ALASKA

POWER

AUTHORITY

SUSITNA HYDROELECTRIC PROJECT PUBLIC MEETINGS

- INTRODUCTION
- PROJECT DESCRIPTION, BACKGROUND AND SCHEDULE
- ECONOMIC FEASIBILITY
- ENVIRONMENTAL
- FINANCING
- SUMMARY

INTRODUCTION

- PURPOSE OF PUBLIC MEETINGS

- PARTICIPANTS IN SUSITNA PROJECT PLANNING AND DEVELOPMENT

PURPOSE OF PUBLIC MEETINGS

- INFORM PUBLIC OF
  - CURRENT PROJECT STATUS
  - UPDATED PROJECT FEASIBLITITY
  - UPDATED PROJECT ENVIRONMENTAL IMPACTS
  - FINANCING OPTIONS
- RECEIVE PUBLIC COMMENT TO BE INCLUDED AS APPROPRIATE IN FINAL SUSITNA ECONOMIC AND FINANCIAL FEASIBILITY UPDATE REPORT

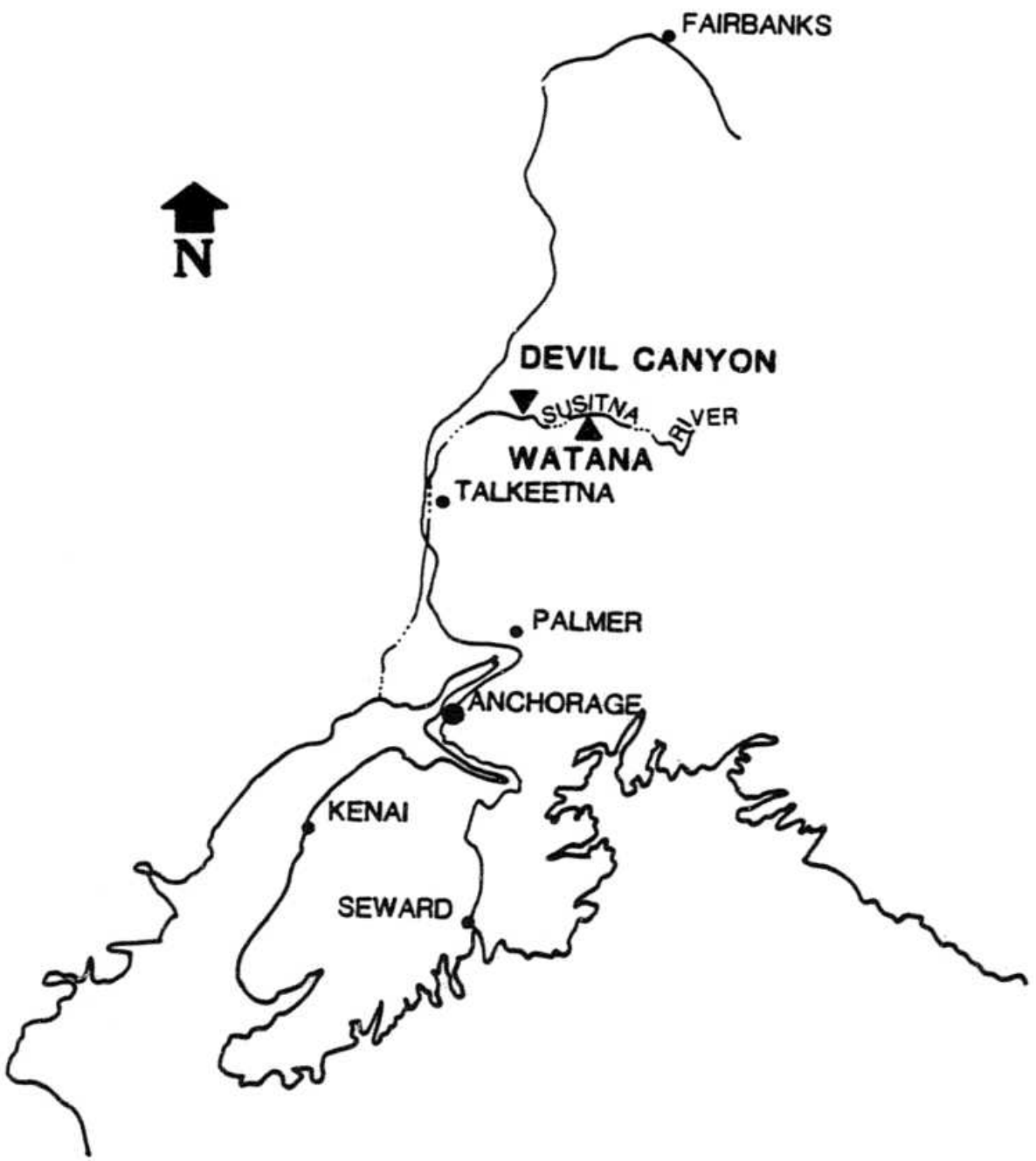
PARTICIPANTS IN SUSITNA PLANNING AND DEVELOPMENT

- ALASKA POWER AUTHORITY
- FEDERAL ENERGY REGULATORY COMMISSION
- RESOURCE AGENCIES
- ADMINISTRATION
- LEGISLATURE
- PUBLIC

PROJECT DESCRIPTION, BACKGROUND AND SCHEDULE

- PROJECT LOCATION AND DESCRIPTION
- BACKGROUNND
  - PREVIOUS STUDIES OF THE SUSITNA PROJECT
  - HISTORY
  - COST STATUS
- SCHEDULE
  - PROJECT DEVELOPMENT
  - FEDERAL ENERGY REGULATORY COMMISSION
- TOTAL PROJECT COSTS

RAILBELT AREA MAP



PREVIOUS STUDIES OF THE SUSITNA PROJECT

ORGANIZATION	YEAR	TYPE OF STUDY
U. S. BUREAU OF RECLAMATION	1953	DAM SITE IDENTIFICATION
U.S. BUREAU OF RECLAMATION	1961	FEASIBILITY
ALASKA POWER ADMINISTRATION	1974	UPDATE USBR 1961
KAISER (FOR STATE OF ALASKA)	1974	PROPOSAL FOR DEVELOPMENT
U. S. ARMY CORPS OF ENGINEERS	1975	FEASIBILITY REPORT
U. S. ARMY CORPS OF ENGINEERS	1979	UPDATED 1975 REPORT

PROJECT HISTORY

o POWER AUTHORITY ASSUMED PROJECT	1979
o FEASIBILITY STUDY STARTED	1980
o FEASIBILITY STUDY COMPLETED	1982
o FERC LICENSE FILED	FEB 1983
o REVISED LICENSE INFORMATION FILED	JUL 1983
o LICENSE APPLICATION ACCEPTED	JUL 1983
o STARTED SETTLEMENT PROCESS	NOV 1983
o AGENCY COMMENTS RECEIVED	DEC 1983
o POWER AUTHORITY RESPONSE TO COMMENTS FILED	JAN-FEB 1984

COST STATUS - WHAT ?

	FY80-FY84 $000	FY85 BUDGET $000
MANAGEMENT	15,608	8,812
ENVIRONMENTAL	42,186	15,367
ENGINEERING STUDIES & FERC SUPPORT	33,590	7,968
CONTINGENCY	1,280	—
TOTAL	92,664	32,147

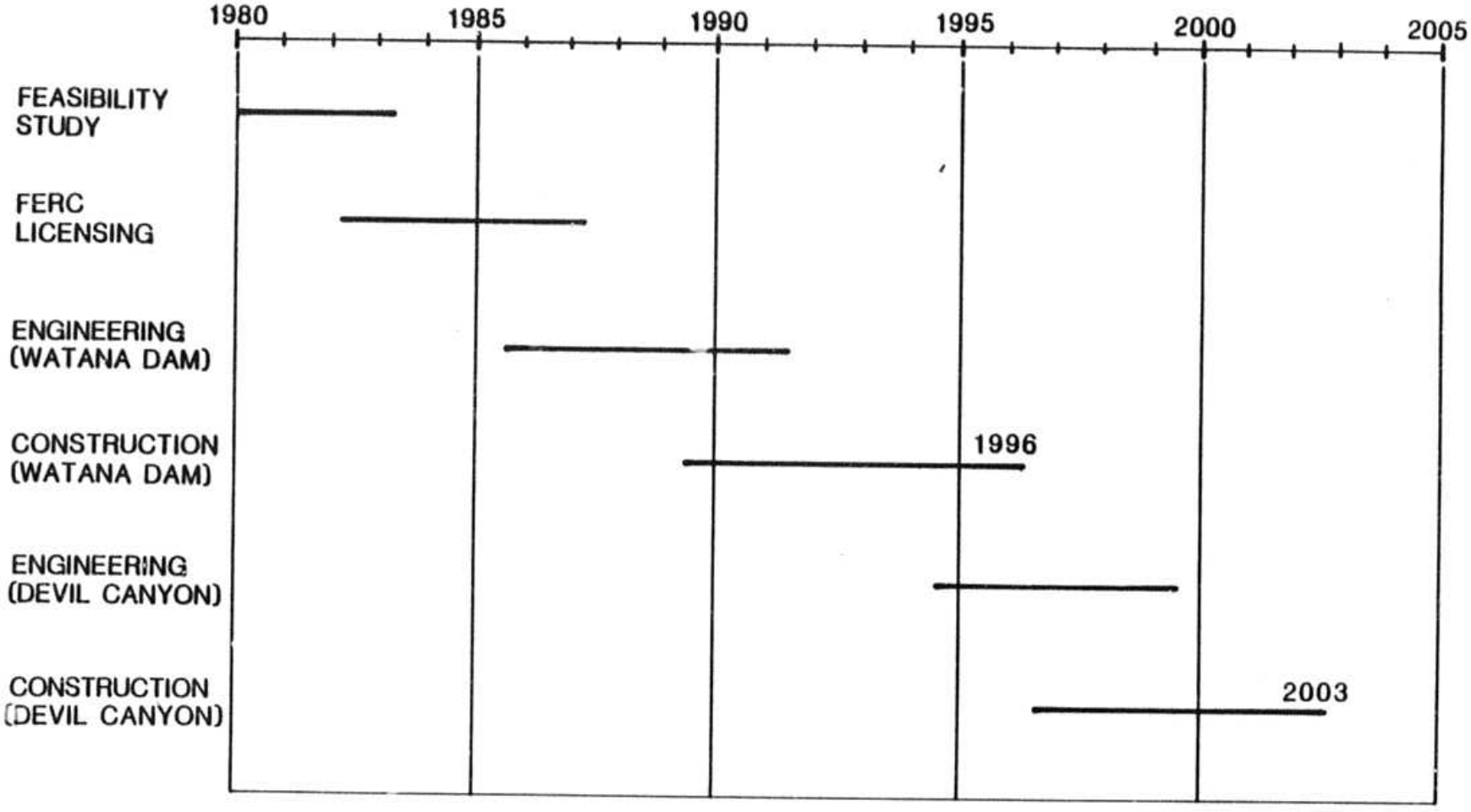
COST STATUS - WHO ?

	FY80-84 $000	FY85 BUDGET $000
FEDERAL AGENCIES	1,041	330
STATE AGENCIES	16,340	5,900
CONTRACTORS	74,023	25,917
CONTINGENCY	1,280	—
TOTAL	92,664	32,147

COST STATUS - WHEN ?

FY	$ 000
80	15,328
81	5,636
82	18,100
83	25,600
84	28,000
TOTAL	92,664
FY 85 BUDGET REQUEST	32,147

SUSITNA
PROJECT SCHEDULE



PROJECT LICENSE SCHEDULE

o FERC DRAFT EIS ISSUED	MAY	1984
o NEED-FOR-POWER HEARINGS	JULY	1984
o FERC FINAL EIS ISSUED	DEC	1984
o ENVIRONMENTAL & DAM SAFETY HEARINGS	APRIL	1985
o SIGN INITIAL POWER SALES AGREEMENTS	JUNE	1985
o INITIATE DETAILED DESIGN	JULY	1985
o FERC LICENSE ISSUED	MAR	1987[1]

[1] COULD BE EARLIER DEPENDING ON LENGTH OF HEARINGS

TOTAL PROJECT COSTS (MILLIONS - 1983 $)

- WATANA - $3,750
- DEVIL CANYON - I,620

- TOTAL PROJECT $5,370

- POSSIBLE COST REDUCTION FROM DESIGN REFINEMENTS - $292 (NOT CONSIDERED IN FEASIBILITY)

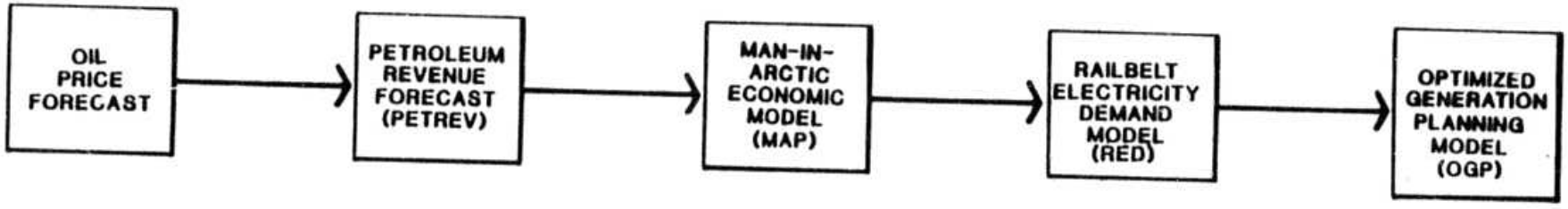
ECONOMIC FEASIBILITY

- DEMAND FORECAST
- EXISTING GENERATION
- ALTERNATIVES TO MEET DEMAND
  - GAS
  - COAL
  - HYDROELECTRIC
  - OTHER
- OPTIMUM GENERATION PLANNING
  - SUSITNA
  - NON-SUSITNA
- CONCLUSIONS

DEMAND FORECAST

- METHODOLOGY USED TO DETERMINE FORECAST
- FACTORS AFFECTING FORECAST
- CONCLUSION (FORECAST)

METHODOLOGY OF DEMAND FORECASTING



FACTORS AFFECTING DEMAND FORECAST

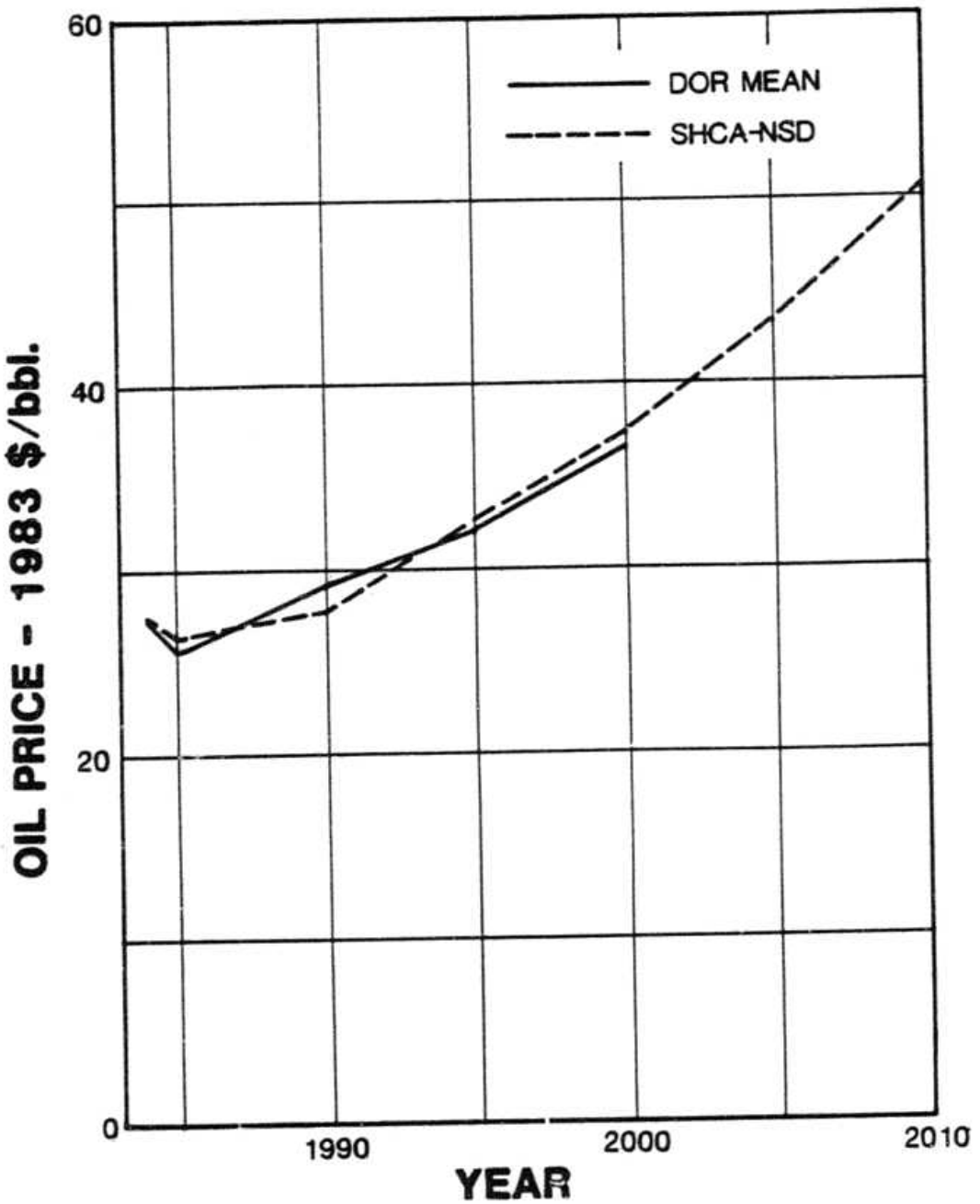
- OIL PRICE FORECAST
- PETROLEUM REVENUE FORECAST
- GROWTH FORECAST

OIL PRICES

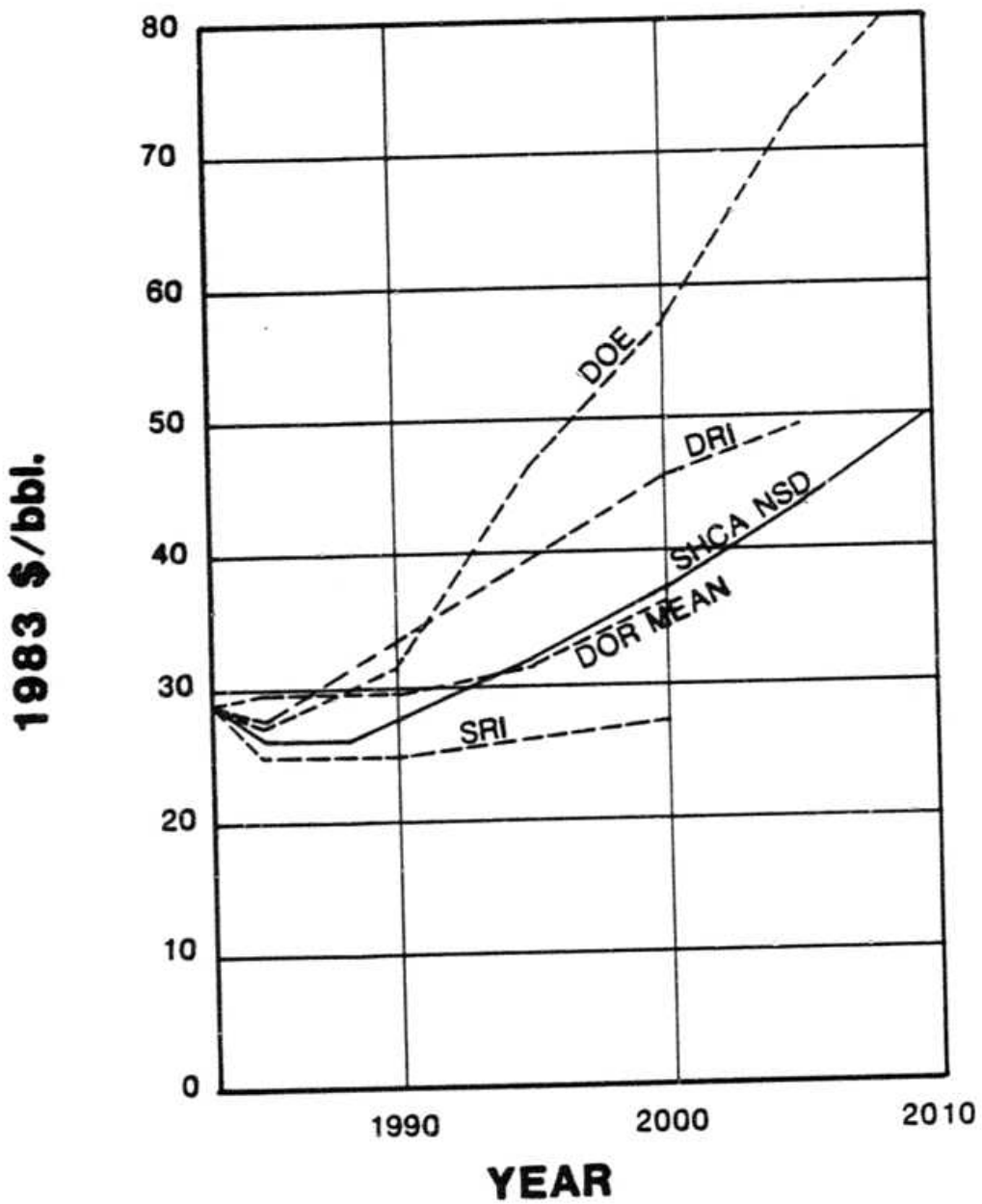
- SHERMAN H. CLARK - NO SUPPLY DISRUPTION (REFERENCE CASE)

- ALASKA DEPARTMENT OF REVENUE - DOR DECEMBER 1983 MEAN

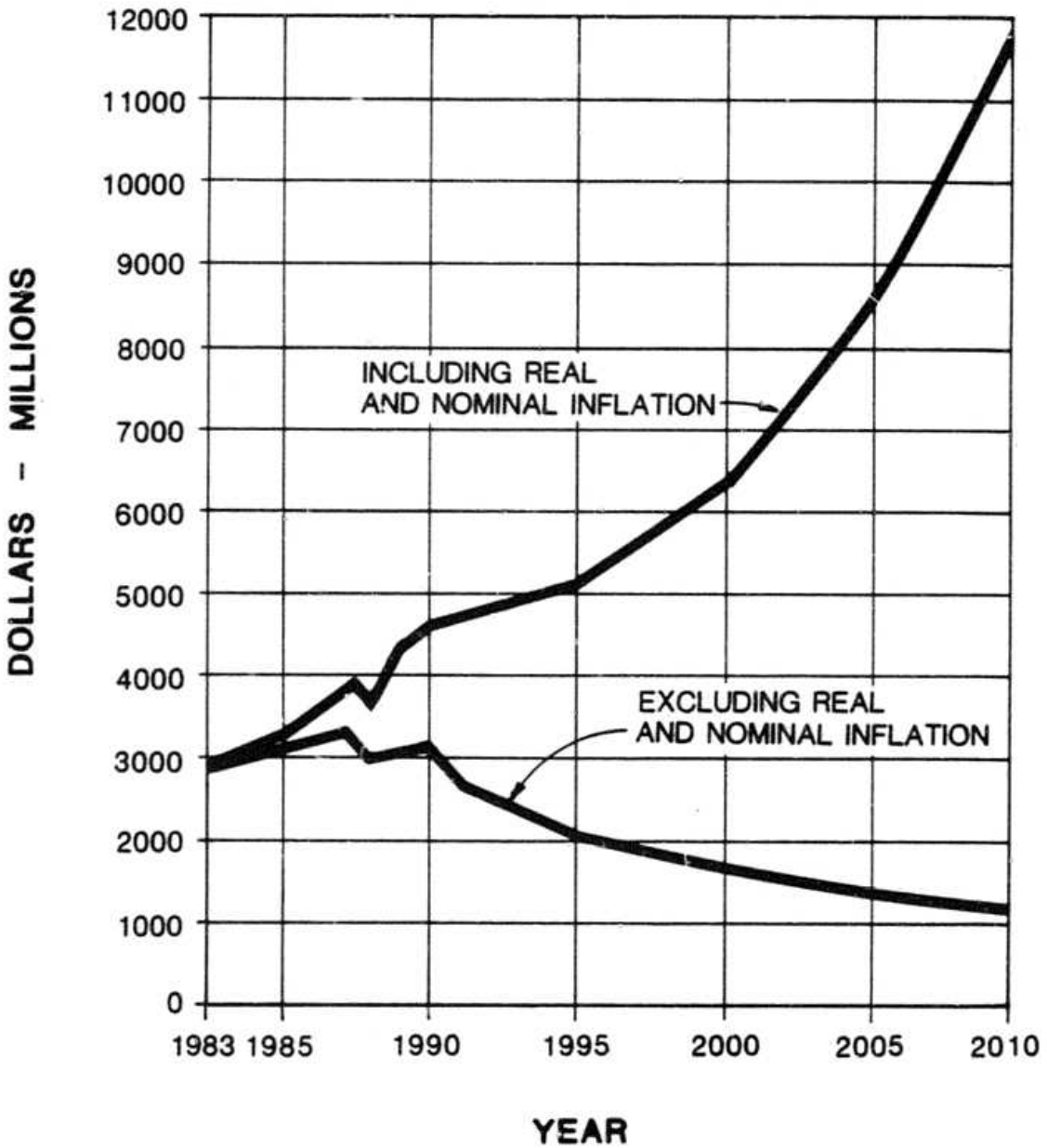
ALTERNATIVE OIL PRICE PROJECTIONS



ALTERNATIVE OIL PRICE PROJECTIONS

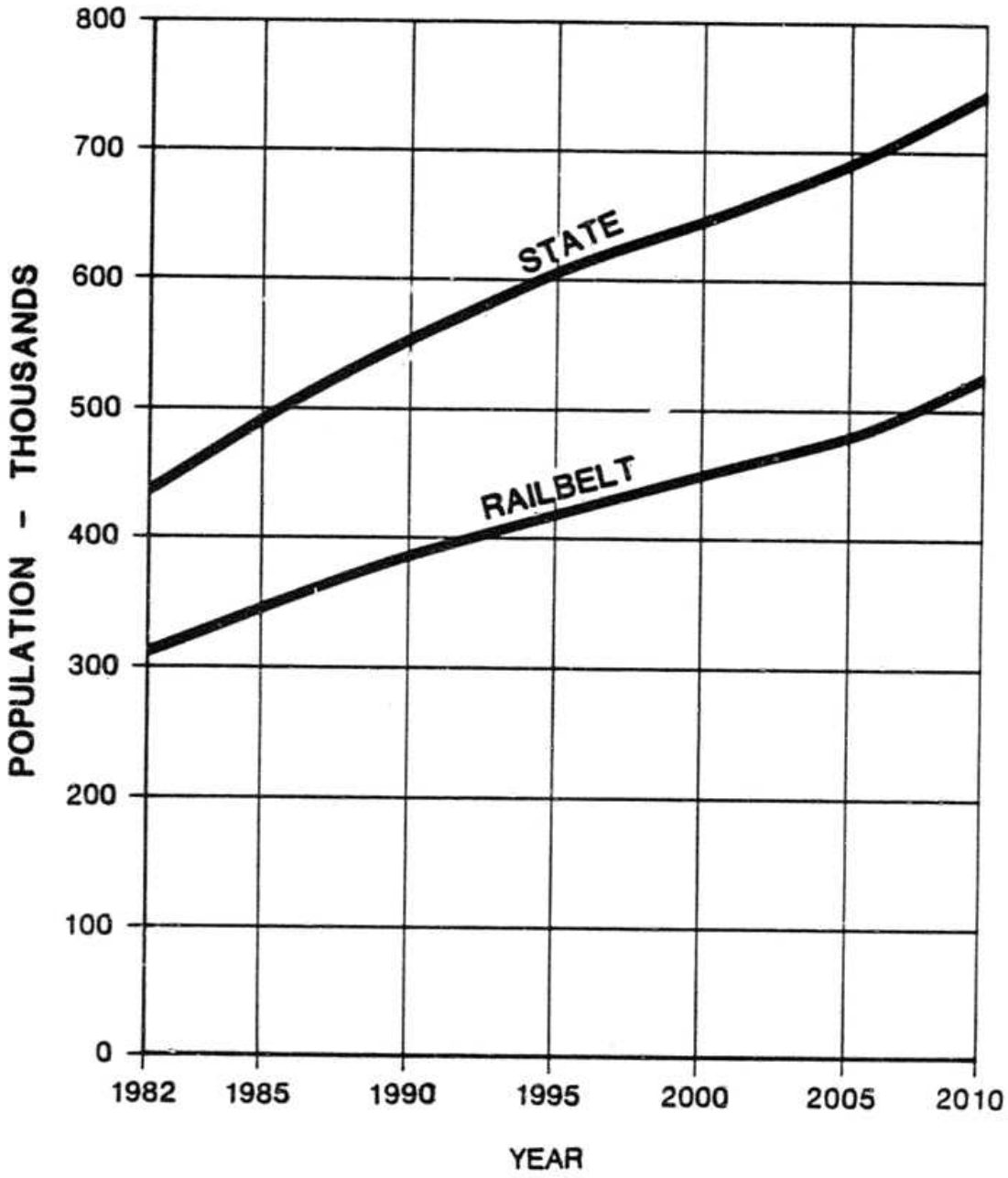


STATE PETROLEUM REVENUES
FORECAST OF ANNUAL CONTRIBUTION
TO GENERAL FUND



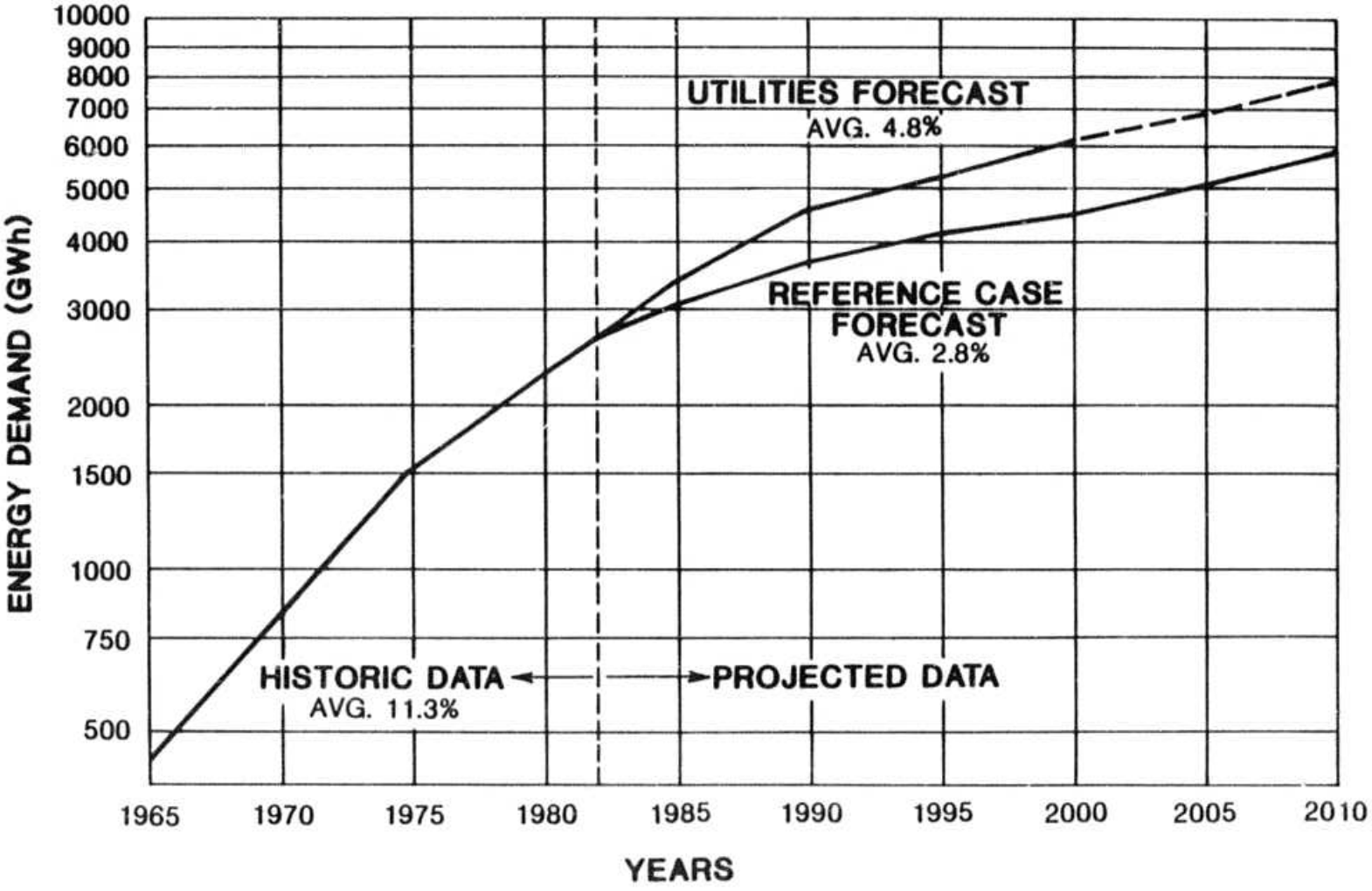
SOURCE: MAP MODEL

POPULATION GROWTH FORECAST



SOURCE: MAP MODEL

ENERGY DEMAND FORECAST



EXISTING GENERATION

- RAILBELT CAPACITY (RETIREMENT)
- LOCATION
- DEMAND VS RESOURCES

EXISTING RAILBELT CAPACITY/AFTER RETIREMENT

	1984	1993
SIMPLE CYCLE GAS ①	664	373
COMBINED CYCLE GAS ②	317	317
COAL-STEAM ③	70	60
HYDRO ④	46	46
TOTAL	1097	796

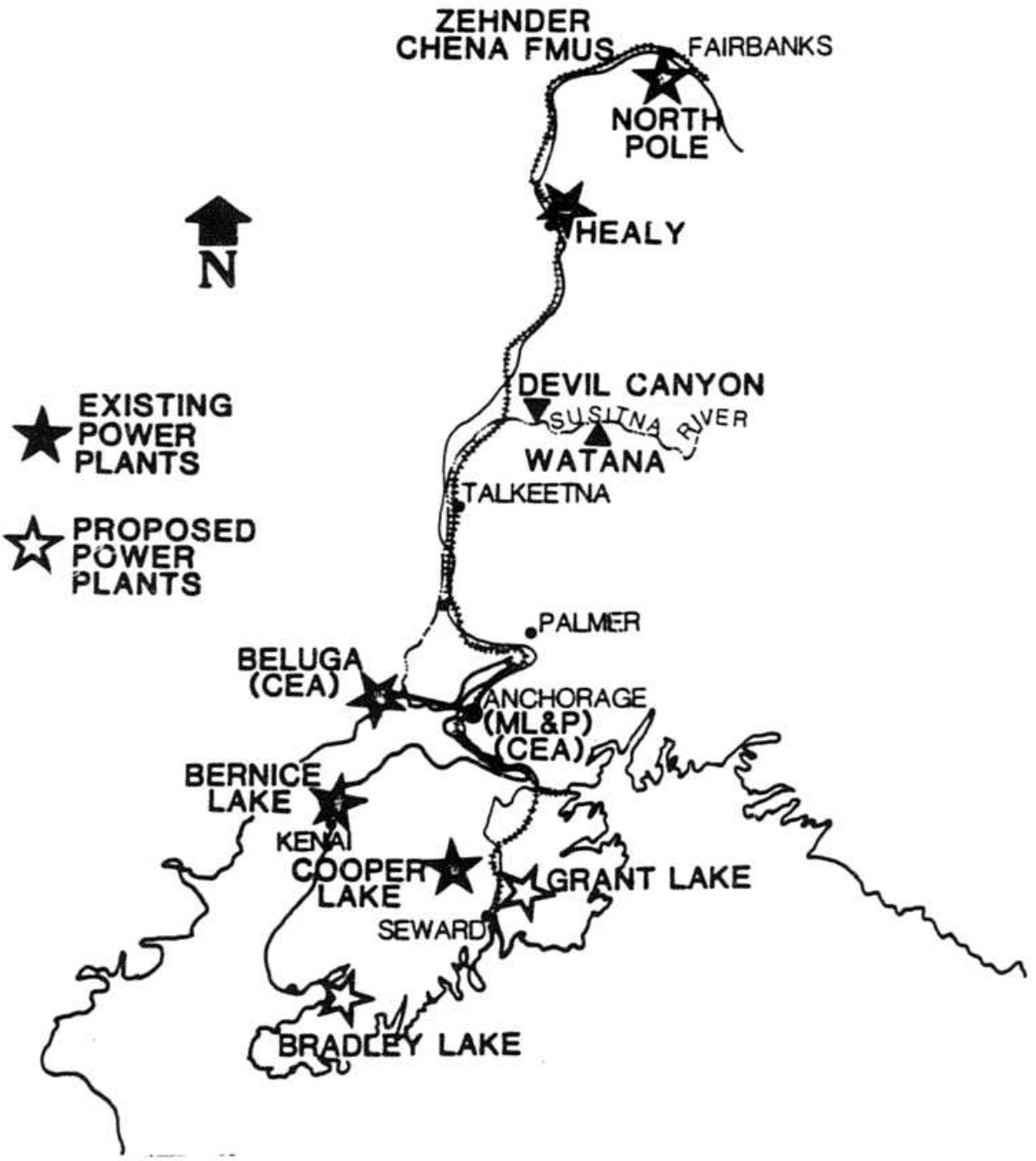
① 20 YEAR LIFE

② 30 YEAR LIFE

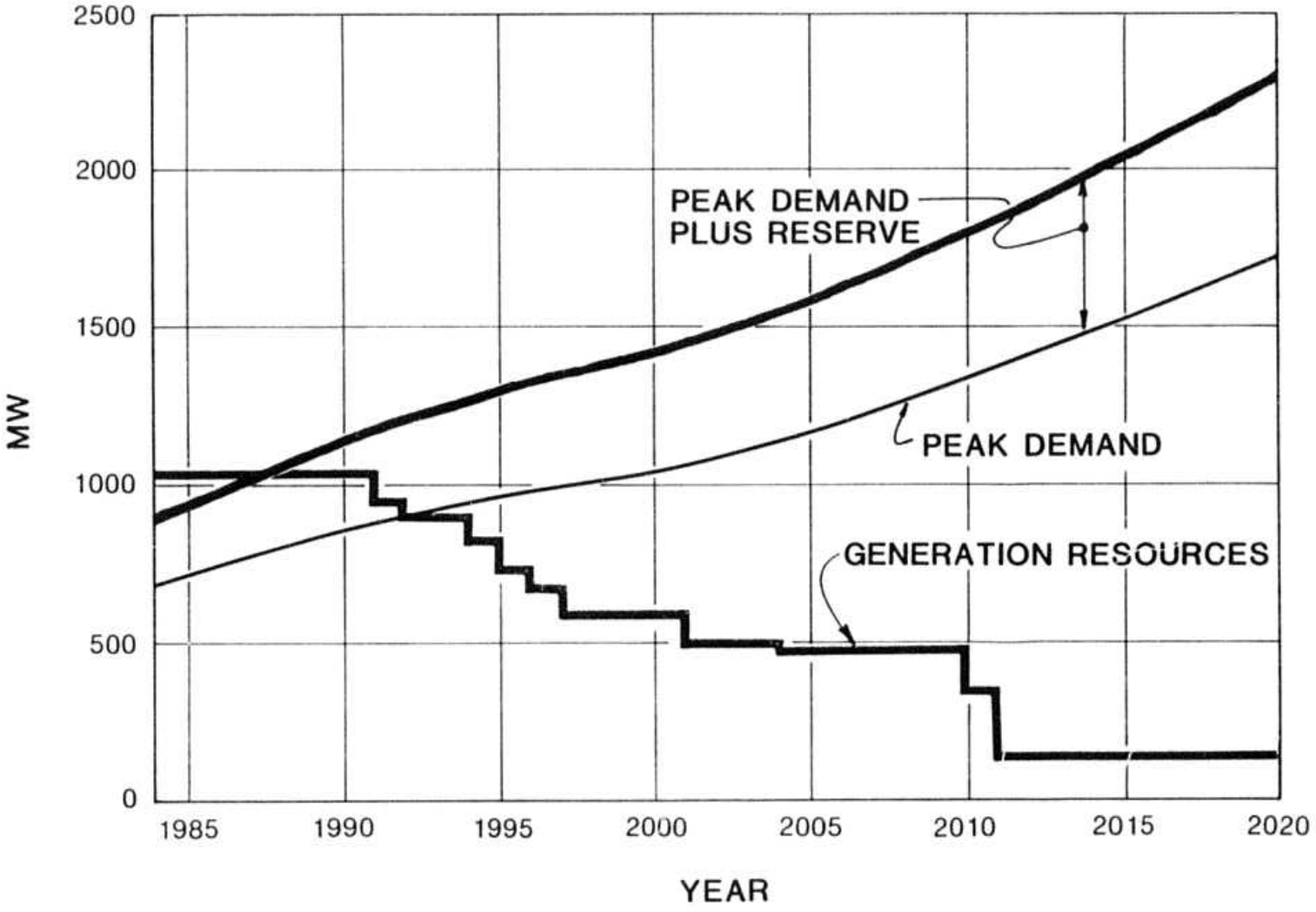
③ 30 YEAR LIFE

④ 50 YEAR LIFE

RAILBELT GENERATION RESOURCES



PEAK POWER DEMAND / GENERATION RESOURCES



ALTERNATIVES TO MEET DEMAND

- NATURAL GAS FIRED
- COAL FIRED
- HYDROELECTRIC
- OTHER

NATURAL GAS FIRED UNITS

- PLANT TYPES
- FUEL AVAILABILITY
- FUEL PRICE PROJECTIONS
- ENVIRONMENTAL IMPACTS

GAS FIRED TURBINE - PLANT TYPES

- SIMPLE CYCLE - 85 MW - 29% EFFICIENCY
- COMBINED CYCLE* - 237 MW - 41% EFFICIENCY

* DUAL SIMPLE CYCLE TURBINES DRIVING A THIRD WASTE HEAT STEAM TURBINE

GAS FIRED TURBINE - FUEL AVAILABILITY

- PROVEN RESERVES (OGCC, 3.5 TCF) EXHAUSTED BY 1998
- RECOVERABLE UNDISCOVERED (DNR, 2.04 TCF) EXHAUSTED BY 2007
- AFTER 2007 - COOK INLET GAS SUPPLIED BY TAGS OR OTHER SOURCE

NORTH SLOPE GENERATION

- NORTH SLOPE GAS ELECTRIC GENERATION-TRANSMISSION TO RAILBELT

  - REPORT BY EBASCO 1983

  - NOT ECONOMICALLY ATTRACTIVE

  - QUESTIONABLE RELIABILITY

  - SERIOUS TECHNICAL UNCERTAINTIES

NATURAL GAS FUEL PRICE FORECASTS

($ PER MILLION BTU)

	1983 (1)	1993
COOK INLET GAS	2.32	3.02
NORTH SLOPE GAS		4.22 (2)

(1) BASED ON CURRENT ENSTAR CONTRACT

(2) BASED ON DELIVERY TO FAIRBANKS (ANGTS) OR KENAI (TAGS)

ENVIRONMENTAL IMPACTS

- GAS FIELD-LOCATION AND DEVELOPMENT
- TRANSMISSION OF GAS
- POWER PLANT
- TRANSMISSION OF ENERGY

COAL FIRED UNITS

- PLANT TYPES
- FUEL AVAILABILITY
- FUEL PRICE PROJECTIONS
- ENVIRONMENTAL IMPACTS

COAL FIRED STEAM PLANTS-
PLANT TYPE

- OPTIMUM CAPACITY IS 200 MW AT 35% EFF.

COAL FIRED STEAM PLANTS - FUEL AVAILABILITY

- NENANA MINEABLE BASE IS 457 MILLION TONS
- BELUGA RESOURCE IS 1.8 - 2.4 BILLION TONS
- MODEST QUALITY 7500 - 7800 BTU/LB

COAL PRICE FORECAST

($ PER MILLION BTU)

	1983	1993	REAL INCREASE 1993 - 2050
NENANA COAL②	1.72	2.17①	1%
BELUGA COAL③	1.86	2.17①	1%

① ASSUMES WORLD MARKET (1983 $ / MMBTU)

② BASED ON CURRENT CONTRACTS (ADJUSTED) *

③ BASED ON 5 - 10 MILLION TPY EXPORT

* ADJUSTED FOR PRODUCTION LEVELS AND TRANSPORTATION COSTS

ENVIRONMENTAL

- COAL FIELD-LOCATION
- MINE DEVELOPMENT
- POWER PLANT
- TRANSMISSION OF ENERGY

HYDROELECTRIC

- STUDIES
- SELECTION OF HYDRO ALTERNATIVES TO SUSITNA
  - NON-SUSITNA ALTERNATIVES
  - TEN SELECTED SITES
  - SELECTED DEVELOPMENT
  - CHAKACHAMNA DETAIL REPORT
  - FINDINGS
- THE SUSITNA ALTERNATIVE

STUDIES OF HYDROELECTRIC SITES IN RAILBELT

ORGANIZATION	YEAR	TYPE STUDY
U. S. BUREAU OF RECLAMATION	1967	INVENTORY
FEDERAL POWER COMMISSION	1969	INVENTORY
U. S. ARMY CORPS OF ENGINEERS	1975	FEASIBILITY
ALASKA POWER ADMINISTRATION	1980	INVENTORY
ALASKA POWER AUTHORITY	1982	FEASIBILITY

SUSITNA HYDROELECTRIC ALTERNATIVE

SUSITNA PROJECT

WATANA PHASE	- 1020 MW
DEVIL CANYON PHASE	- 600 MW

ASSUMES BRADLEY LAKE ON LINE 1987

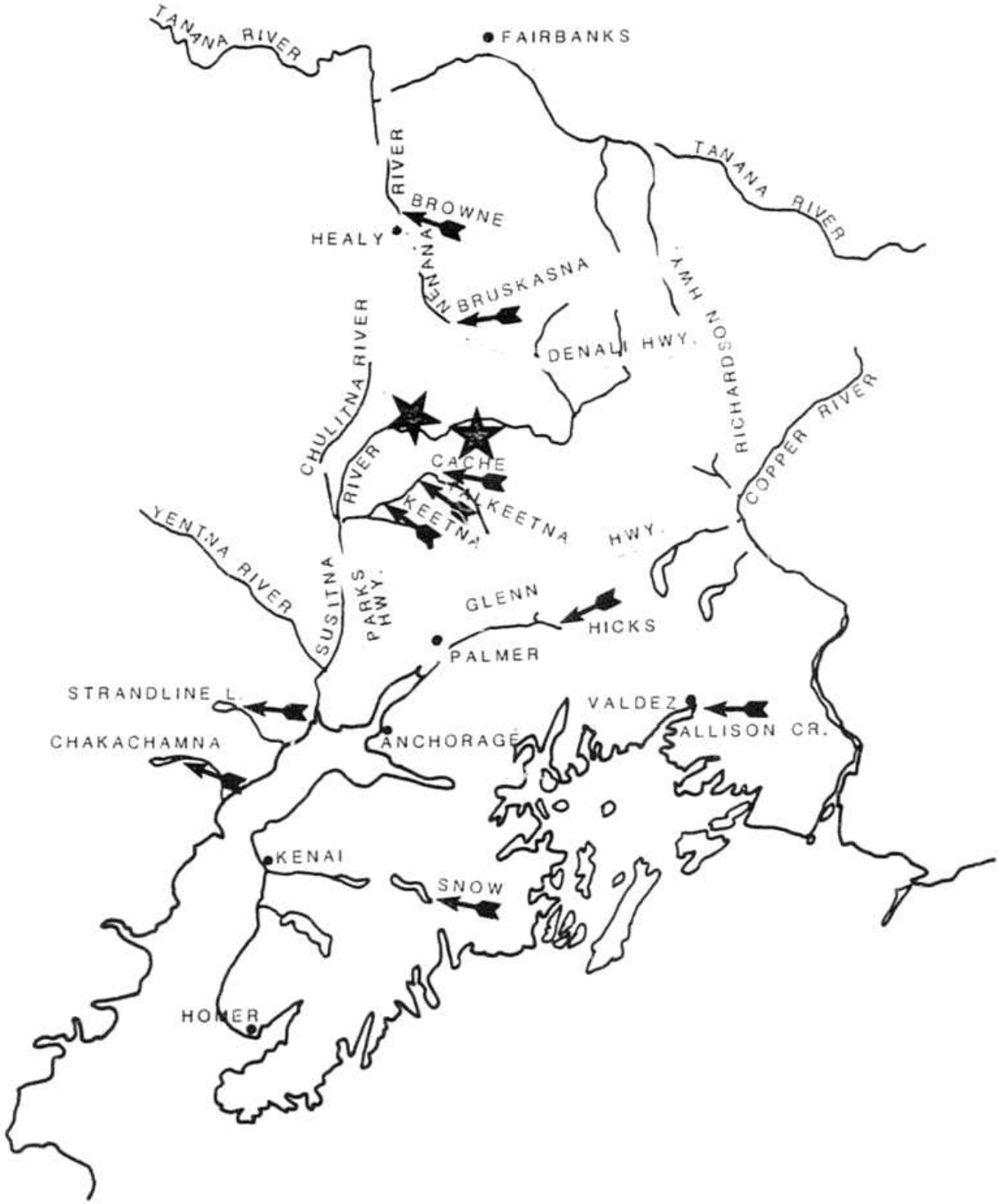
NON-SUSITNA HYDROELECTRIC ALTERNATIVES

- CONSIDERED 91 POTENTIAL SITES IN RAILBELT
- REJECTED 26 SITES - NOT ECONOMICALLY VIABLE
- REJECTED 20 SITES WITH SIGNIFICANT ENVIRONMENTAL IMPACT
- 46 SITES EVALUATED WITH TRANSMISSION LINKS FOR ECONOMY AND ENVIRONMENTAL IMPACTS -18 SITES REJECTED
- 28 SITES CATEGORIZED BY SIZE AND RANKED BY ENVIRONMENTAL AND ECONOMIC CONSIDERATIONS
- 10 SITES SELECTED FOR DETAILED COST ESTIMATES

TEN SELECTED SITES

SITE	RIVER	CAPACITY (MW)	COST (MILLIONS)
SNOW	SNOW	50	255
BRUSKASNA	NENANA	30	238
KEETNA	TALKEETNA	100	477
CACHE	TALKEETNA	50	564
BROWNE	NENANA	100	625
TALKEETNA 2	TALKEETNA	50	500
HICKS	MATANUSKA	60	529
CHAKACHAMNA	CHAKACHAMNA	330	1,480
ALLISON	ALLISON CREEK	8	54
STRANDLINE LAKE	BELUGA	20	126

SELECTED ALTERNATIVE HYDROELECTRIC SITES



SELECTED DEVELOPMENT

- CONSTRUCTION OF:

SITE	CAPACITY (MW)	ON LINE DATE
CHAKACHAMNA	330	1993
KEETNA	100	1997
SNOW	50	2002

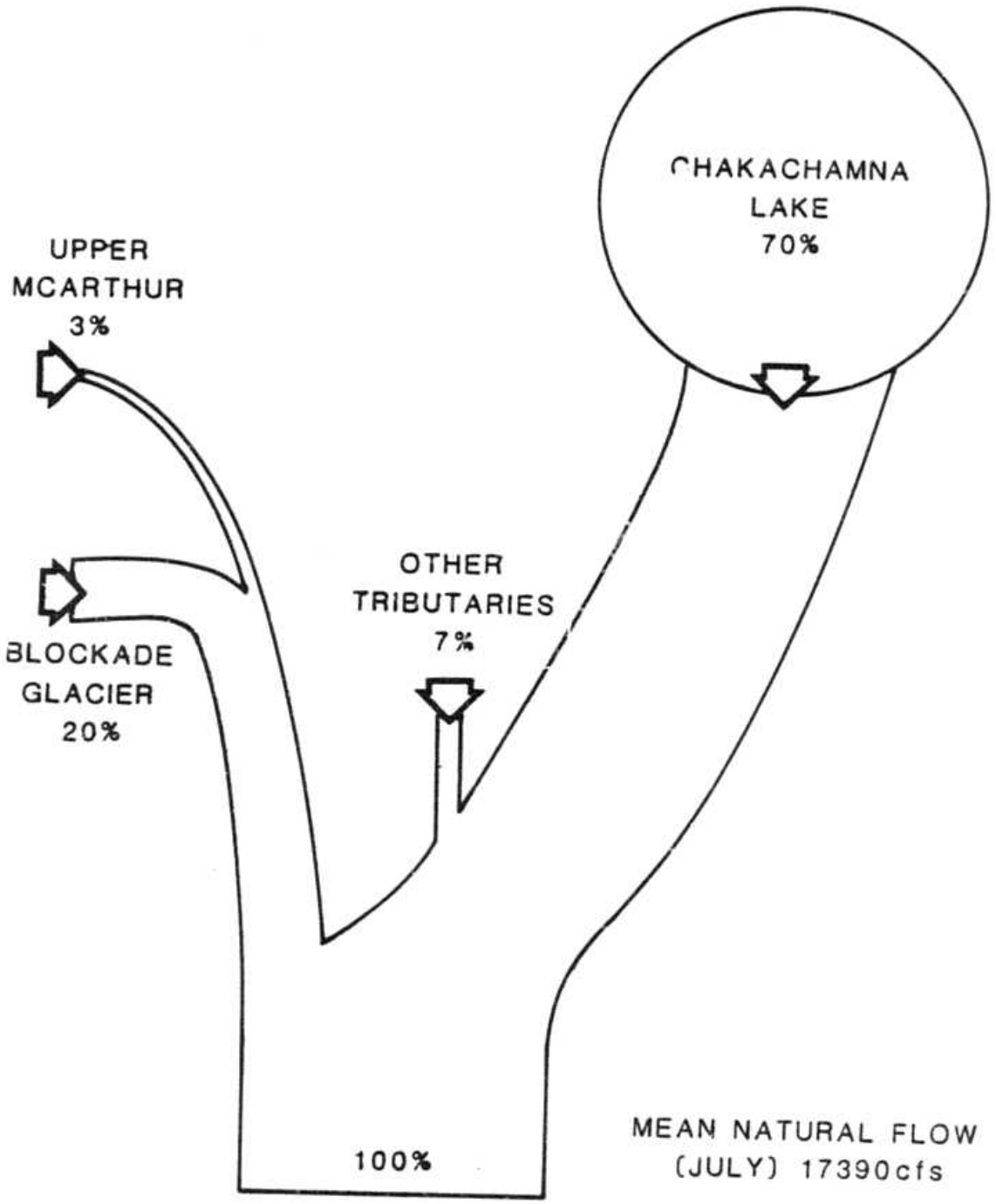
- SUPPLEMENT CAPACITY SHORTFALL WITH THERMAL GENERATION
- ASSUMES BRADLEY LAKE CONSTRUCTED AND ON LINE 1987

CHAKACHAMNA DETAIL REPORT

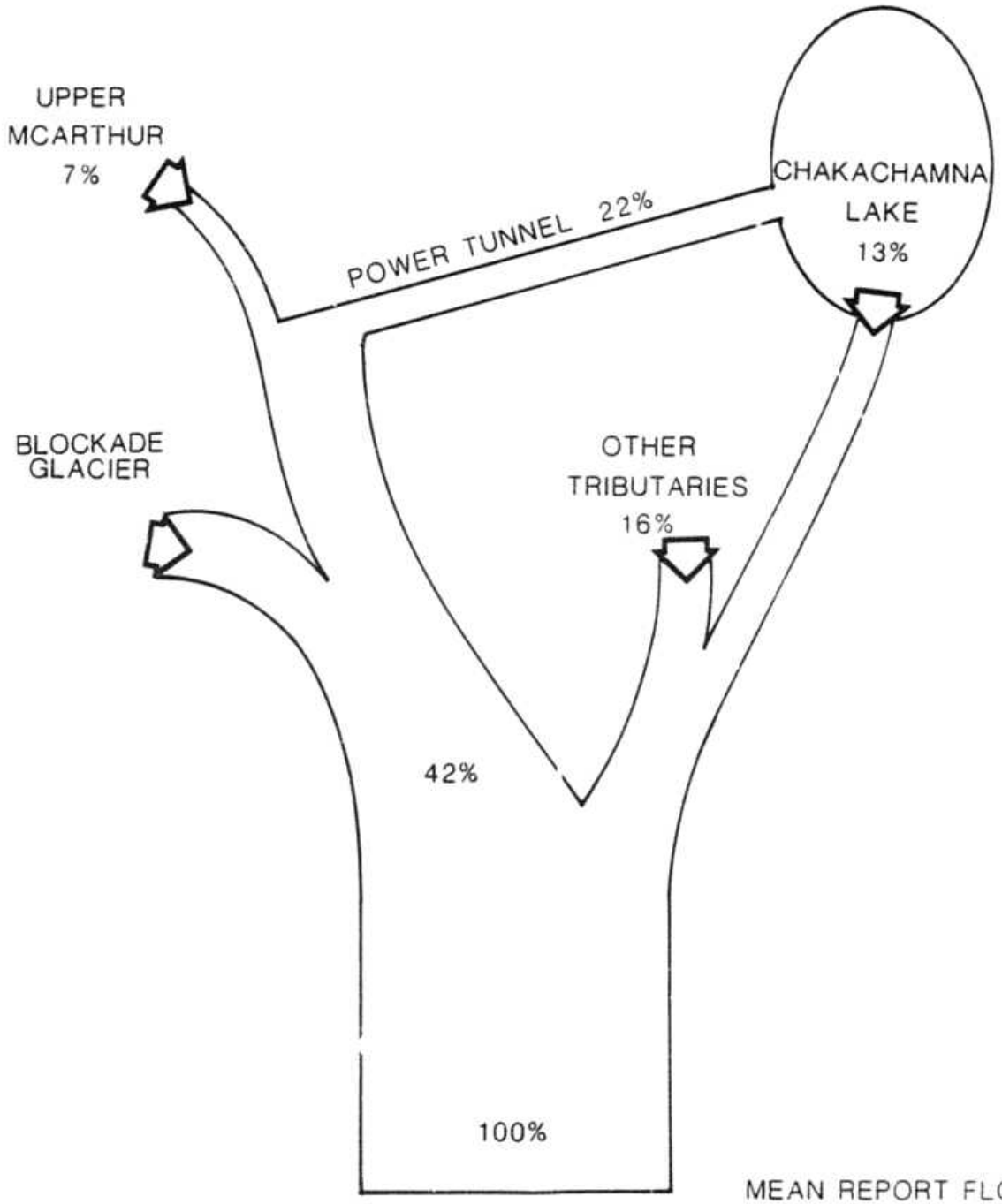
(BECHTEL MARCH 1983)

- 330 MW CAPACITY
- 10 MILE POWER TUNNEL
- 50 FT. DAM WITH FISH PASSAGE
- POWER HOUSE ON MCARTHUR RIVER
- $1.44 BILLION CONSTRUCTION COST (1983 $)
- SIGNIFICANT IMPACT TO 70,000+ SALMON
- ADDITIONAL FISHERIES STUDIES REQUIRED

CONTRIBUTION TO CHAKACHAMNA SYSTEM FLOW (JULY, PRE-PROJECT)

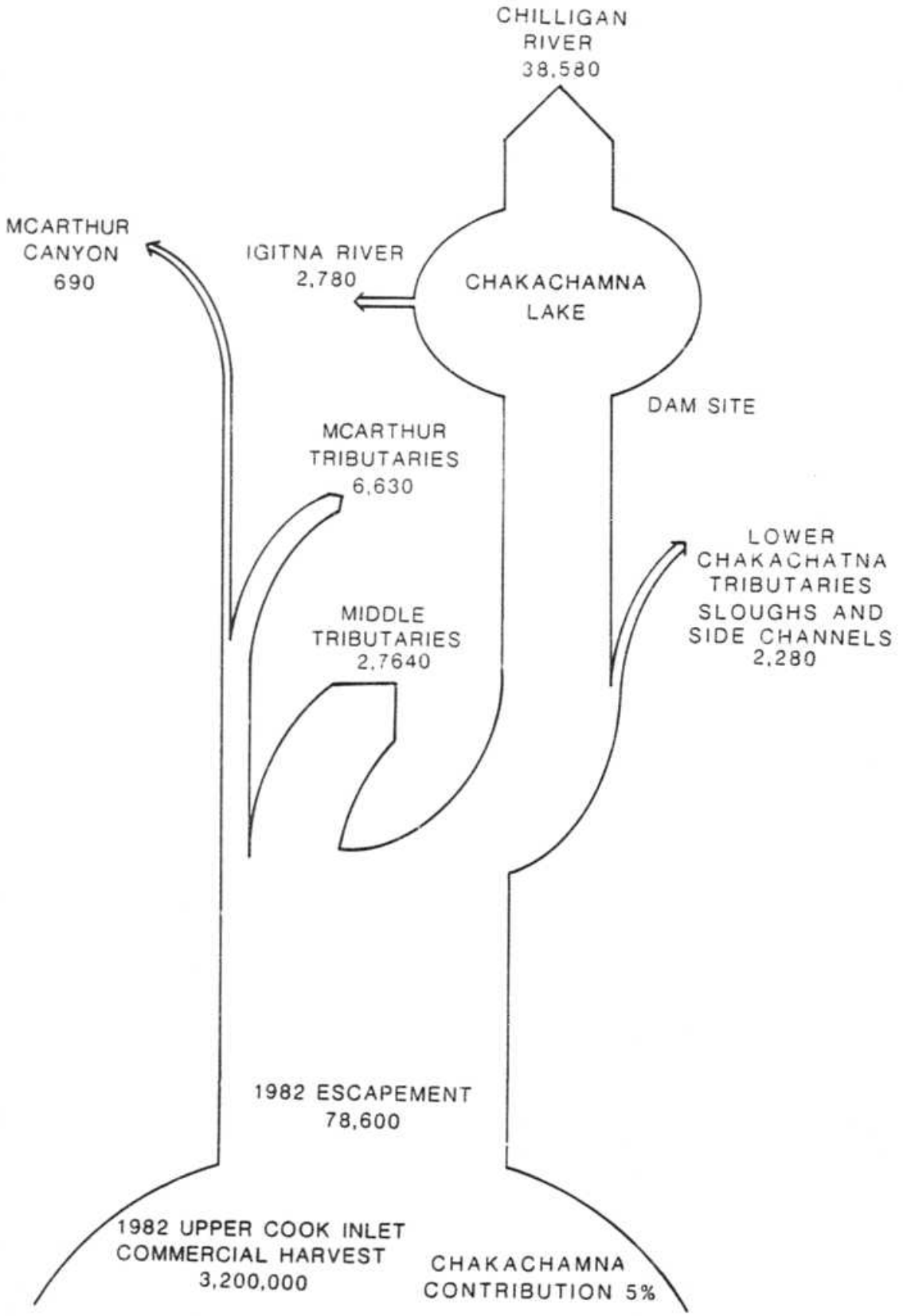


CONTRIBUTION TO CHAKACHAMA SYSTEM FLOW (JULY, PROJECT FLOWS)



MEAN REPORT FLOW
(JULY) 8290cfs

1982 CHAKACHAMNA SOCKEYE



NON-SUSITNA HYDROELECTRIC ALTERNATIVES FINDINGS

- CHAKACHAMNA HAS SIGNIFICANT ENVIRONMENTAL IMPACTS

- ALTERNATIVE HYDRO WITH CHAKACHAMNA NOT ECONOMICALLY OR ENVIRONMENTALLY COMPETITIVE WITH SUSITNA - $ 7.04 VS $ 5.7 BILLION

- VALIDATED RESULT OF ALASKA POWER ADMINISTRATION 1980 RAILBELT STUDY PRINCIPAL FINDING:

  " THERE ARE NO HYDRO GENERATION OPPORTUNITIES AVAILABLE TO GENERATE POWER IN SUFFICIENT QUANITY TO BE AN ALTERNATIVE TO THE SUSITNA PROJECT."

OTHER ALTERNATIVES TO MEET DEMAND

- DIESEL - EVALUATED AS THERMAL ALTERNATIVE
- ALTERNATIVE RESOURCES - BATTELLE ALTERNATIVES STUDY
  - PEAT
  - REFUSE
  - GEOTHERMAL
  - WIND AND SOLAR
- CONSERVATION
  - PRICE INDUCED
  - PROGRAM INDUCED

OPTIMUM GENERATION PLANNING - (OGP)

- INPUTS TO OGP MODEL
- OGP COMPUTER ANALYSIS
- ADDITIONAL GENERATION REQUIRED - ALTERNATIVES
  - NON-SUSITNA
  - SUSITNA
- COMPARISON OF CAPACITY BY ALTERNATIVE
- COMPARISON OF CAPACITY/DEMAND BY ALTERNATIVE
- ALTERNATE ENERGY DEMAND AND DELIVERY
- CONCLUSIONS
- SENSITIVITY

INPUTS TO OGP MODEL

- AVAILABLE TYPES OF GENERATION
- UNIT COSTS
- FUEL COSTS
- OPERATION AND MAINTENANCE COSTS
- LOAD PROJECTION
- LOAD SHAPE
- LOSS OF LOAD PROBABILITY
- ECONOMIC PARAMETERS

OPTIMUM GENERATION PLAN (OGP) COMPUTER ANALYSIS

- CONSIDER ANNUAL PEAK LOAD AND ENERGY REQUIREMENTS
- SELECT NEW RESOURCE FROM AVAILABLE OPTIONS
- CONDUCT ECONOMIC LIFE CYCLE ANALYSIS OF PLAN
- COMPARE PRESENT WORTH OF VARIOUS PLANS TO DETERMINE LOWEST COST PLAN WITH AND WITHOUT SUSITNA

ADDITIONAL GENERATION
NON SUSITNA PLAN

YEAR	RESOURCE	CAPACITY (MW)	LOCATION
1988	BRADLEY & GRANT	97	KENAI
1991-92	SCGT	168	COOK INLET
1993	CCGT	237	COOK INLET
1993	DOUBLE CIRCUIT	345 KV	ANCH/FBKS
1994-97	SCGT	336	COOK INLET
2000-2002	COAL	400	BELUGA
2000	DOUBLE CIRCUIT	230 KV	BELUGA-ANCH
2006-08	COAL	400	NENANA
2011-15	COAL	400	BELUGA
2014-19	SCGT	420	COOK INLET
2020	COAL	200	BELUGA

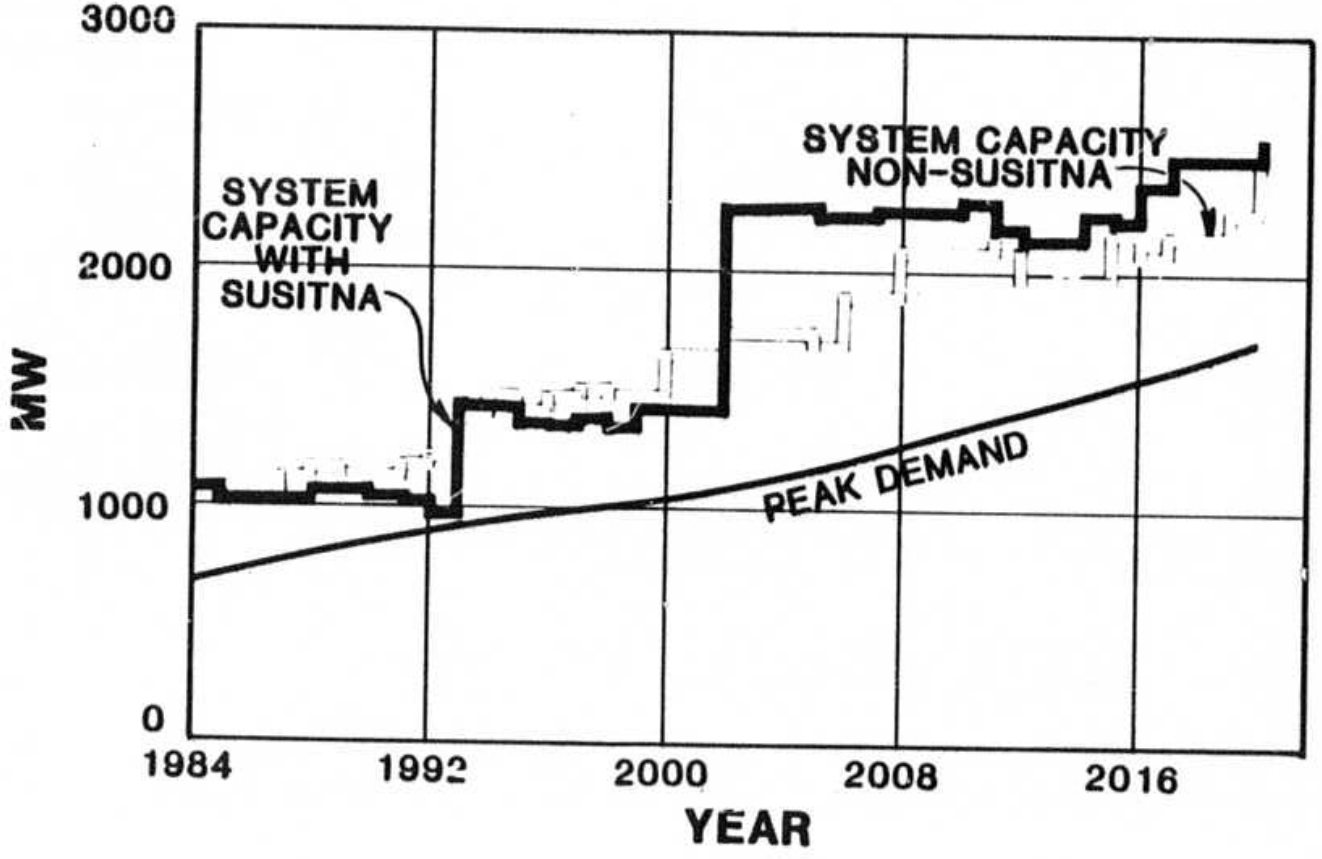
ADDITIONAL GENERATION
SUSITNA PLAN

YEAR	RESOURCE	CAPACITY(MW)	LOCATION
1988	BRADLEY & GRANT	97	KENAI
1993	WATANA	539	SUSITNA
1993	DUAL TRANSMISSION	345 KV	ANCH / FBKS
1996-99	SCGT	252	COOK INLET
2002	DEVIL CANYON	1081	SUSITNA
2012-14	SCGT	252	COOK INLET
2016	CCGT	237	COOK INLET
2017-20	SCGT	336	COOK INLET

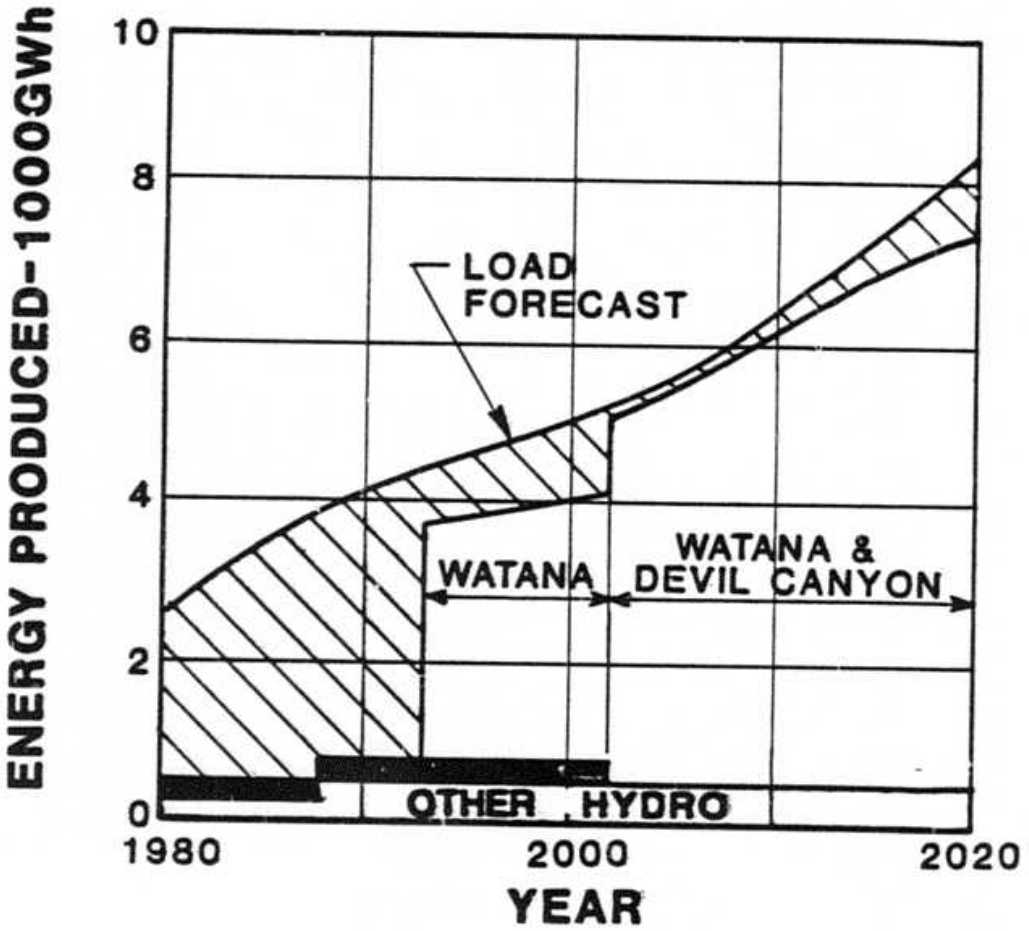
COMPARISON OF CAPACITY BY ALTERNATIVE

	SUSITNA ALT.	NON SUSITNA ALT.
EXIST. CAPACITY: (1984)	1097 MW	1097 MW
RETIREMENTS: (TO 2020)	1302 MW	1386 MW
ADDITIONS:		
HYDRO:	1717 MW	97 MW
COAL:	0 MW	1400 MW
GAS TURBINE:	1077 MW	1230 MW
CAPACITY: (2020)	2589 MW	2438 MW
LOAD:	1724 MW	1724 MW
EXCESS %	50%	41%

COMPARISON OF CAPACITY / DEMAND BY ALTERNATIVE



SUSITNA ALTERNATIVE-ENERGY DEMAND & DELIVERIES

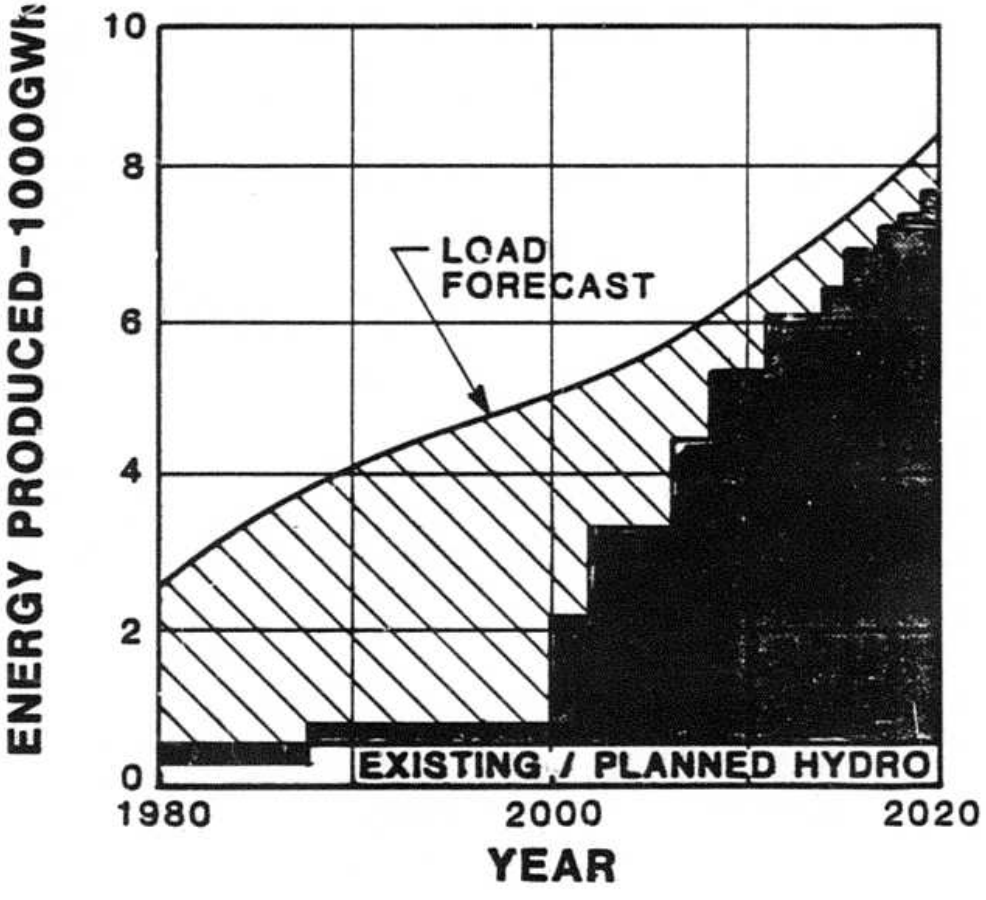


LEGEND

COAL-FIRED

OIL & GAS-FIRED

NON-SUSITNA ALTERNATIVE-ENERGY DEMAND & DELIVERIES



LEGEND

COAL-FIRED

OIL & GAS-FIRED

ECONOMIC FEASIBILITY CONCLUSIONS

(TO YEAR 2050)

	WITH SUSITNA	WITHOUT SUSITNA①
PRESENT WORTH COST	$5.7 BILLION	$6.8 BILLION
COST SAVINGS	$1.1 BILLION②	

① THERMAL (GAS AND COAL) WITH BRADLEY HYDRO

② POTENTIAL SUSITNA DESIGN REFINEMENTS COULD INCREASE COST SAVINGS TO $1.3 BILLION

SENSITIVITY ANALYSES

OBJECTIVE: DETERMINE THE SENSITIVITY OF THE RESULTS OF ECONOMIC ANALYSIS TO ASSUMED CHANGES IN ONE OR MORE KEY VARIABLES.

SENSITIVITY ANALYSES

KEY VARIABLE	CHANGE IN SAVINGS (MILLIONS) ①
AVAILABILITY OF COOK INLET GAS	
- IF UNLIMITED	- $281
REAL ESCALATION OF FUEL COSTS	
- COAL AT 0% 1983-2050	- $950
- ALL FUELS AT 0% 2020-2050	- $120
UTILITIES LOAD FORECAST	
- USED THROUGH 2000	+ $1900

① BASE CASE SAVINGS $1100 MILLION

THRESHOLD VALUES

THRESHOLD VALUE IS VALUE OF KEY VARIABLE AT WHICH COST OF SUSITNA PLAN EQUALS COST OF NON-SUSITNA PLAN

THRESHOLD VALUES

KEY VARIABLE	VALUES USED IN REFERENCE CASE	THRESHOLD VALUE
OIL PRICE FORECAST	$37.00 IN 1999	$27.45 / BARREL IN 1999 1.5% ESCALATION THEREAFTER
CONSTRUCTION COST (1983 $-WATANA ONLY)	$3.75 BILLION	$5.0 BILLION (33% INCREASE)
REAL DISCOUNT RATE	3.5%	5.3%

ENVIRONMENTAL UPDATE

- ISSUE IDENTIFICATION
- STATUS OF ENVIRONMENTAL PROGRAMS
- REMAINING ISSUES

ISSUE IDENTIFICATION

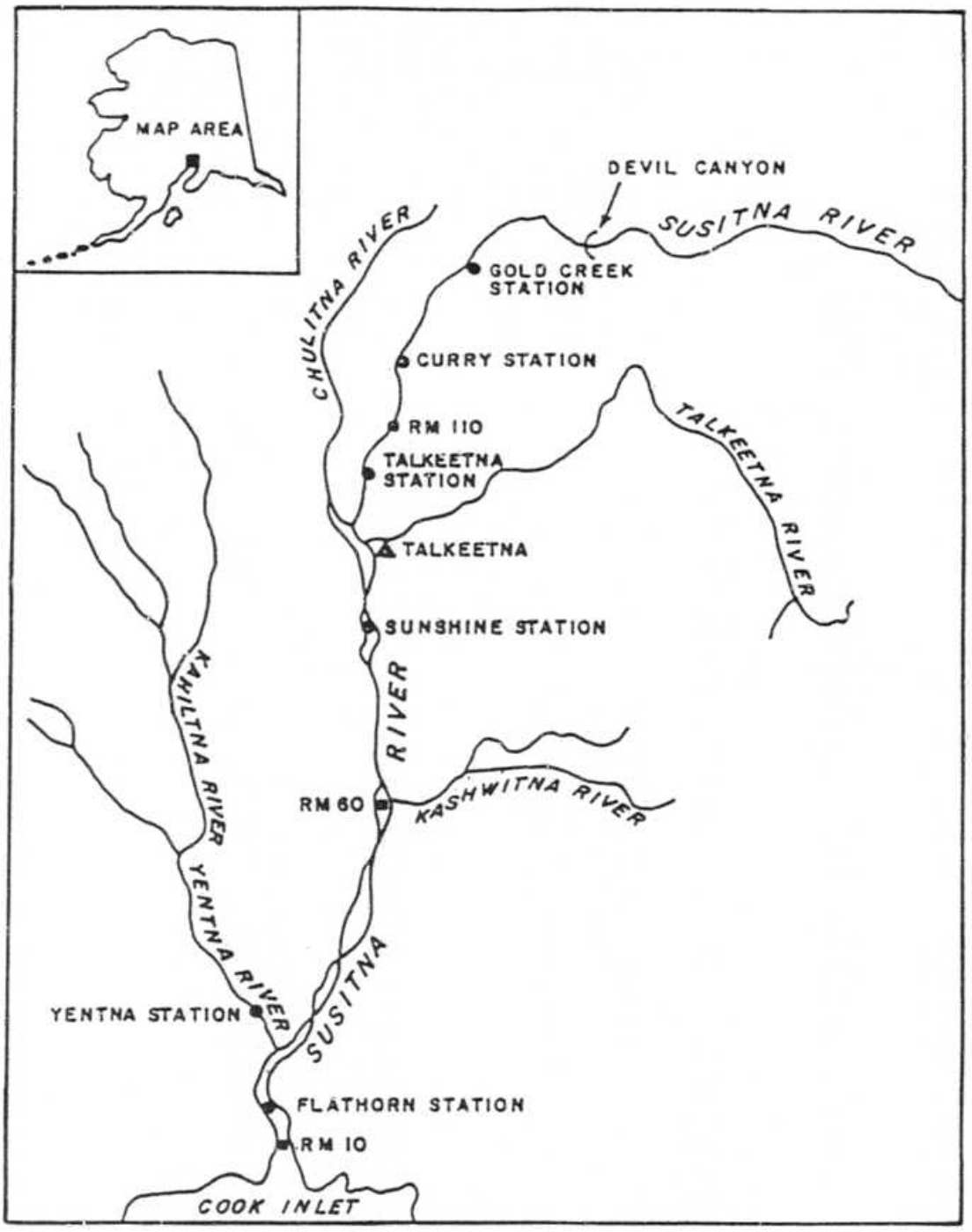
- FEASIBILITY HEARINGS
- REVIEW OF APPLICATION
- FERC SCOPING MEETINGS
- BOARD MEETINGS
- AGENCY WORKSHOPS

STATUS OF ENVIRONMENTAL PROGRAMS

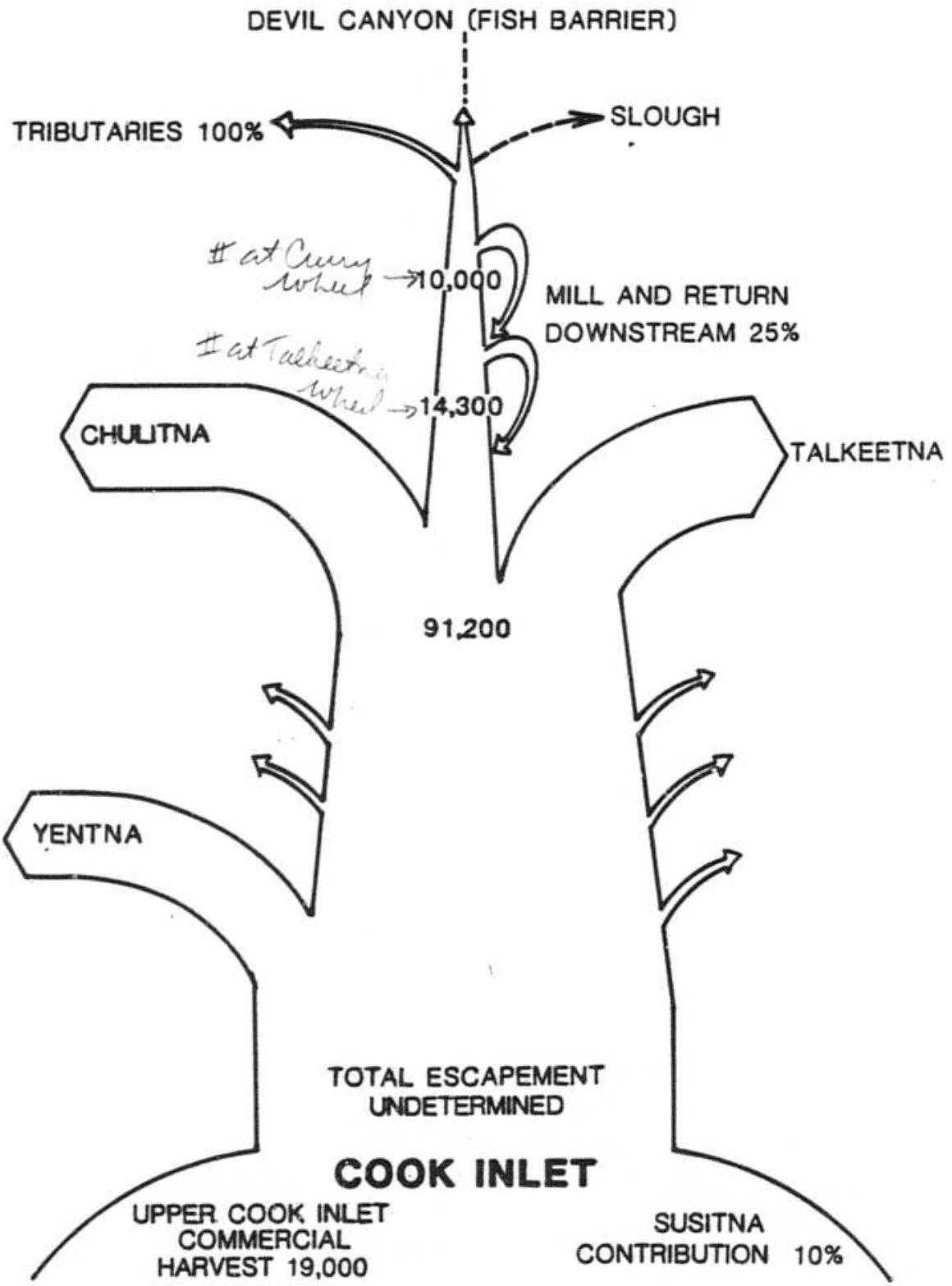
- FISHERIES AND HYDROLOGY
- WILDLIFE AND VEGETATION
- CULTURAL RESOURCES
- SOCIOECONOMICS
- RECREATION
- LAND USE

FISHERIES AND HYDROLOGY

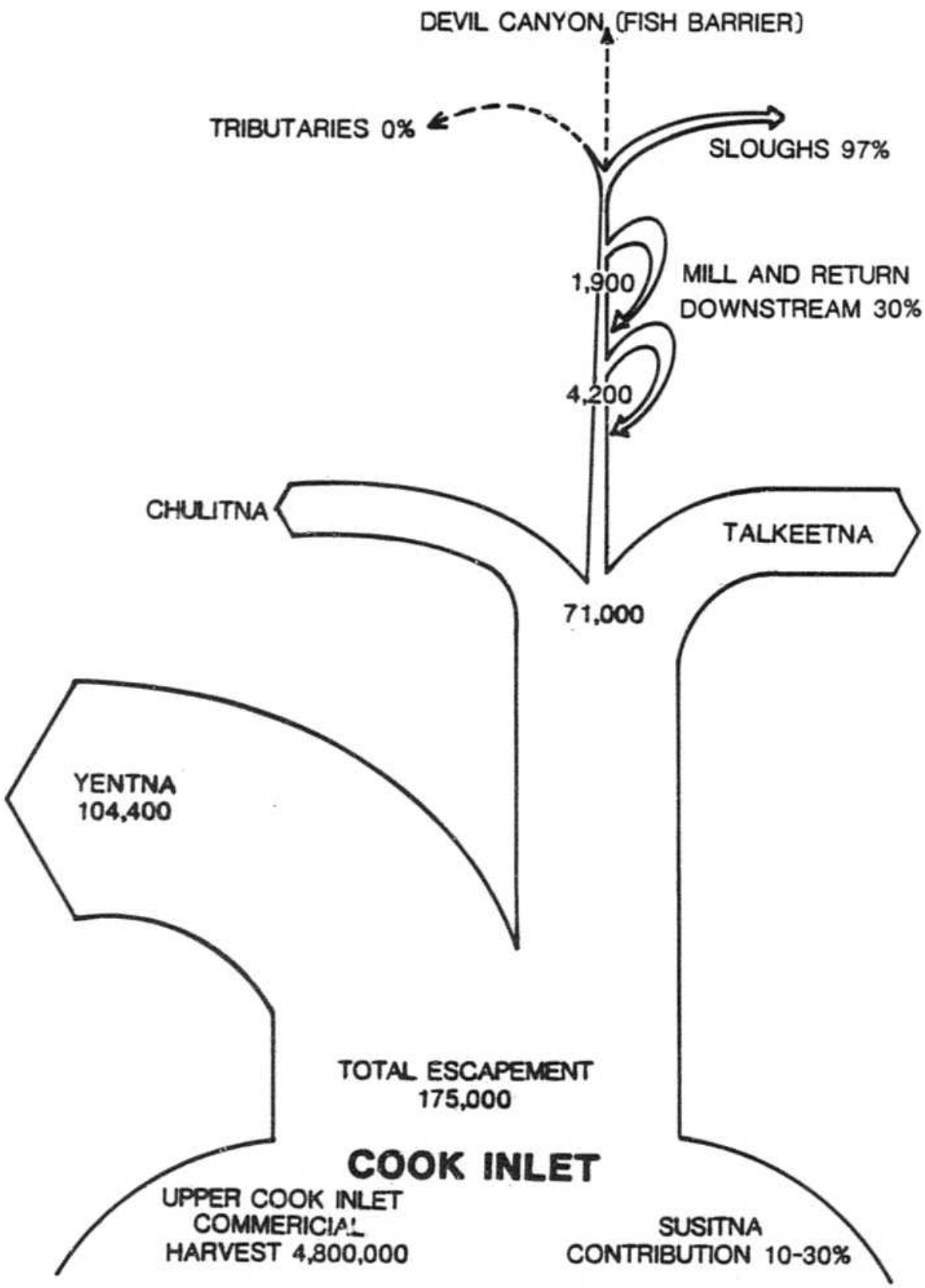
- POPULATIONS AND DISTRIBUTION OF FISH
- CHANGES IN AQUATIC HABITAT
  - FLOW PATTERN
  - WATER QUALITY
- PROJECT EFFECTS ON NAVIGATION
- DEVELOPMENT OF MITIGATION PLAN


MAP AREA
DEVIL CANYON
SUSITNA RIVER
CHULITNA RIVER
GOLD CREEK STATION
CURRY STATION
RM 110
TALKEETNA STATION
TALKEETNA
TALKEETNA RIVER
SUNSHINE STATION
SUSITNA RIVER
KASHWITNA RIVER
RM 60
YENTNA RIVER
YENTNA STATION
FLATHORN STATION
RM 10
COOK INLET

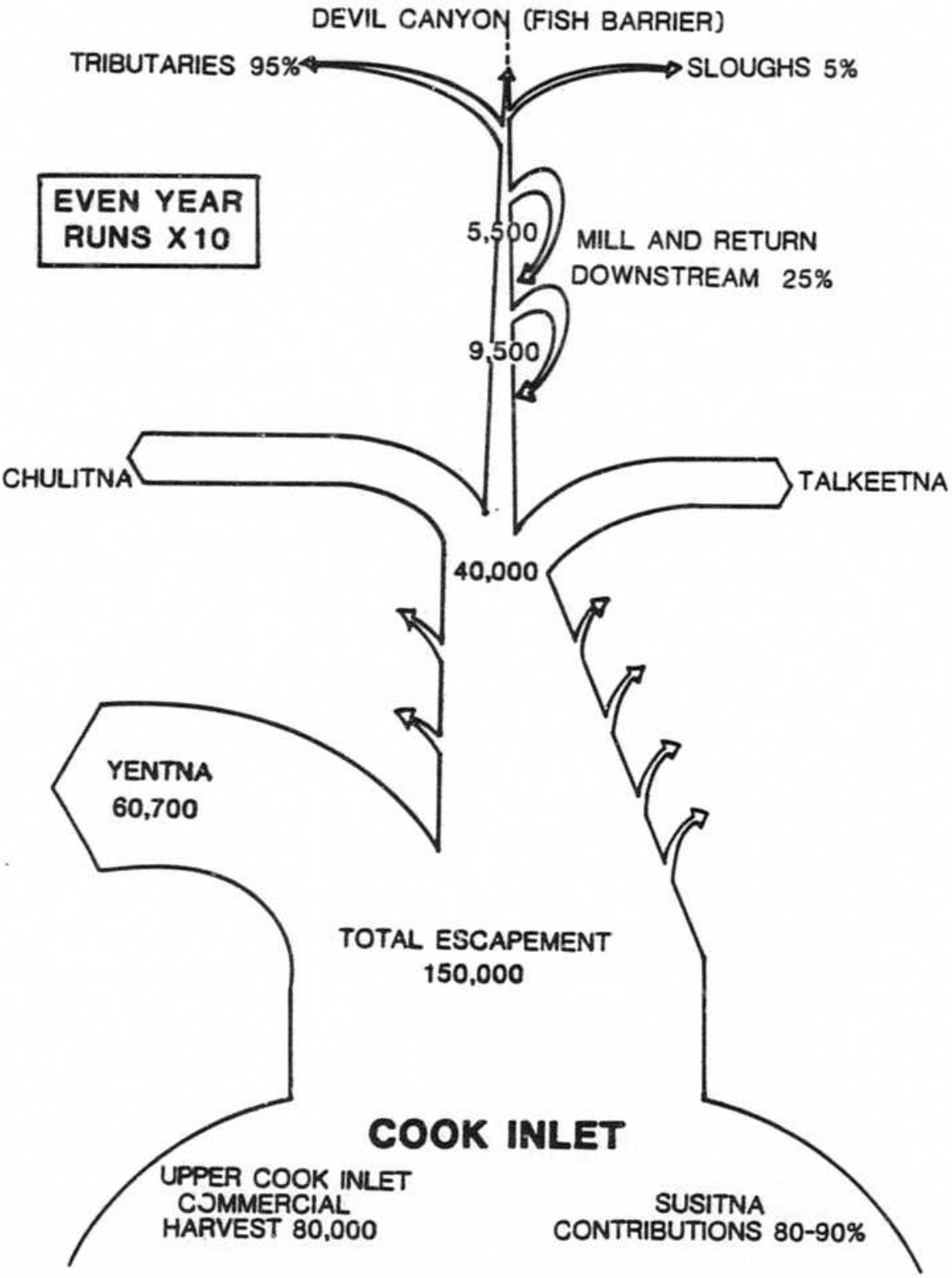
1983 SUSITNA CHINOOK

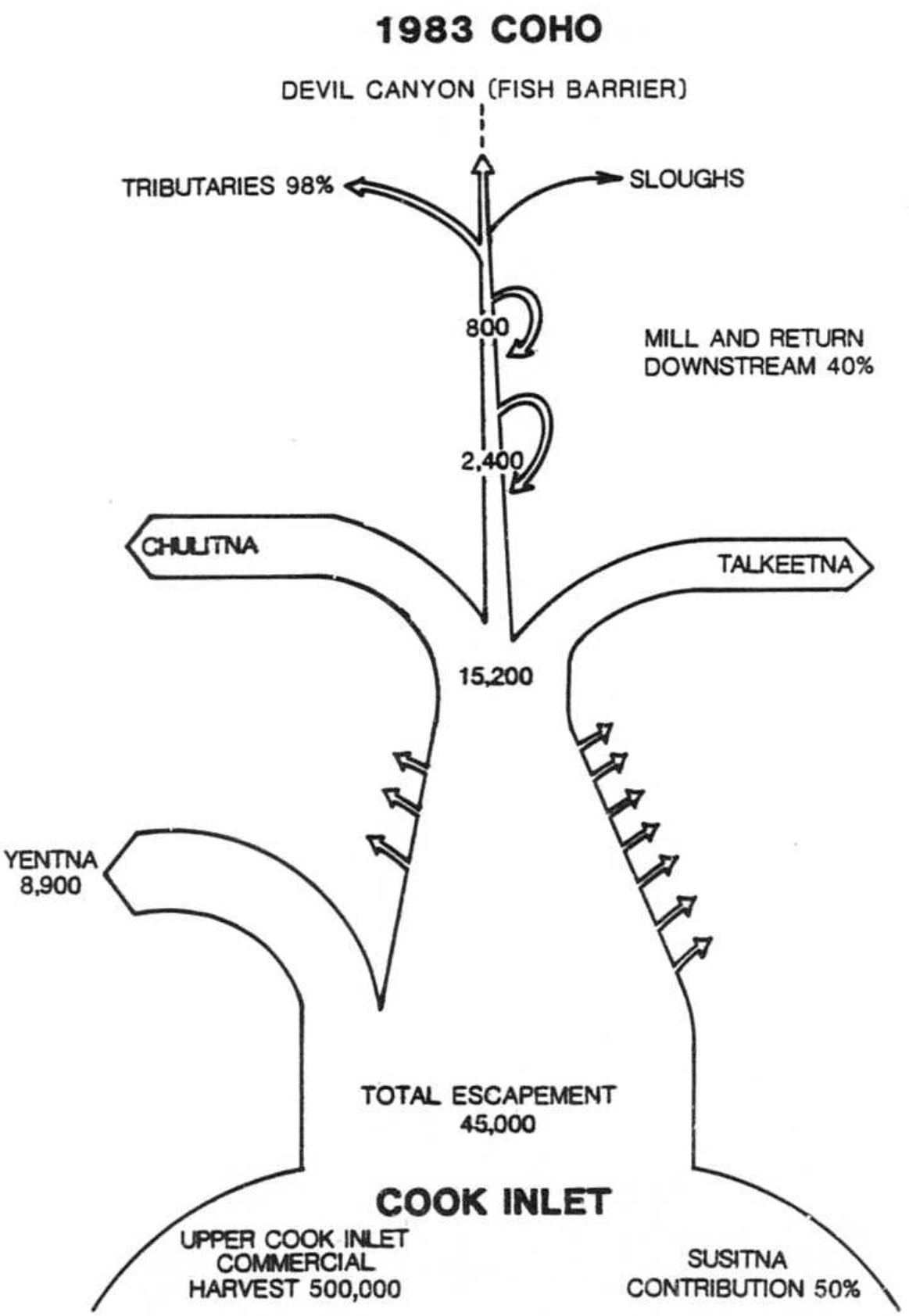


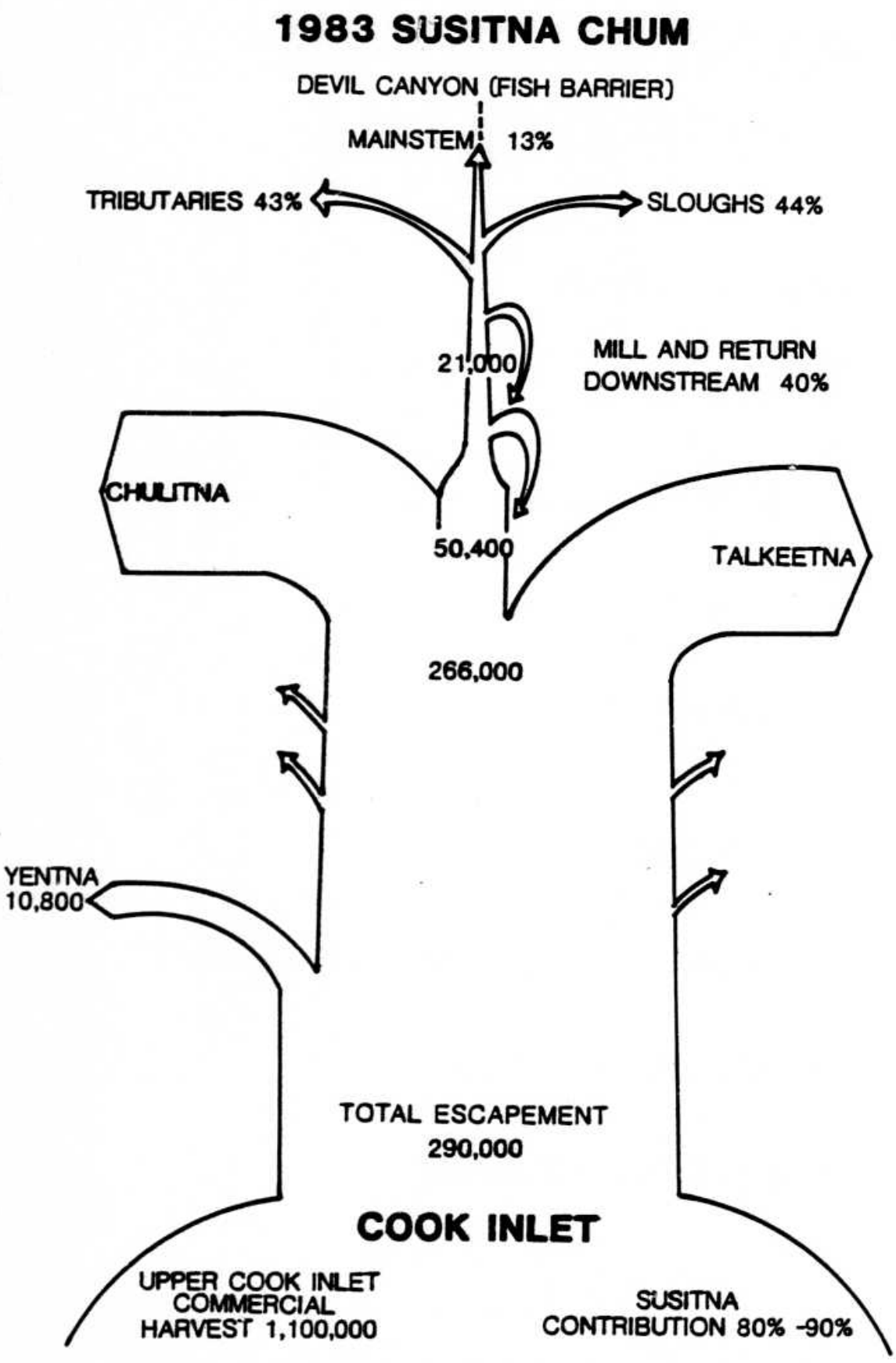
1983 SUSITNA SOCKEYE



1983 SUSITNA PINKS




1983 COHO
DEVIL CANYON (FISH BARRIER)
TRIBUTARIES 98%
SLOUGHS
800
MILL AND RETURN
DOWNSTREAM 40%
2,400
CHULITNA
TALKEETNA
15,200
YENTNA
8,900
TOTAL ESCAPEMENT
45,000
COOK INLET
UPPER COOK INLET
COMMERCIAL
HARVEST 500,000
SUSITNA
CONTRIBUTION 50%


1983 SUSITNA CHUM
DEVIL CANYON (FISH BARRIER)
MAINSTEM 13%
TRIBUTARIES 43%
SLOUGHS 44%
21,000
MILL AND RETURN
DOWNSTREAM 40%
CHULITNA
50,400
TALKEETNA
266,000
YENTNA
10,800
TOTAL ESCAPEMENT
290,000
COOK INLET
UPPER COOK INLET
COMMERCIAL
HARVEST 1,100,000
SUSITNA
CONTRIBUTION 80% -90%

HABITAT TYPES/ LIFE STAGES

HABITAT TYPES

- MAINSTEM
- SIDE CHANNEL
- TRIBUTARIES
- SLOUGHS

LIFE STAGES

- ADULT ACCESS AND SPAWNING
- EGG INCUBATION
- JUVENILE REARING

SPAWNING HABITAT PREFERENCES BY MIDDLE SUSITNA RIVER SALMON

SPECIES	PREDOMINANT SPAWNING HABITAT
PINK	TRIBUTARIES
CHUM	SLOUGHS AND TRIBUTARIES
SOCKEYE	SLOUGHS (IN MIDDLE REACH)
COHO	TRIBUTARIES
CHINOOK	TRIBUTARIES

PROJECT CHANGES IN AQUATIC HABITAT

- CHANGES IN FLOW PATTERNS
  DISCHARGE/STAGE RELATIONSHIP

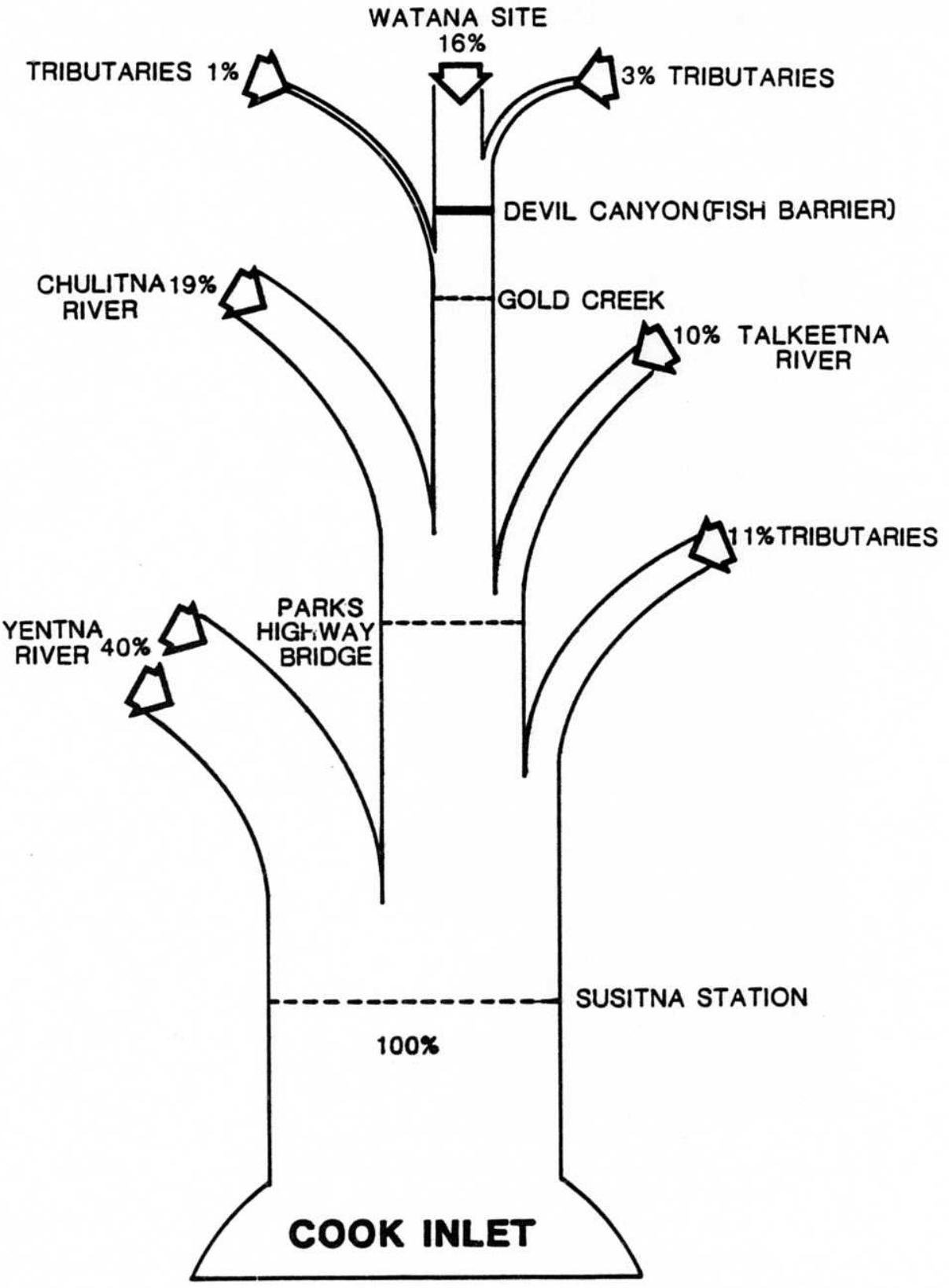
- ACCESS TO SPAWNING AREAS

  SLOUGHS

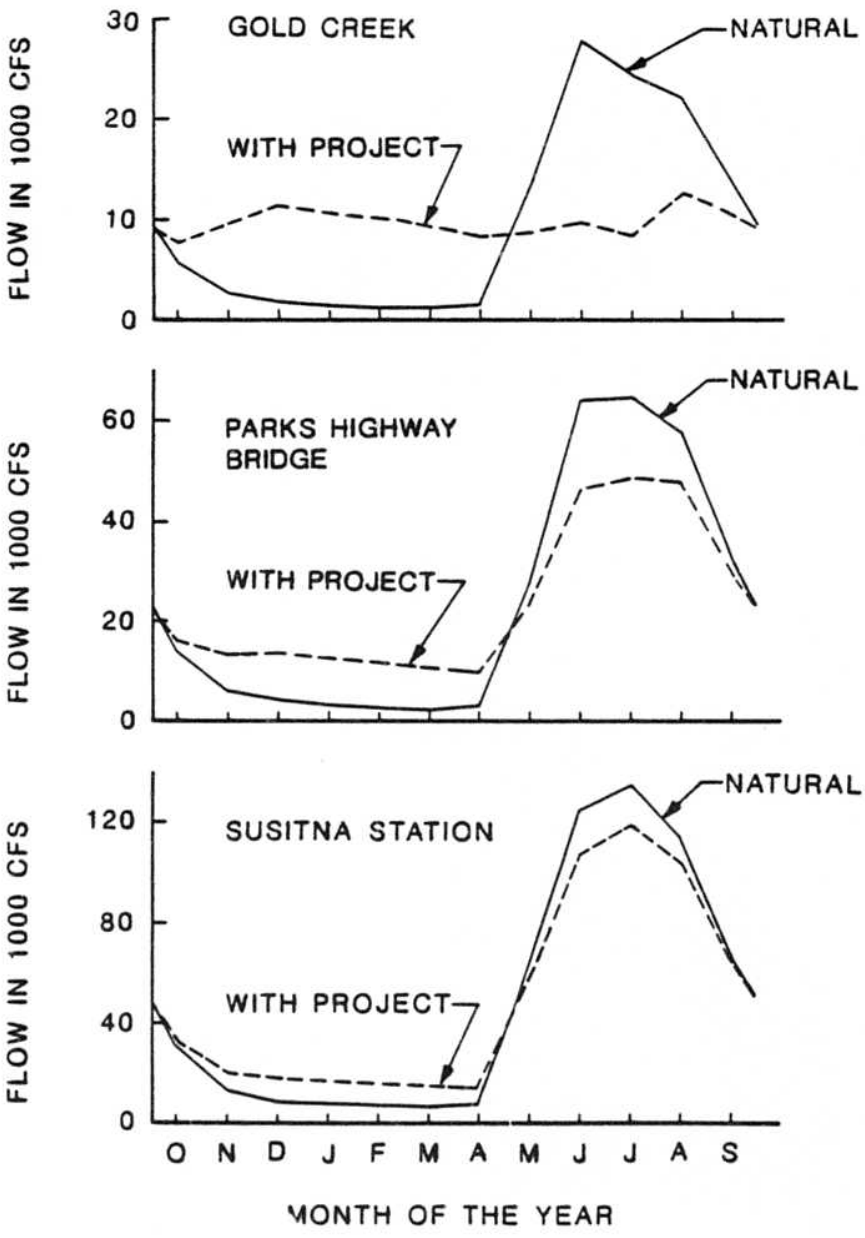
  TRIBUTARIES

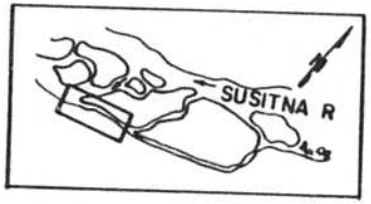
- CHANGES IN AQUATIC HABITAT
  CHARACTERISTICS AND USE

CONTRIBUTION TO SUSITNA RIVER FLOW



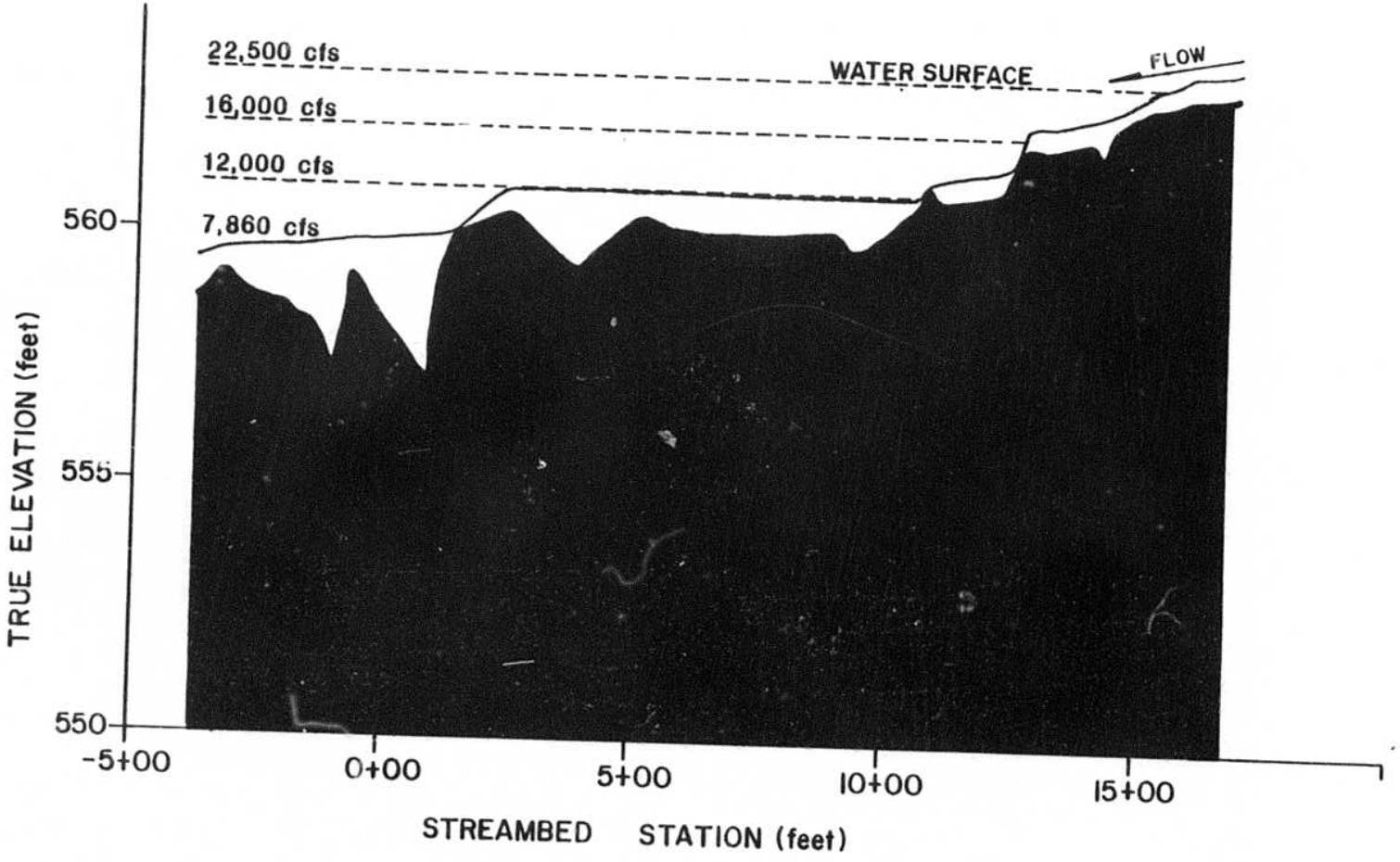
MONTHLY MEAN SUSITNA RIVER FLOWS





THALWEG PROFILE

SLOUGH 8A



PEAK ESCAPEMENT

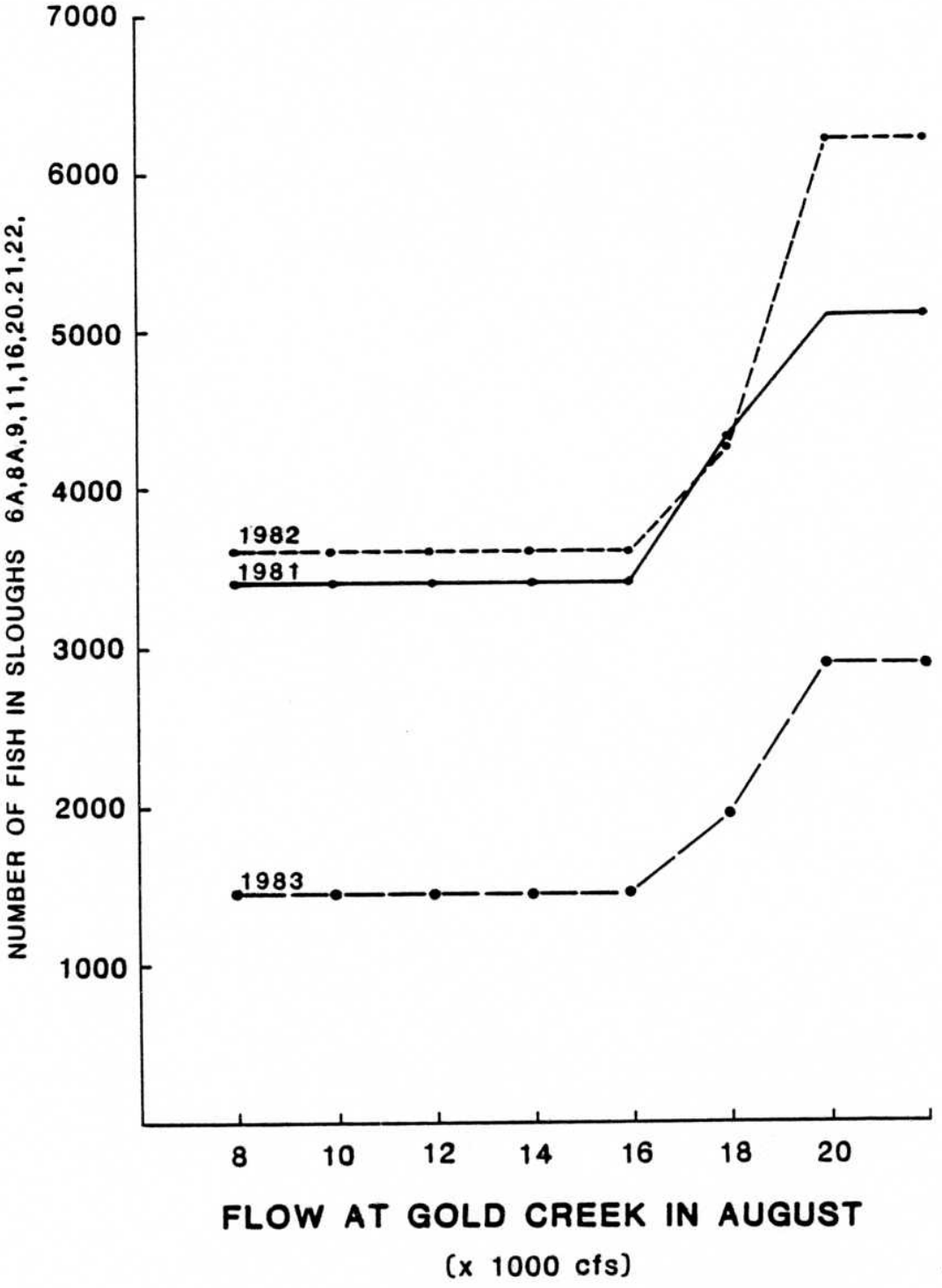
SLOUGH	ACCESS	SOCKEYE	PINK	CHUM
	ACUTE	81	81	81
	UNRESTRICTED	82	82	82
		83	83	83
WHISKERS	8,000	0	–	0
	10,000	0	138	0
		0	0	0
6A	—	0	–	11
	8,000	0	35	2
		0	0	6
8A	7,860	117	–	411
	12,500	68	28	459
		66	0	238
9	18,000	6	–	260
	20,000	10	12	300
		2	0	169
11	—	214	–	411
	6,700	893	131	459
		248	7	238
16B	18,000	0	0	0
	24,000	0	0	0
		0	0	0
20	20,000	2	–	14
	21,500	0	64	30
		0	7	63
21	20,000	38	–	274
	23,000	53	64	736
		197	1	319
22	20,000	0	–	0
	22,500	0	0	0
		0	0	114

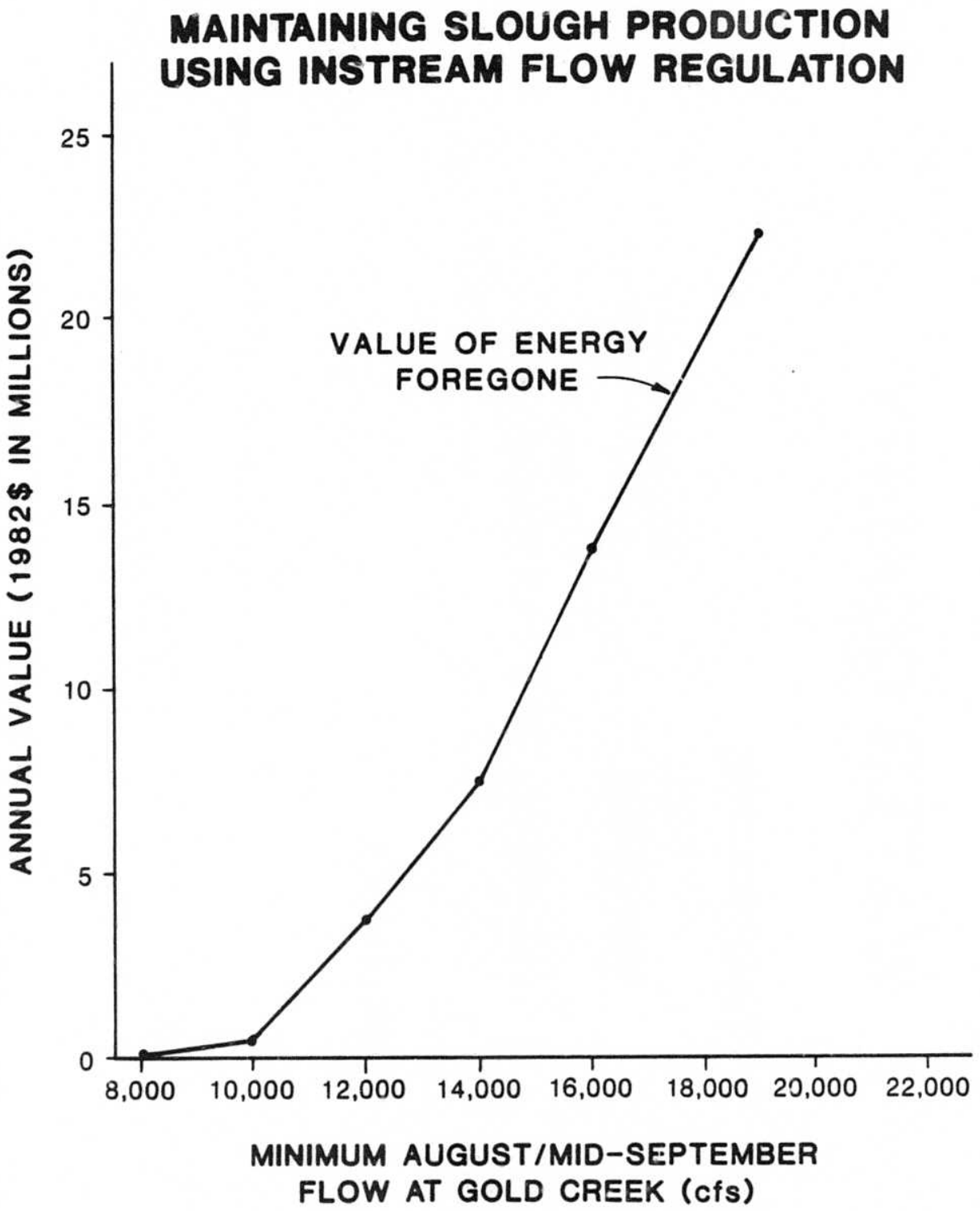
HABITAT SELECTION AND REARING BY MIDDLE SUSITNA RIVER JUVENILE SALMON

SPECIES	PREDOMINANT REARING HABITAT	FRESHWATER REARING PERIOD
PINK	NONE	NONE
CHUM	SLOUGHS	UP TO 3 MONTHS
SOCKEYE *	UPLAND SLOUGHS	ONE YEAR
COHO *	UPLAND SLOUGHS/SMALL TRIBUTARIES	ONE TO TWO YEARS
CHINOOK *	SIDE-CHANNELS AND TRIBUTARIES	ONE YEAR

* OVER WINTER IN MAINSTEM

TOTAL NUMBER OF SLOUGHS SPAWNING SALMON




MAINTAINING SLOUGH PRODUCTION
USING INSTREAM FLOW REGULATION
ANNUAL VALUE (1982$ IN MILLIONS)
25
20
15
10
5
0
VALUE OF ENERGY
FOREGONE
8,000
10,000
12,000
14,000
16,000
18,000
20,000
22,000
MINIMUM AUGUST/MID-SEPTEMBER
FLOW AT GOLD CREEK (cfs)

WATER QUALITY

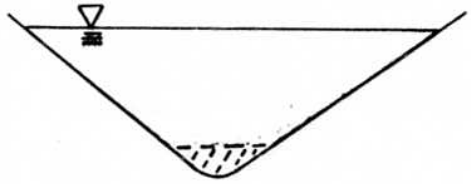
- TEMPERATURE

  MAINSTEM

  ICE FORMATION AND BREAKUP

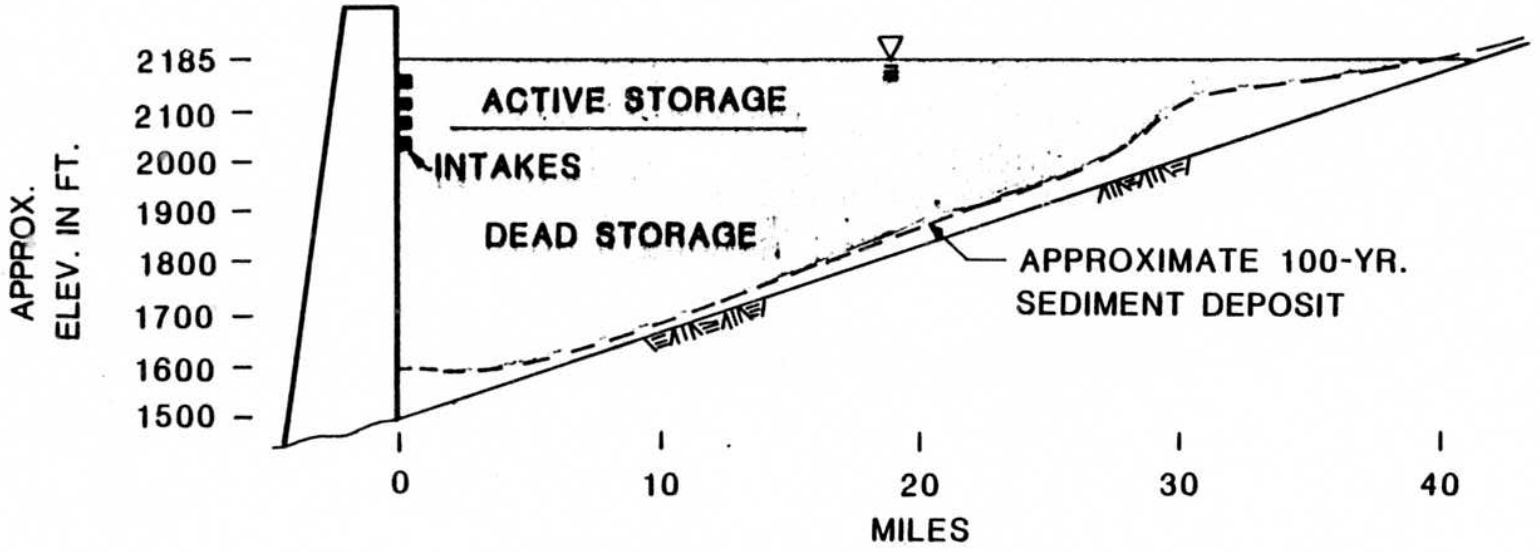
- SEDIMENT

AMOUNT OF RESERVOIR FILL-IN IN 100YRS. - WATANA



AREA CONTAINED BELOW DASHED LINE INDICATES APPROXIMATE VOLUME AND LOCATION OF SEDIMENT AFTER 100 YEARS

4 PERCENT OF VOLUME FILLED WITH SEDIMENT IN 100 YEARS



NAVIGATION

- EXISTING CONDITIONS
- WITH-PROJECT CHANGES

FREQUENCY OF NON-NAVIGABILITY OF DEVIL CANYON - TALKEETNA REACH RESULTING FROM LOW FLOW CONDITIONS

PERCENT OF TIME FLOW LESS THAN 6,500 cfs

MONTH	NATURAL CONDITIONS		WATANA ALONE	WATANA - DEVIL CANYON
MAY	31.0	10	10	10
JUNE	0	0	3	10
JULY	0	0	0	0
AUGUST	1.5	0	0	0
SEPTEMBER	8.6	5	0	0

FISHERIES AND HYDROLOGY CONCLUSIONS

1. NO ANADROMOUS FISH ABOVE DEVIL CANYON
2. ONLY A SMALL PERCENTAGE OF SUSITNA RIVER FISH USE MIDDLE RIVER REACH
3. OF FISH USING MIDDLE RIVER REACH, MOST ENTER TRIBUTARIES
4. SEVERAL THOUSAND SOCKEYE AND CHUM SPAWN IN SLOUGHS AFFECTED BY PROJECT FLOWS

FISHERIES AND HYDROLOGY CONCLUSIONS

5. JUVENILES REAR IN AREAS AFFECTED BY PROJECT FLOWS

6. CHINOOK JUVENILES REAR IN SIDE CHANNELS AND TURBID SLOUGHS

7. MINIMAL EFFECTS ON BOAT TRANSPORTATION

8. POTENTIAL FOR DELAY IN FORMATION OF RIVER ICE AND FOR ICE FRONT TO BE DOWNSTREAM OF DEVIL CANYON

FISHERIES AND HYDROLOGY CONCLUSION

9. LESS MIDDLE RIVER EROSION

   - RIVER BED ARMORED WITH LARGE COBBLES. REGULATED RIVER WILL BE LESS CAPABLE OF MOVING BED MATERIAL.

   - BANK EROSION A FUNCTION OF FLOOD STAGE AND ICE JAMS. PROJECT WILL REDUCE FREQUENCY AND SEVERITY OF EACH.

FISHERIES AND HYDROLOGY CONCLUSION

10. LOWER RIVER SEDIMENT DEPOSITION

- CHULITNA CONTRIBUTES MOST LOWER RIVER SEDIMENT LOAD. REDUCING SUSITNA PEAK FLOWS WILL REDUCE CAPACITY OF RIVER BELOW CONFLUENCE TO REDISTRIBUTE SEDIMENTS.

WILDLIFE & VEGETATION

- HABITAT LOSS
- MOOSE IMPACTS
- CARIBOU IMPACTS
- BLACK AND BROWN BEAR IMPACTS
- DALL SHEEP LICK
- LOSS OF RAPTOR NESTS
- DEVELOPMENT OF MITIGATION PLAN

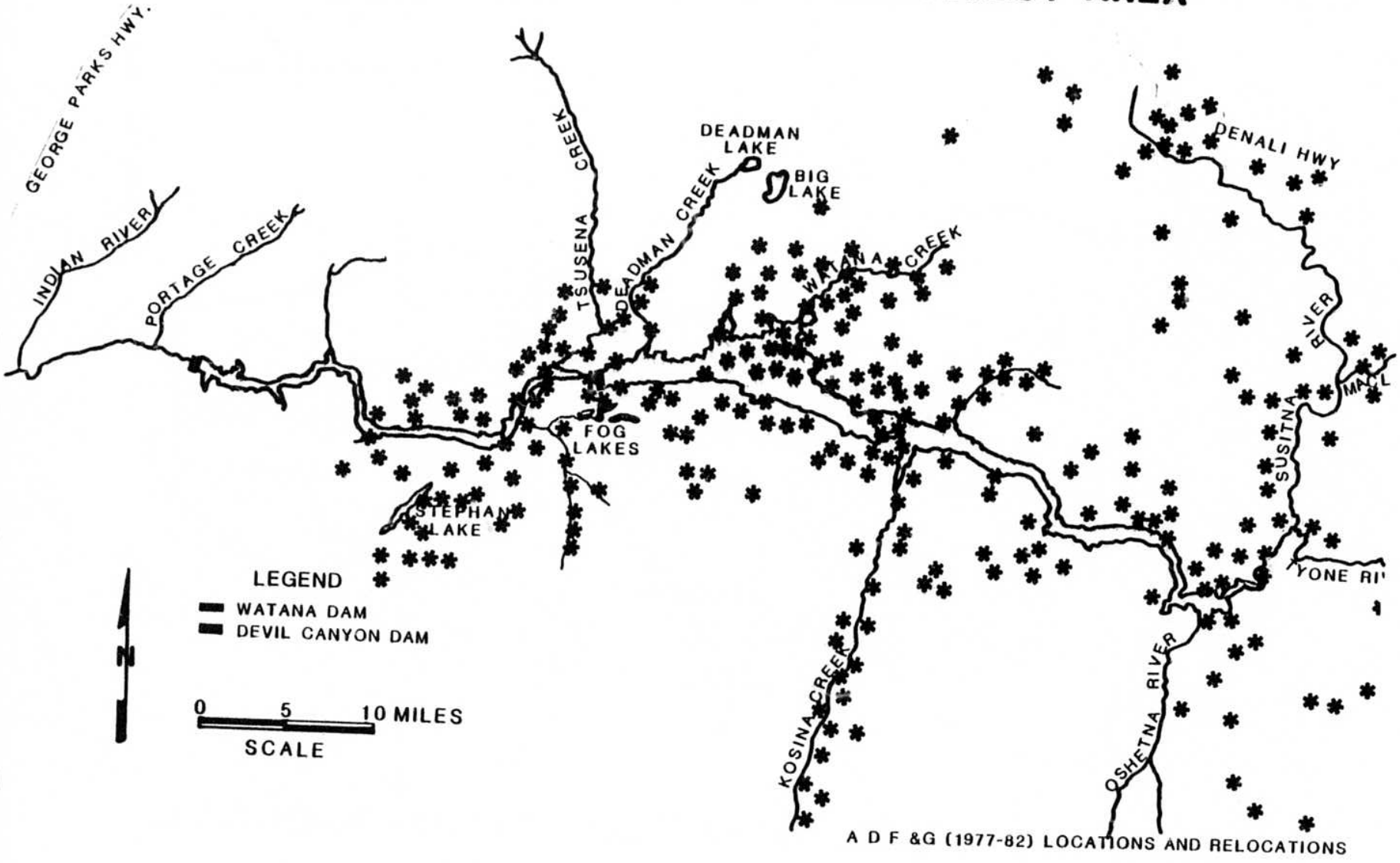
AREA OF HABITAT LOST OR MODIFIED (ACRES)

WATANA RESERVOIR	36,500
DEVIL CANYON RESERVOIR	7,900
PROJECT FACILITIES AND BORROW PITS	4,900
TRANSMISSION CORRIDORS	10,500
ACCESS CORRIDORS	1,100
TOTAL	60,900

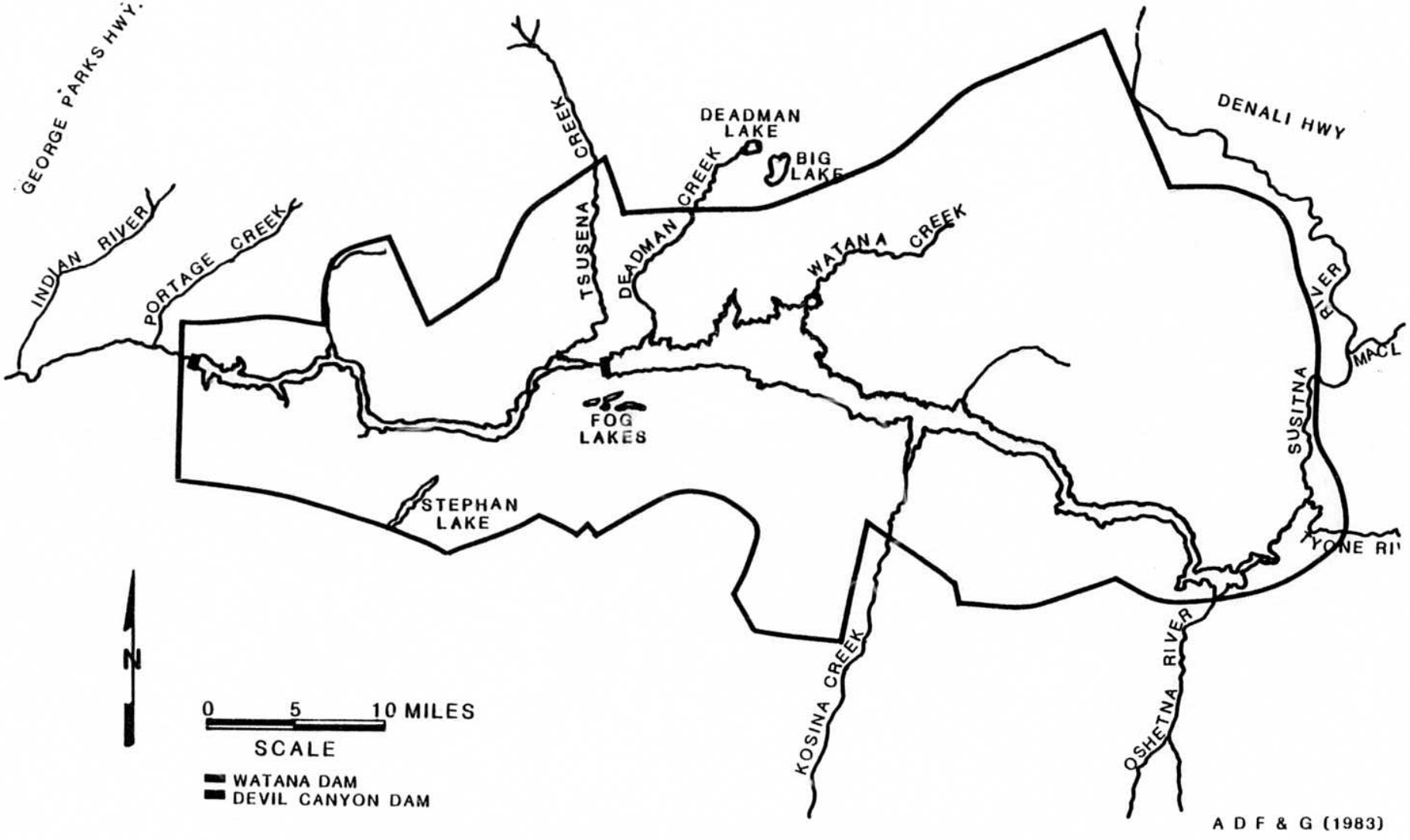
MOOSE IMPACTS

- POPULATION CENSUS
- BROWSE VEGETATION INVENTORY
- MONITORING OF PREDATORS
- CALF MORTALITY STUDY
- COMPUTER MODELING

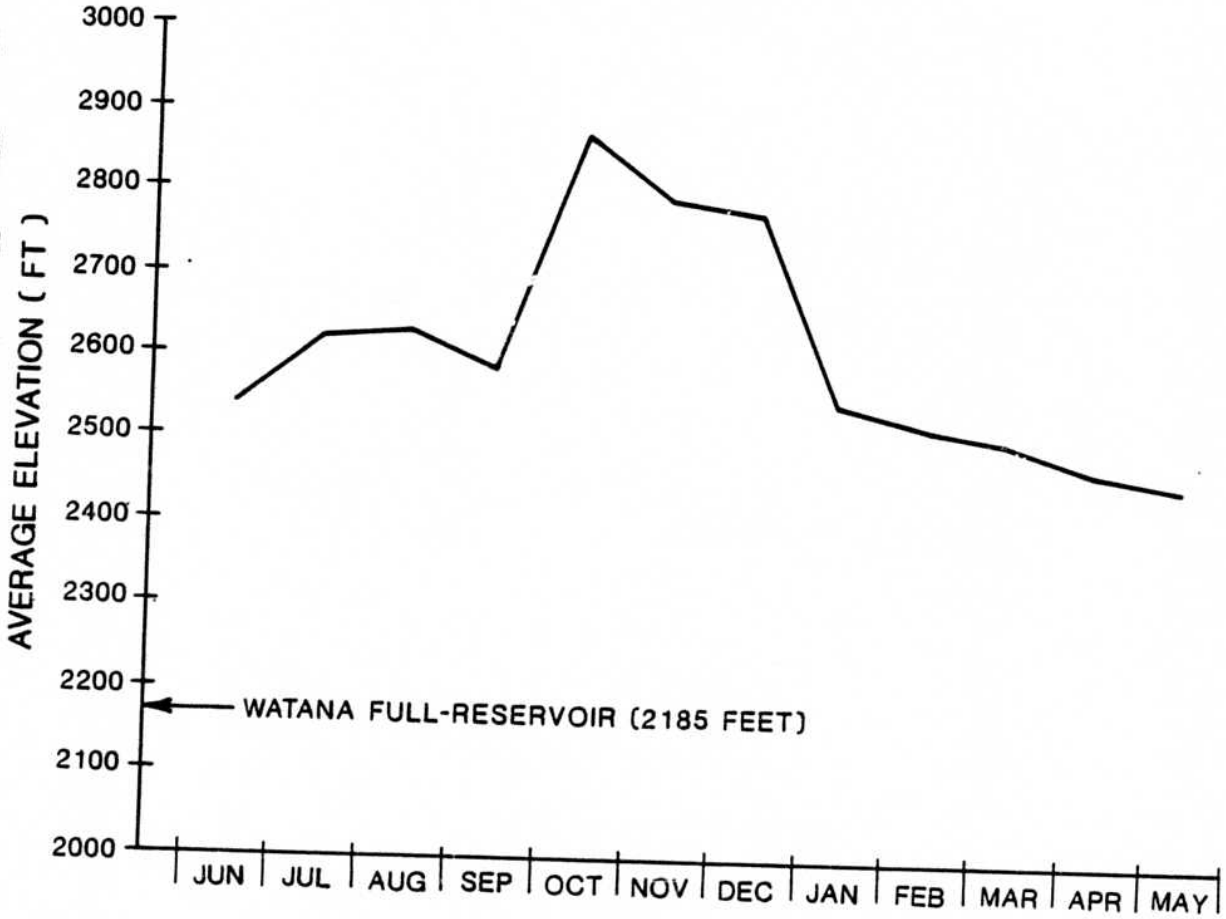
WINTER LOCATIONS OF RADIO-COLLARED MOOSE IN PROJECT AREA



DISTRIBUTION OF MOOSE
WITH HOME RANGES OVERLAPPING THE IMPOUNDMENTS



AVERAGE ELEVATIONS OCCUPIED BY MOOSE WITH HOME RANGES OVERLAPPING THE IMPOUNDMENTS 1976 - 1982

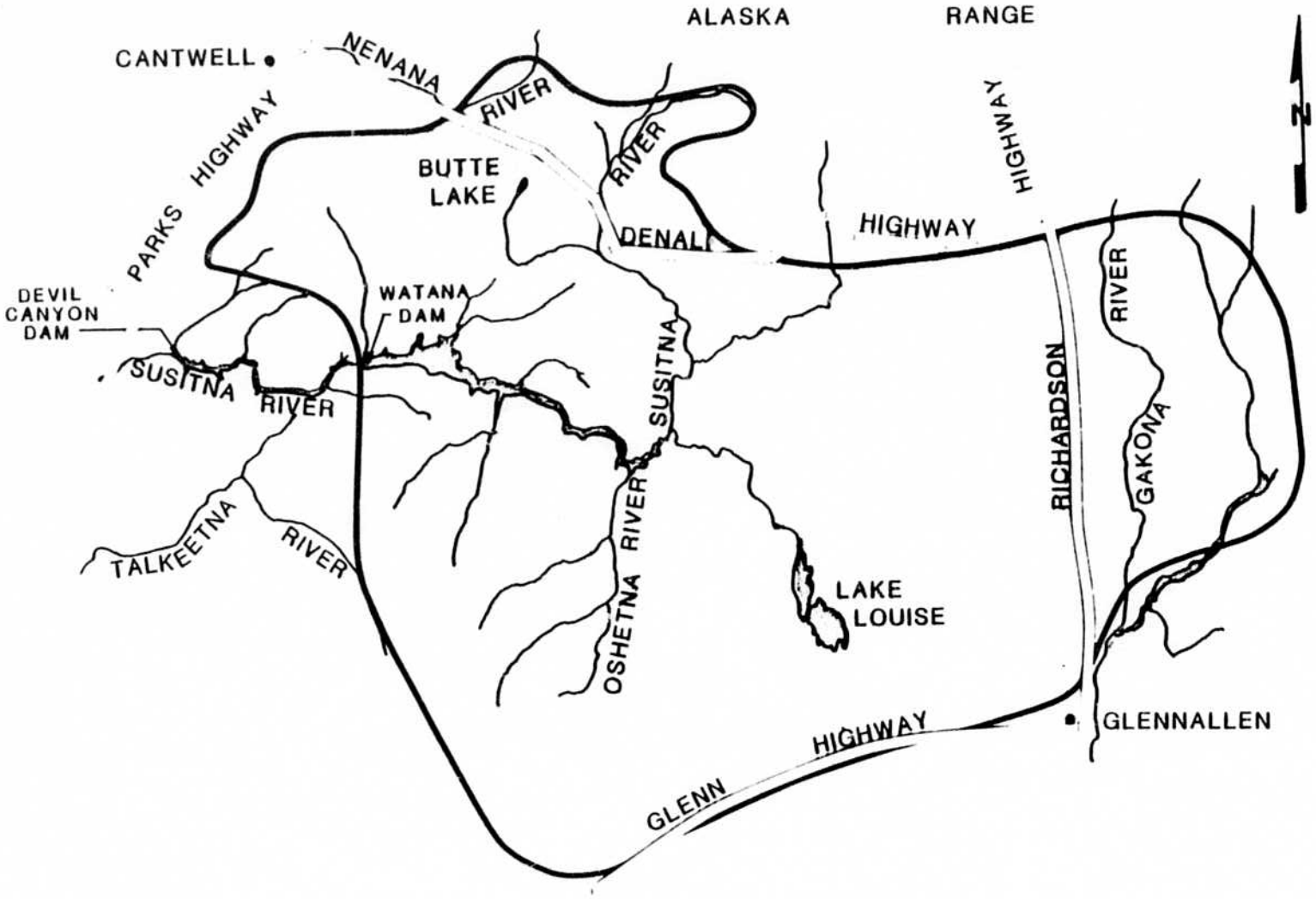


ADF&G

CARIBOU IMPACTS

- POPULATION CENSUS

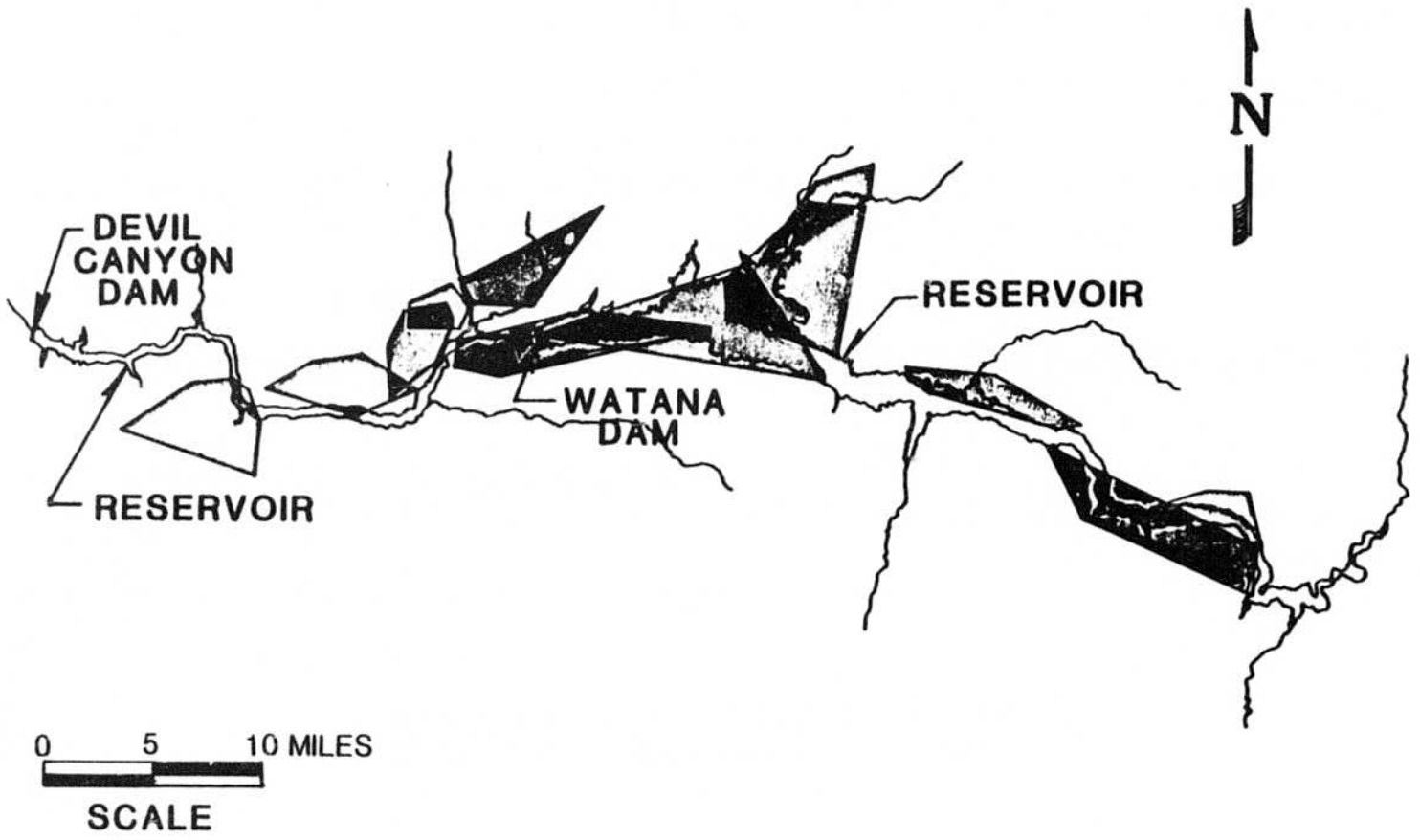
MOVEMENTS OF RADIO-COLLARED CARIBOU



BLACK & BROWN BEAR IMPACTS

- POPULATION CENSUS

HOME RANGES OF FEMALE BLACK BEARS



A D F & G (1980-83)

CONCLUSIONS - WILDLIFE AND VEGETATION

- LOSS OF MOOSE HABITAT
- LOSS OF BEAR HABITAT
- NELCHINA CARIBOU HERD CROSSES IMPOUNDMENT AREA ON SOME MIGRATIONS
- UPPER SUSITNA - NENANA CARIBOU SUBHERD - RANGE CROSSED BY ACCESS ROAD
- 2 OR 3 NESTING PAIRS OF BALD EAGLES DISPLACED TO NEW NEST SITES

CULTURAL RESOURCES

- COMPLIANCE WITH NATIONAL HISTORIC PRESERVATION ACT

  DETERMINATION OF RESPONSIBILITIES

  IDENTIFICATION OF CULTURAL RESOURCES

  DEFINITION OF CRITERIA FOR SIGNIFICANCE

  MITIGATION PLAN

CONCLUSION-CULTURAL RESOURCES

- SITES OR DISTRICT ELIGIBLE FOR REGISTERS

SOCIOECONOMICS

- SOCIOECONOMIC IMPACT PROJECTIONS
- FISH AND WILDLIFE RESOURCE USERS
- ALTERNATIVE WORKERS TRANSPORTATION PLANS
- MITIGATION PLAN

SOCIOECONOMIC IMPACT PROJECTIONS

- HOUSEHOLD, BUSINESS AND PUBLIC SECTOR SURVEYS IN SMALL COMMUNITIES
- INTERTIE CONSTRUCTION WORKER SURVEYS
- SOCIOECONOMIC IMPACT MODEL

SOCIO ECONOMIC SURVEYS

FALL 1983

	CANTWELL	TALKEETNA	TRAPPER CREEK
POPULATION	193	281	196
NATIVE	18%	5%	0%
HOUSEHOLD SIZE	2.38	3.16	3.2
CHILDREN	0.6	0.9	0.95
UNEMPLOYMENT OCT. 83	24%	14%	20%
VACANCY OCT.83	36%	28%	11%
ANGLERS	67%	48%	53%
HUNTERS	56%	29%	42%

INTERTIE CONSTRUCTION WORKER SURVEY

VARIABLE	CANTWELL	TALKEETNA	TOTAL
○TOTAL NUMBER OF WORKERS	45	43	88
○PERCENT NONMOVER	6.7	34.9	20.5
○PERCENT MOVER	35.6	48.8	42.0
○PERCENT WEEKLY COMMUTER	57.8	16.3	37.4
○PERCENT UNION	71.0	0.0	36.4
○AVERAGE AGE	35.8	35.7	35.8
○PERCENT OF NONLOCAL WORKERS WITH DEPENDENTS PRESENT	14.3	21.4	17.1
○AVERAGE NUMBER OF DEPENDENTS PRESENT PER NONLOCAL WORKER	0.3	0.5	0.4
○REMAIN IN COMMUNITIES AFTER JOB ENDS	13.3	47.6	29.9

SOCIOECONOMIC IMPACT MODEL
DEMOGRAPHIC ECONOMIC IMPACTS
1990
MAT SU BOROUGH

	WITHOUT-PROJECT	WITH-PROJECT
POPULATION	47,246	48,639
EMPLOYMENT	7,857	8,856
POLICE MANPOWER	52.4	54.1
HOSPITAL BEDS	60.5	62.3
PRIMARY SCHOOL CHILDREN	5,911	6,117
SECONDARY SCHOOL CHILDREN	5,036	5,211
GENERAL FUND REVENUES(x1000)	$ 39,068	$ 40,220
SERVICE AREA FUNDS (x1000)	$ 5,186	$ 5,229
SCHOOL DISTRICT FUNDS(x1000)	$ 57,972	$ 62,523

REVISED PROJECTIONS 1983 F.O.A.

SOCIOECONOMIC IMPACT MODEL
DEMOGRAPHIC ECONOMIC IMPACTS
1990
TALKEETNA

	WITHOUT-PROJECT	WITH-PROJECT
POPULATION	457	652
EMPLOYMENT	*	*
PRIMARY SCHOOL CHILDREN	57	86
ADDITIONAL SCHOOL ROOMS (AT 1/25)		1.16
SECONDARY SCHOOL CHILDREN	49	74
ADDITIONAL SCHOOL ROOMS (AT 1/21)		1.18

* NOT DETERMINED, NO DIRECT EMPLOYMENT IN TALKEETNA

CONCLUSION - SOCIOECONOMICS

- MINIMAL IMPACT AT THE BOROUGH LEVEL
- SIGNIFICANT IMPACTS TO SMALL ADJACENT COMMUNITIES
- CONFLICTS BETWEEN RESOURCES USER GROUPS

RECREATION

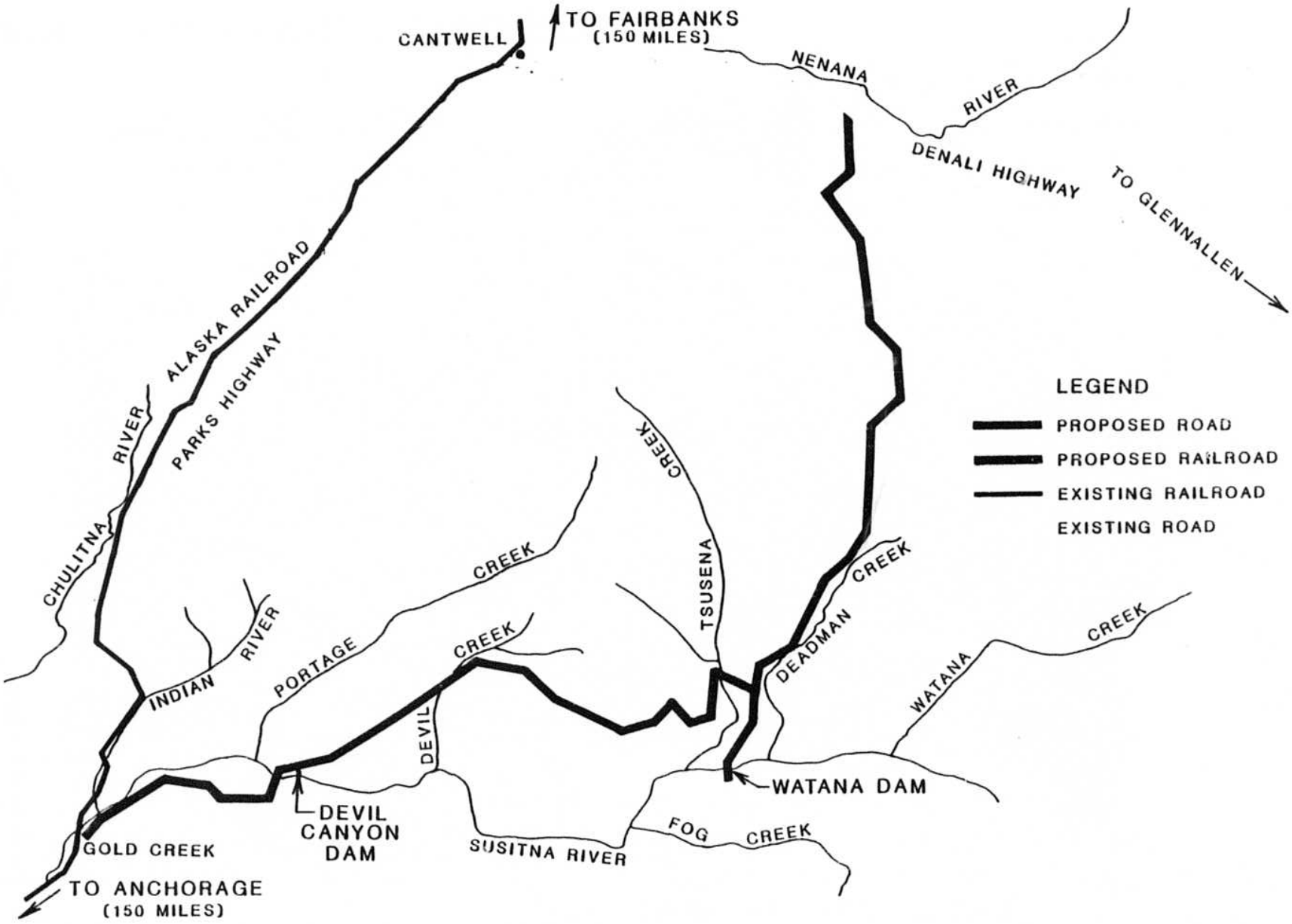
- FISH AND WILDLIFE RESOURCE USERS
- HIKERS AND CAMPERS
- PUBLIC ACCESS ROUTE AND MANAGEMENT
- REFINEMENT OF RECREATION PLAN

CONCLUSION-RECREATION

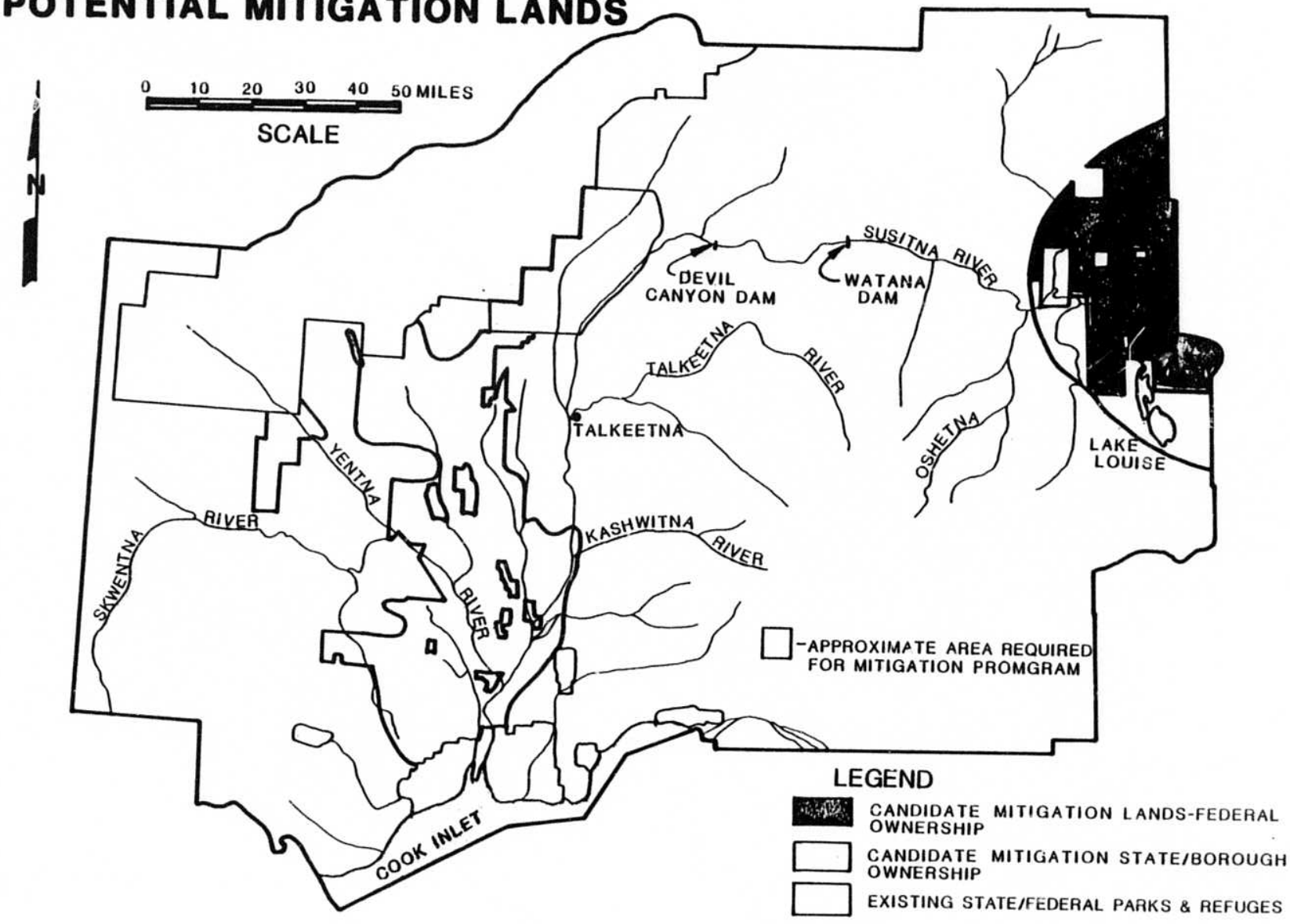
- POST PROJECT: PUBLIC ACCESS WILL IMPACT FISH AND WILDLIFE WHILE PROVIDING RECREATIONAL OPPORTUNITIES

LAND USE

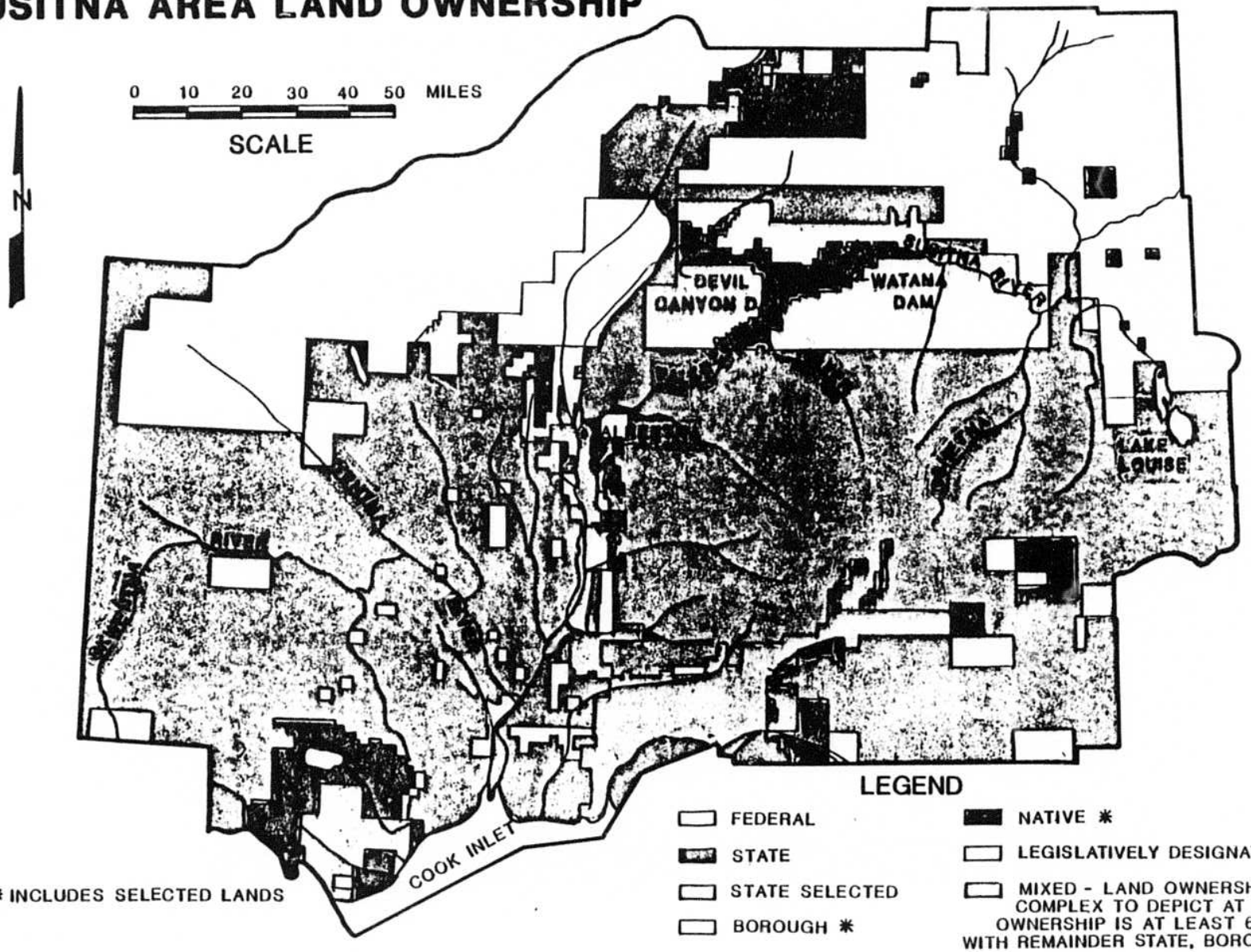
- ACCESS PLAN
- PUBLIC ACCESS
- LOCATION OF MITIGATION LANDS
- DEVELOPMENT PLANS OF ADJACENT LANDOWNERS


CANTWELL
TO FAIRBANKS
(150 MILES)
NENANA
RIVER
DENALI HIGHWAY
TO GLENNALLEN
ALASKA RAILROAD
PARKS HIGHWAY
CHULITNA
RIVER
INDIAN
RIVER
PORTAGE
CREEK
DEVIL
CREEK
TSUSENA
CREEK
DEADMAN
CREEK
WATANA
CREEK
LEGEND
PROPOSED ROAD
PROPOSED RAILROAD
EXISTING RAILROAD
EXISTING ROAD
WATANA DAM
DEVIL
CANYON
DAM
GOLD CREEK
SUSITNA RIVER
FOG
CREEK
TO ANCHORAGE
(150 MILES)

POTENTIAL MITIGATION LANDS



SUSITNA AREA LAND OWNERSHIP



CONCLUSION - LAND USE

- DEVELOPMENT OF ACCESS ROUTE BY PROJECT LEADS TO DEVELOPMENT OPPORTUNITIES ON ADJACENT LANDS

REMAINING ISSUES

- FISHERIES AND HYDROLOGY
  - DEVELOPMENT OF MANAGEMENT PLANS
  - LOWER RIVER STUDIES
  - ICE DYNAMICS
- WILDLIFE AND VEGETATION
  - SELECTION OF MITIGATION LANDS
  - DEVELOPMENT OF MANAGEMENT PLANS

REMAINING ISSUES

- SOCIOECONOMICS
  - WORKER TRANSPORTATION
  - SHIFT / ROTATION AND ACCOMODATIONS
  - FISH AND WILDLIFE USERS ANALYSIS
- LAND USE
  - DETERMINE PUBLIC ACCESS POLICY

FINANCING OPTIONS

- SOURCES OF FUNDS
- FINANCING OPTIONS SELECTED
- ANALYSIS OF OPTIONS
- CONCLUSIONS

POTENTIAL SOURCES OF FUNDING

- STATE CONTRIBUTION
- TAX EXEMPT DEBT
- RURAL ELECTRIFICATION ADMINISTRATION GUARANTEED LOAN
- TAXABLE DEBT

POTENTIAL SOURCES OF FUNDING

STATE CONTRIBUTION

- o EQUITY
- o RATE STABILIZATION FUND
- o PERMANENT FUND

POTENTIAL SOURCES OF FUNDING

TAX EXEMPT DEBT

- REVENUE BONDS
  - LEVEL DEBT SERVICE
  - VARIABLE RATE BONDS
  - CREEPING COUPON BONDS
  - PUT BONDS
  - INSURED BONDS
- TAX EXEMPT COMMERCIAL PAPER
- GENERAL OBLIGATION BONDS
- LEVERAGED LEASE

POTENTIAL SOURCES OF FUNDING

- RURAL ELECTRIFICATION ADMINISTRATION GUARANTEED LOAN

POTENTIAL SOURCES OF FUNDING

TAXABLE DEBT

- o TAXABLE BONDS
- o PRIVATE PLACEMENTS
- o TAXABLE COMMERCIAL PAPER

FINANCING OPTIONS SELECTED FOR ANALYSIS

OPTION A : TAX EXEMPT REVENUE BONDS COMBINED WITH STATE EQUITY AND RATE STABILIZATION FUND

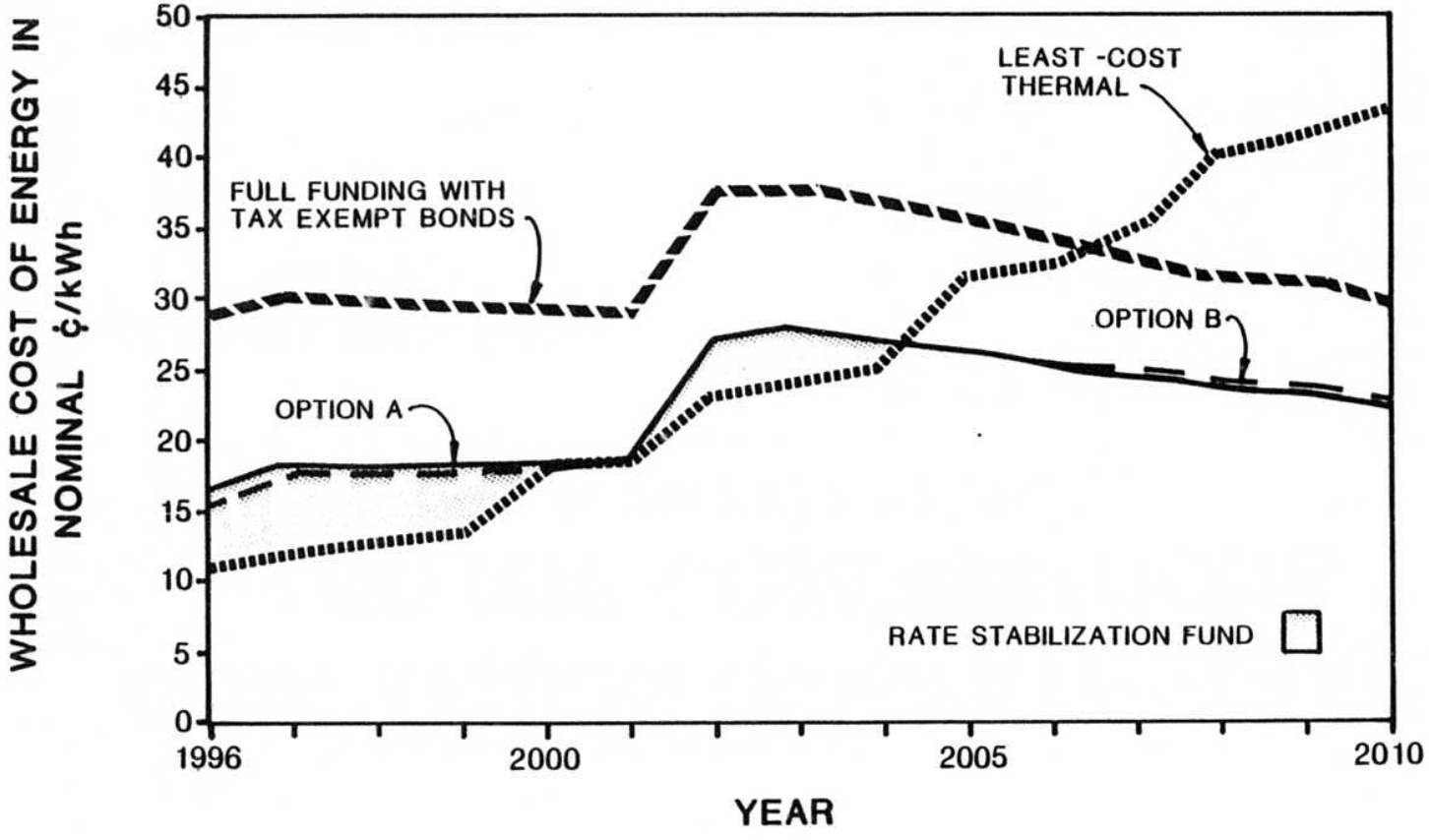
OPTION B : REA GUARANTEED LOAN AND TAX EXEMPT REVENUE BONDS (50/50) COMBINED WITH STATE EQUITY AND RATE STABILIZATION FUND

FUNDING REQUIREMENTS

(MILLION NOMINAL DOLLARS)

	WATANA	DEVIL CANYON	TOTAL
OPTION A			
TAX - EXEMPT BONDS	6,075	7,049	13,124
EQUITY	2,400	--	2,400
RSF	1,013	463	1,476
TOTAL	9,488	7,512	17,000
OPTION B			
TAX - EXEMPT BONDS	2,736	7,049	9,785
REA LOANS	2,332	--	2,332
EQUITY	2,700	--	2,700
RSF	888	463	1,351
TOTAL	8,656	7,512	16,168

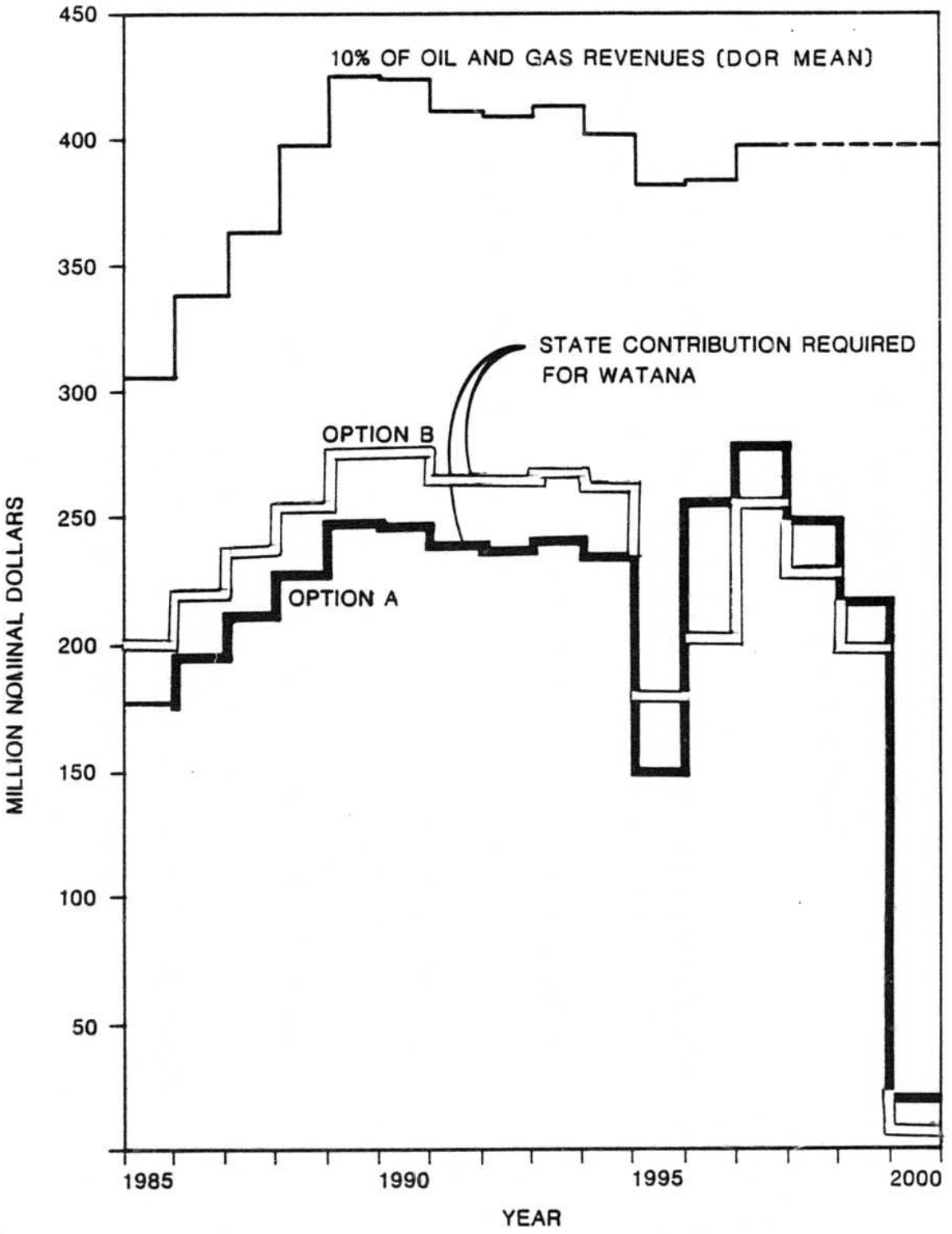
ENERGY COST COMPARISON



COMPARISON OF STATE EQUITY AND RSF CONTRIBUTIONS

(IN MILLION DOLLARS)

	OPTION A	OPTION B
NOMINAL DOLLARS		
EQUITY	$ 2,400	$ 2,700
RSF	1,013	888
TOTAL	$ 3,413	$ 3,588
IN 1983 DOLLARS		
EQUITY	$ 1,519	$ 1,707
RSF	396	347
TOTAL	$ 1,915	$ 2,054



YEARLY STATE CONTRIBUTIONS FOR FINANCING OPTIONS A AND B

ISSUES NEEDING RESOLUTION BEFORE SUSITNA PROJECT PLAN OF FINANCE CAN BE FINALIZED

A. ECONOMIC AND FINANCIAL VIABILITY OF THE PROJECT

- o ACCEPTABLE POWER RATES
- o PUBLIC SUPPORT
- o EXECUTIVE AND LEGISLATIVE COMMITMENT

ISSUES NEEDING RESOLUTION BEFORE SUSITNA PROJECT PLAN OF FINANCE CAN BE FINALIZED

B. VALID POWER SALES CONTRACTS

C. TAX-EXEMPT STATUS OF SUSITNA REVENUE BONDS

D. ABILITY AND WILLINGNESS OF REA TO GUARANTEE DEBT IN MEANINGFUL AMOUNTS

ISSUES NEEDING RESOLUTION BEFORE SUSITNA PROJECT PLAN OF FINANCE CAN BE FINALIZED

E. WILLINGNESS OF THE STATE TO ESTABLISH A DEDICATED REVENUE SOURCE TO SUPPORT THE PROJECTS FINANCING (PROPOSED MAJOR PROJECTS FUND)

F. WILLINGNESS OF THE STATE TO ALLOW THE USE OF ITS "MORAL OBLIGATION" TO SUPPORT PROJECT FUNDING NEEDS TO BE ASSESSED

G. WILLINGNESS OF RAILBELT UTILITIES (AND ULTIMATELY RAILBELT CONSUMERS) TO PAY A PREMIUM PRICE FOR SUSITNA ENERGY NEEDS TO BE EXPLORED AND VALIDATED

FUTURE SUSITNA PROJECT ACTIVITIES

- CONTINUE ENVIRONMENTAL STUDIES
- CONTINUE MITIGATION / SETTLEMENT ACTIVITIES
- NEGOTIATE POWER SALES AGREEMENTS
- FINALIZE FINANCIAL PLAN
- OBTAIN AUTHORIZATION AND FUNDING
- RECEIVE FERC LICENSE AND MAJOR PERMITS
- ACQUIRE PROJECT LANDS
- INITIATE DESIGN
- INITIATE CONSTRUCTION

SUMMARY

- DEMAND FOR POWER WILL EXCEED SUPPLY IN FUTURE YEARS
- A GENERATION PLAN MUST BE DEVELOPED TO MEET THE PROJECTED DEMAND
- THERE ARE SEVERAL ALTERNATIVES AVAILABLE TO MEET THIS PROJECTED DEMAND
- SUSITNA IS THE MOST ECONOMICAL OF THE ALTERNATATIVES
- ENVIRONMENTAL IMPACTS OF THE SUSITNA PROJECT ARE WITHIN ACCEPTABLE LIMITS. MITIGATION MEASURES SHOULD ACHEIVE NO NET LOSS OF FISH AND WILDLIFE RESOURCES
- THERE ARE SEVERAL FINANCING OPTIONS TO FINANCE THE PROJECT