

**AYK Region**  
**Chum and Chinook Salmon**  
**Stock Status and Harvest**



**NPFMC Salmon bycatch Workshop**  
**Anchorage, Alaska**  
**April 4, 2006**  
**Gene J. Sandone**

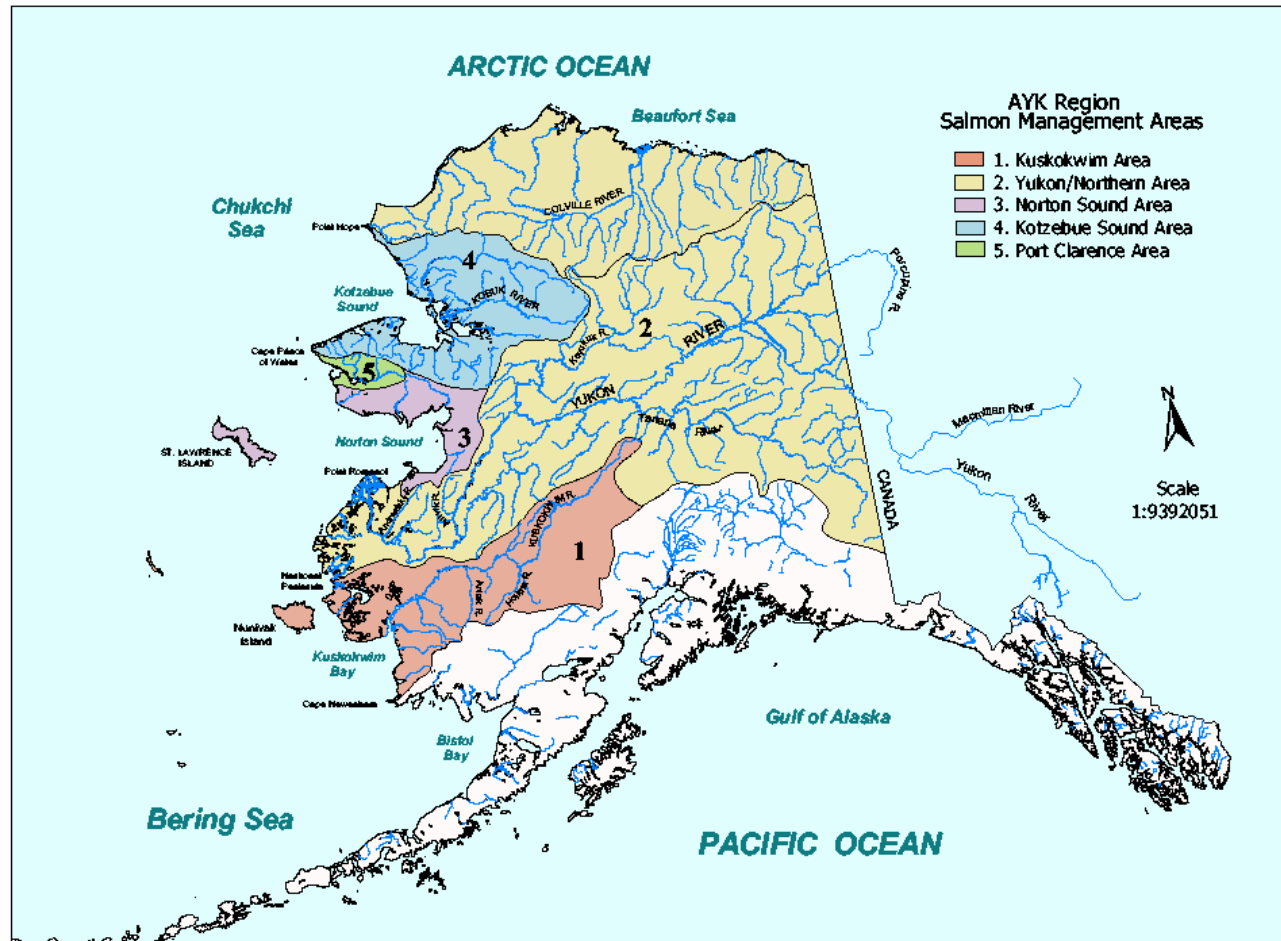
# Goals of Presentation

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- ✓ **Nature of Fisheries**
- ✓ **Salmon Management**
- ✓ **Area-specific Harvest and Stock Status of Chinook and Chum Salmon**

# AYK Region



# People of AYK and Use of Salmon

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**50,000 RURAL RESIDENTS**

**100 VILLAGES AND SMALL TOWNS**

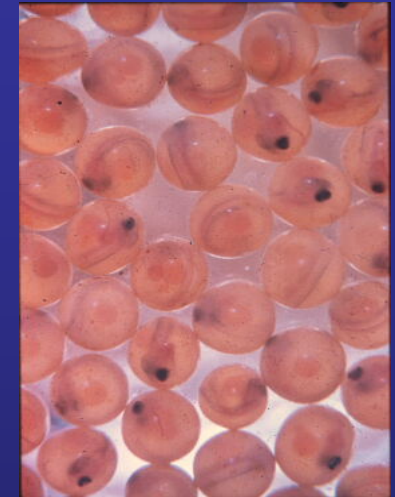
**CITY OF FAIRBANKS – 84,000 POP.**

**Amount Necessary for Subsistence**

**500,000 – 800,000 Salmon**

**Commercial Harvest of up to 3  
Million**

# Salmon Fisheries of AYK



**Small Scale  
Community  
Based Fisheries**





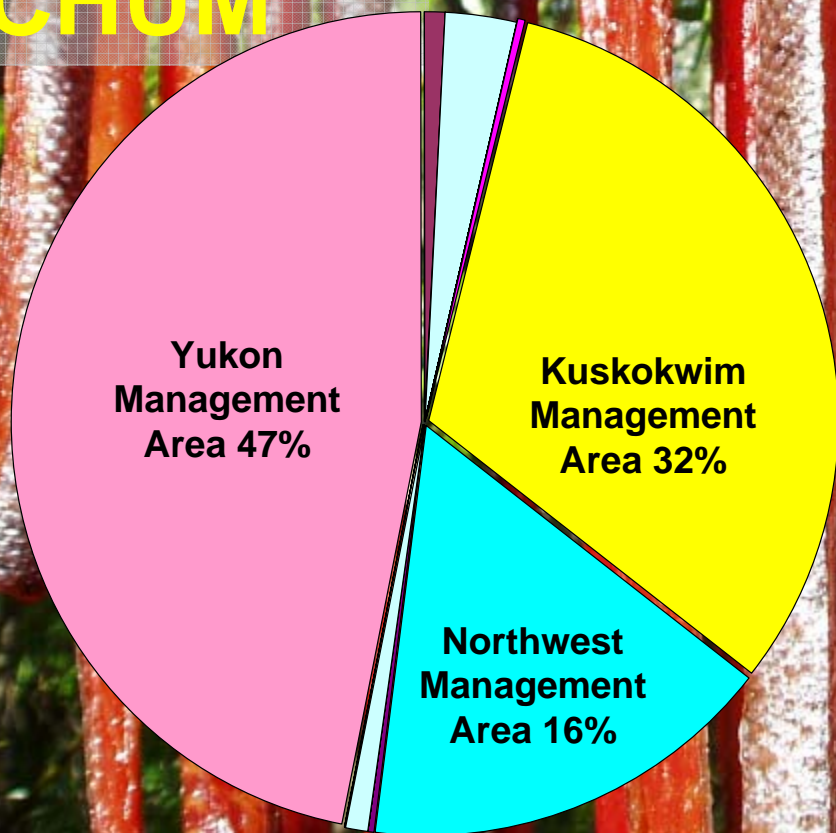
# Subsistence



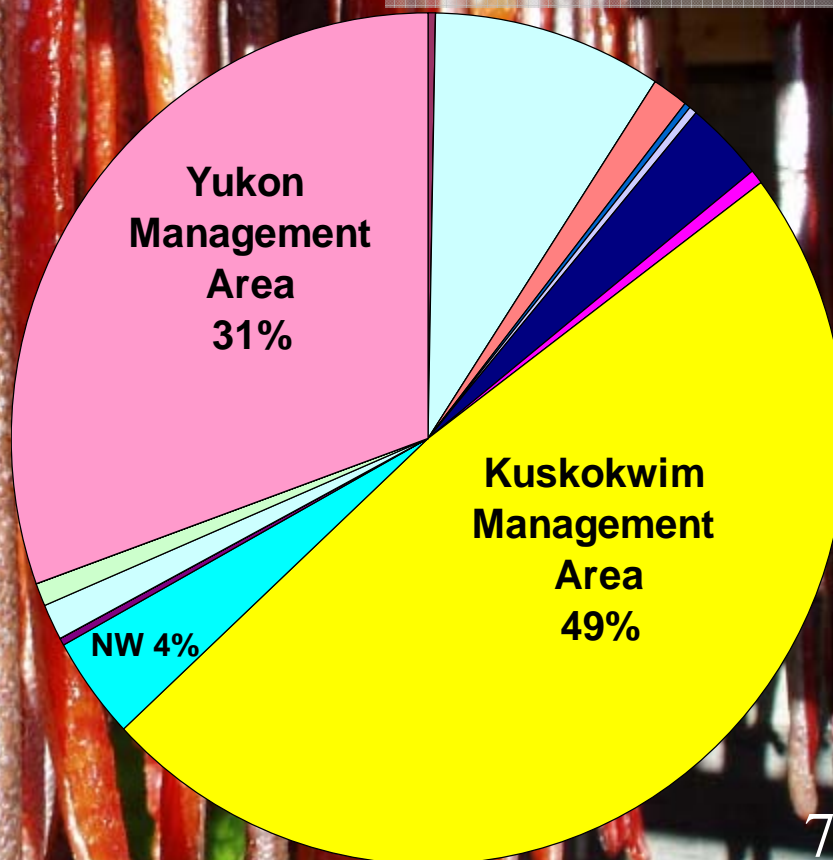


# 2002 State Wide Subsistence Salmon Harvest

## CHUM



## CHINOOK





# Commercial





# Sport and Subsistence Rod and Reel

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# Subsistence and Commercial Fishing are Intertwined

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# **AYK Salmon Management Model**

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- **Based On:**
  - ✓ **Abundance Based**
  - ✓ **Local Managers Knowledgeable About Area**
  - ✓ **Flexible Management Through Emergency Orders Based on Inseason Information**
  - ✓ **Public Process Through Board of Fisheries and Local Fish and Game Advisory Committees**



# Cooperative Management

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- ✓ **Kuskokwim River Salmon Management Working Group - 1988**
- ✓ **Yukon River Drainage Fisheries Association – 1990**
  
- **Declining Runs, Lack of Data, More Stringent Management Actions**
- **Public and Department Looking for a BETTER WAY**
- **Integral to Current Management**

# Preparing for the Future 2001 to Present

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- ✓ **Biological Escapement Goals**
- ✓ **Stocks of Concern**
- ✓ **Program Development**

# Biological Escapement Goal (BEG)

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**“Biological Escapement Goal” or “BEG” means the escapement that provides the greatest potential for maximum sustained yield; BEG will be the primary management objective for the escapement unless an optimal escapement or inriver run goal has been adopted; BEG will be developed from the best available biological information, and should be scientifically defensible on the basis of available biological information; Beg will be determined by the department and will be expressed as a range based on factors such as salmon stock productivity and data uncertainty; the department will seek to maintain evenly distributed salmon escapements within the bounds of a BEG.**

**(Sustainable Salmon Fisheries Policy, 2001)**



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**(Sustainable Salmon Fisheries Policy, 2001)**

# Biological Escapement Goals (BEG) in the AYK Region

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- ✓ **Based On Spawner/Recruit Analyses For These Stocks**
  - **Yukon River**
    - Chinook – Chena, Salcha
    - Summer Chum – Andreafsky, Anvik
    - Fall Chum – Entire Stock and Components
  - **Norton Sound**
    - Chum salmon - Subdistrict 1, Kwiniuk, Tubutulik

# AYK Salmon Escapement Goals

- Most escapement goals for AYK Region salmon stocks of salmon are Sustainable Salmon Escapement Goals (SEGs).



# Sustainable Escapement Goal (SEG)

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**“Sustainable Escapement Goal” or “SEG” a level of escapement, indicated by an index or an escapement estimate, that is known to provide for sustained yield over a 5 to 10 year period, used in situations where a BEG cannot be estimated due to the absence of a stock specific catch estimate.....**

**(Sustainable Salmon Fisheries Policy, 2001)**

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**(Sustainable Salmon Fisheries Policy, 2001)**



# Kuskokwim Management Area



**Alaska Department of Fish and  
Game**

# Kuskokwim Management Area



# Kuskokwim Management Area



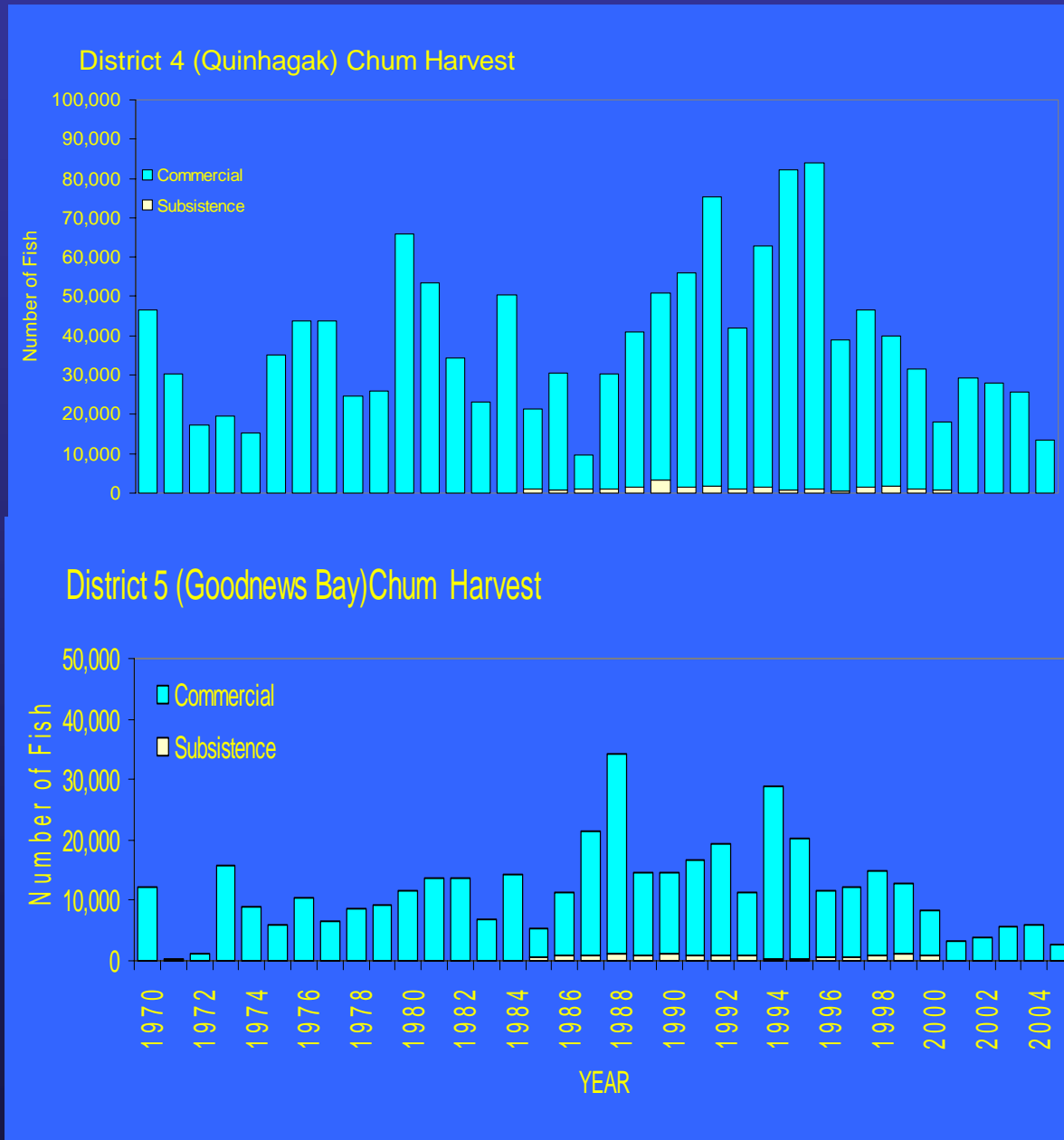
# Kuskokwim Bay Chum and Chinook Salmon Stock Status



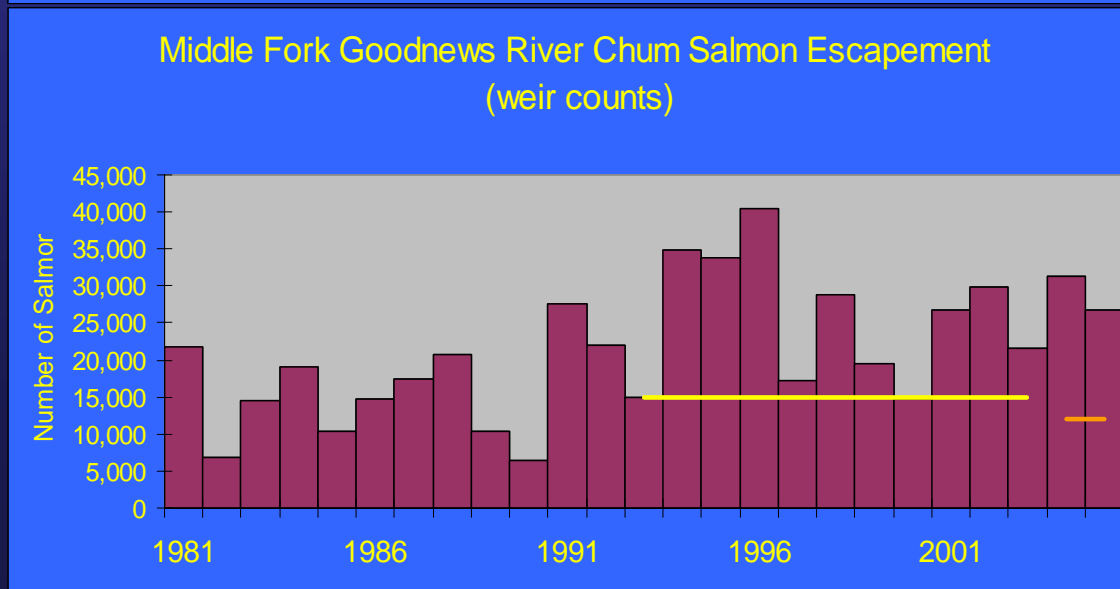
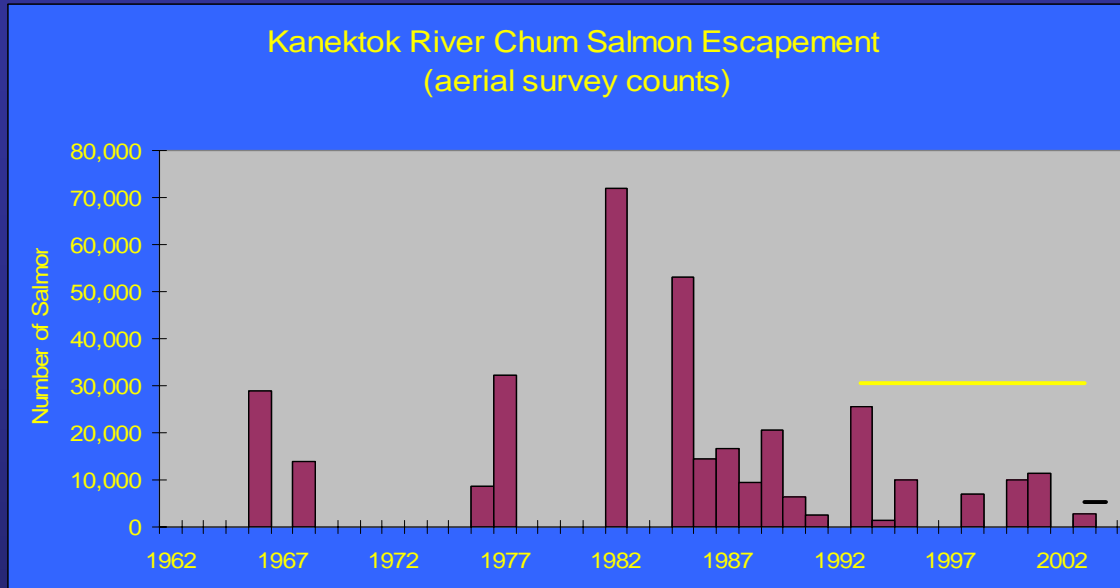
**Alaska Department of Fish and  
Game**



# Kuskokwim Bay *Chum* Salmon Harvest

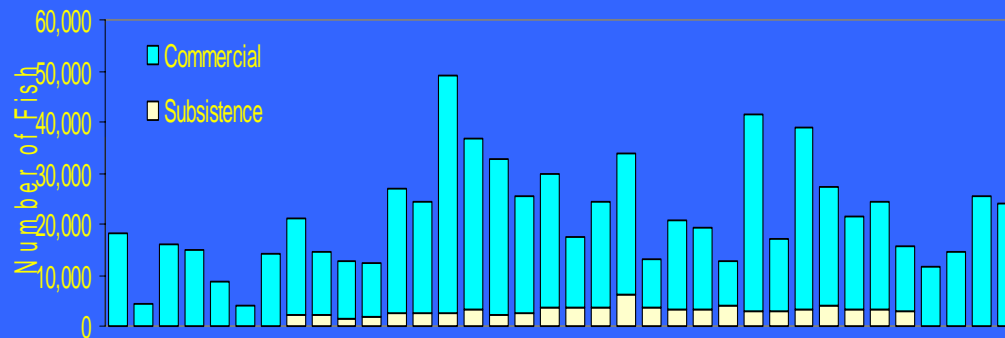


# Kuskokwim Bay Chum Salmon Escapement

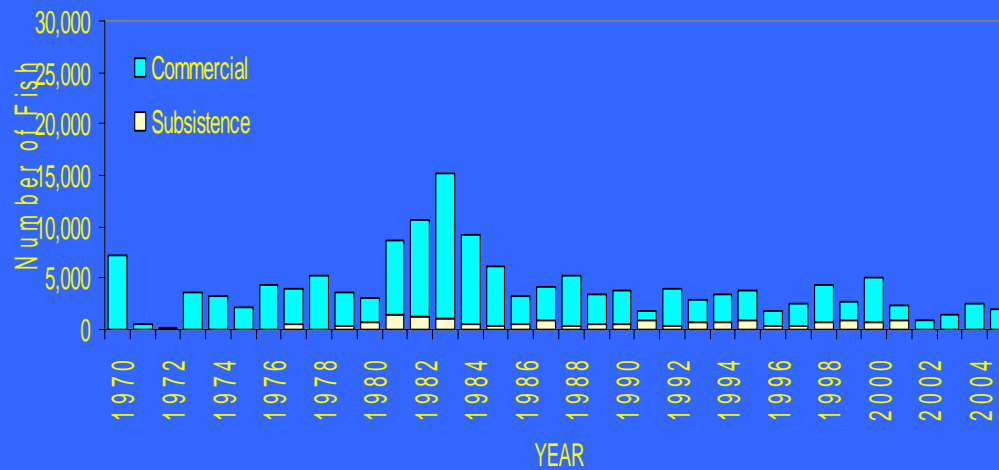


# Kuskokwim Bay Chinook Salmon Harvest

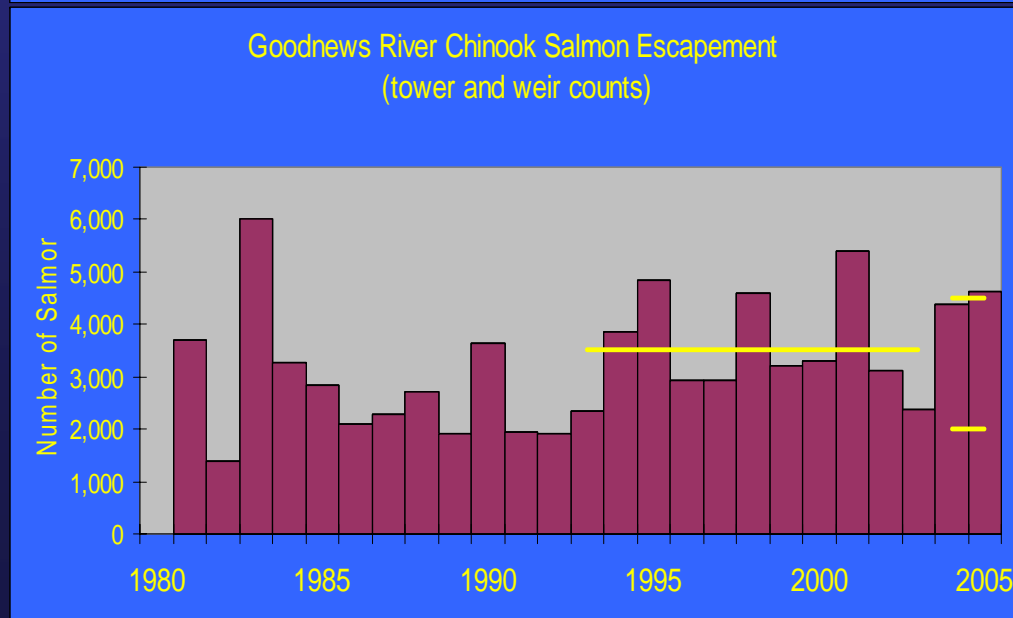
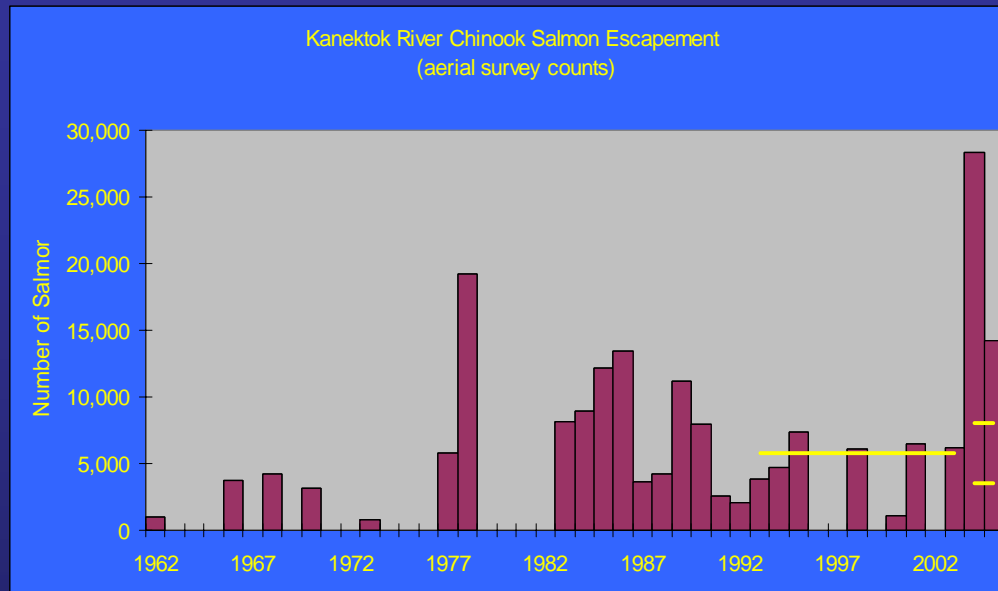
District 4 (Quinhagak) Chinook Harvest



District 5 (Goodnews Bay) Chinook Harvest



# Kuskokwim Bay Chinook Salmon Escapement





# Kuskokwim Bay Stock Status Summary

- Both Chum and Chinook Salmon Stocks are producing adequately to provide for escapement requirements, subsistence needs, and sustainable fisheries.
- It appears that the production failure that resulted in the very poor runs in 1998-2000 in most areas of the AYK Region were not apparent or as severe.

# Kuskokwim River Chum and Chinook Salmon Stock Status



**Alaska Department of Fish and  
Game**

# Kuskokwim River Salmon

# Chum Salmon

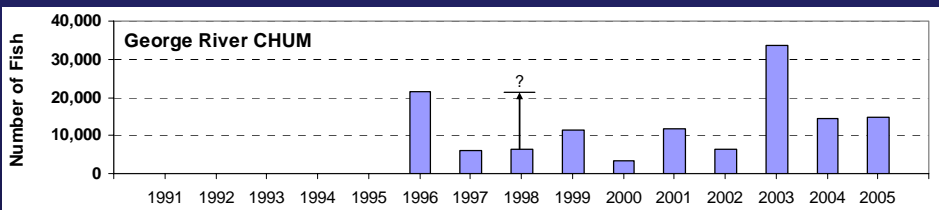
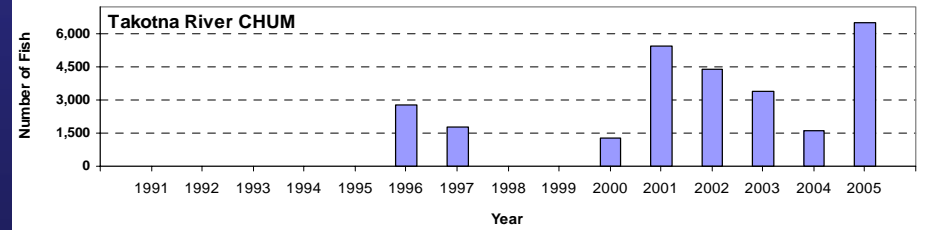
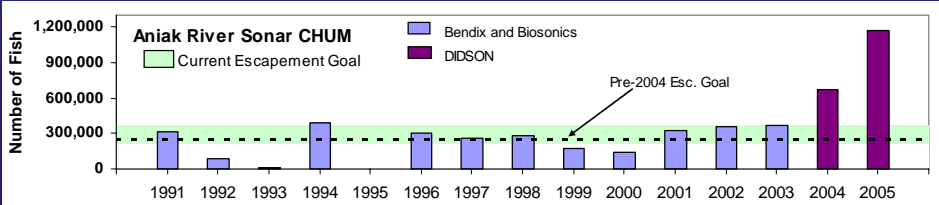
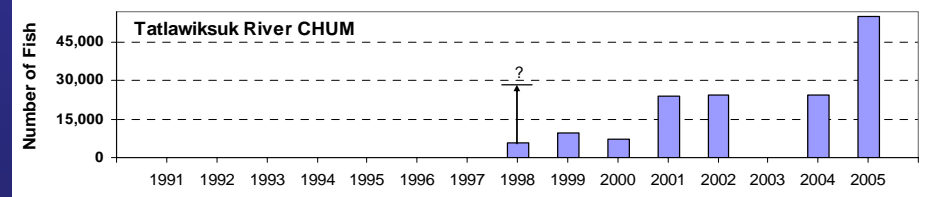
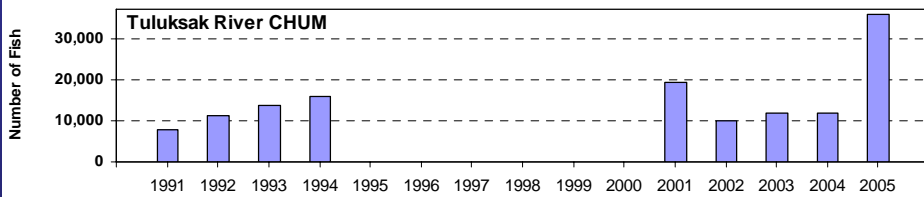
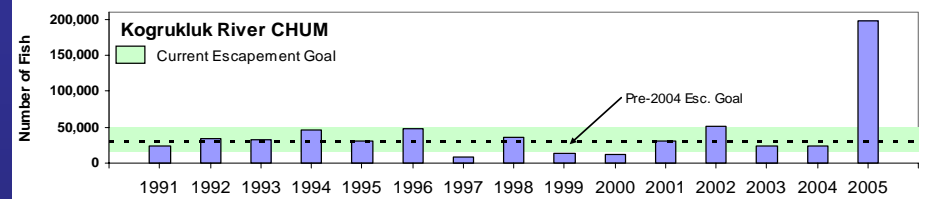
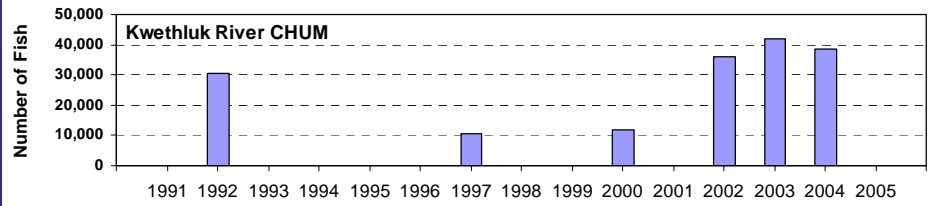
## *Escapement Goals*



# Kuskokwim River Salmon

# Chum Salmon

## Overall Trend Escapement

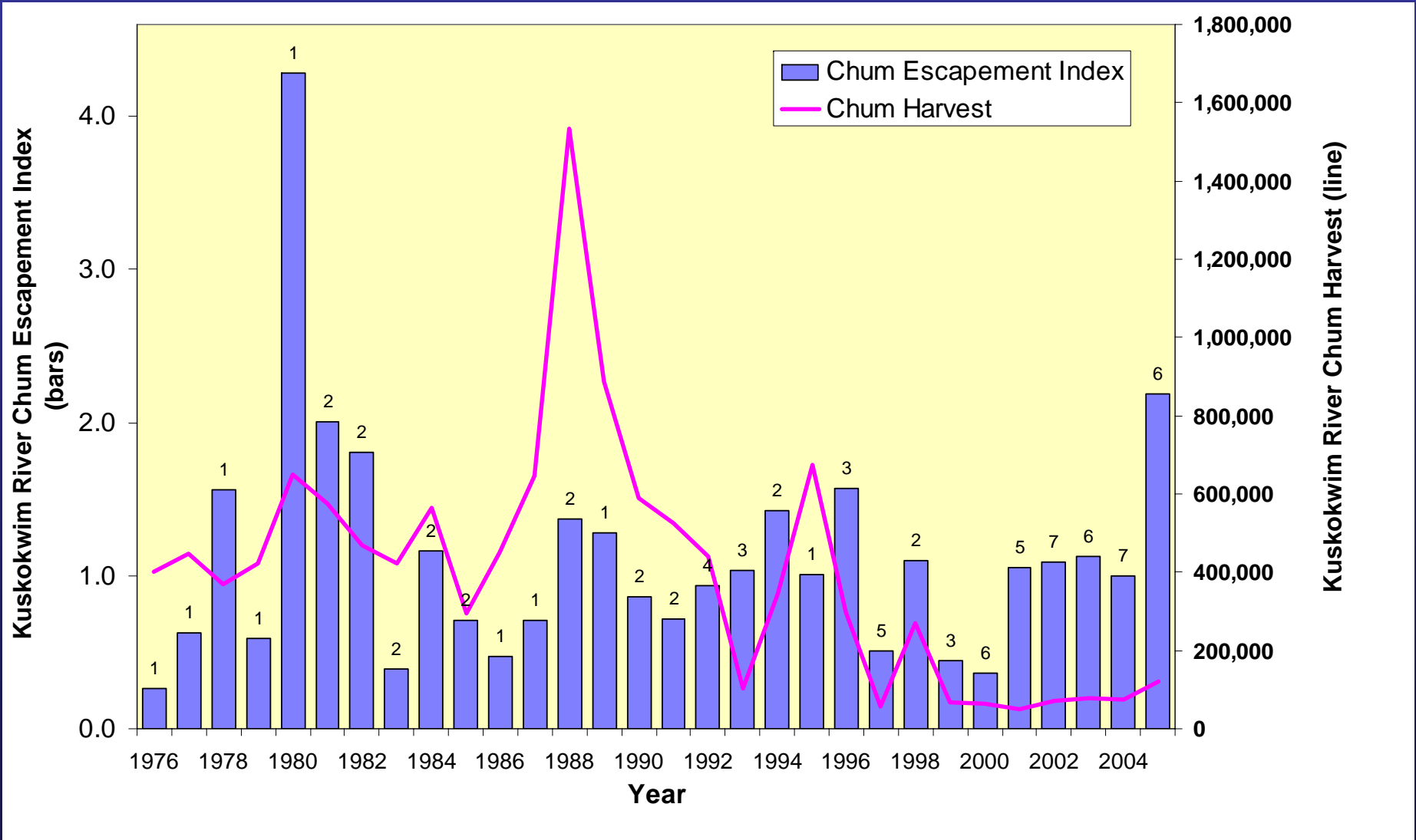




# Kuskokwim River Salmon

# Chum Salmon

## Overall Trend in Catch and Escapement



# **Kuskokwim River Chum Salmon Stock Status Summary**

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- **Strong parent year escapements in 1994 to 1996 produced poor runs in 1998 to 2000.**
- **Poor parent year escapements in 1999 and 2000 produced strong run in 2003 and 2004.**
- **Adequate parent year escapement in 2001 produced a very large run in 2005.**
- **Outlook is for a very large run in 2006, with little or no anticipated commercial harvest.**

# Kuskokwim River Salmon

# Chinook Salmon

*Escapement Goals*



# Kuskokwim River Salmon

# Chinook Salmon

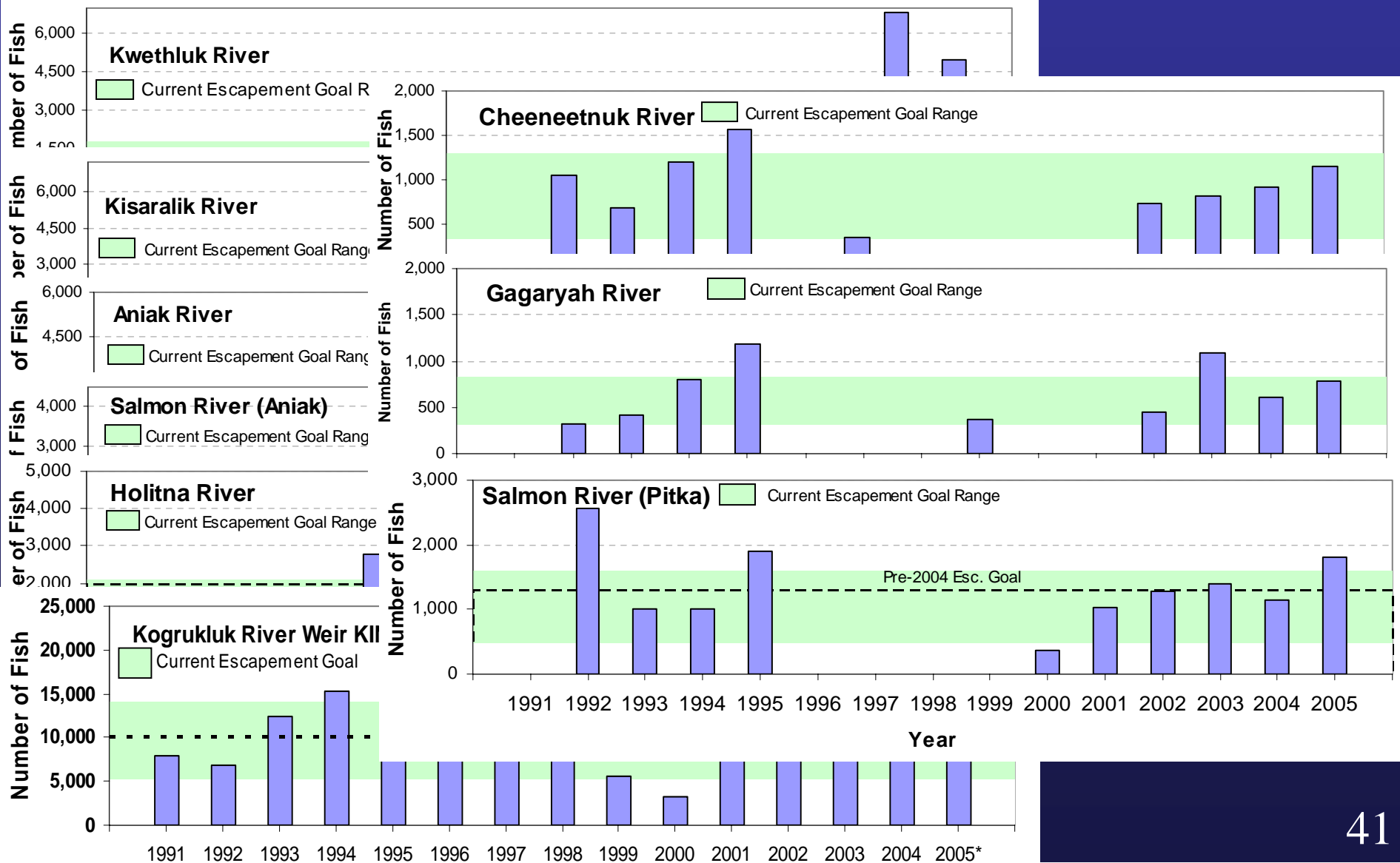
## *Escapement Projects*



# Kuskokwim River Salmon

# Chinook Salmon

## Escapement Goals Achieved?

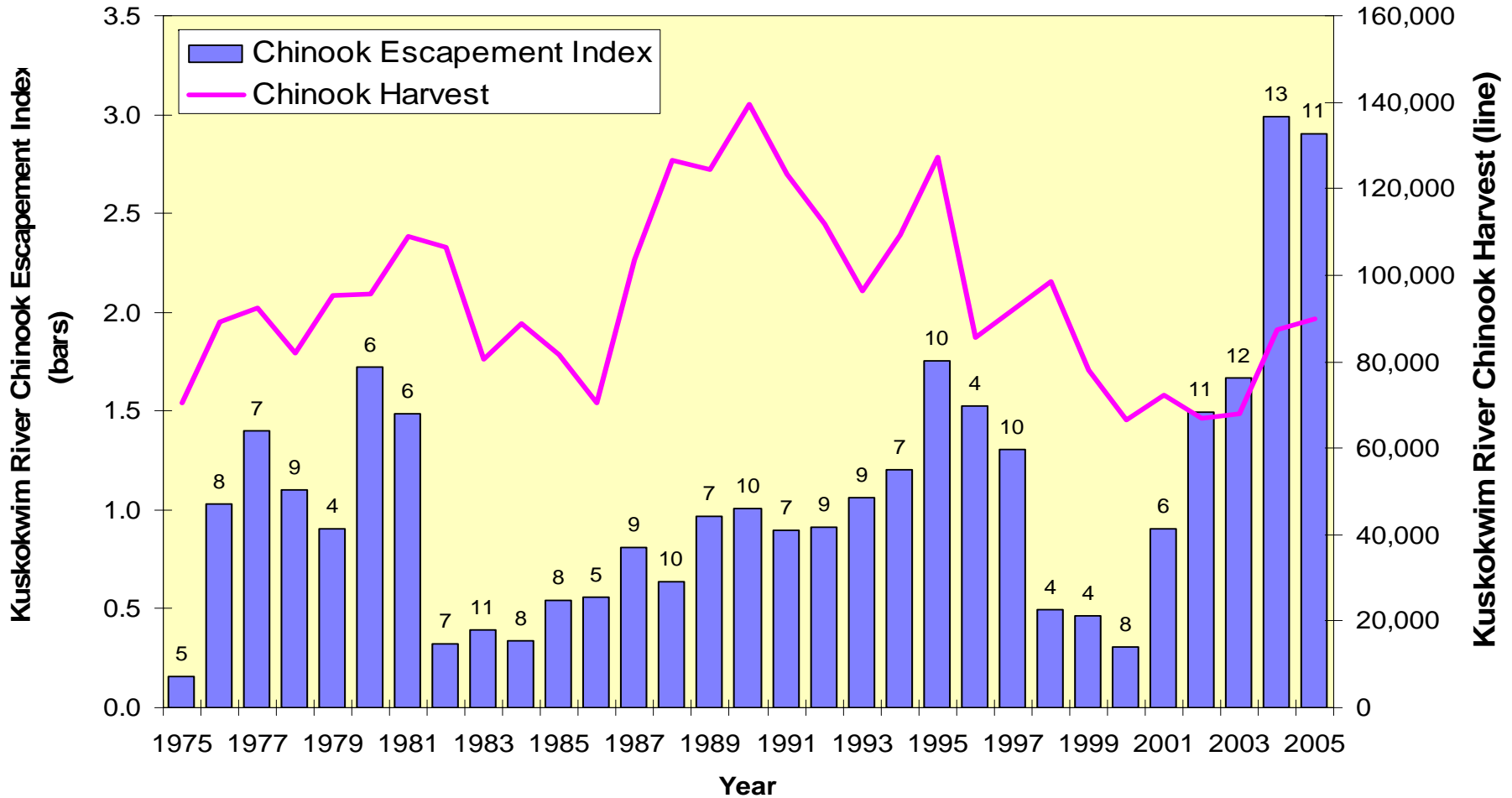




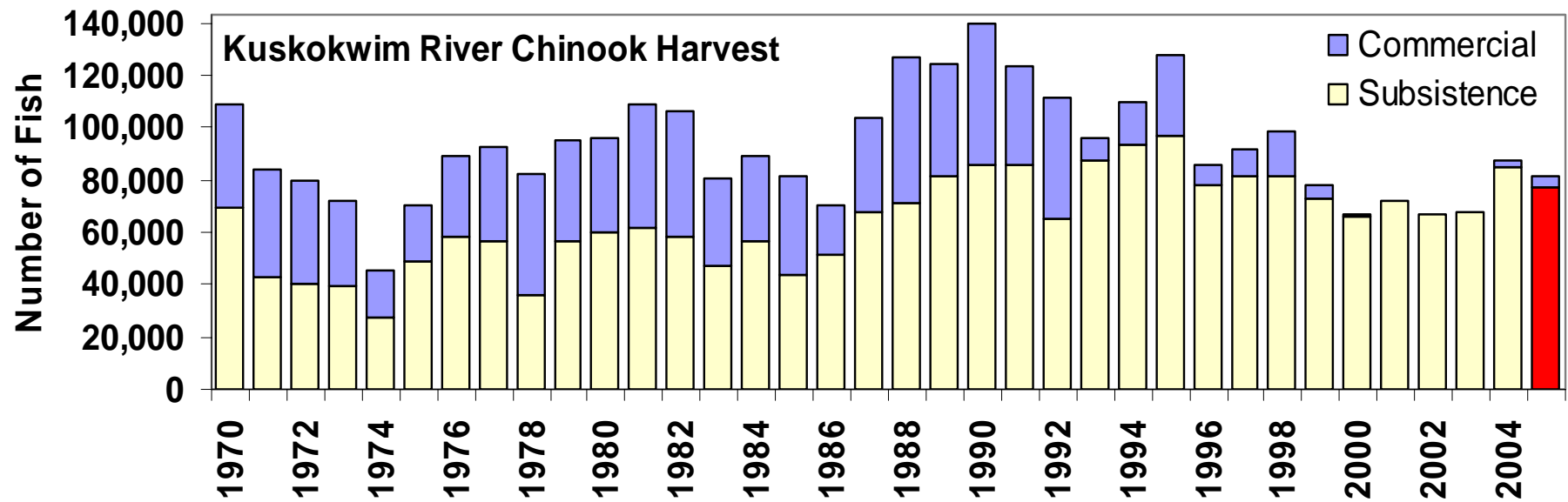
# Kuskokwim River Salmon

# Chinook Salmon

## Overall Trend in Catch and Escapement



# Kuskokwim River Chinook Salmon Harvest



# Kuskokwim River m Salmon Stock Status Summary

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- Adequate parent year escapements in 1992 to 1994 produced poor runs in 1998 to 2000.
- Poor parent year escapements in 1998 – 2000 are producing strong run in 2004, 2005 and 2006(?).
- Outlook is for continued good production and for a large run of Chinook salmon in 2006, with little or no anticipated commercial harvest.

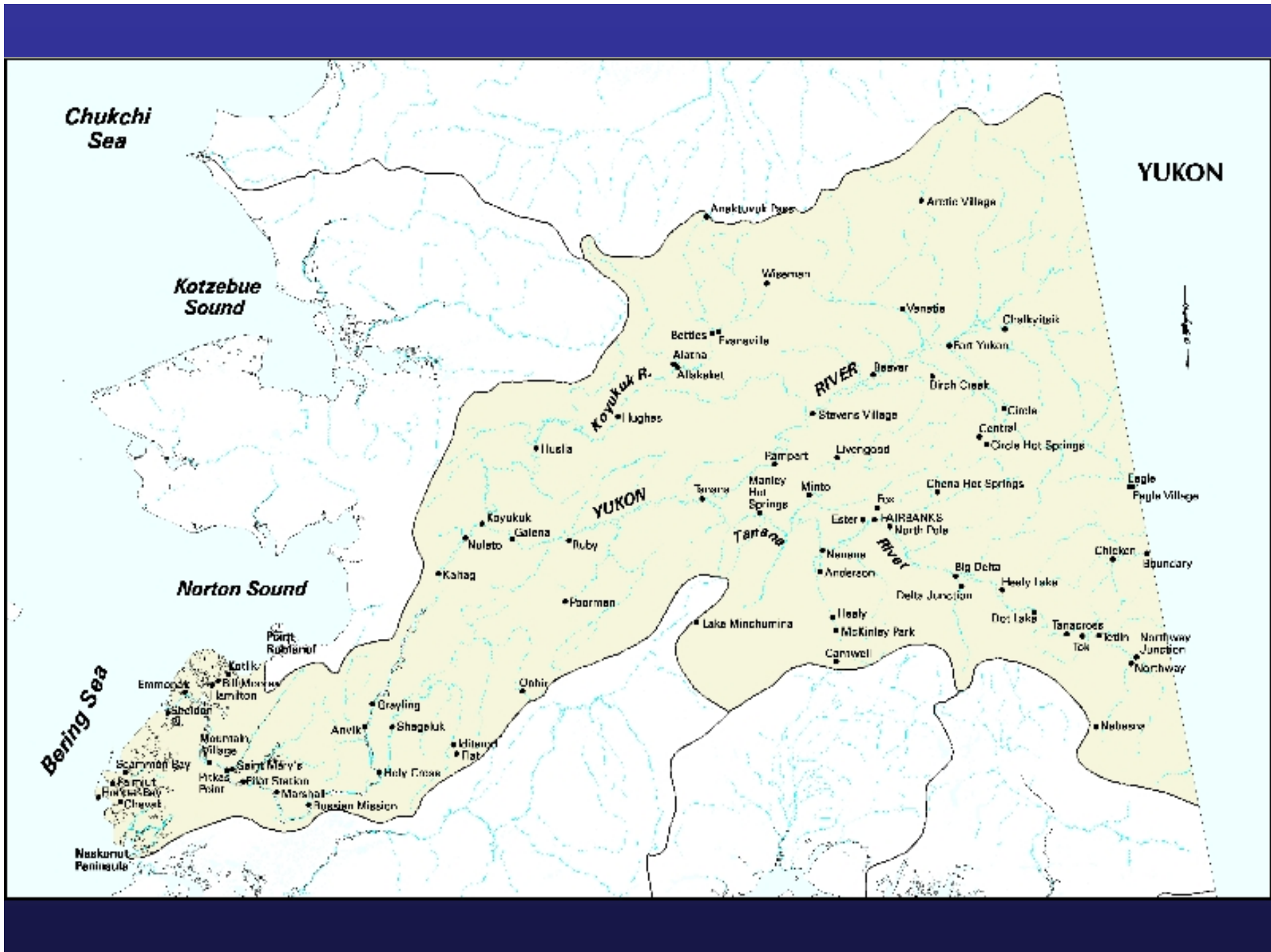
# Yukon River Drainage



**Alaska Department of Fish and  
Game**





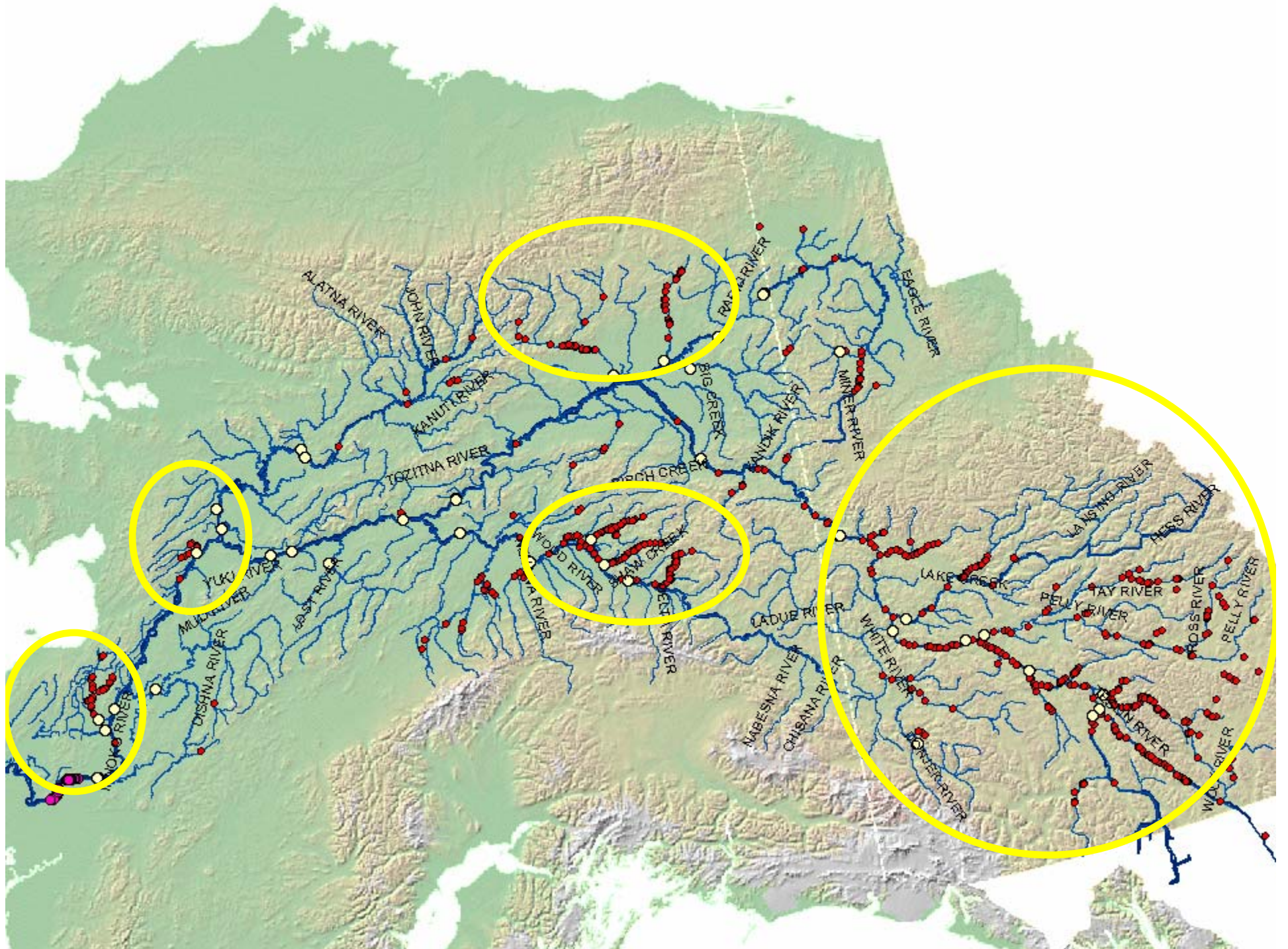


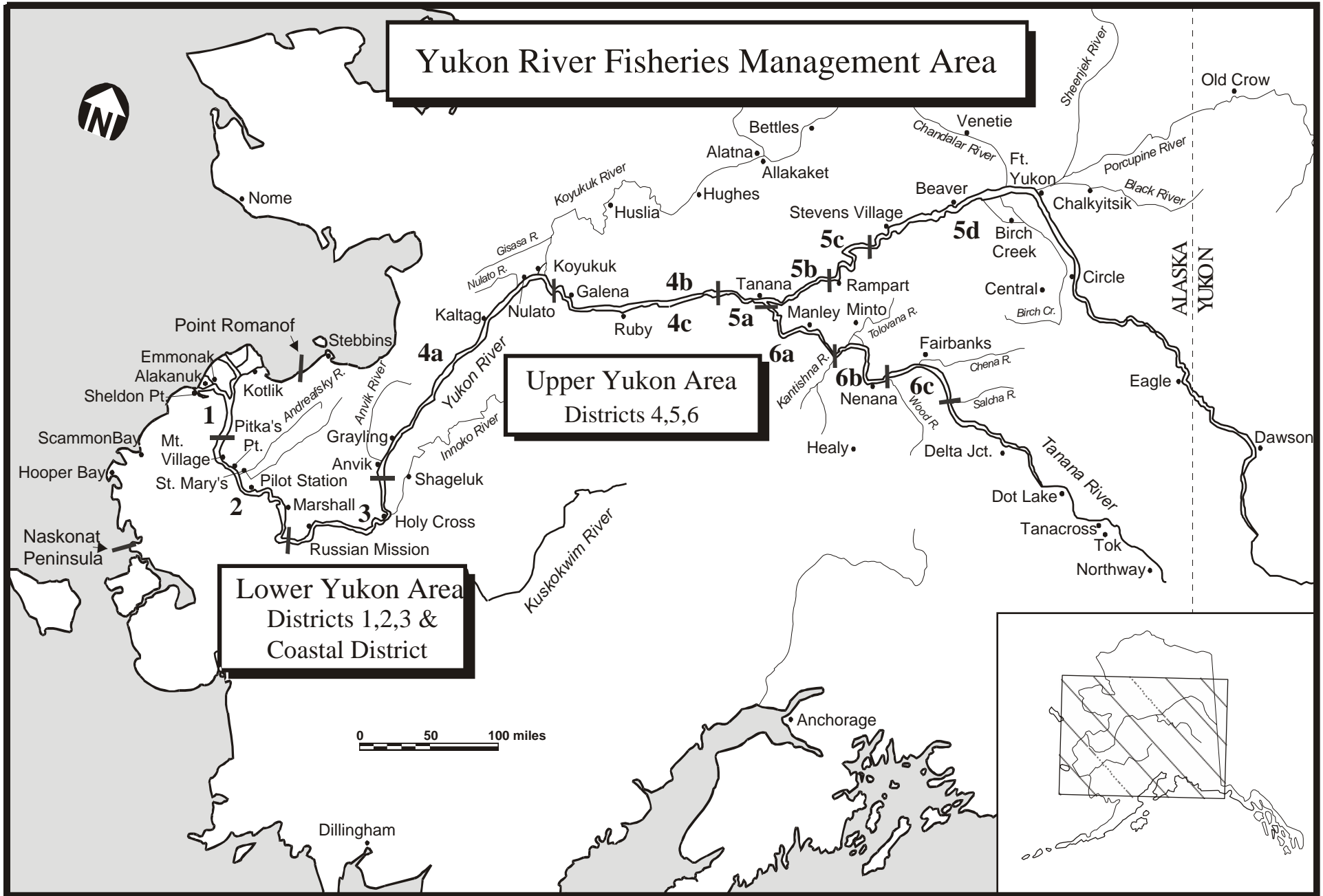
# Yukon River Chinook Salmon Stock Status and Management



**Alaska Department of Fish and  
Game**







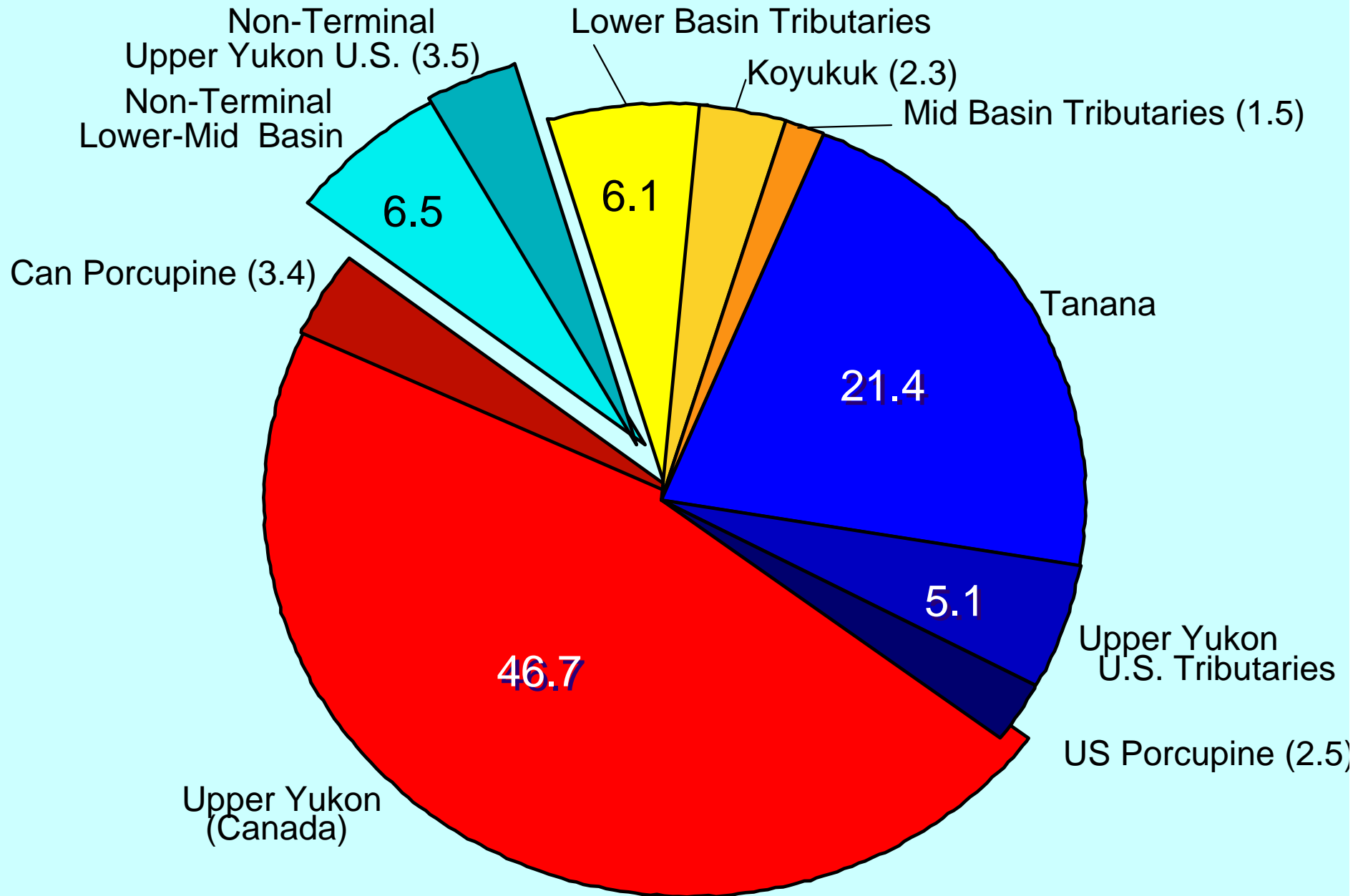
**The Yukon Area showing communities, fishing districts, and subdistricts.**







# Chinook Distribution 2003



# Run Assessment Tools

## Run Index tools

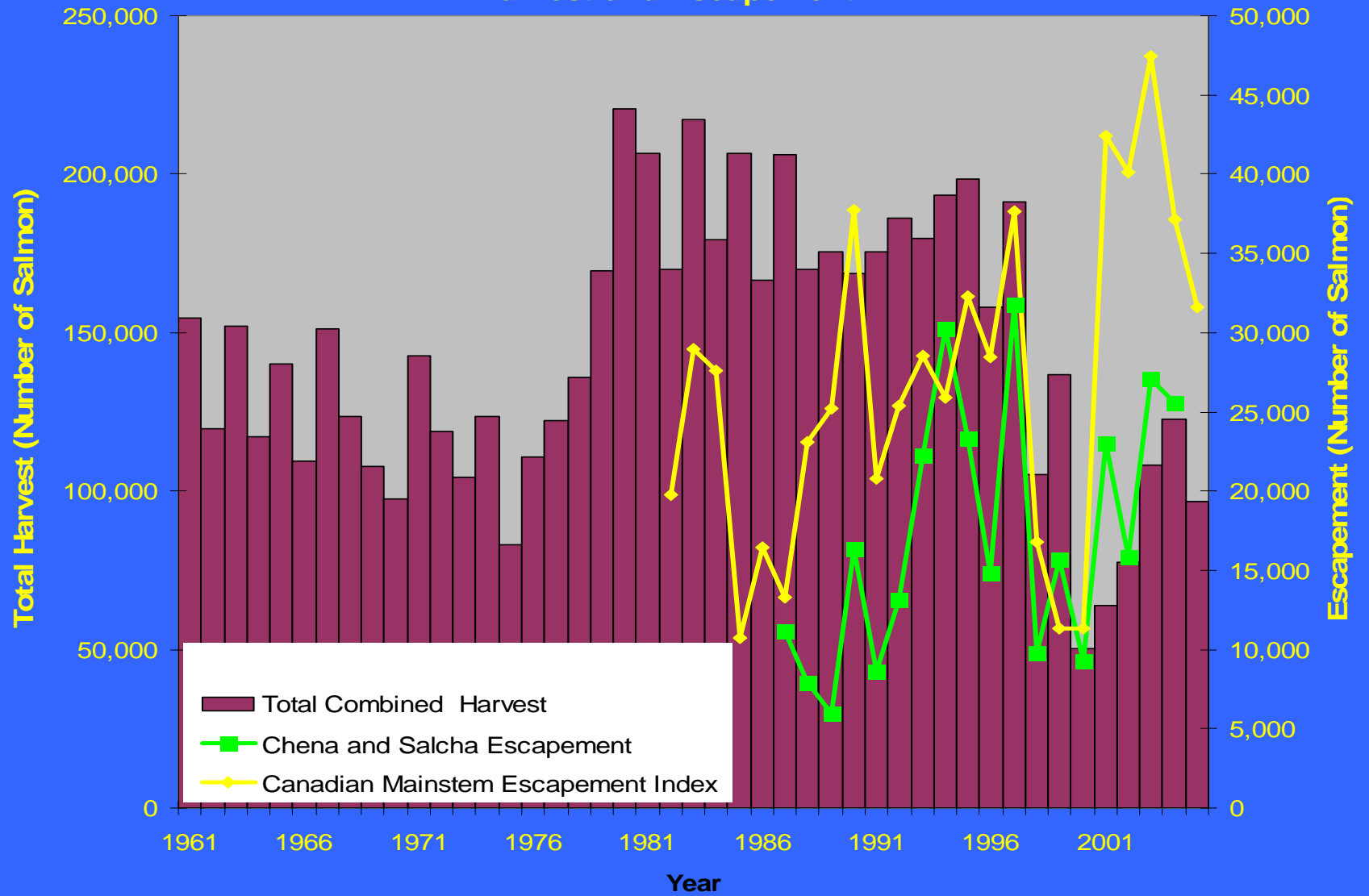
- Pilot Station Sonar (mainstem assessment)
- Set net test fishery at Emmonak
- Subsistence reports
- YRDFA Teleconferences
- Commercial fisheries, if open

## Escapement Projects

- Chena and Salcha Towers/Aerial Sursveys
- U.S./Canada Border Passage



## Yukon River Chinook Salmon Harvest and Escapement



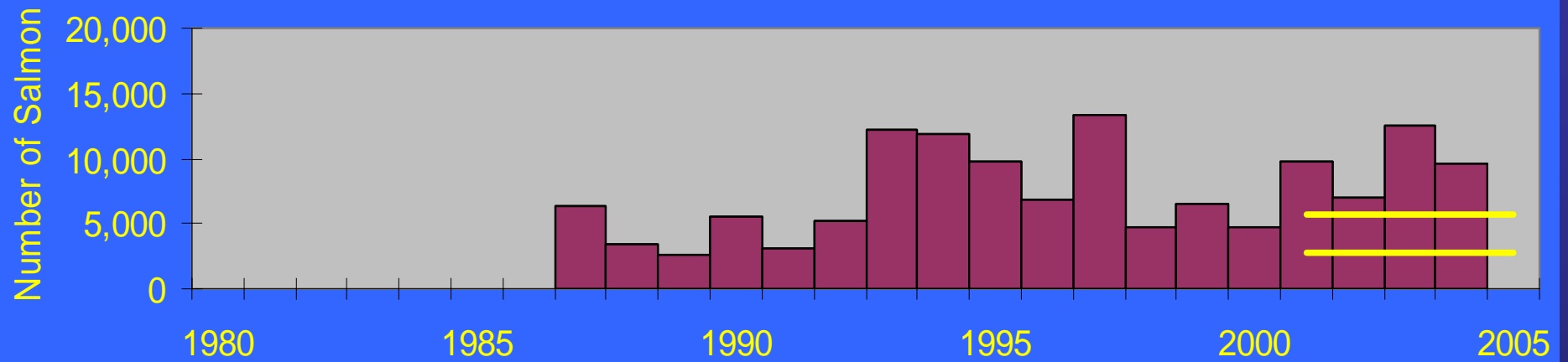
# 2005 US Chinook Harvest Summary

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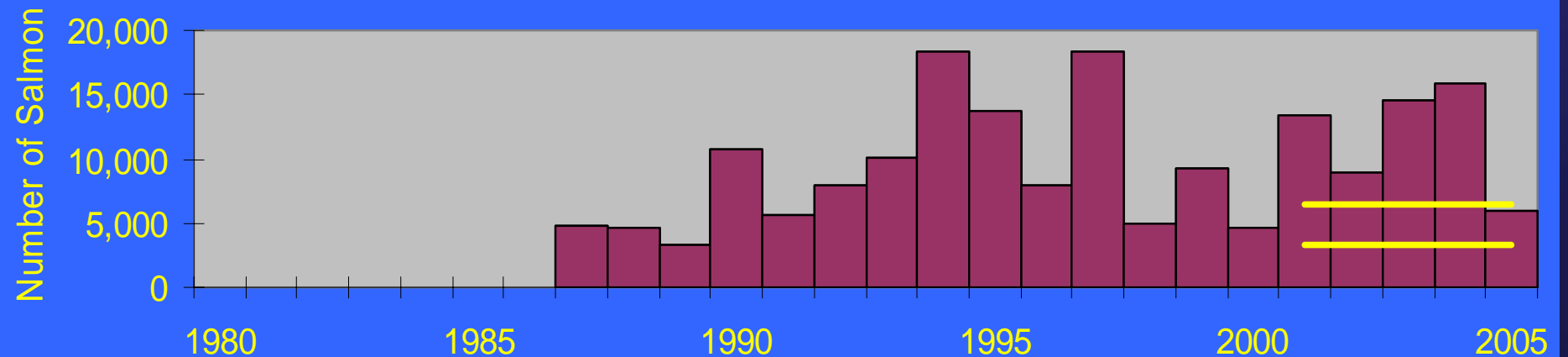
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- Commercial Harvest = 32,000
  - Recent 10 - year avg = 68,450 Chinook  
(not including 2001)
  - 53% below most recent avg
- Subsistence Harvest = 53,300
- Total US Harvest = 85,700

## Chena River Chinook Salmon Escapement (tower counts)

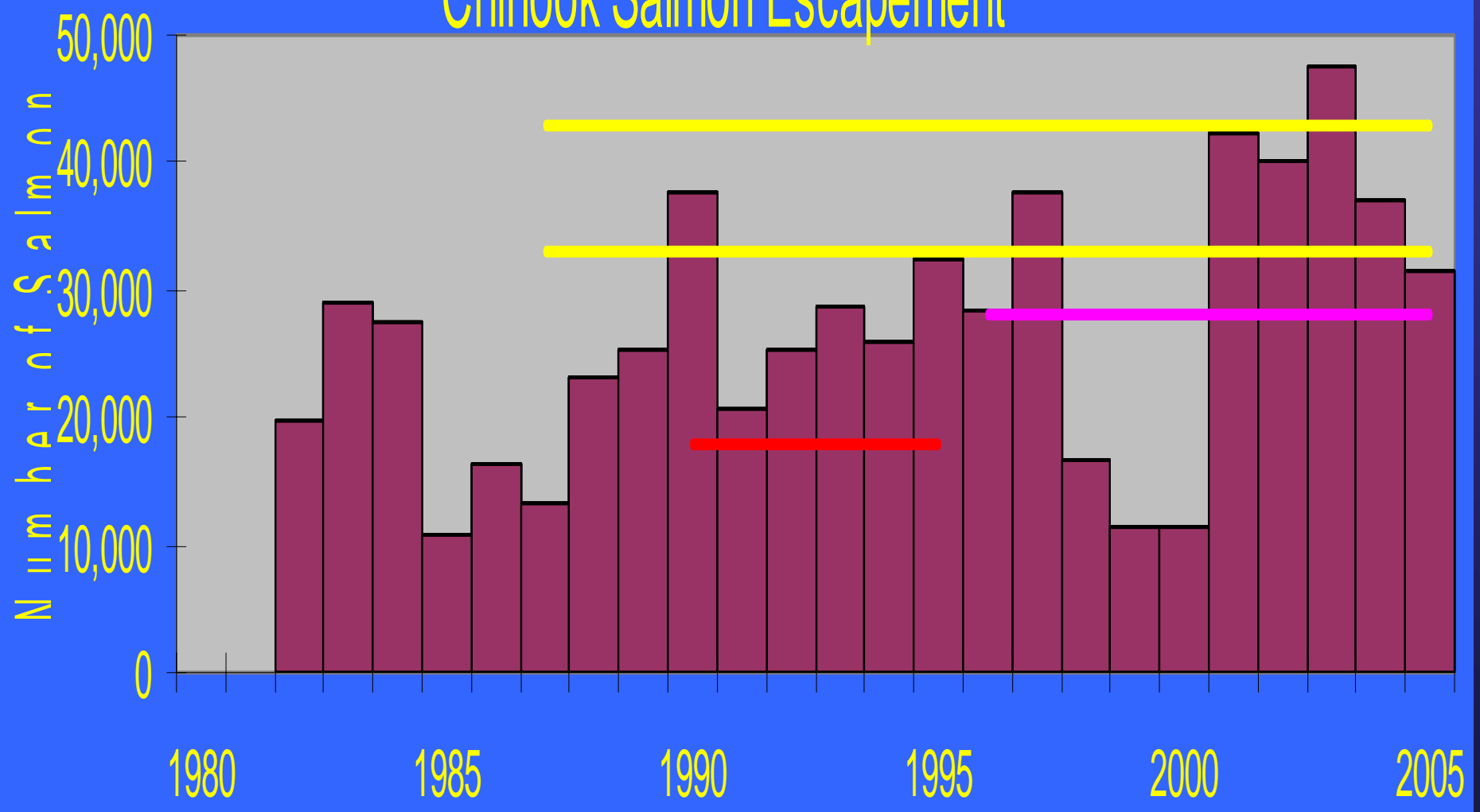


## Salcha River Chinook Salmon Escapement (tower counts)





# Yukon River Canadian-origin Chinook Salmon Escapement



# **Chinook Salmon Stock Status Summary**

- **Poor runs of 1998-2001 from good escapements**
- **Escapement goals met and runs improved starting in 2001**
- **Outlook for continued improvement**
  
- **Subsistence Harvest Steady**
- **Commercial Harvest Reduced**
- **Overall Yield Decrease since 1998**
- **Continued Yield Concern**
- **Continued Conservative Management**

# US Chinook Value Summary

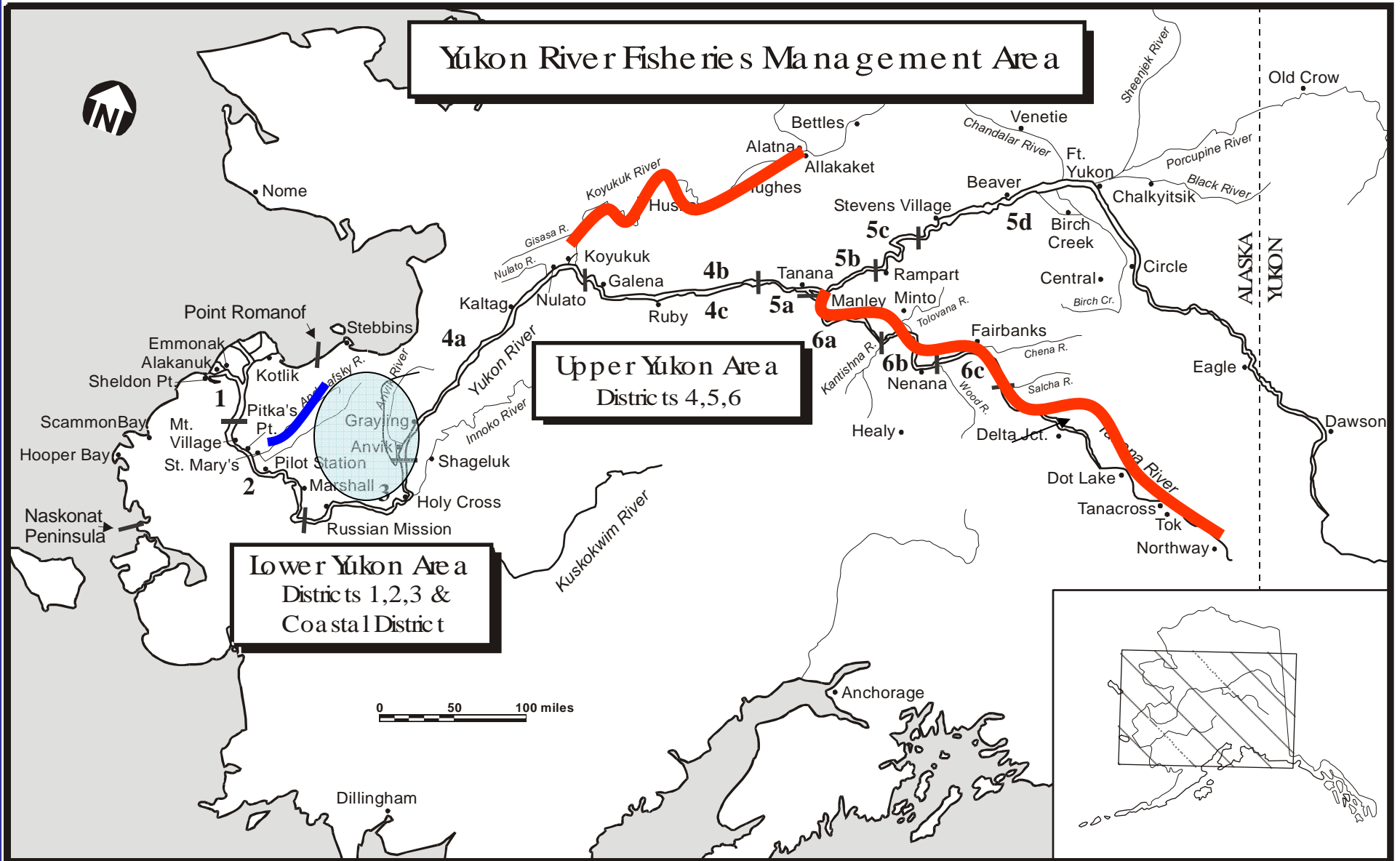
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- 2.0 Million - Commercial Value
  - Recent 10 - year - average = 3.5 Million  
(not including '00 and '01)
  - 48% below recent average

# Yukon River Summer Chum Salmon Stock Status and Management



**Alaska Department of Fish and  
Game**



Alaska portion of the Yukon River drainage showing communities and fishing districts.

# Run Assessment Tools

## Run Index tools

- Pilot Station Sonar (mainstem assessment)
- Drift net test fishery at Emmonak
- Subsistence reports
- YRDFA Teleconferences
- Commercial fisheries, if open

## Escapement Projects

- Weirs and Towers
- Anvik River sonar

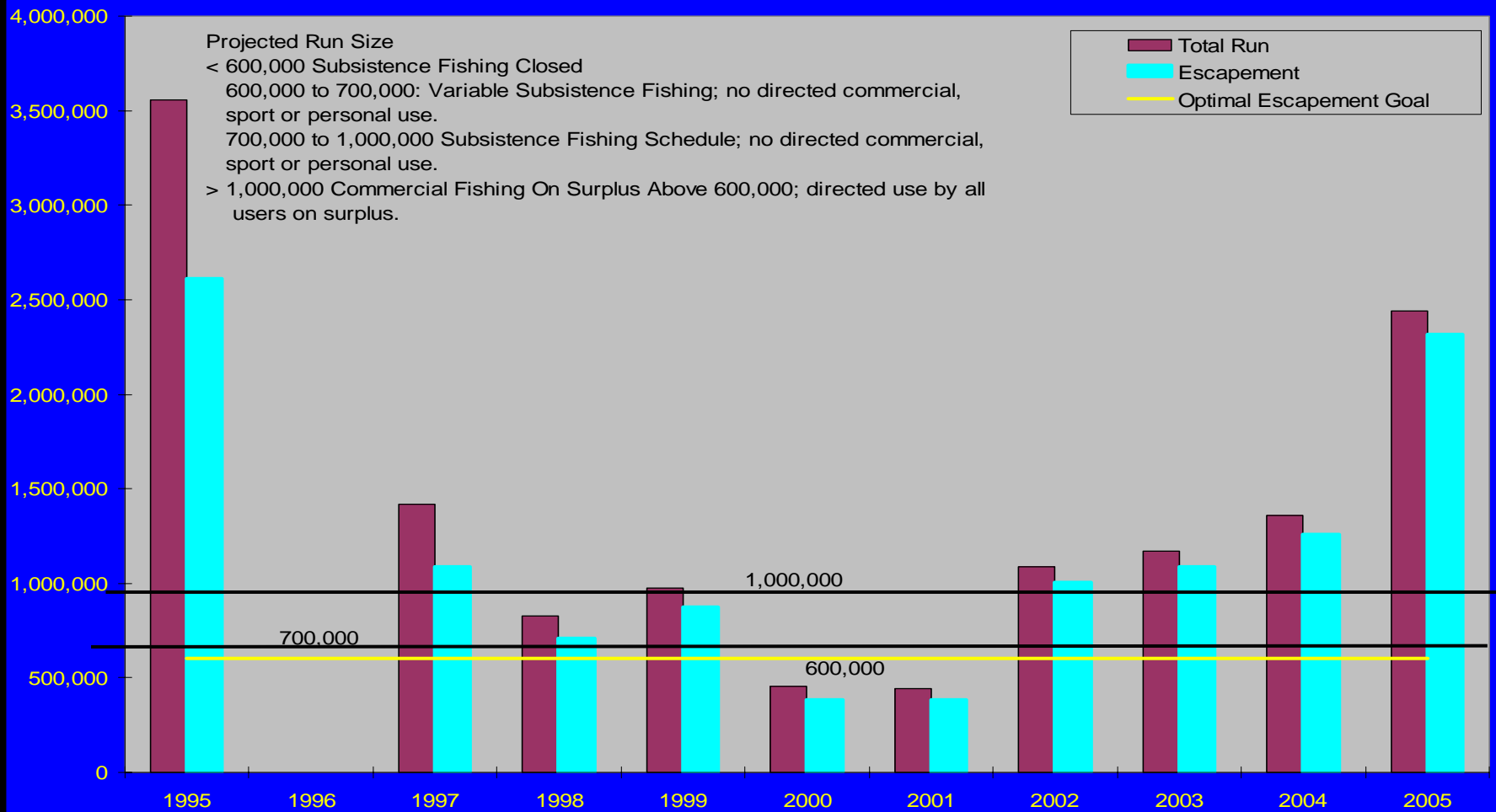


# Stock Assessment Background

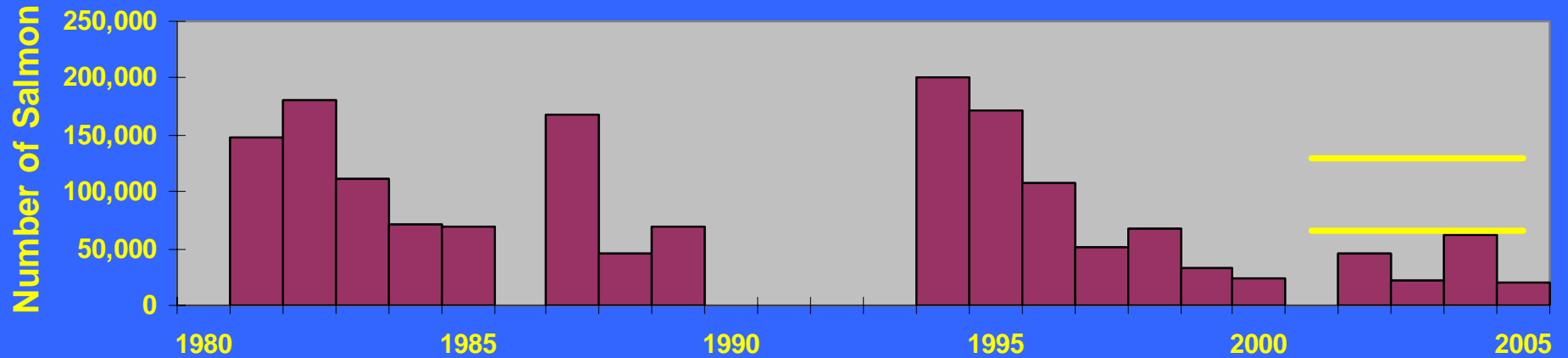
- **Escapement Goals**
- **Anvik River (sonar based index)**
- **Andreafsky River (sonar, tower, and weir based estimate)**

# Yukon River Drainage Summer Chum Salmon Management Plan

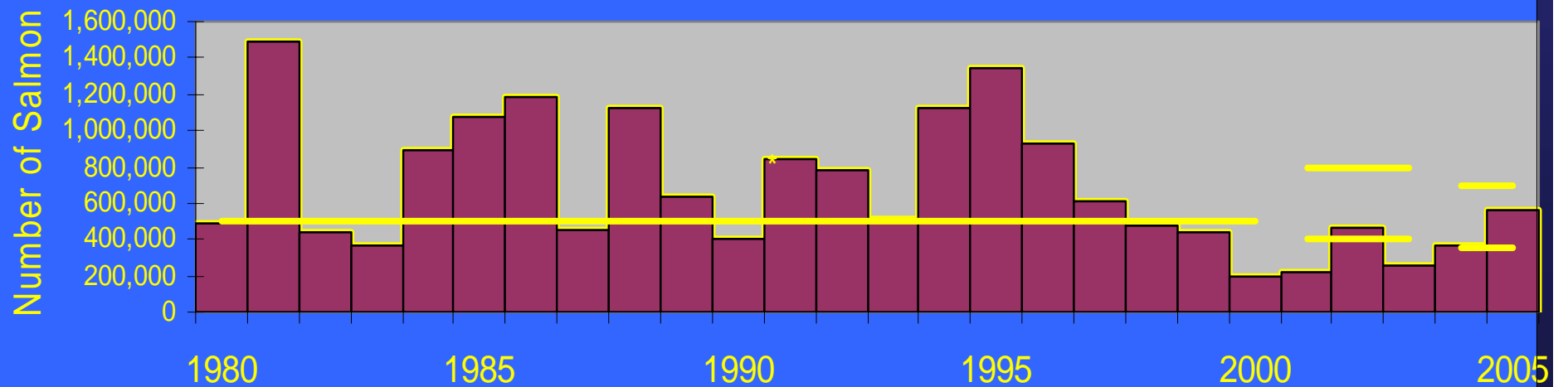
## *Total Run Size and Escapement*



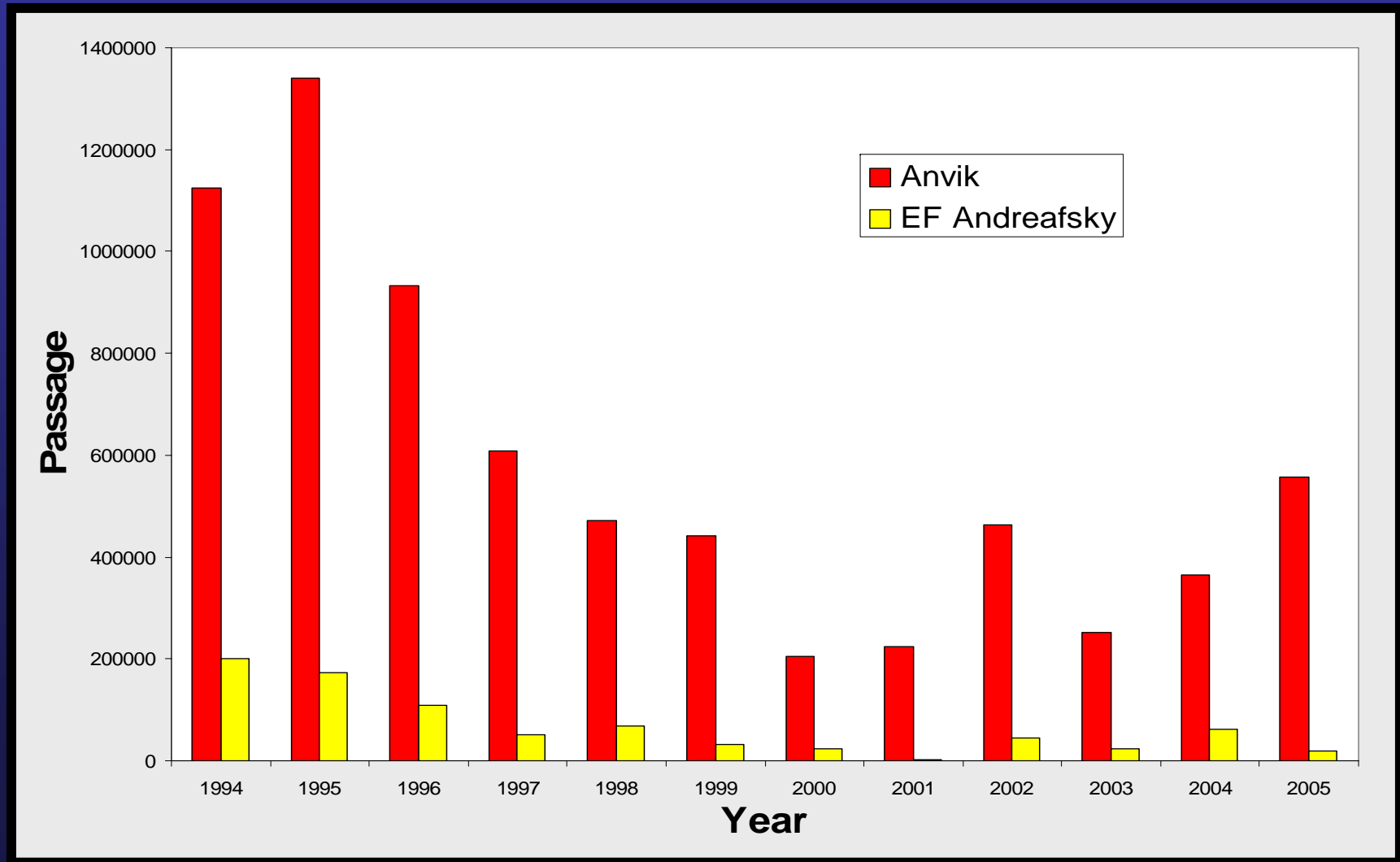
## Andreafsky River Summer Chum Salmon Escapement 1981 - 2005



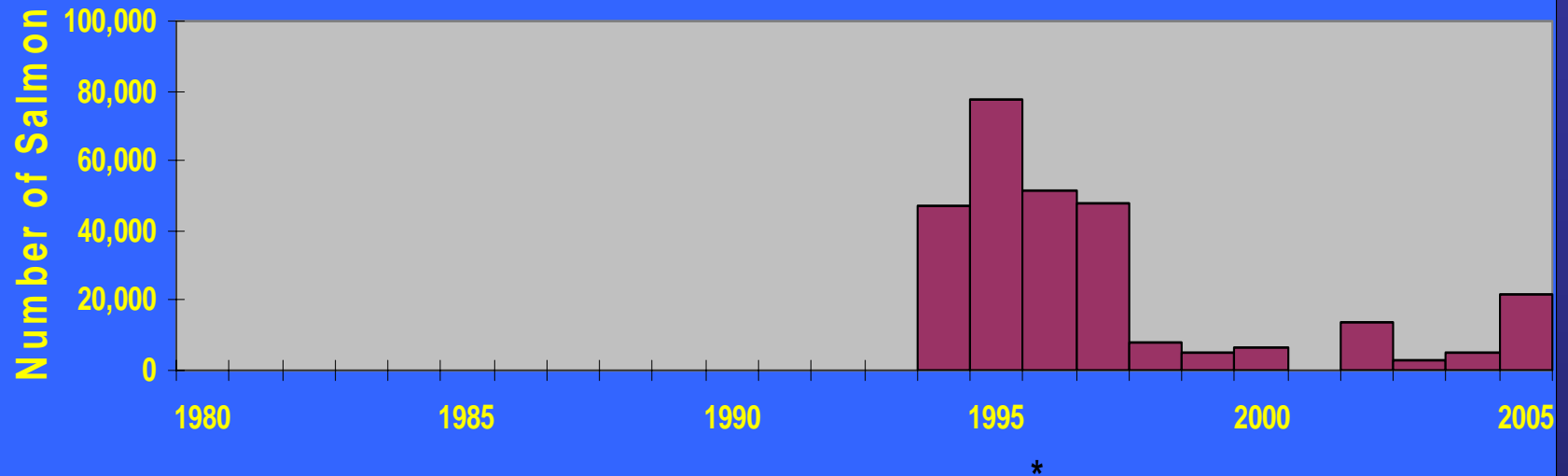
## Anvik River Summer Chum Salmon Escapement 1980-2005



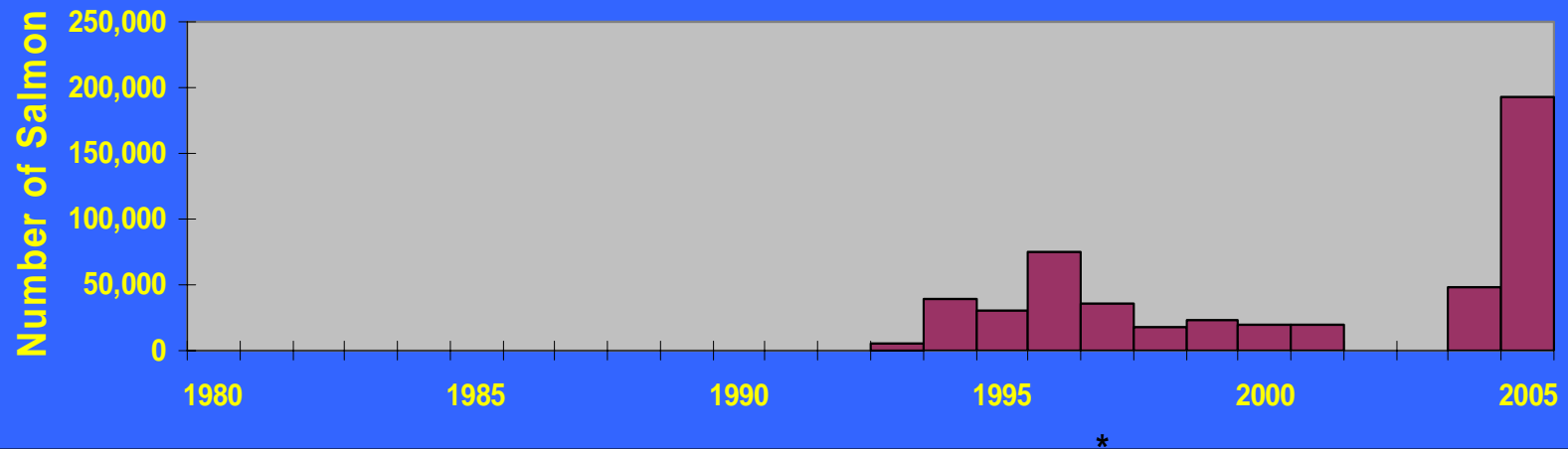
# Observed Declines in Lower River Summer Chum Escapement



## Kaltag Creek Summer Chum Salmon Escapement 1994 - 2005



## Salcha River Summer Chum Salmon Escapement 1994 - 2005



# 2005 Summer Chum Stock Status Summary

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- Total run estimate passed Pilot Station sonar was 2.4 Million
- Drainage wide maximum escapement objective for the Yukon River, 1,200,000, based on the Pilot station sonar project, was exceeded.
- Total run abundance shows continued improvement but lower production in Lower River Tributaries
- Harvests are below anticipated because of poor commercial markets



# 2005 Summer Chum Harvest Summary

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- Commercial Harvest = 41,264
  - Recent 10 - year - average = 204,198
  - (not including 2001)
  - 80% below Recent 10 - year - average
- Subsistence Harvest = 85,823
- Total US Harvest = 127,373

# Summer Chum Value Summary

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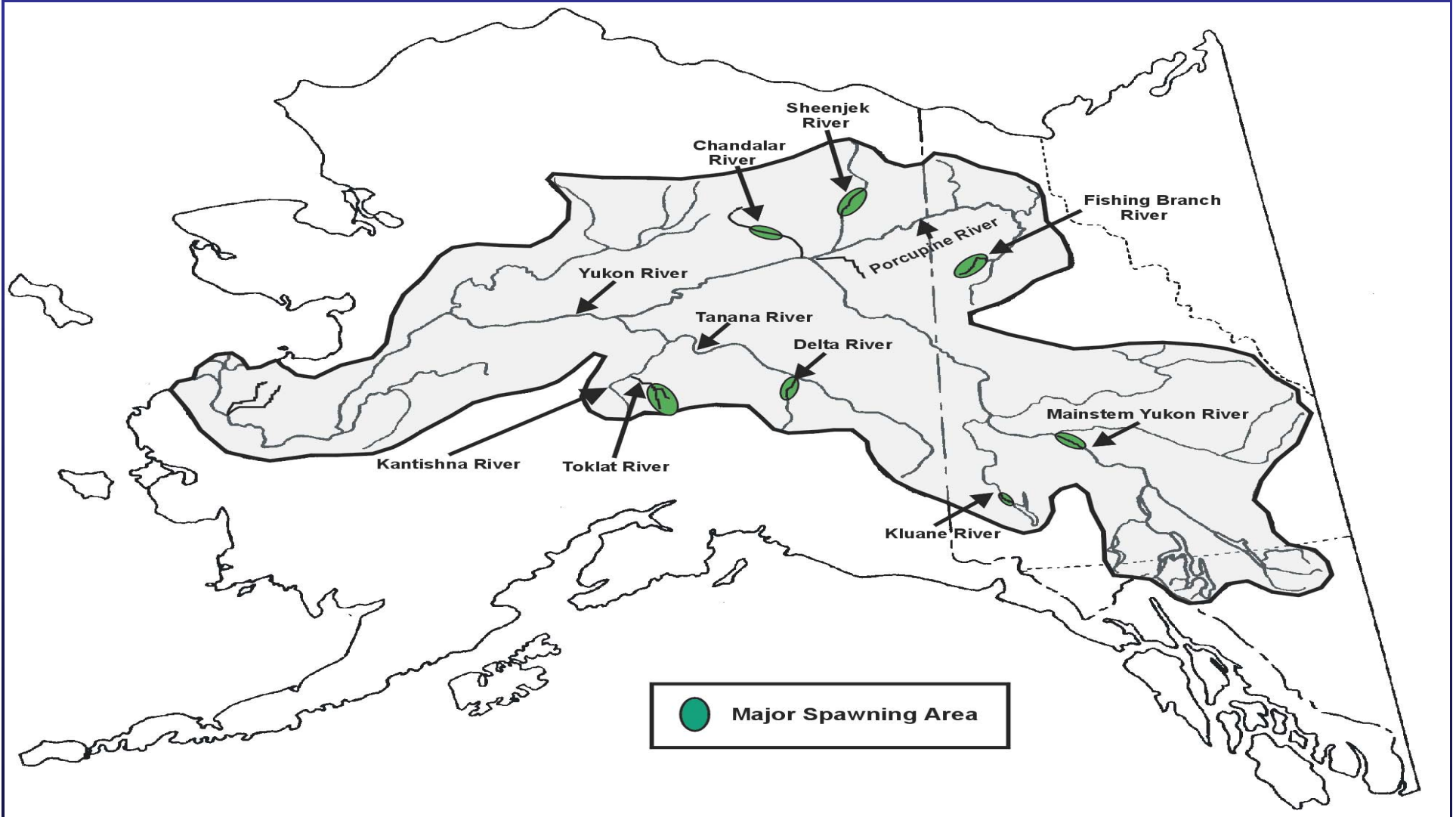
- \$25,000 - Commercial Value
  - Recent 10 - year - avg = 325,000 (not including '00 or '01)
  - 92% below recent average

# Yukon River Fall Chum Salmon Stock Status and Management



**Alaska Department of Fish and  
Game**

# Map of Major Fall Chum Salmon Spawning Areas

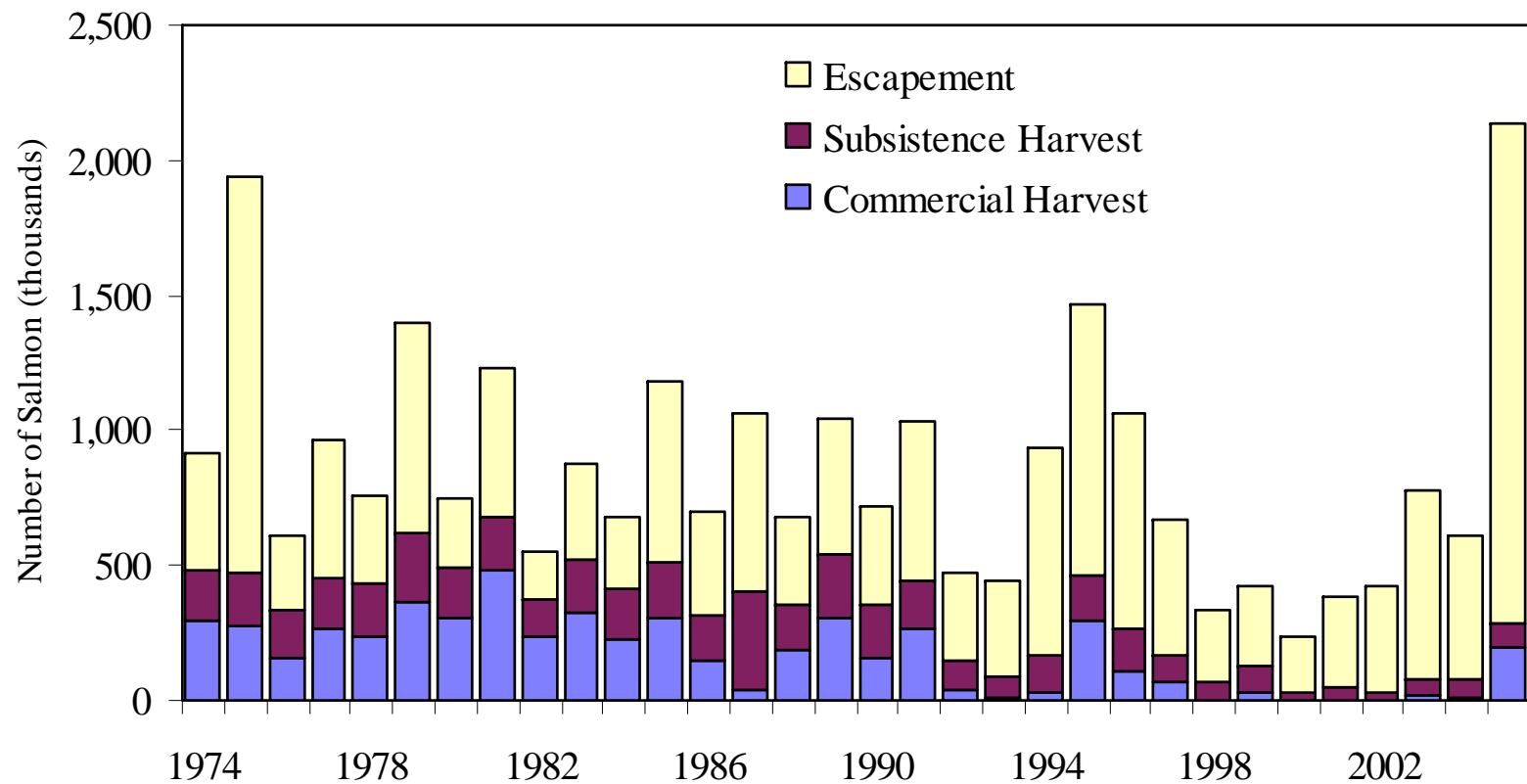


# Fall Chum Stock Status

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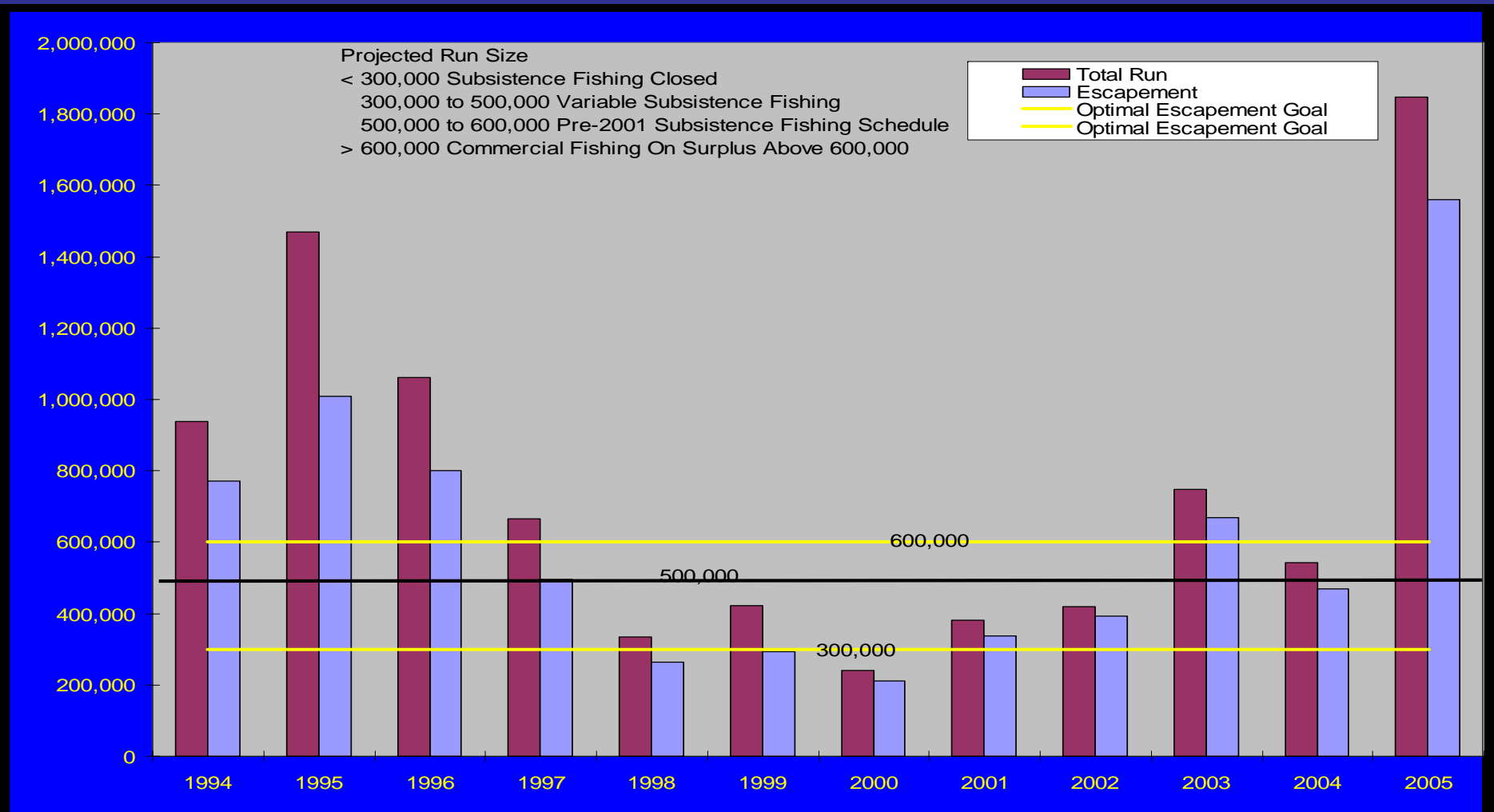
- Yukon fall chum - classified as a “Yield Concern” since September 2000 by the Alaska Board of Fisheries.
- Management regulations developed to benefit subsistence opportunity and to rebuild stocks.
- Fall chum production is improving.

# Estimated Fall Chum Salmon Abundance Yukon River 1974 to 2005



# Yukon River Drainage Fall Chum Salmon Management Plan

## *Total Run Size and Escapement*

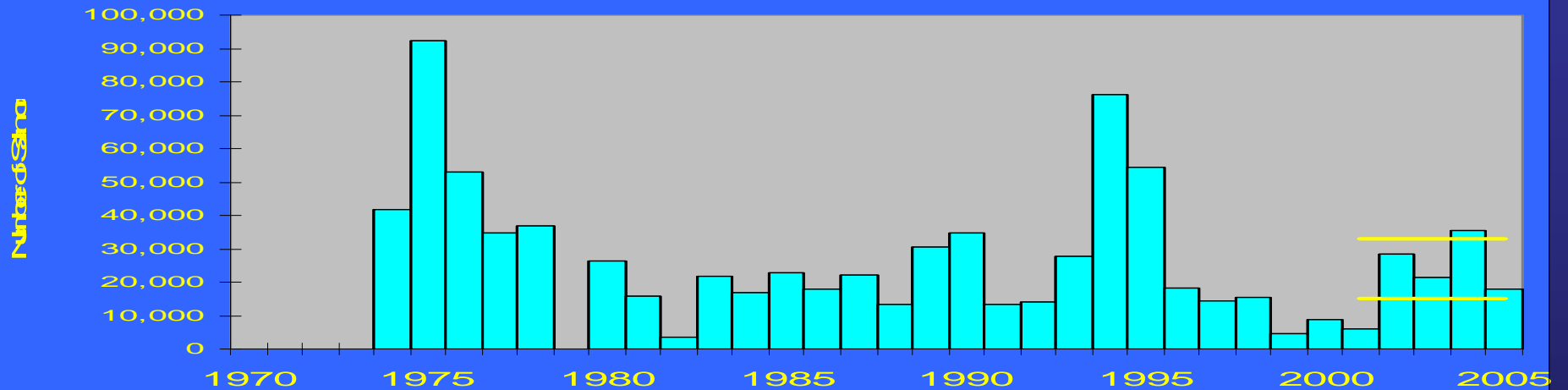




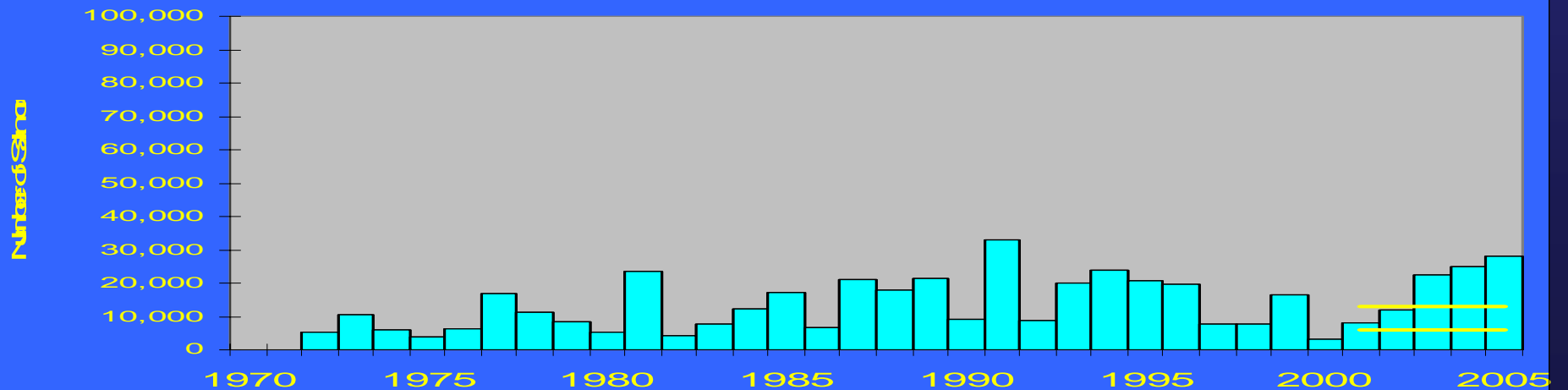


# Yukon River Fall Chum Salmon Tanana River Tributaries

## Toklat River Fall Chum Salmon Escapement

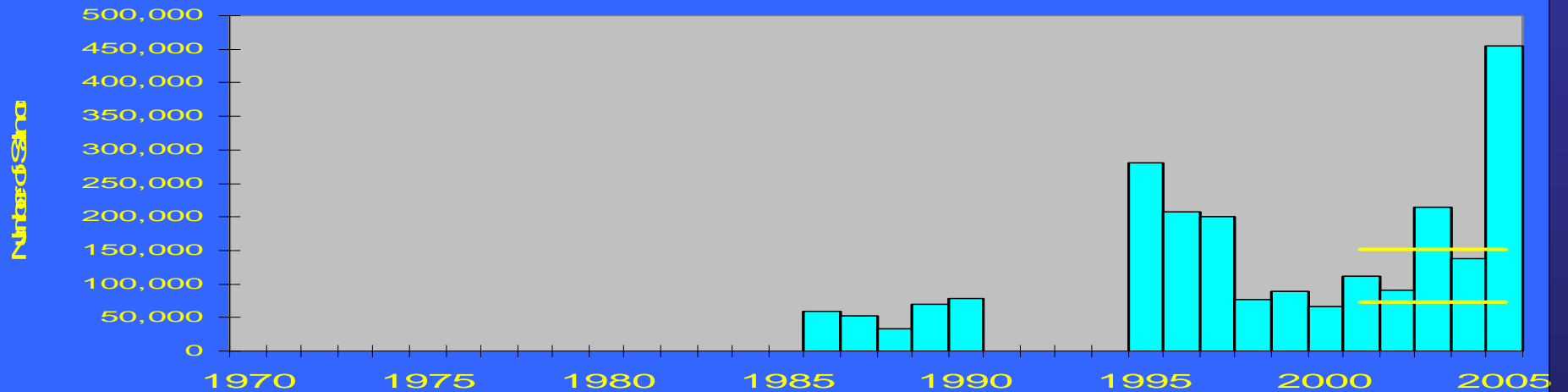


## Delta River Fall Chum Salmon Escapement

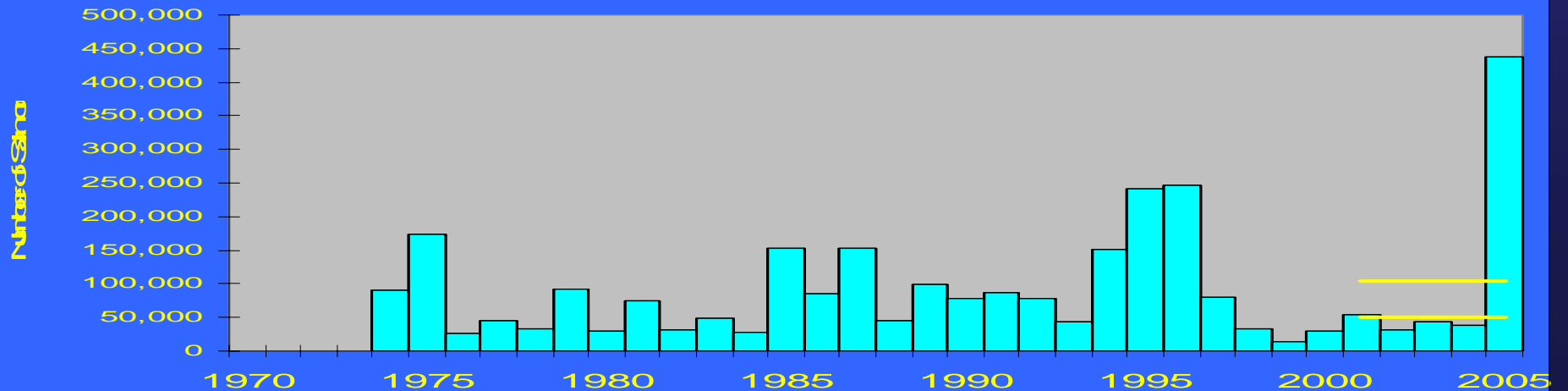


# Yukon River Fall Chum Salmon Upper Yukon River Tributaries

## Chandalar River Fall Chum Salmon Escapement

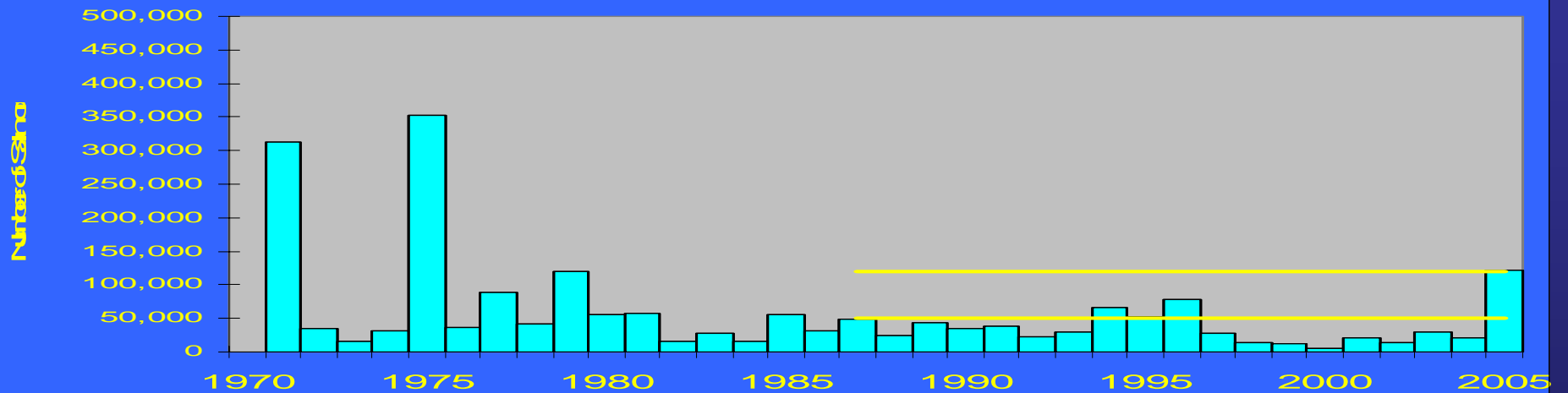


## Sheenjek River Fall Chum Salmon Escapement

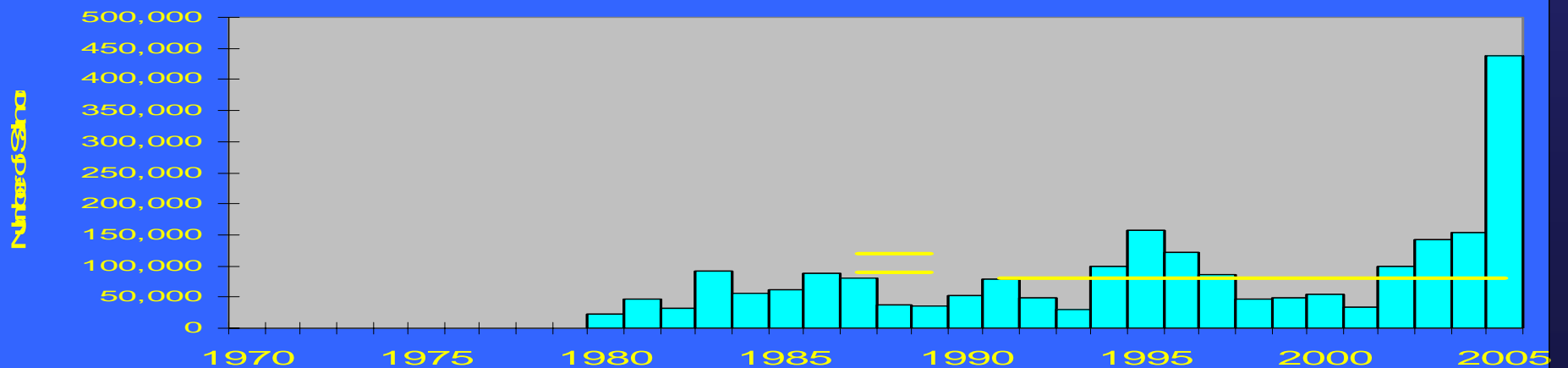


# Yukon River Fall Chum Salmon Canadian-origin Salmon

## Fishing Branch River Fall Chum Salmon Escapement



## Mainstem Yukon River in Canada Fall Chum Salmon Escapement



# Fall Chum Salmon Stock Status Summary

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- Strong parent year escapements in 1994 to 1998 produced poor returns from 1998 to 2002.
- Poor parent year escapements in 1999, and 2000 produced strong run in 2003 and 2004.
- Poor parent year escapement in 2001 produced a record run in 2005 (R/S >8.0)
- Commercial harvest nearly eliminated since 1997.
- Subsistence opportunity severely restricted to attempt to meet escapement goals.
- Significant opportunity was forgone in 2003 because of conservative management.
- Harvest in 2005 was the highest since 1995.
- Outlook is optimistic the run in 2006 will provide sufficient abundance for most subsistence needs and possibly a small commercial harvest.

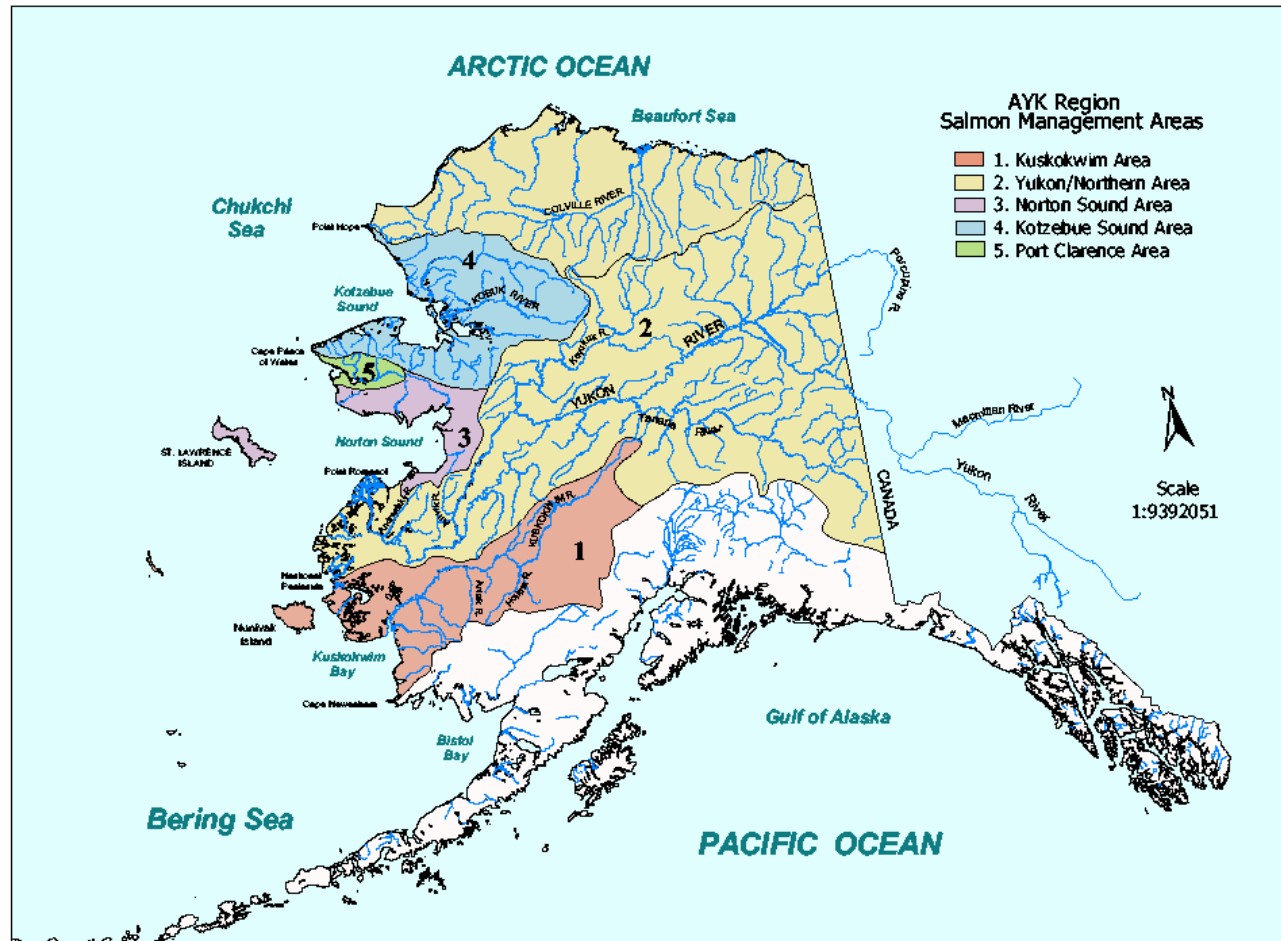
# Norton Sound, Port Clarence, and Kotzebue Areas



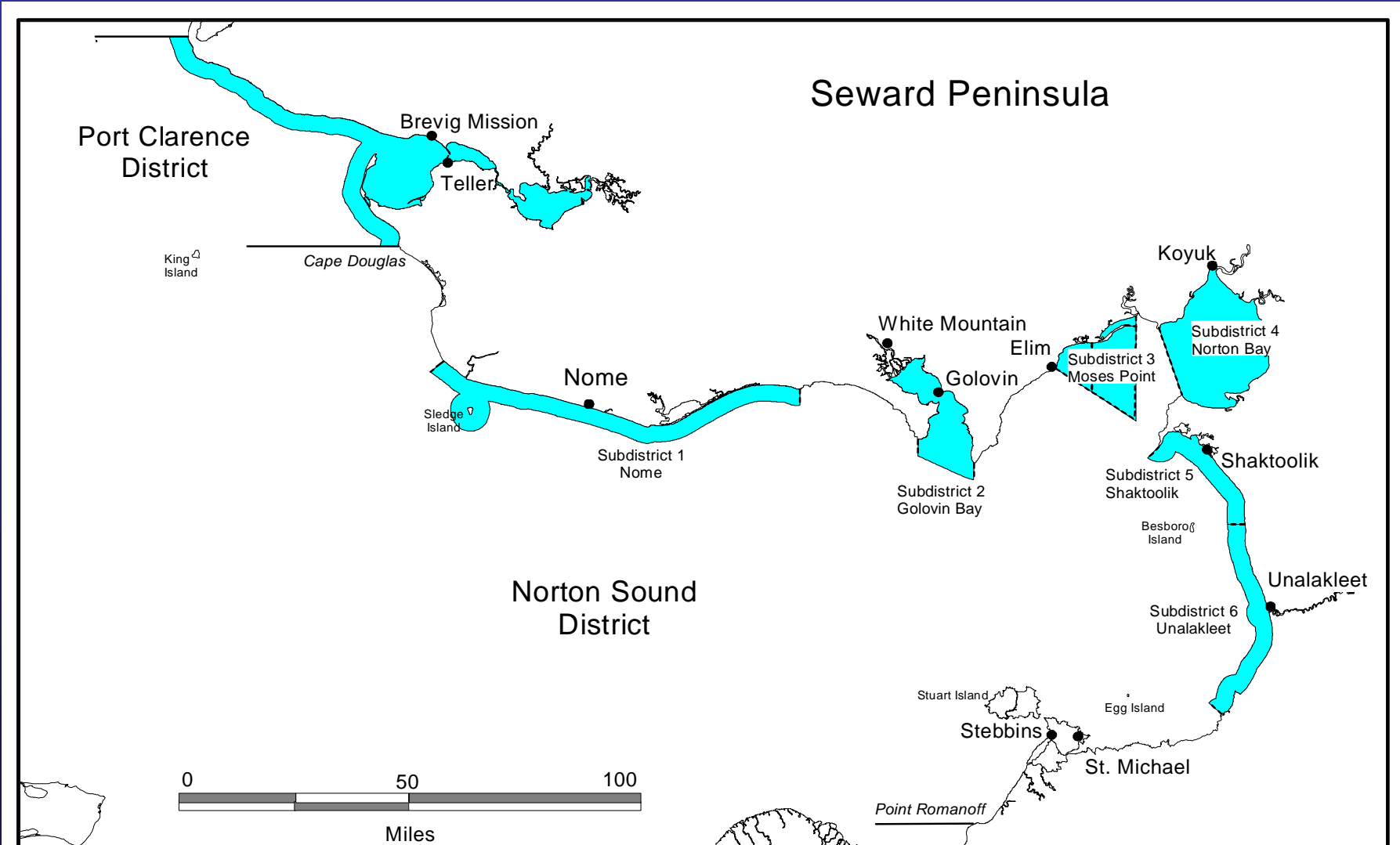
**Alaska Department of Fish and  
Game**

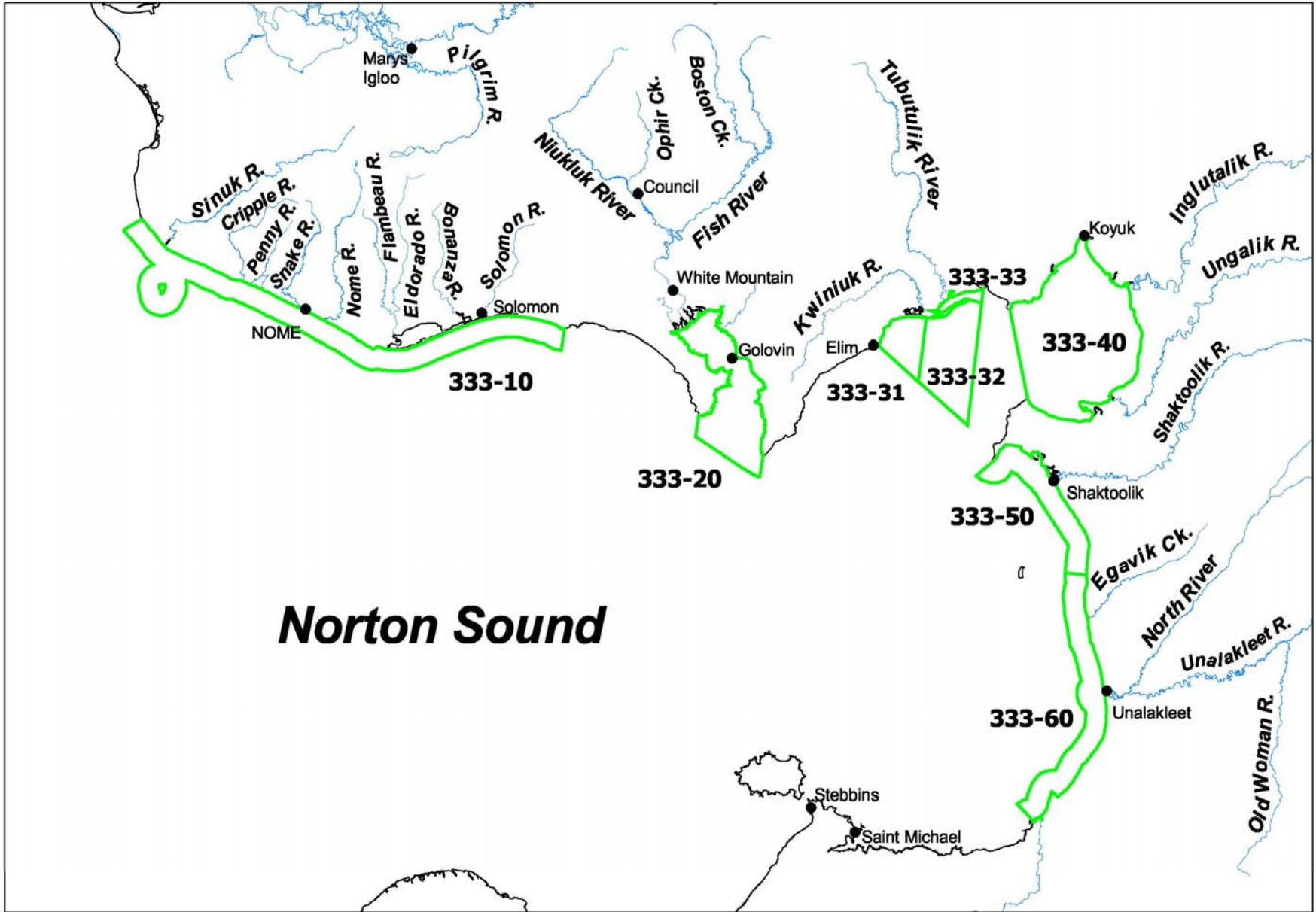


# AYK Region



# Norton Sound and Port Clarence commercial salmon fishing districts and subdistricts.





# Norton Sound Salmon Stocks and Alaska Board of Fisheries Stocks of Concern

## Chum Salmon Stocks of Concern

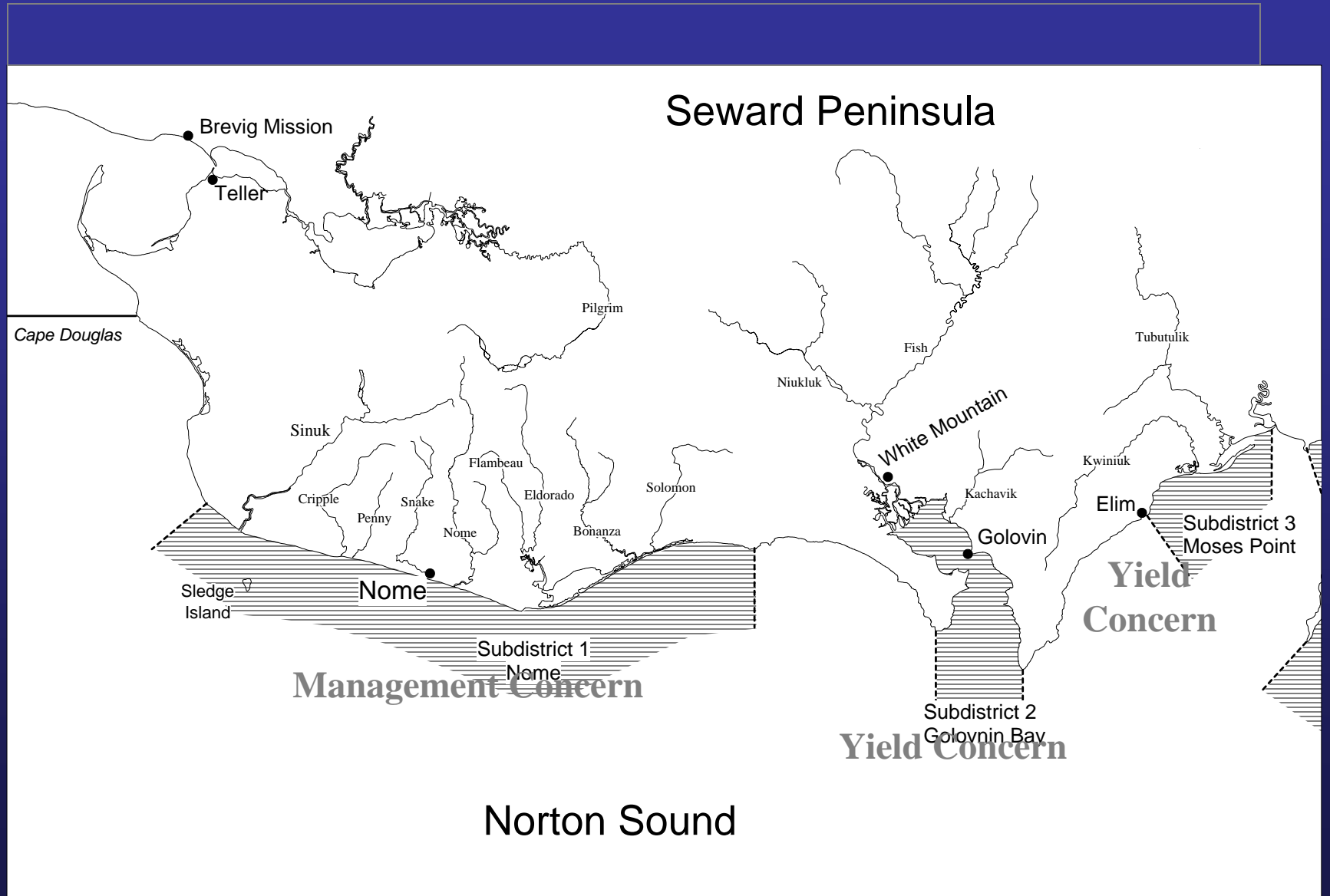
- **Yield concern** – Subdistricts 2 and 3 (Golovin and Moses Point)
- **Management concern** – Subdistrict 1 (Nome)

## Chinook Salmon Stocks of Concern

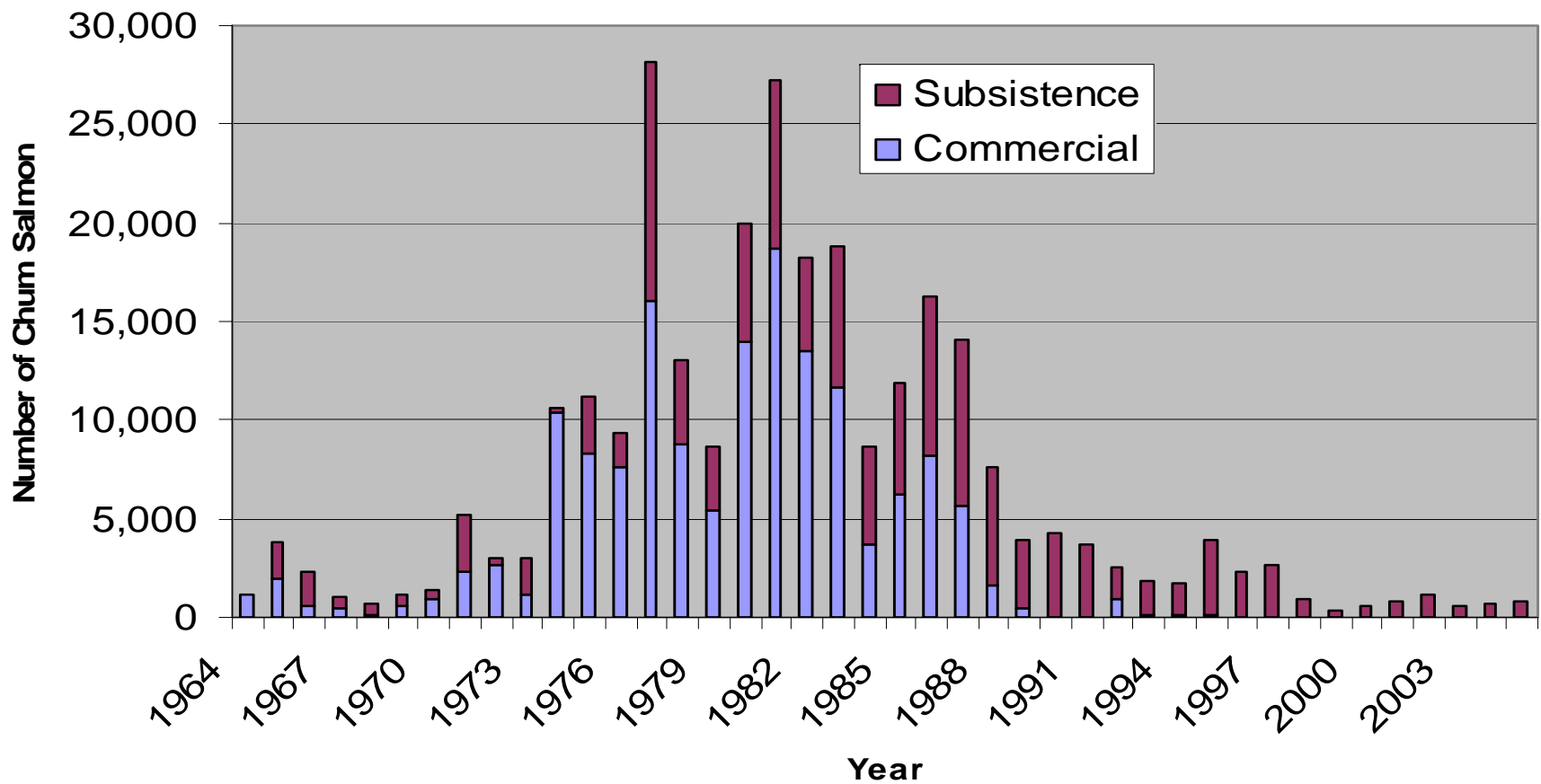
- **Yield Concern** – Subdistricts 5 and 6 (Unalakleet and Shaktoolik)

# Northern Norton Chum Salmon Stocks of Concern

Slide 4

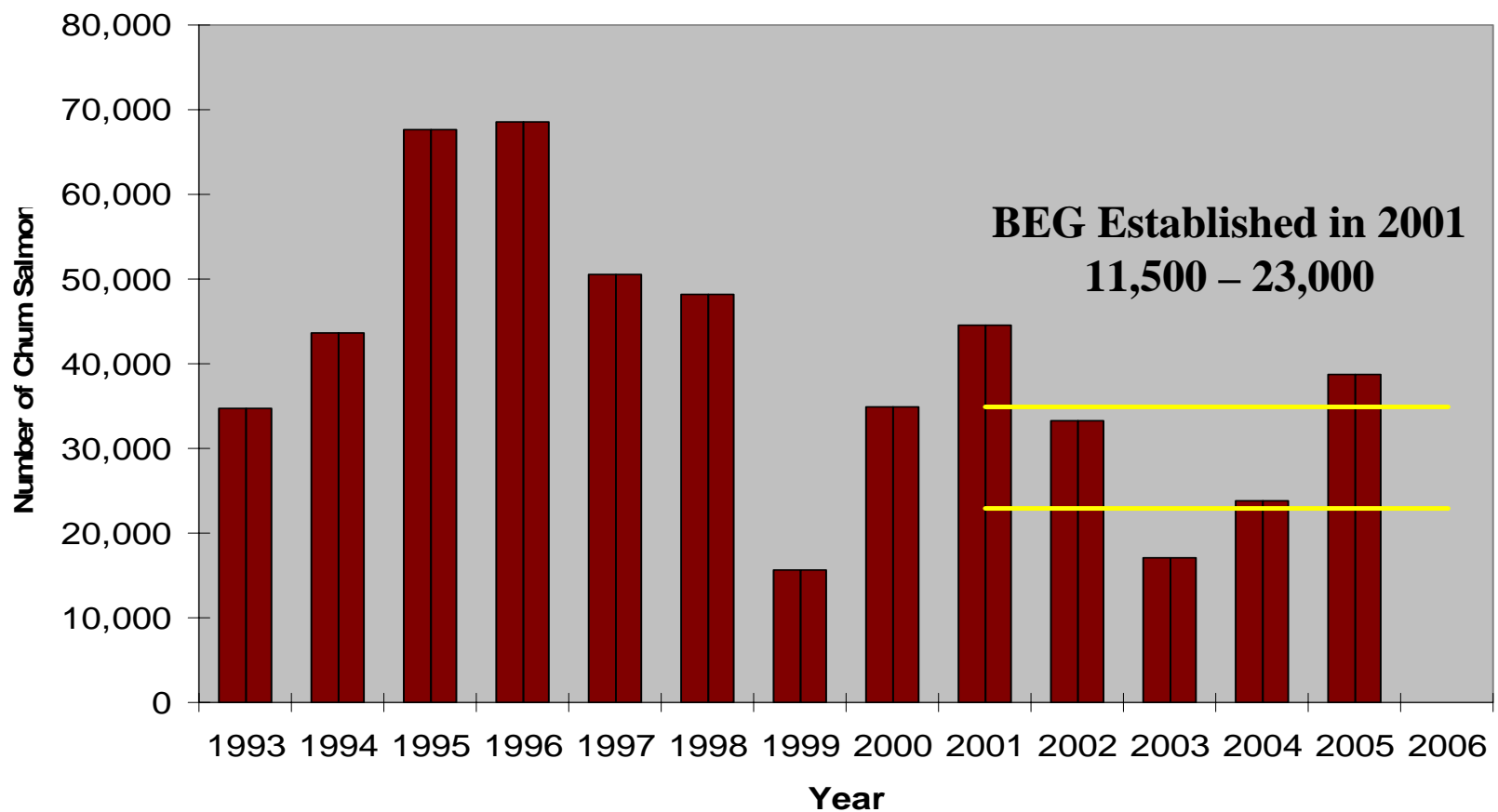


# Subdistrict 1 (Nome) Chum Salmon Commercial and Subsistence Harvest 1961-2005





# Subdistrict 1 (Nome) Subdistrict Chum Salmon Escapement 1993-2005



## **Subdistrict 1 (NOME) Chum Salmon Subsistence Fishery**

- **Intensive management with frequent closures, permits required and bag limits**
- **Established as a Tier II fishery in 1999 by Alaska Board of Fisheries**
- **Amount needed for subsistence (ANS) is 3,430 – 5,716 chum**
- **Because of the failure to provide for ANS classified as Tier II**
- **A Tier II fishery limits the number of people who can fish - permit qualifications are based on applicant's number of years harvesting chum salmon in the Nome area**

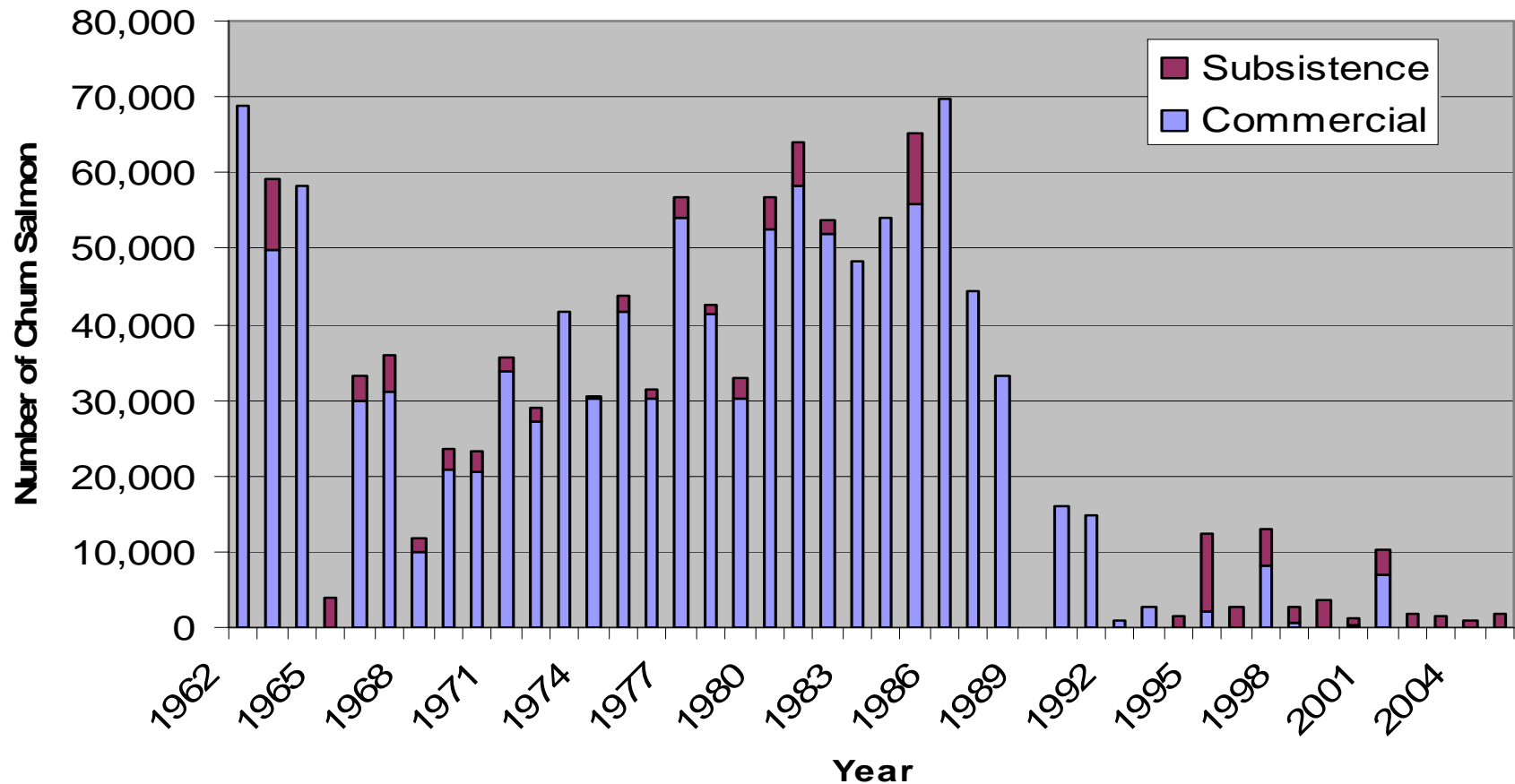
# Subdistricts 2 and 3 Chum Salmon

## Yield Concern

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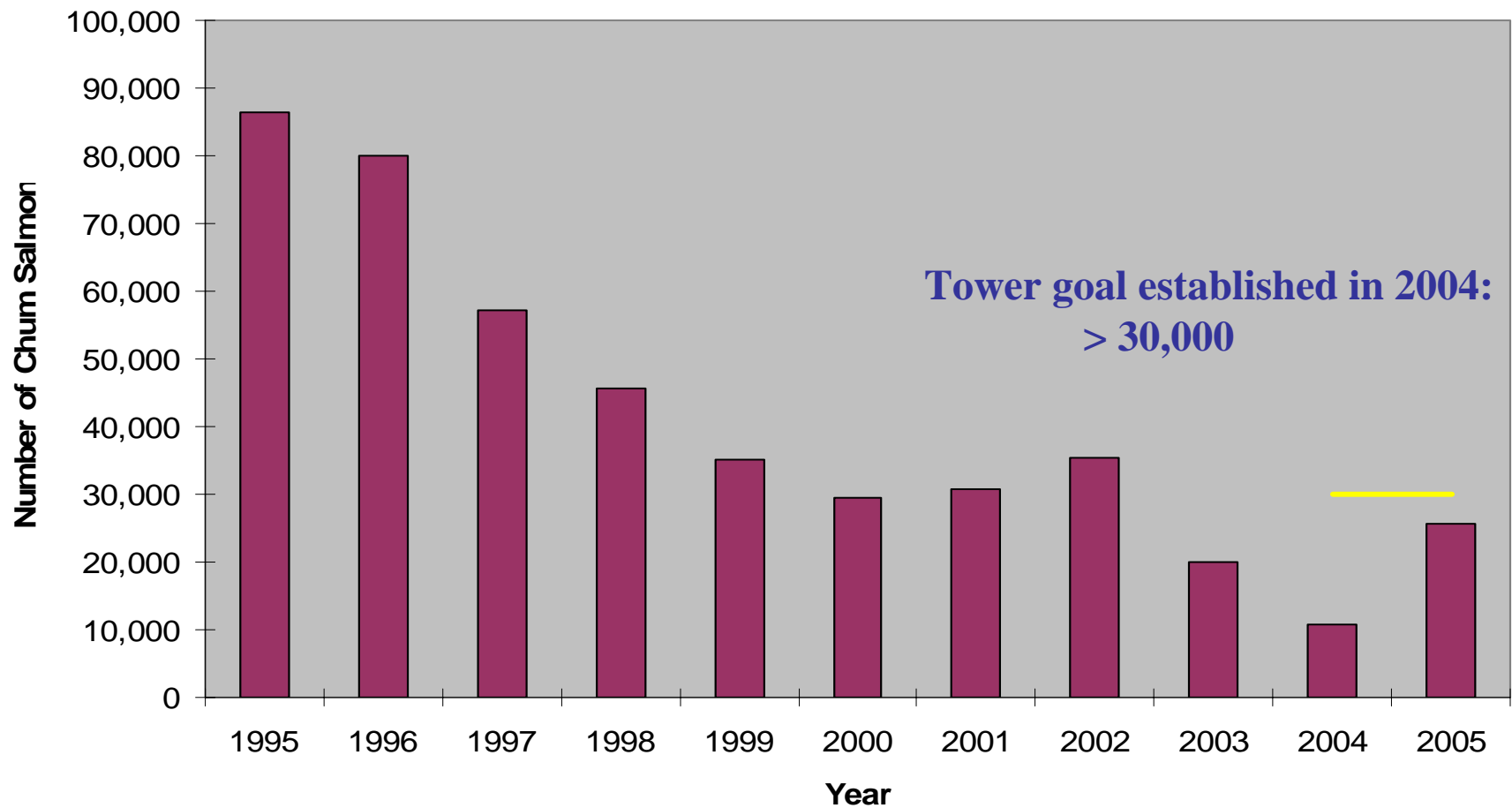
- Continued low and inconsistent yield
- Harvestable surplus well below historical levels

# Subdistrict 2 (Golovin) Commercial & Subsistence Chum Harvest 1961-2004

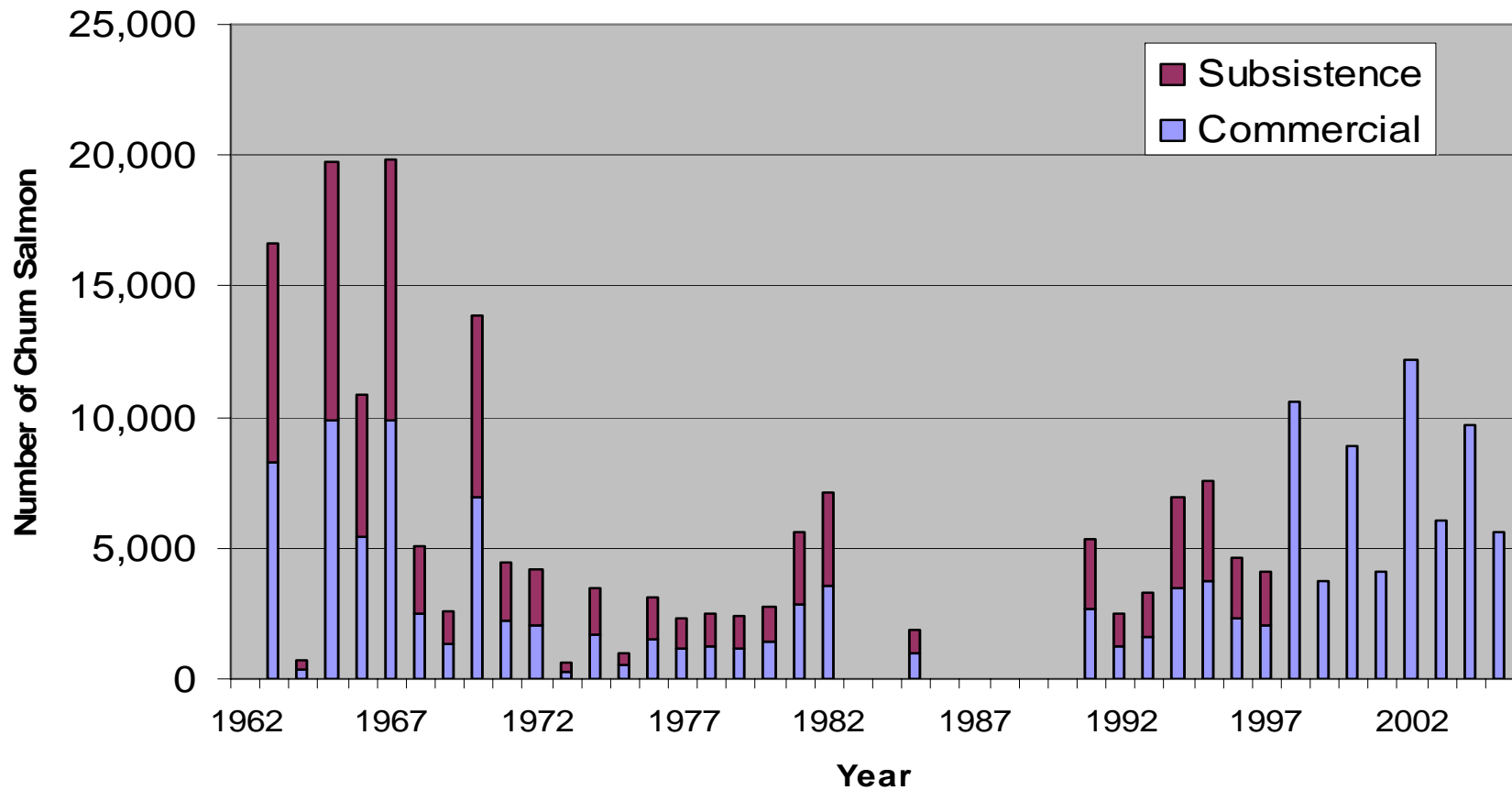


\* Subsistence data not available for all years. 1990s & 2000s subsistence data not comparable with other years.

# Niukluk River (Subdistrict 2) Chum Salmon Escapement 1995-2005

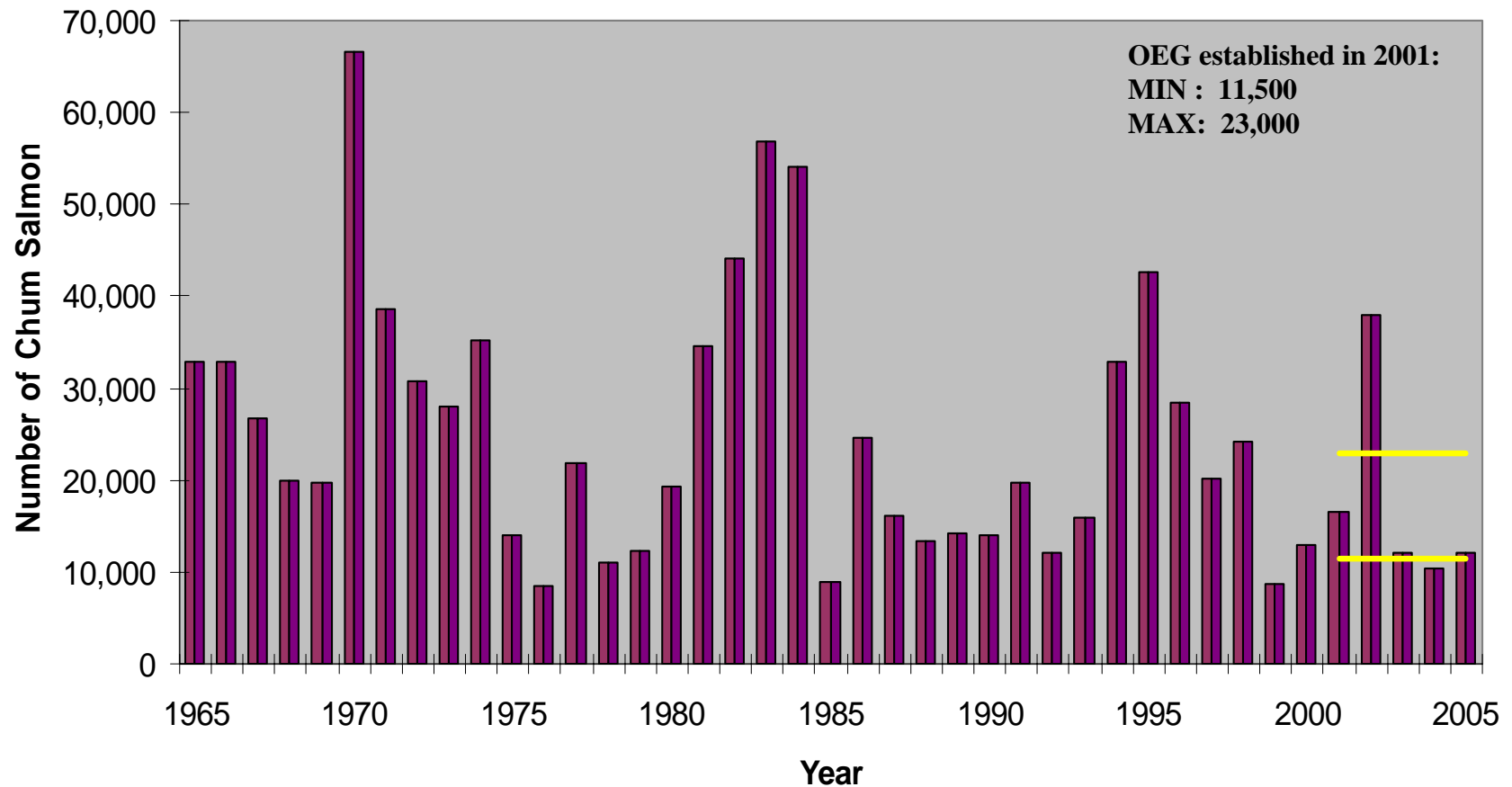


# Subdistrict 3 (Moses Pt.) Commercial & Subsistence Chum Salmon Harvest



\* Subsistence data not available for all years. 1990s and 2000s subsistence data not comparable with other years.

# Kwiniuk River (Subdistrict 3) Chum Salmon Escapement 1965-2005





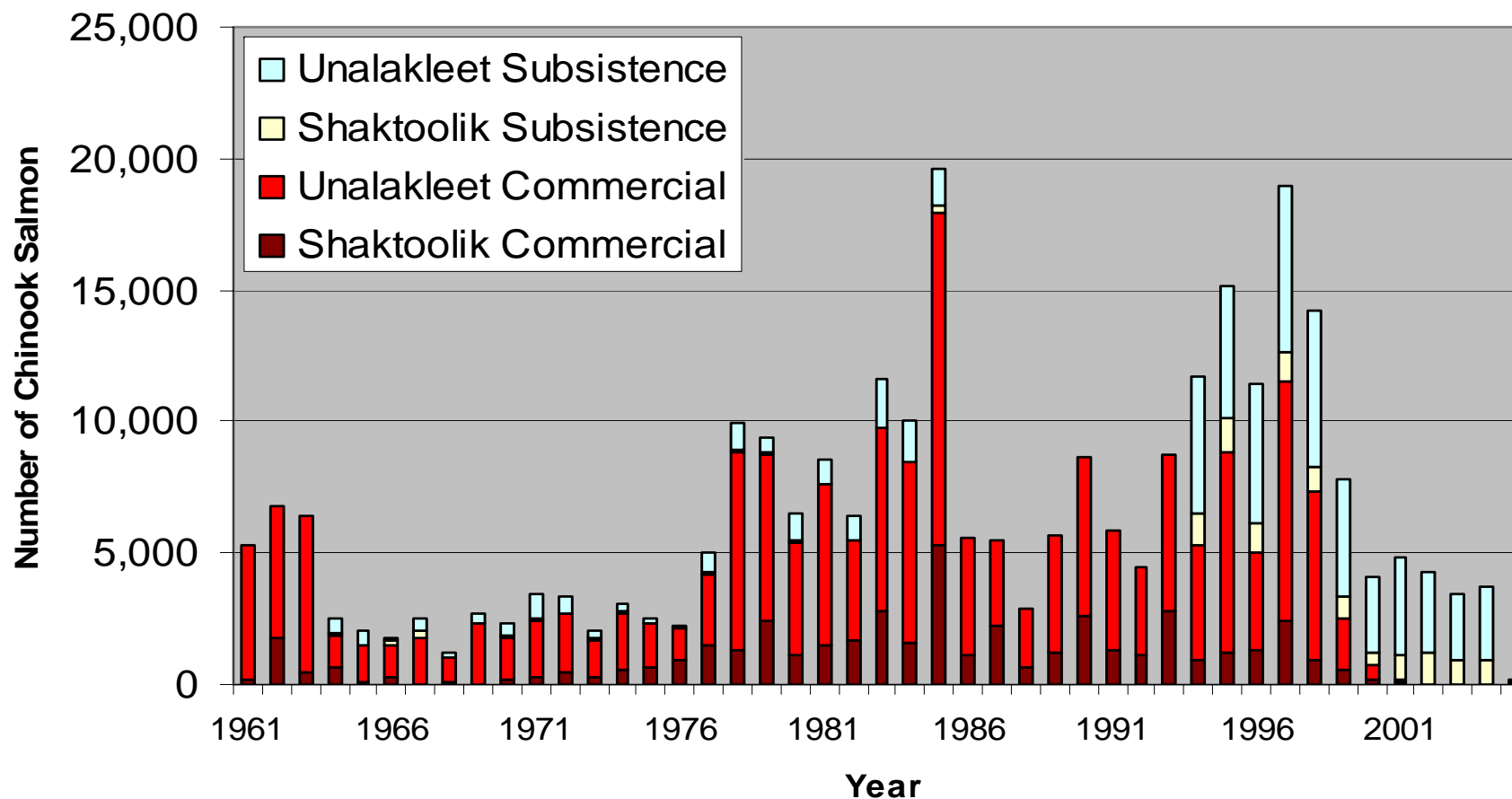
# Subdistricts 5 and 6 Chinook Salmon

## Yield Concern

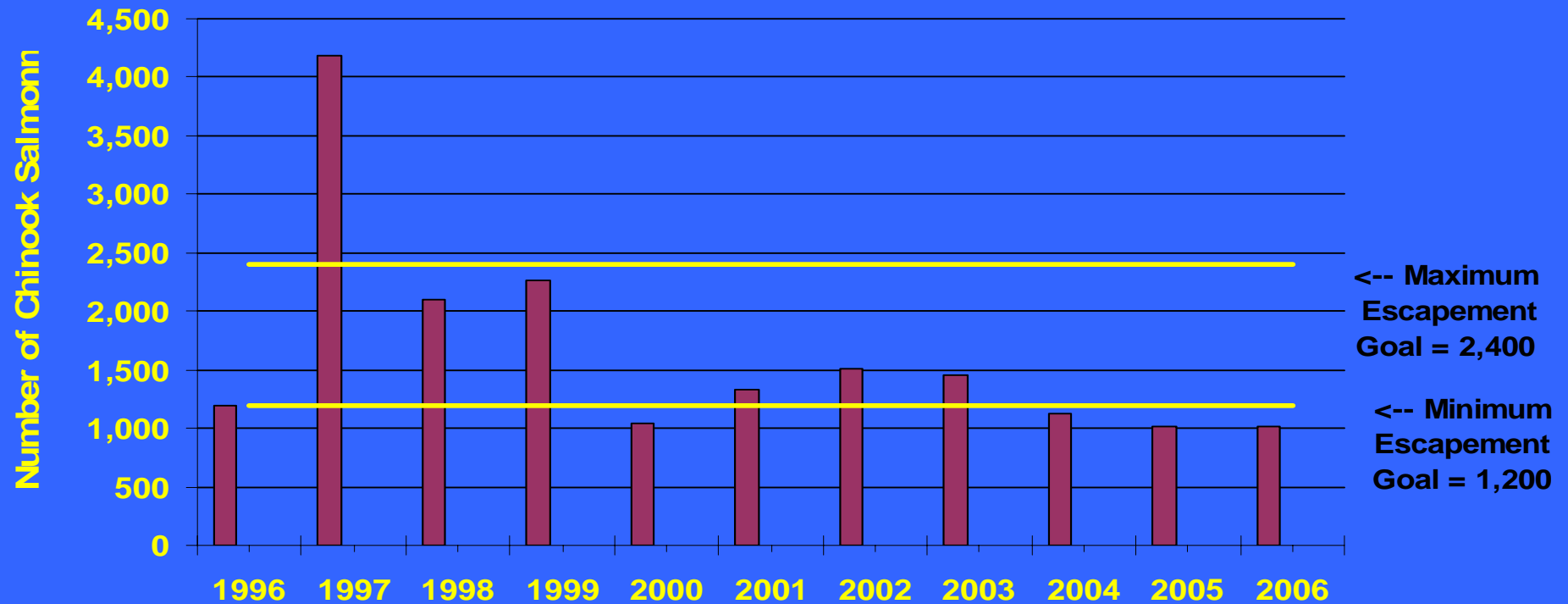
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- North River tower meeting escapement goal in most years
- Average commercial harvest during last 5 years (193 fish)  
down 97% from previous 10-year average(6,422 fish)
- Average subsistence harvest during last 5 years (3,741 fish)  
down 34% from previous 6-year average (5,560 fish)

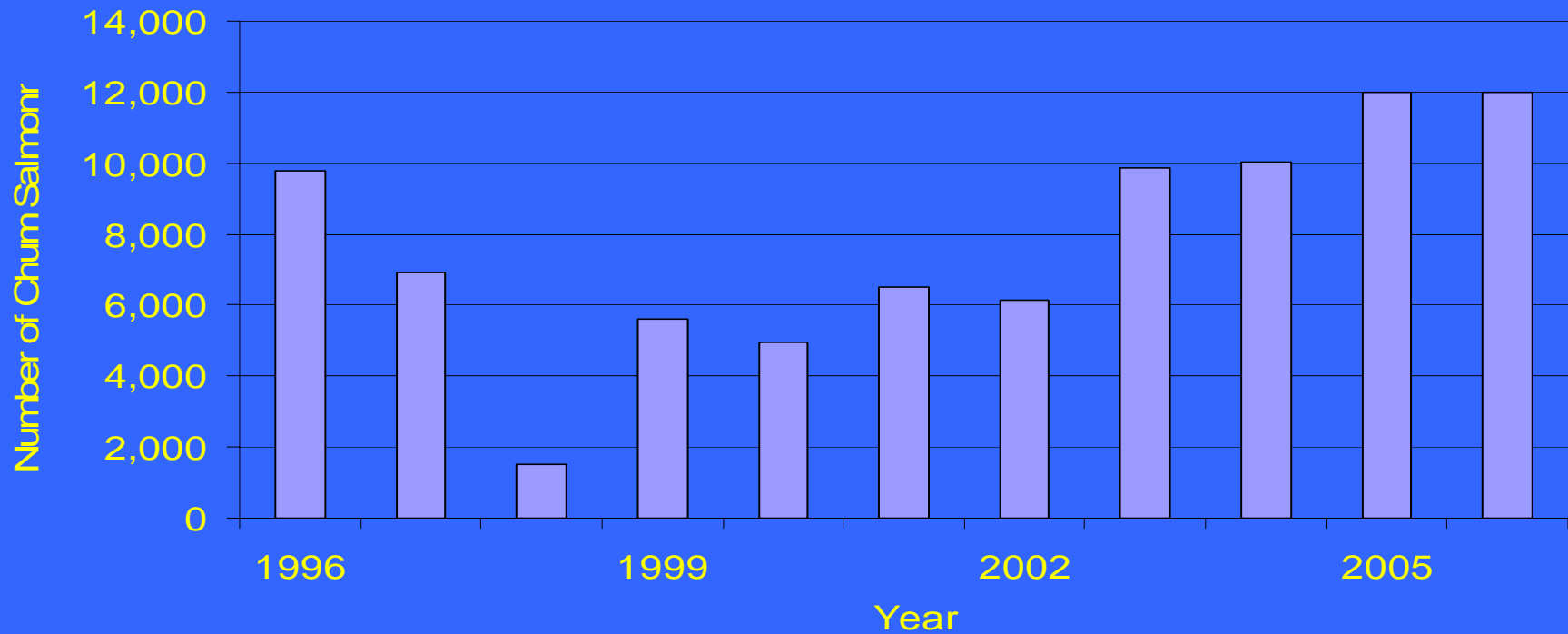
# Subdistricts 5 (Shaktoolik) & 6 (Unalakleet) Commercial & Subsistence Chinook Salmon Harvest 1961-2005



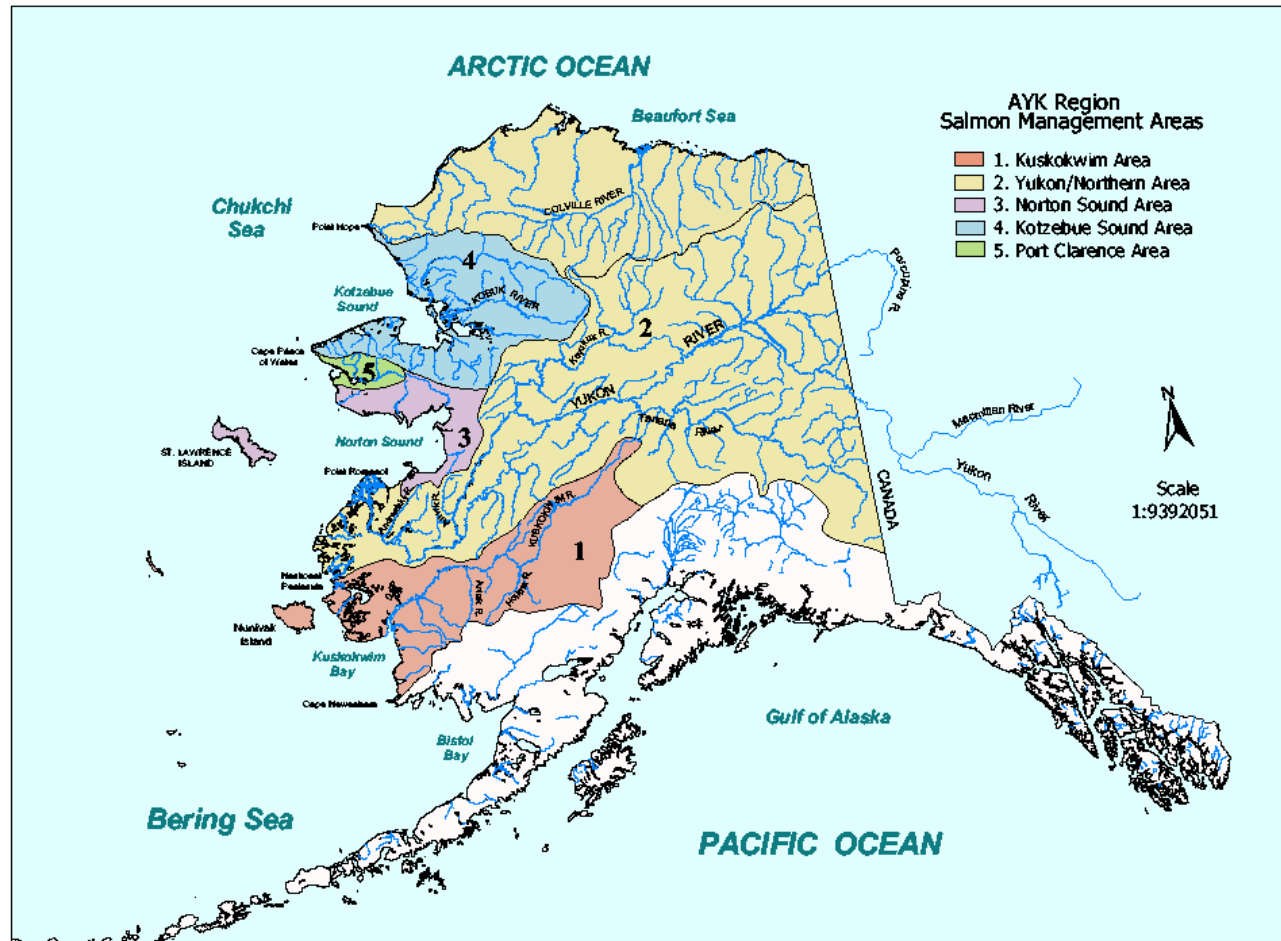
# North River Chinook Salmon Escapement Counts 1996-2005

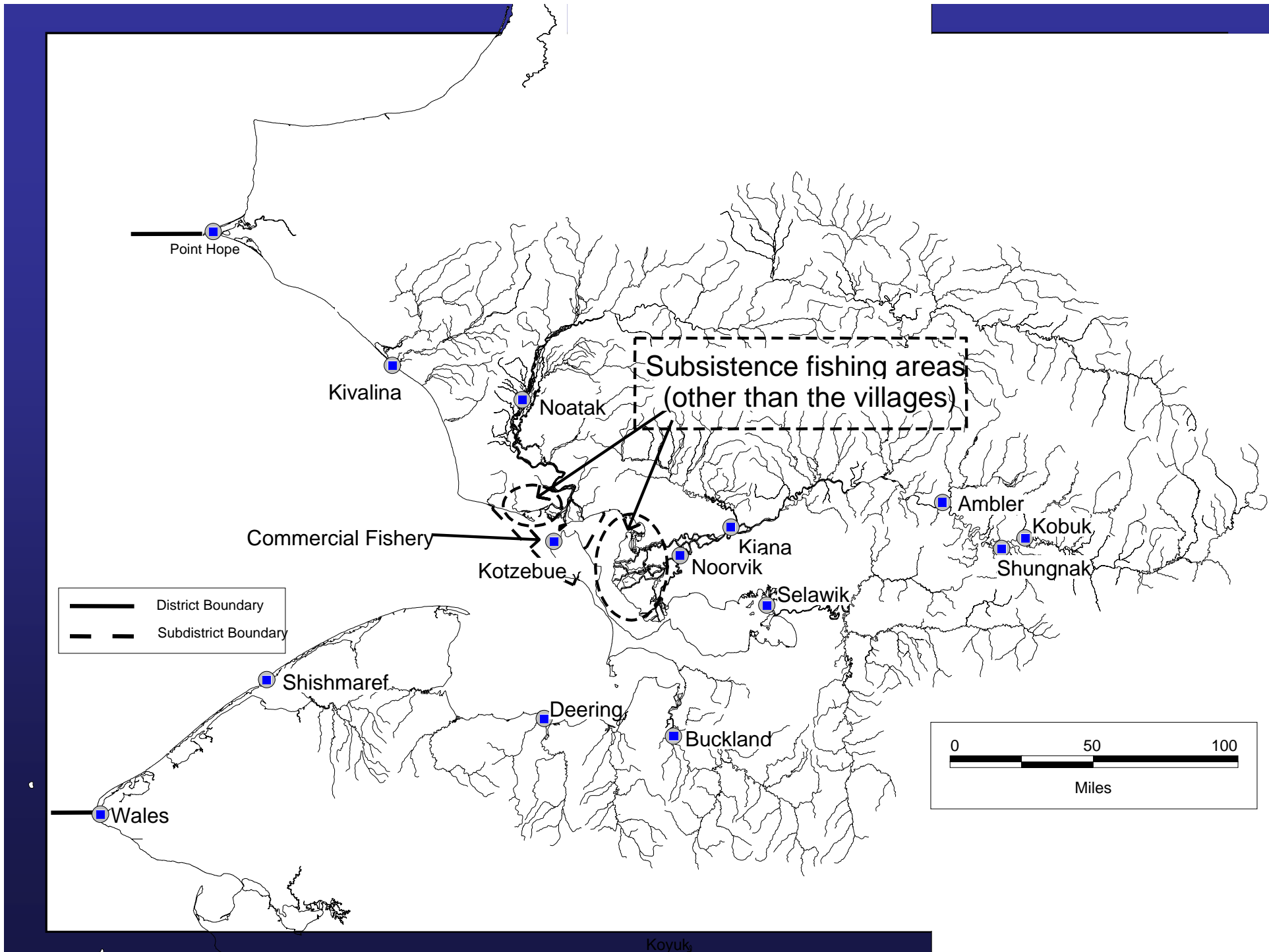


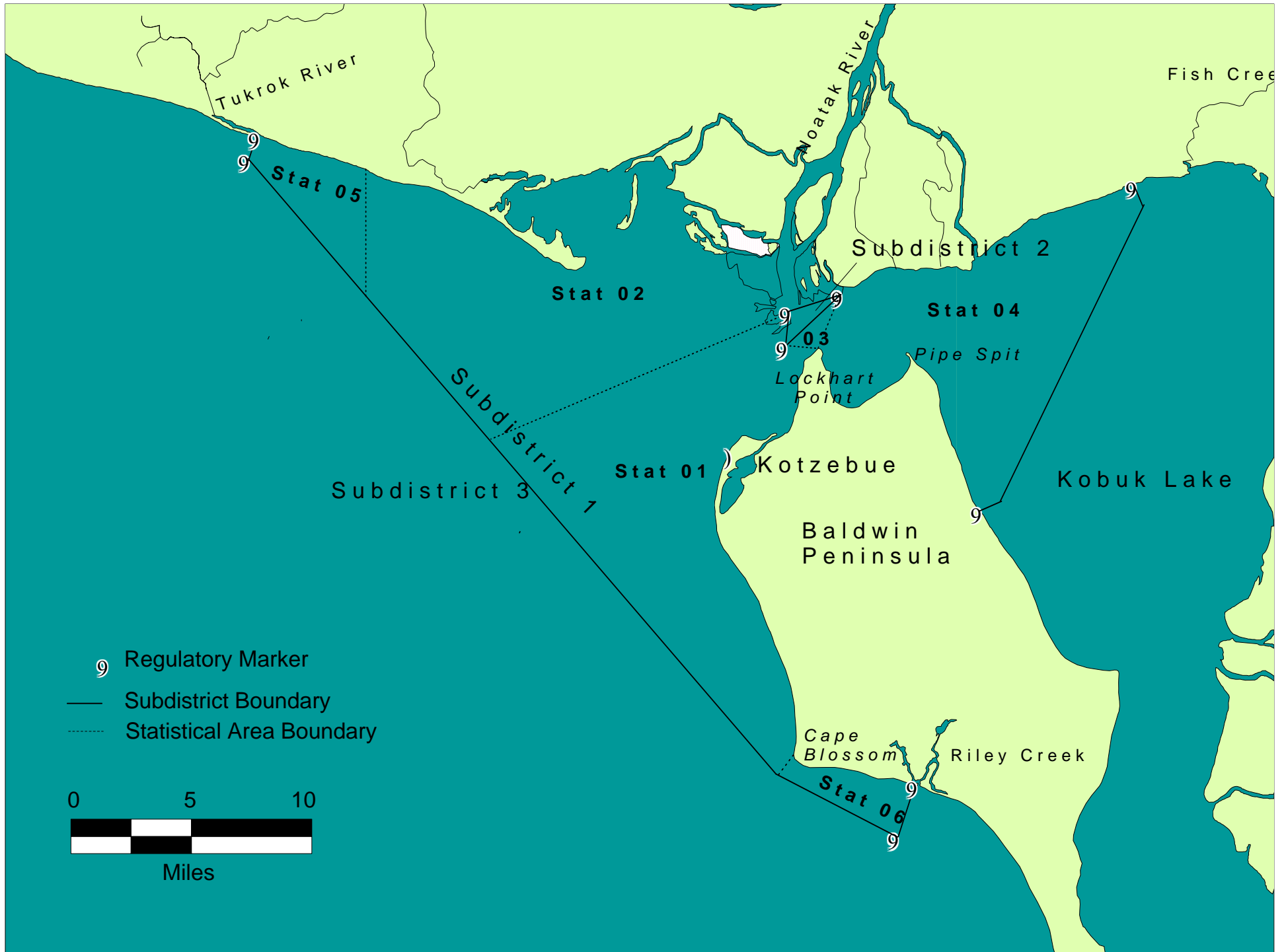
# North River Chum Salmon Escapement Counts 1996-2005



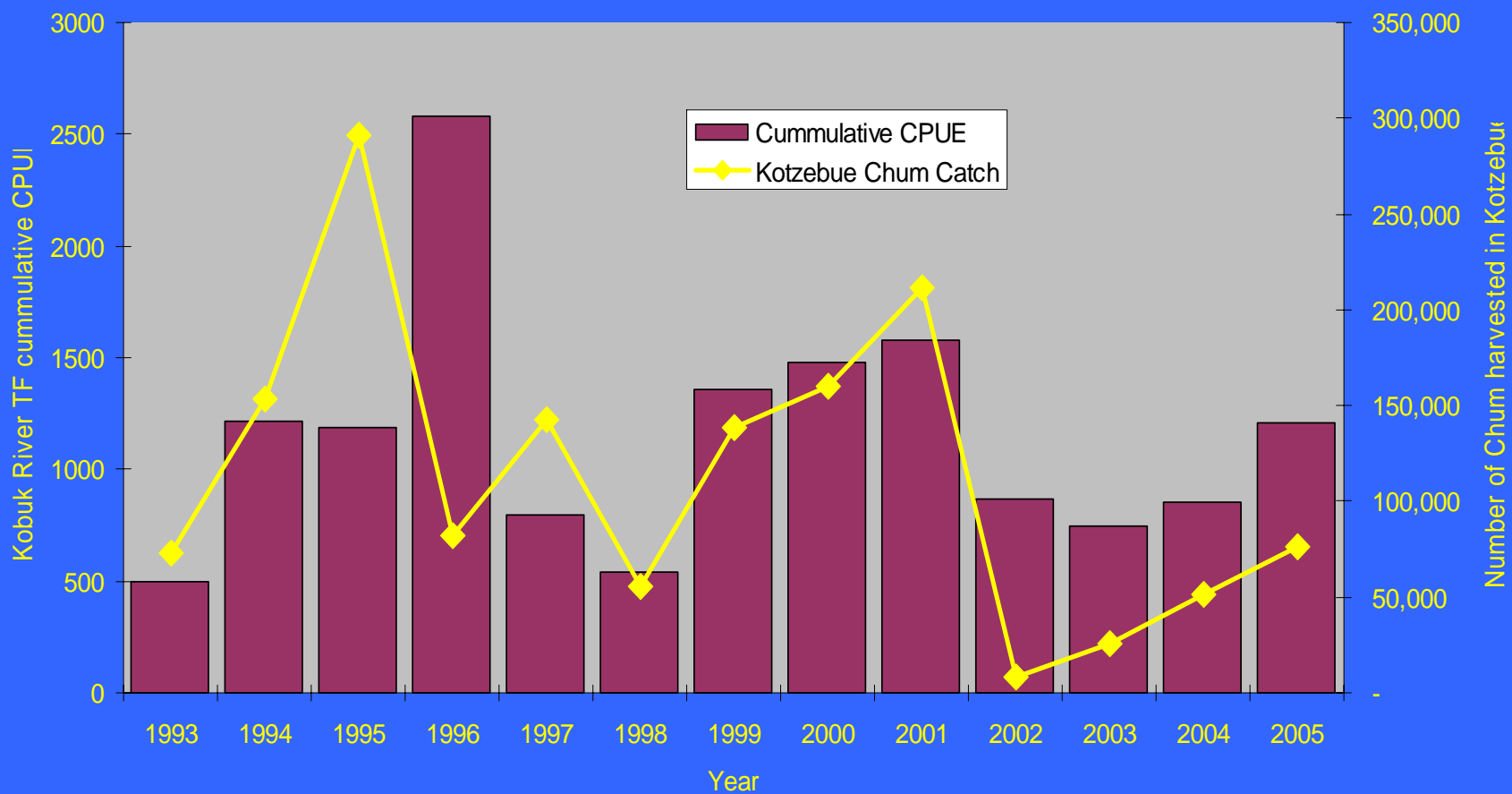
# AYK Region







Kobuk River Chum Test Fish cummulative CPUE and  
Kotzebue District commercial chum harvest, 1993 - 2004





# AYK Chum Salmon Stock Status Summary

- Northern Norton Sound chum stocks continue to be poor since 1989
- Yukon and Kuskokwim chum stocks had good runs/escapement in mid-1990s and poor runs of 1998-2001 from good escapements
- Yukon and Kuskokwim escapement goals met and runs generally improving starting in 2001-02 (summer chum) and 2003 (fall chum)
- Kuskokwim Area salmon stocks appear to be rebuilt
- Continued Yield Stock of Concern for Northern Norton Sound
- Lower Yukon summer chum stocks show lower productivity since 2000

# AYK Chinook Salmon Stock Status Summary

- **Good runs/escapement in mid-1990s**
- **Poor runs of 1998-2001 from good escapements**
- **Escapement goals met and runs generally improving starting in 2001, except for Eastern Norton Sound**
- **Continued Yield Stock of Concerns for Yukon and Eastern Norton Sound**
- **Kuskokwim Area stocks appears to be rebuilt**

