SUSITNA-WATANA HYDRO *Clean, reliable energy for the next 100 years.*

SUSITNA-WATANA HYDROELECTRIC PROJECT

Fish and Aquatic Resources Technical Work Group Meeting 3nd Quarter 2013

September 23, 2013

ALASKA ENERGY AUTHORITY

RSP	RSP Title	3nd Quarter 2013 Activity
9.5	Fish Distribution and Abundance Upper River	ELH and FDA sampling, fish tagging and telemetry, weekly operation of rotary screw traps and pit arrays.
9.6	FDA Middle and Lower River	ELH and FDA sampling, fish tagging and telemetry, weekly operation of rotary screw traps and pit arrays.
9.7	Salmon Escapement	Fish wheel & weir operation, fish collection and tagging, telemetry surveys, aerial and ground escapement counts.
9.8	River Productivity	Two seasonal sampling events, Talkeetna reference sites, emergence trapping, pre- and post-storm sampling, colonization study initiated.
9.9	Habitat Characterization	Field survey initiated.
9.10	Future Reservoir and Entrainment	Rescheduled to 2014.
9.11	Fish Passage Feasibility	Meeting #2, updated background info. Revised schedule.
9.12	Fish Passage Barriers Middle and Upper River	Feld planning, coordination with data collection for modeling studies.
9.13	Access, Alignment, Transmission and Construction Area	Rescheduled to 2014.
9.14	Genetic Baseline	Field collections underway and completed for several species/lifestages.
9.16	Eulachon Run Timing, Distribution, and Spawning	2103 field effort completed: fish tagging and telemetry, sonar surveys, fish collection and confirmation of spawning sites.
9.17	Cook Inlet Beluga Whales	Aerial surveys continued, cameras installed.

FDA Program Upper River (RSP 9.5)

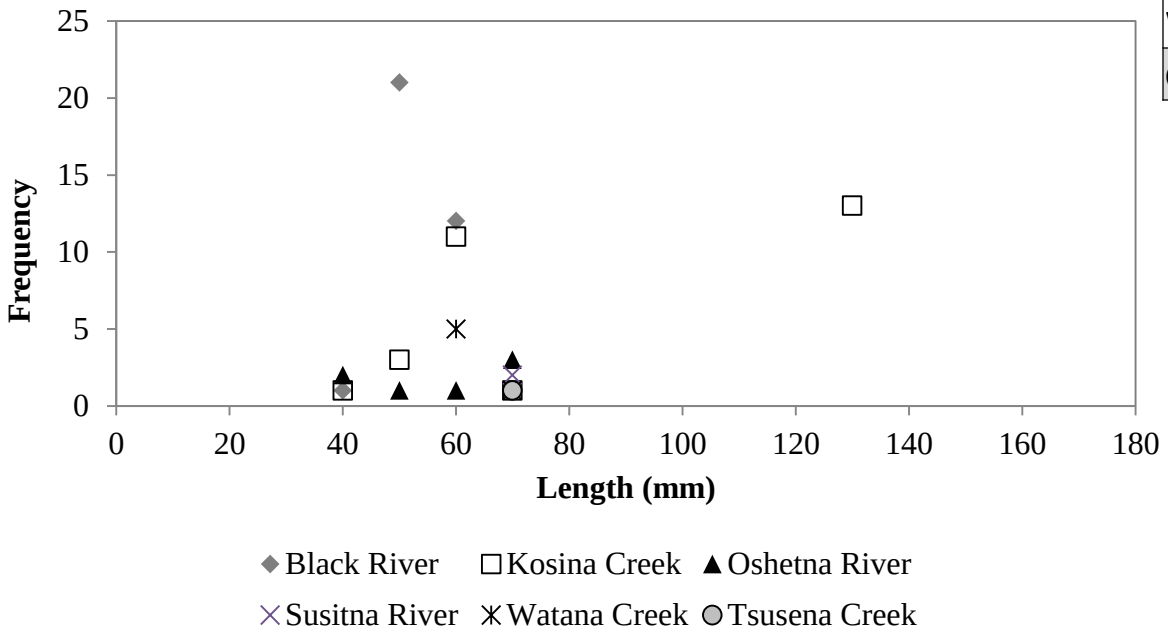
Fish sampling Event 1 occurred from July 15 through August 8.

A total of 135 fish were collected in the mainstem, and 4,083 fish were collected in tributaries.

A total of 53 Chinook were collected in 7 different streams. Size ranged from 38-127 mm

Collected Upper River Chinook Salmon

Stream	# of Juvenile Chinook
Black River	34
Kosina Creek	6
Oshetna River	5
Susitna River	5
Tsusena Creek	1
Watana Creek	2
Grand Total	**53**



Upper River Catch and Observed Totals by Geomorphic Reach

Fish Species	UR-3			UR-4			UR-5			UR-6		
	Obs.	Catch	Total	Obs.	Catch	Total	Obs.	Catch	Total	Obs.	Catch	Total
Artic grayling	0	3	3	0	10	10	0	2	2	0	10	10
Burbot	0	4	4	1	11	12	0	2	2	0	5	5
Chinook salmon	0	0	0	0	0	0	0	0	0	0	1	1
Chum salmon	0	0	0	0	0	0	0	0	0	0	0	0
Coho salmon	0	0	0	0	0	0	0	0	0	0	0	0
Dolly Varden	0	0	0	0	0	0	0	0	0	0	0	0
Humpback whitefish	0	1	1	0	0	0	0	0	0	0	0	0
Lamprey sp.	0	0	0	0	0	0	0	0	0	0	0	0
Longnose sucker	0	1	1	0	5	5	0	0	0	0	21	21
Pink salmon	0	0	0	0	0	0	0	0	0	0	0	0
Rainbow trout	0	0	0	0	0	0	0	0	0	0	0	0
Round whitefish	0	1	1	1	2	3	0	2	2	0	7	7
Salmonid sp.	0	0	0	0	0	0	0	0	0	0	0	0
Sculpin sp.	0	7	7	0	18	18	0	3	3	0	19	19
Slimy sculpin	0	0	0	0	0	0	0	0	0	0	0	0
Stickleback sp.	0	0	0	0	0	0	0	0	0	0	0	0
Whitefish sp.	0	0	0	0	0	0	0	0	0	0	0	0
Total	**0**	**17**	**17**	**2**	**46**	**48**	**0**	**9**	**9**	**0**	**63**	**63**

Tributary Catch Results (1 of 2)

Fish Species	Oshetna R.			Black River			Goose Ck.			Jay Ck.			Kosina Ck.			Tsisi Ck.			198.4 Ck.		
	Obs.	Catch	Total	Obs.	Catch	Total	Obs.	Catch	Total	Obs.	Catch	Total	Obs.	Catch	Total	Obs.	Catch	Total	Obs.	Catch	Total
Artic grayling	56	86	142	9	67	76	352	865	1217	3	14	17	63	20	83	100	99	199	5	10	15
Burbot	0	0	0	0	4	4	0	2	2	0	1	1	0	0	0	0	0	0	0	0	0
Chinook salmon	5	5	10	15	34	49	0	0	0	0	0	0	25	6	31	0	0	0	0	0	0
Chum salmon	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Coho salmon	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dolly Varden	0	0	0	0	0	0	0	0	0	20	91	111	0	0	0	0	0	0	3	22	25
Humpback whitefish	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lamprey sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Longnose sucker	0	1	1	0	1	1	3	4	7	0	0	0	0	0	0	0	0	0	0	0	0
Pink salmon	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rainbow trout	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Round whitefish	0	0	0	0	3	3	2	34	36	0	0	0	1	1	2	1	3	4	0	0	0
Salmonid sp.	0	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sculpin sp.	622	582	1204	327	303	630	102	132	234	4	20	24	26	64	90	68	176	244	2	76	78
Slimy sculpin	39	20	59	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Stickleback sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Whitefish sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0
Total	**723**	**707**	**1430**	**351**	**412**	**763**	**459**	**1037**	**1496**	**27**	**126**	**153**	**115**	**91**	**206**	**170**	**278**	**448**	**10**	**108**	**118**

Tributary Catch Results (2 of 2)

Fish Species	Watana Ck.			Tsusena Ck.			Middle River Above Devils Canyon	Fog Ck.			Chinook Ck.			Middle River Below Devils Canyon	Lane Ck.			Fifth of July Ck.		
	Obs.	Catch	Total	Obs.	Catch	Total		Obs.	Catch	Total	Obs.	Catch	Total		Obs.	Catch	Total	Obs.	Catch	Total
Artic grayling	397	185	582	2	56	58		0	0	0	0	0	0		0	0	0	2	0	2
Burbot	0	0	0	0	0	0		0	0	0	0	0	0		0	0	0	0	0	0
Chinook salmon	4	2	6	0	1	1		0	0	0	0	0	0		0	0	0	5	2	7
Chum salmon	0	0	0	0	0	0		0	0	0	0	0	0		0	0	0	10	0	10
Coho salmon	0	0	0	0	0	0		0	0	0	0	0	0		0	0	0	15	2	17
Dolly Varden	83	301	384	0	3	3		153	34	187	9	21	30		0	0	0	0	0	0
Humpback whitefish	0	0	0	0	0	0		0	0	0	0	0	0		0	0	0	0	0	0
Lamprey sp.	0	0	0	0	0	0		0	0	0	0	0	0		0	0	0	0	0	0
Longnose sucker	0	2	2	0	0	0		0	0	0	0	0	0		0	0	0	0	0	0
Pink salmon	0	0	0	0	0	0		0	0	0	0	0	0		80	0	80	126	0	126
Rainbow trout	0	0	0	0	0	0		0	0	0	0	0	0		0	0	0	8	1	9
Round whitefish	11	9	20	0	3	3		0	0	0	0	0	0		0	0	0	0	0	0
Salmonid sp.	0	0	0	0	0	0		0	0	0	0	0	0		0	0	0	0	0	0
Sculpin sp.	123	276	399	3	5	8		26	25	51	0	4	4		0	0	0	0	2	2
Slimy sculpin	0	0	0	0	0	0		0	0	0	0	0	0		0	0	0	0	0	0
Stickleback sp.	0	0	0	0	0	0		0	0	0	0	0	0		0	0	0	0	0	0
Whitefish sp.	0	0	0	0	0	0		0	0	0	0	0	0		0	0	0	0	0	0
Total	**618**	**775**	**1393**	**5**	**68**	**73**		**179**	**59**	**238**	**9**	**25**	**34**		**80**	**0**	**80**	**166**	**7**	**173**

Note that Middle River Tributaries are presented here for spatial comprehensiveness, but are part of Study 9.6

Oshetna Drainage

Kosina Creek

FDA Program Middle River (9.6)

Event 1 Fish Sampling from July 15 through August 11.

A total of 3,164 fish were collected in the mainstem.

Catch trended to increase lower in the system with the greatest numbers in MR-7.

Middle River Catch and Observed Totals Above Devils Canyon

Fish Species	Observed	Catch	Total
MR-1			
Arctic grayling	0	2	2
Burbot	0	2	2
Dolly Varden	0	1	1
Longnose sucker	0	1	1
Sculpin sp.	0	4	4
MR-2			
Arctic grayling	1	23	24
Burbot	0	4	4
Chinook salmon	0	1	1
Dolly Varden	0	2	2
Longnose sucker	0	12	12
Round whitefish	0	4	4
Sculpin sp.	0	36	36
Total	1	92	93

Middle River Catch and Observed Totals Below Devils Canyon

	MR-5			MR-6			MR-7			MR-8		
	Obs.	Catch	Total	Obs.	Catch	Total	Obs.	Catch	Total	Obs.	Catch	Total
Arctic grayling	0	0	0	0	6	6	0	0	0	0	1	1
Burbot	0	2	2	1	4	5	0	27	27	1	19	20
Chinook salmon	0	0	0	27	6	33	0	20	20	2	13	15
Chum salmon	24	0	24	42	1	43	1	17	18	13	1	14
Coho salmon	12	1	13	4	120	124	0	3	3	6	105	111
Dolly Varden	0	2	2	0	1	1	0	0	0	0	0	0
Humpback whitefish	0	0	0	0	5	5	0	4	4	0	0	0
Longnose sucker	1	75	76	55	22	77	3	15	18	57	71	128
Pacific salmon sp.	0	0	0	0	0	0	1	0	1	21	0	21
Pink salmon	13	1	14	122	12	134	10	20	30	4	0	4
Rainbow trout	0	10	10	1	2	3	0	12	12	0	12	12
Round whitefish	0	1	1	0	6	6	3	21	24	0	6	6
Salmonid sp.	0	0	0	5	0	5	0	0	0	8	1	9
Sculpin sp.	17	156	173	51	191	242	66	122	188	28	98	126
Slimy sculpin	0	0	0	0	0	0	0	0	0	12	16	28
Sockeye salmon	0	4	4	1	17	18	0	12	12	0	14	14
Stickleback sp.	0	0	0	0	0	0	0	0	0	5	68	73
Threespine stickleback	0	0	0	0	1	1	235	1309	1544	6	350	356
Whitefish sp.	2	0	2	1	0	1	0	0	0	0	0	0
Total	**69**	**252**	**321**	**310**	**394**	**704**	**319**	**1582**	**1901**	**163**	**775**	**938**

Middle River, ELH Sampling

- 2 Sampling Events in Q3 2013:
  - June 3-14 and June 16-30: Whiskers Slough, Oxbow Island, Slough 8A, Slough 11/Gold Creek, Indian River, Side Channel 21
  - Focus on finding juvenile salmon in spawning and rearing habitats
- 6, 40-m sites per location
- Methods: backpack electrofishing, fyke net, seine, minnow trapping, snorkel
- 15 species and >2,000 fish collected for 4 ELH events.

Middle River, Preliminary ELH Data

MR 6, Slough 21, PRM 144		
Species	**Lifestage**	**No.**
Burbot	Adult + Juv	14
Chinook Salmon	Juvenile	3
Humpback Whitefish	Adult	1
Longnose Sucker	Adult + Juv	40
Sculpin	Unknown	15

Middle River, Preliminary ELH Data

MR 6, Slough 11 , PRM 138			MR 6, Indian River, PRM 141		
Species	**Lifestage**	**No.**	**Species**	**Lifestage**	**No.**
Arctic Grayling	Juvenile	1	Burbot	Adult	2
Chinook Salmon	Juvenile	16	Chinook Salmon	Juvenile	66
Chum Salmon	Juvenile	716	Chum Salmon	Juvenile	9
Coho Salmon	Juvenile	3	Coho Salmon	Juvenile	12
Longnose Sucker	Adult + Juv	3	Dolly Varden	Juvenile	1
Rainbow Trout	Adult	4	Humpback Whitefish	Juvenile	1
Round Whitefish	Adult	5	Longnose Sucker	Adult + Juv	119
Sculpin	Unknown	120	Pink Salmon	Juvenile	3
Sockeye Salmon	Juvenile	191	Rainbow Trout	Adult + Juv	4
			Sculpin	Unknown	35

Middle River, Preliminary ELH Data…cont.

MR 6, Slough 8A, PRM 128		
Species	**Lifestage**	**No.**
Burbot	Adult + Juv	14
Chinook Salmon	Juvenile	6
Chum Salmon	Juvenile	12
Coho Salmon	Juvenile	4
Dolly Varden	Juvenile	1
Longnose Sucker	Adult + Juv	30
Rainbow Trout	Adult + Juv	4
Round Whitefish	Adult	3
Sculpin	Undetermined	46

MR 7, Oxbow Island, PRM 113		
Species	**Lifestage**	**No.**
Burbot	Adult + Juv	3
Chinook Salmon	Juvenile	26
Chum Salmon	Juvenile	18
Coho Salmon	Juvenile	48
Humpback Whitefish	Juvenile	1
Longnose Sucker	Adult + Juv	58
Rainbow Trout	Adult	2
Sculpin	Undetermined	20
Sockeye Salmon	Juvenile	1

Middle River, Preliminary ELH Data…cont.

MR 8, Whiskers Slough, PRM 104		
Species	**Lifestage**	**Number**
Arctic Lamprey	Juv	4
Burbot	Adult + Juv	7
Chinook Salmon	Juvenile	181
Chum Salmon	Juvenile	2
Coho Salmon	Juvenile	19
Humpback Whitefish	Adult + Juv	10
Longnose Sucker	Adult + Juv	69
Rainbow Trout	Adult	4
Round Whitefish	Adult	8
Sculpin	Unknown	44
Sockeye Salmon	Juvenile	2
Threespine Stickleback	Unknown	13

Middle River, FDA

- 2 Sampling Events in Q3 2013:
  - July and mid and August 20 – September 6
  - 48 GRTS sampling locations in 10 FAs.
- Method effectiveness varies by habitat: fyke net, seine, minnow trap, snorkel, electrofish
- 6 RSTs and PIT arrays

MR FAs, FDA Sampling

- 2 Events July 18 - August 10 and August 20 ~ Sept 11 (5 day weather interruption).
- Preliminary data for Event 1, 4 FAs and 31 sites
- 12 species, 5 Pacific salmon
- 2,089 fish recorded

Rotary Screw Traps

Preliminary Data through July 2013

Trap Location	Fish Species	Total Fish Count
Kosina Creek	Arctic grayling	8
	*Chinook salmon**	*12*
Oshetna River	Arctic grayling	99
	burbot	1
	humpback whitefish	1
	longnose sucker	19
	round whitefish	2
	sculpin	3

* August data

Rotary Screw Traps

Preliminary Data through July 2013

Trap Location	Fish Species	Total Fish Count
Indian River	Arctic grayling	30
	Chinook salmon	238
	chum salmon	146
	coho salmon	130
	Dolly Varden	12
	humpback whitefish	1
	longnose sucker	1
	pink salmon	300
	rainbow trout	9
	round whitefish	4
	sockeye salmon	148

Rotary Screw Traps

Preliminary Data through July 2013

Trap Location	Fish Species	Total Fish Count
Talkeetna Station	Arctic grayling	44
	burbot	4
	chum salmon	91
	Chinook salmon	126
	coho salmon	38
	Dolly Varden	5
	humpback whitefish	20
	lamprey	1
	longnose sucker	66
	pink salmon	32
	sculpin	32
	sockeye salmon	32
	rainbow trout	11
	round whitefish	32

Rotary Screw Traps

Preliminary Data through July 2013

Trap Location	Fish Species	Total Fish Count
Montana Creek	Arctic lamprey	5
	Chinook salmon	153
	chum salmon	33
	coho salmon	15
	Dolly Varden	4
	ninespine stickleback	1
	pink salmon	7
	rainbow trout	8
	round whitefish	1
	sculpin	2
	sockeye salmon	261
	threespine Stickleback	14

RSP 9.6 FDA ML – Early Summer Session

- Middle River Main/Side Channels

  36 habitats among 9 Focus Areas
  - 23 Main Channel
  - 11 Side Channels
  - 2 Split Main

  Sampling below Devils Canyon

  - July 27 and August 4, 2013
    - Sampling yielded a total of 216 fish
    - 68 were Pacific Salmon (13 Chum, 1 Chinook, 7 Coho, 1 Sockeye, and 39 Pink)

  Sampling above Devils Canyon

  – Aug 10-16, 2013
    - Sampling yielded a total of 254 fish
    - Arctic Grayling (43), Round Whitefish (7), Longnose Sucker (6), Burbot (3)
    - Slimy Sculpin (195)

RSP 9.6 FDA ML – Early Summer Session

- Lower River Transects - July 7 and 26, 2013
  - 44 sites sampled along 10 transects
  - Abundance transects PRM34.0, PRM56.1, PRM70.8 and PRM100.3
  - Habitats sampled include
    - 10 Main Channel/Bar Island Complex
    - 10 Side Channel/Side Channel Complex
    - 6 Tributaries
    - 6 Tributary Deltas
    - 4 Side Sloughs
    - 3 Upland Sloughs
    - 4 Slough Mouths
    - 3 Additional Open Waters

RSP 9.6 FDA ML – Early Summer Session

Lower River Transects

- Sampling yielded a total of 3,681 fish
- 470 Pacific Salmon - majority (422) juvenile salmon (Chinook, Sockeye, Coho, Chum)
- The majority fish captured (~2,500) were sticklebacks (spp.)
- Other Species –
- Rainbow trout, Burbot, Grayling,
- Arctic Lamprey, Northern Pike,
- Dolly Varden, Round Whitefish,
- Ninespine Stickleback, Longnose Sucker

RSP 9.6 FDA ML – Early Summer Session

- DNA samples were collected
- No Lower River fish captured during this early summer session were radiotagged.

FDA Upper, Middle and Lower River (RSP 9.5 and 9.6)

Variances (page number from FERC Study Plan Determination or RSP Section in parantheses)

1. Landowner access restrictions resulted in:
   - sampling in habitat units that could be accessed below the ordinary high water mark (B-124, B-140)
   - loss of 6 fixed telemetry stations upstream of Indian Creek (B-146 – B-147) so daily telemetry surveys were added, and
   - no RST in the mainstem upstream of proposed dam site for 2103 (B-134).

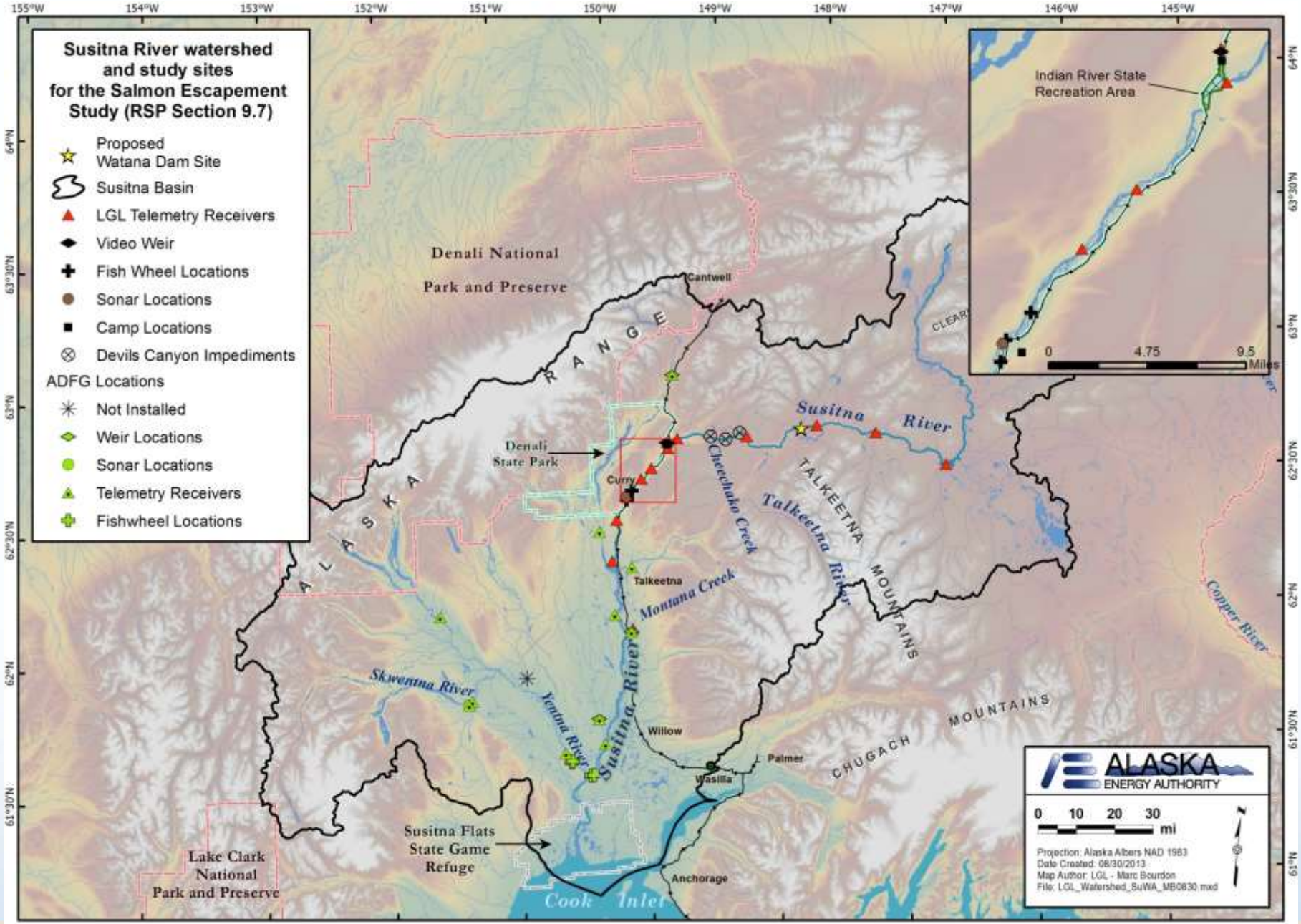
2. Time required to conduct surveys resulted in variance from 500m unit length for all mainstem FDA sampling. 500m completed for boat elecrofishing but unit size was decreased for other methods; 100m in UR, 200m in LR (B-124 – B-126).

3. Multi-pass relative abundance sampling was not attainable. Permit restrictions denied multi-pass electrofishing and logistic constraints prevented multi-pass snorkeling (RSP 9.6.4.3.1).

RSP 9.7 Salmon Escapement – Q3 2013 Study Highlights

Lower, Middle & Upper River

- Intense fishwheel operations
  - 2 @ Yentna River
  - 2 @ PRM 36 near Yentna
  - 3 @ PRM 126 near Curry
- Sonar (ARIS) operated at Curry, Chulitna, & Talachulitna
- Picket weirs operated at Indian, Montana, & Deshka
- 23 fixed radio-telemetry stations operated in the basin
- Over 60 days of aerial telemetry surveys flown
- Sonar surveys conducted at proposed dam site (feasibility) and throughout Middle River below DC (spawning turbid water assessments)


Susitna River watershed and study sites for the Salmon Escapement Study (RSP Section 9.7)
Proposed Watana Dam Site
Susitna Basin
LGL Telemetry Receivers
Video Weir
Fish Wheel Locations
Sonar Locations
Camp Locations
Devils Canyon Impediments
ADFG Locations
Not Installed
Weir Locations
Sonar Locations
Telemetry Receivers
Fishwheel Locations
Indian River State Recreation Area
0 4.75 9.5 Miles
Denali National Park and Preserve
Cantwell
ALASKA RANGE
Susitna River
Denali State Park
Curry
Checchaka Creek
TALKEETNA MOUNTAINS
Talkeetna
Talkeetna River
Montana Creek
Skwentna River
Yentna River
Susitna River
Willow
Palmer
Wasilla
CHUGACH MOUNTAINS
Susitna Flats State Game Refuge
Lake Clark National Park and Preserve
Anchorage
Cook Inlet
Copper River
ALASKA ENERGY AUTHORITY
0 10 20 30 mi
Projection: Alaska Albers NAD 1983
Date Created: 08/30/2013
Map Author: LGL - Marc Bourdon
File: LGL_Watershed_SuWA_MB0830.mxd

RSP 9.7 Salmon Escapement

Susitna River RM 30 effort and catches through 8/26

- operated 6/3 to 8/31
- ~12 hours/day/fishwheel of effort
- gill net fished only as long as necessary
- Radio tags applied to salmon at RM 30
  - 700 Chinook total
    - 577 Chinook via fishwheels
    - 123 Chinook via gill net
  - 200 pink via fishwheels
  - 596 coho via fishwheels

RSP 9.7 Salmon Escapement

Yentna River effort and catches through 6/29

- operated 6/2 to 6/30
- ~12 hours/day/fishwheel of effort
- gill net fished only as long as necessary
- Radio tags applied to salmon
  - 690 Chinook total
    - 423 Chinook via fishwheels
    - 267 Chinook via gill net

RSP 9.7 Salmon Escapement

LOWER RIVER

Preliminary summary of catches at Susitna River RM 30 through 8/26

Species	Total Catch	Min	Max	Avg	n	DNA	Scales
FISH WHEEL							
Chinook (≥50 cm MEF)	--	50	99	65	1,079	574	NC
Chinook (<50 cm MEF)	--	25	50	37	828	3	NC
Chinook (all sizes)		--	--	--	--	--	--
Sockeye Salmon	624	NC	NC	NC	NC	NC	NC
Pink Salmon	34,093	NC	NC	NC	NC	NC	NC
Chum Salmon	3,505	NC	NC	NC	NC	NC	NC
Coho Salmon	3,272	25	62	50	3,235	596	NC
Other species	249	NC	NC	NC	NC	NC	NC
GILL NET							
Chinook (≥50 cm MEF)	--	51	110	68	153	111	NC
Chinook (<50 cm MEF)	--	49	49	49	3	0	NC
Chinook (all sizes)	167	--	--	--	--	--	--

NC=not collected

RSP 9.7 Salmon Escapement

Preliminary summary of catches at the Yentna River through 8/26

Species	Total Catch	Min	Max	Avg	n	DNA	Scales
FISH WHEEL							
Chinook (≥50 cm MEF)	--	50	92	59	348	348	NC
Chinook (<50 cm MEF)	--	21	50	35	1,070	0	NC
Chinook (all sizes)	2,008	--	--	--	--	--	--
Sockeye Salmon		NC	NC	NC	NC	NC	NC
Pink Salmon		NC	NC	NC	NC	NC	NC
Chum Salmon		NC	NC	NC	NC	NC	NC
Coho Salmon		NC	NC	NC	NC	NC	NC
Other species		NC	NC	NC	NC	NC	NC
GILL NET							
Chinook (≥50 cm MEF)	268	53	107	77	268	267	NC
Chinook (<50 cm MEF)	0	--	--	--	--	--	--

NC=not collected

RSP 9.7 Salmon Escapement

Montana Creek Weir

To establish mark rates from RM 30 tagging

- Operated June 17 – now
- Weir topped August 21-25
- ~2,015 Chinook counted
- ~681 coho counted
- Radio-tagged fish detected from fixed and aerial telemetry

RSP 9.7 Salmon Escapement

Deshka River Weir

To establish mark rates from RM 30 tagging

- Operated June 9 – now
- ~18,523 Chinook counted
- ~22,238 coho counted
- Radio-tagged fish detected from fixed and aerial telemetry

RSP 9.7 Salmon Escapement

Chulitna River

To establish mark rates from RM 30 tagging

- Operated June 20 – August 2
- sonar used instead of weir due to water depth & velocity
- fish counts generated post-season
- Radio-tagged fish detected from fixed and aerial telemetry

RSP 9.7 Salmon Escapement

Talachulitna River

To establish mark rates from Yentna tagging

- Operated June 8 – July 31
- sonar used instead of weir due to water depth & velocity
- fish counts generated post-season
- radio-tagged fish detected from fixed and aerial telemetry

RSP 9.7 Salmon Escapement

<u>Curry effort and catches through 8/26</u>

- 2,300 hours of fishwheel effort, ~12+ hrs/day/fw
- 3rd fishwheel site mid July due to changes in river channel; 2-3 fishwheels operated since.
- Radio tags applied to salmon at Curry
  - 603 Chinook
    - 536 (≥ 50 cm MEF) and 67 (< 50 cm MEF);
  - 200 pink
  - 201 chum
  - 137 sockeye
  - 207 coho (ongoing)

RSP 9.7 Salmon Escapement

Preliminary summary of fishwheel catches through 8/26

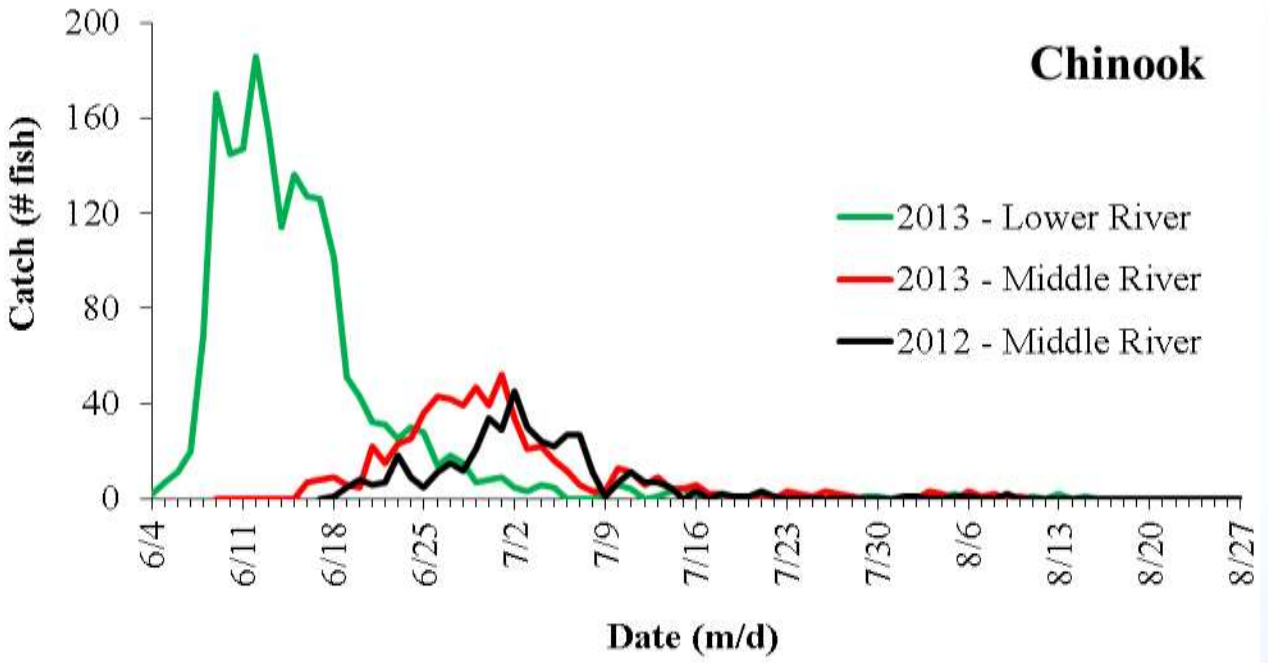
MIDDLE RIVER

Species	Total Catch	MEF/FL (cm) Min	Max	Avg	n	Biosamples DNA	Scales
Chinook (≥50cm MEF)	618	50	110	70	576	542	283
Chinook (<50cm MEF)	333	23	49	36	319	67	33
Sockeye Salmon	272	24	64	45	260	136	86
Pink Salmon	15,659	31	61	42	1,695	199	0
Chum Salmon	3,263	27	70	59	1,288	201	2
Coho Salmon	1,473	31	84	51	928	208	114
Arctic Grayling	53	20	40	34	51	40	0
Dolly Varden	14	19	43	29	13	11	0
Longnose Sucker	18	20	39	29	19	4	0
Rainbow Trout	56	15	46	32	51	30	0
Round Whitefish	103	14	39	27	101	56	0
Humpback Whitefish	18	24	38	29	16	10	0

RSP 9.7 Salmon Escapement

Run timing through 8/26; catches at Lower and Middle River sites

MIDDLE RIVER

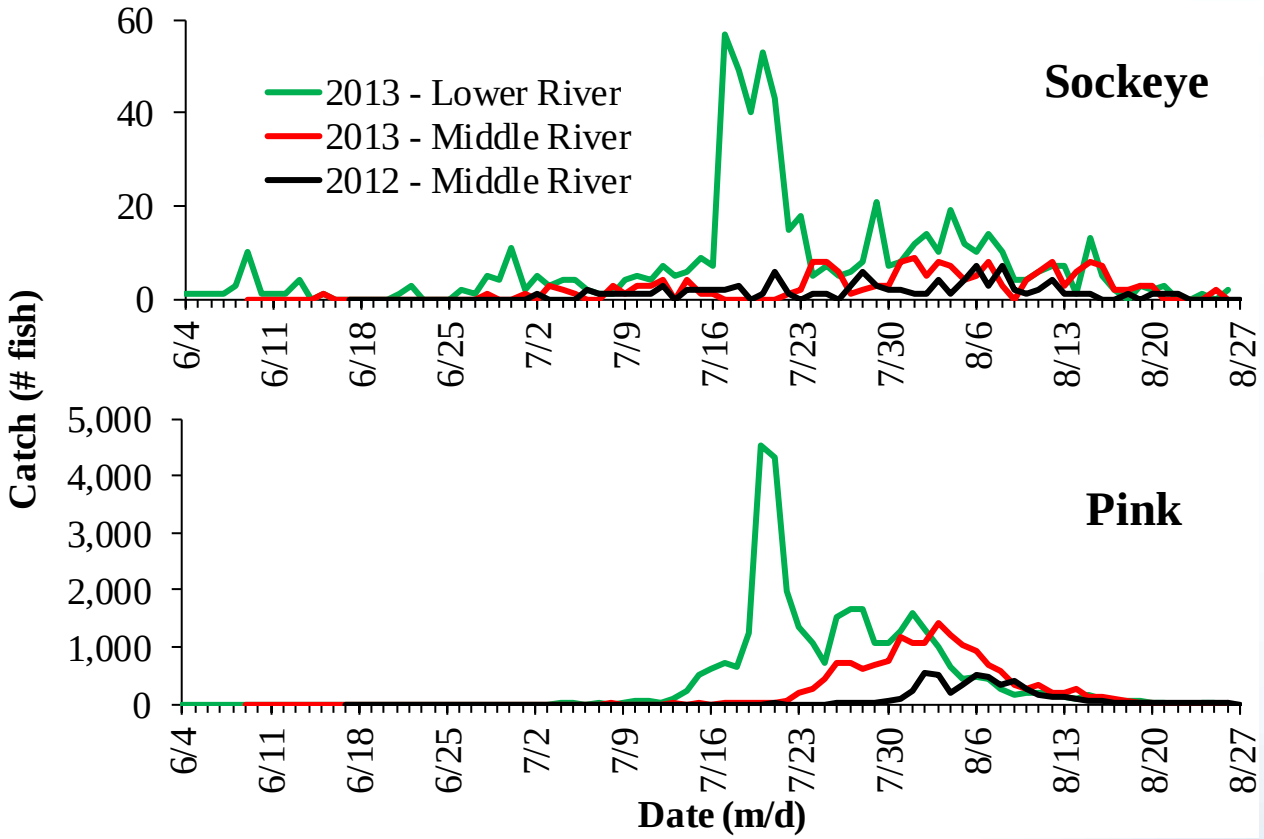


SUSITNA-WATANA HYDRO *Clean, reliable energy for the next 100 years.*

ALASKA ENERGY AUTHORITY

RSP 9.7 Salmon Escapement

Run timing through 8/26; catches at Lower and Middle River sites

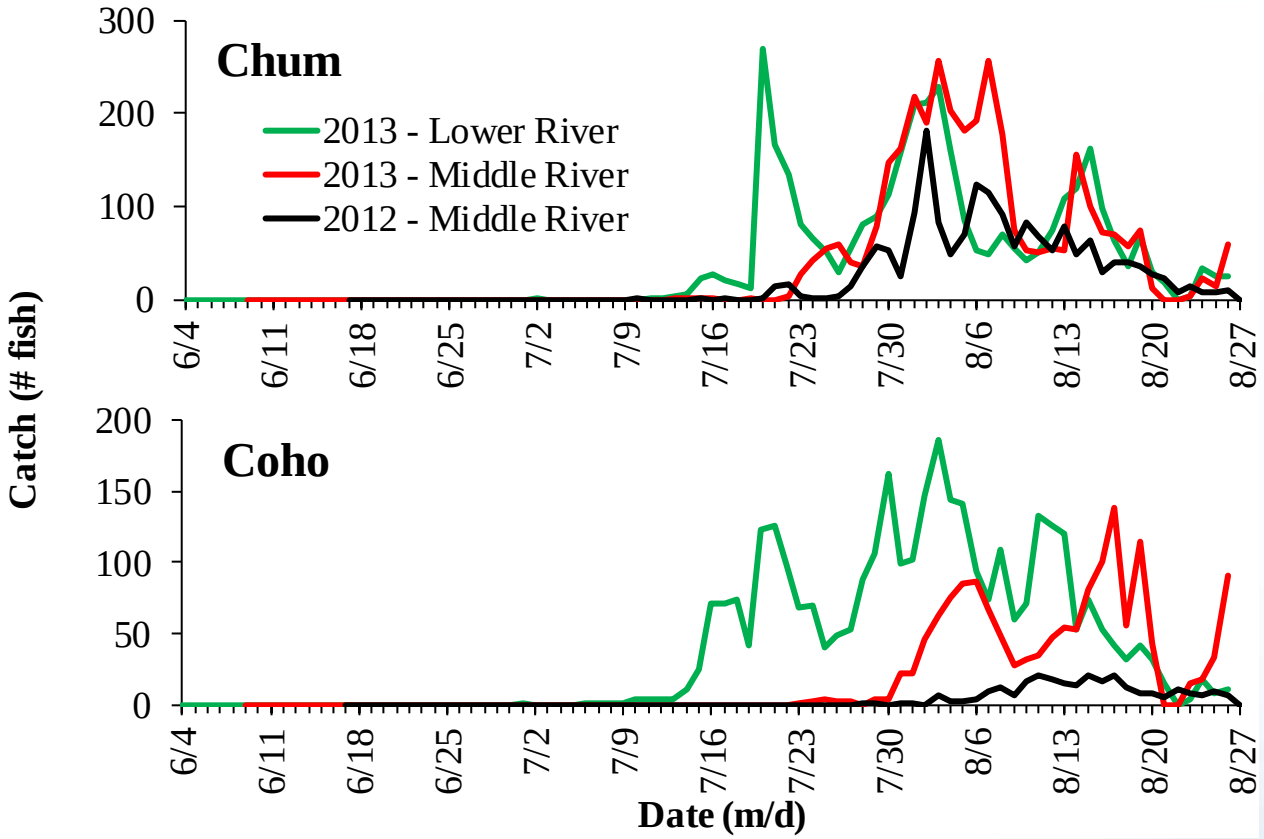


SUSITNA-WATANA HYDRO *Clean, reliable energy for the next 100 years.*

ALASKA ENERGY AUTHORITY

RSP 9.7 Salmon Escapement

Run timing through 8/26; catches at Lower and Middle River sites



SUSITNA-WATANA HYDRO *Clean, reliable energy for the next 100 years.*

ALASKA ENERGY AUTHORITY

RSP 9.7 Salmon Escapement

Indian River Weir & U/W Video

To establish mark rates from Curry tagging

- Operated June 27 – Aug 20
- Weir topped July 19-20
- ~1,300 Chinook examined
- Radio-tagged fish observed visually (spaghetti) and detected from fixed and aerial telemetry.
- Most of video from Aug 2-20 yet to review (pink & chum)

RSP 9.7 Salmon Escapement

Telemetry - Spawning Distribution

Monitoring

- 12 fixed stations
- Daily aerial surveys

Preliminary destinations

- Chinook to Indian & Portage
- Sockeye and pinks to mainstem habitats
- All species showed movement to downstream tributaries more prevalent than 2012

Devils Canyon

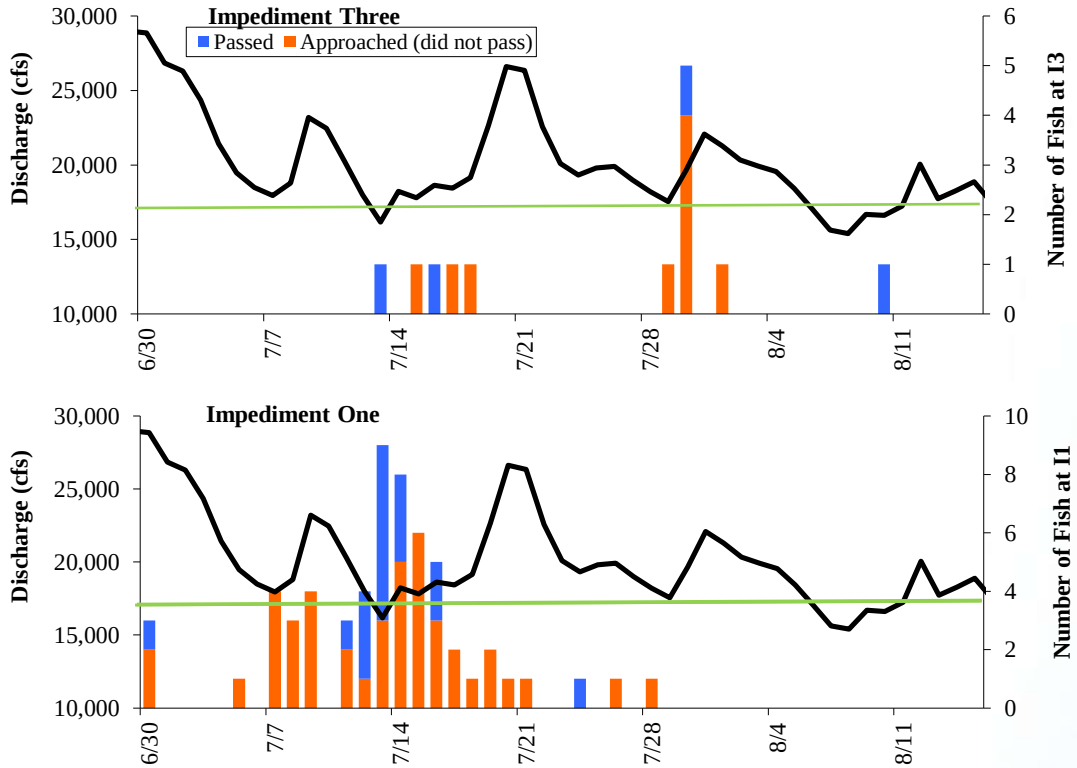
- Four out of 13 tagged Chinook salmon appeared to pass Impediment 3.
- Two Chinook salmon stayed above DC

RSP 9.7 Salmon Escapement

Chinook Salmon Passage through DC

MIDDLE & UPPER RIVER

13 Jul @ 16,200
16 Jul @ 18,600
30 Jul @ 19,600
10 Aug @ 16,600



Susitna discharge @ Gold Creek, Orange = last day of approach, Green line = 17kcfs

SUSITNA-WATANA HYDRO *Clean, reliable energy for the next 100 years.*

ALASKA ENERGY AUTHORITY

RSP 9.7 Salmon Escapement

Turbid Water Surveys using Sonar

Surveys for Chinook in mainstem habitats

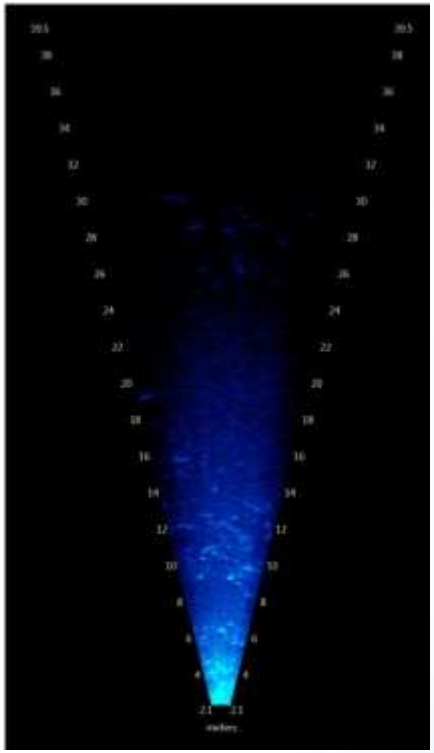
- Operated July 24 – 31 from Gateway to Portage Creek
- Confluence of tributaries and sloughs targeted based on telemetry
- Fish observed on sonar at all locations
- No spawning behavior observed. Identification of redds did not appear feasible due to substrate type and bathymetry

RSP 9.7 Salmon Escapement

Sonar at Watana Dam Site

Test the feasibility of sonar to count fish near dam site

- Conducted July 19 – 23
- Three sites inventoried and sampled
- Conclude that it is feasible to count adult salmon using ARIS sonar, assuming several environmental and logistical conditions can be achieved.



RSP 9.7 Salmon Escapement

Variances from Study Plan

- Sonar, not weir, at Talachulitna River
  - water depth & velocity too great for weir
  - sonar used instead, obtained from Lake Creek site
- No weir or sonar at Lake Creek
  - water depth & velocity too great for weir
  - no direct access to site
  - sonar unit re-assigned to Chulitna River, a higher priority area

RSP 9.7 Salmon Escapement

Variances from Study Plan

- No tagging and fixed stations at Devils Canyon
  - Increased Chinook tagging at Curry
    - Revised goal 560 fish >50 cm
    - Tagged 536 fish ≥50 cm, and 67 fish <50 cm
  - Flew DC daily and twice per day during Chinook run
- ARIS sonar used for turbid water spawning in place of combined DIDSON and Side-scan sonar.
- Operated a weir on Indian River to obtain mark-rate information on Chinook and other species (instead of spawning ground surveys).

RSP 9.7 Salmon Escapement

LOWER & MIDDLE RIVER

Fieldwork in September

- Operate fishwheels through September as long as water and weather permit
- Continue to operate ARIS Sonar.
  - It has operated downstream of the site 1 fishwheel continuously since June 7, 2013
- Aerial and fixed station tracking of coho and any other species still alive
- Remove Deshka River and Montana Creek weirs week of Sept. 9th

Adult Salmon Aerial Counts- Devils Canyon to Oshetna River

Streams Surveyed

1. Indian River (control)
2. Cheechako Creek
3. Chinook Creek
4. Devil Creek
5. Fog Creek
6. Fog Creek Trib L1
7. PRM 184.0
8. PRM 184.0 Trib R1
9. Tsusena Creek
10. Deadman Creek
11. Watana Creek
12. Watana Trib R5
13. Kosina Creek
14. Gilbert Creek
15. Tsisi Creek
16. Tsisi Lakes 1 and 2
17. Jay Creek
18. Goose Creek
19. Oshetna River
20. Black River

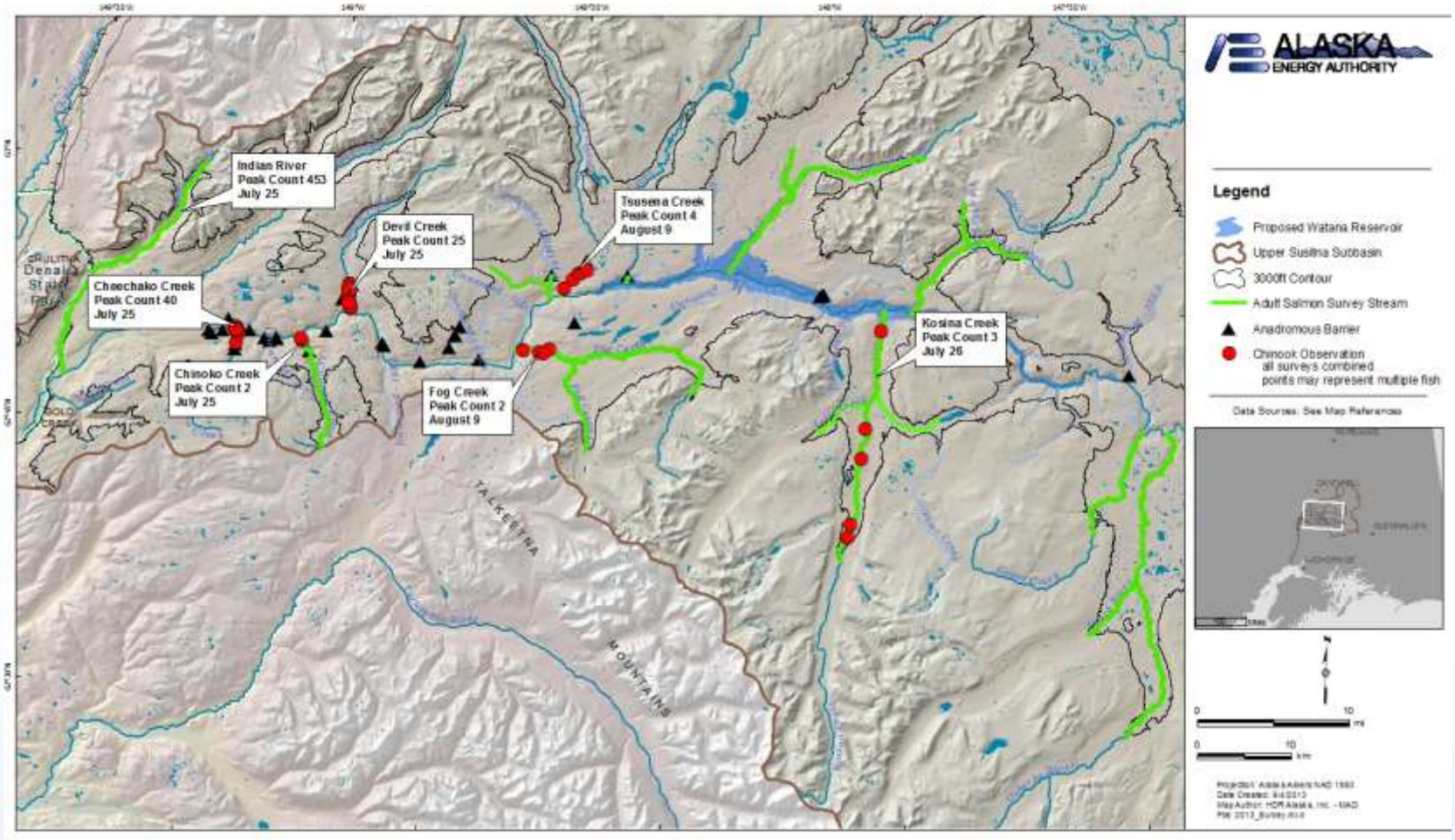
Adult Chinook Salmon Observations

Stream	Survey 1 (July 19-21)	Survey 2 (Jul 25-27)	Survey 3 (Aug 1-3)	Survey 4 (Aug 8-10)	Survey 5 (Aug 14-16)
Cheechako	5	40	24	16	1
Chinook	0	2	1	0	0
Devil	7	25	15	12	0
Fog	0	1	0	2	2
Tsusena	0	0	0	4	2
Kosina	2	3	0	0	0

All 5 surveys completed as scheduled

- Survey Conditions
  - Weather was not a factor
  - Black and Oshetna below Black zero visibility due to glacial origin
  - Lower Watana and Jay limited visibility due to landslides
  - White water, overhanging vegetation, and canyons are limiting factors
- Chinook salmon found in 6 tributaries
- Compared to 2012:
  - Chinook salmon were not observed in Tsusena during 2012
  - Cheechako and Devil had significantly fewer fish during 2012
  - Kosina had the most fish during 2012

Adult Salmon Aerial Counts- Devils Canyon to Oshetna River



SUSITNA-WATANA HYDRO *Clean, reliable energy for the next 100 years.*

ALASKA ENERGY AUTHORITY

RSP 9.8 River Productivity Study

3nd Quarter 2013 Activities:

- Two seasonal collection events
  - June 19 to July 1, and July 9 to 18 (early summer)
  - August 12 to 21, and August 29 to 31 (summer)
- Emergence trap deployment and sampling
- Colonization study sampler deployment
  - H-D samplers at 4 sites in FA-104
- Storm Event Sampling
  - Coincided with summer sampling event

RSP 9.8 River Productivity Study

Spring Seasonal Sampling Event

- Established 20 sites in five study areas, plus 3 “reference” sites on the Talkeetna River

Date Sampled	Name	Focus Area	Sites	Macrohabitats
6/29 – 7/1	Montana Creek	RP-81	4	MC, SC, US, TM
6/19 – 6/23	Whiskers Creek	FA-104	5	MC, SC, SS, US, TM
6/25 – 6/27	Indian River	FA-141	4	MC, SC, US, TM
7/9 – 7/11	Stephan Lake Complex	FA-173	4	MC, SC, SS, TM
7/12 – 7/13	Watana Dam	FA-184	3	MC, SC, TM
7/17 – 7/18	Talkeetna River	TKA	3	SC, SS, US

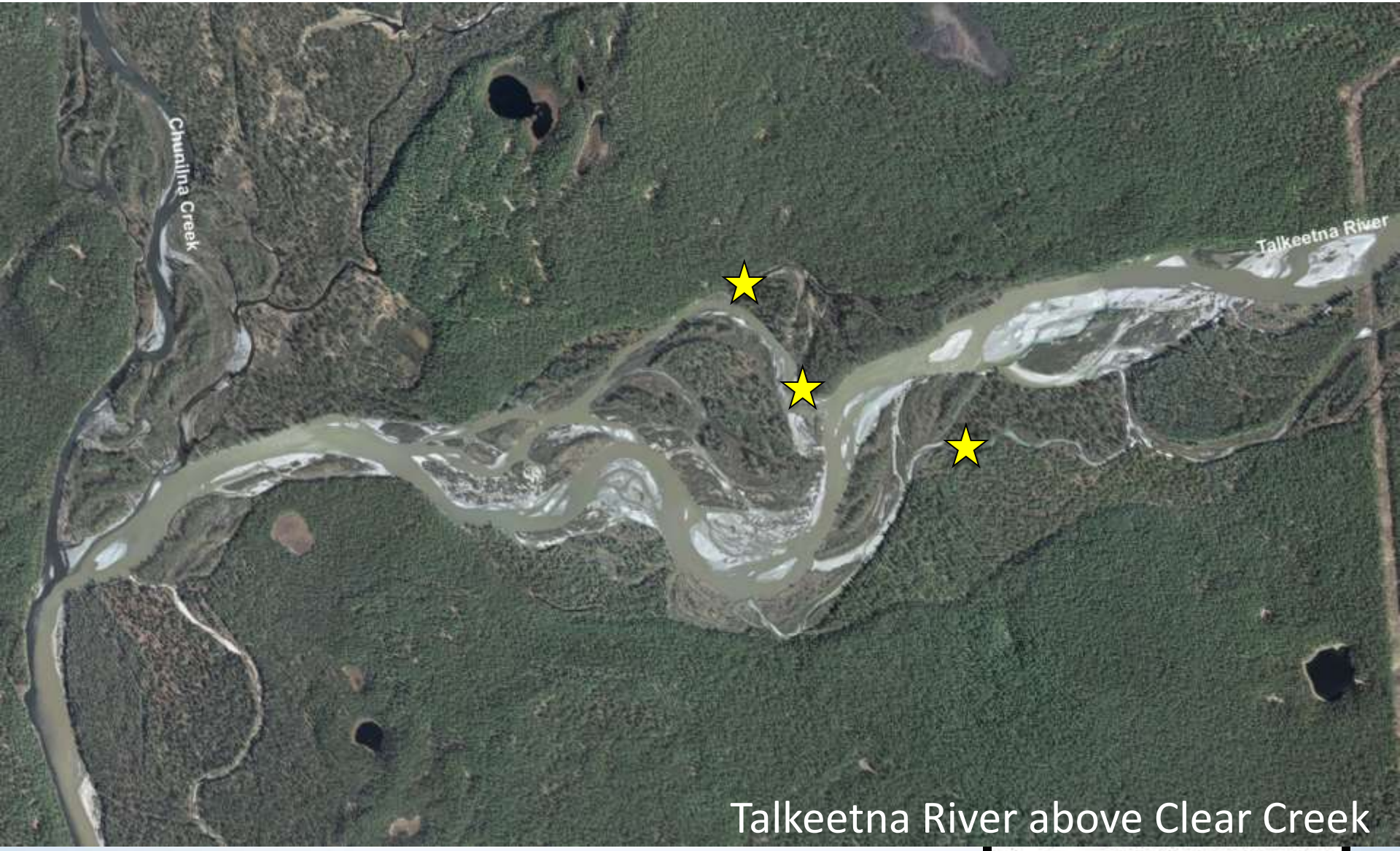
RSP 9.8 River Productivity Study

FERC SPD recommended 2 consultations:

1. Locations of isotope sampling
   - To be completed today.

2. Takeetna reference site location
   - In field reconnaissance and site selection on July 16, 2013.
   - 6 sites visited.
   - 3 sites selected near confluence of Clear Creek: upland slough, side slough, side channel (main channel).

Talkeetna Reference Sites



RSP 9.8 River Productivity Study

- Approximately 474 samples collected
  - 105 Hess samples
  - 120 Chl-a samples
  - 120 AFDM samples
  - 41 LWD (snag) samples
  - 42 Drift samples
  - 25 Grab samples
  - 25 Plankton Tows

RSP 9.8 River Productivity Study

Spring Seasonal Sampling Event – Stable Isotopes

- Approximately 294 total stable isotope samples collected at four stations (FA-104, FA-141, FA-184, and RP-81).
  - 53 Algae samples
  - 75 Organic Matter samples
  - 71 Benthic Macroinvertebrate samples (ID'd and sorted into FFGs):
    - 23 Collector
    - 14 Grazer
    - 14 Shredder
    - 20 Grazer
  - 18 Benthic and 12 Drift samples yet to be ID'd and sorted into FFGs
  - 15 Terrestrial Invertebrate samples
  - 68 Fish Tissue (fin clip) samples

RSP 9.8 River Productivity Study

Spring Seasonal Sampling Event

- Fish Sampling – Gut contents, scales, and fin clips

Sampling Station	Habitat Type	Chinook juvenile			Coho juvenile			Rainbow juvenile			Rainbow adult		
		Lavage	Scales	Isotopes	Lavage	Scales	Isotopes	Lavage	Scales	Isotopes	Lavage	Scales	Isotopes
Montana Creek RP-81	Mainstem												
	Side Channel												
	Tributary Mouth	8	8	8	8	8	8	8	8	8			
	Upland Slough	8	8	8	8	8	8						
Whiskers Creek FA-104	Mainstem												
	Side Channel												
	Tributary Mouth	8	8	8							3	3	3
	Side Slough												
	Upland Slough												
Indian River FA-141	Mainstem												
	Side Channel												
	Tributary Mouth	8	8	8	8	8	8	1	1	1			
	Upland Slough												
Stephan Lake Complex FA-173	Mainstem												
	Side Channel												
	Tributary Mouth												
	Side Slough												
Watana Dam FA-184	Mainstem												
	Side Channel												
	Tributary Mouth												
Totals		**32**	**32**	**32**	**24**	**24**	**24**	**9**	**9**	**9**	**3**	**3**	**3**

RSP 9.8 River Productivity Study

Summer Seasonal Sampling Event

- Revisited and sampled 20 sites in five study areas, plus 3 "reference" sites on the Talkeetna River

Date Sampled	Name	Focus Area	Sites	Macrohabitats
8/14 – 8/15	Montana Creek	RP-81	4	MC, SC, US, TM
8/12 – 8/13, 8/16	Whiskers Creek	FA-104	5	MC, SC, SS, US, TM
8/17 – 8/18	Indian River	FA-141	4	MC, SC, US, TM
8/19 – 8/20	Stephan Lake Complex	FA-173	4	MC, SC, SS, TM
8/20 – 8/21	Watana Dam	FA-184	3	MC, SC, TM
8/29	Talkeetna River	TKA	3	SC, SS, US

RSP 9.8 River Productivity Study

Emergence Trap Sampling

- Traps installed at all 20 sampling sites during the spring seasonal sampling event
- First collection of all traps on week of 7/28
  - One quarter damaged by bears or missing
  - Many main channel and side channel traps stranded on shore by receding waters or boat waking.
- Checking approx. every 2 weeks

RSP 9.8 River Productivity Study

Colonization Sampling Task

- Four locations established in FA-104 representing different turbidity and temperature conditions
  - Clear vs. Turbid, Warm (ca. 13°C) vs. Cold (< 13°C)
- First sets deployed on August 1 – 2 (8 week sets)
- Additional sets for 6, 4, 2, and 1 week periods.
- Final retrieval of all sets: Sept 26 – 27

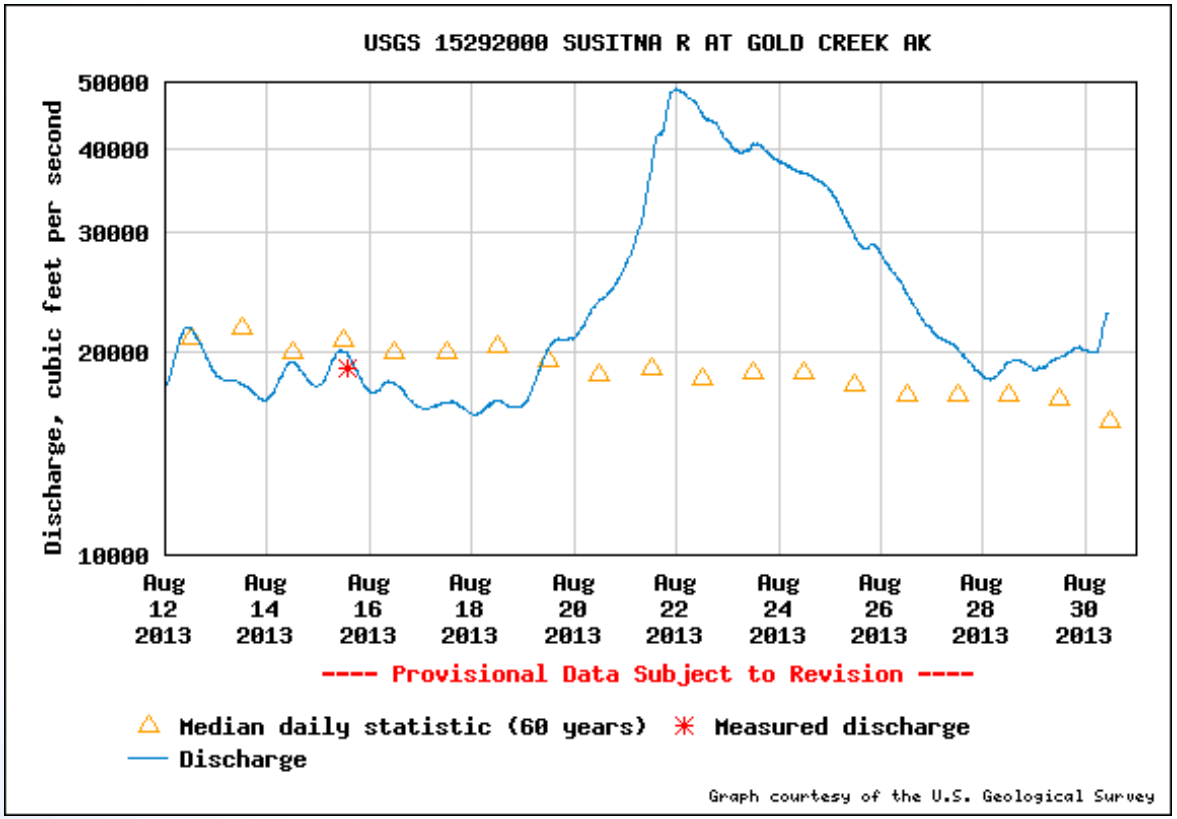
RSP 9.8 River Productivity Study

Storm Event Sampling

- Study Plan: Replicate samples (n=5) will be collected at both the upstream and downstream ends of each slough, and will include benthic macroinvertebrates, algae, and BOM.
- Implementation Plan: Side sloughs in FA-104 and FA-144
  - FA-144 was evaluated in June/July, and possessed few riffles. Fine sediments, very low flows. Considered unsuitable for Hess and algae sampling.

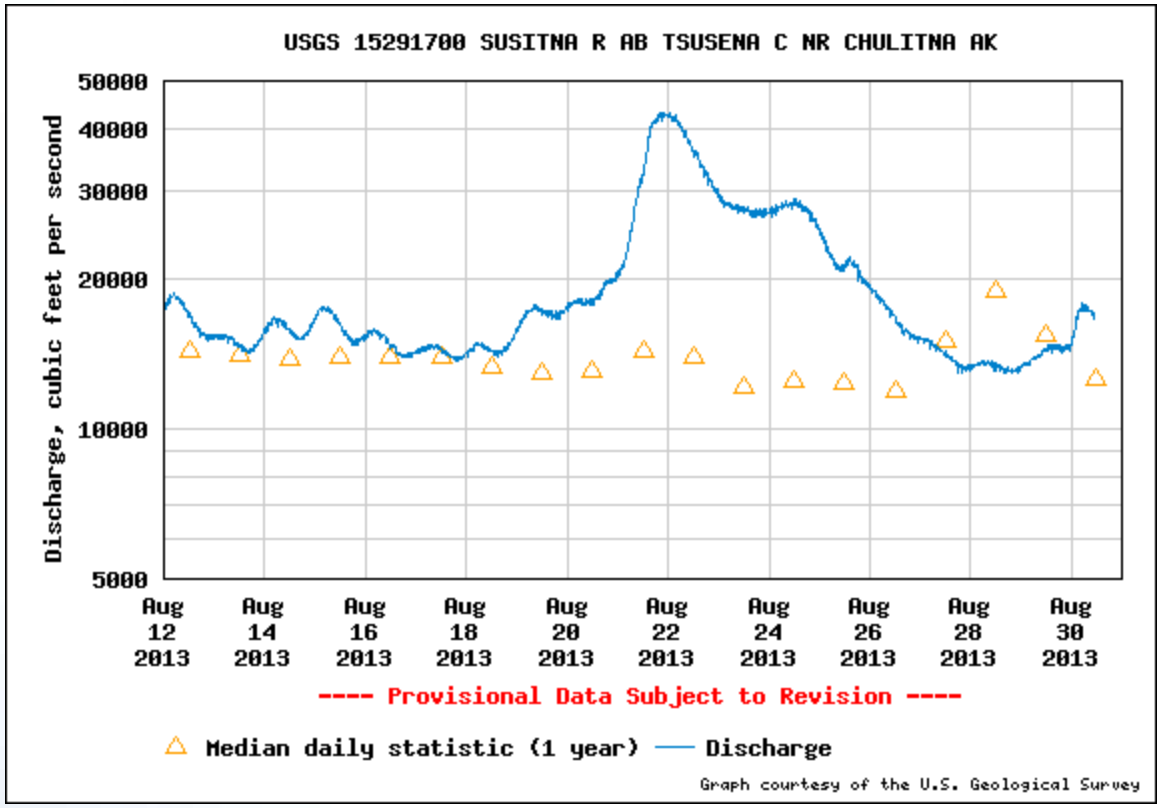
RSP 9.8 River Productivity Study

Storm Event Sampling: August Storm Event



RSP 9.8 River Productivity Study

Storm Event Sampling: August Storm Event



RSP 9.8 River Productivity Study

Storm Event Sampling

- August storm event occurred near the conclusion of the summer seasonal sampling event
- In order to obtain data from this storm event, samples collected for the summer event used as pre-storm samples.
  - Side sloughs from FA-104 and FA-173
  - Provided five replicate samples throughout the side slough, as opposed to at both upstream and downstream ends.
- Post-storm event sampling repeated at these sites

RSP 9.8 River Productivity Study

4th Quarter 2013

- Fall seasonal sampling event scheduled for Sept 21 – October 4.
- Colonization samples to be collected Sept. 26-27
- Emergence trap sampling to conclude with fall seasonal sampling event.
- Second storm event sampling.

RSP 9.8 River Productivity Study

Variances:

- Frequent and rapid river stage changes prevented:
  - sampling limited to instances where substrates had been inundated continually for 30 days (RSP 9.8.4.2.1.; IP 2.2.1.)
  - conduct of extensive transects of depths and velocities for each Hess sample (IP 2.2.1.)
- Lower River site was moved from Trapper Creek to Montana Creek to co-location with FD&A sampling (IP 2.1.3.)
- Access to private land was denied and prevented sampling the FA- 173 upland slough. A small unnamed tributary mouth was substituted (FERC SPD).

RSP 9.8 River Productivity Study

Variances:

- An unanticipated large storm occurred in August and resulted in changes to Storm Event Sampling (RSP 9.8.4.2.1.)
  - Site selection for FA-144 was replaced by FA-173 side slough because FA-144 did not display suitable habitat for Hess sample collection (IP 2.1.2.)
  - Sampling efforts did not establish upper end and lower end sites. Sampling repeated seasonal event sampling efforts for a before-after data set.
- Dry weights for macroinvertebrate taxa will not be taken solely by oven dry weights (RSP 9.8.4.2.1; IP 2.2.2.), but will be estimated using length-weight relationship data and methods utilized by the UAF Wipli Lab to reduce sample processing time and costs

RSP 9.8 River Productivity Study

Variances:

- Algae samples were taken from stones and woody debris as opposed to fine sediment in grab samples because:
  - the top portions from a grab sample cannot be kept intact or isolated from the rest of the collected sample.
  - algae samples were collected following USGS NAWQA protocols, which recommend epilithic or epidendric sampling.
  - NAWQA protocols do not sample fine-sediments for Chl-A or AFDM estimates.

RSP 9.8 River Productivity Study

Variances:

- Plankton tows were conducted at five still water sites, six less than that recommended by the FERC SPD
  - One site established at each station: 4 upland sloughs, and 1 side slough.
  - FERC recommended sampling one side slough, one trib mouths, and one upland slough (if present) at each station (a potential total of 11).
  - Most River Productivity sites are riffle/run habitats, with flow. Upland sloughs are the exception. In cases where stream velocities were not high enough to take drift net samples, plankton tows were used as a substitute.
  - Plankton tows and grab samples were taken together.

RSP 9.9 Habitat Characterization and Mapping Study

- Training and habitat surveys initiated August 2.
- 88% of FA habitats surveyed in August within MR 2, 5, 6, 7, 8.
- 49% of accessible, randomly-selected mainstem habitat units surveyed in August, including all primary MR and UR units.
- 8 of 38 accessible UR tributary geomorphic reaches have been surveyed.

RSP 9.11 Fish Passage Feasibility Study

- Conducted Meeting #3 on July 9, 2013
  - Updates on workshop information, meeting notes, schedule.
- Updated biological appendices to include additional target species information.
- Site Reconnaissance Trip
  - September 17 -20.
  - FPTWG members to observe site prior to beginning the brainstorming and concept development, and begin discussions on concepts.

RSP 9.14 Genetic Baseline Study

Q3 2013 highlights

- Field collections underway
  - Adult salmon: by ADF&G on spawning grounds, backup by LGL at Curry fishwheels, Indian River weir
  - Juvenile Chinook salmon: above Devils Canyon underway, Lower River will be in September by ADF&G
  - Resident species: collections throughout drainage by ADF&G and other contractors on interrelated studies

RSP 9.14 Genetic Baseline Study

Collection progress through August 16th, 2013

Expected collections met:

- Adult Chinook salmon from Lower River, Middle River below Devils Canyon, Talkeetna, and Chulitna rivers.
- Adult pink salmon from Middle River below Devils Canyon, Talkeetna R.
- Adult sockeye and chum salmon from Middle River below Devils Canyon
- Juvenile Chinook salmon from above Devils Canyon
- Resident fish in seven combinations of species by location

Samples archived from adult salmon radio tagged at Curry

- > 600 Chinook, ~ 200 each of pink, chum, and coho, ~ 110 sockeye salmon

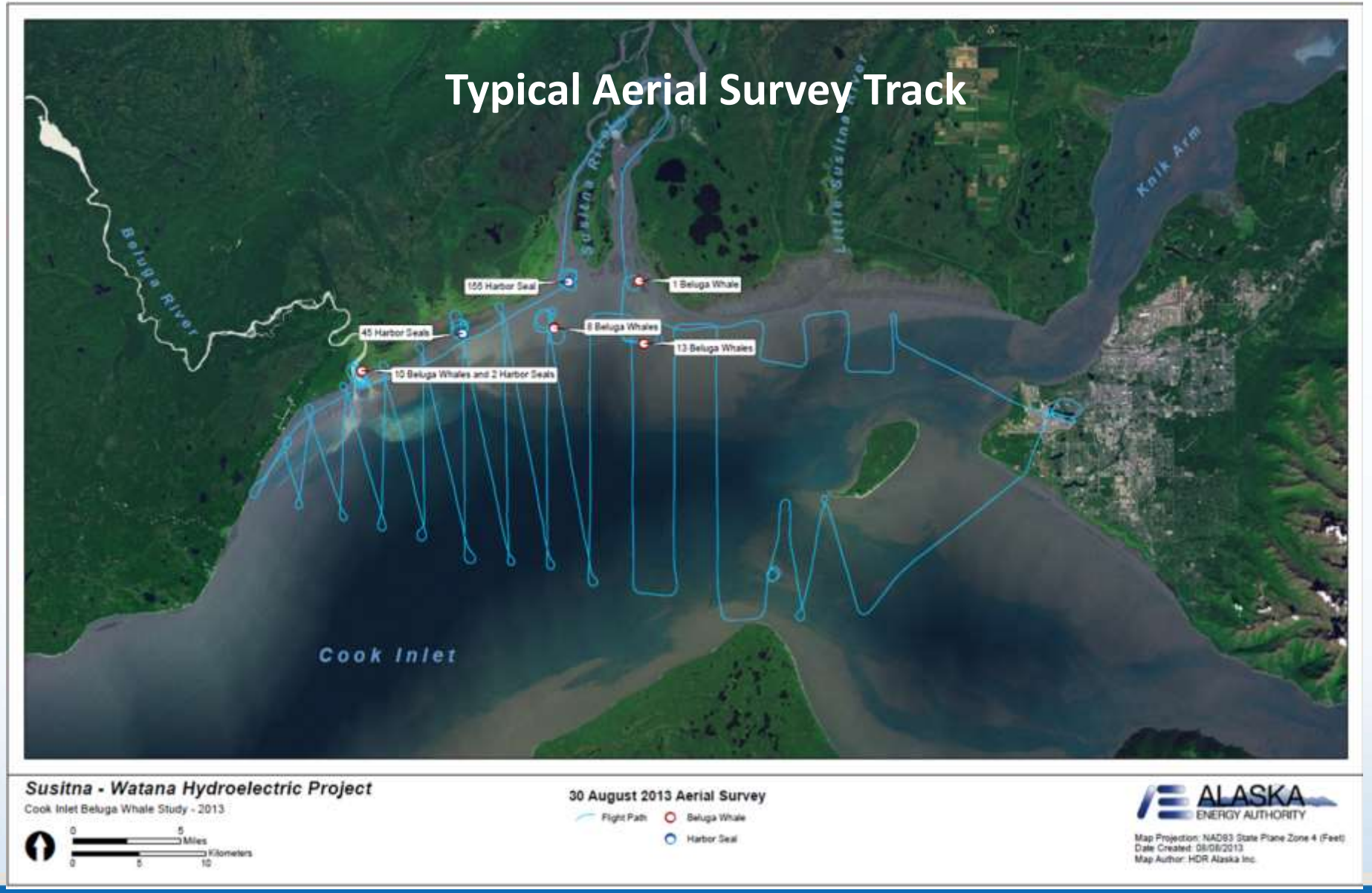
Tissues from interrelated studies archived at ADF&G's Gene Conservation Lab

RSP 9.17 Cook Inlet Beluga Whale Study

Aerial Survey Summaries

Date	Survey Start	High Tide	Low Tide	Beluga-White	Beluga-Gray	Beluga – Dark Gray
May 6	10:00	17:58	12:01	6	1	0
May 13	12:20	09:21	16:43	17	1	0
May 19	13:30	15:23	09:33	2	1	0
May 27	10:30	08:55	16:21	34	6	0
Jun 11	14:30	09:07	16:22	68	6	0
Jun 21	15:00	18:55	12:59	25	0	0
Jun 27	09:45	10:42	17:45	0	0	0
Jul 05	12:00	06:45	13:53	33	6	0
Jul 17	15:18	14:59	21:12	115	3	1
Jul 30	14:10	14:23	20:15	123	13	1
Aug 15	07:57	15:00[1]	09:00[1]	143	8	0
Aug 24	11:31	10:06	16:54	67	10	1
Aug 30	14:15	16:34	22:23	28	2	2

RSP 9.17 Cook Inlet Beluga Whale Study



RSP 9.17 Cook Inlet Beluga Whale Study

Remote Camera Summary

Still Cameras – PRM 10-12

- Four cameras installed June 21
- Photos through late August reviewed – no beluga whales

Video Cameras – Near River Mouth

- Cameras installed late June
- Logistics problems with antenna installation through July 15
- Technical difficulties with system ongoing
- Still cameras installed September 3 to ensure some data collection
- Planning to install hard drives for the video cameras to ensure video recordings

RSP 9.17 Cook Inlet Beluga Whale Study

Variance:

1. Remote operation of video cameras not working as planned.
   - Logistics problems with antenna installation through July 15.
   - Technical difficulties with system ongoing.
   - Still cameras installed September 3 to ensure some data collection.
   - Will try installing hard drives for the video cameras to ensure video recordings .