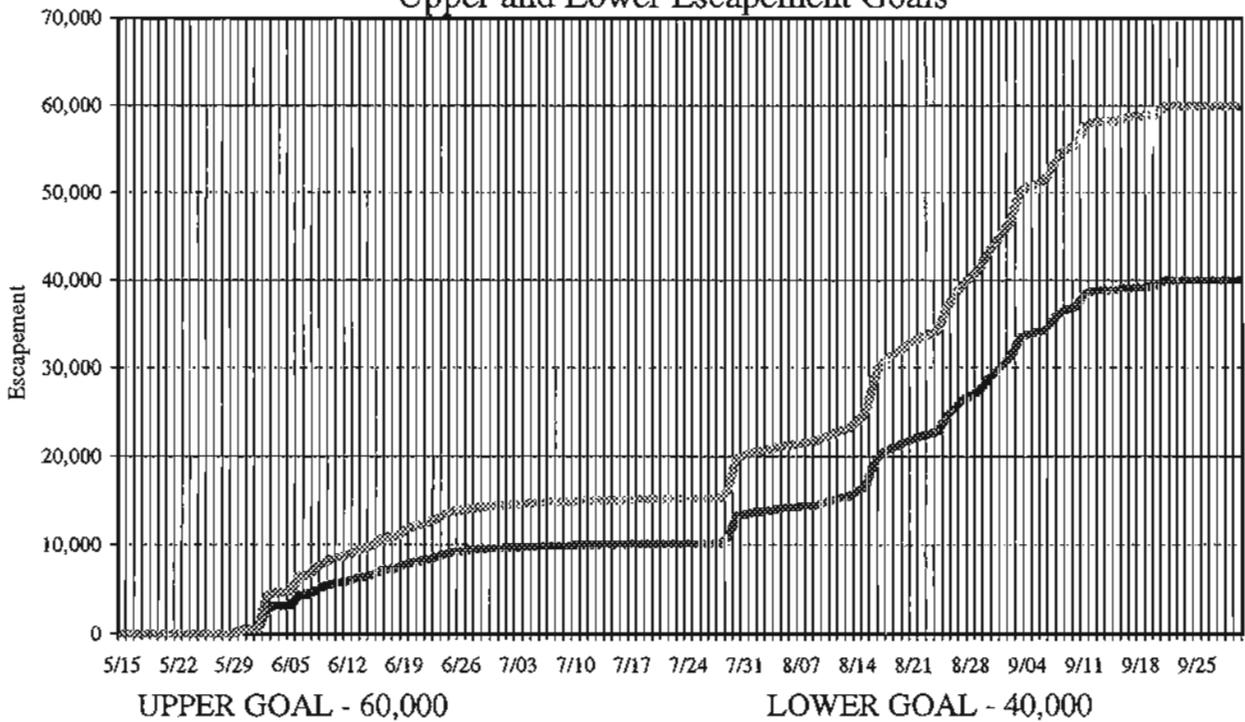


Appendix B.6. Upper and lower escapement goal curves for Frazer (Dog Salmon) sockeye salmon in the Kodiak Management Area, 1998.

SALTERY SOCKEYE SALMON  
Upper and Lower Escapement Goals

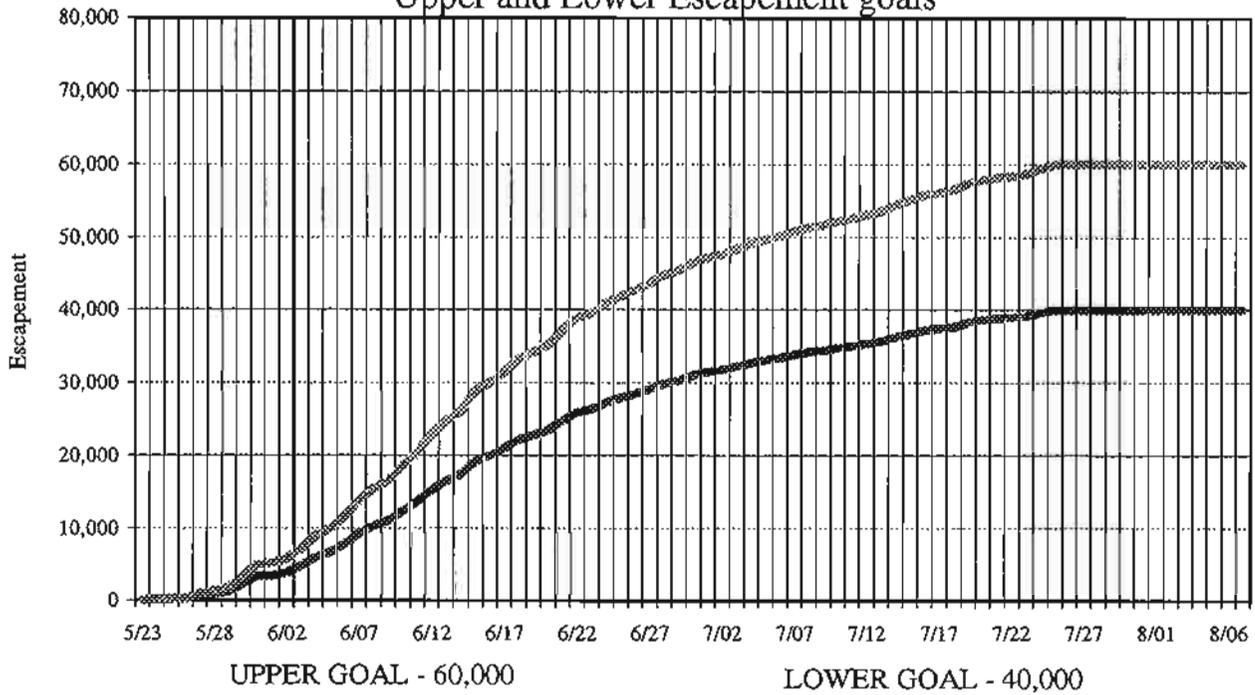


AKALURA SOCKEYE SALMON  
Upper and Lower Escapement Goals

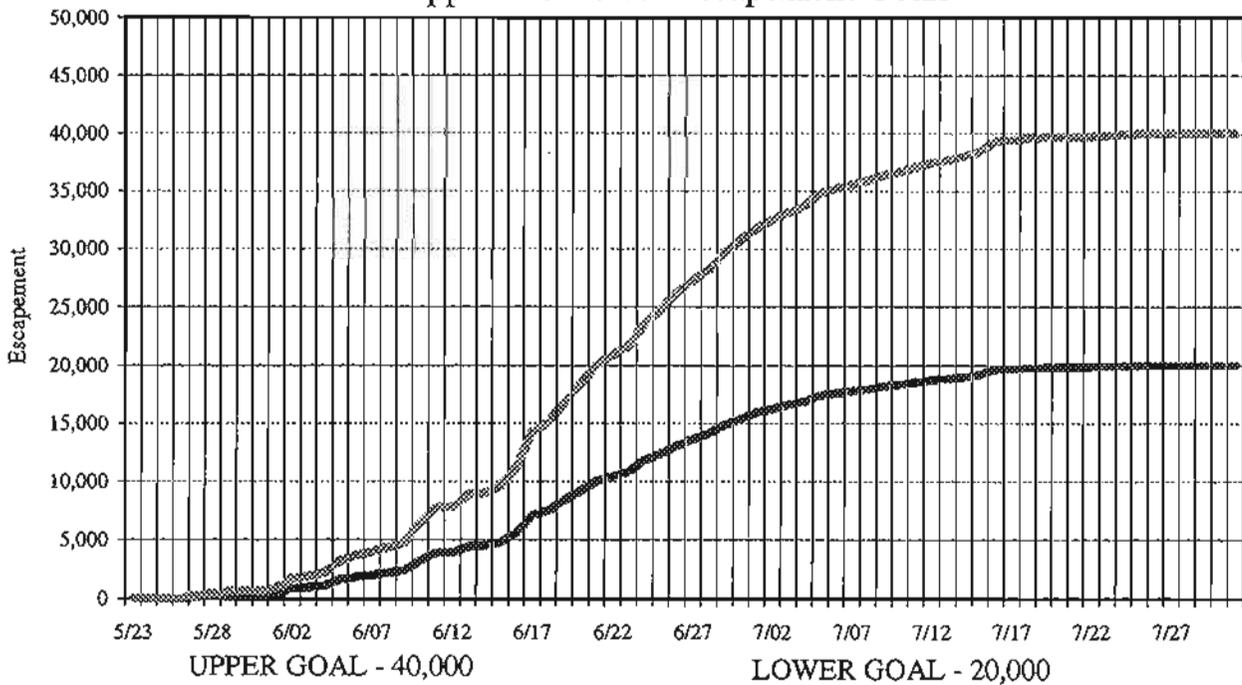


Appendix B.7. Upper and lower escapement goal curves for Saltery and Akalura (early and late runs) sockeye salmon in the Kodiak Management Area, 1998.

### LITNIK SOCKEYE SALMON Upper and Lower Escapement goals

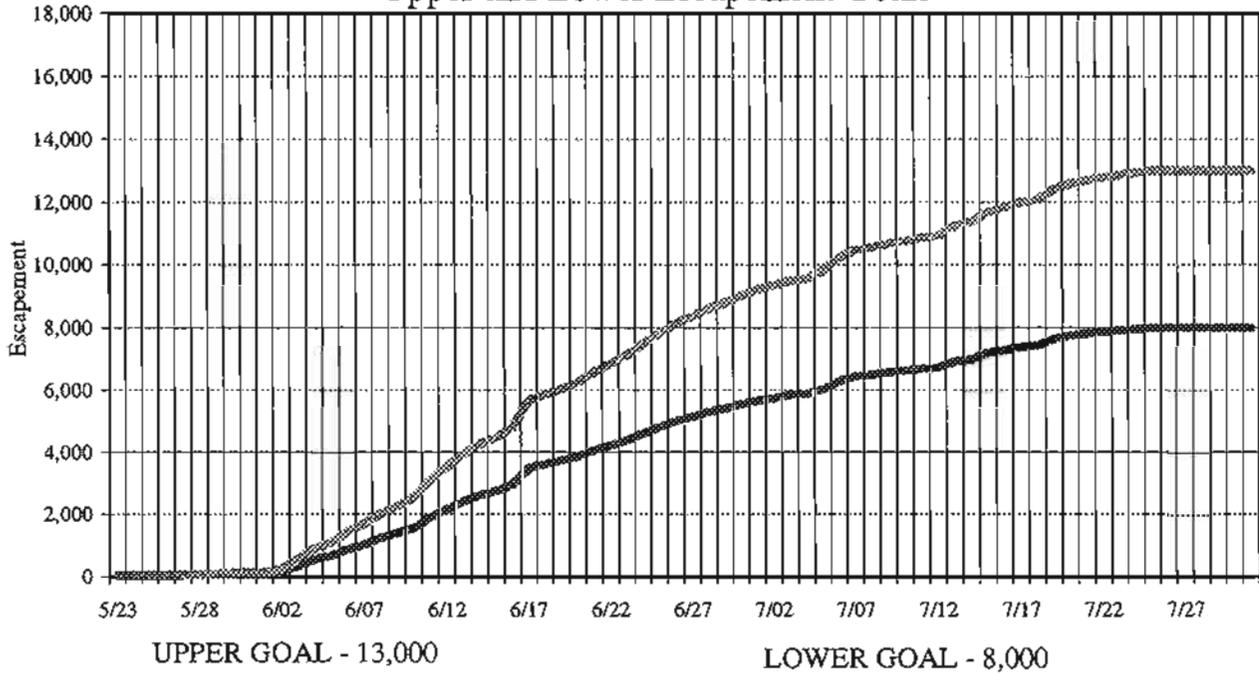


### PAULS BAY SOCKEYE SALMON Upper and Lower Escapement Goals

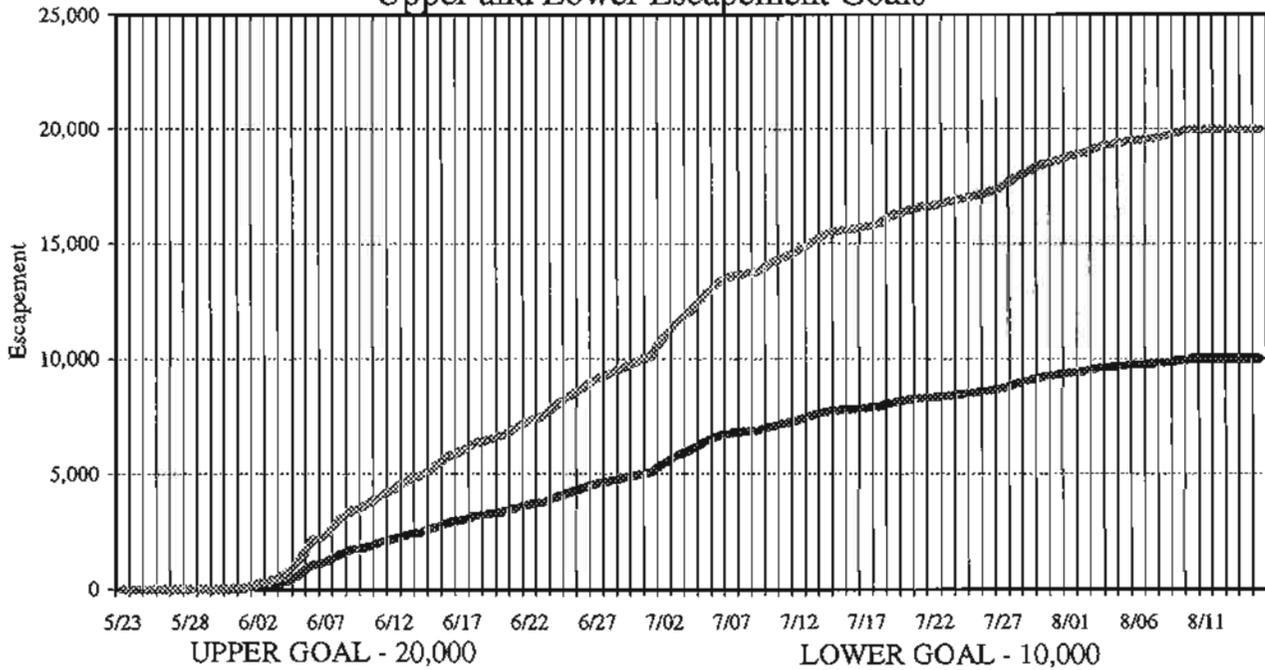


Appendix B.8. Upper and lower escapement goal curves for Litnik and Pauls Bay sockeye salmon in the Kodiak Management Area, 1998.

### BUSKIN LAKE SOCKEYE SALMON Upper and Lower Escapement Goals



### MALINA SOCKEYE SALMON Upper and Lower Escapement Goals



Appendix B.9. Upper and lower escapement goal curves for Buskin and Malina sockeye salmon in the Kodiak Management Area, 1998.

The Alaska Department of Fish and Game administers all programs and activities free from discrimination on the basis of sex, color, race, religion, national origin, age, marital status, pregnancy, parenthood, or disability. For information on alternative formats available for this and other department publications, contact the department ADA Coordinator at (voice) 907-465-4120, or (TDD) 907-465-3646. Any person who believes s/he has been discriminated against should write to: ADF&G, PO Box 25526, Juneau, AK 99802-5526; or O.E.O., U.S. Department of the Interior, Washington, DC 20240.