Fishery Management Report No. 92-3

Area Management Report for the Recreational Fisheries of Northern Cook Inlet

by

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and
Doug Vincent-Lang

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Alaska Department of Fish and Game

Division of Sport Fish

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Anchorage, Alaska

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The Fishery Management Reports series was established in 1989 for the publication of an overview of Division of Sport Fish management activities or management goals in a specific geographic area. Fishery Management Reports are intended for fishery and other technical professionals, as well as lay persons. Distribution is to state and local publication distribution centers, libraries and individuals and, on request, to other libraries, agencies, and individuals. This publication has undergone editorial and peer review.

PREFACE

This report is divided into two sections. Section I presents an introductory overview of the Northern Cook Inlet Management Area. Included in this section is a general geographic and organizational description of the management area; an overview of the Alaska Board of Fisheries processes; fishery resources of the management area; an inventory of the available fishery resources of the management area; a historical perspective of recreational angler effort and harvest within management area waters; an approximation of the economic value of the recreational fisheries of the management area; and, a general description of stocking, research, management, partnership, aquatic education, viewing, and access activities being conducted in the management area. A summary of the major fishery and social issues that presently occur in the Northern Cook Inlet Management Area is presented, as well as any recommendations for solving them including, but not limited to, research, management, access, regulatory changes, aquatic education, partnership, stocking, or habitat options. Section II provides a more detailed summary of all the major fisheries that occur in the Northern Cook Inlet Management Area. Included in this section is a description and historical perspective of each fishery; the objective governing the management of each fishery; description of the recent performance of each fishery; a description of recent Board of Fisheries actions with respect to each fishery; a description of any social or biological issues surrounding each fishery; and a description of any ongoing or recommended research or management activities directed at each fishery.

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SECTION I: MANAGEMENT AREA OVERVIEW

Management Area Description

The Northern Cook Inlet sport fish management area (NCIMA, Figure 1) includes all freshwater drainages which flow into Upper Cook Inlet and contiguous bays north of the forelands excluding the waters of the Kenai Peninsula, the upper Susitna River drainage upstream of the confluence of the Oshetna River, and all waters inside the area bounded by the Eklutna River on the north, Turnagain Arm on the south, the Chugach Mountains on the east, and Knik Arm on the west. The area also includes all salt waters contiguous to these areas. The management area covers approximately 23,000 square miles. With the exception of remote West Cook Inlet tributaries which are accessible only by aircraft, virtually all sport fisheries in the NCIMA are relatively easy to access by road or jet-boat.

In terms of political geography, the management area is almost identical to the boundaries of the Matanuska-Susitna Borough. About 50% of the state's population resides within or immediately adjacent to the management area. Major communities within the management area include Wasilla, Palmer, Talkeetna, Willow, and Houston. Smaller communities that occur in the management area include Tyonek, Chickaloon, and Skwentna. The Municipality of Anchorage/Eagle River, Alaska's largest community, borders the management area. Although much of Alaska's population resides in or near the NCIMA, it is important to note that much of the management area is either sparsely populated or uninhabited because of a limited transportation system. The State of Alaska is the principal land manager in the NCIMA. Other significant land managers in the NCIMA include the Matanuska-Susitna (Mat-Su) Borough, various native corporations and villages, and the federal government.

Management and research functions for the NCIMA are conducted from the Palmer area office. The Division of Sport Fish staff stationed in Palmer that perform NCIMA functions include a permanent fulltime Fisheries Biologist III Area Management Biologist (Larry Engel), a permanent full-time Fisheries Biologist III Area Research Biologist (Al Havens), a permanent full-time Fisheries Biologist II Assistant Area Management Biologist (Larry Bartlett),

and one permanent full-time clerical position Field Office Assistant (Rena Hite) which is shared with the Division of Wildlife Conservation staff. These positions are assisted by numerous permanent seasonal Fisheries Biologist and Fish and Wildlife Technician positions who act as crew leaders and staff for area research and management projects. Significant support is also provided to the area staff from the Sport Fish Division Southcentral regional and Research and Technical Services (RTS) staffs. A regional maintenance worker (James Whitt, Jr.) performs maintenance services for the Southcentral region from a shop located in Palmer.

The NCIMA is comprised of three statewide harvest survey (SWHS) reporting areas(Mills 1991): the Knik Arm Drainage Area reporting unit (Area K), the East Susitna River Drainage Area reporting unit (Area M), also referred to as "eastside", and the West Cook Inlet-West Susitna River Drainage Area reporting unit (Area N). The West Cook Inlet-West Susitna River Drainage is further divided into the West Cook Inlet Drainage, or Coastal Unit, and the West Susitna River Drainage, also referred to as the West Susitna Unit or "westside" (Figure 1).

Alaska Board of Fisheries Activities

The waters of the NCIMA fall within two regulatory areas: the Susitna/West Cook Inlet Regulatory Area and the Cook Inlet/Resurrection Bay Salt Water Regulatory Area. Regulations governing the sport fisheries of the Susitna/West Cook Inlet and the Cook Inlet/Resurrection Bay Salt Water Regulatory Areas are established in Chapters 61 and 58, respectively, of Title 5 of the Alaska Administrative Code.

The process of developing fishing regulations appropriate for fisheries in the NCIMA occurs within the established Alaska Board of Fisheries process. Public input concerning regulation changes and allocation issues are provided for in this process through various means including direct testimony to the Board of Fisheries and through participation in local fish and game advisory committees. Advisory committees have been established throughout Alaska to assist the Boards of Fisheries and Game in assessing fisheries and wildlife issues and proposed regulations. Most active committees meet at least once each

year, usually in the fall prior to the Board meetings. Staff from the Division of Sport Fish and other divisions are often invited to attend the committee meetings. In this way, advisory committee meetings allow for direct public interaction with staff involved with resource issues of local concern. Within the NCIMA there are 4 Fish and Game Advisory Committees: Denali, Matanuska, Tyonek and Mt. Yenlo. Under the current operating schedule, the Board of Fisheries meets on a two-year cycle. Proposals regarding the NCIMA will be heard during the fall of 1992. After 1992 the Board of Fisheries will review Cook Inlet regulations every three years.

Fisheries Resource Inventory

Sport anglers fishing NCIMA waters can target all five species of North Pacific salmon (pink *Oncorhynchus gorbuscha*, coho *O. kisutch*, sockeye *O. nerka*, chum *O. keta*, and chinook *O. tshawytscha*) in both fresh and salt water. In addition, there are major fisheries for rainbow trout (*O. mykiss*), Dolly Varden (*Salvelinus malma*)/Arctic char (*Salvelinus alpinus*), and Arctic grayling (*Thymallus arcticus*) as well as fisheries for lake trout (*Salvelinus namaycush*), northern pike (*Esox lucius*), burbot (*Lota lota*), whitefish (*Coregonus* spp. and *Prosopium* spp.), landlocked salmon (*Oncorhynchus* spp.), and smelt (Osmeridae). The Alaska blackfish (*Dallia pectoralis*), a non-indigenous species, has also been recently reported to be present in NCIMA waters, notably in the Wasilla Creek drainage.

The Division of Sport Fish classifies sport fisheries into one of three levels based on a combination of yield (harvest) and angler-cost criteria. Level 1 fisheries are defined as high yield, low angler-cost fisheries. These fisheries are typically entry level fisheries in which anglers can participate at little direct cost. Level III fisheries are defined as low yield, high cost fisheries. These fisheries are typically remote, guided, or special management fisheries that have a high cost associated with participation. Level II fisheries fall between Level I and Level III fisheries and are defined as basic yield, intermediate-cost fisheries.

The NCIMA offers diverse fishing opportunities for the recreational angler. Stocked lakes and road-accessible salmon and resident fish fisheries within

the Knik Arm and East Susitna River Drainage Areas provide Level I entry-level fisheries. Remote fisheries for salmon, accessible by jet-boat or aircraft, within the West Susitna River Drainage Area offer Level II fisheries. Other examples of Level II fisheries include aircraft accessible salmon fisheries within the West Cook Inlet Drainage Area. Remote rainbow trout and chinook salmon stocks, such as those in the Talachulitna River offer Level III fisheries.

Recreational Angler Effort

From 1977 through 1990, an average of 271,429 angler-days have been spent by anglers fishing NCIMA waters (Table 1). Angler-effort generally increased annually from 1977 through 1988 (Figure 2), when a record number of angler-days (392,875) occurred. Since 1988, angler-effort has fallen and stabilized at around 350,000 angler-days. Historically, the effort expended by anglers fishing NCIMA waters has represented an average of 15.1% and 21.1% of the total statewide and Southcentral region angling effort, respectively (Table 1). The Kenai Peninsula sport fish management area is currently the only management area in Alaska which receives greater use by recreational anglers (Mills 1991).

During 1990, anglers spent an estimated 346,590 angler-days fishing NCIMA waters. This was nearly 30% above the historical average effort for the area but just under 10% of the historical record effort during 1988. The effort in 1990 represented 14.1% and 19.9% of the total statewide and Southcentral region angling effort, respectively (Table 1).

Forty-four percent of the total effort from the NCIMA has historically occurred in the Knik Arm Drainage Area (Table 1). From 1977 through 1990, these waters have supported an average of 119,391 angler-days of fishing effort. A record number of angler-days (183,029) were expended during 1988. Nearly all of the effort over this period has been expended in fresh water (Table 2). The Little Susitna River is the most heavily fished stream in the Knik Arm Drainage Area, averaging about 33,500 angler-days of effort annually (Table 2, Figure 3). Other major fisheries occur in the many stocked lakes in the Knik Arm basin (notably in Big, Wasilla, Finger, Kepler Complex lakes) and

at various road accessible streams including the Knik River and its tributaries, the Eklutna Power Plant Tail Race, Big Lake drainage streams, and Cottonwood and Wasilla creeks (Table 2, Figure 3). A limited saltwater fishery also occurs off the mouth of Fish Creek in Knik Arm (Table 2).

Recreational anglers fishing the East Susitna River Drainage Area from 1977 through 1990 have expended an average of 81,903 angler-days (Table 3). This expenditure of effort has represented an average of 31% of the total sport effort from all NCIMA waters from 1977 through 1990. A record number of angler-days (107,977) occurred during 1988 (Table 3). All of the effort in this area takes place in fresh water. Major fisheries occur in Willow, Caswell, Montana, Sunshine, Sheep, Little Willow, Goose, and Birch Creeks, and at the Kashwitna River and in the Talkeetna River and it's various tributaries (Table 3, Figure 4).

Anglers fishing the West Cook Inlet-West Susitna River Drainage Area from 1977 through 1990 expended an average of 70,135 angler-days (Table 4). This expenditure of effort has represented an average of 25% of the total effort from all NCIMA waters from 1977 through 1990 (Table 4). A record number of angler-days (106,305) occurred during 1989. Nearly all of the annual effort in the area has historically been expended in fresh water (Table 4). Major freshwater fisheries occur in the Deshka, Talachulitna, Chuitna, Theodore, and Lewis Rivers; Lake, Alexander, and Peter's Creeks; and, the Yentna River and its various tributaries (Table 4, Figure 5). Other fisheries occur in various remote lakes in the area (notably in Judd, Beluga, Shell, Whiskey, and Hewitt lakes) (Table 4, Figure 5).

Recreational Fish Harvest

From 1977 through 1990, an average of 207,425 fish have been caught and kept (harvested) by anglers fishing NCIMA waters (Table 5). As was the case with angler effort, harvests from NCIMA waters generally increased annually from 1977 through 1988 (Figure 6), when a record number of fish were harvested (291,249). Since 1988, recreational fish harvests have fallen until in 1990 just under 200,000 were harvested (Table 5).

Harvest Distribution by Area

The waters of the Knik Arm Drainage Area have accounted for most of the sport fish harvest from NCIMA waters. Anglers fishing waters of the Knik Arm Drainage Area have harvested an average of 95,746 fish from 1977 through 1990, or just about 46% of the average NCIMA harvest during this period (Table 5). Hatchery stocks of rainbow trout and landlocked salmon and wild and hatchery stocks of coho salmon, have accounted for most of the historical harvest. From 1977 through 1990, these four species have accounted for an average of nearly 80% of the total harvest from the Knik Arm Drainage Area (Table 6). The stocked lakes of the Knik Arm basin, notably Big and Finger lakes and the lakes of the Nancy Lake State Recreation Area and the Kepler Lake Complex, have historically supported the largest harvests (Table 7, Figure 7). Other sites that have historically supported large recreational fish harvests include the Little Susitna River; tributaries to the Knik River; Wasilla, Cottonwood, and Fish Creeks; and, the Eklutna Power Plant tailrace (Table 7, Figure 7).

Anglers fishing waters of the East Susitna River Drainage Area have harvested an average of 58,660 fish from 1977 through 1990, or just about 28% of the average NCIMA harvest during this period (Table 5). Wild stocks of pink, coho, chum, and chinook salmon, Arctic grayling, and rainbow trout have accounted for most of the historical harvest. From 1977 through 1990, these six species have accounted for an average of nearly 85% of the total harvest from the East Susitna River Drainage Area (Table 8). The eastside tributaries to the Susitna River, notably Willow, Montana, and Sheep creeks and the Talkeetna River and its tributaries, support the largest recreational fish harvests (Table 9, Figure 8). Other systems which have historically supported large recreational fish harvests include Caswell, Little Willow, Goose, and Birch creeks (Table 9, Figure 8).

Anglers fishing waters of the West Cook Inlet-West Susitna River Drainage Area have accounted for an average harvest of 53,019 fish from 1977 through 1990, or just under 26% of the average NCIMA harvest over this period (Table 5). Wild stocks of coho and chinook salmon, rainbow trout, and Arctic grayling have accounted for most of the historical harvest. From 1977 through 1990,

these three species have accounted for an average of just under 75% of the total harvest from West Cook Inlet-West Susitna River Drainage Area (Table 10). Historically, most of the harvest from the West Cook Inlet-West Susitna River Drainage Area has come from the Deshka River, Lake Creek, and Alexander Creek (Table 11, Figure 9). Other systems which have supported large recreational fish harvests include the Fish Lake drainage; Talachulitna, Chuitna, Lewis, and Theodore rivers; Peter's Creek; and, the various lakes of the Area (Table 11, Figure 9).

Harvest Distribution by Species

Wild and hatchery stocks of rainbow trout and coho salmon are the two major species harvested in terms of numbers by recreational anglers fishing NCIMA waters from 1977 through 1990 (Figure 10). Together, these two species have represented 42% of the total harvest by recreational anglers fishing NCIMA waters since 1977 (Table 12). Other species that have represented a significant portion of the historic harvest include wild and hatchery stocks of Arctic grayling (9.3%), wild stocks of pink salmon (8.9%), wild and hatchery stocks of chinook salmon (8.6%), hatchery stocks of landlocked salmon (8.6%), wild and hatchery stocks of Dolly Varden (8.3%), wild and hatchery stocks of sockeye salmon (5.4%), and wild stocks of chum salmon (3.5%).

Just under 45% of the historical sport harvest from NCIMA waters has been wild and hatchery stocks of anadromous salmon, of which just over 60% have been coho and chinook salmon (Table 12, Figure 11). Wild stocks of pink salmon have also comprised a major portion of the anadromous salmon harvest, especially during even years. Wild and hatchery stocks of sockeye and chum salmon generally comprise a small portion of the anadromous salmon harvests.

From 1977 through 1990 an average of 38,436 coho salmon have been harvested by recreational anglers fishing NCIMA waters (Table 12, Figure 12). A record harvest of 76,947 coho salmon occurred in 1988. The wild and hatchery stocks of coho salmon that occur in the Knik Arm Drainage Area, notably in the Little Susitna River and Knik River tributaries, have supported the largest proportion of the annual harvest from NCIMA waters (Appendix Table A1, Figure 12). Anglers fishing these waters have harvested an average of 16,021 coho salmon

from 1977 through 1990. The average harvest of coho salmon from the East Susitna River and West Cook Inlet-West Susitna River Drainages Areas has been 10,762 and 11,654 coho salmon, respectively, over this period (Appendix Tables A2 and A3). Major fisheries for coho salmon in these areas occur in the various tributaries to the Susitna River, notably in the Deshka and Talkeetna rivers and Lake, Alexander, Willow, Montana, and Sunshine creeks. With the exception of recent releases of hatchery coho salmon into Caswell Creek, an eastside Susitna River tributary, nearly all the harvests of coho salmon from these two areas has been from wild stocks. A major stocking effort to expand the recreational fishing opportunities for coho salmon in Upper Cook Inlet is planned to be initiated in select Knik Arm tributaries beginning in 1992 (Delaney and Vincent-Lang 1990). Releases totaling over 800,000 smolt are being proposed for 1992 (Meyer et al. 1991). A major research program will evaluate the success and impacts of these releases on existing stocks and fisheries.

From 1977 through 1990 an average of 17,920 chinook salmon have been harvested by recreational anglers fishing NCIMA waters (Table 12, Figure 13). A record harvest of 35,792 chinook salmon occurred in 1989. The wild stocks of chinook salmon that occur in the West Cook Inlet-West Susitna River Drainage Area, notably in the Deshka River, Lake Creek, and Alexander Creek, have supported the largest proportion of the annual harvest from NCIMA waters (Appendix Table A4, Figure 13). Anglers fishing these waters have harvested an average of 11,533 chinook salmon from 1977 through 1990. The average harvest of chinook salmon from the East Susitna River and Knik Arm Drainage Areas has been 4,715 and 1,672 chinook salmon, respectively, over this period (Appendix Tables A5 and A6). Major fisheries for chinook salmon in these areas occur in the various tributaries to the Susitna River, notably in Willow and Montana creeks and the Talkeetna and Little Susitna Rivers. With the exception of releases of hatchery chinook salmon into select eastside Susitna River tributaries, nearly all the harvest of chinook salmon from the NCIMA have been from wild stocks.

Wild stocks of pink salmon have also comprised a major portion of the anadromous salmon harvest, especially during even years. From 1977 through 1990

anglers fishing NCIMA waters have harvested an average of 18,466 pink salmon (Table 12, Figure 14). A record harvest of 61,985 pink salmon occurred during 1980. In general, harvests of pink salmon have declined in recent years because of reduced fish abundance and perhaps because angler preference has shifted to other fish species. Historically, most of the pink salmon harvest has occurred from east side Susitna River tributaries (Appendix Tables A7-A9).

Wild and hatchery stocks of sockeye and chum salmon generally comprise a small portion of the anadromous salmon harvest (Figure 11). From 1977 through 1990 anglers fishing NCIMA waters have harvested an average of 11,233 sockeye salmon and 7,307 chum salmon (Table 12, Figures 15 and 16). Historically, most of the harvest of chum salmon has occurred from east side Susitna River tributaries and most sockeye salmon harvest has occurred from the Knik Arm area (Appendix Tables A10-A15).

Wild and hatchery stocks of rainbow trout, Arctic grayling, and Dolly Varden and hatchery-reared landlocked salmon have comprised the major portion of the historical harvests of resident fish from NCIMA waters (Table 12, Figure 17). In addition lake trout, burbot, whitefish, northern pike, and smelt also support popular sport fisheries.

From 1977 through 1990 an average of 49,295 rainbow trout have been harvested by anglers fishing NCIMA waters, making this species the largest single contributor to the historical fish harvest (Table 12, Figure 18). A record harvest of 74,907 rainbow trout occurred in 1988. The hatchery stocks of rainbow trout that occur in the lakes of the Knik Arm Drainage Area notably in Big Lake and in the lakes of the Kepler Lakes complex and Nancy Lake State Recreation Area, have supported the largest proportion of the annual harvest from NCIMA waters (Appendix Table A16, Figure 18). Recreational anglers fishing these waters have harvested an average of 32,408 rainbow trout from 1977 through 1990. The average harvest of rainbow trout from the East Susitna River and West Cook Inlet-West Susitna River Drainage Areas has been 7,266 and 9,661 rainbow trout, respectively, over this period (Appendix Tables A17 and A18). Major fisheries for wild stocks of rainbow trout occur in various tributaries to the Susitna River, notably in Willow, Lake, Alexander, and Montana creeks and the Talkeetna and Deshka rivers.

An average of 19,239 Arctic grayling have been harvested from NCIMA waters from 1977 through 1990 (Table 12, Figure 19). A record harvest of 29,720 Arctic grayling occurred in 1980. Wild stocks of Arctic grayling that occur in the tributaries of the eastside Susitna River drainage, notably in the Talkeetna River and Willow Creek, have supported the largest proportion of the annual harvests from NCIMA waters (Appendix Table A19, Figure 19). Anglers fishing these waters have harvested an average of 8,217 Arctic grayling from 1977 through 1990. The average harvest of Arctic grayling from the West Cook Inlet-West Susitna River and Knik Arm Drainage Areas has been 5,936 and 5,086 Arctic grayling, respectively, over this period (Appendix Tables A20 and A21). Major fisheries for wild stocks of Arctic grayling in the West Cook Inlet-West Susitna River Drainage Area occur in the Deshka River, Lake Creek, Alexander Creek, and the Talachulitna River. Major fisheries for hatchery stocks of Arctic grayling in the Knik Arm Drainage Area occur in the various lakes of the Knik Arm basin, notably in Upper and Lower Bonnie lakes and the lakes of the Kepler Lakes complex.

Recreational anglers have harvested an average of 17,170 Dolly Varden from NCIMA waters from 1977 through 1990 (Table 12, Figure 20). A record harvest of 20,310 Dolly Varden occurred in 1981. The Knik Arm Drainage Area has supported the largest proportion of the annual harvest from NCIMA waters. Anglers fishing these waters have harvested an average of 10,938 Dolly Varden from 1977 through 1990 (Appendix Table A22, Figure 20). Wild stocks that occur in the tributaries of the Knik River have supported the largest proportion of the annual harvest of this species from the Knik Arm Drainage Area. The average harvest of Dolly Varden from the West Cook Inlet/West Susitna River and East Susitna River Drainage Areas has been 2,477 and 3,756 Dolly Varden, respectively, over this period (Appendix Tables A23 and A24). Major fisheries for wild stocks of Dolly Varden in these areas occur in the various tributaries to the Susitna River, notably the Talkeetna River.

Nearly all of the landlocked salmon harvested by anglers fishing NCIMA waters from 1977 through 1990 have been harvested from Knik Arm Drainage Area lakes (Table 12, Figure 21). The average harvest of landlocked salmon form the Knik Arm Drainage Area has been 16,932 with a record harvest of 26,917 landlocked salmon occurring in 1977 (Appendix Table A25). The hatchery-reared

landlocked salmon that are stocked into various lakes of the Knik Arm basin, notably in Finger, Memory, and Lucille lakes and lakes of the Kepler Lakes complex have supported the largest proportion of the annual harvests of landlocked salmon from this drainage area (Appendix Tables A25 and A26).

Anglers fishing NCIMA waters have harvested an average of 2,263 lake trout since 1977, harvesting a record 3,532 lake trout during 1983 (Table 12, Figure 22). Several lakes in the NCIMA support populations of lake trout targeted by anglers, the most popular being the lakes of the Nancy Lake State Recreation Area (Appendix Tables A27-A29). An average of 2,780 smelt have been harvested by sport anglers from NCIMA waters since 1977 (Table 12, Figure 23), with nearly all the harvest occurring in the Susitna River drainage (Appendix Tables A30 and A31). Whitefish are also harvested by anglers, often as a bycatch to other species. Since 1977, anglers have harvested an average of 1,204 whitefish from NCIMA waters (Table 12, Figure 24, Appendix Tables A32-A34).

Burbot are a popular target of recreational anglers, especially during the winter. Since 1977, anglers have harvested an average of 1,969 burbot from NCIMA waters (Table 12, Figure 25). This harvest has been split between the various rivers and lakes of the NCIMA (Appendix Tables A35-A37). Although not indigenous to the NCIMA, northern pike have become an increasingly popular target of anglers. Since 1977, anglers fishing NCIMA waters have harvested an average of 1,396 northern pike (Table 12, Figure 26). The Fish Lakes and lakes within the Nancy Lake State Recreation Area, Alexander Lake, and lakes of the Yentna River drainage are the most prominent northern pike fisheries (Appendix Table A38 and A39).

The postal survey (Mills 1991) includes an "other fish" category for species reported harvested by recreational anglers, but not specified on the survey form. In general, the numbers of these other fish harvested have fallen as additional species have been added to the survey form (Table 12, Figure 27, Appendix Tables A40-A42).

Recreational Fish Catch and Release

Estimates of the number of fish caught and released by anglers fishing NCIMA waters became available for the first time during 1990 (Mills 1991). These estimates show that in addition to the 191,904 fish that recreational anglers caught and kept (harvested) while fishing NCIMA waters during 1990, an additional 352,593 fish were caught and released (Table 13). Thus, based on a total estimated catch of 544,497 fish, 65% of the total fish caught by recreational anglers fishing NCIMA waters during 1990 were released (Figure 28).

Considerable variability exists in the percent of fish released by anglers during 1990 (Figure 28). For example, 59% of the fish caught by anglers fishing the Knik Arm Drainage Area were released whereas nearly 70% of the total fish caught by anglers fishing the East Susitna River and West Cook Inlet-West Susitna River Drainage Areas, were released (Table 14).

Considerable variability also exists in the percent of fish released by anglers fishing NCIMA waters during 1990 depending on the species caught (Table 14). For example, none of the smelt caught were released whereas 85% pink salmon caught from NCIMA waters were released (Figure 29). Species with the highest release rates included pink and chum salmon (85% and 83%, respectively), northern pike (83%), Arctic grayling (82%), other fish (75%) and rainbow trout (75%). Species with the lowest release rates included smelt (0%), burbot (23%), and whitefish (33%).

Commercial, Subsistence, and Personal-Use Fish Harvests

Salmon returning to the NCIMA are also harvested by various commercial set and drift gill net fisheries located throughout Upper Cook Inlet. In nearly all cases, harvests in the commercial fisheries are much larger than in NCIMA sport fisheries (Figure 30). From 1977 through 1990, nearly 78 million salmon were harvested by the various commercial fisheries of Upper Cook Inlet, whereas during this same period only about 1.5 million salmon were harvested by recreational anglers (Tables 12 and 15). Chinook salmon are the exception,

where about equal numbers are harvested by recreational and commercial fisheries.

It is generally believed that not all commercial fisheries in Upper Cook Inlet intercept NCIMA salmon stocks equally. For purposes of management, it has generally been assumed that NCIMA salmon stocks are intercepted in the drift net and Western District set net fisheries of the Central District (Appendix Tables B1-B3) and in the set net fisheries of the Northern District (Appendix Tables B4-B6) to a larger extent than in other commercial fishing districts (Figure 31). Although quantifiable estimates of contribution to these commercial fisheries by specific stock units are not available for many of the species, a high proportion of the harvests in the Northern District set net fisheries is assumed to be composed of NCIMA stocks whereas the proportional harvests of NCIMA salmon stocks in the Central District drift and set net fisheries is assumed to be dependent on both time and area fished.

Fish stocks of the NCIMA are also harvested in various subsistence and personal-use fisheries. These include the Fish Creek personal-use salmon fishery, the Knik Arm subsistence salmon fishery, and the Tyonek subsistence salmon fishery. Generally, harvests in these fisheries are small in comparison to the commercial and sport salmon harvests.

Economic Value of Sport Fisheries

Direct estimates are available to assess the economic value of the NCIMA recreational fisheries (Jones and Stokes 1987). During 1986, the economic value of the sport fisheries of the NCIMA was estimated to be approximately 29 million dollars (Table 16). This compares to an estimated value of 127 million dollars for Southcentral Alaska sport fisheries during 1986 (Jones and Stokes 1987). Resident anglers expended about 18.5 million dollars whereas nonresident anglers expended about 10.5 million dollars.

The Jones and Stokes survey also provided estimates of the direct expenditures for selected NCIMA fisheries (Table 17). These data suggest that considerable variability exists in amount of money expended by anglers depending upon the species and location fished. Generally, anglers spent more money fishing for

chinook and coho salmon than for hatchery-reared fish stocked into lakes. Also, anglers expended more money fishing remote locations than road-accessible locations.

Existing Management Plans

Several Alaska Board of Fisheries policies and plans provide the Department of Fish and Game (ADF&G) with management direction for the NCIMA fish stocks. These include the:

1. Upper Cook Inlet Salmon Management Plan (5 AAC 21.363);
2. Northern District Chinook Salmon Management Plan (5 AAC 21.366);
3. Fish Creek Sockeye Salmon Management Plan (5 AAC 21.364);
4. Big River Sockeye Salmon Management Plan (5 AAC 21.368);
5. Little Susitna River Coho Salmon Management Plan; and,
6. Cook Inlet & Copper River Basin Rainbow/Steelhead Trout Management Policy.

The Upper Cook Inlet Salmon Management Plan provides the Department direction towards managing the sport and commercial harvests of Cook Inlet salmon. This plan, which was adopted by the Board of Fisheries as a formal regulation in 1981 can be broken into the following allocative components:

1. provide for a subsistence priority;
2. manage the Susitna River chinook salmon, early Russian River sockeye salmon, and early Kenai River chinook salmon returns, which normally move through Upper Cook Inlet prior to June 30, primarily for recreation use;
3. manage those stocks moving through upper Cook Inlet between July 1 and August 15 primarily for commercial uses;
4. after August 15, manage stocks moving to Kenai Peninsula drainages primarily for recreation use;
5. manage stocks other than those spawning in Kenai Peninsula drainages primarily for commercial uses; and,
6. minimize the incidental commercial harvest of Susitna River coho salmon, late Kenai River chinook salmon, and early Kenai River coho salmon.

This plan clearly states that chinook salmon bound for the NCIMA are to be managed primarily for recreational uses because these fish stocks move through upper Cook Inlet prior to June 30. On the other hand, virtually all other NCIMA salmon are managed primarily for commercial uses because these salmon pass through upper Cook Inlet after June 30. Language that directs the Department to minimize the incidental commercial harvest of specific stocks, such as Susitna River coho salmon, has created user confusion and controversy.

In 1985 the Alaska Board of Fisheries adopted the Northern District Chinook Salmon Management Plan which provides for a commercial harvest of up to 12,500 chinook salmon bound for NCIMA streams. The Alaska Board of Fisheries also sanctions a subsistence fishery for the village of Tyonek which targets salmon stocks bound for NCIMA. This fishery has been regulated by a 4,200 chinook salmon harvest quota since 1980 (5 AAC 01.560).

The Big River Sockeye Salmon Management Plan authorizes a harvest of Big River salmon by set gill nets in the Kustatan subdistrict of the Central district. This fishing extends from May 25 through June 24, but is subject to emergency closure when the incidental harvest of chinook salmon exceeds 1,000 fish.

In 1986 the Alaska Board of Fisheries adopted the Fish Creek Sockeye Salmon Management Plan (5 AAC 21.364) which governs the harvest of Fish Creek sockeye salmon in excess of the system's 50,000 escapement goal. This plan provides for a terminal set gill net fishery in Knik Arm near the mouth of Fish Creek through July 29. On July 30, a personal use dip net fishery in Fish Creek (5 AAC 77.545) replaces the set net gill fishery. This fishery closes the second Friday in August or earlier if interception of coho salmon becomes a conservation concern.

In 1990, the Alaska Board of Fisheries adopted the Little Susitna River Coho Salmon Management Plan. This plan provides the Department management guidelines to ensure that:

1. a spawning escapement of 7,500 nonhatchery produced coho salmon into the Little Susitna River upstream of the George Parks Highway is achieved, and

2. the harvest of hatchery-produced coho salmon returning to the Little Susitna River is maximized.

During 1986 the Alaska Board of Fisheries adopted the Rainbow/Steelhead Trout Management Policy for Cook Inlet Waters. This policy provides future Fisheries Boards, ADF&G managers, and the sport fishing public with the following:

1. management policies and implementation directives for Cook Inlet rainbow and steelhead trout;
2. a systematic approach to developing sport fishing regulations that includes a process for rational selection of waters for such special management as catch and release, trophy areas and high yield fisheries; and,
3. recommended research objectives.

Fisheries for other species not covered by the above management plans or policies are managed to assure for sustained yield of the targeted fish stock while assuring for the continued, and where possible, the expanded opportunity to participate in the fishery.

It is anticipated that specific objectives will be developed in the future for the management of other fisheries in the NCIMA. To guide the establishment of these objectives, the Division of Sport Fish recommended several priority criteria (internal memo from Norval Netsch, Sport Fish Director to Carl Rosier, Fish and Game Commissioner, dated 3/27/91):

1. **Management and protection of existing fish resources.** This criteria directs that the Divisional activities should strive to manage and protect Alaska's wild stocks of fish resources for future generations.
2. **Public use and benefits of existing fish resources.** This criteria directs that Divisional activities should strive towards making Alaska's fishery resources available for public use and benefit on a sustained yield basis.
3. **Rehabilitation of depressed stocks and damaged habitat.** This criteria directs that Divisional activities should strive to restore and maintain fish habitat damaged by man's activities.

4. **Enhancement of natural production or creation of new opportunities.** This criteria directs that the Division should pursue creation of new sport fishing opportunities through rehabilitation of natural stocks or creation of new fisheries where these opportunities do not negatively affect other fisheries.

Participation of the public in the development of specific objectives for each fishery is desired and will be solicited.

Stocking Program Inventory

Stocking has been used to increase and diversify the opportunities available to anglers fishing NCIMA waters. Various species and life stages have historically been stocked including anadromous chinook and coho salmon and landlocked salmon, rainbow trout, Dolly Varden, and Arctic grayling. Nearly all stocking has taken place within waters of the Knik Arm drainage; however, some stocking has occurred in remote waters of the NCIMA.

During 1990, just over 5 million fish were stocked into NCIMA waters (Table 18, Appendix Table C1). About half of these stockings consisted of anadromous coho salmon fingerlings (Figure 32). Because of poor returns from these stockings, plants of anadromous coho salmon fingerlings ceased in 1991. During 1991, just under 3 million fish were stocked into waters of the NCIMA (Table 18, Appendix Table C1). About two-thirds (64%) of the stockings comprised plants of fry, fingerlings, or subcatchables into landlocked lakes; of these, the majority consisted of rainbow trout fingerlings (Figure 32). Other species stocked into landlocked lakes included coho salmon fingerlings, Arctic grayling fingerlings and fry, rainbow trout fry and subcatchables, Arctic char fry and fingerlings, and lake trout fingerlings. Anadromous coho and chinook salmon smolt were also stocked into various Susitna River and Knik Arm drainages during 1990. During 1992, ADF&G plans on releasing similar numbers of fish into NCIMA waters (Table 18, Figure 32).

A major expansion of anadromous coho salmon smolt stocking is planned for 1992 and 1993 (Delaney and Vincent-Lang 1990). These stockings will be done in the Little Susitna River and Cottonwood, Fish, and Wasilla creeks plus other

Anchorage area streams. These stockings are being done to increase recreational angler opportunity for coho salmon in the Upper Cook Inlet urban area.

Ongoing Research and Management Activities

There are seven major research programs ongoing in the NCIMA. These include:

1. creel and escapement studies to assess the annual returns of chinook salmon to the Susitna River drainage;
2. creel and escapement studies to assess the annual returns of wild and hatchery chinook salmon to the Willow Creek drainage;
3. assessment of the rainbow trout stocks of the Susitna River basin;
4. assessment of stocking strategies for rainbow trout in Big Lake;
5. assessment of stocking strategies for landlocked lakes in the Knik Arm basin;
6. creel and escapement studies to assess the annual returns of wild and hatchery coho salmon to the Little Susitna River; and,
7. assessment of the wild and hatchery coho salmon stocks of Upper Cook Inlet.

There are several routine management activities that occur in the NCIMA. These activities include:

1. participation in the Alaska Board of Fisheries process;
2. fishery monitoring and inseason fishery management;
3. involvement with the public;
4. enforcement of fishing regulations;
5. habitat monitoring and permit review; and,
6. assisting the FRED Division with annual fish stockings.

Partnership, Aquatic Education, and Viewing Activities

In many areas of Alaska, the public is increasingly requesting the opportunity to view fish, their various behaviors, and the research being conducted to evaluate them. Due to the accessibility of much of the NCIMA, numerous opportunities exist along many of the road accessible streams for the public to

observe fish and their behaviors. This is particularly true for salmon and salmon spawning. Also, research programs conducted to evaluate NCIMA fish stocks are ongoing on many road-accessible streams. Activities include operation of salmon counting weirs, tagging studies, fish stocking activities, and creel and escapement surveys. A salmon viewing platform is maintained by the Matanuska-Susitna Borough at the outlet of Big Lake on Fish Creek. The Bodenburg Creek sockeye salmon stock is managed by ADF&G primarily for viewing purposes. An ADF&G educational/informational sign and parking are available at the principal viewing site on Bodenburg Creek.

There are no partnership or aquatic education programs ongoing in the NCIMA.

Access Programs

The Federal Aid program stipulates that a portion of the federal funds transferred to the states as part of the Dingle-Johnson Act be used to increase opportunities for angler access to sport fisheries. In the NCIMA, funds are currently spent in four general areas to increase angler access to sport fisheries. These include:

1. land and right-of-way acquisition;
2. management of previously acquired lands and right-of-ways;
3. development of previously acquired lands and right-of-ways; and,
4. maintenance of previously acquired lands and right-of-ways.

The status of the various projects currently underway in each of these categories is presented in Figure 33.

SECTION II: MAJOR FISHERIES OVERVIEW

Northern Cook Inlet Chinook Salmon Fisheries

Chinook salmon runs to the NCIMA collectively comprise the largest stock of this species within the entire Cook Inlet drainage. Cook Inlet chinook salmon have been harvested commercially since 1982. Approximately 40,000 chinook salmon of Northern Cook Inlet (NCI) origin were harvested annually through 1940 by set gill nets and traps. Historical data suggest that for nearly half a century an average harvest of about 40,000 fish may have been at or approaching the sustained yield for the collective chinook salmon stocks of Northern Cook Inlet (Figure 34).

Drift gill net gear first appeared in the Inlet about 1942 and a substantial drift fishery developed rapidly. Growth of the drift fishery catalyzed conservation concerns for chinook salmon because the harvest of this species increased rapidly as the drift fishery expanded. During the period 1941 through 1951, for example, the collective commercial harvest of chinook salmon of NCI origin rose to an average of nearly 85,000 fish annually with a peak harvest of 150,000 occurring in 1951. The level of harvest during this era was considered excessive. In 1953 drift gill nets were prohibited from fishing in the Northern District of Cook Inlet in order to reduce interception of northern chinook salmon. Thereafter, the annual harvest of chinook salmon of NCI origin declined steadily to less than 15,000 fish in 1963 despite increased set gill net fishing effort.

Subsistence/personal use and sport fisheries also harvested NCI chinook salmon prior to the early 1960s but these fisheries were not precisely monitored. These noncommercial harvests were believed, however, to have been very minor relative to the associated commercial harvest.

Commercial, subsistence, and sport chinook salmon fisheries were closed in 1964 and 1965 throughout NCI because of the dramatic decline in chinook salmon abundance. Very conservative sport fisheries were reestablished at the Deshka River, Lake Creek, Alexander Creek and Clear Creek from 1966 through 1969. These limited fisheries were controlled by a harvest card system and a collective seasonal harvest quota of 250 chinook salmon. In 1970, the harvest quota

increased to 1,000 fish and Ship Creek reopened to chinook salmon fishing. The following year the Little Susitna River and Willow Creek opened to fishing and the area-wide harvest quota was eliminated. In 1971, a restricted commercial fishery, consisting of two 12-hour fishing periods, was also allowed for the first time since 1965 within the Northern District. A similar commercial fishery continued in 1972 and sport fisheries within the NCIMA remained unchanged from those authorized in 1971. The 1971 and 1972 Northern District commercial harvests were 9,600 and 4,900 chinook salmon, respectively. An estimated 530 chinook salmon were harvested by anglers in 1971, followed by a harvest of 506 fish in 1972.

All sport and commercial chinook salmon fisheries closed once again in 1973 because of weak escapement indices during the previous two years. Escapement surveys of sufficient coverage to provide approximate estimates of total spawning abundance were initiated in 1973 for the NCIMA. Escapement estimates from 1973 through 1975 ranged from 11,500 to 15,800 chinook salmon. Comparable estimates from 1976 through 1979, however, increased substantially and ranged from 70,000 to 95,000 spawners.

In 1979, selected chinook salmon fisheries within the NCIMA reopened to sport fishing. Each fishery was governed by an individual harvest quota ranging from 200 to as many as 7,000 chinook salmon. Cautious incremental expansion of fishing opportunity has characterized the areas chinook fisheries since 1979. Regulatory strategies that governed these developing fisheries are detailed in Appendix D. The NCIMA's sport harvest increased from 7,964 in 1979 to 38,207 chinook salmon in 1989. The 1990 estimated chinook harvest was 32,977 fish of which 2,489 were less then 16 inches in length.

A subsistence set gill net fishery was authorized at the village of Tyonek in 1980. This fishery is presently regulated by a 4,200 chinook salmon harvest quota, however, the annual harvest has never exceeded 2,800 fish. The 1989 and 1990 subsistence harvests were 1,202 and 797 chinook salmon, respectively (Table 19).

A commercial set gill net fishery for chinook salmon reopened in the Northern District during 1986 after 13 years of closure. This fishery has been managed

under a 12,500 fish harvest quota since the inception of the Northern District King Salmon Management Plan. The 1989 and 1990 Northern District commercial harvests were 12,731 and 9,582 chinook salmon, respectively (Table 20). Chinook salmon originating from the NCIMA also contribute incidentally to commercial fisheries located within the western waters of the Central District of Cook Inlet. Harvests from the westside of the Central District in 1989 and 1990 were 3,092 and 1,763 chinook salmon, respectively.

The combined freshwater and marine harvest of northern chinook salmon in 1989 and 1990 was approximately 53,000 and 43,000 fish, respectively. A direct comparison of current and historical harvests is somewhat difficult because the stock composition of the marine harvest is not precisely known for Cook Inlet. The time and location of the marine harvest, however, strongly suggests that most fish from the western side of the Central District and those harvested within the Northern District are NCIMA stocks. If this assumption is correct about 80% of the entire historical harvest (prior to 1963) of Cook Inlet chinook salmon probably consisted of fish bound for the NCIMA. If this apportionment is accurate it appears that a sustainable annual harvest for the northern stock may be greater than 38,000 but less than 85,000 chinook salmon. This postulate recognizes that an average annual harvest of nearly 38,000 chinook salmon (i.e., 80% of Cook Inlet total harvest) was sustained for half a century whereas an average harvest of about 85,000 fish (1941-1951) represented over exploitation and ultimately sharply reduced abundance.

Any macro comparison of past and present harvests must, of course, take into account that stocks from the NCIMA may have been or are now being exploited by undocumented fisheries beyond the confines of Cook Inlet. The magnitude of such harvest may also vary through time. A review of past and present harvests must further consider that the majority of the historical harvest within Cook Inlet was taken by gill nets consisting of 8 to 9 inch stretch mesh. Such nets selectively harvest a larger proportion of females than males. The harvest from large mesh gill nets, for example, will commonly consist of 50% females whereas the actual chinook salmon run may only contain 30% to 40% females. All Cook Inlet gill net fisheries that currently target chinook salmon have been restricted to six inch or smaller mesh since 1980.

The harvest from smaller mesh nets more closely reflects the sex and size proportions of fish in the actual spawning run.

Sport fisheries within the NCIMA are primarily managed according to the abundance of tributary substocks. The sport harvest closely resembles the age, sex and length characteristics of the fish that comprises the respective substocks. Inseason emergency regulations are employed, where necessary, to balance sport harvest demands with harvestable substock surpluses.

Harvest strategies for NCI chinook salmon have unquestionably changed dramatically since the 1890s. The fishery has slowly evolved from a mixed-stock commercial harvest that contained a proportionately high number of females to a recreational dominate harvest that primarily targets a multitude of discrete substocks. Although past and present fisheries are not directly comparable it is noteworthy that recent harvests are at or below historic levels that resulted in severely depressed stock abundance.

Escapement indices since the mid-1970s suggest total returns (harvest and escapement) in the range of 125,000 to 200,000 chinook salmon annually. The NCI chinook salmon stocks as a whole are presently considered to be in a relatively stable and healthy condition. It is noteworthy that the abundance of NCI chinook salmon increased dramatically in 1976, the year that the Magnuson Fishery Conservation and Management Act was enacted. This act, sometimes known as the 200-mile limit law, extended fishing management authorities into waters from 3 to 200 miles of the United States coast. The effects of the "200-mile limit" on Cook Inlet chinook salmon are not fully understood, however, it seems likely that the act and its associated fishery management plans benefited NCI chinook salmon.

1990 Season:

Apprehension characterized the early arrival of NCI chinook salmon in 1990. Potential negative impacts associated with severe flooding in 1986 were responsible for this concern. Two of the three major age classes that comprised the 1990 return had been exposed to the flood. Two-ocean chinook salmon (i.e., fish in their fourth year of life) had experienced the flood as

incubating eggs whereas 3-ocean fish (i.e., fish in their fifth year) were exposed to the flood as fingerlings.

Assessment of chinook salmon abundance began as the run entered the Tyonek subsistence and Northern District commercial gill net fisheries. A total of 797 chinook salmon was harvested for subsistence according to returns from 36 of 42 permit holders. This harvest was well below the previous 10 year average of 1,813 chinook salmon, however, the number of permit holders was also lower than in the past (Table 19). The harvest rates for permitted subsistence fishermen was about 20% below average in 1990.

The Northern District commercial harvest of 9,582 chinook salmon was also the smallest since this fishery was authorized in 1986. Prior harvests had ranged from 12,731 to 15,488 chinook salmon annually (Table 20).

The 1990 sport harvest of 31,013 chinook salmon from the NCIMA was about 5,500 fish less than the record 1989 harvest. The 1990 performance of major chinook salmon sport fisheries are discussed in the following fishing overviews.

Little Susitna River Chinook Salmon Fishery

Background and Historical Perspective:

The Little Susitna River, located in the Knik Arm Drainage Area supports a major chinook salmon fishery as well as the largest coho fishery in the NCIMA. Collectively, these two salmon fisheries are the largest in terms of effort in NCIMA. Chinook salmon bound for the Little Susitna River are also harvested in the Tyonek subsistence fishery, in the Northern and Central District commercial fisheries, and probably some are harvested during saltwater sport fisheries adjacent to the Kenai Peninsula.

Access to the Little Susitna River occurs at three primary locations. Inter-tidal waters of the river are accessed by boats crossing the marine waters of Knik Arm from a public launch at Ship Creek in Anchorage. The Burma Road public launch and campground, located at River Mile 28 of the Little Susitna River, is the heaviest used access to the Little Susitna River. Private and

public launches near the George Parks Highway provide access to the upper reaches of the river (Figure 35). Power boats can travel from the mouth of the river to the Parks Highway during periods of moderate to high stream discharge. However, during low flows travel can be dangerous or impossible for most boats between River Mile 28 and the Parks Highway at River Mile 70.

Chinook salmon return to the Little Susitna River from late May through early July with the peak immigration occurring about mid-June. Chinook salmon spawn from the Burma Road area upstream to Hatcher Pass. Few chinook salmon use tributaries for spawning. Peak spawning occurs during the last week of July.

Chinook salmon fishing is permitted from the river's mouth upstream to the Parks Highway, a distance of about 70 miles. The chinook salmon fishing season extends from January 1 through July 13 and the bag limit is one chinook salmon 16 inches or more in length, and two in possession.

Inseason harvest and fishing effort for chinook salmon have been estimated by onsite creel survey since 1979. The SWHS also provides harvests estimates for this fishery. According to the SWHS, the estimated annual harvest of chinook salmon from the Little Susitna River has averaged 1,504 fish 16 inches in length or more for the years 1979-1989 (Figure 36).

Escapement was first measured in 1988 by a weir located at River Mile 32.5. The 1988 and 1989 escapements, after adjustment for harvest upstream of the weir, were 7,373 and 4,081 chinook salmon, respectively. Fifty percent of the escapement passed through the weir by mid-June both years. The age composition of the harvest downstream of the weir was not significantly different from the age composition of escapements in 1988 nor in 1989 ($P>0.05$). Length at age of the harvest downstream from the weir was not significantly different from the length at age of escapements in 1988 nor in 1989 ($P>0.05$). During some years aerial assessment of chinook salmon escapement is not practical because of the river's semi-glacial waters.

Recent Fishery Performance:

The 1990 sport harvest of chinook salmon from the Little Susitna River was 1,813 fish, 16 inches or more in length, according to the SWHS. An additional 152 chinook salmon less than 16 inches were also harvested. The harvest of larger chinook salmon (16 inches or more in length) was the lowest since 1986 but above the mean since 1979 (Table 21). This harvest accounted for 6% of the total chinook salmon harvest from NCIMA waters during 1990.

A creel survey was conducted at the Burma Road public access site from June 4 through July 8, 1990. This survey estimated that 1,546 chinook salmon were harvested by anglers expending 40,461 angler-hours of fishing effort. An additional 340 chinook were caught and released. Boat angler fishing effort and harvest were 32,722 angler-hours and 1,489 chinook salmon, respectively. Shore anglers harvested an estimated 57 chinook during 7,749 angler hours. Forty-seven percent of the boat fishing effort and 40% of the harvest occurred downstream from the Burma Road access site. Peak effort and harvest occurred between June 11 and June 17 (Figure 37).

Both effort and harvest in 1990 were the lowest for the Burma Road site since 1986. A seasonal harvest rate of 0.038 chinook salmon per hour was, however, similar to harvest rates since 1986. High turbid stream flows during the early portion of the fishery were probably, at least in part, responsible for reduced participation and harvest.

It is important to recognize that the Burma Road creel survey did not monitor fisheries that occur near the Parks Highway nor anglers that access the river from the Ship Creek boat launch at Anchorage. Harvests from these components of the fishery would probably increase the total Little Susitna River harvest by 200-400 chinook salmon. As previously noted, the SWHS estimated 1,814 chinook salmon 16 inches or more in length for the entire fishery in 1990.

High stream discharge precluded erection and operation of a weir in 1990. The glacial condition of the river during the peak of chinook salmon spawning also prevented a reliable assessment of escapement.

Management Objectives:

No specific fishery objectives have been formally established for this stock. An underlying assumption of past and current management, however, has been to assure for sustained yield and, where possible, provide for expanded fishing opportunities. The inriver exploitation of Little Susitna River chinook salmon was approximately 35% in 1988 and 50% in 1989. This rate of harvest appears to be within an acceptable range for present levels of chinook salmon abundance.

Recent Board of Fisheries Action:

The Alaska Board of Fisheries eliminated the seasonal limit of five chinook salmon for all waters of the NCIMA during their December 1988 meeting. The 1989 season was the first year that a seasonal limit did not govern the area-wide harvest since the NCIMA reopened to chinook salmon fishing in 1979. During this same meeting the board also extended the chinook salmon season at the Little Susitna River from July 6 through July 13. Neither regulatoryR change had a significant effect on the harvest of, nor fishing effort for, chinook salmon at the Little Susitna River.

Current Issues:

There are several issues confronting the fishery resources of the Little Susitna River and the users of these resources. Allocation of the river's salmon resources between the formerly dominant upper river fishery (Parks Highway-Houston area) and the now dominant lower river fishery (Burma Road site) ranks as the highest of these issues. During the early 1980s, the majority of the fishing effort for, and harvest of, chinook salmon commonly occurred at the upper river fishery. Participation in the upper river fishery, however, began to decline rapidly in the mid-1980s when improved road access was constructed to the lower river (Burma Road site). The development of a support road for the Point McKenzie agriculture project was, to a large extent, responsible for shifting fishing effort from the upper to the lower river. Currently, about 90% of the fishing effort at the Little Susitna River occurs within the lower river fishery. Completion of a state maintained

campground and boat launch at the Burma Road site in 1990 further compliments the recent popularity of the lower river fishery.

Government officials and private business leaders from the City of Houston have requested, almost annually, that the lower river fishing be regulated to allow greater numbers of salmon to reach the upper river. To date the Board of Fisheries has not responded favorably to requests to alter the harvest advantage of the lower river fishery.

Officials from the City of Houston have also repeatedly petitioned the department to stock chinook salmon in the Little Susitna River. Although the system has not yet been the recipient of hatchery fish, the river is identified as a candidate for chinook salmon stocking in the department's five year stocking plan.

Extension of the South Big Lake Road to the Little Susitna River at River Mile 39.5 is yet another issue facing this fishery. Construction of road access to this location could substantially increase fishing effort along a portion of the river that presently receives light use due to limited access. Relatively few motorized boat anglers presently use this section of the river because the area features shallow water and numerous constricted channels. Spawning pink, chum, and chinook salmon are abundant within this river reach. Activities that promote increased motorized boat use in this area (i.e., a boat launch) could negatively affect salmon spawning and schooling behavior. A significant chinook salmon harvest from this portion of the river could result in reduced fishing opportunities upriver. This, of course, would inflame the previously identified allocation issue. The development of a substantial fishery adjacent to this proposed road may also mandate moving the fish enumeration weir upstream from the "new" fishery.

The Little Susitna River is one of six Susitna Basin rivers included in the Recreation Rivers Act. This Act was developed and passed by the Alaska legislature in 1988. The legislation was enacted to ensure that all state lands and waters within the six river corridors are maintained and enhanced for recreation and wildlife purposes. The Act assigned management of the corridors to the Alaska Department of Natural Resources and directed that

agency to develop a management plan for each river. The authorities of the Board of Fisheries and the Department of Fish and Game are not diminished by this legislation.

River management plans were finalized in 1990 and will be submitted to the 1991 legislature for approval. Temporal and spatial zoning of the Little Susitna River for motorized and nonmotorized boating are among the most controversial aspects of this plan. The proposed plan recommends alternating weekends for the use of motorized and nonmotorized boats from the Burma Road site upstream to River Mile 60.4. The alternating weekend concept only applies from May 15 through August 20. Many motorized boat users are firmly opposed to the zoning requirement whereas nonmotorized users strongly support the concept. Approximately 95% of the boat fishing effort that exits the fishery through the Burma Road site was from motorized craft in 1989. Restrictions on the use of motorized boats would therefore be expected to affect the distribution of fishing effort and harvest of Little Susitna River salmon.

The Little Susitna River recreational river plan further recommends standards and permit fees for commercial users of the river. In 1989, guided boat anglers accounted for 9% of the boat fishing effort and 21% of the chinook salmon harvest at the Burma Road site. Some Little Susitna River guides remain critical of the proposed commercial fee schedule and other standards recommended for guides. The plan, for example, proposes a first year commercial permit fee of $150 for resident and $450 for nonresident businesses. Additional drop-off/pick-up and per client day fees are recommended for succeeding years of the program.

Ongoing Research and Management Activities:

The Little Susitna River chinook salmon fishery has been monitored annually by inseason creel surveys since 1979. Harvest is also estimated annually by the SWHS. Escapements were measured by a weir in 1988 and 1989 but high water precluded erection of the weir in 1990.

Recommended Research and Management Activities:

The inseason creel survey should be eliminated in 1991 because managers have concluded that inseason restrictions are unlikely. Subsequent harvest trends for chinook salmon will be monitored solely by the SWHS. Operation of the salmon enumeration weir should, however, continue for inseason management purposes.

When the South Big Lake Road is constructed increased use of this portion of river is likely. A campground with sanitation facilities and foot paths to the river are recommended to protect natural resources from degradation. Motorized boats should be prohibited from landing or launching at this site.

East Susitna River Chinook Salmon Fisheries

Background and Historical Perspective:

The Susitna River originates in glaciers of the Talkeetna Mountains and then flows about 200 miles in a southerly direction before entering Cook Inlet near Anchorage (Figure 38). The silt laden waters of the Susitna River are supplemented by many clear water tributaries as the river flows seaward (Figure 39). The drainage encompasses about 20,000 square miles. Only the eastern portion of this vast drainage is accessible by paved road. The George Parks Highway (Alaska Route 1) parallels the Susitna River on the east in route to connecting Anchorage and Fairbanks. The Alaska Railroad, to a large extent, also parallels the east side of the Susitna River. Both transportation systems provide angler access to numerous eastside tributaries of the Susitna River.

The Talkeetna River joins the Susitna River about 98 miles upstream from Cook Inlet. This glacial system contains two major and numerous minor clear water tributaries that support chinook salmon. Clear Creek is the most prominent chinook fishery within the Talkeetna River drainage (Figure 40). The Talkeetna Spur Road provides access to the Talkeetna River, however, a boat is required to reach virtually all chinook salmon fisheries within the drainage. A public boat launch at the community of Talkeetna is the principle access to this drainage.

The main stem of the Susitna River upstream from its junction with the Talkeetna River is accessible only by boat or railroad. This portion of the drainage is referred to as the Upper Susitna River Area for management purposes. The launch at Talkeetna provides access to the area. Boat travel is relatively safe from the Talkeetna River upstream to the entrance of Devil's Canyon a distance of about 55 miles. Boat travel beyond the entrance to Devil's canyon is extremely hazardous and few boat operators ever venture past this location. Indian River and Portage Creek are the most prominent chinook salmon fisheries within the Upper Susitna River Area. Salmon can not migrate through the turbulent waters of Devil's canyon. The entrance to Devil's Canyon is about 150 miles upstream from Cook Inlet.

River reaches within and upstream from Devil's Canyon were evaluated as potential hydroelectric dam sites during the late 1970s and early 1980s. Significant scientific inquiry has been directed toward the area's hydroelectric potential as well as at determining possible environmental impacts of dam construction. Dam related studies were commissioned by the Alaska Power Authority, ADF&G, Susitna Hydro Aquatic Studies.

The Susitna River chinook salmon stock is generally considered to be the fourth largest in Alaska, smaller only than the Yukon, Kuskokwim and Nushagak river stocks. Chinook salmon returns to the drainage have exceeded 100,000 fish for over a decade. Escapement assessment suggests that the eastside Susitna River substocks annually comprise from 35% to 50% of the entire Susitna River chinook salmon escapement. Prairie Creek, a headwater tributary of the Talkeetna River, consistently receives the largest escapement within this portion of the Susitna River drainage.

The Susitna River from its junction with the Deshka River upstream to the Talkeetna River and all waters within 1/4 mile of the Susitna River are open to chinook salmon fishing each Saturday, Sunday and Monday for four consecutive weeks beginning the second Saturday in June. Included in these Saturday through Monday fisheries are Little Willow, Caswell, Sheep, Goose and Montana creeks. Each of these fisheries extends from the Susitna River upstream to the George Parks Highway. Willow Creek is open to chinook salmon fishing from January 1 through the third Monday in June and then reopens on a Saturday

through Monday basis for two consecutive weeks beginning the fourth Saturday in June. In addition, waters within a 1/4 mile radius of the Susitna River and the mouths of Sunshine and Birch creeks plus numerous small sloughs and creeks are open to chinook salmon fishing on a Saturday through Monday basis for four consecutive weeks starting the second Saturday in June.

The entire Talkeetna River drainage is open to chinook salmon fishing from January 1 through July 13. The Upper Susitna River Area (Talkeetna to Devil's Canyon) also has a similar season. This portion of the Susitna River is, however, designated as a trophy fishery for rainbow trout. Therefore only unbaited, single hook artificial lures are permitted as terminal gear.

The limits for all eastside Susitna River fisheries are one chinook salmon, 16 inches or more in length, per day and two in possession. The limits for fish under 16 inches in length are 10 per day and 10 in possession.

Since 1985 the eastside Susitna River fisheries have collectively provided about 25%-30% of the chinook salmon harvest from the NCIMA. The harvest of fish 16 inches or more in length has ranged from 6,898 to 8,510 during the period 1986-1989. An average harvest of 1,374 chinook salmon less than 16 inches in length also occurred during this same period.

Willow Creek, Talkeetna River and Sheep Creek traditionally produce the largest harvest of chinook salmon 16 inches or more in length. Since 1985 the average annual harvest for these fisheries was 2,084, 1,623 and 1,404 chinook salmon from Willow Creek, the Talkeetna River and Sheep Creek, respectively.

Few chinook salmon arrive at the mouths of eastside Susitna River tributaries prior to mid-June. The third and fourth "weekends" in June generally provide the majority of the harvest. Tagging studies have shown that eastside chinook salmon are subject to harvest at stream mouths both downstream and upstream from their natal stream. The magnitude of non-natal stream harvest has, however, not been clearly defined.

Very few chinook salmon arrive at the Talkeetna River prior to June 20. The Talkeetna River harvest peaks the last few days of June and during the first

week in July. The Upper Susitna River Area fishery has a run timing similar to that of the Talkeetna River.

Creel surveys were employed from 1979-1989 to monitor the effort for, and harvest of, chinook salmon at Willow Creek, Sheep Creek, Montana Creek and the Talkeetna River. Creel surveys have also been intermittently conducted at Goose Creek, Caswell Creek, Little Willow Creek and within the Upper Susitna River Area. Findings from these surveys have been documented in the Department of Fish and Game's annual Federal Aid in Fish Restoration reports.

Willow Creek was identified in 1981 as a candidate for chinook salmon stocking in the Cook Inlet Regional Salmon Enhancement Plan. Willow Creek was proposed, in part, as a stocking site because the river and adjoining lands were being considered for park status. Prior to 1985 the mouth of Willow Creek was accessible only by boat. The first two miles of a road to the mouth was built in 1985 and a trail at the terminus of the road provided foot access to the popular mouth fishing area. In 1988 the pioneer road was improved to a two lane all-weather-road. A small campground was also constructed near the mouth of Willow Creek during the spring of 1990.

In 1987 Alaska's legislature established the Willow Creek State Recreation Area (WCSRA). The recreation area encompassed the lower five miles of Willow Creek and its confluence with the Susitna River and included 3,583 acres of public land. In 1989 a cooperative management agreement was developed between the Alaska Department of Natural Resources (DNR), the Matanuska-Susitna Borough and the ADF&G. In 1990 a management plan was completed for the WCSRA which charts the course for the area's future. The Alaska Division of Parks and Outdoor Recreation has the responsibility for on site management of the WCSRA.

A chinook salmon smolt stocking program was initiated in 1985. With the exception of 1987, this stocking program was continued annually (Table 22). The stocking program has three primary goals. The first is to maintain the present quality and quantity of natural chinook salmon production. The second goal is to produce, through stocking, an additional 6,000 returning chinook salmon of which 4,000 would be available for harvest at Willow Creek annually.

The final goal is to provide 10,000 angler-days of additional chinook salmon fishing opportunity annually at Willow Creek. Annual plants of 200,000 chinook salmon smolts are expected to promote achievement of these program goals.

Recent Fishery Performance:

The 1990 harvest of chinook salmon 16 inches or more in length, was estimated by the SWHS to be 8,759 from East Susitna River fisheries. This was the highest harvest on record and represented 31% of the entire chinook salmon harvest from the NCIMA (Table 23). An additional 664 chinook salmon less than 16 inches in length were also harvested in 1990. The SWHS further estimated that 11,821 chinook salmon, 16 inches or more in length, were caught and released in 1990.

Willow Creek (3,069), Talkeetna River (2,222) and Sheep Creek (1,382), in that order, yielded the largest harvests among eastside tributaries. The combined harvest from these three fisheries represented 76% of the total eastside chinook salmon harvest in 1990. The Willow Creek and Talkeetna River harvests were the largest recorded for these respective fisheries.

A creel survey to estimate inseason harvest and effort was conducted at Willow Creek in 1990. The survey also estimated the contribution of hatchery fish to the sport harvest at Willow Creek. The survey revealed that 35,927 angler-hours of effort harvested 2,231 Chinook salmon, 16 inches or more in length, from the fishery at the stream's mouth. An additional 558 fish were harvested during 3,186 angler-hours of effort by anglers fishing near the George Parks Highway. Fishing effort between the highway and mouth was further estimated to be 4,512 angler-hours; however, this survey did not measure harvest from this portion of the fishery.

Hatchery fish comprised 42.5% of the harvest from the mouth fishery, however, no hatchery fish were observed during the survey at the highway. Two-ocean chinook salmon dominated the 1990 hatchery return.

Both harvest and effort were the highest recorded by inseason creel survey at Willow Creek. The fishery at the mouth supported 82% of the seasonal effort and 80% of the measured harvest. Improvements to the road that provides access to the mouth and construction of a public campground at the terminus of the road were at least partially responsible for increased effort in 1990. A strong hatchery supplemented return may also have attracted greater numbers of anglers to the fishery.

The Willow Creek fishery was extended from July 2 to July 4 by emergency order. The two-day extension resulted in an estimated harvest of 415 Chinook salmon during 8,433 angler-hours of effort.

Escapement indices for eastside chinook salmon suggested good spawning abundance for nearly all populations (Table 24). A below average escapement index count at Sheep Creek was a notable exception. The 1989 escapement index count at Sheep Creek was also below most previous counts. The annual estimated harvest has exceeded the corresponding escapement index value at Sheep Creek during the past four years. An exploitation rate of 50% or more appears probable for Sheep Creek. Exploitation at other eastside tributaries is generally less than 50%. Exploitation rates for eastside fisheries are based on the premise that most fish harvested from a specific confluence fishery have their origin in that respective tributary. This assumption, however, has not been confirmed and is likely violated during specific temporal periods.

Management Objectives:

No specific fishery objectives have been formally established for the eastside Susitna River chinook salmon fisheries. Current management strategies for fisheries that are accessed by the George Parks Highway generally attempt to provide maximum levels of sustained chinook salmon fishing opportunity. Full utilization of harvestable surplus in a sense is a management objectives of these "weekend only" fisheries. The Upper Susitna River Area, on the other hand, is managed for a sustained yield of trophy size rainbow trout. Chinook salmon fisheries within this area are managed for sustained stock yield but full utilization is not a primary objective. Fishery objectives for the

Willow Creek stocking program have been previously identified in the background section of this overview.

Recent Board of Fisheries Action:

In 1989 the Alaska Board of Fisheries provided for daily fishing at Willow Creek from January 1 through the third Monday in June. The fishery had previously been conducted on a Saturday through Monday basis. Fishing effort at Willow Creek prior to the third Monday in June during 1989 and 1990 was 20 and 21% of the seasonal total, respectively. Only 6% of the 1989 harvest and 14% of the 1990 seasonal harvest occurred when daily fishing was allowed.

The Board of Fisheries also opened the mouth of the Kashwitna River in 1989 to chinook salmon fishing on a Saturday through Monday basis for four consecutive weeks starting the second Saturday in June. Inseason observations suggest that less than 100 chinook salmon were harvested annually at this location in 1989 and 1990.

During the fall of 1990 the Board of Fisheries closed Larson Creek, a tributary of the Talkeetna River, to chinook salmon fishing. The Board also expanded the area open to chinook salmon fishing at Montana Creek by including an additional 1/4 mile of stream in the fishery. Both of these Board actions became effective in 1991.

Current Issues:

East Susitna River chinook salmon fisheries are relatively free of significant social issues. The Talkeetna River, as one of the six recreation rivers, is confronted with some of the guiding issues previously identified in the overview of the Little Susitna River chinook salmon fishery. Forty-four percent of the 1989 chinook salmon fishing effort at the Talkeetna River was by anglers using commercial transportation. Motorized and nonmotorized boating is not an important issue at the Talkeetna River because there are no proposals to restrict motorized boat use along river reaches that are presently used by this form of transportation.

A proposed public boat launch near the mouth of Willow Creek is an additional issue that is receiving public debate. The WCSRA master plan recommends a launch at this location, however, some motorized boat fishermen fear that development of a launch would result in the closure of Willow Creek to motorized boat use. The WCSRA master plan recommends that boat use on Willow Creek be evaluated after the proposed launch becomes operational. The WCSRA master plan further recommends tie-ups and anchoring restrictions for boats at the mouth fishery at Willow Creek. Some anglers participating in boat and shore fisheries have expressed opposing views regarding the proposed tie-up/anchoring restrictions. Other critics of the Willow Creek boat launch believe that a private launch (Deshka Landing) located about 4-1/2 miles south of Willow Creek adequately accommodates motorized boat fishing in this portion of the Susitna River drainage. This group contends that a "new" launch at Willow Creek would increase boat fishing participation at nearby fisheries that are already too congested.

Ongoing Research and Management Activities:

Research and management activities are currently being directed at development of a responsible chinook salmon stocking program at Willow Creek. Inseason assessment of harvest and escapement are important components of this investigation. Annual assessment of escapement is another ongoing activity associated with the East Susitna River fisheries. Escapement indexing in conjunction with harvest data from the SWHS are the primary elements used to manage these fisheries.

Cooperative management activities are also continuing with the Department of Natural Resources in regards to development of a recreation river management plan for the Talkeetna River. The Division of Sport Fish is additionally involved with the development of recreation support facilities at the mouth of Willow Creek. Federal Aid In Fish Restoration funds have been committed for improving trails, parking and/or camping facilities at the mouths of Willow, Caswell and Sheep Creeks.

Recommended Research and Management Activities:

The relationship between aerial index counts and total chinook salmon escapement is not clearly understood for Susitna River tributaries. Cursory observations within the Susitna River Basin and elsewhere in Alaska have suggested that perhaps only one half of the escapement may be counted by aerial methods. Pilot and observer skills, stream morphology, water clarity, salmon stream life, time of count plus other variables are known to influence the proportion of escapement that is enumerated by aerial observation.

Future demands for roadside chinook salmon fishing is almost certain to increase within the NCIMA. If most East Susitna River chinook salmon fisheries are to provide maximum sustained fishing opportunities, an improved understanding of total stock abundance exploited in these fisheries (harvest and escapement) will be required. Current methods of harvest monitoring appear adequate, but the present procedure for evaluating escapement does not yield total annual spawning abundance nor rate of exploitation. Research to calibrate aerial enumeration relative to total spawning abundance is recommended.

A better awareness of the relationship between index count and total escapement should also enhance public approval of existing and future management strategies. Increased utilization of Susitna River chinook salmon is beginning to catalyze public concern that some stocks are approaching a conservation crisis. This perception is particularly evident when the harvest of a specific stock approaches or exceeds the stock's escapement index value. In such situations the public sometimes mistakenly views the index count as absolute spawning abundance. Future staff interactions with the fishing public should attempt to eliminate this misconception. Research that more closely defines the proportion of escapement observed by aerial survey should help clarify the erroneous conclusions often associated with this method of enumeration.

West Susitna River Chinook Salmon Fisheries

Background and Historical Perspective:

Tributaries that drain into the Susitna River from the west support the largest chinook salmon populations within the NCIMA. Access to the relatively remote fisheries in this area is primarily by boat or aircraft. Susitna Landing, located at the mouth of the Kashwitna River, and Deshka Landing, located about 4 miles upstream from the Deshka River, are the principal boat access sites on the Susitna River. A few anglers also gain access to westside fisheries by traversing Cook Inlet from the Port of Anchorage. The Petersville Road provides the only vehicular access to this portion of the Susitna River drainage. This road allows access to the upper reaches of Deshka River and Peters Creek. The Yentna River is the largest westside tributary of the Susitna River. This glacial river joins the Susitna River about 30 miles upstream from Cook Inlet.

West Susitna River chinook salmon fisheries support the greatest fishing effort for, and harvest of, chinook salmon within the NCIMA. Participation in these fisheries is also increasing more rapidly than at other chinook salmon fisheries in the NCIMA. The harvest of chinook salmon, 16 inches or more in length, has ranged from 9,707 to 16,892 and averaged 13,052 during the period 1986-1989. An average harvest of 2,471 chinook salmon less than 16 inches in length also occurred during this same period (Table 25). West Susitna River tributaries normally provide about two-thirds of the annual chinook salmon harvest from the NCIMA.

The Deshka River, Alexander Creek, and Lake Creek support the largest chinook salmon fisheries in this portion of the Susitna River drainage. The collective harvest from these three fisheries represents nearly 85% of the annual chinook salmon harvest from the westside fisheries. The Deshka River consistently provides the largest chinook salmon harvest within the NCIMA. During the period 1986-1989 the annual Deshka River harvest has ranged from 4,457 to 6,843 and averaged 5,252 chinook salmon 16 inches or more in length. During this four year period the annual harvest at Alexander and Lake creeks averaged 3,075 and 2,579 chinook salmon, respectively (Table 26).

The peak harvest at the mouth of Alexander Creek (River Mile 10) normally occurs during the first week in June. The harvest at the mouth of the Deshka River (River Mile 40) peaks during mid-June whereas at Lake Creek (River Mile 64) the peak harvest usually takes place during the third week in June.

Harvest levels at major West Susitna River fisheries have increased substantially since 1979. Improved boat access, to a large extent, is responsible for the increased participation, and in turn harvest, at many West Susitna River fisheries. Prior to 1975 nearly all boaters accessed the western portion of the Susitna River drainage via a private launch at Willow Creek. This launch site, located near the George Parks Highway, required hazardous travel down Willow Creek in route to the Susitna River. Susitna Landing, a private launch at the confluence of the Susitna and Kashwitna rivers became operational in 1975. The Deshka River, Alexander Creek, and Lake Creek are located about 20, 51 and 64 river miles from Susitna Landing. The popularity of this direct launch into the Susitna River grew rapidly, and by 1984, the site accommodated 80% of the boating traffic to westside tributaries. Most of the remaining boaters, primarily those using airboats, continued to use Willow Creek to reach westside fisheries. During the fall of 1986, the Department of Fish and Game purchased Susitna Landing.

Deshka Landing, located on the east bank of the Susitna River about four miles upstream from the mouth of the Deshka River, became fully operational in 1988. This privately owned boat launch gained popularity immediately because the site reduced round trip travel to West Susitna River fisheries by 32 miles (i.e., Deshka River Landing is 16 river miles closer to major fisheries than Susitna Landing). In addition to eliminating many miles of sometimes hazardous river travel, the new launch also reduced time and transient cost. Deshka Landing's proximity to the Deshka River made the use of conventional propeller driven motors practical for travel to this fishery because at most river levels the Susitna River is relatively free of navigational challenges between Deshka Landing and the Deshka River.

Deshka Landing is currently the heaviest used boat launch on the Susitna River. The effect of this launch on chinook salmon fishing effort has not

been quantified, but field observations suggest that the site's convenient location has promoted increased participation.

Although improved access has undoubtedly increased both participation and harvest, it is important to recognize that liberalized regulations have also contributed to expanded use of the area's chinook salmon resources. Regulations governing westside fisheries since fishing for chinook salmon reopened in 1979 are described in Appendix D.

The chinook salmon fishing season at all West Susitna River fisheries extends through July 13. Bag and possession limits are two chinook salmon (16 inches or more in length) per day and four in possession of which only one daily and two in possession can be over 28 inches in length. With the exception of the Deshka and Chulitna rivers, all West Susitna River tributaries are open to chinook salmon fishing in their entirety. The Deshka River drainage is closed to chinook salmon fishing upstream from the Moose Creek/Kroto Creek forks and the entire Chulitna River drainage is likewise closed. Unbaited, single hook, artificial lures are mandatory within the Talachulitna River and in a large portion of the Lake Creek drainage. Unbaited, single hook, artificial lures are also required in the Deshka River upstream from the Moose Creek/Kroto Creek forks.

The Deshka River, Alexander Creek, Lake Creek and the Talachulitna River are included in the Recreation River Act. Draft management plans similar to those already discussed for the Little Susitna and Talkeetna rivers have been developed for legislative review and concurrence.

Commercial services play an important support role at some West Susitna River fisheries. Creel surveys in 1989, for example, revealed that 64% of the chinook salmon fishing effort at Lake Creek was supported by some form of commercial service such as fishing guides, lodges, and air charter. In contrast, commercial services were used by only 14% and 6% of the participants, respectively, at Alexander Creek and the Deshka River during 1989.

Spawning abundance at several West Susitna River tributaries has decreased during recent years. Notably, decreases have occurred at the Deshka River,

Lake Creek, and Alexander Creek. These decreases, coupled with increasing harvests, have raised concern for several of the more heavily exploited westside stocks.

Recent Fishery Performance:

In 1990, the westside tributaries of the Susitna River continued to support the greatest fishing effort for, and harvest of, chinook salmon in the NCIMA. High stream discharge reduced fishing success at many westside fisheries during the early stage of the season. Fishing conditions improved by mid-June and remained favorable until the season closed on July 13. The collective harvest from this area was estimated by the SWHS to be 15,660 chinook salmon 16 inches or more in length. This represents a slight decline from the record 16,892 chinook salmon harvested from the western drainages in 1989. An estimated 1,380 chinook salmon less than 16 inches in length were also harvested in 1990. The SWHS further estimated that 29,330 chinook salmon 16 inches or more in length were caught and released in 1990.

The Deshka River harvest was 5,675 chinook salmon 16 inches or more in length according to the SWHS. The 1990 harvest was second only to the 6,843 chinook salmon harvested in 1989. Unfavorable water conditions reduced the harvest at this fishery during the early part of the season. An escapement index count of 18,166 chinook salmon revealed that the Deshka River received a relatively strong, but below average, return in 1990.

At Alexander Creek, a record harvest of 4,703 chinook salmon 16 inches or more in length was recorded by the SWHS in 1990. Water conditions were generally favorable for fishing at this tributary throughout the season. The 1990 escapement index count was 2,596 fish. Escapement indices for Alexander Creek during the previous six years have ranged from 2,152 to 6,173 chinook salmon.

A creel survey to estimate harvest and fishing effort was conducted at Lake Creek during 1990 The estimated effort of 41,975 angler-hours was the highest recorded for this chinook salmon fishery. An estimated 38,778 angler-hours of effort in 1988 had previously been the highest level of participation recorded at Lake Creek. An estimated harvest of 3,138 chinook salmon 16 inches or more

in length was similar to the 1989 record harvest of 3,163. The 1990 escapement index count of 2,075 chinook salmon was the lowest recorded for Lake Creek since 1979. Indices from 1979 through 1989 have averaged 5,364 fish and ranged from 3,577 to 7,075 spawning chinook salmon. Escapement index counts for selected westside tributaries are shown in Table 27.

To estimate effort and distribution of fishing effort from the lower reaches of the Yentna and Skwentna river drainages, aerial counts of anglers were performed for the first time in 1990. The survey area included Fish Creek on Kroto Slough and creeks and sloughs entering the Yentna River as far upstream as Fourth of July Creek. Skwentna River tributaries were also surveyed as far upstream as Canyon Creek. Aerial surveys covered about 95 river miles within the census area (Figure 41).

Eighteen random aerial surveys between June 17 and July 11 provided an estimate of fishing effort of 12,688 angler-hours. One-third of this effort was observed at the mouth of the Talachulitna River. The mouths of Eight Mile and Gagnon creeks received the next heaviest fishing pressure with 14% and 13%, respectively, of the total effort (Table 28). Angler counts ranged from 0 to 95 and averaged 24.9 anglers per aerial survey. Anglers were observed at 14 different fishing sites within the survey area. At Donkey Creek, where fishing is only permitted on a Saturday through Mondays basis, aerial surveys revealed just two anglers per count. The highest count at Donkey Creek was eight anglers.

It should be recognized that this survey did not cover the early portion of the chinook salmon season, therefore, some fishing effort took place prior to the census. Most of this effort occurred at locations downstream from the confluence of the Skwentna and Yentna rivers. Fishing participation at the mouths of such tributaries as Fish Lakes Creek, Indian Creek, Moose Creek, Beaver Creek, and Fish Creek (Kroto Slough) was therefore greater than identified by this survey.

The aerial surveys did reveal very light fishing pressure scattered throughout the vast reaches of the Yentna River drainage. The distribution and magnitude

of this effort did not suggest that any surveyed water was in danger of over harvest because of heavy fishing pressure.

Management Objectives:

No specific fishery objectives have been formally established for most West Susitna River chinook salmon stocks. An underlying assumption of past and current management, however, has been to assure sustained yield, and where possible, provide for expanded fishing opportunities. Regulatory strategies for the western drainages of the Susitna River have consistently promoted increased fishing opportunities since the area reopened to chinook salmon fishing in 1979. As previously noted, virtually the entire area is currently open to daily fishing through July 13. Options for opening additional waters to chinook salmon fishing are therefore limited in this portion of the NCIMA.

Recent Board of Fisheries Actions:

The Alaska Board of Fisheries closed Donkey Creek, a Yentna River tributary, to all fishing each Tuesday through Friday from June 1 through September 30, 1989. During the fall of 1990 the board rescinded this closure. During their 1990 meeting the board also opened the East Fork of the Chulitna River drainage to chinook salmon fishing on a Saturday, Sunday and Monday basis for four weeks beginning the second Saturday in June. The Chulitna River fishery will become effective in 1991.

Current Issues:

The Deshka River, Lake Creek, and Alexander Creek account for an average of 60% of the observed recreational harvest of chinook salmon in the Susitna River drainage. At these three systems, recreational harvests have increased while observed spawning escapements have decreased in recent years. This raises concern that current harvest levels at these three streams are excessive and not sustainable. Other westside systems appear healthy and current harvest levels appear sustainable.

Timber development remains a controversial issue within the western drainages of the Susitna River. A major timber sale scheduled by DNR in 1988 catalyzed

both criticism and support. This proposed sale consisted of 200 million cubic feet of timber on 215,000 acres of public land. The Matanuska Susitna Borough, a proponent of a large scale timber products industry for the Susitna Basin, supported the state sale. The Susitna Valley Association (SVA), on the other hand, formed to oppose the timber sale. The SVA is a coalition of lodge owners, air taxi operators, fishing and hunting guides, private landowners in the effected area, environmentalists and other individuals. Critics of the proposed sale noted that large scale timber harvesting may not be compatible with existing recreational uses and supporting businesses. Opponents further claimed that the sale had been hastily prepared and lacked responsible planning. The ADF&G's assessment of the timber proposal also revealed insufficient pre-sale planning to ensure maintenance of fish and wildlife productivity in the affected area. Public debate surrounding the timber proposal prompted the DNR to postpone the sale until additional planning was completed.

In 1990, the DNR issued review drafts of the Susitna Forest Plan and Susitna Forest Guidelines. Recommendations and guidelines within these two documents describe the requirements for managing timber and for protecting other resources and land uses when timber is harvested from state lands within the Susitna Basin. Much of the 2 million acres encompassed by these DNR plans are located within the western drainages of the Susitna River. Timber management is expected to remain a debated issue within this portion of the Susitna Basin.

As previously noted, the Deshka River, Alexander Creek, Lake Creek and the Talachulitna River have been classified by the Alaska legislature as recreation rivers. Management plans for each of these rivers are being reviewed by the legislature. Motorized/nonmotorized restrictions and commercial use permits are the most controversial issues associated with this planning process. The Little Susitna River chinook salmon overview provides a discussion relating to recreation river issues that are also pertinent to some westside chinook salmon fisheries.

Improved or expanded access to the western drainages of the Susitna River is another issue confronting the fisheries and fishery users of this area.

Numerous recreational support industries that service the area, as well as residents of the area, favor retention of the region's wilderness (roadless) features. Many other interests support an expanded road system within the area which would promote development of mineral, forest, agriculture and recreation resources as well as enhance private settlement of the area.

Several transportation corridors have been identified within the western drainages of the Susitna River. These routes include but are not limited to the Chuitna Road, Link Road and the Oilwell Road extension. The Chuitna Road would extend from the South Big Lake Road to the Susitna River (see Little Susitna River chinook salmon overview for a discussion and location of the South Big Lake Road). The Link Road proposal would extend the Chuitna Road across the Susitna and Yentna rivers and ultimately connect with the Kahiltna and Kroto Creek roads. The proposed Oilwell Road extension would tie both the Kahiltna and Kroto Creek roads into the existing Petersville Road (Figure 42).

Construction of any or all of the proposed roads would significantly alter fishing uses and perhaps fishery resources within the western drainages of the Susitna River. Beneficial or negative impacts associated with improved road or boat access will almost certainly remain as debated issues in the years ahead. A major road system would undoubtedly change the wilderness characteristics that are presently offered at many of the area's chinook salmon fisheries.

Ongoing Research and Management Activities:

Escapement index counts have been performed annually on major West Susitna River chinook salmon populations since the mid-1970s. Harvest trends for most westside stocks have also been assessed by the SWHS since chinook salmon fishing reopened in 1979. Inseason creel surveys were conducted annually at the Deshka River, Alexander Creek and Lake Creek from 1979-1989. Inseason creel harvest estimates generally agree with annual estimates from the SWHS. Inseason surveys have also documented age, length, and sex features of major chinook salmon stocks. The distribution of chinook salmon fishing effort within the Yentna River drainage was estimated during 1990 only.

The Alaska Department of Fish and Game has consistently recognized the value of carefully planned timber development within the Susitna River Basin and remains actively involved in responsible forest planning. Considerable assistance and recommendations have been provided the Department of Natural Resources to ensure that future timber harvesting is conducted in ways that do not significantly reduce fishery productivity, adversely impact current fishery users, or negatively affect fishery support industries. Careful pre-sale planning, adequate inter agency and public involvement, appropriate environmental safe guards, and responsible follow up and enforcement are "keystone" objectives of the ADF&G's approach toward timber management within the Susitna Basin.

The ADF&G continues to be an active participant in the DNR directed planning process mandated by the Recreation River Act. Sport fishing has been identified as the most prominent public use on the four recreation rivers located on the west side of the Susitna River. Regulations that will ultimately be promulgated under the provisions of the Recreation River Act may directly or indirectly affect future fishing opportunities on the Deshka River, Alexander Creek, Lake Creek and the Talachulitna River.

Recommended Harvest and Management Activities:

Chinook salmon escapement monitoring similar to past levels of assessment should be continued. Harvest trends should likewise be evaluated annually by the SWHS. Surveys to estimate sport fishing effort for chinook salmon within the Yentna River drainage should be discontinued for at least three years. Inseason creel surveys should be initiated at Alexander Creek, Deshka River and at Lake Creek during the peak of the chinook salmon migration through the respective mouths of these streams. Harvest and catch rate data from these inseason creel surveys will be used to gauge the relative magnitude of the respective runs in terms of small, average or large. Age-length-sex information should also be acquired during these creel surveys.

There is also a need to better understand the relationships between escapement index counts and total spawner abundance. The rationale for researching this

relationship has previously been discussed in the East Susitna River chinook salmon overview.

West Cook Inlet Chinook Salmon Fisheries

Fishery Description and Historical Perspective:

The West Cook Inlet Area extends south from the mouth of the Susitna River to the west foreland of Cook Inlet (Figure 43). Streams of this area, with the exception of the Chakachatna-McArthur and the Beluga River drainages, are relatively small, clear water, coastal drainages that originate in the Alaska Range or from slopes of Mount Susitna. The Chakachatna-McArthur and Beluga River drainages are largely glacial and receive minor use by chinook salmon fishermen. Access to the coastal fisheries within the West Cook Inlet Area is by air or water because there is no road link to the Southcentral Alaska highway system. A road network, built to facilitate oil and gas exploration and the timber industry, does exist in the Tyonek/Beluga area. Several gravel aircraft landing strips are present and a few roads also serve as runways. The village of Tyonek, with a native population of nearly 300 people, is the area's primary human population center.

The Theodore, Chuit, and Lewis rivers are the area's most prominent chinook salmon fisheries. The collective annual harvest of chinook salmon 16 inches or more in length from these three streams has ranged from 1,399 to 2,077 since 1984 (Table 29).

The seasonal bag and possession limits for the area are identical to those previously described for the western drainages of the Susitna River. All waters of the West Cook Inlet Area are open to chinook salmon fishing. Chinook salmon begin to arrive in the area during late May, with the peak of most fisheries occurring during mid to late June. The stock is also harvested in Northern and Central District commercial fisheries and in the Tyonek subsistence fishery. Commercial fishing is permitted within 500 yards of the mouths of several streams.

Recent Fishery Performance:

The 1990 harvest from the Chuit River was 933 chinook salmon 16 inches or more in length. This was the largest harvest recorded for the Chuit River. An estimated harvest of 655 chinook salmon from the Theodore River was the lowest recorded. A harvest of 262 chinook salmon 16 inches or more in length from the Lewis River was slightly above average. The 1,850 chinook salmon harvested from these three streams in 1990 represent about 6% of the entire harvest of this species from the NCIMA.

Aerial and onsite creel observations were employed in 1990 to monitor fishing activities at the Theodore, Chuit and Lewis rivers. High turbid stream discharge characterized the early portion of the season at most West Cook Inlet fisheries. Both harvest and effort were judged to have been low during this period of high water. By mid-June the high water had subsided and water conditions then remained favorable to fishing during the balance of the season.

Onsite surveillance suggested relatively heavy fishing effort during the latter portion of the season. Effort was particularly heavy along the upper reaches of the Theodore and Chuit rivers because of increased use of helicopters for transportation. It was common for helicopter services to transport clients to the area by fixed-wing aircraft and then distribute these fishermen along the respective rivers by helicopter. In a sense these businesses were providing a shuttle air taxi service. Nearly all fishing effort was formerly confined to the lower, road-accessible reaches of the Chuit, Lewis and Theodore rivers.

Chinook salmon escapement counts at the Theodore, Chuit and Lewis rivers were among the lowest recorded. Because conditions were excellent during these surveys, the 1990 index values reflected significantly reduced spawning abundance. Escapement index counts for these three streams were also below average in 1989 (Table 27).

Sharply reduced spawning abundance can not be attributed solely to elevated participation and harvest. Weak returns were probably largely caused by

flood-related mortalities to eggs and juveniles that occurred in 1986. Inspection of the coastal streams after the October 1986 flood revealed substantial streambed scouring and rechannelization. The effects of the flood waters were exacerbated by severe erosion, land slides and subsequent deposition of earth and debris into the streams. Coastal drainages were considered to be among the most severely flood-impacted drainages in the NCIMA during 1986.

Management Objectives:

No specific fishery objectives have been formally established for the West Cook Inlet chinook salmon fisheries. An assumption of past and current fisheries management has been to assure for sustained yield of these stocks, and where possible, to accommodate expanded fishing opportunities.

Recent Board of Fisheries Actions:

There have been no specific actions taken by the Board of Fisheries regarding these fisheries during recent years.

Current Issues:

Declining chinook salmon spawning abundance has become a major concern facing their fisheries during the past two years. Some fishermen, particularly those that reside within the Tyonek/Beluga area, believe that increased use of the area by fishermen travelling to the area by helicopter is at least partially responsible for declining spawning abundance. Fishermen having this option are requesting controls or a ban on the transporting of fish and fishermen by helicopters.

There are also advocates of more restrictive harvest strategies for all users of West Cook Inlet chinook salmon. Proponents of harvest restrictions believe that fishing demand in the area is approaching, or currently exceeds, harvestable chinook salmon surpluses. These people support some combination of reduced season, bag limit, or harvest area to ensure sustained yields.

Another issue confronting the fishery resource of the West Cook Inlet Area relates to the development of the areas vast coal reserves. If developed, the proposed Diamond Chuitna Coal project would consist of a 12 million short ton per year surface mine within the Chuit River drainage. The proposed mine has a projected 34-year life and would encompass about 5,014 acres (Figure 44). Only 450 acres of pit are proposed to be open at one time. A port facility and linking road system would be built to ship the coal.

If appropriate environmental safe guards are not required or adhered to, development of the Diamond Chuitna mine could have a negative impact on the water quality and fish habitat within the Chuit River drainage. Impaired habitat, of course, would have a negative impact on the rivers fishery resources.

Construction employment for the coal project is projected to peak at 1,300 workers and the permanent mine work force would be about 850 workers. People associated with the construction and operation of the mine would undoubtedly increase sport fishing pressure on all fishery resources in the Tyonek/Beluga area. If the coal reserves of the area are developed, it will be necessary to have a management strategy in place that assures that fish availability harmonizes with expected increases in fishing effort.

Ongoing Research and Management Activities:

Research and management activities currently directed at these fisheries consist of periodic onsite creel observation, annual assessment of chinook salmon escapement by helicopter and estimation of annual harvest by the SWHS.

Recommended Research and Management Activities:

Declining spawning abundance during recent years indicates that a more conservative harvest strategy for chinook salmon is warranted. The 1991 chinook salmon return will consist of two age classes that were exposed to the catastrophic flood in 1986. A bag and possession limit of one chinook salmon 16 inches or more in length is therefore recommended for the 1991 season. During 1991, returns to the Theodore, Chuit and Lewis rivers should also be

closely monitored inseason by onsite creel and aerial observations. Appropriate emergency restrictions should be implemented, if necessary, to insure adequate escapement.

Demands on the chinook salmon stocks of the Tyonek/Beluga area are expected to increase. If so, it seems prudent to initiate a more conservative approach to managing these resources in the near future. Regulations that feature reduced chinook salmon exploitation should be proposed to the Board of Fisheries in 1992. Such regulatory proposals should target both the inriver sport fishery and commercial set gill net fishery that operates immediately adjacent to the mouths of several rivers in the area.

Northern Cook Inlet Coho Salmon Sport Fisheries

Management strategies for northern coho salmon begin to develop as the stocks enter Cook Inlet and are intercepted by the commercial fishery. The magnitude, catch per unit effort and distribution of the commercial harvest when tempered with fishing effort often becomes the first indicators of general run strength. As coho salmon enter fresh water the department currently has very limited abilities to gauge overall run size. Fishwheels and sonar at the Yentna River and counting weirs at the Little Susitna River and Fish Creek provide the only quantitative measure of coho abundance in the vast drainages of Northern Cook Inlet. Foot and aerial counts also provide an understanding of relative abundance for a few select systems.

A statistical inseason creel survey to estimate coho salmon harvest and fishing effort has been conducted at the Little Susitna River since 1982. Intermittent or partial creel census data are also collected from additional fisheries. Angler catch rates when considered with water conditions and fishing effort usually provide a crude index of coho abundance in terms of low, average, or high.

The SWHS is used to determine harvest trends from the NCIMA coho salmon sport fisheries. The anadromous coho salmon harvest, according to the SWHS has ranged from about 45,000 to 77,000 fish and averaged 57,000 coho salmon

annually during the period 1987 through 1989. This three year period easily represents the largest sport coho salmon harvests on record for these stock.

Stocks bound for NCIMA drainages normally comprise the major portion of the Upper Cook Inlet commercial harvest of coho salmon. Exploitation of northern coho salmon primarily occurs in the Central District drift fishery and, in turn, in the Northern District set net fishery. Commercial coho salmon harvests have been substantially above average since 1981. During the period 1981-1989, the total Upper Cook Inlet commercial harvest has ranged from 339,201 to 792,224 and averaged 557,585 coho salmon annually. The drift net fishery normally takes almost one-half of the Upper Cook Inlet commercial coho salmon harvest.

It is noteworthy that since 1987, deployment of the drift fishery has differed sharply from historic harvest strategies. In 1987 the drift fishery was, at times, maneuvered to specific areas to avoid spilled crude oil from the Glacier Bay oil tanker. The fleet was also confined to a corridor along the eastside beaches of the Kenai Peninsula for several fishing periods in an attempt to achieve a greater escapement of Susitna River sockeye salmon. During 1988, the drift fishery was once again frequently conducted within a 3-mile wide corridor along the Kenai Peninsula to improve sockeye salmon escapement to the Susitna River. The drift fishery was closed throughout the 1989 season because of the presence of crude oil from the Exxon oil spill. The Northern District set net fishery was also closed at strategic times during this three year period in an effort to enhance sockeye salmon escapement. Although manipulation of the drift fleet did not always fully achieve desired sockeye salmon escapements, the strategy has unquestionably increased coho salmon abundance within the NCIMA since 1987. Record coho salmon sport harvests reflect this increased inriver abundance.

1990 Season:

Initial harvest rates in the commercial drift net fishery suggested favorable coho salmon abundance. Once again, movement of the drift fishery into the 3-mile wide corridor was also a prominent harvest strategy. This tactic enhanced the passage of coho and sockeye salmon through the Central District

into the Northern District in 1990. The total Upper Cook Inlet commercial harvest of 500,026 coho salmon was comparable to harvests since 1981. The Northern District set net harvest of 139,401 coho salmon was among the highest since 1981. Coho salmon accounted for 43% of the entire Northern District harvest in 1990 and very strongly dominated the harvest after late July.

Inriver coho salmon abundance was judged to have been good throughout most of the NCIMA in 1990. The SWHS estimates the northern coho salmon harvest was 45,800 in 1990.

Little Susitna River Coho Salmon Fishery

Background and Historical Perspective:

The Little Susitna River consistently produces the second largest freshwater sport harvest of coho salmon in Alaska. Fishing effort in this fishery is typically greater than participation in the previously discussed Little Susitna River chinook salmon fishery. Coho salmon returning to this system are also harvested in various Cook Inlet commercial fisheries. Commercial set gill net fishing is permitted within 500 yards of the river's terminus.

Access to this fishery is identical to that previously described for the river's chinook salmon fishery. Improvements to lower river access roads have shifted fishing effort and harvest to the lower river where ocean-fresh coho salmon are available. As recently as 1982, for example, approximately 60% of the effort and 40% of the seasonal coho salmon harvest occurred at the upper river near the George Parks Highway. Over 90% of the seasonal effort for, and harvest of, coho salmon now takes place in the lower river near, or downstream from, the Burma Road public use facility.

Coho salmon return to the Little Susitna River from mid-July through late August. Run timing for coho salmon passing the department's weir located 34.5 miles from the river's mouth is shown in Figure 45. Tagging studies indicate that coho salmon migrate slowly up the Little Susitna River. Most fish remain available to the fishery for about four weeks before exiting to closed water upstream from the George Parks Highway. Spawning takes place from late

September through mid-October. Most spawning occurs upstream from the George Parks Highway in the main stem of the river. Some tributary spawning also takes place.

Supplemental coho salmon stocking has occurred at the Little Susitna River since 1982 (Table 30). Fingerling plants dominated the initial years of stocking but these releases generally yielded very poor results. Beginning in 1987 returns from smolt releases started to make significant contributions to the sport harvest. The contribution of hatchery fish to the sport harvest has ranged from 26% to 75% and averaged 51% during the 1987 through 1989 period.

Smolts were initially released into Nancy Lake which drains by Lake Creek into the Little Susitna River about six miles downstream from the George Parks Highway (Figure 35). Nancy Lake did not support an adult coho salmon run before stocking occurred, but substantial numbers of rearing coho salmon utilized this system. Adults of hatchery origin now return to Nancy Lake where some spawn in tributaries to the lake. Nancy Lake coho salmon currently provide all eggs for the Little Susitna River stocking program.

Coho salmon fishing is permitted from the river's mouth upstream to the George Parks Highway, a distance of about 70 river miles, throughout the year. The bag and possession limit is three salmon 16 inches or more in length. Anglers must curtail fishing at the Little Susitna River downstream from the Burma Road access site when the bag limit of coho salmon is harvested. A coho salmon intended to be released cannot be removed from the waters of the Little Susitna River. Prior studies have shown that catch and release of Little Susitna River coho salmon in or near intertidal waters causes high mortalities. Losses as high as 70% have been documented for coho salmon hooked and released in intertidal waters of the Little Susitna River.

Inseason coho salmon harvest and fishing effort have been estimated annually since 1981 by creel survey. The SWHS also provides harvest estimates for the fishery. The SWHS indicates that the annual coho salmon harvest ranged from 2,835 to 19,009 and averaged 8,312 fish from 1977 through 1989 (Table 31).

Escapements were measured by weir in 1986, 1988 and 1989. High water precluded a complete weir operation in 1987. Escapement in 1986, 1988 and 1989 were 6,999, 20,491 and 15,232 coho salmon, respectively. Prior to 1986, coho salmon escapement was indexed, when water conditions permitted, by ground and/or aerial methods (Table 32).

Creel and escapement observations have shown that coho salmon abundance at the Little Susitna River fluctuates widely. Inriver returns, for example, have ranged from 13,000 to almost 40,000 from 1986 through 1989. Escalating fishing pressure when coupled with low coho salmon abundance has catalyzed inseason emergency closure of the fishery.

Recent Fishery Performance:

The Little Susitna River coho salmon fishery was monitored in 1990 by creel survey to estimate fishing effort and harvest. Assessment of hatchery coho salmon in both the harvest and escapement was an additional facet of this investigation. Coho salmon escapement was measured by a weir located 34.5 miles from salt water.

Harvest rates through July suggested that the Little Susitna River was receiving a moderately strong coho salmon run. Approximately 4,000 coho salmon were harvested by August 1 but only 98 coho salmon had passed the Little Susitna River weir on that date. Wild coho salmon comprised over 75% of this early harvest. Extremely low and very warm water conditions apparently retarded the upstream movement of coho salmon during this part of the season. Many coho salmon were concentrated in resting pools just upstream from the Burma Road public access site where they were highly visible and vulnerable to capture.

On August 2, an emergency order was issued reducing the bag and possession limits from three to one coho salmon. The order further closed a portion of the Little Susitna River to all fishing. The closed area extended from the Burma Road access site upstream to the salmon counting weir. An August 11 escapement through the weir began to increase rapidly and by August 13 had

risen to 7,163 coho salmon. The closed area was reopened and the bag limit restored to three coho salmon on August 14.

An estimated 1,041 coho salmon were harvested during the 12 days that the emergency order was in effect. During the 7 days preceding the emergency order an average of 464 coho salmon were harvested each day. The harvest was building prior to the closure. If this level of harvest had continued a probable harvest of 5,570 coho salmon may have occurred during the 12 days that the fishery was restricted. If this is a correct assumption, the harvest was reduced about 80% because of the emergency order. It is also possible that this "probable" harvest could have been much higher because the "stalled" fish were concentrated and very vulnerable to capture.

Fishing effort was probably reduced about 70% while the restrictions were in place. Boat fishing effort appeared to be reduced more than effort from shore anglers. Fifty-one percent of the anglers that fished during the closure harvested the one fish limit.

The seasonal harvest at the Little Susitna River was estimated to be 8,001 coho salmon during 42,458 angler-hours of effort (Table 33). An additional 1,259 fish was estimated to have been caught and released. Coho salmon were harvested at a rate of 0.19 fish per hour. The 1990 census agreed with SWHS seasonal harvest estimate of 7,490 coho salmon.

Ninety-four percent of the effort and 91% of the harvest exited the fishery through the Burma Road access site. This distribution of effort and harvest is consistent with the recent trend toward increased angler use of the lower reaches of the Little Susitna River. Approximately 66% of the seasonal harvest was taken downstream from the Burma Road access site.

Coho salmon of hatchery origin comprised about 25% of the harvest measured at the Burma Road access. Upriver boat anglers that exited the fishery near the City of Houston had a harvest consisting of about 62% hatchery fish. This difference in harvest composition occurred because upriver effort is heaviest near the Lake Creek and Little Susitna River confluence. Most hatchery fish concentrate at this location before migrating up Lake Creek to Nancy Lake

where they were released as smolts. Altogether, hatchery fish comprised about 28% of the Little Susitna River coho salmon harvest in 1990.

A total of 15,413 coho salmon were counted through the Little Susitna River weir. An estimated 1,201 of the fish that passed the structure were later harvested from upriver locations. Therefore the 1990 escapement was about 14,212 coho salmon. The natural spawning escapement consisted of about 9,700 coho salmon in 1990. The total return to the Little Susitna River was about 22,200 coho salmon in 1990. At least 36% of this return was harvested. If the fishery had not been restricted by emergency order it seems likely that exploitation would have exceeded 50% of the inriver return.

Management Objectives:

Nearly from the onset of the smolt release program it became apparent that stocked fish were proportionately returning one to two weeks later than natural fish. It was likewise apparent that supplemental returns were attracting greater numbers of anglers to the fishery. The success of the stocking program raised concerns that the early returning, naturally produced fish would be overharvested by rising participation. During the fall of 1990 a management proposal was developed for the Little Susitna coho salmon fishery. This management proposal consists of the following goals:

1. To maintain the present quality and quantity of natural coho salmon production in the Little Susitna River;
2. To produce through supplemental hatchery production an additional inriver return of 7,500 coho salmon of which 6,500 would be available for harvest annually; and,
3. To provide diverse and uninterrupted coho salmon fishing opportunities from the George Parks Highway downstream to the river's estuary.

The program objectives of the management proposal were:

1. To ensure that approximately 7,500 nonhatchery coho salmon spawn upstream from the George Parks Highway bridge;

2. To ensure that historical age and sex compositions of natural spawning fish as well as run timing are not significantly altered by supplemental coho salmon production; and,
3. To stock 300,000 coho salmon smolts which yields an adult return of approximately 7,500 coho salmon. (This objective assumes a 5% ocean survival and a 50% commercial exploitation).
4. To provide coho salmon fishing opportunity from the George Parks Highway downstream to tidewater without emergency inseason restrictions.

Recent Board of Fisheries Actions:

During the fall of 1990 the Alaska Board of Fisheries adopted a management plan which complements the Little Susitna River's coho stocking program by controlling the harvest of both hatchery and naturally produced fish. This plan address two major issues. First, it identifies an escapement goal for naturally reproducing fish and establishes regulations that enhance achievement of this goal. Second, the plan defines specific management actions that should help to maximize the harvest of hatchery fish.

The plan, which will become effective during 1991, consists of the following elements or actions:

1. Establishes an escapement goal of 7,500 nonhatchery spawners that assures the sustained yield of naturally produced coho salmon and preserved historical run timing;
2. Restricts exploitation by establishing a bag and possession limit of one coho salmon through August 5 when naturally produced fish are most subject to harvest. Reduced exploitation during this time enhances attainment of the river's escapement goal;
3. Establishes August 6 as the date that the bag and possession limit increases to three coho salmon to help maximize the harvest of surplus hatchery salmon; and,
4. Provides for a bag and possession limit of five coho salmon on selective reaches of the river to maximize the harvest of surplus coho salmon once an escapement of 7,500 nonhatchery spawners is projected.

Current Issues:

With the exception of stocking concerns already identified the issues confronting the Little Susitna River coho salmon fishery are the same as those discussed in the overview of the river's chinook salmon fishery.

Allocation disputes between lower and upper river fishery users may be reduced in time by the recently adopted coho salmon management plan. A reduced harvest of coho salmon in the lower river prior to August 6 should allow greater numbers of fish to reach fisheries near the George Parks Highway. A bag limit of one coho salmon prior to August 6 will have little impact on anglers fishing the upper river because few fish will have arrived in that area by August 6.

Ongoing Research and Management Activities:

The current Little Susitna River coho salmon program consists of a creel survey to estimate effort for, and harvest of, coho salmon. This survey also estimates the contribution of hatchery fish to the sport fishery. A weir is employed to enumerate escapement and the composition of hatchery fish in the escapement. The Division of Sport Fish also funds the operation and maintenance of the Burma Road Public Use Facility. Day to day operation of this facility is performed by the Division of Parks and Outdoor Recreation under terms of a contract with ADF&G.

Recommended Research and Management Activities:

Future management and research activities must recognize that the Little Susitna River coho salmon stocking program differs from many supplemental production activities because promotion of additional fishing opportunity is not a primary consideration. Hatchery fish are being introduced to: (1) Provide greater stability to a growing fishery that was being disrupted by emergency inseason restrictions, and (2) to maintain or enhance fishing opportunities from the Parks Highway downstream to the river's estuary. Maintenance or enhancement of diverse coho salmon fishing opportunities within the historical boundaries (70 river miles) of the fishery should be a prominent goal of future management.

Stocking and regulatory strategies for Little Susitna River coho salmon should recognize that this fishery has unique qualities that should be preserved. Attributes of the fishery include but are not limited to the following:

1. Nearly the entire fishery is bordered by underdeveloped public lands that are managed primarily for recreation uses, for example Susitna Flats State Refuge, Nancy Lake State Recreation Area (NLSRA) and Little Susitna River Recreation River Corridor;
2. The fishery features changing river morphology which in turn promotes different angling techniques and opportunities;
3. The river offers several float fishing options that provide differing fishing opportunities, for example, put in at the Parks Highway and take out at either Burma Road or NLSRA canoe system; or put in at NLSRA and take out at Burma Road;
4. Road accessible shore fishing opportunities are available at two locations within the fishery and conventional power boats (propeller driven) can be utilized for transportation along about 28 river miles at virtually all river discharge levels;
5. The lower (intertidal) reaches of the fishery provide opportunities for anglers fishing from "marine type" boats that access the river from the Port of Anchorage;
6. Little Susitna River coho salmon, in terms of length/weight are considered to be among the largest of this species in the NCIMA; and
7. The Little Susitna River is located within a convenient 1-1/2 to 2 hour drive of about one half of Alaska's human population.

The Little Susitna River stocking program may be considered a success if natural stock abundance and quality are sustained at historical levels and if supplemental production provides greater stability to fishing effort within the historical boundaries of the fishery. This stocking program must acknowledge that maintenance or enhancement of diverse fishing opportunities is more important than simply increasing opportunities/participation. Increased participation resulting from stocking will only be desirable if the aforementioned program goals are achieved.

Future management must recognize that increased angling participation is likely to occur because of factors that are unrelated to the present stocking activity. A growing human population, which translates into more resident and nonresident anglers, is expected to elevate fishing participation at the Little Susitna River and at other Alaskan fisheries as well. Road access to portions of the Little Susitna River that are currently roadless could also cause fishing effort and harvest to rise.

Future management strategies that attempt to balance increased fishing demands with harvestable fish surpluses should not rely upon expanded stocking to increase fish abundance. Future imbalances that may occur between increased fishing pressure and available fish stocks should be confronted by tactics that reduce harvest efficiency, such as time and area restrictions, bag limit adjustments, and less effective terminal tackle. The concept of controlling or reducing participation should also be considered to ensure continued diverse recreational benefits from the fishery.

The location, type, and number of public recreation facilities, such as campgrounds, launches, and trails, that are ultimately constructed along the river should compliment management's goal to provide diverse fishing opportunities. In general, "new" road access to the river reaches lying between the Burma Road and Nancy Creek should feature public facilities that promote shore and nonpower boat fishing activities. Road access to this portion of the fishery should also be minimal.

Susitna River Coho Salmon Fisheries

Fishery Description and Historical Perspective:

The Susitna River drainage supports the largest coho salmon stock within the NCIMA. A description of the Susitna River drainage, including access to this area, has previously been discussed in fishery overviews regarding East and West Susitna River chinook salmon. Susitna River coho salmon are an early run stock that begin to enter the drainage about mid-July. The peak of the migration into the Yentna River (River Mile 28) normally peaks the last week in July whereas the peak of passage into the Talkeetna River (River Mile 98.6)

takes place a week or 10 days later. Few coho salmon enter the Susitna River after early September. Most spawning occurs between mid-September and mid-October.

Total coho abundance in the Susitna River has not been estimated. Abundance in portions of this vast drainage have been measured by sonar, fish wheels and mark and recapture methods. During the period 1981 through 1983, coho salmon were enumerated in the Susitna River excluding all systems below River Mile 80 except the Yentna River. Coho salmon abundance during these years was estimated to be 37,000 (1981) 80,000 (1982) and 24,000 (1983). It is important to recognize that significant coho salmon runs occur in tributaries that enter the Susitna River downstream from River Mile 80. Coho salmon abundance in such systems as the Deshka River, Alexander Creek, and Willow Creek, as well as many other important coho salmon sport fisheries were not measured during the 1981-1983 studies.

Coho salmon abundance in the Yentna River has been estimated by sonar and fishwheels since 1981, but only the 1981-1984 counts encompassed the majority of coho salmon migration (Table 34 and Figure 46). The number of coho salmon passing River Mile 80 on the Susitna River exceeded the number of coho salmon entering the Yentna River each year during the period 1981-1983.

The sport harvest of Susitna River coho salmon is estimated annually by the SWHS. Since 1983 this harvest has ranged from 8,746 to 35,728 fish and averaged 24,214 coho salmon (Table 35). The annual harvest is fairly evenly divided between the road accessible eastside tributaries and less accessible tributaries that enter the Susitna River from the west.

The Deshka River, Alexander Creek and Lake Creek are the major westside coho salmon fisheries. The average annual harvest from the Deshka River, for example, was 6,398 coho salmon during the period 1987 through 1989. During these same three years harvests from Alexander and Lake creeks averaged 1,844 and 1,792 coho salmon, respectively.

Numerous East Susitna River tributaries also provide fishing opportunities for coho salmon. Willow Creek and the Talkeetna River often yield the largest

coho salmon harvests among this collection of streams. A harvest of 4,875 coho salmon from Willow Creek in 1988 is the largest documented from an eastside tributary. Annual harvests from most eastside fisheries typically range from fewer than 500 to about 1,500 coho salmon.

With the exception of Caswell Creek coho salmon, all Susitna River coho salmon are from natural production. Caswell Creek has been stocked with coho salmon of Caswell Creek origin since 1988

Coho salmon sport fishing is permitted throughout the year at most fisheries. Portions of several East Susitna River fisheries are closed to salmon fishing. Closures usually include upper reaches of tributaries that are road accessible. Major tributaries or portions of tributaries within the Susitna River drainage are restricted to unbaited, single-hook artificial lures throughout the year. The rationale for, and the location of, these single-hook waters will be discussed in the fishery overview for Susitna River rainbow trout. Unbaited, artificial lures are required in all flowing waters, except those where single hooks are mandated, after August 31. The bag and possession limits are three coho salmon 16 inches or more in length for eastside tributaries whereas the limits for westside tributaries are three coho salmon daily and six in possession. Susitna River coho salmon are harvested in commercial fisheries located in the Northern and Central Districts of Cook Inlet. Commercial fishing is permitted within 500 yards of the terminus of the Susitna River.

Recent Fishery Performance:

The 1990 coho salmon harvest from the Susitna River drainage of 25,406 fish was slightly above the 1983-1989 average but well below harvests during 1988 and 1989 (Table 35). The Susitna River harvest represented about 50% of the total coho salmon harvested from the NCIMA during 1990. Nearly 54% or 13,663 coho salmon were harvested from westside tributaries. As in the past, the Deshka River (4,959 fish), Lake Creek (2,986 fish) and Alexander Creek (1,973 fish) were the most prominent westside coho salmon sport fisheries. Willow Creek (2,711 fish) and the Talkeetna River (2,539 fish) were once again top producing fisheries on the eastside of the Susitna River. A harvest of 2,596

coho salmon in 1990 from Caswell Creek is noteworthy because it was more than three times as large as the average harvest (782 fish) from this fishery during the period 1983-1989. The unusually large harvest from Caswell Creek probably reflects a sizeable contribution from hatchery fish. This possibility could not be confirmed because the 161,822 coho salmon smolts stocked in 1989 did not have identifying marks.

Sonar enumeration of coho salmon in the Yentna River suggested a strong return in 1990. A total of 21,346 coho salmon were estimated to have passed the counters, located at River Mile 4 on the Yentna River, when enumeration ceased on August 12. The run was still in progress when the sonar units were removed. Only the 1982 and 1986 counts exceeded the August 12 total in 1990 (Table 34).

Management Objectives:

Specific fishery objectives have not been formerly established for Susitna River coho salmon. An assumption of past and current management, however, has been to follow the guidelines set forth in the Upper Cook Inlet Salmon Management Plan. Insofar as management is consistent with the statutory subsistence priority, this plan requires that the Department manage salmon stocks moving through Upper Cook Inlet from July 1 through August 15 primarily for commercial uses. The plan also requires that, insofar as consistent with the primary commercial use, management minimize the incidental take of Susitna coho salmon, late Kenai chinook salmon, and early Kenai coho salmon.

This plan further requires the department to assist the Board of Fisheries in setting optimal salmon harvest rates for all users by monitoring Upper Cook Inlet salmon fisheries to determine the interception of Susitna coho salmon, late Kenai chinook salmon, and early Kenai coho salmon.

Recent Board of Fisheries Actions:

The Board of Fisheries has taken no specific actions with respect to Susitna River coho salmon sport fisheries during recent years.

Current Issues:

Coho salmon returns to the Susitna River drainage, as judged by all available indicators, have ranged from good to excellent during recent years. Despite favorable abundance, management of this stock remains the subject of considerable public debate. Dissatisfaction with the management of Susitna coho salmon comes primarily from sport anglers and Northern District commercial fishermen. The large number of regulatory proposals submitted to the Board of Fisheries regarding this stock reflects the controversy associated with management of Susitna coho salmon.

The debate surrounding management of this stock appears, in part, to be fueled by the somewhat ambiguous language found in the Upper Cook Inlet Salmon Management Plan. On one hand, this plan requires Susitna coho salmon to be primarily managed for commercial uses because the stock moves through Cook Inlet between July 1 and August 15. This would be a clear management mandate, except that the plan further requires the Department to manage commercial users to minimize the incidental take of Susitna coho salmon. Strategies to minimize the incidental take of coho salmon, however, must be consistent with the plan's stated objective of managing primarily for commercial uses during the July 1 through August 15 period.

Individuals or groups desiring reduced commercial exploitation of Susitna coho salmon justify their position by referencing the "incidental" clause in the management plan. Those wishing to maintain the status quo point to the commercial "priority" clause in the same plan. These seemingly contradictory segments of the Upper Cook Inlet Management Plan will likely be the focus of debate in the years ahead. It also seems safe to assume that almost any management scheme for Susitna coho salmon would be controversial even if governed by clearly defined management intent. The Central District drift gill net fishery presently has a sizeable harvest advantage over all other users of this stock. Declining sockeye returns to the Northern District and Susitna River drainage during recent years have forced many set gill net fishermen of the Northern District to become more dependent on coho salmon. This dependency in turn sparks greater demands for improved sharing of the resource. On the other hand, a growing number of sport fishermen that utilize

Susitna coho salmon apparently believe existing harvest strategies are much too heavily weighted toward commercial exploitation.

Issues relating to large scale timber development, recreational river management and road and boat launch construction also confront future use and management of Susitna River coho salmon. These issues have previously been discussed in fishery overviews pertaining to Susitna River chinook salmon.

Ongoing Research and Management:

There are no major research activities directed at this fishery at this time. Sonar and fish wheel enumeration of Yentna River coho salmon is performed by the Commercial Fisheries Division. This enumeration project is directed primarily toward sockeye salmon and is therefore terminated while the coho salmon run is still in progress.

The Susitna River coho salmon sport harvest is estimated annually by the SWHS.

Recommended Research and Management Activities:

Sonar enumeration of salmon in the Yentna River should be continued through early September. Complete enumeration of coho salmon in this major drainage of the Susitna River should in turn permit determination of exploitation rates for the Yentna River sport fishery. A positive correlation between coho salmon abundance in the Yentna River and the total Susitna River sport harvest might allow managers to determine relative coho salmon abundance for the entire drainage. Studies conducted from 1981 through 1983 suggest that coho salmon abundance in the main stem of the Susitna River upstream from River Mile 80 does correlate with coho salmon abundance in the Yentna River drainage.

Knik Arm Coho Salmon Fisheries

Background and Historical Perspective:

Knik Arm supports five significant coho salmon fisheries (Figure 47). Fish, Cottonwood and Wasilla creeks are primarily intertidal fisheries that provide

weekend-only salmon fishing. Weekend-only fishing has been mandatory on these streams since 1971 because harvestable stock surpluses cannot normally accommodate continuous daily exploitation. Salmon fishing is further restricted to the terminal areas of the three streams. Fish Creek sport salmon fishing is not allowed until the second Saturday in August. In addition, motor boats are not permitted on weekends at Wasilla Creek from July 15 through August 15.

The Eklutna Hydroelectric Power plant tailrace (Figure 48) is a fishery that is largely supported by coho salmon returning to the Cook Inlet Aquaculture Association's hatchery located at the tailrace. The nonprofit Eklutna hatchery began operation in 1982. Current production goals are 20 million chum and 100,000 coho salmon eggs. Coho salmon are released into the tailrace as smolts. A fish ladder links the hatchery with the tailrace which in turn drains into the Knik River.

The entire sport fishery is confined to the 1/2-mile long tailrace. Coho, chum and a few sockeye salmon are harvested within the tailrace on a daily basis. All but the terminal 100 yards of the tailrace are subject to preferential harvest rights by the aquaculture association. Through 1989 the association has allowed sport fishing within their special harvest zone. Salmon of Knik River drainage origin are also harvested at the confluence of the tailrace and the Knik River.

Jim Creek is traditionally the largest Knik Arm fishery in terms of both participation and coho salmon harvest. This stream enters the glacial Knik River about 10 river miles from salt water. The entire Jim Creek drainage is open to coho salmon fishing throughout the year. The greatest fishing effort occurs at the confluence of Jim Creek and the Knik River in an area locally known as the Jim Creek Flats. Fishing effort and harvest rates at the confluence are sharply influenced by the Knik River discharge. Jim Creek Flats becomes very difficult to fish during periods of high Knik River discharge because the entire area because inundated by glacial waters. Upstream reaches of Jim Creek can be accessed by both power and nonpower boats.

All Knik Arm coho salmon fisheries are accessible by standard passenger vehicle. Prior to 1987, Jim Creek could normally only be accessed by 4-wheel

drive roads and trails that became nearly impassable during periods of heavy precipitation. In 1987, the Matanuska Susitna Borough improved the road to the Jim Creek Flats and also constructed a road into the headwaters of the drainage. The new road allows anglers to launch small boats into the upper drainages at Mud Lake.

Coho salmon return to the Knik Arm fisheries from mid-July through August. Spawning occurs from late September through mid-October. The average weight of Knik Arm coho salmon is less than six pounds. Bag and possession limits for all Knik Arm fisheries are three coho salmon 16 inches or more in length.

All five of the Knik Arm fisheries have been stocked with coho salmon (Table 36). The Eklutna fishery, as previously noted, is primarily supported by hatchery fish. Hatchery coho salmon are also abundant in the Fish Creek returns. Hatchery releases from the Big Lake Hatchery, located in the Fish Creek drainage, supplement the Fish Creek coho salmon run. The contribution of hatchery fish at Cottonwood, Wasilla and Jim creeks has not been evaluated but is thought to be minor relative to wild stocks.

The SWHS provides estimates of harvest for the Knik Arm fisheries. The collective annual harvest for the five fisheries averaged 11,922 coho salmon during the period 1987 through 1989. Jim Creek averaged 6,325 coho salmon during this period whereas the three weekend only fisheries each averaged about 1,000 fish annually. Annual harvest and participation for the five Knik Arm fisheries are presented in Table 37.

Data from the SWHS indicate that the three weekend-only fisheries have remained relatively stable in terms of annual harvest. Fluctuations in harvest from these fisheries probably reflect annual variations in fish abundance. Jim Creek and the Eklutna fishery, on the other hand, are expanding fisheries. The 1988 harvest of 11,078 coho salmon at Jim Creek during 23,239 angler-days of effort occurred because of improved road access to the fishery and a strong coho salmon run. The 1988 coho salmon harvest from Jim Creek was the second largest in the NCIMA and only the Little Susitna River, Deshka River and Willow Creek supported more fishing effort that year.

Knik Arm coho salmon fisheries are periodically monitored by onsite creel observations. A cursory inseason inspection of escapement by foot is possible at the three weekend-only fisheries after coho salmon exit terminal harvest areas. The frequency and intensity of creel and escapement observations depend on perceived run strength, with surveys increasing when weak returns are suspected. A weir is employed to measure escapement at Fish Creek. The Fish Creek escapement has ranged from 2,162 to 8,924 and averaged 3,806 coho salmon since 1980 (Table 38). Foot surveys on established index areas at Cottonwood, Wasilla and Jim creeks are scheduled annually.

Knik Arm coho salmon are harvested commercially in the Central and Northern Districts of Cook Inlet. The stocks are also harvested within Knik Arm by a special set gill net fishery that operates near the mouth of Fish Creek. The Knik Arm gill net fishery has been conducted annually since 1987. Harvests from this fishery have ranged from 2,043 to 11,604 and averaged 6,574 coho salmon annually during the period 1987 through 1989.

The Knik Arm commercial set net fishery is discussed in greater detail in the Fish Creek Sockeye Salmon Fishery section of this report.

Recent Fishery Performance:

In 1990, Jim Creek continued as the dominate coho salmon fishery in Knik Arm. An estimated 6,184 coho salmon were harvested from Jim Creek during 17,878 angler-days of effort according SWHS. Escapement indices at Jim Creek during 1990 were similar to counts during recent years.

An emergency order closing most of the Eklutna power plant tailrace to all fishing reduced the harvest of coho salmon at this fishery in 1990. The emergency order was issued on August 22 because of a weak chum salmon return to the Eklutna hatchery's special harvest area. Between 30,000 and 40,000 chum salmon were expected at Eklutna but just over 3,000 returned to the tailrace. The 1990 coho salmon harvest at Eklutna was estimated to be 1,012 fish by the SWHS. The 660 coho salmon that arrived at the hatchery represented an average escapement.

Coho returns to the three Knik Arm "weekend only" fisheries were considered to have ranged from poor to fair depending on the respective fishery. An estimated harvest of just 286 coho salmon in 1990 from Cottonwood Creek was the lowest on record (Table 37). An escapement index count of 167 spawners was well below the 1980 through 1989 average annual count of 472 coho salmon. Index counts at Cottonwood Creek have averaged 242 spawners since 1987 whereas annual counts from 1980 through 1986 averaged 561 coho salmon. Annual sockeye salmon harvests from Cottonwood Creek since 1987 have also declined substantially.

The 1990 coho salmon harvest of 1,012 fish from Wasilla Creek was similar to recent harvests from this fishery. However, only 34 spawning coho salmon were enumerated within the Wasilla Creek index area. High turbid water conditions frequently preclude escapement enumeration at Wasilla Creek but index counts were completed during four different years since 1981. These index counts ranged from 171 to 876 and averaged 384 spawning coho salmon.

The coho harvest at Fish Creek was 398 fish according to the SWHS. Escapement through the Fish Creek weir was 2,673 coho salmon in 1990. Recent escapements at Fish Creek have shown a decline similar to the downward trend noted at nearby Cottonwood Creek. For example, since 1987 escapements have ranged from 2,162 to 3,479 fish and averaged 2,829 coho salmon. Escapements from 1980 through 1986, on the other hand, averaged 4,343 coho salmon.

Available data suggest that recent harvests, fishing effort, and escapements have declined at the Knik Arm weekend-only fisheries. This trend is in sharp contrast to the relatively strong coho salmon returns to most other systems in the NCIMA. Although a serious conservation problem is not apparent at this time, the status of these stocks warrants careful observation in the years ahead.

In 1990 the Knik Arm set gill net fishery harvested 5,708 coho salmon.

Management Objectives:

No specific fishery objectives have been formally established for Knik Arm coho salmon fisheries. An assumption of past and current management, however, has been to assure for sustained yield of the various stocks while providing for expanded fishing opportunities where possible.

The objective of coho salmon stocking at the weekend-only fisheries is to supplement these stocks to levels that can accommodate weekday fishing opportunities.

Recent Board of Fisheries Actions:

There have been no specific actions taken by the Board of Fisheries during recent years that directly affect these fisheries. Board of fisheries actions targeting the Knik Arm commercial set net fishery do affect all Knik Arm sport salmon fisheries. Recent changes to the Knik Arm commercial fishery are discussed in Fish Creek Sockeye Salmon Fishery section of this report.

Current Issues:

Coho salmon returns to the weekend only Knik Arm fisheries are showing evidence of decline despite relatively strong returns to most other coho salmon fisheries with the NCIMA. The relationship between the recently established commercial fishery near Fish Creek and declining coho salmon abundance is a consideration that warrants review. As previously noted, the Knik Arm set gill net fishery harvested 5,708 coho salmon in 1990 whereas the collective sport harvest from the nearby weekend-only fisheries was 1,696 coho salmon.

Issues associated with the Eklutna tailrace fishery primarily center around people management. Trash removal and maintenance has been voluntarily provided by personnel from the aquaculture association and the federally operated Eklutna power plant. Public use of this fishery has mushroomed from 3,413 angler-days in 1984 to 13,188 angler-days in 1988. This increased participation has taxed volunteer efforts to provide essential sanitary and trash services. Power plant officials have indicated that portions or all of

the lands bordering the tailrace may be closed to public use if state assistance with people management is not provided.

Maintaining angler access at the mouths of Wasilla and Fish creeks are potential issues that merit attention. Significant fishery use currently occurs on private lands at both of these fisheries. Land acquisition or easements, on a willing seller basis, should be pursued at these fisheries before denial of access becomes an issue. Lands are presently available for purchase at both fisheries.

Recently improved road access to both the headwaters and mouth of Jim Creek raises concerns regarding sustainable levels of harvest for this rapidly growing fishery. With the exception of bag and possession limits this fishery has developed essentially without regulation.

Ongoing Research and Management:

Harvest trends for these fisheries are measured by the SWHS. Escapement assessment includes a weir at Fish Creek and enumeration of spawners on established index areas at the other Knik Arm fisheries. Inseason creel and escapement observations are conducted on an as needed basis on the three weekend only fisheries.

Recommended Research and Management Activities:

A creel survey should be performed at Jim Creek to estimate distribution of harvest and effort within the drainage. A comprehensive assessment of coho salmon spawning distribution should likewise be conducted to determine whether existing index count areas reflect spawning abundance within the drainage.

A coho salmon smolt stocking program should replace the current practice of stocking fingerlings in weekend only Knik Arm streams. The smolt stocking program should in turn be evaluated in terms of contribution to the sport harvest and cost effectiveness. The feasibility of employing marked (coded wire tagged) Knik Arm coho salmon smolts to assess exploitation rates,

distribution, and timing of harvests within the commercial fisheries of Cook Inlet should be evaluated.

Fish Creek Sockeye Salmon Fisheries

Background and Historical Perspective:

Fish Creek sockeye salmon have been the target of varied and often changing harvest strategies. These late run sockeye salmon are an important stock that has displayed wide fluctuations in abundance. Escapements ranging from 2,705 to 192,352 sockeye salmon illustrate the changing status of this stock (Figure 49). Declining abundance during the 1970s precipitated a supplemental sockeye salmon stocking program for the Fish Creek drainage. The first sockeye salmon eggs were taken in 1975 and since that time supplemental stocking has played a major role in stock recovery. Hatchery fish now comprise more than 90% of most returns. The Big Lake hatchery, operated by the state and located within the drainage, supports the sockeye salmon enhancement program. The hatchery, located adjacent to Meadow Creek, has a current capacity of about 30 million salmon eggs. Sockeye salmon releases from the Big Lake hatchery are shown in Table 39. Run timing for sockeye and coho salmon as the fish enter the drainage is shown in Figures 50 and 51.

Fish Creek sockeye salmon have been exploited in the Cook Inlet commercial fishery for more than 50 years. A subsistence fishery also harvested this stock prior to Alaska becoming a state. The federally managed subsistence fishery was authorized along the northwest shore of Knik Arm prior to the first week in August. In 1959, when the State of Alaska assumed fishery management responsibilities, the Knik Arm subsistence season was altered to start the first week in August. This later opening diverted much of the subsistence harvest from sockeye to coho salmon. In 1971 the Knik Arm subsistence fishery was closed because of declining sockeye salmon escapements into Fish Creek.

The northwest shore of Knik Arm remained closed to subsistence fishing until judicial decisions in 1984 prompted the Board of Fisheries to reopen the fishery. Subsistence gill net fishing was permitted on Saturdays from

August 3 through September 23 in 1985. A total of 405 permits were issued for this fishery and about 4,200 salmon were harvested. Coho and sockeye salmon comprised 52% and 41% of this harvest, respectively. The Knik Arm subsistence fishery has been closed since 1985.

Fish Creek also formerly supported a flourishing sport fishery for sockeye salmon. In 1971, the sport fishery at Fish Creek was restricted to weekend only fishing starting the second Saturday in August. Closure of the fishery during July precluded a significant sport harvest of sockeye salmon. Termination of the Fish Creek sockeye fishery catalyzed anglers to pursue this stock in the marine waters of Knik Arm. Initially, a small fishery developed along the beach just south of Fish Creek, but during the early 1980s, participation in this fishery increased rapidly. Snagging was the principle method of harvest. The growth of the snag fishery closely paralleled increased abundance of hatchery fish returning to Fish Creek. By 1983 an estimated 6,013 sockeye salmon were harvested by this beach fishery during 11,199 angler-days of effort. In 1985, snagging became illegal within all marine waters of Cook Inlet north of Anchor Point. Prohibition of snagging effectively eliminated the Fish Creek saltwater sockeye salmon fishery.

In 1986, the Board of Fisheries made provisions for a commercial set gill net fishery along the northwest shore of Knik Arm but only if the Fish Creek sockeye salmon escapement goal of 50,000 fish was assured. Closure of this fishery after July 29 was mandatory to prevent an excessive interception of coho salmon. The terminal gill net fishery was established to fully utilize surplus sockeye salmon that could not be harvested in traditional commercial fishing locations. The terminal harvest area was not opened in 1986 because Fish Creek only received an escapement of 29,800 sockeye salmon. During the fall of 1986, the Board of Fisheries provided for a personal use dip net fishery at Fish Creek. This dip net fishery was subject to the same opening and closing criteria that governed the terminal set gill net fishery. Coho salmon could not legally be taken by dip net.

Both fisheries operated from July 27 through July 29 in 1987. About 1,500 to 3,000 sockeye were harvested by dip net whereas 24,090 sockeye and 2,040 coho were taken by set net. The two fisheries reopened in 1988 on July 23 and

about 3,000 sockeye were subsequently harvested by dip net. The 1988 commercial harvest included 38,250 sockeye and 11,604 coho salmon.

User group controversy shadowed the set net and personal use fisheries during the first two years of operation. Complaints from personal use fishermen generally fell into two categories. First, there were personal use fishermen that disagreed with the division of harvest or harvest advantage of the set net fishery, and second, there were personal use fishermen requesting extension of the dip net fishery because large numbers of sockeye salmon entered the stream after the fishery closed. Sport fishermen, on the other hand, expressed dissatisfaction about the "high" interception of coho salmon by the commercial fishery.

The Board of Fisheries, during the fall of 1988, made significant revisions to the Fish Creek personal use dip net regulations. The 1989 dip net fishery, instead of operating concurrent with the terminal gill net fishery, opened on July 30 after the commercial fishery closed. Achievement of a 50,000 sockeye salmon escapement remained a prerequisite of both set and dip net fisheries. The Board of Fisheries further ordered closure of the dip net fishery on the second Friday in August or earlier by emergency order if interception of coho salmon became a concern.

The 1989 set gill net fishery operated from July 24 through July 29. During this six-day fishery, 47,925 sockeye, 6,075 coho, and 4,979 chum salmon were harvested. The dip net fishery commenced on July 30 and continued until closed by emergency order on August 10. The fishery was closed two days earlier than scheduled because of a high interception of coho salmon (about one-half of the salmon caught prior to the closure were coho salmon). A cursory assessment of the dip net fishery suggested a harvest of about 5,000 sockeye salmon.

The 1989 harvest strategy revealed that the Fish Creek dip net fishery could effectively take sockeye salmon surpluses during the absence of the terminal gill net fishery. Extending the dip net fishery into August does, however, promote catch and release of coho salmon. Species identification was difficult for some dip net fishermen because coho salmon from the glacial

waters of Knik Arm are slate grey in color and "spotting" on their back and upper tail is difficult to detect. Indecisive identification sometimes caused delays in the release of coho salmon and/or resulted in unintentional but illegal harvest of this species.

Recent Fishery Performance:

In 1990 the terminal gill net fishery operated from July 26 through July 29 and harvested 23,450 sockeye, 5,708 coho, 5,308 chum, and 696 pink salmon. The dip net fishery started July 30 and continued until closed by emergency order on August 4 when a high percentage of coho salmon entered the catch. Approximately 6,500 sockeye were harvested by dip net.

Controversy between personal use and commercial fishermen was sharply reduced in both 1989 and 1990. Targeting the personal use fishery on the latter portion of the run rather than on sockeye exiting the commercial fishery was apparently responsible for this reduced conflict. Sequential rather than competing fisheries also resulted in a much more effective harvest of surplus Fish Creek sockeye salmon.

Management Objectives:

The primary management objective of both personal use and terminal gill net fisheries is to harvest surplus sockeye salmon of Fish Creek origin. Surplus is defined as fish in excess of the Fish Creek escapement goal of 50,000 sockeye salmon.

Recent Board of Fisheries Actions:

Recent Board of Fisheries actions have previously been discussed in the background section of this overview. During their 1990 meeting the Board left the personal use fishery nearly unchanged. The terminal gill net fishery was modified to reduce exploitation of coho salmon migrating along the northwest shore of Knik Arm. The 1991 commercial set net fishery will be allowed from July 15 through July 26 on Tuesdays and Sundays from 7:00 a.m. to 7:00 p.m. Achievement of the Fish Creek sockeye salmon escapement goal must be projected

before the commercial fishery is allowed. No emergency orders will be issued extending commercial fishing periods.

Current Issues:

A major public concern relates to the commercial harvest of stocks not recognized as harvestable surplus. Since 1987 the commercial fishery has harvested 172,274 salmon, of which 133,716 were sockeye salmon. The 38,558 nontargeted species included 25,430 coho salmon (Table 40). The recognized take of nontarget species represents 22% of the total gill net harvest. Sockeye salmon that are not of Fish Creek origin also undoubtedly contribute to the terminal gill net harvest. Knik Arm tributaries such as Cottonwood Creek, Wasilla Creek, Jim Creek, and the Matanuska River all support sockeye salmon that migrate in total or in part along the northwest shore of the Arm. Cottonwood Creek, for example, enters Knik Arm six miles north of the gill net fishery. Abundance trends for Cottonwood Creek sockeye salmon are unknown because escapements are not regularly measured. Sockeye salmon escapements at Cottonwood Creek were last monitored by weir in 1981 and 1982 when 25,180 and 18,358 sockeye salmon, respectively, were enumerated. These escapements were about one-half as large as escapements into Fish Creek during the same two years.

A significant terminal gill net harvest of sockeye salmon bound for Cottonwood Creek and other Knik Arm tributaries appears probable. This potential interception has not been assessed to determine impacts on these stocks and fisheries they support. The generally depressed state of many NCIMA sockeye salmon stocks further emphasizes the need for such an evaluation. Sockeye salmon sport harvests at Cottonwood Creek have declined during recent years. The sockeye salmon sport harvest at Cottonwood Creek averaged 1,539 fish annually during the period 1980-1986 whereas during the past four years the average annual harvest dropped to 542 fish. The incidental harvest of coho salmon by the terminal commercial fishery has not been well received by anglers that participate in Knik Arm sport fisheries. Mandatory closure of the gill net fishery on July 29 also reflects the Board of Fisheries concern regarding the interception of coho salmon. The average annual gill net harvest of 6,356 coho salmon during the past 4 years is about twice as large

as the combined average harvest for the three Knik Arm weekend-only sport fisheries. Recent coho salmon returns to the weekend-only streams, while generally adequate to sustain these stocks, have not appeared as proportionately strong as the overall coho salmon run to the NCIMA.

Ongoing Research and Management Activities:

Salmon escapement is monitored by a weir located approximately 4 1/2 miles downstream from Big Lake. Onsite creel observations are performed on the personal use dip net fishery to determine the species composition of the catch. These nonrandom creel observations are directed primarily at seasonal times when coho salmon are most likely to be present in the fishery. The personal use harvest is currently measured by the SWHS. The Fish Creek drainage is currently stocked annually with sockeye and coho salmon from the Meadow Creek hatchery.

Recommended Research and Management:

The current personal use dip net fishery normally begins when the entry of sockeye salmon into Fish Creek is starting to decline and the entry of coho salmon is building. Dip netting is permitted daily on a 24-hour basis. Prior observations clearly show that the latter portion of the sockeye salmon run and the early portion of the coho salmon run are being overexploited. Virtually no sockeye or coho salmon 16 inches or more in length escape into Fish Creek when the dip net fishery is occurring.

Although coho salmon cannot legally be harvested by dip net, it is apparent that participants have difficulty distinguishing coho from sockeye salmon. Repeated dipping inspection and release of coho salmon in intertidal waters causes high mortality and wasted fish.

To eliminate these concerns it is recommended that dip netting for all salmon species be allowed on Saturdays, Sundays and Wednesdays after July 23 if the inriver sockeye salmon return is projected to exceed 50,000 fish. If the biological escapement requirement is exceeded, additional fishing time can be

provided by emergency orders, but no more than three consecutive days of fishing should be allowed without at least a one day closure.

This harvest strategy has several benefits. First, it will provide breaks in the fishery which will allow salmon to escape the dip net area. These salmon will provide the genetic diversity needed to preserve the broad spectrum run timing of the respective species. Second, it will allow utilization of coho salmon which are currently wasted by repeated dipping, inspection, and release. Third, it will remove the anxiety of participants concerned with proper identification of salmon species.

Stocked Lake Fisheries

Background and Historical Perspective:

Currently 72 lakes in the NCIMA are stocked on an annual or biennial basis, including one research lake that is closed to fishing. Additionally, three lakes which developed naturally producing populations from hatchery plants and three other lakes with a few indigenous fish require occasional supplemental stocking in order to provide viable sport fisheries. The 72 stocked lakes range in size from 7 to 3,500 surface acres.

The area stocking program began in 1952 when two lakes received 22,000 rainbow trout fry. Although eight species of salmonids have been planted since 1952, rainbow, trout, coho salmon and Arctic grayling have become the primary species used in the stocking program. Steelhead/rainbow trout from the Karluk River (Kodiak) and four strains of Alaska rainbow trout (Naknek River, Talarik Creek, Swanson River and Big Lake) as well as rainbow trout from federal and private hatcheries located in the states of Idaho, Montana, Oregon and Washington have been stocked. However, since 1979 only native Alaskan strains have been stocked in the NCIMA. Landlocked salmon fisheries have been supported by coho salmon from Washington State and at least nine Alaskan egg take sources and chinook salmon from three Alaskan sources. Arctic grayling egg take sources have been Junction Lake, Tolsona Lake and Moose Creek. Arctic char, originating from egg takes at Aleknagik Lake and lake trout from Paxson Lake were first stocked in 1988.

In most cases stocked landlocked lakes represent "new" fisheries because game fish were not present before stocking occurred. Stocked lakes benefit anglers and recreational support industries by providing diverse, year-around fishing opportunities and by diverting angling pressure from natural stocks. The majority of the stocking is directed toward road accessible lakes that tend to draw entire family groups for some combination of fishing, camping, picnicking, boating, and ice skating.

Rainbow trout appear to be the species preferred by most anglers. A survey of anglers fishing stocked lakes in the NCIMA in 1977, for example, revealed that 70% preferred to fish for rainbow trout, 19% desired landlocked coho salmon and 11% listed Arctic grayling as their choice. Rainbow trout have comprised 76% of all fish stocked in landlocked lakes within the NCIMA during the period 1986 through 1989. Annual releases during these four years ranged from 1,014,022 to 2,871,816 game fish and altogether 8.9 million fish of all species were stocked in lakes within the NCIMA. The SWHS indicates that stocked lakes supported about 34,500 angler-days of participation in 1989 or nearly 10% of the total effort for the NCIMA, and that 37,320 rainbow trout, 10,150 landlocked salmon and 5,050 Arctic grayling were harvested. Stocked rainbow trout comprised about 57% of all trout harvested in 1989 from NCIMA waters. Forty-one percent of all Arctic grayling harvested in 1989 were also hatchery fish.

Ninety-eight percent of the rainbow trout released into NCIMA waters during the period 1986-1989 were fry (less than 1 gram) or fingerlings. Most fingerlings weighed between 1 and 2 grams and were released during July. By June of the year following introduction, fingerlings at age I will typically range from 3 to 6 inches in length, at age II from 6 to 11 inches, at age III from 11 to 16 inches, and at age IV from 16 to 20 inches in length. Approximately 70% to 80% of the rainbow trout harvested from stocked lakes are age II and about 15% to 20% are age III. Few stocked rainbow trout exceed age IV and relatively few rainbow trout achieve harvestable size prior to age II.

Subcatchable rainbow trout, weighing about 100 grams, are also stocked to a limited extent to supplement rainbow trout production resulting from fingerling plants. Usually less than 2% of the rainbow trout stocked in the NCIMA

are subcatchable size at introduction. Subcatchable rainbow trout are stocked primarily in the very heaviest fished lakes.

Coho salmon are normally stocked in May at about 3 to 5 grams each. In most lakes these fish achieve a harvestable size (6 to 11 inches) by age I+. Most coho salmon are either harvested or die after becoming sexually mature by age III. Stocked salmon support important winter fishing opportunities within the NCIMA.

Arctic grayling are stocked both as fry and fingerlings. Fingerlings weighing 3 to 5 grams are usually stocked during August whereas the much smaller fry (0.02 gram each) are released during early June. Arctic grayling normally recruit into the harvest by age II.

Although the contributions from the landlocked lake stocking program have been significant to date, it is important to recognize that poor survival of stocked fish has also been documented. A research investigation has accompanied development of the area's stocking program since the early 1970s. The primary objective of this research has been to develop cost-effective stocking practices that provide both expanded and diverse fishing opportunities. Lake stocking research has been directed toward but not limited to the following: evaluation and selection of rainbow trout brood stock; development of effective stocking densities and size of stocked fish for various lake environments; and establishment of optimal time and frequency of stockings in various land locked lake environments.

Recent Fishery Performance:

A total of 66 lakes were stocked with 1,733,653 game fish in 1990. Fifty-four of these lakes were located in the Knik Arm Management Unit whereas the balance of the stocking occurred in lakes within the East Side Susitna Unit. Releases in 1990 included 1,232,498 rainbow trout, 236,355 coho salmon, 227,600 Arctic grayling, 27,200 Arctic Char and 10,000 lake trout. Seventeen lakes were stocked with more than one species of fish in 1990. Stocking locations, species, numbers of fish and fish size are listed in Table 41.

As estimated 35,000 angler-days of participation resulted from the area's landlocked stocking program in 1990. Fishing effort associated with lakes having both stocked and indigenous game fish is excluded from participation associated with lake stocking. The 1990 harvest from stocked landlocked lakes included an estimated 19,793 rainbow trout, 15,199 salmon, 1,904 Arctic grayling and 591 lake trout. The harvest of rainbow trout from stocked lakes represented 49.3% of the entire harvest of this species from the NCIMA. The harvest of stocked Arctic grayling was about 23% of the area-wide harvest of Arctic grayling.

The Kepler Lake Complex, consisting of nine stocked lakes, supported 13,644 angler-days of effort whereas Finger Lake supported 6,737 angler-days of effort in 1990. Collectively, these two stocking sites yielded 58% of the effort associated with stocked lakes within the NCIMA.

The cost associated with each angler-day of participation created by landlocked lake stocking was estimated to be $4.03 in 1990. Costs related to producing and delivering fish to stocked lakes within the NCIMA in 1990 were approximately $1.40 for each subcatchable rainbow trout, $0.08 for each rainbow trout fingerling, $0.16 for each Arctic grayling fingerling, $0.0007 for each Arctic grayling fry, and $0.08 for each salmon fingerling.

Management Objectives:

The primary objective of this program is to provide additional fishing opportunities in a cost effective manner on a sustainable basis by stocking lakes with game fish that are indigenous to Alaska. An additional objective of the program is to insure that stocking does not negatively impact wild stocks or other fisheries. All stocking is conducted in accordance to guidelines set forth in the Statewide Stocking Plan for Recreational Fisheries.

Recent Board of Fisheries Actions:

During the fall of 1988 the Board of Fisheries designated three lakes stocked with rainbow trout as catch and release waters. The three lakes included Long

Lake, located near Palmer, "X" Lake, located near Talkeetna, and Wishbone Lake, located near the community of Sutton. All rainbow trout must be released immediately from the three lakes and only unbaited, single-hook artificial lures can be used in these waters. The catch and release regulations, the first for stocked lakes in Alaska, became effective in 1989.

Current Issues:

The cost associated with providing an angler-day of stocked lake fishing has risen steadily in recent years. Increased stocking levels that have not produced parallel increases in participation are partially responsible for this higher cost. Increasing hatchery production costs also add to the problem. Lake stocking research indicates that the area's stocking program is making more harvestable fish available than ever before but anglers are not taking full advantage of these fish.

Why has increased stocking not produced proportionate increases in participation? Has the current level of stocking exceeded demand for stocked lake fishing? Are anglers unaware of stocked lake fishing opportunities? Is participation hindered because of poor access, or lack of support facilities at many stocked lakes? Finding answers and solutions to these issues will be essential if stocking in the NCIMA is to function in a cost-effective manner.

Ongoing Research and Management Activities:

Landlocked lake research in 1990 was directed primarily at comparing survival and growth of 1 gram rainbow trout fingerling stocked at densities between 50 and 1,000 fish per surface area. Preliminary data indicate that stocking densities ranging from 50 to 200 fish per surface area can be expected to produce survivals to a catchable size ranging between 30% to 35%. Higher stocking densities produce lower survival. Stocking density studies must be continued to determine the effects of annual releases on subsequent rainbow trout survival and growth.

Evaluations were also performed to compare initial survival, growth, and longevity between triploid (sterile) and diploid (normal) rainbow trout.

Preliminary data for the triploid versus diploid experiments indicate no significant difference in survival to age I between the two groups. Only 37% of a group of probable triploid rainbow trout stocked in 1988 were actually triploid whereas 100% of a group of fish stocked in 1989 proved to be triploids.

An evaluation of supplemental rainbow trout stocking at Big Lake continued in 1990. The initial stocking of Big Lake occurred in 1988 when 24,033 catchable size rainbow trout were released in June. All introduced rainbow trout were finclipped. A population estimate in October 1988 indicated that the lake supported 22,261 wild rainbow trout of catchable size. This low population estimate, coupled with recent reductions in annual harvest lead to the conclusion that the lake's rainbow trout population was depressed below historic levels. In 1989, 216,371 rainbow trout fingerlings were released into Big Lake to supplement wild production. Thirty-three percent of the stocked fingerlings were adipose finclipped. A population estimate in 1990 suggested that only 2,603 stocked fingerlings survived to age I. Reasons for this poor survival have not been determined. Supplemental stocking of Big Lake with fingerling rainbow trout of Big Lake origin continued in 1990 with a release of 449,627 fingerlings of which 17.1% were adipose finclipped.

Recommended Research and Management Activities:

Current levels of stocking within the NCIMA should not increase during the next several years. Substantial effort should be directed toward increasing angler participation at stocked lakes by improving the public's awareness of available fishing opportunities. Annual updating of the area's stocked lake brochure and expanded distribution of this popular pamphlet may help improve the public's awareness of fishing opportunities afforded by stocked lakes. Providing the brochure to visitor centers, sporting good outlets and license vendors should become an annual objective of the stocked lake program. An additional objective of the program should be to improve public access, parking, and signing at stocked lakes.

The area-wide stocking program should be evaluated annually in terms of the cost per angler-day of participation, cost per fish caught, and cost per

harvested fish. When coupled with public input, this data should provide the basis for modifying stocking strategies. In addition, research should continue at Big Lake to determine the feasibility of supplementing the lake's natural rainbow trout population. Evaluation of triploid all female rainbow trout should likewise be continued in 1991. If triploid rainbow trout can be developed in a cost-effective manner, the fish could be stocked in lakes that have intermittent linkages with drainages that support wild rainbow trout. Triploid fish may also have a longer life span that normal (diploid) fish. Increased longevity would be a desirable feature for many stocking activities because many stocked fish die after unsuccessfully attempting to spawn in landlocked lakes.

Evaluation of the stocked lakes program depends heavily on harvest and effort data from the SWHS. In fact, assessment of the cost effectiveness of various stocking strategies depends almost totally upon the SWHS because onsite creel surveys to estimate seasonal effort and harvest have not been performed. Does the SWHS accurately reflect effort and harvest for stocked lakes that support relatively modest fishing effort? Since this issue is so important to the development of a responsible stocking program, it is recommended that results from the SWHS be compared to estimates from onsite creel surveys of stocked lakes. There are reasons to believe that the SWHS may not accurately reflect harvest and effort from stocked lakes. In 1986, for example, onsite creel surveys were performed over a 68 day period (May 25 through July 30) on four stocked lakes in Anchorage. The collective estimated harvest for the four lakes was 18,200 rainbow trout. On the other hand, the SWHS estimated 8,199 rainbow trout harvested for the entire year from the four lakes. The onsite estimate of harvest was larger than the SWHS estimate for each lake. The SWHS estimates for two lakes, however, were within the confidence limits of the harvests for two of the onsite surveys. Estimates of effort could not be compared between the two surveys because the SWHS reported angler-days whereas the onsite studies measured angler-hours. According to the SWHS, participation ranged from 1,590 to 4,587 angler-days in the four stocked lakes.

Under-reporting of effort and harvest for stocked lakes by the SWHS, if it does occur, could be caused by any of the following:

1. Teenage children that are not accompanied by adults may comprise a substantial portion of the participation at urban and suburban stocked lakes. SWHS questionnaires are usually completed by adults, that may not be able to accurately account for their children's frequent fishing activities during the nonschool summer months.
2. Anglers may have a tendency to remember details of fishing trips that target salmon but have greater difficulty recalling all visits to local lakes where fishing may be a secondary activity to the primary purpose of the trip, such as picnicking, boating, swimming or ice skating.
3. SWHS questionnaires are mailed in October and anglers are requested to report fishing activities from January through December or from January through receipt of the survey. Ice fishing trips to stocked lakes during November and December would obviously be omitted by respondents who promptly return their questionnaires in October.

Over the years the SWHS has without question proven effectual in providing reliable estimates of effort for and harvest of fish from major fisheries. Results from the SWHS, for example, have been consistent with inseason creel survey of major fisheries throughout Alaska. If the SWHS is to be the primarily yard stick upon which the stocked lake program is measured it seems essential that the reliability of estimates for stocked lakes be understood.

Susitna River Rainbow Trout Fisheries

Background and Historical Perspective:

During the past decade the Susitna River drainage has frequently yielded the largest annual harvest of wild rainbow trout in Alaska. The harvest of rainbow trout from the drainage peaked during the late 1970s and early 1980s and then began a steady decline (Table 42). During recent years releasing some, most or all rainbow trout, if required, has become a common practice at many Susitna River fisheries. This conservative "let some go" attitude did not surface overnight but rather evolved over a period of several years. Formerly, the relatively remote features of the Susitna River drainage deterred angler use, cushioning the area's abundant rainbow trout stocks from overexploitation. The diverse fishery attributes of the drainage began to

attract greater numbers of anglers as the area became more accessible in the 1970s. Public concern regarding the conservation and welfare of the area's rainbow trout closely paralleled rising fishing pressure.

The Alaska Board of Fisheries, after several years of attempting to accommodate a wide array of individual requests for regulatory reform, determined in 1984 that a comprehensive rainbow trout plan was needed. A 13-member citizen planning team working with the department and the angling community developed a draft management plan over a two year period.

During the fall of 1986, the Board of Fisheries officially adopted this plan as a management policy for Cook Inlet and Copper River rainbow trout. The policy provides a systematic approach for selecting fishery regulations, as well as a process for rational identification of waters for special management. Four general management concepts are highlighted in the policy. These basic concepts include: Total closure, Catch and Release, Conservative Yield and Maximum Sustained Yield.

The innovative policy features a 12-point rating system for screening waters considered for special regulations. This rating system considers criteria such as fish size, fish abundance, remoteness of the fishery, conflicts with salmon fisheries, land ownership and several related factors. Waters that score high are considered candidates for trophy or catch and release management. In a sense, the policy promotes creative use of regulations that are tailored to site-specific conditions. The Board of Fisheries has used the policy since 1986 to implement regulations for rainbow trout within the NCIMA.

Even before the rainbow trout plan was developed, the management of Susitna River rainbow trout was becoming conservative. Bag and possession limits, for example, were 10 rainbow trout prior to 1982. Beginning in 1982, the bag and possession limits dropped to five rainbow trout of which only two could be 20 inches or more in length. In 1983 the limit was further reduced to allow just one fish 20 inches or more in length. Starting in 1987 and continuing to the present, nearly all streams within the Susitna River drainage have been regulated according to the Conservative Yield concept of the rainbow trout plan. This management concept strives to maintain historical size and age

compositions and abundance levels of wild rainbow trout. Bag and possession limits for this concept is two rainbow trout, of which only one may be 20 inches or more in length. This management strategy also requires the use of artificial lures after August 31 to enhance survival of released fish at the time when rainbow trout are often a targeted species. This regulatory scheme attempts to allow a modest portion of the annual rainbow trout production to be removed from most populations while the rest are recycled.

A major portion of the Susitna River drainage has been managed for trophy-size rainbow trout since 1987. This fishery encompasses all drainages of the Susitna River upstream from the junction of the Susitna and Talkeetna rivers to Devil's Canyon. Under this concept only one rainbow trout 20 inches or more in length is allowed daily. Small rainbow trout must be released immediately. An unbaited, single hook lure requirement compliments this strategy.

Major portions of three of the Susitna River drainage's best rainbow trout streams joined the Talachulitna River as catch and release waters starting in 1987. The Talachulitna River had previously became Alaska's first catch and release rainbow trout fishery in 1977. No-kill strategies govern most of the Lake Creek drainage, much of the Deshka River and the Fish Creek drainage located within the Talkeetna River drainage. Unbaited, single hook lures are mandatory at all catch and release waters. Catch and release strategies were adopted to perpetuate quality fishing rather than because the respective stocks were woefully depressed.

Stocked landlocked lakes are the only waters within the drainage that fall under the Maximum Sustained Yield Management concept. Bag and possession limits for this form of management are five rainbow trout. The seasonal limit for rainbow trout 20 inches or more in length is two for all waters of Cook Inlet. This seasonal limit became effective in 1987.

Wild rainbow trout are not supplemented with hatchery rainbow trout in the Susitna River drainage. Public testimony during the development of the rainbow trout plan suggested little interest in the use of hatchery fish to augment wild stocks. In fact, many participants in the planning process

expressed strong opposition to any hatchery assistance for wild Susitna River rainbow trout.

A description of the Susitna River drainage as well as a discussion of access routes within the area have previously been discussed in overviews pertaining to Susitna River chinook salmon fisheries. According to SWHS the harvest of rainbow trout has ranged from 9,948 to 22,018 fish and averaged 16,707 rainbow trout annually during the period 1977 through 1989. Nearly 56% of the rainbow trout harvest has been from tributaries that enter the Susitna River from the west (Table 42).

The Deshka River, Lake Creek and Alexander Creek generally provide the largest harvests among westside fisheries. Willow Creek, Montana Creek and the Talkeetna River drainage are the major rainbow trout fisheries on the eastside of the Susitna River.

Studies have been directed toward rainbow trout stocks of the Deshka River, Lake Creek and the Talachulitna River since 1988. Assessment of the age and length characteristics of these stocks has been the primary focus of these investigations, although onsite creel surveys were conducted at Lake Creek during 1988 and 1989. Harvest trends for Susitna River rainbow trout are measured by the SWHS.

Recent Fishery Performance:

A harvest of 8,969 rainbow trout in 1990 was the lowest on record for the Susitna River drainage and represents about one-half of the historical mean harvest for this stock (Table 42). The reduced harvest probably reflects the conservative regulations that presently govern major rainbow trout populations within the drainage as well as a growing desire among anglers to release the majority of their rainbow trout catch. In 1990, the SWHS provided estimates of both harvest and catch for the first time. A total of 55,316 rainbow trout were estimated to have been caught from the Susitna River drainage in 1990. This, of course, means that five of every six fish that were caught were released on a drainage-wide basis. A closer examination of harvest and catch statistics reveals that the "release" ratio for westside fisheries was almost

twice as great as that of East Susitna River rainbow trout fisheries. The westside harvest and catch were 3,960 and 35,510 rainbow trout respectively. On the eastside anglers harvested 5,008 of the 21,806 rainbow trout that were caught. The annual eastside rainbow trout harvest has only exceeded the harvest from westside tributaries on three occasions since 1977.

In 1990, the Talkeetna River drainage produced the largest rainbow trout harvest from the Susitna River drainage. An estimated 1,109 rainbow trout were harvested from the Talkeetna River's catch of 5,443 rainbow trout. The second largest rainbow trout harvest occurred at Willow Creek where 1,008 fish were kept from a catch of 3,914 fish.

Lake Creek, a westside tributary, had an estimated 808 fish harvested from a catch of 8,757 rainbow trout. The Deshka River, also a westside tributary, yielded a rainbow trout harvest and catch of 707 and 6,197 fish, respectively. The Talachulitna River drainage, which is a catch and release fishery, produced a catch of 9,178 rainbow trout in 1990.

An onsite creel survey of the lower three miles of Lake Creek from August 12 through September 9 revealed that most anglers preferred to voluntarily release most of their rainbow trout catch. The survey, for example, estimated that only 139 rainbow trout were kept from a catch of 1,457 fish. Ninety percent of the effort measured by the survey occurred in waters where rainbow trout could be retained. The ratio of fish kept to those released was consistent between this short duration survey and seasonal estimates from the SWHS for Lake Creek.

Management Objectives:

No specific fishery objectives have been established for Susitna River rainbow trout. An assumption of past and current management, however, has been to follow the guidelines set forth in the Cook Inlet and Copper River Basins Rainbow/Steelhead Trout Management Policy.

Recent Board of Fisheries Actions:

The background section of this overview provides a description of recent Board of Fisheries actions that target Susitna River rainbow trout. In addition the board also established a regulation that requires the use of unbaited artificial lures in all flowing waters of the Talkeetna River drainage from September 1 through June 15. This action, which became effective in 1989, was directed at rainbow trout and other resident fishes. During the fall of 1990, the Board extended the boundary of the Talachulitna River catch and release special management area to include all waters within a 3/4 mile radius of the confluence of the Talachulitna River with the Skwentna River. During the same meeting, the date (September 1) that unbaited artificial lures became mandatory along the lower 2 1/2 miles of Lake Creek was changed to August 15. The modified date did not apply to the confluence waters of Lake Creek and the Yentna River. Board actions that were taken in 1990 became effective in 1991.

Current Issues:

The public's desire for conservative yet diversified wild rainbow trout management has been clearly evident during recent years in the NCIMA. Special regulations that have been implemented following the guidelines set forth in the rainbow trout management policy have generally been well received by the angling community and no significant problems or confusion regarding these regulations have been apparent. Proposals to establish additional special management areas within the NCIMA are expected to be offered to the Board of Fisheries on a continuing basis. The rainbow trout management policy must remain the "tool" by which these recommendations are gauged. In order to responsibly evaluate candidate waters for special rainbow trout management the department should increase research on Susitna River rainbow trout. A comprehensive evaluation of the effectiveness of special regulations requires assessment of both the fishery and fish population before and after application of special regulations. Such evaluations have seldom been performed within the NCIMA.

Other issues confronting Susitna River wild rainbow trout have previously been discussed in various fishery overviews pertaining to the drainage's salmon fisheries.

Ongoing Research and Management Activities:

Studies to define baseline age and length features of rainbow trout populations at the Talachulitna River, Deshka River and Lake Creek are being conducted. Lake Creek has been the site of an onsite creek survey for rainbow trout since 1988. Harvest trends for rainbow trout are measured by the SWHS.

Recommended Research and Management Activities:

Age and length assessment of Talachulitna River, Lake Creek and the Deshka River rainbow trout should be curtailed at the end of the 1991 season. Similar research should then be directed at rainbow trout populations in the Talkeetna River drainage, at Alexander Creek, at Peter's Creek and at the North Fork of the Kashwitna River. The use of electroshocking capture methods should be evaluated for Susitna River rainbow trout. Estimation of catch as well as harvest and effort should become an annual, or at least a regular feature of the SWHS. Management staff should continue to participate in land and water use planning within the Susitna River drainage.

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Table 1. Number of angler-days of sport fishing effort expended by recreational anglers fishing Northern Cook Inlet Management Area waters, 1977-1990.

Year	Knik Arm		East Sustina R.		West UCI & West Susitna R.		NCIMA	Alaska	% by	Region II	% by
	Effort	% NCIMA	Effort	% NCIMA	Effort	% NCIMA	Total	Total	NCIMA	Total	NCIMA
1977	81,949	48.1	56,651	33.2	31,946	18.7	170,546	1,198,486	14.2%	828,351	20.6%
1978	75,540	37.9	86,010	43.1	37,971	19.0	199,521	1,285,063	15.5%	913,417	21.8%
1979	78,411	37.9	78,222	37.8	50,374	24.3	207,007	1,364,739	15.2%	1,014,018	20.4%
1980	102,530	42.4	91,304	37.7	48,125	19.9	241,959	1,488,962	16.3%	1,072,384	22.6%
1981	105,052	51.9	59,854	29.6	37,335	18.5	202,241	1,420,172	14.2%	1,016,731	19.9%
1982	91,713	40.8	80,745	35.9	52,222	23.2	224,680	1,623,090	13.8%	1,131,358	19.9%
1983	138,389	50.4	67,471	24.6	68,657	25.0	274,517	1,732,528	15.8%	1,212,680	22.6%
1984	130,727	46.8	81,758	29.2	67,102	24.0	279,587	1,866,837	15.0%	1,341,658	20.8%
1985	122,626	44.2	67,764	24.4	87,097	31.4	277,487	1,943,069	14.3%	1,406,419	19.7%
1986	131,546	41.1	92,289	28.9	96,054	30.0	319,889	2,071,412	15.4%	1,518,712	21.1%
1987	140,167	44.8	77,817	24.9	95,042	30.4	313,026	2,152,886	14.5%	1,556,050	20.1%
1988	183,029	46.6	107,977	27.5	101,869	25.9	392,875	2,311,291	17.0%	1,679,939	23.4%
1989	146,912	42.0	96,864	27.7	106,305	30.4	350,081	2,264,079	15.5%	1,583,381	22.1%
1990	142,884	41.2	101,917	29.4	101,789	29.4	346,590	2,453,284	14.1%	1,745,110	19.9%
MEAN	119,391	44.0	81,903	31.0	70,135	25.0	271,429	1,798,278	15.1%	1,287,158	21.1%

Table 2. Angler-days of sport fishing effort for Knik Arm waters, 1977-1990.

FISHERY	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	Mean
Marine															
Fish Ck.							11,199	3,865			761	673	763	531	2,965
Other							5,928	451	692	983	1,213	566	1,589	1,963	1,673
Total							17,127	4,316	692	983	1,974	1,239	2,352	2,494	3,897
Little Sustina River	11,063	12,127	21,301	22,420	26,162	24,020	35,477	48,517	41,643	45,770	35,659	49,731	54,798	40,159	33,489
Knik Arm Tributaries															
Knik River & Tributaries (incl. Jim Ck.)					4,904	6,653	9,183	9,369	8,970	13,015	6,990	23,229	11,141	17,878	11,133
Wasilla Ck.	2,805	3,446	4,024	5,726	4,019	6,261	3,239	3,547	3,115	3,387	2,173	2,228	2,406	2,679	3,504
Cottonwood Ck.			5,345	9,268	8,663	5,186	5,944	7,144	4,560	5,653	2,934	4,056	3,069	3,056	5,407
Big Lake Drainage streams									903	2,641	2,898	3,110	4,204	3,936	2,949
Ekultna Power Plant Raceway								3,413	2,995	8,549	11,663	13,188	10,342	7,618	8,253
Total	2,805	3,446	9,369	14,994	17,586	18,100	18,366	23,473	20,543	33,245	26,658	45,811	31,162	35,167	21,480
Knik Basin Lakes															
Wasilla Lake			3,521	1,642	2,829	2,457	3,325	3,112	2,769	2,093	1,467	1,382	1,416	1,135	2,262
Finger Lake	14,864	11,502	4,433	6,483	5,267	3,514	8,512	6,843	4,259	5,589	10,830	8,240	4,840	6,737	7,280
Kepler Complex Lakes	7,962	5,730	5,439	8,597	8,227	6,943	9,149	9,770	9,226	9,544	14,379	18,245	12,821	13,644	9,977
Big Lake	11,869	9,865	8,300	12,195	14,568	15,371	15,989	12,916	16,299	14,559	17,693	10,077	12,748	11,798	13,161
Lucille Lake	7,440	4,803	2,987	3,798	2,844	2,218	1,981	1,188	2,062	829	4,690	6,312	3,124	1,772	3,289
Kalmback Lake													1,271		1,271
Knik Lake													754		754
Memory Lake								770					1,725		1,248
Seymour Lake										651			672		662
Lower & Upper Bonnie Lakes										633		1,090	795	1,155	918
Nancy Lake Complex Lakes	7,259	7,647	7,011	9,153	8,488	8,615	10,907	7,194	5,960	6,520	15,125	12,099	8,349	9,973	8,879
Total	49,394	39,547	31,691	41,868	42,223	39,118	49,863	41,793	40,575	40,418	64,184	57,445	48,515	46,214	45,203

-continued-

Table 2. (page 2 of 2)

FISHERY	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	Mean
Other Waters															
Other Streams							3,291	1,806	1,761	2,249	1,662	2,428	818	2,963	2,122
Other Lakes							14,265	10,822	17,412	8,941	10,030	26,375	9,267	15,887	14,125
Other Waters	18,687	20,420	16,050	23,248	19,081	10,475									17,994
Total	18,687	20,420	16,050	23,248	19,081	10,475	17,556	12,628	19,173	11,190	11,692	28,803	10,085	18,850	16,996
Area Total	81,949	75,540	78,411	102,530	105,052	91,713	138,389	130,727	122,626	131,606	140,167	183,029	146,912	142,884	119,395

Table 3. Angler-days of sport fishing effort for the Eastside Susitna River drainage, 1977-1990.

FISHERY	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	Mean
Willow Creek	14,024	22,682	18,911	29,011	14,060	19,704	13,405	21,649	16,282	10,733	13,583	27,758	23,811	32,200	19,844
Caswell Creek			3,710	4,963	3,860	5,101	5,048	4,952	5,289	4,362	3,332	4,529	4,029	6,103	4,607
Montana Creek	14,268	25,762	22,621	19,287	16,657	23,645	17,109	19,239	20,028	20,268	13,745	16,498	16,179	11,284	18,328
Sunshine Creek			3,317	5,208	3,062	3,787	3,429	3,229	4,144	8,124	3,912	4,129	4,592	4,485	4,285
Talkeetna River & Tributaries (in. Clear Ck)	3,163	5,040	5,125	4,388	3,584	3,856	7,564	9,252	7,213	8,638	17,096	12,733	15,218	18,299	8,655
Sheep Creek	8,112	11,869	6,728	8,041	6,936	9,093	6,237	6,106	2,844	10,091	9,019	18,699	13,010	11,392	9,156
Little Willow Creek	4,583	5,687	5,171	8,190	3,845	5,579	2,791	5,872	5,705	4,490	5,850	10,768	5,285	6,505	5,737
Goose Creek								1,305		1,993	1,865	2,947	3,058	3,714	2,480
Birch Creek										2,010	2,046	2,074	767		1,724
Kashwitna Creek							1,344	2,995		2,908	2,717	1,454	6,320	2,313	2,864
Total	44,150	71,040	65,583	79,088	52,004	70,765	56,927	74,599	61,505	73,617	73,165	101,589	92,269	96,295	72,328
Other Waters															
Other Streams							5,460	4,417	4,162	10,566	2,101	3,648	1,907	3,287	4,444
Lakes							5,084	2,742	2,097	8,106	2,551	2,740	2,688	2,335	3,543
Other Waters	12,501	14,970	12,639	12,216	7,850	9,980									11,693
Total	12,501	14,970	12,639	12,216	7,850	9,980	10,544	7,159	6,259	18,672	4,652	6,388	4,595	5,622	9,575
Area Total	56,651	86,010	78,222	91,304	59,854	80,745	67,471	81,758	67,764	92,289	77,817	107,977	96,864	101,917	81,903

Table 4. Angler-days of sport fishing effort for the West Cook Inlet-West Susitna River drainage, 1977-1990.

FISHERY	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	Mean
Deshka River	3,852	9,111	13,236	19,364	13,248	18,391	23,174	20,561	29,322	29,739	30,008	32,160	39,432	32,082	22,406
Lake Creek	6,946	8,767	13,881	8,325	6,471	8,649	14,749	14,739	14,323	15,626	16,842	16,007	14,061	17,914	12,664
Fish Lake Drainage (Yentna Drainage)										3,838	6,918	5,784	8,035	4,857	5,886
Alexander Creek	5,991	6,914	8,284	6,812	6,892	10,748	9,425	7,261	12,884	19,113	13,220	19,591	14,651	19,863	11,546
Talachulitna River	1,342	732	2,185	2,542	1,378	1,911	4,566	3,848	1,682	2,186	3,242	8,040	8,698	5,184	3,395
Chuitna River	1,355	1,185	1,069	614	1,364	751	4,290	2,342	3,381	3,532	3,169	1,637	2,666	4,443	2,271
Theodore River	1,037	905	912	700	899	375	448	3,497	5,601	4,786	6,194	4,056	4,113	3,626	2,654
Lewis River	343	172	31	43					1,023		1,231	837	1,114	1,285	675
Peter's Creek								786				2,001	914	1,318	1,255
Yentna River													656	849	753
Beluga River													866		866
Moose Creek										1,193			345		769
Rabideux Creek													550	1,024	787
Judd Lake	317	151	519	814			913	1,255		963	2,698	588	400		862
Begula Lake													1,238		1,238
Shell Lake	566	302	263	414		444	155								357
Whiskey Lake	287	129	189	29		171									161
Hewitt Lake	436	172	613	471		358									410
Total	22,472	28,540	41,182	40,128	30,252	41,798	57,720	54,289	68,216	80,976	83,522	90,701	97,739	92,445	59,284
Other Waters															
Other Streams	7,269	6,011	7,577	4,998	4,963	7,012	6,284	9,652	13,159	13,753	9,571	8,047	5,565	5,430	7,807
Other Lakes	2,205	3,420	1,615	2,999	2,120	3,412	4,653	3,161	5,722	1,325	1,949	3,121	3,001	3,914	3,044
Total	9,474	9,431	9,192	7,997	7,083	10,424	10,937	12,813	18,881	15,078	11,520	11,168	8,566	9,344	10,851
Area Total	31,946	37,971	50,374	48,125	37,335	52,222	68,657	67,102	87,097	96,054	95,042	101,869	106,305	101,789	70,135

Table 5. Number of fish harvested by recreational anglers fishing Northern Cook Inlet Management Area waters, 1977-1990.

Year	Knik Arm Effort	Knik Arm % NCIMA	East Susitna R. Effort	East Susitna R. % NCIMA	West UCI & West Susitna R. Effort	West UCI & West Susitna R. % NCIMA	NCIMA Total	Alaska Total	% by NCIMA	Region II Total	% by NCIMA
1977	67,979	43.3	49,274	31.4	39,606	25.2	156,859	2,300,332	6.8	1,929,407	8.1
1978	66,420	31.5	96,469	45.7	48,287	22.9	211,176	2,399,472	8.8	1,992,212	10.6
1979	68,658	40.7	50,476	30.0	49,392	29.3	168,526	2,502,213	6.7	2,044,813	8.2
1980	102,015	41.2	93,271	37.7	52,272	21.1	247,558	2,627,312	9.4	2,118,543	11.7
1981	109,824	57.1	46,558	24.2	36,110	18.8	192,492	2,528,056	7.6	2,052,719	9.4
1982	82,976	43.6	58,998	31.0	48,199	25.3	190,173	2,828,706	6.7	2,222,354	8.6
1983	92,690	50.6	45,330	24.7	45,333	24.7	183,353	3,086,280	5.9	2,409,876	7.6
1984	94,974	45.3	62,071	29.6	52,823	25.2	209,868	3,115,966	6.7	2,517,185	8.3
1985	104,136	52.8	39,684	20.1	53,514	27.1	197,334	3,096,044	6.4	2,469,836	8.0
1986	90,264	39.7	73,083	32.2	63,768	28.1	227,115	3,163,433	7.2	2,609,304	8.7
1987	98,373	47.2	47,548	22.8	62,640	30.0	208,561	3,207,138	6.5	2,584,420	8.1
1988	156,784	53.8	62,693	21.5	71,772	24.6	291,249	3,483,306	8.4	2,841,033	10.3
1989	115,315	50.6	51,426	22.6	61,039	26.8	227,780	3,213,867	7.1	2,519,404	9.0
1990	90,035	46.9	44,360	23.1	57,509	30.0	191,904	3,033,301	6.3	2,428,172	7.9
MEAN	95,746	46.0	58,660	28.3	53,019	25.7	207,425	2,898,959	7.2	2,338,520	8.9

Table 6. Numbers and species harvested by recreational anglers fishing in Knik Arm waters, 1977-1990.

Year	Rainbow Trout	Landlocked Salmon	Coho Salmon	Dolly Varden	Sockeye Salmon	Arctic Grayling	Chum Salmon	Pink Salmon	Chinook Salmon	Lake Trout	Smelt	White Fish	Northern Pike	Other	Burbot	Total
1977	18,615	26,917	4,366	7,541	1,576	3,916	250	1,661	207	2,260				380	290	67,979
1978	23,139	18,884	7,895	7,982	1,239	2,413	1,132	1,842	140	507				795	452	66,420
1979	24,843	11,853	7,139	8,582	3,616	8,371	654	818	800	1,254				437	291	68,658
1980	29,368	19,500	16,030	12,484	5,674	9,514	534	4,701	646	2,118				1,136	310	102,015
1981	41,749	24,255	10,484	14,475	6,080	7,396	431	834	1,466	1,791				776	87	109,824
1982	30,549	10,845	13,676	13,540	4,621	2,924	1,174	1,425	1,666	1,058				817	681	82,976
1983	26,421	22,805	6,139	13,391	14,297	4,425	643	1,009	1,255	1,279				429	597	92,690
1984	26,418	14,768	23,429	9,103	9,240	2,480	2,032	2,743	2,057	1,919				449	336	94,974
1985	46,431	14,461	14,339	13,336	5,612	4,768	514	787	1,889	277	560	587	156	209	210	104,136
1986	27,690	14,299	12,361	13,048	6,009	4,233	3,770	1,800	1,524	313	3,351	580	458	24	804	90,264
1987	24,663	14,887	25,787	11,425	8,785	3,893	2,574	886	2,476	906	0	380	924	462	325	98,373
1988	58,609	16,588	40,037	11,314	8,076	8,367	5,221	1,927	2,916	1,911	0	1,163	364	0	291	156,784
1989	44,518	11,268	23,846	8,161	9,040	5,429	4,477	1,321	4,341	835	0	844	863	0	372	115,315
1990	30,699	15,950	18,762	8,746	6,588	3,068	746	650	2,022	1,067	0	622	754	99	262	90,035
Mean	32,408	16,949	16,021	10,938	6,461	5,086	1,725	1,600	1,672	1,250	652	696	587	430	379	95,746
Percent of Mean	33.8%	17.7%	16.7%	11.4%	6.7%	5.3%	1.8%	1.7%	1.7%	1.3%	0.7%	0.7%	0.6%	0.4%	0.4%	

Table 7. Number of fish harvested at individual locations by recreational anglers fishing in Knik Arm waters, 1977-1990.

FISHERY	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	Mean
Marine															
Fish Ck.							7,520	2,108			715	946	1,161	561	2,169
Other							2,553	335	839	3,668	1,090	346	836	287	1,244
Total							10,073	2,443	839	3,668	1,805	1,292	1,997	848	2,871
Little Sustina River	7,594	10,568	9,606	17,307	16,057	16,547	10,445	28,618	17,373	15,254	20,937	28,597	23,939	12,982	16,845
Knik Arm Tributaries															
Knik River & Tributaries (incl. Jim Ck.)					3,381	4,664	3,423	6,722	6,537	8,765	5,235	16,370	7,766	10,403	7,327
Wasilla Ck.	1,560	2,867	2,256	4,184	1,695	3,123	1,729	2,519	2,280	1,328	2,553	1,957	1,267	1,202	2,180
Cottonwood Ck.			4,705	7,559	5,509	3,290	2,863	3,304	2,774	1,669	2,339	1,910	1,930	1,131	3,249
Big Lake Drainage streams									945	1,708	2,424	4,856	5,582	3,174	3,115
Ekultna Power Plant Raceway								848	858	2,496	5,299	7,621	5,265	1,638	3,432
Total	1,560	2,867	6,961	11,743	10,585	11,077	8,015	13,393	13,394	15,966	17,850	32,714	21,810	17,548	13,249
Knik Basin Lakes															
Wasilla Lake			4,127	2,308	2,519	2,348	2,002	1,073	1,656	1,843	1,440	1,546	1,043	471	1,865
Finger Lake	14,739	8,588	5,209	10,685	9,321	4,506	12,714	7,282	9,051	9,416	10,969	17,317	6,593	13,079	9,962
Kepler Complex Lakes	2,422	6,463	5,808	9,729	11,448	9,033	6,724	10,387	19,091	10,689	12,250	24,011	23,046	13,374	11,748
Big Lake	10,372	10,522	7,921	13,852	18,969	19,513	11,403	11,248	16,000	13,488	12,472	11,878	10,707	9,774	12,723
Lucille Lake	8,952	4,963	4,272	3,633	7,549	3,312	2,245	2,681	1,526	414	4,918	9,113	1,689	525	3,985
Kalmback Lake													1,625		1,625
Knik Lake													1,298		1,298
Memory Lake								2,045					2,324		2,185
Seymour Lake										726			445		586
Lower & Upper Bonnie Lakes										2,132		1,383	1,381	1,001	1,474
Nancy Lake Complex Lakes	3,648	2,419	3,417	3,908	6,140	4,495	7,720	2,731	2,951	3,272	6,884	8,840	6,730	4,688	4,846
Total	40,133	32,955	30,754	44,115	55,946	43,207	42,808	37,447	50,275	41,980	48,933	74,088	56,881	42,912	45,888

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Table 7. (page 2 of 2)

Other Waters															
Other Streams							3,900	3,390	2,261	2,206	1,423	2,056	762	2,670	2,334
Other Lakes							17,449	9,683	19,994	11,190	7,425	18,037	9,926	13,075	13,347
Other Waters	18,692	20,030	21,337	28,850	27,236	12,145									21,382
Total	18,692	20,030	21,337	28,850	27,236	12,145	21,349	13,073	22,255	13,396	8,848	20,093	10,688	15,745	18,124
Area Total	67,979	66,420	68,658	102,015	109,824	82,976	92,690	94,974	104,136	90,264	98,373	156,784	115,315	90,035	95,746

Table 8. Numbers and species harvested by recreational anglers fishing the Eastside Susitna River drainage, 1977-1990.

Year	Pink Salmon	Coho Salmon	Arctic Grayling	Rainbow Trout	Chum Salmon	Chinook Salmon	Dolly Varden	Sockeye Salmon	Landlocked Salmon	White Fish	Burbot	Lake Trout	Northern Other	Northern Pike	Smelt	Total
1977	19,663	5,709	7,469	5,225	1,382	1,056	2,726	3,594	512		619	693	626	0	0	49,274
1978	50,711	8,573	6,590	5,930	14,203	886	5,640	267	2,368		271	877	153	0	0	96,469
1979	11,189	7,564	10,489	9,463	3,791	1,298	3,699	1,020	291		427	472	773	0	0	50,476
1980	52,746	10,368	10,959	6,715	4,552	1,370	2,671	873	1,663		367	267	720	0	0	93,271
1981	8,143	6,593	11,860	8,813	4,149	2,202	2,874	833	278		220	287	306	0	0	46,558
1982	15,345	10,167	9,747	7,536	6,644	2,063	4,066	1,555	996		199	335	345	0	0	58,998
1983	3,954	5,176	7,478	9,639	4,982	2,852	4,205	3,221	1,049		901	1,404	469	0	0	45,330
1984	9,491	13,916	11,222	7,656	5,211	4,428	4,004	2,705	660	1,058	1,133	362	225	0	0	62,071
1985	2,510	7,042	7,822	7,872	2,142	4,342	3,138	1,465	884	1,365	1,085	17	0	0	0	39,684
1986	10,527	16,190	10,346	8,061	4,756	8,569	4,213	4,029	2,106	1,090	1,380	1,816	0	0	0	73,083
1987	2,209	11,028	7,568	6,647	3,042	8,603	3,946	2,046	145	796	1,175	343	0	0	0	47,548
1988	4,129	19,518	6,020	7,622	6,604	9,139	4,748	2,857	619	546	600	291	0	0	0	62,693
1989	2,715	17,078	4,562	4,972	4,151	9,783	3,040	2,527	536	442	395	1,210	15	0	0	51,426
1990	4,093	11,743	2,910	5,008	1,565	9,423	3,613	2,677	151	1,378	1,345	387	67	0	0	44,360
Mean	14,102	10,762	8,217	7,226	4,798	4,715	3,756	2,119	876	954	723	626	264	0	0	58,660
Percent of Mean	24.0%	18.3%	14.0%	12.3%	8.2%	8.0%	6.4%	3.6%	1.5%	1.6%	1.2%	1.1%	0.5%	0.0%	0.0%	

Table 9. Number of fish harvested at individual locations by recreational anglers fishing the Eastside Susitna River drainage, 1977-1990.

FISHERY	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	Mean
Willow Creek	12,775	23,804	8,877	29,994	8,737	11,466	8,564	12,533	8,415	5,229	9,069	14,501	12,109	11,457	12,681
Caswell Creek			1,643	3,740	2,127	2,905	1,701	2,830	1,603	1,271	1,302	2,852	1,589	3,526	2,257
Montana Creek	8,351	25,812	8,564	14,003	7,952	12,576	6,698	13,981	6,313	8,749	5,057	7,582	5,668	2,774	9,577
Sunshine Creek			2,660	4,567	2,759	4,067	2,455	3,505	4,035	9,003	2,709	2,740	3,955	2,429	3,740
Talkeetna River & Tributaries (in. Clear Ck)	4,227	10,430	5,909	4,959	4,578	4,442	8,588	9,402	6,633	14,121	12,578	11,695	10,428	11,199	8,514
Sheep Creek	6,464	10,492	5,203	8,723	3,870	6,282	3,860	4,177	1,892	8,095	5,340	8,959	5,442	4,134	5,924
Little Willow Creek	3,336	5,067	3,038	8,937	1,937	3,123	1,137	4,737	3,834	2,942	3,752	4,339	2,785	2,238	3,657
Goose Creek								911		907	1,131	1,382	1,331	1,856	1,253
Birch Creek										2,215	459	1,211	529		1,104
Kashwitna Creek							1,615	2,382		2,433	2,016	1,308	2,057	1,377	1,884
Total	35,153	75,605	35,894	74,923	31,960	44,861	34,618	54,458	32,725	54,965	43,413	56,569	45,893	40,990	47,288
Other Waters															
Other Streams							5,968	4,707	4,723	10,456	2,308	2,959	2,090	1,723	4,367
Lakes							4,744	2,906	2,236	7,662	1,827	3,165	3,443	1,647	3,454
Other Waters	14,121	20,864	14,582	18,348	14,598	14,137									16,108
Total	14,121	20,864	14,582	18,348	14,598	14,137	10,712	7,613	6,959	18,118	4,135	6,124	5,533	3,370	11,372
Area Total	49,274	96,469	50,476	93,271	46,558	58,998	45,330	62,071	39,684	73,083	47,548	62,693	51,426	44,360	58,660

Table 10. Numbers and species harvested by recreational anglers fishing the West Cook Inlet/West Susitna River drainage, 1977-1990.

Year	Pink Salmon	Coho Salmon	Arctic Grayling	Rainbow Trout	Chum Salmon	Chinook Salmon	Dolly Varden	Sockeye Salmon	White Fish	Burbot	Lake Trout	Northern Other	Northern Pike	Smelt	Total
1977	8,812	7,131	4,414	8,430	430	3,411	3,098	2,792		115	278	563	132		39,606
1978	6,255	10,560	6,725	13,018	2,635	2,517	3,508	1,634		153	596	370	316		48,287
1979	1,918	9,373	9,089	13,618	1,154	5,866	5,437	1,557		454	63	481	382		49,392
1980	4,538	12,769	9,247	13,345	491	6,182	3,100	1,111		706	448	103	232		52,272
1981	650	6,793	5,250	13,030	317	4,934	2,961	1,456		211	297	86	125		36,110
1982	2,284	11,403	6,525	11,863	449	8,720	2,148	2,891		776	167	366	607		48,199
1983	723	4,322	9,324	10,124	408	10,753	2,703	3,905		807	849	471	944		45,333
1984	2,529	10,172	7,446	8,777	872	13,939	1,321	3,477		1,309	562	598	1,821		52,823
1985	721	12,701	5,895	9,016	397	15,673	2,065	2,601	525	560	328	104	1,248	1,680	53,514
1986	3,665	13,787	5,530	6,880	828	15,780	3,007	4,165	435	715	157	0	1,519	7,300	63,768
1987	1,539	11,372	4,944	8,599	688	14,827	1,014	2,699	1,685	3,640	797	31	1,540	9,265	62,640
1988	2,637	17,392	4,275	8,676	1,583	17,665	1,565	3,622	1,419	944	327	0	2,818	8,849	71,772
1989	1,155	20,279	2,247	5,462	469	21,668	1,514	2,671	430	211	352	0	2,257	2,324	61,039
1990	1,262	15,095	2,192	4,415	246	19,522	1,231	2,564	1,516	1,534	202	51	2,088	5,591	57,509
Mean	2,763	11,654	5,936	9,661	783	11,533	2,477	2,653	1,002	867	387	230	1,145	5,835	53,019
Percent of Mean	5.2%	22.0%	11.2%	18.2%	1.5%	21.8%	4.7%	5.0%	1.9%	1.6%	0.7%	0.4%	2.2%	11.0%	

Table 11. Number of fish harvested at individual locations by recreational anglers fishing the West Cook Inlet/West Susitna River drainage. 1977-1990.

FISHERY	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	Mean
Deshka River	4,225	7,630	8,929	13,079	8,431	12,775	10,216	12,009	14,099	22,893	14,741	20,154	19,769	14,026	13,070
Lake Creek	11,202	11,738	12,970	9,903	7,109	9,783	10,141	12,321	10,567	7,294	10,399	9,469	7,831	11,124	10,132
Fish Lake Drainage (Yentna Drainage)										3,383	2,898	3,403	3,302	2,680	3,133
Alexander Creek	5,667	9,542	4,922	6,862	5,882	9,621	3,562	5,223	6,959	8,210	6,511	12,691	9,060	9,496	7,443
Talachulitna River	2,687	840	1,484	4,091	987	1,425	3,744	2,282	1,019	1,698	913	3,746	1,936	1,857	2,051
Chuitna River	1,993	1,744	1,465	791	2,280	985	2,786	2,618	3,065	2,602	2,500	2,022	2,115	2,665	2,117
Theodore River	1,309	1,187	861	998	1,351	419	471	1,632	2,319	2,179	2,612	1,992	2,310	1,324	1,497
Lewis River	208	139	127	9					262		475	264	348	335	241
Peter's Creek								897				804	671	1,293	916
Yentna River													646	3,970	2,308
Beluga River													819		819
Moose Creek										1,508			335		922
Rabideux Creek													430	696	563
Judd Lake	340	441	938	1,308			273	723		1,296	1,105	291	288		700
Begula Lake													304		304
Shell Lake	199	100	203	370		544	1,165								430
Whiskey Lake	144	28	252	0		367									158
Hewitt Lake	171	127	191	9		147									129
Total	28,145	33,516	32,342	37,420	26,040	36,066	32,358	37,705	38,290	51,063	42,154	54,836	50,164	49,466	39,255
Other Waters															
Other Streams	9,391	11,332	15,078	11,581	6,935	8,675	8,456	11,291	11,366	11,420	17,887	15,164	7,883	4,888	10,811
Other Lakes	2,070	3,439	1,972	3,271	3,135	3,458	4,519	3,827	3,858	1,285	2,599	1,772	2,992	3,155	2,954
Total	11,461	14,771	17,050	14,852	10,070	12,133	12,975	15,118	15,224	12,705	20,486	16,936	10,875	8,043	13,764
Area Total	39,606	48,287	49,392	52,272	36,110	48,199	45,333	52,823	53,514	63,768	62,640	71,772	61,039	57,509	53,019

Table 12. Numbers and species harvested by recreational anglers fishing Northern Cook Inlet Management Area waters, 1977-1990.

Year	Chinook Salmon	Coho Salmon	Sockeye Salmon	Pink Salmon	Chum Salmon	Landlocked Salmon	Rainbow Trout	Dolly Varden	Arctic Grayling	Lake Trout	Burbot	Northern Pike	White Fish	Smelt	Other	Total
1977	4,674	17,206	7,962	30,136	2,062	27,429	32,270	13,365	15,799	3,231	1,024	132	0	0	1,569	156,859
1978	3,543	27,028	3,140	58,808	17,970	21,252	42,087	17,130	15,728	1,980	876	316	0	0	1,318	211,176
1979	7,964	24,076	6,193	13,925	5,599	12,144	47,924	17,718	27,949	1,789	1,172	382	0	0	1,691	168,526
1980	8,198	39,167	7,658	61,985	5,577	21,163	49,428	18,255	29,720	2,833	1,383	232	0	0	1,959	247,558
1981	8,602	23,870	8,369	9,627	4,897	24,533	63,592	20,310	24,506	2,375	518	125	0	0	1,168	192,492
1982	12,449	35,246	9,067	19,054	8,267	11,841	49,948	19,754	19,196	1,560	1,656	607	0	0	1,528	190,173
1983	14,860	15,637	21,423	5,686	6,033	23,854	46,184	20,299	21,227	3,532	2,305	944	0	0	1,369	183,353
1984	20,424	47,517	15,422	14,763	8,115	15,428	42,851	14,428	21,148	2,843	2,778	1,821	1,058	0	1,272	209,868
1985	21,904	34,082	9,678	4,018	3,053	15,345	63,319	18,539	18,485	622	1,855	1,404	2,477	2,240	313	197,334
1986	25,873	42,338	14,203	15,992	9,354	16,405	42,631	20,268	20,109	2,286	2,899	1,977	2,105	10,651	24	227,115
1987	25,906	48,187	13,530	4,634	6,304	15,032	39,909	16,385	16,405	2,046	5,140	2,464	2,861	9,265	493	208,561
1988	29,720	76,947	14,555	8,693	13,408	17,207	74,907	17,627	18,662	2,529	1,835	3,182	3,128	8,849	0	291,249
1989	35,792	61,203	14,238	5,191	9,097	11,804	54,952	12,715	12,238	2,397	978	3,120	1,716	2,324	15	227,780
1990	30,967	45,600	11,829	6,005	2,557	16,101	40,122	13,590	8,170	1,656	3,141	2,842	3,516	5,591	217	191,904
Mean	17,920	38,436	11,233	18,466	7,307	17,824	49,295	17,170	19,239	2,263	1,969	1,396	1,204	2,780	924	207,425
Percent of Mean	8.6%	18.5%	5.4%	8.9%	3.5%	8.6%	23.8%	8.3%	9.3%	1.1%	0.9%	0.7%	0.6%	1.3%	0.4%	

Table 13. Percent of fish released by recreational anglers in the Northern Cook Inlet Management Area for 1990.

	Catch	Kept	Released	Percent Released
Chinook Salmon	80,485	30,967	49,518	61.5%
Coho Salmon	75,568	45,600	29,968	39.7%
Sockeye Salmon	23,124	11,829	11,295	48.8%
Pink Salmon	40,631	6,005	34,626	85.2%
Chum Salmon	15,239	2,557	12,682	83.2%
Landlocked Salmon	28,017	16,101	11,916	42.5%
Lake Trout	5,052	1,656	3,396	67.2%
Dolly Varden	40,620	13,590	27,030	66.5%
Rainbow Trout	156,460	40,122	116,338	74.4%
Arctic Grayling	46,490	8,170	38,320	82.4%
Whitefish	5,247	3,516	1,731	33.0%
Northern Pike	17,058	2,842	14,216	83.3%
Burbot	4,078	3,141	937	23.0%
Smelt	5,591	5,591	0	0.0%
Other	837	217	620	74.1%
All	544,497	191,904	352,593	64.8%

Table 14. Percent of fish released by recreational anglers in the Knik Arm Area, Eastside Susitna River Area and Westside Susitna/West-Cook Inlet Area for 1990.

	Knik Arm Area				East Susitna Area				West Susitna/WCI Area			
	Catch	Kept	Released	Percent Released	Catch	Kept	Released	Percent Released	Catch	Kept	Released	Percent Released
Chinook Salmon	3,240	2,022	1,218	37.6%	22,077	9,423	12,654	57.3%	55,168	19,522	35,646	64.6%
Coho Salmon	29,958	18,762	11,196	37.4%	18,174	11,743	6,431	35.4%	27,436	15,095	12,341	45.0%
Sockeye Salmon	12,966	6,588	6,378	49.2%	4,499	2,677	1,822	40.5%	5,659	2,564	3,095	54.7%
Pink Salmon	3,560	650	2,910	81.7%	24,264	4,093	20,171	83.1%	12,807	1,262	11,545	90.1%
Chum Salmon	3,880	746	3,134	80.8%	8,711	1,565	7,146	82.0%	2,648	246	2,402	90.7%
Landlocked Salmon	27,765	15,950	11,815	42.6%	252	151	101	40.1%	0	0	0	ERR
Lake Trout	2,380	1,067	1,313	55.2%	2,033	387	1,646	81.0%	639	202	437	68.4%
Dolly Varden	21,316	8,746	12,570	59.0%	12,331	3,613	8,718	70.7%	6,973	1,231	5,742	82.3%
Rainbow Trout	98,720	30,699	68,021	68.9%	21,806	5,008	16,798	77.0%	35,934	4,415	31,519	87.7%
Arctic Grayling	10,188	3,068	7,120	69.9%	16,834	2,910	13,924	82.7%	19,468	2,192	17,276	88.7%
Whitefish	737	622	115	15.6%	2,388	1,378	1,010	42.3%	2,122	1,516	606	28.6%
Northern Pike	2,593	754	1,839	70.9%	0	0	0	ERR	14,465	2,088	12,377	85.6%
Burbot	344	262	82	23.8%	1,864	1,345	519	27.8%	1,870	1,534	336	18.0%
Smelt	0	0	0	ERR	0	0	0	ERR	5,591	5,591	0	0.0%
Other	181	99	82	45.3%	521	67	454	87.1%	135	51	84	62.2%
All	217,828	90,035	127,793	58.7%	135,754	44,360	91,394	67.3%	190,915	57,509	133,406	69.9%

Table 15. Upper Cook Inlet commercial salmon harvests from all districts, 1977-1990.

Date	Chinook	Sockeye	Coho	Pink	Chum	All
1977	14,792	2,052,511	192,599	553,855	1,233,722	4,047,479
1978	17,302	2,621,667	219,360	1,689,098	571,959	5,119,386
1979	13,738	924,415	265,166	72,982	650,357	1,926,658
1980	13,795	1,573,637	271,378	1,786,430	390,810	4,036,050
1981	12,240	1,439,235	485,148	127,169	833,549	2,897,341
1982	20,870	3,259,864	793,937	790,648	1,433,866	6,299,185
1983	20,634	5,049,733	516,322	70,327	1,114,858	6,771,874
1984	8,819	2,102,767	442,619	622,510	684,124	3,860,839
1985	23,297	3,852,141	619,924	83,538	714,140	5,293,040
1986	39,240	4,787,982	756,830	1,299,360	1,134,173	8,017,585
1987	39,661	9,500,186	451,404	109,801	349,132	10,450,184
1988	29,060	6,834,342	560,022	469,972	708,573	8,601,969
1989	26,742	5,010,698	339,201	67,430	122,027	5,566,098
1990	16,105	3,604,064	500,026	603,630	351,197	5,075,022
Mean	21,164	3,758,089	458,138	596,196	735,178	5,568,765

Table 16. Estimated economic value of NCIMA sport fisheries during 1986.

Angler Type	Jones & Stokes (1986) Data			NCI Management Area		
	Angler-Days	Expenditures	$/Ang-Day	Angler-Days	$/Ang-Day	Expenditures
Resident	1,153,660	74,163,000	64.29	288,613	64.29	18,555,000
Non-Resident	201,488	52,892,000	262.51	40,380	262.51	10,600,000
Both	1,355,148	127,055,000	---[a]	328,993	---[a]	29,155,000

[a] Value not computed.

Table 17. Economic value for selected NCIMA sport fisheries during 1986.

Fishery	Resident Anglers (dollars)	Non-Resident Anglers (dollars)	Total (dollars)
Little Susitna River			
Chinook Salmon Fishing	794,000	666,000	1,460,000
Coho Salmon Fishing	312,000	397,000	709,000
Combined	1,106,000	1,063,000	2,169,000
West Susitna River/WCI			
Chinook Salmon Fishing	2,480,000	2,569,000	5,049,000
Coho Salmon Fishing	278,000	363,000	641,000
Combined	2,758,000	2,932,000	5,690,000
East Susitna River			
Chinook Salmon Fishing	435,000	507,000	942,000
Coho Salmon Fishing	161,000	195,000	356,000
Combined	596,000	702,000	1,298,000
Lake Creek (all species)	541,000	322,000	863,000
Kepler Lake Complex			
Rainbow Trout Fishing	162,000	2,000	164,000
Big Lake			
Rainbow Trout Fishing	214,000	40,000	244,000
All Sites	5,377,000	5,061,000	10,438,000

Table 18. Number and species of fish stocked (actual and planned) in Northern Cook Inlet Management Area waters, 1990-1992.

Species/Life Stage	1990 (Actual)	1991 (Actual)	1992 (Planned)
Chinook Salmon Anadromous Smolt	654,477	400,000	400,000
Coho Salmon Anadromous Smolt	473,212	636,000	633,000
Coho Salmon Anadromous Fingerlings	2,184,404	0	0
Rainbow Trout Landlocked Fingerlings	1,193,115	930,300	990,620
Rainbow Trout Landlocked Fry	0	355,000	355,000
Coho Salmon Landlocked Fingerlings	235,929	240,000	186,800
Arctic Grayling Landlocked Fingerlings	125,700	93,700	130,300
Arctic Grayling Landlocked Fry	101,900	101,900	101,900
Arctic Char Landlocked Fingerlings	27,200	27,200	34,200
Rainbow Trout Landlocked Lg Subcatchables	39,383	38,000	26,000
Lake Trout Landlocked Fingerlings	10,000	10,600	0
Total	5,045,320	2,832,700	2,857,820

Table 19. Tyonek subsistence salmon harvests, 1980-1990.

Year	Number Of Permits	Chinook	Sockeye	Coho	Pink	Chum
1980	67	1,927	261	0	0	0
1981	70	2,002	269	62	32	13
1982	69	1,574	274	113	15	4
1983	73	2,755	251	78	0	6
1984	70	2,364	310	66	3	23
1985	176	1,967	163	91	0	10
1986	101	1,674	198	210	45	44
1987	64	1,552	161	149	10	24
1988	47	1,474	53	185	6	9
1989	49	1,202	67	70	0	1
1990	42	797	92	366	124	10

Table 20. Northern District commercial chinook salmon harvest, 1986-1990.

Year	Northern District	Total Upper Cook Inlet
1986	15,488	39,240
1987	12,701	39,661
1988	12,836	29,060
1989	12,731	26,742
1990	9,582	16,105

Table 21. Harvest and effort for Little Susitna River chinook salmon, 1979-1989.

Year	Chinook	Small Chinook[a]	Annual Effort in Angler-days[b]
1979	800	---	21,301
1980	646	---	22,420
1981	920	498	26,162
1982	933	534	24,020
1983	847	340	35,477
1984	1,671	212	48,517
1985	1,365	480	37,498
1986	1,049	408	45,770
1987	1,864	418	35,659
1988	2,150	199	49,731
1989	3,661	543	54,708

[a] Chinook salmon less than 20 inches 1979-86 and less than 16 inches 1987-89.

[b] Participation directed at chinook salmon represents a portion of this annual effort.

Table 22. Number of chinook salmon smolt stocked into the Willow Creek drainage from 1985-1990.

Brood Year	Release Location	Total Smolt Release	Number Coded-wire Tagged	Mean Size	Release Date
1983	Deception	101,256	8,152	18.0	6/13/85
1984	Deception	214,384	11,038	13.8	6/11-12/85
	Deception	218,743	10,708	14.0	6/20/85
1985	Deception	49,668	9,933	16.7	5/01/86
	Deception	127,904	18,400	12.2	5/10/86
	Deception	147,877		11.4	5/10/86
		275,781	18,400		
1987	Deception	201,091	20,936	10.9	7/12/88
1988	Deception	240,885	19,851	13.0	5/31/89
1989	Deception	219,362	41,570	14.4	5/24/90
	Deception	219,432	40,575	13.4	5/24/90
	Deception	216,697	40,438	13.9	5/24/90
		655,491	122,583		

Table 23. Harvest of chinook salmon from eastside Susitna River tributaries, 1979-1989.

Year	Chinook	Small Chinook[a]	Total
1979	1,298	---	1,298[b]
1980	1,370	---	1,370[b]
1981	1,322	880	2,202
1982	1,215	848	2,063
1983	1,689	1,163	2,852
1984	3,417	1,011	4,428
1985	2,291	2,051	4,342
1986	6,898	1,671	8,569
1987	7,094	1,509	8,603
1988	8,098	1,041	9,139
1989	8,510	1,273	9,783
1990	8,759	664	9,423

[a] Chinook salmon less than 20 inches 1981-86 and less than 16 inches 1987-89.

[b] Includes both small and large chinook salmon.

Table 24. Chinook salmon escapement counts in eastside Susitna River streams, 1979-1990.

Location[a]	1979	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Willow Creek	848	991	592	777	2,789	1,856	2,059	2,768	2,496	5,060	2,365
Deception Creek	239	366	229	121	675	1,044	521	692	790	800	700
Montana Creek	1,094	814	887	1,641	2,309	1,767	---	1,452	2,016	2,701	1,576
Little Willow Creek	327	459	316	1,042	---	1,305	2,133	1,320	1,515	1,325	1,115
Sheep Creek	778	1,013	527	975	1,028	1,634	1,285	895	1,215	610	634
Goose Creek	---	262	140	477	258	401	630	416	1,076	835	552
Clear Creek	864	---	982	938	1,520	2,430	---	1,949	4,850	---	2,380
Prairie Creek	---	---	3,844	3,200	9,000	6,500	8,500	9,138	8,650	9,463	9,113
Chulitna River	---	---	644	3,845	4,191	783	---	5,252	---	---	2,681
Other Streams[b]	1,185	1,877	2,943	5,000	4,449	4,066	1,119	4,734	3,647	2,323	4,231
Total	5,335	5,782	11,104	18,016	26,219	21,786	16,247	28,616	26,255	23,117	25,347

[a] No counts taken in 1980.

[b] N.F. Kashwitna R., Larson Cr., Portage Cr., Indian R.

Table 25. Harvest of chinook salmon from westside Susitna River tributaries, 1979-1989.

Year	Chinook	Small Chinook[a]	Total
1979	5,796	---	5,768[b]
1980	6,182	---	6,182[b]
1981	3,506	1,428	4,934
1982	6,279	2,441	8,720
1983	7,291	2,277	9,568
1984	9,552	2,554	12,106
1985	10,424	3,220	13,644
1986	9,707	3,695	13,402
1987	11,360	1,990	13,350
1988	14,248	1,722	15,970
1989	16,892	2,480	19,372
Mean			
1979-89	9,200	2,423	11,183
1986-89	13,052	2,471	15,523

[a] Chinook salmon less than 20 inches 1981-86 and less than 16 inches 1987-89.

[b] Includes both small and large chinook salmon.

Table 26. Harvest of chinook salmon over 16 inches in length for the Deshka River, Alexander Creek and Lake Creek, 1986-1989.

Year	Deshka	Alexander	Lake	Total
1986	4,457	2,055	1,799	8,311
1987	4,622	2,020	2,845	9,487
1988	5,086	3,958	2,509	11,553
1989	6,843	4,267	3,163	14,273
Mean	5,252	3,075	2,579	10,906

Table 27. Chinook salmon escapement counts in Westside Susitna River/West Cook Inlet waters, 1979-1990.

Location[a]	1979	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Westside Susitna River Streams											
Alexander Creek	6,215	---	2,546	3,755	4,620	6,241	5,225	2,152	6,273	3,497	2,596
Deshka River	27,385	---	16,000	19,237	16,892	18,151	21,080	15,028	19,200	---	18,166
Lake Creek	4,196	---	3,577	7,075	---	5,803	---	4,898	6,633	---	2,075
Talachulitna River	1,648	2,025	3,101	10,014	6,138	5,145	3,686	---	4,112	---	2,694
Peters Creek	---	---	---	2,272	324	2,901	1,915	1,302	3,927	959	2,027
Other Streams[b]	---	1,376	728	357	---	691	424	556	818	362	847
Total	39,444	3,401	25,952	42,710	27,974	38,932	32,330	23,936	40,963	4,813	28,405
West Cook Inlet Streams											
Chuitna River	1,246	---	3,438	4,043	2,845	1,600	3,946	---	3,024	990	480
Theodore river	512	535	1,368	1,519	1,251	1,458	1,281	1,548	1,906	1,026	642
Lewis River	546	560	606	---	947	861	722	875	616	452	207
Other Streams	225	1,400	1,000	500	---	700	165	---	---	---	---
Total	2,529	2,495	6,412	6,062	5,043	4,619	6,114	2,423	5,546	2,468	1,329
Grand Total	41,973	5,896	32,364	48,772	33,017	43,551	38,444	26,359	46,482	7,282	29,734

[a] No counts taken in 1980.

[b] Cache Cr., Donkey Cr., Martin Cr.

Table 28. Yentna River and Skwentna River estimated effort for chinook salmon, 1990.

Location	Effort (hours)	Percent of Total Effort
Yentna River		
Fish Cr.	1,140	9
Beaver Cr.	0	0
Moose Cr.	1,013	8
Indian Cr.	253	2
Fish Lakes Cr.	507	4
Bottle Cr.	0	0
Hewitt Cr.	127	1
Bob's Cr.	127	1
Donkey Cr.	507	4
Malone Cr.	507	4
Johnson Cr.	127	1
Kichatna R.	0	0
Otter Cr.	633	5
Gagnon Cr.	1,647	13
Clearwater Cr.	127	1
Fourth of July Cr.	0	0
Total	6,715	53
Skwentna River		
Eight Mile Cr.	1,773	14
Talachulitna R.	4,180	33
Shell Cr.	0	0
Canyon Cr.	0	0
Total	5,953	47
Grand Total	12,668	100

Table 29. West Cook Inlet harvest of chinook salmon over 16 inches in length, 1984-1989.

Year	Chuit	Theodore	Lewis	Total
1984	686	910	---	1,596
1985	560	921	100	1,581
1986	882	1,195	---	2,077
1987	136	1,107	156	1,399
1988	265	1,004	246	1,515
1989	569	1,167	190	1,926
Mean	516	1,137	173	1,683

Table 30. Coho salmon stocking history for the Little Susitna River, 1982-1990.

	Fry Release			Smolt Release			Total Number Released
Year Stocked	Size (gms)	Number Released	Number Marked	Size (gms)	Number Released	Number Marked	
1982	0.57	2,950					2,950
1983	0.57	216,508	20,835				216,508
1984	0.91	426,216	10,000				426,216
1985	0.30	1,225,000	10,004	17.1	54,394	12,151	1,279,394
1986	1.00	316,270		17.2	580,065	24,401	580,065
1987				19.2	302,055	23,955	302,055
1988	1.00	3,374,126	3,126	20.1	438,374	24,628	3,812,500
1989				19.8	358,478	25,631	358,478
1990	1.1-2.0	473,327	72,327	22.3	277,762	46,358	751,089

Table 31. Harvest and effort for Little Susitna River coho salmon, 1977-1989.

Year	Harvest	Annual Effort in Angler-days[a]
1977	3,415	11,063
1978	4,865	12,127
1979	3,382	21,301
1980	6,302	22,420
1981	5,940	26,162
1982	7,116	24,020
1983	2,835	35,477
1984	14,253	48,517
1985	7,764	37,498
1986	6,039	45,776
1987	13,003	35,659
1988	19,009	49,731
1989	14,129	54,708
Mean	8,312	32,651

[a] Participation directed at coho salmon represents only a portion of the annual effort.

Table 32. Little Susitna River coho salmon harvest and escapement indices, 1981-1990.

	1981	1982	1983	1984	1985	1986	1987	1988	1989[a]	1990
Harvest	5,222	7,308	2,965	14,308	4,615	6,098	12,181	12,759	14,150	8,001
Escapement[b]	6,750	6,800	2,666	20,990	4,500	6,999	9,000	20,491	15,232	14,212

[a] The weir washed out August 26 resulting in a loss of the last two weeks of escapement.

[b] Escapements were obtained by aerial and/or foot counts 1981 thru 1985 and 1987. Escapements for 1986 and 1988 thru 1990 were obtained by weir counts.

Table 33. Estimated coho salmon harvest, catch and effort at the Little Susitna River, 1990.

Location	Harvest	Harvest Rate	Catch	Catch Rate	Effort Angler-Hrs
Little Susitna River, Burma Rd.					
Shore anglers	1,082	0.083	1,109	0.085	13,098
All Boat anglers	6,236	0.233	7,329	0.274	26,768
Above weir	518	0.269	986	0.513	1,923
Between weir and landing	860	0.247	927	0.266	3,488
Below landing	4,858	0.227	5,416	0.254	21,357
Total (boat and shore)	7,318	0.184	8,438	0.212	39,866
Little Susitna River, Houston					
Miller's Landing	478	0.251	566	0.298	1,901
Miller's Reach	205	0.297	256	0.370	691
Total	683	0.264	822	0.317	2,592
Grand Total	8,001	0.188	9,260	0.218	42,458

Table 34. Yentna River coho salmon escapements, 1981-1989.

Year	Estimated Coho Salmon	Period of Sonar Enumeration
1981	17,017	6/22-9/5
1982	34,089	6/27-9/5
1983	8,867	6/30-9/5
1984	15,007	7/1-9/5
1985	9,181	7/1-8/8
1986	23,457	6/29-8/6
1987	6,279	7/1-8/13
1988	12,173	7/7-8/11
1989	25,695	7/7-8/20

Table 35. Coho salmon harvest for the Susitna River drainage, 1983-1989.

Year	Eastside Harvest	Westside Harvest	Total Harvest	% of NCIMA[a]
1983	5,176	3,570	8,746	44.8
1984	13,916	9,137	23,035	45.9
1985	7,042	11,270	18,312	46.8
1986	16,190	12,804	28,994	62.2
1987	11,028	8,547	19,574	35.7
1988	19,518	16,210	35,728	42.9
1989	17,078	18,009	35,087	51.9
Mean	12,850	11,364	24,214	46.9

[a] Percent of total harvest of the Northern Cook Inlet management area.

Table 36. Summary of coho salmon stocked into Cottonwood, Wasilla, Jim,and Fish Creeks and Eklutna tailrace, 1977-1990.

Brood Year	Brood Stock	Release Year	Release Location	Size (gms)	Number	Number Marked
Big Lake Hatchery						
1977	Big Lake	1978	Cottonwood Creek	0.80	317,694	32,064
1978	Big Lake	1979	Cottonwood Creek	0.54	246,762	19,992
1979	Big Lake	1980	Cottonwood Creek	0.63	154,991	15,000
1979	Big Lake	1980	Cottonwood Creek	0.49	155,004	15,000
1980	Big Lake	1981	Cottonwood Creek	0.78	179,117	18,450
1980	Big Lake	1981	Cottonwood Creek	0.45	181,658	18,500
1981	Big Lake	1982	Cottonwood Creek	0.45	364,911	86,850
1982	Cottonwood Lk & Big Lake	1983	Cottonwood Creek	0.45	368,022	21,917
1983	Cottonwood Lk & Big Lake	1984	Cottonwood Creek	0.91	372,318	10,000
1984	Cottonwood Lk & Big Lake	1985	Cottonwood Creek	0.30	336,000	10,000
1985	Big Lake	1988	Cottonwood Creek	17.0	6,275	0
1986	Big Lake	1989	Cottonwood Creek	16.2	16,900	0
1986	Big Lake	1987	Cottonwood Creek	1.4	315,916	0
1987	Big Lake	1990	Cottonwood Creek	16.4	16,900	0
1989	Big Lake	1990	Cottonwood Creek	1.1	202,000	0
1985	Big Lake	1988	Wasilla Creek	17.0	6,575	0
1986	Big Lake	1989	Wasilla Creek	15.7	21,600	0
1987	Big Lake	1990	Wasilla Creek	16.0	16,100	0
1989	Big Lake	1990	Wasilla Creek	1.1	152,000	0
1985	Big Lake	1988	Jim Creek	17.0	7,550	0
1986	Big Lake	1989	Jim Creek	16.4	20,100	0

-continued-

Table 36. (Page 2 of 3)

Brood Year	Brood Stock	Release Year	Release Location	Size (gms)	Number	Number Marked
1987	Big Lake	1990	Jim Creek	16.5	21,100	0
1989	Big Lake	1990	Jim Creek	1.1	163,000	0
1976	Big Lake	1977	Fish Creek	0.28	40,673	23,852
1977	Big Lake	1978	Fish Creek	0.70	101,081	40,959
1978	Big Lake	1979	Fish Creek	0.49	383,295	20,218
1979	Big Lake	1980	Fish Creek	0.64	99,736	0
1979	Big Lake	1980	Fish Creek	0.38	351,151	22,337
1980	Big Lake	1981	Fish Creek	0.46	118,071	13,072
1981	Big Lake	1982	Fish Creek	0.45	585,548	23,085
1982	Big Lake	1983	Fish Creek	0.45	1,612,337	21,607
1983	Big Lake	1984	Fish Creek	0.76	986,552	10,000
1984	Big Lake	1985	Fish Creek	0.30	1,053,000	9,623
1985	Big Lake	1986	Fish Creek	1.0	2,688,893	13,092
1986	Big Lake	1987	Fish Creek	1.2	1,775,934	15,600
1986	Big Lake	1987	Fish Creek	7.8	445,000	20,000
1986	Big Lake	1988	Fish Creek	17.0	20,400	19,739
1987	Big Lake	1988	Fish Creek	1.2	2,047,000	14,050
1987	Big Lake	1988	Fish Creek	7.6	366,226	21,226
1987	Big Lake	1989	Fish Creek	15.7	15,044	9,644
1988	Big Lake	1990	Fish Creek	16.0	21,700	5,671
1989	Big Lake	1990	Fish Creek	1.2	504,000	20,077
Eklutna Hatchery						
1981	Cottonwood Lk & Big Lake	1983	tailrace	15.4	>> 633[a]	452

-continued-

Table 36. (Page 3 of 3)

Brood Year	Brood Stock	Release Year	Release Location	Size (gms)	Number	Number Marked
1982	Cottonwood Lk & Big Lake	1984	Cottonwood Creek	18.7	16,244	15,757
1982	Cottonwood Lk & Big Lake	1984	tailrace	18.7	>> 28,150[a]	27,306
1984	Cottonwood Lk & Big Lake	1986	tailrace	22.0	101,326	101,326
1985	Eklutna	1987	tailrace	25.0	147,715	14,772
1986	Eklutna	1988	tailrace	16.0	72,881	7,300
1987	Eklutna	1988	McRoberts Creek	[b]	68,000	0
1987	Eklutna	1989	tailrace	19.0	50,787	2,052
1988	Eklutna	1990	tailrace	21.6	54,278	2,916

[a] Some fingerlings escaped into tailrace due to vandalism.

[b] Fingerlings, weight unknown.

Table 37. Fishing effort and coho salmon harvest from Knik Arm fisheries, 1977-1989.

Year	Wasilla Creek		Cottonwood Creek		Fish Creek		Eklutna		Jim Creek	
	Harvest	Angler-days[a]	Harvest	Angler-days[a]	Harvest	Angler-days[a]	Harvest	Angler-days[a]	Harvest	Angler-days[a]
1977	472	2,805								
1978	2,112	3,446								
1979	1,211	4,024	1,198	5,345						
1980	3,555	5,726	3,375	9,268						
1981	814	4,019	1,373	8,663					1,801	4,904
1982	1,624	6,261	1,886	5,186					2,306	6,653
1983	345	3,239	518	5,944					774	9,183
1984	1,920	3,547	1,895	7,144			561	3,413	3,429	9,369
1985	1,900	3,115	1,005	4,560	284	903	557	2,995	2,523	8,970
1986	944	3,387	690	5,653	364	2,641	502	8,549	2,948	13,015
1987	1,195	2,173	1,159	2,934	833	2,898	2,318	11,663	3,676	6,990
1988	1,273	2,228	746	4,056	1,637	3,110	3,329	13,188	11,078	23,229
1989	975	2,406	876	3,069	784	3,314	1,666	10,342	4,220	11,141

[a] In some cases, participation includes effort directed at species other than coho salmon.

Table 38. Fish Creek coho salmon escapement counts, 1980-1990.

Year	Coho Salmon Escapement[a]
1980	8,924
1981	2,330
1982	5,201
1983	2,342
1984	4,510
1985	5,089
1986	2,166
1987	3,871
1988	2,162
1989	3,478
1990	2,673
Mean	3,886

[a] Measured by weir plus ground surveys downstream from the weir upon conclusion of the weir operation.

Table 39. Big Lake hatchery sockeye salmon fry releases into the Big Lake drainage, 1975-1990.

Brood Year	Eggs Incubated	Fry Released	Egg/Fry Survival	Number Marked	Size (gm) At Release
1975	180,300	71,168	39.5%	0	0.15
1976	10,034,013	7,686,382	76.6%	72,673	0.15
1977	8,748,867	5,739,010	65.6%	66,153	0.13
1978	9,832,726	0	0.0%	0	
1979	5,053,808	806,047	15.9%	0	0.15
1980	4,699,733	3,967,941	84.4%	0	0.14
1981	5,662,004	4,263,356	75.3%	0	0.17
1982	8,624,662	6,601,409	76.5%	0	0.16
1983	9,294,426	7,362,000	79.2%	0	0.15
1984	16,210,000	12,430,000	76.7%	18,835	0.15
1985	21,550,000	15,000,000	69.6%	18,120	0.20
1986	17,500,000	11,866,000	67.8%	19,613	0.20
1987	20,300,000	14,492,000	71.4%	20,085	0.15
1988	19,700,000	13,205,848	67.0%	24,848	0.15
1989	14,835,000	10,815,319	72.9%	24,319	0.20
1990	14,734,000	10,037,290	68.1%	22,290	0.24

Table 40. Fish Creek sockeye salmon harvests, 1987-1990.

	Gill Net						Personal Use
Year	Sockeye	Coho	Chum	Pink	Chinook	Total	Sockeye
1987	24,090	2,043	403	264		26,800	2,200
1988	38,251	11,604	325	591	9	50,780	3,000
1989	47,925	6,075	4,979	545	4	59,528	5,000
1990	23,450	5,708	5,308	696	4	35,166	6,500
Total	133,716	25,430	11,015	2,096	17	172,274	16,700

Table 41. Northern Cook Inlet Management Area 1990 lake stocking summary for non-anadromous fish.

RAINBOW TROUT

LAKE STOCKED	SURFACE ACRES	DATE STOCKED	NUMBER STOCKED	FIN MARK	BROODSTOCK	HATCHERY	STOCKING SIZE	STOCKING METHOD[a]
Barley	18.6	07/17/90	3,720		90 Swanson R.	Ft. Richardson	1.69g	T/BU
Bear Paw	45	07/17/90	2,250		90 Swanson R.	Ft. Richardson	1.69g	T/BU
Bench	34	07/26/90	5,200		90 Swanson R.	Ft. Richardson	1.70g	A
Big	2,495	07/16/90	372,758		90 Big Lake	Ft. Richardson	1.65g	T
		07/16/90	76,869	AD	90 Big Lake	Ft. Richardson	1.65g	T
Big No Luck	67.9	07/27/90	6,800		90 Swanson R.	Ft. Richardson	1.07g	A
Blodgett	57.6	07/09/90	5,760		90 Big Lake	Ft. Richardson	0.78g	T
Carpenter	176.4	07/17/90	35,280		90 Swanson R.	Ft. Richardson	1.69g	T
Christiansen	179	07/20/90	17,900		90 Swanson R.	Ft. Richardson	1.43g	T
Crystal	131.7	07/13/90	52,772		90 Swanson R.	Ft. Richardson	1.93g	T
Coyote	1	06/01/90	608		89 Swanson R.	Ft. Richardson	92.80g	T
Dawn	11.8	07/17/90	9,440		90 Swanson R.	Ft. Richardson	1.69g	T/BU
Diamond	139	07/17/90	55,600		90 Swanson R.	Ft. Richardson	1.90g	T
East Twin	41.1	07/27/90	4,110		90 Swanson R.	Ft. Richardson	1.07g	A
Echo	23	06/01/90	1,946		89 Swanson R.	Ft. Richardson	97.10g	T
Eklutna	3,520	08/01/90	50,016		90 Swanson R.	Ft. Richardson	1.27g	A
		09/28/90	19,224		90 Swanson R.	Ft. Richardson	6.40g	T
Finger	362	07/12/90	23,890		90 Swanson R.	Ft. Richardson	1.83g	T
Florence	54.6	07/20/90	5,460		90 Swanson R.	Ft. Richardson	1.43g	T/BU
Honeybee	58	07/13/90	46,395		90 Swanson R.	Ft. Richardson	1.96g	T
Ida	46.4	07/19/90	4,640		90 Swanson R.	Ft. Richardson	1.30g	T/BU
Irene	18	06/01/90	2,216		89 Swanson R.	Ft. Richardson	92.80g	T/BU

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Table 41. (Page 2 of 7)

LAKE STOCKED	SURFACE ACRES	DATE STOCKED	NUMBER STOCKED	FIN MARK	BROODSTOCK	HATCHERY	STOCKING SIZE	STOCKING METHOD[a]
Johnson[b]	40.3	09/14/90	2,020	LV	90 Swanson R.....	Ft. Richardson	8.40g	T
		09/14/90	2,020	RV	90 Swanson R.	Ft. Richardson	7.10g	T
Kalmback	125	07/17/90	50,000		90 Swanson R.	Ft. Richardson	1.90g	T
Kashwitna	160	07/20/90	5,200		90 Swanson R.	Ft. Richardson	1.43g	T
Kepler-Bradley	58	05/11/90	5,043		89 Swanson R.	Ft. Richardson	98.50g	T
		05/31/90	9,584		89 Swanson R.	Ft. Richardson	97.10g	T
Knik	50.4	06/01/90	3,986		89 Swanson R.	Ft. Richardson	97.10g	T
Little Lonely	56	07/13/90	44,820		90 Swanson R.	Ft. Richardson	2.05g	T
Little No Luck	34.1	07/27/90	3,410		90 Swanson R.	Ft. Richardson	1.07g	A
Loberg (Junction)	10.9	06/01/90	1,056		89 Swanson R.	Ft. Richardson	97.10g	T
Long(K-B)	74.4	07/26/90	29,776		90 Swanson R.	Ft. Richardson	1.70g	A
Loon	108	07/19/90	10,800		90 Swanson R.	Ft. Richardson	1.10g	T
Lorraine	132	07/26/90	6,620		90 Swanson R.	Ft. Richardson	1.70g	A
Lower Bonnie	99.8	07/18/90	12,010		90 Swanson R.	Ft. Richardson	1.86g	T
Lucille	362	07/09/90	36,348		90 Big Lake	Ft. Richardson	0.80g	T
Lynne	70	07/13/90	7,000		90 Swanson R.	Ft. Richardson	2.05g	T
Marion	113	07/19/90	11,300		90 Swanson R.	Ft. Richardson	1.10g	T
Matanuska	61.5	05/11/90	5,032		89 Swanson R.	Ft. Richardson	95.50g	T
		05/31/90	9,324		89 Swanson R.	Ft. Richardson	97.10g	T
Memory	83	07/19/90	8,300		90 Swanson R.	Ft. Richardson	1.10g	T
Morvro	86.6	07/17/90	17,320		90 Swanson R.	Ft. Richardson	1.69g	T
North Friend	81.4	07/20/90	8,140		90 Swanson R.	Ft. Richardson	1.43g	T
Prator	98	07/17/90	4,900		90 Swanson R.	Ft. Richardson	1.69g	T
Ravine	12.3	07/19/90	2,500		90 Swanson R.	Ft. Richardson	1.30g	T/BU

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Table 41. (Page 3 of 7)

LAKE STOCKED	SURFACE ACRES	DATE STOCKED	NUMBER STOCKED	FIN MARK	BROODSTOCK	HATCHERY	STOCKING SIZE	STOCKING METHOD[a]
Reed[c]	19.5	08/02/90	1,832	LV	90 Swanson R.	Ft. Richardson	1.50g	T/BU
		08/02/90	1,862	RV	90 Swanson R.	Ft. Richardson	1.50g	T/BU
Rocky	58.7	07/19/90	5,870		90 Swanson R.	Ft. Richardson	1.10g	T
Seventeenmile	100	07/19/90	10,000		90 Swanson R.	Ft. Richardson	1.30g	T
Seymour	229	07/09/90	23,082		90 Big Lake	Ft. Richardson	0.78g	T
Slipper (Eska)	9.1	06/01/90	588		89 Swanson R.	Ft. Richardson	92.80g	T
South Friend	55.7	07/20/90	5,570		90 Swanson R.	Ft. Richardson	1.43g	T/BU
South Rolly	107.7	07/20/90	12,770		90 Swanson R.	Ft. Richardson	1.43g	T
Tigger	18.9	07/26/90	1,894		90 Swanson R.	Ft. Richardson	1.70g	A
Twin Island	151	07/27/90	15,100		90 Swanson R.	Ft. Richardson	1.50g	A
Vera	110.5	07/13/90	11,050		90 Swanson R.	Ft. Richardson	2.05g	T/BU
Walby	53.9	07/17/90	5,390		90 Swanson R.	Ft. Richardson	1.90g	T
Weiner	20.7	07/19/90	4,140		90 Swanson R.	Ft. Richardson	1.30g	T
Wishbone	52.7	07/27/90	5,267		90 Swanson R.	Ft. Richardson	1.48g	A
Wolf	62	07/20/90	6,200		90 Swanson R.	Ft. Richardson	1.43g	T
"X"	101.4	07/26/90	20,320		90 Swanson R.	Ft. Richardson	1.61g	A
"Y"	39.7	07/17/90	1,900		90 Swanson R.	Ft. Richardson	1.69g	T/BU

RAINBOW TROUT [1990 Totals Stocked]
Lakes: 57
Surface Acres: 10,553.2

	Swanson R.	Big Lake	Total
# Large sub-catchables	39,383		39,383
# Fingerling:	677,998	515,117	1,193,115
Total Rainbow Stocked:	717,381	515,117	1,232,498

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Table 41. (Page 4 of 7)

COHO SALMON (non-anadromous)

LAKE STOCKED	SURFACE ACRES	DATE STOCKED	NUMBER STOCKED	FIN MARK	BROODSTOCK	HATCHERY	STOCKING SIZE	STOCKING METHOD[a]
Benka	123	05/15/90	33,073		89 Bear Lake	Elmendorf	2.96g	T
Christiansen	179	05/14/90	35,750		89 Bear Lake	Elmendorf	3.05g	T
Echo	23	05/09/90	4,600		89 Bear Lake	Elmendorf	3.00g	T
Finger	362	05/10/90	72,156		89 Bear Lake	Elmendorf	3.00g	T
Junction (Loberg)	10.9	05/09/90	1,100		89 Bear Lake	Elmendorf	3.00g	T/BU
Knik	50.4	05/10/90	5,850		89 Bear Lake	Elmendorf	3.00g	T
Loon	108	05/10/90	21,450		89 Bear Lake	Elmendorf	3.00g	T
Matanuska	61.5	05/10/90	12,350		89 Bear Lake	Elmendorf	3.00g	T
Memory	83	05/10/90	17,550		89 Bear Lake	Elmendorf	3.00g	T
Rocky	58.7	05/10/90	11,700		89 Bear Lake	Elmendorf	3.00g	T
		05/16/90	426		87 Big Lake	Big Lake	95.00g	T
Victor	13.5	05/10/90	6,700		89 Bear Lake	Elmendorf	3.00g	T/BG(O2)
Wolf	62	05/10/90	13,650		89 Bear Lake	Elmendorf	3.00g	T

COHO SALMON (non-anadromous) [1990 Totals Stocked]
Lakes: 12
Surface Acres: 1,135

	Bear Lake	Big Lake	Total
# Large sub-catchables	0	426	426
# Fingerling:	235,929	0	235,929
Total Coho Stocked:	235,929	426	236,355

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Table 41. (Page 5 of 7)

ARCTIC GRAYLING

LAKE STOCKED	SURFACE ACRES	DATE STOCKED	NUMBER STOCKED	FIN MARK	BROODSTOCK	HATCHERY	STOCKING SIZE	STOCKING METHOD[a]
Bruce	26.9	08/23/90	2,700		90 Moose L.	Clear	5.13g	T/BU
Canoe	21.2	06/05/90	21,200		90 Moose L.	Clear	0.02g	CA/BG(02)
		08/23/90	4,200		90 Moose L.	Clear	5.13g	T/BU
Farmer	21	08/23/90	2,100		90 Moose L.	Clear	5.13g	T
Finger	362	08/23/90	36,800		90 Moose L.	Clear	5.13g	T
Kepler-Bradley	58	08/23/90	11,200		90 Moose L.	Clear	5.13g	T
Knik	50.4	08/23/90	5,000		90 Moose L.	Clear	5.13g	T
Loberg (Junction)	10.9	08/21/90	1,100		90 Moose L.	Clear	5.31g	T
Long(Mi.86)	106	06/05/90	64,000		90 Moose L.	Clear	0.02g	CA/BG(02)
		08/27/90	10,600		90 Moose L.	Clear	5.60g	T
Matanuska	61.5	08/23/90	6,100		90 Moose L.	Clear	5.13g	T
Meirs	16.8	06/05/90	16,700		90 Moose L.	Clear	0.02g	CA/BG(02)
		08/23/90	3,400		90 Moose L.	Clear	5.13g	T/BU
Mile 180 Parks Hwy	15	08/21/90	1,000		90 Moose L.	Clear	5.31g	T/BU
Seventeenmile	100	08/27/90	10,000		90 Moose L.	Clear	5.60g	T
Willow	143.3	08/21/90	31,500		90 Moose L.	Clear	4.51g	T

ARCTIC GRAYLING (1990 Totals Stocked)
Lakes: 13
Surface Acres: 993

	Moose Lake
# Fry:	101,900
# Fingerling:	125,700

Total Grayling Stocked:	227,600

-continued-

Table 41. (Page 6 of 7)

ARCTIC CHAR

LAKE STOCKED	SURFACE ACRES	DATE STOCKED	NUMBER STOCKED	FIN MARK	BROODSTOCK	HATCHERY	STOCKING SIZE	STOCKING METHOD[a]
Benka	123	06/26/90	12,300	89	Domestic/ Aleknagik L.	Clear	6.63g	T
Irene	18	06/26/90	3,600	89	Domestic/ Aleknagik L.	Clear	6.63g	T/BU
Marion	113	06/26/90	11,300	89	Domestic/ Aleknagik L.	Clear	6.63g	T/BU

ARCTIC CHAR [1990 Totals Stocked]
Lakes: 3
Surface Acres: 254

	Domestic/ Aleknagik L.
# Fingerling:	27,200
Total Arctic Char Stocked:	27,200

-continued-

Table 41. (Page 7 of 7)

LAKE TROUT

LAKE STOCKED	SURFACE ACRES	DATE STOCKED	NUMBER STOCKED	FIN MARK	BROODSTOCK	HATCHERY	STOCKING SIZE	STOCKING METHOD[a]
Long (Mi.86)	106	06/05/90	10,000		89 Paxson L.	Clear	4.60g	T

LAKE TROUT [1990 Totals Stocked]
Lakes: 1
Surface Acres: 106

	Paxson L.
# Fingerling:	10,000
Total Lake Trout Stocked:	10,000

Totals Stocked
ALL SPECIES (non-anadromous) GAME FISH

Lakes: 66
Surface Acres: 11,039.9

# Rainbow Trout	=	1,232,498
# Coho Salmon (non-anadromous)	=	236,355
# Arctic Grayling	=	227,600
# Arctic Char	=	27,200
# Lake Trout	=	10,000
Total Fish Stocked (1990)	=	1,733,653

[a] Stocking Method: A = airdrop; T = tank truck; T/BU = carried in buckets to lake; T/BG(02) = carried to lake in sealed bags with oxygen; CA/BG(02) = flown on commercial airlines from Fairbanks to Anchorage in sealed bags, with oxygen, on ice.
[b] Johnson: LV = Diploid (production) RT; RV = Triploid RT
[c] Reed: LV = BDC Control RT; RV = BDC Select RT

Table 42. Harvest of Susitna River drainage rainbow trout, 1977-1989.

Year	Eastside	Westside	Total
1977	5,225	7,472	12,697
1978	5,930	12,295	18,225
1979	9,463	12,555	22,018
1980	6,715	12,794	19,509
1981	8,813	11,296	20,109
1982	7,536	11,465	19,001
1983	9,639	9,253	18,892
1984	7,656	8,079	15,735
1985	7,872	8,114	15,986
1986	8,061	6,668	14,729
1987	6,647	8,020	14,667
1988	7,622	8,059	15,680
1989	4,972	4,976	9,948
Mean	7,396	9,311	16,707

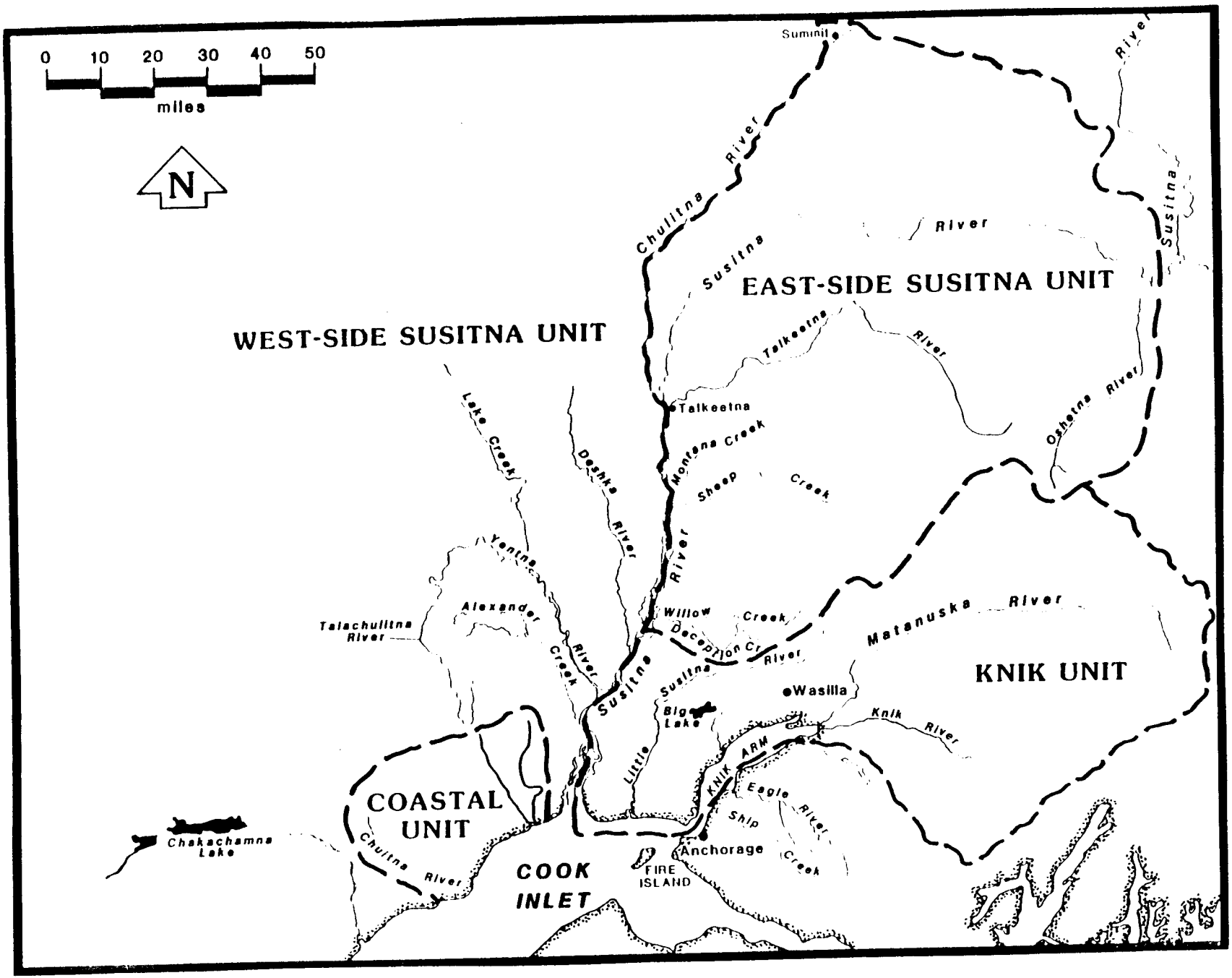

Figure 1. Map of the Northern Cook Inlet sport fish management area.

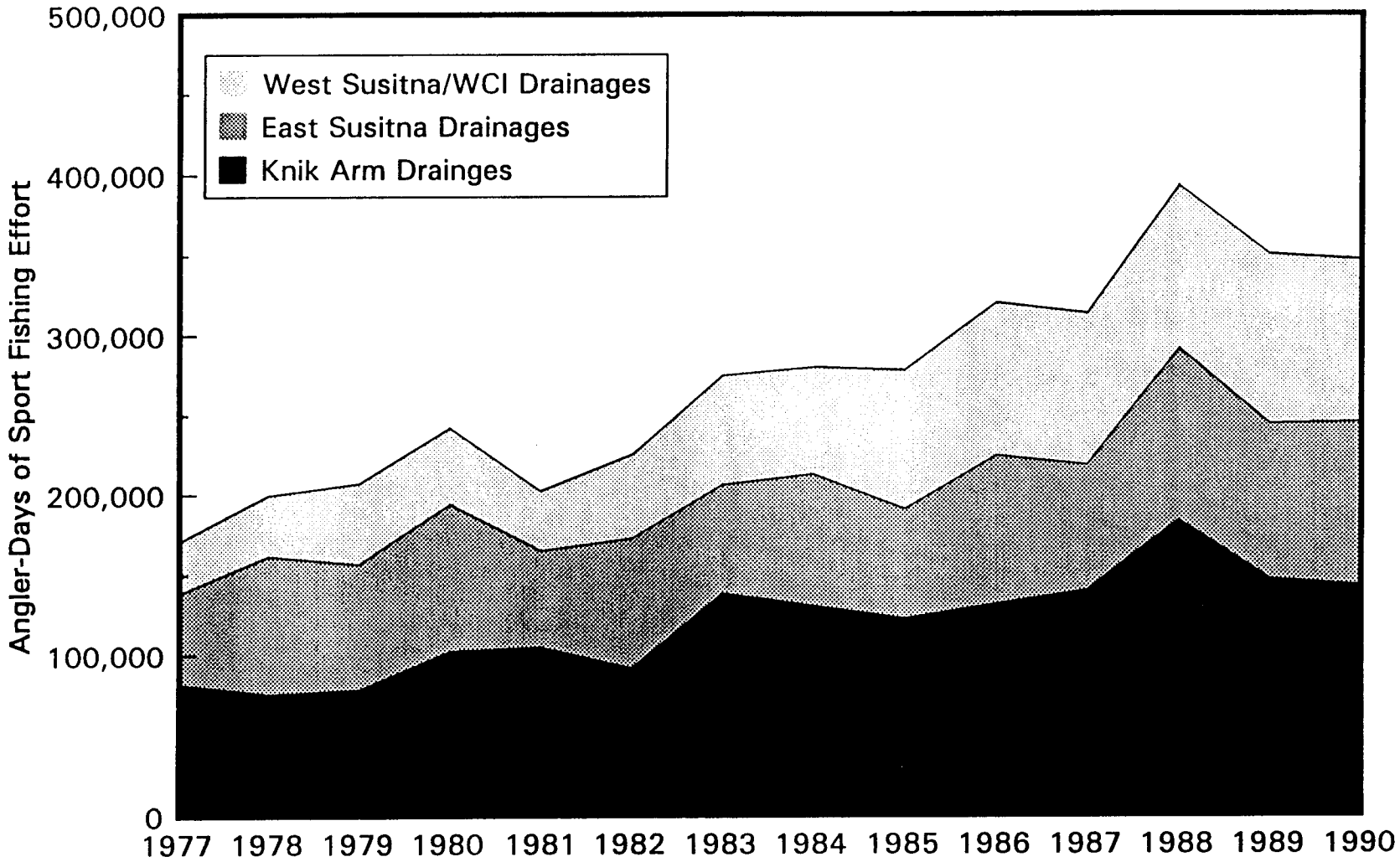

Figure 2. Number of angler-days of sport fishing effort expended by recreational anglers fishing Northern Cook Inlet Management Area waters, 1977-1990.

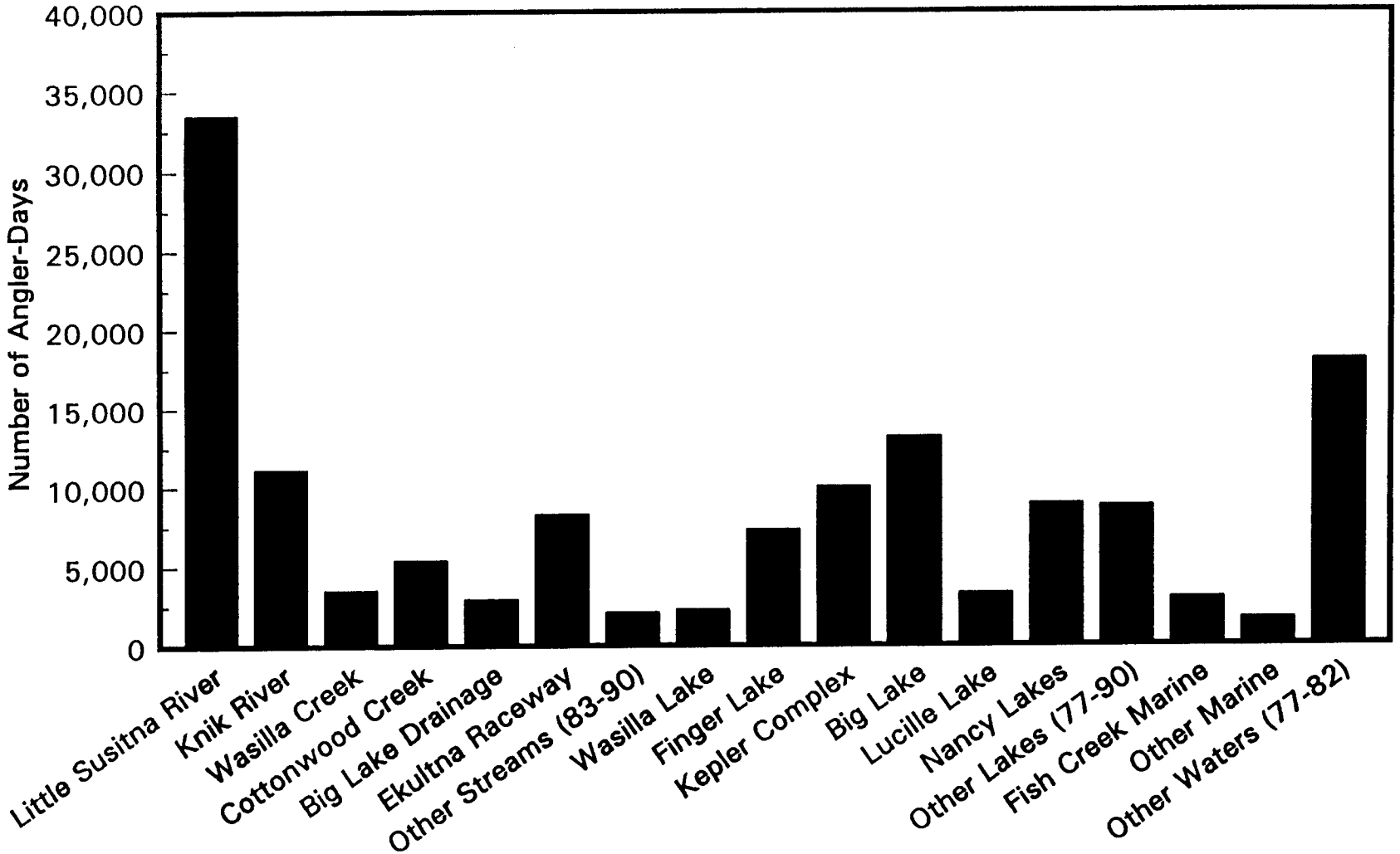

Figure 3. Mean number of angler-days per year of sport fishing effort expended in Knik Arm waters, 1977-1990.

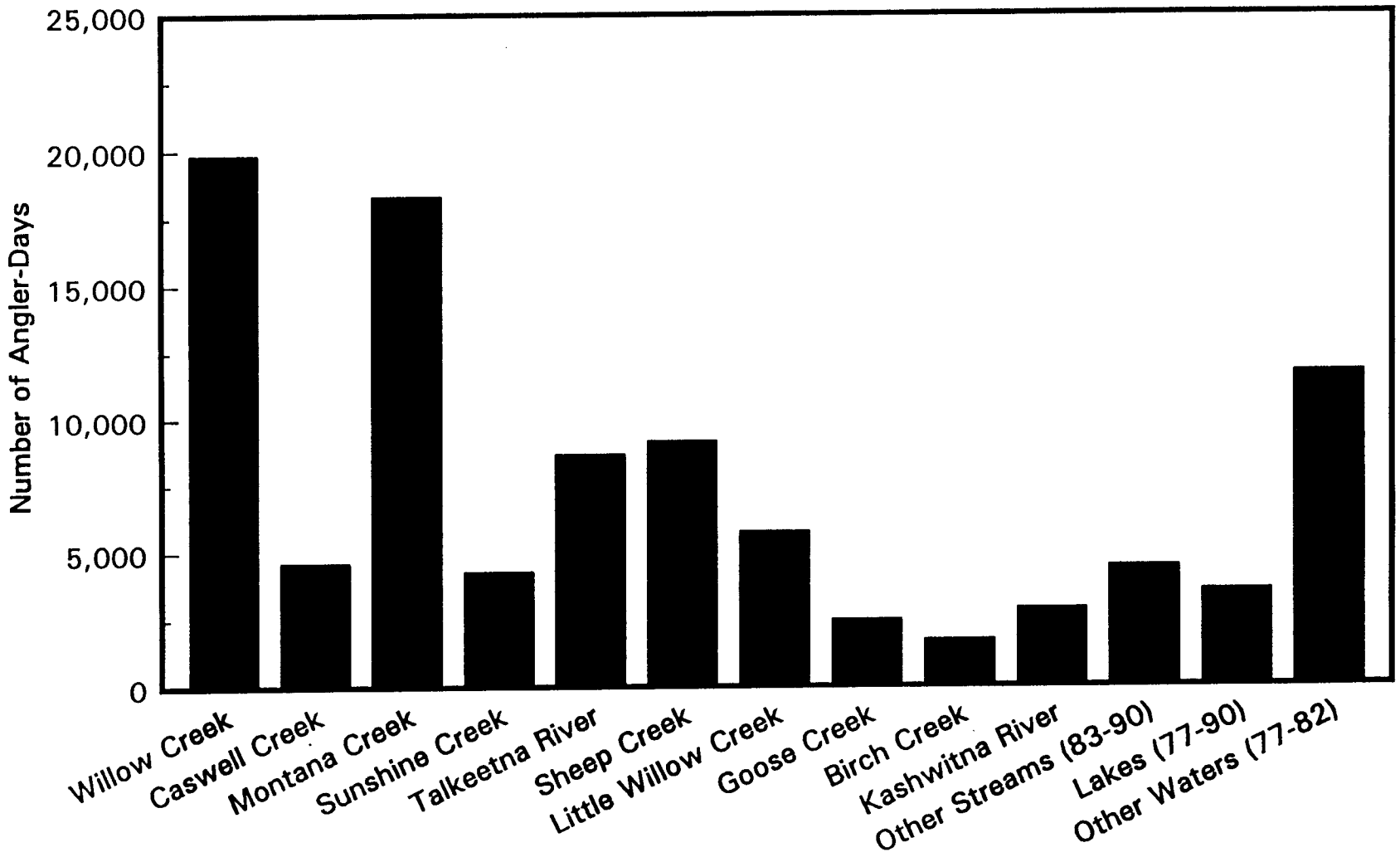

Figure 4. Mean number of angler-days per year of sport fishing effort expended in the Eastside Susitna River drainage, 1977-1990.

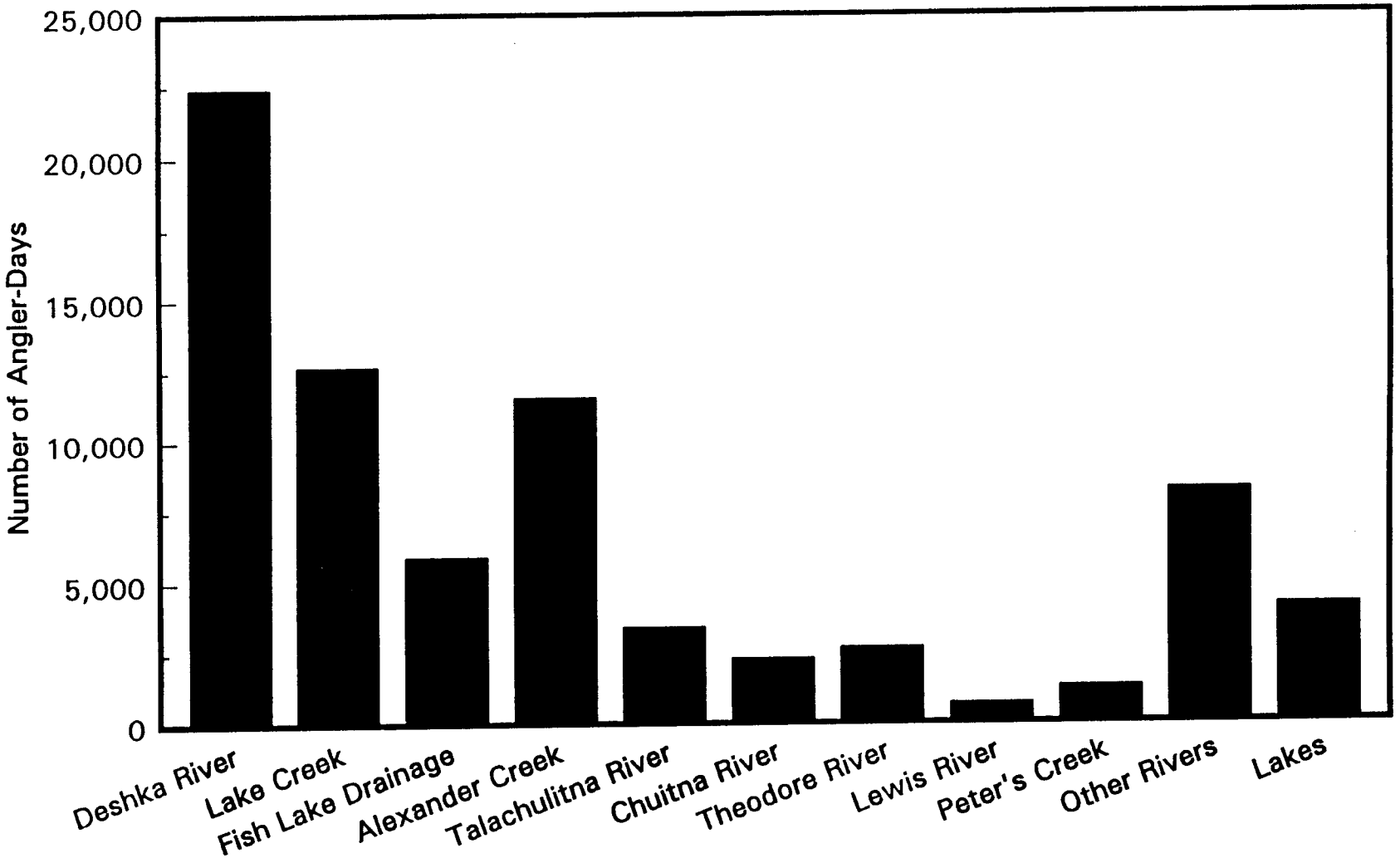

Figure 5. Mean number of angler-days per year of sport fishing effort expended in the West Cook Inlet-West Susitna River drainage, 1977-1990.

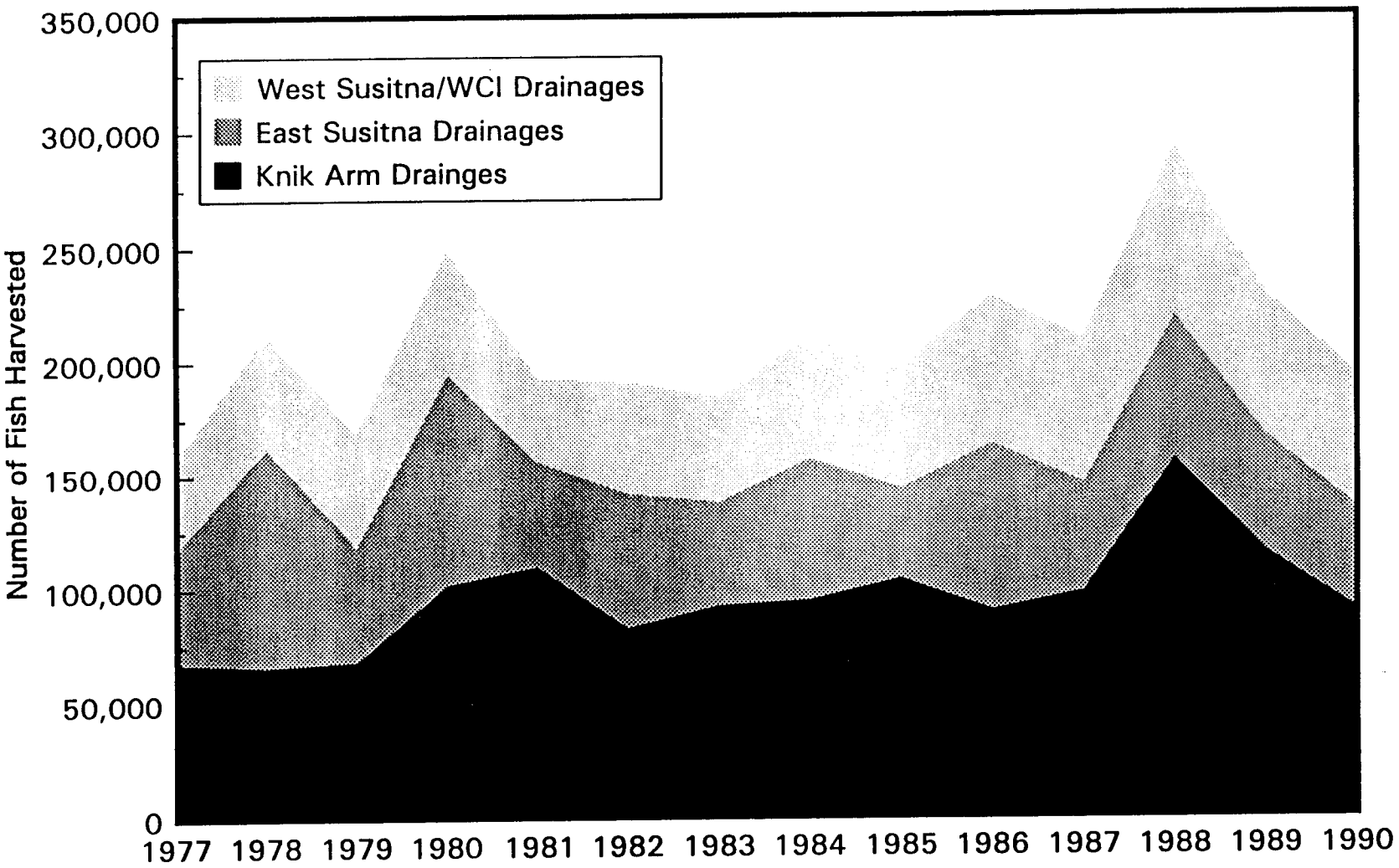

Figure 6. Number of fish harvested per year by recreational anglers fishing Northern Cook Inlet Management Area waters, 1977-1990.

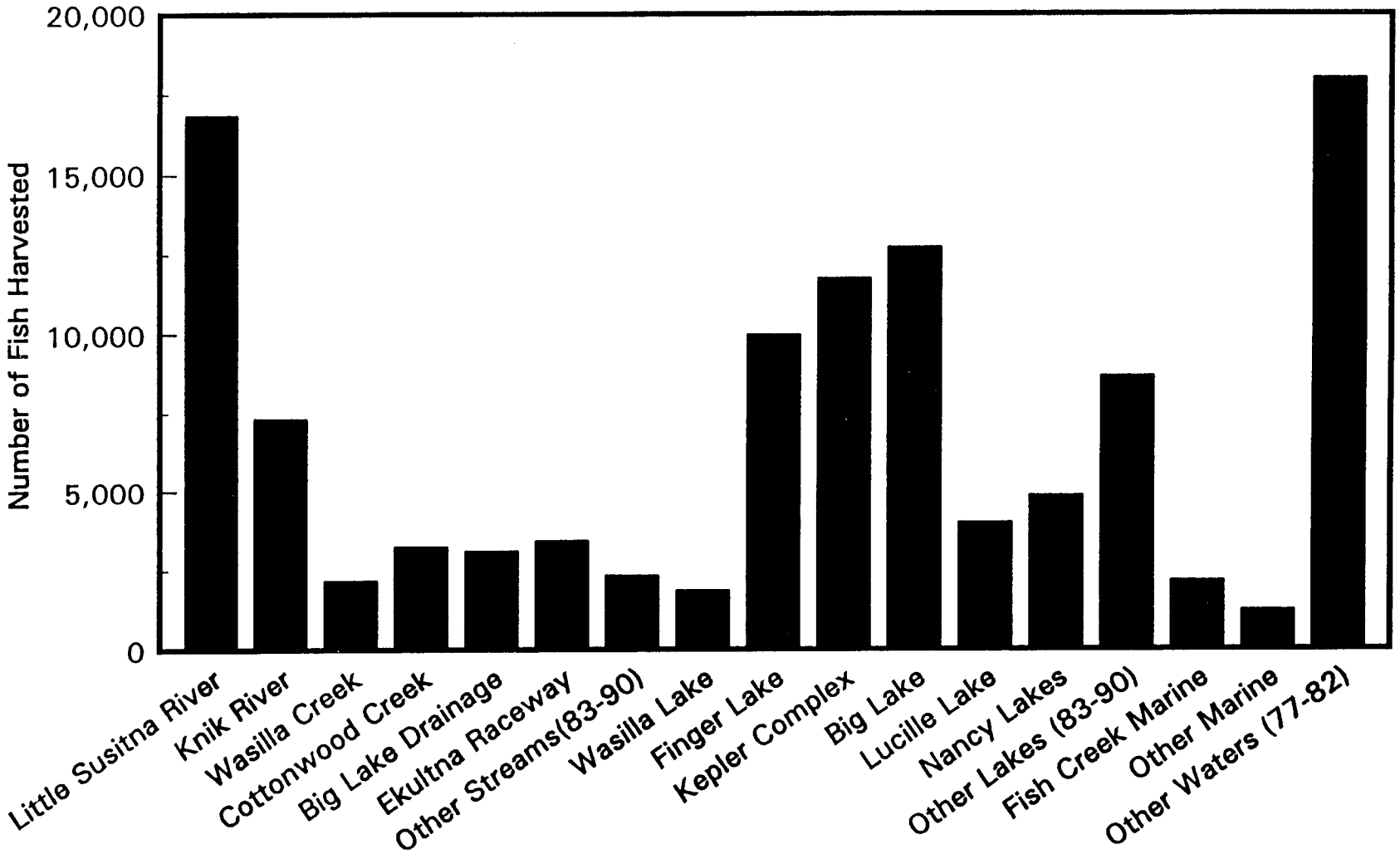

Figure 7. Mean number of fish harvested per year by recreational anglers fishing Knik Arm waters, 1977-1990.

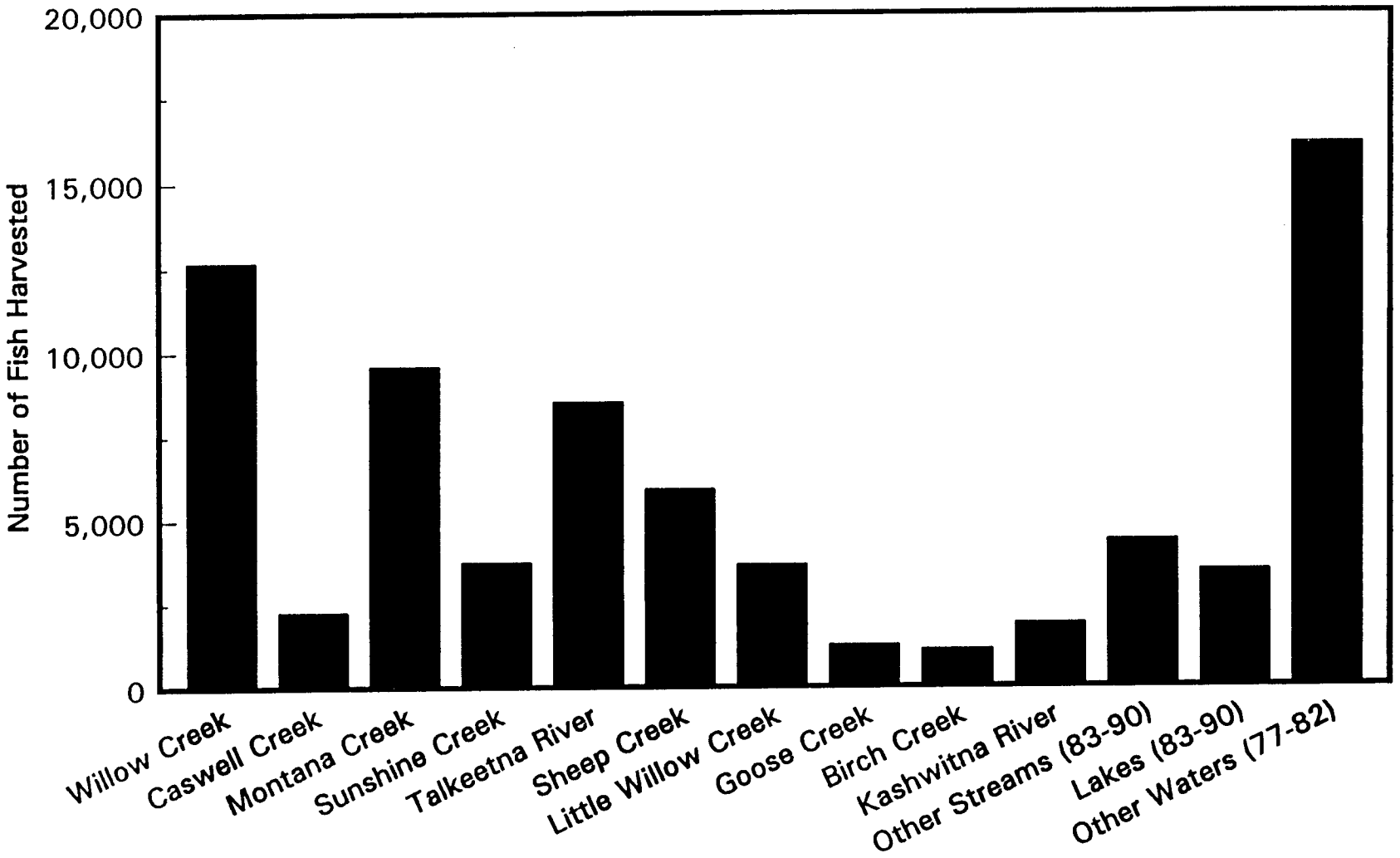

Figure 8. Mean number of fish harvested per year by recreational anglers fishing the Eastside Susitna River drainage, 1977-1990.

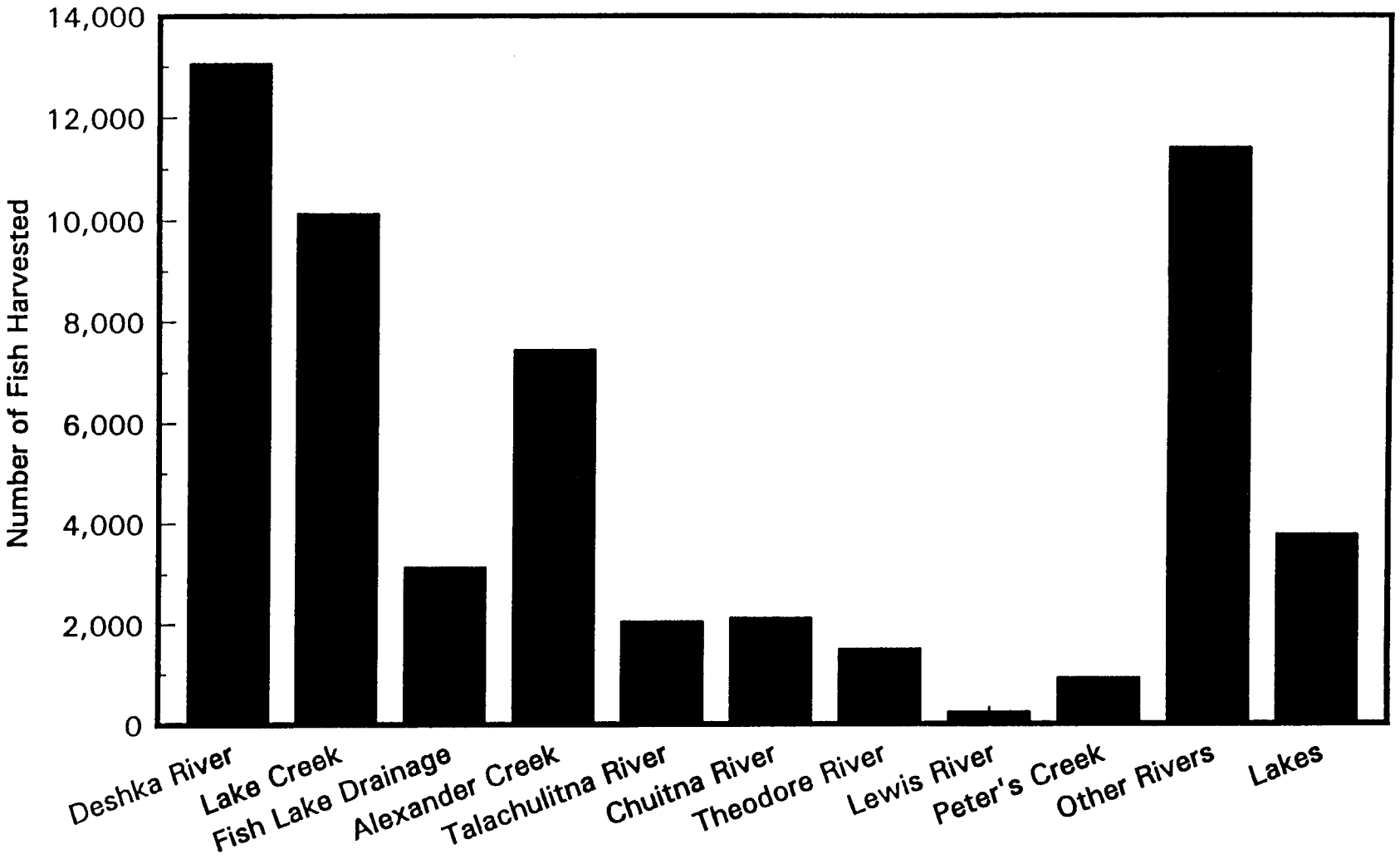

Figure 9. Mean number of fish harvested per year by recreational anglers fishing the West Cook Inlet/West Susitna River drainage, 1977-1990.

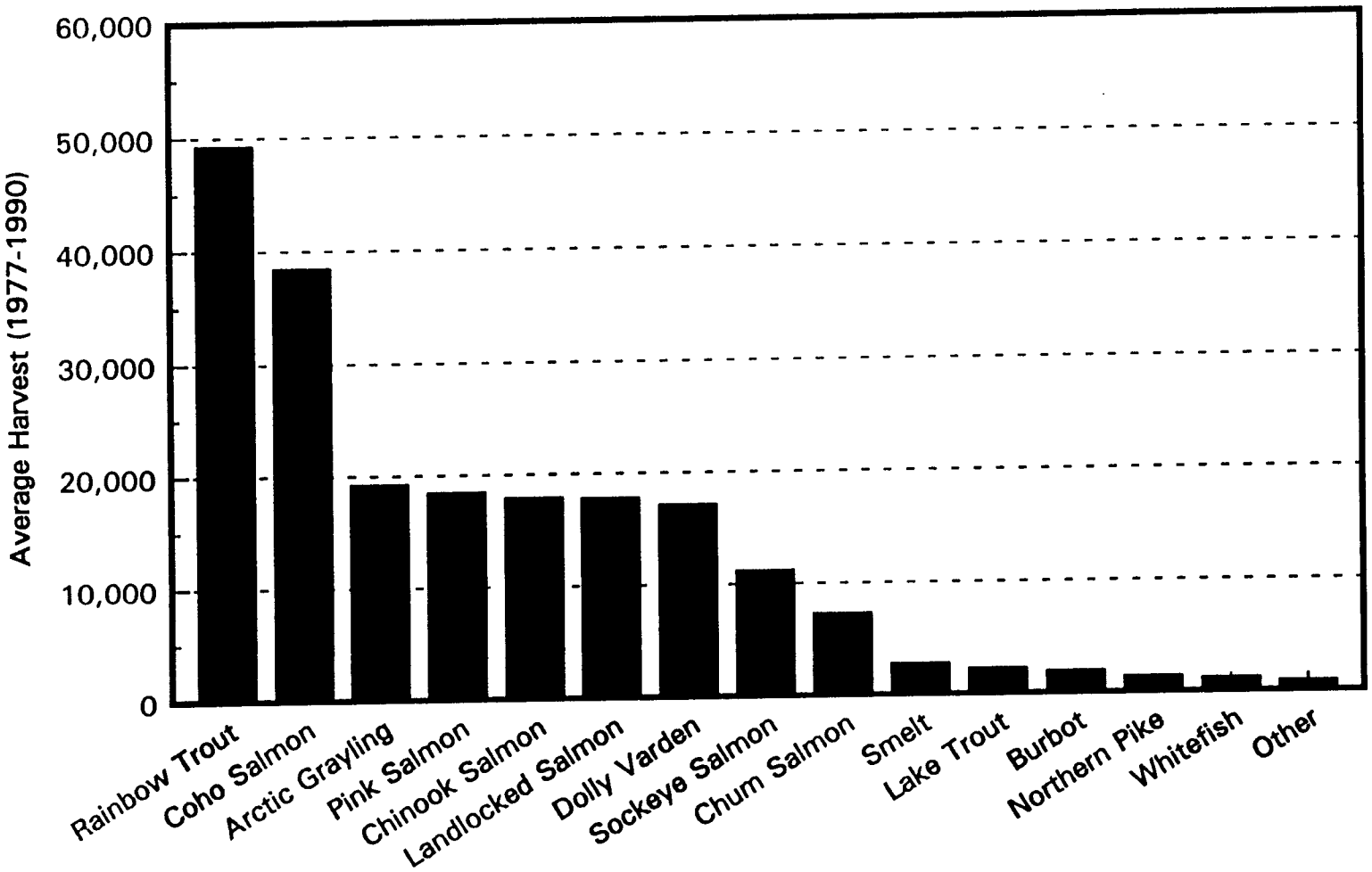

Figure 10. Mean number of fish per year, by species, harvested by recreational anglers fishing Northern Cook Inlet Management Area waters, 1977-1990.

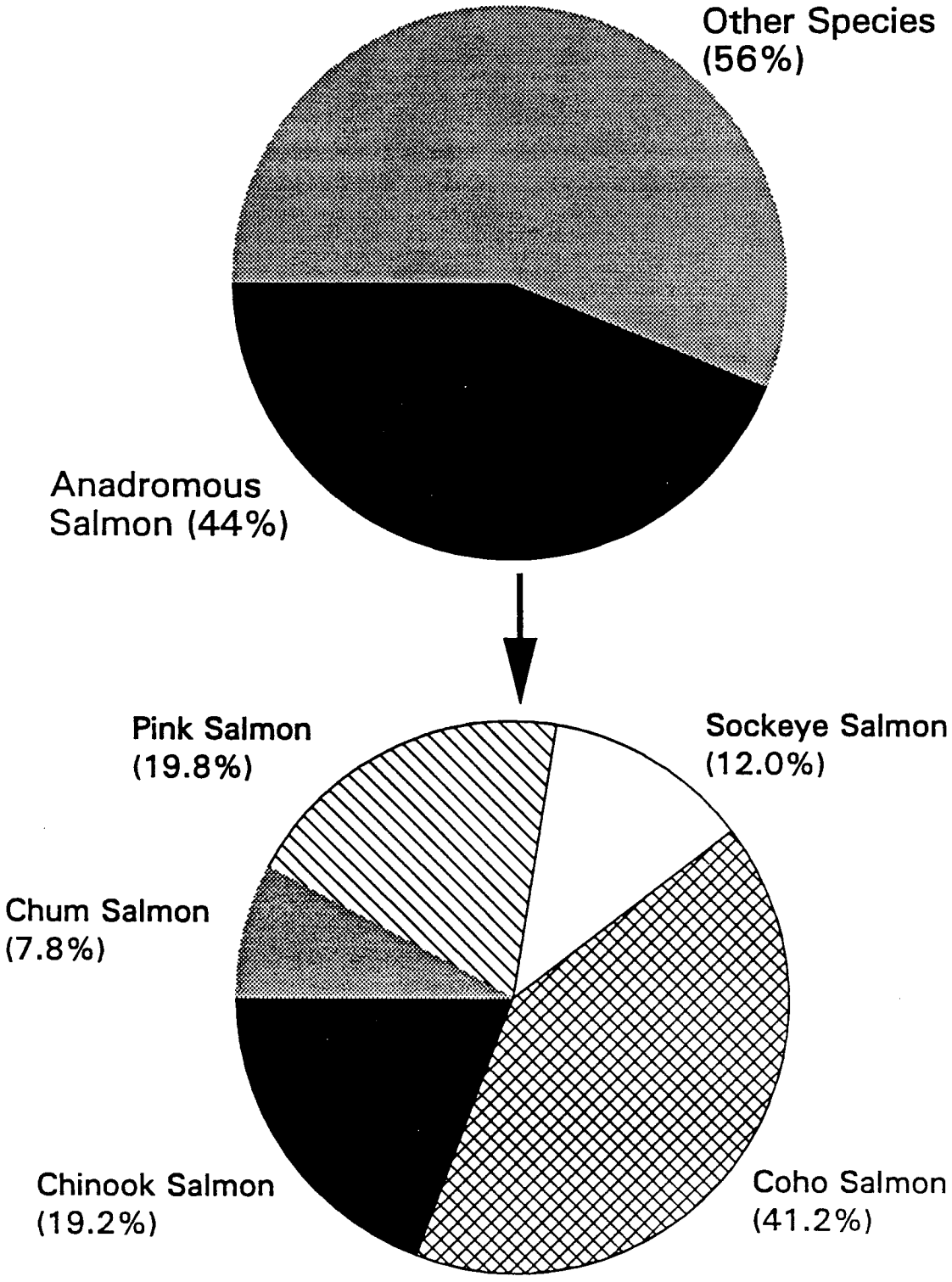

Figure 11. Anadromous salmon composition of the Northern Cook Inlet Management Area sport fish harvest, 1977-1990.

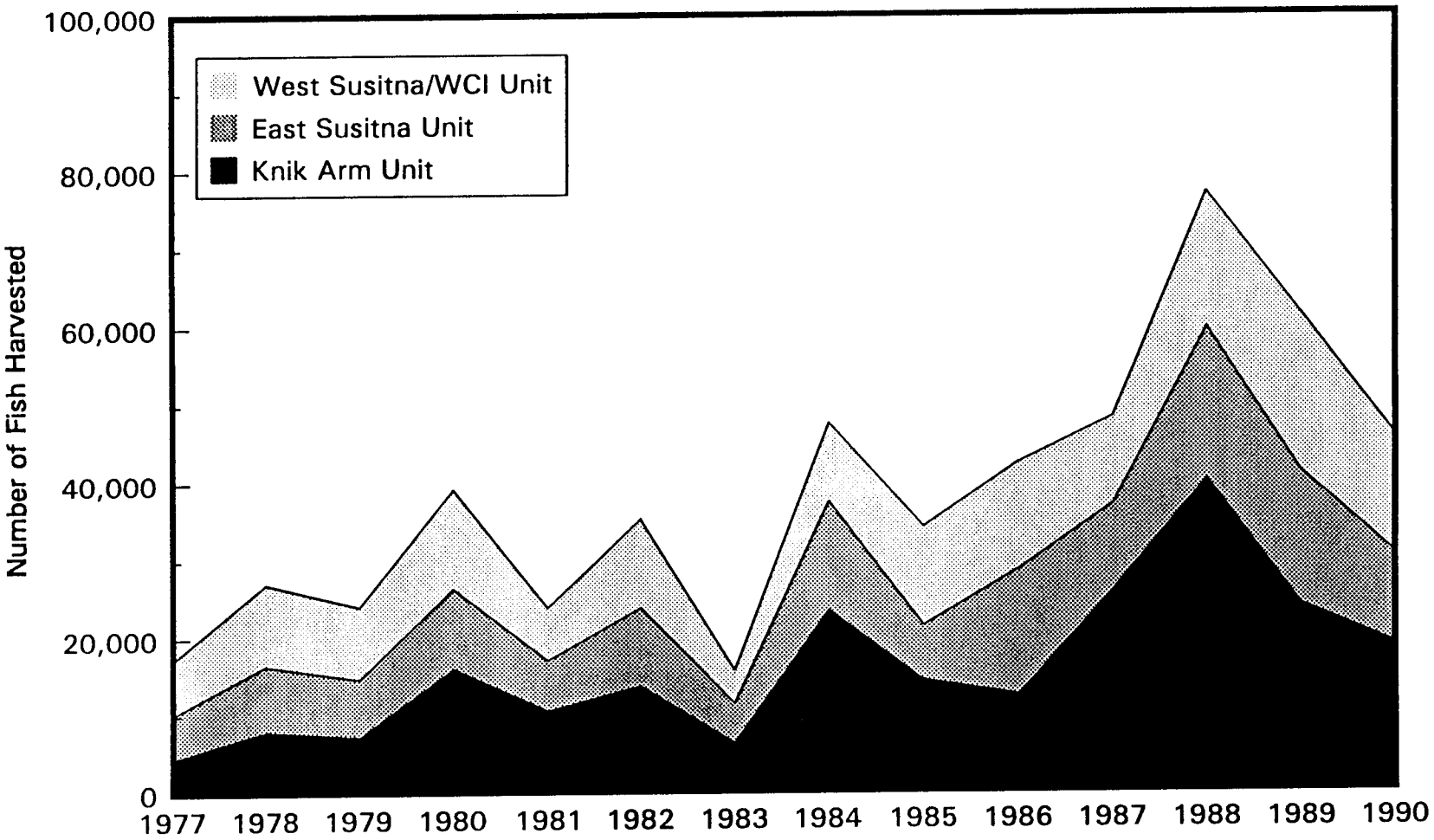

Figure 12. Number of coho salmon harvested by recreational anglers fishing Northern Cook Inlet Management Area waters, 1977-1990.

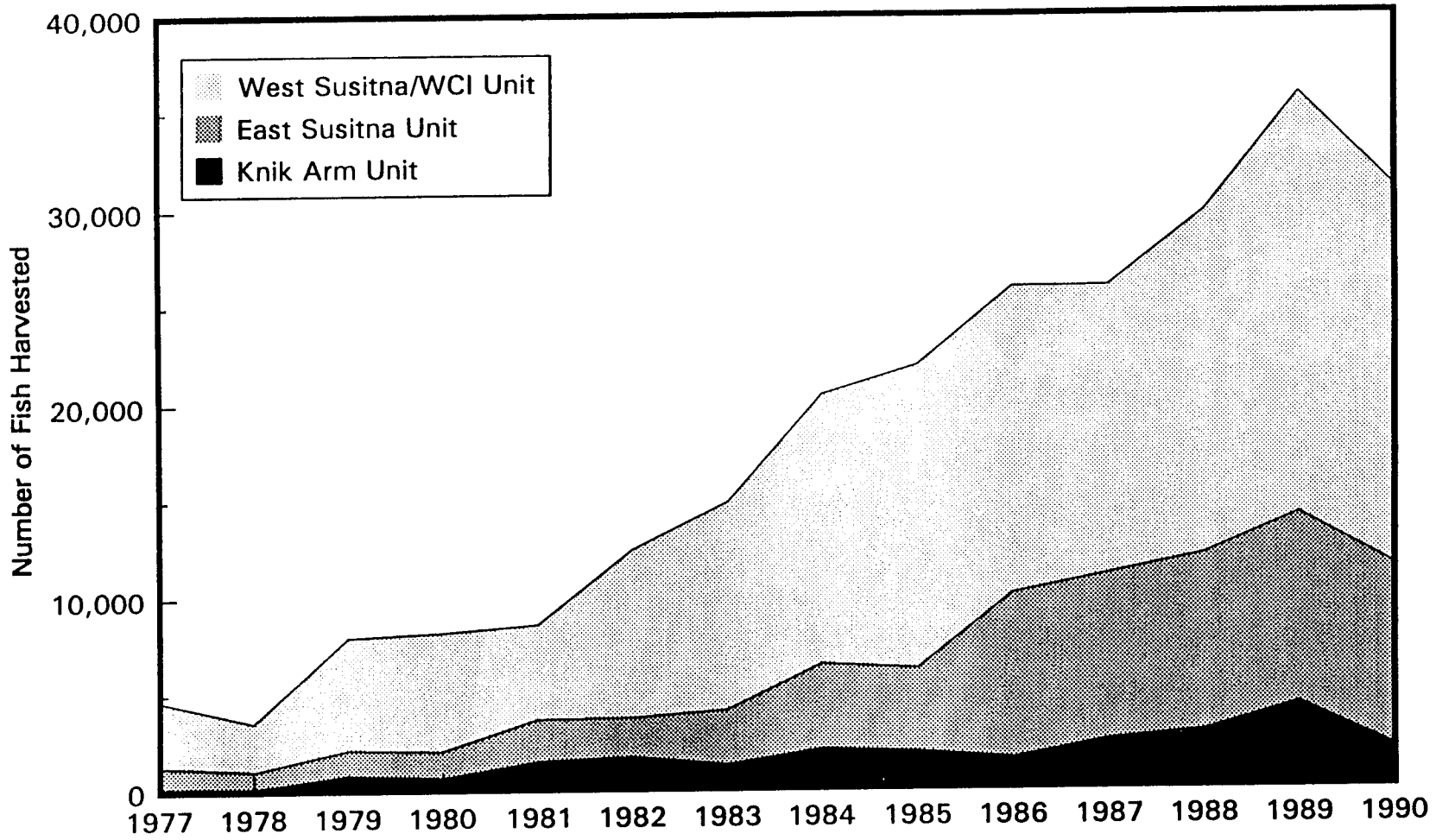

Figure 13. Number of chinook salmon harvested by recreational anglers fishing Northern Cook Inlet Management Area waters, 1977-1990.

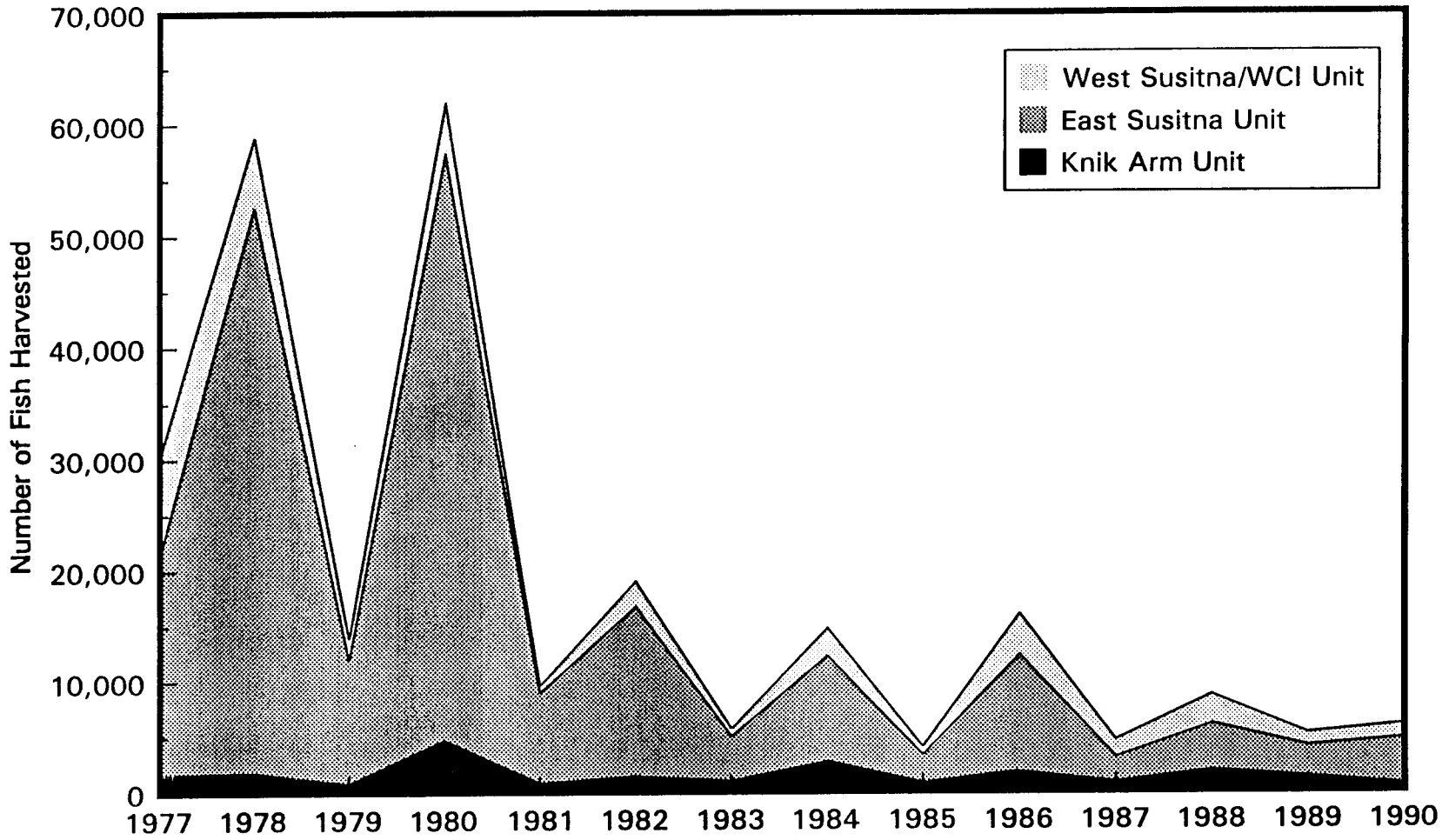

Figure 14. Number of pink salmon harvested by recreational anglers fishing Northern Cook Inlet Management Area waters, 1977-1990.

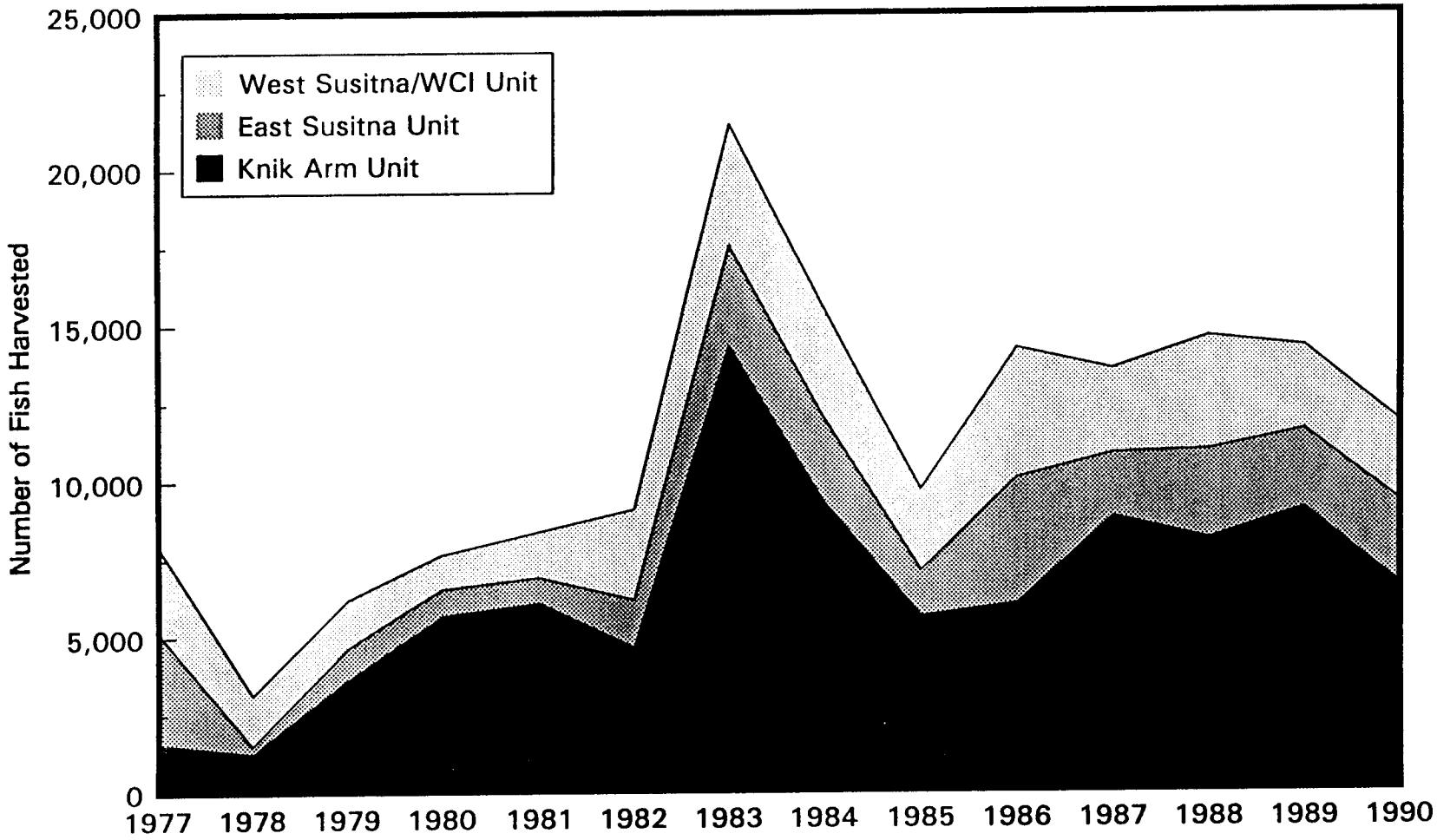

Figure 15. Number of sockeye salmon harvested by recreational anglers fishing Northern Cook Inlet Management Area waters, 1977-1990.

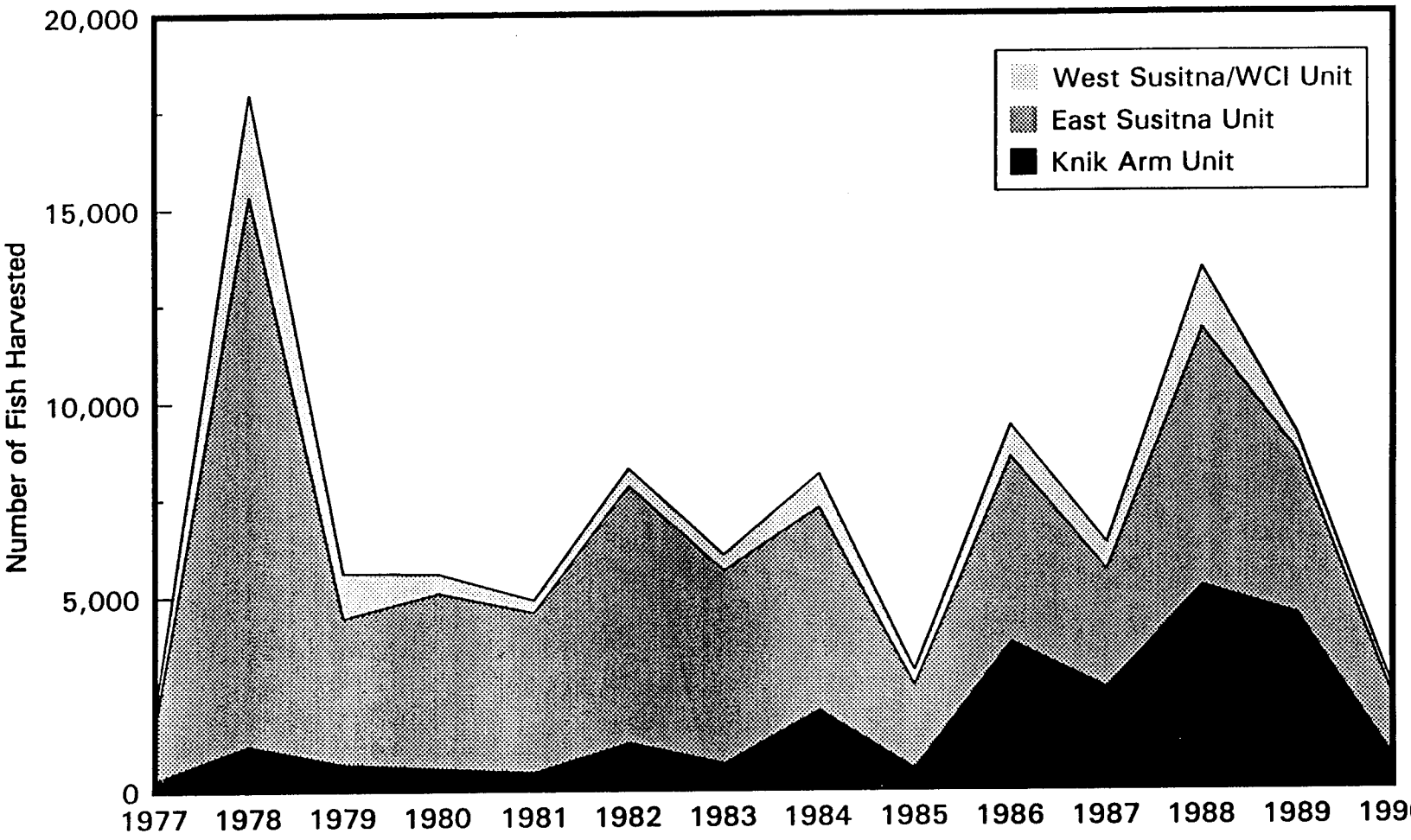

Figure 16. Number of chum salmon harvested by recreational anglers fishing Northern Cook Inlet Management Area waters, 1977-1990.

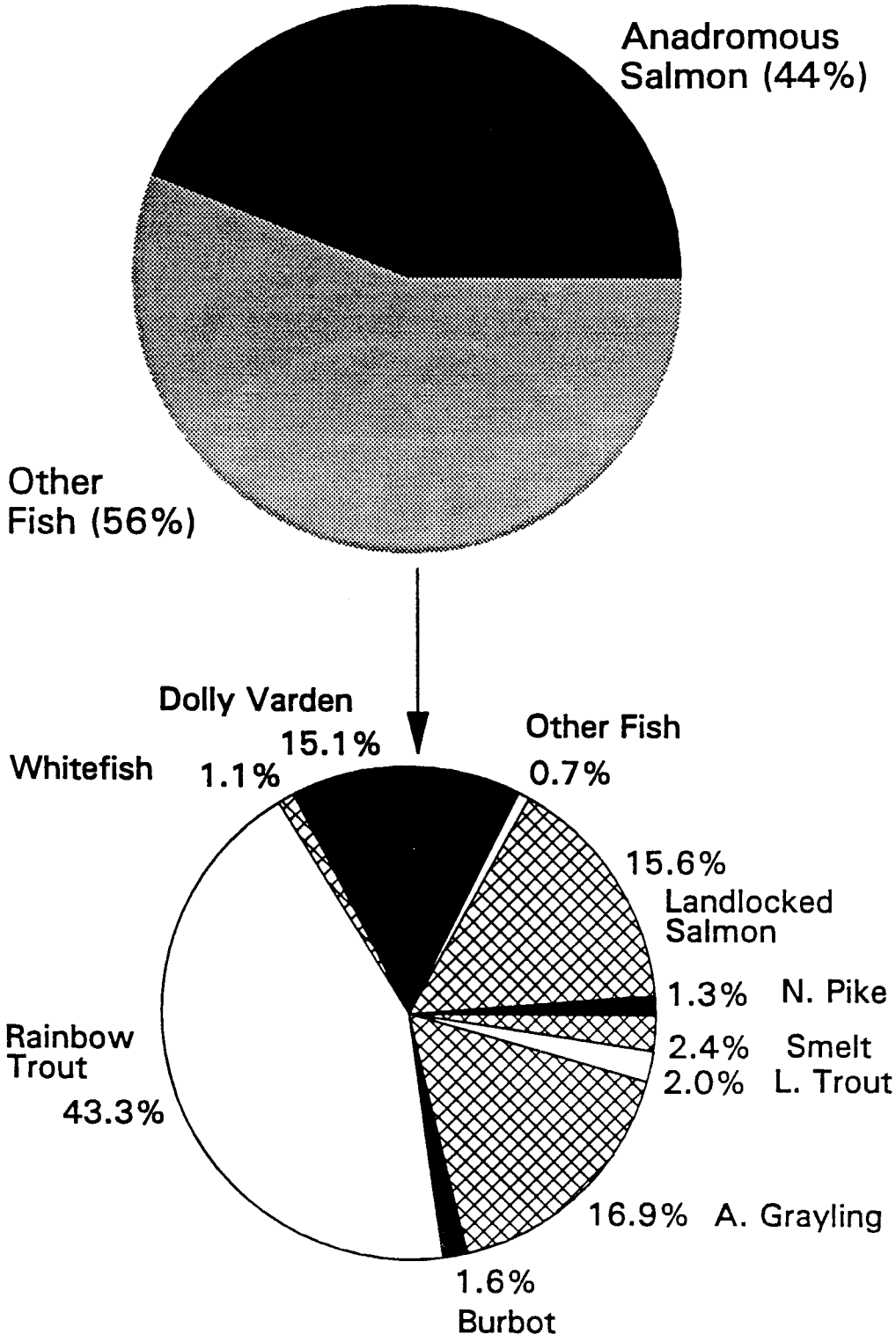

Figure 17. Resident fish composition of the Northern Cook Inlet Management Area sport fish harvest, 1977-1990.

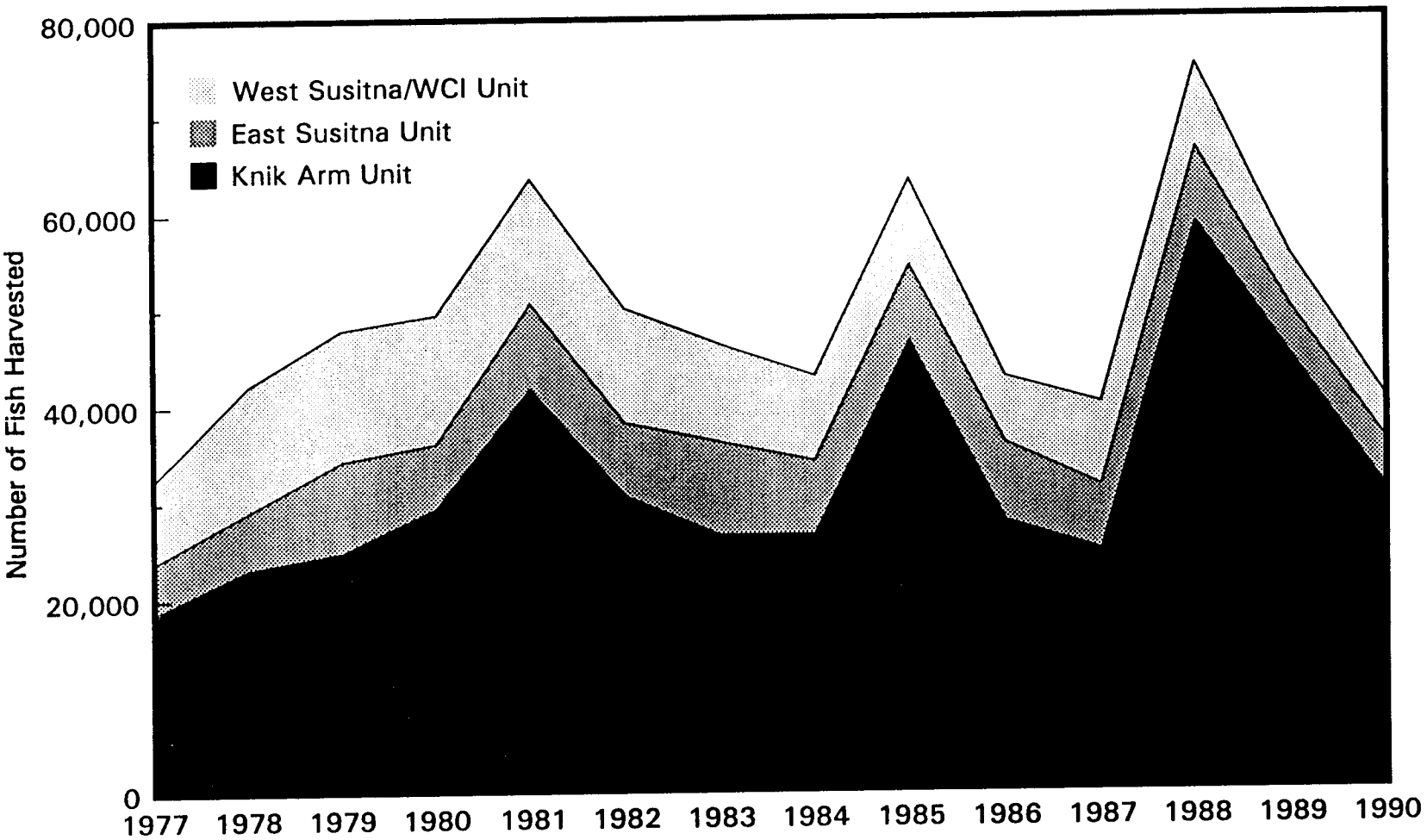

Figure 18. Number of rainbow trout harvested by recreational anglers fishing Northern Cook Inlet Management Area waters, 1977-1990.

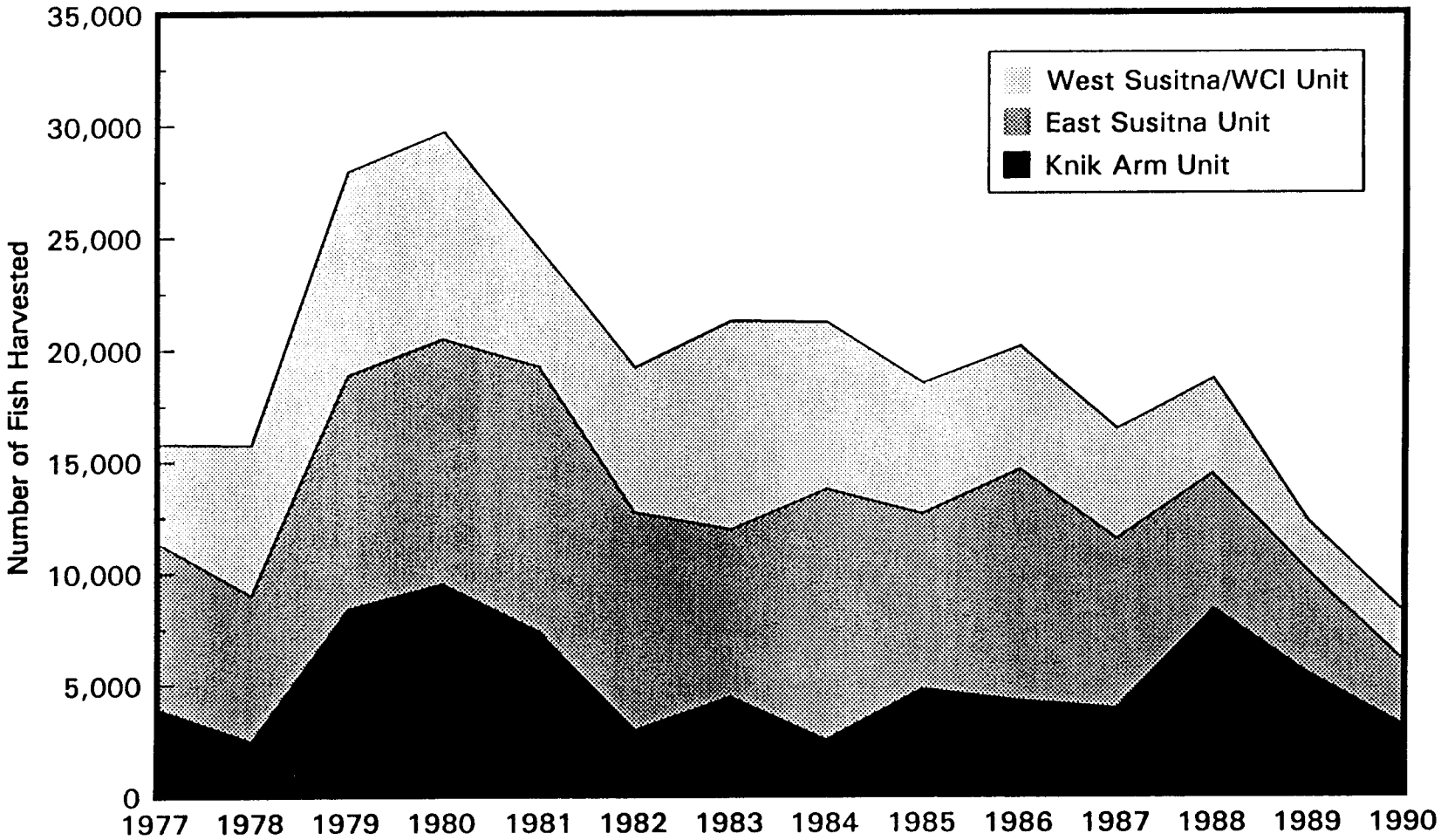

Figure 19. Number of Arctic grayling harvested by recreational anglers fishing Northern Cook Inlet Management Area waters, 1977-1990.

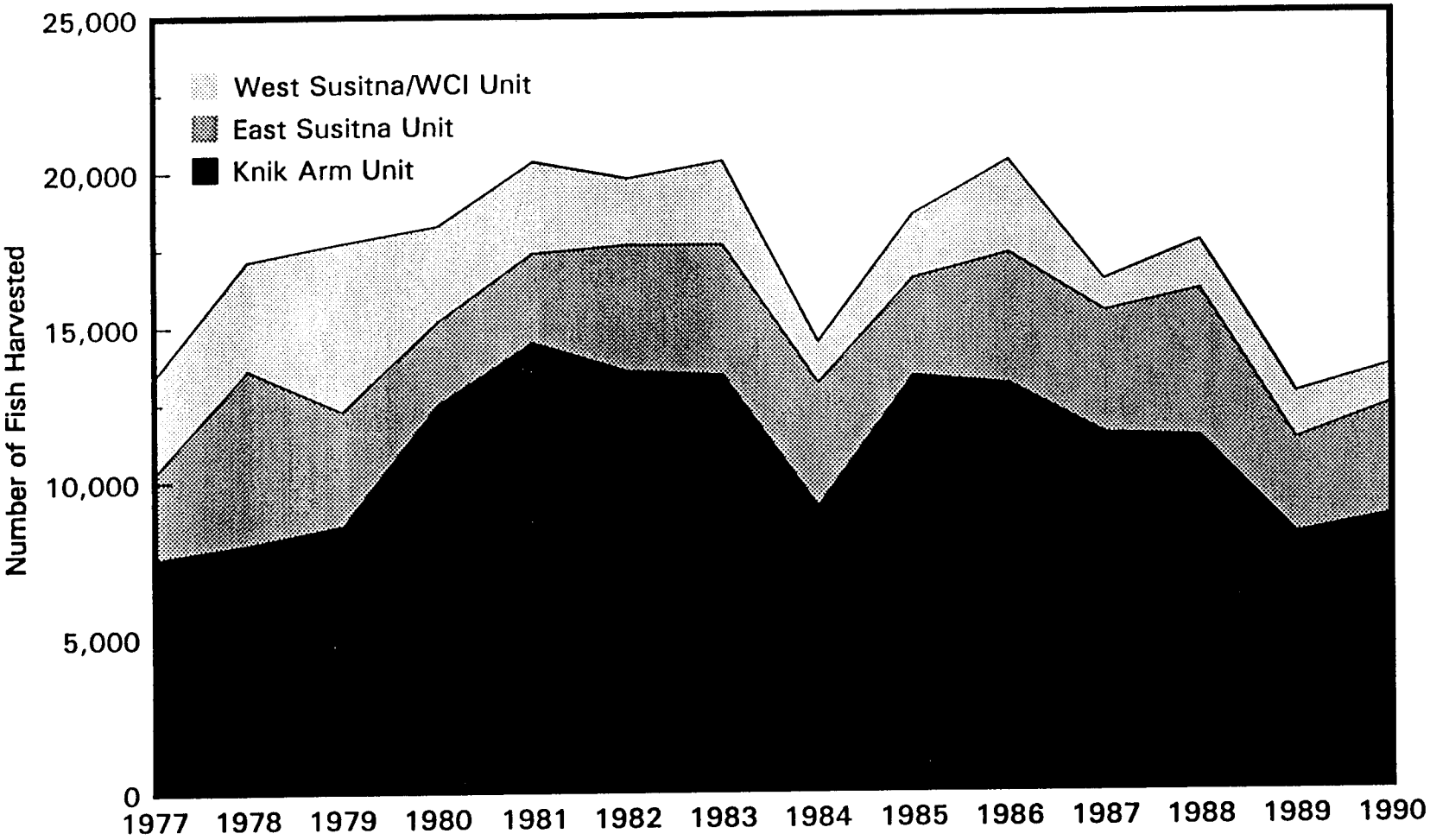

Figure 20. Number of Dolly Varden harvested by recreational anglers fishing Northern Cook Inlet Management Area waters, 1977-1990.

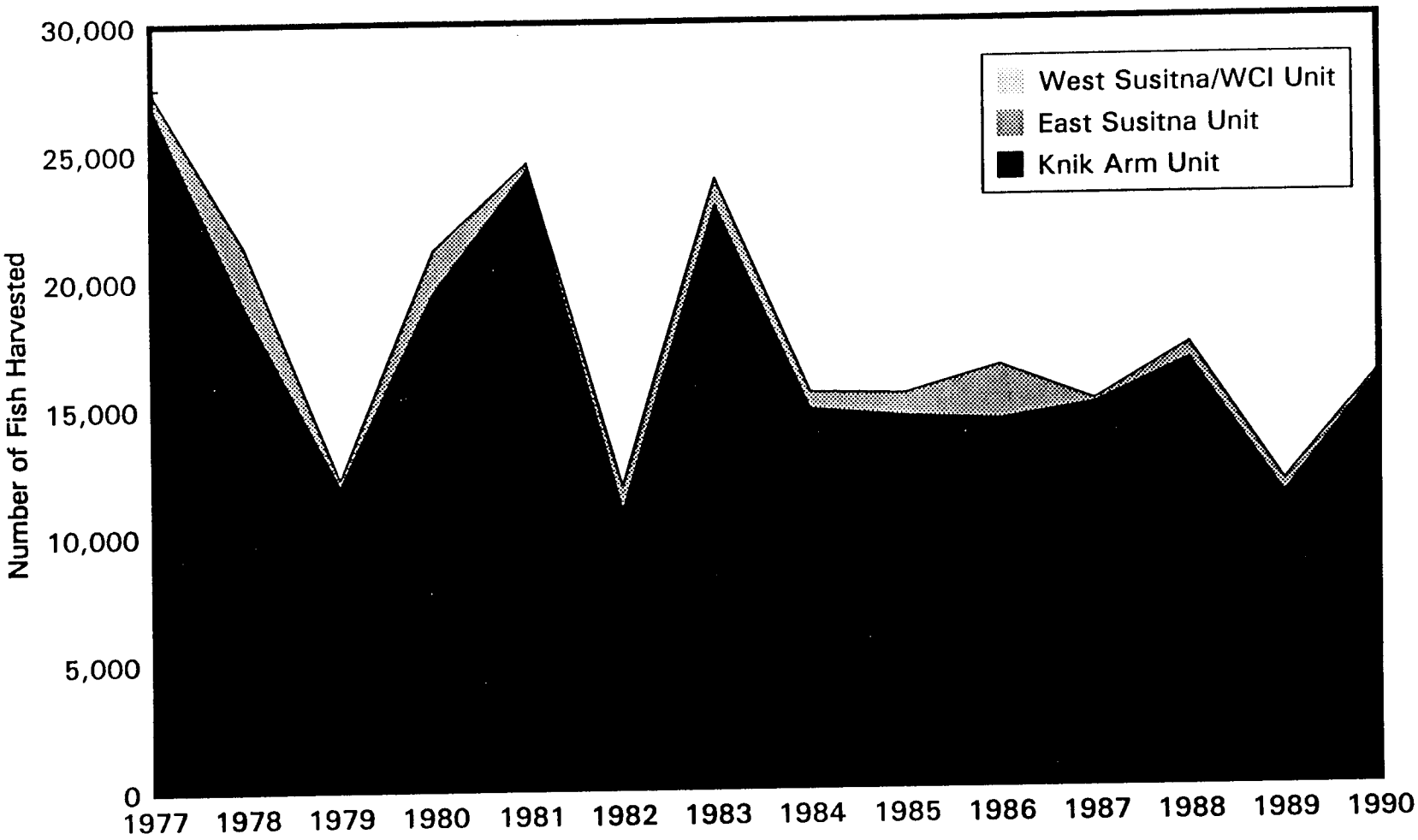

Figure 21. Number of landlocked salmon harvested by recreational anglers fishing Northern Cook Inlet Management Area waters, 1977-1990.

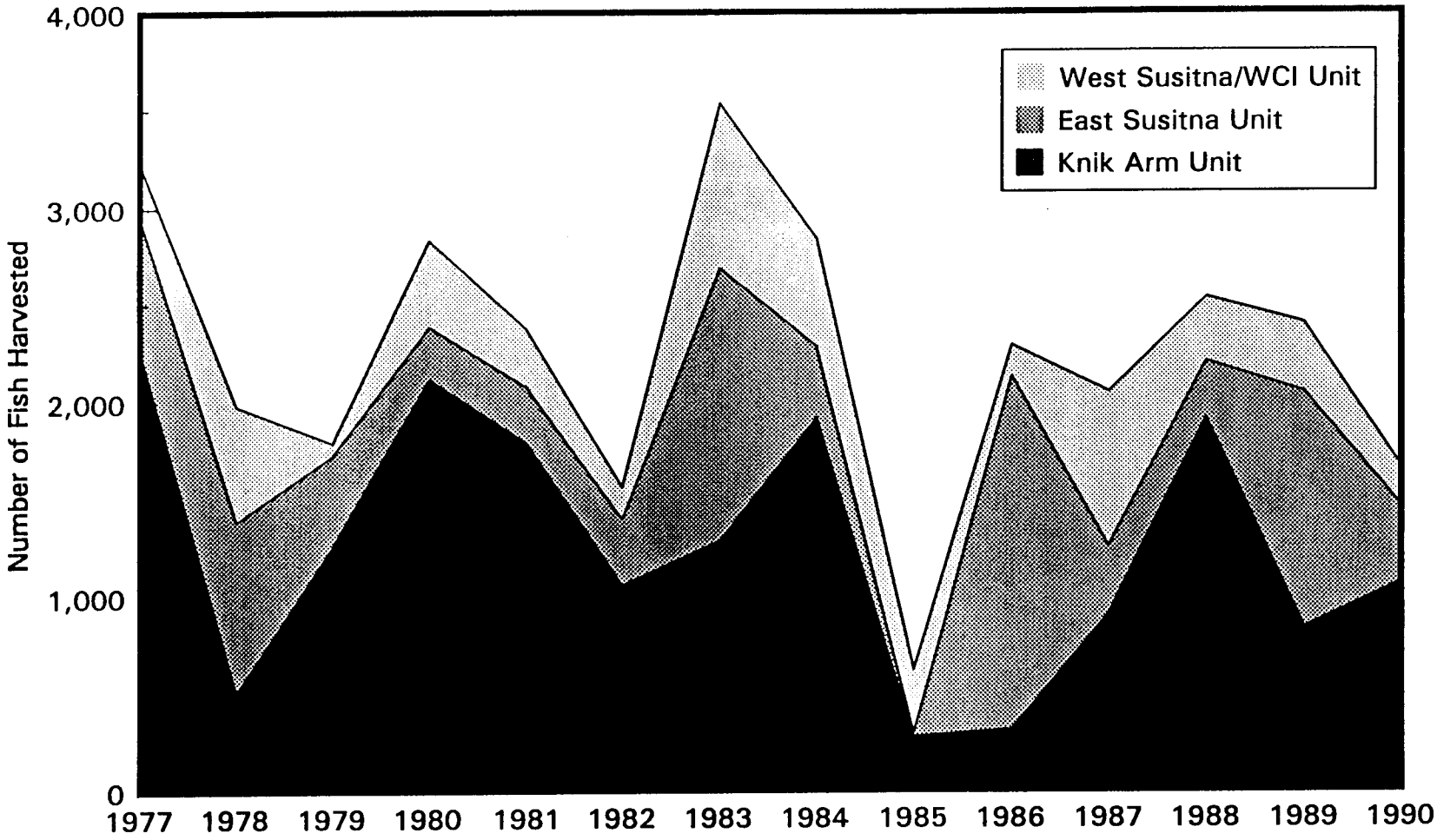

Figure 22. Number of lake trout harvested by recreational anglers fishing Northern Cook Inlet Management Area waters, 1977-1990.

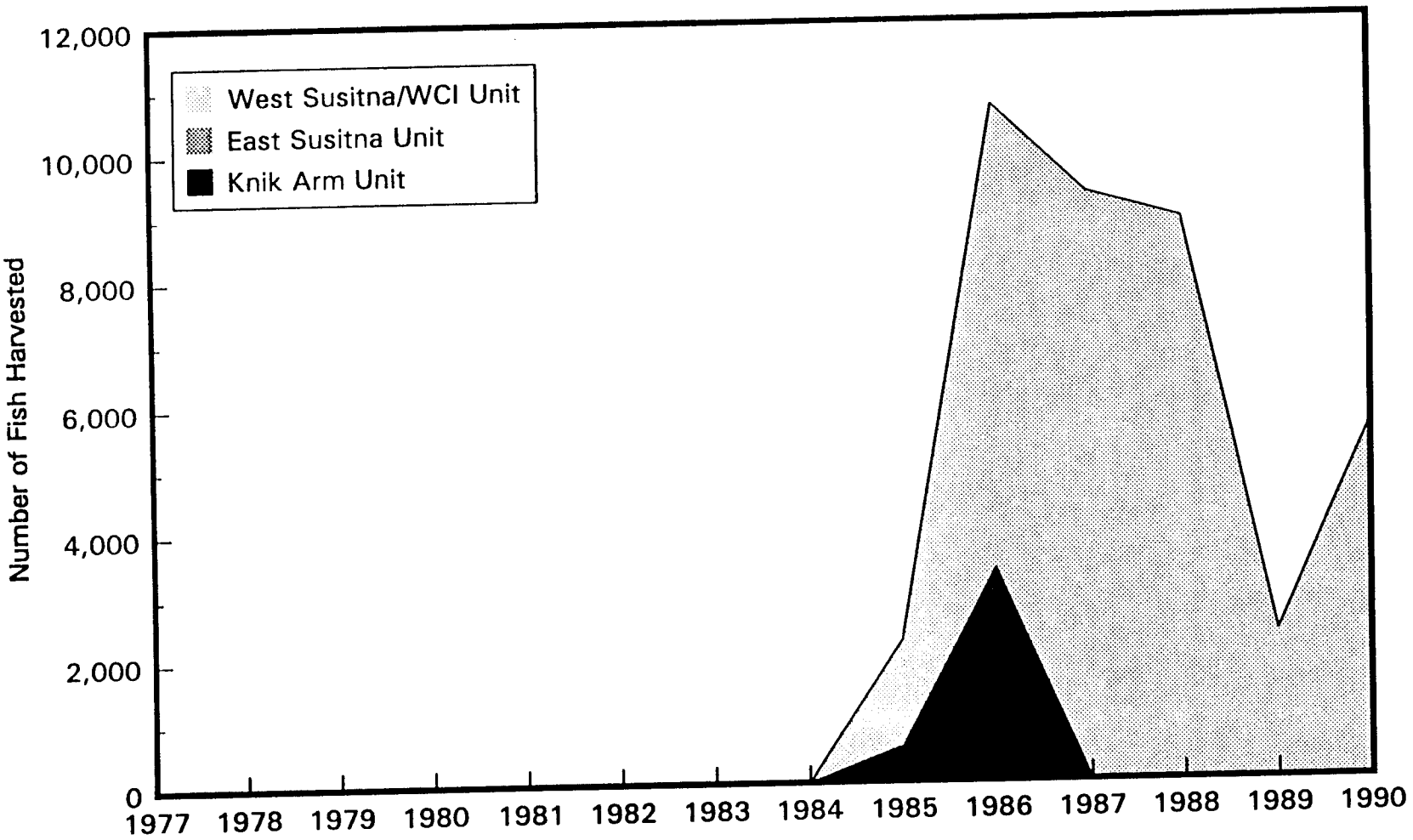

Figure 23. Number of smelt harvested by recreational anglers fishing Northern Cook Inlet Management Area waters, 1984-1990.

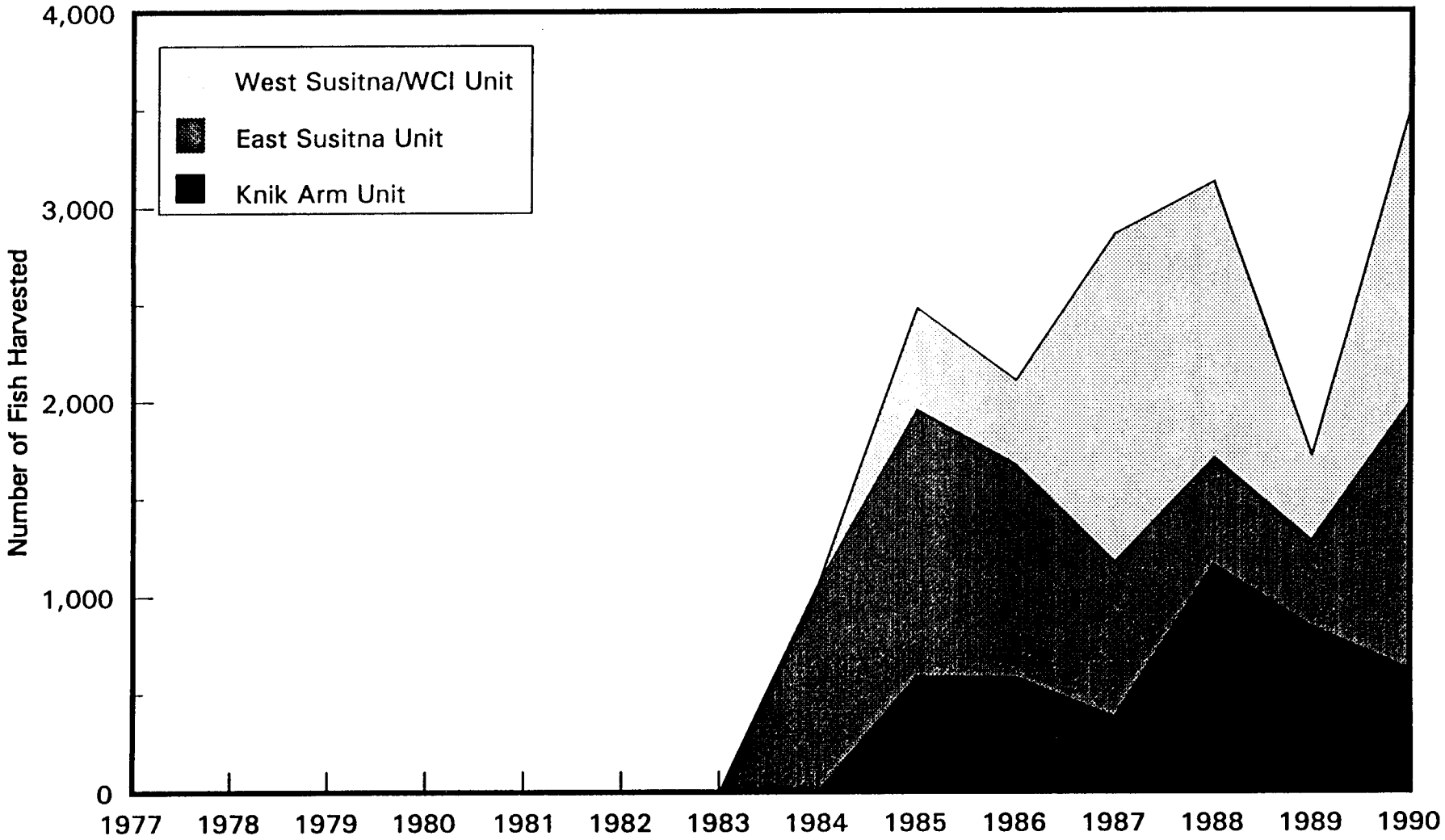

Figure 24. Number of whitefish harvested by recreational anglers fishing Northern Cook Inlet Management Area waters, 1983-1990.

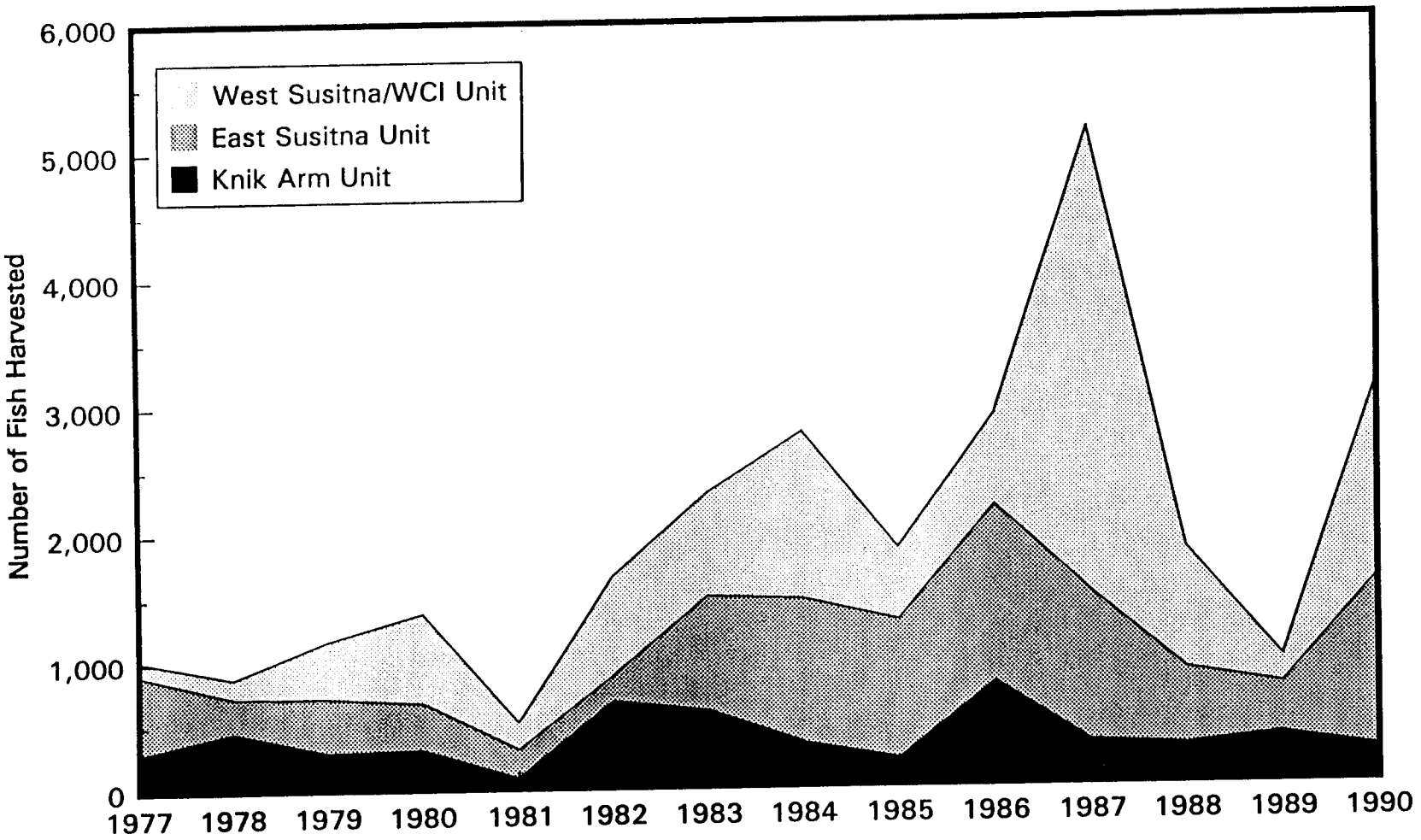

Figure 25. Number of burbot harvested by recreational anglers fishing Northern Cook Inlet Management Area waters, 1977-1990.

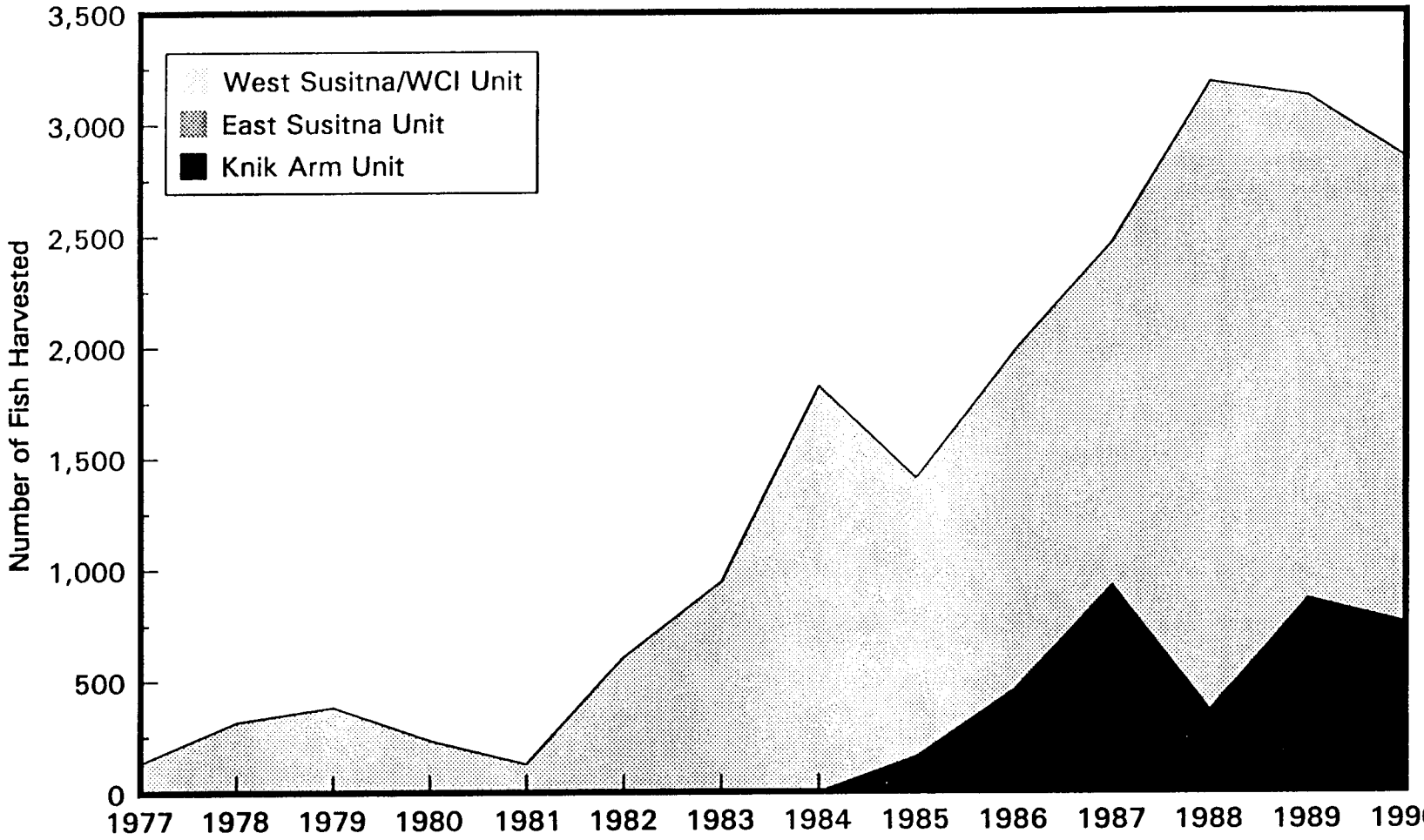

Figure 26. Number of northern pike harvested by recreational anglers fishing Northern Cook Inlet Management Area waters, 1977-1990.

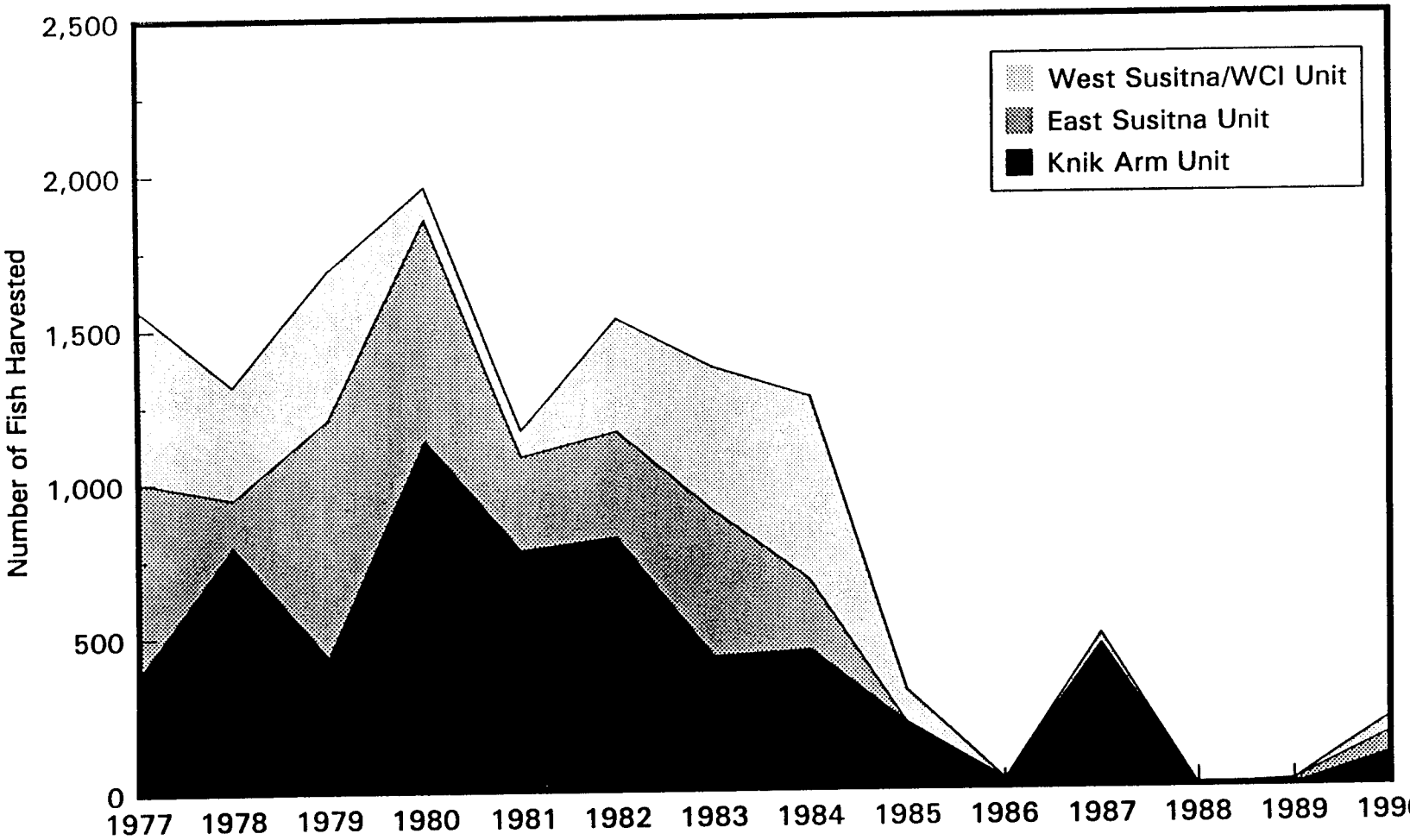

Figure 27. Number of other fish harvested by recreational anglers fishing Northern Cook Inlet Management Area waters, 1977-1990.

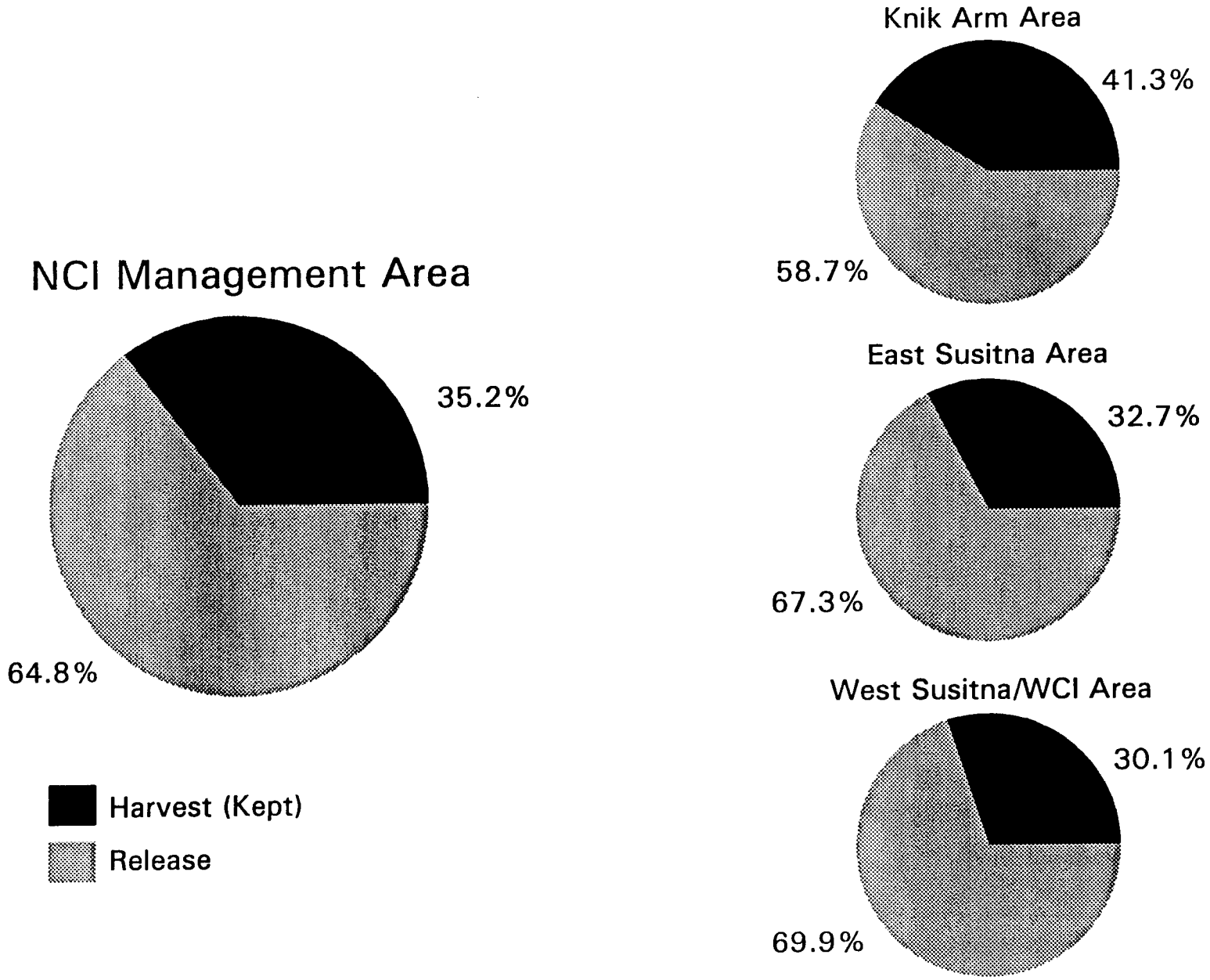

Figure 28. Percent of the recreational catch from Northern Cook Inlet Management Area harvested (kept) and released in 1990.

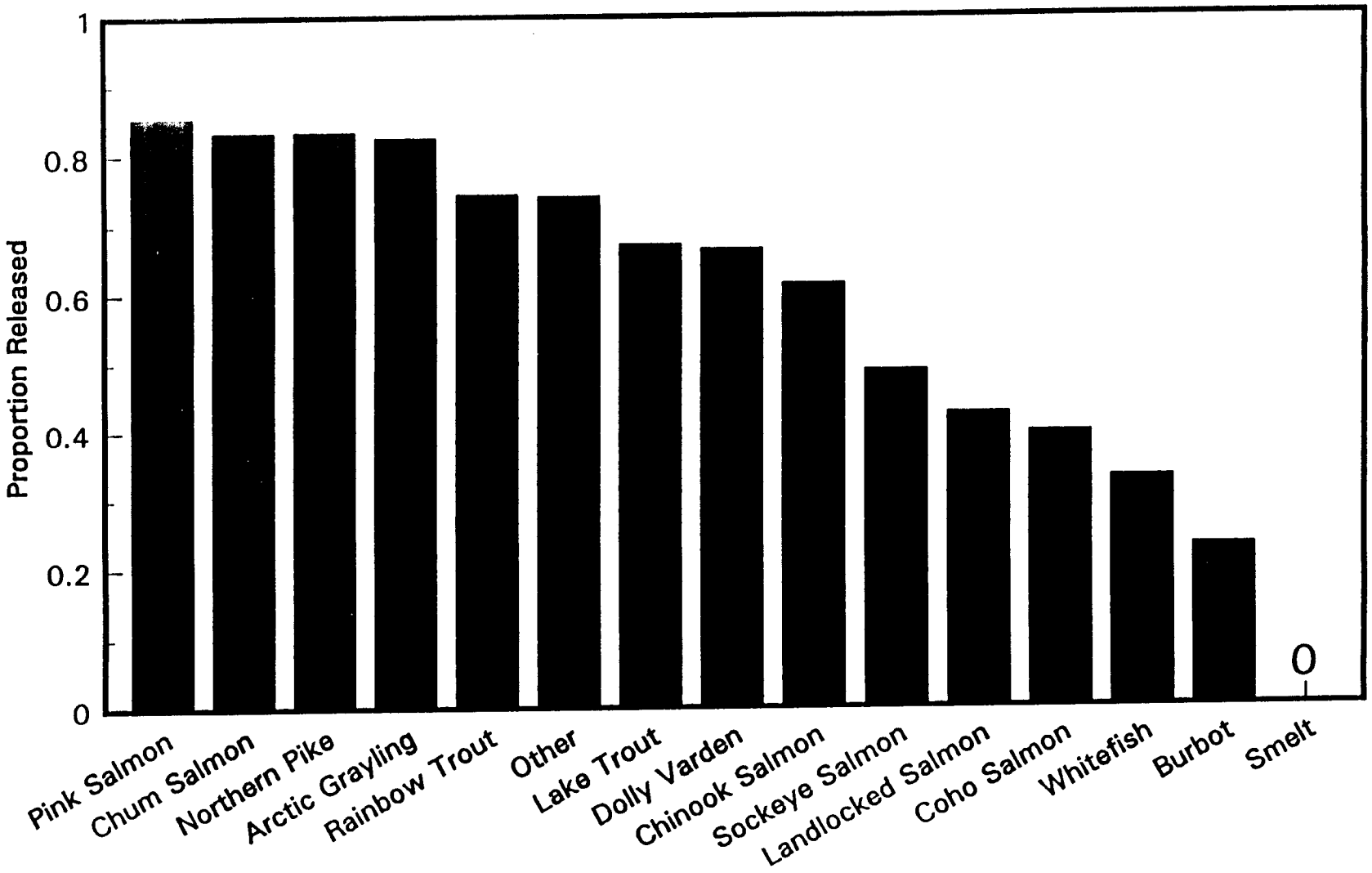

Figure 29. Proportion of recreational catch, by species, from Northern Cook Inlet Management Area waters released in 1990.

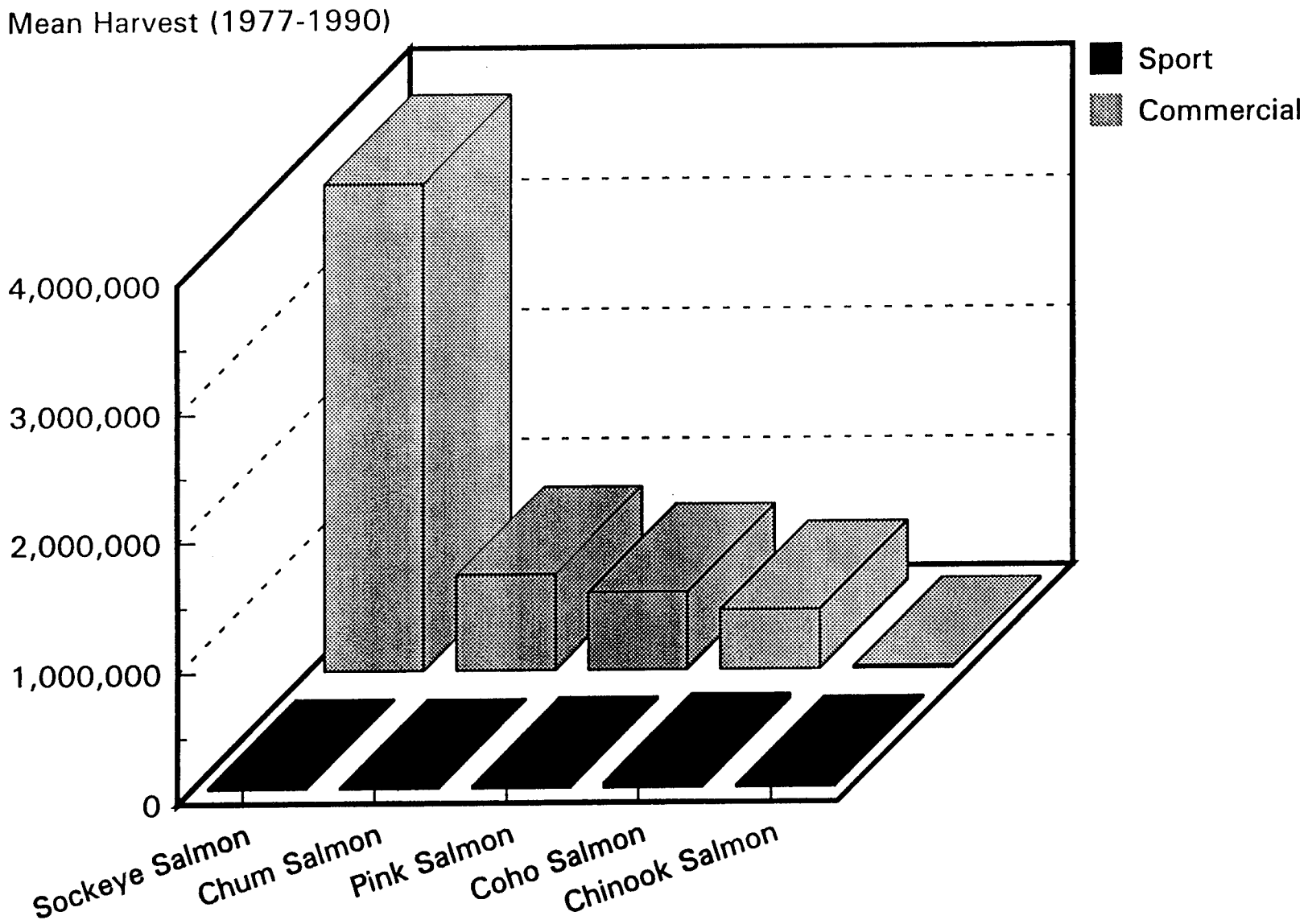

Figure 30. A comparison of the mean for sport and commercial harvests, 1977-1990, from Northern Cook Inlet Management Area waters.

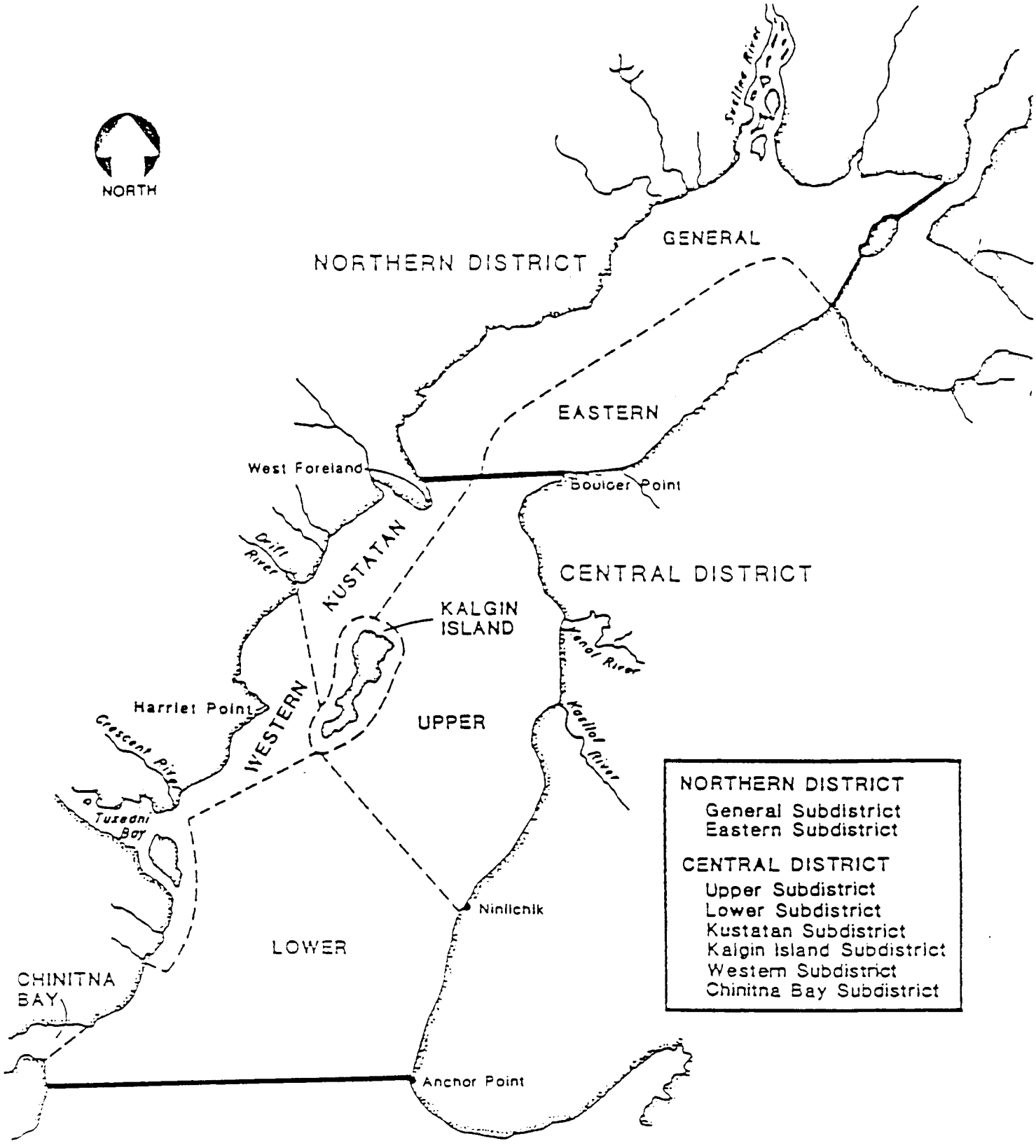

Figure 31. Map of Upper Cook Inlet commercial salmon fishing districts.

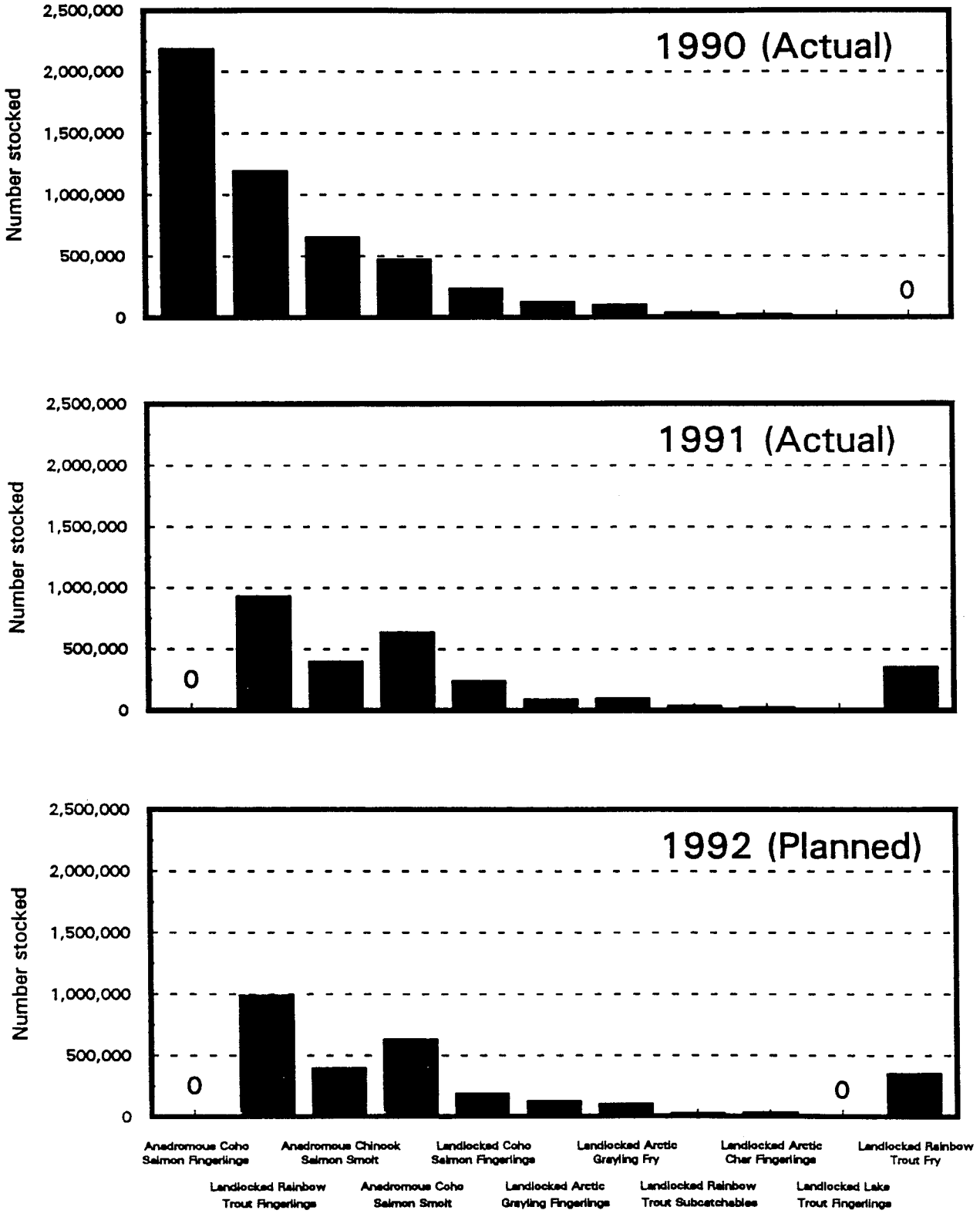

Figure 32. Number and species of fish stocked (actual and planned) in Northern Cook Inlet Management Area waters, 1990-1992.

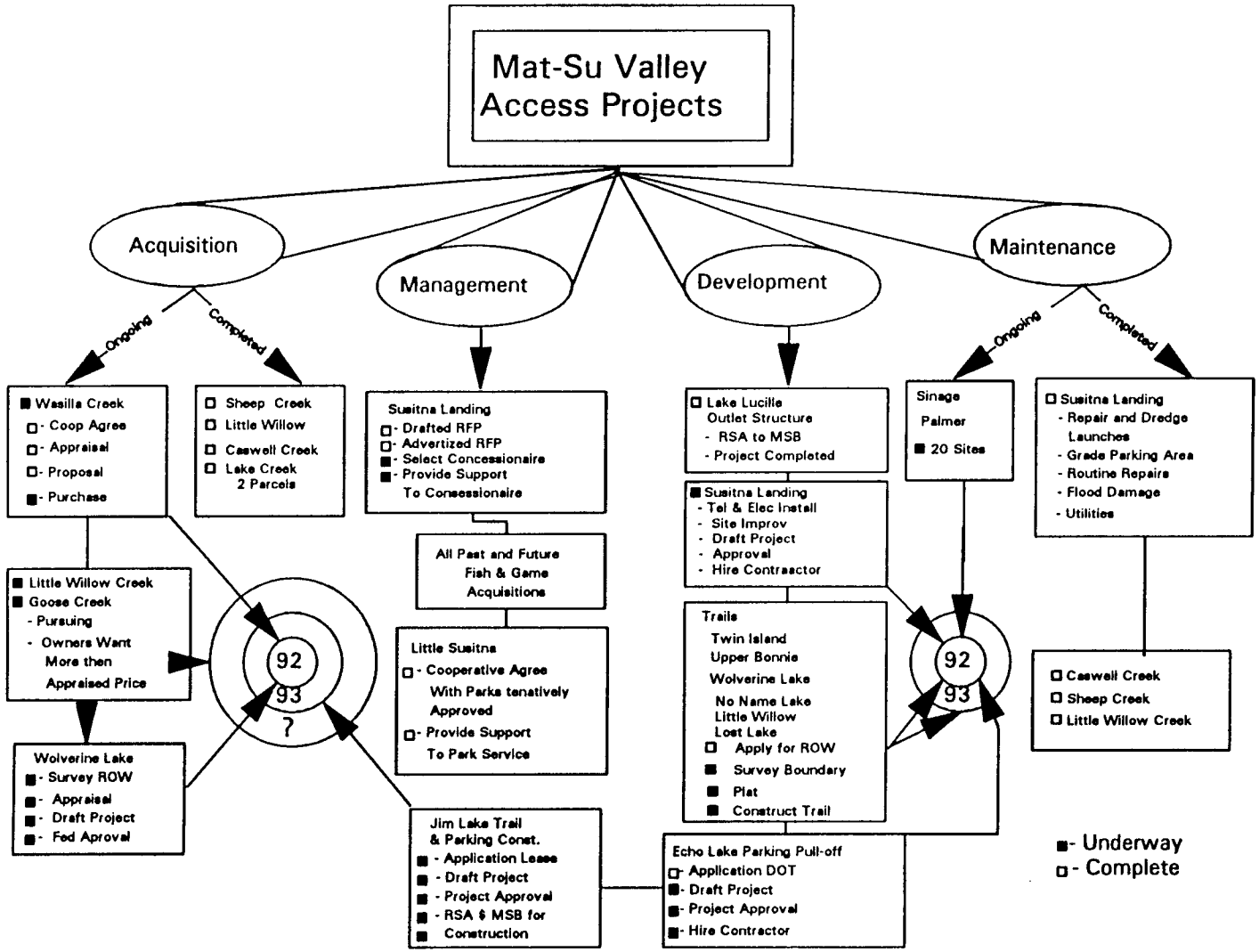

Figure 33. Matanuska-Susitna Valley access projects.

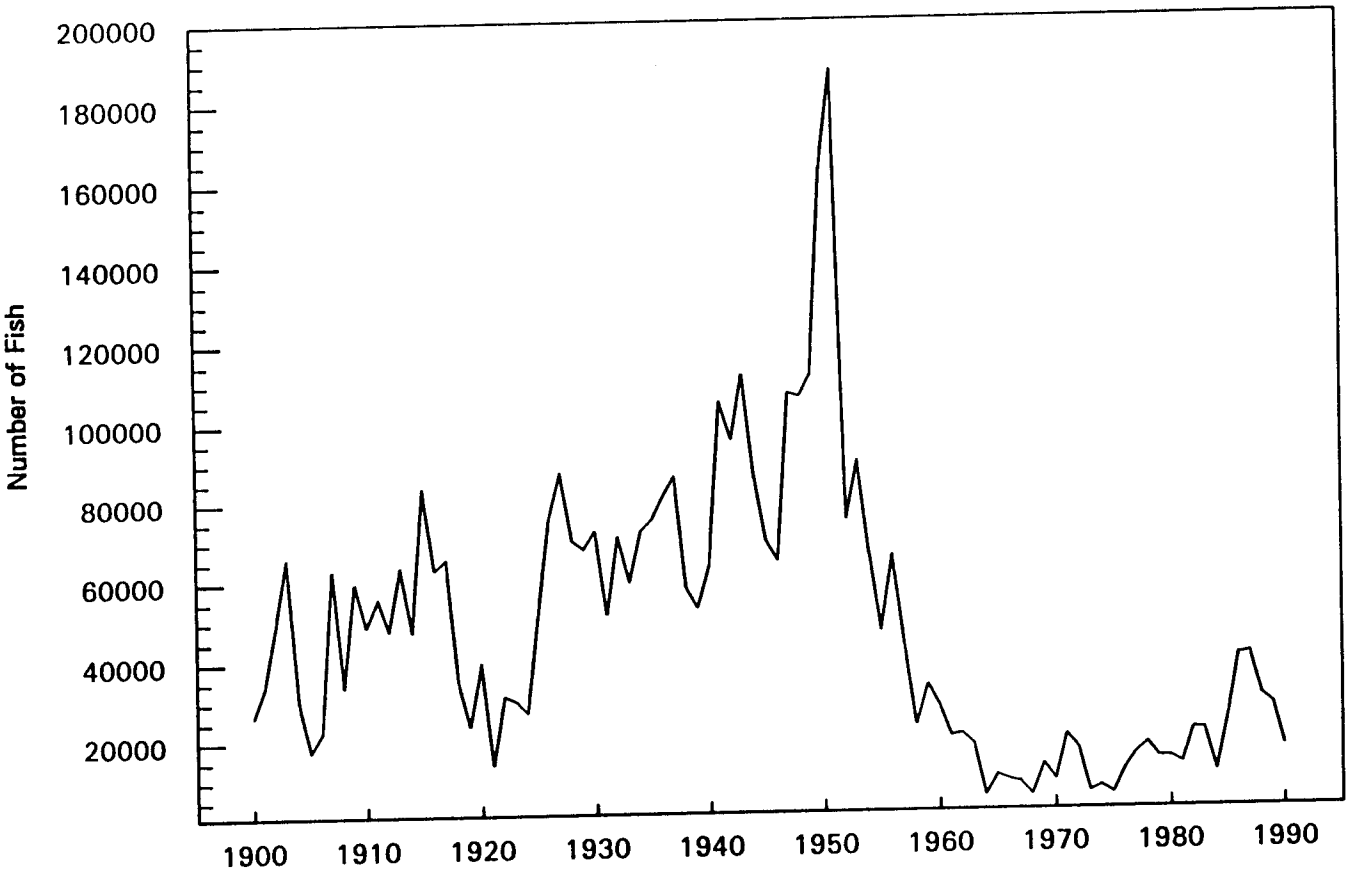

Figure 34. Cook Inlet commercial chinook salmon harvest, 1900-1990.

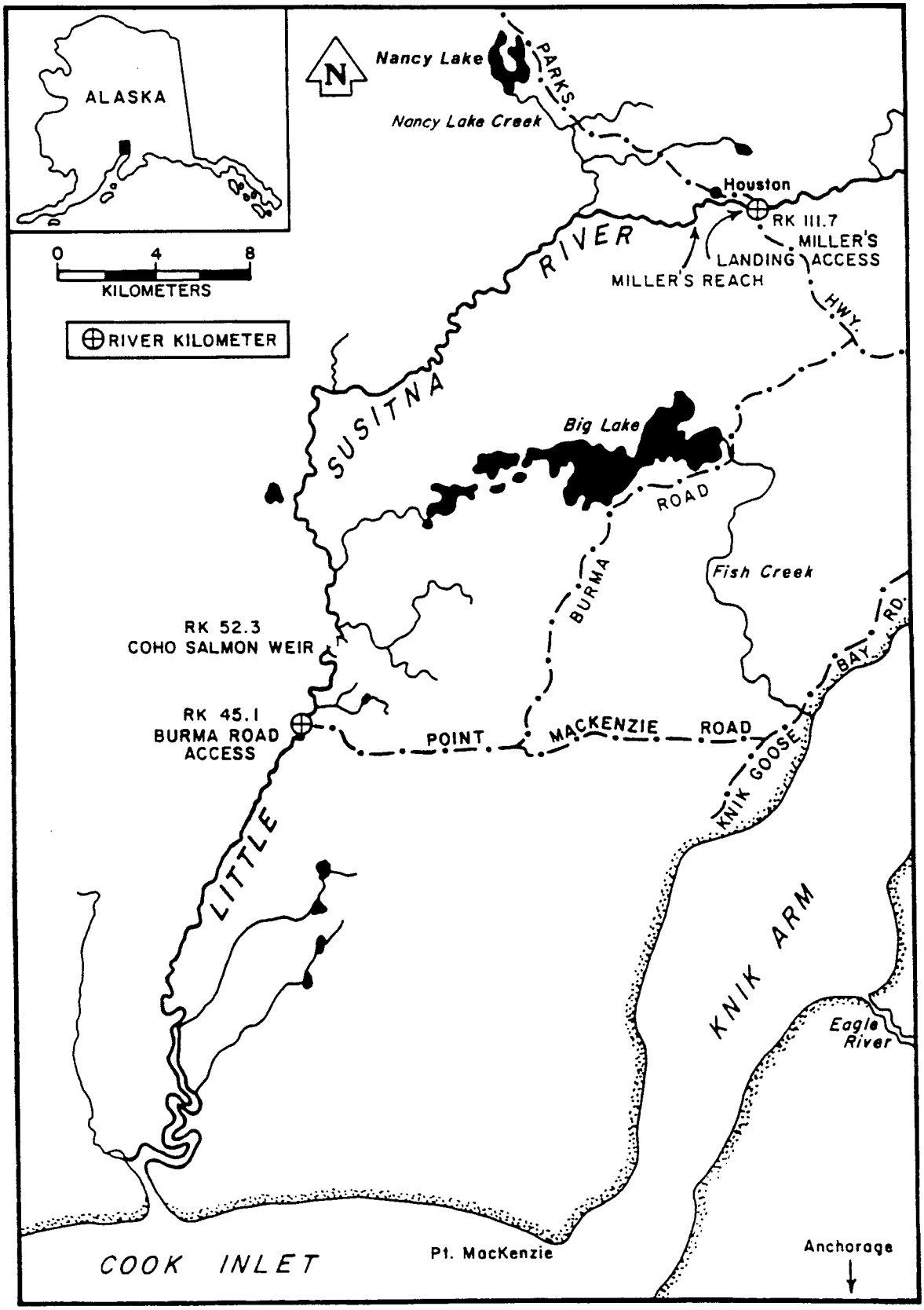

Figure 35. Map of the Little Susitna River.

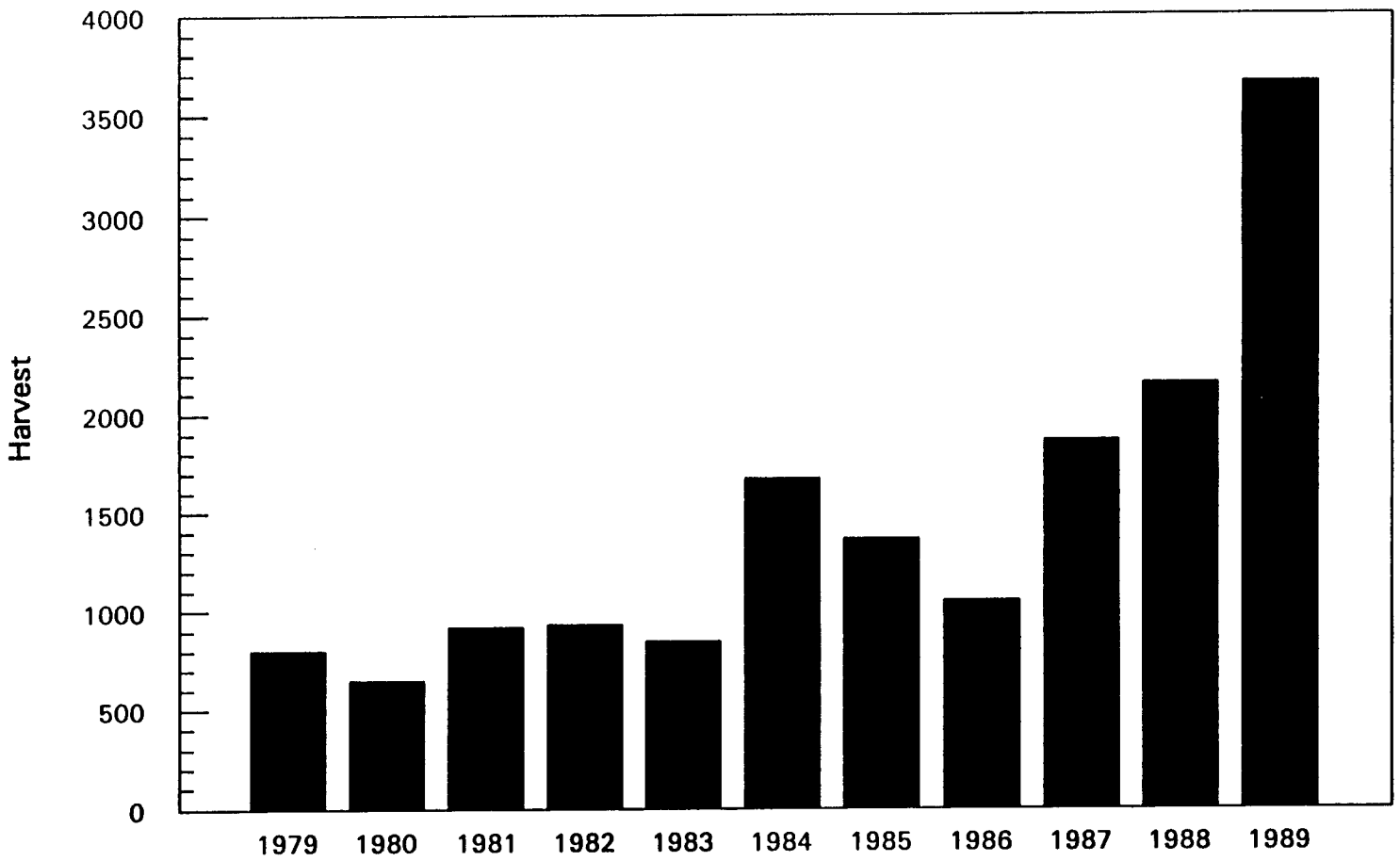

Figure 36. Little Susitna River chinook salmon harvest, 1979-1989.

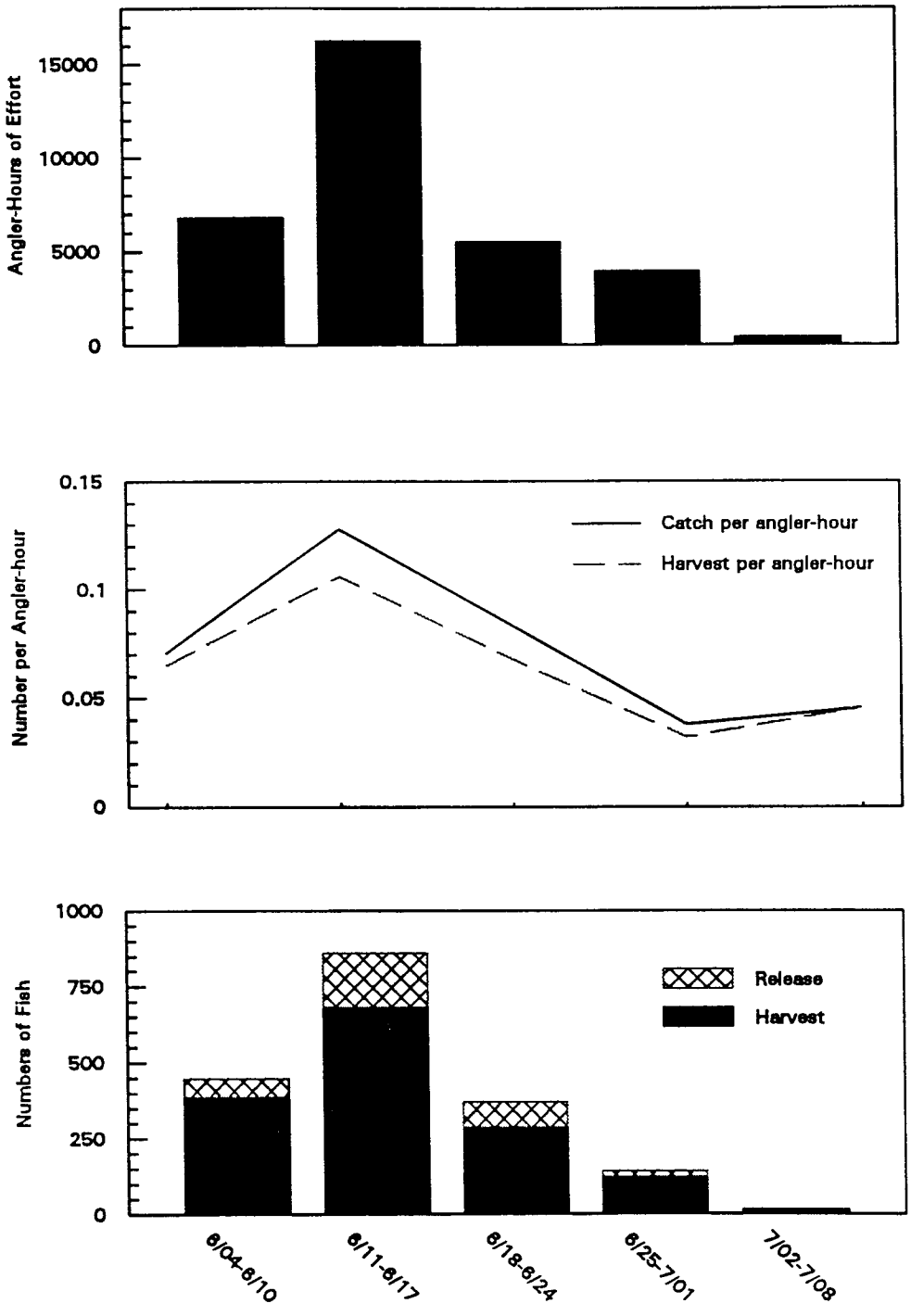

Figure 37. Fishing effort for and the harvest and catch of chinook salmon at the Burma Road access site during 1990.

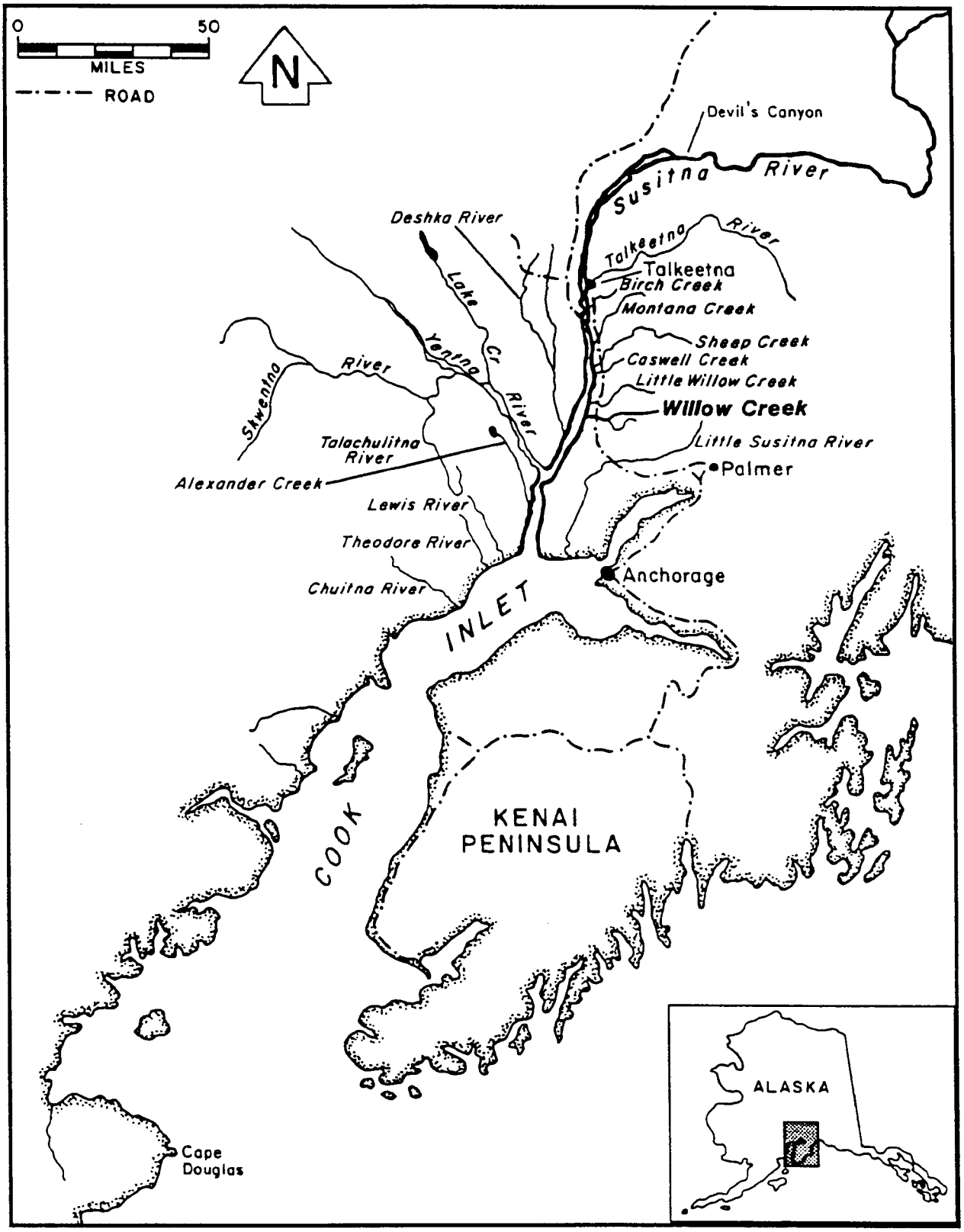

Figure 38. Map of Northern Cook Inlet area.

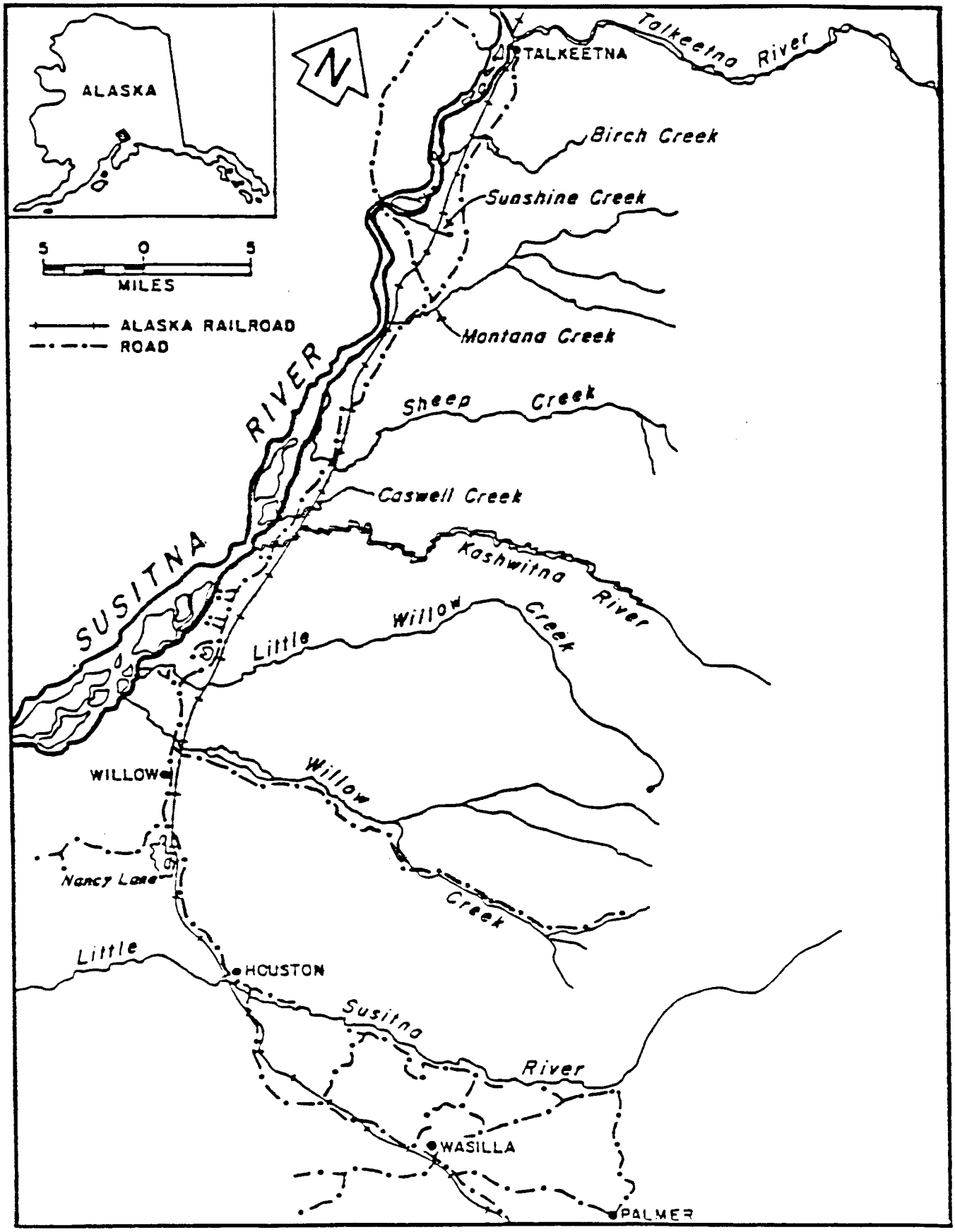

Figure 39. Map of eastside tributaries of the Susitna River.

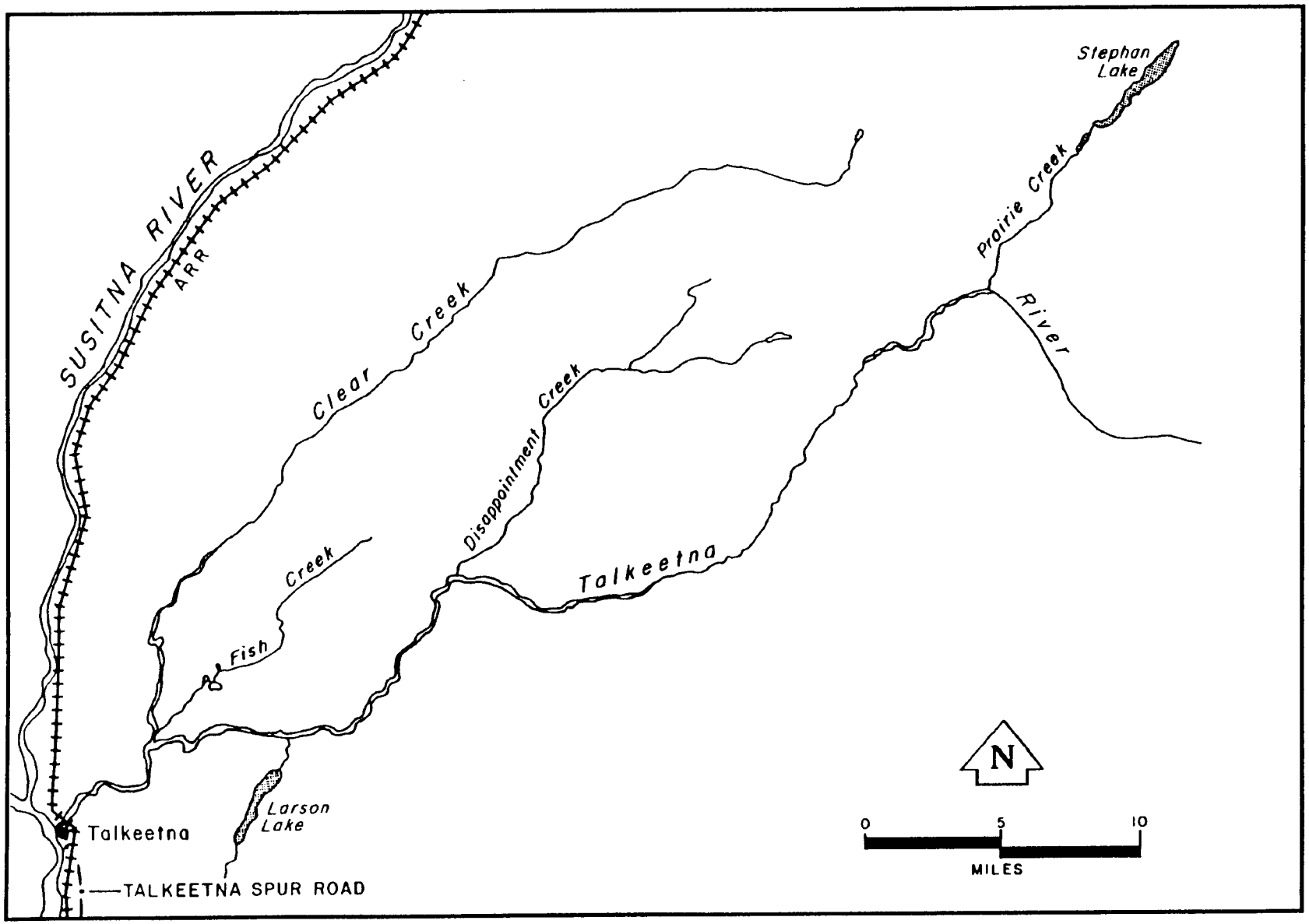

Figure 40. Map of the Talkeetna River area.

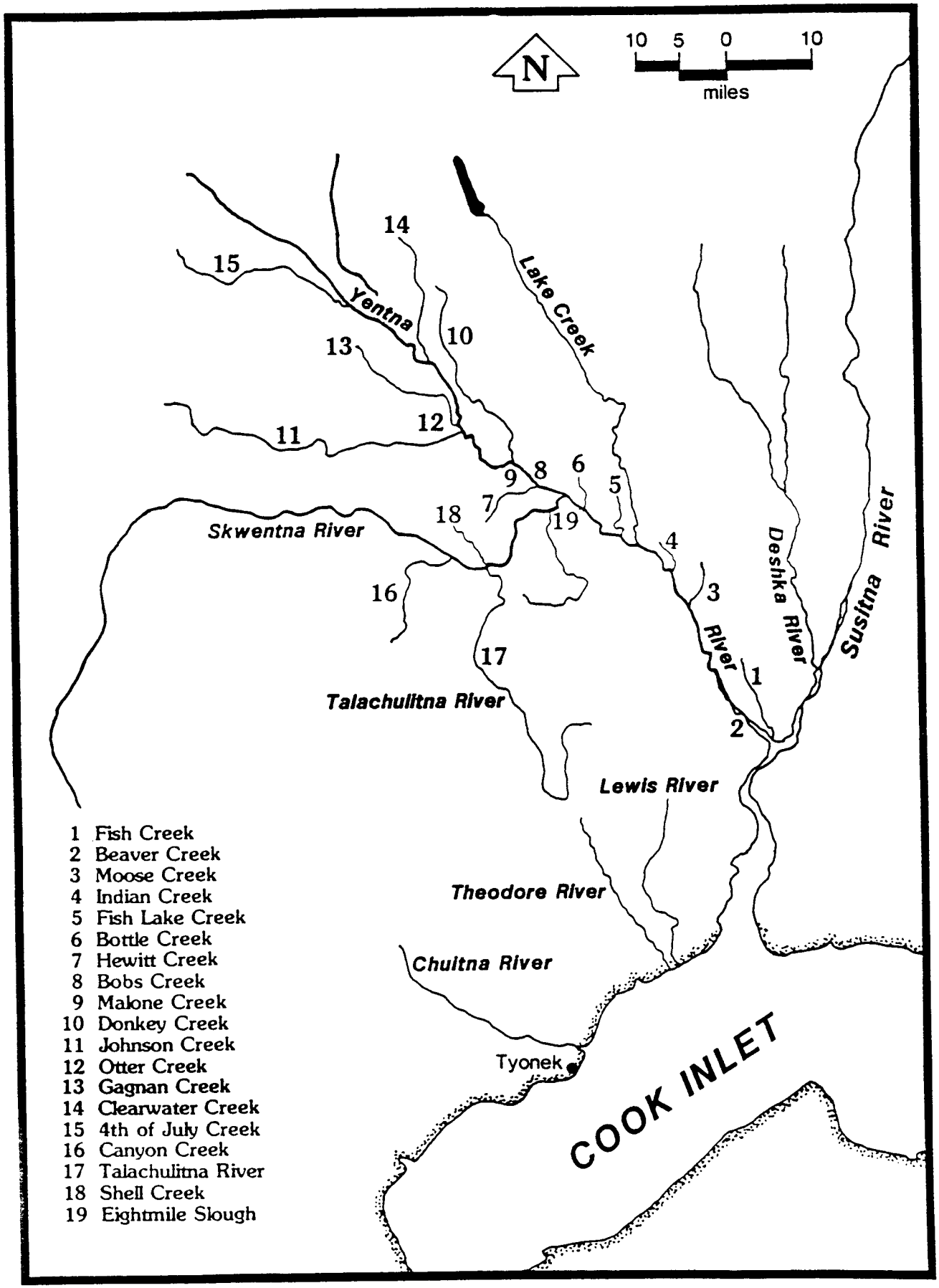

Figure 41. Map of the Yentna River drainage survey area.

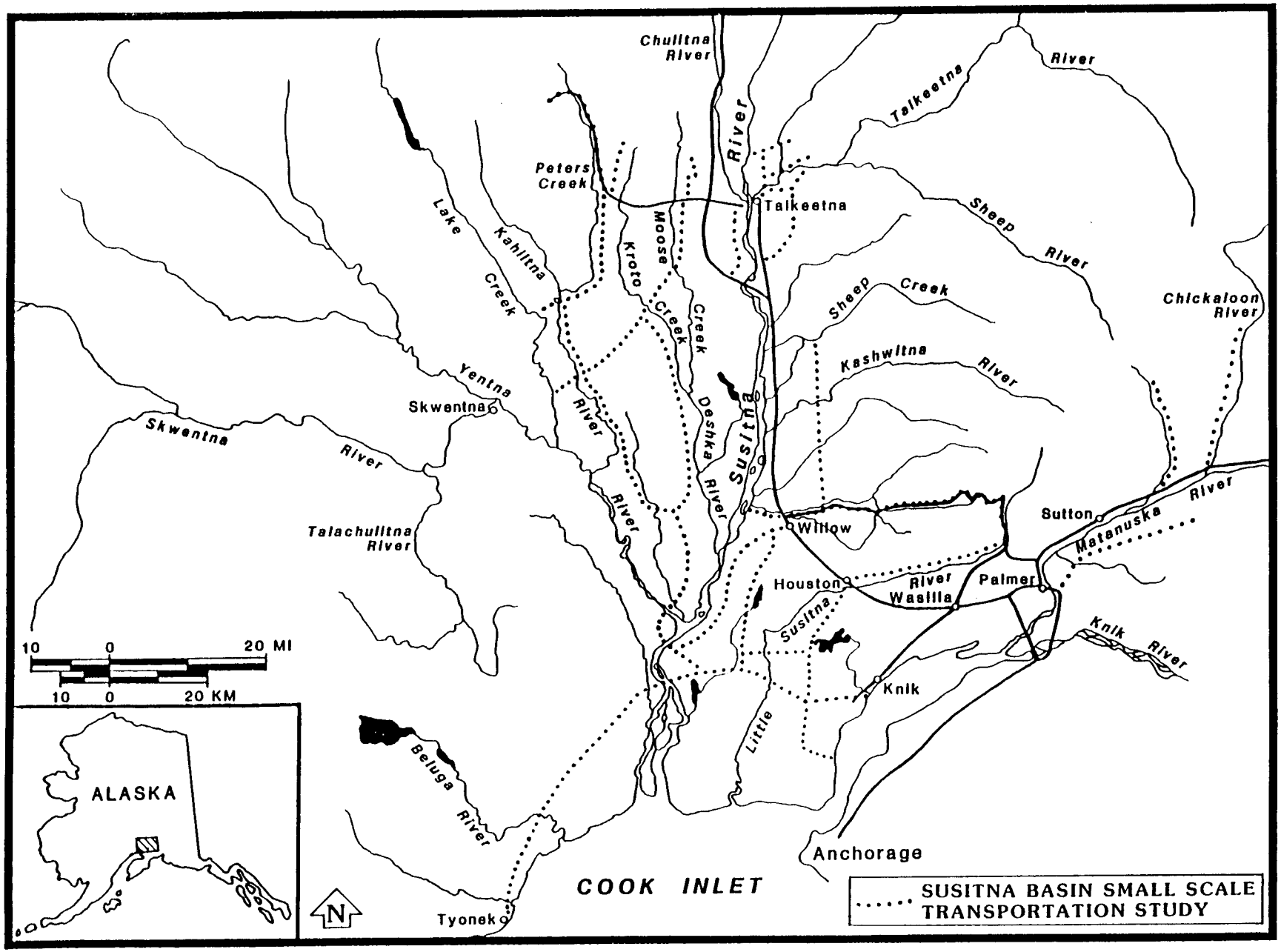

Figure 42. Map of proposed roads in the Susitna basin.

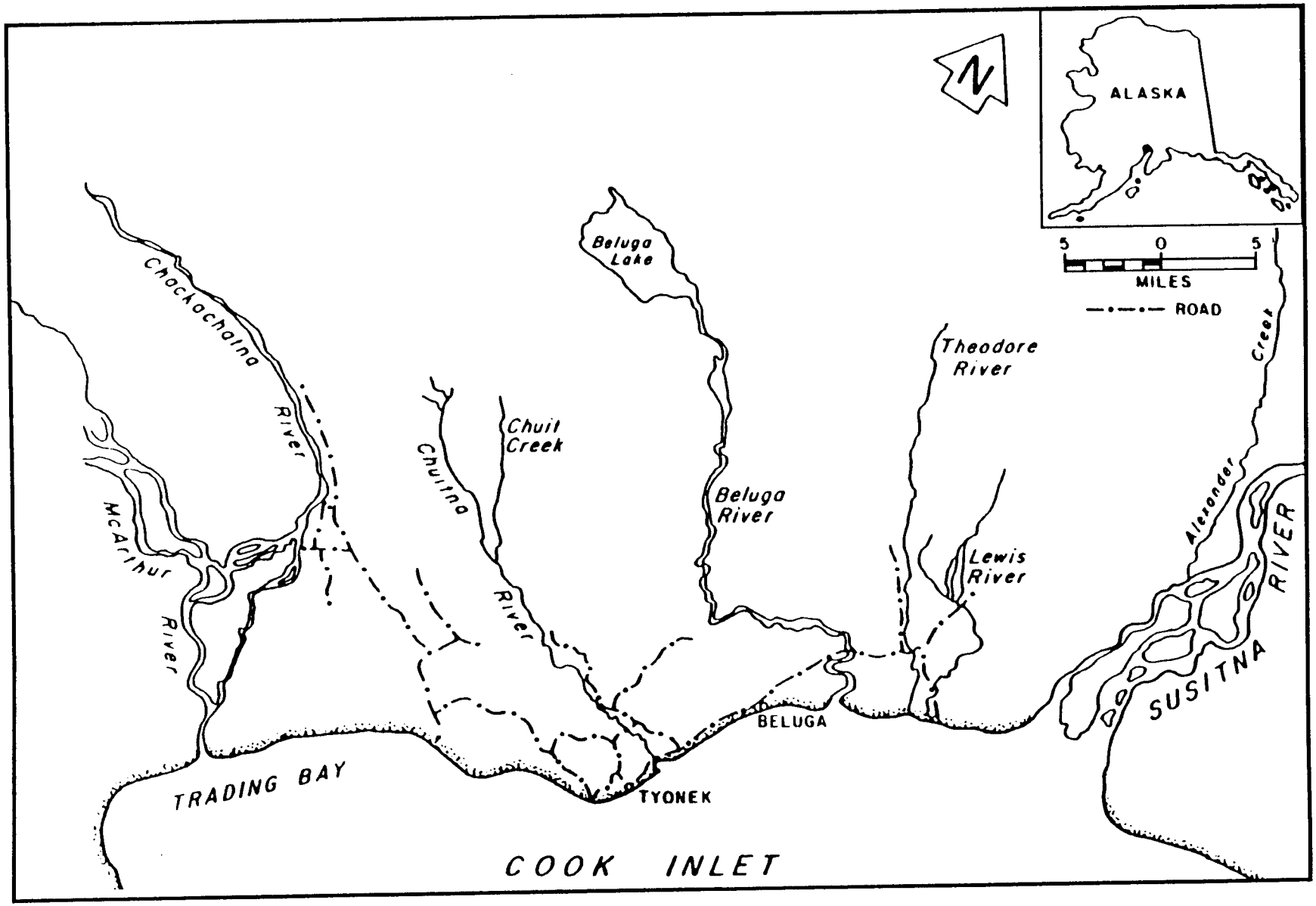

Figure 43. Map of West Cook Inlet coastal streams.

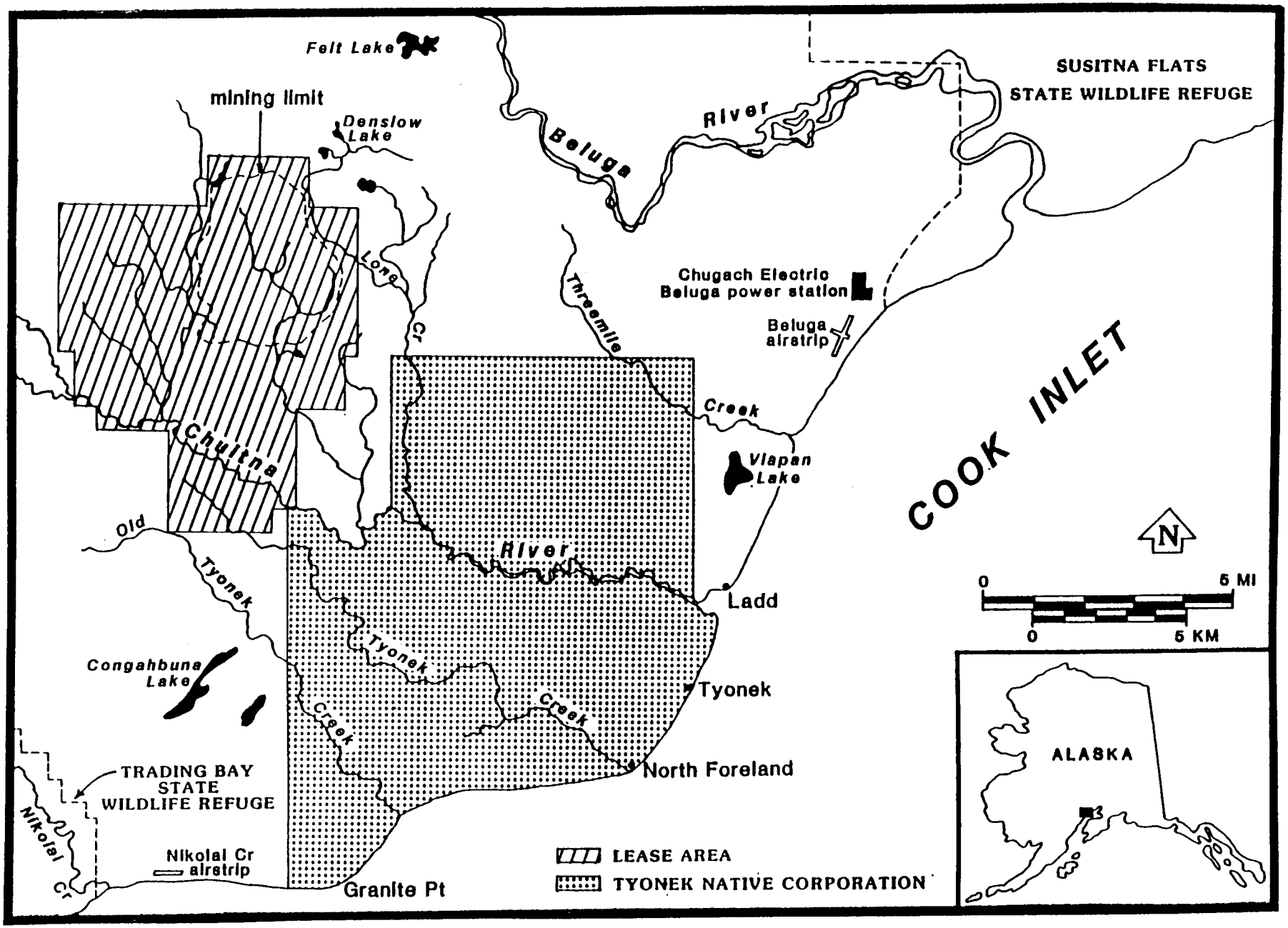

Figure 44. Map of proposed Chuitna coal mine project.

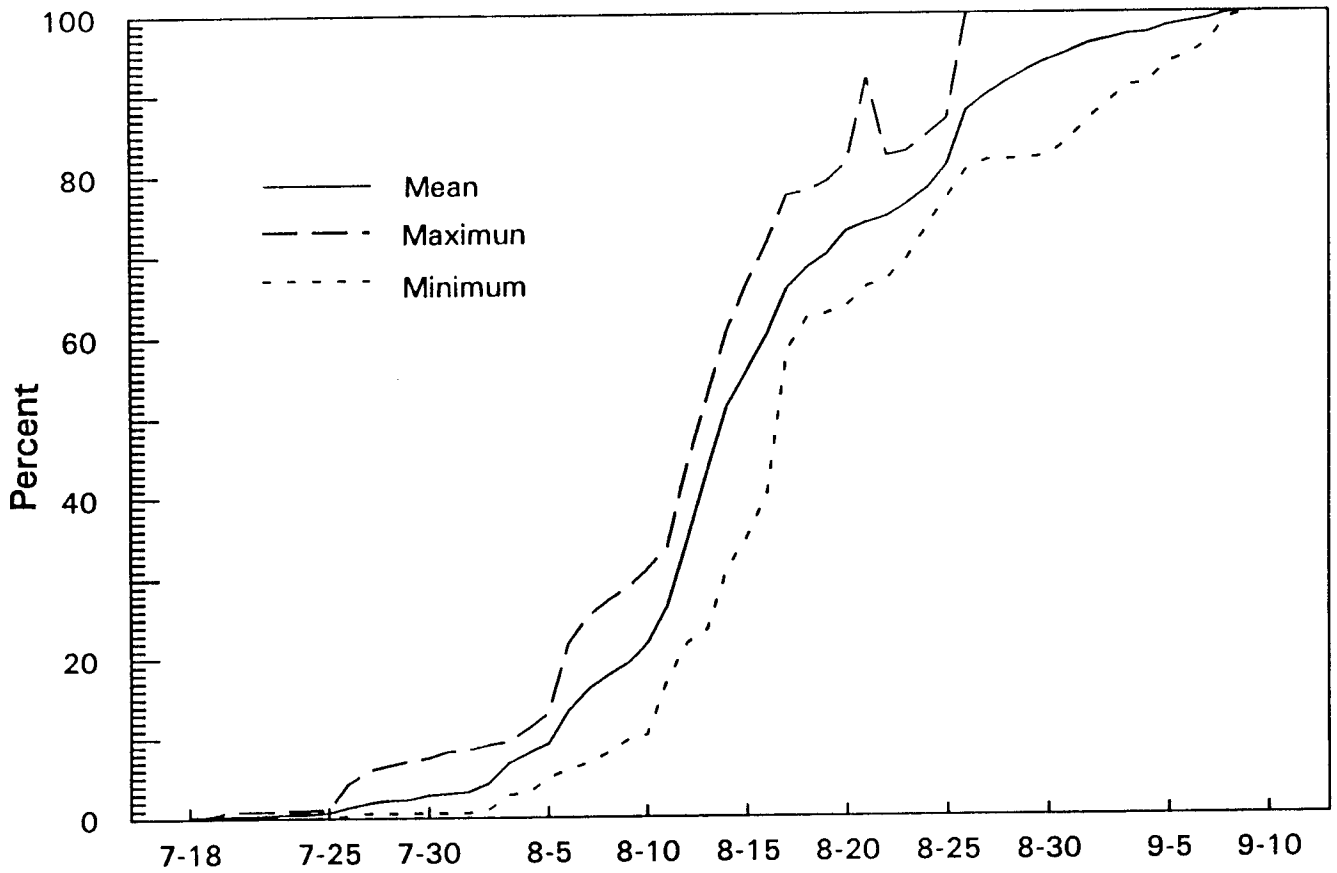

Figure 45. Mean, minimum and maximum percent of the total escapement of coho salmon, by date, through the Little Susitna River weir, 1986- 1990.

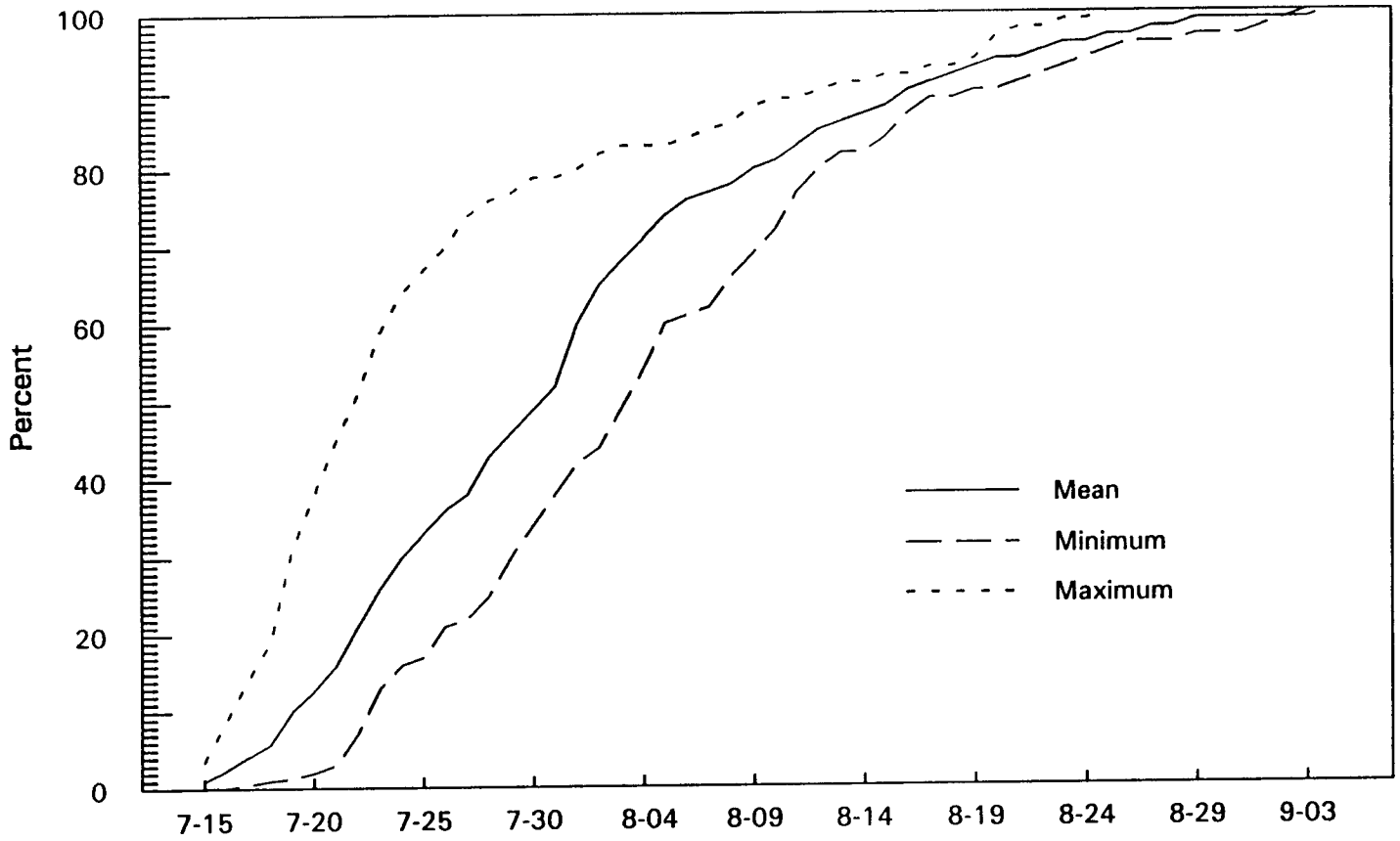

Figure 46. Mean, minimum and maximum percent of the total coho salmon, by date, from Yentna River sonar counts, 1981-1984.

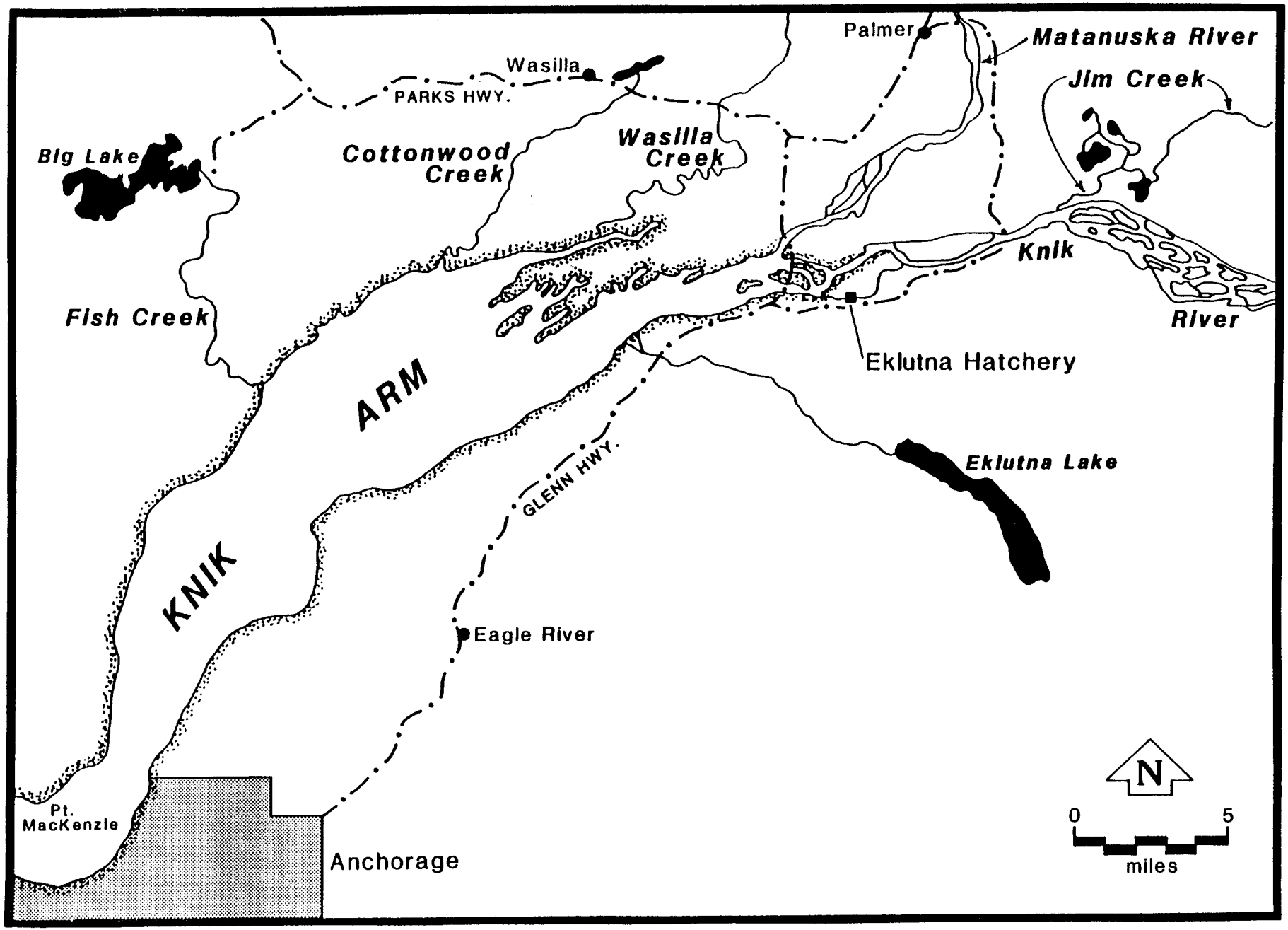

Figure 47. Map of the Knik Arm drainage.

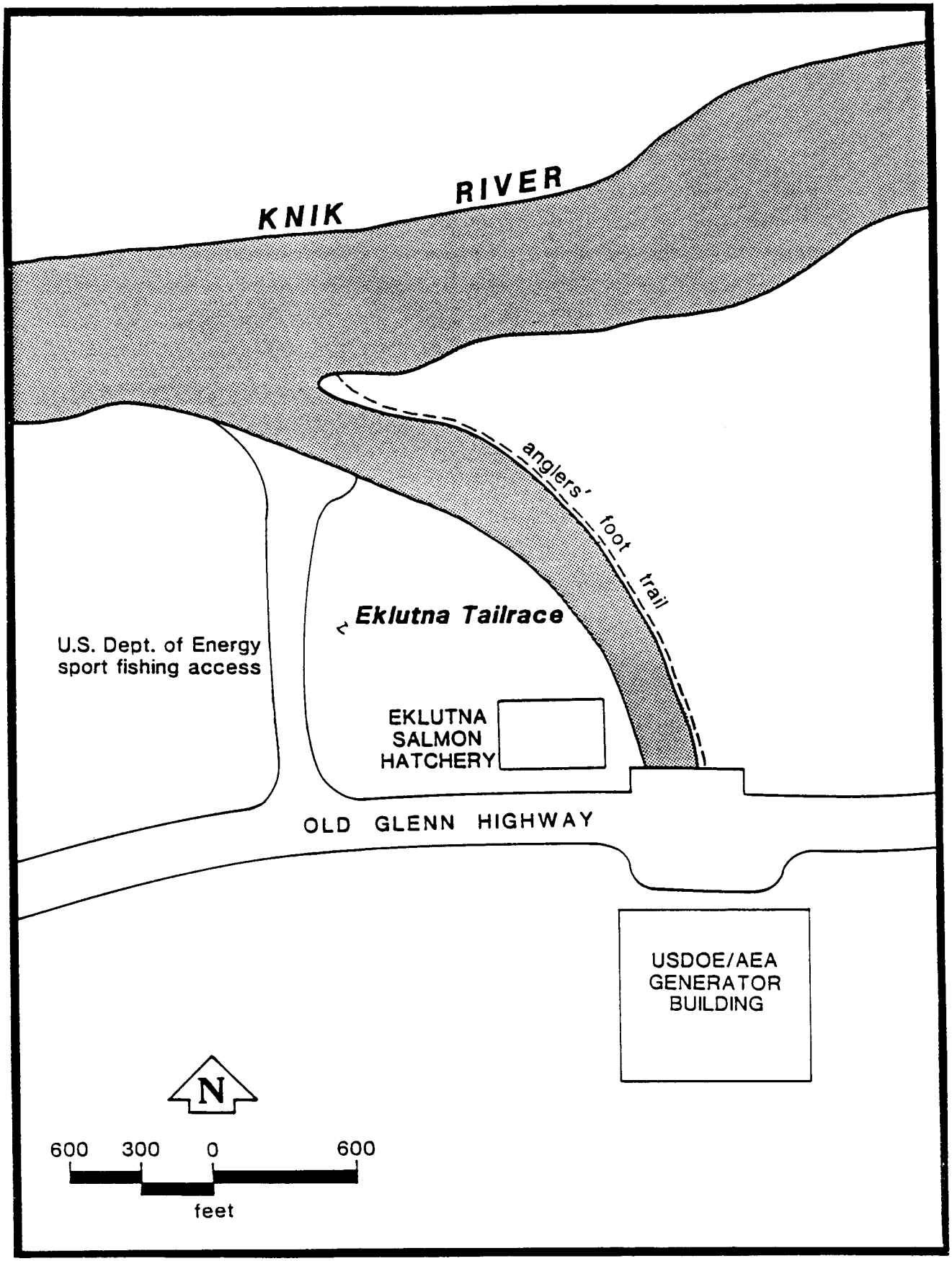

Figure 48. Map of the Eklutna hatchery and Eklutna powerplant tailrace.

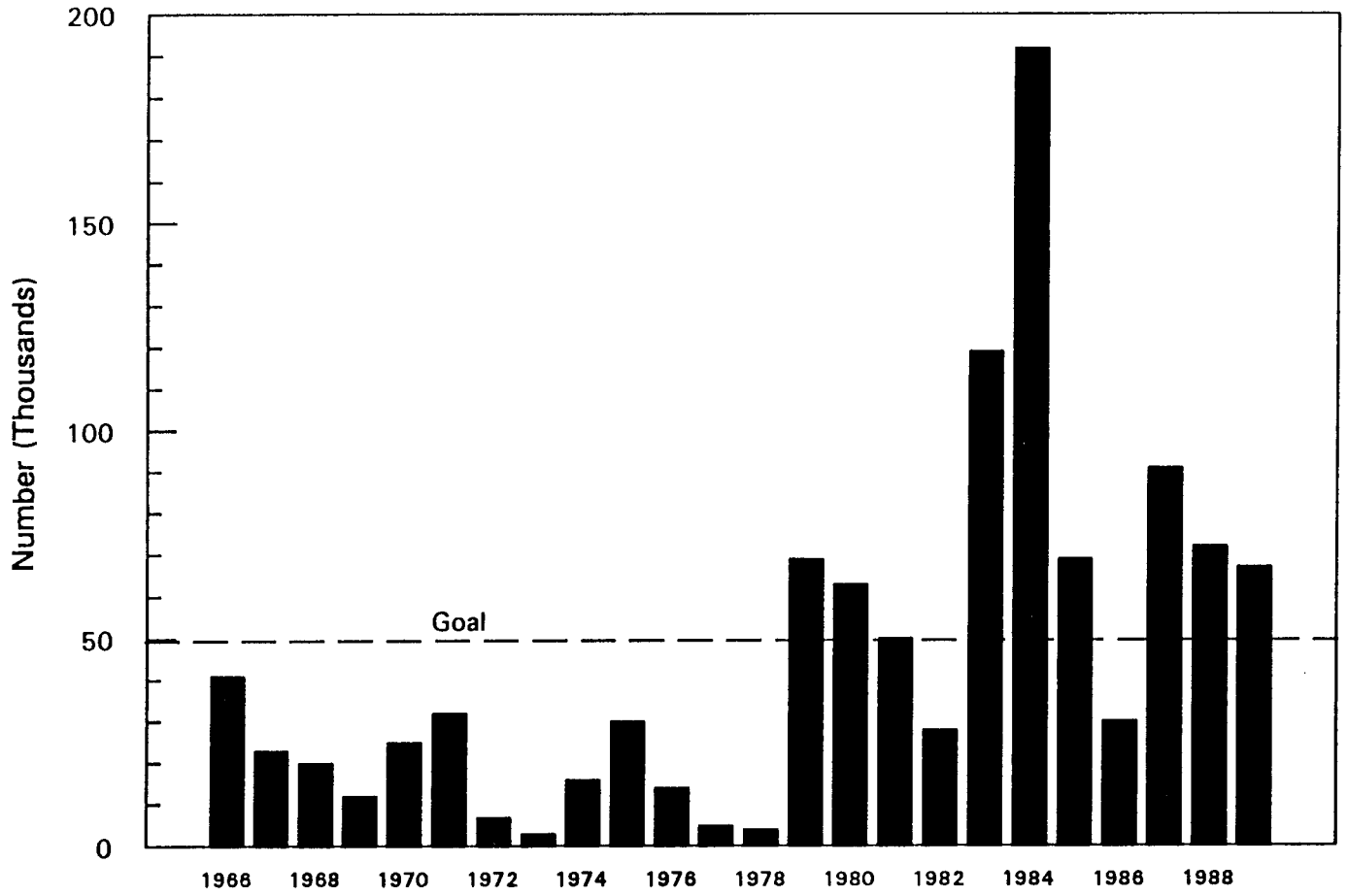

Figure 49. Fish Creek sockeye salmon escapement, 1966-1989.

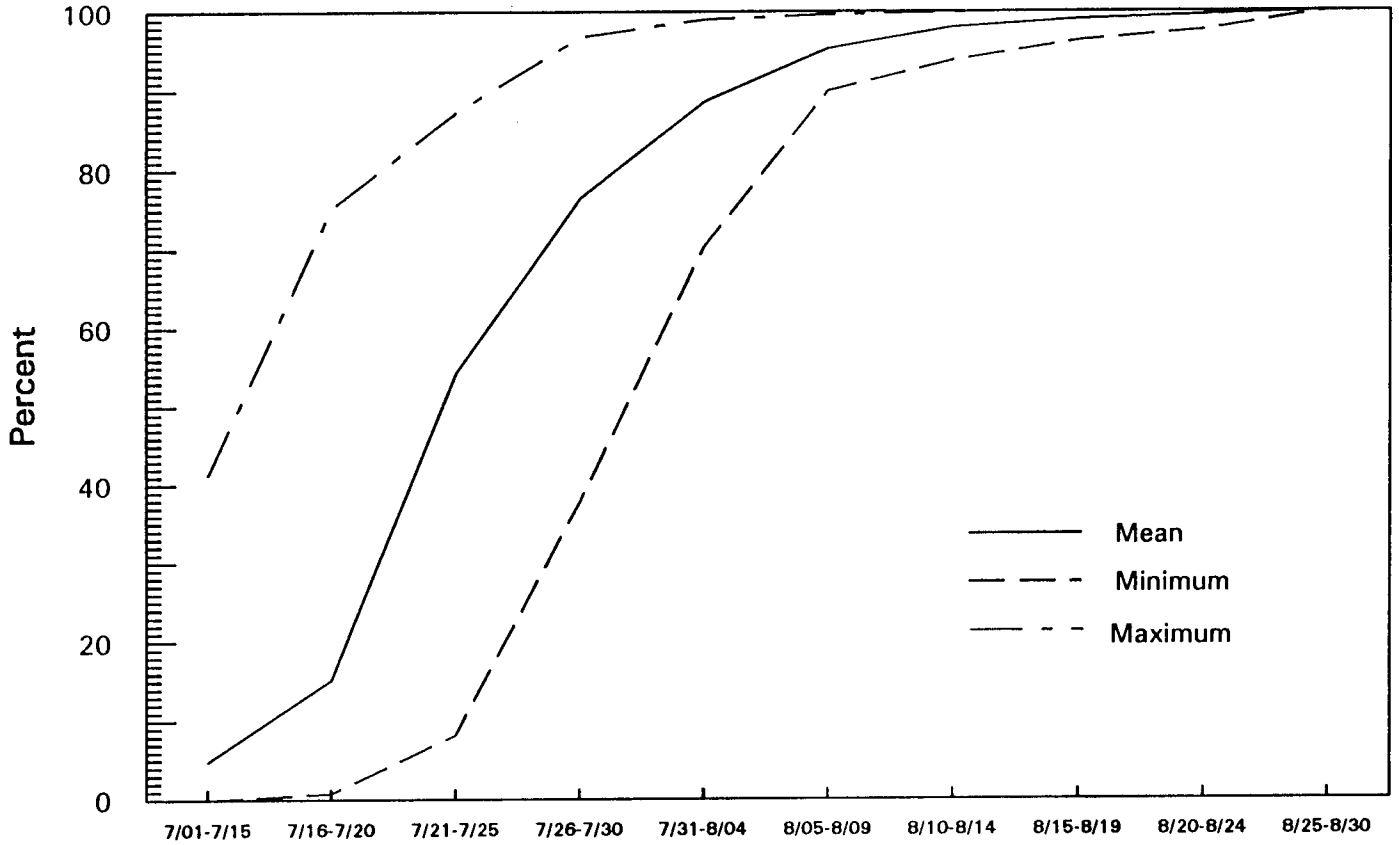

Figure 50. Mean, minimum and maximum percent of the total escapement of sockeye salmon, by date, through the Fish Creek weir, 1978-1990.

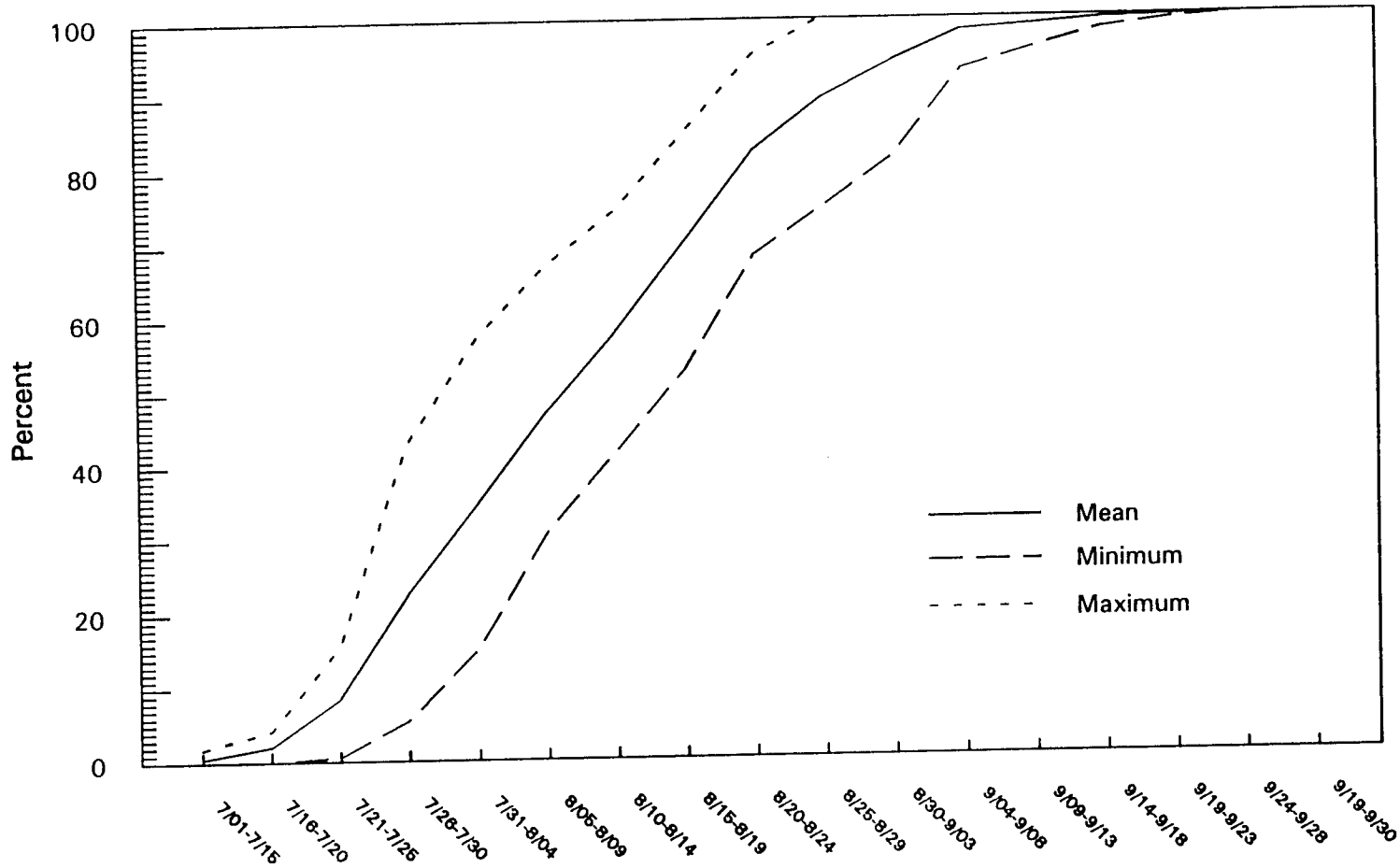

Figure 51. Mean, minimum and maximum percent of the total escapement of coho salmon, by date, through the Fish Creek weir, 1978-1981.

APPENDIX A

Appendix A1. Number of coho salmon harvested from Knik Arm waters, 1977-1990.

FISHERY	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	Mean
Marine							983	1,060			181	200	142	251	470
Fish Ck.							513	12	120	106	453	73	204	35	190
Other															
Total							1,496	1,072	120	106	634	273	346	286	542
Little Sustina River	3,415	4,865	3,382	6,302	5,940	7,116	2,835	14,253	7,764	6,039	13,003	19,009	14,129	7,497	8,254
Knik Arm Tributaries															
Knik River & Tributaries (incl. Jim Ck.)					1,801	2,306	774	3,429	2,523	2,948	3,676	11,078	4,220	6,184	3,894
Wasilla Ck.	472	2,112	1,211	3,555	814	1,624	345	1,920	1,900	944	1,195	1,273	975	1,012	1,382
Cottonwood Ck.			1,198	3,375	1,373	1,886	518	1,895	1,005	690	1,159	746	876	286	1,251
Big Lake Drainage streams									284	364	833	1,637	784	398	717
Ekultna Power Plant Raceway								561	557	502	2,318	3,329	1,666	1,012	1,421
Total	472	2,112	2,409	6,930	3,988	5,816	1,637	7,805	6,269	5,448	9,181	18,063	8,521	8,892	6,253
Knik Basin Lakes															
Wasilla Lake			0	0	0	0	0	0	44	0	688	273	62	28	91
Finger Lake	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kepler Complex Lakes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Big Lake	0	0	0	0	0	0	0	0	44	618	1,322	1,655	666	1,487	414
Lucille Lake	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kalmback Lake													0		0
Knik Lake													0		0
Memory Lake								0					0		0
Seymour Lake										0			0		0
Lower & Upper Bonnie Lakes										0		0	0	0	0
Nancy Lake Complex Lakes	56	0	0	0	0	0	0	0	22	0	525	673	86	432	128
Total	56	0	0	0	0	0	0	0	110	618	2,535	2,601	814	1,947	620

-continued-

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FISHERY	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	Mean
Other Waters															
Other Streams							171	212	76	144	434	36	30	98	150
Other Lakes							0	87	0	6	0	55	6	42	25
Other Waters	423	918	1,348	2,798	556	744									1,131
Total	423	918	1,348	2,798	556	744	171	299	76	150	434	91	36	140	585
Area Total	4,366	7,895	7,139	16,030	10,484	13,676	6,139	23,429	14,339	12,361	25,787	40,037	23,846	18,762	16,021

Appendix A2. Number of coho salmon harvested from eastside Susitna River waters, 1977-1990.

FISHERY	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	Mean
Willow Creek	679	905	462	1,207	747	1,069	576	1,846	1,026	944	2,898	4,875	4,218	2,711	1,726
Caswell Creek			624	1,124	901	776	408	1,247	608	472	453	1,455	834	2,596	958
Montana Creek	1,415	2,451	1,735	2,684	2,261	3,060	1,402	4,502	1,972	1,488	1,394	2,219	2,295	778	2,118
Sunshine Creek			774	1,534	968	1,719	722	1,733	1,205	4,029	1,612	2,146	2,159	704	1,609
Talkeetna River & Tributaries (in. Clear Ck)	1,070	2,200	1,248	661	422	996	836	1,509	747	3,376	2,608	2,929	2,775	2,539	1,708
Sheep Creek	438	478	462	430	326	367	596	661	478	1,343	1,068	3,165	2,231	991	931
Little Willow Creek	225	151	262	494	29	398	52	1,147	528	363	561	1,237	1,388	639	534
Goose Creek								449		363	145	291	190	180	270
Birch Creek										980	163	691	281		529
Kashwitna Creek							52	162		871	36	327	336	197	283
Total	3,827	6,185	5,567	8,134	5,654	8,385	4,644	13,256	6,564	14,229	10,938	19,335	16,707	11,335	9,626
Other Waters															
Other Streams							480	660	478	1,961	90	183	371	408	579
Lakes							52	0	0	0	0	0	0	0	7
Other Waters	1,882	2,388	1,997	2,234	939	1,782									1,870
Total	1,882	2,388	1,997	2,234	939	1,782	532	660	478	1,961	90	183	371	408	1,136
Area Total	5,709	8,573	7,564	10,368	6,593	10,167	5,176	13,916	7,042	16,190	11,028	19,518	17,078	11,743	10,762

Appendix A3. Number of coho salmon harvested from West Cook Inlet-West Susitna River waters, 1977-1990.

FISHERY	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	Mean
Deshka River	559	1,798	973	2,290	632	2,463	1,036	1,646	2,637	4,256	2,789	7,458	8,947	4,959	3,032
Lake Creek	1,203	2,212	2,671	2,351	1,035	1,603	1,392	2,432	4,105	1,575	1,358	2,110	1,907	2,986	2,067
Fish Lake Drainage (Yentna Drainage)										324	362	400	549	793	486
Alexander Creek	1,562	2,401	1,560	999	891	1,907	408	1,509	1,455	1,352	1,539	1,965	2,027	1,973	1,539
Talachulitna River	346	88	125	491	240	524	84	486	224	402	235	418	688	276	331
Chuitna River	316	277	287	258	594	220	554	898	1,095	815	1,684	782	1,228	1,113	723
Theodore River	113	101	50	370	10	115	10	137	261	168	996	400	502	198	245
Lewis River	103	0	0	0					75		145	0	112	33	52
Peter's Creek								12				18	47	33	28
Yentna River													103	353	228
Beluga River													419		419
Moose Creek										34			177		106
Rabideux Creek													409	540	475
Judd Lake	0	0	0	0			0	62		268	199	73	9		61
Begula Lake													9		9
Shell Lake	0	0	0	0		0	0								0
Whiskey Lake	0	0	0	0		0									0
Hewitt Lake	0	0	0	0		0									0
Total	4,202	6,877	5,666	6,759	3,402	6,832	3,484	7,182	9,852	9,194	9,307	13,624	17,133	13,257	8,341
Other Waters															
Other Streams	2,929	3,683	3,707	6,010	3,391	4,571	798	2,678	2,849	4,548	2,065	3,768	3,127	1,618	3,267
Other Lakes	0	0	0	0	0	0	40	312	0	45	0	0	19	220	45
Total	2,929	3,683	3,707	6,010	3,391	4,571	838	2,990	2,849	4,593	2,065	3,768	3,146	1,838	3,313
Area Total	7,131	10,560	9,373	12,769	6,793	11,403	4,322	10,172	12,701	13,787	11,372	17,392	20,279	15,095	11,654

Appendix A4. Number of chinook salmon harvested from West Cook Inlet-West Susitna River waters, 1977-1990.

FISHERY	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	Mean
Deshka River	1,017	850	2,811	3,685	2,769	4,307	4,889	5,699	6,407	6,490	5,632	5,474	8,062	6,161	4,590
Lake Creek	464	326	1,796	775	795	1,645	2,423	2,881	2,575	2,134	3,282	2,784	3,554	3,423	2,061
Fish Lake Drainage (Yentna Drainage)										647	834	729	1,202	740	830
Alexander Creek	820	769	712	1,438	1,121	2,506	1,711	2,107	2,761	2,937	2,224	4,687	4,882	5,119	2,414
Talachulitna River	224	12	293	121	57	0	336	424	224	201	116	909	403	709	288
Chuitna River	227	408	78	17	115	105	1,185	723	734	960	146	312	581	1,064	475
Theodore River	237	58	20	17	77	42	0	1,110	1,195	1,418	1,146	1,137	1,317	748	609
Lewis River	9	12	0	0					100		185	246	190	285	114
Peter's Creek								112				549	339	385	346
Yentna River													215	178	197
Beluga River													202		202
Moose Creek										44			81		63
Rabideux Creek													12	55	34
Judd Lake	0	0	0	0			0	0		0	0	0	6		1
Begula Lake													35		35
Shell Lake	0	0	0	0		0	0								0
Whiskey Lake	0	0	0	0		0									0
Hewitt Lake	0	0	0	0		0									0
Total	2,998	2,435	5,710	6,053	4,934	8,605	10,544	13,056	13,996	14,831	13,565	16,827	21,081	18,867	10,964
Other Waters															
Other Streams	413	82	156	129	0	115	209	709	1,677	904	1,252	829	575	631	549
Other Lakes	0	0	0	0	0	0	0	174	0	45	10	9	12	24	20
Total	413	82	156	129	0	115	209	883	1,677	949	1,262	838	587	655	568
Area Total	3,411	2,517	5,866	6,182	4,934	8,720	10,753	13,939	15,673	15,780	14,827	17,665	21,668	19,522	11,533

Appendix A5. Number of chinook salmon harvested from eastside Susitna River waters, 1977-1990.

FISHERY	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	Mean
Willow Creek	137	47	459	289	585	629	534	774	1,063	1,017	1,987	2,349	2,846	3,237	1,140
Caswell Creek			156	215	249	471	272	586	527	327	88	578	357	330	346
Montana Creek	415	408	312	559	661	241	504	1,522	979	2,796	1,726	1,070	1,708	478	956
Sunshine Creek			10	13	57	52	105	125	771	327	319	303	368	465	243
Talkeetna River & Tributaries (in. Clear Ck)	25	12	312	172	373	450	934	1,272	871	908	1,639	1,762	2,372	2,358	961
Sheep Creek	259	256	10	45	0	0	0	0	0	1,778	1,610	1,847	1,116	1,537	604
Little Willow Creek	16	0	0	32	0	0	0	37	25	872	711	937	507	387	252
Goose Creek								0		145	334	218	385	504	264
Birch Creek										290	44	28	28		98
Kashwitna Creek							231	0		73	116	0	11	6	62
Total	852	723	1,259	1,325	1,925	1,843	2,580	4,316	4,236	8,533	8,574	9,092	9,698	9,302	4,590
Other Waters							272	112	106	36	29	47	85	121	101
Other Streams							0	0	0	0	0	0	0	0	0
Lakes															158
Other Waters	204	163	39	45	277	220									
Total	204	163	39	45	277	220	272	112	106	36	29	47	85	121	125
Area Total	1,056	886	1,298	1,370	2,202	2,063	2,852	4,428	4,342	8,569	8,603	9,139	9,783	9,423	4,715

Appendix A6. Number of chinook salmon harvested from Knik Arm waters, 1977-1990.

FISHERY	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	Mean
Marine															
Fish Ck.							16	125			117	0	77	28	61
Other							47	24		50	58	0	44	23	35
Total							63	149	0	50	175	0	121	51	76
Little Sustina River	191	93	800	646	1,418	1,467	1,187	1,883	1,845	1,457	2,282	2,822	4,204	1,965	1,590
Knik Arm Tributaries															
Knik River & Tributaries (incl. Jim Ck.)					0	0	5	0	0	0	0	0	0	0	1
Wasilla Ck.	0	47	0	0	0	0	0	0	0	0	0	66	16	6	10
Cottonwood Ck.			0	0	0	0	0	0	0	0	0	0	0	0	0
Big Lake Drainage streams									44	0	19	0	0	0	11
Ekultna Power Plant Raceway								0	0	0	0	0	0	0	0
Total	0	47	0	0	0	0	5	0	44	0	19	66	16	6	15
Knik Basin Lakes															
Wasilla Lake			0	0	0	0	0	0	0	0	0	0	0	0	0
Finger Lake	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kepler Complex Lakes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Big Lake	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lucille Lake	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kalmback Lake													0		0
Knik Lake													0		0
Memory Lake								0					0		0
Seymour Lake										0			0		0
Lower & Upper Bonnie Lakes										0		0	0	0	0
Nancy Lake Complex Lakes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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FISHERY	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	Mean
Other Waters															
Other Streams							0	0	0	17	0	19	0	0	5
Other Lakes							0	25	0	0	0	9	0	0	4
Other Waters	16	0	0	0	48	199									44
Total	16	0	0	0	48	199	0	25	0	17	0	28	0	0	24
Area Total	207	140	800	646	1,466	1,666	1,255	2,057	1,889	1,524	2,476	2,916	4,341	2,022	1,672

Appendix A7. Number of pink salmon harvested from Knik Arm waters, 1977-1990.

FISHERY	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	Mean
Marine							361	312			0	36	60	81	142
Fish Ck.							209	0	0	39	18	36	69	0	46
Other															
Total							570	312	0	39	18	72	129	81	153
Little Sustina River	1,208	1,517	618	3,918	709	1,163	251	2,045	590	696	217	1,146	518	325	1,066
Knik Arm Tributaries					0	31	47	287	175	138	18	127	164	35	102
Knik River & Tributaries (incl. Jim Ck.)	217	279	136	310	96	147	10	62	0	66	199	0	69	23	115
Wasilla Ck.			0	0	0	0	0	0	0	0	0	0	17	0	1
Cottonwood Ck.									22	646	217	255	199	127	244
Big Lake Drainage streams								0	0	160	217	327	225	35	138
Ekultna Power Plant Raceway															
Total	217	279	136	310	96	178	57	349	197	1,010	651	709	674	220	363
Knik Basin Lakes			0	0	0	0	0	0	0	0	0	0	0	0	0
Wasilla Lake	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Finger Lake	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kepler Complex Lakes	0	0	0	0	0	0	89	0	0	0	0	0	0	0	6
Big Lake	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lucille Lake													0		0
Kalmback Lake													0		0
Knik Lake								0					0		0
Memory Lake										0			0		0
Seymour Lake										0		0	0	0	0
Lower & Upper Bonnie Lakes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nancy Lake Complex Lakes															
Total	0	0	0	0	0	0	89	0	0	0	0	0	0	0	6

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FISHERY	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	Mean
Other Waters															
Other Streams							42	37	0	55	0	0	0	24	20
Other Lakes							0	0	0	0	0	0	0	0	0
Other Waters	236	46	64	473	29	84									155
Total	236	46	64	473	29	84	42	37	0	55	0	0	0	24	78
Area Total	1,661	1,842	818	4,701	834	1,425	1,009	2,743	787	1,800	886	1,927	1,321	650	1,600

Appendix A8. Number of pink salmon harvested from eastside Susitna River waters, 1977-1990.

FISHERY	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	Mean
Willow Creek	7,140	18,901	3,445	23,638	2,797	4,789	1,647	3,155	697	1,561	815	1,510	1,045	1,554	5,192
Caswell Creek			100	1,663	335	1,092	126	337	10	254	36	55	41	142	349
Montana Creek	3,568	15,619	2,472	8,230	1,782	3,595	902	3,030	807	2,033	507	709	288	712	3,161
Sunshine Creek			700	2,408	958	1,132	241	611	468	944	54	73	436	273	692
Talkeetna River & Tributaries (in. Clear Ck)	1,314	2,074	645	622	19	220	73	636	120	399	272	182	379	130	506
Sheep Creek	4,291	6,981	2,418	6,362	1,236	2,599	682	948	10	3,049	344	891	288	486	2,185
Little Willow Creek	1,261	3,142	745	6,420	604	1,520	157	524	169	799	109	491	115	463	1,180
Goose Creek								50		145	18	164	107	154	106
Birch Creek										290	0	18	16		81
Kashwitna Creek							0	0		36	54	36	0	0	18
Total	17,574	46,717	10,525	49,343	7,731	14,947	3,828	9,291	2,281	9,510	2,209	4,129	2,715	3,914	13,194
Other Waters															
Other Streams							126	200	229	1,017	0	0	0	179	219
Lakes							0	0	0	0	0	0	0	0	0
Other Waters	2,089	3,994	664	3,403	412	398									1,827
Total	2,089	3,994	664	3,403	412	398	126	200	229	1,017	0	0	0	179	908
Area Total	19,663	50,711	11,189	52,746	8,143	15,345	3,954	9,491	2,510	10,527	2,209	4,129	2,715	4,093	14,102

Appendix A9. Number of pink salmon harvested from West Cook Inlet-West Susitna River waters, 1977-1990.

FISHERY	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	Mean
Deshka River	391	697	109	689	19	377	21	748	87	882	652	800	152	297	423
Lake Creek	4,927	2,833	882	2,101	412	398	430	636	137	670	670	491	177	262	1,073
Fish Lake Drainage (Yentna Drainage)										313	18	255	177	48	162
Alexander Creek	1,263	1,146	236	809	57	482	126	62	112	413	91	400	8	273	391
Talachulitna River	539	31	100	276	29	220	0	87	0	235	0	18	8	250	128
Chuitna River	245	155	55	69	38	147	21	0	62	235	0	0	34	12	77
Theodore River	363	449	9	232	57	63	0	62	75	45	72	55	0	12	107
Lewis River	62	46	0	0					0		0	0	8	0	13
Peter's Creek								0				0	0	0	0
Yentna River													0	0	0
Beluga River													68		68
Moose Creek										0			0		0
Rabideux Creek													0	0	0
Judd Lake	0	0	0	0			0	12		0	36	0	0		5
Begula Lake													0		0
Shell Lake	0	0	0	0		0	0								0
Whiskey Lake	0	0	0	0		0									0
Hewitt Lake	0	0	0	0		0									0
Total	7,790	5,357	1,391	4,176	612	1,687	598	1,607	473	2,793	1,539	2,019	632	1,154	2,273
Other Waters															
Other Streams	1,022	898	527	362	38	597	125	922	248	872	0	582	523	108	487
Other Lakes	0	0	0	0	0	0	0	0	0	0	0	36	0	0	3
Total	1,022	898	527	362	38	597	125	922	248	872	0	618	523	108	490
Area Total	8,812	6,255	1,918	4,538	650	2,284	723	2,529	721	3,665	1,539	2,637	1,155	1,262	2,763

Appendix A10. Number of sockeye salmon harvested from Knik Arm waters, 1977-1990.

FISHERY	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	Mean
Marine															
Fish Ck.							6,013	499			417	437	789	174	1,388
Other							1,748	237	76	50	435	36	364	87	379
Total							7,761	736	76	50	852	473	1,153	261	1,420
Little Sustina River	888	859	1,478	2,127	1,619	1,865	2,787	6,385	2,894	3,616	3,513	2,310	2,315	891	2,396
Knik Arm Tributaries															
Knik River & Tributaries (incl. Jim Ck.)					450	880	1,277	823	1,037	905	1,105	1,928	1,322	2,219	1,195
Wasilla Ck.	274	0	0	0	0	0	0	200	120	61	18	36	98	19	59
Cottonwood Ck.			1,525	2,660	3,245	608	1,632	661	1,179	789	869	346	683	271	1,206
Big Lake Drainage streams									109	39	1,087	2,037	2,900	2,238	1,402
Ekultna Power Plant Raceway								187	142	28	254	200	204	29	149
Total	274	0	1,525	2,660	3,695	1,488	2,909	1,871	2,587	1,822	3,333	4,547	5,207	4,776	2,621
Knik Basin Lakes															
Wasilla Lake			0	0	0	0	0	0	0	0	0	109	9	0	10
Finger Lake	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kepler Complex Lakes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Big Lake	37	0	157	43	134	126	89	175	22	0	0	0	0	0	56
Lucille Lake	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kalmback Lake													0		0
Knik Lake													0		0
Memory Lake								0					0		0
Seymour Lake										0			0		0
Lower & Upper Bonnie Lakes										0		0	0	0	0
Nancy Lake Complex Lakes	56	14	0	69	316	618	587	12	33	99	670	109	169	107	204
Total	93	14	157	112	450	744	676	187	55	99	670	218	178	107	269

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FISHERY	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	Mean
Other Streams							164	24	0	422	417	473	169	466	267
Other Lakes							0	37	0	0	0	55	18	87	25
Other Waters	321	366	456	775	316	524									460
Total	321	366	456	775	316	524	164	61	0	422	417	528	187	553	364
Area Total	1,576	1,239	3,616	5,674	6,080	4,621	14,297	9,240	5,612	6,009	8,785	8,076	9,040	6,588	6,461

Appendix A11. Number of sockeye salmon harvested from West Cook Inlet-West Susitna River waters, 1977-1990.

FISHERY	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	Mean
Deshka River	0	0	0	0	0	0	0	125	50	11	272	146	217	189	72
Lake Creek	658	254	440	267	211	252	726	374	137	547	435	291	121	358	362
Fish Lake Drainage (Yentna Drainage)										1,273	398	146	165	89	414
Alexander Creek	349	183	79	52	67	335	69	87	261	0	72	55	260	30	136
Talachulitna River	457	141	47	112	172	63	41	262	50	424	290	800	251	189	236
Chuitna River	6	0	0	0	48	10	356	62	274	22	272	437	43	139	119
Theodore River	0	0	0	0	0	0	0	0	25	67	0	18	52	50	15
Lewis River	0	0	0	0					0		0	0	0	0	0
Peter's Creek								0				0	0	0	0
Yentna River													139	20	80
Beluga River													9		9
Moose Creek										0			0		0
Rabideux Creek													9	0	5
Judd Lake	24	70	220	267			0	312		514	580	182	130		230
Begula Lake													260		260
Shell Lake	52	28	94	198		157	315								141
Whiskey Lake	99	28	252	0		283									132
Hewitt Lake	43	0	0	0		0									9
Total	1,688	704	1,132	896	498	1,100	1,507	1,222	797	2,858	2,319	2,075	1,656	1,064	1,394
Other Waters															
Other Streams	842	662	362	34	594	1,320	1,370	1,395	772	1,173	163	1,038	547	646	780
Other Lakes	262	268	63	181	364	471	1,028	860	1,032	134	217	509	468	854	479
Total	1,104	930	425	215	958	1,791	2,398	2,255	1,804	1,307	380	1,547	1,015	1,500	1,259
Area Total	2,792	1,634	1,557	1,111	1,456	2,891	3,905	3,477	2,601	4,165	2,699	3,622	2,671	2,564	2,653

Appendix A12. Number of sockeye salmon harvested from eastside Susitna River waters, 1977-1990.

FISHERY	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	Mean
Willow Creek	831	56	94	83	77	94	425	249	139	290	254	564	414	208	270
Caswell Creek			0	77	38	52	151	87	110	0	0	164	110	69	72
Montana Creek	978	85	346	257	182	514	534	561	279	363	163	364	296	149	362
Sunshine Creek			157	116	220	189	685	100	249	290	181	18	363	119	224
Talkeetna River & Tributaries (in. Clear Ck)	334	28	31	6	29	115	534	636	508	1,597	580	1,110	617	1,506	545
Sheep Creek	450	14	31	0	105	88	370	62	30	0	163	273	169	149	136
Little Willow Creek	305	28	141	77	67	105	110	337	80	0	72	55	51	149	113
Goose Creek								0		0	0	36	17	50	17
Birch Creek										182	72	255	76		146
Kashwitna Creek							0	0		109	54	18	59	99	48
Total	2,898	211	800	616	718	1,157	2,809	2,032	1,395	2,831	1,539	2,857	2,172	2,498	1,752
Other Waters															
Other Streams							343	636	70	1,198	507	0	25	179	370
Lakes							69	37	0	0	0	0	330	0	55
Other Waters	696	56	220	257	115	398									290
Total	696	56	220	257	115	398	412	673	70	1,198	507	0	355	179	367
Area Total	3,594	267	1,020	873	833	1,555	3,221	2,705	1,465	4,029	2,046	2,857	2,527	2,677	2,119

Appendix A13. Number of chum salmon harvested from eastside Susitna River waters, 1977-1990.

FISHERY	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	Mean
Willow Creek	343	2,458	582	989	1,533	2,086	1,490	2,095	926	508	851	1,419	1,454	336	1,219
Caswell Creek			9	19	0	0	0	112	0	218	0	18	44	35	38
Montana Creek	326	4,429	745	571	805	1,708	1,311	1,447	508	871	217	928	379	69	1,022
Sunshine Creek			55	225	125	231	42	37	50	545	0	36	176	12	128
Talkeetna River & Tributaries (in. Clear Ck)	146	1,912	355	385	57	31	650	337	329	799	1,032	1,255	626	197	579
Sheep Creek	202	1,697	682	648	987	1,750	902	586	159	1,307	616	1,892	890	382	907
Little Willow Creek	175	1,015	118	270	192	199	147	224	10	109	217	546	115	197	252
Goose Creek								125		36	91	255	273	278	176
Birch Creek										254	18	146	26		111
Kashwitna Creek							0	0		36	0	18	62	0	17
Total	1,192	11,511	2,546	3,107	3,699	6,005	4,542	4,963	1,982	4,683	3,042	6,513	4,045	1,506	4,238
Other Waters															
Other Streams							440	111	160	73	0	91	106	59	130
Lakes							0	137	0	0	0	0	0	0	17
Other Waters	190	2,692	1,245	1,445	450	639									1,110
Total	190	2,692	1,245	1,445	450	639	440	248	160	73	0	91	106	59	560
Area Total	1,382	14,203	3,791	4,552	4,149	6,644	4,982	5,211	2,142	4,756	3,042	6,604	4,151	1,565	4,798

Appendix A14. Number of chum salmon harvested from West Cook Inlet-West Susitna River waters, 1977-1990.

FISHERY	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	Mean
Deshka River	0	0	0	0	0	0	0	87	25	34	54	164	0	12	27
Lake Creek	162	1,015	136	69	48	199	52	249	124	212	36	346	163	70	206
Fish Lake Drainage (Yentna Drainage)										0	0	0	0	0	0
Alexander Creek	30	215	45	121	10	0	0	37	12	22	127	18	45	12	50
Talachulitna River	37	234	55	17	0	0	0	75	0	45	0	91	72	12	46
Chuitna River	7	0	0	0	0	0	10	0	50	179	0	109	0	0	25
Theodore River	0	0	0	0	0	0	0	0	0	34	0	0	0	12	3
Lewis River	0	0	0	0					0		0	0	0	0	0
Peter's Creek								0				0	9	0	2
Yentna River													18	0	9
Beluga River													54		54
Moose Creek										0			0		0
Rabideux Creek													0	0	0
Judd Lake	0	0	0	0			0	0		0	0	0	0		0
Begula Lake													0		0
Shell Lake	0	0	0	0		0	0								0
Whiskey Lake	0	0	0	0		0									0
Hewitt Lake	0	0	0	0		0									0
Total	236	1,464	236	207	58	199	62	448	211	526	217	728	361	118	362
Other Waters															
Other Streams	194	1,171	918	284	259	250	346	424	186	302	471	855	81	128	419
Other Lakes	0	0	0	0	0	0	0	0	0	0	0	0	27	0	2
Total	194	1,171	918	284	259	250	346	424	186	302	471	855	108	128	421
Area Total	430	2,635	1,154	491	317	449	408	872	397	828	688	1,583	469	246	783

Appendix A15. Number of chum salmon harvested from Knik Arm waters, 1977-1990.

FISHERY	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	Mean
Marine															
Fish Ck.							84	62			0	18	93	11	45
Other							26	0	66	72	0	55	92	11	40
Total							110	62	66	72	0	73	185	22	74
Little Sustina River	131	956	364	465	278	943	450	1,708	382	822	534	673	712	170	613
Knik Arm Tributaries															
Knik River & Tributaries (incl. Jim Ck.)					0	168	10	125	11	1,021	233	291	435	45	234
Wasilla Ck.	17	59	45	9	57	0	0	0	0	0	146	0	0	11	25
Cottonwood Ck.			0	0	0	0	0	0	0	0	10	0	0	0	1
Big Lake Drainage streams									0	66	10	564	19	34	116
Ekultna Power Plant Raceway								25	55	1,750	1,641	3,438	3,043	464	1,488
Total	17	59	45	9	57	168	10	150	66	2,837	2,040	4,293	3,497	554	986
Knik Basin Lakes															
Wasilla Lake			0	0	0	0	0	0	0	0	0	0	0	0	0
Finger Lake	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kepler Complex Lakes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Big Lake	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lucille Lake	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kalmback Lake													0		0
Knik Lake													0		0
Memory Lake								0					0		0
Seymour Lake										0			0		0
Lower & Upper Bonnie Lakes										0		0	0	0	0
Nancy Lake Complex Lakes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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FISHERY	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	Mean
Other Waters															
Other Streams							73	37	0	39	0	127	83	0	45
Other Lakes							0	75	0	0	0	55	0	0	16
Other Waters	102	117	245	60	96	63									114
Total	102	117	245	60	96	63	73	112	0	39	0	182	83	0	84
Area Total	250	1,132	654	534	431	1,174	643	2,032	514	3,770	2,574	5,221	4,477	746	1,725

Appendix A16. Number of rainbow trout harvested from Knik Arm waters, 1977-1990.

FISHERY	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	Mean
Marine															
Fish Ck.															
Other															
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Little Sustina River	843	886	1,391	852	2,692	1,551	1,290	860	1,294	1,407	447	1,273	599	673	1,147
Knik Arm Tributaries															
Knik River & Tributaries (incl. Jim Ck.)					0	0	0	549	780	235	58	382	0	0	200
Wasilla Ck.	252	45	500	121	38	63	84	312	260	11	126	582	91	131	187
Cottonwood Ck.			1,736	1,085	824	786	556	748	590	145	301	782	163	410	677
Big Lake Drainage streams									347	391	204	309	1,063	361	446
Ekultna Power Plant Raceway								25	0	0	0	0	0	0	4
Total	252	45	2,236	1,206	862	849	640	1,634	1,977	782	689	2,055	1,317	902	1,103
Knik Basin Lakes															
Wasilla Lake			2,782	2,084	2,261	2,243	1,804	848	1,231	1,653	680	891	972	443	1,491
Finger Lake	0	0	0	0	0	0	0	0	3,381	3,172	2,476	5,421	2,788	2,544	1,413
Kepler Complex Lakes	1,822	5,180	3,372	5,906	8,200	7,325	3,986	9,128	14,011	7,249	7,758	16,462	18,233	10,223	8,490
Big Lake	3,906	4,845	2,882	5,398	9,810	9,369	4,102	4,938	6,953	5,105	2,476	4,220	5,402	3,282	5,192
Lucille Lake	0	0	0	0	0	0	0	0	35	168	3,379	8,495	972	246	950
Kalmback Lake													1,625		
Knik Lake													872		
Memory Lake								382					590		
Seymour Lake										726			445		
Lower & Upper Bonnie Lakes										736		910	945	738	832
Nancy Lake Complex Lakes	2,642	1,853	2,909	2,540	4,723	2,840	4,846	1,771	2,514	2,200	2,728	5,439	3,696	2,182	3,063
Total	8,370	11,878	11,945	15,928	24,994	21,777	14,738	17,067	28,125	21,009	19,497	41,838	36,540	19,658	20,955

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FISHERY	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	Mean
Other Waters															
Other Streams							1,490	1,222	1,197	815	427	964	117	1,131	920
Other Lakes							8,263	5,635	13,838	3,677	3,603	12,479	5,945	8,335	7,722
Other Waters	9,150	10,330	9,271	11,382	13,201	6,372									9,951
Total	9,150	10,330	9,271	11,382	13,201	6,372	9,753	6,857	15,035	4,492	4,030	13,443	6,062	9,466	9,203
Area Total	18,615	23,139	24,843	29,368	41,749	30,549	26,421	26,418	46,431	27,690	24,663	58,609	44,518	30,699	32,408

Appendix A17. Number of rainbow trout harvested from eastside Susitna River waters, 1977-1990.

FISHERY	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	Mean
Willow Creek	1,055	913	1,500	1,168	1,475	891	1,689	1,359	2,046	545	1,141	1,128	906	1,008	1,202
Caswell Creek			282	154	326	189	231	175	139	0	308	73	37	101	168
Montana Creek	727	1,193	1,536	854	1,111	2,243	1,332	1,197	1,248	399	417	1,492	407	487	1,046
Sunshine Creek			382	193	249	545	178	374	416	581	72	55	259	168	289
Talkeetna River & Tributaries (in. Clear Ck)	450	1,501	1,373	950	1,226	608	1,836	910	832	1,234	869	1,110	822	1,109	1,059
Sheep Creek	368	470	573	385	201	325	409	349	191	218	507	236	240	286	340
Little Willow Creek	224	334	345	353	374	335	514	1,047	746	218	1,213	400	277	286	476
Goose Creek								125		145	272	291	240	353	238
Birch Creek										73	36	73	37		55
Kashwitna Creek							357	449		436	471	255	675	352	428
Total	2,824	4,411	5,991	4,057	4,962	5,136	6,546	5,985	5,618	3,849	5,306	5,113	3,900	4,150	4,846
Other Waters															
Other Streams							1,656	598	1,266	1,126	471	636	443	320	815
Lakes							1,437	1,073	988	3,086	870	1,873	629	538	1,312
Other Waters	2,401	1,519	3,472	2,658	3,851	2,400									2,717
Total	2,401	1,519	3,472	2,658	3,851	2,400	3,093	1,671	2,254	4,212	1,341	2,509	1,072	858	2,379
Area Total	5,225	5,930	9,463	6,715	8,813	7,536	9,639	7,656	7,872	8,061	6,647	7,622	4,972	5,008	7,226

Appendix A18. Number of rainbow trout harvested from West Cook Inlet-West Susitna River waters, 1977-1990

FISHERY	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	Mean
Deshka River	1,556	3,634	3,182	4,305	3,631	3,804	2,434	2,120	3,104	2,513	3,006	4,075	1,676	707	2,839
Lake Creek	1,853	2,721	4,527	2,144	2,874	3,134	2,287	3,080	1,439	961	1,902	1,146	676	808	2,111
Fish Lake Drainage (Yentna Drainage)										45	398	109	428	135	223
Alexander Creek	1,251	2,640	1,182	1,945	2,290	2,505	608	785	1,318	1,553	978	1,419	486	640	1,400
Talachulitna River	0	0	0	379	0	0	0	0	0	0	0	0	0	0	27
Chuitna River	509	443	336	301	642	199	441	424	590	67	344	218	162	286	354
Theodore River	415	226	609	250	1,092	199	430	274	225	145	199	382	305	135	349
Lewis River	34	54	118	9					87		36	18	19	17	44
Peter's Creek								611				73	162	303	287
Yentna River													38	0	19
Beluga River													48		48
Moose Creek										525			0		263
Rabideux Creek													0	17	9
Judd Lake	68	0	100	86			0	0		0	0	18	105		38
Begula Lake													0		0
Shell Lake	124	27	91	103		335	378								176
Whiskey Lake	45	0	0	0		84									26
Hewitt Lake	128	127	191	9		147									120
Total	5,983	9,872	10,336	9,531	10,529	10,407	6,578	7,294	6,763	5,809	6,863	7,458	4,105	3,048	7,470
Other Waters															
Other Streams	1,677	1,528	2,709	1,722	872	597	2,917	1,084	1,387	614	1,357	672	576	810	1,323
Other Lakes	770	1,618	573	2,092	1,629	859	629	399	866	457	379	546	781	557	868
Total	2,447	3,146	3,282	3,814	2,501	1,456	3,546	1,483	2,253	1,071	1,736	1,218	1,357	1,367	2,191
Area Total	8,430	13,018	13,618	13,345	13,030	11,863	10,124	8,777	9,016	6,880	8,599	8,676	5,462	4,415	9,661

Appendix A19. Number of Arctic grayling harvested from eastside Susitna River waters, 1977-1990.

FISHERY	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	Mean
Willow Creek	1,483	208	1,654	1,868	1,188	1,520	1,794	2,157	1,630	218	743	1,692	721	1,378	1,304
Caswell Creek			345	353	144	252	315	162	104	0	72	109	148	17	168
Montana Creek	379	958	791	655	891	849	336	786	503	472	254	418	92	17	529
Sunshine Creek			0	0	57	42	31	287	0	363	18	36	9	0	70
Talkeetna River & Tributaries (in. Clear Ck)	486	859	1,045	1,348	996	943	1,553	1,784	1,665	3,049	2,481	1,000	1,063	605	1,348
Sheep Creek	317	461	645	725	872	723	839	761	815	218	924	400	286	118	579
Little Willow Creek	934	334	1,091	1,156	623	377	84	1,259	1,231	581	761	455	286	50	659
Goose Creek								125		73	163	127	74	34	99
Birch Creek										0	0	0	0		0
Kashwitna Creek							514	1,397		436	851	418	517	202	619
Total	3,599	2,820	5,571	6,105	4,771	4,706	5,466	8,718	5,948	5,410	6,267	4,655	3,196	2,421	4,975
Other Waters															
Other Streams							1,625	2,042	1,527	4,355	868	1,092	831	304	1,581
Lakes							387	462	347	581	433	273	535	185	400
Other Waters	3,870	3,770	4,918	4,854	7,089	5,041									4,924
Total	3,870	3,770	4,918	4,854	7,089	5,041	2,012	2,504	1,874	4,936	1,301	1,365	1,366	489	3,242
Area Total	7,469	6,590	10,489	10,959	11,860	9,747	7,478	11,222	7,822	10,346	7,568	6,020	4,562	2,910	8,217

Appendix A20. Number of Arctic grayling harvested from West Cook Inlet-West Susitna River waters, 1977-1990.

FISHERY	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	Mean
Deshka River	631	579	1,463	1,817	1,255	1,457	1,280	1,110	1,335	938	942	1,164	457	152	1,041
Lake Creek	1,599	2,115	1,963	1,972	1,600	1,955	2,224	2,257	1,266	983	1,322	637	314	825	1,502
Fish Lake Drainage (Yentna Drainage)										112	91	0	38	0	48
Alexander Creek	280	1,871	745	1,145	1,130	1,582	483	362	988	1,273	1,050	891	267	118	870
Talachulitna River	832	99	664	1,713	479	587	3,178	898	434	290	272	1,128	466	337	813
Chuitna River	0	0	0	0	0	0	0	0	0	89	36	0	57	17	14
Theodore River	0	0	0	0	0	0	10	37	0	0	0	0	86	17	11
Lewis River	0	0	0	0					0		0	0	0	0	0
Peter's Creek								150				164	114	303	183
Yentna River													76	0	38
Beluga River													0		0
Moose Creek										771			67		419
Rabideux Creek													0	0	0
Judd Lake	45	0	45	232			21	75		0	36	0	19		47
Begula Lake													0		0
Shell Lake	0	0	0	0		0	0								0
Whiskey Lake	0	0	0	0		0									0
Hewitt Lake	0	0	0	0		0									
Total	3,387	4,664	4,880	6,879	4,464	5,581	7,196	4,889	4,023	4,456	3,749	3,984	1,961	1,769	4,420
Other Waters															
Other Streams	619	1,953	3,691	1,808	546	734	1,782	2,395	1,664	1,040	1,141	291	76	389	1,295
Other Lakes	408	108	518	560	240	210	346	162	208	34	54	0	210	34	221
Total	1,027	2,061	4,209	2,368	786	944	2,128	2,557	1,872	1,074	1,195	291	286	423	1,516
Area Total	4,414	6,725	9,089	9,247	5,250	6,525	9,324	7,446	5,895	5,530	4,944	4,275	2,247	2,192	5,936

Appendix A21. Number of Arctic grayling harvested from Knik Arm waters, 1977-1990.

FISHERY	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	Mean
Marine															
Fish Ck.															
Other															
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Little Sustina River	190	54	36	181	153	388	199	100	191	223	217	0	73	115	151
Knik Arm Tributaries															
Knik River & Tributaries (incl. Jim Ck.)					0	0	0	0	0	0	0	0	0	0	0
Wasilla Ck.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cottonwood Ck.			0	0	0	0	0	0	0	0	0	0	0	0	0
Big Lake Drainage streams									0	0	0	0	0	0	0
Ekultna Power Plant Raceway								0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Knik Basin Lakes															
Wasilla Lake			0	0	0	0	0	0	0	0	0	0	0	0	0
Finger Lake	0	0	0	0	0	0	0	0	0	0	54	0	0	82	10
Kepler Complex Lakes	72	985	2,372	1,016	671	1,027	514	486	277	860	942	5,366	3,351	837	1,341
Big Lake	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lucille Lake	0	0	0	0	0	0	0	0	0	0	18	0	54	0	5
Kalmback Lake													0		0
Knik Lake													245		245
Memory Lake								0					0		0
Seymour Lake										0			0		0
Lower & Upper Bonnie Lakes										1,396		473	436	263	642
Nancy Lake Complex Lakes	0	0	0	0	0	0	0	12	0	67	307	273	90	131	63
Total	72	985	2,372	1,016	671	1,027	514	498	277	2,323	1,321	6,112	4,176	1,313	1,620

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FISHERY	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	Mean
Other Waters															
Other Streams							398	125	260	89	0	273	182	705	254
Other Lakes							3,314	1,757	4,040	1,598	2,355	1,982	998	935	2,122
Other Waters	3,654	1,374	5,963	8,317	6,572	1,509									4,565
Total	3,654	1,374	5,963	8,317	6,572	1,509	3,712	1,882	4,300	1,687	2,355	2,255	1,180	1,640	3,314
Area Total	3,916	2,413	8,371	9,514	7,396	2,924	4,425	2,480	4,768	4,233	3,893	8,367	5,429	3,068	5,086

Appendix A22. Number of Dolly Varden/Arctic char harvested from Knik Arm waters, 1977-1990.

FISHERY	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	Mean
Marine															
Fish Ck.							21	50			0	255	0	16	57
Other							0	62	17	0	126	146	63	131	68
Total							21	112	17	0	126	401	63	147	111
Little Sustina River	645	570	1,191	1,748	2,529	1,331	1,227	1,272	1,791	838	380	564	763	821	1,119
Knik Arm Tributaries															
Knik River & Tributaries (incl. Jim Ck.)					1,130	1,279	1,310	1,509	2,011	3,094	127	2,237	1,507	1,822	1,603
Wasilla Ck.	328	325	364	189	690	1,289	1,290	25	0	246	869	0	18	0	402
Cottonwood Ck.			191	439	67	10	157	0	0	45	0	36	191	164	108
Big Lake Drainage streams									104	168	36	36	517	16	146
Ekultna Power Plant Raceway								50	104	56	869	309	118	98	229
Total	328	325	555	628	1,887	2,578	2,757	1,584	2,219	3,609	1,901	2,618	2,351	2,100	1,817
Knik Basin Lakes															
Wasilla Lake			264	181	38	63	167	50	225	11	36	273	0	0	109
Finger Lake	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kepler Complex Lakes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Big Lake	4,953	5,433	4,227	7,585	7,741	8,793	6,126	3,866	8,096	7,406	8,638	5,930	4,467	4,907	6,298
Lucille Lake	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kalmback Lake													0		0
Knik Lake													18		18
Memory Lake								0					0		0
Seymour Lake										0			0		0
Lower & Upper Bonnie Lakes										0		0	0	0	0
Nancy Lake Complex Lakes	277	18	118	327	345	272	1,154	150	17	168	163	1,055	155	66	306
Total	5,230	5,451	4,609	8,093	8,124	9,128	7,447	4,066	8,338	7,585	8,837	7,258	4,640	4,973	6,699

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FISHERY	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	Mean
Other Waters															
Other Streams							1,531	1,696	711	625	145	146	181	147	648
Other Lakes							408	373	260	391	36	327	163	558	315
Other Waters	1,338	1,636	2,227	2,015	1,935	503									1,609
Total	1,338	1,636	2,227	2,015	1,935	503	1,939	2,069	971	1,016	181	473	344	705	1,239
Area Total	7,541	7,982	8,582	12,484	14,475	13,540	13,391	9,103	13,336	13,048	11,425	11,314	8,161	8,746	10,938

Appendix A23. Number of Dolly Varden/Arctic char harvested from West Cook Inlet-West Susitna River waters, 1977-1990.

FISHERY	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	Mean
Deshka River	0	0	0	0	10	0	0	25	139	78	72	273	86	84	55
Lake Creek	122	154	164	121	67	482	262	125	87	0	36	91	124	101	138
Fish Lake Drainage (Yentna Drainage)										78	36	0	38	0	30
Alexander Creek	53	136	182	353	287	42	136	75	0	34	0	236	171	0	122
Talachulitna River	252	235	155	982	10	31	105	50	87	101	0	382	10	84	177
Chuitna River	671	461	664	146	843	304	209	511	260	235	18	164	10	34	324
Theodore River	181	353	173	129	115	0	21	12	538	302	199	0	0	17	146
Lewis River	0	27	9	0					0		109	0	19	0	18
Peter's Creek								12				0	0	269	70
Yentna River													0	0	0
Beluga River													0		0
Moose Creek										56			0		28
Rabideux Creek													0	0	0
Judd Lake	195	371	573	723			252	262		514	254	0	19		316
Begula Lake													0		0
Shell Lake	0	0	0	0		0	0								0
Whiskey Lake	0	0	0	0		0									0
Hewitt Lake	0	0	0	0		0									0
Total	1,474	1,737	1,920	2,454	1,332	859	985	1,072	1,111	1,398	724	1,146	477	589	1,234
Other Waters															
Other Streams	1,279	1,220	2,872	603	1,130	471	669	212	642	1,609	163	401	257	372	850
Other Lakes	345	551	645	43	499	818	1,049	37	312	0	127	18	780	270	392
Total	1,624	1,771	3,517	646	1,629	1,289	1,718	249	954	1,609	290	419	1,037	642	1,242
Area Total	3,098	3,508	5,437	3,100	2,961	2,148	2,703	1,321	2,065	3,007	1,014	1,565	1,514	1,231	2,477

Appendix A24. Number of Dolly Varden/Arctic char harvested from eastside Susitna River waters, 1977-1990.

FISHERY	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	Mean
Willow Creek	863	280	618	636	249	262	336	424	538	73	308	728	370	538	445
Caswell Creek			91	83	38	73	157	25	35	0	109	73	0	17	58
Montana Creek	300	633	527	167	240	356	325	661	17	327	235	291	185	84	311
Sunshine Creek			264	39	10	42	84	125	0	508	0	0	0	0	89
Talkeetna River & Tributaries (in. Clear Ck)	379	1,817	827	751	1,418	1,069	1,962	2,020	1,352	2,396	2,680	2,146	1,719	2,369	1,636
Sheep Creek	94	108	127	83	57	409	52	125	104	182	72	182	120	50	126
Little Willow Creek	139	63	336	122	48	189	73	100	520	0	54	200	28	67	139
Goose Creek								0		0	36	0	18	34	15
Birch Creek										0	18	0	0		5
Kashwitna Creek							304	212		327	380	218	268	386	299
Total	1,775	2,901	2,790	1,881	2,060	2,400	3,293	3,692	2,566	3,813	3,892	3,838	2,708	3,545	2,940
Other Waters															
Other Streams							786	187	572	182	18	910	64	68	348
Lakes							126	125	0	218	36	0	268	0	97
Other Waters	951	2,739	909	790	814	1,666									1,312
Total	951	2,739	909	790	814	1,666	912	312	572	400	54	910	332	68	816
Area Total	2,726	5,640	3,699	2,671	2,874	4,066	4,205	4,004	3,138	4,213	3,946	4,748	3,040	3,613	3,756

Appendix A25. Numbers of landlocked salmon harvested from Knik Arm waters, 1977-1990.

FISHERY	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	Mean
Marine															
Fish Ck.															
Other															
Total							0	0	0	0	0	0	0	0	0
Little Sustina River	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Knik Arm Tributaries															
Knik River & Tributaries (incl. Jim Ck.)					0	0	0	0	0	0	0	0	0	0	0
Wasilla Ck.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cottonwood Ck.			0	0	0	0	0	0	0	0	0	0	0	0	0
Big Lake Drainage streams									0	0	0	0	0	0	0
Ekultna Power Plant Raceway								0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Knik Basin Lakes															
Wasilla Lake			1,054	43	182	42	31	100	69	168	0	0	0	0	141
Finger Lake	14,739	8,588	5,209	10,685	9,321	4,506	12,714	7,282	5,618	6,244	8,439	11,896	3,805	10,453	8,536
Kepler Complex Lakes	528	298	64	2,807	2,577	681	2,224	773	4,803	2,580	3,550	2,183	1,462	2,314	1,917
Big Lake	721	226	145	189	651	324	462	1,384	659	0	0	0	0	0	340
Lucille Lake	8,952	4,963	4,272	3,633	7,549	3,312	2,245	2,681	1,491	246	1,521	618	663	279	3,030
Kalmback Lake													0		0
Knik Lake													163		163
Memory Lake								1,663					1,734		1,699
Seymour Lake										0			0		0
Lower & Upper Bonnie Lakes										0		0	0	0	0
Nancy Lake Complex Lakes	76	262	227	146	354	126	231	50	0	34	199	18	1,108	295	223
Total	25,016	14,337	10,971	17,503	20,634	8,991	17,907	13,933	12,640	9,272	13,709	14,715	8,935	13,341	14,422

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FISHERY	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	Mean
Other Waters															
Other Streams							0	0	0	0	0	0	0	0	0
Other Lakes & Waters	1,901	4,547	882	1,997	3,621	1,854	4,898	835	1,821	5,027	1,178	1,873	2,106	2,609	2,543
Total	1,901	4,547	882	1,997	3,621	1,854	4,898	835	1,821	5,027	1,178	1,873	2,106	2,609	2,511
Area Total	26,917	18,884	11,853	19,500	24,255	10,845	22,805	14,768	14,461	14,299	14,887	16,588	11,041	15,950	16,932

Appendix A26. Number of landlocked salmon harvested from eastside Susitna River waters, 1977-1990.

FISHERY	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	Mean
Willow Creek	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Caswell Creek			0	0	0	0	0	0	0	0	0	0	0	0	0
Montana Creek	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sunshine Creek			0	0	0	0	0	0	0	0	0	0	0	0	0
Talkeetna River & Tributaries (in. Clear Ck)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sheep Creek	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Little Willow Creek	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Goose Creek								0		0	0	0	0	0	0
Birch Creek										0	0	0	0	0	0
Kashwitna Creek							0	0		0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Waters															
Other Streams							0	0	0	0	0	0	0	0	0
Other Lakes & Waters	512	2,368	291	1,663	278	996	1,049	660	884	2,106	145	619	536	151	876
Total	512	2,368	291	1,663	278	996	1,049	660	884	2,106	145	619	536	151	876
Area Total	512	2,368	291	1,663	278	996	1,049	660	884	2,106	145	619	536	151	876

Appendix A27. Number of lake trout harvested from Knik Arm waters, 1977-1990.

FISHERY	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	Mean
Marine															
Fish Ck.															
Other															
Total							0	0	0	0	0	0	0	0	0
Little Sustina River	0	0	0	0	0	0	31	0	0	0	91	91	0	0	15
Knik Arm Tributaries															
Knik River & Tributaries (incl. Jim Ck.)					0	0	0	0	0	0	0	0	0	0	0
Wasilla Ck.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cottonwood Ck.			0	0	0	0	0	0	0	0	0	0	0	0	0
Big Lake Drainage streams									0	34	0	0	0	0	6
Ekultna Power Plant Raceway								0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	34	0	0	0	0	2
Knik Basin Lakes															
Wasilla Lake			0	0	0	0	0	0	0	0	0	0	0	0	0
Finger Lake	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kepler Complex Lakes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Big Lake	665	0	455	594	623	440	441	798	156	0	0	0	0	0	298
Lucille Lake	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kalmback Lake													0		0
Knik Lake													0		0
Memory Lake								0					0		0
Seymour Lake										0			0		0
Lower & Upper Bonnie Lakes										0		0	0	0	0
Nancy Lake Complex Lakes	336	127	145	749	354	356	304	549	104	201	562	691	472	558	393
Total	1,001	127	600	1,343	977	796	745	1,347	260	201	562	691	472	558	691

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FISHERY	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	Mean
Other Waters															
Other Streams							0	0	17	0	0	0	0	0	2
Other Lakes & Waters	1,259	380	654	775	814	262	503	572	0	78	253	1,129	363	509	426
Total	1,259	380	654	775	814	262	503	572	17	78	253	1,129	363	509	541
Area Total	2,260	507	1,254	2,118	1,791	1,058	1,279	1,919	277	313	906	1,911	835	1,067	1,250

Appendix A28. Number of lake trout harvested from eastside Susitna River waters, 1977-1990.

FISHERY	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	Mean
Willow Creek	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Caswell Creek			0	0	0	0	0	0	0	0	0	0	0	0	0
Montana Creek	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sunshine Creek			0	0	0	0	0	0	0	0	0	0	0	0	0
Talkeetna River & Tributaries (in. Clear Ck)	0	0	0	0	0	0	0	25	0	0	0	0	0	0	2
Sheep Creek	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Little Willow Creek	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Goose Creek								0		0	0	0	0	0	0
Birch Creek										0	0	0	0		0
Kashwitna Creek							0	0		0	0	0	0	0	0
Total	0	0	0	0	0	0	0	25	0	0	0	0	0	0	2
Other Waters							63	0	0	218	0	0	83	17	48
Other Streams															
Other Lakes & Waters	693	877	472	267	287	335	1,341	337	17	1,598	343	291	1,127	370	597
Total	693	877	472	267	287	335	1,404	337	17	1,816	343	291	1,210	387	624
Area Total	693	877	472	267	287	335	1,404	362	17	1,816	343	291	1,210	387	626

Appendix A29. Number of lake trout harvested from West Cook Inlet-West Susitna River waters, 1977-1990.

FISHERY	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	Mean
Deshka River	0	0	0	0	0	0	0	0	0	0	36	0	0	17	4
Lake Creek	116	36	9	0	19	0	0	0	121	0	0	36	0	84	30
Fish Lake Drainage (Yentna Drainage)										0	18	0	0	0	4
Alexander Creek	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Talachulitna River	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chuitna River	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Theodore River	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lewis River	0	0	0	0					0		0	0	0	0	0
Peter's Creek								0				0	0	0	0
Yentna River													38	0	19
Beluga River													0		0
Moose Creek										56			0		28
Rabideux Creek													0	0	0
Judd Lake	8	0	0	0			0	0		0	0	18	0		3
Begula Lake													0		0
Shell Lake	23	45	18	69		52	409								103
Whiskey Lake	0	0	0	0		0									0
Hewitt Lake	0	0	0	0		0									0
Total	147	81	27	69	19	52	409	0	121	56	54	54	38	101	88
Other Waters															
Other Streams	23	0	36	181	0	0	10	125	0	0	109	0	0	0	35
Other Lakes	108	515	0	198	278	115	430	437	207	101	634	273	314	101	265
Total	131	515	36	379	278	115	440	562	207	101	743	273	314	101	300
Area Total	278	596	63	448	297	167	849	562	328	157	797	327	352	202	387

Appendix A30. Number of smelt harvested from West Cook Inlet-West Susitna River waters (grouped with other fish prior to 1985), 1977-1990.

FISHERY	1985	1986	1987	1988	1989	1990	Mean
Deshka River	0	7,300	0	0	0	842	1,357
Lake Creek	0	0	0	1,083	785	674	424
Fish Lake Drainage (Yentna Drainage)		0	0	0	0	0	0
Alexander Creek	0	0	0	1,547	0	707	376
Talachulitna River	0	0	0	0	0	0	0
Chuitna River	0	0	0	0	0	0	0
Theodore River	0	0	0	0	0	0	0
Lewis River	0		0	0	0	0	0
Peter's Creek				0	0	0	0
Yentna River					0	3,368	1,684
Beluga River					0		0
Moose Creek		0			0		0
Rabideux Creek					0	0	0
Judd Lake		0	0	0	0		0
Begula Lake					0		0
Shell Lake							0
Whiskey Lake							0
Hewitt Lake							0
Total	0	7,300	0	2,630	785	5,591	2,718
Other Waters							
Other Streams	1,680	0	9,265	6,219	1,539	0	3,117
Other Lakes	0	0	0	0	0	0	0
Total	1,680	0	9,265	6,219	1,539	0	3,117
Area Total	1,680	7,300	9,265	8,849	2,324	5,591	5,835

Appendix A31. Number of smelt harvested from Knik Arm waters (grouped with other fish prior to 1985), 1985-1990.

FISHERY	1985	1986	1987	1988	1989	1990	Mean
Marine							
Fish Ck.	0	0	0	0	0	0	0
Other	560	3,351	0	0	0	0	652
Total	560	3,351	0	0	0	0	652
Freshwater	0	0	0	0	0	0	0
Area Total	560	3,351	0	0	0	0	652

Appendix A32. Number of whitefish harvested from Knik Arm waters (grouped with other fish prior to 1985), 1985-1990.

FISHERY	1985	1986	1987	1988	1989	1990	Mean
Marine							
Fish Ck.							
Other							
Total	0	0	0	0	0	0	0
Little Sustina River	587	134	199	673	599	443	439
Knik Arm Tributaries							
Knik River & Tributaries (incl. Jim Ck.)	0	424	18	327	118	98	164
Wasilla Ck.	0	0	0	0	0	0	0
Cottonwood Ck.	0	0	0	0	0	0	0
Big Lake Drainage streams	0	0	0	18	100	0	20
Ekultna Power Plant Raceway	0	0	0	18	9	0	5
Total	0	424	18	363	227	98	188
Knik Basin Lakes							
Wasilla Lake	0	11	36	0	0	0	8
Finger Lake	0	0	0	0	0	0	0
Kepler Complex Lakes	0	0	0	0	0	0	0
Big Lake	0	0	0	18	9	16	7
Lucille Lake	0	0	0	0	0	0	0
Kalmback Lake					0		0
Knik Lake					0		0
Memory Lake					0		0
Seymour Lake		0			0		0
Lower & Upper Bonnie Lakes		0		0	0	0	0
Nancy Lake Complex Lakes	0	11	127	91	9	65	51
Total	0	22	163	109	18	81	66

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FISHERY	1985	1986	1987	1988	1989	1990	Mean
Other Waters							
Other Streams	0	0	0	18	0	0	3
Other Lakes	0	0	0	0	0	0	0
Total	0	0	0	18	0	0	3
Area Total	587	580	380	1,163	844	622	696

Appendix A33. Number of whitefish harvested from eastside Susitna River waters (grouped with other fish prior to 1984), 1984-1990.

FISHERY	1984	1985	1986	1987	1988	1989	1990	Mean
Willow Creek	349	245	73	72	218	111	403	210
Caswell Creek	12	0	0	109	18	0	34	25
Montana Creek	175	0	0	72	91	18	0	51
Sunshine Creek	175	560	581	109	0	0	50	211
Talkeetna River & Tributaries (Clear Ck)	49	105	363	272	146	46	319	186
Sheep Creek	37	105	0	18	55	102	101	60
Little Willow Creek	62	350	0	0	18	0	0	61
Goose Creek	0		0	0	0	18	0	3
Birch Creek			73	36	0	0		27
Kashwitna Creek	150		0	36	0	83	101	62
Total	1,009	1,365	1,090	724	546	378	1,008	874
Other Waters								
Other Streams	49	0	0	72	0	64	34	31
Lakes	0	0	0	0	0	0	336	48
Total	49	0	0	72	0	64	370	79
Area Total	1,058	1,365	1,090	796	546	442	1,378	477

Appendix A34. Number of whitefish harvested from West Cook Inlet-West Susitna River waters (grouped with other fish prior to 1985), 1985-1990.

FISHERY	1985	1986	1987	1988	1989	1990	Mean
Deshka River	175	134	163	564	86	488	268
Lake Creek	315	145	851	91	10	623	339
Fish Lake Drainage (Yentna Drainage)		11	272	91	10	67	90
Alexander Creek	0	112	127	637	95	152	187
Talachulitna River	0	0	0	0	38	0	6
Chuitna River	0	0	0	0	0	0	0
Theodore River	0	0	0	0	48	135	31
Lewis River	0		0	0	0	0	0
Peter's Creek				0	0	0	0
Yentna River					0	0	0
Beluga River					0		0
Moose Creek		22			0		11
Rabideux Creek					0	0	0
Judd Lake		0	0	0	0		0
Beluga Lake					0		0
Shell Lake							0
Whiskey Lake							0
Hewitt Lake							0
Total	490	424	1,413	1,383	287	1,465	910
Other Waters							
Other Streams	0	11	163	36	143	51	67
Other Lakes	35	0	109	0	0	0	24
Total	35	11	272	36	143	51	91
Area Total	525	435	1,685	1,419	430	1,516	1,002

Appendix A35. Number of burbot harvested from West Cook Inlet-West Susitna River waters, 1977-1990.

FISHERY	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	Mean
Deshka River	3	0	309	224	96	252	126	237	140	257	1,123	36	86	118	215
Lake Creek	42	0	64	0	29	0	283	100	140	67	507	327	0	556	151
Fish Lake Drainage (Yentna Drainage)										89	145	218	19	438	182
Alexander Creek	0	0	36	0	29	84	0	12	0	0	18	36	0	51	19
Talachulitna River	0	45	0	0	0	0	0	0	0	0	0	0	0	0	3
Chuitna River	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Theodore River	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lewis River	0	0	0	0					0		0	0	0	0	0
Peter's Creek								0				0	0	0	0
Yentna River													19	34	27
Beluga River													19		19
Moose Creek										0			10		5
Rabideux Creek													0	0	0
Judd Lake	0	0	0	0			0	0		0	0	0	0		0
Begula Lake													0		0
Shell Lake	0	0	0	0		0	63								11
Whiskey Lake	0	0	0	0		0									0
Hewitt Lake	0	0	0	0		0									0
Total	45	45	409	224	154	336	472	349	280	413	1,793	617	153	1,197	463
Other Waters															
Other Streams	51	72	45	448	57	10	125	199	105	302	1,738	127	58	84	244
Other Lakes	19	36	0	34	0	430	210	761	175	0	109	200	0	253	159
Total	70	108	45	482	57	440	335	960	280	302	1,847	327	58	337	403
Area Total	115	153	454	706	211	776	807	1,309	560	715	3,640	944	211	1,534	867

Appendix A36. Number of burbot harvested from eastside Susitna River waters, 1977-1990.

FISHERY	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	Mean
Willow Creek	26	9	18	0	48	63	21	0	105	0	0	18	9	84	29
Caswell Creek			0	26	0	0	31	87	70	0	127	309	18	185	71
Montana Creek	110	9	9	13	0	0	0	75	0	0	72	0	0	0	21
Sunshine Creek			45	39	115	73	367	100	0	835	344	73	185	638	235
Talkeetna River & Tributaries (in. Clear Ck)	0	27	9	32	0	0	84	62	420	0	145	55	9	67	65
Sheep Creek	45	18	64	45	0	0	10	648	0	0	18	18	0	34	64
Little Willow Creek	0	0	0	0	0	0	0	0	175	0	54	0	18	0	18
Goose Creek								37		0	72	0	9	269	65
Birch Creek										73	72	0	65		53
Kashwitna Creek							0	12		109	18	18	46	34	34
Total	181	63	145	155	163	136	513	1,021	770	1,017	922	491	359	1,311	518
Other Waters															
Other Streams							126	112	315	290	253	0	18	34	144
Lakes							262	0	0	73	0	109	18	0	58
Other Waters	438	208	282	212	57	63									210
Total	438	208	282	212	57	63	388	112	315	363	253	109	36	34	205
Area Total	619	271	427	367	220	199	901	1,133	1,085	1,380	1,175	600	395	1,345	723

Appendix A37. Number of burbot harvested from Knik Arm waters, 1977-1990.

FISHERY	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	Mean
Marine															
Fish Ck.															
Other															
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Little Sustina River	6	9	55	9	29	10	52	25	35	22	54	36	27	82	32
Knik Arm Tributaries															
Knik River & Tributaries (incl. Jim Ck.)					0	0	0	0	0	0	0	0	0	0	0
Wasilla Ck.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cottonwood Ck.			0	0	0	0	0	0	0	0	0	0	0	0	0
Big Lake Drainage streams									0	0	18	0	0	0	3
Ekultna Power Plant Raceway								0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	18	0	0	0	1
Knik Basin Lakes															
Wasilla Lake			0	0	0	0	0	0	0	0	0	0	0	0	0
Finger Lake	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kepler Complex Lakes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Big Lake	73	18	0	43	0	461	94	75	70	335	36	55	163	82	108
Lucille Lake	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kalmback Lake													0		0
Knik Lake													0		0
Memory Lake								0					0		0
Seymour Lake										0			0		0
Lower & Upper Bonnie Lakes										0		0	0	0	0
Nancy Lake Complex Lakes	148	145	9	34	29	210	357	62	105	34	217	127	82	98	118
Total	221	163	9	77	29	671	451	137	175	369	253	182	245	180	226

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FISHERY	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	Mean
Other Waters															
Other Streams							31	37	0	0	0	0	0	0	9
Other Lakes							63	137	0	413	0	73	100	0	98
Other Waters	63	280	227	224	29	0									137
Total	63	280	227	224	29	0	94	174	0	413	0	73	100	0	120
Area Total	290	452	291	310	87	681	597	336	210	804	325	291	372	262	379

Appendix A38. Number of northern pike harvested from West Cook Inlet-West Susitna River waters (grouped with other fish prior to 1985), 1977-1990.

FISHERY	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	Mean
Deshka River	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lake Creek	42	9	209	103	0	52	52	50	52	0	0	36	0	320	66
Fish Lake Drainage (Yentna Drainage)										491	326	1,455	676	370	664
Alexander Creek	0	0	0	0	0	0	0	0	17	514	254	800	819	404	201
Talachulitna River	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chuitna River	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Theodore River	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lewis River	0	0	0	0					0		0	0	0	0	0
Peter's Creek								0				0	0	0	0
Yentna River													0	17	9
Beluga River													0		0
Moose Creek										0			0		0
Rabideux Creek													0	84	42
Judd Lake	0	0	0	0			0	0		0	0	0	0		0
Begula Lake													0		0
Shell Lake	0	0	0	0		0	0								0
Whiskey Lake	0	0	0	0		0									0
Hewitt Lake	0	0	0	0		0									0
Total	42	9	209	103	0	52	52	50	69	1,005	580	2,291	1,495	1,195	511
Other Waters															
Other Streams	0	0	0	0	0	0	105	1,136	156	45	0	346	381	51	159
Other Lakes	90	307	173	129	125	555	787	635	1,023	469	960	181	381	842	476
Total	90	307	173	129	125	555	892	1,771	1,179	514	960	527	762	893	634
Area Total	132	316	382	232	125	607	944	1,821	1,248	1,519	1,540	2,818	2,257	2,088	1,145

Appendix A39. Number of northern pike harvested from Knik Arm waters (grouped with other fish prior to 1985), 1977-1990.

FISHERY	1985	1986	1987	1988	1989	1990	Mean
Marine							
Fish Ck.							
Other							
Total	0	0	0	0	0	0	0
Little Sustina River	0	0	0	0	0	0	0
Knik Arm Tributaries							
Knik River & Tributaries (incl. Jim Ck.)	0	0	0	0	0	0	0
Wasilla Ck.	0	0	0	0	0	0	0
Cottonwood Ck.	0	0	0	0	0	0	0
Big Lake Drainage streams	0	0	0	0	0	0	0
Ekultna Power Plant Raceway	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
Knik Basin Lakes							
Wasilla Lake	0	0	0	0	0	0	0
Finger Lake	0	0	0	0	0	0	0
Kepler Complex Lakes	0	0	0	0	0	0	0
Big Lake	0	0	0	0	0	0	0
Lucille Lake	0	0	0	0	0		0
Kalmback Lake					0		0
Knik Lake					0		0
Memory Lake					0		0
Seymour Lake		0			0	0	0
Lower & Upper Bonnie Lakes		0		0	0	0	0
Nancy Lake Complex Lakes	156	458	924	364	863	754	587
Total	156	458	924	364	863	754	587

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FISHERY	1985	1986	1987	1988	1989	1990	Mean
Other Waters							
Other Streams	0	0	0	0	0	0	0
Other Lakes	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
Area Total	156	458	924	364	863	754	587

Appendix A40. Number of other fish (includes smelt, whitefish and northern pike prior to 1985) harvested from Knik Arm waters, 1977-1990.

FISHERY	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	Mean
Marine							42	0			0	0	0	0	7
Fish Ck.							10	0	0	0	0	0	0	0	1
Other															
Total							52	0	0	0	0	0	0	0	7
Little Sustina River	77	759	291	1,059	690	713	136	87	0	0	0	0	0	0	272
Knik Arm Tributaries															
Knik River & Tributaries (incl. Jim Ck.)					0	0	0	0	0	0	0	0	0	0	0
Wasilla Ck.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cottonwood Ck.			55	0	0	0	0	0	0	0	0	0	0	0	5
Big Lake Drainage streams									35	0	0	0	0	0	6
Ekultna Power Plant Raceway								0	0	0	0	0	0	0	0
Total	0	0	55	0	0	0	0	0	35	0	0	0	0	0	6
Knik Basin Lakes															
Wasilla Lake			27	0	38	0	0	75	87	0	0	0	0	0	19
Finger Lake	0	0	0	0	0	0	0	0	52	0	0	0	0	0	4
Kepler Complex Lakes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Big Lake	17	0	55	0	10	0	0	12	0	24	0	0	0	0	8
Lucille Lake	0	0	0	0	0	0	0	0	0	0	0	0	0		0
Kalmback Lake													0		0
Knik Lake													0		0
Memory Lake								0					0		0
Seymour Lake										0			0	0	0
Lower & Upper Bonnie Lakes										0		0	0	0	0
Nancy Lake Complex Lakes	57	0	9	43	19	73	241	125	0	0	462	0	0	0	74
Total	74	0	91	43	67	73	241	212	139	24	462	0	0	0	102

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FISHERY	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	Mean
Other Waters															
Other Streams							0	0	0	0	0	0	0	99	12
Other Lakes							0	150	35	0	0	0	227	0	52
Other Waters	229	36	0	34	19	31									58
Total	229	36	0	34	19	31	0	150	35	0	0	0	227	99	61
Area Total	380	795	437	1,136	776	817	429	449	209	24	462	0	227	99	446

Appendix A41. Number of other fish (includes smelt, whitefish and northern pike prior to 1984) harvested from eastside Susitna River waters, 1977-1990.

FISHERY	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	Mean
Willow Creek	218	27	45	116	38	63	52	125	0	0	0	0	15	0	50
Caswell Creek			36	26	96	0	10	0	0	0	0	0	0	0	14
Montana Creek	133	27	91	13	19	10	52	25	0	0	0	0	0	0	26
Sunshine Creek			273	0	0	42	0	0	0	0	0	0	0	0	26
Talkeetna River & Tributaries (in. Clear Ck)	23	0	64	32	38	10	126	0	0	0	0	0	0	0	21
Sheep Creek	0	9	191	0	86	21	0	0	0	0	0	0	0	0	22
Little Willow Creek	57	0	0	13	0	0	0	0	0	0	0	0	0	0	5
Goose Creek								0		0	0	0	0	0	0
Birch Creek										0	0	0	0		0
Kashwitna Creek							157	0		0	0	0	0	0	22
Total	431	63	700	200	277	146	397	150	0	0	0	0	15	0	170
Other Waters															
Other Streams							51	0	0	0	0	0	0	0	6
Lakes							21	75	0	0	0	0	0	67	20
Other Waters	195	90	73	520	29	199									184
Total	195	90	73	520	29	199	72	75	0	0	0	0	0	67	94
Area Total	626	153	773	720	306	345	469	225	0	0	0	0	15	67	264

Appendix A42. Number of other fish (includes smelt, whitefish and northern pike prior to 1985) harvested from West Cook Inlet-West Susitna River waters, 1977-1990.

FISHERY	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	Mean
Deshka River	68	72	82	69	19	115	430	212	0	0	0	0	0	0	76
Lake Creek	14	18	109	0	19	63	10	137	69	0	0	0	0	34	34
Fish Lake Drainage (Yentna Drainage)										0	0	0	0	0	0
Alexander Creek	59	181	145	0	0	178	21	187	35	0	31	0	0	17	61
Talachulitna River	0	0	45	0	0	0	0	0	0	0	0	0	0	0	3
Chuitna River	12	0	45	0	0	0	10	0	0	0	0	0	0	0	5
Theodore River	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lewis River	0	0	0	0					0		0	0	0	0	0
Peter's Creek								0				0	0	0	0
Yentna River													0	0	0
Beluga River													0		0
Moose Creek										0			0		0
Rabideux Creek													0	0	0
Judd Lake	0	0	0	0			0	0		0	0	0	0		0
Begula Lake													0		0
Shell Lake	0	0	0	0		0	0								0
Whiskey Lake	0	0	0	0		0									0
Hewitt Lake	0	0	0	0		0									0
Total	153	271	426	69	38	356	471	536	104	0	31	0	0	51	179
Other Waters															
Other Streams	342	63	55	0	48	10	0	50	0	0	0	0	0	0	41
Other Lakes	68	36	0	34	0	0	0	12	0	0	0	0	0	0	11
Total	410	99	55	34	48	10	0	62	0	0	0	0	0	0	51
Area Total	563	370	481	103	86	366	471	598	104	0	31	0	0	51	230

APPENDIX B

Appendix B1. Commercial salmon catch from all Central Cook Inlet districts, 1977-1990.

Date	Chinook	Sockeye	Coho	Pink	Chum	All
1977	14,792	2,052,511	192,599	553,855	1,233,722	4,047,479
1978	17,302	2,621,667	219,360	1,689,098	571,959	5,119,386
1979	13,738	924,415	265,166	72,982	650,357	1,926,658
1980	13,795	1,573,637	271,378	1,786,430	390,810	4,036,050
1981	12,240	1,439,235	485,148	127,169	833,549	2,897,341
1982	20,870	3,259,864	793,937	790,648	1,433,866	6,299,185
1983	20,634	5,049,733	516,322	70,327	1,114,858	6,771,874
1984	8,819	2,102,767	442,619	622,510	684,124	3,860,839
1985	23,297	3,852,141	619,924	83,538	714,140	5,293,040
1986	39,240	4,787,982	756,830	1,299,360	1,134,173	8,017,585
1987	39,661	9,500,186	451,404	109,801	349,132	10,450,184
1988	29,060	6,834,342	560,022	469,972	708,573	8,601,969
1989	26,742	5,010,698	339,201	67,430	122,027	5,566,098
1990	16,105	3,604,064	500,026	603,630	351,197	5,075,022
Mean	21,164	3,758,089	458,138	596,196	735,178	5,568,765

Appendix B2. Commercial salmon catch from the Central District drift net fishery, 1977-1990.

Date	Chinook	Sockeye	Coho	Pink	Chum	All
1977	3,381	1,072,066	106,284	285,943	1,118,861	2,586,535
1978	2,009	1,801,600	67,775	933,049	474,633	3,279,066
1979	1,032	453,692	106,696	19,379	601,404	1,182,203
1980	837	769,078	88,792	963,133	327,506	2,149,346
1981	2,317	632,756	221,923	53,795	752,764	1,663,555
1982	1,232	2,102,307	398,958	270,122	1,340,789	4,113,408
1983	1,115	3,221,783	318,208	26,603	1,040,170	4,607,879
1984	505	1,228,252	195,230	279,608	563,187	2,266,782
1985	1,912	1,890,388	314,795	33,986	643,425	2,884,506
1986	1,826	2,834,170	501,059	614,384	1,009,591	4,961,030
1987	4,551	5,631,691	195,937	38,587	208,014	6,078,780
1988	2,216	4,129,686	263,701	226,456	575,441	5,197,500
1990	620	2,305,707	245,223	323,936	289,302	3,164,788
Mean	1,812	2,159,475	232,660	312,999	688,084	3,395,029

Appendix B3. Commercial salmon catch from the Central District western set net fishery, 1977-1990.

Date	Chinook	Sockeye	Coho	Pink	Chum	All
1977	727	200,175	18,721	22,076	96,460	338,159
1978	1,368	164,975	33,881	20,619	50,758	271,601
1979	1,799	111,124	36,329	1,665	72,877	223,794
1980	1,463	143,118	27,600	33,750	34,349	240,280
1981	748	93,036	46,478	4,636	89,676	234,574
1982	1,852	235,208	102,716	8,255	98,459	446,490
1983	1,938	215,566	50,797	1,050	56,161	325,512
1984	1,108	556,300	93,962	55,293	145,645	852,308
1985	2,040	595,122	134,770	9,122	130,096	871,150
1986	1,417	396,175	87,755	51,323	115,800	652,470
1987	424	651,037	51,017	7,640	42,146	752,264
1988	664	298,252	39,626	14,086	45,656	398,284
1989	1,272	55,856	23,342	1,899	17,797	100,166
1990	620	137,425	37,368	16,549	26,596	218,558
Mean	1,246	275,241	56,026	17,712	73,034	423,258

Appendix B4. Commercial salmon catch from all Northern Cook Inlet districts, 1977-1990.

Date	Chinook	Sockeye	Coho	Pink	Chum	All
1977	565	123,780	20,623	116,518	23,861	285,347
1978	669	51,624	47,256	327,270	37,331	464,150
1979	1,714	112,449	52,635	26,332	9,270	202,400
1980	990	105,647	90,098	474,488	16,728	687,951
1981	725	249,662	134,362	53,325	46,208	484,282
1982	2,716	118,060	85,352	73,307	43,006	322,441
1983	933	184,219	53,867	21,604	29,321	289,944
1984	885	210,947	110,218	103,941	75,846	501,837
1985	1,863	163,012	79,245	26,511	31,213	301,844
1986	15,488	141,830	88,108	139,002	76,040	460,468
1987	12,701	164,602	98,920	18,205	67,180	361,608
1988	12,836	129,713	149,742	54,210	75,728	422,229
1989	12,731	280,801	175,710	23,878	81,948	575,068
1990	9,582	96,398	139,401	43,944	35,710	325,035
Mean	5,314	152,339	94,681	107,324	46,385	406,043

Appendix B5. Commercial salmon catch from the Northern Cook Inlet general district, 1977-1990.

Date	Chinook	Sockeye	Coho	Pink	Chum	All
1977	511	88,729	15,892	102,679	22,252	230,063
1978	388	33,326	35,313	302,529	35,835	407,391
1979	1,418	51,537	34,943	22,627	8,717	119,242
1980	741	60,799	78,345	446,388	14,183	600,456
1981	634	148,806	118,792	45,951	41,789	355,972
1982	2,003	66,940	63,712	66,112	31,850	230,617
1983	841	117,015	42,089	20,749	26,556	207,250
1984	784	136,596	86,813	83,112	67,054	374,359
1985	1,461	95,412	56,751	23,847	27,221	204,692
1986	13,462	94,849	68,994	118,537	67,426	363,268
1987	10,775	97,089	64,082	13,215	53,159	238,320
1988	11,592	98,289	123,356	46,441	70,136	349,814
1989	10,333	201,268	133,952	20,731	64,042	430,326
1990	7,094	69,386	107,300	35,491	31,833	251,104
Mean	4,431	97,146	73,595	96,315	40,147	311,634

Appendix B6. Commercial salmon catch from Northern Cook Inlet eastern district, 1977-1990.

Date	Chinook	Sockeye	Coho	Pink	Chum	All
1977	54	35,051	4,731	13,839	1,609	55,284
1978	278	18,293	11,943	24,741	1,493	56,748
1979	296	60,912	17,692	3,705	553	83,158
1980	245	44,077	11,110	26,609	2,397	84,438
1981	91	100,856	15,570	7,374	4,419	128,310
1982	713	51,120	21,640	7,195	11,156	91,824
1983	92	67,204	11,778	855	2,765	82,694
1984	101	74,351	23,405	20,829	8,792	127,478
1985	402	67,600	22,494	2,664	3,992	97,152
1986	2,026	46,981	19,114	20,465	8,614	97,200
1987	1,926	67,513	34,838	4,990	14,021	123,288
1988	1,244	31,424	26,386	7,769	5,592	72,415
1989	2,398	79,533	41,758	3,147	17,906	144,742
1990	2,488	27,012	32,101	8,453	3,877	73,931
Mean	882	55,138	21,040	10,903	6,228	94,190

APPENDIX C

Appendix C1. Number of fish (actual and planned) stocked into Northern Cook Inlet Management Area waters, 1990-1992.

Species/Life Stage/Site	1990 (Actual)	1991 (Actual)	1992 (Planned)
Chinook Salmon Anadromous Smolt			
Willow Creek	654,477	400,000	400,000
Total	654,477	400,000	400,000
Coho Salmon Anadromous Smolt			
Wasilla Creek Drainage	0	76,000	75,000
Cottonwood Creek Drainage	0	76,000	75,000
Little Susitna River Drainage	308,439	265,000	265,000
Big Lake Drainage	21,671	76,000	75,000
Caswell Creek	143,102	143,000	143,000
Total	473,212	636,000	633,000
Coho Salmon Anadromous Fingerlings			
Wasilla Creek	152,000	0	0
Cottonwood Creek	202,000	0	0
Jim Creek	163,000	0	0
Little Susitna River Drainage	1,163,327	0	0
Big Lake Draiange	504,077	0	0
Total	2,184,404	0	0
Coho Salmon Landlocked Fingerlings			
Loon Lake	21,450	21,600	4,600
Lucille Lake	0	0	0
Victor Lake	6,700	6,700	6,700
Bear Paw Lake	0	0	9,000
Echo Lake	4,600	6,900	4,600
Christiansen Lake	35,750	35,800	35,800
Loberg (Junction) Lake	1,100	2,200	1,100
Finger Lake	72,156	72,400	47,400
Memory Lake	17,550	16,600	16,600
Rocky Lake	11,700	11,700	11,700
Prator Lake	0	0	19,600
Matanuska Lake	12,350	12,300	12,300
Knik Lake	5,850	5,000	5,000
Wolf Lake	13,650	12,400	12,400
Benka Lake	33,073	36,400	0
Total	235,929	240,000	186,800

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Species/Life Stage/Site	1990 (Actual)	1991 (Actual)	1992 (Planned)
Rainbow Trout Landlocked Large Subcatchables			
AK State Fair Ponds	0	2,000	0
Kepler/Bradley Lake	14,627	16,000	8,000
Matansuka Lake	14,356	10,000	8,000
Lucille Lake	0	0	0
Irene Lake	2,216	2,000	2,000
Walby Lake	0	0	2,000
Knik Lake	3,986	4,000	2,000
Coyote Lake	608	500	500
Loberg (Junction) Lake	1,056	1,000	1,000
Slipper Lake	588	500	500
Echo Lake	1,946	2,000	2,000
Total	39,383	38,000	26,000
Rainbow Trout Landlocked Fingerlings			
Barley Lake	3,270	3,720	3,720
Bear Paw Lake	2,250	2,250	0
Bench Lake (Glenn Hwy)	5,200	0	5,200
Beverly Lake	0	4,200	8,400
Big Beaver Lake	0	0	13,100
Big Lake	449,627	570,000	570,000
Big No Luck Lake	6,800	6,800	6,800
Blodgett Lake	5,760	5,760	5,760
Carpenter Lake	35,280	17,640	17,640
Christiansen Lake	17,900	0	17,900
Crystal Lake	52,772	13,170	13,170
Dawn Lake	9,440	2,360	2,360
Diamond Lake	55,600	13,900	13,900
East Twin Lake	4,110	0	4,110
Ekultna Lake	69,240	0	0
Finger Lake	23,890	36,600	0
Florence Lake	5,460	5,460	5,460
Honeybee Lake	46,395	5,800	5,800
Ida Lake	4,640	0	4,640
Johnson Lake	4,040	8,000	8,000
Kalmback Lake	50,000	12,500	12,500
Kashwitna Lake	5,200	5,200	5,200
Kepler/Bradley Lake	0	0	5,800
Knik Lake	0	0	5,000
Lalen Lake	0	0	9,190
Lazy Lake	0	0	2,250
Little Lonely Lake	44,820	5,600	5,600
Little No Luck Lake	3,410	0	3,410
Long Lake (K/B)	29,776	14,800	14,800

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Species/Life Stage/Site	1990 (Actual)	1991 (Actual)	1992 (Planned)
Rainbow Trout Landlocked Fingerlings, cont.			
Long Lake (Big Lake)	0	0	4,440
Loon Lake	10,800	0	0
Lorraine Lake	6,620	2,870	13,200
Lower Bonnie Lake	12,010	0	0
Lucille Lake	36,348	36,200	0
Lynda Lake	0	0	1,120
Lynne Lake	7,000	7,000	7,000
Marion Lake	11,300	11,300	11,300
Memory Lake	8,300	0	0
Morvro Lake	17,320	17,320	8,660
North Friend Lake	8,140	3,885	8,140
Prator Lake	4,900	0	0
Ravine Lake	2,500	2,500	2,500
Reed Lake	3,694	3,900	3,900
Robin Lake	0	0	1,000
Rocky Lake	5,870	0	0
Seventeenmile Lake	10,000	10,000	10,000
Seymour Lake	23,082	22,900	45,800
South Friend Lake	5,570	2,785	5,570
South Rolly Lake	12,770	10,770	10,770
Stepan Lake	0	0	5,990
Tigger Lake	1,894	1,890	1,890
Twin Island Lake	15,100	15,100	15,100
Vera Lake	11,050	11,050	11,050
Visnaw Lake	0	0	13,070
Walby Lake	5,390	5,390	5,390
Weiner Lake	4,140	4,140	4,140
West Beaver Lake	0	0	11,500
Wishbone Lake	5,267	5,270	5,270
Wolf Lake	6,200	0	0
"X" Lake	20,320	20,280	10,140
"Y" Lake	1,900	1,990	3,970
Total	1,193,115	930,300	990,620
Rainbow Trout Landlocked Fry			
Ekultna Lake	0	355,000	355,000
Total	0	355,000	355,000
Arctic Grayling Landlocked Fingerling			
Kelper/Bradley Lake	11,200	5,800	5,800
Meirs Lake	3,400	3,400	3,400
Mile 180 Parks Hwy Lake	1,000	1,000	1,000

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Species/Life Stage/Site	1990 (Actual)	1991 (Actual)	1992 (Planned)
Arctic Grayling Landlocked Fingerling, cont.			
Seventeenmile Lake	10,000	10,000	10,000
Willow Lake	31,500	14,300	14,300
Canoe Lake	4,200	4,200	4,200
Matanuska Lake	6,100	6,100	6,100
Long (Mile 86) Lake	10,600	19,900	10,600
Lucille Lake	0	0	18,100
Walby Lake	0	0	5,400
Junction Lake	1,100	1,100	1,100
Knik Lake	5,000	5,000	5,000
Finger Lake	36,800	18,100	36,600
"Y" Lake	0	0	3,900
Farmer Lake	2,100	2,100	2,100
Bruce Lake	2,700	2,700	2,700
Total	125,700	93,700	130,300
Arctic Grayling Landlocked Fry			
Long Lake (Mile 86)	64,000	64,000	64,000
Meirs Lake	16,700	16,700	16,700
Canoe Lake	21,200	21,200	21,200
Total	101,900	101,900	101,900
Arctic Char Landlocked Fingerlings			
Irene Lake	3,600	3,600	3,600
Benka Lake	12,300	12,300	12,300
Lynne Lake	0	0	7,000
Marion Lake	11,300	11,300	11,300
Total	27,200	27,200	34,200
Lake Trout Landlocked Fingerlings			
Long Lake (Mile 86)	10,000	10,600	0
Total	10,000	10,600	0
Total Anadromous Stockings	3,312,093	1,036,000	1,033,000
Total Landlocked Stockings	1,732,477	1,796,700	1,824,820
Total Stockings	5,044,570	2,832,700	2,857,820

APPENDIX D

Appendix D1: Emergency orders issued for NCIMA waters during 1989 and 1990.

Emergency Orders issued in 1989

1. E.O. No. 2-KS-2-02-89 closed a 1,500 foot stretch of the Little Susitna River immediately downstream from the Department's salmon counting weir. Effective from May 26 through September 15.

2. E.O. No 2-RS-2-11-89 opened Fish Creek for personal use dip net fishing July 30 through August 11, 1989.

3. E.O. No. 2-RS-2-13-89 closed Fish Creek personal use dip net fishing effective August 10, 1989.

Emergency Orders issued in 1990

1. E.O. No. 2-SS-2-14-90 closed a 1,500 foot stretch of the Little Susitna river immediately downstream from the Department's salmon counting weir. Efective from July 20 through September 15.

2. E.O. No. 2-KS-2-07-90 extended the chinook salmon season at Willow Creek for two additional days starting July 3. Effective July 3 and July 4.

3. E.O. No. 2-RS-2-17-90 opened the Fish Creek personal use dip net fishery on July 30. Effective from July 30 through August 10.

4. E.O. No. 2-SS-2-18-90 reduced the bag and possession limits at the Little Susitna River to one coho salmon and further closed the Little Susitna River from the Burma Road access site upstream to the Department's salmon counting weir to all fishing. Effective from August 2 through Sptember 15.

5. E.O. No. 2-RS-2-21-90 closed the Fish Creek personal use dip net fishery on August 4.

6. E.O. No. 2-SS-2-23-90 restored bag and possession limits for coho at the Little Susitna River and reopened waters between the Burma Road access site and the Department's salmon counting weir on August 14.

7. E.O. No. 2-CS-2-25-90 closed the Eklutna Power Plant tailrace to all fishing from the Old Glenn Highway downstream to markers placed approximately 100 yards upstream from the confluence of the tailrace and the Knik River. Effective from August 22 through December 31.

APPENDIX E

Appendix E1. Chinook salmon regulatory history for NCIMA waters, 1979-1989.

Selected Susitna River streams were reopened to chinook salmon fishing in 1979 after being closed for several years because of low stock abundance. Cautious incremental expansion has characterized the area's chinook salmon fisheries since they reopened. From 1979 through 1982 chinook salmon fishing was permitted at Alexander Creek, Lake Creek and at the Deshka River from the fourth Saturday in May through July 6. These streams drain into the Susitna River from the west. Clear Creek, a tributary of the Talkeetna River, also had a similar chinook salmon season. In addition, three eastside tributaries of the Susitna River, Willow, Caswell and Montana Creeks were open on Saturdays and Sundays only for four consecutive weekends commencing on the second Saturday in June. Harvest quotas, ranging from 200 to 7,000 chinook salmon, governed these respective fisheries from 1979 through 1982. The Chuitna River, a coastal stream near Beluga, and the entire Yentna and Talkeetna River drainages were opened to chinook salmon fishing in 1983. The opening date for chinook salmon fisheries that provided continuous daily fishing was also changed to January 1.

The following year, 1984, the remaining coastal streams near Beluga and all waters draining into the westside of the Susitna River downstream from the Deshka River were opened to chinook salmon fishing. In 1986, five road accessible streams on the eastside of the Susitna River opened to weekend only fishing. These streams included Little Willow, Goose, Sunshine, Sheep and Birch Creeks.

Expanded chinook salmon fishing opportunity continued in 1982 when Monday fishing was added to all former weekend only fisheries that drain into the Susitna River from the east. Saturday through Monday fishing was also allowed on the Susitna River and all flowing waters within 1/4 mile of the Susitna River (excluding the Kashwitna River) between the Deshka and Talkeetna rivers. These "corridor" fisheries were open for four continuous "weekends" similar to the previously mentioned Saturday through Monday fisheries. Chinook salmon fishing was permitted for the first time on the Susitna River drainage upstream from the Susitna River's confluence with the Talkeetna River to Devil's Canyon but excluding the Chulitna River drainage. Unbaited, single-hook, artificial lures were mandatory in this area. The season extended from January 1 through July 13. The season for all Susitna River and coastal fisheries that formerly closed on July 6 was extended to July 13 in 1987.

In 1989, chinook salmon fishing was allowed within a 1/4 mile radius of the mouth of the Kashwitna River. That same year fishing was permitted daily at Willow Creek between January 1 and the third Monday in June and on Saturday through Monday for two consecutive weeks starting the fourth Saturday in June.

Bag and possession limits were one chinook salmon 20 inches or over in length in 1979. The following year bag and possession limits changed to two chinook salmon 20 inches or over in length but only one chinook salmon could be over 28 inches in length. In 1981 the bag limit was reduced to one chinook salmon 20 inches or more in length and two in possession. This limit remained in effect through 1985. A five fish (20 inches or more in length) per year limit governed all Cook Inlet chinook salmon fisheries from 1979 through 1985. This

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limit applied collectively to NCI, Cook Inlet saltwater and the Kenai Peninsula.

In 1986, bag and possession limits for the western drainages of the Susitna River were changed to two chinook salmon, 16 inches or more in length, daily and four in possession. Only one fish daily and two in possession could be over 28 inches. Similar limits also applied to the West Cook Inlet coastal fisheries. Bag and possession limits for eastern drainages of the Susitna River in 1986 were one chinook salmon, 16 inches or more in length, and two in possession. The yearly limit was five chinook salmon 16 inches or more in length. Anglers were required to list their chinook salmon harvest on non-transferable punch cards or harvest records from 1979 through 1988. The date and location of harvested chinook salmon was recorded. A five dollar permit stamp was mandatory for chinook salmon fishing from 1980 through 1982. Since 1986 bag and possession limits have remained unchanged, however, the harvest record and yearly limit was eliminated for all NCI chinook salmon fisheries in 1989.